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July 4, 1978 Volume 972 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Access to Interference Settlement Agreements by Government Agencies

Under the provisions of 35 U.S.C. § 135(c), a party to an interference filing a copy of a settlement agreement may request that the copy be kept separate from the file of the interference, and made available only to Government agencies on written request, or to any person on a showing of good cause.

In order to provide the parties with a record of the inspection of such agreements by Government agencies, a representative of an agency will henceforth be required to present a written request, similar to the following, for each interference in which the inspection and/or copying of the agreement(s) is desired:

> Date: ______________
>
> To: Clerk, Board of Patent Interferences
>
> Pursuant to the provisions of 35 USC 135(c), please permit ____
> the bearer(s) of this letter, to [ ] inspect and/or [ ] copy the settlement agreement(s) filed in Interference No. ________________________________
> The information gained from such inspection and/or copying will be kept in confidence and will not be disclosed to any other person except for official investigative or law enforcement purposes.
>
> ________________________________
> Name, Title
>
> ________________________________
> Agency

The request will be placed in the folder containing the copy of the agreement, where it may be inspected by the parties of their authorized representatives.

This procedure will be applicable only to inspection or copying by the representatives of Government agencies, since no person other than a representative of a Government agency, or of a party, will be granted access to a copy of an interference settlement agreement which is kept separate from the interference file except by way of a petition for access thereto, see M.P.E.P. § 1002.02(k), item 2, and the parties to the interference are normally provided with copies of any such petition.

LUTRELLE F. PARKER.
Acting Commissioner of Patents and Trademarks.

Date: June 5, 1978.

Board of Appeals Decisions Rendered in the Month of May 1978

Affirmed	194
Affirmed in Part	24
Reversed	87
Total	305

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,139,947, M. W. Beardsley, AIR CUSHION VEHICLE FOR TRAVELING OVER IRREGULAR TERRAIN; **3,140,687**, same, WATER TRAVERSING AIR CUSHION VEHICLE, **filed** Jan. 3, 1978, United States Court of Claims (District of Columbia), Doc. 7-78, *A. Fred Starobin v. The United States.*

3,140,687. (See 3,139,947.)

3,415,129, R. D. Stamm, DUAL BAND PUSHBUTTON TUNER; **3,463,017**, Stadium and Smart, same, **filed** Feb. 27, 1976, D.C. Del. (Wilmington), Dec. 76–97, *General Instrument Corporation v. Lear Jet Stereo, Inc.* Plaintiff's voluntary dismissal, without prejudice, Aug. 5, 1976.

3,463,017. (See 3,415,129.)

3,480,905, J. A. Toedtman, ELECTRICAL CONNECTOR MANIFOLD; **3,528,051**, Toedtman and Cooper, FLEXIBLE INSULATING SHEATH; **3,644,876**, same, ELECTRICAL CONNECTOR, **filed** June 17, 1977, D.C. Conn. (Hartford), Doc. H–77–292, *International Telephone & Telegraph Corp. v. Burndy Corporation.*

3,528,051. (See 3,480,905.)

3,636,903, Anderson and Munn, RECTANGULAR-DUCT FORMING MACHINE; **3,722,443**, same, METHOD OF FORMING A RECTANGULAR HEAT DUCT; **3,757,830**, same, RECTANGULAR AIR DUCT, **filed** May 16, 1972, D.C., N.D. Ind. (South Bend), Doc. 72–S102, *Manufacturers Systems, Inc. v. ADM Industries, Inc.* Judgment is entered for defendants, ADM Industries, Inc., Indiana Tool & Mfg. Inc., Drexell (Rex) L. Simpson and AMS of Indiana, Inc. and against plaintiff, Manufacturer System Inc. and to recover costs laid out.

3,644,878. (See 3,480,905.)

3,650,460, B. P. Lokey, PAPER BAG; **3,687,356**, Goodrich and Waxlax, GUSSETED TYPE BAGS, **filed** July 6, 1973, D.C. S.D.N.Y. Doc. 73–C–2983, *Gilman Paper Company v. St. Regis Paper Company.* **Same, filed** May 29, 1973, D.C., S.D. Iowa (Des Moines) Doc. 73–117–2, *Great Plains Bag Corp. v. St. Regis Paper Company.* Dismissed Jan. 1, 1978.

3,687,356. (See 3,650,460.)

3,722,443. (See 3,636,903.)

3,757,830. (See 3,636,903.)

3,961,460, Jelling, Kahn, Moore, Friedman, BAGGING APPARATUS WITH BAG SPREADING DEVICE AND BRAKING DEVICE; **3,990,625**, same, SPECIAL BAGS FOR BAGGING APPARATUS, **filed** Apr. 1, 1977, D.C.N.J. (Newark), Doc. 77–0645, *Murray Jelling et al. v. American Poly Bag Corporation.*

3,967,752, D. F. Cudzik, EASY-OPEN WALL, **3,967,753**, same, **filed** Jan. 23, 1978, D.C. Colo. (Denver), Doc. 78–F–0079 *Reynolds Metals Company v. Ball Corporation.*

3,967,753. (See 3,967,752.)

3,990,625. (See 3,961,460.)

4,033,058, G. F. Lyman, PICTURE DISPLAY STAND, **filed** Jan. 25, 1978, D.C. Mass. (Boston), Doc. CA78–0239–F, *Data Packaging Corporation v. Charles D. Barnes Company.*

4,062,302, B. J. Krizan, SHELVING ASSEMBLY WITH REMOVABLE DIVIDER INSERTS, **filed** Feb. 27, 1978, D.C., S.D. Fla. (West Palm Beach), Doc. 78–843–C–CF, *Safco Products Co. v. Kole Enterprises, Inc.*

D. 214,063, I. J. Alligood, INDUSTRIAL VACCUM CLEANING UNIT, **filed** Sept. 3, 1976, D.C., N.D. Okla., Doc. 76–C465–C, *National Systems, Inc. and Ira J. Alligood, Jr. v. Bob Smith, doing business as Delco Manufacturing Co.* **Same, filed** Sept. 3, 1976, D.C., N.D. Okla. (Tulsa), Doc. 76–C–466–C, *National Systems, Inc. and Ira J. Alligood, Jr. v. Okie Manufacturing Co. et al.* In a spirit of settlement and compromise, and by consent and agreement of the plaintiffs and the defendants herein, Jan. 23, 1978.

D. 237,169, Hill and Marquardt, EXTENDED COUPLING FOR A TRAILER, **filed** July 13, 1976, D.C., E.D. Ill. (Danville), Doc. 76–2–096, *Tri-Star Corporation v. Dean Johns, doing business as Dean John's Trailer Sales.* That U.S. Design Patent No. 237,169, is good and valid and that defendant Dean Johns has infringed said patent. That a permanent injunction issue enjoining defendant Dean Johns, etc., from infringing said patent; and that no award for recovery of profits and damages is made.

D. 237,349, S. S. Broussard, TRIVET, **filed** July 14, 1976, D.C. E.D. La. (New Orleans), Doc. 76–2148, *Sandra S. Broussard v. Betty Reeves and Lou Bland, doing business as Betty-Lou Creations.*

D. 242,573, P. G. Kelman, EARRING, **filed** Nov. 10, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–4217–MML, *Pepi Kelman v. Tony Jewelers.* Filed consent judgment and order thereon that patent is good and valid, that defendant has infringed on said patent and that defendant is permanently enjoined from infringement of plaintiff's patent, Jan. 16, 1978.

D. 243,217, E. E. Warsaw, SOFA, **filed** Feb. 1, 1978, D.C., E.D. Wash. (Spokane), Doc. C–78–32, *Sheffield Furniture Corp. v. Mount Adams Furniture.*

D. 245,299, P. Beck, WALL MOUNTED RACK FOR BEER CANS OR THE LIKE, **filed** Jan. 17, 1978, D.C., N.D. Ill (Chicago) Doc. 78c154, *G. Pierce Toy Mfg. Co. Inc. v. Classic Products, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 236,874, Re. S.N. 905,570, Filed May 12, 1978, Cl. D8/317, PULL, Raymond U. H. Tegner, Owner of Record: *Amerock Corp., Rockford, Ill.*, Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

3,498,135, Re. S.N. 897,871, Filed Apr. 19, 1978, Cl. 73/425.6, PIPETTE, Lamont J. Seitz, et al., Owner of Record: *Baxter Laboratories Inc., Morton Grove, Ill.*, Attorney or Agent: Lawrence W. Flynn, et al., Ex. Gp.: 244

3,640,467, Re. S.N. 895,529, Filed Apr. 11, 1978, Cl. 239/224, ATOMIZER WHEEL WITH WEAR-RESISTANT, SINTERED BUSHINGS, Aage Moller, et al., Owner of Record: *Aktieselskabet Niro Atomizer, Soborg, Denmark*, Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 313

3,686,118, Re. S.N. 899,091, Filed Apr. 21, 1978, Cl. 210/31 C, CHROMATOGRAPHIC METHOD, James R. Benson, Owner of Record: *Durrum Chemical Corp., Palo Alto, Calif.*, Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 176

3,956,378, Re. S.N. 904,941, Filed May 11, 1978, Cl. 260/533 N, PROCESS FOR THE MANUFACTURE OF UNSATURATED ALDEHYDES AND ACIDS FROM THE CORRESPONDING OLEFINS, Robert K. Grasselli, et al., Owner of Record: *The Standard Oil Co., Cleveland, Ohio*, Attorney or Agent: Herbert D. Knudsen, et al., Ex. Gp.: 126

4,016,772, Re. S.N. 903,444, Filed May 5, 1978, Cl. 74/243 R, SPROCKET MEMBER CONFIGURATION, Donald E. Clemens, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.*, Attorney or Agent: Charles L. Rowe, Ex. Gp.: 345

4,035,801, Re. S.N. 904,727, Filed May 10, 1978, Cl. 343/12 R, MULTIPLE RANGING DME, Wayne L. Miller, Owner of Record: *The Cessna Aircraft Co., Wichita, Kans.*, Attorney or Agent: Joseph A. Degrandi, et al., Ex. Gp.: 222

4,042,537, Re. S.N. 901,927, Filed May 1, 1978, Cl. 260/2.5 AP, PROCESS FOR THE PRODUCTION OF POLYURETHANE FOAMS, Manfred Dahm, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany*, Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 141

4,042,612, Re. S.N. 899,683, Filed Apr. 24, 1978, Cl. 260/448.8 R, POLYMERIC ALKOXYSILANES, Walter L. Magee, Jr., Owner of Record: *Stauffer Chemical Co., Westport, Conn.*, Attorney or Agent: Ellen P. Trevors, et al., Ex. Gp.: 126

4,049,320, Re. S.N. 905,659, Filed May 15, 1978, Cl. 301/13 SM, VEHICLE WHEELS, SPACERS AND DUAL RIMS, Robert A. DeRegnaucourt, et al., Owner of Record: *Dayton-Walther Corp., Dayton, Ohio*, Attorney or Agent: Mack D. Cook II, Ex. Gp.: 311

PATENT NOTICES

Certificates of Correction for the Week of July 4, 1978

Re. 29,352
D. 242,096
3,638,941
3,815,836
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4,083,705
4,085,168
4,087,538
4,092,889

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,516,527. A. S. Radford, G. T. A. Blakey, G. E. P. Constable, G. E. Cullen and R. Swarbrick, TOKEN CONTROL ACCESS-CONTROL EQUIPMENT AND ITEM-DISPENSING SYSTEMS INCLUDING SUCH EQUIPMENT, final judgment adverse to the patentees was rendered Mar. 21, 1974, as to claims 1, 4 and 7.

Patent No. 3,678,421. I. Ono, PRESET DEVICE FOR ALL CHANNEL TUNER USING VARIABLE REACTANCE ELEMENT AS TUNING ELEMENT, Interference No. 98,922, decided July 28, 1977, claims 1 and 2.

Patent No. 3,796,599. J. H. McLaughlin, METHOD OF TREATING CLOTHES IN A CLOTHES DRYER WITH A FOAM CONTAINING AN ADJUVANT MATERIAL, Interference No. 98,815, decided Jan. 10, 1978, claims 4, 6 and 7.

Patent No. 3,806,359, J. H. McLaughlin, METHOD OF TREATING CLOTHES IN A CLOTHES DRYER WITH A FOAM CONTAINING A FABRIC SOFTENER, Interference No. 98,816, decided Jan. 10, 1978, claims 1 and 4.

Disclaimers

3,651,625.—*George Redford* and *Alan Redford,* Radcliffe, Lancashire, England. HARVESTER. Patent dated Mar. 28, 1972. Disclaimer filed Apr. 19, 1978, by the inventors.

Hereby enter this disclaimer to claim 1 of said patent.

3,972,763.—*Arthur Dole Walvin,* Longview, and *Richard Milton Morris, Jr.* Bellevue, Wash. METHOD OF LAMINATING PLANAR AND CORRUGATED SURFACE DEFINING LAYERS OF SHEET MATERIAL. Patent dated Aug. 3, 1976. Disclaimer filed May 1, 1978, by the assignee, *Weyerhaeuser Company.*

Hereby enters this disclaimer to claims 1–5, 7 and 11–14 of said patent.

4,018,725.—*John F. Hadley,* Bradford Woods, Pa. PHENOLIC FOAM PRODUCTS AND METHOD OF MAKING THE SAME. Patent dated Apr. 19, 1977. Disclaimer filed May 10, 1978, by the assignee, *H. H. Robertson Company.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,042,330.—*Arvind D. Deshmukh,* Santa Monica, Calif. IN A METHOD FOR CHECKING THE ACCURACY OF A TEST USING AN ENZYMATICALLY HYDROLYZABLE, SERUM-SOLUBLE CHOLESTEROL COMPOUND. Patent dated Aug. 16, 1977. Disclaimer filed May 12, 1978, by the inventor.

The term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Erratum

Design No. 234,367.—*Jon Wolford,* Albany, Calif. OIL LAMP. In the notice of Disclaimers appearing on pages 15 and 16 in the OFFICIAL GAZETTE of May 10, 1977, the entire term of said patent was erroneously disclaimed and should be corrected to read as follows: The term of this patent subsequent to Jan. 27, 1989, has been disclaimed.

Patents Available for Licensing or Sale

3,579,841. PROTRACTOR. Dana Peterson, 464 B Ave. Coronado, Calif. 92118.

3,820,274. FINGER SAVING PLIERS. Tefel Dremzyk, 4 Prospect Place, Torrington, Conn. 06790.

4,069,103. PROCESS FOR RECOVERING DEXTROSE AND DEXTRINS FROM PROTEIN-CONTAINING STARCH PRODUCTS. Hans Muller, Im Allmendli, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,079,766. DRILL BIT. Beecher E. Conley, 2569 Butano Drive, Sacramento, Calif.

4,080,029. PLUG LOCK. Raymond St. Fort, 45 Argyle Rd., 1–C, Brooklyn, N.Y. 11218.

The following patent is offered by Edgar S. Downs, 6530 Huntley Road, Worthington, Ohio 43085.

4,043,578. PORTABLE DOOR LOCK.

The following two patents are offered by David E. Russell, 110 Riverside Ave., Jacksonville, Fla. 32202.

3,602,389. CONTAINER OPEN AND HANDLE ASSEMBLY.
3,857,432. CURTAIN AND ATTACHED AIR SEAL.

National Technical Information Service

Government-Owned Inventions

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

Douglas J. Campion,
Patent Program Coordinator,
National Technical Information Service.

U.S. Department of the Air Force
AF/JACP, 1900 Half St. SW.
Washington, D.C. 20324

Patent application 871,067. Adding Frequency Agility to Fire-Control Radars. Filed Jan. 20, 1978.

Patent application 871,866. Improved Fabry-Perot Diplexer. Filed Jan. 24, 1978.

U.S. Department of the Navy
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 840,939. Fluidic Combustion of a Solid Fuel Ramjet. Filed Oct. 11, 1977.

Patent application 843,905. Two-Axis Motion Compensation for AMTI. Filed Oct. 20, 1976.

Patent application 852,646. Parabolic Optical Waveguide Horns and Design Thereof. Filed Nov. 18, 1977.

Patent application 858,873. Wide Field-of-View Michelson Filter. Filed Dec. 8, 1977.

Patent application 860,814. Apparatus for Determining Projectile Position and Barrel Pressure Characteristics. Filed Dec. 15, 1977.

National Aeronautics and Space Administration
Assistant General Counsel for Patent Matters—NASA,
Code GP–2, Washington, D.C. 20546

Patent application 839,963. Mixed Diamines for Lower Melting Addition Polyimide Preparation and Utilization. Filed Oct. 6, 1977.

Patent application 858,763. Pseudo Continuous Wave Acoustic Instrument. Filed Dec. 8, 1977.

Patent application 860,404. A Speed Control Device for a Heavy Duty Shaft. Filed Dec. 13, 1977.

Patent 3,387,218. Apparatus for Handling Micron Size Range Particulate Material. Filed May 6, 1964. Patented June 4, 1968. Not available NTIS.

Patent 3,492,858. Microbalance. Filed May 8, 1967. Patented Feb. 3, 1970. Not available NTIS.

Patent 3,538,053. Nuclear Alkylated Pyridine Aldehyde Polymers and Conductive Compositions Thereof. Filed Sept. 11, 1968. Patented Nov. 3, 1970. Not available NTIS.

Patent 3,600,599. Shunt Regulation Electric Power System. Filed Oct. 3, 1968. Patented Aug. 17, 1971. Not available NTIS.

Patent 3,777,811. Heat Pipe With Dual Working Fluids. Filed June 1, 1970. Patented Dec. 11, 1973. Not available NTIS.

Patent 4,063,814. Optical Scanner. Filed Apr. 6, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,064,692. Variable Cycle Gas Turbine Engines. Filed June 2, 1975. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,066,039. Adjustable Securing Base. Filed Sept. 7, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,067,653. Differential Optoacoustic Absorption Detector. Filed Aug. 27, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,068,495. Closed Loop Spray Cooling Apparatus. Filed Mar. 31, 1976. Patented Jan. 17, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	[illegible]-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents	Numbers 2,055 to 2,066, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 4, 1978

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T972,001
NOVEL UV ABSORBING COMPOUNDS AND PHOTOGRAPHIC ELEMENTS CONTAINING UV ABSORBING COMPOUNDS

Wayne Woodrow Weber, II, and Donald Warren Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

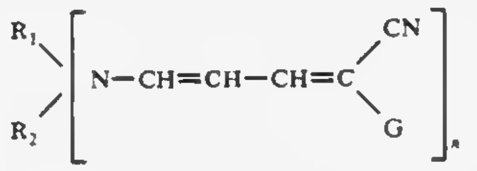
Division of Ser. No. 641,788, Dec. 18, 1975, which is a continuation-in-part of Ser. No. 506,913, Sep. 17, 1974, abandoned. This application Jan. 25, 1977, Ser. No. 762,356

Int. Cl.^{2} C07C *87/24;* **C07D** *223/02, 241/02;* **C07D** *295/20*

U.S. Cl. 542—469

No Drawing. 32 Pages Specification

1-Amino-4-cyano-1,3-butadiene compounds of the formula



$$\left[\begin{matrix}R_1 \\ R_2\end{matrix}\right\rangle N-CH=CH-CH=C\left\langle\begin{matrix}CN \\ G\end{matrix}\right]_n$$

wherein n is 1 or 2; when n is 1, R_1 and R_2 are the same or different and represent hydrogen, alkyl including substituted alkyl, aryl including substituted aryl or cyclic alkyl groups, except that both R_1 and R_2 cannot be hydrogen, or taken together R_1 and R_2 represent the elements necessary to complete a cyclic amino group and, when n is 2, at least one of R_1 and R_2 is alkylene or arylene; G represents an electron withdrawing group. The compounds are especially useful in photographic elements as UV absorbers. Particularly useful UV absorbers are 3-dibutylaminoallylidenemalononitrile, 3-dihexylaminoallylidenemalononitrile, 3-tert-butylaminoallylidenemalononitrile, 3-diisobutylaminoallylidenemalononitrile, 3-di-sec-butylaminoallylidenemalononitrile, 3-hexahydroazepinoallylidenemalononitrile, 3-N(n-butyl)-N-cyanomethyl aminoallylidenemalononitrile, 3[N,N-bis-(2,2-diethoxyethyl)amino]allylidenemalononitrile, 3(N-methyl-N-cyanomethyl)aminoallylidenemalononitrile, 1,4-piperazino bis(allylidenemalononitrile), N,N-diethyl-N,N-di-(4,4-dicyanobutadienyl)-1,6-diaminohexane, 3-[N,N-bis(2-cyanoethyl)amino]allylidenemalononitrile, 3-morpholinoallylidene methylsulfonylacetonitrile, 3-morpholinoallylidene 4-tert-butylphenylsulfonylacetonitrile, 3-piperazinoallylidene 4-tert-butylphenylsulfonylacetonitrile and 3-N-methylpiperazinoallylidene 4-tert-butylphenylsulfonylacetonitrile.

T972,002
HIGH TEMPERATURE THERMOPLASTIC ADHESIVE COMPOSITIONS COMPRISING A PROPYLENE POLYMER AND AN ETHYLENE/CARBOXYLIC ACID COPOLYMER

David Perez Flores, 317 Pine, and Kenneth Earl Bow, 104 Lily, both of Lake Jackson, Tex. 77566

Filed Nov. 10, 1977, Ser. No. 850,172

Int. Cl.^{2} C08L *23/12*

U.S. Cl. 260—897 B

No Drawing. 13 Pages Specification

Thermoplastic adhesive composition comprising from about 95 to about 5 percent by weight of a propylene polymer having a melt flow index of from about 0.5 to about 500 and from about 5 to about 95 percent by weight of an ethylene/α,β-ethylenically unsaturated carboxylic acid copolymer containing from about 1 to about 30 percent by weight of said acid copolymerized therein and having a melt index of from about 0.5 to about 500 can advantageously be used as thermoplastic adhesives for metals and polymeric substrates and are capable of retaining their adhesion to such substrates at elevated temperatures. Such compositions are particularly useful as adhesives in the manufacture of a retortable pouch for food which will withstand normal retort conditions.

T972,003
SORT/MERGE ALGORITHM

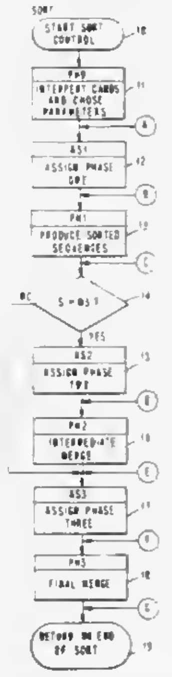
Leslie Stinson Coleman, Jr., 19 Homer Pl., Poughkeepsie, N.Y. 12603

Continuation of Ser. No. 552,389, Feb. 19, 1975, which is a continuation of Ser. No. 524,002, Nov. 15, 1974, which is a continuation of Ser. No. 199,691, Nov. 17, 1971, abandoned. This application Oct. 11, 1977, Ser. No. 844,324

Int. Cl.^{2} G11B *27/00*

U.S. Cl. 364—300

21 Sheets Drawing. 80 Pages Specification



A sort/merge program incorporating a technique for optimizing the number of strings processed in phase 2, a recording handling technique for minimizing the number of records handled in phase 2, a flexible blocking technique and a flexible merge order technique whereby these parameters are reset to their best values subsequent to the internal sort and where the merge order of phase 2 may differ from the merge order of phase 3, a floating buffer technique to place next blocks of records into core prior to merging, a smart look-ahead technique to place those blocks needed next into the spare buffers, a distribution technique whereby work space on auxiliary storage disk devices can be regarded as a single work space regardless of the physical location of the storage spaces, a track interleave technique whereby each sequence is begun on a separate track, a block address chaining technique and a write-in-place technique for minimizing arm movements.

REISSUES

JULY 4, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

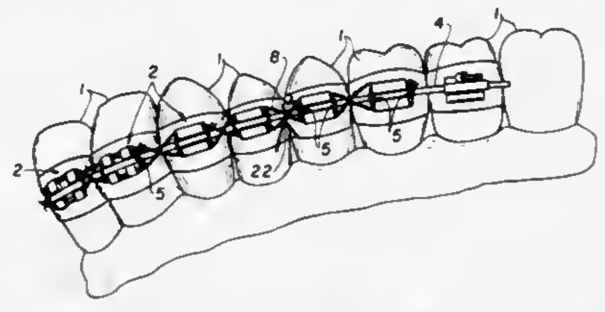
Re. 29,686
ORTHODONTIC ELASTIC BAND WITH VARYING OUTER PERIPHERY

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214
Original No. 3,961,421, dated Jun. 8, 1976, Ser. No. 566,752, Apr. 10, 1975. Continuation-in-part of Ser. No. 310,574, Nov. 29, 1972, Pat. No. 3,879,850. Application for reissue Apr. 21, 1977, Ser. No. 789,458

The portion of the term of this patent subsequent to Apr. 29, 1992 has been disclaimed

Int. Cl.^{2} A61C *7/00*

U.S. Cl. 32—14 A **77 Claims**



1. An ortbodontic elastic band for use with orthodontic bracket means mountable on teeth, each bracket means at least partially defining an opening of predetermined cross-sectional dimension adapted to receive at least a portion of an orthodontic elastic band therein, at least one of said bracket openings having at least one engaging and retaining surface adjacent thereto,

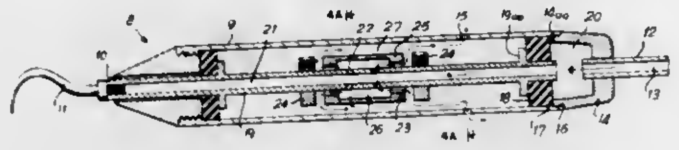
said elastic band comprising an elongated elastic member having, distributed over a substantial length thereof, alternately arranged portions of larger and smaller dimensions relative to a substantially straight and substantially central axial line passing through the elongated band when it is in a straight condition, said dimensions being taken in the same direction in a common plane containing said substantially straight axial line, said larger dimensions portions [being] *comprising abutment portions which are* dimensioned such that when said elastic band is stretched along its length and is at least partially engaged in an opening defined by at least one orthodontic bracket means, *at least one of* said larger dimension [portion] *abutment portions* abuttingly engages at least a portion of said at least one engaging and retaining surface to substantially prevent the stretched elastic band from relaxing, and when knotting the ends thereof, at least two of said larger dimension portions engaging each other to substantially prevent the stretched elastic band from relaxing.

Re. 29,687
AIR-VIBRATOR DENTAL SCALER

Anthony T. Sertich, 30 Dover Green, Staten Island, New York, N.Y. 10312
Original No. 3,811,190, dated May 21, 1974, Ser. No. 364,348, May 29, 1973. Application for reissue Nov. 30, 1976, Ser. No. 746,081

Int. Cl.^{2} A61C *3/08*

U.S. Cl. 32—56 **35 Claims**



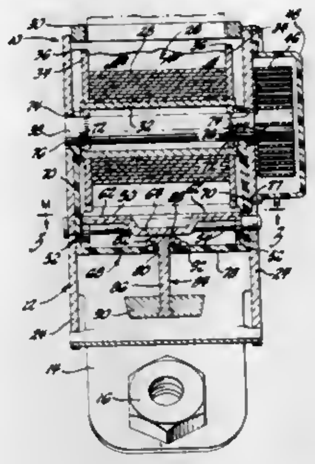
1. A vibrator device comprising in combination: support means; rigid tubular means supported by [the] *said* support means, said tubular means including structure defining an inlet port and spaced from the inlet port [defining] at least one outlet port, [the] *each said* outlet port being defined in a side wall of [the] *said* tubular means *and being slanted angularly relative to the outer surface of said tubular means such that an imaginary, straightline extension of the axis of each outlet port is offset from the longitudinal axis of said tubular means*; a rotatable wheel means drivable by a fluid media, said rotatable wheel means being operatively mounted [around said tubular means] for rotation [there-around] *around said tubular means*, [each] said [outlet port] *rotatable wheel means* being located relative to [the rotatable wheel means] *each said outlet port* such that the fluid *exiting* from *each* said outlet port serves to propel the wheel rotatably[.], *said inlet port being defined as an end-opening to the said tubular means, and said rotatable wheel means has an inner diameter larger than an outer diameter of said tubular means, said rotatable wheel means being mounted for operative rotation such that fluid from each said outlet port travels through the spacing between the inner surface of said rotatable wheel means and an outer surface of said tubular means and serves as a fluid-bearing cushion, said tubular means and said rotatable wheel means being of configuration such that the space therebetween during rotation of said rotatable wheel is filled solely by the propelling fluid.*

Re. 29,688
PENDULUM SUPPORT FOR A SEAT BELT RETRACTOR

Joseph D. Kondziola, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Original No. 3,948,460, dated Apr. 6, 1976, Ser. No. 563,099, Mar. 28, 1975. Application for reissue Mar. 28, 1977, Ser. No. 781,688

Int. Cl.^{2} A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **4 Claims**



4. In a vehicle inertia responsive seat belt retractor having a housing with laterally spaced walls, a belt reel having a reel shaft for mounting the reel on the laterally spaced walls of the housing for belt winding and unwinding reel rotation, a locking bar movable between an undetenting position permitting rotation of the belt reel and detenting position blocking rotation of the belt reel, and an inertia responsive member for moving the locking bar between undetenting and detenting positions, the improvement comprising: a support member for mounting the inertia responsive member at a predeterminedly consistent mounting location relative the reel shaft, the support member having laterally spaced walls, said support member walls having apertures which receive the reel shaft to mount the support member, and an inertia member support portion integral with the walls of the support member *and bridging the lateral space therebetween, the inertia member support portion having means located at a predetermined location with respect to the apertures receiving the reel shaft for mounting the inertia responsive member at a predetermined location relative the reel shaft.*

Re. 29,689

PROCESS OF PREPARING GLUCOSE ISOMERASE

Lawrence E. Hayes, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,645,848, dated Feb. 29, 1972, Ser. No. 877,474, Nov. 17, 1969. Division of Ser. No. 877,474, Nov. 17, 1969, Pat. No. 3,645,848. Application for reissue May 18, 1973, Ser. No. 361,544

Int. Cl.^{2} C12D *13/00;* C12D *13/10*

U.S. Cl. 195—31 F **15 Claims**

8. A process for converting glucose to fructose which comprises incubating a glucose-containing liquor with a glucose-isomerizing enzyme derived from [a micro-organism belonging to the genus Arthrobacter] *the micro-organism Arthrobacter nov. sp. NRRL B-3725 or NRRL B-3728* and recovering a fructose-containing liquor.

Re. 29,690

PROCESS OF PREPARING GLUCOSE ISOMERASE

Chin K. Lee, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,645,848, dated Feb. 29, 1972, Ser. No. 877,474, Nov. 17, 1969. Division of Ser. No. 877,474, Nov. 17, 1969, Pat. No. 3,645,848. Application for reissue May 18, 1973, Ser. No. 361,546

Int. Cl.^{2} C12D *13/00, 13/10*

U.S. Cl. 195—31 F **16 Claims**

8. A process for converting glucose to fructose which comprises incubating a glucose-containing liquor with a glucose-isomerizing enzyme derived from [a micro-organism belonging to the genus Arthrobacter] *the micro-organism Arthrobacter nov. sp. NRRL B-3726 or NRRL B-3727* and recovering a fructose-containing liquor.

Re. 29,691

PROCESS OF PREPARING GLUCOSE ISOMERASE

Margaret E. Long, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,645,848, dated Feb. 29, 1972, Ser. No. 877,474, Nov. 17, 1969. Division of Ser. No. 877,474, Nov. 17, 1969, Pat. No. 3,645,848. Application for reissue May 18, 1973, Ser. No. 361,548

Int. Cl.^{2} C12D *13/00, 13/10*

U.S. Cl. 195—31 F **19 Claims**

1. A process for preparing a glucose-isomerizing enzyme which comprises inoculating a carbohydrate-containing nutrient medium with a micro-organism belonging to the genus Arthrobacter, maintaining the inoculated medium for a period of time under conditions suitable for production of said enzyme by said organism and recovering said enzyme.

Re. 29,692

PROCESS OF PREPARING GLUCOSE ISOMERASE

Margaret E. Long, Winston-Salem, N.C., assignor to R.J. Reynolds Tobacco Company, Winston-Salem, N.C.

Original No. 3,645,848, dated Feb. 29, 1972, Ser. No. 877,474, Nov. 17, 1969. Division of Ser. No. 361,548, May 18, 1973, which is a division of Ser. No. 877,474, Nov. 17, 1969, Pat. No. 3,645,848. Application for reissue Jan. 28, 1976, Ser. No. 653,062

Int. Cl.^{2} C12D *13/00, 13/10*

U.S. Cl. 195—31 F **2 Claims**

19. A process for converting glucose to fructose which comprises incubating a glucose-containing liquor with a glucose-isomerizing enzyme derived from an Arthrobacter microorganism capable of producing said enzyme in a nutrient medium containing glucose as the sole carbohydrate source and recovering a fructose-containing liquor.

Re. 29,693

PROCESS OF SOAKING AND STERILIZING HYDROPHILIC SOFT CONTACT LENS WITH CHLORHEXIDINE

Russell E. Phares, Jr., Saratoga, Calif., assignor to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Original No. 3,689,673, dated Sep. 5, 1972, Ser. No. 88,521, Nov. 10, 1970. Application for reissue Nov. 6, 1975, Ser. No. 629,729

Int. Cl.^{2} A01N *9/20, 9/24*

U.S. Cl. 424—326 **8 Claims**

1. The process of soaking and sterilizing hydrophilic soft contact lenses comprising placing a lens in an aqueous solution containing from about [0.001] *0.004* percent to [0.1] *0.01* percent of chlorhexidene for a time sufficient to sterilize said lens.

PLANT PATENTS

GRANTED JULY 4, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,274

POMEGRANATE TREE

M. Dwight Slayman, 30701 Fairgreens West, Laguna Niguel, Calif. 92677

Filed May 2, 1977, Ser. No. 793,181

Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—33 **1 Claim**

1. A new and distinct variety of pomegranate tree substantially as described and illustrated, said tree resembling the Wonderful (unpatented) pomegranate tree in appearance and blossoms, but being distinguished therefrom by its regular bearing of fruit which ripens about 10 days earlier than that of the Wonderful variety, is of a more pleasing cherry red color and is slightly less tart in flavor.

4,275

AZALEA PLANT-LUCILLE K

Fred Kraus, 19250 Hesperian Blvd., Hayward, Calif. 94541

Filed Aug. 19, 1977, Ser. No. 825,954

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—55 **1 Claim**

1. A new and distinct variety of Azalea of the Belgium Indica type as described and illustrated, known by the cultivar name Lucille K.

PATENTS

GRANTED JUL. 4, 1978

ERRATA

For CLASS	See PATENT NO.
019–052	4,097,956
248–399	4,098,357
400–124	4,098,388
400–649	4,098,389
366–144	4,098,494
028–784	4,098,520
528–403	4,098,726
521–141	4,098,728
521–128	4,098,729
521–107	4,098,730
521–051	4,098,731
521–125	4,098,732
521–123	4,098,732
528–001	4,098,765
528–217	4,098,766
528–099	4,098,769
528–130	4,098,770
526–209	4,098,771
528–049	4,098,772
528–065	4,098,773
528–315	4,098,774
528–350	4,098,775
528–481	4,098,776
264–220	4,098,785
544–277	4,098,787
544–293	4,098,788
544–299	4,098,789
568–824	4,098,827
568–824	4,098,827
568–726	4,098,828
568–741	4,098,829
568–730	4,098,830
423–226	4,098,886
526–116	4,098,907
235–101	4,099,049

PATENTS

GRANTED JULY 4, 1978

GENERAL AND MECHANICAL

4,097,929

PROTECTIVE VISOR MEANS FOR A HELMET

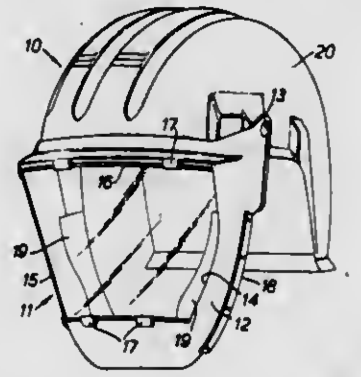
Brian Arthur Lowe, Cheshunt, and Raymond Odell, Potters Bar, both of England, assignors to RACAL-Amplivox Communications Ltd., England

Filed Feb. 24, 1977, Ser. No. 771,769

Claims priority, application United Kingdom, May 14, 1976, 20050/76

Int. Cl.^{2} A61F *9/00*

U.S. Cl. 2—10 **8 Claims**



1. A protective visor assembly for helmets, comprising

(a) a bowed frame member (12) formed from a synthetic plastic material, said frame member containing a generally rectangular aperture (14) having arcuate upper and lower edges contained in a pair of parallel spaced planes, respectively;

(b) an initially planar generally rectangular visor member (15) formed from a sheet of transparent resilient material; and

(c) retaining means (16, 17 12*a*) integral with said frame for removably mounting said visor member in a bowed condition within said aperture, said retaining means including first means adjacent the upper and lower edges of said aperture causing the corresponding upper and lower edges of said visor member to conform to the arcuate configuration of said aperture upper and lower edges, respectively, and second means adjacent the lateral sides of said aperture arranged for cooperating engagement with the corresponding side edges of said visor member.

4,097,930

HELMET SHIELD APPARATUS

William P. Bay, Rte. 1, Box 53, Ormond Beach, Fla. 32974

Filed Mar. 4, 1977, Ser. No. 774,386

Int. Cl.^{2} A42B *3/00*

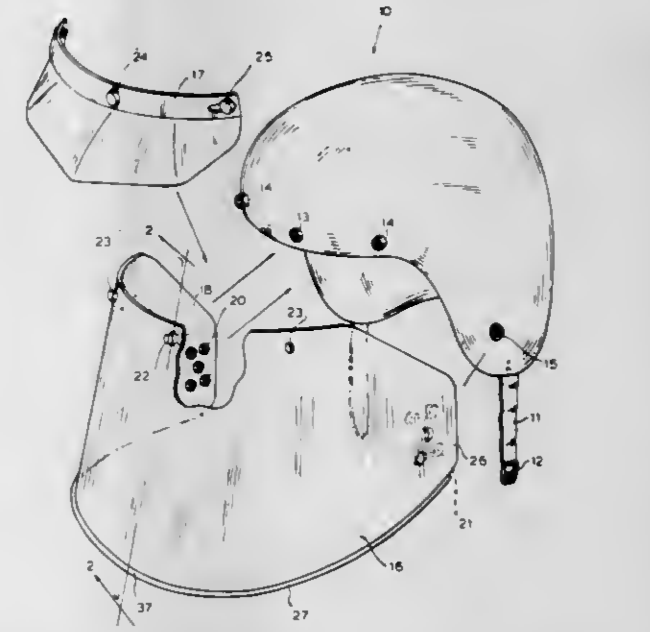
U.S. Cl. 2—10 **9 Claims**

1. A helmet snap on shield comprising in combination:

a transparent flat shield of predetermined shape to fit onto a helmet and having two sides with a top, bottom, and two end edges;

a polymer center snap portion formed on said shield, adjacent said top edge of said shield and between the end edges thereof for cooperation with a snap portion located on a helmet; and

a pair of grouped polymer snap fastener portions formed in said shield, each group being located adjacent one said end edge of said shield, and each snap fastener portion of each group being located to fit a snap fastener portion on a helmet, whereby a shield having snaps molded therein fits a variety of helmet designs.



4,097,931

FINGER PROTECTION USABLE FOR ARCHERY

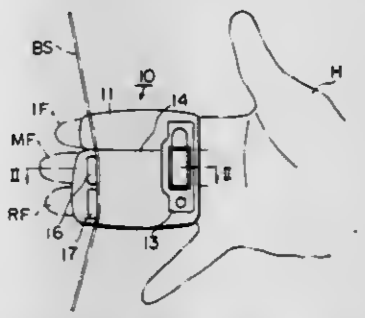
Akira Hirose, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jun. 2, 1976, Ser. No. 691,973

Claims priority, application Japan, Jun. 18, 1975, 50-82912[U]

Int. Cl.^{2} A41D *13/08*

U.S. Cl. 2—21 **14 Claims**



1. A finger protector for use in archery, comprising:

a finger protecting strip adapted to cover portions of the middle, ring and index fingers of an archer's hand;

a raised bowstring engaging section projecting from said strip and positioned at a location corresponding generally to the first joint of the middle finger of the archer's hand, said raised section having a width equal to or less than the width of the middle finger of the average archer's hand, said raised section also having a length no greater than its width.

4,097,932

ATHLETIC KNEE PROTECTION DEVICE

Richard J. Lacey, 46 NE. 61st., Apt. 2B, Gladstone, Mo. 64118

Filed Apr. 22, 1977, Ser. No. 789,786

Int. Cl.^{2} A41D *13/06*

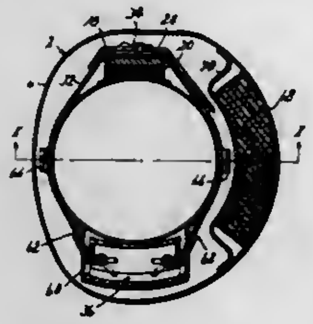
U.S. Cl. 2—24 **9 Claims**

1. An athletic knee protection device comprising:

a. an elongated reinforcing bar consisting of two rigid sections pivotally joined at their contiguous ends,

b. supporting means operable to support said reinforcing bar to extend along a wearer's leg at the inner side thereof, extending both above and below the knee joint, with the axis of the pivotal connection of said bar sections substantially coaxial with the lateral axis of said knee joint,

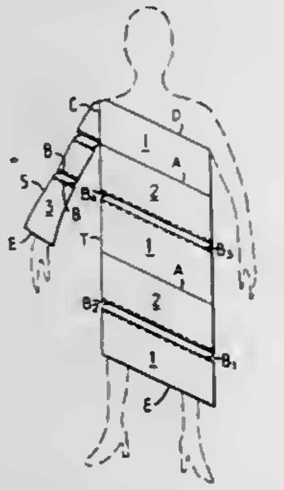
c. a pair of straps adapted to encircle tightly the leg of the wearer, and said reinforcing bar, respectively above and below the knee joint and the pivotal connection of said reinforcing bar sections, whereby said reinforcing bar sections are secured firmly relative to the wearer's leg, and



d. a strap tightener interposed in each of said straps whereby to be disposed at the outer side of the wearer's leg, and each being operable by the impact of a blow thereagainst to draw the associated strap still more tightly about the wearer's leg and about said reinforcing bar.

4,097,933
GARMENTS FORMED OF HELICALLY JOINED PIECES

Harry Rodolph de Polo, 480 Park Ave., New York, N.Y. 10022
Filed Feb. 18, 1977, Ser. No. 770,034
Int. Cl.² A41D *1/22*
U.S. Cl. 2—105 **17 Claims**



1. A dress-type garment comprising a body portion formed essentially of an elongate strip of fabric material helically wound about an axis, said strip having a width between approximately eleven inches and twenty-four inches and making at least one complete convolution in a length of about thirty inches measured parallel to said axis and means securing substantially equal lengths of the edges of adjacent convolutions of said strips together to form a continuous generally cylindrical body.

4,097,934
UNIFORM CAP

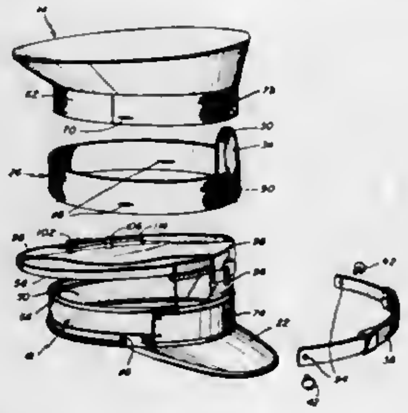
Bernard Weinstein, 1040 E. 3rd St., Hialeah, Fla. 33010
Filed Mar. 9, 1976, Ser. No. 665,247
Int. Cl.² A42B *1/02*
U.S. Cl. 2—195 **7 Claims**

7. In a uniform cap having a frame arranged to fit the head of a user, a flexible replaceable cover, releasable means for aligning and fastening said cover to said frame, means to stretch said cover into its deployed condition, side locators mounted on said frame securing a decorative front strap, and a braid band, the improvement comprising,

said braid band being formed of a stretchable material and carrying an emblem flap,

said emblem flap being located intermediate sides of said cap and at the front center of the cap,

said emblem flap carrying locating means for releasable attachment thereof to said frame at said front center so as to positively fix said braid band at a front center position yet allow stretching thereon at points about said frame,



said locating means being carried by said emblem flap and constructed and arranged to cooperate with a mating locating means on said frame,

and said braid band defining side holes for permitting passage therethrough of said locators for said decorative front strap of said cap.

4,097,935
HYDROXYLAPATITE CERAMIC

Michael Jarcho, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
Continuation-in-part of Ser. No. 707,315, Jul. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 593,303, Jul. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 494,240, Aug. 2, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,266
Int. Cl.² A61F *1/24;* **A61K** *5/01;* **C09K** *3/00;* **C04B** *35/00*
U.S. Cl. 3—1.9 **43 Claims**

1. As an article of manufacture, substantially pure hydroxylapatite in the form of a translucent, isotropic, polycrystalline, sintered ceramic having an average crystallite size in the approximate range 0.2 to 3 microns, a density greater than approximately 98 percent of the theoretical density of hydroxylapatite and being further characterized by the absence of pores and by cleavage along smooth curved planes.

4,097,936
FLUSH TANK VAPORIZER

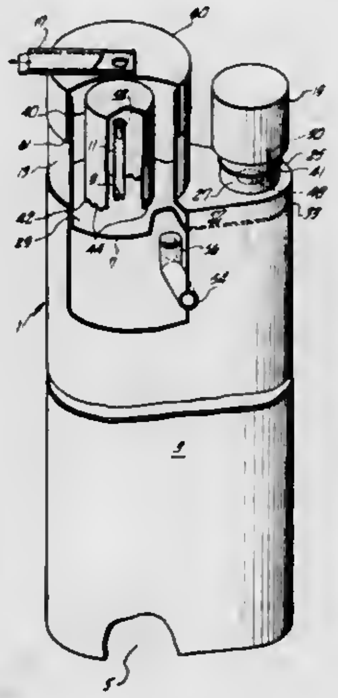
Alan D. Brite, 114 S. Canyon View Rd., Los Angeles, Calif. 90049
Continuation-in-part of Ser. No. 611,446, Sep. 8, 1975, abandoned. This application Jul. 26, 1976, Ser. No. 708,740
Int. Cl.² E03D *9/04;* **B67B** *7/24*
U.S. Cl. 4—228 **3 Claims**

1. A vaporizer adaptable for insertion into a water closet tank comprising:

a first chamber being in communication with the varying water level of a water closet tank;

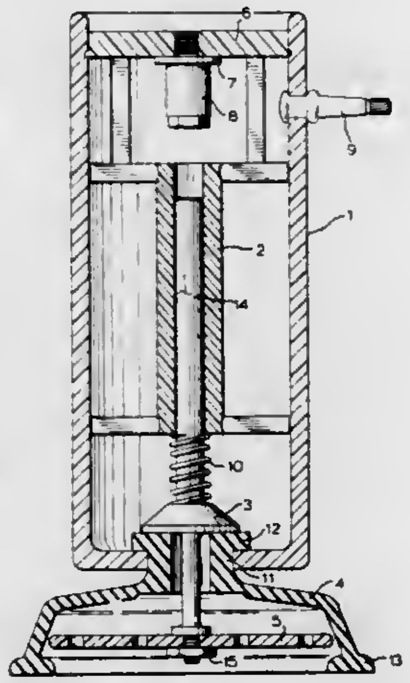
a second chamber having an inlet extending vertically into said second chamber, said inlet extending through the base of said second chamber, said second chamber with said base separating the first and second chambers being further defined as having an outlet to the atmosphere; an enclosure bounded by the base of said second chamber, an annular ring and a top member, said enclosure being in communication with said second chamber, a separable reservoir in communication with said enclosure;

an air inlet entending through the upper portion of said first chamber, said air inlet being in communication with said first chamber and said tank, said air inlet including a one way valve so that air flow may only occur from said tank to said first chamber; an annular enclosure open at one end positioned on said second chamber base and about said second chamber inlet, said enclosure open end being serrated, said second chamber inlet including a one way valve so that fluid flow may occur from the second chamber inlet into said annular enclosure.



4,097,937
APPARATUS FOR CLEARING DRAINS

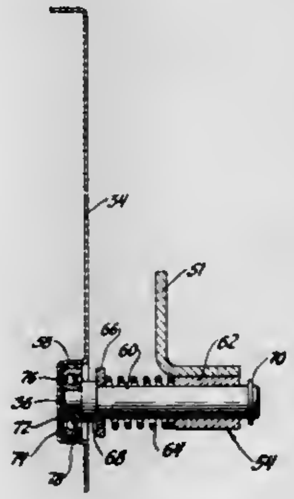
Hermann L. Hofmann, 4847 Kent Ave, Niagara Falls, Ontario, Canada (L2H 1J5)
Filed May 2, 1977, Ser. No. 792,531
Int. Cl.² E03D *11/00*
U.S. Cl. 4—255 **5 Claims**



1. Apparatus for clearing drains comprising a reservoir for pressurized gas incorporating a non-return air inlet valve and a pressure relief valve, an inverted infundibular sealing member of elastomeric material having a neck anchored in a opening in the base of the reservoir, an orifice defined within and passing through the neck, a valve steam passing through and of smaller cross-section than the orifice, a valve member supported by the valve stem within the reservoir, a valve seat surrounding the inner end of the orifice and upon which the valve member is normally seated so as to close the orifice, and an actuator member adapted to engage the rim of a drain opening, said actuator member being attached to the outer end of the valve stem and housed within the sealing member.

4,097,938
SOFA BED ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Jun. 27, 1977, Ser. No. 810,057
Int. Cl.² A47C *17/14*
U.S. Cl. 5—18 R **6 Claims**



1. A sofa bed assembly of the type which includes a support frame having a storage compartment in the seating portion thereof and an articulated bed frame which is receivable within the storage compartment in a folded configuration and is movable from the storage compartment to a deployed position where it can be unfolded, the assembly further including roller assemblies on the bed frame each including a roller which cooperate with tracks in the side panels of the seating portion for guiding the movement of the bed frame between the storage compartment in the deployed position and for supporting the bed frame on the support frame the improvement comprising: connecting means for connecting the rollers to the bed frame such that the rollers are retractable to provide a quick release connection between the bed frame and the support frame, said connecting means including a shaft for supporting the roller which extends at a right angle to the track, support means carried by the bed frame for permitting only axial slidable movement of said shaft to permit movement of the shaft and the roller toward and away from the track and to maintain the angular relationship between said shaft and the track, and spring means for continuously urging said shaft toward the track to normally maintain the rollers in rolling engagement with the track.

4,097,939
HOSPITAL BED

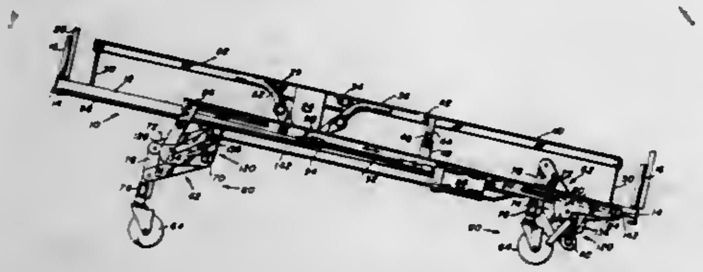
William H. Peck, and Daniel R. Tekulve, both of Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.
Filed Feb. 18, 1976, Ser. No. 659,162
Int. Cl.² A61G *7/10*
U.S. Cl. 5—63 **20 Claims**

1. A hospital bed comprising:

(a) a primary frame supporting a mattress frame;

(b) leg assemblies supporting each end of said bed, said assemblies including wheels interconnected to each end of said bed by at least one parallelogram linkage;

(c) said linkage including a mounting block depending downward from said frame, and a vertical standard extending upward from said wheels, said standard and said mounting block being interconnected by two pivotally movable parallel bars; and



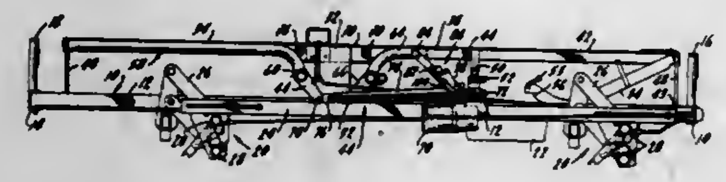
(d) lever means connected to at least one of said parallel bars for pivoting said bar relative to said mounting block for raising said end of said bed relative to said wheels.

4,097,940

HOSPITAL BED HAVING AUTOMATIC CONTOUR MECHANISM

Daniel R. Tekulve, Batesville, and William H. Peck, Oldenburg, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Nov. 9, 1976, Ser. No. 740,102
Int. Cl.² A47C *3/32*
U.S. Cl. 5—66 **15 Claims**



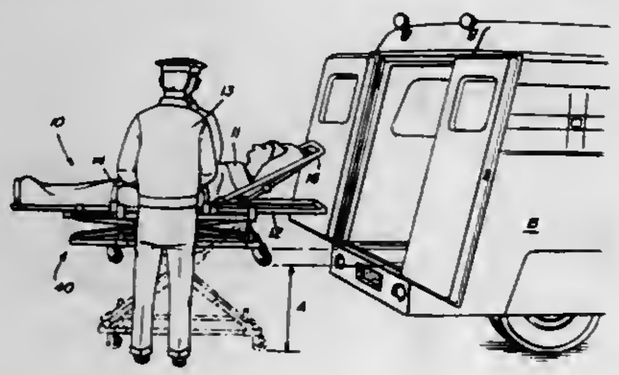
1. An electrically operable bed having a main frame, an articulated mattress support frame supported on said main frame and including a head section and a thigh section movable to various positions of inclination, operating means operatively connected to said head section to elevate said head section to said position of inclination, and an automatic contouring mechanism, including a collapsible linkage selectively actuable to define a rigid link interposed between said thigh section and said main frame which is movable in response to inclination of said head section to support said thigh section on said main frame and progressively elevate said thigh section to said positions of inclination.

4,097,941

EMERGENCY COT WITH SPRING-BIASED RETRACTABLE WHEEL CARRIAGE

Jerome L. Merkel, P.O. Box 674, Bayfield, Wis. 54814

Filed May 17, 1977, Ser. No. 797,744
Int. Cl.² A61G *1/02. 7/08*
U.S. Cl. 5—81 R **20 Claims**



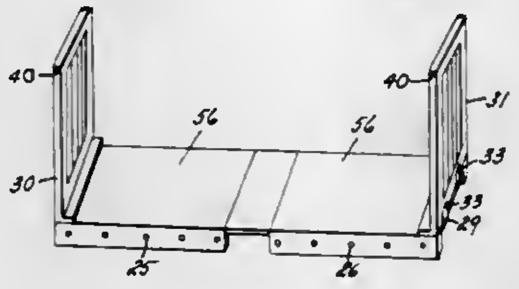
1. In an emergency cot structure including an upper patient-supporting frame, a lower frame, and support members connected between the upper and lower frames for permitting relative extension between the upper and lower frames, the cot structure further including a latch bar mounted to the upper frame and a slidable crossbar pivotally mounted to upper ends of the support members, portions of the slidable crossbar being received in slots in guide channel members mounted to the upper frame for movement therein to allow relative extension between the upper and lower frames, the latch bar being releasably mounted to the slidable crossbar to position the upper frame relative to the lower frame in differing positions, the improvement comprising:
a cross member pivotally mounted to at least one of the support members;
at least one rod member;
means carried by the rod member at one end thereof for engaging a portion of the cross member;
means carried by the cross member for releasably engaging the first-mentioned means on the rod member;
means pivotally mounting the rod member to the upper frame at the other end of said rod member for exerting a force against the rod member to displace the cross member when the first-mentioned means in said rod member is engaged by the second-mentions means carried by the cross member, thereby to displace the slidable cross member within the guide channel members on release of the latch bar from the slidable cross bar.

4,097,942

PORTABLE CRIB CONSTRUCTION

Abraham A. Bridger, 125 E. 94th St., New York, N.Y. 10028

Filed Sep. 28, 1977, Ser. No. 837,143
Int. Cl.² A47B *9/00*
U.S. Cl. 5—93 B **3 Claims**



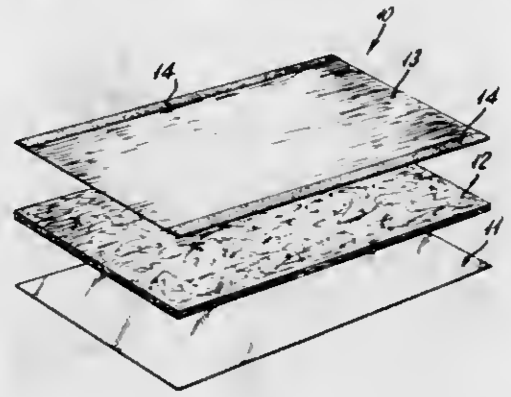
1. In a folding crib structure of a type including a hingedly connected base element, a pair of end wall elements, hingedly interconnected to free end edges of said base element, the improvement comprising: said base element including end wall elements and longitudinally extending flanges defining a cavity for the retention of said side wall elements when in folded condition, hinge means interconnecting said end wall elements for rotation through a substantially 270° path of movement, said end walls having laterally extending flanges thereon lying in a plane substantially at right angles relative to the plane of the respective end wall, said laterally extending flanges forming limiting means engaging said base element when said end walls are in fully extended condition, and forming part of a storage enclosure when said structure is in folded condition; a pair of elongated upper rail elements selectively interconnecting said end wall elements when in erected condition, and tensing said end wall elements against said limiting means; and a pair of foldable planar side wall elements of generally rectangular configuration having means along an upper edge thereof selectively engaging said rail elements and at a lower edge thereof selectively engaging a horizontal edge of said base element.

4,097,943

ABSORBENT PAD

Thomas Christopher O'Connell, Dartray, Ireland, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 3, 1976, Ser. No. 747,135
Claims priority, application United Kingdom, Dec. 9, 1975, 50427/75
Int. Cl.² A61F *13/16*
U.S. Cl. 5—335 **10 Claims**



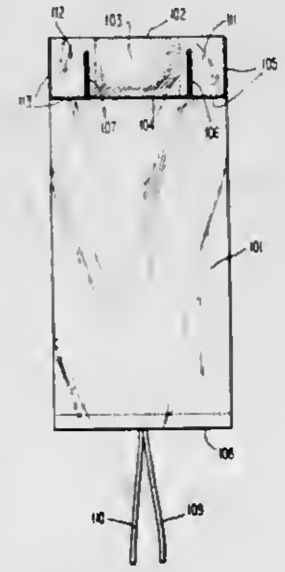
1. An underpad which comprises a fluid-impervious backing sheet, a fluid absorbent fabric fully adhesively laminated to one face of the backing sheet, a fluid pervious facing layer covering the absorbent fabric on the face thereof away from the backing sheet, and at least two strips of pressure-sensitive adhesive affixed on edge portions of the other face of the backing sheet for adhering the pad to a substrate, said pressure-sensitive adhesive being provided with a releasable cover sheet, and said adhesive strips are provided in the form of tape bearing pressure-sensitive adhesive on both sides thereof, one side of such tape being adhered to the exposed surface of the backing sheet, the adhesive strength on said one side of the tape being greater than the adhesive strength on the outer side of the tape.

4,097,944

BEACH MAT

Eugene Norman Yulish, 67 E. 11th St., New York, N.Y. 10003

Filed May 11, 1977, Ser. No. 795,861
Int. Cl.² A47G *9/06*
U.S. Cl. 5—344 **4 Claims**



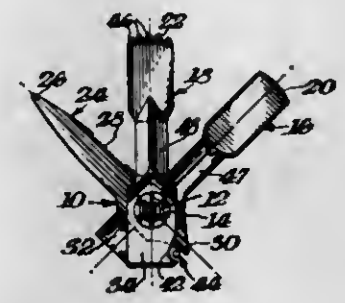
1. A beach mat comprising:
an elongated, generally rectangular fabric piece which when flat defines the extent of said mat;
pillow means attached to and at one longitudinal extremity of said fabric piece, said pillow being centered substantially on the longitudinal axis of said piece, said pillow having a width extending in both directions from said axis to predetermined distances short of the side extremities of said fabric piece; wherein said pillow means and said fabric piece together comprise on integral unit;
a plurality of rectangular fabric overlays, on each side of said pillow and extending from the end of said pillow to the associated side extremity of said fabric piece, each of said fabric overlay being attached to said fabric piece on three sides to define storage pockets; and
a pair of strap means attached to said piece generally along said axis of said on the longitudinal extremity opposite said one longitudinal extremity and wherein said fabric piece includes an integral flap portion at said one longitudinal extremity, said flap portion being folded back toward said opposite end and affixed to said fabric piece to define an outer cover for said pillow means and to constitute said fabric overlays defining said storage pockets, and said pockets formed by said overlays open towards said pillow, and are closed towards said longitudinal extremities and said associated side extremity and wherein said pockets are automatically sealed when said fabric piece is folded co-axially about said pillow.

4,097,945

FOLDING GARDEN TOOL

Bill B. Scott, Weston, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 22, 1977, Ser. No. 790,020
Int. Cl.² B25F *1/00*
U.S. Cl. 7—116 **4 Claims**



1. A folding combination garden tool primarily useful for indoor use comprising a pair of implements having substantially blunt edges and longer forward and shorter rear ends, a pair of cooperating tamper elements disposed adjacent each other on the shorter ends of the implements having substantially blunt edges, pivot means disposed adjacent the shorter rear ends of the implements whereby they may be pivoted in line or apart from each other, an implement having sharp edges constituting it as a cutting implement disposed and pivoted in between the implements having substantially blunt edges, the cutting implement has relatively sharp edges including a longer front end and a short rear end, the shorter rear end of the cutting implement having a short cutting edge on a side of its shorter rear end, a recess in at least one of the shorter rear end of the substantially blunt implements for cooperating with the short cutting edge to provide a pruner, the substantially blunt implements in the aligned condition providing a tamper at their shorter rear ends and housing the cutting element between their longer front ends, and the implements having substantially blunt edges comprise at their forward ends a scoop and a rake.

4,097,946

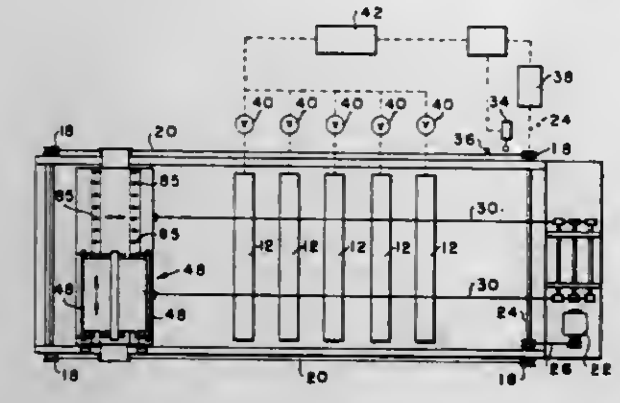
DYEING METHOD

John K. McCollough, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

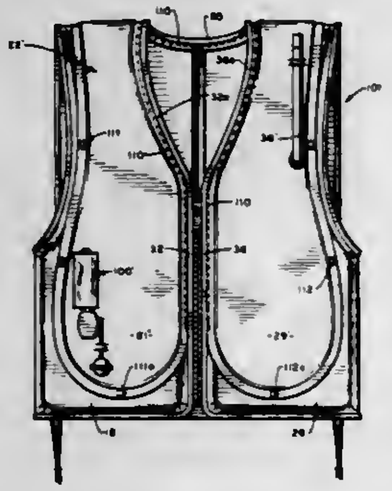
Division of Ser. No. 745,657, Nov. 29, 1976, Pat. No. 4,058,991.
This application Apr. 18, 1977, Ser. No. 788,136
Int. C.² D06B *1/02. 11/00*
U.S. Cl. 8—150 **1 Claim**

1. Method to jet dye a sample fabric in a jet dyeing apparatus having a plurality of substantially parallel spaced dye jet gun

bars and a sample fabric carrier movable under the dye jet gun bars to receive dye therefrom comprising the steps of: placing a sample fabric on the carrier and securing it thereto, moving the sample fabric under the plurality of dye jet gun bars and applying a stripe of dye to the sample fabric, moving the portion of the carrier to which the sample is secured laterally of the base of the carrier and parallel to the dye jet gun bars, moving the carrier again under the dye jet gun bars to apply another stripe of dye adjacent the first stripe applied to the sample fabric and removing the dyed sample fabric from the carrier.

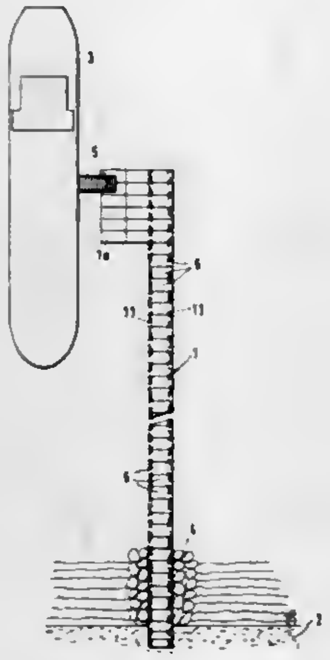


4,097,947
INFLATABLE WEARABLE FLOTATION DEVICE
James E. Kiefer, Olivenhain, Calif., assignor to SoniForm Incorporated, La Mesa, Calif.
Filed Apr. 15, 1977, Ser. No. 788,004
Int. Cl.² B63C *9/16*
U.S. Cl. 9—338 **8 Claims**



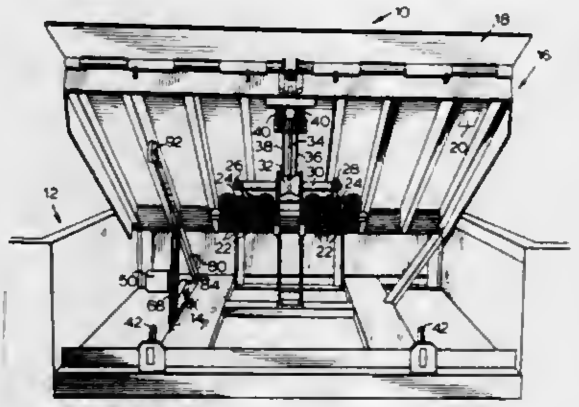
1. In an inflatable, wearable flotation device having two front panels located at the front of the wearer and a back panel located at the back of the wearer, each containing flotation material, the improvement comprising:
an inflatable bladder having two leg sections, one located on each of said front panels, and a collar section located on said back panel;
fastening means for maintaining said bladder flat when fastened;
means for inflating said bladder;
said fastening means being unfastened by the force developed by inflation of said bladder to permit said bladder sections to fully expand;
each of said leg sections being attached to one of said front panels along the inside edge of said leg section and the inside edge of said one front panel; and
said fastener means being located along other portions of said leg section.

4,097,948
FLOATING ROADWAY ASSEMBLY FOR ROAD VEHICLES
Ulrich Finsterwalder, Munich, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany
Filed Aug. 11, 1976, Ser. No. 713,534
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536442
Int. Cl.² E01D *15/14*
U.S. Cl. 14—27 **10 Claims**



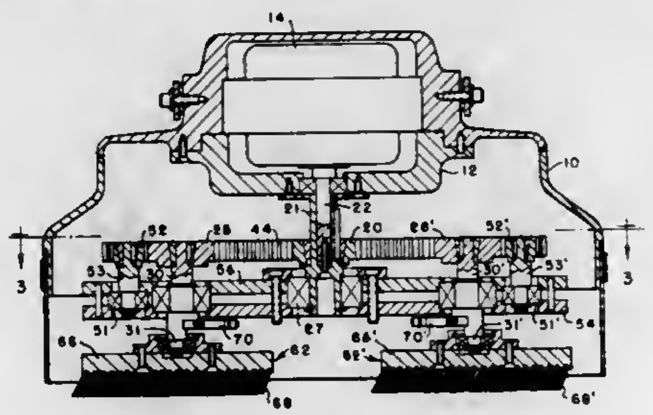
1. A floating roadway assembly adapted to support road vehicles comprising a plurality of pontoons consisting of concrete material, a plurality of elongated metal carrying rods extending continuously longitudinally through each of said pontoons to join said pontoons together to form said roadway, said rods being resistant to traction and pressure, and means joining said rods to each of said pontoons to enable relative movement therebetween longitudinally of said rods, said means joining said rods to each of said pontoons comprising a pair of concentrically arranged encasing tubes with one of said encasing tubes being located within the other of said encasing tubes, said encasing tubes being longitudinally displaceable relative to each other, with said carrying rods being located within said one inner encasing tube.

4,097,949
ELECTRICAL ASSEMBLY FOR LIFTING BIASED DOWN DOCK LEVELERS
Jack P. Barrett, 43 Athlone Ave., Bramalea, Ontario, Canada
Filed Oct. 19, 1976, Ser. No. 733,915
Int. Cl.² E01D *1/00*
U.S. Cl. 14—71.3 **5 Claims**



1. The combination of a biased down dock leveler having a ramp, and lip at one end and an electrical elevating assembly positioned under the ramp for elevating the ramp of the dock leveler, said assembly comprising an electric motor, cable drum, cable stored in said cable drum, scissors arm, and pivot arm, and means to activate the electric motor, said electric motor connected to the cable drum for taking up and letting out the cable stored in the drum, the free end of the cable being secured adjacent the end of the scissors arm remote the ramp adjacent the floor of the dock leveler for the taking up and letting out of such end of the scissors arm as the cable is taken up or played out from the drum, the other end being connected to a central portion of the pivot arm connected at the end of the pivot arm remote the lip of the ramp, to the dock leveler at a position below the ramp for pivoting of said arm about said position, the other end riding on the underside of the ramp and causing the ramp to be elevated when the motor is activated by drawing the cable to be taken up into the cable drum, the electric motor being of such construction that when inactive, it does not preclude the manual lifting and lowering of the ramp.

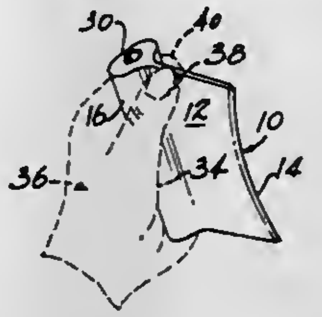
4,097,950
DEVICE FOR SCRUBBING SURFACES
Larry S. Satterfield, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Mar. 7, 1977, Ser. No. 774,883
Int. Cl.² A47L *11/206*
U.S. Cl. 15—49 R **14 Claims**



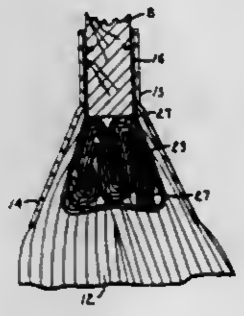
1. A device for scrubbing surfaces, comprising:
a frame;
a rotating support plate rotatably mounted on said frame;
at least two shafts rotatably mounted on said rotating support plate;
a scrubber means rotatable mounted on each shaft, each scrubber means being rotatably about an axis which is substantially parallel to but offset from the axis of rotation of said shaft;
means for rotating said rotating support plate; and
means for rotating each of said shafts;
wherein the number of said shafts rotatably mounted on said rotating support plate is even and wherein half of said shafts rotate clockwise and the other half rotate counterclockwise.

4,097,951
SPREADER HAVING INTEGRALLY MOLDED DEFORMABLE HANDLE AND BENDABLE BLADE
Jesse J. Hurtt, 6059 Short Leaf Dr., Forest Park, Ga. 30050
Filed Mar. 28, 1977, Ser. No. 781,746
Int. Cl.² B05C *17/10*
U.S. Cl. 15—104 S **7 Claims**

1. In a spreader which may be manufactured from solid plastic or the like:
a bendable spreader blade of substantially flat solid and planar construction having a bottom edge thereon,
an elongated top portion on said spreader spreader,
an elongated tubular and deformable handle integrally attached to said blade along said top portion thin closed side walls and, and walls and a hollow interior whereby said handle may be the said walls being thinner than the bladedes, deformed by the hand by squeezing, twisting or otherwise manipulating same said blade being more ridig more dense and less flexible than said handle so that said solid blade may be maniplated and curved or deformed to a lesser extent than said handle thereby providing contouring, sculpturing and control over a liquid material which is being worked into a solid material.



4,097,952
MOPS OF CELLULOSE SPONGE CLOTH MATERIAL
Robert J. Lindstrom, 400-410 W. 2nd. St., Sedalia, Mo. 65301
Filed Apr. 25, 1977, Ser. No. 790,404
Int. Cl.² A47L *13/16, 13/20*
U.S. Cl. 15—244 R **7 Claims**

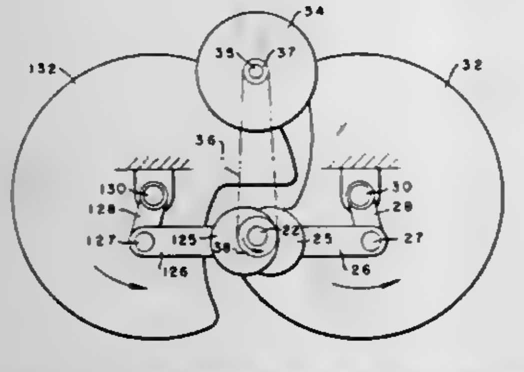


1. A wet mop comprising:
(a) an elongated handle having a lower end;
(b) a mop head having at least one layer of cellulose sponge cloth, said layer being generally rectangular in shape and having opposing end portions, flat strips cut inwardly from said end portions and communicating with an uncut integral central section;
(c) said layer being inwardly gathered along said integral central section in a direction transverse to said strips in such a manner so as to form an indulated gathered central section with said opposing end portions directed therefrom; and
(d) connecting means attaching said central section to said loer end with said strips falling downwardly and oriented away from said lower end in an outwardly directed and flared configuration.

4,097,953
DEVICE FOR SCRUBBING SURFACES
David B. McKinney, Spartanburg, and Paul W. Eschenbach, Moore, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 2, 1977, Ser. No. 821,187
Int. Cl.² A47L *11/12*
U.S. Cl. 15—320 **7 Claims**

1. A device for scrubbing surfaces, comprising:
a frame;
at least two angularly oscillating scrubbing means mounted on said frame, each scrubbing means having at least one recessed portion, the recessed portions being arranged so that as the scrubbing means angularly oscillate the scrub-

bing means scrub overlapping areas of the surface but do not collide with each other; and



means mounted on said frame for angularly oscillating said scrubbing means.

4,097,954

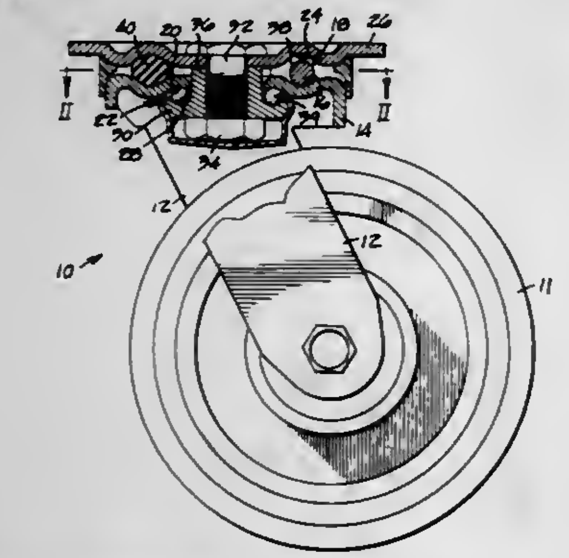
FLUTTER-RESISTANT CASTER

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corp., Oakland, Calif.

Filed Jan. 26, 1977, Ser. No. 762,655

Int. Cl.² B60B *33/00*

U.S. Cl. 16—21 **3 Claims**



1. A flutter-resistant caster comprising:

(a) mounting means for attaching said caster to an object to be castered;

(b) wheel-supporting means pivotally supported on said mounting plate;

(c) wheel means rotatably supported on said wheel-supporting means; and

(d) bearing means interposed between said mounting means and said wheel-supporting means, said bearing means including a plurality of solid hard rolling elements adapted to roll between a pair of races mounted for limited movement toward and away from each other between a first position where said races are spaced from one another by a distance substantially greater than the diameter of said hard rolling elements, and a second position where said races are sufficiently close to each other so that at least some of said hard rolling elements are rollingly engaged by both of said races;

(e) said bearing means further including, between at least some of said hard rolling elements, a plurality of solid resilient rolling elements of similar shape but greater diameter, said resilient rolling elements being arranged to bias said races into said first position;

(f) the compressibility and diameter of said resilient elements being such that under no-load conditions, they impose a sufficient pre-load upon said bearing means to impede fluttering of said caster, and that under load conditions, the load is borne essentially by said hard rolling elements without substantial interference by said resilient elements.

4,097,955

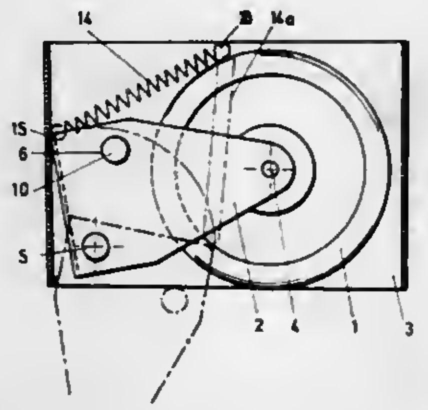
DEVICE OR WHEEL UNIT FOR MOUNTING IN A SUITCASE

Helga Helene Føge, Lyngby, Denmark, and Hans Thomas Thomsen, Friesvej 10, Greve Strand, Denmark, assignors to Hans Thomas Thomsen, Denmark

Filed Dec. 2, 1975, Ser. No. 553,621

Int. Cl.² B60B *33/00*

U.S. Cl. 16—29 **1 Claim**



1. A wheel support for transporting a suitcase, comprising:

(a) a box-shaped housing adapted to be secured to the suitcase;

(b) a bifurcated bracket including a pair of legs joined together by a connecting part, said bracket being pivotally supported on said housing near one corner thereof;

(c) a wheel adapted to roll over small objects such as curbs or steps and rotatably carried on said bracket for pivoting therewith between a retracted and an extended position;

(d) a sleeve fixedly secured at its ends to said bracket and extending between its legs in registry with aligned apertures in said bracket, the outside of said sleeve being adjacent to said wheel; and

(e) a pair of pins slidably retained in said sleeve, and a spring yieldingly biasing said pins apart, the ends of said pins normally projecting through said bracket apertures, the ends of said pins being laterally engageable with abutments on said housing in said extended position, and both of said pins being depressable endwise out of engagement with said housing when said bracket is in said extended position;

(f) and a further spring connected at one end to said connecting part of said bracket, and at the other end to the interior of the housing, said spring being more tensioned in both of said retracted and extended positions of said bracket than in a position intermediate said retracted and extended positions.

4,097,956

HYDRAULIC DOOR OPERATOR WITH OVERTRAVEL RESTRAINT

Hiromu Kitutaka, Fuchu, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Apr. 1, 1977, Ser. No. 783,596

Claims priority, application Japan, Apr. 2, 1976, 51-41417[U]

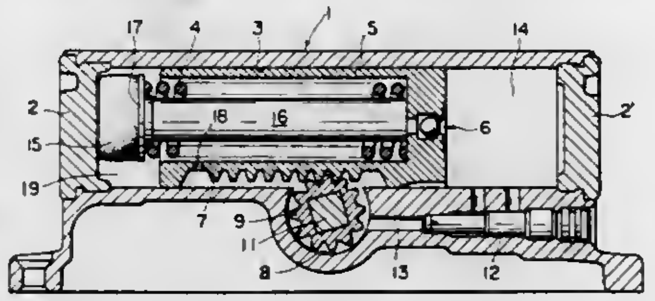
Int. Cl.² E05F *3/10, 3/22*

U.S. Cl. 16—52 **4 Claims**

1. In a door operator mechanism including a housing defining a hydraulic cylinder therein, a piston slidably disposed in the cylinder, a spring member disposed within the cylinder and engaging the piston at one end to bias the piston in a first direction, and drive means operatively coupled to the piston for moving the piston in a second direction opposite to the first direction against the force of the spring member in response to the opening of a door, the improvements characterized by:

(a) a resilient member disposed in the cylinder between one end thereof and the other end of the spring member and having a higher coefficient of resiliency than the spring member, whereby the spring member alone is primarily compressed when the door is opened within a normal angular range, and

(b) a rigid, unmounted rod member disposed for free axial movement within the spring member and dimensioned to become engaged between the resilient member and the inner face of the piston when the limit of said normal angular range is reached and before the spring member becomes fully compressed, whereby said rod member thereafter compresses said resilient member to increasingly resist the opening of the door beyond said normal angular range.



4,097,957

AUTOMATIC DOOR CLOSING DEVICE

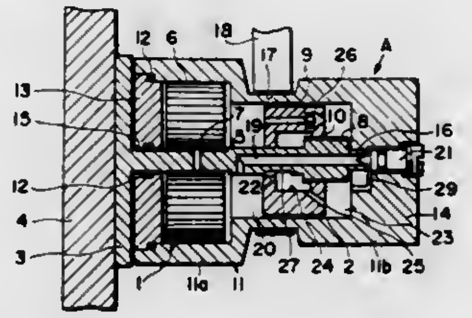
Hiromu Kitutaka, Fuchu, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Sep. 15, 1977, Ser. No. 833,612

Claims priority, application Japan, Sep. 16, 1976, 51-124936[U]

Int. Cl.² E05F *3/14, 3/22*

U.S. Cl. 16—58 **6 Claims**



1. An automatic door closing device for a sliding type door which is supported by and slidable between a pair of vertical frames, comprising;

(a) a stationary shaft adapted to be fixedly secured to said door, said stationary shaft being extended normally from said door when secured thereto,

(b) a generally cylindrical housing rotatably supported by said stationary shaft to provide a fluid-tight annular space around said stationary shaft,

(c) a biasing means housed in said housing for biasing said housing in one rotational direction,

(d) a movable member housed in said housing and mounted on said stationary shaft therealong, said movable member being engaged with an inner periphery of said housing to be rotated therewith,

(e) a belt having one end secured to an outer periphery of said housing and the other end adapted to be secured to one of the frames, said belt being wound normally on said outer periphery of said housing and unwound when said housing being rotated against the biasing force of said biasing means, and

(f) passage means provided to permit a fluid communication between a first and a second chambers defined by opposite sides of said movable member for controlling the rotational speed of said housing in the belt winding direction.

4,097,958

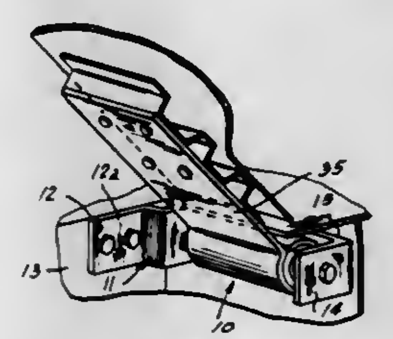
RUBBER TORSION SPRING HOOD HINGE FOR AUTOMOTIVE VEHICLE

Clarence Arthur Van Dell, Franklin Village, Mich., assignor to Dura Corporation, Southfield, Mich.

Filed Apr. 20, 1977, Ser. No. 789,109

Int. Cl.² E05D *1/04, 11/10*

U.S. Cl. 16—128.1 **8 Claims**



1. An automotive vehicle hood hinge assembly comprising: a bracket attachable to the body of a vehicle in non-movable relation therewith, a hinge strap having an end attachable to a vehicle hood in non-movable relation therewith and having a second end attached to the outer surface of an elastomeric torsion spring in non-relatively rotatable relationship therewith, an inner surface of the torsion spring attached to the bracket in non-relatively rotatable relation therewith, the hood relatively rotatable with respect to the vehicle body, said relative rotation accommodated by elastomer torsional flow within the elastomeric torsional spring, abuttable means carried respectively by the hinge strap and the bracket, the abuttable means being brought into abutment by rotation of the hinge strap relative to the bracket, further rotation requiring compression of the elastomeric spring, compression of the elastomeric spring allowing an abutment means on the strap to pass an abutment means on the bracket during further rotation of the strap relative to the bracket, movement of the abutment means on the strap past the abutment means on the bracket relieving said compression whereby the abutment means provide an overcenter stop.

4,097,959

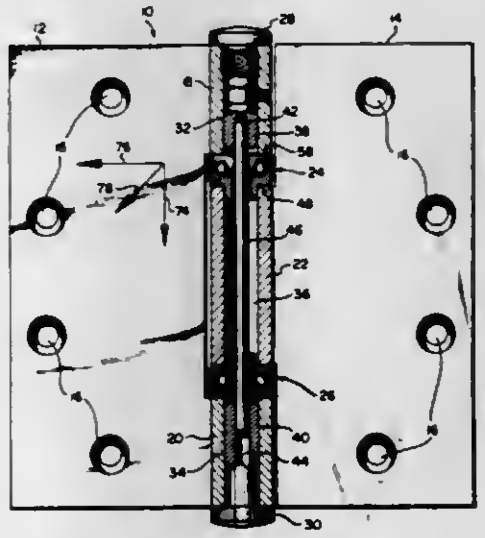
LOAD SUPPORTING HINGE STRUCTURE

Larry K. Johnson, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Mar. 31, 1977, Ser. No. 783,324

Int. Cl.² E05D *11/04*

U.S. Cl. 16—136 **8 Claims**



1. A hinge structure comprising: a pair of leaves, one of said pair of leaves including at least a pair of spaced knuckles, the other of said pair of leaves including at least one intermediate knuckle, said spaced knuckles and intermediate knuckle having

a central axial bore, pintle means disposed coaxially within said knuckles to maintain assembly of said leaves, said pintle means being connected to said spaced knuckles to rotate in unison therewith, and being spaced from the bore of said intermediate knuckle to rotate relative thereto, and bearing means disposed between each of said end knuckles and an adjacent intermediate knuckle whereby the axial and radial components of the loading forces created upon mounting of a door are transmitted from said leaves through said knuckles and pintle means to said bearing means and are accommodated by said bearing means to minimize friction and wear of said hinge structure, and improve performance thereof, at least one of said bearing means comprising a first, axially inner generally annular race member engaged with said intermediate knuckle for rotation in unison therewith, and a second, axially outer generally annular race member including a central aperture sized to be engaged with said pintle means for rotation in unision therewith, and a plurality of bearing elements disposed between said first and second race members, and first race member including an axially extending shoulder portion formed about the radially outer periphery thereof and including an inwardly facing arcuate surface portion merging smoothly with a substantially flat inner peripheral portion free of any shoulder means to confine said bearing elements and thereby defining a first raceway, and said second race member including an axially extending shoulder portion formed about the radially inner periphery thereof and including an outwardly facing arcuate portion merging smoothly with a substantially flat outer peripheral portion free of any shoulder means to confine said bearing elements, thereby defining a second raceway spaced from said first raceway, with said bearing elements engaged between said first and second raceways thereby providing a structural arrangement wherein the raceways are free to shift in accordance with the load placed thereon to accommodate both radial and thrust loading.

4,097,960

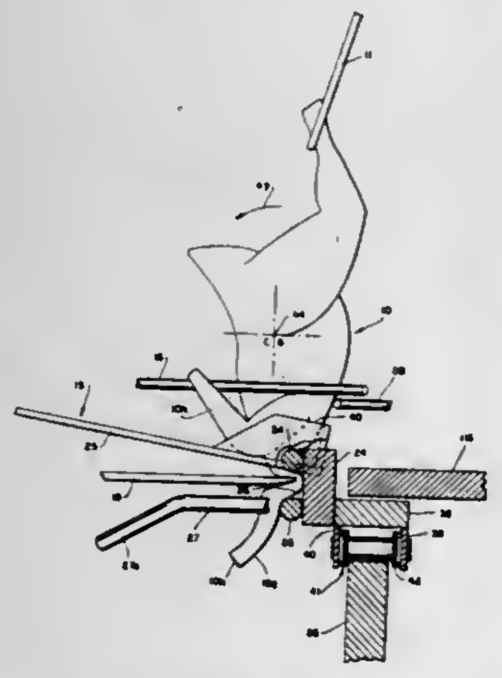
POULTRY PROCESSING SYSTEM

Kenneth Z. Graham, Rt. 2, Dawsonville, Ga. 30354, and Johnny R. Graham, Rt. 8, Gainesville, Ga. 30501

Filed Oct. 28, 1976, Ser. No. 736,544

Int. Cl.² A22C *21/00*

U.S. Cl. 17—11 **17 Claims**



1. In a method of processing poultry or the like comprising moving a series of birds suspended in a neck-down attitude along an approximately rectilinear path, and as the birds are continuously moved along the rectilinear path, the steps of sequentially moving a series of bird holders up an incline from below the path of the birds in timed relationship with the movement of the birds until the bird holders at least partially support the birds at the shoulders of the birds with the necks of the birds hanging downwardly beneath the birds, moving the bird holders along an approximately horizontal path while the birds are partially supported by the bird holders, rotating a plurality of blades about an approximately vertical axis with the blades extending radially outwardly from the vertical axis, with the rotation of the blades being in timed relationship with the bird holders to move in a circular path progressively toward the bird holders and birds carried by the bird holders into contact with the necks of the birds at a predetermined distance beneath the portions of the shoulders of the birds being supported by the bird holders as the bird holders move along their approximately horizontal path and pinching the necks of the birds with the blades against the bird holders.

4,097,961

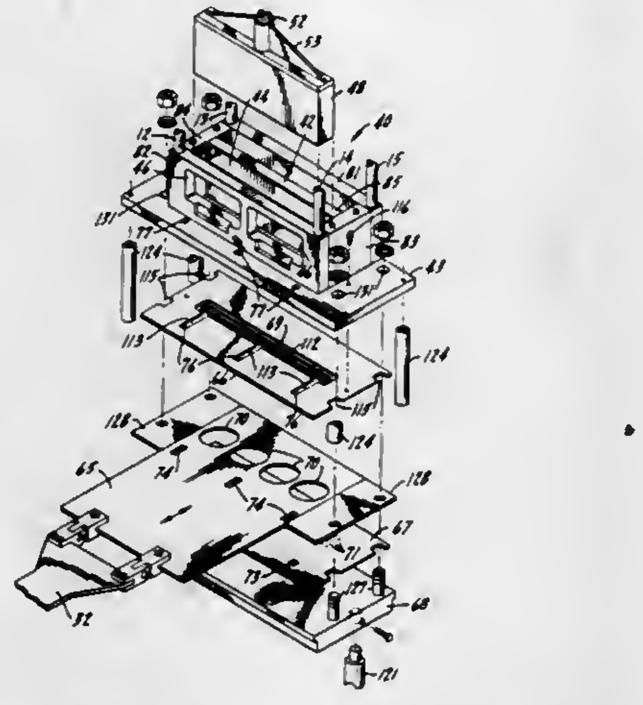
MOLD COVER FOR FOOD PATTY MOLDING MACHINE

Louis R. Richards, Mokena, Ill., assignor to Formax, Inc., Mokena, Ill.

Continuation-in-part of Ser. No. 623,986, Oct. 20, 1975, Pat. No. 4,054,967, This application Oct. 18, 1976, Ser. No. 733,045

Int. Cl.² A22C *7/00*

U.S. Cl. 17—32 **10 Claims**



1. In a food patty molding machine of the kind comprising a mold base, a mold cover, a mold plate including at least one mold cavity aperture disposed between the base and the mold cover, a cyclic mold plate drive for moving the mold plate between a fill position in which the mold cavity is closed by the mold base and the mold cover and a discharge position in which the mold cavity is exposed for discharge of a patty therefrom, and a food pump for pumping food product under pressure into the mold cavity when the mold plate is in its fill position, an improved mold cover comprising:

a cover plate, affixed to the food pump, having a pump outlet aperture therethrough;

a fill plate having a fill aperture therethrough;

mounting and aligning means for removably mounting the fill plate on the cover plate, in close surface-mating engagement with the cover plate and in sliding surface-mating engagement with the mold plate, and with the pump outlet and fill apertures aligned to provide a fill passage for food product from the pump into the mold cavity;

and a relief channel, in one of the mating surfaces of the cover and fill plates, adjacent to but out of direct communication with the fill passage, for receiving excess food product forced between the cover plate and the fill plate to thereby preclude such excess food product from causing the fill plate to bind against the mold plate.

4,097,962

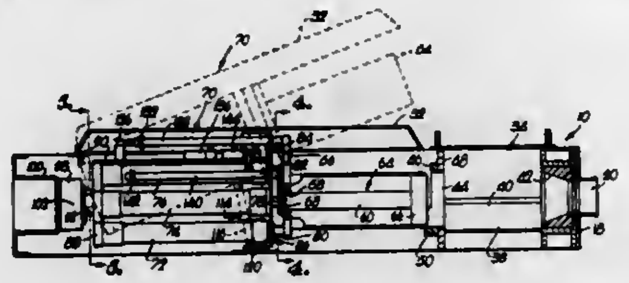
MACHINE FOR CONTINUOUS PUMPING OF PLASTIC MATERIALS

Lewis F. Alley, Kansas City, Mo., and James E. White, Overland Park, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Jul. 26, 1976, Ser. No. 708,624

Int. Cl.² A22C *7/00*

U.S. Cl. 17—39 **5 Claims**



1. In a machine for the continuous pumping of plastic materials:

an elongated, open-top cabinet, having a receptacle supported therein at one end thereof,

said receptacle having dual, laterally spaced sets of axially aligned inlets and outlets below the open top of the cabinet which communicate the receptacle with internal and external portions of the cabinet, respectively;

a materials supply hopper mounted above said receptacle for feeding materials downwardly into the latter through the open top of the cabinet;

a pair of alternately reciprocable, pump chamber-defining sleeves in the cabinet each aligned with a corresponding inlet and outlet and movable through its inlet between a rectracted position substantially outside of the receptacle and an extended position sealing off the hopper from further materials supply;

a plunger for each of said sleeves, respectively,

said plungers being alternately reciprocable through their corresponding sleeves for pushing successive charges of materials from alternate ones of said outlets when their sleeves are extended and loaded with materials from the hopper;

an operating and control pack in the cabinet behind the plungers and sleeves for moving the same through their respective operating cycles in timed relationship with one another so as to effect substantially continuous pumping of materials from the machine,

said pack including a power device for each of said plungers and each of said sleeves, respectively; a plurality of limit switches for controlling reciprocation of the plungers and their sleeves; actuating structure associated with said plungers and sleeves for engaging and operating said switches during reciprocation of the plungers and sleeves; and a frame common to said plungers, said sleeves, said power devices, said switches and said structure; and

means mounting said frame for vertical swinging movement about a horizontal axis between lowered and raised positions,

said frame joining said plungers, said sleeves, said power devices, said switches and said actuating structure together for swinging thereof as a unit about said axis for locating the plungers and sleeves in alignment with their respective inlets when the frame is in said lowered position and for projecting the plungers and sleeves accessibly through the open top of the cabinet when the frame is in said raised position,

said cabinet including an open rectangular section behind said receptacle defining a longitudinally and transversely unobstructed cavity extending between the rear wall of the cabinet and the receptacle on the one hand, and the two lateral sides of the cabinet on the other hand,

said cavity receiving said pack, said plungers and said sleeves for movement thereof about said axis between said positions,

said frame including a front transverse plate spanning said cavity from top to bottom and from said to side thereof between the pack and said plungers and sleeves so as to subdivide the cavity into a pair of unobstructed subcavities on opposite fore-and-aft sides of the plate when the plungers, sleeves and power pack are in said lowered position whereby to facilitate cleanup of the machine.

4,097,963

SHAPED ARTICLE COMPRISING CELLULOSE HYDRATE WHICH IS CHEMICALLY MODIFIED BY POLYALKYLENE OXIDE CONTAINING SYNTHETIC POLYMERS, AND PREPARATION THEREOF

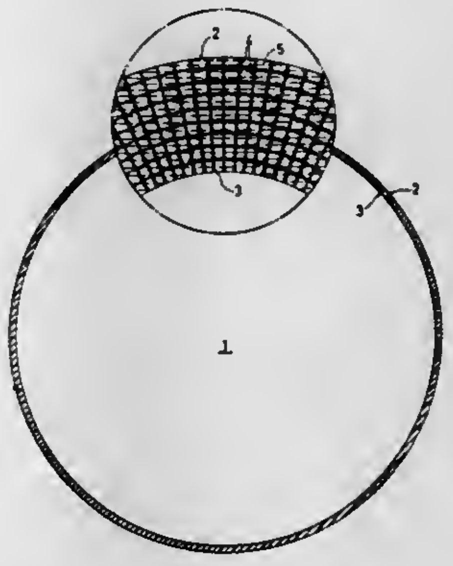
Klaus-Dieter Hammer, Mainz; Günter Gerigk, Oberursel; Lorenz Heiss, Hofheim, and Klaus Fischer, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 826,131

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637510

Int. Cl.² A22C *21/00;* F16L *11/00;* C08L *1/10;* A23G *1/00*

U.S. Cl. 17—49 **60 Claims**



1. A shaped article comprising

(a) a chemically modified cellulose hydrate obtained by reacting a cellulose derivative selected from the group consisting of cellulose hydrate, a chemical reaction product of cellulose hydrate with an alkylamido-bis-dimethylene-triazinone-tetramethylol, a chemical reaction product of cellulose hydrate with an alkylamino-bis-dimethylene-triazinone-tetramethylol and mixtures thereof, with a synthetic polymer containing recurring oxyalkylene units and at least one terminal N-methylol carbamate group having the formula

$-CH_2-O-CO-NH-CH_2-OH$ and

(b) water.

28. A process for preparing the shaped article as defined in claim 1 which comprises the steps of

(a) treating a shaped article comprising the cellulose derivative in a gel state with an aqueous solution of the synthetic polymer to incorporate into the cellulose derivative a plasticity enhancing amount of the synthetic polymer

(b) heat treating the treated shaped article to obtain a dried shaped article comprising the chemically modified cellulose hydrate.

60. A method of preparing sausages which comprises the step of filling a sausage material into a tube-shaped article as defined in claim 1.

4,097,964
MACHINE FOR DRAWING TEXTILE FIBRES

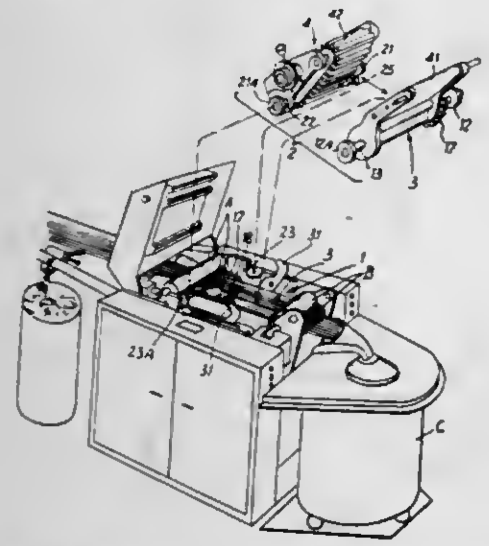
Jean Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie., Guebwiller, France

Filed Aug. 17, 1976, Ser. No. 715,212

Claims priority, appilcation France, Sep. 12, 1975, 75 28002

Int. Cl.² D01H *5/00, 5/74, 5/86*

U.S. Cl. 19—236 **2 Claims**



1. A textile fiber drawing machine comprising a frame, feed rollers and drawing rollers rotatably mounted in spaced relation in said frame, a lower drawing head having fiber treating mobile elements of selected characteristics removably mounted in said frame for interchangeability with non-selected lower drawing heads having fiber treating mobile elements of differing characteristics, said lower drawing head being located between said feed rollers and said drawing rollers, said fiber treating mobile elements of said lower drawing head mounted in said frame having characteristics which are different from the characteristics of the fiber treating mobile elements of non-selected lower drawing heads, an upper drawing head having fiber treating mobile elements of a selected characteristic removably mounted in said frame for interchangeability with non-selected upper drawing heads having fiber treating mobile elements of differing characteristics, said upper drawing head being located between said feed rollers and said drawing rollers for cooperation with said lower drawing head, said fiber treating mobile elements of said upper drawing head mounted in said frame having characteristics which are different from the characteristics of the fiber treating mobile elements of non-selected upper drawing heads, said fiber treating mobile elements of said upper and lower drawing heads mounted in said machine positioned for cooperation with each other for drawing preselected fibers through said machine, two pair of substantially semi-cylindrical sockets carried by said frame for removably supporting said upper and lower drawing heads in said machine, said lower drawing head having a drive shaft and ball bearing support members carried thereon, said ball bearing support members of said lower drawing head being supported within one pair of said semi-cylindrical sockets, said upper drawing head having a drive shaft and ball bearing support members carried thereon, said ball bearing support members of said upper drawing head being supported within the other pair of said semi-cylindrical sockets, said drive shaft of said upper and lower drawing heads being operatively connected with said fiber treating mobile elements of said upper and lower drawing heads respectively, said ball bearing support members of said upper and lower drawing heads and said two pair of semi-cylindrical sockets for supporting said upper and lower drawing heads respectively being adapted for rapid positioning and removal of said upper and lower drawing heads respectively in said machine, said drive shaft and ball bearing support members of said lower drawing head being identical with a drive shaft and ball bearing support members of non-selected lower drawing heads to facilitate interchangeability of lower drawing heads, said drive shaft and ball bearing support members of said upper drawing head being identical with a drive shaft and ball bearing support members of non-selected upper drawing heads to facilitate interchangeability of upper drawing heads, drive means carried on said lower drawing head for causing rotation of said drive shaft for driving the fiber treating mobile elements of said lower drawing head, the drive means of said lower driving head being identical with drive means of non-selected lower driving heads for interchangeability, drive means carried by said upper drawing head for causing rotation of said drive shaft on said upper drawing head for driving said fiber treating mobile elements thereon, said drive means on said upper drawing head being identical to drive means on non-selected upper drawing heads to facilitate interchangeability, and a drive member carried by said frame for driving the drive means of said upper and lower drawing heads, the drive means on said lower drawing head being positioned in said frame for cooperative engagement with said drive member in said frame, the drive means on said upper drawing head positioned in said frame being in cooperative engagement with said drive means on said lower drawing head positioned in said frame.

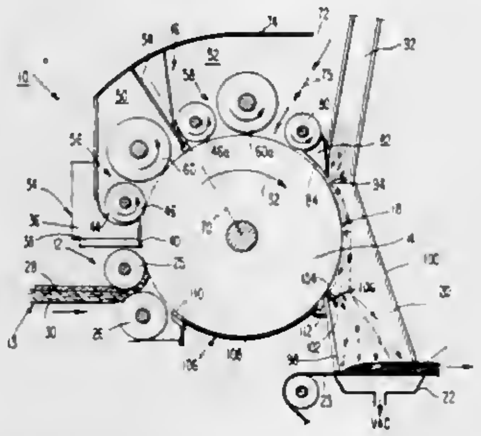
4,097,965
APPARATUS AND METHOD FOR FORMING FIBROUS STRUCTURES COMPRISING PREDOMINANTLY SHORT FIBERS

Joel Peter Gotchel, Glen Mills, Pa., and Henry James Norton, Wilmington, Del., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 17, 1976, Ser. No. 715,165

Int. Cl.² D01G *25/00, 27/00, 13/00*

U.S. Cl. 19—306 **62 Claims**



1. An apparatus for dry-forming a fibrous structure, said apparatus including:

A. a rotatable main drum having projections on its outer periphery, said drum having a fiber release zone;

B. an inlet means outside of said release zone and including feed means for directing a fibrous feed into engagement with the outer periphery of the main drum, whereby rotation of said drum past the inlet means separates the fibers from the feed;

C. a fiber working section between said inlet means and said release zone for individualizing fibers as they are directed in a downstream direction from said inlet means to said release zone by movement of the periphery of the main drum, said fiber working section including a movable satellite member having projections on its outer periphery and a housing positioned about said satellite member, the outer periphery of said satellite member being movable along a path in which the projections are directed close to the periphery of the main drum to cooperate with said main drum for individualizing fibers;

D. a movable foraminous forming surface for intercepting the fibers after they leave the release zone of the main drum, whereby a fibrous structure is formed on said forming surface;

E. a baffle means disposed adjacent the satellite member between said satellite member and the release zone, said baffle means including a lower air-directing section positioned close to the outer periphery of the main drum, said air-directing section including an upstream air-diverting surface means for (1) intercepting air conveyed to the air-directing section by movement of the outer periphery of the main drum past the satellite member, (2) diverting a first portion of the intercepted air away from the periphery of the main drum into the region between the satellite member and baffle means, and (3) diverting a second portion of said intercepted air through a constriction provided between the outer periphery of the main drum and a lower peripheral surface segment of the air-directing section;

F. said baffle means being sealed against top and side walls of the housing to provide a barrier to the downstream movement of said first portion of diverted air to increase the static pressure adjacent the satellite member.

4,097,966
BINDING CLIP FOR BUNDLING AND/OR ATTACHING CABLES AND SIMILAR OBJECTS

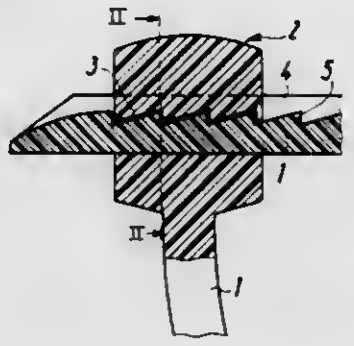
Otto Lefnaer, Stuttgart-Botnang, Fed. Rep. of Germany, assignor to Wurttembergische Allplastik GmbH, Fed. Rep. of Germany

Filed Apr. 12, 1976, Ser. No. 676,146

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1975, 2516005

Int. Cl.² B65D *63/10;* **H02G** *3/26*

U.S. Cl. 24—16 PB **16 Claims**



1. A binding clip for bundling cables and similar objects, comprising a head portion having a tongue engagement means, a tongue portion having a pair of opposing major surfaces and a pair of opposing minor surfaces, said tongue portion being connected to said head portion and having a free end insertable into said head portion, and profile means engageable by the engagement means of said head portion when said binding clip is closed, said profile means being fully recessed within both of said minor surfaces.

4,097,967
SNAP LOCK STRUCTURE

William Nicholas Conner, Jr., 439 Westfield Ct., Wichita, Kans. 67212

Filed Apr. 20, 1977, Ser. No. 789,107

Int. Cl.² B65D *77/10*

U.S. Cl. 24—30.5 R **7 Claims**

1. A snap lock structure connectable to a neck portion of a bag structure to provide an airtight seal, comprising:

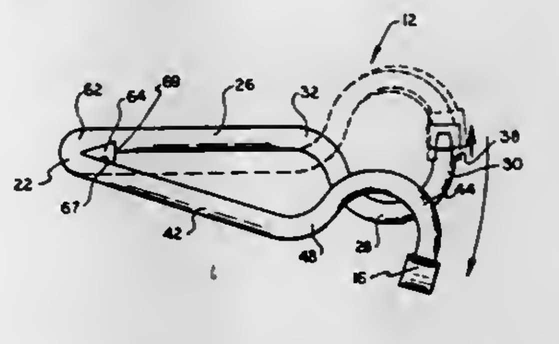
(a) an upper clamp member secured through a connector section to a lower clamp member;

(b) said upper clamp member having a main clamp body connected through a clamp section to a lock receiver portion;

(c) said lower clamp member having a main body clamp connected through a connector clamp section to a lock head portion;

(d) said lock receiver portion and said lock head portion engaged in a latched condition and biased into engagement by the bag structure; and

(e) the bag member in the clamped condition operates to separate said main clamp body and said main body clamp to create a clamping force between said lock receiver portion and said lock head portion to provide the clamping action.



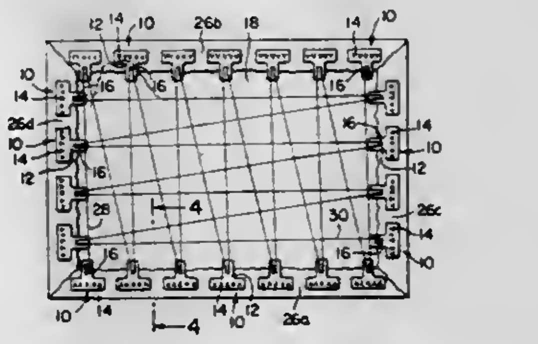
4,097,968
CLIP

Joseph R. Pikus, 71 Central Ave., Lancaster, N.Y. 14086

Filed Apr. 7, 1976, Ser. No. 674,412

Int. Cl.² A44B *21/00;* **D06C** *3/08*

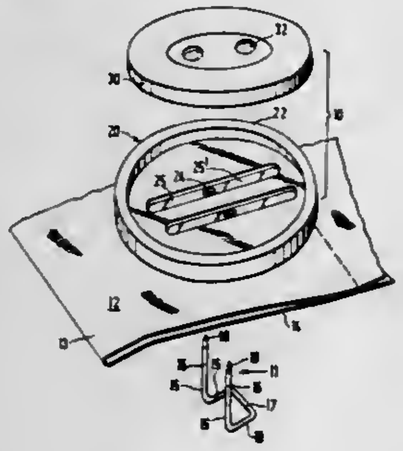
U.S. Cl. 24—73 CC **1 Claim**



1. A clip to detachably grip fabric comprising a generally planar member, said member being defined, in plan view, by a broad leading portion and a relatively narrow trailing portion, said broad leading portion having a forward edge and a rearward edge, a plurality of pointed prongs integrally formed on said member and adapted to engage the fabric, said pointed prongs being positioned on said broad leading portion spaced from said forward and rearward edges thereof and extending from one planar side of said member, said pointed prongs being disposed in canted configuration so as to angle in a direction generally towards said trailing portion, a finger integrally formed on said trailing portion and extending minutely from the other planar side of said member, said finger being defined by a bend part rising minutely upwardly from the plane of said member and an elongated part having one end integral with said bend part and the other end oriented so as generally to point towards said broad leading portion, said bend part being disposed on said trailing portion spaced from said pointed prongs, said elongated part being disposed parallel opposed over, yet spaced from, said other planar side of said member, said finger being adapted to couple a tensional force to said member such that when the tensional force is coupled to said member, said pointed prongs securely grip the fabric whereby said member becomes firmly attached to the fabric.

4,097,969
BUTTON HAVING A STITCHLESS FASTENER

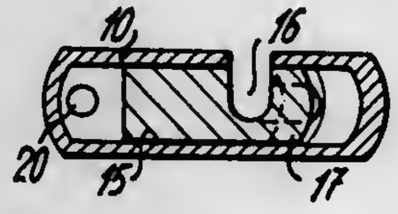
Bernhard Nysten, Aachen, Fed. Rep. of Germany, assignor to William Prym-Werke KG, Stolberg, Fed. Rep. of Germany
Filed Dec. 1, 1976, Ser. No. 746,324
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555025
Int. Cl.² A44B *1/18*
U.S. Cl. 24—90 R **12 Claims**



1. In a button with a stitchless fastener, the button including a two-part button body having an upper and lower part to be arranged on the front side of a carrier material, the lower part having a top and bottom surface through which two apertures extend and a recess proceeding along said top surface from said apertures, a fastener in the form of a U-shaped staple, the staple having two legs which each have an end thrust through the back side of the carrier material to emerge on the front side, and passed through the two apertures of the lower part and the protruding portions of the ends of the legs and being received in downwardly deformed condition in the recesses and wherein the upper part is connectable to the lower part and covers the recess-containing upper surface of the lower part, the improvement comprising a form-maintaining fastener having two parallel L-shaped legs projecting from a bight, said fastener having and substantially maintaining this preformed shape wherein the ends of the legs serve to hold the button in place without deformation of the shape of the fastener, wherein the lower part has parallel directed recesses corresponding to the parallel legs and originating from the separate apertures, the recesses defining a turning plane for the ends of the legs upon turning motion of the entire staple; and an upper part connectable to the lower part and operative to confine the ends of the legs and wherein said lower part further has a wall with an inwardly directed rim surrounding said top surface of said lower part, and confining said upper part.

4,097,970
SAFETY FASTENER

Ennio Cagnato, Rue Neuve du Molard 18, CH-1204 Geneva, Switzerland
Filed Jul. 11, 1977, Ser. No. 814,695
Int. Cl.² A44B *13/00*
U.S. Cl. 24—238 **9 Claims**



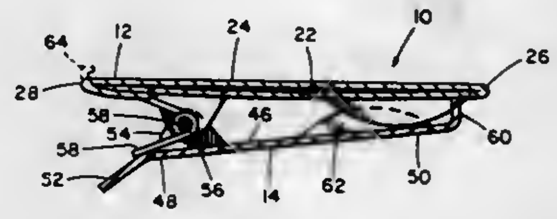
1. A safety fastener, comprising

a casing having two opposite ends and a pair of transversely spaced discrete side walls each including a first portion extending from one of said ends towards the other end and a second portion extending from said first portion to said other end, said first portions extending parallel to each other and being provided with registering openings and said second portions converging in direction towards each other and towards said other end; and

a locking member received in said casing and having an end portion of wedge-shaped configuration, said locking member being slidable in said casing between a first position in which said openings are unobstructed so that an element to be connected to the fastener can be placed into the openings, and a second position in which said wedge-shaped end portion is wedged into the tapering spaced between said converging second portions and said locking member blocks said openings against withdrawal of said element from the same.

4,097,971
CLIP APPARATUS

William E. Morris, Appleton, Wis., assignor to Scolding Locks Corporation, Appleton, Wis.
Filed Feb. 2, 1977, Ser. No. 765,047
Int. Cl.² A44B *21/00;* **G09F** *19/00*
U.S. Cl. 24—253 **12 Claims**



1. A clip apparatus, having an assembled state and an unassembled state, comprising, in combination:

an integral display member including a display section having opposed first and second faces and opposed first and second edges, an arm section extending from said first edge and substantially away from said second edge and said unassembled state, and a tab section extending from said second edge, said arm section having an arm section end opposite said first edge and a pair of opposed flange portions, said arm section being folded about said first edge upon said first face of said display section in said assembled state, said opposed flange portions extending outwardly from said first face in said assembled state, said tab section being folded about said second edge onto said arm section end in said assembled state to substantially retain said arm section against said first face;

a clip member having a grasping end portion;

means for rotatably securing said clip member to said opposed flange portions of said arm section in said assembled state; and

means for biasing said grasping end portion of said clip member against said integral display member.

4,097,972
BAND CLAMP

Giuseppe Tomasina, Via Milano, 1, Ternate (Varese), Italy
Filed Aug. 1, 1977, Ser. No. 820,953
Claims priority, application Italy, Sep. 8, 1976, 26993 A/76
Int. Cl.² F16L *33/10*
U.S. Cl. 24—278 **3 Claims**

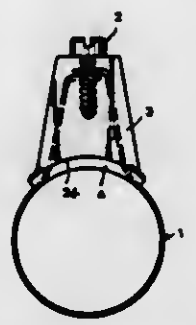
1. A band clamp for the fastening of pipes or hoses consisting of elastic material on fittings or rigid junctions, including:

(i) a metal band wound in a ring-wise fashion the free ends of which are provided with holes, being overlapped each other and so shaped as to build a loop;

(ii) an arcuate guide-plate provided with a central window-opening into which there is inserted the loop;

(iii) a U-shaped member having the free ends curved and

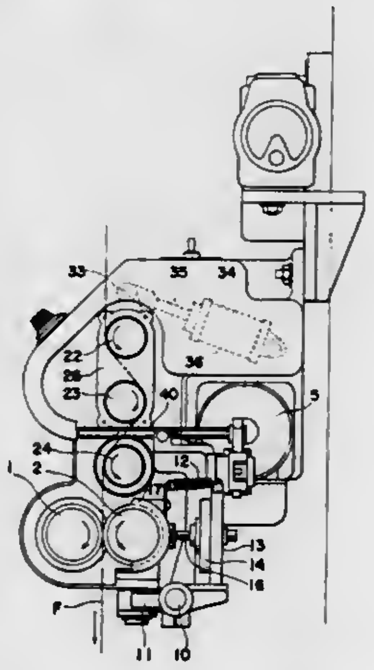
resting upon the guide-plate, the said member being provided with a through-hole at the horizontal side, and



(iiii) a screw passing through the U-shaped member and screwed to the holes of the loop-like shaped ends of the metal band.

4,097,973
APPARATUS FOR UNFOLDING, SPREADING AND GUIDING TRAVELLING FABRIC

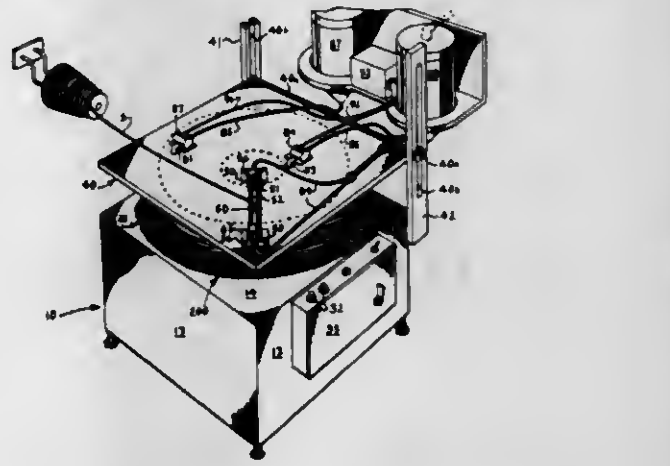
Hideyuki Cho, 5-6-4, Takanodai, Suita-shi, Osaka-fu, Japan
Filed Jun. 28, 1977, Ser. No. 810,722
Int. Cl.² D06C *3/06*
U.S. Cl. 26—78 **9 Claims**



1. An apparatus for unfolding, spreading and guiding a travelling fabric comprising for each selvage of the fabric guide means including a stationary roller and a movable roller opposed to the stationary roller and movable toward or away therefrom to nip a selvage of the fabric between the rollers when required to correct deviation of the fabric, unfolding and spreading means including at least three screw rollers arranged side by side at the feed side of the guide means and along the direction of travel of the fabric, each of the screw rollers being rotatable by a motor in the direction of unfolding and spreading the fabric, at least one of the screw rollers other than the screw rollers at the opposite sides thereof being pivotally movable in a direction toward or away from the surface of the fabric when required, the stationary roller of the guide means having a roller main body and a shaft rotatable by the motor in the same direction as the direction of travel of the fabric, a friction member provided between the shaft and the stationary roller main body and having suitable frictional resistance to render the stationary roller main body rotatable by the motor when the movable roller is away from the stationary roller, a selvage sensor disposed for the selvage of the fabric, means for moving the movable guide roller into contact with the stationary guide roller upon the sensor detecting inward deviation of the selvage of the fabric, and shifting means for forcing the movable screw roller into the space between the screw rollers on the opposite sides thereof simultaneously with the contact of the movable guide roller with the stationary guide roller upon the sensor detecting the inward deviation of the selvage.

4,097,974
METHOD AND APPARATUS FOR SIMULTANEOUSLY DYEING YARN AND FORMING YARN PACKAGE

James H. Eakes, P.O. Box 609, Cartersville, Ga. 30120
Filed Jun. 17, 1974, Ser. No. 480,024
Int. Cl.² B65H *54/82;* **D06P** *5/00*
U.S. Cl. 28—169 **9 Claims**



1. An improved method for random or space dyeing yarn while simultaneously forming a package of yarn including the steps of:

rotating a support means about an axis;

advancing a length of yarn along its length on to the support means adjacent the axis of rotation of the support means during cyclic of rotation of the support means;

effecting a rectilinear radial reciprocating displacement of the length of yarn as the yarn moves along its length toward the support means during the cyclic rotation of the support means to cause the yarn to form an annular build up of yarn on the support means in a sinusoidal wave pattern with portions of the yarn displaced at various radial distances from and concentrically around the axis of rotation of the support means;

applying dye material to the revolutions of yarn as the yarn continues to move onto the support means; and

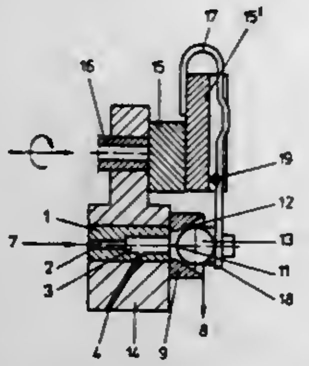
continuing the cycles of rotation of the rotatable support means, the rectilinear radial reciprocating displacement of the length of yarn during successive cycles of rotation and the dye application to each revolution to cause a number of overlapping layers of sinusoidal wave patterns of yarn to be axially formed relative to each other to develop an annular porous package of yarn and to include a random or space dye pattern in the yarn.

4,097,975
NOZZLE ASSEMBLY FOR TEXTURING SYNTHETIC FILAMENTS

Norbert Möeller, Berlin, Fed. Rep. of Germany, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland
Filed Jul. 19, 1977, Ser. No. 816,948
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634460
Int. Cl.² D02G *1/16*
U.S. Cl. 28—254 **9 Claims**

1. A nozzle assembly for texturing at least one yarn consisting of a plurality of endless synthetic filaments, said assembly comprising a member formed substantially coaxially with a guide passage and a whirling chamber, having a larger cross-section than said guide passage, and also formed with at least one bore radially communicating with said whirling chamber for conveying compressed air into said whirling chamber, whereby yarn while passing in sequence through said guide

passage and said whirling chamber is textured in said whirling chamber, said whirling chamber and said bore being arranged for the air to emerge from said chamber in the same direction as the yarn and as a spreading stream, a nozzle member extending coaxially from said whirling chamber and formed with an expanding passageway of greater cross-section than the spreading conical stream of air, a guide element formed with a spherical surface and means mounting said guide member with said spherical surface spaced from and facing towards said whirling chamber, said guide element being mounted in said expanding passageway to define therewith an annular slot serving to guide and accelerate the air stream as it passes therethrough, the arrangement being such that the yarn also is delivered through said slot.



4,097,976

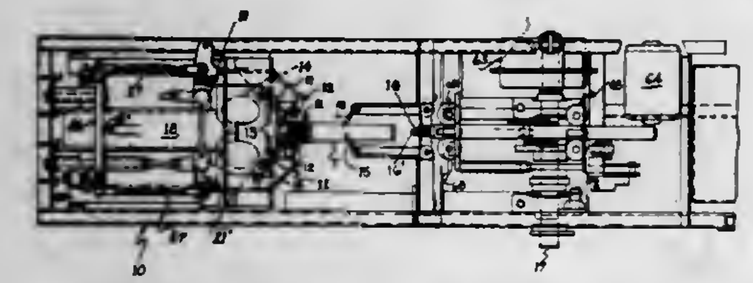
SPINNING TUBE STRIPPING MEANS

Richard Ferguson, and Gettys D. Hoyle, Jr., both of Charlotte, N.C., assignors to The Terrell Machine Company, Charlotte, N.C.

Filed Jun. 23, 1976, Ser. No. 698,908

Int. Cl.² B65H *73/00*

U.S. Cl. 28—297 **14 Claims**



1. In apparatus for stripping residual yarn from spinning tubes, the combination of means for aligning a spinning tube axially for stripping, means for applying a pair of stripping blades oppositely and transversely to the body of an aligned spinning tube adjacent the base thereof, means acting at the tip of an aligned spinning tube for pressing the same axially between said applied stripping blades, means responsive to a stripping force resisting said pressing means, and means for causing said blades to spread for reducing said stripping force when said force is sufficient to threaten spinning tube damage.

2. In apparatus for stripping residual yarn from spinning tubes, the combination of means for aligning a spinning tube axially for stripping, means for applying a pair of stripping blades oppositely and transversely to the body of an aligned spinning tube adjacent the base thereof, means acting at the tip of an aligned spinning tube for pressing the same axially between said applied stripping blades, and means for relieving said stripping blade application whenever said pressing means is resisted by a stripping force sufficient to threaten spinning tube damage, wherein said aligning means includes a pair of pivot arms having elements at their extending ends shaped for respectively engaging at the tip and base ends of a spinning tube along the longitudinal axis of said tube for supporting the same, said pivot arms being mounted for pivoting transversely with respect to the spinning tube axis, and means for pivoting said pivot arms so as to transfer a spinning tube from a supply position to an aligned position for stripping.

4,097,977

METHOD TO ATTACH THE CENTER ELECTRODE INTO A CERAMIC INSULATOR BODY OF SPARK PLUGS

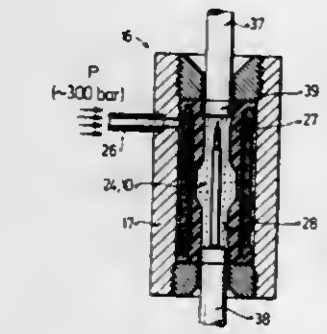
Rudolf Pollner, Bamberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 807,872

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628667

Int. Cl.² H01T *13/00*

U.S. Cl. 29—25.12 **8 Claims**



1. Method of attaching a center electrode (11) to a ceramic insulator body (10) of a spark plug by embedding the center electrode in the end portion of the unfired, pre-formed ceramic insulator material formed with a central bore to provide communication with the inner end of the center electrode with the central bore and permit electrical connection through the central bore to the center electrode comprising, the sequential steps of

- providing a movable plug element (38) having a needle-like extension (42) formed with a hollow end portion (43, 44), and providing an elastic tubular press mold (27);
- inserting the end portion of the center electrode (11) which is to form the inner or connecting end into the hollow end portion (44) of the needle-like extension, while the plug element (38) is removed from the tubular mold (27);
- inserting the plug element (38) within the tubular mold, the needle-like extension (42) extending into the inner chamber formed by the tubular opening of the tubular mold, the plug element (38) closing off said tubular mold (27);
- introducing a measured predetermined quantity of pulverized, granular or powdery ceramic (24) through the still remaining opening of the tubular mold to fill the chamber (28) formed by the tubular mold as closed off by the plug (38), with said ceramic material;
- inserting a second plug (37) into the free opening to close off the fill opening of the tubular mold;
- applying radially inwardly directed pressure from the outside on the elastic tubular mold to transfer radially inwardly directed pressure to the ceramic insulating material introduced into the tubular mold, with the needle-like extension of the first plug (38) and the electrode tip (11) inserted therein;
- releasing the pressure on the outside of the tubular elastic mold (11);
- withdrawing both said plugs from the tubular mold, the ceramic insulator press form remaining on the needle-like extension (42) with the center electrode tip pressed therein;
- and removing the insulator press form with the center electrode (11) compressed therein from the end bore (44) of the needle-like extension (42).

4,097,978

DC ARC FURNACE HEARTH ELECTRODE INSTALLATION

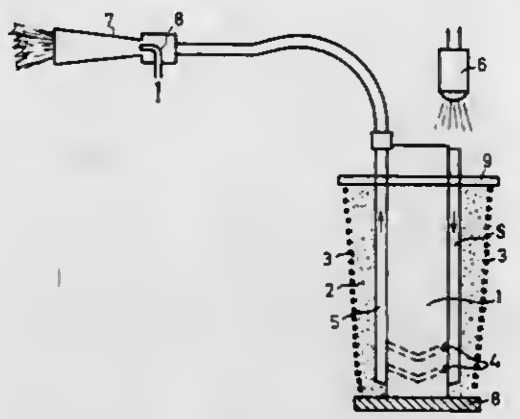
Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Mar. 17, 1977, Ser. No. 778,471

Claims priority, application Sweden, Mar. 22, 1976, 7603485

Int. Cl.² H01J *9/02*

U.S. Cl. 29—25.14 **4 Claims**



1. A method for drying a new hearth electrode for a DC electric arc furnace, the new electrode comprising a metal billet extending through a wall portion of the furnace, the billet having an inside end which will be contacted by a melt in the furnace during operation of the furnace, and an outside end for an electrical connection, and at least slightly moist refractory surrounding the billet; said method comprising prior to surrounding the billet with the moist refractory forming at least one transverse hole through said billet adjacent to one of its ends, forming at least two metal channels having lengths substantially as long as the billet and fixing the channels to the billet with the channel's open sides facing the billet and respectively overlying opposite ends of said hole, closing the ends of the channels adjacently beyond said hole and surrounding the billet and channels with the moist refractory while leaving the channels with open ends remote from the hole, whereby to form a U-shaped passage via the channels and said hole, and passing hot gas through said passage to heat the billet until the refractory is substantially dried.

4,097,979

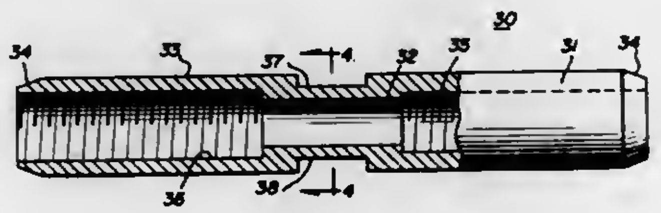
GUIDE TOOL FOR MOUNTING VEHICLE WHEELS

Stephen R. Interdonato, 2507 N. New England Ave., Chicago, Ill. 60635

Filed Aug. 15, 1977, Ser. No. 824,536

Int. Cl.² B25B *27/14*

U.S. Cl. 29—273 **1 Claim**



1. A guide tool for use in guiding the stud holes of an automobile vehicle wheel over the mounting studs of the associated vehicle hub, said guide tool comprising an elongated hollow tubular body having a smooth cylindrical outer surface extending the length thereof dimensioned to be received through a stud hole of an associated wheel and chamfered at each of the opposite ends thereof, said body having two internally threaded portions respectively at the opposite ends thereof and respectively having two different sizes of thread diameter for threaded engagement with a stud of either of said two sizes on the associated hub for mounting thereon, each of said threaded portions having a length less than the length of an associated stud and substantially greater than the distance between said threaded portions, and two diametrically opposed flat rectangular recesses in said outer surface of said body substantially midway between the opposite ends thereof for accommodating an end wrench or the like, said body when mounted on an associated stud being receivable through a wheel stud hole for guiding the wheel onto and off of the stud substantially without sliding engagement therebetween.

4,097,980

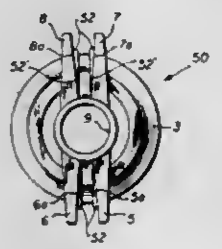
METHOD OF MANUFACTURE OF A MECHANICAL CORK PULLER

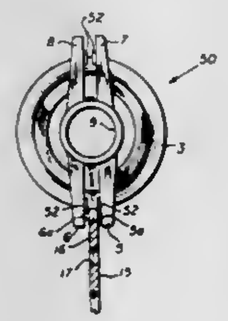
George J. Bozzo, New Milford, N.J., assignor to Irvinware Division of Beatrice Foods Company, Astoria, N.Y.

Division of Ser. No. 647,784, Jan. 9, 1976. This application Mar. 1, 1977, Ser. No. 773,169

Int. Cl.² B23P *19/00*

U.S. Cl. 29—434 **7 Claims**



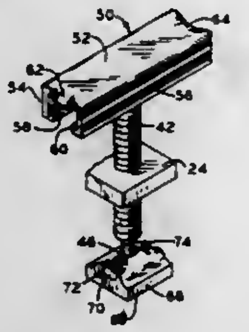


1. A method for the manufacture of a mechanical cork puller having a cork puller shaft and at least one lever arm mounted for pivotal movement between a pair of opposed support members about a pivot hole formed in said one lever arm, and wherein said lever arm is adapted to linearly displace said cork puller shaft so as to raise and remove a cork from a bottle, said method including the steps of:

- providing pivot means on the opposed inner surfaces of said support members which is not visible on the outer surfaces thereof, said pivot means being provided by the steps of
  - forming a pair of elongated spaced parallel rib members integrally with each of the inner surfaces of said support members, and
  - cutting said rib members to a length which is adapted to be received in said pivot hole provided in said lever arm; and
- temporarily springing apart said support members by forceably slidably inserting said lever arm between said support members and said pivot means until said pivot means is in registry with said pivot hole, whereupon said support members spring back to their original position to thereby lock the lever arm in place for pivotal movement about said pivot means.

4,097,981
METHOD OF FABRICATING C-CLAMP

Samuel A. Hochstetler, P.O. Box 97, Topeka, Ind. 46571
Division of Ser. No. 675,978, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 797,070, May 16, 1977. This application Apr. 18, 1977, Ser. No. 788,141
Int. Cl.^{2} B23P *11/00*
U.S. Cl. 29—441 R **10 Claims**



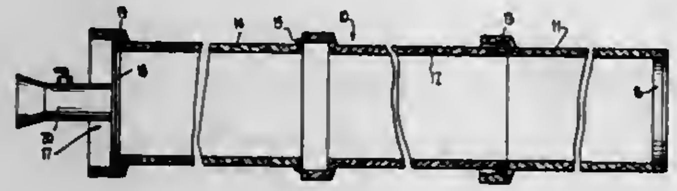
1. The method of forming a handle comprising the steps of: transversely cutting sections from an extruded metallic channel-shaped member;

inserting a polygonal bolt head into a section; said bolt head having an interference fit with the sides of said section to prevent relative rotation thereof; and

forming the section to a smaller cross-sectional size than said head to prevent the withdrawal of the head from the section.

4,097,982
METHOD AND APPARATUS FOR JOINING PIPES

David William Pentreath, St. Albans, and Malcolm Colledge, North Altona, both of Australia, assignors to Porto & Valente Industries Pty. Limited, North Altona, Australia
Filed Jun. 21, 1976, Ser. No. 698,023
Claims priority, application Australia, Jun. 23, 1975, 2094/75
Int. Cl.^{2} B23P *11/02, 19/02, 19/04*
U.S. Cl. 29—451 **15 Claims**

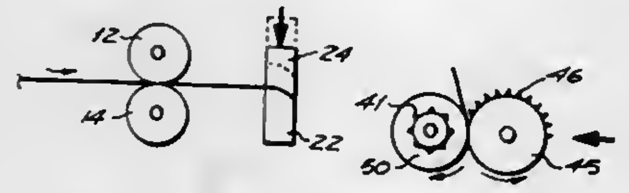


9. A method of joining a series of pipes together to form a pipeline in a fluid environment, and in which the joints between the pipes incorporate sealing means, said method including the steps of positioning closure means over the ends of first and second pipes remote from the joint to be formed between said pipes, positioning said first and second pipes in axial alignment and with a sealing means therebetween, positioning a first disposable closure means, having a closable passage therethrough, at the joint between said first and second pipes, evacuating the space within said first and second pipes to a pressure below the outside fluid pressure with the greater outside fluid pressure axially forcing the pipes together against the resistance of the sealing means at said joint, removing the closure means from the end of said second pipe remote from said joint, positioning a closure means on the end of a third pipe to be joined to said second pipe, closing the closable passage through said first disposal closure means to form a closure at the joint between said first and second pipes, positioning said third pipe in axial alignment with said second pipe and with a sealing means therebetween, positioning a second disposable closure means at the joint between said second and third pipes, evacuating the space within said second and third pipes to a pressure below the outside fluid pressure with the greater outside fluid pressure axially forcing said third pipe onto the end of said second pipe against the resistance of the sealing means at said joint, repeating the above steps for each successive pipe to be added, and removing an inner portion of each disposable closure means after it has performed its closure function by cutting around the inner periphery of the joint of which it forms part.

10. A system for joining a series of pipes together to form a pipeline in a fluid environment, and in which the joints between the pipes incorporate sealing means, said pipes each having spigot and socket ends adapted to mate with socket and spigot ends, respectively, on adjacent pipes, said system including a first closure means adapted to be positioned over the spigot end of a first pipe and having a closable opening therethrough, said first pipe spigot end being positionable in axial alignment with and adjacent a socket end of a second pipe, sealing means between said aligned spigot and socket ends, a second closure means adapted to sealingly engage and close the socket end of said first pipe, a third closure means adapted to sealingly engage and close the spigot end of said second pipe, means for evacuating the space within said first and second pipes, while said closable opening in said first closure means is open, to a pressure below the fluid pressure outside said pipes, whereby the outside fluid pressure causes said first pipe spigot end to move into sealing engagement with said second pipe socket end, said first closure means opening being thereafter closed, whereby said first closure means closes the spigot end of said first pipe, a fourth closure means having a closable opening therethrough adapted to sealingly engage the spigot end of a third pipe positionable in axial alignment with and adjacent the socket end of said first pipe after said second clsoure means is removed therefrom, sealing means between said aligned spigot and socket ends, said second closure means adapted to sealingly engage and close the socket end of said third pipe, means for evacuating the space within said first and third pipes to a pressure below the fluid pressure outside said first and third pipes, whereby the outside fluid pressure causes the spigot end of said third pipe to move into sealing engagement with the socket end of said first pipe.

4,097,983
WOUND ROLL OF FIBROUS MATERIAL AND A METHOD FOR FORMING THE SAME

Terrell A. Cole, 2820 Sherwood Dr., San Bruno, Calif. 94066
Filed Jun. 25, 1976, Ser. No. 700,012
Int. Cl.^{2} B21D *39/00;* B23P *11/00*
U.S. Cl. 29—521 **5 Claims**

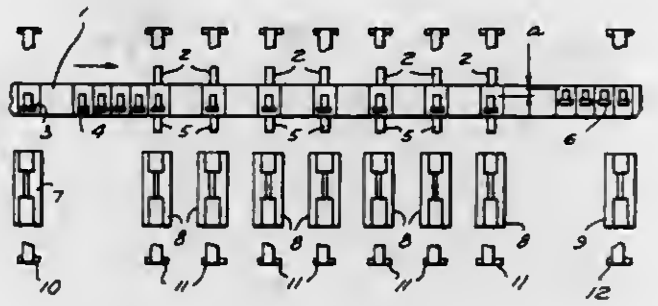


1. A method of forming a wound roll of fibrous material, such as label ribbon, comprising the steps of:

connecting one end portion of a fibrous ribbon to a rotatable spindle, progressively winding the ribbon in successive layers on the spindle for forming a roll consisting of a plurality of concentric, contiguous layers of substantially annular configurations, puncturing the innermost layers of the roll adjacent to said spindle for forcing burrs to project radially from each of the punctured layers into received relation with punctures formed in adjacent layers, and closing the roll by puncturing successive outer layers of the ribbon for forcing burrs to project radially from each of the punctured layers into an interlocked relation with punctures formed in adjacent layers, and removing the closed roll from the spindle.

4,097,984
SECTOR OF AUTOMATIC PRODUCTION LINE

Georgi Nikolov Petrov, Sofia, Bulgaria, assignor to Institute za Metallorejeshti Machini, Sofia, Bulgaria
Filed May 5, 1976, Ser. No. 683,620
Claims priority, application Bulgaria, May 7, 1975, 29895
Int. Cl.^{2} B23B *25/00;* B23P *23/06*
U.S. Cl. 29—563 **2 Claims**



1. In an automatic production line with a group of machine tools operating in parallel, the combination therewith of:

a conveyor passing through a plurality of stops each aligned with a respective machine tool;

a plurality of carriages slippably entrained by said conveyor for the transportation of individual workpieces to be machined;

retaining means at each stop for temporarily arresting an oncoming carriage;

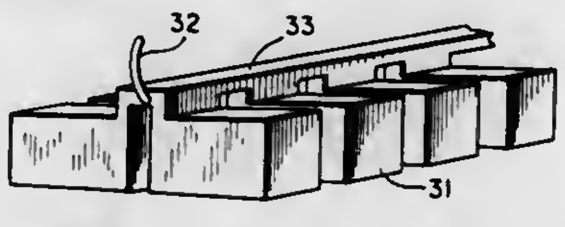
first sensing means at each stop for detecting the presence of an unmachined workpiece only in a first position on an oncoming carriage;

a manipulator at each stop operable under the control of said first sensing means to pick up an unmachined workpiece from said first position on an oncoming carriage for delivery to the associated machine tool and transfer of a previously machined workpiece from said associated machine tool to a second position on the same carriage; and

second sensing means at each stop for detecting the presence of a machined workpiece on an oncoming carriage in said second position only, said retaining means being responsive to said second sensing means for giving passage to a carriage loaded with a machined workpiece.

4,097,985
METHOD OF MANUFACTURING A SOLID ELECTROLYTE CAPACITOR

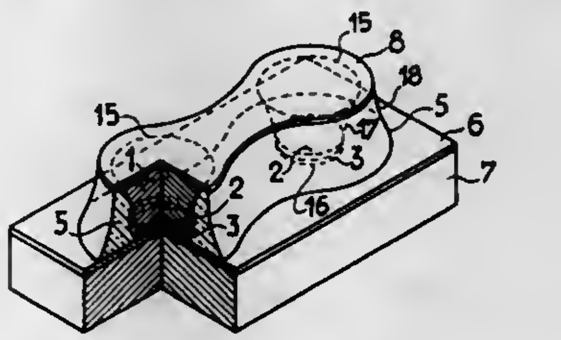
Koichi Morimoto, and Tatsuo Tokumaru, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1977, Ser. No. 763,660
Claims priority, application Japan, Jan. 30, 1976, 51-9064
Int. Cl.^{2} H01G *9/05*
U.S. Cl. 29—570 **4 Claims**



1. A method of manufacturing a solid electrolyte capacitor comprising the steps of preparing an anode body of valve-metal provided with means for supplying electric current thereto, forming a dielectric layer over the surface of said anode body by anodic oxidation, forming a solid electrolyte layer and cathode conductive layer over said dielectric layer, selectively removing a predetermined portion of said solid electrolyte layer, cathode conductive layer and dielectric layer to partially expose the surface of said anode body, coating the surface of said cathode conductive layer near said predetermined portion, and attaching an anode terminal to said exposed surface of said anode body by way of a conductive connecting means.

4,097,986
MANUFACTURING PROCESS FOR THE COLLECTIVE PRODUCTION OF SEMICONDUCTIVE JUNCTION DEVICES

Raymond Henry, and Alain Chapard, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Dec. 9, 1976, Ser. No. 748,879
Claims priority, application France, Dec. 12, 1975, 75 38109
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—583 **7 Claims**



1. A manufacturing process for the collective production of semiconductor devices, comprising the following steps:

A. starting from a semiconductor wafer of a predetermined type of conductivity, forming a first layer of said type of conductivity more weakly doped than said wafer, when forming at least a second semiconductive layer of the opposite type of conductivity;

B. creating grooves by mesa etching of the wafer on the side of said layers;

C. filling said grooves with a dielectric material and lapping said wafer on the side of said material to make it level with said layers;

D. depositing a conductive layer onto the flat surface formed at step (C);

E. adding metal to form a heat-dissipating support;

F. lapping said wafer on its free face so as to bring it to a uniform thickness less than the depth of said grooves;

G. selectively depositing metal onto the surface obtained at step (F) to cover the semiconductive material left by said lapping;

H. etching said dielectric material to obtain grooves onto said wafer;

I. cutting said wafer along said grooves.

4,097,987
METHOD OF MANUFACTURING AN INDUCTIVE COIL

Imrich M. Miller, Paterson, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.
Division of Ser. No. 729,816, Oct. 5, 1976, Pat. No. 4,048,606, which is a continuation of Ser. No. 580,015, May 22, 1975, abandoned. This application May 25, 1977, Ser. No. 800,236
Int. Cl.^{2} H01F *41/06*
U.S. Cl. 29—605 **9 Claims**

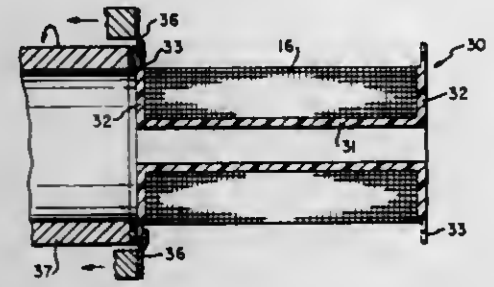
1. A method of winding an inductive wire coil comprising the steps of:

providing a bobbin having a core and a flange at each end, the peripheral edge of at least one of said flanges having a thinned down portion, as compared to the remainder of said at least one flange,

clamping the bobbin at the thinned down portion of said at least one of the flanges,

rotating said bobbin and a wire relative to each other to wind a coil of wire on the bobbin core between the flanges while the said at least one flange is clamped,

unclamping the bobbin, and



bending the thinned down portion of said at least one flange over the coil of wire.

4,097,988
METHOD OF MANUFACTURING THICK-FILM RESISTORS TO PRECISE ELECTRICAL VALUES

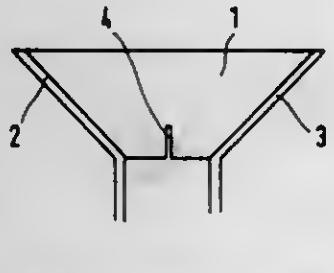
Frank-Dieter Hauschild, Nordstemmen, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Jun. 21, 1977, Ser. No. 808,643

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630237

Int. Cl.^{2} H01C *17/06*

U.S. Cl. 29—620 **7 Claims**



1. A method of manufacturing improved thick-film resistors on plane substrates, including the steps of:

applying the resistance material of the thick-film resistor (1) onto a substrate in a layer so as to cause said layer to have the configuration of a finite surface bounded by at least one straight border and tapering with increasing distance from this straight border;

providing two current leads (2,3) in contact with respective edges of said layer along the tapering borders of said surface, and

partly removing the resistance material in a direction substantially perpendicular to said straight border from the portion of said layer located at the greatest distance from said straight border.

4,097,989
DYNAMOELECTRIC MACHINE COIL INSERTING APPARATUS

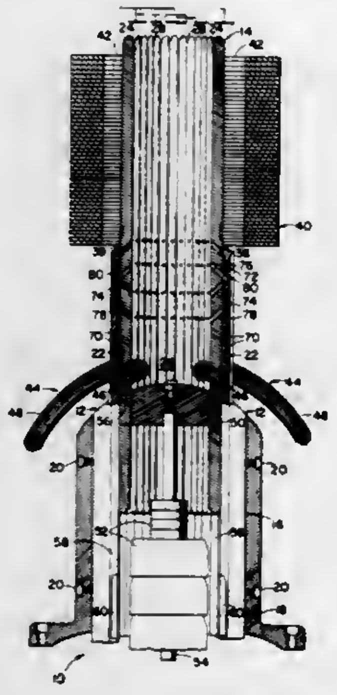
Michael Alfred Stanczak, Jr., Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 23, 1977, Ser. No. 800,596

Int. Cl.^{2} H02K *15/06*

U.S. Cl. 29—734 **8 Claims**

1. In apparatus for inserting prewound coils and slot wedges into the slots of an internally slotted dynamoelectric machine stator core member, said apparatus comprising a base, a plurality of elongated, axially extending, parallel wedge guide members secured to said base and arranged in an annular array to define wedge guide passages therebetween, a plurality of elongated, axially extending, parallel blade elements respectively in axial and radial alignment with said wedge guide members to define an annular array of said blade elements coaxial with said array of wedge guide members, said blade elements having rear portions respectively abutting the inner surfaces of said wedge guide members and having forward portions projecting beyond said wedge guide members, the forward portions of selected adjacent ones of said blade elements defining coil accommodating spaces, the outer surfaces of said forward portions being contoured to engage a bore defining surface of a stator core member, stripper means axially movable within said array of blade elements for pushing prewound coils from said coil accommodating spaces into the slots of a stator core member, and means for pushing slot wedges from said wedge guide passages into the slots of a stator core member; the improvement for detachably retaining said blade elements respectively in axially and radially aligned engagement with said wedge guide members wherein each of said wedge guide members has at least one aperture formed in its inner surface extending obliquely at a predetermined angle relative to the longitudinal axis of the wedge guide member and each of said blade elements has at least one opening formed in its rear portion extending obliquely at said predetermined angle relative to the longitudinal axis of the blade element, and a retaining pin positioned in an obliquely extending opening of each said blade element and projecting into the obliquely extending aperture of a respective one of said wedge guide members.



4,097,990
PLASTIC DOUBLE EDGE RAZOR

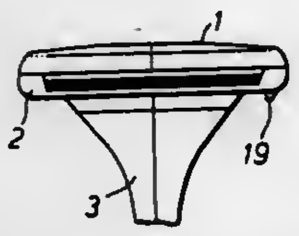
Harry Pentney, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed Jan. 27, 1977, Ser. No. 763,030

Claims priority, application United Kingdom, Feb. 5, 1976, 4636/76

Int. Cl.^{2} B26B *21/32*

U.S. Cl. 30—57 **2 Claims**



1. A safety razor comprising a guard platform member, a cap member adapted to overlie said guard platform member to clamp a razor blade therebetween, projection means extending from an undersurface of said cap member, said guard platform member having opening means therethrough, said projection means being adapted to extend through said opening means in said guard platform member, said projection means having a longitudinal extent such as to provide for distribution of clamping forces, a handle adapted for sliding movement on said guard platform member between positions of engagement with said projection means to clamp said guard platform member and said cap member together and disengagement from said projection means, and interlock means acting between said handle and said guard platform member to prevent movement of said handle from its disengaged position to its engaged position relative to said projection means except when said cap member is in its clamping position relative to said guard platform member.

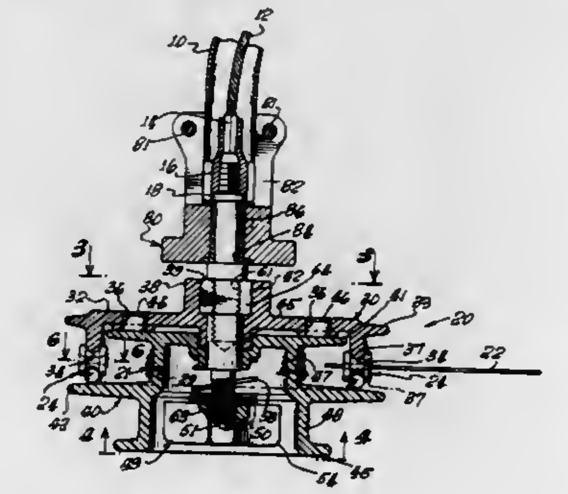
4,097,991
ROTARY CUTTING HEAD FOR MOWERS EQUIPPED WITH FLEXIBLE CUTTING BLADES

Raymond E. Proulx, 1538 N. 1st Ave., Upland, Calif. 91786

Filed Sep. 10, 1976, Ser. No. 722,105

Int. Cl.^{2} A01D *55/18;* **B26B** *27/00*

U.S. Cl. 30—276 **11 Claims**



1. An improved cutting head for apparatus for mowing and trimming vegetation by means of cutting flails formed of elongated fibers, said cutting head comprising:

a cylindrical body rotatable about a central axis and containing within internal volumes thereof supplies of elongated cylindrical fiber to form said cutting flails,

guide means including a plurality of grommets secured in openings in the periphery of said body, each of said grommets having a central opening radially disposed to the axis of rotation for extension therethrough of an elongated fiber from the supply within the body,

said openings being slots substantially parallel to the axis of rotation and uniformly spaced about the periphery of the body, and said grommets being reciprocably secured in the slots,

said grommet opening having an enlarged radially outward portion defined by a curvilinear wall to support the fiber when a portion thereof is extended to form a cutting flail and is deflected from a radial orientation by contact with foreign objects to minimize stress, shear and bending forces on the cutting flail extending radially therethrough, and

a pair of circumferential flanges extending radially about the body and beyond the radially outer faces of the grommets, one flange being above and one flange being below the grommet to protect the cutting flails against abrasion and breakage by being crushed between the cutting head and foreign objects.

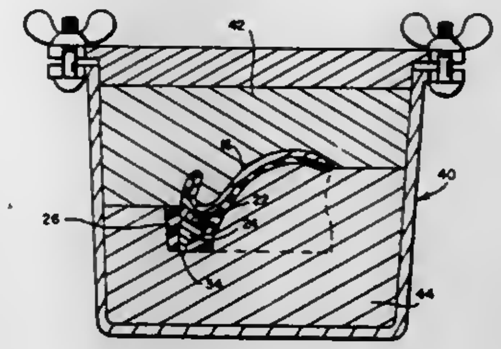
4,097,992
METHOD FOR PRODUCING ARTIFICIAL DENTURES

Mitchell M. Hazar, Phoenix, Ariz., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 27, 1976, Ser. No. 726,812

Int. Cl.^{2} A61G *13/00*

U.S. Cl. 32—2 **3 Claims**



1. A method for producing artificial dentures comprising: preparing a plurality of substantially identical generally U-shaped hard base denture elements; each hard base element having a substantially identical set of teeth fixed therein; securing a formable edentulus ridge fitting layer onto one of said hard base denture elements; then formably fitting said ridge fitting layer to an edentulus ridge in a human patient's mouth; then removing said denture element with the so formed layer and placing curable impression formable material in said layer and reinserting said layer and denture element in the patient's mouth to impression fit said impression formable material to said edentulus ridge and allowing said curable material to cure in fixed position; then placing a rubber-like shield around said teeth and said denture element; then impression forming a pair of denture stone molds on said denture element, said teeth, said shield, said layer and said cured curable material; placing one of said dental stone molds in a flask; placing said shield around the side of another one of said identical denture elements and placing said last mentioned dental element and said shield in said one of said dental stone molds; placing curable plastic material adjacent said last mentioned one of said denture elements contiguous with a surface thereof opposite to said teeth; closing the other one of said molds over said last mentioned curable plastic material; closing said flask over said molds and allowing said last mentioned curable plastic material to cure, harden and bond to said last mentioned identical denture elements in said mold to thereby form an artificial denture that fits said edentulus ridge.

4,097,993
ORTHODONTIC ARCH WIRE

Lawrence F. Andrews, San Diego, Calif., assignor to "A"-Company, Inc., San Diego, Calif.

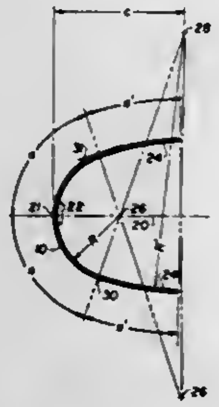
Filed Apr. 4, 1977, Ser. No. 784,227

Int. Cl.^{2} A61C *7/00*

U.S. Cl. 32—14 A **8 Claims**

1. An arch wire adapted to engage the grooves in a set of tooth-mounted orthodontic brackets that have been applied at about the middle of the clinical crown of respective teeth, said arch wire being symmetrical about a mid-point and formed of a plurality of contiguous circular segments on each side of said mid-point, the length and curvature of each said segment being

sufficient to engage the groove of at least one of said tooth-mounted orthodontic brackets, the point of transition between



respective said contiguous segments being defined by a common line tangential to said contiguous segments.

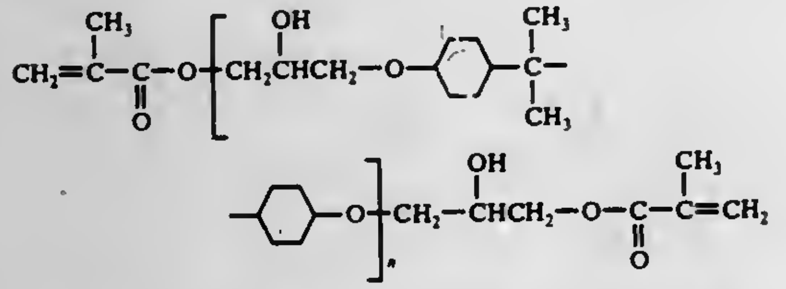
4,097,994
DENTAL RESTORATIVE COMPOSITION CONTAINING OLIGOMERIC BIS-GMA RESIN AND MICHLER'S KETONE

Eric T. Reaville, Webster Groves, and Gudrun M. Streicher, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,554
Int. Cl.² C08F *8/00*

U.S. Cl. 32—15 **8 Claims**

1. A photo-polymerizable composition suitable for dental restorative and tooth coating purposes comprising from about 30% to about 80% by weight of oligomeric resin having the formula



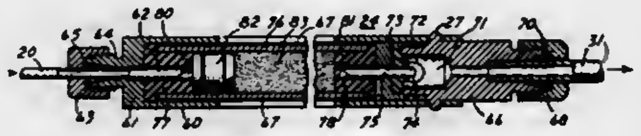
wherein *n* ranges from about 1 to 10, and mixtures thereof, from about 70% to about 20% by weight low molecular weight low viscosity diluent aliphatic acrylate monomer, from about 0.5% to about 2% by weight organic peroxide free radical initiator and from about 0.25% to about 2% by weight photosensitizer comprising 4,4'-bis(dimethylamino)benzophenone.

4,097,995
SYSTEM AND APPARATUS FOR DENTAL PROPHYLAXIS

Arthur J. Danne, 13196 E. 6th Pl., Aurora, Colo. 80010, and Richard A. Edwards, 5340 S. Oak St., Littleton, Colo. 80123
Division of Ser. No. 465,506, Apr. 30, 1974, Pat. No. 3,987,550, which is a continuation-in-part of Ser. No. 254,330, May 17, 1972, abandoned, which is a continuation of Ser. No. 106,648, Jan. 15, 1971, abandoned. This application Aug. 17, 1976, Ser. No. 715,103
Int. Cl.² A61C *5/04*

U.S. Cl. 32—58 **2 Claims**

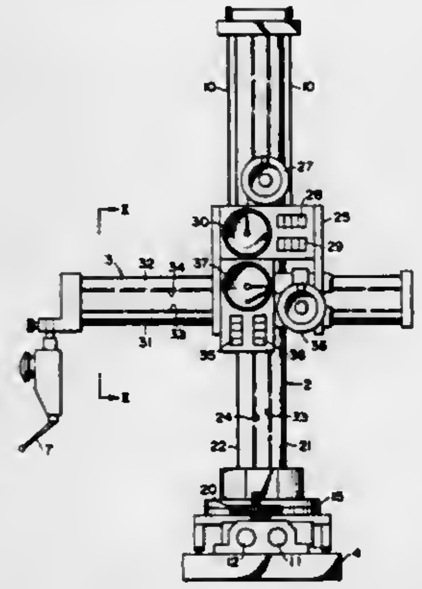
1. A discardable cartridge for dental prophylaxis material and the like comprising a cylindrical body having sealed closures at both ends, each of said closures being a flanged rubber-like plug and having a central portion pierceable by a piercing tube, said closures being positioned to serve as gaskets at their respective ends of said cylindrical body, a free floating piston adjacent one of said closures, a charge of dental prophylaxis material filling the interior of said body between said piston and the other of said closures, said other closure affording the piercing of its central portion and the discharge of prophylaxis material therethrough whereby upon the admission of fluid under pressure between said one closure and said piston material is discharged through said other closure.



4,097,996
APPARATUS FOR THREE DIMENSIONAL MEASUREMENT

Tokumi Yamazawa, and Shingo Nishina, both of Kawasaki, Japan, assignors to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan
Filed Dec. 13, 1976, Ser. No. 750,186
Claims priority, application Japan, Feb. 4, 1976, 51-12154[U]
Int. Cl.² G01B *5/02*

U.S. Cl. 33—1 M **3 Claims**

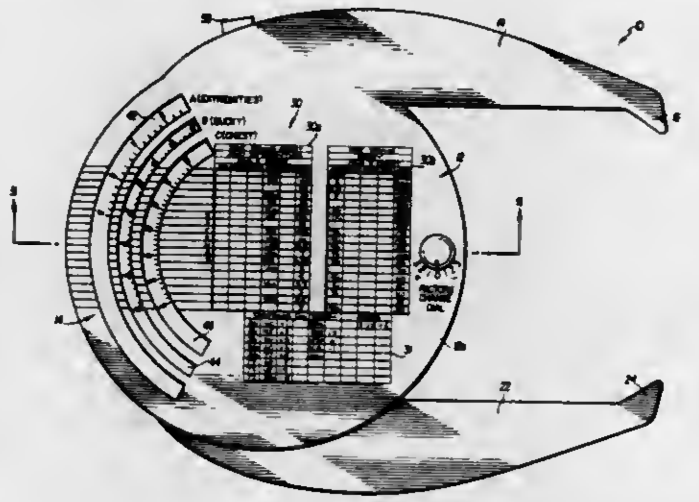


1. An apparatus for measurement in three dimensions comprising:
a first pair of mutually parallel beam members oriented along a first axis, said first pair of beam members each having a rack gear disposed on the inside surface of said members;
a first movable member slidably disposed on said first pair of beam members;
a second pair of mutually parallel beam members mounted on said first movable member and disposed along a second axis, said second pair of beam members each having a rack gear disposed on the inside surface of said beam members;
a second movable member slidably disposed on said second pair of beam members;
a third pair of mutually parallel beam members slidably disposed on said second movable member and disposed along a third axis, said third pair of beam members each having a rack gear disposed on inside surface of said beam members; and
said first and second movable members, each further including first means for displacing said movable member with respect to the corresponding pair of beam members by engaging the rack gear of one of said corresponding beam members, and each said first and second movable member further including second means for measuring displacement of said movable member with respect to said corresponding pair of beam members by engaging the rack gear of the other one of said corresponding beam members.

4,097,997
X-RAY CALIPERS

Allen L. Bjornson, 5746 Preston View Blvd., #1006, Dallas, Tex. 75240
Filed Apr. 15, 1976, Ser. No. 677,145
Int. Cl.² G06G *1/02;* **G01B** *5/06;* **A61B** *5/10*

U.S. Cl. 33—1 SD **13 Claims**

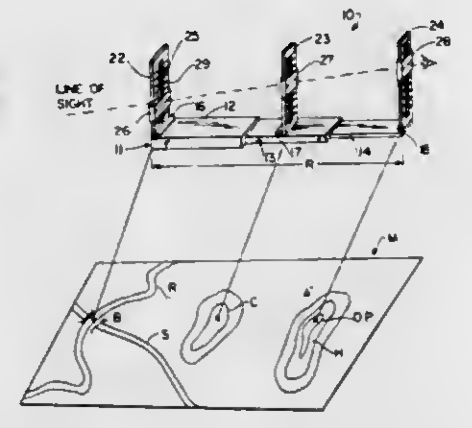


1. An x-ray caliper for use in measuring the part of the anatomy to be x-rayed and determining the proper voltage, current and time duration settings for an x-ray machine, said caliper comprising:
(a) upper, intermediate and lower dial means mounted for rotational movement relative to each other, said upper and lower dial means each having additional means associated therewith to enable said upper and lower dial means to be positioned relative to each other an amount from an initial position, said amount corresponding to the measured distance between opposite sides of said part of said anatomy to be x-rayed; and
(b) indicia on one surface of said intermediate dial means indicating at least one range of operating voltages for said x-ray machine cooperating with chart means on said upper dial means for indicating desired x-ray machine operating values proportional to time as a function of said operating voltages, and indicia on the other surface of said intermediate dial means indicating at least two parts of the anatomy capable of being x-rayed cooperating with index means located on the lower surface of said lower dial means and arranged such that said chart means will indicate proper settings for said x-ray machine for the part of the anatomy indexed.

4,097,998
LINE OF SIGHT PLOTTER

Frank Klimavicz, Fort Belvoir, Va. 22060, and Jack S. Chase, R.F.D. 1, Box 53, Jericho, Vt. 05465
Filed Feb. 28, 1977, Ser. No. 772,409
Int. Cl.² G01C *5/00*

U.S. Cl. 33—1 G **10 Claims**

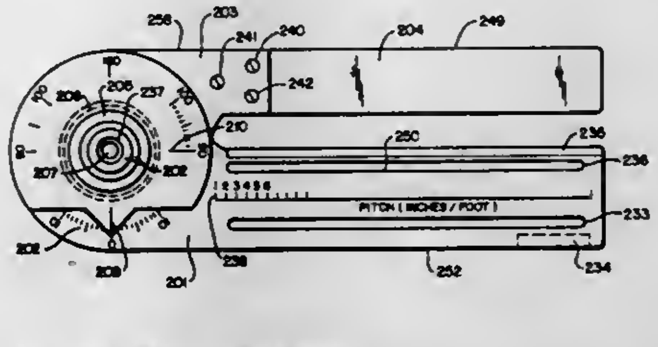


1. Apparatus for determining the existance of a line of sight between two spaced points on a map having an intervening rise between said spaced points comprising:
a linearly extending base,
at least three posts, each of said posts having a sighting opening extending longitudinally thereof,
means for mounting said posts on said base for extension upwardly therefrom in spaced, substantially parallel and coplanar relationship,
means for adjusting the distances between the said posts, and
cursor means slidably attached to each of said posts for longitudinal movement thereon, said cursor means comprising an indicia extending across said sight opening.

4,097,999
ANGLE GAUGE

William E. Nowlin, 961 E. 21st Ave., Columbus, Ohio 43211
Continuation-in-part of Ser. No. 665,424, Mar. 10, 1976, abandoned. This application Jan. 3, 1977, Ser. No. 756,130
Int. Cl.² B43L *7/00*

U.S. Cl. 33—75 R **2 Claims**



1. An angle gauge comprising:
(a) A pair of pivotally connected gauging arms, one of said arms having means defining a pivot axis each arm formed with an outwardly facing straight edge spaced radially offset from said pivot axis and pivotally joined at the pivot axis by an adjustable fastener means for at times clamping said arms at a selected relative angle, one of said gauging arms having a pitch scale indicating the tangent of an angle formed along said one arm and the second of said arms having an indicator mark formed thereon wherein the intersection of said pitch scale with an edge of the arm not having the pitch scale occurs at the tangent of the angle on the below recited angle scale which is in registration with said indicator mark;
(b) a circular angle scale fixed relative to a first one of said arms coaxially with the pivot axis and extending radially outwardly a distance not greater than the least offset of said outwardly facing straight edges; and
(c) a pointer fixed relative to a second one of said gauging arms and pivotal with said second arm about said pivot axis for indicating a scale reading.

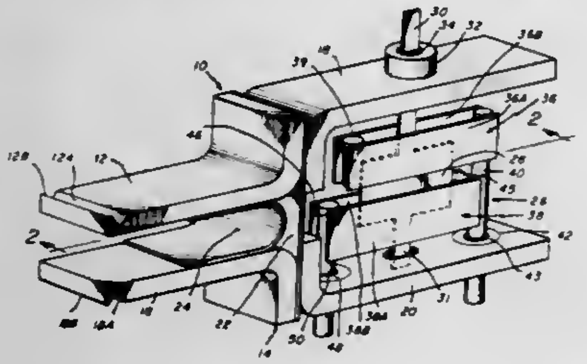
4,098,000
CRACK OPENING DISPLACEMENT GAGE

Richard L. Egger, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 4, 1977, Ser. No. 784,238
Int. Cl.² G01B *5/00*

U.S. Cl. 33—148 D **8 Claims**

1. A crack opening displacement gage comprising;
a pair of front legs each having an end adapted to be disposed in the crack opening,
a pair of rear legs having ends that extend away from the front legs,
common pivot means including a flexural planar pivot having the pairs of legs supported therefrom on opposite respective sides thereof,
said rear legs moving toward and away from each other as the crack opening opens and closes,

and differential capacitive sensor means disposed between said rear legs including a sensing plate, means for supporting said sensing plate from one of said rear legs with the sensing plate extending between the rear legs, an upper excitation plate assembly comprising a pair of spaced plates extending parallel to said sensing plate on opposite sides thereof and means for supporting said plates from the



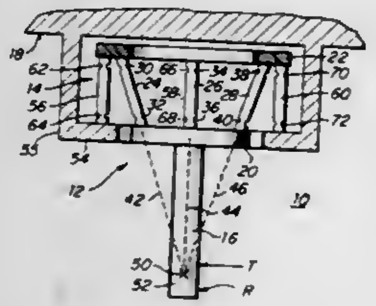
other rear leg and forming a cavity therebetween in which at least a part of the sensing plate extends, and a lower excitation plate assembly disposed coplanar with the upper excitation plate assembly and also comprising a pair of spaced plates extending parallel to said sensing plate on opposite sides thereof and means for supporting said plates from the other rear leg and forming a cavity therebetween in which at least a part of the sensing plate extends.

4,098,001

REMOTE CENTER COMPLIANCE SYSTEM

Paul C. Watson, Arlington, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Oct. 13, 1976, Ser. No. 732,286
Int. Cl.² G01B *5/25*
U.S. Cl. 33—169 C 2 Claims



1. A remote center compliance system for an assembler device comprising:

a first member fixed to said assembler device;

a second member;

operator means interconnected with said second member;

a third member intermediately interconnected with said first and second members;

at least three rotational interconnection elements interconnected between said third member and one of said first and second members and disposed along spherical radii of a remote center at, near or beyond the end of said operator means for enabling said operator means to rotate about said remote center; each of said rotational elements including a major motion portion proximate each of said members with which it is interconnected; and

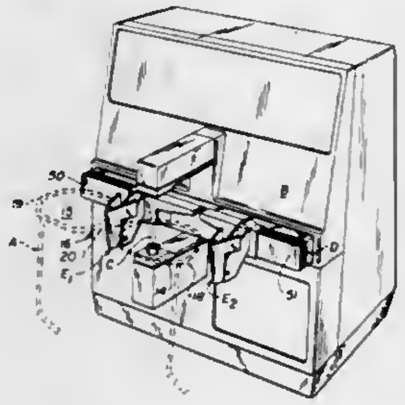
a plurality of translational interconnection elements interconnected between said third member and the other of said first and second members and disposed generally parallel to the axis of said operator means for enabling said operator means to translate relative to said first member; each of said translational elements including a major motion portion proximate each of said members with which it is interconnected.

4,098,002

APPARATUS FOR LOCATING INTER-PUPILARY OF NOSE BRIDGE MOUNTED SPECTACLES TO LENS METER

Charles E. Campbell, Berkeley, and William E. Humphrey, Orinda, both of Calif., assignors to Humphrey Instruments Incorporated, San Leandro, Calif.

Filed Jan. 13, 1977, Ser. No. 805,957
Int. Cl.² A61B *3/10*
U.S. Cl. 33—200 13 Claims



4. In combination a lens meter having a single path for sampling at least a segment of a suspect lens placed within said lens meter; a sampling interval in said optical path provided for the placement of a suspect lens mounted to a pair of nose bridge frame mounted suspect spectacle lenses; a bar extending transversely of said single path on at least one side of said sampling interval to extend substantially parallel to a pair of nose bridge frame mounted suspect lenses along a line spanning at least a portion of the distance between the right lens on one side of said nose bridge from to the left lens on the other side of nose bridge frame; means for a conforming fit to the nose receiving interval in said nose bridge frame mounted suspect lenses to substantially locate the position of the nose bridge frame of said glasses with respect to said bar; means for mounting said nose conforming fit means to said bar for towards and away movement from said sampling interval to register one of said suspect lenses to said sampling interval; and means for indicating the distance interval for measuring the separation between said nose conforming fit means and the visual center of said suspect lens being measured by said lens means.

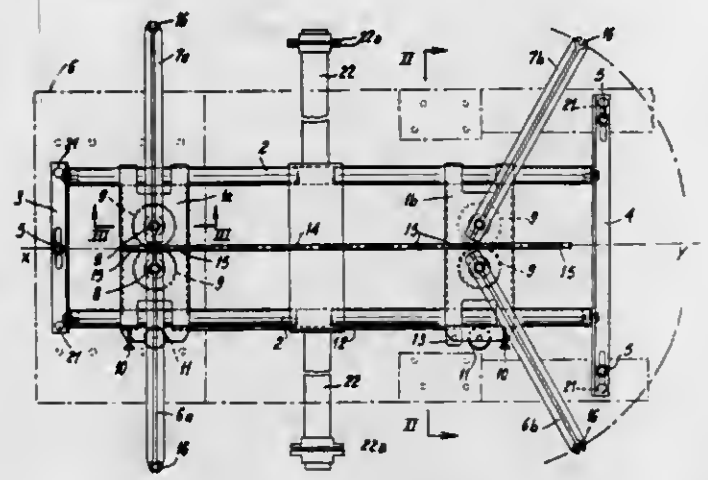
4,098,003

DISTORTION DETECTION DEVICE, NOTABLY FOR MOTOR VEHICLE FRAMES

Gilbert Négrin, Cloyes-sur-le-Loire, France, assignor to Celette S.A., Vienne, Vienne, France

Filed May 18, 1977, Ser. No. 797,926
Claims priority, application France, Nov. 23, 1976, 76 35194
Int. Cl.² G01C *15/12;* G01B *11/26*
U.S. Cl. 33—288 9 Claims

1. Device for detecting a possible distortion in a given structure by checking predetermined reference points of said structure which are disposed symmetrically in relation to the longitudinal center line of said structure, comprising in combination a support adapted to be disposed horizontally beneath the structure to be checked by causing the longitudinal center line of said support to register with the longitudinal center line of said structure, a pair of carriages slidably mounted on said support, a pair of horizontal arms pivotally mounted on each carriage and forming somewhat the two arms of a compass, mechanical means interconnecting the two arms of each carriage and adapted constantly to keep said two arms in a symmetrical angular position in relation to said longitudinal center line, and means adapted to be fitted to the outer ends of said compass arms for checking predetermined reference points provided on said structure.

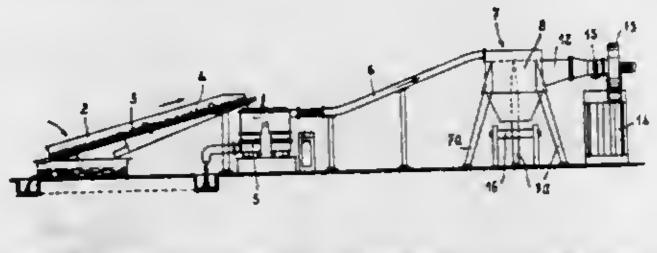


4,098,004

APPARATUS FOR THE DEHYDRATION (DRYING) OF TEXTILE MATERIALS

Joseph Rousselet, "Montalivet", Annonay (Ardeche), France

Filed Sep. 24, 1976, Ser. No. 726,485
Claims priority, application France, Oct. 3, 1975, 75 30879
Int. Cl.² F26B *17/10*
U.S. Cl. 34—57 E 5 Claims



1. An apparatus for the dehydration of textile material which comprises:

conveyor means for advancing wet textile material;

a continuously operable centrifugal extractor adjacent said conveyor means and receiving wet textile material therefrom, said centrifugal extractor expelling extracted textile material in a heated transport gas at an elevated pressure;

a conduit receiving the transport gas and extracted material from said centrifugal extractor;

a cyclone connected to said conduit and separating said extracted material from said transport gas;

means for equilibrating the pressure in said cyclone to enable said extracted material to fall to the bottom thereof by gravity,

the means for equilibrating the pressure in said cyclone comprising a perforated wall disposed in said cyclone and defining therein a central chamber receiving the wet material and transport gas from said conduit, and an outer annular compartment surrounding said central compartment, said conduit opening tangentially into said central compartment, said means for equilibrating also including a suction-generating device communicating with said annular compartment; and

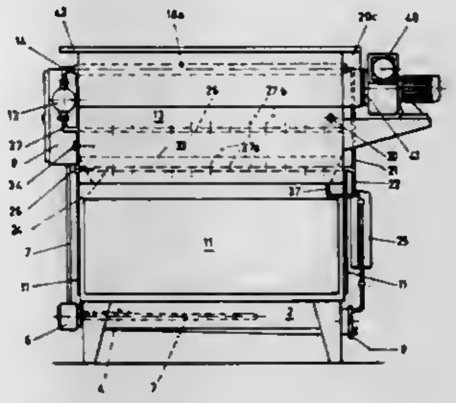
means below said cyclone for removing said material in a dry state therefrom.

4,098,005

VAPOR DEGREASER

Johannes Ymer Wiarda, De Deel 15, Kamerik, Netherlands

Filed Dec. 3, 1976, Ser. No. 747,174
Claims priority, application Netherlands, Dec. 4, 1975, 7514181
Int. Cl.² F26B *21/14*
U.S. Cl. 34—73 7 Claims



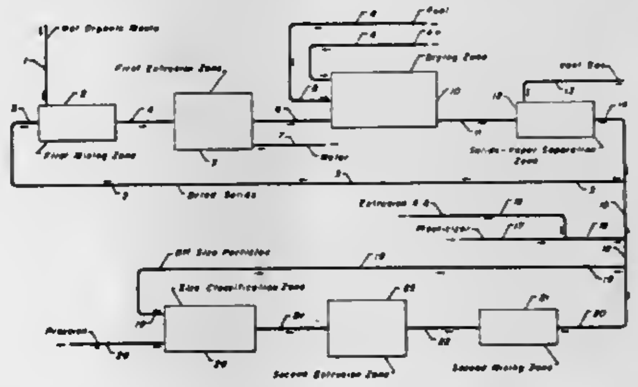
1. Vapour degreasing apparatus comprising a tank having in its lower part a heatable reservoir for a solvent for fats, oils, lubricants or the like, and having, above said reservoir, a vapour space adapted for introducing therein metal articles or machine parts to be degreased, a cooling water piping being provided in the upper part of the tank, said piping comprising a section which functions as a heat exchanger for incoming heat released during the vapour-liquid conversion of the solvent while forming a vapour escape barrier for retaining through condensation the solvent vapor, said piping also comprising a section which functions as a heat exchanger for outgoing heat to the ambient air, a gutter being provided below the heat exchangers for catching the condensate, a pump connected to the cooling water piping for circulating the water, air exhaust means provided in the uppermost part of the tank for exhausting threads of vapour, if any, passing the vapour escape barrier, and for cooling that section of the cooling water piping which functions as the heat exchanger for said outgoing heat, and a water jacket in which the cooling water piping which functions as the heat exchanger for incoming heat is positioned, the cooling water piping being formed as a closed circuit without direct communication between the water coolant and the air of the outgoing heat exchanger.

4,098,006

ORGANIC WASTE DEWATERING AND DRYING PROCESS

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 775,673, Mar. 8, 1977. This application Jul. 7, 1977, Ser. No. 813,577
Int. Cl.² F26B *7/00*
U.S. Cl. 34—12 6 Claims



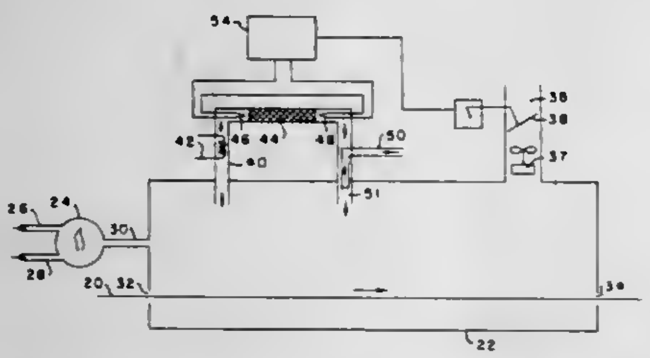
1. A process for dewatering and drying organic waste which comprises the steps of:

(a) admixing a solids recycle stream with an organic waste stream which is to be dewatered and which comprises water and particulate organic waste, with the organic waste stream containing at least 60 wt.% water, in a mixing zone and forming a mixing zone effluent stream;
(b) passing the mixing zone effluent stream into a first extrusion zone, and effecting a partial dewatering of the mixing zone effluent stream and the formation of a water stream and an extrusion zone effluent stream comprising organic waste and water by extruding the mixing zone effluent stream;
(c) passing the extrusion zone effluent stream into a drying zone operated at drying conditions and effecting the evaporation of water contained in the extrusion zone effluent stream and the production of a drying zone effluent stream comprising organic waste and water vapor;
(d) separating the drying zone effluent stream in a solids-vapor separating zone and producing a vapor stream comprising water vapor and a dry solids stream comprising particulate organic waste and containing less than about 15 wt.% water;
(e) separating the dry solids stream into two portions and admixing a first portion of the dry solids stream with the organic waste stream as the solids recycle stream of step (a); and,
(f) extruding a second portion of the dry solids stream in a second extrusion zone under conditions sufficient to cause the plasticization of the dry solids and the formation of a product stream having a bulk density of about 30–65lb/ft^3.

4,098,007
DRYING OVEN CONTROLLER

William Ross Davis, and Charles E. Willbanks, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 7, 1977, Ser. No. 804,302
Int. Cl.² F26B *21/06*
U.S. Cl. 34—72 **5 Claims**

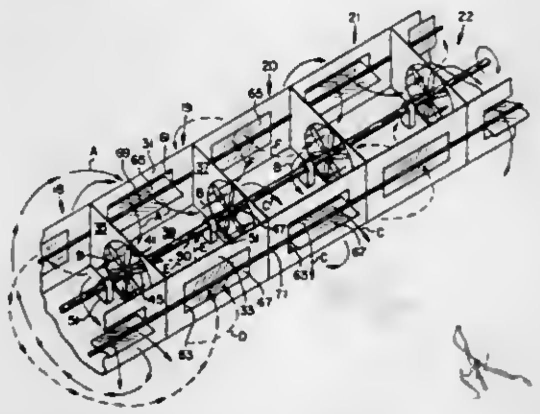


1. An apparatus for controlling the exhaust rate from a drying oven comprising:
means for exhausting gas from said oven;
sampling duct means opening into the interior of said oven for withdrawing gas from the interior of said oven;
heater means operably connected to said sampling duct means for heating the gas withdrawn from the interior of said oven;
catalyst bed means operably connected to said sampling duct means for combusting the organic material in the heated gas which is withdrawn from the interior of said oven;
temperature difference measuring means operably associated with said catalyst bed means for measuring the temperature difference between the gas entering the catalyst bed means and the gas leaving the catalyst bed means; said temperature difference measuring means including a thermocouple having a first junction disposed within said sampling duct means upstream of said catalyst bed means but downstream of said heater means and a second junction downstream of said catalyst bed means;
controller means operably associated with said means for exhausting gas and said temperature difference measuring means for varying the rate at which gas is exhausted in response to the temperature difference across said catalyst bed means;
discharge duct means operably associated with said catalyst bed means for discharging the gas withdrawn from the oven; and
means for drawing gas through said sampling duct means, said catalyst bed means and into said discharge duct means.

4,098,008
DRY KILN HAVING BIDIRECTIONAL AIR FLOW WITH UNIDIRECTIONAL FAN ROTATION

Henry W. Schnette, Tigard, Oreg., and Martin N. Nye, Vancouver, Wash., assignors to Wellons, Inc., Sherwood, Oreg.

Filed Nov. 8, 1976, Ser. No. 740,119
Int. Cl.² F26B *21/06*
U.S. Cl. 34—191 **5 Claims**



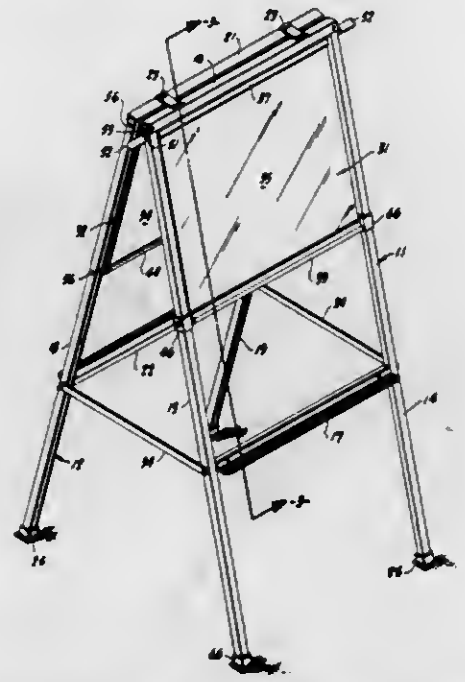
1. In a dry kiln having a drying chamber,
means defining plural, in-tandem, air control compartments for controlling the flow of air to said drying chamber,
a fan mounted between each pair of compartments,
means for rotating said fans in one direction only,
adjacent fans having blades of opposite pitch so that the fans drive air from certain compartments into adjacent compartments,
said compartments each having a pair of air flow ports for ingress and egress of air,
a valve for each port,
and control means for opening the valves of one of a pair of flow ports while closing the other, and vice versa to achieve directional control of the air entering and leaving said compartments.

4,098,009
EASEL ASSEMBLY

William T. Flynn, 1548 Park Wood Dr., San Mateo, Calif. 94403

Filed Sep. 17, 1976, Ser. No. 724,409
Int. Cl.² G09B *11/06*
U.S. Cl. 35—26 **7 Claims**

1. In an easel assembly: a supporting frame comprising a pair of generally parallel front legs and a rear leg diverging downwardly from the front legs, a drawing board, means slidably and pivotally mounting the lower portion of the drawing board on the front legs of the frame for movement between a raised position in which the board is positioned toward the top of the frame and generally parallel to the front legs and a lowered position in which the board is positioned below the top of the frame and inclined rearwardly with the upper portion of the board positioned between the front and rear legs,

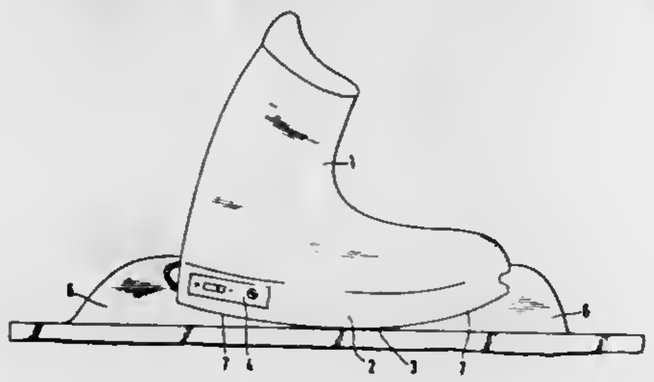


and means for releasably securing the board in the raised position.

4,098,010
SKI-BOOT

Karl-Heinz Rothmayer, Sintzenichstrasse 12, D-8000 Munich 71, Fed. Rep. of Germany

Filed Jun. 23, 1976, Ser. No. 698,872
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529081; Sep. 3, 9175, 2539068; Apr. 29, 1976, 2618790; Apr. 29, 1976, 2518789; May 13, 1976, 2621267
Int. Cl.² A43B *5/04*
U.S. Cl. 36—117 **7 Claims**



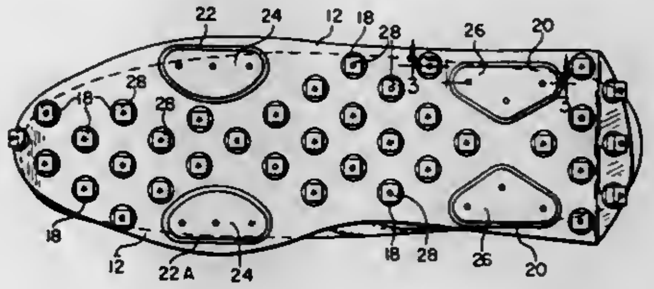
1. A ski-boot having an upper and a sole, said sole comprising a sole core and an outer sole part connected detachably to said sole core, said sole being in the form of a rolling sole and having a tread side curved continuously in the longitudinal direction of said sole over the entire length thereof.

4,098,011
CLEATED SOLE FOR ATHLETIC SHOE

William J. Bowerman; Stanley L. James, and Dennis E. Vixie, all of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.

Filed Apr. 27, 1977, Ser. No. 791,495
Int. Cl.² A43B *5/00*
U.S. Cl. 36—129 **21 Claims**

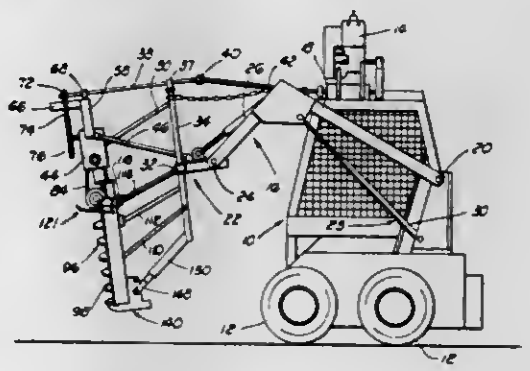
1. An athletic shoe designed for running in which the improvement comprises:
an outer sole having a plurality of cleats of resilient material molded integral with said sole and each cleat projecting downward from a base portion to a ground engaging surface at the bottom end of the cleat, said outer sole including an arch portion between a toe portion and a heel portion with the arch portion substantially in longitudinal alignment with the heel portion;
said cleats including a plurality of laterally spaced first cleats on each of the toe portion, arch portion and heel portion of said sole and a plurality of second cleats of larger size than said first cleats including one pair of second cleats on the heel portion whose ground engaging surfaces are in substantial alignment with those of the first cleats on said arch portion and heel portion; and
said second cleats having larger area ground engaging surfaces than the first cleats on said heel portion but being of substantially the same height as said first cleats.



4,098,012
AUGER-TYPE THIN-KEELED EXCAVATING MACHINE

Renel C. Parrish, P.O. Box 1846, Enid, Okla. 73701

Continuation-in-part of Ser. No. 712,601, Aug. 9, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,539
Int. Cl.² E02F *5/04*
U.S. Cl. 37—82 **4 Claims**



1. Excavating apparatus comprising:
an auger assembly including:
an upwardly extending shaft;
a flat, vertically extending keel plate below the shaft having an upper edge directly below the shaft, a sharpened lower edge and a point at the upper forward terminus of said upper edge;
a bearing subassembly rotatably supporting the shaft on the upper edge of the keel plate, said bearing assembly comprising:
a hub secured to the lower end of the shaft;
a pin secured to the upper edge of said keel plate; and
bearing means between and interengaging said pin and said hub for rotatably supporting the shaft on the upper edge of the keel plate;
a helical blade spiralling around and affixed to the shaft and having a lower end portion at least partially around and radially outside the bearing subassembly and terminating in a lower edge located immediately above the horizontal plane containing the upper edge of the keel plate, said helical blade having a leading, forwardmost edge of said helical blade which is forward of the point at the upper forward side of the keel plate at the forward terminus of said upper edge whereby said leading forwardmost edge of the helical blade encounters the earth being removed during excavation prior to the time that said point contacts the earth;

said keel plate point being offset rearwardly from the leading forwardmost edge of said helical blade, and said keel plate having a transverse vertical dimension which is at least three times its thickness;

a semi-circular dirt shield plate extending around the rear side of said auger assembly adjacent said helical blade and extending substantially parallel to said shaft and terminating in a lower edge which is no lower than said lower edge of said helical blade;

a vehicle adapted for horizontal movement over the ground; and

means movably supporting the auger assembly on the vehicle for vehicle movement and pivotal movement about a horizontal axis.

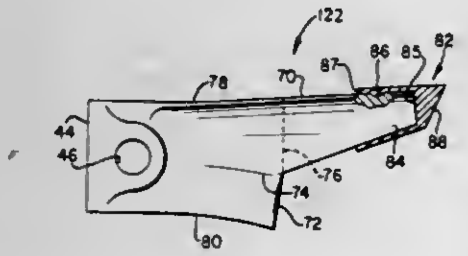
4,098,013
DIGGING TOOTH WITH REPLACEABLE CUTTING EDGE

Charles Wayne Hemphill, 1106 Green Valley La., Duncanville, Tex. 75116

Continuation-in-part of Ser. No. 715,560, Aug. 18, 1976, Pat. No. 4,037,337. This application Jul. 21, 1977, Ser. No. 817,734

Int. Cl.² E02F *9/28*

U.S. Cl. 37—142 R **12 Claims**



1. A digging tooth for attachment to the lip of an excavating bucket, said tooth having a leading end spaced from a trailing end;

a shank formed at said trailing end by which said tooth can be affixed to the lip of the excavating bucket; a ground engaging member formed at said leading end so that movement of the tooth in a direction towards said leading end enables said tooth to engage the ground and excavate material therefrom;

said ground engaging member includes a penetrating member and a secondary member, said penetrating member extends forward of said secondary member;

said secondary member has a forward, ground engaging edge and an upper face, said upper face commences at said edge and upwardly slopes towards said trailing end;

opposed sidewalls, said penetrating member and said secondary member each have one of said opposed sidewalls; said penetrating member has an upper face which commences at one said sidewall and slopes downward towards said face of said secondary member; said penetrating member is progressively reduced in cross-section towards the leading end thereof and terminates in a cutting end;

said ground engaging edge of said secondary member includes a forward terminal end portion in the form of a cutting edge;

a wall, said cutting end of said penetrating member and said cutting edge of said secondary member are spaced from one another by the last said wall with the last said wall being spaced from each of said opposed walls;

the marginal forward end of said penetrating member being in the form of a replaceable nose, means forming the marginal rear end of said penetrating member into a mount means by which said nose is mounted to the forward end of said tooth;

a socket which includes a stump and a cavity with the socket being received within said cavity in close tolerance relationship therewith;

one of said stump and said cavity being formed on the forward marginal end of said marginal rear end of said penetrating member while the other of said stump and said cavity is formed at a rear marginal end of said nose;

whereby said nose can be replaced should the cutting end thereof become worn.

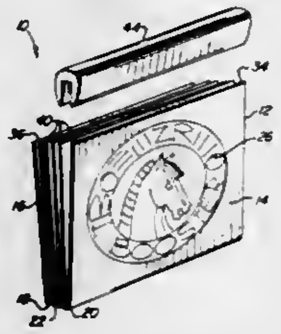
4,098,014
COMBINATION BADGE AND FOLDER

Robert E. Laoer, 6201 E. Monterey Way, Scottsdale, Ariz. 85251, and Leonard T. Symcox, 10618 N. 25th St., Phoenix, Ariz. 85028

Filed Aug. 9, 1976, Ser. No. 712,940

Int. Cl.² A44C *11/00*

U.S. Cl. 40—1.5 **1 Claim**



1. As an article of manufacture a combination identification badge and information folder, said article comprising:

(a) a front panel of transparent material having an edge portion;

(b) a rear panel having an edge portion said front panel and said rear panel being joined along said respective edge portions at an expandable section;

(c) removable retaining means securing said front and rear panels together along said edge portions at a location spaced apart from said expandable section;

(d) an information receiving section defined between said front and rear panels, said information receiving section adapted to receive and retain informational materials in place between said and secured therein by said removable retaining means whereby materials may be periodically inserted and removed in said information receiving section;

(e) said removable retaining means comprising a clip having a generally U-shaped cross section and including an elongate channel for receiving the edge of said front and rear panels and said informational materials therein, and

(f) means for securing said article to the garment of the wearer.

4,098,015
RETRIEVER TRAINING GUN WITH PISTOL TYPE HANDLE

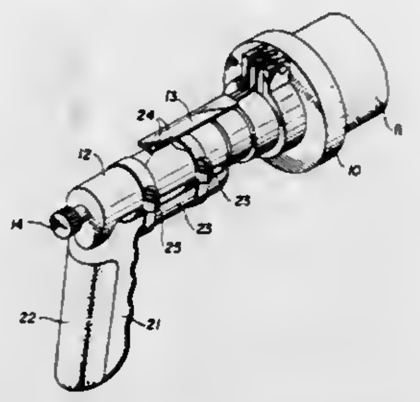
Andrew W. Walbe, 2207 Irene Dr., La Marque, Tex. 77568

Filed Mar. 29, 1977, Ser. No. 782,452

Int. Cl.² F41C *3/00*

U.S. Cl. 42—1 F **5 Claims**

1. A retriever training device having a projectile and a handle which are coaxial and a spring-urged axial firing pin projecting from the rear end of the handle, a pistol type hand grip for said training device secured fixedly to said handle near the rear end of the handle and depending from the handle, compressible padding on at least the rear side of the pistol type hand grip to absorb firing recoil forces, said pistol type hand grip formed separately as an attachment to said handle, and releasable means detachably securing the pistol type hand grip to said handle, and said pistol type hand grip having an upper end forwardly extending transversely contoured rest extending longitudinally of said handle and beneath the handle and conforming to the cross sectional profile of the lower side of the handle, said releasable means comprising binding strap means encircling said handle and said rest.



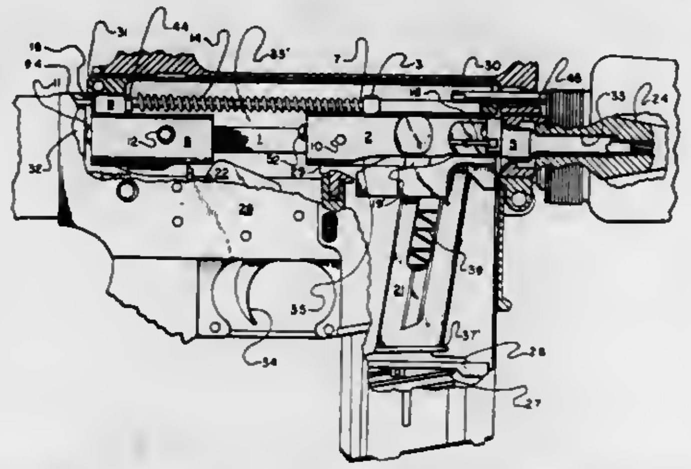
4,098,016
AUTOMATIC AND SEMIAUTOMATIC SMALL CALIBER CONVERSION SYSTEM

John P. Foote, Marietta, Ga., assignor to U.S. Armament Corporation, Gretna, La.

Filed Oct. 31, 1975, Ser. No. 627,743

Int. Cl.² F41C *11/00*

U.S. Cl. 42—16 **3 Claims**



1. In an adapter for converting a firearm adapted for automatic feed of ammunition to use different size ammunition, the firearm having a firearm receiver with a first and a second end and a firearm barrel extending from the second end, the adapter having a fixed adapter receiver with a first portion located at the first end of the firearm receiver and a barrel insert at the second end of the firearm receiver, the barrel insert extending into the fireman barrel, the first portion of the adapter receiver and its barrel insert having a connection therebetween, the improvement comprising:

a resilient spring mounted on the adapter receiver facing the first end of the firearm receiver biasing the adapter receiver away from the first end of the firearm receiver.

4,098,017
WATER FLOW THROUGH FISHING LURE

Joe Patrick Hall, P.O. Box 505, Branson, Mo. 65616

Filed Dec. 17, 1976, Ser. No. 751,705

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.06 **10 Claims**

1. A noise-making fishing lure comprising, in combination,

an elongate body, substantially oval in each of side and plan views, with a relatively short, blunt front end rounding rearwardly to an enlarged mid-portion and thereafter tapering rearwardly therefrom to a relatively narrower rear end,

the body having lateral, opposed sides and top and bottom sides,

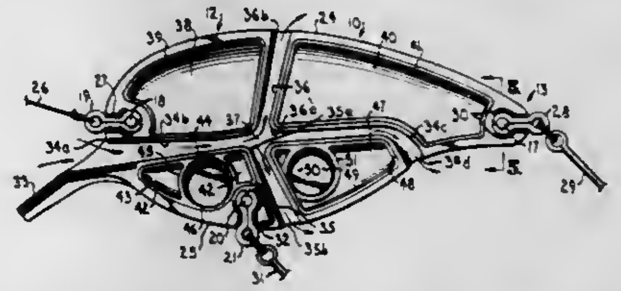
a first eyelet attached to the front end of the body for connection to a fishing line,

a second eyelet attached to the rear end of the body for carrying a hook,

a third eyelet attached to the underside of the body for carrying a hook,

a bill connected to the front end of the body below and spaced away from the first eyelet body connection, said bill angling somewhat downwardly from its connection to the body, with respect to the longitudinal axis of the body,

a first passage in said body entering the front end at the base of the bill and below the said first eyelet connection, running substantially axially rearwardly of the body past the mid-portion thereof, then turning downwardly and exiting out of the underside of the body ahead of the second eyelet connection, but well aft of the third eyelet connection,



a second passage connecting at its inward end to the first passage substantially midway of the ends thereof, passing downwardly in the body substantially immediately rearwardly of the third eyelet connection and exiting from the bottom side of the body well forward of the exit of the said first passage therefrom,

a first sealed air chamber in said body above said first passage running substantially from aft of the first eyelet connection to forward of the second eyelet connection,

a second sealed air chamber in said body under the front end of the first passage and forward of the said second passage,

a third sealed air chamber in said body under rear end of the first passage and aft of the second passage, and

non-air sealed chambers contained within said second and third chambers, each receiving a weight therewithin.

4,098,018
INSECT TRAP ATTACHABLE TO A TREE

Jack H. Bartelme, Rhinelander, Wis., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jul. 30, 1976, Ser. No. 710,229

Int. Cl.² A01M *1/18*

U.S. Cl. 43—108 **4 Claims**

1. An insect trap attachable to a tree, comprising: an insect trap of conic section,

means of resiliently constraining an upper edge of the trap against a circumference of the tree,

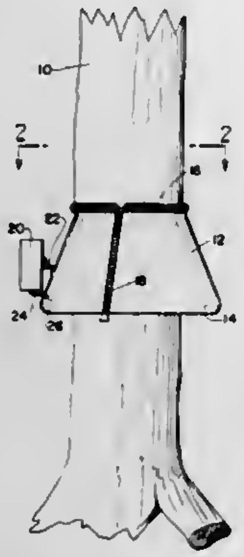
a lower edge of the trap extended inwardly to form a trough,

an upper edge of the trap resiliently held against the trunk of the tree by a spring,

a zipper attached along a vertical section of the trap to the trap to form a means of removably attaching the trap to the trunk of the tree,

a cannister attached to an external surface of the trap and connected by a tube passing through the trap to the trap to deliver an insecticide to the trough,

a bracket attached to the cannister and passing through a side of the trap, a vertical bracket attached to a distal end of the bracket and extended upward and attached to the spring, and

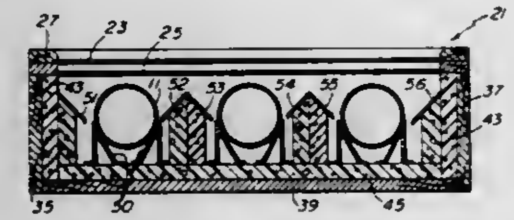


a distal end of the tube forming a downward bend extending over the trough, whereby a droplet of the insecticide may be delivered into the trough.

4,098,019

SOIL PASTEURIZING APPARATUS

John D. Strong, 136 Gray St., Amherst, Mass. 01002
Filed Jul. 5, 1977, Ser. No. 812,564
Int. Cl.² A01G *11/00;* F24J *3/02*
U.S. Cl. 47—1 R **9 Claims**



1. Portable soil pasteurizing apparatus, said apparatus comprising:

a plurality of elongate canisters having substantially equal transverse dimensions, said canisters being openable at one end for receiving soil to be pasteurized;

a housing generally in the form of a shallow box having a transparent window constituting one of the broad faces thereof and having also openings in one end wall thereof through which said canisters may be inserted into said box in a spaced, generally parallel array, said canisters constituting a vapor barrier between the contents of the canisters and the interior of the box outside of the canisters;

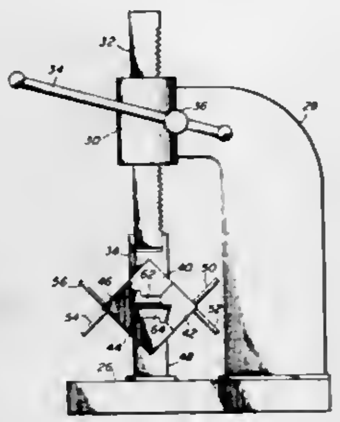
said housing including means for supporting said canisters in spaced relation from the walls of the housing thereby permitting air to circulate from the front of the canisters to the back to distribute heat; and

reflective means for directing, onto the canisters, radiation entering the housing in regions not occupied by the canisters, the exterior surface of the canisters being blackened so as to be solar energy absorbing, the area of said housing window being about twice the projected area of the portions of said canisters within said housing, said housing being of a generally insulating construction to minimize heat loss by conduction.

4,098,020

METHOD AND APPARATUS FOR HORTICULTURAL GRAFTING

Edward J. Cook, 12 Patton Dr., South Hamilton, Mass. 01982
Continuation-in-part of Ser. No. 653,465, Jan. 29, 1976, Pat. No. 4,014,132. This application Mar. 28, 1977, Ser. No. 781,554
Int. Cl.² A01G *1/06*
U.S. Cl. 47—6 **10 Claims**



1. The method of grafting one plant component to another of similar diameter comprising the steps of

slitting the end of each component longitudinally substantially along its central axis forming two facing halfs thereby and slitting each half diagonally in a plane perpendicular to the longitudinal slit and oblique to the central axis, each oblique slit extending transversely of the respective half, with the plane of one oblique slit at an angle to and intersecting the plane of the other oblique slit to form four tapered sections on each component,

(b) removing from the end of each component two resulting diametrically opposite matching tapered sectors to leave two diametrically opposite complementary tapered sectors of substantially equal size at the end of each component,

(c) said complementary sectors being of substantially equal length and of a thickness at their bases equal to the radius of said components,

(d) coaxially aligning the facing sectored ends of said components with the ends oriented for sliding, interlocking engagement,

(e) sliding said ends together, and

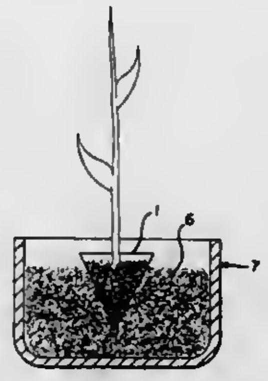
(f) binding the joint formed thereby.

4,098,021

CONTAINER FOR RESTRICTING THE GROWING SIZE OF PLANTS AND METHOD OF APPLYING THE SAME

Bruno Gruber, Ehbaner-Ring 2, 8031 Puchheim, Fed. Rep. of Germany
Filed Dec. 13, 1976, Ser. No. 750,249
Claims priority, application Germany, Jan. 21, 1976, 2602107
Int. Cl.² A01G *9/02*
U.S. Cl. 47—66 **17 Claims**

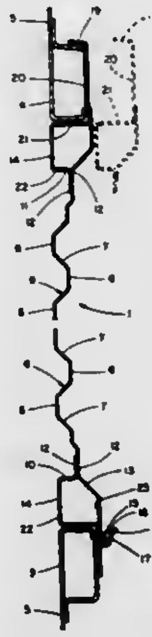
1. A plant container comprising a receptacle having an upwardly facing opening formed from a corrosion resistant material and having holes formed therethrough, said holes having a width of approximately 0.05 mm to about 0.3 mm, said receptacle being adapted to contain a nutrient medium and the root portion of a plant and adapted to be placed in a pot containing a nutrient medium, said receptacle being sized so that its volume cannot contain a sufficient amount of nutrient necessary for normal growth of a plant growing therein, said receptacle having a sufficient number of holes therethrough to allow the plant roots in said receptable to draw sufficient nutrients from outside said receptacle to nourish said plant.



4,098,022

PLUG SLIDING DOOR

Harold E. Hesch, St. John, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Jan. 17, 1977, Ser. No. 760,049
Int. Cl.² E05D *15/10*
U.S. Cl. 49—209 **8 Claims**



1. In a railway car having a side wall including horizontally spaced vertical door posts providing a door opening,

a door assembly adapted to be moved outwardly and laterally with respect to said opening comprising;

first and second horizontally spaced vertical edge beams,

a door panel connecting said beams,

said beams each including a vertical inner wall and a vertical outer wall,

said outer wall having a vertical wall portion sloping inwardly and including flanges connected to said door panel,

vertical side walls on each said beam connecting said inner and outer walls providing a tubular configuration, and

resilient flange means on said outer walls of each beam overlapping portions of said door posts in the closed position of said door assembly,

one of said resilient flange means including a resilient flange member having a vertical wall projecting laterally outwardly from said outer wall and extending over one of said door posts,

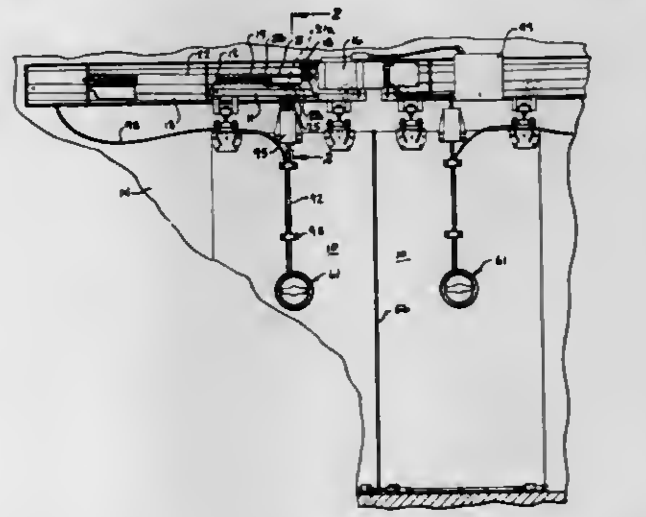
said resilient flange member including a flange portion projecting inwardly of and in transverse relation to said outer wall of said door post,

the other of said resilient flange means including an angle-shaped vertical sealing member having an overlapping sealing relationship with the outer wall of the other door post.

4,098,023

LOCK AND SAFETY RELEASE FOR POWER OPERATED DOORS

Robert E. Slopa, Woodstock, Ill., assignor to Hussmann Refrigeration, Inc., Bridgeton, Mo.
Filed Dec. 7, 1976, Ser. No. 748,383
Int. Cl.² E05F *15/00*
U.S. Cl. 49—139 **10 Claims**



1. A lock and safety release for power operated doors of the type including a motor driven door operator operable to reversibly move a door drive member along a path, means including selectively operable control switch means for controlling operation of said door operator, and a door connector latch carried by the door for releasably coupling the door to the door drive member for movement thereby, said lock and safety release comprising first and second emergency release handles at opposite sides of the door, latch actuator means operable in a release mode for moving said door connector latch to a release position whereby to decouple the door from the door drive member, means responsive to operation of either the first or the second emergency release handle for operating said latch actuator means in its release mode, means for locking said second emergency release handle against operation without locking said first emergency release handle against operation whereby to prevent the second handle from operating the latch actuator means in its release mode while continuing to allow the first handle to operate the latch actuator means in its release mode, door operator disabling switch means operable when actuated to prevent operation of said door operator by said control switch means, and means for actuating said door operator disabling switch means when said second emergency release handle is locked against operation.

4,098,024

ACCESS DOOR

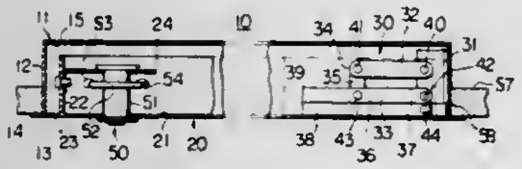
Hiromitsu Naka, No. 39, Oaza Shinmachi, Yashio-shi, Saitama-ken, Japan
Filed Jun. 29, 1976, Ser. No. 701,027
Claims priority, application Japan, Jul. 2, 1975, 50-80959; Jul. 2, 1975, 50-91631[U]; Jul. 14, 1975, 50-85307
Int. Cl.² E05D *15/40*
U.S. Cl. 49—246 **11 Claims**

1. An access door comprising:

an outer framework adapted to be fitted and secured in a rough opening in a building ceiling or wall, said outer framework having therein an opening;

a cover for opening and closing said opening in the outer framework; and

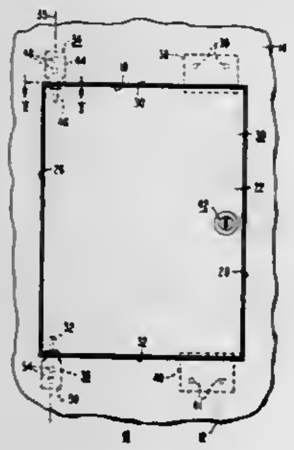
link hinge means positioned between said outer framework and a side of said cover for mounting said cover to said outer framework such that said cover undergoes both pivotal movement with respect to said outer framework and movement in a direction perpendicular to the plane of said opening in said outer framework during opening and closing of said opening, said link hinge means comprising a pair of link hinges, each of said link hinges including a substantially L-shaped follower link having an upright leg and a horizontal leg pivoted at a free end thereof to a corner of said cover, a shorter upper link pivoted at one end thereof to said outer framework and at the other end thereof to said upright leg of said follower link, and a longer lower link parallel to and spaced from said shorter upper link and pivoted at one end thereof to said outer framework and at an intermediate portion thereof to said upright leg of said follower link, the portion of said lower link extending from said intermediate portion thereof to the other end thereof forming an extension guide portion.



4,098,025
DOOR ASSEMBLY AND METHOD OF CONSTRUCTION SAME

Mark E. Stock, McSherrystown, and Edward F. Sherwood, Gettysburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1977, Ser. No. 806,398
Int. Cl.^{2} E05D *7/08*
U.S. Cl. 49—388 **8 Claims**

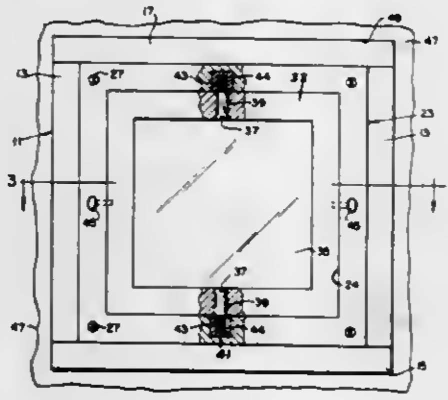


1. A door assembly, comprising:
a door having first and second major opposed surfaces, first and second vertically oriented edge portions, and top and bottom edge portions,
a wall panel having first and second major opposed surfaces, and an opening which extends between its opposed surfaces configured to receive said door,
and fastener means pivotally mounting said door in the opening defined by said wall panel, about a vertical pivot axis which intersects the top and bottom edge portions of said door adjacent to a selected edge portion thereof, with the first major surfaces of said door and wall panel being in a common plane when said door is in a selected position,
said fasteners means including first and second angle members, each having first and second arm portions disposed at a right angle relative to one another, first and second elongated fastener means and additional fastener means,
said first and second elongated fastener means being disposed to secure the first arm portions of said first and second angle members to the top and bottom edge portions, respectively, of said door,
said additional fastener means being disposed to secure the second arm portions of said first and second angle members to the second major surface of said wall panel,
said first and second elongated fastener means being disposed with their longitudinal axes coincident with said vertical pivot axis, such that said elongated fastener means perform both pivot and fastener functions.

4,098,026
WINDOW ASSEMBLY

Joseph A. Strzepek, 2241 Poland, Hamtramck, Mich. 48212

Filed Dec. 15, 1977, Ser. No. 860,817
Int. Cl.^{2} E06B *3/34*
U.S. Cl. 49—390 **1 Claim**



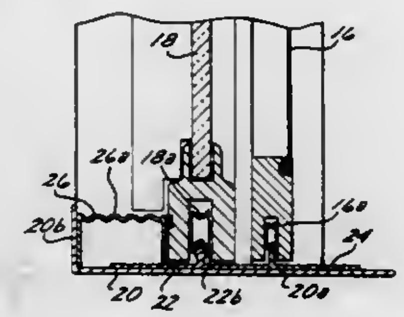
1. A window assembly for a building having a wall with an aperture;
a housing nested and secured in said aperture, including opposed side plates and top and bottom plates;
said side plates each having an inwardly opening upright recess throughout their height of a predetermined horizontal depth defining stop ledges;
a hollow frame of a thickness substantially the same as said recess depth snugly nested within said housing and within said recesses, and bearing against said top, bottom and side plates;
headed fasteners engaging and projected through said frame and threaded into said housing;
said frame having an internal recess therethrough of predetermined shape;
and a glazed window of the same shape loosely nested within said recess and swivelly mounted thereon upon a vertical axis, adapted for rotation through 360°;
opposed aligned interiorly threaded cups nested within central portions of said frame;
said swivel mounting including a pair of opposed vertically aligned fasteners extending through and pivotally receiving central top and bottom portions of said window, and including ends projecting from said window and threaded into said cups;
said fasteners journalling and securing said window within said frame for rotation therein;
and at least one latch on said frame having a manually retractable element nested within a corresponding recess within said window, for securing it within said frame in one of two 180° related positions.

4,098,027
SLIDING-DOOR AND SLIDING-SCREEN SILL

James M. Crance, 1776 Newport Blvd., Costa Mesa, Calif. 92627

Filed Jan. 3, 1978, Ser. No. 866,534
Int. Cl.^{2} E06B *1/04*
U.S. Cl. 49—504 **7 Claims**

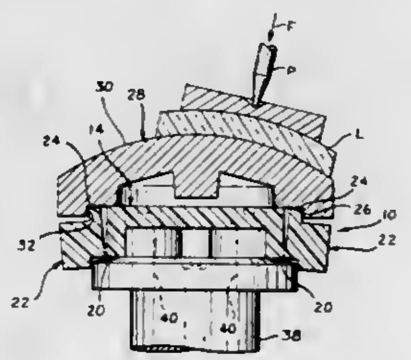
1. A sliding-door and sliding-screen sill comprising in combination,
first and second rail members each having a base and an elongated rail thereon and being formed with at least one elongated break-notch in said base to vary as desired the width of said base, said rail members being positionable in juxtaposed relation with any one of several dimensions between said rails by breaking away a portion of the base of either or both of said rail members to accommodate existing spacing between a sliding door and sliding screen.



4,098,028
ADAPTOR FOR LENS SURFACING TOOL

Louis Prunier, Oxford, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 21, 1977, Ser. No. 789,601
Int. Cl.^{2} B24B *41/06*
U.S. Cl. 51—216 LP **4 Claims**



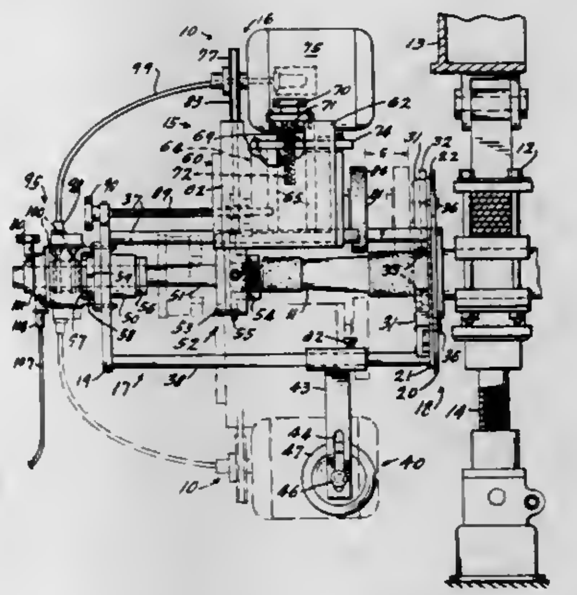
1. An adaptor for a lens surfacing tool comprising a unitary body including a flat circular main central portion of resilient material having a first thickness and peripherally disposed circumferentially successive segment portions each flexurally connected to said central portion by a section of a thickness thinner than said first thickness, said segment portions further each having an upstanding jaw component for displacement toward and away from said main central portion for securing said tool in place upon said adaptor by flexing of said segment portions at said connections in collet-like fashion from said central portion and against a peripheral portion of said tool when said portion of said tool is forced against said segment portions.

4,098,029
AXLE GRINDER

Leo C. Shiets, 522 Venetian, Sandusky, Ohio 44870

Filed Mar. 11, 1977, Ser. No. 776,492
Int. Cl.^{2} B24B *19/00*
U.S. Cl. 51—241 S **8 Claims**

1. A device for grinding a cylindrical wheel bearing surface on a truck axle to desired radius and alignment which bearing surface has been built up to an oversized radius, said device comprising, in combination,
an elongate hollow frame having an internal reference axis extending between an inner and an outer end, chuck means associated with said outer end and coincident said reference axis for receiving and securing said axle within said frame and at least three radially translatable roller means disposed about said inner end for positioning said frame relative to said axle with said reference axis of said frame generally coincident with the axis of said axle, said roller means oriented for rotation about axes parallel to said reference axis and movable into engagement with the surface of said axle,
a grinding wheel driven by a motor about a wheel shaft, means for positioning said wheel shaft parallel to said reference axis of said frame and spaced therefrom, said shaft axis being movable in a rotary path about said reference axis,

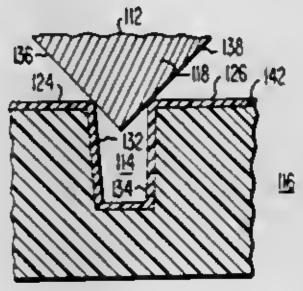


means for moving said grinding wheel parallel to its said wheel to thereby translate such wheel parallel to its axis over the bearing surface to be ground, and
means for moving said wheel shaft in a radial direction toward or away from said reference axis whereby said oversized bearing surfaces may be ground to desired radius and alignment by moving said wheel parallel to its wheel shaft over the axial length of said bearing surface while said wheel is driven on its shaft which rotates about said reference axis.

4,098,030
METHOD FOR FORMING A NARROWED-ELECTRODE PICKUP STYLUS FOR VIDEO DISC SYSTEMS

Jack Selig Fuhrer, Princeton Junction, and Eugene Orville Keizer, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,019
Int. Cl.^{2} B24B *1/00*
U.S. Cl. 51—281 R **3 Claims**



1. A method of fabricating a narrowed-electrode stylus by modifying a tapering dielectric support element having a tip which is defined by a prow and a substantially flat V-shaped rear surface remote from said prow; the entire rear surface of said dielectric support element being covered with conductive material to form an electrode; said narrowed-electrode stylus being suitable for playing back prerecorded signals from a disc record groove of a given width and a given pitch; said method comprising the steps of:

introducing said tip of said tapering support element in an abrasive groove having a bottom wall, substantially parallel side walls separated by a distance less than said given width and lands extending away from said side walls; while

establishing relative motion between said tapering support element and said abrasive groove along a line which is disposed in a plane substantially perpendicular to said V-shaped rear surface;

gently tilting said electrode face of said support element toward said abrasive groove until it subtends a shallow angle with the bottom wall of said abrasive groove to form a portion having an arrowhead-shape cross-section in the region of said tip;

the apex of said arrowhead-shape cross-section being located on said prow; the base of said arrowhead-shape cross-section being defined by said substantially flat rear surface;

said lands of said abrasive grooves forming the shoulders of said arrowhead-shape cross-section;

said side walls of said abrasive groove forming the sides of said arrowhead-shape cross-section interconnecting said shoulders and said base of said arrowhead-shape cross-section; and

terminating said relative motion subsequent to formation of said tip portion having an arrowhead-shape cross-section.

4,098,031

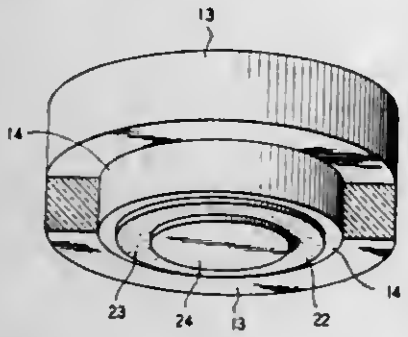
METHOD FOR LAPPING SEMICONDUCTOR MATERIAL

Robert Louis Hartman, Warren Township, Somerset County, and Wilbur Dexter Johnston, Jr., Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 26, 1977, Ser. No. 762,444

Int. Cl.^{2} B24B *1/00, 41/06*

U.S. Cl. 51—323 **2 Claims**



1. A method of lapping a wafer of semiconductor material in a manner to substantially reduce the initiation or propagation of stress induced defects,

said method being carried out in an apparatus which includes a rotatable lapping turntable, a mounting plate to which said wafer is removably secured, said wafer being positioned in contact with said lapping turntable, and means for moving said lapping turntable relative to said mounting plate,

said method being characterized by the steps of:

(a) placing a spacer on said mounting plate, said spacer being of a soft fibrous material of substantially uniform thickness sufficient to deform around irregularities and particulates on the surface of said material and to prevent said irregularities and particulates from contacting the surface of said mounting plate;

(b) securing said wafer and said spacer to said mounting plate;

(c) applying a layer of abrasive material to said lapping plate;

(d) moving said lapping plate relative to said mounting plate thereby to thin said wafer;

(e) removing said abrasive from said lapping plate;

(f) placing a chemical etchant soaked polishing pad on said lapping plate; and

(g) moving said lapping plate relative to said mounting plate thereby to polish said wafer.

4,098,032

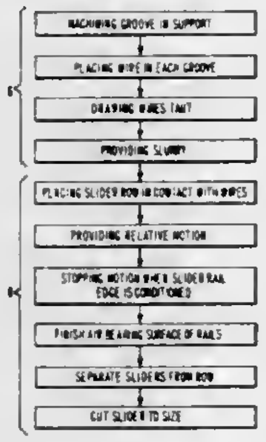
METHOD OF FORMING AIR BEARING RAILS OF HEAD ASSEMBLIES

Manfred Olbert, Gau-Bischofsheim, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,707

Int. Cl.^{2} B24B *1/00*

U.S. Cl. 51—326 **2 Claims**


MACHINING GROOVE IN SUPPORT
PLACING WIRE IN EACH GROOVE
DRAWING WIRES TAUT
PROVIDING SLURRY
PLACING SLIDER ROW IN CONTACT WITH WIRES
PROVIDING RELATIVE MOTION
STOPPING MOTION WHEN SLIDER RAIL EDGE IS CONDITIONED
FINISH AIR BEARING SURFACE OF RAILS
SEPARATE SLIDERS FROM ROW
CUT SLIDER TO SIZE

1. A method of forming precision air bearing rails on a slider element for determining the air bearing flying height between a head assembly and a magnetic media as a result of relative motion therebetween, said method comprising the steps of:

(a) placing at least one slider element in contact with a plurality of abrasive parallel wires drawn taut in longitudinal V shaped grooves precision machined in a flat support surface, the distance between the grooves defining the thickness and separation between the rails of the slider element and the diameter and shape of the wires and the depth of the groove determining the shape and depth of bleed slots in the slider element, said wires supplied from a source mounted at one end of the support surfaces and taken up by a spool mounted at the other end of the support surface;

(b) providing a back and forth relative motion between the grooved support with the wires and the slider element in a direction parallel to said wires; and

(c) stopping the motion when the slider element rail edge is conditioned according to predetermined dimensions.

4,098,033

SAND BLASTING APPARATUS

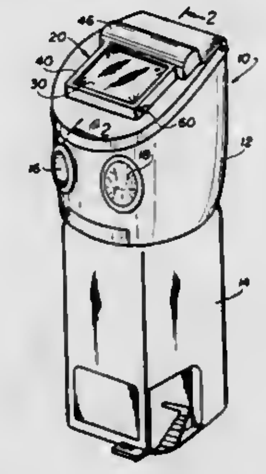
Douglass M. Mann, c/o Niranium Corp., 34-37 Eleventh St., Long Island City, N.Y. 11106

Filed Sep. 29, 1977, Ser. No. 837,751

Int. Cl.^{2} B24C *9/00*

U.S. Cl. 51—426 **4 Claims**

1. In a sand blasting apparatus useful for the cleaning of molded products or the like of the type including a housing bounding an internal blasting compartment and having a viewing opening into said compartment, the improvement thereto comprising an elongated strip of clear plastic put up in a supply roll, means mounting said plastic supply roll adjacent one side of said viewing opening for unwinding successive length portions therefrom incident to positioning each such unwound length portion in covering relation over said viewing opening, and a pivotally mounted frame movable from a clearance position into an operative position in engaged relation about the peripheral edges of such unwound plastic length portion functioning as said viewing opening cover, whereby supervision of said blasting operation is facilitated by the view thereof as afforded through said plastic and a freshly clear successive length portion thereof is readily available as a replacement by being unwound from said supply roll.



4,098,034

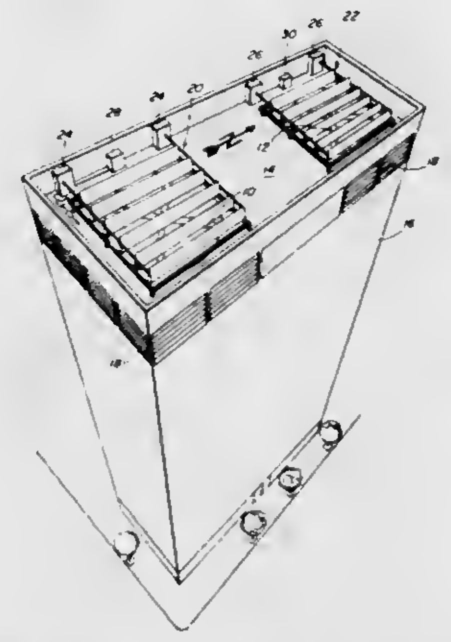
BUILDING SWAY CONTROL

Wallace E. Howell, R.F.D. 3 Box 400, Golden, Colo. 80401

Filed May 6, 1976, Ser. No. 683,661

Int. Cl.^{2} E04B *1/34*

U.S. Cl. 52—1 **13 Claims**



1. An apparatus for controlling the motion of a building which motion is caused by winds which comprises:

(a) a plurality of movable vanes arranged in a sail-like configuration, the vanes adapted to direct an air stream and secured to the building in a movable manner;

(b) means to sense a linear magnitude arising substantially from translational motion of the building and to provide a signal corresponding to the translational motion; and,

(c) means to control the movement of the vanes, said means directly responsive to the means to sense whereby when the building moves the translational motion is sensed and the surfaces of the vanes interact with the air to generate a force opposed to the motion of the building.

4,098,035

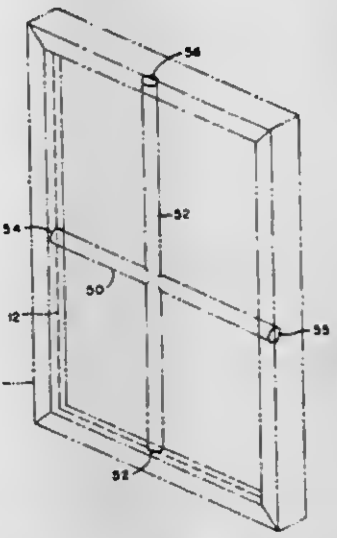
INFLATABLE STORM WINDOW

Edward W. Bessler, 8 Rosemont Dr., Crestview Hills, Ky. 41017

Filed Jul. 18, 1977, Ser. No. 816,488

Int. Cl.^{2} E04B *1/34*

U.S. Cl. 52—2 **4 Claims**



1. An inflatable storm window adapted for positioning within a surrounding frame structure, comprising:

a continuous hollow outer portion of tubular cross section formed from a pliable and expandable plastic, said outer portion being capable of being inflated, the outside dimensions after inflation of said hollow outer portion being dimensionally sized for sealing and retaining engagement within said frame structure;

a valve placed in the sidewall of said tubular outer portion for accomplishing inflation; and

a pliable central portion comprising,

two transparent spaced apart membranes, each peripherally attached to the inner edge of said outer tubular portion, said membranes, being dimensionally sized so as to become taut when said tubular outer portion is inflated;

a multiplicity of communication ports in the inward facing wall of said tubular outer portions, said ports being for the purpose of pressurizing the space formed between said membranes when said outer tubular portion is inflated; and

tubular support members between said spaced apart membranes, the ends of said tubular support members being attached to the inner wall of the outer tubular member, said tubular support members including cross axis indentations at regular intervals whereby pressurization of the inside of the tubular member with respect to the outside tends to make said tubular member expand in length, thus providing additional pressure between the outer tubular portions and the window frame in the midspan regions.

4,098,036

ELEVATED TRAIN STATION

Johannes-Gerhard Spoler, Ennepetal-Voerde, and Uwe Lichtenvort, Essen, both of Germany, assignors to Demag A.G., Duisburg, Germany

Filed Oct. 14, 1976, Ser. No. 732,303

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 2548555

Int. Cl.^{2} E04D *13/08;* **E04B** *1/346*

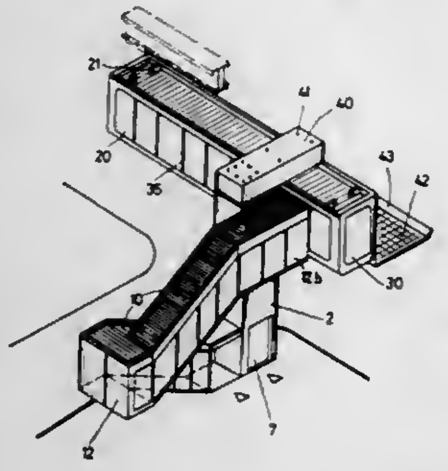
U.S. Cl. 52—16 **25 Claims**

1. A station for elevated trains characterized by

(a) a single verticle support girder;

(b) a support beam cantilevered from said single support girder and supported solely upon said girder;

(c) an elevated station platform suspended from said support beam and positioned adjacent the right of way for the elevated trains, said platform supported solely on said support beam; and

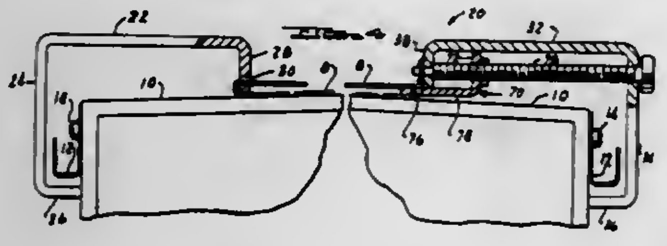


(d) access means supported on said single girder and extending from the ground to said platform.

4,098,037

ROOF MUFFLER

Leon E. Day, Hughes, Ark., assignor to Jeff Pratt and George G. Watts, both of Memphis, Tenn.
Filed Apr. 16, 1976, Ser. No. 677,740
Int. Cl.^{2} E04B *7/00*
U.S. Cl. 52—23 **4 Claims**



1. In a vibration dampner for the reduction of roof rumble in a mobile home, the combination of,

a set of generally L-shaped brackets having a first leg portion and a second leg portion, with each of said first and second leg portions being disposed at substantially right angles to each other;

the outermost squared end of the first leg portion is deformed to underlie the second leg portion in generally parallel relationship, thus forming a spacing foot structure which engages the vertical side-wall of the mobile home immediately beneath a drip-rail-;

the outermost squared end of the second leg portion is deformed to lie in generally parallel relationship to the first leg portion;

the first "L" shaped bracket of said set is of unitary construction and has an elongated slot in generally parallel relationship to the deformed portion on the outermost squared end of the second leg portion, while the second L-shaped bracket of the set is in the form of a multi-part assembly and has a first centrally positioned opening in the deformed portion on the outermost squared end of the second leg portion, as well as a second opening in the first leg portion, which second opening is disposed in alignment therewith;

intermediate the first leg portion and the outermost squared end of the second leg portion is positioned another L-shaped bracket having two legs, one leg having an elongated slot therein on the outermost squared end thereof, while the other leg has a centrally positioned threaded opening therein which is in substantial alignment with the first opening in the outermost squared end of the second leg portion, as well as the second opening in the first leg, when the squared end thereof is positioned adjacent the underside of the second leg portion;

a threaded member secured within each of said openings;

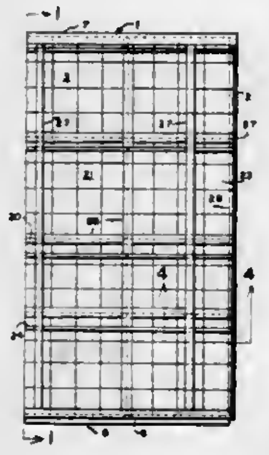
and a connecting member secured between said first unitary bracket member and said second "L" shaped bracket assembly when said L-shaped bracket members are positioned against the vertical side walls of the mobile home;

rotation of said threaded member functioning to tension said connecting member by drawing same into contact with the roof of the mobile home so as to reduce roof panel displacement when said roof is exposed to the wind.

4,098,038

TILED ENCLOSURE, AND METHOD TO MAKE SAME

John G. Contardi, 3612 Parker, Dearborn, Mich. 48121
Filed Dec. 20, 1976, Ser. No. 752,532
Int. Cl.^{2} A47B *5/00*
U.S. Cl. 52—35 **5 Claims**



1. A pre-formed, water resistant structure including,

a substantially vertical, elongated main wall having a first, vertical longitudinal edge,

a first sidewall elongated approximately coextensively with said main wall and having a longitudinal edge adjacent to said first longitudinal edge,

each said wall including peripherally adjacent sheets of multiple, conjoined tiles, and each wall having an inner surface and an outer surface,

adhesive binding means conjoining the adjacent peripheries of said sheets of tile to constitute each respective wall,

further binding means conjoining said adjacent longitudinal edge portions,

a plurality of horizontally elongated, vertically spaced support members applied to said outer surfaces and continuously interengaging said walls, and

a coating of material covering and adhering to said outer surfaces, said coating covering said support members, and being solidified to give rigidity and unit to said structure.

4,098,039

MULTI-LEVEL BUILDING WITH PREFABRICATED TRIANGULAR CANTILEVER UNITS

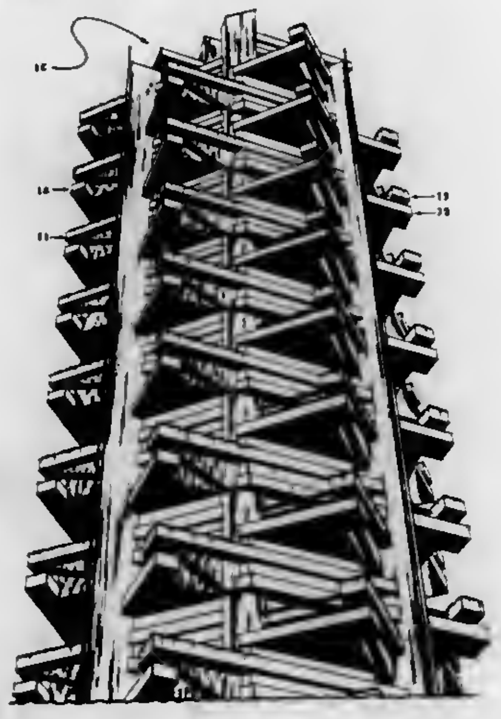
Franklin S. Sutelan, 301 E. 53rd #3A, New York, N.Y. 10022
Division of Ser. No. 654,538, Feb. 2, 1976, Pat. No. 4,035,973, which is a continuation of Ser. No. 507,992, Sep. 20, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 739,474
Int. Cl.^{2} E04B *1/32;* E04H *1/04*
U.S. Cl. 52—73 **14 Claims**

1. A multi-level building construction including prefabricated self-supporting triangular dual floor cantilever units attached to and cantilevered from a side of said building construction, thereby extending the floor space of two floors of the building, each unit comprising in combination:

(a) a first substantially triangular planar floor member having a first side edge, called a base edge, and second and third side edges, called lateral edges;

(b) a second substantially triangular planar floor member having a first side edge, called a base edge, and second and third side edges, called lateral edges, said second floor member being arranged above and parallel to said first floor member with the base edges of the two floor members in a common vertical plane;

(c) a first support member, extending diagonally from a point substantially at the base edge of one of said first and second floor members to a point substantially at the apex of the lateral edges of the other of said first and second floor members; and



(d) a second support member, extending substantially vertically downward from a point substantially at the apex of the lateral edges of said second floor member to a point substantially at the apex of the lateral edges of said first floor member;

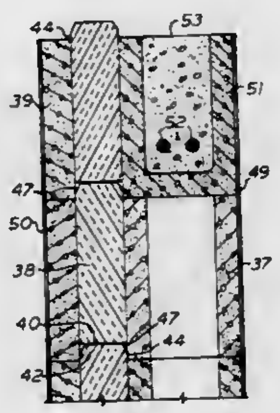
(e) said cantilevered units being attached into place directly on pairs of structural column supports forming a part of said building construction;

whereby the units are prefabricated on the ground and lifted and attached to said building.

4,098,040

CONCRETE BLOCK PANEL

Monte Riefler, P.O. Box 210, Hamburg, N.Y. 14075
Continuation-in-part of Ser. No. 539,774, Jan. 9, 1975, Pat. No. 4,001,988. This application Nov. 9, 1976, Ser. No. 740,095
The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.
Int. Cl.^{2} E04G *21/00;* E04C *1/02*
U.S. Cl. 52—125 **13 Claims**

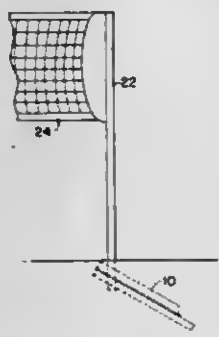


1. A prefabricated concrete block wall panel, said panel being one block thick, a plurality of blocks high and a plurality of blocks long and comprising a plurality of contiguous courses of concrete blocks with the joints between the blocks and courses dry and with the joints between blocks in adjacent courses staggered, the blocks having spaced load carrying walls with planar top and bottom load carrying surfaces and vertically aligned load carrying pillars at the centers of the blocks, the blocks having vertical core openings and thrust surfaces on said pillars within said core openings vertically aligned from top to bottom, said thrust surfaces being parallel to each other and having edges spaced inward from said walls, a plurality of tension loops at the center of the panel each surrounding a plurality of blocks both vertically and horizontally and each engaging said thrust surfaces for pulling the blocks within the loops tight against each other both vertically and horizontally and putting the blocks in compression both vertically and horizontally, the loops being spaced from each other along the length of the panel and having sides of each loop spaced apart a plurality of blocks, and struts diverging from opposite edges of said thrust receiving surfaces to said walls for transmitting load from tension loops on said thrust receiving surfaces in compression through the pillar to said walls.

4,098,041

BURIED SAND ANCHOR FOR VOLLEYBALL POLES AND THE LIKE

Norman V. Frye, R.R. #4, Davenport, Iowa 52800
Filed Mar. 11, 1977, Ser. No. 776,728
Int. Cl.^{2} E02D *5/74*
U.S. Cl. 52—155 **1 Claim**



1. An anchor of the class described, comprising: an elongated tubular member open at both ends and adapted to be buried in an inclined position in a pre-dug sloped trench for supporting an upright pole for a volleyball net or the like whereby one end portion of the member is substantially below ground level and the other end portion is adjacent to ground level, said one end portion of the member being formed as a scoop enabling the member to be used as a trench-digging tool, said scoop presenting an upper sand-retaining surface, and said ground-adjacent end portion of the member including pole-supporting means in the form of a pair of apertures respectively through diametrically opposite wall portions of the member, said apertures being aligned on an upright axis substantially perpendicular to the horizontal when the member is buried, said member being formed of a relatively stiff yet slightly flexible material capable of being temporarily "ovalized" and recovering its shape at said ground-adjacent end portion to accommodate at least some of the forces applied to the pole during game usage.

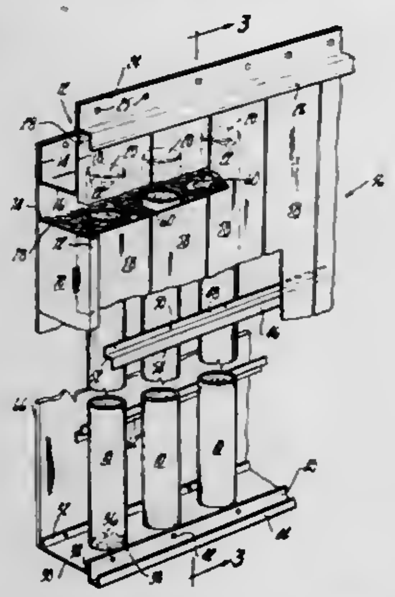
4,098,042

BLOCK-FORM FOR USE IN REINFORCED CONCRETE STRUCTURES

Melvin H. Sachs, 5415 Fairway La., W. Bloomfield, Mich. 48033, and Calvin Shubow, 30840 Running Stream, Farmington, Mich. 48024
Filed Aug. 23, 1976, Ser. No. 716,656
Int. Cl.^{2} E04F *13/08*
U.S. Cl. 52—383 **12 Claims**

1. A block for use in forming concrete structures comprising: a plurality of elongated rigid tubes disposed in spaced

parallel relationship to one another; a top elongated frame member extending normally to the axes of the tubes connected to one end of each of the tubes; a bottom elongated frame member extending normally to the axes of the tubes and connected to the opposite end of each tube; parallel inner and outer wall panels having a height at least equal to the length of the tubes and a width in excess of the dimensions between the center lines of the opposite end tubes in said plurality of tubes, the panels being spaced from one another by a distance greater



than the diameter of the tubes and being disposed on opposite sides of the tubes with their opposed faces spaced from the adjacent tube walls so that the volume between the panels encompasses the tubes; and insulation filling a substantial portion of the volume between the panels and exterior of the tubes, whereby a plurality of blocks may be supported in spaced relationship to one another and the tubes may act as forms for forming a concrete framework encased by the blocks which form wall surfaces thereof.

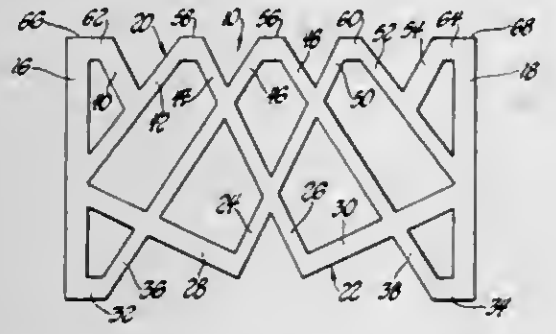
4,098,043
JOINT SEAL

Samuel D. McCready, Birmingham, Mich., assignor to Harry S. Peterson Company, Pontiac, Mich.

Filed Aug. 1, 1977, Ser. No. 820,507

Int. Cl.² E01C *11/10;* E04B *1/62*

U.S. Cl. 52—403 **9 Claims**



1. A joint seal comprising an elastomeric tubular structure having a pair of laterally spaced planar side walls, a nonplanar upper wall interconnecting the upper ends of said side walls, and a nonplanar lower wall interconnecting the lower ends of said side walls, said lower wall including a first pair of angularly related linear wall sections interconnected at one pair of ends and laterally spaced at the other ends to define a downwardly opening V centrally of said side walls, first and second linear compression bars respectively connecting the spaced other ends of the angularly related wall sections with said side walls at points below the vertical midpoints of said side walls, said lower wall including a second pair of linear sections respectively projecting from proximate the lower ends of said side walls to points intermediate the ends of the first and second compression bars, said first pair of angularly related wall sections moving into abutting relationship after initial lateral compression of said seal.

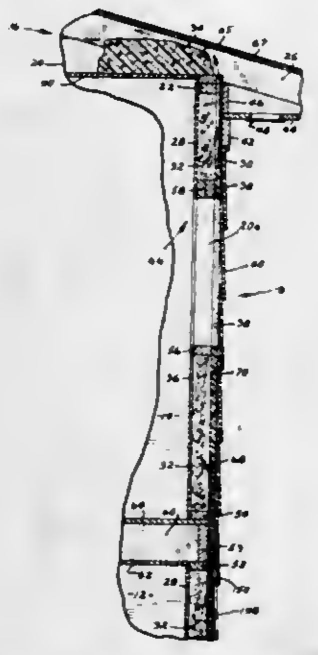
4,098,044
SHEATHING BOARD

Raymond F. Slavik, 2281 Hampden Ave., St. Paul, Minn. 55114

Filed Jun. 24, 1977, Ser. No. 809,548

Int. Cl.² E04C *1/08*

U.S. Cl. 52—503 **13 Claims**



1. A sheathing forming part of a structure wall having a plurality of horizontal and vertical interconnected spaced-apart frame members:

said sheathing including:

A. a plurality of sheathing panels having relatively high thermally insulative properties and each panel having a substantially planar interior surface bounded by generally horizontal and generally upright circumferential edges;

B. means for fastening said panels in contiguous relation to each other and to have their interior surfaces in contacting relation to exterior surfaces of said frame members, each of said panels contacting a horizontal frame member along an upper circumferential edge thereof; and

C. said panels each being provided with at least one groove open to said interior surface and, when so fastened, open to its upper circumferential edge between each pair of adjacent vertical frame members.

4,098,045
WALL FORMING CONSTRUCTION UNIT

Edward A. Astor, 1441 NE. 103rd St., Miami Shores, Fla. 33138

Continuation of Ser. No. 669,106, Mar. 22, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,278

Int. Cl.² E04B *1/32*

U.S. Cl. 52—639 **7 Claims**

1. For use with a generally planar wall form for use in a wall construction, a plurality of commonly aligned trusses, wherein each truss comprises:

an elongate main support,

a rigidifying member spaced from said support and parallel thereto,

a plurality of struts each having a first end and a second end and said struts interconnecting said main support and member defining a framework,

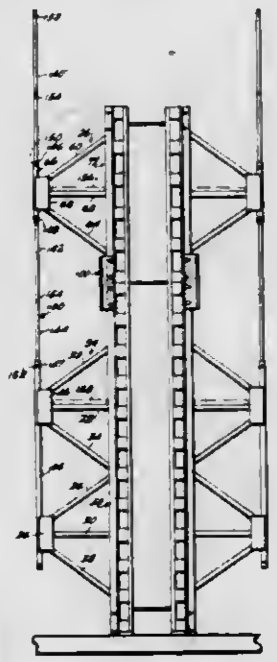
said struts including

a strut perpendicular to the support and to the member, and means to connect the first end of said perpendicular strut to the support and the second end of said perpendicular strut to the member, and

a first strut and a second strut, and means to connect the second ends of said first and second strut to the rigidifying member on opposite sides of said perpendicular strut at its connection to the rigidifying member, and means to connect the first ends of first and second struts to the main support in spaced relation and on opposite sides of the connection of said perpendicular strut to said main support,

said first and second struts being in a common plane with said perpendicular strut and extending from said rigidifying member and diverging with respect to one another and to the perpendicular strut toward the main support,

said main support having a support surface facing away from said rigidifying member and including holes through said support surface for connection to the generally planar wall form, whereby the wall form when spanning a plurality of the commonly aligned trusses, a wall construction unit is defined;



said main support includes:

a first and a second spaced parallel member of rigid material each having a support surface in a common first plane and a pair of parallel spaced clamp surfaces in generally rightangular relation to the first plane, and extending toward said rigidifying member; and

the first ends of said struts at said main support being sized for snug receipt between said clamp surfaces and,

said means to connect tightly clamping the first ends of said struts between said clamp surfaces;

said means to connect the second ends of said struts to the rigidifying member comprises a pair of plates, one of the plates of the pair being on each side of said rigidifying member and defining a slot and one of the second ends of each of said struts being in said slot at said rigidifying member, and said means to connect clampingly engaging the ends of said struts between said plates and in said slot.

4,098,046
GUIDE FRAME FOR SLIDABLE ARTICLES

Franco Papa, Cusano Milanino, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Nov. 29, 1976, Ser. No. 745,572

Claims priority, application Italy, Nov. 27, 1975, 29710 A/75

Int. Cl.² E04C *2/38;* A47G *19/08*

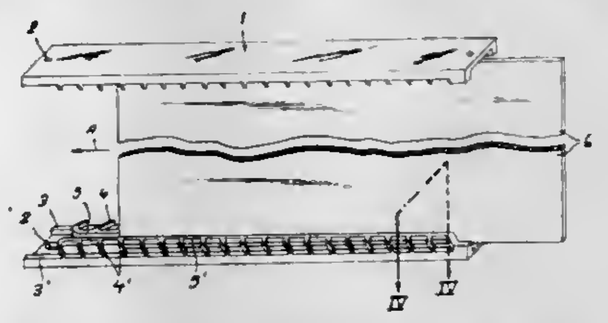
U.S. Cl. 52—716 **10 Claims**

1. An integrally molded frame member of plastic material for the guidance and retention of a slidable article having a frame-engaging portion of predetermined thickness, comprising:

an elongate base of rectangular outline with a pair of sidewalls rising from said base along the major edges of the rectangle;

two sets of ribs cantilevered on said sidewalls and extending toward each other at an acute angle to said edges in a herringbone pattern, said ribs being substantially parallel to and spaced from said base; and

two bars parallel to said edges overhanging said base and



movable with reference thereto, each of said bars being connected with the ribs of a respective set at inner ends thereof remote from said sidewalls, said bars being separated by a distance less than said thickness to form a gap for the endwise insertion of said article in a single direction only, said bars having confronting faces diverging from each other toward said base in a plane transverse to said base.

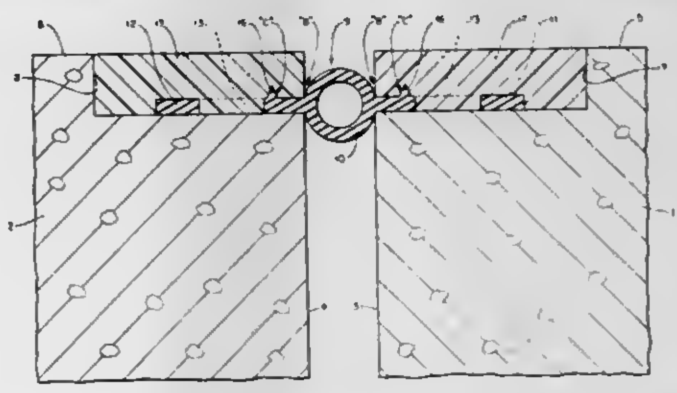
4,098,047
JOINT SEALING METHOD

Victor Weber, Hinsdale, Ill., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jun. 2, 1977, Ser. No. 802,836

Int. Cl.² E04G *21/00*

U.S. Cl. 52—741 **22 Claims**



1. A method of rendering an expansion joint formed between opposed surfaces of two adjacent spaced sections of concrete each having a further non-opposed, exposed traffic -bearing surface joining said opposed surface at an angle thereto at the locus of the joint, proof against passage of water and solids which enter the joint from the direction of said exposed surfaces, said method comprising the steps of;

(a) providing a pair of longitudinally-extending opposed recesses one each on each respective side of said joint and in each of said nonopposed, exposed surfaces of said concrete sections generally at the location where the said exposed surface joins the said opposed surface at the locus of the joint;

(b) providing a preformed joint-spanning and sealing element in the form of a continuous length of flexible elastic strip material having in cross-section a width greater than the width of said joint but not greater than the combined widths of said recesses across the joint, said strip further in cross-section having a center section and lateral web portions extending outwardly from and on opposite sides of said center section, each of said web portions in cross-section having broad upper and lower surfaces, narrower terminal end surfaces and a height less than the height of said recesses, said web portions each further having a plurality of preformed openings therethrough connecting said upper and lower surfaces and spaced from one another along the longitudinal extend of said strip and each a continuous, longitudinally extending rib raised from its upper surface and positioned between said center section and said openings, the number, dimensions and spacing of said openings being sufficient to accomodate the said amount of hardened grout specified in step (e) below;

(c) positioning the said joint-spanning strip in said recesses across said joint in a manner such that the lower surfaces of said web portions are adjacent the bottom of said recesses and the said center section lies in the joint space, and in a manner further such that one of said lateral webs, its openings therethrough, and its raised rib portion lie in and alongs the recess in one section of concrete and the other said lateral web, its openings, and raised rib portion lie in and along the opposed recess in said other section of concrete;

(d) covering said lateral webs by placing a layer of hardenable fluid grouting material having good adesion to concrete over the upper surface of an along the longitudinal extent of each of said lateral webs in said recesses to the height of said exposed surfaces of said concrete sections and causing said grouting material to enter and fill said openings and to contact the said recess bottom portions exposed by said openings, said fluid grouting material further being placed such that said raised ribs are embedded in said grout and the grout over each web terminates at said center section and does not enter the space between said concrete sections; and

(e) thereafter allowing said grout to harden to a mass more rigid than said joint-spanning strip material, the amount of hardened grout in said openings being sufficient to prevent the upper, web-covering layers of grout from being flexed to the extent of cracking by repeated passage of traffic thereover over a reasonably extended period of time and to lock said lateral web portions to the respective concrete sections, the said raised ribs acting, by pressing against said hardened grout when the joint-spanning strip is stretched by movement of the joint, to prevent water entering the joint space from passing through the said openings.

4,098,048

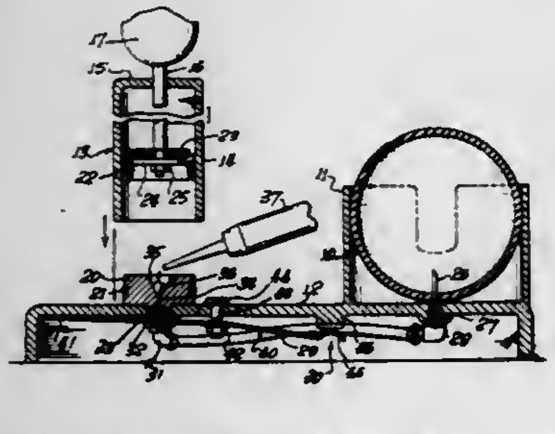
TENNIS BALL PUMP

Kenneth Bruno Sawa, 5081 Sumac Ridge, and Gordon E. Mehaffy, 18891 Via Encanto, both of Yorba Linda, Calif. 92686

Filed Jan. 24, 1977, Ser. No. 761,815

Int. Cl.^{2} B65B *31/04*

U.S. Cl. 53—7 **14 Claims**



14. A process for inflating a tennis ball to a pre-set pressure comprising;
inserting a sharpened hollow needle through the wall of a tennis ball;
injecting air and a sealant into said ball;
injecting additional air into said ball after injection of all sealant into said ball said additional air being such that said ball is inflated to a pressure in excess of the desired pre-set pressure; and
removing excess air from the ball through said needle and through a pressure sensitive valve which is set to permit air in excess of the pre-set desired pressure to pass therethrough but to prohibit the flow of air under the desired pre-set pressure.

4,098,049

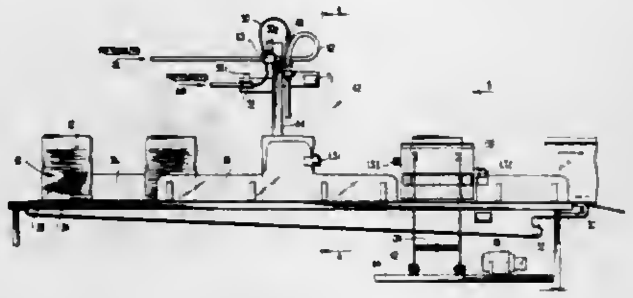
APPARATUS AND METHODS FOR IMPREGNATING OIL INTO A LUBRICATING PAD

William G. Jackson, Virginia Beach; Lance Selbert, Chesapeake; Dillard T. Bates, Norfolk, and James M. Smith, Virginia Beach, all of Va., assignors to Norfolk & Western Railway Company, Roanoke, Va.

Filed Dec. 29, 1976, Ser. No. 755,493

Int. Cl.^{2} B65B *3/10, 57/06, 39/12*

U.S. Cl. 53—22 B **9 Claims**



1. An automated method for impregnating oil into a pad and packaging same comprising the steps of:
(a) positioning a succession of bags with open ends in an upright position on a continuous belt-like conveying means;
(b) loading an oil impregnable pad in each of the open ended bags;
(c) transferring the bag with the loaded pad along the conveying means between two opposing continuous vertical bag-support walls to a first dispensing station with an overhead dispensing means;
(d) sensing the presence of a bag with the loaded pad at the first station;
(e) temporarily stopping transfer of the bag with the loaded pad on the conveying means upon sensing the presence of the bag at the first station;
(f) dispensing a predetermined quantity of oil into the bag with the pad by the overhead dispensing means actuated upon sensing the presence of the bag and after stopping transfer of same at the first station;
(g) transferring the bag containing the oil and pad along the conveying means between the two continuous bag-support walls from the first station to a second compression and sealing station having two opposing vertical platens contiguous with the two bag-support walls, at least one of the platens being movable toward the other;
(h) sensing the presence of the bag with the oil and pad at the second station between the two opposing vertical platens;
(i) temporarily stopping transfer of the bag with the oil and pad on the conveying means upon sensing the presence of the bag at the second station;
(j) compressing the bag with the oil and pad sufficient only to allow impregnation of the pad with oil and to substantially exhaust the air from the bag by the at least one platen moving toward the other platen a predetermined compression distance actuated upon sensing the presence of the bag and after stopping transfer of same at the second station;
(k) simultaneously sealing the opposite sides of the bag to each other adjacent its upper end at the second station by sealing means, mounted on each platen, contacting the upper ends of the bag when the platens are moved together the predetermined compression distance;
(l) subsequently relieving the sealing and compression of the bag at the second station by the at least one platen moving back to its original position contiguous with the corresponding bag-support wall;
(m) transferring the sealed bag with the impregnated pad along the conveying means between the two opposing vertical bag-support walls from the second station; and
(n) unloading the sealed bag with the impregnated pad from the conveying means.

4,098,050

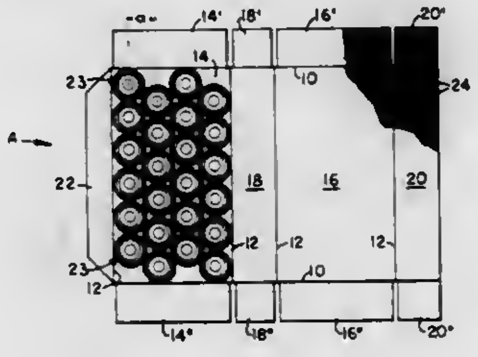
METHOD OF STAGGER PACK PARTITIONLESS PACKAGING

Max R. Dietz; Cameron D. Keim, and Lloyd A. Nelson, all of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Continuation of Ser. No. 153,854, Jun. 16, 1971, abandoned, which is a continuation of Ser. No. 754,437, Aug. 21, 1968, abandoned. This application Jan. 2, 1975, Ser. No. 538,285

Int. Cl.^{2} B65B *11/00, 21/00*

U.S. Cl. 53—26 **3 Claims**



1. In a method for packaging a plurality of generally cylindrically-shaped glass jars at least partially enclosed in a corrugated paperboard carton, so as to minimize breakage of said jars from impact, the steps comprising: moving said carton relative to and about said plurality of glass jars arranged in parallel rows, wherein the distance between horizontal center lines of adjacent parallel rows of jars in said carton is less than the diameter of each of said jars with the proviso that one end of said row of jars is spaced from said carton by a distance corresponding to at least about one-half the diameter of said jar; and forming the carton so as to hold said jars in constant physical contact with each other to prevent displacement of the jars relative to the carton, the peripheral jars being in constant physical contact with the carton.

4,098,051

METHOD AND APPARATUS FOR PACKING A PLURALITY OF SEPARATE ARTICLES, IN A COVER OF SHRINKABLE FOIL

Werner Cordes, Schulstrasse 26, 2165 Harsefeld, and Roland Schneider, Gerngros Strasse, 11, 8500 Nürnberg, both of Fed. Rep. of Germany

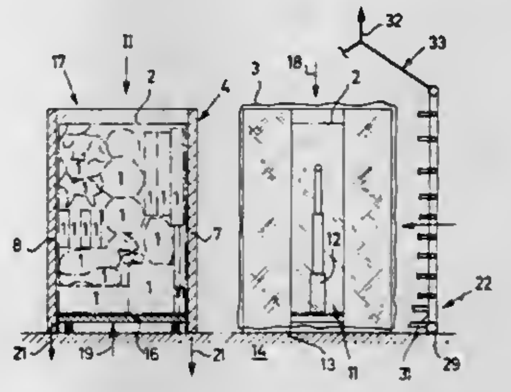
Filed Jan. 13, 1977, Ser. No. 759,198

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601885

Int. Cl.^{2} B65B *5/00, 39/00, 53/02*

U.S. Cl. 53—30 S **9 Claims**

1. A method of packing a plurality of separate articles in a single package, comprising: providing a cover of heat shrinkable foil, providing a first guide having walls which together define a shaft within said first guide, said shaft being open at one end, stacking said articles within said shaft, subsequently enclosing said first guide in said cover of heat shrinkable foil, whereby said cover surrounds said walls of said first guide and extends across said open end of said shaft, subsequently placing a second guide around said first guide, said second guide extending around the outside of said cover and being maintained in a position relative to said cover and said stack while subsequently separating said first guide from said cover, from said stack, and from said second guide by effecting relative movement between said first guide on the one hand and said cover, said stack, and said second guide on the other hand, so that in relation to said first guide, said stack is moved out of said open end of said shaft while maintaining its position with respect to said cover and said second guide, a supporting force being applied to said stack, and, subsequent to separation of said first guide from said stack and said cover, shrinking said cover around said stack.



4,098,052

WRAPPING APPARATUS AND METHOD

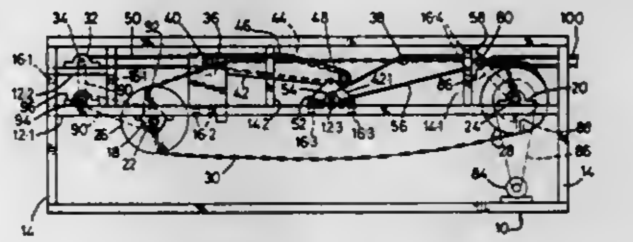
Alec Singer, 14 Mountain Rd., Claremont Cape Town, Cape Province, South Africa

Filed Sep. 27, 1976, Ser. No. 727,099

Claims priority, application South Africa, Oct. 2, 1975, 75/6269

Int. Cl.^{2} E04H *3/04*

U.S. Cl. 53—33 **14 Claims**

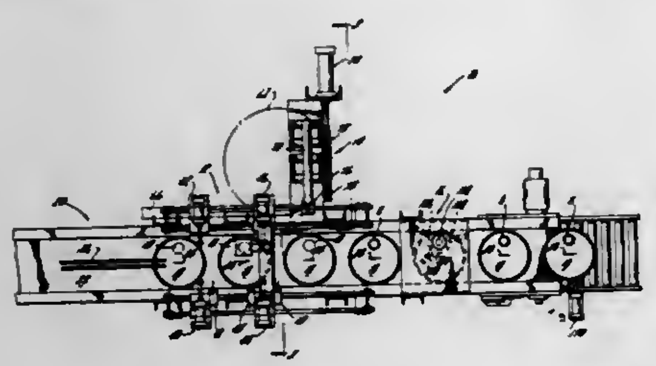


1. In wrapping apparatus, an article conveying structure comprising a conveyor for supporting an article being wrapped along the central region thereof, drive means for displacing the conveyor in a feed direction through the apparatus, a series of supports on each side of the conveyor, drive means for displacing the supports in the feed direction through the apparatus, means for successively displacing the supports towards said conveyor from opposite sides thereof during movement in the feed direction and at a level below said conveyor, and guiding means for the conveyor and guiding means for the supports for changing the relative levels of the conveyor and supports so as to bring the supports above the conveyor and thereby to transfer, from the conveyor to the supports, articles supported thereby whereby the articles then become supported along edge regions thereof by a support of each series while leaving said central region unsupported.

4,098,053
AUTOMATIC CONTAINER CAPPING APPARATUS

Harvey T. Shank, Papillion, Nebr., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 31, 1977, Ser. No. 801,596
Int. Cl.² B65B *57/08, 7/28*
U.S. Cl. 53—72 **8 Claims**



1. Apparatus for capping a container, which container has an opening with an outwardly protruding ridge surrounding the opening and a cap with deformable edges adapted for seating on the ridge and being crimped onto the ridge, the apparatus comprising:

a. conveyor means for supporting and moving the container in predetermined increments through operating stations of the apparatus;

b. a first station comprising aligning means for aligning the container in a predetermined relationship on the conveyor means, the aligning means including a mandrel having a tapered opening engaging end, the mandrel being located in a predetermined relationship to the conveyor means and operable mounted to extend and engage the opening of the container with its tapered end and thereby align the opening of the container in a predetermined relationship to the conveyor means;

c. a second station comprising a cap placer for placing the caps on the opening of the container, the cap placer including delivery means for supplying caps one at a time to a pick-up position and a pick-up arm with a cap gripping means attached to it wherein the pick-up arm with its attached cap gripping means oscillates between the cap pick-up position and the opening of the container so that the cap gripping means first grips the cap at the pick-up position and then places the cap on the opening of the container and releases it; and

d. a third station comprising a crimper having crimping jaws for crimping the cap onto the ridge around the opening of the container and means for movably and flexibly supporting the crimper adjacent the cap on the ridge of the opening so that the crimper can move toward the cap for engagement of the jaws therewith.

4,098,054
DEVICE FOR FORWARDING SACKS OR LIKE CONTAINERS

Renzo Giuseppe Cerioni, Milan, Italy, assignor to EL CU S.p.A., Milan, Italy

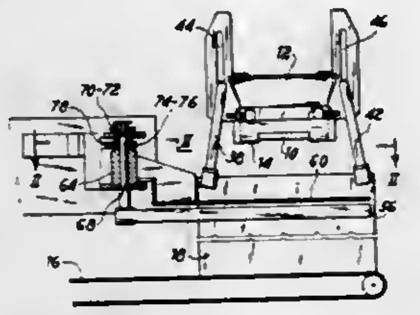
Filed Dec. 30, 1976, Ser. No. 755,556
Claims priority, application Italy, Feb. 19, 1976, 20325 A/76
Int. Cl.² B65B *1/06, 7/06*
U.S. Cl. 53—139 **3 Claims**

1. In a machine for filling material into the open mouth of a sack and then sewing shut the mouth of the sack, said machine being of the type including a fixedly positioned filling sleeve adapted to supply material into a sack, gripping jaw means for gripping central portions of the edges of an open mouth of a sack against said sleeve while the sack is in a filling position being filled with material supplied through said sleeve, such that first and second outer portions of the edges of the open mouth of the sack remain ungripped by said gripping jaw means and extend outwardly from opposite sides thereof, an intermittently operable belt conveyor means positioned beneath said sleeve for moving filled sacks away from said sleeve in a direction parallel to a plane extending through said outer portions, the upper surface of said belt conveyor means being spaced beneath the bottom of a sack being gripped by said gripping jaw means in said filling position, and sewing means positioned downstream of said sleeve with respect to the direction of movement of said belt conveyor means for sewing shut the mouths of the filled sacks, the improvement comprising:

first and second presser means, positioned adjacent said sleeve, for grasping respective first and second of said outer portions of the edges of the mouth of a sack held at the filling position thereof by said gripping jaw means, and for thereby supporting said sack;

said gripping jaw means being vertically immovable and operable to release said central portions of the edges of the mouth of said sack after said sack is filled with material supplied through said sleeve, whereby the thus filled sack is then supported by said presser means;

means for lowering said presser means and thereby said filled sack toward said belt conveyor means until the bottom of said filled sack rests on said upper surface of said belt conveyor means, and for simultaneously spreading said first and second presser means away from each other, thereby closing the open mouth of said filled sack;



first and second arms pivoted at first ends thereof about vertical axes;

first and second conveyor bands, one each supported by a respective said first and second arm, said first and second conveyor bands being pivotable at first ends thereof about said axes from respective inoperative positions spaced from each other and from said filled sack supported on said belt conveyor means by said presser means to respective operative positions toward each other and against opposite sides of said filled sack adjacent the mouth thereof at positions below said presser means supporting said sack;

means for pivoting said first and second arms about said axes and for thereby moving said first and second conveyor bands from said inoperative positions to said operative positions thereof and for thereby supporting said sack on said belt conveyor means;

said presser means being operable to release said filled sack, after said filled sack is supported by said first and second conveyor bands, and to move vertically upwardly to a position adjacent said sleeve; and

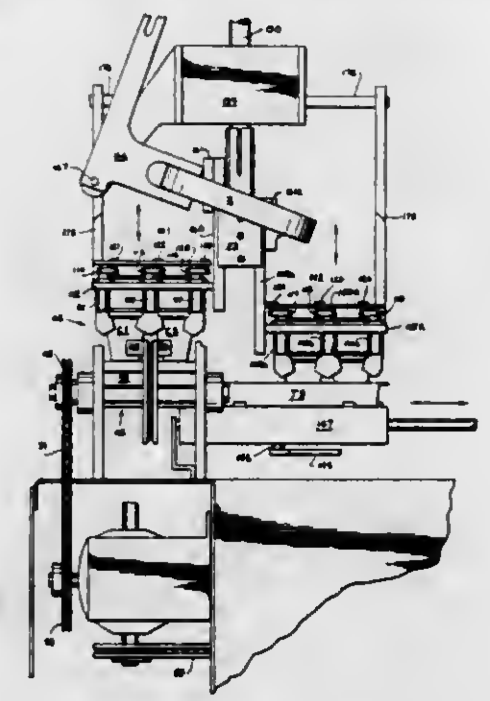
said first and second conveyor bands being intermittently operable in synchronization with said belt conveyor means to move said filled sack away from a position beneath said sleeve in a direction toward said sewing means.

4,098,055
APPARATUS FOR LOADING GROUPS OF ARTICLES INTO TRAYS

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 730,747, Oct. 8, 1976. This application Apr. 18, 1977, Ser. No. 788,210
Int. Cl.² B65B *5/08, 5/10*
U.S. Cl. 53—160 **14 Claims**

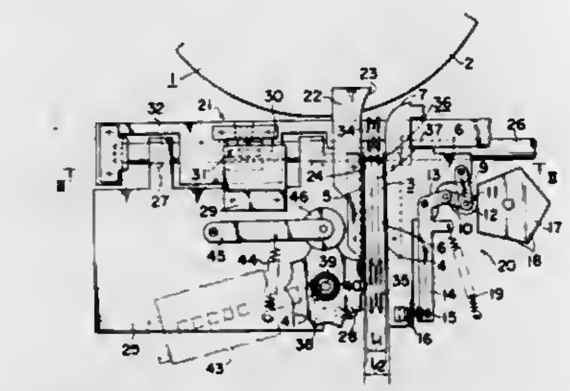
1. In a loading system for removing a group of articles from a receiving station and for depositing the group of articles at a loading station and including support structure rotatable about a vertical axis and disposed between said stations, a pair of substantially identical article handling mechanisms mounted on said support structure and arranged to swing thereabout, said mechanisms being arranged for simultaneous disposition at said stations respectively and wherein the improvement comprises a pair of vertically reciprocable support brackets mounted in diametrically opposed relation on said support structure and interconnected with said article handling mechanisms respectively, a support ring disposed about said brackets and slidably connected therewith so as to accommodate rotation of said brackets and mechanisms about said vertical axis, and means for tilting said support ring into and out of a horizontal plane to vertically reciprocate said support brackets and said article handling mechanisms connected thereto.



4,098,056
COIN PASSAGE DEVICE OF A COIN PROCESSING MACHINE

Ichiro Ozaki, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Aug. 18, 1976, Ser. No. 715,646
Claims priority, application Japan, Aug. 22, 1975, 50/101795
Int. Cl.² B65B *11/04*
U.S. Cl. 53—212 **3 Claims**

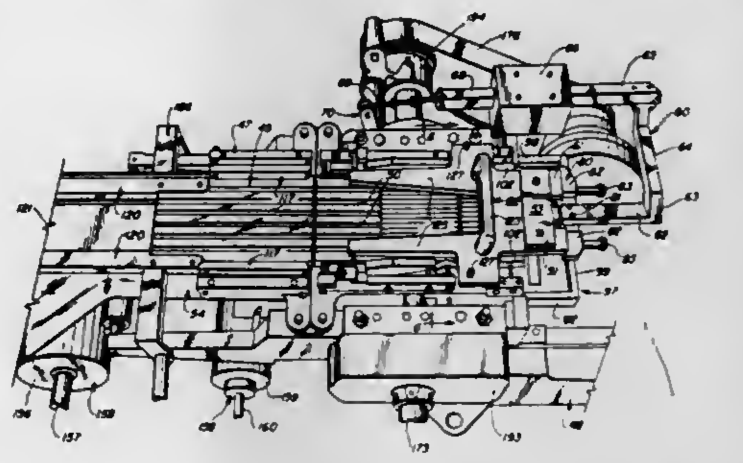


1. In a coin counting machine having a rotating turntable onto which coins to be counted are supplied, a coin passage device adjacent said turntable at a position for receiving coins from said turntable due to centrifugal force acting on the coins on said turntable for aligning the successively fed coins, a coin propelling means provided on said coin passage device for forcibly propelling the coins introduced onto said coin passage therethrough, a coin counting device provided along said coin passage for counting the number of coins passing through said coin passage, and a coin guide structure provided adjacent the outlet end of said coin passage device for guiding the coins discharged from said coin passage device one by one, the improvement wherein said coin passage device comprises first and second side perimeter edge member each having means defining a vertical side wall and a horizontal coin edge supporting surface, the spaced side walls defining opposite side walls of the coin passage, at least the means of said perimeter edge members defining said vertical side walls being adjustably movable toward and away from each other equal distances in accordance with the diameter of the coins to be counted thereby to adjust the transverse width between the side walls of the coin passage to a dimension slightly larger than the coins to be counted, said adjusting movement being without causing a shift of the longitudinal centerline of said coin passage and position adjusting means connected to said perimeter edge members for adjustably moving at least said means defining the vertical side walls on said first and second perimeter edge members, whereby the coins are always propelled along said centerline of the coin passage irrespective of the kind of coins to be counted; and said coin counting device being fixedly connected with said second side perimeter edge member so as to be moved together with said member thereby to always maintain said coin counting device at a position appropriate for the coin counting irrespective of the diameter of the coins to be counted; said coin propelling means being at a position coincident with said centerline of the coin passage; and said guide structure comprises side wall members corresponding respectively to said first and second side perimeter edge members and means for adjustably moving said side wall members equal distances with respect to the centerline of the coin guide structure for positioning said side wall members in positions corresponding to the diameter of the coins to be processed, and the centerline of said guide structure being aligned with the centerline of said coin passage device, whereby said guide structure is always positioned to receive coins irrespective of the diameter of the coins to be counted.

4,098,057
ICE CREAM SANDWICH WRAPPING MACHINE

Gregory W. Holcomb, Yorba Linda, Calif., assignor to Interbake Foods Inc., Richmond, Va.

Filed Sep. 10, 1976, Ser. No. 722,323
Int. Cl.² B65B *11/06, 49/00, 51/32*
U.S. Cl. 53—230 **51 Claims**



1. A wrapping machine for wrapping and folding a wrapper sheet of heat-sealable flexible coated wrapping material about the body of an ice cream sandwich, said wrapper sheet including a top panel foldable over the upper or top surface of the said ice cream sandwich; side panels foldable against the sides of the ice cream sandwich; bottom panels foldable under the bottom surface of the said ice cream sandwich; first and second end panels foldable over the end walls of the said ice cream sandwich; and top and bottom end-sealing panels foldable one

against the other and over the said end panels; said wrapping machine comprising:

- (a) a supporting frame;
- (b) a generally horizontal trackway on the said supporting frame including
  - (1) an input end; and
  - (2) a delivery end; and having
  - (3) an upper surface along which the said ice cream sandwich with the said wrapper sheet thereon is adapted to be moved from the said input end to the said delivery end of the said horizontal trackway;
- (c) a vertically movable and reciprocating elevator device mounted on the said supporting frame at the input end of and below the said generally horizontal trackway and adapted to elevate the said ice cream sandwich with its wrapper sheet thereon from a point below the said horizontal trackway to the said upper surface of the said trackway;
- (d) web-advancing means for advancing a web of the said heat-sealable flexible coated wrapping material along a path below the said horizontal trackway over the said upper or top surface of an ice cream sandwich disposed on the said elevator device;
- (e) web-severing means for severing an individual wrapper sheet section of the said flexible coated wrapping material from the said web thereof;
- (f) means for operating and vertically reciprocating the said elevator device and for moving the said elevator device and the said ice cream sandwich and its wrapper sheet thereon upwardly toward the said horizontal trackway and thereby forming the said top panel over the said upper or top surfaces of the said ice cream sandwich;
- (g) a horizontally reciprocable pusher and folding device slidably and reciprocably mounted on the said supporting frame at the input end of the said horizontal trackway and adjacent the said elevator device for slidably pushing the said ice cream sandwich with its wrapper sheet thereon off the said elevator device onto the said upper surface of the said horizontal trackway and for sequentially advancing a horizontal row of ice cream sandwiches with their wrapper sheets thereon along the upper surface of the said horizontal trackway from the said input end to the said delivery end thereof;
- (h) means for reciprocably operating the said combination pusher and folding device in timed relationship with the vertical and reciprocating movement of the said elevator device;
- (i) a plurality of means coacting with the said combinational pusher and folding device for sequentially folding the said side panels, the said bottom panels, the said end panels, and the said end-sealing panels of the said wrapper sheet folded into position against the body of the ice cream sandwich as the ice cream sandwich is slidably moved off the said elevator device and along the said horizontal trackway by the said combination pusher and folding device;
- (j) heat-sealing means disposed at a point along the said upper surface of the said horizontal trackway at the sides thereof for heat-sealing the said top and bottom end-sealing panels of the said wrapper sheet together.

4,098,058

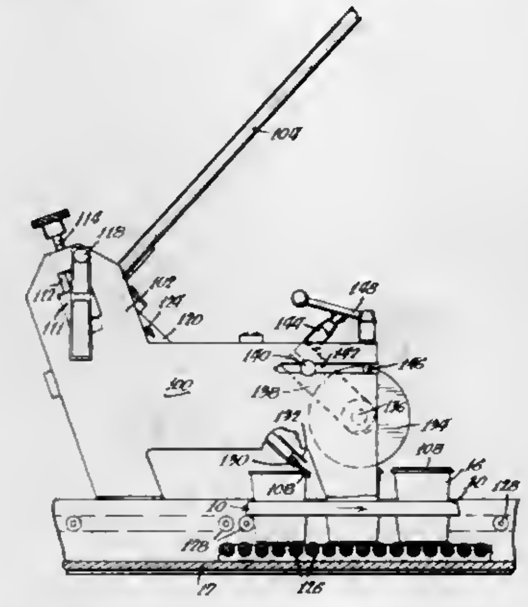
APPARATUS FOR DISPENSING, FILLING AND CAPPING A PLURALITY OF CUPS

David B. Carrigan, Hickory Corners, and Roy W. Freas, Kalamazoo, both of Mich., assignors to David Carrigan and Associates, Inc., Kalamazoo, Mich.

Filed Jun. 25, 1976, Ser. No. 700,045

Int. Cl.^{2} B65B *7/28;* B67B *3/08*

U.S. Cl. 53—315 **7 Claims**



6. The apparatus of claim 5 wherein means are provided for adjusting said rotatable roll means in various horizontal positions to accommodate cups of various heights.

4,098,059

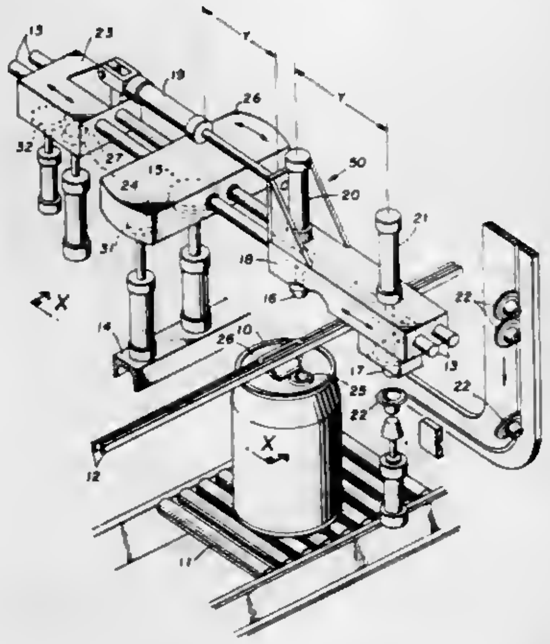
APPARATUS FOR SEALING CONTAINERS

Howard G. Chattillion, East Carondelet, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 16, 1977, Ser. No. 833,793

Int. Cl.^{2} B65B *7/28;* B67B *1/04, 3/08*

U.S. Cl. 53—319 **8 Claims**



1. A system for sealing containers equipped with a handle which comprises:

a conveyor;

orientation means positioned above said conveyor for engagement with said handle such that said container may be properly oriented on said conveyor;

a rail positioned above said orientation means, said rail being pivotally mounted about a fixed frame for radial movement with respect to said container;

locator means for locating the spout of said container, said locator means being housed within a first block, said first block being slidably mounted upon said rail for longitudinal movement thereon;

a capper housed within said first block and longitudinally spaced a fixed distance from said locator means;

vertical actuator means connected to said locator means for vertical movement of said locator means; and

vertical actuator means connected to said capper for vertical movement of said capper.

4,098,060

SUGAR CANE HARVESTERS

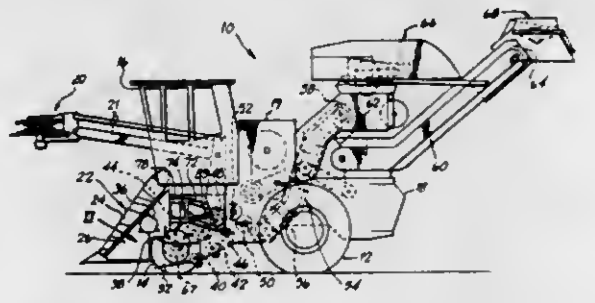
Donald J. Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 26, 1976, Ser. No. 735,665

Claims priority, application United Kingdom, Oct. 30, 1975, 44789/75

Int. Cl.^{2} A01D *45/10*

U.S. Cl. 56—13.9 **10 Claims**



1. A mobile sugar cane harvester including a frame; a pair of transversely spaced generally vertical fore and aft walls on the frame defining a crop gathering throat at the front of the harvester; ground engaging support means mounted on each side of the frame adjacent the crop gathering throat; a first rotatable base cutter including a first base cutter gear box mounted on the frame adjacent one of said walls and between said ground engaging support means, an upwardly and forwardly inclined blade support shaft journaled in the first base cutter gear box and inside the crop gathering throat, a first blade support mounted on the blade support shaft journaled in the first base cutter gear box, a plurality of projecting blades attached to the first blade support for severing sugar cane sticks from their roots as the harvester moves forward over a row of cane, drive means in the first base cutter gear box for driving the blade support shaft journaled in the first base cutter gear box to rotate the blades attached to the first blade support in a first circular path, and drive means outside the throat for driving the drive means in the first base cutter gear box; a second base cutter gear box mounted on the frame adjacent the other of said walls, opposite the first base cutter gear box and between said ground engaging support means, an upwardly and forwardly inclined blade support shaft journaled in the second base cutter gear box and inside the crop gathering throat, a second blade support mounted on the blade support shaft journaled in the second base cutter gear box, a plurality of projecting blades attached to the second blade support for severing sugar cane sticks from their roots as the harvester moves forward over a row of cane, drive means in the second base cutter gear box for driving the blade support shaft journaled in the second base cutter gear box to rotate the blades attached to the second blade support in a second circular path which intersects the first circular path, and drive means outside the throat for driving the drive means in the second base cutter gear box; and timing means for timing the second blade support relative to the first blade support to prevent the blades from striking each other.

4,098,061

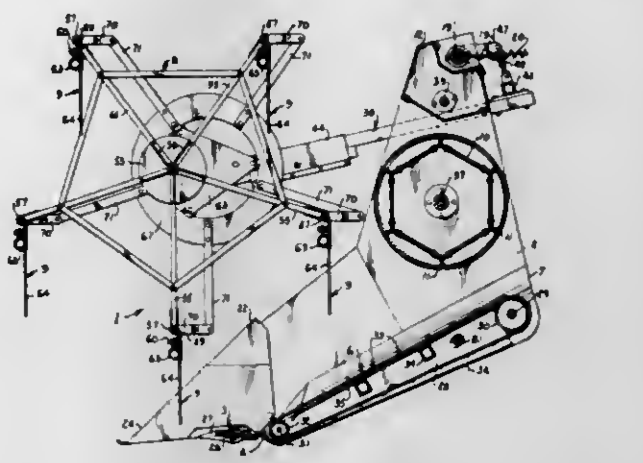
ROW-CROP HARVESTING ATTACHMENT

Quentin B. Spiker, 1107 MacVicar, Topeka, Kans. 66604

Filed Sep. 8, 1976, Ser. No. 721,798

Int. Cl.^{2} A01D *41/00, 45/22*

U.S. Cl. 56—124 **9 Claims**



1. A row-crop harvesting attachment for use in combination with a combine having a sickle bar on the forward portion of a trough and a driven auger within said trough and a drive means operatively connected to said sickle bar and auger to drive same and comprising:

- (a) an attachment frame and means for mounting said frame on a forward portion of a combine adjacent to and forwardly of a combine trough, said frame having a leading side and a trailing side, said frame having walls defining a plant passageway extending between the leading side and the trailing side of said frame, said frame walls being arranged to receive vegetation substantially aligned in a row;
- (b) means mounted on said frame and positioned adjacent the leading side of said frame for cutting vegetation;
- (c) means mounted on said frame and positioned above said means for cutting vegetation for moving vegetation toward said vegetation cutting means as the combine moves along a vegetation row;
- (d) an endless conveyor mounted on said frame and extending along the defined passageway from adjacent said vegetation cutting means to adjacent the trailing side of said frame for moving vegetation into the combine trough; and
- (e) drive means on the combine and operatively connected to said vegetation cutting means and to said means for moving vegetation toward said vegetation cutting means and to said endless conveyor for driving same.

4,098,062

HAND OPERATED FRUIT PICKER, WITH HOLDER

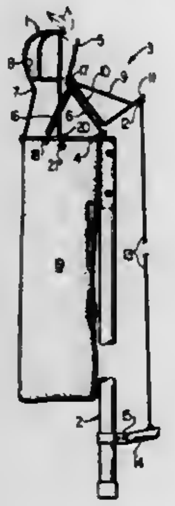
Alfred E. Gauhis, P.O. Box #597, Fruitland Park, Fla. 32731

Filed Nov. 19, 1976, Ser. No. 743,502

Int. Cl.^{2} A01D *46/24*

U.S. Cl. 56—334 **3 Claims**

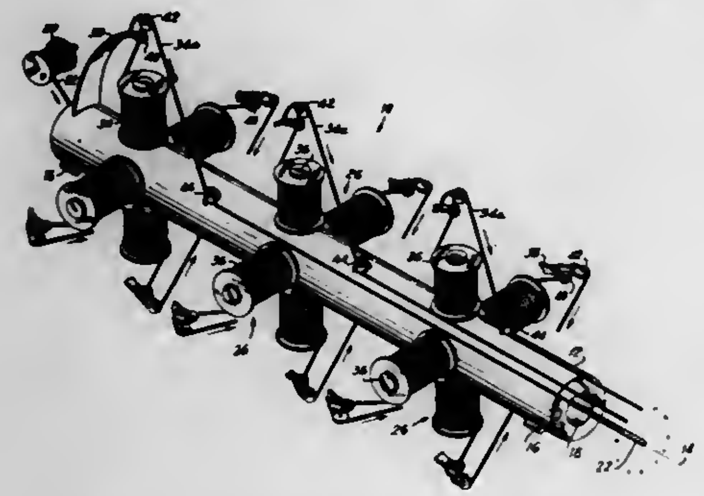
1. A hand operable fruit picker, characterized by a pole, and a gate which gate is horizontally pivoted to the upper end of the said pole, and a cage fixedly attached to the pole and which cage has an opening therein and also has a horizontally restricted area therein forming an upper chamber amply large to hold fruit unit, the said upper chamber having a concave shaped section to accomodate the unit of fruit, the said gate facing the opening of the cage, the gate being formed of two horizontal sections, the angle between these two sections being substantially 132°-142°, the lower section having a height of approximately the distance between the pivot of the gate and the restricted area of the cage, the gate being of lesser size than the opening of the cage, so that it can fit within the cage's opening when in closed position leaving a space above the



gate, springs attached at their lower end within the cage and at their upper end to the gate at the upper end of the lower section of the gate, a control cable and a lever, which cable is attached to the gate at its own upper end and to the lever at its lower end, the said lever being pivotally attached to the pole.

4,098,063
HIGH SPEED FLY-OFF STRANDER

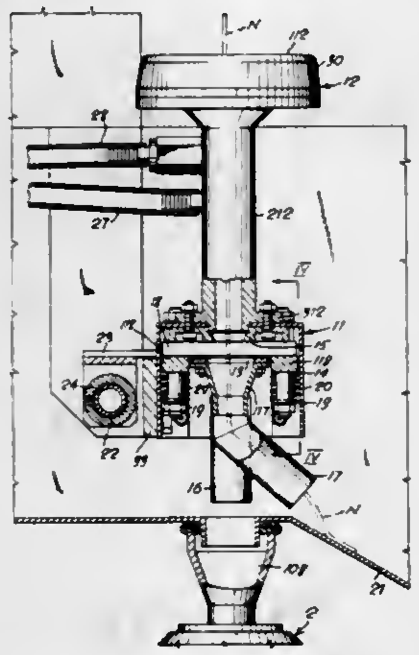
Joseph Varga, Toronto, Canada, assignor to Ceeco Machinery Manufacturing Limited, Concord, Canada
Filed May 2, 1977, Ser. No. 792,980
Int. Cl.² D07B *3/04, 3/06*
U.S. Cl. 57—13 **38 Claims**



1. A strander comprising at least one elongated main shaft mounted for rotation about its own axis and adapted to advance a core wire proximate to the axis of rotation of the strander; support means for securing a plurality of wire carrying bobbins externally of said main shaft in positions displaced from the axis of rotation of said main shaft and with the longitudinal axes of said bobbins oriented at a substantial angle from the axis of rotation of said main shaft; and wire payout means for guiding wire over and around one end of a respective bobbin, thence about a point on an axis substantially coincident with the longitudinal axis of a respective bobbin, without requiring the bobbins to rotate about their individual axes, and thence in a direction generally parallel to the axis of rotation of the strander thus enabling the wires which are paid off from the bobbins to be brought to the end of each main shaft and wound about the core wire in successive layers corresponding to the number of shaft sections constituting the stranding machine.

4,098,064
STRAND SHEARING AND DEFLECTING DEVICE

Claude A. Kennedy, Moncks Corner, S.C.; Adriano A. Gardella, Ruggero E. Brogi, both of Genoa, Italy, and Lorenzo Lavagetto, Genoa-Serra Ricco, Italy, assignors to Raybestos-Manhattan, Inc., Trumbull, Conn. and Adriano Gardella S.p.A., Genoa, Italy
Filed Nov. 1, 1976, Ser. No. 737,404
Claims priority, application Italy, Dec. 16, 1975, 12938 A/75
Int. Cl.² D01H *9/00, 13/00*
U.S. Cl. 57—34.5 **21 Claims**



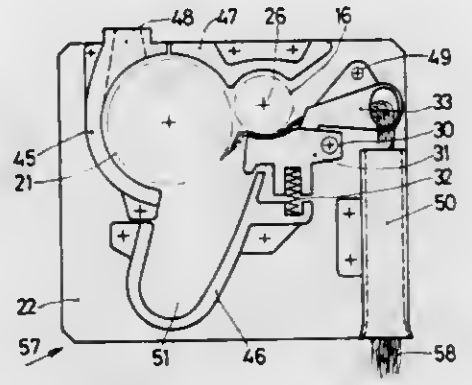
1. Apparatus for alternatively feeding or diverting a continusouly produced strand to or from a location where the strand is to be collected said apparatus comprising the combination of a first conduit means for guiding the strand toward said location, said first conduit means having an outlet spaced from said location, second conduit means movable into registry between said outlet for guiding the strand from said first conduit means to said location, third conduit means movable into registry with said outlet for guiding said strand away from said location, means for alternatively moving either of said second or third conduit means into registry with said outlet, and means for severing said strand at said outlet upon movement of either of said second or third conduit means into registry with said outlet.

4,098,065
FEEDING AND OPENING APPARATUS FOR A OPEN-END SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, both of Germany
Filed Jan. 1, 1976, Ser. No. 691,716
Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524093
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.95 **39 Claims**

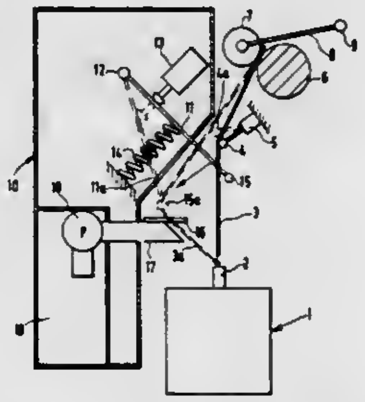
1. Fiber feeding and opening apparatus for a spinning machine comprising:
- opening roll means for opening a supply of fibers,
- housing means for housing said opening roll means, said housing means including baseplate means,
- guide means for guiding the supply of fibers during its travel adjacent the opening roll means,
- feeder roll means housed by said housing means,
- and opening roll bearing means for rotatably supporting said opening roll means,
- wherein said opening roll bearing means are supported at said baseplate means,

- and wherein said feeder roll means is supported independently of the housing means at the spinning machine, said baseplate means including an opening for accommodating disposition of said feeder roll means in said housing means.



4,098,066
OPEN-END SPINNING MACHINE

Fritz Stahlecker, Bad Uberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany
Filed Sep. 24, 1976, Ser. No. 726,070
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554102
Int. Cl.² D01H *13/16*
U.S. Cl. 57—80 **11 Claims**

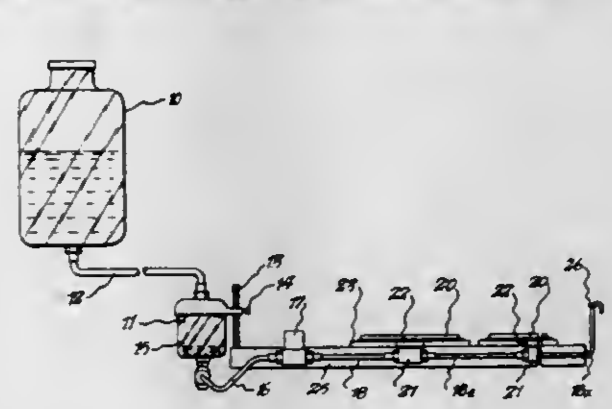


1. In an open-end spinning machine comprising at least one spinning unit, a thread monitoring sensor associated with the thread draw-off path of each spinning unit, each of said thread monitoring sensors including a thread engaging member which is maintained in a first position by a running thread in said draw-off path and which is movable to a second position away from said draw-off path, at least one movable maintenance device, the maintenance device having deflecting means for deflecting a respective thread engaging member away from its first position, the improvement wherein said deflecting means comprises means for indirect, non-contacting displacement of the thread engaging member.

4,098,067
WICK-LUBRICATED SPINNING AND TWISTING RING

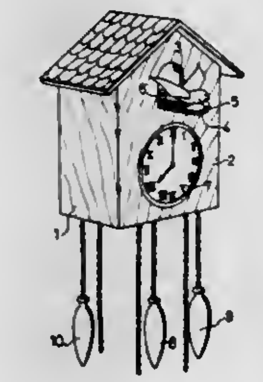
James N. McLean, Tonawanda, N.Y., assignor to Herr Manufacturing Company, Inc., Tonawanda, N.Y.
Filed Oct. 4, 1976, Ser. No. 728,925
Int. Cl.² D01H *7/62*
U.S. Cl. 57—120 **13 Claims**

1. A spinning and twisting ring construction comprising a ring fabricated from first and second sections secured to each other in fluid-tight relationship by an interference fit, annular conduit means formed entirely within said ring by said first and second sections, first opening means in said ring in communication with said annular conduit means for conducting lubricant to the outside of said ring for providing lubrication for a traveler, second opening means in said ring for conducting lubricant to said annular conduit means from an external source, continuous wick means having a first portion extending substantially throughout said annular groove and a second portion extending outwardly of said ring through said second opening means, said continuous wick means being entirely confined within said annular conduit means except for said second portion, and means communicating with said annular conduit means for permitting threading of said continuous wick means into position in said annular conduit means.



4,098,068
CUCKOO CLOCK

Isao Masuyama, 5075, Ohaza Ishioka, Ishioka-shi, Ibaragi-ken, Japan
Filed Mar. 14, 1977, Ser. No. 777,406
Claims priority, application Japan, Mar. 23, 1976, 51/30810
Int. Cl.² G04B *21/08, 37/00*
U.S. Cl. 58—12 **8 Claims**



1. In a cuckoo clock including a clock mechanism and a whistle means for tolling a time, a bird-displaying mechanism comprising:
- a clock housing having an aperture in the front wall thereof;
- door means pivotally mounted on said front wall adjacent said aperture;
- a bird movable into and out of said aperture and having movable wings;
- plate means pivotally supporting said bird;
- guiding means having a guiding base slidably supporting said plate means;
- driving means for driving said guiding means;
- control means for controlling said driving means in time to a tolling signal from said clock mechanism;
- spreading means including a rotation lever pivotally mounted on said plate means for spreading said wings when said plate means travels along said guiding base by a predetermined distance in response to said tolling signal.

4,098,069

DIGITAL CLOCK WITH TIMER

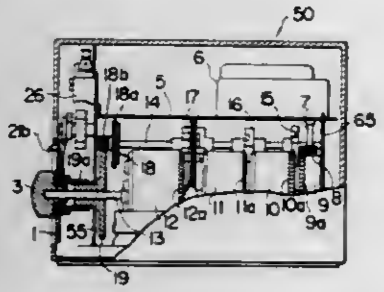
Toshiji Kobayashi, Takamori, Japan, assignor to Iida Sankyo Co., Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,396

Claims priority, application Japan, Oct. 21, 1975, 50-126790

Int. Cl.^{2} G04B *13/00*

U.S. Cl. 58—21.11 **8 Claims**



1. A digital clock with a timer, comprising, in combination, a digital clock mechanism including a rotating element; a disc-shaped timer dial rotatable by said element; at least one set of timer-presetting on pieces and timer-presetting off pieces disposed around the periphery of said timer dial for rotation as a unit therewith, said pieces being selectively angularly adjustable about the periphery of said timer dial to preset on and off times of said timer; said on presetting pieces and said off presetting pieces having respective projections rotatable in mutually different axially spaced rotation paths; a timer switch spaced from the periphery of said timer dial and having an operating arm; a shaft positioned between said timer dial and said timer switch and extending parallel to the axis of said timer dial; an angularly displaceable on cam and an angularly displaceable off cam rotatable on said shaft as a unit and each positioned in a respective one of said rotation paths for engagement and angular displacement by the respective projections of said on and off presetting pieces; and an angularly displaceable switch cam on said shaft, normally aligned with said switch operating arm, concentric with said on and off cams and rotatable as a unit therewith; said operating arm directly engaging said switch cam for operating said switch alternately to its on and off positions responsive to rotation of said on and off cams by the associated on and off presetting pieces.

4,098,070

DIGITAL DISPLAY ELECTRONIC WRISTWATCH

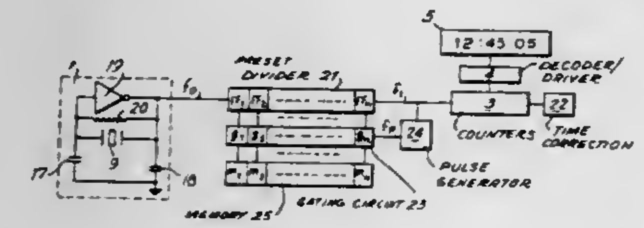
Akio Shimoi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,081

Claims priority, application Japan, Jan. 13, 1975, 50-6068

Int. Cl.^{2} G04C *3/00*

U.S. Cl. 58—23 R **9 Claims**



1. An electronic wristwatch comprising in combination oscillator means, said oscillator means including a quartz crystal time standard said quartz crystal time standard having a predetermined resonant frequency, said oscillator means being adapted to produce a high frequency time standard signal having a frequency equal to said predetermined resonant frequency of said quartz crystal time standard, divider means including a plurality of series-connected divider stages for receiving said high frequency time standard signal and dividing same to produce a low frequency timing signal, a plurality of series-connected counters for receiving said low frequency timing signal, said signal being applied thereto being adapted to produce timekeeping signals representative of actual time, digital display means for receiving said timekeeping signals and in response thereto displaying the time represented thereby, low frequency timing signal adjusting means coupled by output means to each divider stage, said adjusting means including a memory means adapted to store a frequency rate grade count therein, said adjustment means being adapted to adjust the frequency rate grade of said low frequency timing signal to a desired frequency by an amount equal to said frequency rate grade count stored in said memory, an inhibit gate disposed intermediate the series-connected divider stages and series-connected counters for inhibiting the application of the low frequency timing signal to the series-connected counters, timing rate grade adjustment means for applying to a further input of said inhibit gate means and said memory means a timing rate grade adjustment signal for inhibiting the application of said low frequency timing signal to said series-connected counters, correction means coupled to said series-connected counters for selectively adjusting the count thereof, and means coupling said memory means to said counters for selectively setting said memory means to the count of said counters producing timekeeping signals, in response to said counters being adjusted by said correction means when said timing rate grade signal is applied to said memory means.

4,098,071

TIME SIGNAL CLOCK

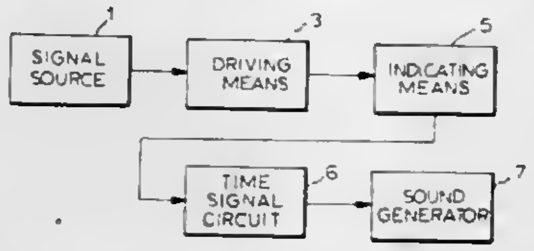
Hakuhei Kawakami, Kadoma; Kenzo Hatada, Katano, and Takeshi Ishihara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 4, 1976, Ser. No. 729,608

Claims priority, application Japan, Oct. 9, 1975, 50-122679; Oct. 9, 1975, 50-122680; Oct. 9, 1975, 50-122681; Oct. 9, 1975, 50-122682

Int. Cl.^{2} G04C *17/02, 21/14, 21/30*

U.S. Cl. 58—39 **11 Claims**



1. An electronic time indicating signal clock comprising a time indicating means, a frequency dividing circuit for dividing a standard oscillation frequency, electronic driving means to which said frequency dividing circuit is coupled and which is driven by the output of said frequency dividing circuit, said driving means being coupled to said time indicating means for driving said time indicating means, time detecting means coupled to said time indicating means for detecting when said time indicating means indicates one of a plurality of particular periodic times occuring at regular intervals from each other for which it is desired to produce a unique time indicating signal and producing a time detecting output signal each time one of the plurality of particular periodic times is detected as being indicated, a time indicating signal producing circuit coupled to said time detecting means for producing in response to receipt of said time detecting output signal a unique time indicating signal corresponding to each of the plurality of particular periodic times indicated by said time indicating means, and a time indicating signal producing means coupled to said time indicating signal producing circuit for producing a time indication signal which is perceivable by at least one of the human senses in response to the time indicating signal.

4,098,072

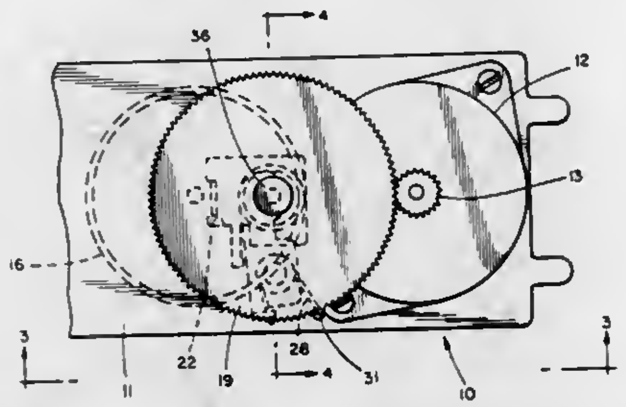
DIGITAL CLOCK GEARING

Frans Broower, Glencoe, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Jul. 2, 1976, Ser. No. 704,101

Int. Cl.^{2} G04B *13/00;* **G04C** *3/00;* **G04B** *19/02;* **F16H** *55/18*

U.S. Cl. 58—125 C **7 Claims**



1. A digital clock assembly, comprising; motor means, input gearing drawn by said motor means, output gearing, digit wheels drawn by said output gearing, intermediate gearing between said input gearing and said output gearing, resilient means biasing said intermediate gearing into engagement with said input gearing and said output gearing to eliminate the backlash therebetween, said resilient means biases said intermediate gearing including a bracket pivotal about an axis, spring means biasing said bracket, said bracket axis being substantially parallel to the axis of said intermediate gearing, said bracket and said intermediate gearing also being tiltable in a plane parallel to said bracket axis so that backlash is removed between said intermediate gearing and both said input gearing and said output gearing.

4,098,073

FLUID FLOW DIFFUSER

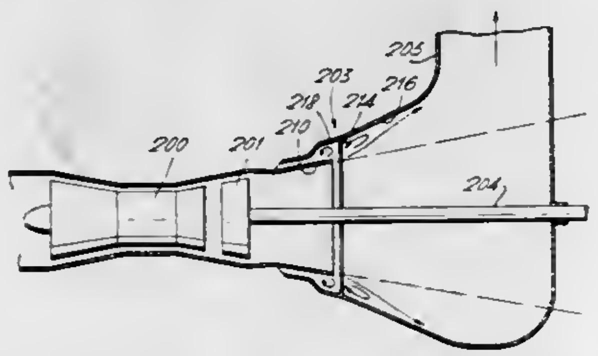
Richard Cyril Adkins, Bedford, and James Oswald Yost, Bristol, both of England, assignors to Rolls-Royce Limited, Great Britain

Filed Mar. 21, 1977, Ser. No. 779,553

Claims priority, application United Kingdom, Mar. 24, 1976, 11778/76

Int. Cl.^{2} F02C *3/10*

U.S. Cl. 60—39.16 R **4 Claims**



1. Fluid flow diffuser comprising a first and a second divergent duct connected in flow series, the first duct being divergent at a rate less than that at which boundary layer separation occurs, the upstream end of the second duct having a flow perimeter substantially larger than the flow perimeter of the downstream end of the first duct thereby to define a sudden enlargement of flow area between the ducts wherein the sudden enlargement is defined by a fence situated downstream of the downstream end of the first duct, the bottom of the fence defines the upstream end of the second duct, the top of the fence is situated at a flow perimeter intermediate between those of the adjacent ends of the two ducts, a chamber is provided at the outside of the first duct at the downstream end thereof, an opening having access to said chamber is defined between the downstream end of the first duct and the top of the fence, means are provided for reducing the static pressure in the chamber to below that at the end of the first duct thereby to facilitate the formation of a vortex in the chamber, and the second duct has a rate of divergence greater than that at which boundary layer separation would normally occur.

4,098,074

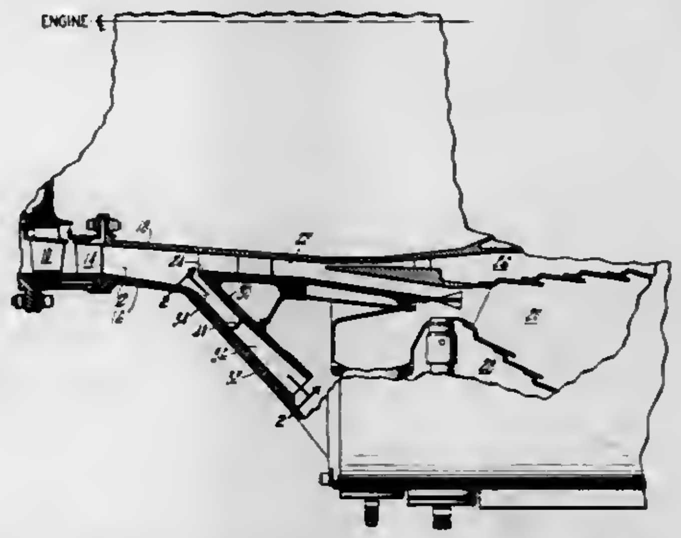
COMBUSTOR DIFFUSER FOR TURBINE TYPE POWER PLANT AND CONSTRUCTION THEREOF

Paul B. Greenberg, Manchester; Robert P. Lohmann, South Windsor, and Philip M. Wing, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 1, 1976, Ser. No. 691,813

Int. Cl.^{2} F02C *7/22*

U.S. Cl. 60—39.36 **7 Claims**



4. In combination, a turbine power plant having an annular burner and compressor, an annular flow passage extending axially in said power plant parallel to the power plant's axis interconnecting said compressor and said burner, a splitter having a v-shaped portion in cross section having one leg of said v defining a wall portion for said annular flow passage wall means and the other leg of said v defining another annular flow passage angularly disposed with respect to said annular flow passage, the center lines of said annular flow passage and said other annular flow passage being substantially at a 45° angle with respect to each other, a shroud surrounding said burner and defining therewith a chamber for receiving a portion of said compressor discharge air from said other annular flow passage, diffuser means in said other annular flow passage, and circumferentially spaced strut means supporting said splitter in said diffuser means having an elongated body extending between said wall means and said other leg and defining open-ended passageways whose axial axis is canted relative to the axis of said other annular flow passage.

4,098,075

RADIAL INFLOW COMBUSTOR

Paul B. Greenberg, Manchester; Robert P. Lohmann, South Windsor, and Philip M. Wing, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

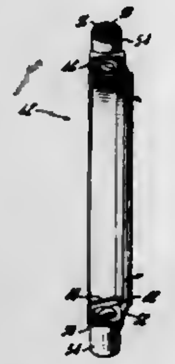
Filed Jun. 1, 1976, Ser. No. 691,814

Int. Cl.^{2} F02C *7/22*

U.S. Cl. 60—39.36 **5 Claims**

1. A pilot combustor for a main combustor having an annular chamber including a rear, inner, top and front wall, the rear wall having an annular exit opening communicating with the main combustor, a plurality of air/fuel inlets mounted circumferentially about the outer wall defining a radial inlet with

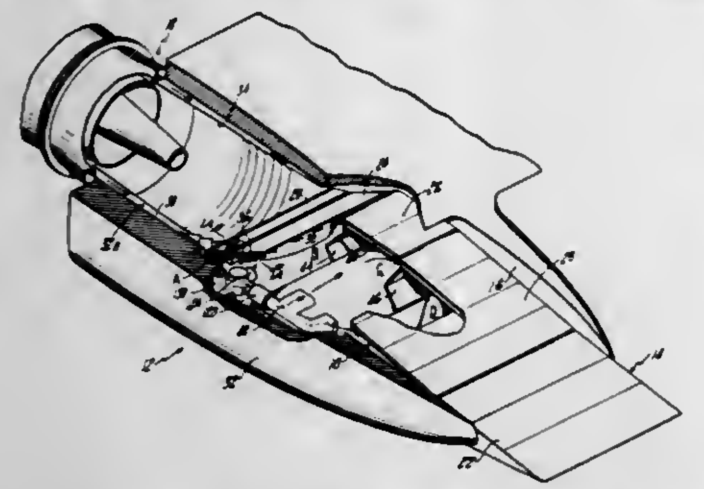
respect to the center line and being disposed on an angle relative to the radial center line of said chamber so that the gases generated by said fuel/air mixture discharging from said inlets impinge said inner wall substantially tangentially, and said inlets being a swirl cup having a plurality of vanes surrounding an aperture leading axially inwardly and communicating with said annular chamber.



4,098,076
COOLING AIR MANAGEMENT SYSTEM FOR A TWO-DIMENSIONAL AIRCRAFT ENGINE EXHAUST NOZZLE

John H. Young, South Windsor, Conn., and Gerald F. Goetz, Seattle, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1976, Ser. No. 751,429
Int. Cl.² F02K *1/08;* B64C *15/06*
U.S. Cl. 60—230 **7 Claims**

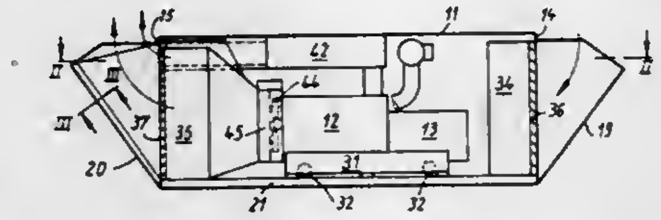


1. For aircraft powered by a gas turbine engine and having a two-dimensional exhaust nozzle, an articulating centerbody disposed in said two-dimensional nozzle for effectuating flight control of said aircraft, means to cool said centerbody including a source of cooling air, a series of axially aligned chambers formed in the cavity of said centerbody, panel members defining the outer wall of said centerbody and having cooling passages formed therein, manifold means supporting said panels and having openings in the preceding chamber to conduct cooling air to said passage for cooling said panels, an air cooling management system having conduit means having an inlet with one of said compartments and at least one outlet with another of said compartments disposed downstream thereof, modulating valve means in said conduit means for regulating the pressure of said cooling air in said downstream compartment, so that air from said source communicates with an upstream compartment and the downstream compartments communicate with the air in said upstream compartment whereby the pressure of the cooling air is at a level sufficiently high to conduct air internally of said centerbody to the gas exhaust stream in said nozzle.

4,098,077
MOBILE POWER UNIT HOUSING

Franz Edmaier, Markdorf; Einhart Grunert, Tettnang, and Ulrich Herms, Kressbronn, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,973
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605941
Int. Cl.² H02P *9/04*
U.S. Cl. 60—272 **36 Claims**

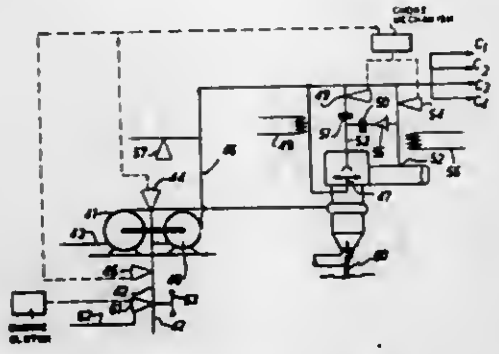


1. A housing at least approximately in the form and size of a freight container, in which a machine aggregate adapted to be driven by an internal combustion engine together with its accessories can be premanently accommodated and operated, characterized in that guide surface means are provided in front of openings in end faces of the housing for the supply and exhaust of cooling air, combustion air and exhaust gases, said guide surface means including flap means operatively connected with a housing bottom by hinge means and pivotal into an angular position relative to the end faces of the housing means.

4,098,078
PROCESS AND APPARATUS FOR AFTERBURNING OF COMBUSTIBLE POLLUTANTS FROM AN INTERNAL COMBUSTION ENGINE

Pierre Alfred Laurent, 62, Avenue Theophile Gautier, 75016 Paris, France

Continuation of Ser. No. 496,017, Aug. 7, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,558
Claims priority, application France, Feb. 12, 1973, 73.04925; Aug. 10, 1973, 73 29322
Int. Cl.² F01N *3/10;* F02B *75/10*
U.S. Cl. 60—274 **3 Claims**

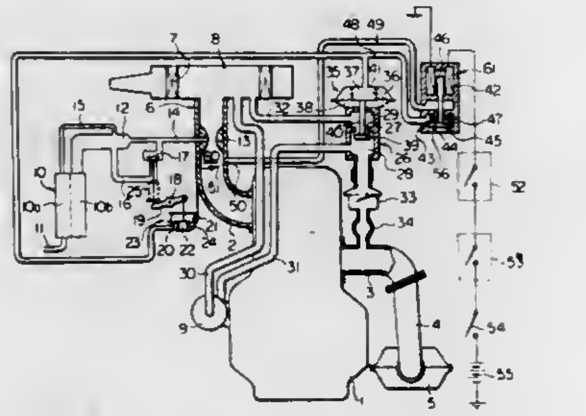


1. A process for the afterburning of the combustible pollutants from an internal combustion engine wherein secondary air is introduced into the engine exhaust gases, the secondary air being introduced in an amount in relation to primary combustion air drawn into the engine inlet to form a secondary air injection ratio, the improvement comprising, reducing the secondary air ratio when the engine power increases, independently of the engine carburettor venturi suction, by pumping secondary air into the engine with a volumetric efficiency which decreases when, as a consequence of increase of engine power and exhaust gas flow, the ratio *c* of the pressure of pumped air to the inlet air pressure also increases, said volumetric efficiency decrease being obtained by maintaining a volumetric compression ratio of the pumped air between 1 and 1.5 times the ratio *c* for a pumping operation when the engine is running at maximum speed and load.

4,098,079
SECONDARY AIR FEED CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Tatehito Ueda, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 2, 1977, Ser. No. 773,772
Claims priority, application Japan, Dec. 1, 1976, 51-143298
Int. Cl.² F02B *75/10;* B60K *21/00*
U.S. Cl. 60—290 **9 Claims**



1. A secondary air feed control device of an internal combustion engine for purifying the exhaust gas, said engine having a transmission, an intake passage and an exhaust passage equipped with a catalytic converter, said transmission having a shift gear, said control device comprising:

air-fuel mixture forming means for increasing an air-fuel ratio of an air-fuel mixture fed into said intake passage after completion of the warm-up of the engine compared with a case wherein the warm-up of the engine is not completed;

first detecting means for providing a first detecting signal which indicates the completion of the warm-up of the engine;

second detecting means for providing a second detecting signal which indicates that the shift gear of said transmission is in the top gear position;

additional fuel feed control means controlling a feeding amount of an additional fuel into said intake passage in response to a change in the vacuum in said intake passage and having

(a) a first operating state in which the feeding operation of an additional fuel remains stopped, and

(b) a second operating state in which an additional fuel is fed into said intake passage when a vacuum level in said intake passage is greater than a predetermined level, while stopping the feeding operation of an additional fuel when a vacuum level in said intake passage is smaller than a predetermined value,

valve means controlling a feeding amount of secondary air into said exhaust passage located upstream of said catalytic converter in response to a change in the vacuum in said intake passage and having

(c) a first opening state in which a relatively small amount of secondary air continues to be fed into said exhaust passage, and

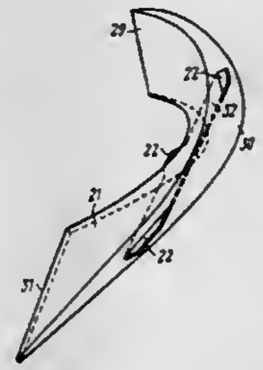
(d) a second opening state in which a relatively large amount of secondary air is fed into said intake passage is greater than a predetermined level, while feeding a relatively small amount of secondary air into said exhaust passage when a vacuum level in said intake passage is smaller than a predetermined level, and

shifting means responsive to said first and said second detecting signals for causing said additional fuel feed control means and said valve means to shift to said first operating state and said first opening state from said second operating state and said second opening state, respectively, when the shift gear of said transmission is in the top gear position after completion of the warm-up of the engine, and for causing said additional fuel feed control means and said valve means to shift to said second operating state and said second opening state from said first operating state and said first opening state, respectively, when the warm-up of the engine is not completed or when the shift gear of said transmission is not in the top gear position.

4,098,080
HYDRAULIC TORQUE CONVERTER

Valery Viktorovich Pogorelov, Uralskaya ulitsa, 5, kv. 138; Sergei Mikhailovich Trusov, Festivalnaya ulitsa, 22, korpus 5, kv. 546; Nikolai Petrovich Kolbin, ulitsa Ivana Susanina, 6, korpus 1, kv. 161, all of Moscow, and Lev Nikolaevich Chistyakov, ulitsa Dzerzhinskogo, 59, kv. 155, Yaroslavl, all of U.S.S.R.

Filed Mar. 9, 1977, Ser. No. 775,931
Int. Cl.² F16D *33/00*
U.S. Cl. 60—361 **4 Claims**



1. A hydraulic torque converter comprising: an impeller; a turbine; a stator designed to take reactive torque; the casing of said impeller; the inner ring of said impeller; the vanes of said impeller secured to said impeller casing and said impeller inner ring; the casing of said turbine; the inner ring of said turbine; the vanes of said turbine secured to said turbine casing and said turbine inner ring; the casing of said stator; the inner ring of said stator; the vanes of said stator secured to said stator casing and said stator inner ring; said vaned members, viz. the impeller, turbine and stator, arranged so that their vanes form a closed circuit for circulation of the flow of working fluid; said flow of working fluid enclosed on the outside by the casings of said vaned members, which casings jointly form an outer toroidal surface of said fluid conduit, the inside enclosure being made up of said inner rings which jointly form the toroidal surface of said fluid circuit; the vanes of at least one of the vaned members having a hydrodynamic profile of varying thickness; the casing of a vaned member having vanes with a hydrodynamic profile, in which casing provision is made of through slots; the inner ring of a vaned member having vanes with a hydrodynamic profile, in which inner ring provision is made of through slots; at least one plate provided in the body of each of said vanes with a hydrodynamic profile; tongues for fixing the vanes with a hydrodynamic profile to said casing and inner ring, which tongues are formed by the elements of said plate, which elements project from the body of the vane and fit into said slots.

4,098,081

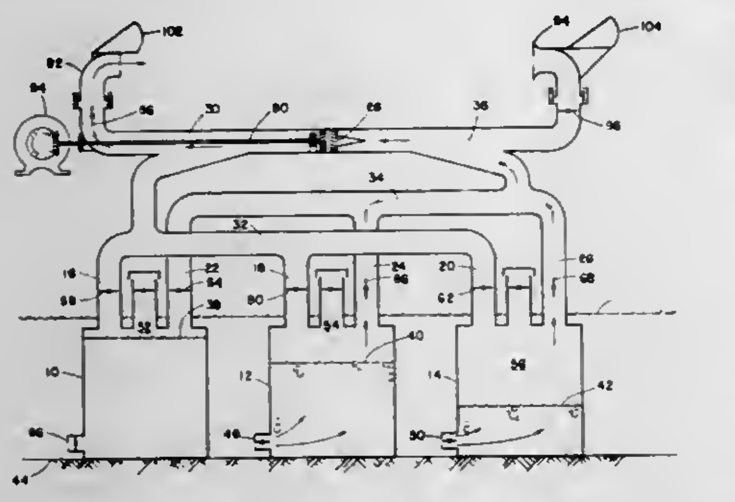
TIDAL POWER PLANT AND METHOD OF POWER GENERATION

Harvey R. Woodman, 311 Cedar Crest Ct., P.O. Box 271, Napavine, Wash. 98565

Filed Feb. 14, 1977, Ser. No. 768,390

Int. Cl.² F03B *13/12*

U.S. Cl. 60—398 **4 Claims**



1. Apparatus for use in conjunction with a turbine or other power generation means, for generation of power from tidal energy, comprising:

a. a plurality of tidal chambers having sea water inlet means; and

b. first manifold means, communicating air flow generated by rising tidal level within the tidal chambers to the said power generating means; and

c. second manifold means, communicating air flow generated by falling tidal level within the tidal chambers t said power generating means; and

d. valve means enabling sequential communication of air flow from the respective chambers through said first and second manifold means.

4,098,082

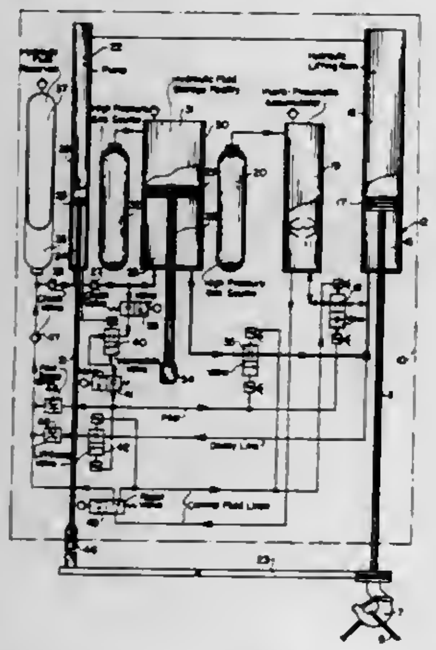
WAVE-MOTION COMPENSATING APPARATUS FOR USE IN CONJUNCTION WITH AN OFF-SHORE CRANE, OR THE LIKE

Martin R. Packer, 3 Cherington Close, Handforth, Cheshire, SK93AS, England

Filed Mar. 18, 1977, Ser. No. 779,065

Int. Cl.² F15B *1/02*

U.S. Cl. 60—413 **7 Claims**



1. In combination: a hydro-pneumatic accumulator having a gas side and an hydraulic fluid side and constituting a first source of hydraulic fluid; means for introducing a pressurized gas to the gas side of the accumulator; an hydraulic ram; first conduit means coupling the hydraulic fluid side of the accumulator to the ram to introduce hydraulic fluid from the accumulator into the ram; valve means in said first conduit means; control means coupled to said valve means and responsive to a control effect for causing the valve means to close and terminate the introduction of hydraulic fluid from the accumulator into the ram; a second source of hydraulic fluid comprising a storage means, an hydraulic fluid reservoir, and a pump comprising a cylinder and a piston reciprocally movable in said cylinder for introducing hydraulic fluid from said hydraulic fluid reservoir into said storage means; and second conduit means coupled to said second source for introducing hydraulic fluid from said source into said ram.

4,098,083

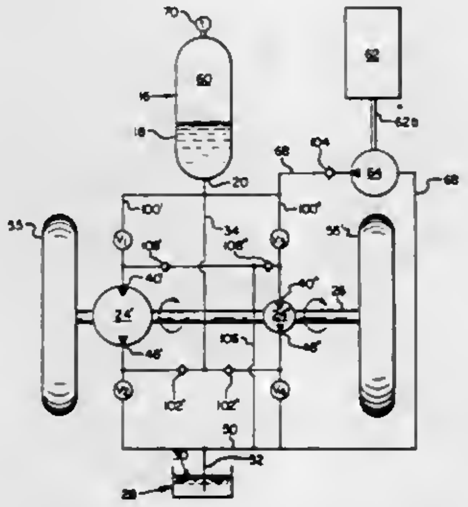
HYDRAULIC ENERGY STORAGE MULTI-SPEED TRANSMISSION

Vincent E. Carman, 10728 NE. Halsey D-34, Portland, Oreg. 97220

Filed Apr. 20, 1977, Ser. No. 789,197

Int. Cl.² F15B *1/02*

U.S. Cl. 60—414 **8 Claims**



1. In a wheeled vehicle, a hydraulic multi-speed, multi-torque transmission system for selectively storing energy normally lost in braking the vehicle and releasing the stored energy to aid in accelerating the vehicle, said system comprising:

(a) an accumulator for hydraulically pressurizing a compressible gas and storing hydraulic fluid under the pressure of said gas;

(b) hydraulic pump means mechanically coupled to the wheels of said vehicle for being driven by said wheels, said pump means having an inlet and an outlet, the outlet of said pump means being selectively hydraulically connected to said accumulator for pumping hydraulic fluid into said accumulator to pressurize said gas in response to the driving of said pump means by said wheels to brake said vehicle;

(c) hydraulic motor means mechanically coupled to the wheels of said vehicle for driving said wheels, said motor means having an inlet and an outlet, the inlet of said motor means being selectively hydraulically connected to said accumulator for receiving hydraulic fluid under pressure therefrom, said motor means comprising a plurality of fixed displacement hydraulic motors mechanically coupled to said vehicle wheels;

(d) an engine mounted on said vehicle;

(e) fixed displacement hydraulic pump means driven by said engine, said fixed displacement pump means having an inlet and an outlet, said outlet being connected to the inlet of said hydraulic motor means for supplying hydraulic fluid under pressure to said motor means; and

(f) selectively operable valve means interposed between the inlet of said motor means and the outlet of said engine-driven fixed displacement pump means for selectively directing the flow of hydraulic fluid under pressure from said fixed displacement pump means alternatively to any one or more of said plurality of fixed displacement hydraulic motors.

4,098,084

APPARATUS FOR EXTRACTING ENERGY FROM WAVE MOVEMENT OF THE SEA

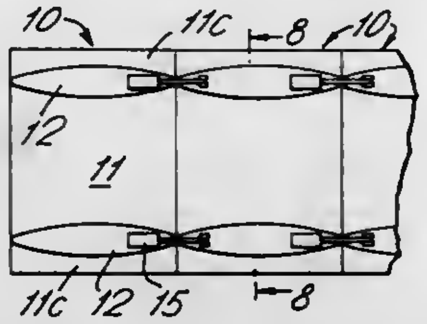
Christopher Cockerell, Southampton, England, assignor to Wavepower Limited, Southampton, England

Filed Apr. 21, 1976, Ser. No. 678,863

Claims priority, application United Kingdom, Apr. 28, 1975, 17597/75

Int. Cl.² E02B *9/08*

U.S. Cl. 60—500 **18 Claims**



1. Apparatus for extracting energy from movement of water, comprising a plurality of buoyant members, means for interconnecting said buoyant members one with another so that they are movable relative to one another, a plate member being provided on each buoyant member, said plate member being supported from the buoyant member and positioned so as to be submerged below the level of the water in use of the apparatus so that movememnt of water over the plate member reacts on said plate member and energy is transmitted therefrom to the buoyant members to increase said relative movement of the buoyant members, said plate member extending beyond the buoyant member, and means for converting the relative movement of the buoyant members into useful energy.

4,098,085

FLOW CONTROL VALVES

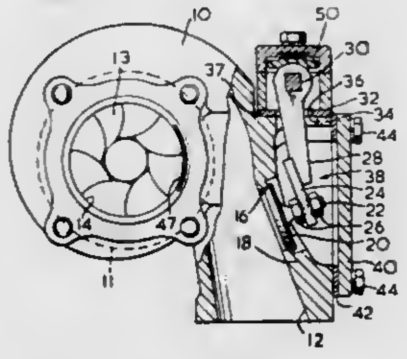
Peter Vincent McDowell, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Filed Mar. 8, 1976, Ser. No. 665,011

Claims priority, application United Kingdom, Mar. 13, 1975, 10416/75

Int. Cl.² F02D *23/00;* **F16K** *15/03*

U.S. Cl. 60—600 **10 Claims**



1. Apparatus comprising:

a turbine housing surrounding a rotatable turbine wheel, said turbine housing having a primary passage through which hot combustion gases pass to said turbine;

said turbine housing also having a valve seat formed in the wall of said primary passage and a bypass passage extending from said valve seat to a point downstream of said turbine wheel;

a valve closure member;

means connected to said turbine housing for defining a chamber therein connected to said bypass passage through an opening;

means for mounting said closure member for displacement between a first position in which said closure member engages said valve seat to block flow into said bypass passage and a second position in which it permits flow therethrough, said mounting means being adapted for substantially angular displacement about an axis positioned laterally of said closure member and within said chamber; and

means for biassing said closure member towards said first position.

4,098,086

BREAKWATER

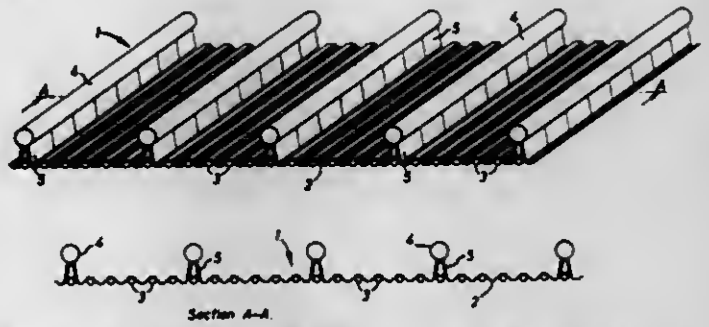
Denis Henry Desty, Weybridge, and Roger Duckworth, Guildford, both of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Oct. 18, 1976, Ser. No. 733,285

Claims priority, application United Kingdom, Oct. 17, 1975, 42672/75

Int. Cl.² E02B *3/06*

U.S. Cl. 61—5 **9 Claims**



1. A floating breakwater suitable for reducing the height of liquid waves comprising a plate having a beam direction and a cross-beam direction at right angles and in the plane of the plate, the plate being substantially rigid at least along the beam direction, wherein the ratio of mean liquid wavelength to the length of the plate along its beam direction is 0.5 to 5.0, buoyancy means associated with the plate so as to locate the upper surface of the plate at a depth of 1/40 to 1/5 of the length of the plate along its beam direction below the mean liquid surface level, and anchoring means attached to said plate which permit rocking motion of the plate along a horizontal axis in the cross-beam direction.

4,098,087

ANCHORING BOLT AND METHOD

James C. Swain, Upper Arlington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 2, 1976, Ser. No. 746,983

Int. Cl.² E21D *21/00*

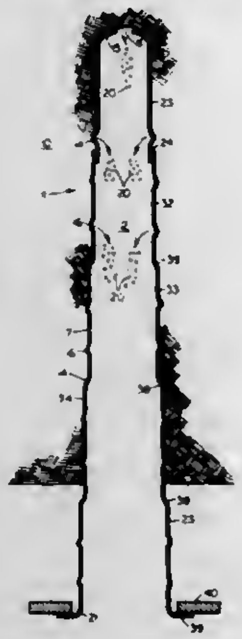
U.S. Cl. 61—45 B **19 Claims**

1. A method of supporting a structure such as a mine or tunnel roof or side wall or the like, comprising

providing an elongate annular anchoring bolt defining a central longitudinal passage therethrough and having cutting edges in an inwardly extending region at its leading end and in outwardly protruding areas at spaced positions along and around its outer surface for cutting into the structure to be supported, and openings in the bolt adjacent to at least some of the cutting edges for permitting material that is cut away from the structure to proceed into the central passage and out through its trailing end, the outer diameter of the bolt being smaller at its leading end and progressively larger along its length to the trailing end,

pressing the leading end of the bolt against a surface of the structure to be supported,

applying axial and rotational forces against the bolt to drive its cutting edges against and into the structure along approximately parallel helical paths and to penetrate into the hole formed by the cutting until only a short minor portion of the bolt remains outside of the structure, and
then applying a final axial force against the bolt sufficient to

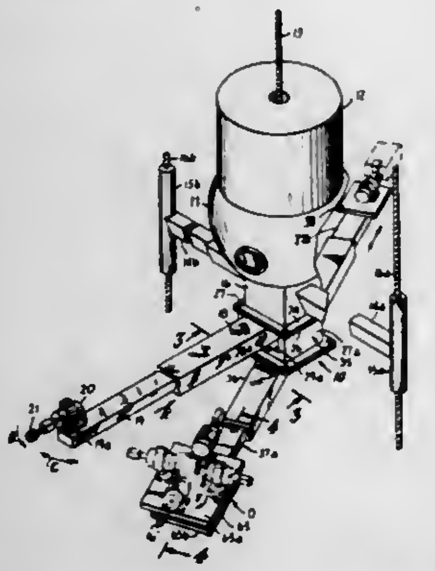


upset inwardly a portion of the bolt at its leading end and to drive the remaining portion of the bolt at the trailing end into the hole to provide an interference fit between the adjacent surfaces of the structure and the outwardly protruding areas of the bolt, and thus to provide a tight gripping force against the structure along substantially the entire length of the bolt.

4,098,088

WORK ARM SYSTEM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, Box 504, Covington, La. 70433
Division of Ser. No. 687,549, May 18, 1976. This application Jan. 10, 1977, Ser. No. 757,988
Int. Cl.² B25J *3/00;* B63C *11/00;* B63G *8/00*
U.S. Cl. 61—69 R **8 Claims**

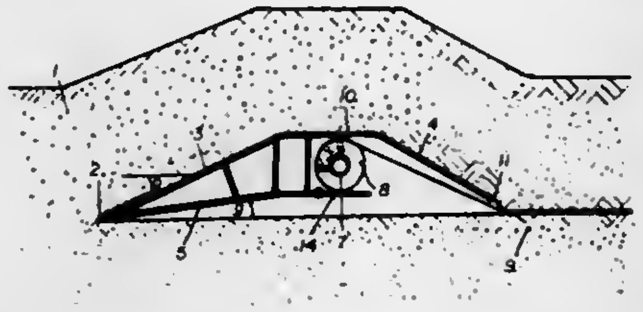


1. A work arm system for a submergible chamber comprising, a submergible chamber, means mounted to an outwardly disposed from the chamber to hold said chamber at a submerged depth adjacent a work area, a work arm rotatably mounted to said chamber and wherein the arm extends outwardly from the chamber in two directions, and means at each end of the arm to mount a tool, so that with rotation of the arm each end may be opposed to the work area and wherein at least one tool mount end of said arm comprises a rotatable platform, a plurality of tool drive means being mounted on said platform, and means to rotate said platform so that each of the tool drives may in turn be disposed away from the chamber and opposed to the work area.

4,098,089

METHOD OF LAYING SUBSOIL MEMBRANES

Dan Zaslavsky; Gideon Sinai, and Giora Biran, all of Haifa, Israel, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel
Filed Oct. 20, 1976, Ser. No. 734,174
Claims priority, application Israel, Oct. 20, 1975, 48328
Int. Cl.² E02B *11/02*
U.S. Cl. 61—72.6 **23 Claims**

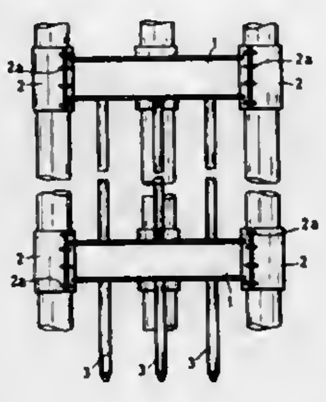


1. A method of laying subsoil membranes comprising the steps of:
(a) dragging through the soil, at a predetermined depth, a hollow, cutting blade having an interior chamber, a leading cutting edge arranged transverse to direction of motion and upstream of said chamber, a front portion upwardly sloping from said leading cutting edge and a rear portion downstream from said chamber and downwardly sloping and having a rear edge, the rear edge no lower than the level of the cutting edge of the blade;
(b) providing a roll of a prefabricated thin sheeting of a pliable material within the interior chamber of the blade, said roll being freely rotatable and mounted parallel to the rear edge; and
(c) continuously feeding said sheeting from the roll of sheeting within the interior chamber of the blade through an opening extending underneath and along said rear edge, into the soil, where the sheet material is held in position between undisturbed subsoil and soil dropping onto its upper surface after having been raised by the passing blade.

4,098,090

RIGID, DEMOUNTABLE BUOY SUPPORT

Giuseppe Dotti, Milan, Italy, assignor to Snamprogetti S.p.A., Italy
Filed Dec. 3, 1975, Ser. No. 637,123
Claims priority, application Italy, Dec. 3, 1974, 30125 A/74
Int. Cl.² E02B *17/00*
U.S. Cl. 61—102 **5 Claims**

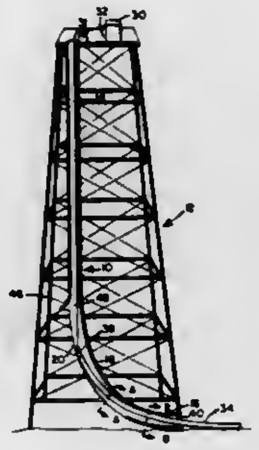


1. In an articulated leg buoy anchoring assembly having polygonal articulate legs universally connected between a buoy and a base on a marine bed to allow movement of the buoy in the sea relative to the base, the improvement which comprises a removable locking device including a polygonal frame having at its ends split sleeves, each one of which clamps one of the articulated legs therebetween, a plurality of vertical struts extending through the sides of said frame to the base, and locators on the base which receive said struts for temporarily rendering the system stationary in the sea for assembly, disassembly, servicing and repair thereof.

4,098,091

RISER GUIDE MEMBER

Ardeshir R. Desai, and Dayton M. Simpson, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.
Filed Aug. 1, 1977, Ser. No. 820,777
Int. Cl.² F16L *1/04*
U.S. Cl. 61—110 **6 Claims**



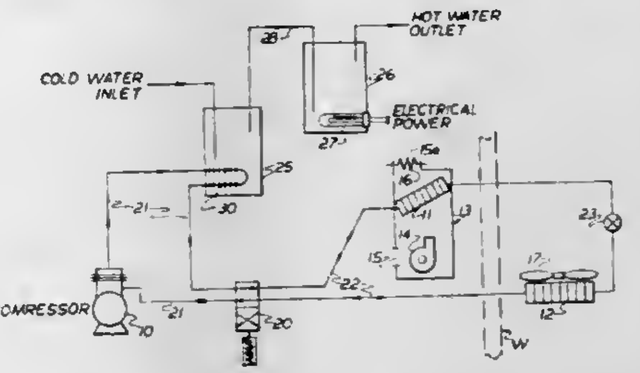
1. Apparatus for guiding installation of a riser member which connects an underwater pipeline lying substantially on the bottom of a body of water to an above water facility of an offshore apparatus comprising
- a J-shaped riser guide member having a long tubular, vertically extending upper section, a short tubular substantially horizontal lead-in section, and a curved channel section connecting said vertical section and said lead-in section, said curved channel section being open on a side away from the lead-in section,
- means for securing said J-shaped member to said offshore apparatus, said lead-in section being positioned substantially at the bottom of said body of water, and
- a pipeline pulling apparatus for pulling a riser pipeline through said J-shaped member starting at said lead-in section,
- whereby said pipeline pulling apparatus requires less pulling force than would be required if said J-shaped member were a tubular member for its entire length,
- said lead-in section provides initial control and guidance during riser installation, and
- said upper section provides stabilizing control of said riser during installation as said riser leaves said curved channel section.

4,098,092

HEATING SYSTEM WITH WATER HEATER RECOVERY

Kanwal N. Singh, 6436 Saddle Lane Ct., Westerville, Ohio 43081
Filed Dec. 9, 1976, Ser. No. 749,170
Int. Cl.² F25B *27/02, 13/00*
U.S. Cl. 62—238 **3 Claims**

1. A heating system for a building comprising
- a fluid refrigerant compressor
- a first heat exchanger incorporated in a building heating apparatus
- a second heat exchanger disposed external to a building to be thus heated
- fluid conduit means interconnecting said compressor and heat exchangers in series relationship and carrying a refrigerant fluid
- selectively operable valve means interposed in said fluid conduit means intermediate said compressor and said first and second heat exchangers
- to alternatively route refrigerant fluid flow through said heat exchangers in opposite directions, and
- water heating apparatus which includes an auxiliary unit and a primary unit, said auxiliary unit having a heat exchanger

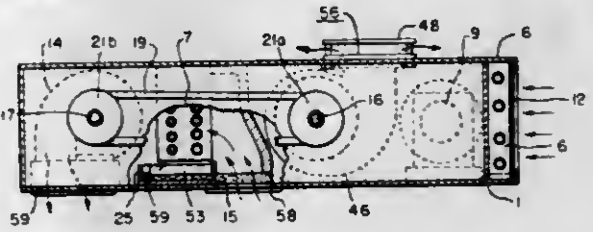


which is interconnected in said fluid conduit means intermediate said compressor and said valve means in downstream relationship to said compressor, said auxiliary unit having a water inlet connectable to a water source and an outlet communicating with said primary unit enabling water flow from the auxiliary unit water inlet and into said primary unit, said primary unit having a water outlet connectable with a utilization system and including an independent heat source responsively operable to the temperature of the water in said primary unit.

4,098,093

UNITARY CAB AIR COOLING SYSTEM FOR LARGE OFF ROAD VEHICLES

Joseph L. Czyl, Harvey, Ill., assignor to Vapor Corporation, Chicago, Ill.
Filed Dec. 6, 1976, Ser. No. 747,704
Int. Cl.² B60H *3/04*
U.S. Cl. 62—243 **15 Claims**



1. In a unitary air conditioning system for the cab of a large vehicle;
- a hydraulic prime mover having an output shaft;
- a vapor cycle refrigeration compressor, providing a first pulsating torque shaft load;
- means resiliently coupling said prime mover and said compressor transmitting said first pulsation after a first delay;
- means moving ambient air and cab air through said system having a drive shaft, and rotational inertia, providing a second shaft torque pulsation;
- means semi-resiliently coupling said prime mover and air moving means, transmitting said second pulsation after a second delay, said first and second delays unequal in duration, each greater than direct coupling;
- wherein said couplings transmit torque pulsations to said prime mover, displaced in time and said first and second delays provide compensated shaft torque load to said prime mover thereby reducing peak prime mover loading.

4,098,094

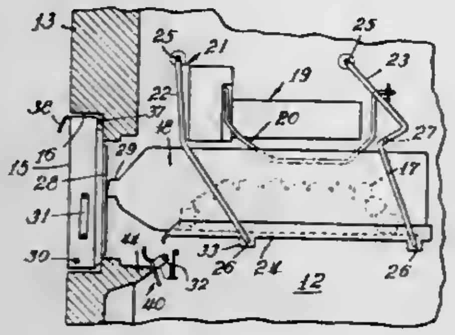
STOP MECHANISM FOR MOVABLE ICE RECEPTACLE

William John Linstromberg, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 10, 1976, Ser. No. 749,535

Int. Cl.² F25C *5/18*

U.S. Cl. 62—344 **12 Claims**



1. In a refrigeration appliance having a cabinet defining a freezing space, a freezer door for selectively closing said space and having an ice access opening, a closure for selectively closing said access opening, and a receptacle for storing ice within said space, an improved ice access system comprising:

mounting means for mounting said receptacle for movement between a rearward ice storage position and a forward ice access position, said mounting means mounting said receptacle to move from said ice storage position toward said ice access position as an incident of movement of either of said doors toward their open position; and

movement limiting means for permitting forward movement of said receptacle to a preselected intermediate position intermediate said ice storage position and said ice access position as an incident of opening of said freezer door.

4,098,095

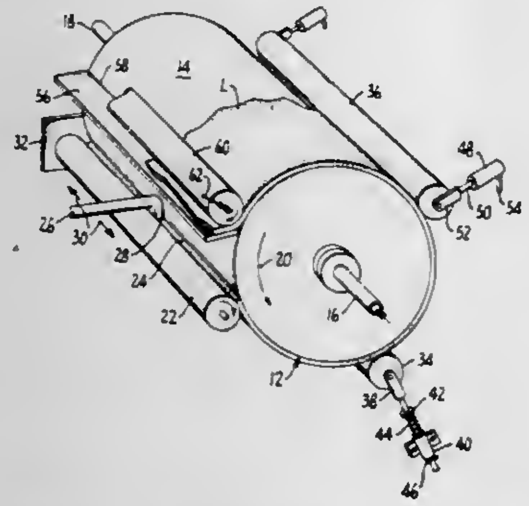
REFRIGERATION APPARATUS FOR VISCOUS PASTE SUBSTANCE

Eldon N. Roth, 1025 Tennessee St., San Francisco, Calif. 94107

Filed May 21, 1976, Ser. No. 688,599

Int. Cl.² A23P *1/00*

U.S. Cl. 62—346 **10 Claims**



2. Apparatus for rapidly reducing the temperature of a viscous paste substance, said apparatus comprising: a drum having a cylindric exterior wall formed of heat conductive material, means for refrigerating said wall; means for rotatively driving said drum about the central cylindric axis thereof, means for introducing the viscous paste snbstance onto the surface of said drum along a line substantially parallel to said axis; at least one roller circumferentially spaced along said drum from said introducing means; means for resiliently biasing said roller toward said cylindric wall so as to compress the viscous paste substance against the cylindric wall and smooth the exterior surface of the viscous paste substance on said cylindric wall; and, means spaced circumferentially from said roller for removing cooled viscous paste from said drum surface.

4,098,096

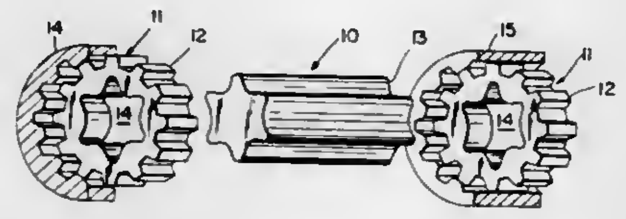
HIGH STRENGTH, NON-METALLIC COUPLING

Steven D. Chard; W. A. Loker, both of Leonardtown, and John T. Meredith, Lexington Park, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1977, Ser. No. 800,590

Int. Cl.² F16D *3/64, 3/18, 3/14*

U.S. Cl. 64—14 **6 Claims**



1. A coupling for transmitting high torque rotational forces between internal involute shafts, comprising:

at least two rigid non-metallic inserts press-fitted one each into said internal involute shafts, said inserts having bores of multi-sided configuration, said inserts having means on their outside circumference for coupling said inserts to said internal involute shafts;

a metallic shaft of multi-sided configuration slip-fitted into said insert bores;

said multi-sided configurations of said metallic shaft and insert bores comprising a plurality of tooth-like splines substantially flat along their sides, whereby said inserts are evenly, symmetrically, and compressively loaded.

4,098,097

FABRICS MADE FROM AS SPUN UNTWISTED YARN

Helmut Langanke, Offenbach; Roman Hoffmeister, Wehrheim, and Herbert Fritz, Niederdorfelden, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 25, 1977, Ser. No. 790,369

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623904

Int. Cl.² D04B *1/00, 21/00*

U.S. Cl. 66—202 **6 Claims**

1. A warp knit fabric characterized by a pleasant hand of close construction for use in articles of clothing made directly from high speed as spun synthetic multifilament yarn of less than 170 dtex and about 2 to 8 dtex per filament of a material selected from the group consisting of polyamide, polyester and polypropylene, said yarn being in a nontextured and untwisted state and having an elongation at break of at least 45% and a tenacity corresponding to that of a conventional drawn yarn.

4,098,098

OUT-OF-BALANCE AND SAFETY SWITCH ARRANGEMENT FOR WASHING MACHINE

Ronald L. Altnau, Ripon, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 11, 1977, Ser. No. 795,851

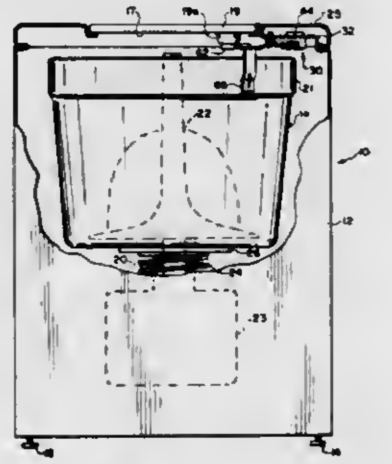
Int. Cl.² D06F *37/42;* **F16P** *3/10;* **H01H** *3/16*

U.S. Cl. 68—23 R **8 Claims**

1. In a washing machine or the like device having a housing, a clothes receiving tub mounted for rotation in said housing, said tub mounting permitting out-of-balance rotation of said tub, means including a motor for rotating said tub, an energizing circuit for said motor, and a cover attached to said housing for movement between open and closed positions to control access to said tub, an out-of-balance and safety switch arrangement mounted on said washing machine housing, including in combination:

switch means operatively connected in said motor circuit, said switch means including an actuator biased to a first operating position and movable to a second operating position for controlling the energization of said motor,

switch actuator lever arm means mounted for pivotal movement in first and second transverse planes, means biasing said lever arm means to a first position in said first plane for locating a first end of said lever arm means in operative alignment with said switch actuator, the opposite end of said lever arm means being positioned in the path of said tub access cover for engagement thereby upon moving said cover to a closed position, the first end of said lever arm means being pivoted in said second plane into engagement with said switch actuator for movement thereof from said first to said second operating position in response to the closing of said cover, whereby said motor circuit is completed for energization of said tub drive motor, a portion of the second end of said lever arm means being positioned adjacent said washing machine tub for engagement thereby in response to predetermined excessive unbalanced rotation of said tub, said lever arm means being pivoted in said first plane against said biasing means to a second position in response to engagement by said tub so that the first end of said lever arm means releases said switch actuator for movement to said first operating position, deenergizing said motor circuit, said biasing means pivoting said lever arm means in said first plane toward said first position upon discontinuation of the rotation of said tub, said first end of said lever arm means being relocated in operative alignment with said switch actuator only after said tub access cover is moved to the open position.



4,098,099

REEL LOCK

Marvin D. Smith, 820 N. 89th St., East St. Louis, Ill. 62203

Filed Mar. 2, 1977, Ser. No. 773,696

Int. Cl.² E05B *71/00*

U.S. Cl. 70—18 **10 Claims**

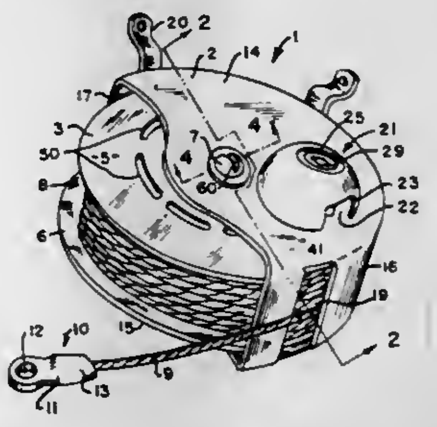
1. A locking means, comprising:

an enclosure, said enclosure including a top wall having at least one opening in it;

reel means rotatably mounted to said enclosure, said reel means including a spool having spaced first and second sides defining a storage area therebetween, said first side having at least one opening in it, said last mentioned opening being alignable with the opening in the top wall of said enclosure as said reel means rotates with respect to said enclosure;

cable means windable and winded on said reel means, said cable means having a free first end, said free first end having an eyelet formed in it, said eyelet defining an opening; and

a locking device mounted to said enclosure, said locking device including a plunger movable between at least a first position and a second position, said plunger being insertable through the openings in said eyelet, said enclosure and said reel to define a locked arrangement for said locking means.



4,098,100

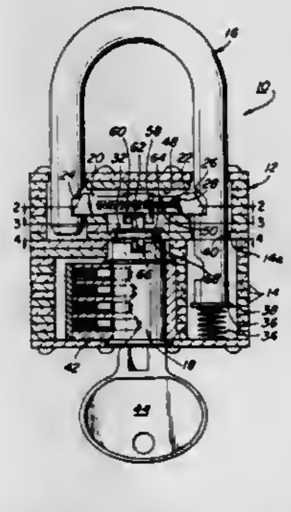
LAMINATED PADLOCK

Man Wah, 2664 Kowloon Central Post Office, Hong Kong, Hong Kong

Filed Apr. 20, 1977, Ser. No. 789,011

Int. Cl.² E05B *67/22*

U.S. Cl. 70—38 A **3 Claims**



1. A padlock comprising in combination

a plurality of superimposed flat plates secured together to provide a laminated body,

a shackle having a pair of spaced, parallel legs,

said laminated body having first and second openings respectively receiving said legs,

a key operated lock barrel mounted in one end of said laminated body for selective rotation,

said lock barrel having a transverse slot at the inner end,

a safety rotator rotatably mounted in said laminated body,

said safety rotator having a cylindrical body portion provided with an annular flange extending beyond the perimeter thereof at one end,

an intermediate one of said flat plates having a circular opening rotatably receiving said cylindrical body portion with said annular flange resting on one side of said intermediate one of said flat plates,

said safety rotator having a first portion extending from one end into said slot,

said safety rotator having a cam portion at the other end,

first and second locking plates mounted in said laminated body for reciprocal movement in a plane lying perpendicular to the axis of rotation of said safety rotator,

first and second cam follower surfaces respectively provided on said plates for operative engagement by said cam portion to move said locking plates simultaneously away from said legs,

a plurality of notches respectively provided in said legs,

said notches being aligned with said locking plates when said shackle is in a locked position, and

spring means interposed in compressed relationship between said locking plates for resiliently biasing the ends of said locking plates into said notches to retain said shackle in the locked position until said key operated locking barrel is rotated to rotate said safety rotator to move said locking plates out of said notches.

4,098,101

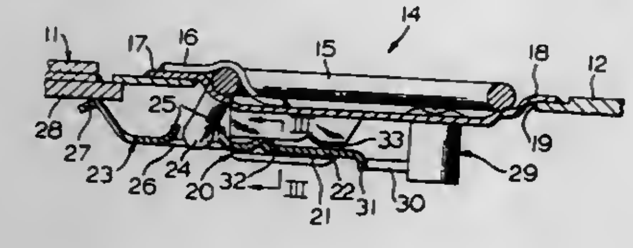
LATCH MECHANISM FOR DOORS AND THE LIKE

James Svoboda, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 4, 1976, Ser. No. 729,525

Int. Cl.^{2} E05B *65/06*

U.S. Cl. 70—134 **10 Claims**



1. A latch mechanism mounted on a first member movably mounted on a second member comprising

handle means movably mounted on an outer side of said first member for movement between latched and unlatched positions thereon,

guide means secured to an underside of said first member, and

a latch member comprising a resilient spring-like member slidably mounted on said guide means and connected to said handle for sliding movements between said latched position underlying an inner side of said second member and said unlatched position in response to movement of said handle means, said latch member including a bent spring portion formed unitarily therewith to function as a spring for biasing said latch member against said inner side of said second member when the latch member is in said latched position, said spring-like latch member further including a detent portion formed unitarily thereon,

said guide means including a recess defined therein positioned to accommodate said detent portion, said detent portion resiliently deflecting into said recess to thereby releasably hold said latch member in said unlatched position thereof.

4,098,102

AUTO SAFE LOCK

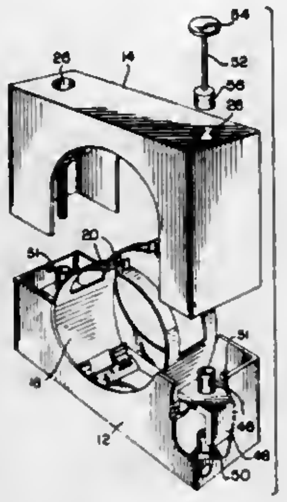
Edward O. Kalina, Midlothian, Ill. 60445

Filed Mar. 17, 1977, Ser. No. 778,380

Int. Cl.^{2} B60R *25/00;* **E05B** *17/14*

U.S. Cl. 70—237 **4 Claims**

1. A safety lock for the conventional ignition lock which projects laterally from the steering column of an automobile, said safety lock comprising; a housing including telescopically joined upper and lower parts removably mounted on the steering column and enclosing the ignition lock, the lower part having side and end walls and a bottom, and a removable clamp extending around the steering column for securing the lower part to the column, the upper part having a top and side and end walls telescoping down over the lower part and enclosing the ignition lock, and lock means attached to and recessed below the top within the upper part and having a portion extending within and releasably secured to a cooperating sleeve bracket fixed to said lower part.



4,098,103

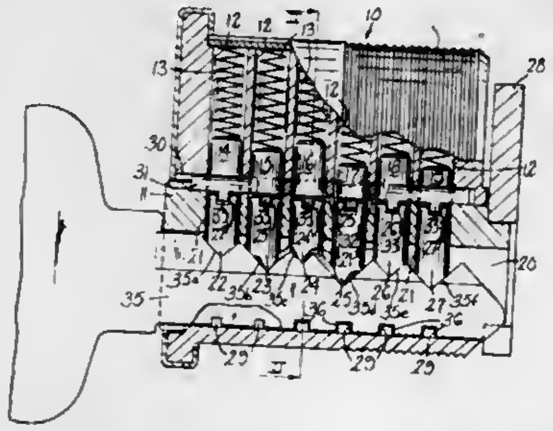
CYLINDER LOCK

Leo Raskevicius, E. Hartford, Conn., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Mar. 7, 1977, Ser. No. 774,917

Int. Cl.^{2} E05B *27/04*

U.S. Cl. 70—364 A **4 Claims**



1. A lock having a body portion and a cylindrical barrel rotatable in a bore in the body portion, the barrel having a keyway and at least one key pin hole and the body portion having the same number of driver holes each adapted to register with a key pin hole, all of said holes being circular in cross section, the surface of the barrel being provided with an annular groove intersecting each key pin hole, a driver in each driver hole, a key pin in each key pin hole, at least one key pin having a diametrically disposed groove across its upper end and adapted to be aligned with the respective annular groove and a beveled chisel tip on its lower end, and a gate fitted in the body portion adjacent to the barrel, the gate being provided with projections extending into each said annular groove to prevent rotation of the barrel when said diametrically disposed groove and its respective annular groove are not in alignment, the bore in the body portion being provided with a recess intersecting each driver hole, the gate being fitted in said recess and being traversed by a hole in register with each driver hole.

4,098,104

REVERSIBLE-FLAT KEY FOR A CYLINDER LOCK

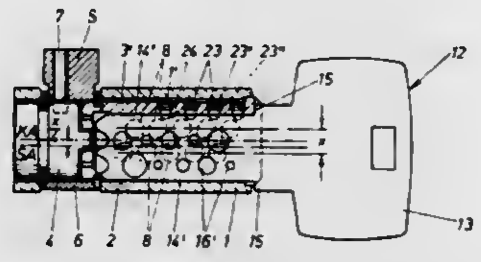
Heinz Wolter, Cologne, Fed. Rep. of Germany, assignor to DOM-Sicherheitstechnik GmbH & Co. KG, Brühl, Fed. Rep. of Germany

Filed Aug. 26, 1976, Ser. No. 717,605

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541808; Feb. 19, 1976, 2606557

Int. Cl.^{2} E05B *19/04, 27/06*

U.S. Cl. 70—406 **9 Claims**



1. A reversible flat key for cylinder locks, comprising

a key shaft having opposite wide sides and a tip of the key shaft,

said tip being formed with lead-in bevels extending from said opposite wide sides of the key shaft,

said key shaft being formed with two rows of recesses reversibly identically arranged on each of the wide sides of the key shaft, said two rows of recesses of both said wide sides being adapted to arrange tumbler pins of a cylinder lock in proper order, respectively,

said two rows of recesses on one of said wide sides of the key shaft being arranged offset in a transverse direction of the key shaft relative to the two rows of recesses on the opposite wide side of the key shaft, respectively, and

adjacent of said lead-in bevels extending from opposite wide sides being aligned with corresponding opposite of said rows of recesses on said opposite wide sides of the key shaft and being arranged offset relative to each another, said lead-in bevels being formed as individual grooves, respectively, each extending from one of the wide sides to the opposite wide side, respectively, beyond a longitudinal center plane of the key shaft, the longitudinal center plane being substantially parallel to the wide sides of the key shaft.

4,098,105

METHOD AND APPARATUS FOR SETTING THE VALUE OF THE FORGING DIMENSION IN FORGING PRESSES USING V-DIES AS FORGING TOOLS

Detlef Fullers, Monchen-Gladbach and Eduard Schmitz, Dusseldorf, both of, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1976, Ser. No. 714,834

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536532

Int. Cl.^{2} B21J *9/20*

U.S. Cl. 72—21 **1 Claim**

1. A method for setting the operation of a forging press having V-dies, so as to produce a desired workpiece dimension after forging, comprising the steps of:

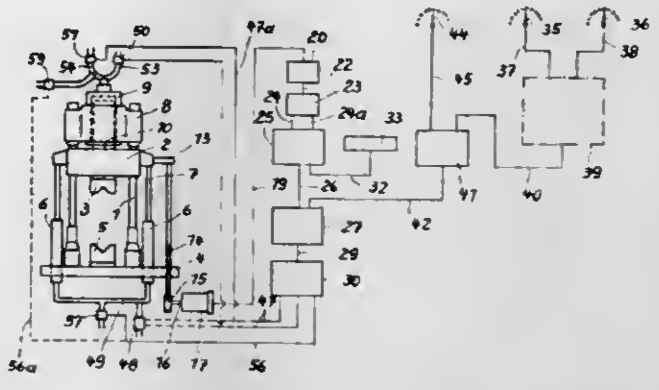
feeding the width across flats of the V-dies when the dies meet and the desired workpiece dimension into a control circuit;

calculating with a computer in the circuit a correction value to be added to the workpiece dimension to obtain a set value for the forging stroke;

passing the set value for the forging stroke to valves controlling the operation of the press, and performing a forging stroke;

measuring the length of the forging stroke;

comparing the measured value with the set value in a comparator; and



initiating the next forging stroke when the set and measured values coincide.

4,098,106

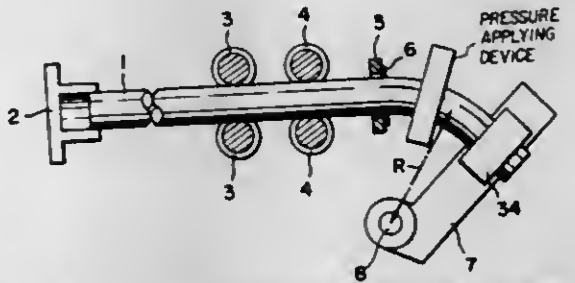
BENDING METHOD AND APPARATUS WITH SLIDABLE CLAMP

Jousuke Yamaguchi, Kanagawa, Japan, assignor to Daiichi Koshuha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 593,961, Jul. 8, 1975, Pat. No. 4,062,216. This application Jul. 29, 1976, Ser. No. 709,950

Int. Cl.^{2} B21D *7/03, 7/16*

U.S. Cl. 72—128 **6 Claims**



1. An apparatus for hot bending elongated materials such as pipe comprising:

means for advancing the elongated material;

means for guiding an unbent portion of the material;

annular heating means for heating a limited region of the material to a high temperature;

a bending arm freely pivotable about an axis located in the plane of the heating means; and,

means on said bending arm for clamping a leading portion of the material including a first clamp, contacting the material, and slidably moveable with respect to the arm in a direction generally parallel to the longitudinal axis of the clamped portion of the material.

4,098,107

VARIABLY POSITIONABLE ROLLING STAND

Vincenzo Bruno, Busto Arsizio (Varese), Italy, assignor to Pomini Farrel, S.p.A., Italy

Filed May 11, 1977, Ser. No. 795,810

Int. Cl.^{2} B21B *31/02*

U.S. Cl. 72—237 **4 Claims**

1. A rolling assembly, comprising

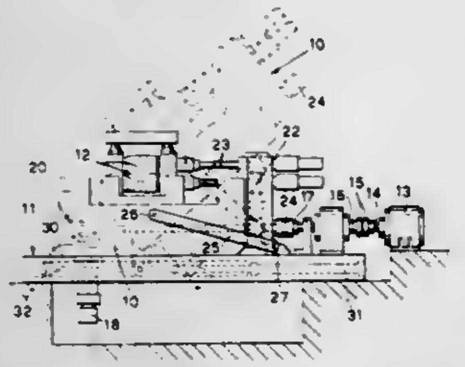
a stationary base,

driving motor means fixedly supported on said base and having one driving end,

a transformable rolling stand movably mounted on said base to be supported thereby, and having thereon a pair of cooperating rolls which define therebetween the rolling axis of the assembly, and

linking means connecting said rolling stand to said stationary base to allow the rolling stand to be rotated about said rolling axis between two angular positions 90° apart,

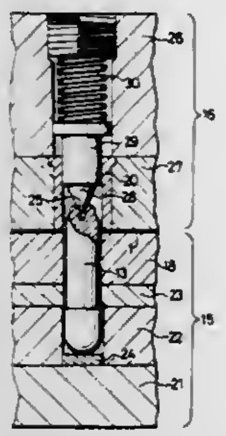
said linking means comprising wheel means located below said rolling stand and movable along a substantially horizontal path defined by guide means in said stationary base, and strut means pivoted at one end to said rolling stand and at another end to said stationary base outside said path for causing the rolling stand to rotate between said two angular positions responsive to reciprocation of said wheel means along said path,



said rolling stand also having thereon a gear transmission system for said cooperating rolls, said system including two separate driven ends arranged to be connected selectively to said one driving end of the driving motor means upon movement of the rolling stand from one to the other of its two angular positions.

4,098,108
PUNCH AND DIE ASSEMBLY FOR USE IN THE PRODUCTION OF HEAT EXCHANGER FINS

Toyoo Kozima, Tokyo, Japan, assignor to Hidaka Engineering Company, Limited, Tokyo, Japan
Filed Mar. 7, 1977, Ser. No. 774,758
Claims priority, application Japan, Dec. 9, 1976, 51-147125
Int. Cl.² B21D ***53/04***
U.S. Cl. 72—358 **7 Claims**



1. A punch and die assembly for use in the production of heat exchanger fins comprising:

a fixed lower tool holder including an elongated ironing punch having the same dimension as a predetermined flanged aperture, said ironing punch being loosely mounted in and supported by said lower tool holder such that the upper part of said ironing punch can tilt with respect to said lower tool holder,

a movable upper tool holder having an elongated die matching said ironing punch,

an elongated guide rod coupled to and movable with said upper tool holder whereby the longitudinal axis of the lower end of said guide rod is always coincidental with the axis of the die,

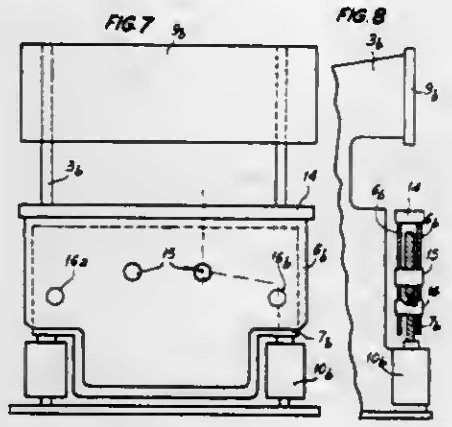
a spring normally urging said guide rod towards said lower tool holder,

a conical recessed aperture positioned in either the upper end center of said ironing punch or lower end center of said guide rod, and

a conical projected end positioned in the other end center and adapted to be matingly received in said conical recessed aperture, whereby said ironing punch and said guide rod are guided and cooperate with each other through said spring and said die during operation of said punch and die assembly.

4,098,109
BENDING PRESS OR SIMILAR MACHINE TOOL

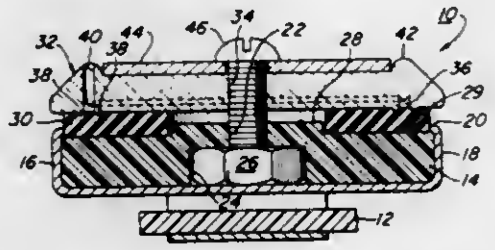
Paul Cailloux, La Varenne Saint Hilaire, France, assignor to **Promecam Sisson-Lehmann, Saint-Denis, France**
Filed Mar. 30, 1977, Ser. No. 782,833
Claims priority, application France, Apr. 13, 1976, 76 10806
Int. Cl.² B21D ***5/02***
U.S. Cl. 72—389 **16 Claims**



1. A machine tool of the type comprising a top beam and a bottom beam superposed to each other, and provided each with a tool, one said beam being fixed and the other movable, the fixed beam bearing with its ends on the frame structure of the machine while the movable beam is operatively connected to driving members disposed at either end thereof, wherein one of said beams is a compound beam comprising two sections, namely a section supported at either end and another section provided with the corresponding tool and connected to said first section by means of at least one common stud disposed symmetrically in relation to the transverse median plane of the beams and relatively close to said plane.

4,098,110
DEPTH GAUGE

William A. Bowden, Glenview, Ill., assignor to Dacor Corporation, Northfield, Ill.
Filed May 4, 1977, Ser. No. 793,633
Int. Cl.² G01F ***23/16***
U.S. Cl. 73—300 **9 Claims**



1. A depth gauge for use under water, comprising

a generally flat, transparent lens member having a semicircular groove in one facial surface thereof,

a gasket held in sealing contact with said facial surface whereby said groove is closed by said gasket and forms a capillary tube,

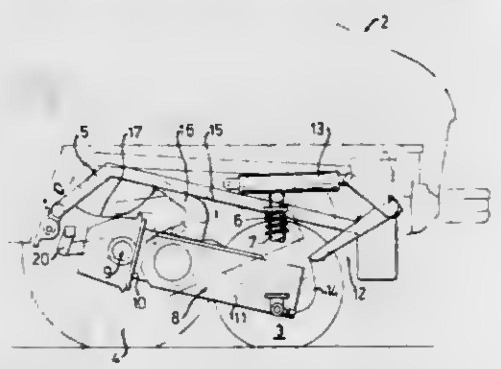
one end of said tube being closed and the other end being in communication with the exterior of said gauge,

said lens member having a raised, convex annular surface on the side thereof opposite said facial surface and said convex annular surface directly overlying said groove whereby said groove may be observed through said convex annular surface, and

a circular plate member mounted to said lens member within said raised annular surface and having reference marks graduated in depth provided thereon in proximity to said raised annular surface.

4,098,111
ROADWAY FRICTION MEASURING METHOD AND APPARATUS

Ragnar Malcus Hardmärk; Bror Anders Sören Hanberger, and Sven Edvin Forsberg, all of Linkoping, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden
Filed Jan. 27, 1977, Ser. No. 763,081
Claims priority, application Sweden, Mar. 31, 1976, 7603814
Int. Cl.² G01N ***19/02***
U.S. Cl. 73—9 **16 Claims**



1. A method of measuring and indicating limiting values for driving and braking vehicles on a substructure comprising the steps of:

bringing a measuring wheel mounted on a vehicle engage said substructure with a predetermined slip in relation to vehicle speed,

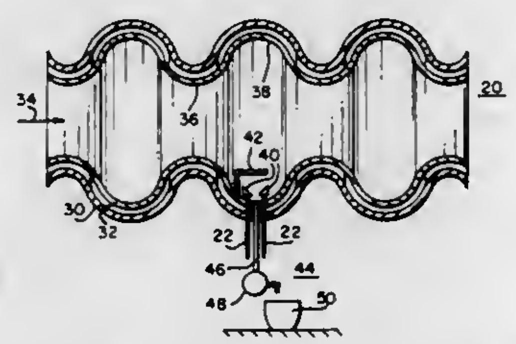
measuring the loads acting on said measuring wheel to produce measuring signals,

combining said measuring signals in an electronic unit to produce signals indicating said limiting values, and

producing a display of said limiting values.

4,098,112
STEAM TURBINE EXPANSION JOINT WITH PROBE FOR MONITORING MOLTEN CAUSTICS

Leslie D. Kramer, Wilmington, Del., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 10, 1977, Ser. No. 776,327
Int. Cl.² G01R ***27/02;*** **G08B** ***21/00***
U.S. Cl. 73—28 **5 Claims**



1. A steam turbine system caustic detector comprising:

a steam turbine having a plurality of separate housings;

a first conduit for carrying steam between said turbine housings;

a second conduit which cooperates with and functions as an expansion joint for said first conduit, said second conduit having a wall of circumferentially disposed, axially alternating inward and outward protruding convolutions;

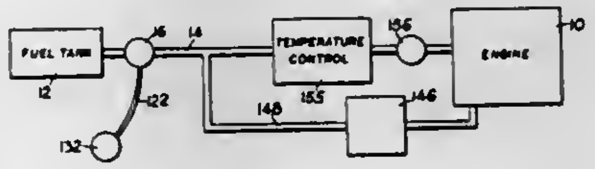
a pair of electrical probes each of which have a first and second end, said first ends being insertable through an outward protruding convolution at the bottom of said second conduit, said first ends being suitably separated;

means for applying an electrical potential across said electrical probes; and

means for measuring current flow through said electrical probes whereby said current measuring means will indicate a current when a caustic of suitable electrical conductivity collects in said outward protruding convolution in sufficient quantity to electrically connect said probes' first ends.

4,098,113
TEMPERATURE CONTROLLED FUEL SYSTEMS FOR ENGINES

Curtis L. Erwin, Jr., 5805 SE. Gladstone, Portland, Oreg. 97236
Division of Ser. No. 456,264, Mar. 29, 1974, Pat. No. 3,949,602.
This application Mar. 9, 1976, Ser. No. 665,275
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.² G01F ***9/00***
U.S. Cl. 73—113 **34 Claims**



27. A temperature controlled fuel measuring system arranged for use with an engine having fuel supply means, said fuel system comprising volumetric measuring means measuring fuel flow in said fuel system, sensing means operable with said fuel system sensing the temperature of the fuel supplied to the engine, temperature control means responsive to said sensing means regulating the temperature of the fuel delivered to the engine, indicating means responsive to said measuring means indicating the total amount of fuel flowing through said measuring means, and compensating means in the fuel system correcting the indications of said indicating means due to variations in the physical characteristics of the fuel.

4,098,114
RECORDING SHEET

Yasuzi Asao; Yasuhiro Ogata, and Noriyuki Hosoi, all of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Mar. 28, 1977, Ser. No. 781,801
Claims priority, application Japan, Mar. 26, 1976, 51-33164
Int. Cl.² B41M ***5/16;*** **G01L** ***1/00***
U.S. Cl. 73—141 R **17 Claims**

1. A recording sheet comprising a support, a recording layer thereon containing a color former and a color developer, and a protective layer of a transparent synthetic resin provided on the recording layer by extrusion coating, said recording layer containing microcapsules having a δ/D ratio of about 1.5×10^{-3} to about 2.5×10^{-1}, wherein δ is the number average wall thickness of the microcapsules and D is the volume average particle diameter of the microcapsules.

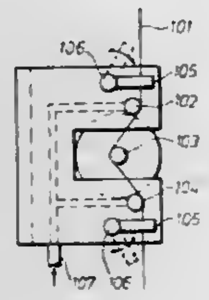
4,098,115

YARN TENSION MEASURING DEVICE

Michael Bueb, and Edgar Muschelknautz, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1976, Ser. No. 649,166
Int. Cl.² G01L *5/04*

U.S. Cl. 73—144 **10 Claims**



1. A yarn tension measuring device, comprising a measuring head having three guide elements and means for enabling a Sommerfield number of ≦0.5 for yarn travelling at a speed of from 400 - 400 m/min comprising mounting the guide elements for rotation up to 300,000 r.p.m. with the axes of rotation at the apexes of a triangle, in which a middle guide element is mounted on the force pick-up of an electrical dynamometer working virtually motionlessly and which is arranged in a block, wherein the guide elements comprise air cushioned runners having very low moments of inertia.

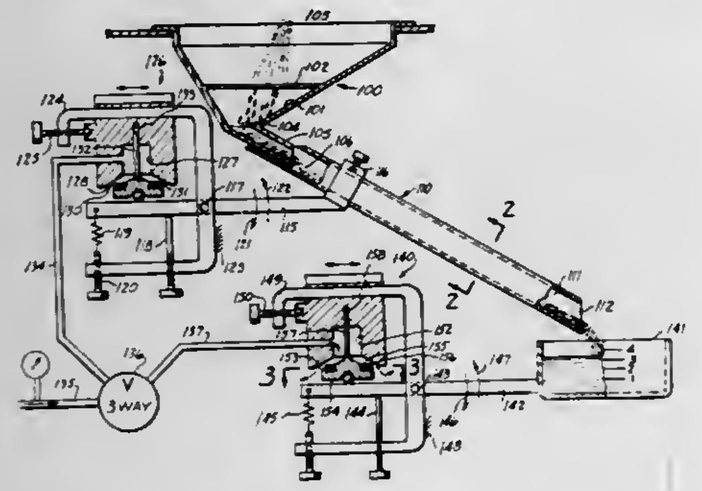
4,098,116

LIQUID FLOW AND VOLUME RECORDING APPARATUS AND METHOD

Lawrence T. Browne, Santa Barbara, Calif., assignor to Browne Engineering Corporation, Santa Barbara, Calif.

Filed Nov. 15, 1976, Ser. No. 741,795
Int. Cl.² G01G *11/06, 3/02*

U.S. Cl. 73—194 M **10 Claims**



1. In combination:

(a) apparatus for measuring the rate of liquid flow comprising: sloped channel means having an outlet and a known length, the amount of liquid in said channel means at any time being a function of the rate of flow along the channel means, deflectable beam means mounting said channel means, the weight of the channel and of liquid in the channel tending to deflect the beam in a first direction, bias means acting in a second, opposite direction, tending to resist said deflection, said bias means having a constant whereby there is a unique amount of deflection for each amount of weight in said channel means, first gauging means including a first variable orifice whose opening is proportional to said deflection, and a gauging conduit connected to said first variable orifice;

(b) apparatus for weighing liquid comprising: a container to receive liquid; deflectable beam means mounting said container, the weight of the container and of liquid in the container tending to deflect the beam in a first direction, bias means acting in a second, opposite direction, tending to resist said deflection, said bias means having a constant whereby there is a unique amount of deflection for each amount of weight in said container, second gauging means including a second variable orifice whose opening is proportional to said deflection, and a second gauging conduit connected to said variable orifice;

(c) fluid supply means for supplying fluid at a regulated delivery pressure; and

(d) selector valve means so disposed and arranged as selectibly to connect either one of said gauging conduits to said fluid supply means, the pressure in said gauging conduits being variable as a function of variation in size of the respective variable orifice, the variation in size of the first variable orifice as a consequence of liquid on said channel means providing means for measuring the amount of said liquid on the channel means, and the variation in size of the second variable orifice as a consequence of liquid in the container providing means for measuring the amount of said liquid in the container, said selector valve means enabling either of said means for measuring selectively to be employed.

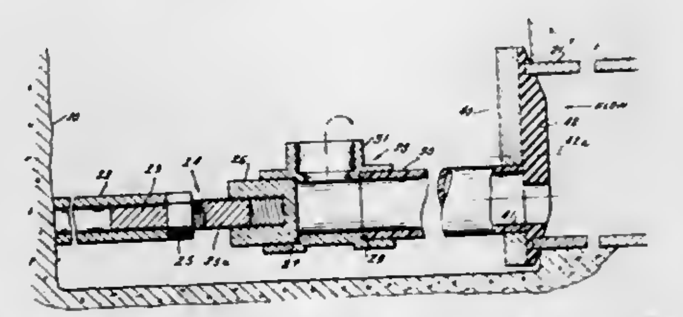
4,098,117

OPEN CHANNEL FLOW TRANSDUCER FOR SEWERAGE SYSTEM

Joseph Baumoel, 107 Columbia Dr., Jericho, Long Island, N.Y. 11753

Filed Apr. 29, 1977, Ser. No. 792,103
Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **10 Claims**



1. A flow transducer for a sewerage system; said flow transducer comprising, in combination: a flow tube; connection means connected to one end of said flow tube for connecting and sealing said flow tube to the interior of a horizontal and relatively large diameter sewer pipe; flow discharge means connected to the opposite end of said flow tube for discharging liquid flow from said flow tube at a height vertically above said flow tube, thereby to insure that said flow tube is filled with liquid; and ultrasonic flow measuring means connected to said flow tube for measuring the flow of liquid therethrough; said sewer pipe comprising the influent sewer pipe disposed to discharge liquid into a manhole; said transducer being removably fixed within said manhole; said connection means comprising a seal securable across the end of said influent sewer pipe, which seal contains an opening in communication with said flow tube; and pressure means connected to said opposite end of said flow tube for applying pressure between the interior wall of said manhole and said flow tube to press said seal into contact with said influent sewer pipe.

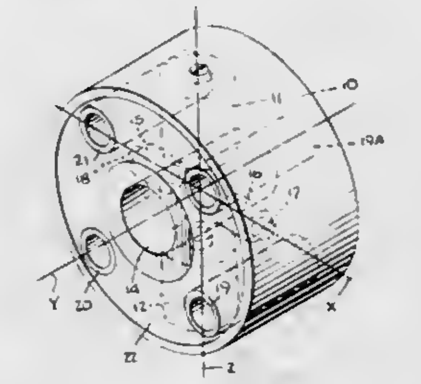
4,098,118

UNITARY ELECTROMAGNETIC FLOWMETER

Roy F. Schmoock, Richboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Feb. 23, 1977, Ser. No. 771,420
Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **14 Claims**



1. An electromagnetic flowmeter unit comprising:

A a cylindrical ring of ferromagnetic material.

B a pair of electromagnets each having a coil wound about a ferromagnetic core attached at one end to the ring, the electromagnets being positioned with their cores extending along a diametrical axis at right angles to the longitudinal axis of the ring, the ring acting as a magnetic return path with respect to the electromagnets;

C an annular pressure vessel formed of insulating material molded within the ring and having a central flow passage through which the longitudinal flow axis extends, said vessel encapsulating the electromagnets, said ring also acting to reinforce said pressure vessel; and

D a pair of electrodes embedded in said pressure vessel at diameterically-opposed positions with respect to said flow passage along a transverse axis which is perpendicular both to sid diametrical axis and to said longitudinal axis.

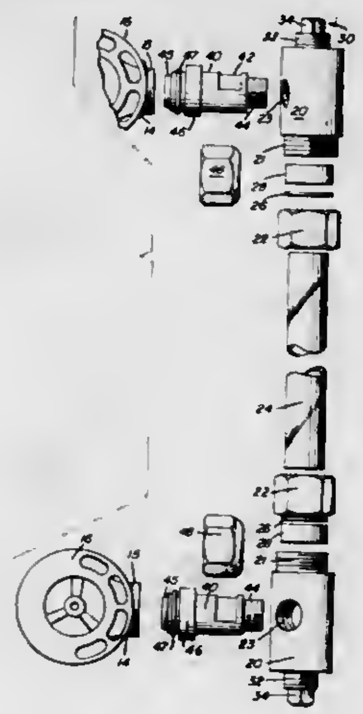
4,098,119

SIGHT-GLASS ADAPTER

William H. Coats, 2323 Webster, Woodward, Okla. 73801

Filed Jul. 27, 1976, Ser. No. 709,162
Int. Cl.² G01F *23/02*

U.S. Cl. 73—323 **1 Claim**



1. A sight-glass adapter unit comprising; a main body member of tubular shape, a central opening extending longitudinally of the main body member and opening to each end thereof, one end of the opening for alignment with the end of a sight glass, means associated with this end of the main body for retaining in liquid tight manner the end of a sight glass fastened to this end portion, the other end of the main body member having a removable closure means associated therewith, and additional means for connecting the main body member to a valve on a vessel on which the sight glass is to be used, the means associated with the end of the sight glass for retention thereof including a threaded projection on the one end of the main body member, a flexible and resilient sealing member engageable around the tip of the sight glass, and a removable nut with a central aperture just slightly larger than the circumference of the sight glass and threaded for tightening on the threaded projection of the main body member for compressing the resilient seal member to form a liquid tight seal, the removable closure means for the other end of the main body member consisting of a threaded plug member with wrench engaging projection thereon for reception in a threaded aperture in the main body member, the additional means for connecting the main body member to an existing valve consisting of an elongated secondary body member separate from the main body member and having a threaded projection at one end thereof for reception in a threaded side aperture in the main body member and permitting attachment and removal of the main body member to the valve with the liquid tight seal of the sight glass intact, a central aperture extending through the secondary body member for permitting liquid flow therethrough, a valve engaging projection on the other end of the secondary body member, a retaining collar provided thereon, sealing means provided thereon, and a retaining nut for association with the collar and the existing valve to retain the secondary body member in liquid tight engagement with the valve, the retaining nut being spaced from the main body member and the secondary body member having provided thereon a wrench engaging slot disposed between the nut and main body member for facilitating mounting and removal of the secondary body member.

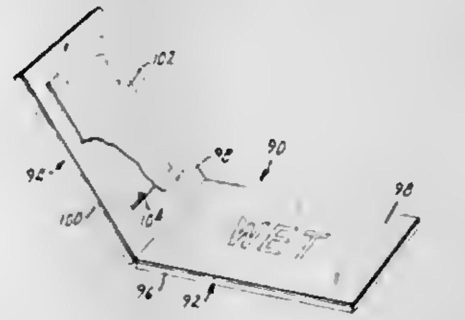
4,098,120

HUMIDITY INDICATING METHOD AND DEVICE

Wendell J. Manske, Birchwood Village, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 6, 1975, Ser. No. 584,472
Int. Cl.² G01W *1/00*

U.S. Cl. 73—335 **12 Claims**



1. A device for indicating a humidity history comprising, in combination, a porous pad containing a deliquescent compound, an elongated wick capable of wicking liquid from said pad, and means for directing migration of available liquid in said pad through said wick to provide a visible, migrating front of liquid in said wick.

4,098,121

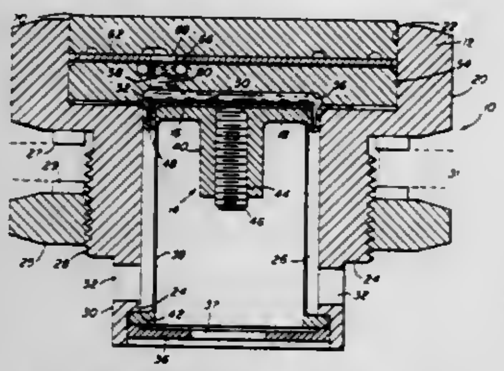
HUMIDITY INDICATOR

Khushroo M. Captain, Cambridge, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Apr. 8, 1977, Ser. No. 786,006

Int. Cl.^{2} G01N *19/10*

U.S. Cl. 73—337 **10 Claims**



1. A humidity indicator comprising:
(a) a housing formed with a cavity;
(b) sensing element means constrained within said cavity for movement relative to said housing, said sensing element means composed of a material that changes dimensionally in response to humidity variations, said sensing element having a head that is formed with a through hole;
(c) a flexible diaphragm captively held within said cavity in contact with said head;
(d) an adjusting member received within said hole, said adjusting member configured to move said flexible diaphragm;
(e) first plate means received within said cavity, said first plate means formed with an opening on one face thereof, said flexible diaphragm disposed between said head and said first plate means, a reservoir formed between said first plate means and said flexible diaphragm;
(f) second plate means formed with a capillary groove, said first plate means and said second plate means formed with a port interconnecting said reservoir and said capillary groove; and
(g) a transduction fluid within said reservoir constrained to flow within said capillary groove when the volume of said reservoir changes as a result of movement of said flexible diaphragm in response to dimensional changes in said sensing element due to variations in humidity.

4,098,122

TEMPERATURE PROBES

Brice Charles Landman, Figtree Heights; Granville Sykes, Keiraville, and Thien Siung Yang, Mt. Ousley, all of Australia, assignors to The Broken Hill Propietary Company Limited, Melbourne, Australia

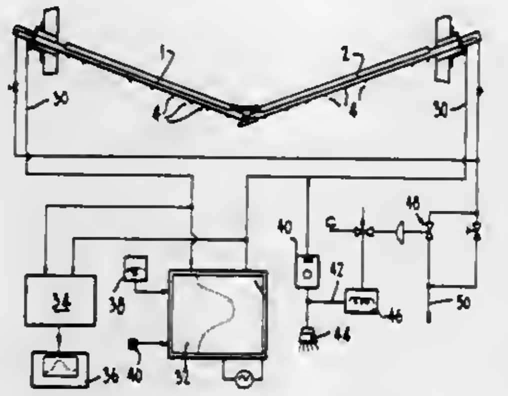
Filed Jul. 30, 1976, Ser. No. 710,308

Claims priority, application Australia, Aug. 5, 1975, 2656

Int. Cl.^{2} G01K *13/12*

U.S. Cl. 73—341 **7 Claims**

1. An improved probe for monitoring physical and/or chemical properties such as temperature and chemical composition of a material in a blast furnace in which the material profile is substantially a shallow V-configuration, comprising an elongate probe member supporting a plurality of sensing and/or collecting devices spaced along its length, said elongate probe member comprising two hollow support members pivoted together at one end and adapted to be mounted at their free ends, means for securing said free ends of said hollow support members to said blast furnace at diametrically opposed positions, said securing means and said elongate member being constructed and arranged so that, in use, said elongate member adopts a position which substantially corresponds to the shallow V-configuration of the profile of the material in the blast furnace whereby the member is at about the same distance from the surface of the material along its length, and means extending between said pivoted ends and engaging same to prevent pivotal movement beyond an angle in which the tube adopts a disposition generally corresponding to said shallow V-configuration.



4,098,123

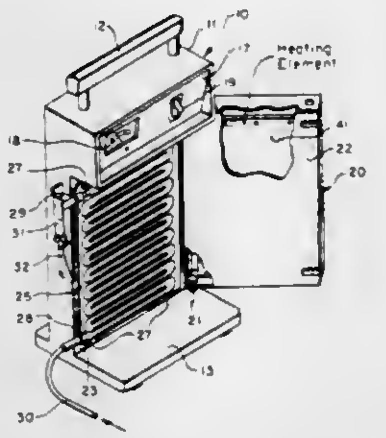
METHOD AND APPARATUS FOR MEASURING THE OPERATING TEMPERATURE OF BLOOD WARMING APPARATUS

Daniel B. Granzow, Jr., Arlington Heights, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 24, 1977, Ser. No. 761,924

Int. Cl.^{2} G01K *1/14*

U.S. Cl. 73—343 R **8 Claims**



1. Temperature measuring apparatus for use in conjunction with a thermometer for measuring operating temperature in fluid warming apparatus of the type which warms fluid as it passes through a disposable warming bag, and which includes a housing defining a heating chamber for containing the warming bag, and a door providing access to the chamber, a first heating plate on the inside surface of the door, and a second heating plate underlying the door, said temperature measuring apparatus comprising, in combination:
- a thermally-conductive block member having mounting means for receiving said thermometer and establishing thermal communication therewith, and first and second surfaces on opposite sides thereof, said first surface being adapted to engage in abutting relationship one of said heating plates; and
- insulating means including a layer of thermally-insulating material on said second surface whereby said block is thermally isolated from the other of said heating plates and said thermometer reads only the temperature of said one plate.

4,098,124

METHOD FOR MANUFACTURING THERMOMETERS AND A THERMOMETER MANUFACTURED ACCORDING TO THE METHOD

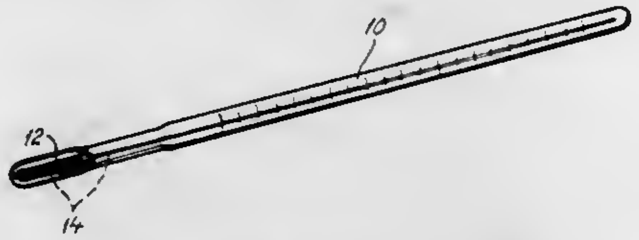
Klas Torsten Hjalmar Tardelius, Heleneborgsgatan 17, Stockholm, Sweden (S-117 81)

Continuation of Ser. No. 615,905, Sep. 23, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,412

Claims priority, application Sweden, Sep. 26, 1974, 7412099

Int. Cl.^{2} G01K *1/00*

U.S. Cl. 73—371 **3 Claims**



1. The method for manufacturing thermometers, obviating post-calibtation of the thermometer, comprising the steps of:
- a. producing graded capillary tubes from a material such as glass, plastic, or the like and determining the internal volumes thereof as a function of graded lengths in relation to a bulb measurement of 1.0 equal to a predetermined standard bulb volume;
- b. providing predetermined graduated temperature scales along the graded lengths of the capillary tubes;
- c. producing bulbs from a material compatible to that from which said graded capillary tubes are produced for connection to the tubes and for containing a liquid medium such as mercury, or the like, which, when subject to temperature changes reflect temperature changes, measuring the internal volumes of the bulbs in order to ascertain relationships within 0.01 to said bulb measurement of 1.0;
- d. matching the internal volumes of the bulbs and the capillary tubes according to the formula:

$$\frac{\text{Graded length for } 100^\circ}{\text{Capillary tube [No.] graded length}} = \text{Bulb [vol.] volume relationship within 0.01 to said bulb measurement of 1.0}$$

in which the capillary tube graded length is obtained for a given bulb volume, or vise versa, thus obviating calibration of the thermometer;
- e. connecting the matched bulbs and graded capillary tubes for producing thermometers without requiring post-adjustment of the graduated temperature scales.

4,098,125

ADJUSTABLE VOLUME PIPETTING DEVICE

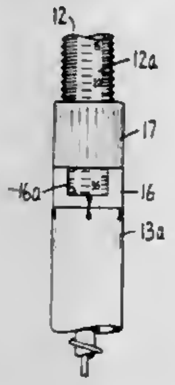
Thomas E. Lee, 3938 Canyon Rd., Lafayette, Calif. 94549

Filed Mar. 30, 1977, Ser. No. 783,051

Int. Cl.^{2} B01L *3/02*

U.S. Cl. 73—425.6 **4 Claims**

1. An adjustable volume pipetting device comprising:
- a barrel assembly including an elongated barrel having an outer thread and a scaled surface, a sleeve threadably engaged with said barrel and axially adjustable thereon by relative rotation between said barrel and sleeve, a tubular stop coaxially mounted relative to said sleeve and axially movable therewith, a capillary tube coaxially mounted relative to said barrel and sleeve at one end of the device, a slip ring axially slidable on said barrel adjacent one end of said sleeve, said slip ring having a window through which the scaled surface of said barrel may be viewed, and a lock nut threadably engaged with said barrel and axially adjustable thereon by relative rotation between said barrel and nut;
- a plunger assembly carried in part within the barrel assembly including a reciprocating plunger and plunger wire, said plunger wire extending through said tubular stop and into said capillary tube;
- and stop means engageable with said tubular stop while said plunger wire is being moved in said capillary tube;



whereby the length of said plunger wire stroke is adjustably set by selectively positioning the tubular stop relative to the barrel by reference to said scaled surface and slip ring, the axial position of said plunger wire within said capillary tube being fixed for each position of sleeve adjustment when said stop means contacts said tubular stop.

4,098,126

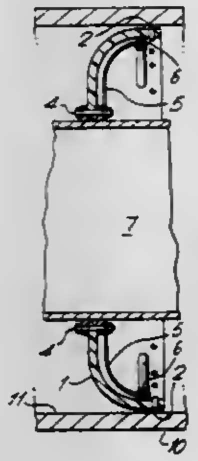
NON-DESTRUCTIVE TESTING OF PIPELINE

David Campbell Howard, Fritchley, England, assignor to British Gas Corporation, England

Filed Apr. 4, 1977, Ser. No. 784,614

Int. Cl.^{2} G01B *5/28*

U.S. Cl. 73—432 R **5 Claims**



1. A pig having at least one driving elastomeric cup member which is reacted upon by the pressure of the fluid flowing in a pipeline, wherein the improvement comprises at least one further elastomeric cup mounted upon the pig, the cup being an annular ring of elastomeric material having an inner ring for fixing onto a pig body, a lip portion on the outer periphery of the ring which houses sensors for detecting defects in a pipeline, the sensors being mounted in the lip and being urged radially outward from the inner ring by spring members fixed to the cup close to the inner ring and extending close to the sensors, so arranged that when the pig is located in a pipeline the sensors are in slidable contact with the internal surface of the pipe.

4,098,127

BALANCING METHOD FOR USE IN MULTIPLE-SPAN ROTOR SHAFT SYSTEM AND BALANCING SYSTEM USING SAME

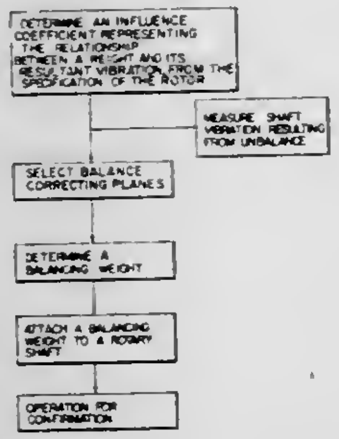
Motohiro Shiga, Hitachi; Fumio Fujisawa, Mito; Kazuo Sato, Kitaibaraki; Kouki Shiohata, Hitachi; Masakazu Takasumi, Ibaraki, and Tsuguaki Koga, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 30, 1976, Ser. No. 728,183

Claims priority, application Japan, Apr. 12, 1976, 51-41153

Int. Cl.² G01M *1/16*

U.S. Cl. 73—462 **9 Claims**


DETERMINE AN INFLUENCE COEFFICIENT REPRESENTING THE RELATIONSHIP BETWEEN A WEIGHT AND ITS RESULTANT VIBRATION FROM THE SPECIFICATION OF THE ROTOR
MEASURE SHAFT VIBRATION RESULTING FROM UNBALANCE
SELECT BALANCE CORRECTING PLANES
DETERMINE A BALANCING WEIGHT
ATTACH A BALANCING WEIGHT TO A ROTARY SHAFT
OPERATION FOR CONFIRMATION

1. A balancing method for a multi-rotor shaft comprising the steps of measuring initial vibration amplitudes at at least one desired vibration measuring point on the shaft; determining influence coefficients representative of vibration amplitudes at the at least one vibration measuring point when a unit weight is attached to at least one predetermined balancing plane on said shaft; and determining at least one correction weight so as to reduce the values of residual vibration amplitudes at the at least one measuring point; the values of the residual vibration amplitudes being dependent on the initial vibration amplitudes, influence coefficients and the at least one correction weight on the at least one balancing plane; wherein the step of determining influence coefficients includes determining the influence coefficients for different measuring conditions; and the step of determining the at least one correction weight includes determining the at least one correction weight by the method of least squares so as to minimize the sum of squares of the residual vibration amplitudes.

4,098,128

METHOD OF AND APPARATUS FOR MONITORING SLAG THICKNESS IN REFINING CRUCIBLE

Jean Baumert, Esch, Alzette, Luxembourg, assignor to ARBED — Aciéries Réunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Oct. 29, 1975, Ser. No. 626,871

Claims priority, application Luxembourg, Oct. 31, 1974, 71228

Int. Cl.² G01N *29/00;* G01F *23/28*

U.S. Cl. 73—591 **15 Claims**

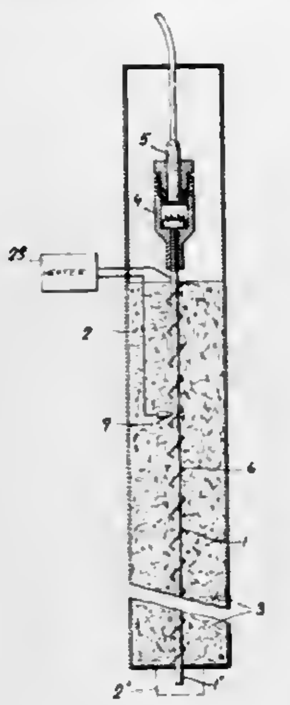
1. In combination with a refining crucible holding a spongy slag-topped oxygen-refined iron melt, an apparatus for monitoring the spongy slag thickness during the refining operation in said crucible, said apparatus comprising:

an elongated acoustic tube having a predetermined resonant frequency and one end close to said slag and another end remote from said slag,

means including a microphone at said end of said tube remote from said slag for detecting sound passing from said slag through said tube and converting said sound into an electrical signal,

filter means connected to said microphone for linearizing said signal substantially in the range of said resonant frequency, and

electrical heater means connected to said tube for continuously maintaining same at a temperature above ambient temperature.



4,098,129

NON-DESTRUCTIVE TESTING OF MATERIALS USING ULTRASONIC WAVES

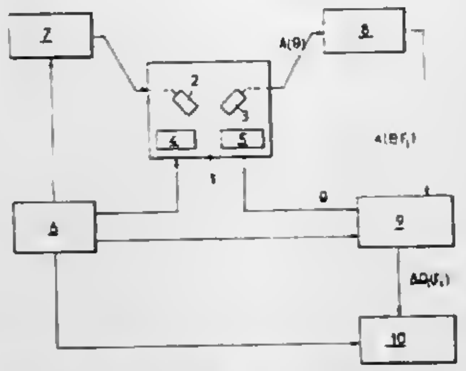
Marie-Claude Deblaère, Paris; Alain Lambert, Creil, and Christian Flambard, Gagny, all of France, assignors to Centre Technique des Industries Mecaniques, Senlis, France

Filed Nov. 18, 1976, Ser. No. 742,902

Claims priority, application France, Nov. 20, 1975, 75 35448

Int. Cl.² G01N *29/00*

U.S. Cl. 73—599 **12 Claims**



1. A method for obtaining and displaying the variations of hardness of a hardened layer at the surface of a steel material comprising the steps of:

directing an incident beam of ultrasonic waves onto the surface of said material at varying angles of incidence and wave lengths of said waves;

detecting, for each of said wave lengths, the critical angle for the corresponding Rayleigh waves, said critical angle being equal to the angle of incidence at which the energy of the reflecting beam passes through a minimum and used to examine variations in the depth of the hardened structure;

displaying the variations of said critical angle as a function of frequency.

4,098,130

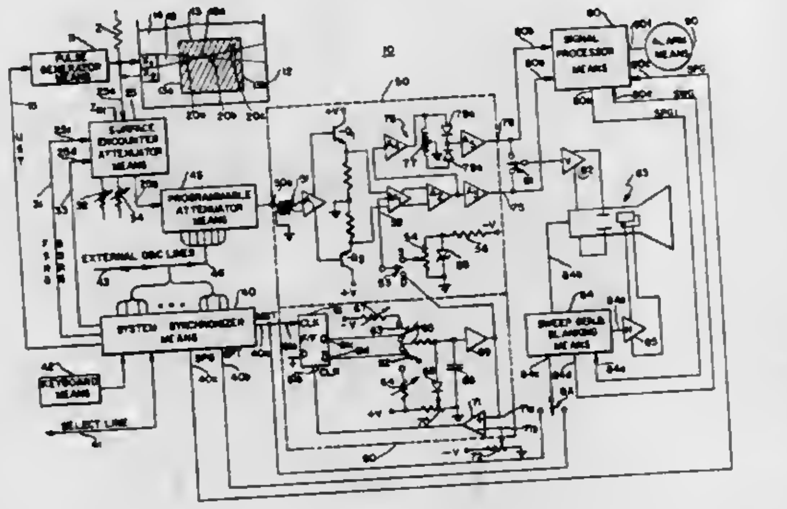
ENERGY REFLECTION FLAW DETECTION SYSTEM

William N. Coffey, Ballston Lake; George Jernakoff, Loudonville, both of N.Y., and John R. Zurbrick, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,589

Int. Cl.² G01N *29/04*

U.S. Cl. 73—614 **14 Claims**


PULSE GENERATOR MEANS
SURFACE ENCOUNTER ATTENUATOR MEANS
PROGRAMMABLE ATTENUATOR MEANS
EXTERNAL OSC LINES
SYSTEM SYNCHRONIZER MEANS
KEYBOARD MEANS
SELECT LINE
SIGNAL PROCESSOR MEANS
ALARM MEANS
SWEEP SCALE BLANKING MEANS
10
12
50
80
82
83
85

1. An energy reflection flaw detection system for analyzing an object, comprising:

means for generating a pulsed beam of energy toward and through said object;

means for converting energy reflected from front and back surfaces of and flaws within said object into an electrical signal;

system synchronization means having high stability and resolution for generating a plurality of system timing signals each independently variable with respect to the time at which the energy pulse is generated;

first means enabled by at least one of the timing signals generated by said system synchronizer means for controllably highly attenuating at least one portion of said signal due to energy reflected by at least one of the back and front surfaces of said object, said first means transmitting another portion of said signal occurring between said front and back surface reflection signals with variable and relatively low attenuation;

second means coupled to said first means for amplifying the attenuated signal;

third means coupled to said second means for processing said signal responsive to a selected pair of said timing signals to determine the magnitude of at least one flaw within said object and received during a time interval between said pair of timing signals; and

fourth means for performing an alarm function if the magnitude of the signal responsive to a flaw is greater than a predetermined set of flaw conditions.

4,098,131

METHOD AND APPARATUS FOR INCREASING THE SPEED OF ULTRASONIC PULSE-ECHO TESTING

Peter Renzel, Düren, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Jan. 31, 1977, Ser. No. 763,865

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646541

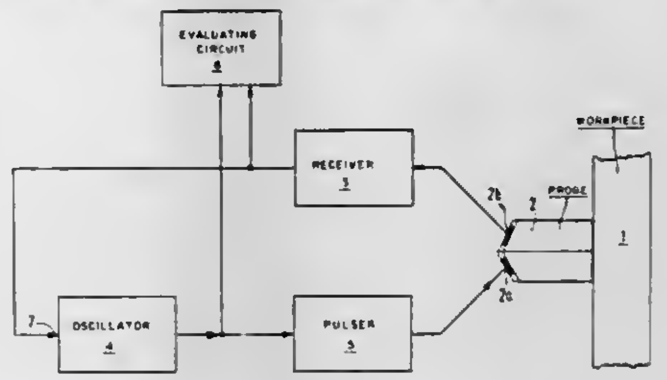
Int. Cl.² G01N *29/04*

U.S. Cl. 73—627 **5 Claims**

1. The method of testing a workpiece by the ultrasonic pulse-echo technique comprising:

periodically generating an electrical transmit pulse signal;

applying said transmit pulse signal to an electroacoustic probe which is acoustically coupled to the surface of a workpiece for causing said probe to transmit in response to the receipt of a respective transmit pulse signal an ultrasonic search signal into the workpiece and to subsequently receive echo responsive acoustic signals arising from said search beam intercepting an acoustic discontinuity in the workpiece, and said probe producing corresponding echo responsive electrical signals, and



inhibiting generating an electrical transmit pulse signal for a predetermined time interval responsive to the receipt at said probe of an echo responsive electrical signal exceeding a predetermined threshold amplitude value.

4,098,132

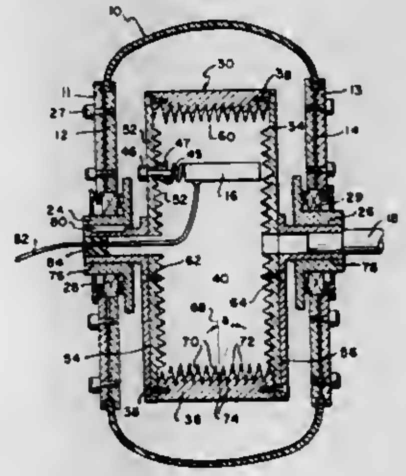
ULTRASONIC SEARCH WHEEL PROBE

Charles R. Mikesell, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1977, Ser. No. 825,502

Int. Cl.² G01N *29/04*

U.S. Cl. 73—639 **11 Claims**



1. In an ultrasonic search wheel probe having an ultrasonic transducer positioned inside a balloon tire filled with a fluid, the tire and fluid coupling the sound from the transducer to an object being examined, the improvement in the probe for reducing undesirable reflections comprising:

a liner whose inner walls are serrated and within which is positioned the transducer, said liner being mounted in said probe inside the wheel, said liner having an aperture through which said transducer is capable of directing ultrasound and receiving ultrasound.

4,098,133

VIBRATING DIAPHRAGM FLUID PRESSURE SENSOR DEVICE

Richard H. Frische, Phoenix, Ariz., and Timothy T. Maxwell, London, England, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,223

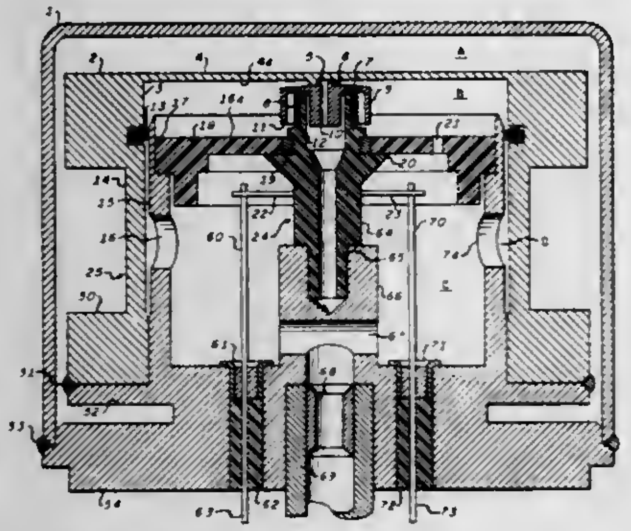
Int. Cl.² G01L *9/14*

U.S. Cl. 73—702 **13 Claims**

1. In fluid pressure measuring apparatus of the kind including a vibratable common wall disposed between first and sec-

ond chambers, at least said first chamber being adapted for coupling to a source of fluid pressure for providing a differential pressure acting across said vibratable common wall, said vibratable common wall having a resonant frequency changing in accordance with changes in the differential pressure acting thereupon, means responsive to vibration of said vibratable common wall for driving same over a predetermined range of operating frequencies and for providing an output signal corresponding thereto, the improvement comprising:

rigid wall means affixed within said first chamber for dividing said first chamber into first and second cavity means, said first cavity means being bounded in part by said vibratable common wall,



said second cavity means being adapted for coupling to said source, and

restricted orifice means for mutually coupling said first and second cavity means through said rigid wall means whereby pressure variation frequencies below a predetermined frequency are coupled into said first cavity means to act upon said vibratable common wall, whereas pressure variation noise frequencies above said predetermined frequency are excluded by said first and second cavity means and by said restricted orifice means from acting upon said vibratable common wall.

4,098,134

DEVICE FOR MOVING CURVED PLATE BENT IN A SUBSTANTIALLY ARCUATE-SHAPE

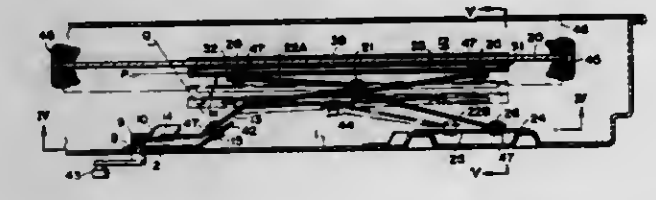
Osamu Kondo, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 14, 1976, Ser. No. 676,960

Claims priority, application Japan, Jul. 25, 1975, 50-91384

Int. Cl.^{2} F16H *21/18*

U.S. Cl. 74—45 **8 Claims**



1. A device for moving a curved plate of uniform curvature along a curved path comprising:

(a) a base panel;

(b) curved plate holding means for holding said curved plate disposed in substantially parallel relation and predetermined spaced relation with said base panel;

(c) a rotary shaft rotatably mounted on said base panel;

(d) a pivot shaft mounted on said base panel with the axis thereof inclined at a predetermined angle with the axis of said rotary shaft, said axis of the pivot shaft as extended making an acute angle with said curved plate holding means wherever the holding means is positioned along its traveling path;

(e) arm means pivotably mounted at an intermediate portion thereof on said pivot shaft and having a distal end portion bent substantially parallel to said curved plate holding means;

(f) rotation transmission means for transmitting the rotation of said rotary shaft to the end of said arm means opposite to said distal end thereby causing swinging movement of said arm means around said pivot shaft;

(g) a guide pin fixed substantially upright on said bent end portion of the arm means;

(h) arm bracket means secured to said curved plate holding means and having an elongated guide slot for receiving said guide pin on said arm means to permit only lateral sliding movement therethrough; and

(i) curved plate guiding means for guiding the curved plate along a predetermined curved path defined thereby,

whereby as said arm means rotates, said curved plate holding means is adapted to move substantially parallel to the curvature of the curved plate.

4,098,135

FREE WHEELING DRIVE ARRANGEMENT FOR A TURNABLE MEMBER, ESPECIALLY FOR ADJUSTING THE POSITION OF BACKRESTS OR WINDOW PANES IN AUTOMOTIVE VEHICLES

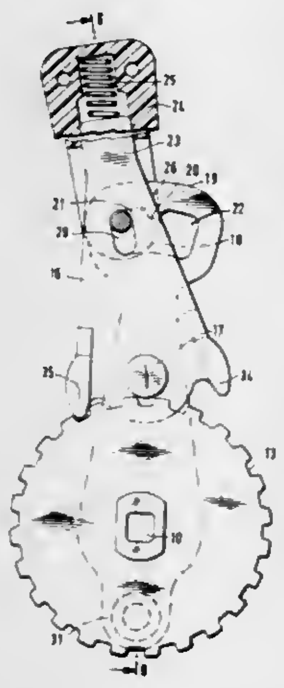
Paul Werner, Remscheid-Hasten, Fed. Rep. of Germany, assignor to Keiper K.G., Remscheid-Rasten, Fed. Rep. of Germany

Filed May 17, 1976, Ser. No. 686,956

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1975, 2526149

Int. Cl.^{2} F16H *27/00*

U.S. Cl. 74—157 **10 Claims**



1. A free wheeling drive arrangement for a turnable member, and especially for adjusting the position of a backrest and window panes in automotive vehicles, comprising, in combination, a circular adjusting member turnable about its axis; a carrier arm tiltable about said axis; a driving arm eccentrically mounted on said carrier arm for tilting movement with respect thereto between an active position in which said driving arm is tiltable in one direction relative to the carrier arm to thereby engage the turnable member and turn the latter about its axis by turning the driving arm and thereby the carrier arm in said one direction, and a free wheeling position in which said driving arm is tilted in the opposite direction relative to the carrier arm and disengaged from said turnable adjusting member; and cooperating means on said carrier arm and said driving arm for maintaining the latter in said free wheeling position during

tilting of said driving arm in said opposite direction relative to said carrier arm during turning of said driving arm and said carrier arm in said opposite direction, said adjusting member having a cylindrical surface coaxial with said axis, and said driving arm comprising at least one pressure pin fixed thereto in frictional engagement with said cylindrical surface, when said driving arm is in said active position.

4,098,136

TENSION ROLLER IN THE DRIVE MECHANISM BETWEEN A WEAVING MACHINE AND A DOBBY

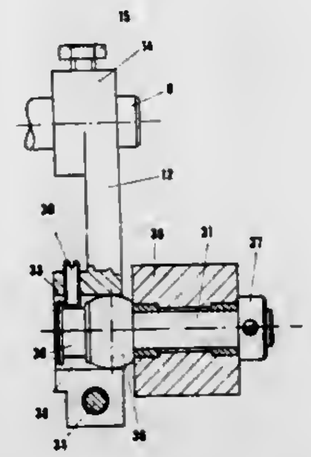
Walter Wicker, Oeberrieden, and Adolf Reisdorf, Horgen, both of Switzerland, assignors to Stanbli Ltd., Horgen-Zurich, Switzerland

Filed Jan. 6, 1977, Ser. No. 803,892

Claims priority, application Switzerland, Jun. 11, 1976, 7415/76

Int. Cl.^{2} F16H *7/10*

U.S. Cl. 74—242.15 R **12 Claims**



1. In a tension roller for an endless belt for the belt drive mechanism between a weaving machine and an attached dobby, which tension roller is rotatably supported on an axle, wherein the relative position of the axes is adjusted and secured with respect to position and direction of the axes of the driving and driven shaft within predetermined limits, the improvement comprising wherein the axle of the roller is spherically adjustably supported on a pivotal lever and has means for its adjustment and locking.

4,098,137

PULLEY AND METHOD OF MAKING SAME

Anthony P. Yaros, Pinconning, Mich., assignor to Peters Manufacturing Company, Inc., Kawkawlin, Mich.

Filed Sep. 15, 1976, Ser. No. 723,572

Int. Cl.^{2} F16H *55/44;* B21D *53/26*

U.S. Cl. 74—230.8 **27 Claims**

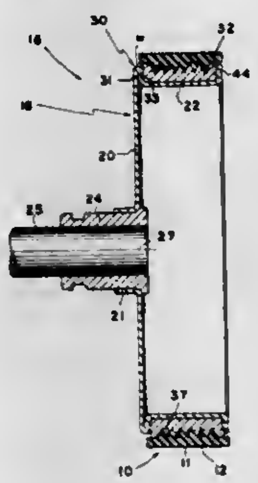
8. A rotary pulley for transmitting rotative movement between a rotatable element and a belt comprising:

a one-piece, generally cup-shaped hub having

a radially extending endwall for mounting the pulley for rotation about an axis, and

an integral, hollow cylindrical sidewall extending axially outwardly away from said endwall;

said sidewall including a radially outwardly extending, double wall thickness, annular retaining fold at the axially inner end thereof, and a radially outwardly flaring, annular retaining flange at the axially outer end of said sidewall.



4,098,138

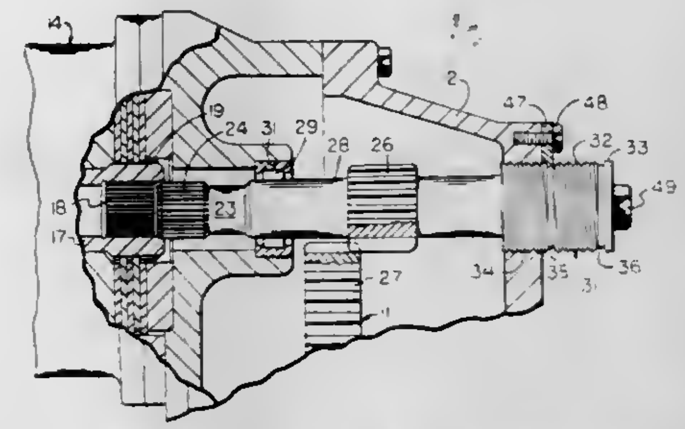
DRIVE DISCONNECT DEVICE

Calvin L. Miller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 13, 1977, Ser. No. 805,939

Int. Cl.^{2} F16H *57/00*

U.S. Cl. 74—405 **3 Claims**



1. A drive disconnect device for a power train contained within a housing and having first and second rotary members, said first member being movable between a first position at which said first and second members are engaged to transmit power therebetween and a second position at which the first member is disconnected from the second member, and said housing having a threaded bore in axial alignment with the first member, said drive disconnect device comprising:

a cylindrical cage having an outer surface, an external thread and first and second grooves formed in the outer surface, said first groove being axially spaced from said second groove, said external thread being threadably positionable within the threaded bore, said cage being rotatably connected to the first member and being of a construction sufficient for moving the first member from the second position to the first position in response to the cage being rotated in a first direction and for moving the first member from the first position to the second position in response to the cage being rotated in an opposite direction; and

a lock member detachably connectable to the housing and being engageable with the first groove at the first position of the first member and being engageable with the second groove at the second position of the first member.

4,098,139

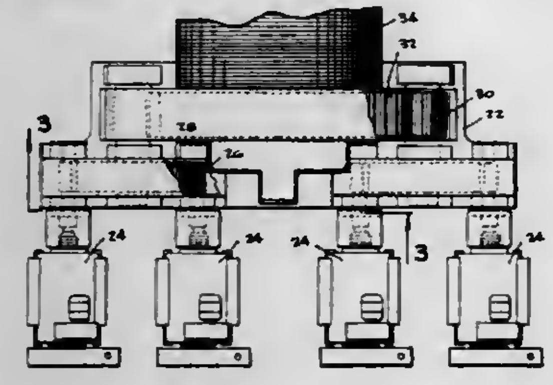
GEAR TRAIN AND METHOD OF ALIGNING COMPONENT GEARS THEREOF

Edwin W. Sankey, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Filed Dec. 15, 1976, Ser. No. 750,723

Int. Cl.² F16H *57/00*

U.S. Cl. 74—410 **5 Claims**



3. A gear assembly having a desired alignment of gears in a gear train, said gear assembly comprising a support structure having openings at predetermined locations, bearings positionable in said opening with said opening having cross sectional areas smaller than the cross sectional areas of said openings when a bearing is positioned in an opening, at least two shafts each journaled in said bearings, at least one gear journaled on each of said shafts, said shafts positioned to provide the desired clearance of said gears and alignment of said shafts, and a moldable, hardenable material filling at least a portion of the openings between said support assembly and said bearings, thereby providing a gear assembly in which the shafts may be positioned in the desired alignment without requiring accurate machining of the openings in the support structure.

4,098,140

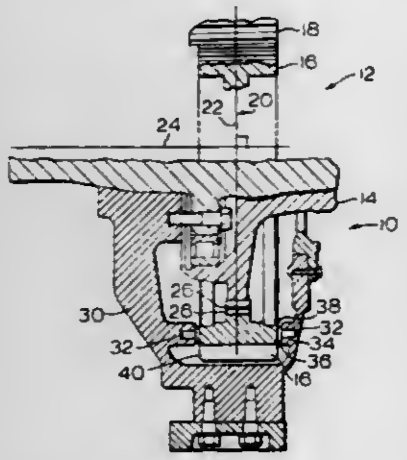
GEAR JOINT

Donald K. Strohschein, Naperville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1977, Ser. No. 779,980

Int. Cl.² F16H *55/12, 57/00, 55/30*

U.S. Cl. 74—447 **6 Claims**



1. In a gear having a hub and a peripheral toothed portion positioned about said hub for mating with an associated gear and rotating in a preselected plane, the improvement comprising:

- a joint connecting said hub and toothed portion and being of a construction sufficient for absorbing deflective motion of the hub relative to the toothed portion, said deflective motion being in a direction different than along said preselected plane; and
- at least two motion limiters each having a base and a contacting surface and being disposed in a preselected spaced relation to one of said hub and toothed portion and disposed in spaced relation therefrom.

4,098,141

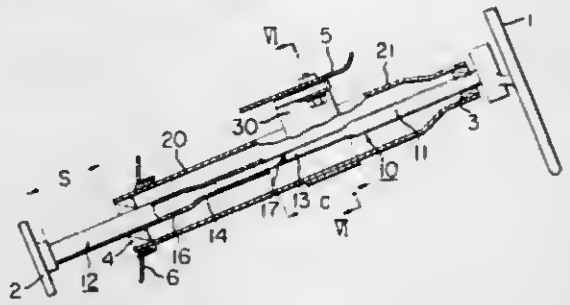
ENERGY ABSORBING STEERING ASSEMBLY

Mikio Yamaguchi, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 742,131

Int. Cl.² B62D *1/18*

U.S. Cl. 74—492 **10 Claims**



1. An energy absorbing assembly comprising a steering column and a steering shaft, the steering column being externally fitted to the steering shaft to rotatably support it and held by a vehicle body, the steering shaft consisting of an upper shaft mounting a steering wheel of the vehicle and a lowe shaft connected to a steering gear, the lower end portion of the upper shaft and the upper end portion of the lower shaft being collapsibly fitted to each other for transmissive rotation, and a projection having a spherical top surface provided in one of said upper and lower shafts at a position spaced a given distance from the end surface of the fitted portions of said two shafts, said one shaft being fitted into the other shaft.

4,098,142

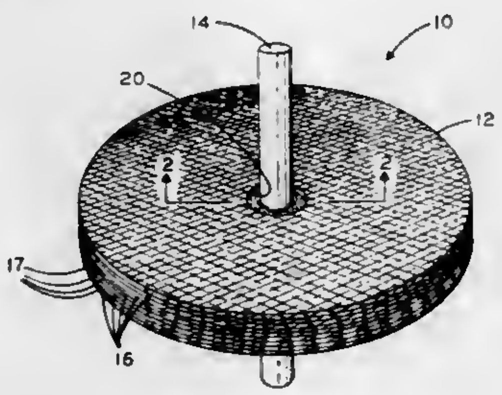
ROTATABLE MASS FOR A FLYWHEEL

George M. Weyler, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 14, 1975, Ser. No. 632,111

Int. Cl.² G05G *1/00*

U.S. Cl. 74—572 **3 Claims**



1. An improved rotatable mass for a flywheel comprising:

- a mass including a plurality of contiguous, coaxially related disks, each disk being formed of a plurality of woven fibers disposed in a plane transversely related to an axis of rotation extended through the mass, the fibers of alternate disks being continuous throughout their length; and
- a spin shaft extended through the mass in concentric relation with said axis of rotation.

4,098,143

BREATHING SYSTEM FOR AN AUTOMATIC TRANSMISSION

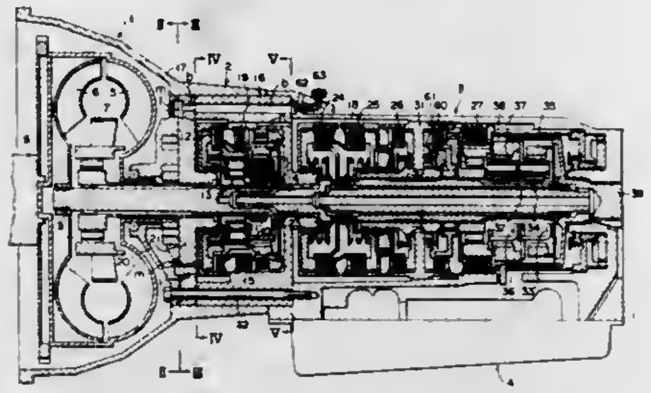
Seitoku Kubo; Kojiro Kuramochi, and Yoshio Shindo, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 25, 1977, Ser. No. 827,706

Claims priority, application Japan, Apr. 28, 1977, 52-49444

Int. Cl.² F16H *57/02;* B60K *17/02*

U.S. Cl. 74—606 R **6 Claims**



1. A breathing system for an automatic transmission which comprises a fluid torque converter, an oil pump, an overdrive means and an auxiliary gear means each having its own housing and being air-tightly connected with each other in series in said order, said system comprising a first breathing passage formed in the housing of said oil pump, a second breathing passage formed in the housing of said overdrive means and having one end connected with said first breathing passage, a third breathing passage formed in the housing of said auxiliary gear means and having one end connected with said second breathing passage and the other end opened to the atmosphere, a fourth breathing passage formed in either or both of the housings of said overdrive means and said auxiliary gear means and having one end connected with the joining region of said second and third breathing passages and extending substantially downward from said one end towards the other end thereof, and a fifth breathing passage formed in the housing of said overdrive means and having one end connected with said other end of said fourth breathing passage and the other end connected with said first breathing passage, said fifth breathing passage being positioned to be substantially lower than said second breathing passage.

4,098,144

DRIVE ASSEMBLY WITH ENERGY ACCUMULATOR

Gunter Besel, and Karl Nikolaus Regar, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 26, 1976, Ser. No. 670,590

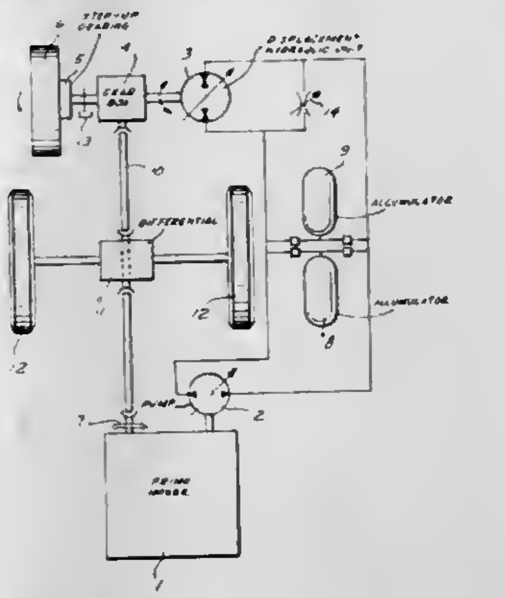
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1975, 2515048

Int. Cl.² B60K *9/04*

U.S. Cl. 74—687 **11 Claims**

1. A drive assembly for a machine having variable operating speeds, comprising

- (a) a prime mover (1),
- (b) a primary energy accumulator (6),
- (c) an output shaft (10)
- (d) a power distribution means (4) for connecting said output shaft to both said primary energy accumulator and said prime mover,
- (e) clutch means (7) for directly connecting said prime mover to said output shaft, and
- (f) a hydrostatic torque converter operatively connected between said prime mover and said power distribution means, said converter including
  - (I) a hydraulic pump (2) operable by said prime mover,
  - (II) a displacement hydraulic unit (3) operable as a pump or as a motor in each of its directions of rotation,
  - (III) means connecting said displacement hydraulic unit to said power distribution means,
  - (IV) hydraulic circuit means interconnecting said pump and said displacement hydraulic unit, and



- (V) a buffer energy accumulator (9) hydraulically connected to said displacement hydraulic unit, said buffer energy accumulator communicating with said power distribution means only through said displacement hydraulic unit.

4,098,145

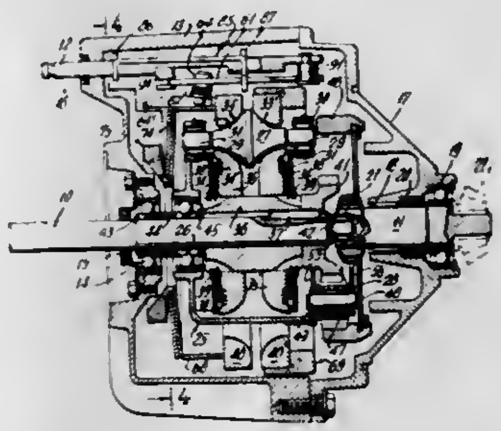
TRACTION-DRIVE TRANSMISSION

Thorn W. Dickinson, Berlin, Conn., assignor to Textron Inc., Providence, R.I.

Continuation of Ser. No. 614,606, Sep. 18, 1975, abandoned. This application Sep. 15, 1976, Ser. No. 723,603

Int. Cl.² F16H *37/06, 15/16*

U.S. Cl. 74—690 **28 Claims**



1. A transmission comprising a housing, a drive shaft and a driven shaft journaled for rotation in said housing on a common axis, a variable-ratio coupling mechanism coupling said shafts, said mechanism including reaction means having antirotational support in said housing, torsionally resilient means providing such support, whereby in reaction to increasing torsional load said mechanism will be displaced in rotation about said axis and against increasing torsional resistance by said resilient means, said mechanism further including a control member for changing the coupling ratio between said input and output shafts, and cam-operated means reacting to such displacement and including means for modifying the instantaneous control condition of said control member.

4,098,146

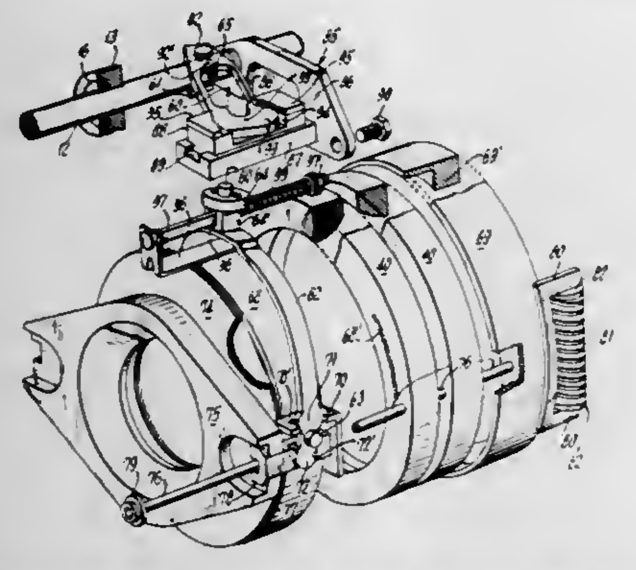
TRACTION-DRIVE TRANSMISSION

Daniel R. McLarty, Plantsville, Conn., assignor to Textron Inc., Providence, R.I.

Filed Sep. 10, 1976, Ser. No. 721,938

Int. Cl.² F16H *37/06, 15/08*

U.S. Cl. 74—690 **13 Claims**



1. A transmission comprising a housing, a drive shaft and a driven shaft journaled for rotation in said housing on a common axis, a variable-ratio coupling mechanism coupling said shafts, said mechanism including reaction means having torsionally resilient antirotational support about said axis in said housing, whereby in reaction to increasing torsional load said mechanism will be displaced in rotation about said axis and against increasing torsional resistance by said resilient means, said mechanism further including a control member for changing the coupling ratio between said input and output shafts, cam and follower elements reacting to such displacement and including a cam carried by said housing and a follower connected to said control member for modifying the instantaneous control condition of said control member, and means for varying the effective slope orientation of said cam, whereby the rate at which the coupling ratio is varied in response to load torque is a function of the instantaneous slope orientation of said cam.

4,098,147

WADDINGTON DRIVE HAVING A CAM ACTUATED BY AN INTEGRAL FLYWEIGHT

Clive Waddington, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,632

Int. Cl.² F16H *3/44*

U.S. Cl. 74—750 B **11 Claims**

1. In a stepless variable stroke drive, the combination of:

an input shaft journaled for rotation on its axis and being constructed with a radially extending flange;

a cam having a cylindrical disc mounted with its axis parallel to the axis of said shaft; said cam disc having an aperture through which said input shaft projects, said aperture permitting pivotal motion of said cam about said axis of said input shaft;

a driving connection between said cam and said input shaft, said connection comprising a pivot pin eccentrically fixed in said cam and journaled in said flange, thereby permitting the radial displacement of said disc to positions of varying eccentricity relative to the axis of the shaft;

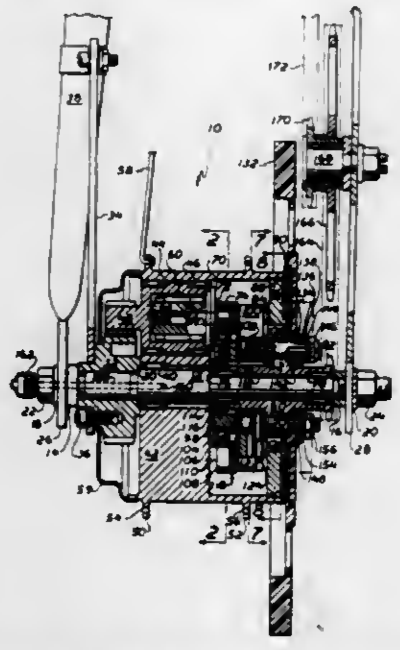
means for yieldingly biasing said cam to a given initial eccentricity;

a relatively massive flyweight integral with said disc and extending radially therefrom for urging said disc toward greater eccentricity with a torque varying as a function of the rotational speed of said input shaft;

crank means having at one end a follower engagable with said cam for pivoting cyclic movement of said follower, the length of movement of said follower being proportional to the eccentricity of said cam whereby the speed and torque ratios of said drive are varied;

an output element journaled for rotation;

means for transmitting the rotational motion of said crank means to said output element;



a counterweight having a driving connection between said counterweight and said input shaft, said connection permitting the radial displacement of said counterweight from the axis of said input shaft; and

linking means between said cam and said counterweight, said counterweight, said driving connection, and said linking means cooperating to maintain said input shaft in dynamic balance.

4,098,148

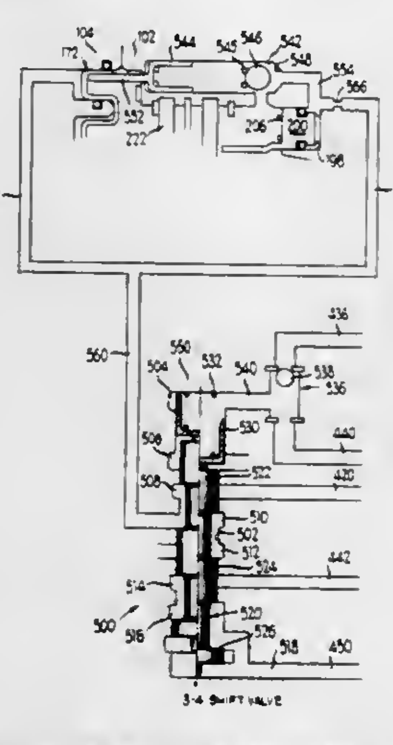
TRANSMISSION CONTROLS

Robert William Wayman, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 8, 1976, Ser. No. 748,625

Int. Cl.² B60K *41/18;* F16H *3/74*

U.S. Cl. 74—863 **7 Claims**



1. A control mechanism for an automatic transmission, said transmission including a high-speed drive section including a planetary gear set having a plurality of relatively rotating elements, a friction brake for one of said elements and a one-way clutch having a plurality of wedging means engageable between two of said elements, said clutch including a cage for said wedging means, a high-ratio shift valve in said control systems, a fluid actuated controller for said cage movable between positions where said cage is held in a controlled position and a position wherein said clutch will establish a one-to-one drive through said high-speed section, pressure signal means connected to said shift valve, said shift valve normally being urged to a position in which no fluid pressure is supplied to said controller or said brake and said clutch establishes a one-to-one ratio through said gear set, said shift valve moving in response to said pressure signal means to a position supplying pressure to said controller and said brake to hold said cage in the controlled position and engage the brake mechanism to establish a high-speed drive ratio through said high-speed section automatically, and fluid interlock means to prevent supply of pressure to said brake until said controller is in position controlling said cage.

4,098,149

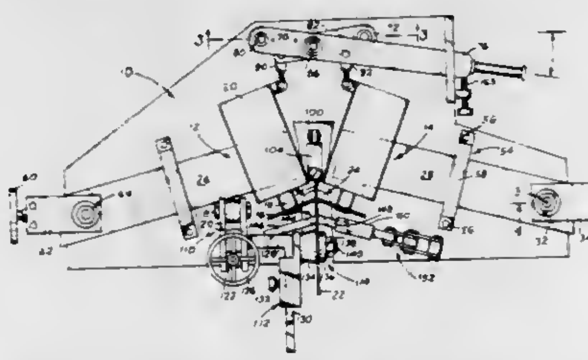
GRINDING MACHINE

James L. Wright, 81085 N. Beach Rd., Creswell, Oreg. 97426

Filed Nov. 11, 1976, Ser. No. 740,835

Int. Cl.² B23D *63/14*

U.S. Cl. 76—40 **12 Claims**



1. In a saw tooth grinding machine, means for mounting a saw with a tooth of the saw occupying a grinding station in the machine,

first and second power-driven grinding wheel means, each including a grinding wheel, and a mounting for each grinding wheel means, said mountings supporting said grinding wheel means with the grinding wheels thereof disposed in opposed relation on opposite sides of a tooth in said grinding station,

the mounting for each of said grinding wheel means including means for producing movement of the grinding wheel thereof with that part of the grinding wheel which engages a tooth occupying the grinding station moving in a curved sweep across the side of the tooth which sweep moves toward the tip of the tooth and thence toward the base of the tooth while converging on the side of the tooth.

4,098,150

CONE LOCKING SYSTEM FOR A ROTARY ROCK BIT

Samuel Lee Penny, Lancaster, and Robert Dale Clamon, Mesquite, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 24, 1977, Ser. No. 761,739

Int. Cl.² B21K *5/02*

U.S. Cl. 76—108 A **3 Claims**

1. A method of constructing a rotary rock bit, comprising the steps of:

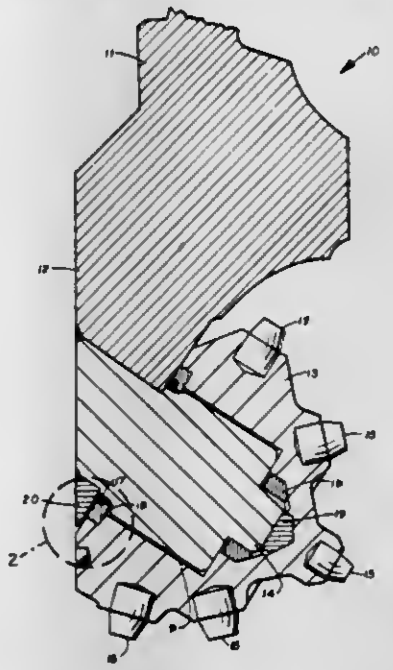
providing a rock bit arm;

providing a bearing pin, said bearing pin having a bearing section with an annular bearing surface and a mounting section with a bearing pin mounting surface;

providing a rotatable cutter having an annular bearing surface adapted to functionally interact with said annular bearing surface of said bearing section of said bearing pin;

providing an annular retainer element and an annular groove for receiving said annular retainer element, said retainer element and groove cooperating to lock said cutter on said bearing pin;

providing a mounting recess in said rock bit arm, said mounting recess having a recess mounting surface;



positioning said mounting section of said bearing pin in said mounting recess of said rock bit arm thereby forming a seam between said bearing pin mounting surface and said recess mounting surface;

directing a beam of energy into said seam; and

causing relative movement between said beam of energy and said seam to fuse said mounting surface of said bearing pin to said mounting surface of said mounting passage.

4,098,151

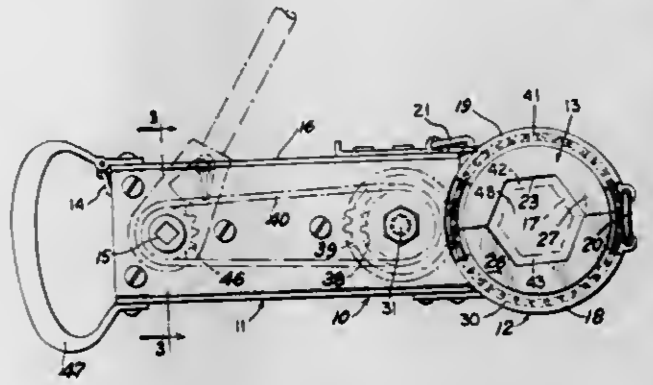
POWERED WRENCH

Gary F. Bliss, 2307 Union Ave., Wesleyville, Pa. 16510

Filed Aug. 17, 1977, Ser. No. 825,303

Int. Cl.² B25B *17/00*

U.S. Cl. 81—57.3 **10 Claims**



1. A wrench comprising,

a body,

a guide supported on the body,

a socket rotatably supported on the guide,

a drive gear supported in the said body,

drive means supported adjacent said drive gear,

a socket drive gear rotatably supported in said body adjacent said guide,

a drive chain engaging said drive gear and said socket drive gear,

a socket gear rigidly attached to said socket drive gear,

a socket chain fixed to the outer periphery of said socket,
said socket having a non-circular opening therein,
said socket comprising a first part and a second part,
teeth on said socket gear engage said socket chain around said socket whereby when the driving means rotates the drive gear, the drive chain moves revolving the socket drive gear which turns the socket gear which rotates the socket.

4,098,152
CHUCK KEY

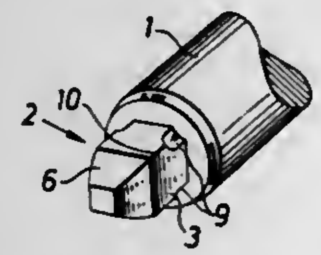
Åke Lennart Jonsson, Backavagen 17 G, S-641 00 Katrineholm, Sweden

Filed Dec. 8, 1976, Ser. No. 748,529

Claims priority, application Sweden, Dec. 9, 1975, 7513838

Int. Cl.^{2} B23B *31/06*

U.S. Cl. 81—90 A **2 Claims**



1. A chuck key for operation of a chuck formed of an axially extending hole with one or more peripheral contact surfaces, comprising:

a key shaft having a handle at one end and a flat outer extremity provided with an annular peripheral chamfer;

a key head integral with said key shaft terminating at the outer extremity thereof in a polyhedral end portion having a plurality of uniform substantially flat engagement surfaces extending peripherally thereabout for cooperation with the contact surfaces of the chuck and a plurality of flat surfaces equal in number to the engagement surfaces respectively constituting extensions of said engagement surfaces directed axially away from said key shaft and inclined toward the center line of said key shaft,

each of the edges between adjacent flat engagement surfaces being in part bevelled radially inwardly toward the axis of said key shaft, said bevels being restricted to the portions of the edges adjacent the juncture of said key head with said key shaft and cooperating with said inclined surfaces to permit automatic release of said key from the chuck when the axis of said chuck and said key are at an angle with respect to each other.

4,098,153
MACHINING METHOD

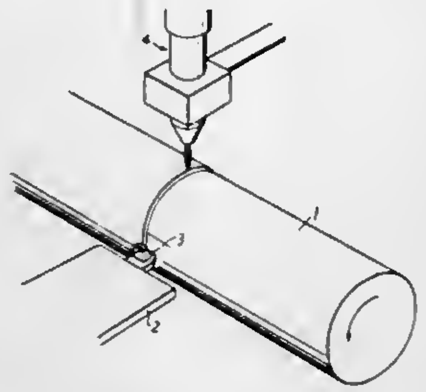
William Thomas Clark, Birstall, and Edward Colin Partington, Buckminster, both of England, assignors to The Products Engineering Research Association of Great Britain, Melton Mowbray, England

Continuation of Ser. No. 225,925, Feb. 14, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,821

Int. Cl.^{2} B23B *1/00;* **B23C** *1/00*

U.S. Cl. 82—1 C **3 Claims**

1. In a method of hot-machining metallic workpieces with a heat-resistant cutting tool including the steps of subjecting successive areas of that workpiece to be machined to intense localized heating with a plasma gas from a transferred arc plasma torch to render said areas malleable, then machining said malleable areas with said heat-resistant cutting tool, the improvement comprising providing pure argon gas as said plasma gas, and adjusting the electrical power input to said plasma gas within an operation range up to 10 kilowatts so as to selectively and successively locally heat said areas to be machined immediately prior to said machining, whereby said argon gas precludes deleterious workpiece surface side effects and permits low electrical power and gas flow rates.



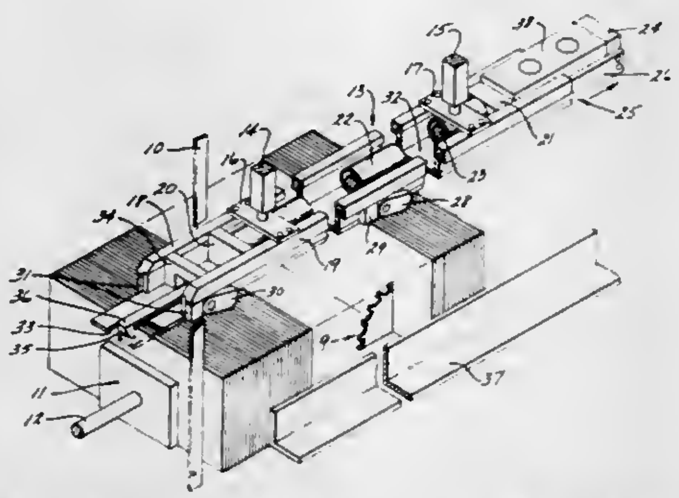
4,098,154
SAFETY END OF RUN FEEDER

David L. Whitten, Grand Rapids, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 7, 1977, Ser. No. 813,644

Int. Cl.^{2} B26D *3/14*

U.S. Cl. 83—5 **7 Claims**



1. Apparatus for moving groups of corrugated partition strips that are cut to length sideways through a notching saw area, comprising:

a generally horizontal arm extending in overlying relationship to said groups of partition strips;

a downwardly extending, spring-mounted, catch mounted adjacent the forward end of said arm for serving as a means to retain any group of strips that have passed under the end of the arm in generally compacted order without permitting fall-back;

a horizontally reciprocable slide mounted on said arm;

first pivotal latch means mounted adjacent the forward end of said slide, said first pivotal latch means being pivotally retracted when overlying said groups of strips and downwardly extending when moved by said slide beyond the forward end of said arm.

4,098,155
SELF-COMPENSATING SCORING HEAD

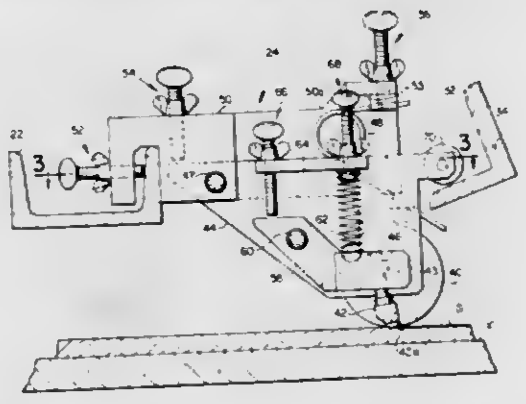
Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed Sep. 17, 1976, Ser. No. 725,090

Int. Cl.^{2} B26D *3/08*

U.S. Cl. 83—8 **2 Claims**

1. Apparatus for scoring sheet material laid on a table, said apparatus comprising bridge means extending across the table above the sheet surface to be scored and including guide rail means, a trolley structure movably mounted on said guide rail means and adapted to traverse the table, a jump wheel, first lever means pivotally mounting said jump wheel in said trolley structure so that said wheel rolls along the sheet surface to be scored, first biasing means urging said wheel toward the sheet surface, a scoring tool adjacent said jump wheel, second lever means pivotally mounting said scoring tool to said first lever means, second biasing means acting between said first and second lever means to urge said scoring tool downwardly toward said sheet surface with a force independent of pivotal motion of the jump wheel as the trolley traverses the table, a return spring located at one side of said bridge means to be compressed by movement of said trolley structure in one direction and to act upon said trolley structure to return it in an opposite or return direction, cam means for raising said first lever means at said one side, and latch means on said trolley structure for holding said first lever means in an inactive or raised position for return movement thereof.



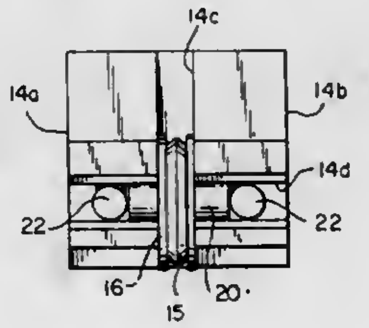
4,098,156
GLASS CUTTER WITH LONG AXLE AND RETAINER HOLDER

Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed May 16, 1977, Ser. No. 797,003

Int. Cl.^{2} B26D *3/08*

U.S. Cl. 83—12 **10 Claims**



1. A glass cutter, for use in a glass cutting machine having a head adapted to traverse a glass sheet in at least a forward direction, and comprising:

(a) a bifurcated holder member fixed in the head and having furcations defining a downwardly open retainer slot therebetween,

(b) a generally U-shaped retainer formed from a resilient material and having the legs of the U provided with aligned axle openings one of which openings is slightly larger than the other and said retainer having an unstressed configuration such that the legs are spread slightly so that said retainer legs are adapted to being moved toward one another and into parallel relationship with one another when said retainer is located in said slot in said holder member,

(c) an elongated axle having a diameter at least approximately equal to the diameter of the smaller of said leg openings, and said axle having end portions projecting outwardly beyond said legs of said U-shaped retainer a distance at least approximately equal to the diameter of said axle, and a glass scoring wheel on said axle and between said retainer legs,

(d) said holder member having a cross slot for receiving said axle, said cross slot oriented at right angles to said downwardly open slot for said retainer, and

(e) spaced pins in said holder furcations extending across said cross axle slot for engaging said axle end portions and restraining said axle against movement in its slot and so that said axle end portions bear against the inner wall of said cross axle slot while the head traverses the glass sheet.

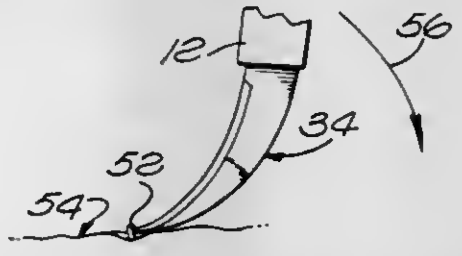
4,098,157
METHOD FOR SUTURE REMOVAL

Donald E. Doyle, 8147 Amor Rd., Los Angeles, Calif. 90046

Filed Jun. 26, 1975, Ser. No. 590,614

Int. Cl.^{2} B26D *3/00, 11/00*

U.S. Cl. 83—13 **5 Claims**



1. A method of cutting sutures with an instrument operable with one hand, wherein said instrument comprises a thin, substantially flat blade having a sharp concave cutting edge and widening to a non-cutting, convex bearing edge, said cutting and bearing edges converging to a sharp point at a first blade end and diverging to a second blade end remote from the first end with the arc of said bearing edge being substantially equal to or less than the arc of said cutting edge, and a handle secured to said second end of the blade, an obtuse angle being formed between a line drawn parallel to the longitudinal axis of that portion of the handle which is connected to the blade and a line drawn tangent to the bearing edge at the point of the blade, comprising the steps of:

inserting the pointed end of the blade between a suture and the sutured surface with the sharpened edge in engagement with the suture and the non-cutting bearing edge in engagement with the sutured surface;

rotating the blade to raise the suture from the sutured surface and to direct the blade point away from the sutured surface; and,

linearly advancing and further rotating the blade to progressively increase the tension on the suture across the sharpened blade edge until the suture is severed.

4,098,158
METHOD OF AND APPARATUS FOR SEVERING STRIPS OF MATERIAL

Eberhard Escales, Münich, and August Hell, Feldkirchen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,837

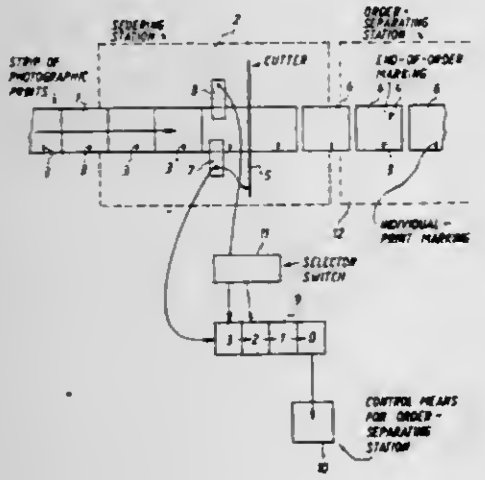
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606814

Int. Cl.^{2} B26D *7/06, 5/38*

U.S. Cl. 83—27 **5 Claims**

1. In a method of processing a strip composed of a plurality of successive groups of successive strip sections each bearing a respective photographic image, each group of strip sections constituting one order, the strip being provided with end-of-order markings each coordinated with the last image of the respective order and located near the end of the respective order, in combination, the steps of transporting the strip back-

wards along a predetermined path so that each end-of-order marking precedes the first image of the respective order; using a detector located at a predetermined position along said path for detecting the end-of-order markings and generating corresponding end-of-order signals; in response to each generated end-of-order signal generating a corresponding activating signal, by applying the end-of-order signal to a time-delay device, setting the time-delay device for a time delay compensating for the backward transport of the strip and utilizing the time-delayed end-of-order signal as the activating signal; and applying the activating signals to a separating means to cause the latter to separate one order from the next.

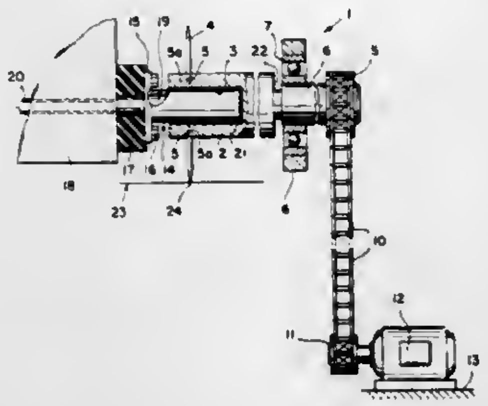


3. In an apparatus for processing a strip composed of a plurality of successive groups of successive strip sections, each strip section bearing at least one respective photographic image, each group of strip sections constituting one customer order, each strip section being provided with an individual-section marking, each group of strip sections being provided with an end-of-order marking coordinated with the last image of the respective order and located near the end of the respective order, in combination, means for transporting the strip backwards along a predetermined path so that each end-of-order marking is at the leading end of the respective customer order; a severing station arranged along said path including severing means operative when activated for severing an individual strip section from the strip; an order-separating station located downstream of the severing station for receiving severed individual strip sections and including order-separating means operative when activated for performing an order-separating operation upon a group of strip sections constituting one customer order; first detecting means located along the transport path and operative for detecting each individual-section marking, generating a corresponding individual-section signal and activating the severing means; second detecting means located along the transport path and operative for detecting each end-of-order marking and generating a corresponding end-of-order signal; and storage means receiving the end-of-order signals and the individual-section signals and operative for activating the order-separating means in response to receipt of an end-of-order signal followed by receipt of a plurality of individual-section signals, the number of individual-section signals in said plurality of individual-section signals being such as to introduce into the activation of the order-separating means a time delay compensating for the backwards transport of the strip.

4,098,159

SHRINK FILM PERFORATING UNIT

William John Rothfuss, 20 Buist Ave., Greenville, S.C. 29609
Continuation of Ser. No. 704,893, Jul. 13, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 825,880
Int. Cl.² B26F *1/24*
U.S. Cl. 83—171 **9 Claims**



1. Rotary heater perforator arrangement for perforating thermoplastic film which comprises:

a rotor member having an internal axial bore open at one end of the rotor member and a plurality of peripherally outwardly projecting heatable external contact perforation points on the rotor member and operatively arranged for receiving heat from within such axial bore,

a stator member having heating means operatively captively received within the axial bore at the open end of the rotor member for heating the external contact perforation points from within such axial bore and with sufficient clearance being provided between the members to permit unhindered rotation of the rotor member about the stator member,

said rotor member being provided with heat insulation material for substantially containing the heat generated by the heating means and for substantially limiting the dissipation and transfer of such heat locally to the vicinal zones at which the external contact perforation points are disposed and distally through such clearance to the open end of the rotor member, and

stationarily mounting means for stationarily mounting the stator member with respect to the rotor member and rotatably mounting means arranged for rotatably mounting the rotor member at a mounting location spatially and heat insulatedly operatively isolatingly remote from the heating means and from the open end of the rotor member, whereby the rotor member is disposable for location crosswise of the path of travel of a movable web of thermoplastic film and in selectively spaced relation thereto for permitting the contact perforation points to engage the adjacent surface of the web operatively for heat perforation thereof upon concordant rotation of the rotor member and movement of the web.

4,098,160

ADJUSTABLE CUTTING DEVICE

Hans Herman Weil, 8 III Östra Tullgatan, Malmö, Sweden (S-21128)
Filed Mar. 8, 1976, Ser. No. 665,121
Int. Cl.² B26D *5/08*
U.S. Cl. 83—468 **6 Claims**

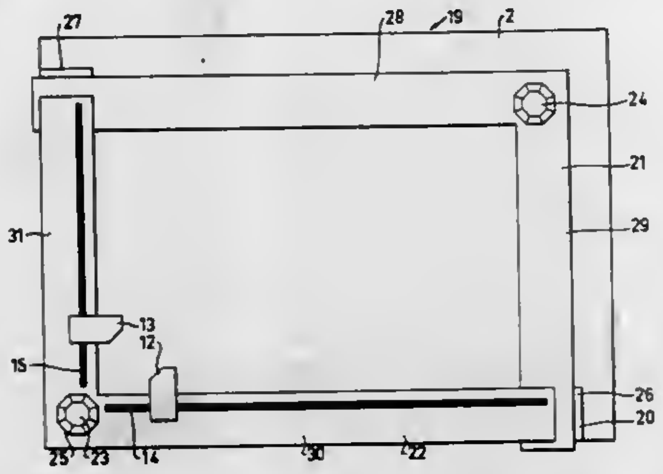
1. A device for plotting and cutting out a window-shaped recess in sheet material such as cardboard, leather, foil and sheet metal, which comprises

a pair of angle shaped ruler means having shanks in overlapping surface contact so as to frame four sides of a recess to be cut out;

guide means in at least two shanks of such ruler means and capable of maintaining an invariable angular relationship of said pair of ruler means when the shanks of one of said pair of ruler means are displaced relative to the shanks of the other of said pair of ruler means;

at least two cutter means capable of cutting out at least two edges of recess at the same time;

clamping means and key means at the intersections of the shanks of said pair of ruler means; and

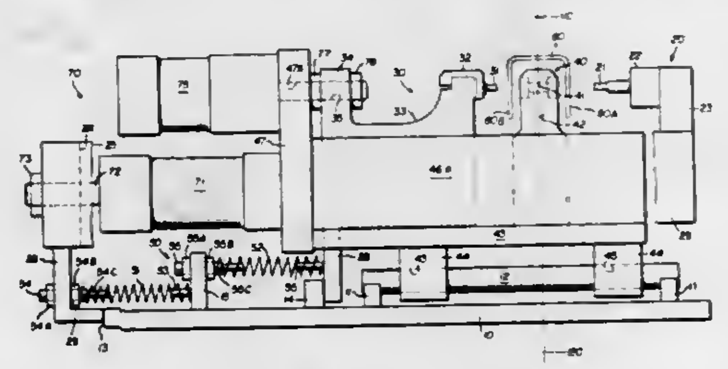


a third ruler means having thereon socket means mating with the key means of one of said pair of angle shaped ruler means for locking the shanks of said one of said pair of ruler means and said third ruler means in a selected angular position.

4,098,161

APPARATUS FOR PERFORMING SEQUENTIAL FABRICATING OPERATIONS ON A WORKPIECE

Alf Leif Bloch, Pleasant Ridge, Mich., assignor to Wes Industries, Inc., Troy, Mich.
Filed Jun. 28, 1977, Ser. No. 810,705
Int. Cl.² B26F *1/04*
U.S. Cl. 83—519 **12 Claims**



1. An apparatus for performing sequential fabricating operations on a workpiece, comprising:

an anvil mounted for axially reciprocal movement to both sides of a neutral datum planar during a pair of sequential fabricating operation;

a fabricating tool disposed on each side of the anvil along the axis of anvil movement, each tool being mounted for axial reciprocating movement (a) toward the anvil during one phase of the fabricating operation and (b) with the anvil toward the other tool during another phase of the fabricating operation, a first of said tools being on one side of the datum plane and the second of said tools being on the other side of the datum plane, said second tool being rigidly interconnected with a displacement structure which extends from said second tool across the datum plane to said one side thereof;

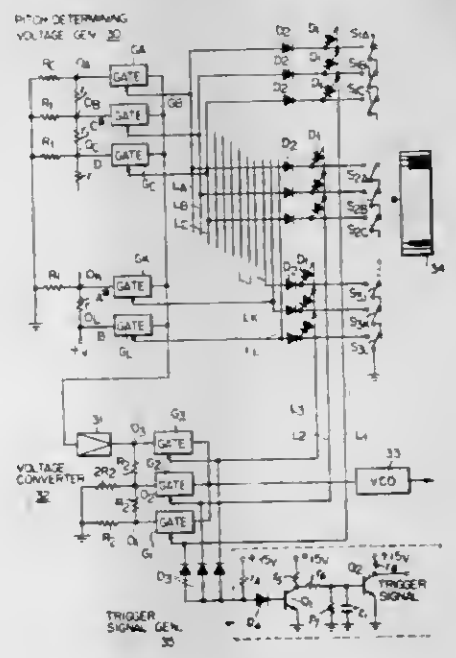
a pair of power means rigidly interconnected on said one side of the datum plane and rigidly interconnected with said anvil, one of the power means including a displacement member interconnected to said first tool and the second of the power means including a displacement member interconnected with a portion of said displacement structure on said one side of the datum plane; and

a force equalizing system interconnected with each of the fabricating tools (a) for displacing the anvil and said second tool toward the first tool as said first tool is displaced toward the anvil by said one power means and (b) for displacing the anvil and said first tool toward the second tool as said second tool is displaced toward the anvil by said second power means.

4,098,162

SYNTHESIZER TYPE ELECTRONIC MUSICAL INSTRUMENT

Eisaku Okamoto, and Kiyoshi Ichikawa, both of Hamakita, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Dec. 10, 1976, Ser. No. 749,224
Claims priority, application Japan, Dec. 15, 1975, 50-148433
Int. Cl.² G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **6 Claims**



1. An electronic musical instrument comprising:

keyboard means having keys over a plurality of octave ranges and generating, in response to a depressed key, both note information and octave information corresponding to said depressed key;

voltage signal generating means operatively coupled to said keyboard means for generating a first voltage signal which is a function of one of said note information and said octave information;

voltage converting means coupled to an output of said voltage signal generating means and operatively coupled to said keyboard means for generating a second voltage signal having a magnitude corresponding to the note and octave of said depressed key in response to said first voltage signal and in response to the other of said note information and said octave information; and

voltage controlled oscillator means coupled to an output of said voltage converting means for generating a tone signal corresponding to said depressed key.

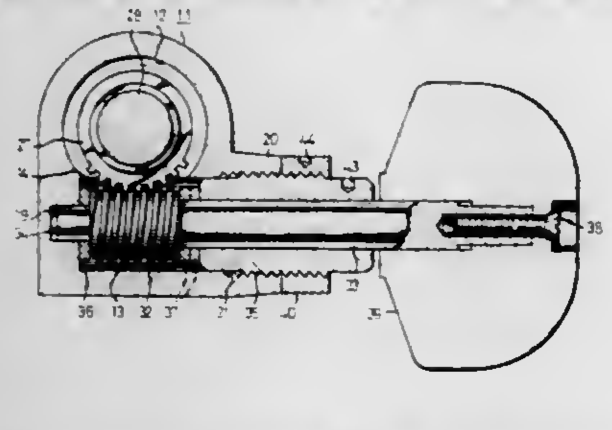
4,098,163

STRING WINDING DEVICE FOR STRING INSTRUMENTS

Kazuma Kato, Gifu, Japan, assignor to Nikko Seiki Company Limited, Japan
Filed Feb. 14, 1977, Ser. No. 768,059
Int. Cl.² G10D *3/14*
U.S. Cl. 84—306 **7 Claims**

1. A string winding device for string instruments, which

comprises a casing to be attached to the top end portion of a string instrument, which has in the interior thereof a container chamber extending in the longitudinal direction and a container chamber extending in the lateral direction, a worm wheel rotatably arranged in the container chamber of the casing extending in the longitudinal direction, a winding shaft extended from the worm wheel outwardly of the casing to wind the end of a string of the string instrument, a worm rotatably disposed in the container chamber of the casing extending in the lateral direction so that the worm is engaged with the worm wheel, a substantially cylindrical bearing member screwed and fixed to the side portion of the casing so that said bearing member can advance and retreat and the worm is gripped and supported between the inner end portion of said bearing member and the inside of the casing to prevent the worm from moving in the axial direction, an adjustment shaft extended from the worm outwardly of the casing while piercing through the bearing member so that it rotates the winding shaft so as to adjust the quantity of the string wound, and an operation knob disposed on the end portion of the adjustment shaft in the state separated from said bearing member.



4,098,164
MOUTHPIECE FOR MUSICAL WIND INSTRUMENTS

Domenick O. Calicchio, 702 Cherokee Ave., Los Angeles, Calif. 90038

Filed Mar. 4, 1976, Ser. No. 663,961
Int. Cl.² G10D *9/02*
U.S. Cl. 84—399 **4 Claims**

1. A mouthpiece for a musical instrument, comprising:

a tubular stem having a first end and a second end connected by a unitary external surface forming a head adjacent said first end and an instrument receiving surface adjacent said second end, said head having means for removably securing a rim thereto;

said tubular stem having an internal bore therethrough, said bore including a central passage extending from said second end, an intermediate counterbore portion terminating in a first shoulder adjacent said stem passage, and an enlarged counterbore portion enclosed within said head extending from said stem first end to a second shoulder tapered inwardly toward said intermediate portion;

a sleeve removably disposed within said intermediate portion having one end engaging said first shoulder and the other end being tapered to form a continuation of said second shoulder taper, said sleeve having a central passage therethrough which diverges from a throat portion at said other end to said first shoulder engaging end, said sleeve central passage merging smoothly with said stem central passage;

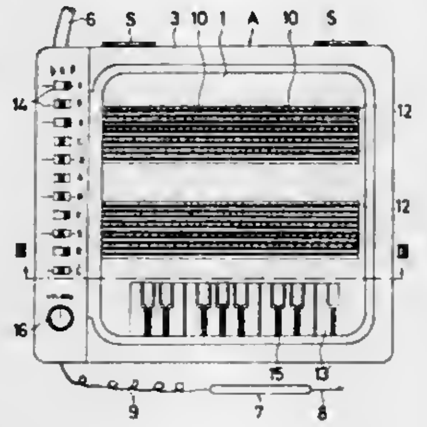
a cup removably disposed within said enlarged portion having a tapered end companion to and engaging the tapers of said second shoulder and said sleeve and having a second end substantially flush with said stem first end, said cup having an internal central passage diverging from a throat portion which merges smoothly with said sleeve throat portion to said cup second end to form a cavity within said cup; and

a rim removably secured to said securing means for holding said cup and said sleeve in said stem, said rim forcing the tapers of said cup, said second shoulder, and said sleeve to coaxially align said cup, said sleeve, and said stem, thereby assuring the smooth merging of said central passages.

4,098,165
MUSIC STUDYING DEVICE

Kakunosuke Akiyama, 1-1-7-301, Sakuratsutsumi, Musashino-shi, Tokyo-to, Japan

Filed Aug. 19, 1976, Ser. No. 715,835
Int. Cl.² G09B *15/04*
U.S. Cl. 84—470 **7 Claims**

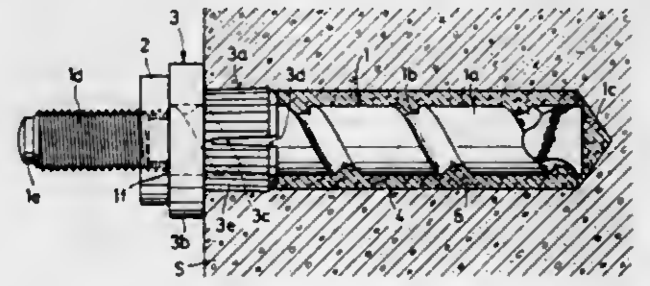


1. a device for studying music comprising:
(a) a teaching sheet member with a musical staff entered therein,
(b) a transparent plate member overlying said teaching sheet member, said plate member having conductive films fixed thereon, said films being pervious to light and disposed corresponding to the lines and inter-line spaces of said staff of said teaching sheet member,
(c) a contact bar means,
(d) an audio-frequency electronic circuit adapted to produce sounds corresponding to each scale of notes in said staff, and
(e) said contact bar means and each of said conductive films being connected to said audio-frequency electronic circuit to produce sounds corresponding to each of said scale notes in said staff when said contact bars means is brought into contact with each of said films above said staff.

4,098,166
ANCHORING MEMBER SECURED BY AN ADHESIVE MATERIAL

Guztav Lang, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 31, 1976, Ser. No. 719,148
Claims priority, application Germany, Sep. 1, 1975, 2538821 1975, 2538821
Int. Cl.² F16B *13/04*
U.S. Cl. 85—63 **19 Claims**



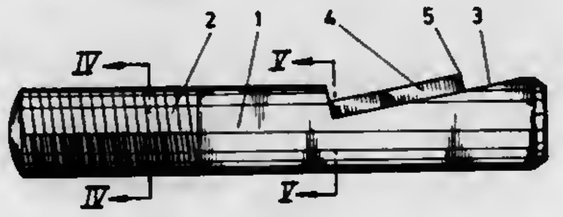
1. A method of securing an anchoring member within a borehole in a receiving material by the use of a hardenable adhesive material where the borehole has a diameter greater than the diameter of the anchoring member including the steps

of placing an adhesive material within the borehole and before it hardens, inserting a guide ring into the borehole, inserting an anchoring member through the guide ring and into the borehole, and using the movement of the anchoring member into the borehole for mixing the adhesive material so that it hardens and secures the anchoring member within the borehole, wherein the improvement comprises the steps of inserting the anchoring member into the borehole by applying solely an axially directed force to the anchoring member and converting the axially directed force into a combined axially directed and rotatably directed force by means of cooperating helical means on the guide ring and the anchoring member, thereby rotating the anchoring member as it is inserted axially into the borehole while maintaining the anchoring member out of interengagement with the surface of the borehole and, consequently, distributing the adhesive material throughout the borehole.

4,098,167
ANCHOR BOLT

Jan J. Dijksterbuis, Roden, Netherlands, assignor to Industrie- en Handelsonderneming Elton B.V., Roden, Netherlands

Filed Mar. 18, 1976, Ser. No. 668,307
Claims priority, application Netherlands, Mar. 20, 1975, 7503339
Int. Cl.² F16B *13/04*
U.S. Cl. 85—79 **5 Claims**



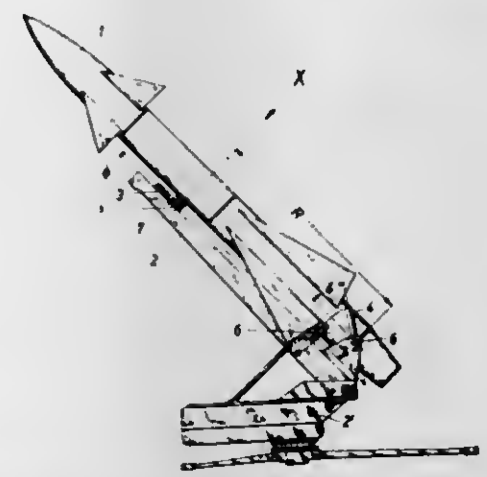
1. An anchor bolt having a cylindrical shank, a screw-threaded portion formed on one end of said shank for receiving a nut, wherein the screw-threaded portion has a diameter equal to that of the shank, said shank having an essentially flat bevelled portion, the depth of said bevelled portion perpendicular to the bolt axis decreasing in the direction of the shank end opposite to the screw-threaded end, a shiftable member mounted on said bevelled portion and movable away from the bolt with respect to the bolt axis during relative displacement of said shiftable member and said bolt, wherein the improvement comprises said shiftable member mounted on the bevelled portion comprising a flat plate of uniform thickness, wherein said flat plate is polygonal in shape and at least one corner of said flat plate projects from the cylindrical circumference of said bolt shank, and wherein the cross-sectional area of said bolt at the position of the maximum depth of said bevelled portion is greater than the cross-sectional area of the core of the screw-thread.

4,098,168
MECHANICAL STRUCTURE

Hans Joachim Seeger, Bremen-Huchting, and Ulrich Sorgatz, Wolfsburg, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker G. m.b.H., Bremen, Germany

Filed Sep. 15, 1970, Ser. No. 80,519
Int. Cl.² F41F *3/04*
U.S. Cl. 89—1.815 **3 Claims**

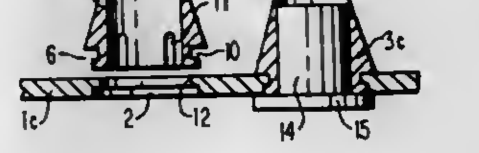
1. In a launching pad for a guided missile to combat aerial targets, and particularly low-flying aircraft, said launching pad being inclined with respect to the horizontal plane by an angle ϕ, the improvement comprising: means mounted on said launching pad for imparting a predetermined desired angular momentum to the missile about its transverse axis and in a direction toward a horizontal plane while the missile is on the launching pad and accelerating, said means including three guide rails for engaging three suspension members on the guided missile to suspend the missile, said guide rails being disposed in the direction of flight to positively guide the missile during acceleration, one of said guide rails being further forward in the direction of flight than the other two guide rails and being fixedly mounted on said launching pad, said other two guide rails being mounted so that they are simultaneously pivotal about a horizontal axis which is disposed perpendicular to the firing direction, the vertical projections of said guide rails being parallel to one another with the two planes including the longitudinal axis of said forward guide and the longitudinal axes of said other two guide rails, respectively, intersecting in a horizontal line and enclosing an acute angle δ, and said other two guide rails being inclined with respect to the firing direction of the missile such that the angle of inclination of said other two guide rails with respect to the horizontal plane is equal to the sum of the angles δ and ϕ.

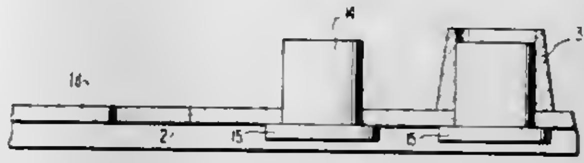


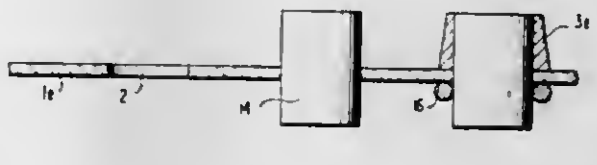
4,098,169
AMMUNITION BELT APPARATUS AND METHOD OF MAKING SAME

Heinz Gawlick, Furth, and Hans Umbach, Stadeln, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 2, 1973, Ser. No. 346,893
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1972, 2216022; Mar. 2, 1973, 2310370
Int. Cl.² F42B *39/08*
U.S. Cl. 89—35 R **36 Claims**







1. Ammunition belt apparatus comprising:
a flexible coilable strip,
at least one hole extending transversely through said strip,

a cartridge associated with each of said at least one holes,

and clamping means associated with each of said at least one holes for clamping respective ones of said cartridges to said strip with portions of respective ones of said cartridges extending through respective holes,

wherein each of said clamping means includes a tubular casing and a rim means, said tubular casing being formed separately from said strip and having an internal wall surface configuration dimensioned to form a press fit with outer wall surfaces of said cartridge, said tubular casing having at least one lateral part with lateral outer dimensions greater than the dimensions of said hole for preventing movement of said tubular casing through said hole, said rim means being engaged with a first side of said strip and said at least one lateral part of said tubular casing being engaged with a second side of said strip directly opposite said first side such that said strip is clamped between said rim means and said lateral part of said tubular casing when said cartridge is clamped in position on said strip, all portions of said cartridge which are located on said first side of said strip having a cross-sectional size at least as small as the cross-sectional size of the hole, said rim means being formed separately of said cartridge and being clampingly engaged with outer wall surface portions of said cartridge at a predetermined position along the length of said cartridge for preventing movement of said cartridge through said hole,

wherein said at least one hole includes a plurality of holes spaced from one another along the length of the strip,

wherein said tubular casings are open at opposite ends thereof, and wherein said cartridges are caseless propellant cartridges having a predetermined length at said second side which is no greater than the length at said second side of respective ones of said tubular casings press fitted to the respective cartridges.

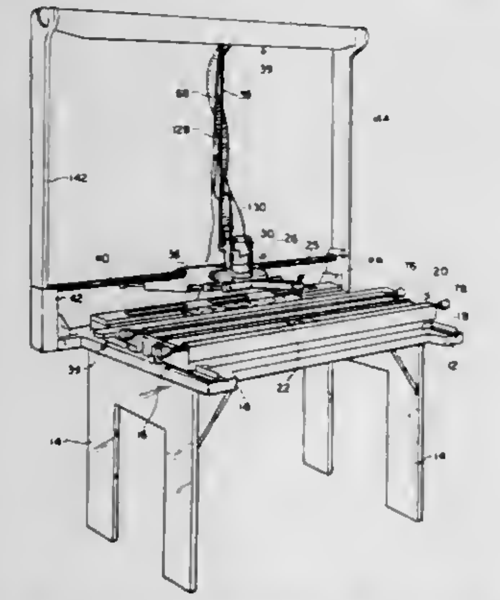
4,098,170
ENGRAVING MACHINE HAVING MINIMUM SETUP TIME

John A. Russell, 3030 S. Magnolia, Sanford, Fla. 32771

Filed May 27, 1975, Ser. No. 580,780

Int. Cl.² B27C ***5/02;*** **B23Q** ***35/04***

U.S. Cl. 90—13.1 **28 Claims**



1. An engraving machine comprising an elongate guide letter holder having long edges, and an elongate workpiece holder disposed adjacent and essentially parallel thereto, one of the said holders being selectively movable relative to the other, while at all times preserving the essentially parallel relationship, means for preventing undesired relative movement of said holders, said guide letter holders having an elongate bar of substantial length slidably disposed along each of its long edges, with endwise movements of each rod controlling the movement of respective guide letter contacting members with respect to selected guide letters, a router assembly slidably mounted on an elongate bar disposed above and to one side of said holders, said router assembly comprising a stylus disposed above said letter holder, and a router disposed above said workpiece holder, said stylus and said router being relatively movable, such that upon an operator grasping said stylus and tracing one or more guide letters placed upon said guide letter holder, said router will be caused to undertake like movements with respect to said workpiece holder, and when energized, to perform desired cutting movements upon a workpiece secured thereon, the movable relation between said holders facilitating the construction of multiple line signs, and bias means biasing said stylus and router upwardly, such that operative portions of said stylus and router are respectively out of contact with the guide letters and workpiece except when the operator is grasping the stylus.

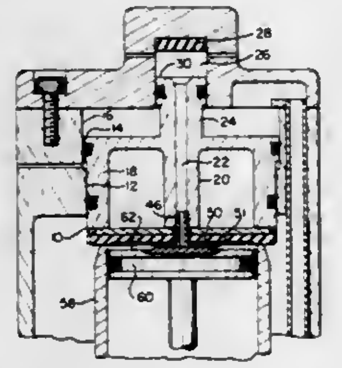
4,098,171
PNEUMATIC PISTON APPARATUS

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billercia,, Mass.

Filed Aug. 19, 1976, Ser. No. 715,854

Int. Cl.² F15B ***13/04;*** **F16K** ***1/46***

U.S. Cl. 91—461 **9 Claims**



1. A poppet valve of the type having a movable valve member adapted for travel in an axial direction;

said movable valve member comprising a cylindrical outside wall coaxially spaced from a hollow central column;

a face plate terminating one end of said valve member, said face plate comprising a substantially disk-shaped core;

a boss integral with said core and coaxially projecting from a core surface interior to said valve member to form a peripheral core flange, said boss and said flange jointly defining a recess therebetween;

said face plate further including a resilient cover molded to said core, said cover enveloping the exterior core surface and said flange and abutting said core boss in said recess to form a common coplanar surface with said interior core surface;

the exterior surface of said cover being centrally relieved to define a raised peripheral lip projecting in an axial direction, said lip presenting a resilient, peripheral sealing surface normal to the axis of said valve member;

a washer disposed on the exterior cover surface and extending beyond said sealing surface in an axial direction; and

a hollow screw flush with said washer extending through the latter and said face plate and threading into said central column.

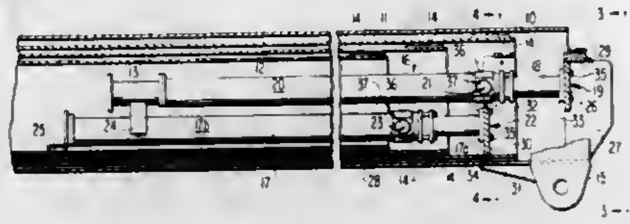
4,098,172
HYDRAULIC CYLINDER ROD END FIXITY CONNECTOR FOR TELESCOPIC CRANE BOOMS

William Enterline Wright, and Huber Daniel Bock, Jr., both of Hagerstown, Md., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Continuation of Ser. No. 631,199, Nov. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 511,606, Oct. 3, 1974, abandoned. This application Jan. 18, 1977, Ser. No. 764,829

Int. Cl.² F01B ***1/00, 7/20***

U.S. Cl. 92—161 **3 Claims**



1. A self-aligning and end fixity connection for a hydraulic cylinder assembly in a multi-section telescopic crane boom and wherein said cylinder assembly embodies a cylinder barrel and a piston rod slidably received therein, said connection comprising a flange plate rigidly secured to the end of said piston rod which is external to said cylinder barrel, said flange plate being disposed in a plane normal to the longitudinal axis of the rod, bolt means connecting said flange plate to an opposing fixed structural web of one boom section to thereby establish end fixity for said rod, the opposite ends of the piston rod being substantially fixed against rotational movement about a horizontal transverse axis thereby increasing the column loading capacity of the rod and associated boom section, the end of the cylinder barrel opposite from the piston rod end being slidably mounted in a boom section different from the first-mentioned boom section, additional means interposed between said piston rod connection and said opposite end of said cylinder barrel forming a limited lost motion connection between said cylinder barrel and a fixed structural part of the next adjacent boom section in a vertical direction only when the cylinder assembly and crane boom are horizontally disposed; said additional means forming said limited lost motion connection comprising, a pair of spaced vertical support plates on said next adjacent boom section, an opposing pair of retainer plates fixed to the interior face of said support plates and each retainer plate having a vertically elongated opening, and a pair of side trunnions on said cylinder barrel engaged in said openings and retained therein and adapted for limited movement lengthwise only in the elongated openings, said trunnions and openings having substantially the same widths so that said cylindrical barrel is restrained from moving in other directions relative to said next adjacent boom section.

4,098,173
AUTOMATIC COMPENSATING REGISTER

James L. Schauman, Jamestown, N.Y., assignor to Jamestown Container Corporation, Jamestown, N.Y.

Filed Apr. 22, 1977, Ser. No. 789,851

Int. Cl.² B31B ***1/14***

U.S. Cl. 93—58.2 R **11 Claims**

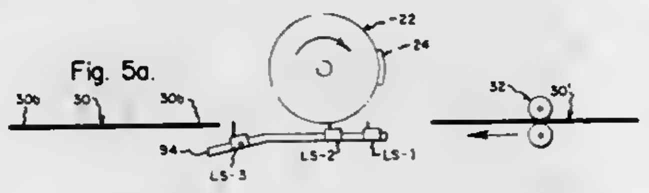


Fig. 5a.

1. In a container blank slotting apparatus having slotting head means fixed for rotation with a shaft, means for transporting a container blank to be slotted at a given speed past said slotting head means, an index gear fixed for rotation with said shaft, a main drive gear and means for locking said index gear for rotation with said main drive gear, said main drive gear being driven at a rotational speed correlated with container blank transport speed to effect forming of slots in leading and trailing edges of said container blank by said slotting head means, the improvement in combination for accommodating said apparatus to handle container blanks of a length in excess of the maximum length for which said apparatus was designed, said improvement comprising:

a drive assembly supported on and for rotation with said main drive gear for selectively locking said index gear for rotation with and driving said index gear for oppositely directed rotations relative to said main drive gear during each blank slotting operational cycle of said apparatus, thereby in sequence to initially rotatably position said slotting head means relative to said main drive gear for slotting a leading edge of said container blank in its direction of travel, to reposition said slotting head means relative to said main drive gear for slotting a trailing edge of said container blank and to return said slotting head means to its initial rotatable position relative to said main drive gear, said drive assembly includes an electric motor, an electric brake and motion transmission means connecting the output of said motor and brake to means operable to selectively lock said index gear for rotation with and drive said index gear for rotation to said main drive gear; and

control means for controlling operation of said drive assembly in response to feeding of said container blank relative to said slotting head means, said control means controls energization of said motor and said brake.

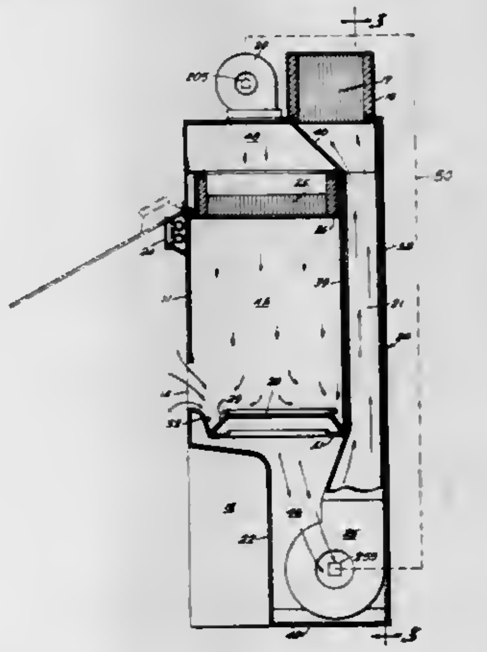
4,098,174
TOTAL EXHAUST LAMINAR FLOW BIOLOGICAL FUME HOOD SAFETY CABINET AND METHOD

Jerome J. Landy, 13700 SW. 78 Ct., Miami, Fla. 33144

Filed Apr. 8, 1976, Ser. No. 675,257

Int. Cl.² B08B ***15/02***

U.S. Cl. 98—115 LH **11 Claims**



8. A method of purging a work tray for use in handling biohazardous and explosive materials, comprising the steps of

positioning the work tray in a confined vertical space and permitting an air passage therebeneath,

delivering make-up air passing vertically downward and filtered of particulate matter over the work tray and through said air passage,

providing a work opening to the confined vertical space along one edge of the tray which also defines an access port for air,

beneath the work tray providing a negative pressure to draw the filtered air over the work tray and through said air passage and to draw air from the access port through said air passage under the work tray at one edge thereof adjacent the opening,

confining the air at the terminus of the negative pressure area beneath the work tray in a vertical path substantially parallel to the path of the filtered air passing downwardly over the work tray,

and applying further differential pressure to the air at a position beneath the work tray to deliver the same in its confined path vertically and opposed to the particulate filtered air passing downwardly over the work tray, and

filtering or otherwise purging the thus defined exhaust air passing vertically and thereafter passing the same to a remote environment separate from the work tray,

proportioning the pressure differentials to the end that the velocity and volume of the filtered air passing vertically downward, is less than the velocity and volume of the air passing through the work opening, and the exhaust air velocity and volume is a resolution of the sum of both, whereby total exhaust of air is achieved in an environment wherein contamination to the work room is avoided and the operator may have free access to the work area.

4,098,175

AUTOMATIC COFFEE-BREWING MACHINE

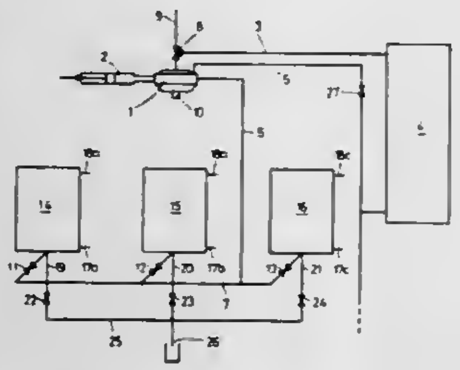
Heinrich Flerz, Zurich, Switzerland, assignor to Hagezet Aktiengesellschaft, Zurich, Switzerland

Filed May 26, 1976, Ser. No. 690,268

Claims priority, application Switzerland, Jan. 6, 1975, 7297/75

Int. Cl.² A23F *1/08*

U.S. Cl. 99—283 **1 Claim**



1. In a coffee-brewing machine of the type comprising at least one brewing chamber and an outlet for brewed coffee, the improvement comprising:

a plurality of storage containers connected in parallel between said brewing chamber and said outlet, each said container having a capacity equal to one predetermined charge of brewed coffee, respective means in each said storage container for sensing when a said storage container is full with a charge of brewed coffee and empty of said charge and

means responsive to the sensing by said sensing means of an empty condition of a said container, for successively filling each of said storage containers with a said predetermined charge of brewed coffee from said brewing chamber and responsive to the sensing by said sensing means of a full condition of said storage containers for successively fully emptying said containers so that a said container is able to receive a said predetermined charge of brewed coffee.

4,098,176

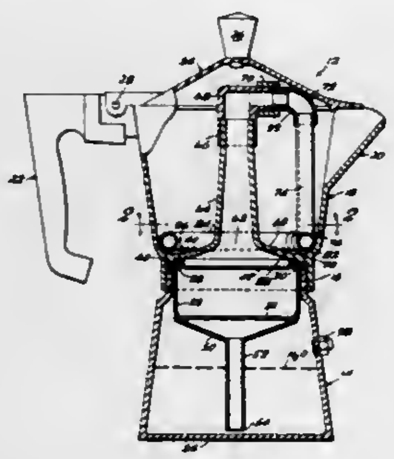
COFFEE BREWING DEVICE

Thomas Perez, 3310 NW. 9 Ct., Miami, Fla. 33127

Filed Jan. 10, 1977, Ser. No. 758,074

Int. Cl.² A47J *31/10*

U.S. Cl. 99—303 **4 Claims**



1. A coffee brewing apparatus comprising, an upper container and a lower container, an openwork coffee holding member suspended between the upper and lower containers and screw-threaded means for joining the containers together, said lower container including a floor and said coffee holder including a stem extending downwardly toward said floor in open communication with the coffee holder and said stem terminating at a mouth adjacent the floor of said lower container, said upper container including a floor defining a wide central annular mouth in fluid communication with the coffee holder, said floor extending upwardly defining a stem in the upper container, said stem terminating at an upper mouth, said upper portion having a coffee pouring spout and said upper mouth terminating at about the level of the coffee pouring spout, a radially upwardly extending cylindrical fluid passageway defining structure and a downwardly extending passageway defining structure extending to a zone adjacent the floor of the upper container and an annular ring connected to the downwardly extending structure and arranged adjacent the floor of the upper member, said structures and ring being in fluid communication with the stem in the upper container and upper mouth, whereby coffee is adapted to be brewed and flowed through the stem's coffee holder structure and ring and out the hole so that when sugar is placed on the floor of the upper container, the brewed coffee will be constrained to pass through a charge of sugar.

4,098,177

FILTER PAPER CUP FOR A PERCOLATOR AND PROCESS FOR MAKING THE SAME

Wallace E. Olney, and Robert G. Wright, both of Portage, Mich., assignors to Brown Company, Kalamazoo, Mich.

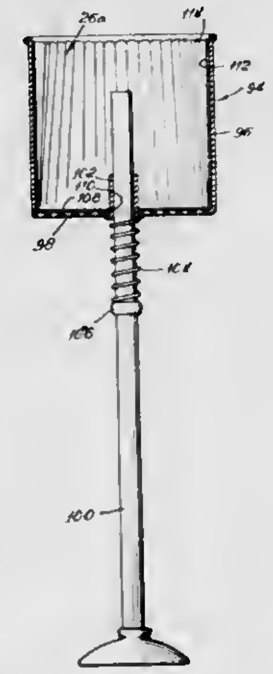
Filed May 13, 1976, Ser. No. 686,109

Int. Cl.² A47J *31/08*

U.S. Cl. 99—310 **6 Claims**

1. In a percolator for brewing coffee comprising a cylindrical basket concentric with a tubular wand, the combination therewith of a filter paper cup having a flat annular bottom coextensive with and lying flat on the bottom of said basket and having an integral upstanding sidewall only at the outer periphery of said annular bottom, said upstanding sidewall being fluted with accordian pleat-type flutes and said flutes being under compression by the fact that said upstanding sidewall normally flares outwardly when unconfined by said basket, but is constrained to a vertical position by said basket, in which the filter paper is composed essentially of bleached cellulose fiber from chemically processed wood pulp, is uncalendered, is unsized, is creped from about 6 to about 15 percent, and has a basis weight between about 28 and about 40 pounds, in which the sidewalls of the filter cup have at least 1 flute every 15°, and in which said accordian pleat-type flutes are heat set so that the upstanding sidewall is set in the normal outwardly flaring position, and substantially only the outermost apices of said flutes are substantially entirely in contiguous relationship with the inner wall of said basket into which said paper filter cup is placed.

5. A filter paper cup adapted for use in a percolator having a cylindrical basket concentric with a tubular wand comprising a flat annular bottom having an integral upstanding wall only at the outer periphery of said annular bottom, said upstanding wall flaring outwardly and being fluted with accordian pleat-type flutes, in which the filter paper is composed essentially of bleached cellulose fiber from chemically processed wood pulp, is uncalendered, is unsized, is creped from about 6 to about 15 percent, and has a basis weight between about 28 and about 40 pounds, in which there is at least one flute for every 15°, and in which said accordian pleat-type flutes are heat set so that the upstanding sidewall is set in the normal outwardly flaring position, the outermost apices of said flutes being rectilinear so that, when the filter cup is inserted into the cylindrical basket of said percolator with the annular bottom of said filter cup resting on the bottom of said basket and extending from said tubular wand to the outer wall of said cylindrical basket, substantially only the outermost apices of said flutes will be in substantially entirely contiguous relationship with said inner wall.



4,098,178

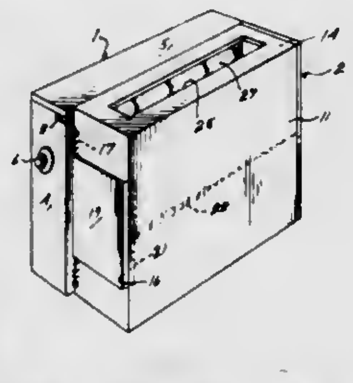
WALL TOASTER

Lionel Lalancette, 241 de la Bretagne St., Jonquiére, Quebec, Canada

Filed Mar. 16, 1977, Ser. No. 778,020

Int. Cl.² A47J *37/08*

U.S. Cl. 99—329 RT **11 Claims**



1. A wall toaster comprising a wall mounting portion, a toasting portion, hinge means pivotally connecting said toasting portion to said wall mounting portion, said toasting portion including a relatively flat casing having a top and a bottom, electric toasting elements laterally spaced apart in said casing, said casing having a sliced bread slot vertically extending therethrough between said toasting elements and opening at the top and bottom of said casing, a gate selectively closing said slot and positioned at the bottom of said casing, an operator device connected to said gate for producing opening of the latter to allow ejection of a bread slice through the bottom outlet end of said slot, said wall mounting portion comprising a relatively flat body and a pair of flat and opposite and largest side walls, said flat body adapted to be operatively secured with one of said side walls extending flat against a supporting wall, said casing of said toasting portion further including a pair of flat and opposite largest side walls, and an end wall transversely joining said side walls at one end of said casing, and a first and second laterally yielding pivot means pivotally connecting said one end of the casing to said wall mounting portion and operatively pivoting the casing between an inoperative position and an operative position, respectively, defined by lateral engagement of one side wall of the casing against the other side wall of the wall mounting portion and by endwise engagement of said one end wall of the casing against said other side wall of the wall mounting portion.

4,098,179

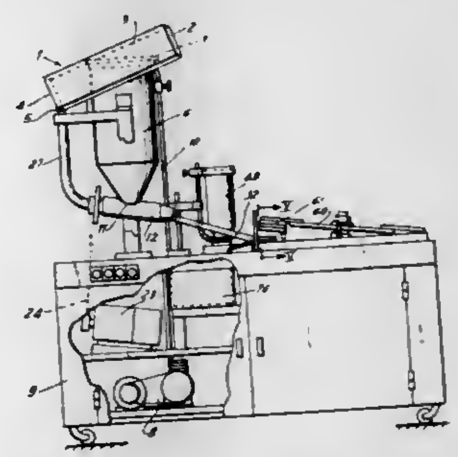
MACHINE FOR PRODUCING FRIED DOUGH-ENCLOSED SAUSAGES

Michail Fleishaker, 3091 Brighton 5th St., and Michael Lidogoster, 3049 Brighton 12th St., both of Brooklyn, N.Y. 11235

Filed Jun. 21, 1976, Ser. No. 697,763

Int. Cl.² A47J *37/12*

U.S. Cl. 99—450.6 **20 Claims**



1. A machine for producing fried dough-enclosed sausages, comprising an extruder having a central passage and an annular passage surrounding said central passage, said central passage being defined by a tube rotatable relative to said surrounding passage, each of said passages having an inlet and an outlet; means for rotating said tube; means for feeding sausages in abutting end to end relationship through said inlet of said central passage into the latter; means for feeding pre-made dough through said inlet of said annular passage into the latter so that a strand of sausages surrounded by dough will leave the outlet of said passage; cutting means downstream of the outlet of said annular passage for cutting the strand emanating therefrom into portions of predetermined length; frying means downstream and below said outlet of said annular passage for frying said portions; means for supporting said cut off portions emanating from said cutting means and for transferring the same to said frying means; and means for removing said fried portions out of said frying means in timed sequence with operation of said cutting means, said removing means comprising a rotatable member located above said frying pan and having circumferentially spaced, downwardly extending paddles,

means for intermittently rotating said member, said member having an axis of rotation inclined at an acute angle to a vertical plane so that said paddles describe a trajectory comprising a first part descending towards the bottom of said frying pan so that said paddles are gradually dipping into the oil in the pan and a second part ascending from the bottom of said frying pan so that said paddles move gradually out of the oil.

4,098,180

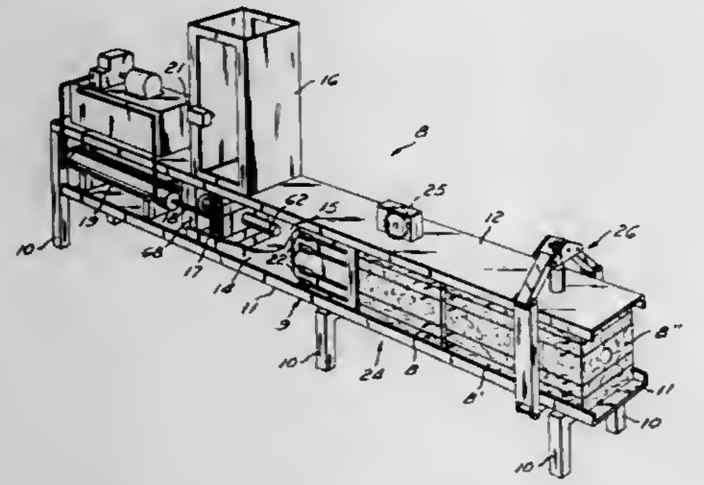
APPARATUS FOR BALING BAGASSE AND THE LIKE

Frank C. Tea, and Philip S. Hartman, both of Bellevue, Ohio, assignors to The American Baler Company, Bellevue, Ohio

Filed Nov. 15, 1976, Ser. No. 741,967

Int. Cl.² B30B *15/06*

U.S. Cl. 100—98 A **1 Claim**



1. A baling apparatus for baling bagasse or other material in which a longitudinal hole is formed through the bale, said apparatus comprising:

a longitudinally horizontally extending frame including

a horizontal floor and fixed vertical enclosing sides extending perpendicularly thereto which form a baling chamber having a rectangular cross section;

a baling head longitudinally reciprocal within said chamber between a retracted position and an advanced position, each reciprocation capable of forming one pad of the bale, said baling head having longitudinally extending clearance through said head with an annular bearing member within said clearance, said baling head having rollers which engage portions of said frame for facilitating the reciprocable movement of said head;

a pair of ram means, each ram means comprising a sealed cylinder mounted on said frame behind the retracted position of said baling head and an operative rod extending from said cylinder and connected to said baling head for reciprocating the head between its retracted and advanced positions;

a support column mounted on said frame between the extending rods of said pair of ram means and in front of the cylinders of said pair of ram means and behind the retracted position of said baling head;

a horizontally extending tubular mandrel adjustably anchored at one end in said support column with the other end extending through said clearance in said baling head and through said annular bearing member and through at least one pad of the bale when said baling head is in its fully advanced position, said clearance accommodating lateral adjustments in the longitudinal alignment of said mandrel between said supported column and the baled material, said baling head capable of slidably moving along said mandrel as it reciprocates, the rods of said pair of ram means extending generally parallel to said mandrel and spaced laterally on either side of it; and

a wiper seal with said clearance in said baling head surrounding said mandrel for wiping said mandrel clean and for preventing pieces of baled material from passing through said clearance as said head reciprocates.

4,098,181

DISPOSAL INSTALLATION FOR DOMESTIC WASTE

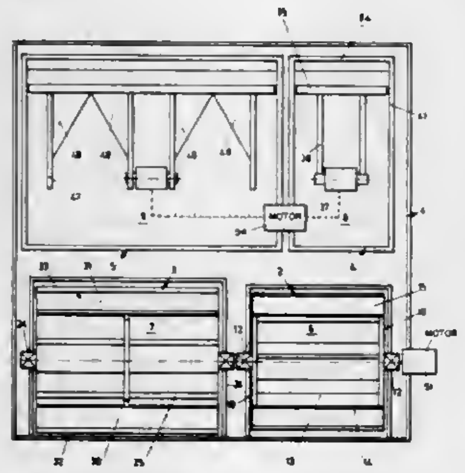
Eduard August Schultz, 291, Engelandlaan, Haarlem, Netherlands

Filed Sep. 10, 1976, Ser. No. 722,285

Claims priority, application Netherlands, Sep. 12, 1975, 7510762

Int. Cl.² B30B *1/18, 7/00*

U.S. Cl. 100—102 **2 Claims**



1. A disposal installation for recycling of domestic waste for use in or near kitchens of houses, hotels and the like, said waste being selectively collected in four different containers and disposal installation comprising in combination,

four separate chutes for receiving and holding respectively food remains, synthetic material, tins, and glass for separate recycling;

said four chutes being essentially parallel to each other, vertical, and of rectangular section;

said chute for food remains and said chute for synthetic material being adjacent to each other and each having a rotating grinder, both driven by a common driving means;

said chute for glass and said chute for tins being adjacent to each other and each having a pressing installation, both driven by a common driving means;

said chute for food remains having

a drying installation under said grinder in which ground food remains are received and dried for a predetermined time,

and a receiving container provided under said drying installation into which fall the ground food remains after drying;

said chute for synthetic material including

a grinding compartment,

a cylindrically bent perforated plate closing said synthetic material chute grinding compartment at its underside,

a horizontal shaft arranged along a cylinder shaft of said bent plate

a rotor in said compartment which can rotate around said horizontal shaft along said cylinder shaft and provided with a number of rotating edge knives regularly distributed over its circumference,

said edge knives cooperating with two oppositely situated fixed edge knives arranged at both sides above said bent plate that when rotating, cutting edges of said rotating knives pass close by cutting edges of said fixed knives so that sufficiently reduced synthetic parts are pressed subsequently through holes in said perforated plate;

each of said chutes for glass and for tins including

a plate press in each said chutes,

said plate press comprising

two parallel, vertical press plates, a first of which is fixed to a wall of said chute and a second of which is mobile towards and away from said first by means of a jack driven by a threaded shaft, said second plate being guided along two oppositely situated walls of said chute by means of a system of bearings and rollers,

a closing plate just under said plate press adjacent and parallel to said fixed plate having a slot through which crushed glass or flattened tins can fall down.

4,098,182

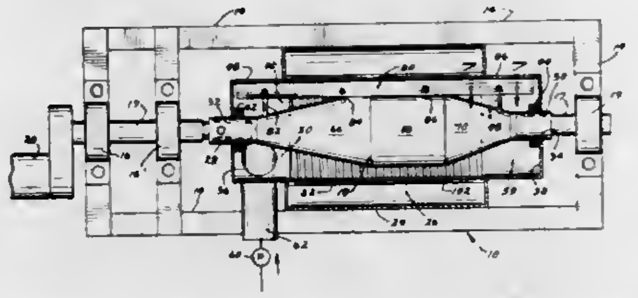
PRESS FOR REMOVING LIQUIDS FROM AMORPHOUS MATERIAL

Boyd R. Rasmus, Fridley, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed May 17, 1976, Ser. No. 687,275

Int. Cl.² B30B *9/20*

U.S. Cl. 100—121 **6 Claims**



1. A press for removing liquid from amorphous material comprising,

(a) a supporting framework,

(b) a pressure chamber having an inlet at one end and an outlet at the other end, said chamber being mounted upon the supporting framework,

(c) a curved screen formed from parallel bars comprising a portion of the pressure chamber,

(d) said curved screen having a curved inner surface and having slots between the bars through which the liquid passes during operation,

(e) pump means connected to the inlet for introducing said material into the chamber under pressure,

(f) pressure control means connected to the outlet of the chamber through which material is exhausted from the chamber for controlling the pressure within the chamber,

(g) a drum journaled for rotation concentrically within the chamber and spaced at a fixed uniform distance from the inner curved surface of the screen,

(h) material flowing from the inlet to the outlet being thereby adapted to pass between the drum and the curved inner surface of the screen,

(i) a longitudinal scraper blade between the screen and the drum extending the full length of the screen, said scraping blade having a scraping edge contacting the inner surface of the screen, and

(j) the scraper blade being supported upon the drum without being connected thereto tightly to thereby permit play between the scraper blade and the drum whereby the blade tip can move to follow the contour of the screen,

(k) means for imparting movement to the scraper to rotate the scraper blade within the pressure chamber whereby the scraping edge passes over the inner surface of the screen during operation, and

(l) the pressure and flow of the material from the inlet through the pressure chamber to the outlet being controlled solely by the pump and the pressure control means.

4,098,183

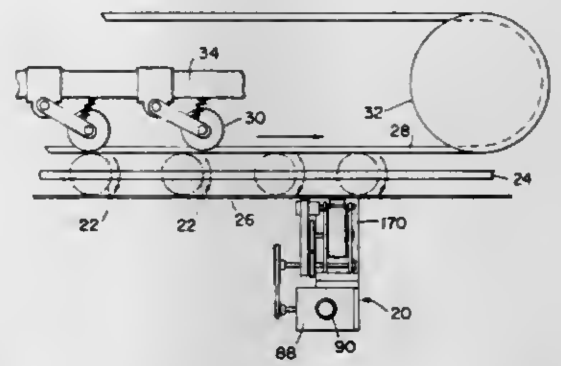
IN-LINE PRINTING DEVICE

George Erick Johnson, Sausalito, Calif., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 21, 1976, Ser. No. 752,733

Int. Cl.² B41F *17/20*

U.S. Cl. 101—40 **6 Claims**



1. An apparatus for high speed printing on the curved sides of cylindrical containers, comprising:

a linear barrier plate having an aperture therein which is smaller than the containers to be imprinted;

conveyor means for urging the curved sides of the cylindrical containers against the barrier plate and simultaneously rolling the containers in single file along said plate, past said aperture;

a first rotatable shaft mounted adjacent said aperture on the opposite side of the barrier plate as the rolling containers, the axis of said shaft being perpendicular to the axes of said containers;

holding means carried by, and radially projecting from, the first rotatable shaft for retaining printing type at a distance far enough from the axis of said first rotatable shaft that said type will project into said aperture when aligned therewith, and will be rolled against by the surface of a container moving past the aperture;

continuous, unidirectional, rotary power means;

circular slip clutch means mounted coaxially with said first rotatable shaft for turning the shaft when such turning is not impeded;

transmission means for utilizing the output of said power means to continuously turn said clutch means;

a cam wheel carried by said first rotatable shaft, the cam surface of said wheel having a radial notch;

a pawl normally biased against said cam wheel so as to follow the cam surface when the first shaft turns and engage the radial notch, thereby arresting the turning of the shaft on each revolution, said pawl being so positioned that it arrests the turning of the shaft when said type holding means is aligned with the aperture in the barrier plate;

release means for withdrawing the pawl from the cam wheel notch, thereby permitting said first shaft to resume turning, said release means including a trigger mounted immediately adjacent to said aperture and protruding into the path of said file of containers so as to be tripped, thereby activating the release means, each time a container passes from in front of the aperture;

a second rotatable shaft mounted adjacent and parallel to said first shaft on the same side of the barrier plate as said first shaft;

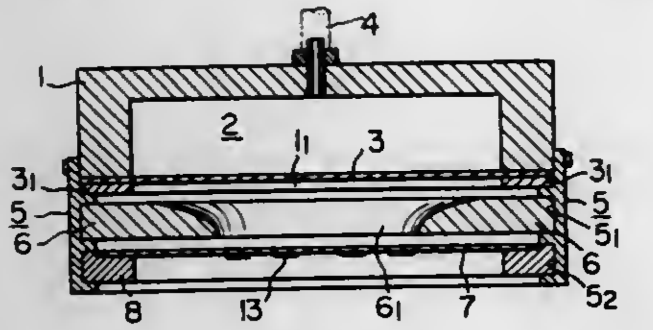
and a cylindrical ink roll carried by said second shaft, the diameter of the ink roll being sufficiently large that the ink roll will be tangentially touched by printing type retained in said holding means during each revolution of said first shaft.

4,098,184

PRESSURE OPERATED FLEXIBLE TRANSFER MEMBER FOR SCREEN PRINTER

Eiichi Okada, Tsurugashima; Hiroo Ebisawa, Sayama; Masashi Honma, Kawagoe, and Tadashi Murakami, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Feb. 24, 1977, Ser. No. 771,542
Claims priority, application Japan, Jan. 17, 1977, 52/2985
Int. Cl.² B41F *17/28, 15/10*
U.S. Cl. 101—41 **3 Claims**



1. An apparatus for printing an image on a convex surface of an object to be printed which comprises in combination:
   a. a reciprocating hollow main body having a charging and discharging port for a pressurized fluid, and an opening;
   b. a flexible membrane attached to said hollow main body to tightly seal the opening thereof;
   c. a restrictive frame having an opening similar in shape to, and slightly larger in size than, a flat configuration of the convex surface of said object, said frame being mounted on said hollow main body at the outer side of said flexible membrane;
   d. a flexible carrier mounted on said hollow main body at the outer side of said restrictive frame with an image portion thereon to be transferred being faced externally; and
   e. a fixed table for mounting the object disposed in confrontation to said flexible carrier, said object having a convex or raised surface, on which printing of the image is to be effected,

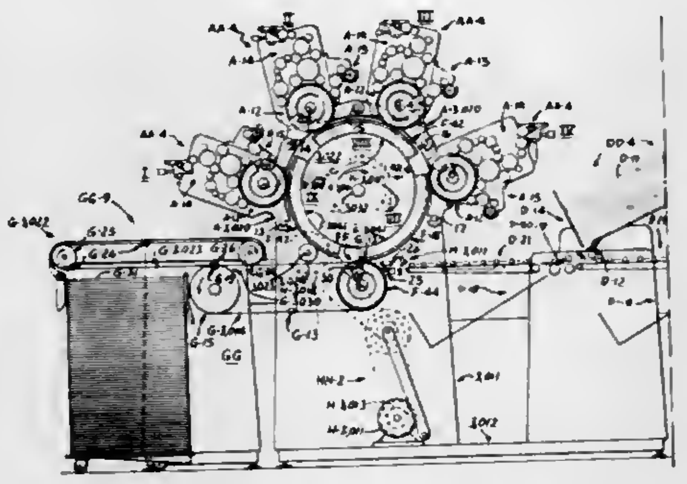
said opening of said restrictive frame serving to control a degree of expansion of said flexible membrane, and to squeeze and intimately contact said flexible carrier with said object, when said object is inserted into said hollow main body through said opening of said restrictive frame at the time of printing.

4,098,185

PRINTING PRESS

William Ward Davidson, Jr., Port Washington, N.Y., assignor to North Shore Precision Research Corporation, Long Island, N.Y.

Division of Ser. No. 235,221, Mar. 16, 1972, Pat. No. 3,848,320, which is a continuation-in-part of Ser. No. 73,161, Sep. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 658,385, Aug. 4, 1967, abandoned. This application Aug. 19, 1974, Ser. No. 498,844
Int. Cl.² B41F *7/08, 31/30;* **B65H** *3/10, 7/12*
U.S. Cl. 101—137 **52 Claims**



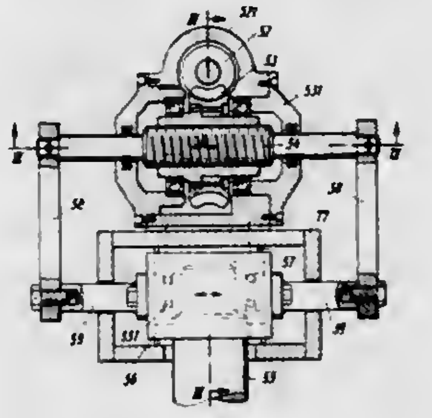
1. A five cylinder, sheet-fed offset printing press including a first printing cylinder and a second printing cylinder mounted in rotational, tangential relationship to form a printing couple with a printing bite therebetween, said second printing cylinder being mounted for rotation about a fixed axis, with the axis of said first printing cylinder being movable toward and away from the axis of said second printing cylinder into a latched or unlatched relationship therewith, means to feed sheets to and through said bite including grippers in registered position in said first printing cylinder on each revolution thereof and also including automatic register means to front and side register each sheet presented to said register means and to deliver said sheet into said grippers, and means to operate said register means once for each revolution of said first printing cylinder; the effective diameter of said second printing cylinder being an integer multiple, greater than one, of the effective diameter of said first printing cylinder, said first printing cylinder having a single work area of given peripheral length and a single gap, said second printing cylinder having a plurality of work areas each having substantially said given peripheral length, and an equal number of gaps, the number of said work areas on said second printing cylinder being equal to said integer multiple; means for mounting offset blankets in the work areas of said second printing cylinder, said means to feed sheets including means to automatically feed one sheet to be printed to said grippers for each revolution of said second printing cylinder and including means for passing said sheet through said bite more than one time and including means for detecting the presence or absence of a sheet being fed to said grippers once for each revolution of said second printing cylinder and for then causing said first printing cylinder to be latched or unlatched with respect to said second printing cylinder for one revolution of said second printing cylinder, and alternative means to automatically feed a number of sheets to be printed equal to said integer multiple to said grippers for each revolution of said second printing cylinder and to pass each sheet through said bite one time and including means for detecting the presence or absence of a sheet being fed to said grippers once for each revolution of said first printing cylinder, and for then causing said first printing cylinder to be latched or unlatched with respect to said second printing cylinder for one revolution of said first printing cylinder; third, fourth and fifth printing cylinders each mounted in rotational, tangential relationship to said second printing cylinder with the axis of each of said cylinders being movable toward and away from the axis of said second printing cylinder into a latched or unlatched relationship therewith, and each having an effective diameter equal to that of said first printing cylinder, said third, fourth and fifth printing cylinders each having a single work area of substantially said given peripheral length, and a single gap, and each being adapted to mount a printing plate in said single work area and means for inking each of said printing plates; said press having means for printing images by the offset process, on sheets which pass through the said bite of said printing couple, said means including means for printing, on each revolution of said second printing cylinder, up to three images from one blanket onto one side of a first sheet, and up to three identical images from one or more additional blankets onto one side of each of one or more additional sheets up to a number of sheets equal to said integer multiple, each of which sheets pass through the said bite only once, and said means also including means for printing, on each revolution of said second printing cylinder, up to three different images from separate blankets onto one side of a single sheet which passes through said bite one time for each such separate blanket, and with the number of such separate blankets being not greater than said integer multiple; said means including means for selectively causing each of said third, fourth, and fifth printing cylinders to be normally latched with respect to said second printing cylinder during the passage of each work area of said second printing cylinder to cause the said printing plates mounted on said printing cylinders to roll in contact with each work area of said second printing cylinder on each revolution of said second printing cylinder, or alternatively to cause each of said third, fourth and fifth printing cylinders to be normally latched with respect to said second printing cylinder during the passage of only one of the work areas of said second printing cylinder to cause the said printing plates mounted on each of said printing cylinders to roll in contact with only one work area of said second printing cylinder on each revolution of said second printing cylinder, and means to override the normally latched position of said third, fourth and fifth printing cylinders and to cause each of said third, fourth and fifth printing cylinders to be unlatched with respect to the said second printing cylinder during the passage of any work area of the second printing cylinder from which the first printing cylinder was unlatched due to the detection of the absence of a sheet of paper.

4,098,186

SCREEN PRINTING MACHINE WITH ADJUSTABLE END-MOUNTING UNITS

Mathias Mitter, Sandweg 11, 4831 Veri-Sende Mitte, Germany

Continuation of Ser. No. 458,342, Apr. 5, 1974, Pat. No. 3,995,552. This application Jun. 28, 1976, Ser. No. 700,206
Int. Cl.² B41F *15/08, 15/38*
U.S. Cl. 101—127.1 **17 Claims**



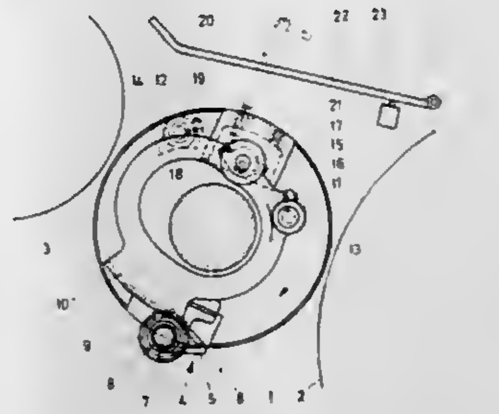
1. In a screen printing machine, in combination, roller means comprising at least a pair of transversely spaced first guide rollers; means comprising a support and a pair of end mounting units thereon and mounting said first guide rollers for rotation about fixed first axes which are located in a common first plane; a second roller mounted for rotation about a second axis which is normally in a first position wherein it parallels said first axes and which is located in a second plane parallel to said first plane; an endless travelling printing screen band trained about said rollers for entrainment thereby and defining in the space between said first rollers a planar printing run parallel to said planes and having an operating position in which it is juxtaposed with a web to be printed, said band tending at least at times to shift axially of said rollers during entrainment by the same so that said printing run moves out of its operating position; restoring means for moving said band during the travel thereof axially of said rollers in direction counter to the axial shift for restoring said printing run to said operating position thereof, said restoring means comprising a pair of shaft bearings each journalling one end of said second roller for rotation, pivot means mounting one of said shaft bearings for pivotal movement about an upright axis, and first adjusting means mounting the other of said shaft bearings for displacement in a path parallel to said planes and transverse to said first axes, for pivoting said second roller and said second axis thereof in said second plane about said upright axis from said first position to a plurality of second positions in each of which said second roller extends skew to said first axes; and means for shifting at least one of said mounting units parallel to said planes with reference to said support, including a plate on said support and carrying lifting means for lifting said units, and bolt means connecting said plate with said support and being operative for displacing said plate with reference to said support.

4,098,187

DEVICE FOR REVERSING THE OPERATION OF GRIPPERS OF A SHEET-TURNING DRUM IN A PRINTING MACHINE FOR PRINTING SELECTIVELY ON ONE OR BOTH SIDES OF A SHEET

Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Oct. 18, 1976, Ser. No. 733,344
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546522
Int. Cl.² B41F *21/04*
U.S. Cl. 101—410 **3 Claims**



1. In a printing machine operable for printing selectively in either one of two modes, said modes comprising printing on one side or on both sides of a sheet, a sheet-turning drum provided with grippers, control cams, followers and resilient spring means for biasing said followers and said cams relatively against one another, mechanical linkage means connecting said cams and said followers with the grippers for actuating the same, said followers and said cams being in relative rolling engagement with one another, said control cams and said followers being shiftable relative to one another when changing from one mode of printing to the other in a direction normal to the plane of said relative rolling of said followers and said cams, and said linkage means including control elements carrying said followers, a device for reversing the operation of the grippers when changing from one mode of printing to the other by shifting said followers, on the one hand, and said rollers, on the other hand, relative to the other, comprising a tool insertable into the sheet-turning drum so as to project well beyond the periphery thereof, said tool cooperating with said control elements so as to lift the followers from the control cams against the bias of said spring means during shifting of the control cams and said followers relative to one another.

4,098,188

PRINTING PLATE

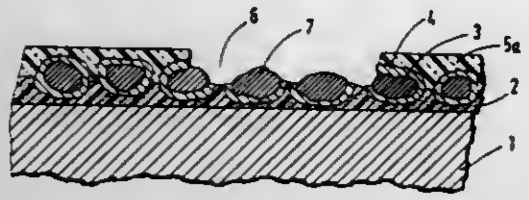
Joachim Stroszynski, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1976, Ser. No. 730,680
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2544971
Int. Cl.² B41N *1/00, 3/00*
U.S. Cl. 101—458 **18 Claims**

1. A printing plate comprising a support bearing a layer comprising particles each containing a hydrophilic metal core selected from the group consisting of aluminum, zinc, steel, chromium, and nickel,

and an oleophilic metal casing selected from the group consisting of copper, brass, and lead.

9. A printing plate comprising a support bearing a layer

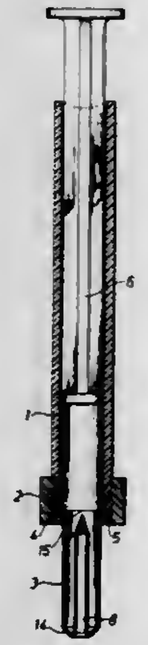


comprising particles each containing an oleophilic metal core selected from the group consisting of copper, brass, and lead, and a hydrophilic metal casing selected from the group consisting of aluminum, zinc, steel, chromium, and nickel.

4,098,189

METHOD AND APPARATUS FOR PREPARING AN EXPLOSIVE CHARGE

Harry Holm, Odens vag 15, S-150 22 Nykvarn, Sweden
Filed Sep. 28, 1976, Ser. No. 727,623
Int. Cl.^{2} F42B *1/02*
U.S. Cl. 102—24 R **7 Claims**



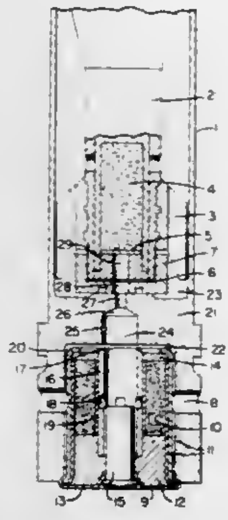
1. A method of preparing an explosive charge comprising a moldable explosive material, a detonator, and a cartridge, comprising the steps of forming a cartridge comprising a casing defining a cavity open at one end thereof and a hollow tube of substantially the same length as the casing for accomodating a detonator substantially centrally disposed within said casing and open at an end thereof remote from the said one end of the cavity, a wall having at least one hole therein connecting the periphery of the open end of said tube to said casing, the end of said tube adjacent the open end of said casing being tapered to facilitate entry of said moldable explosive material and said casing being formed with a radially outwardly extending flange at said open end to facilitate holding of said cartridge on introduction of said moldable explosive material, connecting the cartridge to a piston and cylinder device which contains moldable explosive material; said cylinder having means for securing the radial flange at the end of the cylinder, operating the piston to urge said explosive material into said cavity to at least partially fill said cavity with explosive, with said explosive surrounding said hollow tube; and inserting a detonator into said hollow tube through the open end thereof.

2. An explosive cartridge comprising a cylindrical casing open at one end and a coaxially hollow tube extending into said casing from the other end, a wall integrally connecting the casing and the tube at the end opposite the open end, said tube being of substantially the same length as said casing defining a space for accomodating a basting cap, said tube and casing defining therebetween a cavity for receipt of a moldable explosive material, the end of said tube adjacent the open end of said casing being tapered to facilitate entry of said moldable explosive material and the connecting wall having at least one hole for the exhaust of air on introduction of the explosive material.

4,098,190

TRAINING AMMUNITION FOR MORTARS

Heinz Gawlick, Vagen-Feldkirchen, and Rodolf Stahlmann, Fürth, Bay, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany
Filed Aug. 18, 1976, Ser. No. 715,499
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1975, 2537636
Int. Cl.^{2} F42B *13/20*
U.S. Cl. 102—41 **29 Claims**



1. Training ammunition for mortars comprising projectile means disposed in cartridge case means and provided with propellant charge means for being fired from a barrel insert of a dummy shell, ejector charge means associated with said cartridge case means, said ejector charge means including ignition means and being arranged for ejecting the dummy shell together with said cartridge case means from the mortar barrel, means forming a flash hole arranged between said propellant charge means and said ejector charge means, and an ignition jet conducting tube means being disposed coaxially within said ejector charge means and extending from said ignition means to the end of said ejector charge means facing said flash hole means, said ignition jet conducting tube means being provided with at least one radial ignition aperture therethrough, said ignition jet conducting tube means enabling ignition of said propellant charge means prior to enabling ignition of said ejector charge means so as to improve the ballistics of the training ammunition.

4,098,191

PASSIVE OPTICAL PROXIMITY FUZE

Bryan G. Bagwell, Mesa, and Frank S. Gemmell, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 9, 1976, Ser. No. 703,874
Int. Cl.^{2} F42C *13/02, 13/00, 11/06*
U.S. Cl. 102—213 **8 Claims**

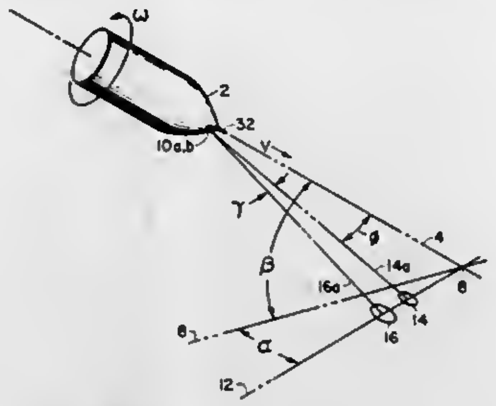
1. An apparatus for determining the slant range from a ballistic vehicle to the ground along the flight path of the ballistic vehicle, comprising in combination:

means for measuring the flight path velocity of the vehicle;

first means for sensing a plurality of landmarks on the ground from the ballistic vehicle, said first sensing means being aimed along a first path, said first path being at a first angle with respect to the vehicle flight path;

second means for sensing said plurality of landmarks on the ground from the ballistic vehicle, said second sensing means being aimed along a second path, said second path being at a second angle with respect to the vehicle flight path, said second angle being greater than said first angle;

means for determining a time delay between said first and said second sensing of one of said plurality of landmarks, as the result of the vehicle motion along the flight path;



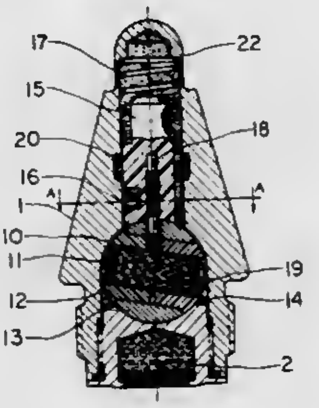
means for determining a time between successive sensings of said plurality of landmarks; and

means for calculating the slant range from the ground to the ballistic vehicle along the flight path.

4,098,192

BALL ROTOR SAFETY AND ARMING DELAY DEVICE

David S. Breed, Hillcrest Rd., Boonton Township, Morris County, N.J. 07005
Continuation-in-part of Ser. No. 470,152, May 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 288,026, Sep. 11, 1972, abandoned. This application Jun. 23, 1976, Ser. No. 698,806
Int. Cl.^{2} F42C *15/22*
U.S. Cl. 102—232 **9 Claims**

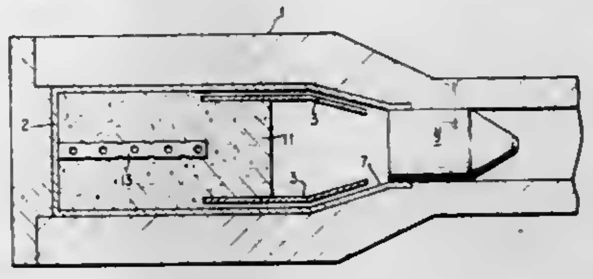


1. A safety and arming delay fuze for spinning munitions comprising a housing, a cavity in said housing, a ball rotor in said cavity having a polar moment of inertia larger than either transverse moment of inertia, a detonator within said ball rotor, a firing pin means in said housing, means to hold said ball rotor in a first safe position with said detonator out of alignment with said firing pin means and to release said ball rotor when said munition is launched, means for increasing arming distance by reducing substantially all friction forces between the walls of said cavity and the ball rotor, the latter means involves the use of a low viscosity liquid to exert a buoyant force on the ball rotor such that as the munition rotates after launch, the detonator revolves many times about the axis of the projectile and eventually spirals into alignment with the firing pin means thereby providing longer arming delays for the fuze with the revolving motion of the detonator being controlled primarily by the friction forces between the cavity and the ball rotor.

4,098,193

WEAR AND CORROSION REDUCING ADDITIVE FOR GUN PROPELLANTS

Michael A. Schroeder, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 8, 1976, Ser. No. 721,617
Int. Cl.^{2} F42B *5/12, 1/00;* **C06B** *45/00*
U.S. Cl. 102—92 **2 Claims**

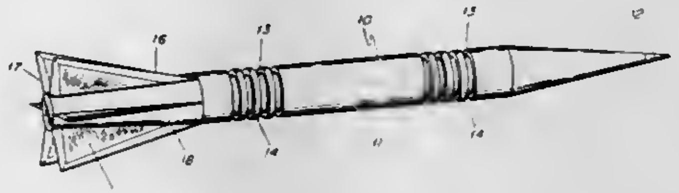


1. A method of protecting the interior surfaces of gun barrels from wear and corrosion, which comprises: applying an unfoamed laminar sheath comprising poly(2-methyl-5-vinyltetrazole) to a gun propellant in such a manner that the heat generated by firing of the gun causes the compound to decompose thereby evolving gaseous products which buffer said interior surfaces from the corrosive and wearing effects of the combustion products of the propellant.

4,098,194

HYPERVELOCITY PROJECTILE WITH ALUMINUM COMPONENTS OF HIGH RESISTANCE TO THERMODYNAMIC ABLATION

Gary M. Miller, and Curtis J. Koch, both of Waterloo, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 1, 1977, Ser. No. 802,412
Int. Cl.^{2} F42B *11/00;* **C25D** *11/08*
U.S. Cl. 102—105 **4 Claims**



1. A hypervelocity kinetic energy projectile containing external aluminum stabilizing fins having a coating of high resistance to termodynamic ablation, said coating consisting essentially of a hard anodic oxide coating sealed by contact with an aqueous solution of an alkali metal silicate of the formula $Me_2O{:}x.SiO_2$, wherein Me is an alkali metal and x is at least 2.0.

4,098,195

TRANSPORTATION SYSTEM FOR THE DISTRIBUTION OF ARTICLES TO SEVERAL RECEIVING STATIONS ALONG A TRACK

Karl-Heinz Zander, Boblingen, Germany, assignor to Büro Patent AG, Glarus, Switzerland
Filed Feb. 4, 1977, Ser. No. 765,601
Claims priority, application Switzerland, Feb. 6, 1976, 1490/76; Feb. 6, 1976, 1491/76
Int. Cl.^{2} B61K *1/00*
U.S. Cl. 104—88 **32 Claims**

1. A system for distributing impact-sensitive articles to a number of destinations, comprising:

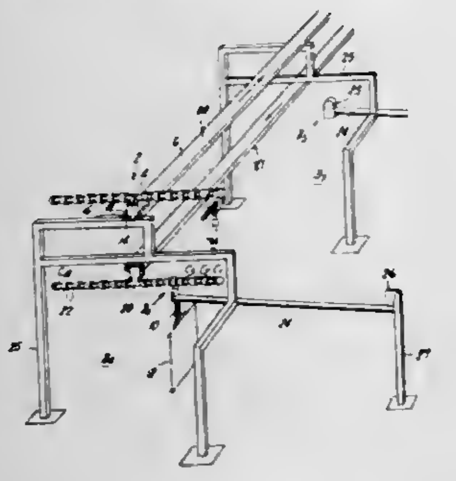
track means forming a path leading past all said destinations;

at least one transporter movable along said path;

support means on said transporter including a transverse rod formed with a plurality of predetermined engagement positions for articles respectively headed for said destinations, said engagement positions being transversely spaced with reference to said path;

holders emplaceable on said rod in any of said engagement positions, each holder being adapted to carry at least one article;

hook means on each holder fitting onto said rod in a forwardly open position for disengagement therefrom by relative rearward motion;



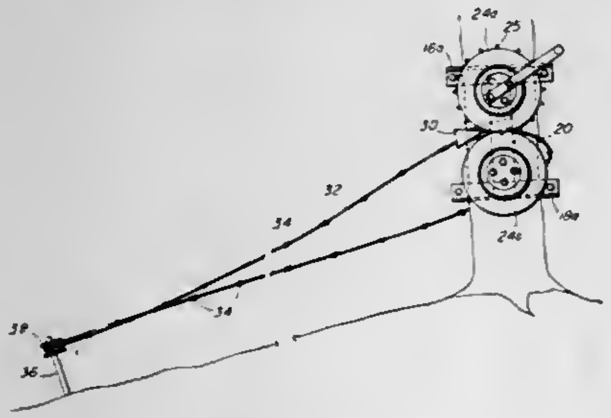
retrieval means at each destination aligned with the respective engagement position for arresting a corresponding holder with resulting release of said hook means from said rod upon movement of said transporter past said retrieval means; and

guide means at each destination juxtaposed with said retrieval means for directing a released holder to a receiving station, said retrieval means including retaining means synchronized with the movement of said transporter for temporarily immobilizing a released holder in an elevated position just above said guide means.

4,098,196

PORTABLE SKI TOW HOIST

Clyde R. Weibe, Jr., 17 Lindbergh Ave., Needham, Mass. 02192
Continuation-in-part of Ser. No. 661,536, Feb. 26, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,760
Int. Cl.² B61B *12/10*
U.S. Cl. 104—173 ST **2 Claims**



1. A tow device which comprises:

(a) a substantially rigid roller having a bearing surface with a plurality of elongated ridges formed on the bearing surface and extending therefrom;

(b) a substantially soft roller having a bearing surface in contacting engagement with the bearing surface of the rigid roller, the rollers providing the entire driving force for a towline passing therebetween, at least one ridge at all times frictionally engaged with and elastically deforming the soft roller the longitudinal axes of the ridges transverse to the direction of the towline passing between the bearing surfaces, the towline clamped therebetween;

(c) means to rotate at least one of the rollers to draw the towline therethrough;

(d) the towline being endless and having a plurality of equally spaced protuberances formed integrally therewith, first guide means adjacent and upstream of the rollers, the towline and the protuberances received between the bearing surfaces in a direction substantially perpendicular to the axes of rotation of the rollers;

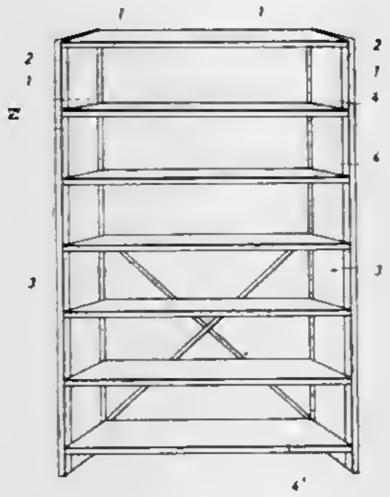
(e) means to vary the resiliency of the rollers to maintain the amount of frictional engagement between the surfaces substantially the same at all times and to allow the protuberances to pass between the bearing surfaces without deformation; and,

(f) second guide means to maintain solely the orientation of the towline downstream of the rollers said second guide means positioned such that there is substantially no tension on the towline downstream of the rollers and upstream of the second guide means, the towline discharged from the rollers in a direction non-perpendicular to the axes of rotation of the rollers.

4,098,197

COMPOSITE SHELVING SYSTEM

Ib Offer Jörgensen, Holbaek, Denmark, assignor to Nord-Plan Stalreoler A/S, Vipperod, Denmark
Filed Jul. 13, 1977, Ser. No. 815,166
Int. Cl.² A47G *57/16*
U.S. Cl. 108—109 **5 Claims**

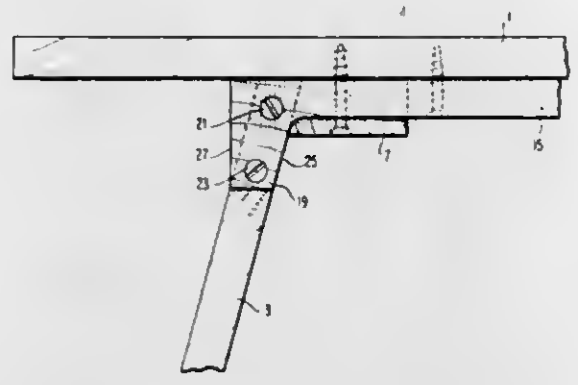


1. A composite shelving system comprising two sidepieces and a plurality of rectangular shelves (4) arranged therebetween, whereby each sidepiece is built of two columns (1) joined by connecting means (2), and whereby the shelves (4) comprise protruding supporting means (10) secured in apertures (6) in the columns (1), said apertures facing the centre of the shelving system, and whereby the two sidepieces are braced by cross bars (3), characterized in that each column is constituted by a profiled bar (1) comprising at least one very long main slot (16) for receiving the connecting means (2), and at least two small auxiliary slots (5), into which the ends (3*a*) of the cross bars are loosely insertable since the profiled bar (1) comprises a substantially C-shaped, but almost closed cross section (FIG. 2), and since the ends of the free webs of the "C" are bent so as to form flanges (17*a*., 17*b*), said flanges forming the main slot (16), whereas the auxiliary slots (5) are provided at the portion of the profiled bar (1) corresponding to the back of the "C", and that the connecting means (2) are constituted by abutting sheet members comprising bent portions (14) at their side edges, said portions being adapted so as to cooperate with the flanges (17*a*, 17*b*) of the profiled bars, whereby the sheet members (2) are inserted into the main slot (16) of the profiled bars, and that the supporting means of the shelves are constituted by tongues (10) cut out of and bent outwards from the shelves, said tongues being capable of clamping the lower portion (6*a*) of the edge of the apertures (6) of the profiled bars.

4,098,198

TABLE WITH TWO BRACED LEGS

Theodore Neel Patch, 4106 Leland St., Chevy Chase, Md. 20015
Filed Jun. 8, 1977, Ser. No. 804,730
Int. Cl.² A47B *13/00*
U.S. Cl. 108—161 **7 Claims**

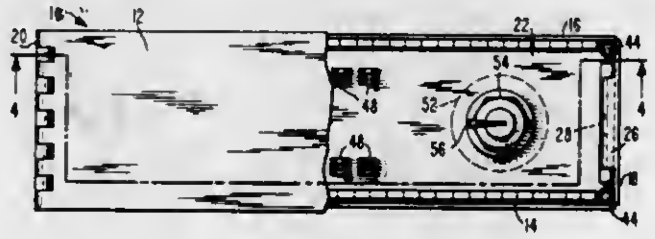


1. A wooden table comprising a flat elongated top, a pair of parallel crosspieces secured to the underside of the top adjacent opposite ends of the top and perpendicular to the length of the top, the crosspieces having a length which is most but not all of the width of the top, a pair of parallel ribs extending most of the length of the tabletop, the ribs being disposed at opposite ends of each said crosspiece and extending toward the end of the tabletop beyond each crosspiece and terminating in downwardly depending ends, a pair of flat rectangular legs disposed one adjacent each end of the table, the legs depending downwardly from the table and diverging downwardly away from each other, the upper ends of the legs being disposed between said ends of the ribs and being in contact with the outer side edges of said crosspieces, and means securing said ends of said ribs to the edges of the upper ends of the legs at points spaced a substantial distance below those portions of the lower edges of said ribs that are between said ends of said ribs, the space below said ribs and crosspieces and between said legs being free and open, and fasteners extending through said ribs and up into said top between said ends of said ribs.

4,098,199

PORTABLE SAFE

Bassam N. Haje, 9034 Arlington Blvd., Fairfax, Va. 22030
Filed May 25, 1977, Ser. No. 800,595
Int. Cl.² E05G *1/024*
U.S. Cl. 109—52 **9 Claims**

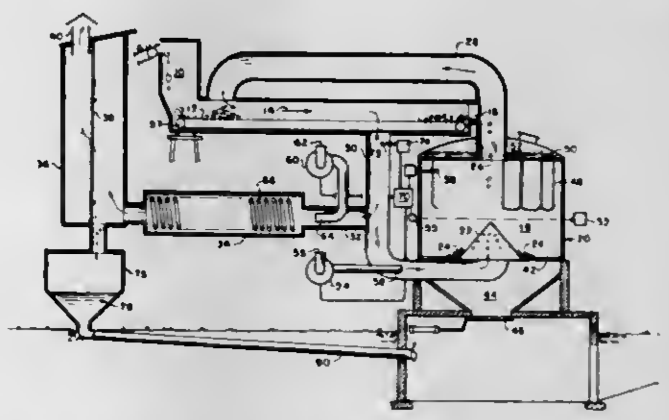


1. A portable safe comprising
a bottom panel member;
a top panel member;
a plurality of further panel members;
a plurality of hinges connected to said panel members to hingedly connect said bottom panel member, said top panel member, and said further panel members for hinged movement between a first position, in which said bottom panel member, said top panel member, and said further panel members lie substantially flat, and a second position, in which said bottom panel member, said top panel member, and said further panel members cooperate to define an enclosure with said hinges on the interior thereof;
a plurality of pin members;
each of said further panel members having on two edges thereof a plurality of loop members positioned so that, when said panel members are in said second position, the loop members of adjacent ones of said further panel members interleave to receive said pin members, whereby said panel members are retained in said second position;
lock means for locking said top panel member to one of said further panel members in said second position to provide a locked enclosed space within said members while permitting unlocking thereof; and
actuable securing means connected to one of said panel members and including a securing position positioned to be outside the enclosure when said panel members are in said second position; an actuating portion positioned to be within the enclosure when said panel members are in said second position for actuating said securing portion to secure said one of said panel members, and thus said portable safe, to a surface; and cover means for covering said securing portion and cooperating with the surface to prevent access to said securing means when said portable safe is secured to the surface.

4,098,200

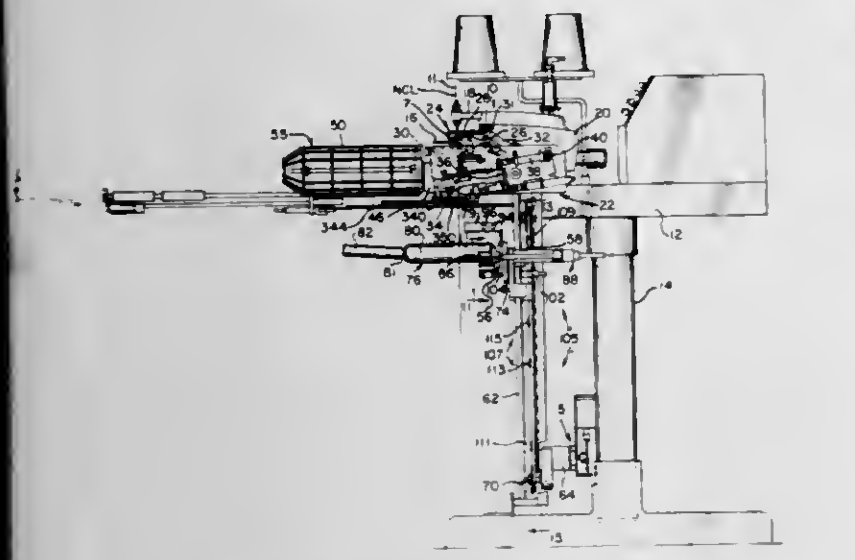
LOW POLLUTION SOLID WASTE BURNER

Hector A. Dauvergne, 419 E. Merle Ct., San Leandro, Calif. 94577
Filed Dec. 9, 1976, Ser. No. 749,066
Int. Cl.² F23G *5/02;* **F23J** *15/00*
U.S. Cl. 110—204 **6 Claims**



1. A disposal apparatus for solid waste comprising
means defining a first combustion chamber,
a combustion bed located in said first combustion chamber,
means for conveying said solid waste to said combustion chamber,
means defining a gaseous combustion products exhaust port located in said combustion chamber above said combustion bed,
means defining a first conduit having one end connected to and in fluid communication with said gaseous combustion products exhaust port and having its other end in fluid communication with said combustion bed, and
a first air blower having an intake port and an exhaust nozzle, said exhaust nozzle disposed in said first conduit, said exhaust nozzle arranged to blow air into said combustion bed with entrained gaseous combustion products in said first conduit,
means defining a space below said combustion bed,
means defining a second conduit having one end in fluid communication with said first conduit upstream from said exhaust nozzle and the other end in fluid communication with said space below said combustion bed.

4,098,201
METHOD AND APPARATUS FOR HEMMING
Maximilian Adamski, Jr., Wheeling; Robert E. Smith, Crystal Lake, and Dhimat R. Desai, Palatine, all of Ill., assignors to Union Special Corporation, Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,604
Int. Cl.² D05B *21/00*
U.S. Cl. 112—2 **17 Claims**



1. An apparatus in combination with a sewing machine which has a needle means and a cloth plate means having the needle center line passing therethrough, for sewing a hem on a tubular fabric means comprising:

freely rotatable material support means adjacent to and spaced away from said cloth plate having a major axis generally parallel and coextensive with a major axis of said cloth plate;

freely rotatable material tensioning means adjacent to and spaced away from said material support means, said tensioning means and said support means having generally parallel major axes, said axes being generally perpendicular to the major axis of said needle center line, said tensioning means including inner and outer portions, said inner portion having first and second section means, said first section situated generally below said cloth plate and said second section situated generally below and to the side of said cloth plate whereby a series of tension zones are achievable during operation of said apparatus; and

a material puller means positioned adjacent said needle means actuatable for initiating a material hem and causing material flow to form said zones of tension.

14. A sewing machine having a needle means and a cloth plate means for performing work on a tubular fabric means and having an ejection means for deflecting said tubular fabric means away from the needle means during the initial stages of the work cycle thereof comprising:

a lever means located adjacent the needle means capable of exerting deflecting force on only an edge of said fabric means positioned on said cloth plate means;

means operative to deliver force to said lever means; and

means causing actuation of said lever means prior to actuation of said work performing instrumentality and deactuation thereof after a predetermined cycle.

17. A sewing machine apparatus in combination with a fabric tensioning means for tensioning a tubular fabric means such that a work cycle can be performed thereon comprising:

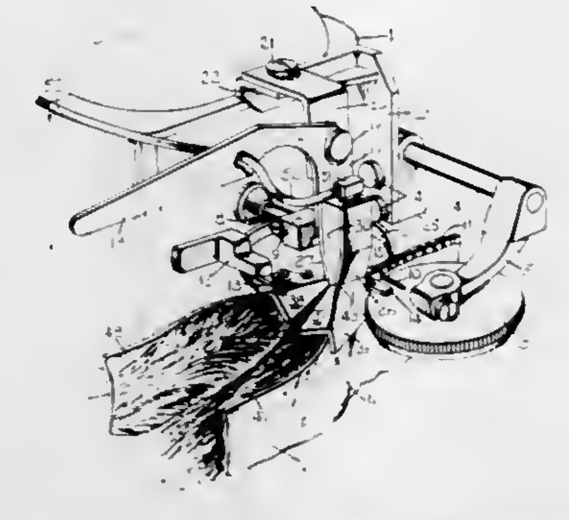
a carriage means capable of moving along a track means;

a lever means movably secured to said carriage means in a following manner, said lever means engages said fabric means and is movable to either a first or second position depending on the tension to which said fabric is subjected to;

a force transfer means including an electric motor means capable of moving said carriage means along said track means; and

a series of switch means controlled by the response of said fabric engaging lever means, said series of switch means includes first and second switch means, said first switch means activating said motor means to drive said carriage in a first direction and said second switch means activating said motor means to drive said carriage means in a second direction.

4,098,202
WORKPIECE GUIDE FOR SEWING MACHINES
Nerino Marforio, Milan, and Pietro Bonalumi, Cernusco sul Naviglio (Milan), both of Italy, assignors to Rockwell-Rimoldi S.p.A., Milan, Italy
Filed Apr. 25, 1977, Ser. No. 790,445
Claims priority, application Italy, May 7, 1976, 23067 A/76
Int. Cl.² D05B *23/00, 35/10*
U.S. Cl. 112—20 **1 Claim**



1. A device for guiding two pieces of fur defining a workpiece to the stitching instrumentalities in a sewing machine of the type having a pair of counter-rotating disks for advancing the workpiece in a plane normal to the direction of movement of the machine's stitching needle, said device comprising:

(a) a pair of angular elements (**35,36**) symmetrically supported on the machine in operative association with the plane of advancement of the workpiece which includes:
  (i) upper walls (**37,38**) respectively directed inwardly and downwardly one toward the other for folding the fur on the upper portion of the two pieces inwardly and downwardly between said pieces; and
  (ii) lateral walls (**39,40**) connected to said upper walls (**37,38**) respectively extending one toward the other in the direction of the rounter-rotating disks defining a funnel-shaped element;

(b) a pair of substantially vertical walls (**43,44**) connected to said lateral walls (**39,40**) respectively forming a continuation of said funnel-shaped element;

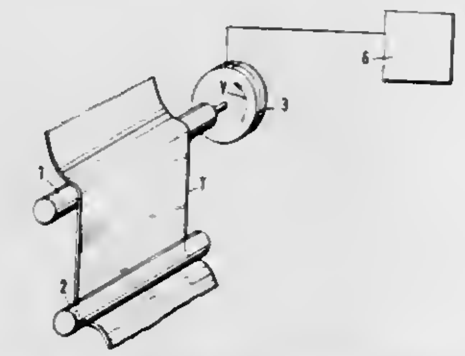
(c) means defining a depending guide plate (**45**) interposed between said vertical walls (**43,44**) forming parallel channels (**41,42**) therein having a length corresponding to the width of said depending guide plate (**45**) for separately guiding the pieces of fur toward the stitching instrumentalities;

(d) said depending guide plate (**45**) including an arcuated edge (**46**) defining a curvilinear profile for effecting a continued folding influence on the fur;

(e) means operatively connected to said channels (**41,42**) for subjecting the workpiece to downwardly directed flows of compressed air for maintaining the fur in its folded position during reception of the workpiece by the rotating disks; and

(f) a central element (**29**) forming the upper portion of said channels (**41,42**) having spaced sidewalls disposed in operative association with said depending guide plate (**45**) defining openings (**53,54**) through which said downwardly directed flows of compressed air are emitted and said openings (**53,54**) correspond dimensionally to the length and width of said channels and in combination with said depending guide plate (**45**) and compressed air produce laminar air flows throughout the entire aligned area between said openings and the upper edges of the two pieces of fur in vertical alignment therewith.

4,098,203
ADVANCING OF A TEXTILE CLOTH ON AN EMBROIDERY MACHINE
Pierre Job, Lessines, Belgium, assignor to Waroo Belgium S.A., Lessines, Belgium
Filed Dec. 27, 1976, Ser. No. 754,239
Claims priority, application Belgium, Dec. 29, 1975, 645313
Int. Cl.² D05C *9/08*
U.S. Cl. 112—90 **4 Claims**

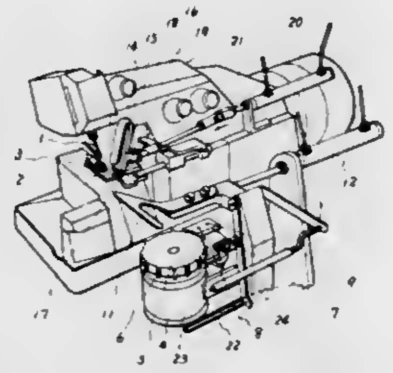


1. A device for advancing of a textile cloth, for instance on an embroidery loom, comprising

means for unwinding a cloth in a forward direction without limitation, with possible rearward-return, while continuously retaining the same predetermined tension,

an electromagnetic coupler means directly operatively connected with said unwinding means for retaining the same tension on the cloth and by electronically controlled tensions and relaxations for balancing out the advance and rearward-return of the cloth.

4,098,204
APPARATUS FOR STRETCH-SEWING A HEM IN TUBULAR FABRIC
Toshihiko Kojima, Hyogo, Japan, assignor to Yamato Mishin Seizo Kabushiki Kaisha, Osaka, Japan
Filed Jul. 6, 1976, Ser. No. 703,115
Claims priority, application Japan, Sep. 5, 1975, 50-108421
Int. Cl.² D05B *21/00, 33/00, 35/10*
U.S. Cl. 112—121.12 **7 Claims**



1. A machine for forming and sewing a hem in the marginal portion of a workpiece, said machine comprising:

stitch forming means operable to grip a first portion of a workpiece having a hem folded in a marginal portion thereof and to sew said hem;

means for feeding said workpiece through said stitch forming means;

a circular guide plate positioned upstream of said stitch forming means, in the direction of feed of said workpiece, said guide plate having an upper flat surface extending in a plane which is parallel to said direction of feed and an annular peripheral surface;

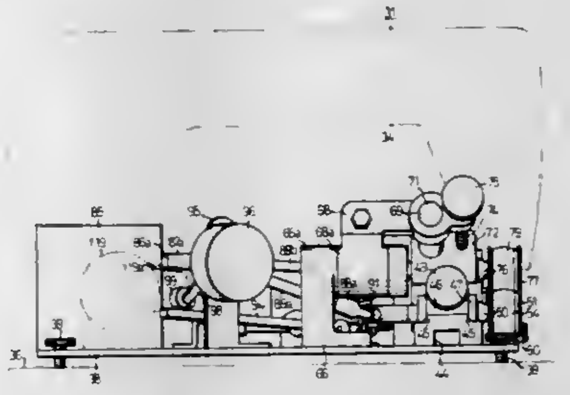
gripping means for gripping the workpiece at a position thereof upstream of said guide plate and for forcing said workpiece against said upper flat surface of said guide plate and downwardly so that the marginal portion of said workpiece contacts and travels along said annular peripheral surface of said guide plate, whereby as said feeding means feeds said marginal portion of said workpiece over said annular peripheral surface and then over said upper flat surface of said guide plate, said marginal portion has automatically formed therein a substantially Z-shaped fold;

fold guide means positioned downstream of said guide plate for extending into the thus formed fold and to interiorly guide said fold as said workpiece is fed in said direction of feed;

hemming guide means positioned between said fold guide means and said stitch forming means for exteriorly guiding said fold as said workpiece is fed in said direction of feed; and

said fold guide means and said hemming guide means together forming said Z-shaped fold into a triple-thickness hem which is thereafter sewn by said stitch forming means.

4,098,205
APPARATUS FOR STRETCHING SEWED PORTIONS OF CLOTH IN SEWING OPERATION
Yoshiroo Kawashima, 18 Higashi-Komazume-cho, Gifu City, Gifu-ken, Japan
Filed Aug. 18, 1976, Ser. No. 715,444
Claims priority, application Japan, Sep. 9, 1975, 50-109321; Nov. 13, 1975, 50-154937; Dec. 29, 1975, 50-176478; Jan. 19, 1976, 51-4323
Int. Cl.² D05B *27/00*
U.S. Cl. 112—217 **9 Claims**



1. For a sewing machine with a sewing work station, an apparatus for stretching sewn portions of work cloth which comprises:

a. a stretching member (**40**) adapted to be disposed to the rear of the sewing work station, said stretching member including an insert portion (**41**) which enters into the cloth in the front of the sewing work station and a pair of flat stretching portions (**42*a*, 42*b***) for stretching the side edge sections of the work cloth from a seam sewn by the sewing machine, said stretching portions having upper and lower faces;

b. a guide member (**43**) for guiding and shifting the stretched cloth toward the rear, which extends from the rear end of one stretching portion;

c. upper and lower cloth feed devices (**55, 66**) extending over the upper and lower faces, respectively, of the stretching portions (*42a*, *42b*) and the guide member (43) to perform stretching of side edge sections of the cloth and shifting of the stretched cloth smoothly; d. an ironing device disposed in the vicinity of the inner side face of the guide member to iron the stretched side edge sections of the cloth which has been shifted onto the guide member, said ironing device including a supporting member (100), means for moving said supporting member in a direction approaching the guide member (43) or away therefrom and a heating plate (105) supported on said supporting member (100) and having a heating face (105*a*) opposite the inner side face of the guide member (43);

e. first spacing means for spacing the upper cloth feed device from the upper faces of the stretching portions (*42a*, *42b*) and the guide member (43) when the cloth feed operation of the sewing machine is interrupted; and,

f. second spacing means for spacing the ironing device from the inner side face of the guide member (43) when the cloth feed operation of the sewing machine is interrupted.

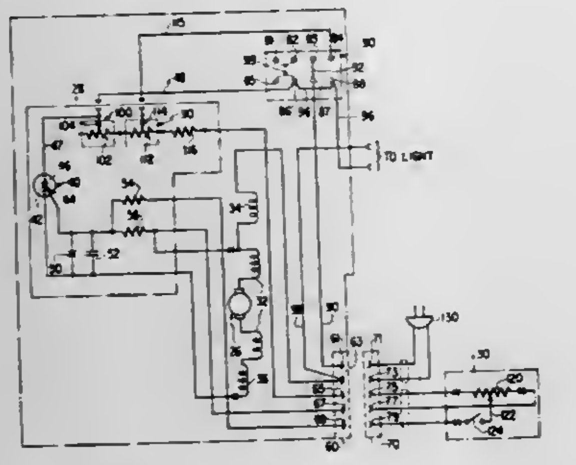
4,098,206

ELECTRONIC MOTOR SPEED REGULATING SYSTEM HAVING ADJUSTABLE HIGH AND LOW SPEED RANGES

Alfred Rolf Suchsland, Morris Plains; Raymond Steven Tyburcy, Middletown, and Charles Robert Odermann, Mootville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 17, 1977, Ser. No. 797,888
Int. Cl.² D05B *69/18*

U.S. Cl. 112—220 **7 Claims**



1. In a sewing machine having an electric motor for driving said sewing machine, an electronic motor speed regulating system comprising means for selectively providing at least two separate predetermined speed ranges for said electric motor, means for varying the speed of said motor within the selected speed range, and means for independently preadjusting the maximum attainable speed of said motor in each of said speed ranges, whereby the adjusting of the maximum attainable speed in one of said speed ranges will not affect the previously set maximum attainable speed in the other of said speed ranges.

4,098,207

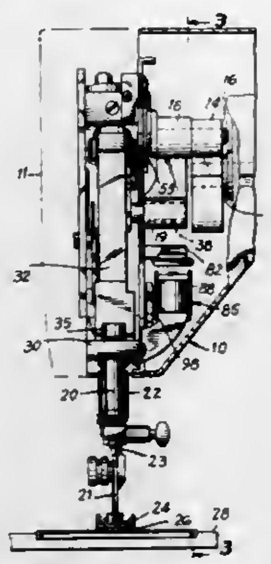
ELECTROMECHANICAL NEEDLE BAR ENGAGING DEVICE

Wesley Robinson Peterson, Bound Brook, N.J., assignor to The Singer Company, New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,116
Int. Cl.² D05B *55/16*

U.S. Cl. 112—221 **3 Claims**

1. A sewing machine having a frame, an endwise reciprocal needle bar supported by said frame, latch mechanism carried by said needle bar, actuating means operating through said latch mechanism for influencing endwise reciprocal motion of said needle bar, means for normally disengaging said latch mechanism from said actuating means, means driven by said actuating mechanism for engaging said latch mechanism to said actuating means, and means for retaining said engaging means with said latch mechanism engaged to said actuating means.



4,098,208

SEWING MACHINE HAVING A DEVICE FOR INITIATING THE MOVEMENT OF THE THREAD CATCHER OF A THREAD CUTTING DEVICE

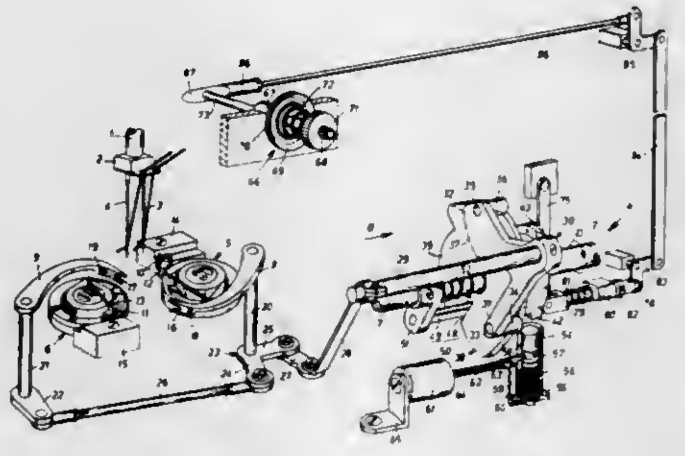
Kristen Hedegaard, Gentofte, Denmark, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,678

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632362

Int. Cl.² D05B *65/02*

U.S. Cl. 112—291 **5 Claims**



1. In a sewing machine including a reciprocating needle bar with a thread-engaging needle cooperating with a rotatable looper which carries looper thread and is driven by a rotatable looper drive shaft and including a thread knife and a thread clamp mounted alongside each other adjacent the looper and a thread-catcher mounted on a catcher shaft which is driven from the looper shaft to move the catcher in the same direction of movement as the looper to the knife and in an opposite return direction, the improvement comprising, a control member for operating said catcher freely rotatably on said looper shaft and being axially displaceable therealong between an inoperative position and an operative position spaced from said inoperative position, a coupling for coupling said control member to the looper shaft, said control member having a control disc portion defining a control surface and a cam portion, a stud abutment, means mounting said stud abutment for movement toward and away from the control member between a starting position of said stud abutment and an operative position, locking means for locking said stud abutment in a starting position, said cam portion being engageable with said abutment to return it to a starting position, spring means biasing said control member to an inoperative position, a retaining member adjacent said control member and means mounting said retaining member for movement against said control member to hold it in an operative position.

4,098,209

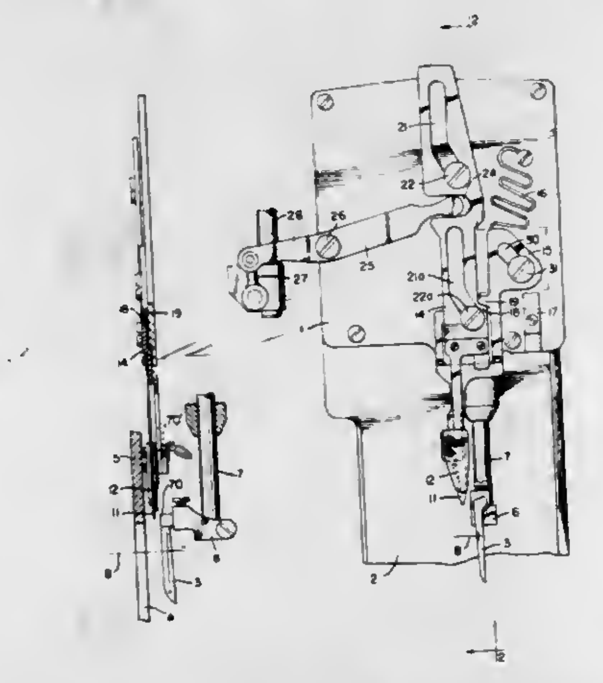
THREAD CUTTER FOR CHAINSTITCH SEWING MACHINE

Dieter Schopf, Gerlingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 717,064, Aug. 24, 1976, abandoned. This application Jun. 21, 1977, Ser. No. 808,502

Int. Cl.² D05B *65/02*

U.S. Cl. 112—298 **14 Claims**



1. A thread severing mechanism for chainstitch sewing machines having a cylinder arm as workpiece rest means and a looper means which is slidable therein perpendicular to the direction of feed and parallel with the workpiece rest for loop pickup comprising:

- a thread catching means movable between the looper means and the workpiece rest means;
- a knife means;
- a thread clamp means;
- a carrier means; and
- a sliding guide means connected to the thread catching means and driving said carrier means which mounts the knife means and the thread clamp means whereby upon actuation the sliding guide means and the carrier means move forwardly and to the side a predetermined distance where the carrier means is engaged and the sliding guide means thereafter moves the thread catching means into engagement with the thread.

6. A thread severing mechanism for a sewing machine including a needle and a looper adapted to form a chain of thread, said thread severing mechanism comprising:

- a reciprocal support means;
- a transporter means;
- a thread catching means carried by said reciprocal support means;
- a knife means mounted on said transporter means for cooperative operation with said catching means;
- means adapted to move said reciprocal support means and said transporter means forwardly and laterally a controlled distance whereby said transporter means is moved to a first position where the transporter means is engaged and said reciprocal support means is moved to a second position for seizing the threads.

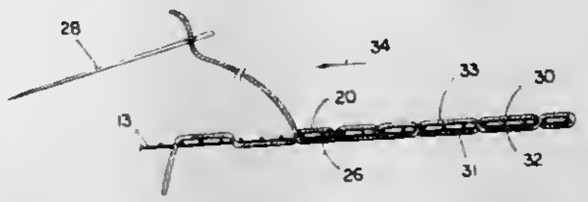
4,098,210

CANVASWORKING METHOD AND ARTICLE

V. Gene Wright, 2349 Garfield Dr. S., Indianapolis, Ind. 46203

Filed Feb. 18, 1977, Ser. No. 769,963
Int. Cl.² D05C *3/00*

U.S. Cl. 112—439 **15 Claims**



1. A method of canvasworking an area of an open weave material defining many holes and having a first, top surface and a second, bottom surface comprising the steps of:

a. making several endways-adjacent top stitches in a line along the first surface of the open weave material, each of the top stitches extending from a first hole in the open weave material to a second hole in the open weave material, the first and second holes of at least two of the top stitches having at least one hole in the open weave material lying therebetween;

b. making several endways-adjacent bottom stitches in a line along the second surface of the open weave material, the line of bottom stitches directly underlying the line of top stitches, each of the bottom stitches extending from a first hole in the open weave material to a second hole in the open weave material, the first and second holes of at least two of the bottom stitches having at least one hole in the open weave material lying therebetween and;

c. repeating steps (a) and (b) to produce a plurality of lines of top and bottom stitches along the first and second surfaces of the open weave material.

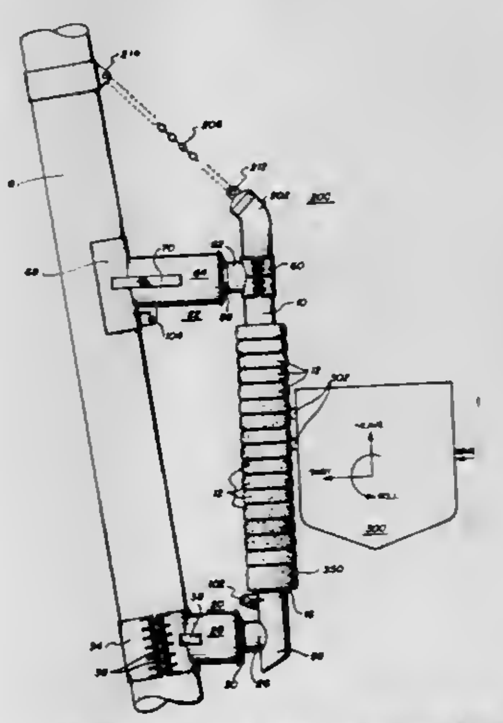
4,098,211

BUMPER RINGS

James H. Files, New Orleans, La.; John M. Montague, Dallas, and Clarence T. Thomerson, Corsicana, both of Tex., assignors to Regal Tool & Rubber Co., Inc., Corsicana, Tex.

Filed Oct. 15, 1976, Ser. No. 732,654
Int. Cl.² B63B *59/02*

U.S. Cl. 114—219 **4 Claims**



1. In a bumper for attachment to a stable structure for fending off vessels floating adjacent thereto, the combination which comprises:

(a) a rigid upright column; and

(b) an outer protective shield surrounding said column and of material which is yieldable compared to the material of said column wherein the outer protective shield comprises a plurality of elastomeric bumper rings surrounding said column in a stacked relationship, wherein the lowermost bumper ring surrounding said column forms a spring means, the spring means comprising a spring having as its center the center of said plurality of elastomeric bumper rings, said spring means sized to receive and freely move on said column for receiving and absorbing axially directed forces on said outer protective shield.

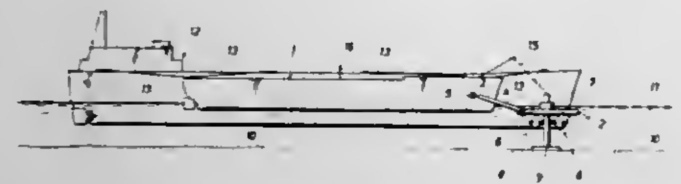
4,098,212
TANKER LOADING TERMINAL

Wilhelmus Kemper, The Hague; Gerard Kruisman, Waarder, and Hendrikus S. Rutten, Voorburg, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 17, 1977, Ser. No. 769,627

Int. Cl.^{2} B63B *21/00*

U.S. Cl. 114—230 **7 Claims**



7. A mooring system, in particular for (un)loading a tanker, comprising a structure secured to the bottom of a body of water and extending vertically to a point above the water line, first annular means rotatably mounted on said structure substantially at the water line thereof, second annular means concentrically mounted outwardly of and operatively connected to the first annular means, a floating mooring arm operatively secured to the second annular means and extending horizontally therefrom, a gravity-actuated spring system connecting and extending between said first and second annular means, said gravity-actuated spring system comprising a set of weights, each weight being suspended between the first and second annular means by elongated suspension means, and a plurality of elastic means selectively carried on one of said annular means, one end of each of said elongated suspension means being connected to one of said elastic means on one of said annular means and the other end of said suspension means being connected to the other of said annular means.

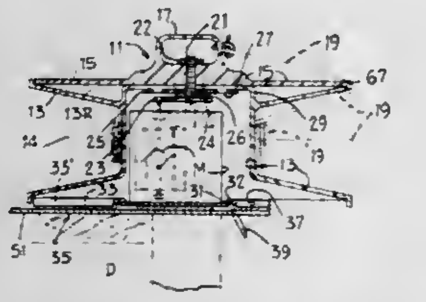
4,098,213
DUAL-ROLE SKI-ROPE RETRIEVER

Lee R. McGinnis, P.O. Box 205, Loami, Ill. 62661

Continuation-in-part of Ser. No. 611,358, Sep. 8, 1975. This application Apr. 5, 1976, Ser. No. 673,972

Int. Cl.^{2} B63B *21/00*

U.S. Cl. 114—254 **8 Claims**



1. A dual-role ski-rope retriever, comprising: a reel member having an inverted cup-shaped hub portion with upper and lower flanges extending therefrom and an upper disc portion covering the upper flange, the upper and lower flanges defining a radially open annular ski-rope-receiving channel, a reversible motor positioned in said hub portion and having a drive shaft which is vertically disposed when the reel member is in a normally vertical-axis power-driven position, means connecting said reel member to said drive shaft to support and reversibly rotate said reel member, and base structure comprising a first plate attachable flatwise to a horizontally disposed support surface, a second plate hingedly connected to said first plate and swingable from a position overlying said first plate to a vertically disposed position, means arresting the swinging of said second plate in its vertically disposed position, and means fixing said reel member and its motor to said second plate, the retriever being constructed and arranged to permit said reel member to be swung from its normally vertical-axis power-driven position to a rearwardly and horizontally disposed axis position for non-rotatingly paying-out ski rope over and around the upper disc portion of the reel member.

4,098,214
FLOAT MADE OF AN AUTOMOBILE-TIRE

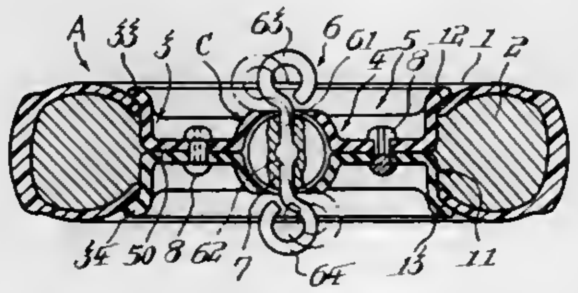
Sboni Ogura, Tokyo, Japan, assignor to Kanazawa Tsusho Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 732,990

Claims priority, application Japan, Mar. 26, 1976, 51-33145

Int. Cl.^{2} B63C *9/04*

U.S. Cl. 114—267 **2 Claims**



1. A float device comprising: an annular float (A) consisting of a casing (1) made of a pneumatic tire which has inner peripheral opening (11) defined between the peripheral annular edge portions (12 and 13) thereof and a mass of porous material (2) filled in the annular hollow of said casing; a body structure (B) having an annular disc portion (5) and an annular flange portion (3) formed around the periphery of said disc portion (5) and generally extending vertically upward and downward and also have annular radially bent edges (33 and 34) therewith for sealing engagement with said peripheral annular edge portions (12 and 13) and said inner peripheral opening (11) therebetween; and hook means (C) provided on said body structure from rope connection;

said body structure (B) being of split form, including an upper body half (B_1) and a lower body half (B_2) joined with each other, said upper body half (B_1) including an annular upper disc portion (5*a*), an annular flange portion (3*a*) formed around the periphery of said upper disc portion (5*a*) and generally extending vertically upward and having an annular radially bent edge (33) thereon, said lower body half (B_2) including an annular lower disc portion (5*b*), an annular flange portion (3*b*) formed around the periphery of said lower disc portion (5*b*) and generally extending vertically downward and having an annular radially bent edge (34) thereon; and in which said hook means (C) provided on said body structure (B) extends through both of the central portions of said upper and lower disc portions (5*a*, 5*b*) therethrough; and

said upper and lower disc portions (5*a*, 5*b*) having hollow hemispherically raised ball-receiving portions (4*a*, 4*b*) formed in the central portion on the same side as said flange portions (3*a*, 3*b*) and having a top opening (40) therein; and in which said hook means (C) comprises a hook member (6) of rust-free metal material and a global body (7) formed thereon integrally therewith, said ball receiving portions (4*a*, 4*b*) of said two body halves corresponding to form a ball retainer 4 to hold said global body (7) of said hook means (C) and swingably support said hook member (6) by said two body halves ($B_1$and B_2) as secured.

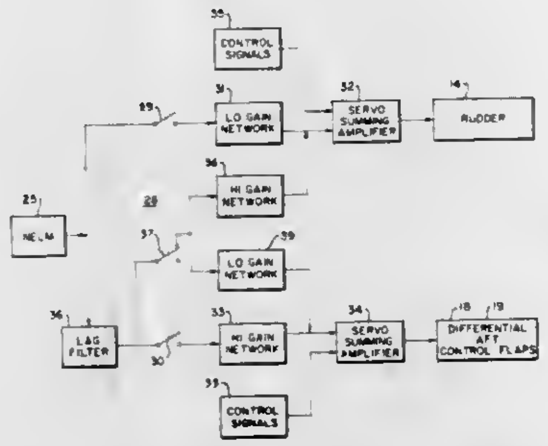
4,098,215
STEERING CONTROL SYSTEM FOR HYDROFOILS

Thomas A. Owan, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 21, 1977, Ser. No. 817,656

Int. Cl.^{2} B63B *1/28*

U.S. Cl. 114—275 **5 Claims**



1. In a steering control system for a hydrofoil craft having a foil system and a rudder, the foil system including separately movable control surfaces, and said craft being adapted for operation in a hull-borne mode and a foil-borne mode, said control system including helm means for generating command signals to effect turning of the craft, a first control loop responsive to said command signals for causing said control surfaces to move in opposite directions to cause the craft to bank about its roll axis, a second control loop responsive to said command signals for turning said rudder, each of said control loops including amplifier means, and means for decreasing the gain of the first loop and increasing the gain of the second loop during acceleration of the craft from the hull-borne mode of operation to the foil-borne mode.

4,098,216
APPARATUS FOR RETRIEVING ANCHORS

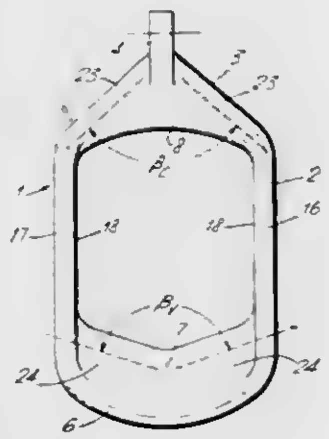
Peter Bruce, "Le Victoria", App. 5e etage, Bloc D, 13 bd. Princesse Charlotte, Monte Carlo, Monaco

Filed Mar. 28, 1977, Ser. No. 782,173

Claims priority, application United Kingdom, Apr. 1, 1976, 13159/76

Int. Cl.^{2} B63B *21/26*

U.S. Cl. 114—297 **20 Claims**



1. A chaser for placement or removal of a link-chain attached anchor from the sea bed, said chaser comprising an anchor grappling member including a loop shaped portion serving to catch and support the anchor for anchor retrieval or placement, said grappling member being adapted for constrained movement along the chain to or from the anchor, a lower part of the loop shaped portion having an inner surface for sliding engagement with the chain during said constrained movement of the grappling member along the chain while an upper part of the loop shaped portion includes means for attachment of the grappling member to a pendant line, said inner surface of the loop shaped portion defining in transverse cross-section, an arcuate line, which arcuate line includes a leading portion and a following elongate portion having a radius of curvature substantially greater than that of said leading portion, said following elongate portion serving to engage two successively similarly orientated links of the chain during movement of the grappling member on the chain towards the anchor, the chord subtended by said following portion of the arcuate line forming an obtuse angle β with the line from the attachment means to the point on the arcuate line separating said leading portion from the following portion.

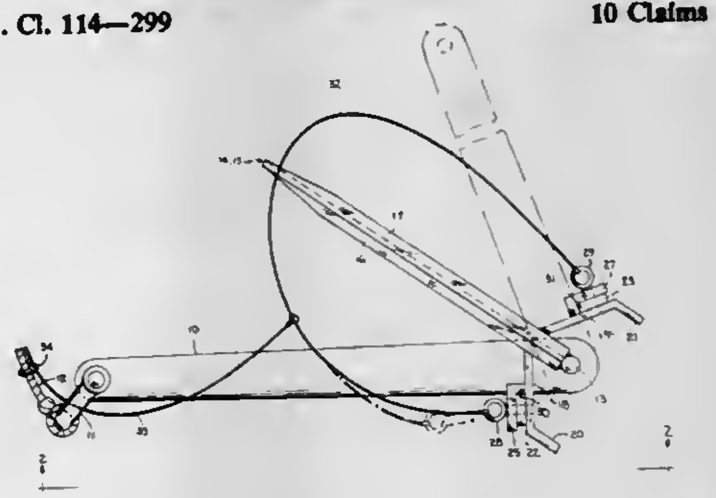
4,098,217
TRIP-RELEASE ANCHOR

Robert E. Altman, West Manchester Township, York County, Pa., assignor to Arnold G. Tucker, York, Pa.

Filed Jul. 27, 1977, Ser. No. 819,482

Int. Cl.^{2} B63B *21/46*

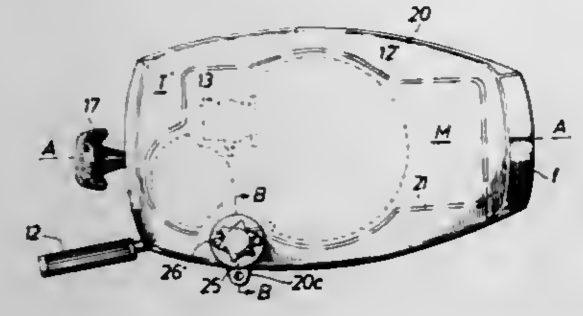
U.S. Cl. 114—299 **10 Claims**



1. A trip-release anchor comprising:
an elongated shank;
an anchoring line extending from one end of the shank to a floating vessel;
a transverse shaft rotatably supported at the other end of the shank;
a pair of coplanar flukes secured along their rear marginal edges to the shaft on opposite sides of the shank, with their inner edges spaced from the shank;
two pairs of transversely spaced crown members attached respectively to opposite sides of the flukes and extending rearwardly at an acute angle to the flukes;
two restraining bars respectively pivotally connected at one end to one crown member of each pair and extending in a transverse direction to the other crown member of each pair, said restraining bars being adapted to limit to an acute angle the swing of the shank out of the plane of the flukes;
locking members engaging the other ends of the restraining bars to position the same in restraining position; and
a release line connected to each locking member, the release line extending substantially coextensively with the anchoring line and adapted to be pulled to remove the locking member from the restraining bar engaging the shank and thereby to permit said restraining bar to be moved freely from restraining position and permit the shank to swing relative to the flukes beyond its restrained position whereby the anchor can be pulled clean of any obstruction.

4,098,218
OUTBOARD MOTOR WITH REMOVABLE COMBINATION FUEL TANK AND SHROUD

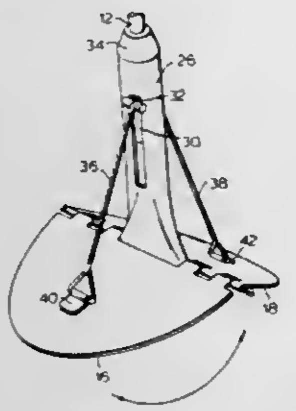
Heinz Pichl, Uppsala, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden
Filed Apr. 14, 1977, Ser. No. 787,350
Claims priority, application Sweden, Apr. 28, 1976, 7604869
Int. Cl.² B63H *21/26*
U.S. Cl. 115—17 **11 Claims**



1. In an outboard motor having a propeller leg and drive and transom attachment means attached to an upper end portion of said leg, said means including an engine, a fuel tank provided with a fill opening and cap, quick detachable means removably attaching said tank to said engine, said tank having a fuel outlet opening and a valve disposed in said outlet opening, said engine having a fuel inlet conduit, second quick detachable means for connecting said conduit to said tank in communication with said outlet opening, an outwardly extending perforate locking tab integrally attached to said tank, and a second perforate tab integral with said engine cooperative with and positioned immediately adjacent said first tab and with its perforation aligned with the perforation of said first tab when said tank is in position for such removable attachment to said engine.

4,098,219
SKI PROPULSION PADDLES

Riccardo Tesan, 2397 Finch Ave. W., Weston, Canada
Filed Dec. 6, 1976, Ser. No. 747,664
Int. Cl.² B63H *1/32*
U.S. Cl. 115—31 **4 Claims**



1. A water propulsion paddle for use in self-propelled water skiing including a lower water-engaging portion, a shaft extending upwardly from said water-engaging portion and a handle means adapted to be gripped by the operator's hand at the upper portion of the shaft;

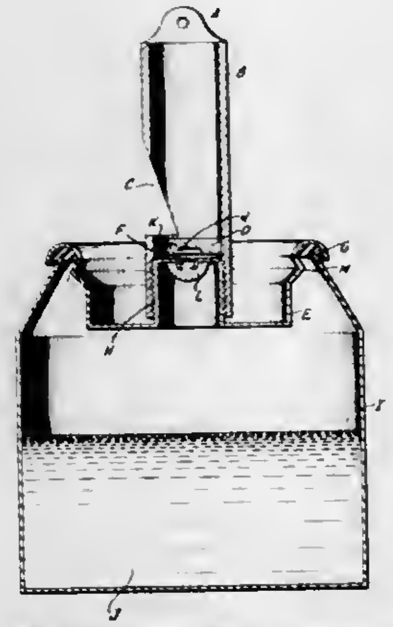
the water-engaging portion comprising a pair of essentially similar flat plate members hingedly mounted on a hinge pin secured to and extending transversely to the axis of the shaft for mutually co-ordinated hinging movement of the plates between an open position in which the plate members make an angle from about 130° to about 170° between each other and a closed position in which the plate members define an angle of from about 10°-30° therebetween;

said hinge pin extending generally in a forward to rearward direction with respect to the direction of travel of the paddle when in operation;

and biasing means urging said plates towards their closed position.

4,098,220
ALARM

Edward Richard Yuhas, 40 Cambridge Ave., Yonkers, N.Y. 10701
Filed Sep. 3, 1976, Ser. No. 720,435
Int. Cl.² G08B *17/04*
U.S. Cl. 116—106 **5 Claims**

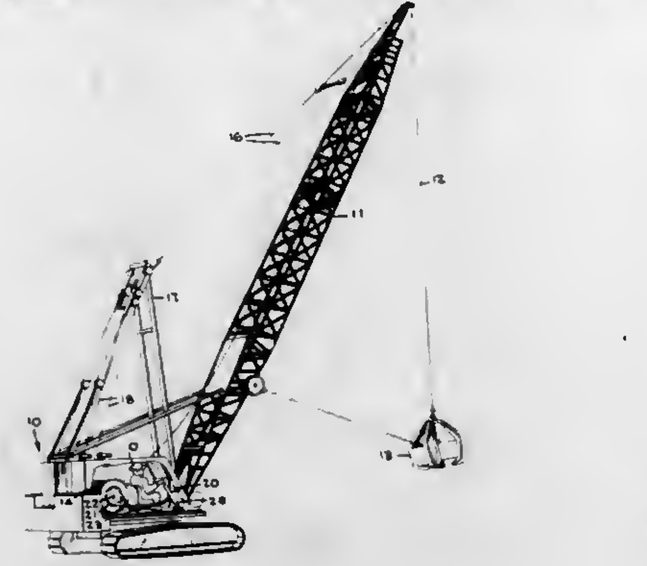


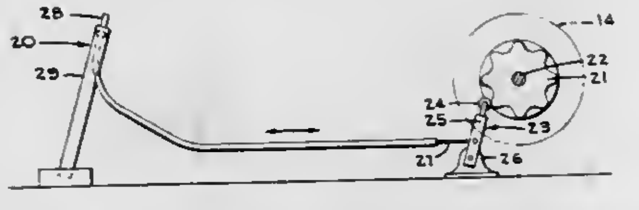
1. A fire alarm assembly comprising a container defining an internal enclosed volume, means defining an orifice in flow communication with said internal volume of said container, said orifice being dimensioned with a size within the range between about 0.040 inches and 0.060 inches, a plug sealing said orifice thereby to seal said internal volume of said container to prevent escape therefrom of fluid, said plug consisting essentially of between about 0.40 and 1.0 grams of a material which will melt at a predetermined temperature to unseal said orifice and permit fluid flow therethrough out of said container, flange means located proximite said orifice and extending therefrom with a slanted configuration inwardly of said container, said flange means being embedded within said plug material to hold said plug in place in sealing engagement over said orifice on a side thereof inwardly of said container, a compressible liquified gas contained within said container in an amount such that the volume of the liquid phase of said gas does not exceed 60% of the total volume of said container, and sonic means in operative proximity to said orifice for producing an audible alarm signal due to fluid flow emitted from said container through said orifice upon melting of said plug material.

4,098,221
DRUM ROTATION INDICATOR

Roger D. Mickelson, Cedar Rapids, Iowa; John Eric Doyle, Menlo Park, Calif., and David L. Willard, Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.
Filed May 4, 1976, Ser. No. 682,928
Int. Cl.² G01P *13/00*
U.S. Cl. 116—114 G **10 Claims**

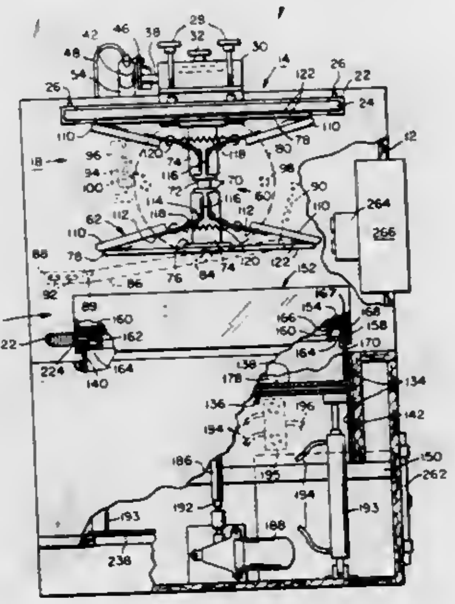
1. A device for indicating rotation of a drum, said device comprising a cam mounted in coaxial relationship for positive rotation with the drum, a cam follower pivotally mounted adjacent the cam for translating cam rotation into motion in a direction away from contact with the cam, a readout plunger mounted for reciprocating motion at a location remote from the drum, and a medium that interconnects the cam follower with the readout plunger for positively transferring motion therebetween in either direction and for maintaining the relative positioning of both the cam follower and the readout plunger after the transfer of motion in one direction from one end of the medium until reversely acted upon by motion in the opposite direction from the opposite end of the medium.





4,098,222
GARMENT HOLDING TURRET SYSTEM FOR A FLOCKING MACHINE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.
Filed Aug. 16, 1976, Ser. No. 714,474
Int. Cl.² B05B *5/02;* B05C *13/02, 19/02*
U.S. Cl. 118—7 **7 Claims**

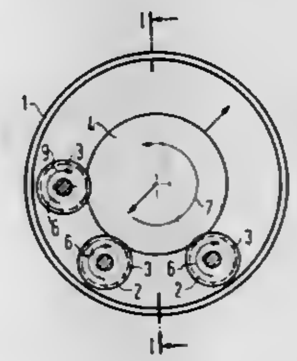


1. A flocking machine including a garment holding turret apparatus and an electrostatic flocking station positioned below the turret apparatus and comprising:

(a) a horizontal shaft mounted for rotation,
(b) a pair of garment supporting platens supported on diametrically opposed sides of said shaft;
(c) detent means for holding said shaft and platens in one of two diametrically opposed positions,
(d) means for holding excessive portions of a garment in place on said platens and means for biasing said holding means in the garment retaining position, said holding means contacting said platens and being movable away from said platens to accommodate receipt of a garment on said platens, and
(e) switch means associated with said turret apparatus for energizing said flocking station when said turret apparatus is rotated in one direction and for preventing energization of said flocking station when said turret apparatus is rotated in the other direction, whereby an operator can rotate said turret apparatus in in said other direction for set-up and adjustments without initiating a flocking cycle.

4,098,223
APPARATUS FOR HEAT TREATING SEMICONDUCTOR WAFERS

Wilhelm Ertl, Ottobrunn; Helmut Guckel, Neubiberg; Hugo Ruchardt, Gauting, and Fritz Schneckenaichner, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 4, 1976, Ser. No. 738,675
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619444; Jul. 2, 1976, 2629951
Int. Cl.² C23C *11/00;* B05C *13/02*
U.S. Cl. 118—48 **1 Claim**



1. A heating apparatus for heat treating semiconductor wafers comprising a tubular heating chamber, a pair of rods having similar grooves formed as a screw thread in the respective surfaces rotating at the same speed and in the same direction, said rods being disposed so as to support the total weight of said wafer, the groove of each rod being a trapezoidal cross-sectional shape and size to receive a wafer in a standing up position to frictionally grip the same, said wafers being thereby rotated in a direction opposite to the direction of rotation of the rods, said rods each extending out of the heating chamber at both ends, at least one additional rod which provides guidance to said wafers and having a screw thread type groove therein similar to the grooves in said pair of rods and located to engage said wafers on a side thereof above the plane of support of said wafers by said pair of rods, said additional rod rotating at the same speed and in the same direction as said pair of rods, in which the pitch of said screw thread type groove gradually increases in each rod near the ends of said tubular heating chamber and the upper portions of said wafers not being engaged by said pair of rods and said additional rod.

4,098,224
GAS COATING APPARATUS

Robert C. Noren, and Michael H. Spritzer, both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.
Filed Dec. 13, 1976, Ser. No. 749,876
Int. Cl.² C23C *11/00*
U.S. Cl. 118—49 **16 Claims**

1. Apparatus for coating particles with a substance contained

in a reactant gas, the particles being suspended in a fluidized bed within a coating chamber, comprising

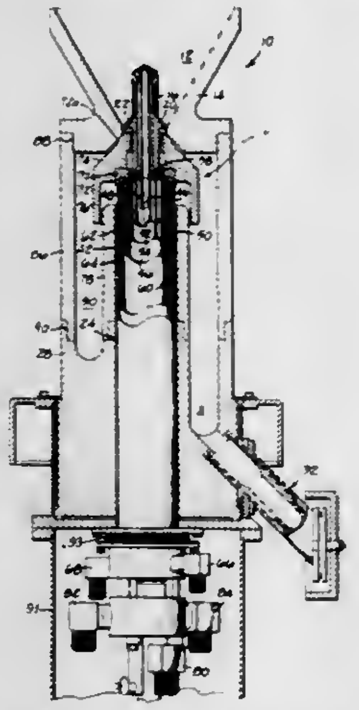
a base plate having a center opening for gravity unloading of coated particles from the coating chamber,

a gas probe assembly including a reactant gas nozzle extending upwardly into said coating chamber through the center opening in said base plate, said gas probe assembly having means for closing said opening,

said gas probe assembly further including an elongated gas probe secured thereto and including gas passage means for communicating reactant gas to said nozzle and a coolant circulating shell means surrounding said passage means, said probe being movable relative to said base plate in order to form an annular unloading opening between said base plate and said closing means on said gas probe assembly therefor.

housing means forming an annular passage about a portion of said probe for communication with said annular unloading opening, and

a side unloading chute in communication with a lower portion of said annular passage.



4,098,225

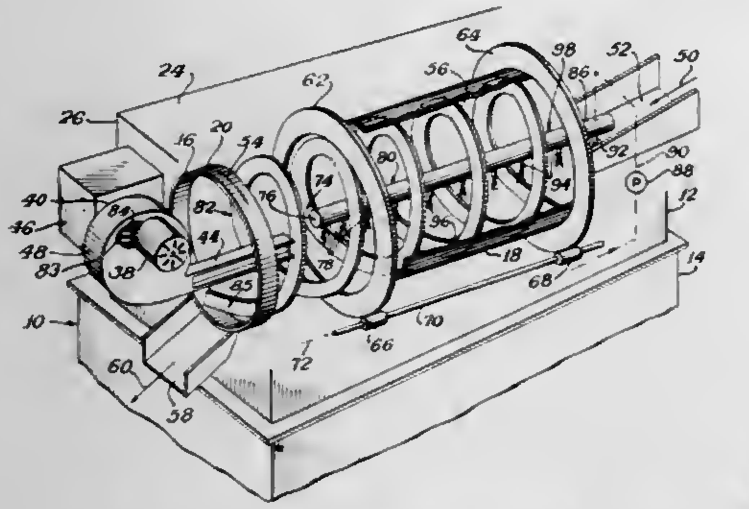
ENVIRONMENTAL, SMALL-PART CONTINUOUS WASHING APPARATUS

Maurice Norman, c/o John W. Gaines, 140 Fairway Ln., Wheaton, Ill. 60187

Filed Jul. 30, 1974, Ser. No. 493,077

Int. Cl.² B05C *3/02, 5/00, 15/00*

U.S. Cl. 118—64 **14 Claims**



1. For use in processing parts in manufacture, continuous hot-spray-process washing apparatus effective to hold therein a water-base washing material employed, and including a rust inhibitor for coating the washed parts, said rust inhibitor having the characteristic when elevated in temperature to be effectively drawn off with the steaming vapor arising from hot spraying, said apparatus comprising:

an elongated, generally horizontal, hollow drum respectively imperforate and perforated at opposite ends; said drum having means supporting it for rotation about a slightly tilted axis, so as to be correspondingly inclined to the horizontal and with the perforations at the relatively upper end and being imperforate at the lower end;

means for admitting parts into the drum at the imperforate end and discharging them from the perforated end; said drum having tumbling means connected to rotate therewith for moving tumbled parts from their admission, through at least an intervening drip-dry (wet) station in the drum and thence through discharge from the perforated end of the drum;

mutually opposing, first and second substantially aligned means both adjacent and on opposite sides of said intervening station in the drum, and each arranged in a generally central, longitudinal disposition within the drum, with said first means comprising wash-down manifold structure with portions located as aforesaid in the imperforate drum end at a respective immersion station and spray station, and said second means comprising duct structure located as aforesaid in the perforated end at a rinse-coat (damp) station;

said first means having heating and recirculating liquid supply means connected to the wash-down manifold structure, and having liquid impinging opening means in the manifold structure at the respective immersion and spray stations for pressure impingement of hot wash liquid on the parts at those stations consecutively;

said second means having compression and recirculating supply means connected to the duct structure, and having blow opening means in the duct structure at the rinse-coat (damp) station so as to blow on the parts with a part-rinsing rinse applied thereby over same and with a part-coating inhibitor coat applied thereby over same;

enclosing means substantially enclosing the apparatus; and

a temperature control connected to said heating and recirculating liquid supply means to prevent the wash liquid from cooling below the effective draw-off temperature of the rust inhibitor therein.

4,098,226

POWDER-COATING APPARATUS

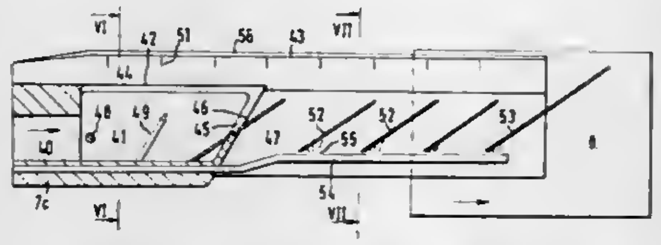
Walter Furter, Niederlenz, Switzerland, assignor to Hero Conserven Lenzburg, Lenzburg, Switzerland

Filed Feb. 22, 1977, Ser. No. 770,297

Claims priority, application Switzerland, Feb. 20, 1976, 2130/76

Int. Cl.² B05B *5/02*

U.S. Cl. 118—622 **8 Claims**



1. Apparatus for powder coating at least a portion of a body, the apparatus comprising a spray gun barrel for the delivery axially with respect to said barrel of a gas stream containing suspended powder therein, a spray head mounted on said spray gun barrel so as substantially to constitute a continuation of said spray gun, said spray head being formed with an expanding passage having an entry opening for the entry into said passage of the powder-gas stream delivered by said gun barrel and also having an exit opening located laterally in said spray head for the delivery of the powder-gas stream in a direction transversely to the axis of said gun barrel onto the body, said spray head being further formed with a deflect wall located at an end of said passage opposite said entry opening and inclined so as to deflect a portion of the gas stream reaching said wall toward said exit opening, insert baffles fixed in said passage and distributed across the path therethrough traversed by the powder-gas stream in passing from said entry opening to said exit opening, for slowing down, distributing and orienting the powder-air stream in relation to said exit opening, said exit opening being formed in said spray head as a first slot-type nozzle extending at least approximately parallel to the axis of said entry opening, said spray head passage being formed so that said exit opening is displaced substantially to one side of the powder-air stream that is discharged by said entry opening when the apparatus is in use, and said spray head being further formed with internal walls defining an antechamber located to receive the powder-air stream discharged from said entry opening, said internal walls being formed with a second slot-type nozzle approximately parallel to said first slot-type nozzle and said internal walls comprising said deflector wall positioned to deflect the powder-air stream though said second slot-type nozzle and then through said first slot-type nozzle to the body to be coated, said antechamber being formed so as to extend only part of the distance from said entry opening to the remote end of said first slot-type nozzle and of said spray head passage.

8. Apparatus for internal powder coating of container bodies, the apparatus comprising a spray gun barrel for the delivery axially with respect to said barrel of a gas stream containing suspended powder therein, a spray head mounted on said spray gun barrel so as substantially to constitute a continuation of said spray gun, said spray head being formed with an expanding passage having an entry opening for the entry into said passage of the powder-gas stream delivered by said gun barrel and also having an exit opening located laterally in said spray head for the delivery of the powder-gas stream in a direction transversely to the axis of said gun barrel onto a body, said spray head being further formed with a deflect wall located at an end of said passage opposite said entry opening and inclined so as to deflect a portion of the gas stream reaching said wall toward said exit opening, insert baffles fixed in said passage and distributed across the path therethrough traversed by the powder-gas stream in passing from said entry opening to said exit opening, for slowing down, distributing and orienting the powder-air stream in relation to said exit opening, said exit opening being formed in said spray head as a slot-type nozzle extending at least approximately parallel to the axis of said entry opening, a suction hood formed with a suction slot arranged opposite said slot-type nozzle of said spray head, means for feeding cylindrical container bodies continuously over said spray head with portions of the walls thereof passing between said suction slot and said slot-type nozzle and two cover strips mounted parallel to said slot-type nozzle with parallel edges separated by an amount equal to the width of a coating to be applied inside each container body by said suction head, said cover strips extending from an end region of said spray head remote from said gun barrel to a point outside said suction hood.

4,098,227

BIASED FLEXIBLE ELECTRODE TRANSFER

Robert L. Thompson, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 27, 1977, Ser. No. 819,633

Int. Cl.² G03G *15/06*

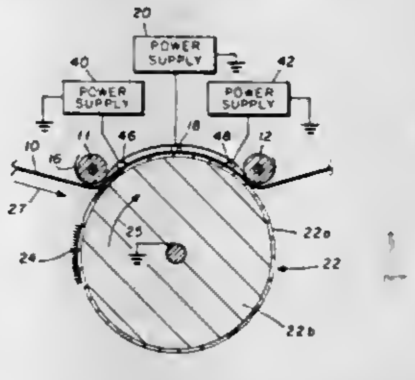
U.S. Cl. 118—649 **11 Claims**

1. In a transfer system for transferring electrostatically charged toner particles from an imaging surface of an electrostatographic printer to a paper web; the improvement comprising

a. a flexible, solid electrode extending widthwise of said web;

b. dielectric means for supporting said electrode in sliding contact with one side of said web and for maintaining an opposite side of said web in contact with said imaging surface throughout a predetermined zone; and

c. means for electrically biasing said electrode relative to said imaging surface, whereby toner particles transfer from said imaging surface to said web.



4,098,228

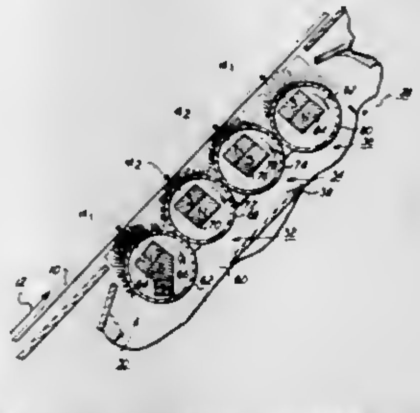
HIGH SPEED MAGNETIC BRUSH DEVELOPMENT SYSTEM

Frederick R. Ruckdeschel, Webster; Oscar G. Hauser; Charles A. Whited, both of Rochester, and Robert E. Gary, Sodus, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1976, Ser. No. 743,816

Int. Cl.² G03G *15/09*

U.S. Cl. 118—658 **13 Claims**



1. An apparatus for depositing particles on a member, including:

first means, moving at a first velocity and spaced a first distance from the member, for depositing particles on the member, said first means comprises a first magnetic brush developer roller rotating at the first velocity and spaced the first distance from the member; and

second means, moving at a second velocity and spaced a second distance from the member, for depositing particles on the member with the first velocity being less than the second velocity and the first distance being greater than the second distance, wherein the product of the first velocity and the first distance is substantially equal to the product of the second velocity and the second distance.

4,098,229

SELF-CONTAINED, PORTABLE ANIMAL COMMODE

Dennis C. Haynes, 513 W. 31st St., Erie, Pa. 16508, and Richard G. Sins, 2914 Reed St., Erie, Pa. 16504

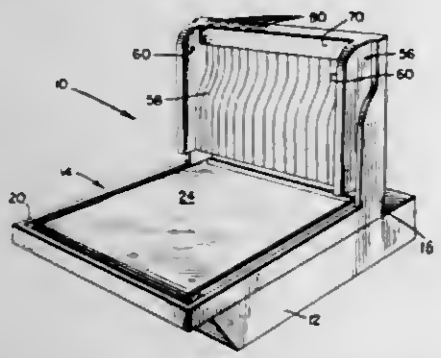
Filed Jun. 4, 1976, Ser. No. 692,863

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **5 Claims**

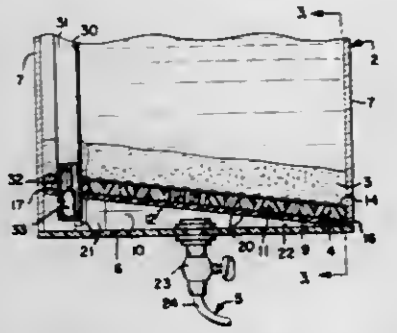
1. An animal commode comprising a base structure, a waste

holding receptacle located in said base structure and being removable therefrom, a unitary platform and end wall assembly pivotally mounted on said base structure, said assembly normally being disposed to position said platform over said receptacle and pivotal away therefrom for periodic removal of said receptacle and disposal of its contents, an endless belt having an upper run arranged over said platform for an animal to stand thereupon and a lower run disposed between said platform and said receptacle, drive means for said belt mounted in said end wall for moving said belt in one direction to transfer waste thereon to said receptacle and to reversely drive said belt to return the same thereto to the initial position for subsequent use by an animal, a generally vertically disposed panel mounted in said end wall rearwardly of said platform, the lower edge of said panel being disposed above said belt, a liquid reservoir in said end wall, a distribution manifold adjacent the upper end of said panel for directing liquid across the full width of said panel adjacent the upper end thereof, a pump mounted in said end wall for pumping liquid from said reservoir to said distribution manifold, and belt cleaning means comprising a first wiper blade carried by said end wall and selectively engagable with the upper run of said belt and a second wiper blade engagable with the lower run of said belt.



4,098,230
AQUARIUM

Arthur A. Jackson, 11605 Manchester, Grandview, Mo. 64134
Filed Sep. 29, 1976, Ser. No. 727,954
Int. Cl.^{2} A01K *63/00*
U.S. Cl. 119—5 **3 Claims**



1. In an aquarium having an aquarium bed in the form of gravel within a water retaining tank defined by a bottom wall, and opposed side and end walls, an aquarium drain and filter structure including means for effecting substantially continuous filtration and aeration and comprising:

(a) a planar support member positioned within an aquarium tank and having a plurality of apertures therein for flow of water and debris therethrough, said support member having opposite side and end edges:

(b) means within the aquarium tank for positioning said support member above a bottom wall of the aquarium tank and with the support member end edges in engagement with the aquarium tank end walls and with one side edge in engagement with said bottom wall and one side wall of the aquarium tank and the other side edge of the support member positioned above the aquarium tank bottom wall thereby positioning said support member in inclined relation to said bottom wall and defining a lower water receiving compartment between the aquarium tank bottom wall and said support member, said lower water receiving compartment having its greatest height adjacent said other side wall;

(c) a plurality of drain members above and in engagement with said support member and each in engagement with at least one adjacent drain member and each having at least one flow passage extending downwardly therethrough, each of the flow passages having an inlet end and an outlet end above said support member;

(d) foraminous means overlying said drain members for covering the inlet end of each of said flow passages, said foraminous means having openings smaller than the particle size of the gravel forming the aquarium bed for supporting the aquarium bed on the foraminous means and permitting movement of water and debris therethrough toward the lower water receiving compartment;

(e) means having passages communicating the area of greatest heighth of the water receiving compartment with the aquarium tank above said aquarium bed;

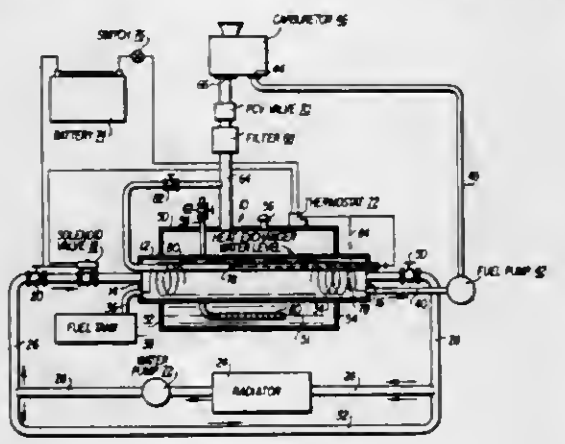
(f) means communicating with said passages adjacent the water receiving compartment for discharging air bubbles and flow thereof toward an upper surface of water within the aquarium tank;

(g) at least one valve controlled flow member communicating with the lower water receiving compartment in spaced relation to said side and end walls for flow of drain water and debris therefrom; and

(h) a filter device having communication with said valve controlled flow member and capable of removing debris from aquarium water and including a pump means having said valve controlled flow member connected thereto for moving water and debris through said filter device and discharging said filtered water adjacent the upper surface of water within the aquarium tank.

4,098,231
APPARATUS FOR IMPROVING THE EFFICIENCY AND REDUCING THE HYDROCARBON EMISSIONS OF CARBURETED ENGINES

Oliver Thurston Davis, Rte. 1, Box 33; Norman Jones R., Rte. 2, both of Dunlop, Tenn. 37397, and Elmer Carl Eddy, Rte. 1, Box 258, Whitwell, Tenn. 37327
Filed May 13, 1977, Ser. No. 796,752
Int. Cl.^{2} F02D *19/00*
U.S. Cl. 123—25 B **8 Claims**



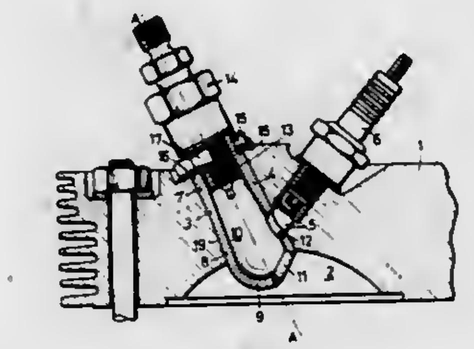
1. An apparatus for improving the efficiency and reducing the hydrocarbon exhaust emissions of combustion engines having a circulating water cooling system and a carburetor having a vacuum inlet port and a fuel inlet port, and a fuel pump connected between said fuel inlet port and a fuel tank including in combination:

(a) A heat exchanger having a first tank means with an inlet and outlet connected to said circulating water cooling system to supply heat, said first tank having first tube means therein connected in between said fuel tank and said fuel pump whereby said fuel is expanded by said circulating heated water before entering said fuel pump, and

(b) second tank means partially filled with water in heat exchange relationship with said first tank, said second tank having means for introducing air into said water and pipe means connecting the unfilled part of said second tank to said vacuum inlet port of said carburetor for drawing air form said introduction means through said water into said carburetor.

4,098,232
PRE-CHAMBER IN THE CYLINDER HEAD OF AN INTERNAL COMBUSTION ENGINE WITH APPLIED IGNITION

Fritz Gleiter, Pleidelsheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany
Filed Nov. 4, 1976, Ser. No. 738,902
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2549933
Int. Cl.^{2} F02B *3/00, 23/00*
U.S. Cl. 123—32 ST **11 Claims**



1. A pre-chamber arrangement in a cylinder head of an internal combustion engine with applied ignition comprising pre-chamber means constructed as a separate structural part in the cylinder head and provided with an opening for a spark plug and with at least one opening leading to the main combustion space, and a fuel-injection nozzle for supplying fuel-air mixture to the pre-chamber, characterized in that the pre-chamber means is arranged in an opening provided in the cylinder head which, at least sectionwise, becomes wider in the direction toward the main combustion space, and in that the pre-chamber means is fixed in the opening by fastening means arranged substantially coaxially to the center plane of the injection nozzle, said pre-chamber means cooperating with the opening in the cylinder head which becomes wider in the direction toward the main combustion space so that combustion pressures of the internal combustion engine are absorbed by the side walls of the opening in the cylinder head.

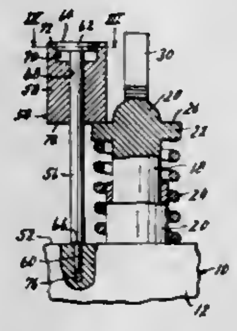
4,098,233
TIMING GAUGE FOR DIESEL ENGINES

Darrell B. Boyd, 2500 E. James C-16, Baytown, Tex. 77520, assignor to Darrell B. Boyd; Kathy Sue Boyd; Mark A. Stodola; James E. Hall; Stuart C. Vess, all of Little Rock and J. Russell Reinmiller, North Little Rock, all of, Ark., part interest to each
Filed May 2, 1977, Ser. No. 792,649
Int. Cl.^{2} F02M *65/00*
U.S. Cl. 123—32 R **7 Claims**

1. A timing gauge for an injector of a diesel engine, said injector including a body having an outwardly facing external surface and an operating plunger projecting outwardly from said body and being movable normally to said body surface in the operation of said injector, the projecting portion of said plunger having an outwardly facing surface parallel to said body surface, the correct timing of said injector being indicated when the spacing between said body and plunger surfaces equals a specified distance, denoted the "timer spacing" of said injector, when the piston operable in the engine cylinder associated with that injector is disposed at a specified point in its stroke, said gauge being usuable when said piston is at said specified point in its stroke, and comprising:

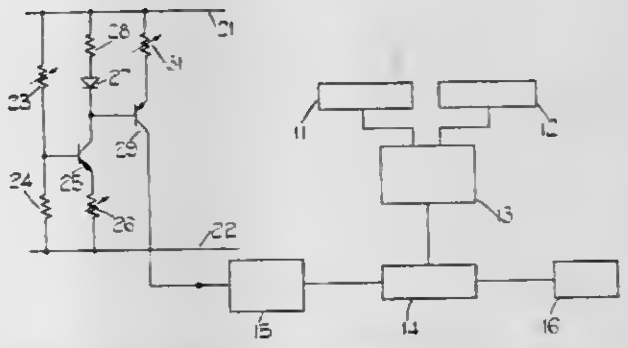
a. a stem restable at one end on said body surface to extend outwardly therefrom parallel to and adjacent said plunger, and having an outer end surface at right angles to the axis thereof, and

b. a gauge body provided with an axial bore slidably mounted on said stem for movement therealong and having end surfaces at right angles to said stem, the inner end surface of said body being restable on said plunger surface, and the projection of said stem from said injector body surface being equal to the sum of said specified timer spacing and the axial length of said gauge body, whereby when the timer spacing of said injector is properly set, the outer end surfaces of said gauge stem and body will be disposed accurately in coplanar relation, the existence of this coplanar relation, or any lack of it, being detected by passing a fingertip over said outer end surfaces of said gauge members.



4,098,234
ENGINE CONTROL SYSTEM

Malcolm Williams, Solihull, and Adrian Walter Melady, Stourport, both of England, assignors to The Lucas Electrical Company Limited, Birmingham, England
Filed Jul. 31, 1974, Ser. No. 493,277
Claims priority, application United Kingdom United Kingdom, Aug. 11, 1973, 38153/73
Int. Cl.^{2} F02B *3/00;* **F02P** *5/04*
U.S. Cl. 123—32 EA **4 Claims**

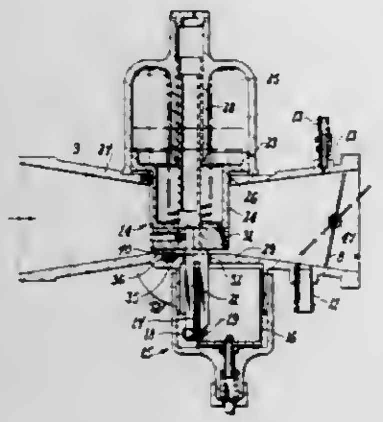


1. An engine control system comprising a memory unit producing a digital output dependent on the values of one or more engine parameters, a comparator to which said output is fed, a variable frequency clock coupled to said comparator, control means responsive to the time taken for the clock to count to the digital signal in the comparator for controlling an engine function, and a trim control for varying the clock frequency in accordance with at least two further engine parameters to modify said time for a given output from the memory unit, said trim control comprising a transistor the collector current of which determines the frequency of the clock.

4,098,235

FUEL FEED CONTROL APPARATUS AND SYSTEM

Alan William Dickerson, Melbourne, Australia, assignor to Repco Research Proprietary Limited, Dandenong, Australia
Filed Aug. 25, 1975, Ser. No. 607,260
Claims priority, application Australia, Aug. 28, 1974, PB8680; Aug. 28, 1974, PB8681
Int. Cl.² F02M *51/00*
U.S. Cl. 123—32 EG **17 Claims**



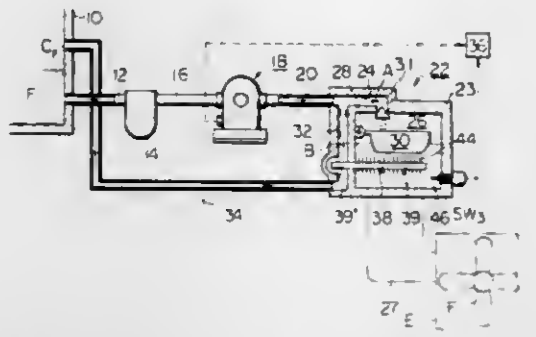
1. Fuel feed control apparatus for internal combustion engine fuel injection systems, including:

- a duct having an air flow passage formed therethrough and being connectable into the air induction system of an engine;
- an air flow monitor connected to said duct and being responsive to flow of air through said passage to move relative to said duct along an axis transverse to said flow, and being connectable to switching means for at least one injector of said injection system to determine the on time of the injector according to the position of said monitor relative to said duct;
- an enrichment control member mounted for movement through a range of operative positions in which it intrudes into said passage so as to modify air flow characteristics through said passage, the degree of said intrusion and consequently said modification varying between a maximum at an extreme operative position and substantially zero at an inoperative position of said enrichment control member;
- a portion of said enrichment control member being engageable with said monitor so that said enrichment control member is operable during movement towards said extreme operative position, to move said monitor into a position such as to influence the fuel enrichment characteristics of said apparatus, the degree of said maximum intrusion of said enrichment control member being predetermined so that said monitor is displaced thereby to produce enrichment characteristics for engine cold starting conditions, and said enrichment control member being further operable in at least some of said operative positions to provide a variable position stop which determines a minimum displacement of said monitor;
- said enrichment control member being contoured so that, when said member and monitor engage, an opening is provided to permit air flow through said opening, thereby ensuring that no displacement of said monitor due to air flow results until said air flow exceeds a predetermined minimum, the nature of said opening being predetermined to produce suitable enrichment characteristics over a range of engine operating conditions, and said enrichment characteristics varying with variation of said air flow modification; and
- temperature responsive means connected to said enrichment control member to cause said movement thereof, and being connectable to the engine so as to respond to the temperature thereof and thereby vary the position of said enrichment control member.

4,098,236

DEVICE FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE

Susumu Okawa, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Feb. 2, 1977, Ser. No. 765,067
Claims priority, application Japan, Oct. 29, 1976, 51-129334
Int. Cl.² F01P *3/12*
U.S. Cl. 123—41.02 **2 Claims**



1. A device for supplying fuel to an internal combustion engine of carburetor type, said device comprising:

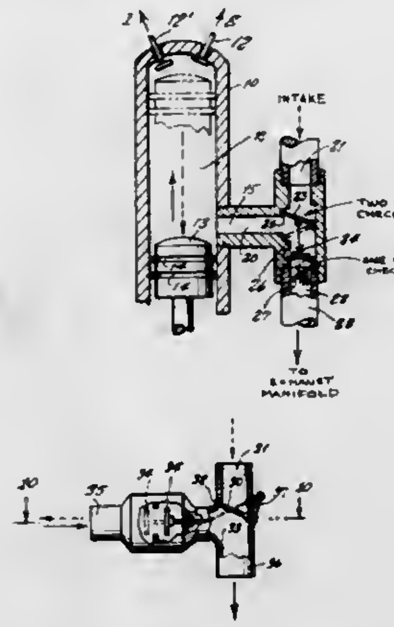
- a fuel tank; first passageway means adapted for connecting said fuel tank with the float chamber of the carburetor; a pump device arranged on said first passageway means for forcibly introducing an amount of fuel into said float chamber; second passageway means connecting the first passageway means downstream of the pump device with said fuel tank for recirculating an extra amount of fuel from the first passageway means to the fuel tank, and; a heat pipe constituting a heat exchanging member, one end of said pipe being located in a middle portion of the float chamber so that it touches the fuel in the float chamber and the other end thereof being located in said second passageway means so that it touches the extra amount of fuel recirculated into the fuel tank from said first passageway means, whereby the heat of the hot fuel in the float chamber due to the high temperature of the carburetor is, via said heat pipe transmitted to the cool fuel recirculated in said second passageway means under a forced convection principle, thereby preventing an increase of the temperature of the fuel in the float chamber.

4,098,237

INTERNAL COMBUSTION ENGINE

Jaime Suquet, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007
Filed Aug. 15, 1975, Ser. No. 604,907
Claims priority, application Argentina, Aug. 18, 1974, 255337
Int. Cl.² F02D *39/02*
U.S. Cl. 123—75 C **1 Claim**

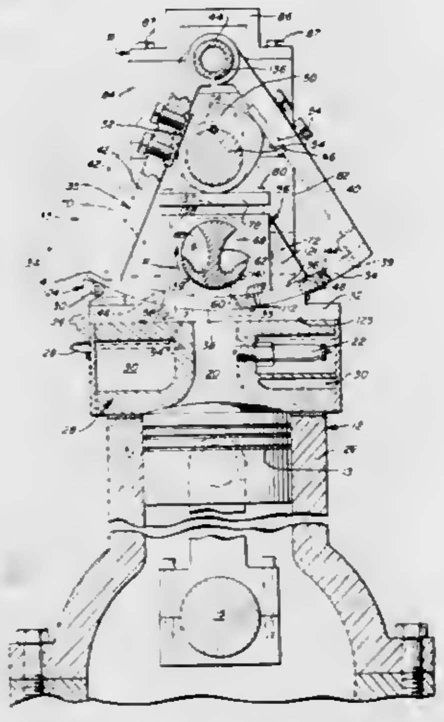
1. An improved four stroke internal combustion engine having a piston mounted for reciprocation in a cylinder, said piston having sealing rings thereabout its upper end, including exhaust and inlet valves at the upper end of said cylinder in combination with means for causing air to enter the cylinder at the end of the first stroke and for causing combustion gases to exhaust at the end of the third stroke, said means including an orifice through said cylinder spaced longitudinally from said valves located above the low dead point of the piston including check valves responsive to varying pressure differentials imposed on said orifice by piston movement wherein said check valves are mounted in a duct system having one duct in communication with said orifice and a second duct transverse to and communicating with the first said duct, the second said duct having an air intake port and a gas exhaust outlet, whereby said check valves are responsive to low pressure in the cylinder to cause only the intake of air into the orifice, and to high pressure in the cylinder to cause only the exhaust of gases from the orifice to the exhaust outlet wherein said valves include a normally closed pivotal valve in the second said duct and an axially reciprocating disc valve in the first said duct mechanically connected to said pivotal valve whereby both said valves open upon low pressure in the cylinder to cause air flow from the intake port into the orifice and only the second said valves opens upon high pressure in the cylinder to cause gas exhaust from the cylinder to the exhaust outlet including resilient means maintaining the said disc valve in a closed position.



4,098,238

ROTARY VALVE SYSTEM FOR MOTORS AND THE LIKE HAVING IMPROVED SEALING MEANS

Tony E. Vallejos, Paramount, Calif., assignor to Alto Automotive, Inc., Deerfield, Ill.
Filed Jan. 28, 1976, Ser. No. 653,195
Int. Cl.² F01L *7/00*
U.S. Cl. 123—81 B **38 Claims**



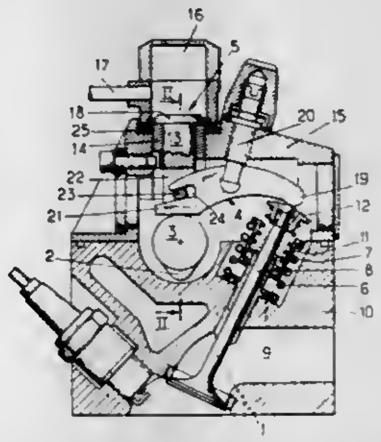
1. In a rotary valve system for a motor and the like, including a flow conduit terminating in a combustion chamber, and a rotary valve mounted in a housing, interposed in said flow conduit, the improvement comprising, in combination:

- rotatable camshaft means; means for rotating said rotary valve in a manner responsive to rotation of said camshaft means; intermittent occluding and sealing means for preventing flow through said flow conduit comprising a stationary sealing surface intermittently positionable across said conduit, and first means, operated by said camshaft means, for moving said stationary sealing surface into stationary occluding and sealing relation with said flow conduit and out of occluding and sealing relation with said flow conduit, said occluding and sealing means being adapted whereby the intermittent occluding and sealing by said surfaces is correlated with the operation of said rotary valve means, to seal said flow conduit when said rotary valve is in closed position, and to be out of said occluding and sealing relation when said rotary valve is in open position, and second means, operated by said camshaft means, for intermittently exerting pressure through said rotary valve housing to press said stationary sealing surface into improved occluding and sealing relation with said flow conduit when said sealing surface is positioned in said occluding and sealing relation.

4,098,239

VALVE CONTROL DEVICE PARTICULARLY IN AN OVERHEAD CAMSHAFT ENGINE

Philippe Jarry, Sevres, France, assignor to Le Moteur Moderne, Boulogne-Billancourt, France
Filed Oct. 12, 1976, Ser. No. 731,380
Claims priority, application France, Oct. 31, 1975, 75 33362
Int. Cl.² F01L *1/18, 1/30, 1/00*
U.S. Cl. 123—90.44 **5 Claims**



1. In an overhead camshaft engine including an engine head, the improvement which comprises a rotatable cam, at least one valve mounted for reciprocal movement in said engine head from an open to a closed position, a return member normally biasing said valve toward said closed position, a transmission interconnecting said cam and said valve and including a rocker pivotal about an axis, said rocker including first and second arms extending in opposite directions from said axis, said first arm bearing against said valve, said second arm having an end remote from said axis said end directly engaging said cam, and a hydraulic brake connected to said second rocker arm at said end to retard movement of said valve toward said closed position.

4,098,240

VALVE GEAR AND LASH ADJUSTMENT MEANS FOR SAME

Roy F. Abell, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Feb. 18, 1975, Ser. No. 550,485
Int. Cl.² F01L *1/24*
U.S. Cl. 123—90.55 **10 Claims**

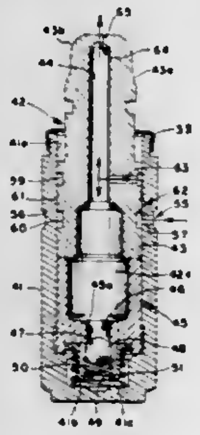
1. Hydraulic lash adjusting means for valve gear of an internal combustion engine comprising:

- (a) a body having a blind bore formed therein;
- (b) plunger means slidably received in said body bore for defining, in cooperation with the blind end of said bore, a cavity, said plunger means including pivot means adapted to contact associated engine valve gear components, and,
  - (i) means defining a fluid reservoir, and

(ii) one-way valve means permitting fluid flow from said reservoir to said cavity;

(c) said body including port means adapted for receiving fluid under pressure therein;

(d) means defining a first fluid passage communicating with said port means and providing exclusively fluid communication therefrom with said reservoir, said passage defining means including a first fluid metering means defining a substantially constant length annular metering orifice between said plunger means and said body bore for continuously metering said fluid flow into said fluid reservoir,



said annular metering orifice being effective for causing a substantial pressure drop thereacross;

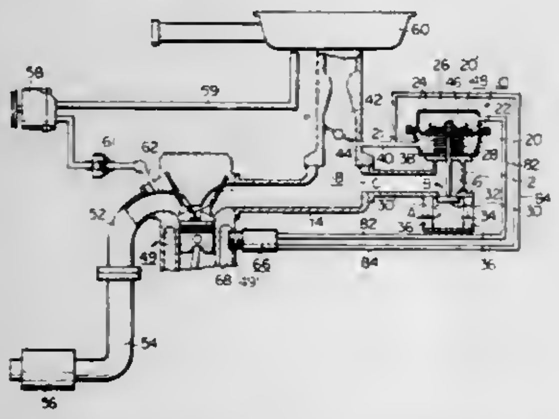
(e) said plunger means including means defining second fluid passage and providing exclusive fluid communication from said reservoir means to said pivot means, said second passage defining means including second fluid metering means comprising a metering orifice, said metering orifice providing continuous fluid communication to said pivot being sized for maintaining said fluid pressure in said fluid reservoir above atmospheric pressure; and

(f) means biasing said plunger means outwardly of said cavity.

4,098,241
APPARATUS FOR PREVENTING AFTER-FIRE IN AN INTERNAL COMBUSTION ENGINE

Hidenori Tateno, Nagoya, and Kazuo Nakano, Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1976, Ser. No. 754,975
Claims priority, application Japan, Oct. 22, 1976, 51-126032
Int. Cl.² F02D *31/00;* **F02M** *23/04*
U.S. Cl. 123—97 B **2 Claims**

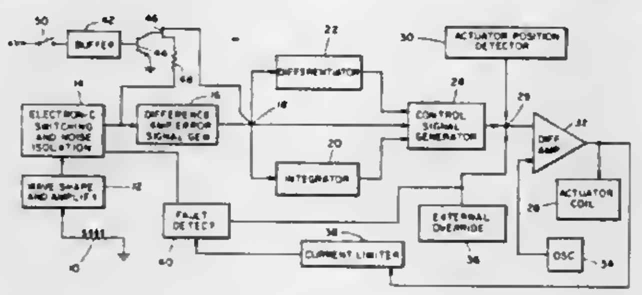


1. In an apparatus for preventing after-fire of an unburnt air-fuel mixture in the intake system of the internal combustion engine due to a misfire in the combustion chambers when the engine begins to decelerate while the throttle valve of the engine is kept in its fully closed position, which apparatus comprises an air control valve capable of being opened for introducing air into the intake system of the engine and a vacuum actuator which includes a spring urged diaphragm connected to the air control valve, which diaphragm forms two chambers on the sides thereof, one of which is connected to a vacuum port formed in the engine intake system, and which diaphragm operates to open the air control valve when a predetermined pressure difference is formed between said chambers due to the engine beginning to decelerate, so that an amount of air is introduced into the engine intake system by the opened air control valve from the beginning of the engine deceleration, thereby preventing a misfire of the air-fuel mixture in the combustion chamber, the improvement that comprises temperature detecting valve means having two valve ports and a temperature sensing valve member for connecting said ports to each other until the engine is fully warmed up, and for thereafter disconnecting said ports from each other, two pipe means, connecting said two valve ports with said two chambers of the vacuum actuator, respectively, whereby said two chambers are connected to each other when the engine is not fully warmed up, in order to cancel the pressure difference between the two chambers.

4,098,242
AUTOMATIC CONTROL SYSTEM WITH GAIN SWITCHING

George H. Anderson, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Jun. 17, 1976, Ser. No. 696,897
Int. Cl.² F02D *11/10*
U.S. Cl. 123—102 **10 Claims**



1. An automatic control system for a device to be controlled such as a prime mover comprising

(a) means for detecting an operating condition of said controlled device and generating a proportional signal,

(b) amplifier means receiving said proportional signal and producing an error signal representative of the difference between the detected condition and a preset value thereof for controlling said device,

(c) means for switching the gain of said amplifier means between at least two preset values, and

(d) means for controlling said switching means in accordance with load conditions on the controlled device.

4,098,243
IGNITION TIMING CONTROL SYSTEM

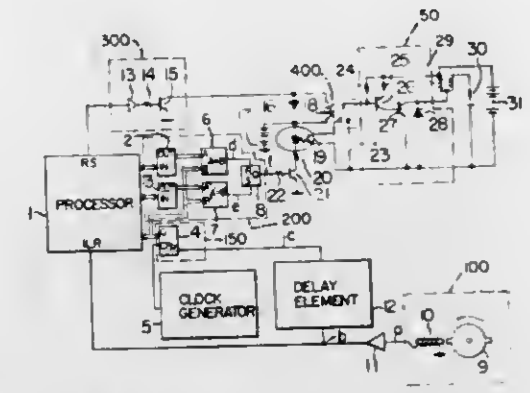
Hiroshi Yoshida, Aichi, and Kiyokazu Konishi, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 18, 1976, Ser. No. 733,406
Claims priority, application Japan, Oct. 30, 1975, 50-131022
Int. Cl.² F02P *1/00. 5/04*
U.S. Cl. 123—117 D **15 Claims**

1. In an ignition timing control system for use with an internal combustion engine, said engine having associated therewith a processor for sequentially executing a plurality of control functions including said ignition timing control, said ignition timing control system being of the type including means for generating a signal indicative of the rotational position of the engine camshaft and means for developing from said position signal a speed signal indicative of the rotational speed of said camshaft, said speed signal being applied as an input signal to said processor; the improvement wherein:

said processor includes interrupt means, responsive to said

positional signal, for effecting an interruption of the normal operational sequence of said processor and initiating

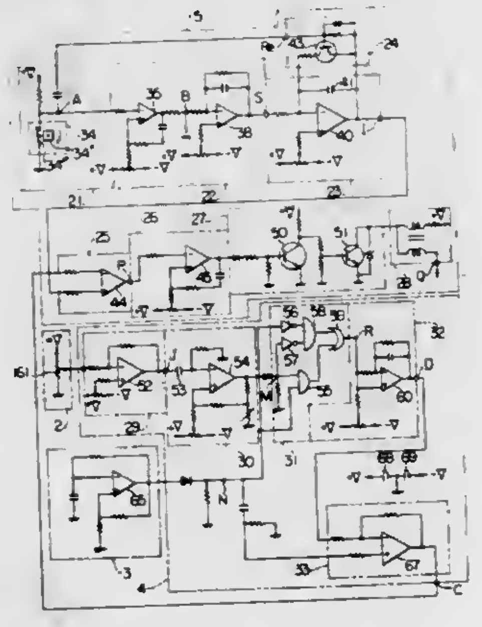


on a priority basis, execution of said ignition timing control function.

4,098,244
CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi; Osamu Ito, both of Toyota; Nobuhito Hobo, Inuyama; Yutaka Suzuki, Nishio; Takashi Hasegawa, Kariya, and Makoto Shiozaki, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 18, 1975, Ser. No. 641,874
Claims priority, application Japan, Sep. 23, 1975, 50-115214
Int. Cl.² F02P *5/04, 5/14, 5/06*
U.S. Cl. 123—117 R **7 Claims**



1. A control system for an internal combustion engine which produces a torque comprising:

torque change detecting means for detecting the increase and decrease of the torque developed by the internal combustion engine and producing a detection pulse signal having one output level indicative of the torque increase and another output level indicative of the torque decrease;

periodic signal generating means for generating a periodic pulse signal of a fixed frequency, said periodic pulse signal having one output level instructing the advance of ignition timing and another output level instructing the retard of the same;

discriminating means for discriminating phase relations between said detection pulse signal and said periodic pulse signal and producing an output signal changing in one and another directions to instruct respective advance and retard of ignition timing while the phase relations are discriminated respectively to be in phase and in opposite phase;

superimposing means for superimposing said periodic pulse signal on said output signal and producing a control signal having an output level indicative of the ignition timing of said engine;

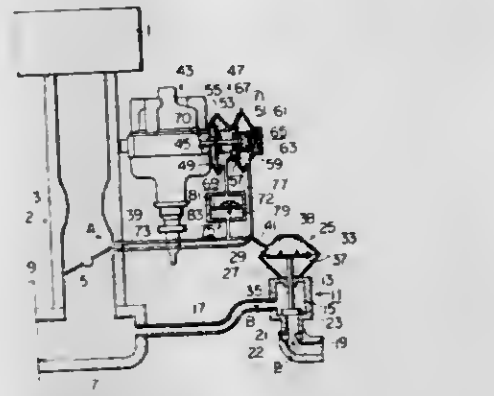
sawtooth signal generating means for generating a sawtooth signal in synchronization with engine rotation, said sawtooth signal changing the output level thereof at a speed proportional to engine rotational speed; and

ignition control means for igniting said engine when the output levels of said control signal and said sawtooth signal become equal to each other.

4,098,245
APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Akira Ohata, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 14, 1976, Ser. No. 695,447
Claims priority, application Japan, Mar. 16, 1976, 51-30619[U]
Int. Cl.² F02P *5/02*
U.S. Cl. 123—117 A **1 Claim**



1. An internal combustion engine comprising:

an air cleaner;

a carburetor which includes a throttle valve connected to said air cleaner;

an intake manifold located downstream of said carburetor;

an engine body connected to said intake manifold;

an exahust manifold for receiving the exhaust gas from the engine body;

a conduit connecting said exhaust manifold with said intake manifold;

a valve in said conduit for controlling the exhaust gas recirculation from said exhaust manifold to said intake manifold;

a first pipe connecting said exhuast gas recirculation valve with said carburetor at a position upstream of said throttle valve when said valve is in the closed condition;

a vacuum advancer connected to a distributor, said vacuum advancer comprising a casing joined at one end to said distributor body, a longitudinally movable advance shaft extending from said distributor body into said casing, said advance shaft being sealingly connected at a position spaced from its outer end to a first diaphragm which extends across said casing, the outer end portion of said advance shaft passing slidably through a second diaphragm which extends across said casing and is spaced from said first diaphragm and defines a first chamber at the end of said casing remote from said distributor, said advance shaft having an enlargement on the side of said second diaphragm remove from said first diaphragm, which enlargement provides an abutment with said second diaphragm, a cup member sealed to said second diaphragm enclosing said enlargement and allowing displacement of said enlargement away from said second diaphragm, a first spring acting on said second diaphragm so as to urge it towards said distributor, a second spring located between said first and second diaphragms so as to urge said second diaphragm towards abutment with said enlargement on said advance shaft, a bellows member sealingly connecting said first diaphragm with said casing so as to define a second chamber in said casing between said bellows member and said first diaphragm, and a vent hole in said casing between said bellows member and said second diaphragm;

a second pipe connecting said first chamber of said vacuum advancer with said carburetor at a position which is always effectively downstream of said throttle valve;

a branch pipe connecting said first pipe with said second chamber in said vacuum advancer, and; a vacuum transmitting valve device in said branch pipe, comprising a hollow valve body having first and second ports communicating with said branch pipe on said carburetor side and vacuum advancer side, respectively, a partition extending across said valve body between said ports, said partition having a restricted orifice which allows restricted transmission of a vacuum from said first port to said second port and a check valve which is arranged so as to open and by-pass said restricted orifice when the gas pressure at said first port is greater than the gas pressure at said second port;

said engine being arranged so that when said throttle valve is opened said first pipe is exposed to the vacuum in said carburetor, which actuates said valve in said recirculation conduit to provide exhaust gas recirculation to said intake manifold, the vacuum in said first pipe being transmitted at a restricted rate controlled by said restricted orifice to said second chamber in said vacuum advancer, whereby the displacement of said first diaphragm against the action of said second spring, and hence the vacuum advance of the ignition timing, is delayed.

4,098,246
INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Masaaki Noguchi, Nagoya; Shongo Sanda, Numazu; Norihiko Nakamura, Mishima, and Takashi Kato, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 9, 1976, Ser. No. 749,054

Claims priority, application Japan, Oct. 1, 1976, 51-117108

Int. Cl.² F02R *25/06*

U.S. Cl. 123—119 A **19 Claims**

1. An internal combustion engine having an intake system, an exhaust system, and an exhaust gas recirculating system for recirculating the exhaust gas from the exhaust system into the intake system, comprising:

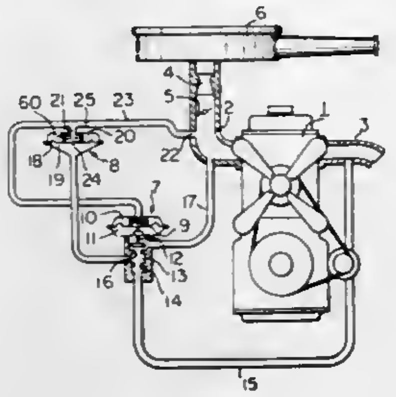
a cylinder comprising a cylinder block and a cylinder head;

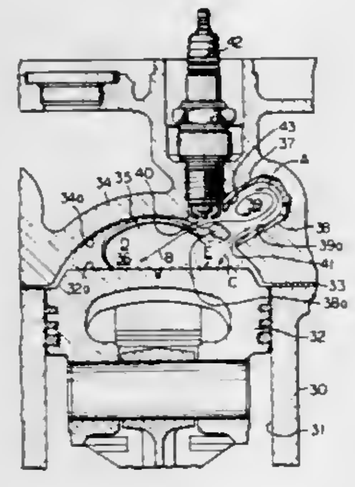
a piston reciprocally movable in said cylinder;

a main combustion chamber formed in said cylinder between said cylinder head and said piston, said cylinder head having therein a bore which has an inner wall defining an auxiliary combustion chamber;

a first connecting passage communicating said auxiliary combustion chamber with said main combustion chamber and opening into said auxiliary combustion chamber tangentially to the inner wall of said auxiliary combustion chamber for generating a swirl motion of a combustible mixture containing the recirculated exhaust gas therein in said auxiliary combustion chamber;

a second connecting passage communicating said auxiliary combustion chamber with said main combustion chamber and opening into the auxiliary combustion chamber towards said inner wall of the auxiliary combustion chamber to which said first connecting passage opens tangentially for strengthening said swirl motion, and;





a spark plug having a spark gap located in an auxiliary chamber region consisting of said auxiliary combustion chamber and said connecting passages.

4,098,247
MINUTE PRESSURE CONTROL SYSTEM

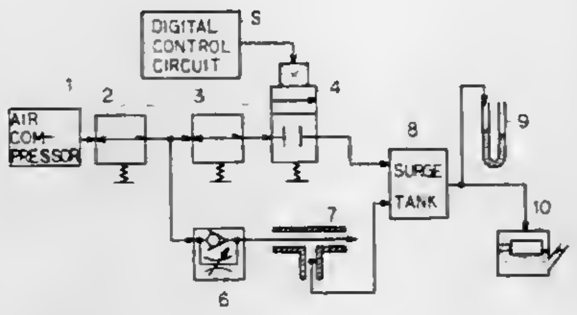
Kiyokazu Konishi, Kariya, and Hiroshi Yoshida, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 9, 1976, Ser. No. 721,843

Claims priority, application Japan, Sep. 22, 1975, 50-115308

Int. Cl.² F02M *5/00*

U.S. Cl. 123—119 R **7 Claims**



1. A minute pressure control system comprising:

a compressor for producing a positive pressure fluid;

a pressure regulator, coupled to said compressor, for regulating the pressure of said positive pressure fluid;

a T-shaped pipe having a straight portion and a branched bypass portion, said straight portion being coupled to said pressure regulator to thereby generate a negative pressure fluid in said bypass portion;

an electronic control circuit for generating a control signal having a predetermined on-off ratio;

a switching valve, coupled to said pressure regulator and said electronic control circuit, for intermittently passing said regulated positive pressure fluid in response to said control signal; and

a surge tank having two inlets and an outlet, said inlets being respectively communicated with said bypass portion and said switching valve to thereby combine said regulated positive pressure fluid and said negative pressure fluid and generate a control pressure at said outlet thereof.

4,098,248
FUEL REGULATOR FOR A TWO-CYCLE GAS ENGINE

William L. Todd, 100 Cottonwood La., Gillette, Wyo. 82716

Continuation-in-part of Ser. No. 532,624, Dec. 13, 1974, Pat. No. 3,919,995. This application Nov. 3, 1975, Ser. No. 628,535

Int. Cl.² F02M *21/02*

U.S. Cl. 123—120 **5 Claims**

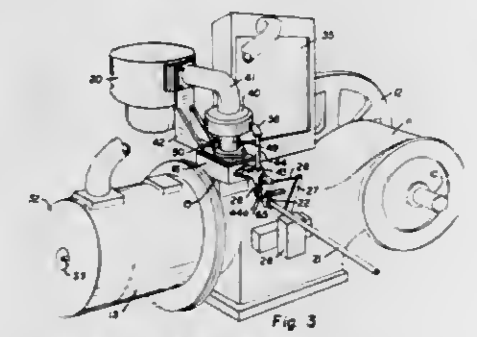


Fig 3

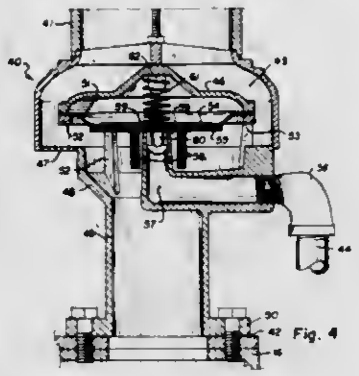


Fig. 4

1. In combination with a large two-cycle post-scavenging gas engine of the type having a piston displacement exceeding 250 cubic inches, a single cylinder associated with a crankcase chamber which constitutes an air-gas mixing chamber and an air-gas receiver connecting with the crankcase chamber with a low-pressure-drop check valve means to prevent backflow from the crankcase chamber, a fuel regulation system comprising:

(a) an air intake line having an uninterrupted flow passageway to the aforesaid receiver;

(b) a fuel gas regulator in the air intake line;

(c) a fuel gas supply line to the fuel gas regulator; and wherein

(d) said fuel gas regulator is of the type having a substantially unrestricted passageway with respect to the air intake line whereby to minimize the pressure drop of air flowing through the intake line and to the mixing chamber and also having an air flow control means to permit the fuel gas to flow into the air intake line responsive to and proportional to the flow of air in the line through the regulator whereby a properly proportioned air-gas mixture always flows into the engine regardless of changes of air flow rate through the air intake line.

4,098,249
FUEL INJECTION PUMPING APPARATUS

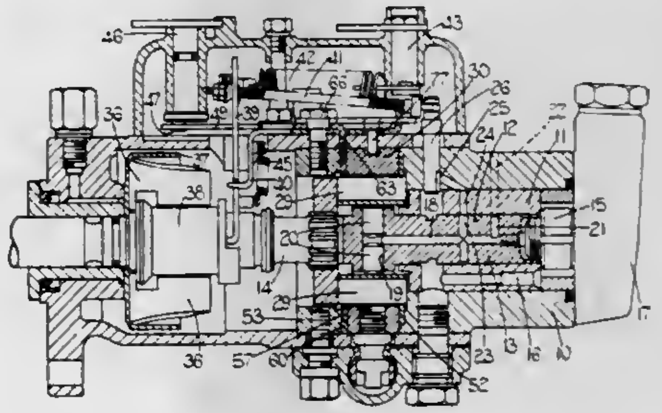
Dorian Farrar Mowbray, Burnham, England, assignor to CAV Limited, Birmingham, England

Continuation of Ser. No. 637,371, Dec. 3, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,183

Int. Cl.² F02M *59/28*

U.S. Cl. 123—139 ST **12 Claims**

1. A fuel injection pumping apparatus comprising a housing, a distributor member rotatably mounted in the housing, means coupling the distributor member to an engine so that the distributor member is driven in timed relationship with the engine, a bore formed in the distributor member and a pump plunger mounted therein, a cam ring mounted in the housing and having cam lobes, a roller which during rotation of the distributor member co-operates with the cam lobes to effect inward movement of the plunger, a passage in the distributor member communicating with said bore, outlet ports in the housing and with which said passage registers in turn during inward movement of the plunger, means for feeding fuel to said bore during the time when the plunger is permitted outward movement by the cam lobes, a fixed stop ring positioned on one side of the cam ring and engageable by one end portion of the roller as the plunger moves outwardly, an annular and angularly adjustable stop member positioned on the other side of the cam ring, a plurality of pivotal stop links positioned adjacent the other side of the cam ring, said links being positioned inwardly of said stop member, said links defining inner surfaces engageable by the other end portion of the roller and outer surfaces engageable by lobes respectively carried by said stop member, whereby the angular setting of said stop member will determine the position of said stop links and thereby the extent of outward movement of the roller, first means operable from the exterior of the housing to allow movement of said stop member to a position in which an excess of fuel will be supplied for starting purposes and second means for determining the setting of said stop member so that during normal running of the associated engine no more than a permitted maximum amount of fuel will be supplied to the engine.



4,098,250
SUCTION LINE FORMATION OF COMBUSTION ENGINES

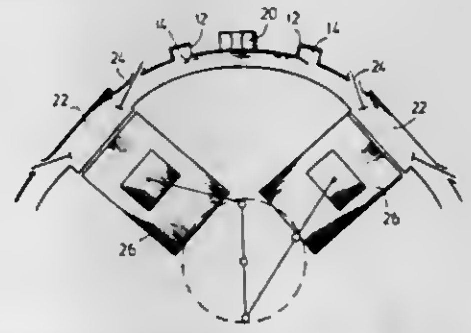
Theo Göpel, Fraustadstrasse 13, D-8000 Munich 40, Fed. Rep. of Germany

Filed May 24, 1976, Ser. No. 688,954

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524772

Int. Cl.² F02M *29/00*

U.S. Cl. 123—141 **6 Claims**



1. Suction line formation for internal combustion engines, particularly Otto engines, arranged between a carburetor and the inlet valve of the engine, comprising:

a closed end vortex chamber disposed on top of and protruding outwardly from the engine fuel suction line and having an open end directed at least in part into the suction line, and

a vortex constricting means extending from a leading edge of the opening of said vortex chamber and projecting downwardly and obliquely into the suction line for increasing vorticity in the fuel-air mixture passing through said suction line.

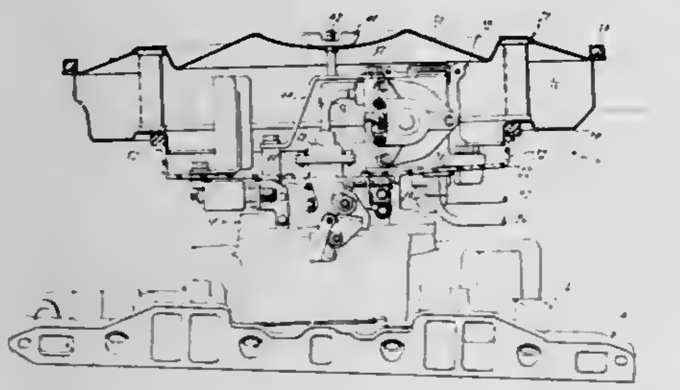
4,098,251
ARRANGEMENT FOR MOUNTING A FUEL METERING CONTROL PUMP ON AN ENGINE

Ian J. C. Scott, Madison Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 28, 1977, Ser. No. 782,107

Int. Cl.² F02B *77/00*

U.S. Cl. 123—195 A **9 Claims**



1. In combination:

an internal combustion engine having an intake manifold including an air-fuel mixture inlet;

an air intake system via which air is drawn into the engine via the inlet of said intake manifold, said air intake system comprising an annular support element disposed on the engine with a central aperture of the annular support element in communication with the inlet of said intake manifold, an annular air filter housing element having its inner periphery supported on the outer periphery of said annular support element, an annular air filter supported on said filter housing element, and a second air filter housing element cooperating with said filter and said two annular elements such that air conducted by the air intake system into the engine must flow through said filter;

a control pump disposed on said annular support element interiorily of said filter to be exposed to induction air passing through said air intake system;

means for supplying fuel to said control pump;

and, means for distributing fuel from the pump to the inlet of the intake manifold for mixture with air drawn into the engine via said air intake system.

4,098,252
METHOD AND APPARATUS FOR CARRYING OUT THE METHOD TO CONTROL A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Jörg Abthoff, Pluderhausen; Hans-Dieter Schuster, Schorndorf; Dag-Harald Hüttebräucker, Weinstadt; Reiner Kreeb, and Marijan Laszlo, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 779,993

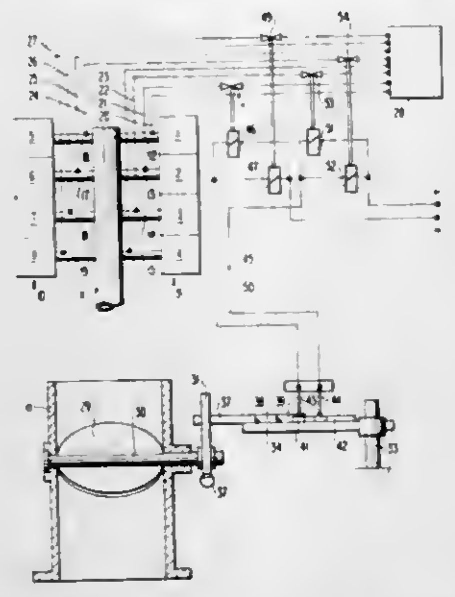
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 2612172

Int. Cl.² F02D *17/00*

U.S. Cl. 123—198 F **20 Claims**

1. A method for controlling a multi-cylinder internal combustion engine by connection or disconnection of one or several cylinders, which includes a throttling device provided in the suction system of the internal combustion engine, comprising the step of changing the position of the throttling device jump-like at the same time with the connection or disconnection of the cylinders in such a manner that the output of the internal combustion engine remains essentially unchanged.

7. An installation for controlling a multi-cylinder internal combustion engine by effectively connecting or disconnecting at least one cylinder means, comprising throttling means provided in the suction system of the internal combustion engine, characterized by control means for changing the position of the throttling means jump-like substantially simultaneously with the selective connection or disconnection of the cylinder means in such a manner that the output of the internal combustion engine remains essentially unchanged.



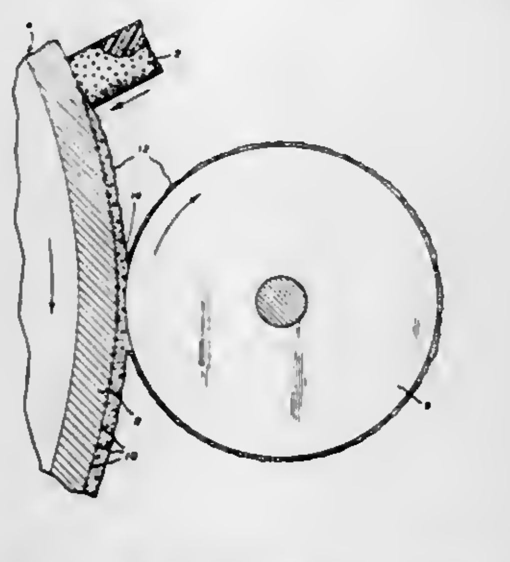
4,098,253
GRINDING WHEEL DRESSER

Phillip E. Bonnice, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Division of Ser. No. 535,016, Dec. 20, 1974, Pat. No. 4,068,416. This application Apr. 15, 1976, Ser. No. 677,112

Int. Cl.² B24B *53/00*

U.S. Cl. 125—11 R **5 Claims**



1. A grinding wheel dresser comprising:

a. a normally solid, friction-meltable matrix consisting of polyethylene glycol with a molecular weight of about 1300 to 1600 and melting point about 35° to 46° C; and

b. a multiplicity of inorganic crystals dispersed in said matrix, said crystal having from 60 to 150 grit size.

4,098,254
HEATING DEVICE

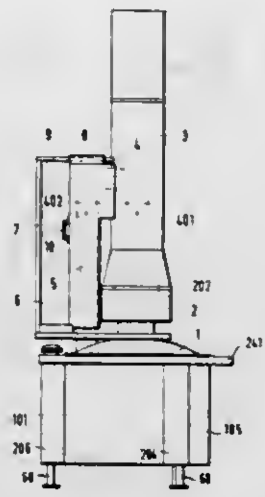
Theo William Böse, 28 Reltmorstrasse, 8 Munich 22, Fed. Rep. of Germany

Filed Oct. 6, 1975, Ser. No. 620,031

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1974, 2447794; Oct. 7, 1974, 2447793; Oct. 7, 1974, 2447734

Int. Cl.² A01G *13/06;* F23L *0/00;* F24B *5/00*

U.S. Cl. 126—79 **24 Claims**



1. In a heating device comprising: a fuel container including a cover in which a liquid fuel such as oil can be evaporated within an evaporation chamber formed by said fuel container and its cover; a combustion chamber connected on the fuel container, for combustion of the evaporated fuel; a heating tube connected to the combustion chamber, for carrying combustion gases therefrom; and a gas feedback means air-tightly connecting the heating tube to the evaporation chamber, for returning to the evaporation chamber a part of the combustion gases in the heating tube, thereby to cause evaporation of fuel during operation; the improvement wherein the gas feedback means is controllable to regulate the amount of heat introduced into the evaporation chamber by the feedback gas, thereby to maintain said amount at a substantially constant level, air-tight connections between said combustion and said evaporation chambers and between said combustion chamber and said heating tube, and wherein mechanical support means in the form of a separate framework connected at least between said fuel container of said heating tube for sustaining the respective air-tight connections between the evaporating chamber and the combustion chamber and between the heating tube and the combustion chamber, both during heating operation and also during transportation of the heating device.

4,098,255
DUAL FUEL RADIANT TUBE BURNER

Leonard G. Nowak, Ypsilanti, and Paul K. Shefsiek, Farmington, both of Mich., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Sep. 7, 1976, Ser. No. 721,139

Int. Cl.² F24C *3/00*

U.S. Cl. 126—91 A **12 Claims**

1. A radiant tube heater comprising:

an elongated radiant heating tube for radiating internally produced heat energy to its surroundings;

a flame holding plate for dividing said radiant tube between a combustion zone and a feed zone, said plate having a centrally located opening for positioning a liquid fuel atomizing means with respect to said combustion zone to facilitate delivery of atomized fuel to said combustion zone;

means for mounting said flame holding plate within the input end of said radiant tube;

liquid fuel atomizing means positioned within the centrally located opening of said flame holding plate;

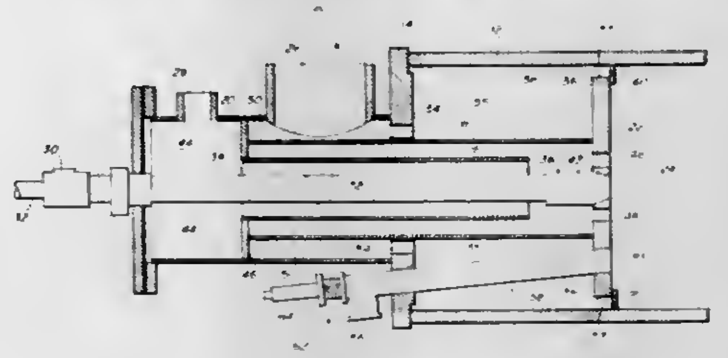
means for supplying liquid fuel and atomizing air to said liquid fuel atomizing means;

aperture means in said plate surrounding said opening for directing a first stream of combustion air into liquid fuel delivered to said combustion zone, passage means at the periphery of said plate outward from and circumscribing said aperture means for directing a second stream of combustion air into said combustion zone along the inner surface of said radiant tube;

a combustion air delivery conduit sealingly affixed at one end to the feed side of said plate, said one end surrounding said aperture means and said opening for delivering the first stream of combustion air to said plate;

combustion air delivery means formed between the inside surface of the input end of the radiant tube on the feed side of said flame holding plate and the outside surface of said combustion air delivery conduit for conducting combustion air to said passage means; and

means for proportioning combustion air between said combustion air delivery conduit and said combustion air delivery means for dispersing fuel along the radiant tube to produce an elongated flame pattern extending substantially the length of said tube.



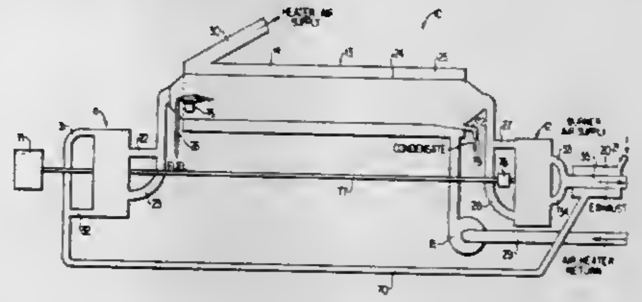
4,098,256
HEATING SYSTEM

Charles A. Sleck, 2311 N. Front St., Harrisburg, Pa. 17110

Filed Apr. 29, 1976, Ser. No. 681,575

Int. Cl.² F24H *3/14*

U.S. Cl. 126—116 R **6 Claims**



1. A heating system which provides for full utility of the heat value of fuel upon combustion of such fuel, comprising: a compressor having a rotor which rotates about a shaft; an expander having a rotor which rotates about a shaft, the shaft of the compressor being connected to the shaft of the expander by a common shaft to allow the shaft of the compressor to be driven by the expander; a positive pressure combustion apparatus in fluid communication between said compressor and expander, said combustion apparatus including an outer case and an inner concentrically mounted combustion liner which together provide an annular chamber therebetween, said annular chamber being in heat exchange relationship with said combustion liner; means for introducing fuel to the interior of said combustion liner; burner means for igniting said fuel to provide combustion gases within said combustion liner; a heat exchanger connected to said expander and mounted downstream from said combustion apparatus and said expander; an inlet

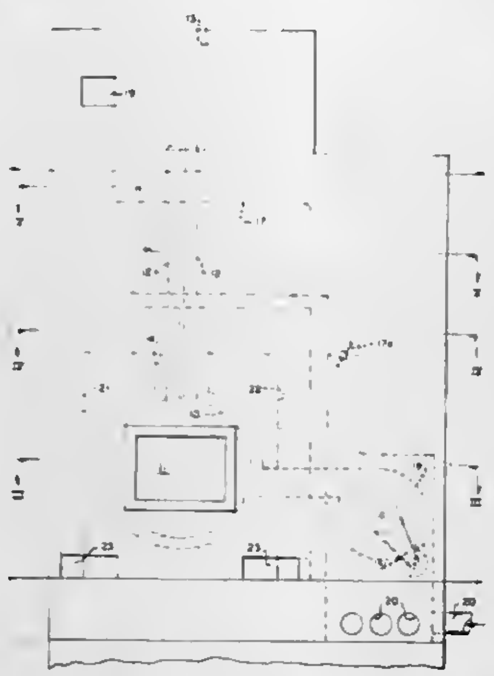
conduit in heat exchange relation with said heat exchanger, said inlet conduit including means for providing a gas which supports combustion to the inlet side of said compressor; and means for passing a heating medium through said annular chamber in heat exchange relationship with said combustion liner with the heating medium passing in a countercurrent direction relative to the flow of combustion gases within the combustion liner, wherein said compressor comprises a generally cylindrical rotor, said compressor rotor being provided with a plurality of generally radially extending, slidable vanes; a rotor housing surrounding said compressor rotor and having a generally cylindrically shaped chamber which is concentric with said compressor rotor, the inner surface of said chamber slanting inwardly on opposite sides of said compressor rotor to a point where the inner surface of the chamber is closely adjacent to said compressor rotor on opposite sides of said compressor rotor to provide a pair of compression cavities, each of which is crescent-shaped at one end thereof, on opposite sides of said compressor rotor, the inner surface of said chamber being engaged by said vanes, said vanes being biased outwardly against the inner surface of said chamber; a suction port and a discharge port for each of said compression cavities, each discharge port being located in the crescent-shaped end of its respective cavity and with each suction port being located at the opposite end of its respective cavity, each discharge port having valve means for allowing discharge of gas from said respective cavity at a predetermined pressure.

3. A heating system which provides for full utility of the heat value of fuel upon combustion of such fuel, comprising: a compressor having a rotor which rotates about a shaft; an expander having a rotor which rotates about a shaft, the shaft of the compressor being connected to the shaft of the expander by a common shaft to allow the shaft of the compressor to be driven by the expander; a positive pressure combustion apparatus in fluid communication between said compressor and expander, said combustion apparatus including an outer case and an inner concentrically mounted combustion liner which together provide an annular chamber therebetween, said annular chamber being in heat exchange relationship with said combustion liner; means for introducing fuel to the interior of said combustion liner; burner means for igniting said fuel to provide combustion gases within said combustion liner; a heat exchanger connected to said expander and mounted downstream from said combustion apparatus and said expander; an inlet conduit in heat exchange relation with said heat exchanger, said inlet conduit including means for providing a gas which supports combustion to the inlet side of said compressor; and means for passing a heating medium through said annular chamber in heat exchange relationship with said combustion liner with the heating medium passing in a countercurrent direction relative to the flow of combustion gases within the combustion liner, wherein said expander comprises a generally cylindrical rotor, said expander rotor being provided with a plurality of generally radially extending, slidable vanes; a rotor housing surrounding said expander rotor and having a generally cylindrically shaped chamber which is concentric with said expander rotor, the inner surface of said chamber slanting inwardly on opposite sides of said expander rotor to a point where the inner surface of the chamber is closely adjacent to said expander rotor on opposite sides of said expander rotor to provide a pair of expansion cavities, each of which is crescent-shaped at one end thereof, on opposite sides of said expander rotor, the inner surface of said chamber being engaged by said vanes, said vanes being biased outwardly against the inner surface of said chamber; a suction port and a discharge port for each of said expansion cavities, each discharge port being located in the crescent-shaped end of its respective cavity and with each suction port being located at the opposite end of its respective cavity, each discharge port having valve means for allowing discharge of gas from said respective cavity at a predetermined pressure; each suction port being provided with a valve having means for opening and closing said valve in relationship to a predetermined position of said expander rotor.

4,098,257
FIREPLACE SYSTEMS

John J. Stanko, 327 Corsopolis Rd., Corsopolis, Pa. 15108

Filed Jan. 24, 1977, Ser. No. 761,607
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **10 Claims**

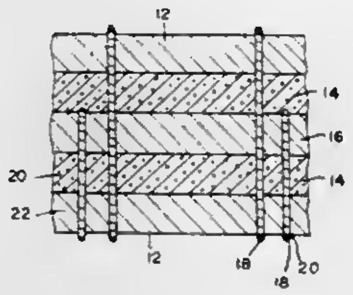


1. A fireplace heating system comprising a fireplace box having a fireplace opening therein, a heat chamber surrounding said box, a plurality of spaced generally vertically extending flues connected to said fireplace box and holding said box suspended generally centrally of said heat chamber and spaced from the walls of said heat chamber, said flues being adapted to carry the exhaust gases from the fireplace box, a hot air distribution duct connected to said heat chamber and surrounding the said flues over a portion of their length, said distribution duct having discharge vent means into the room being heated, a pre-heat chamber spaced from the heat chamber and the hot air distribution duct and surrounding said flues over a second portion of their length, a cold air inlet connected to said pre-heat chamber, a blower connected to said pre-heat chamber on the side of the pre-heat chamber opposite the cold air inlet receiving pre-heated air passing around the second portion of said flues from said pre-heat chamber for delivery to the heat chamber and chimney means connected to said flues receiving exhaust gases therefrom and supporting said flues and fireplace box.

4,098,258
COMPLEX ELECTROCHEMICAL HEATING ELEMENT

Frederick P. Kober, Bayside, N.Y., assignor to Chem-E-Watt Corp., Racine, Wis.

Filed Nov. 19, 1976, Ser. No. 743,438
Int. Cl.² F24J *1/00;* H01M *2/24*
U.S. Cl. 126—263 **6 Claims**



1. An electrochemical heating element comprising:

an anode layer;

two separator layers of porous absorbent material, one on either side of said anode layer and each having an anode-adjacent surface and a cathode-adjacent surface, each of said anode-adjacent surfaces juxtaposed in contact with one side of said anode;

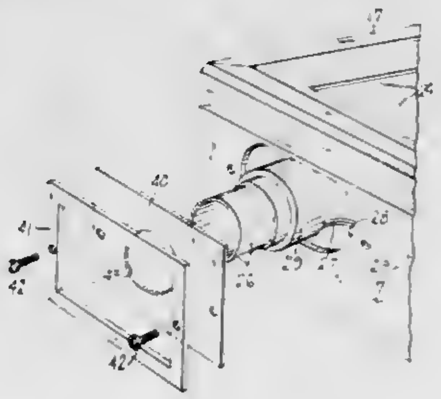
two cathode layers, one on either side of said anode layer and each having a surface juxtaposed in contact with one of said cathode-adjacent surfaces of said separator layers; and

a multiplicity of electrically-conductive connector means extending through said anode, separator and cathode layers to conduct an electric heating current between said anode layer and said cathode layers, including at least one connector extending only through said anode layer, one of said separator layers and the adjacent cathode layer.

4,098,259
SOLAR ENERGY COLLECTION SYSTEM

Everett M. Barber, Jr., Guilford, and Thomas P. Hopper, Durham, both of Conn., assignors to Sunworks, Inc., Guilford, Conn.

Filed Jul. 9, 1976, Ser. No. 703,975
Int. Cl.² F24J *3/00*
U.S. Cl. 126—270 **4 Claims**



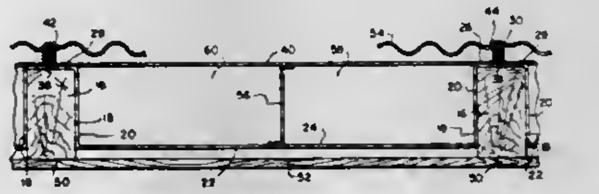
1. A solar energy collector system of the type comprising a plurality of housing members having bottom walls and side walls and a transparent cover member, each having a heat absorbing member therein and heat exchange conduit means in heat transfer contact with said member, said conduit means including tubular members extending between spaced apart metallic headers, said headers adapted to be connected to spaced apart exterior metallic manifolds extending along a plurality of housing members, openings defined in side walls, tubular connection means extending through said openings from said headers to said manifolds, a non-metallic heat insulating sleeve disposed about each of said connection means and extending on either side of said openings to insulate said connection means from said housing, said openings being of greater dimension than said connection means, closure means disposed about and contacting said sleeve and closing said openings but permitting movement of said connection means in said opening, said closure means comprising a sheet of flexible non-metallic material, and means securing said sheet to said frame.

4,098,260
SOLAR HEAT COLLECTOR AND RADIATOR FOR BUILDING ROOF

William H. Goettl, 2005 E. Indian School, Phoenix, Ariz. 85018

Filed Feb. 7, 1977, Ser. No. 766,087
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **9 Claims**

1. A heat collecting and heat radiating roof structure having a plurality of spaced apart substantially parallel rafters; said rafters having upper and lower portions and first and second substantially upward and downwardly extending opposite sides; substantially U-shaped duct members disposed between adjacent ones of said rafters; said duct members each having an intermediate portion substantially spanning the distance between said rafters; said duct members each having a pair of flange portions extending upwardly from said intermediate portion adjacent respective upward and downwardly extending sides of respective rafters; each flange portion having a generally horizontal portion overlying approximately half of said upper portion of a respective rafter; said generally horizontal portion being disposed above said intermediate portion; a first upwardly extending portion extending upwardly from each respective horizontal portion of each respective flange; said first upwardly extending portion being located in an intermediate area over said upper portion of a respective one of said rafters; a duct cover plate positioned over one of said horizontal portions of one of said flanges; said cover plate having a second upwardly extending portion adjacent said first upwardly extending portion; a second duct cover plate having a third upwardly extending portion adjacent said first upwardly extending portion; said second duct cover plate extending in a direction opposite to said first duct cover plate with respect to



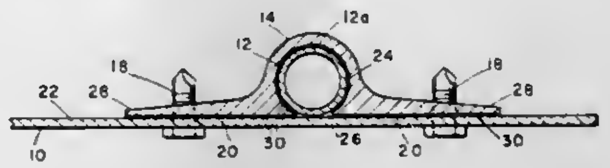
said first upwardly extending portion; and an inverted U-shaped in cross section cover member positioned over and covering said first, second and third upstanding portions.

8. In a heat collecting and heat radiator roof structure for a building; a vertical wall, an inclined roof structure supported by said wall and including a portion extending beyond said wall to the exterior of said wall with eaves depending from said portion of the roof on the exterior of said wall, a plurality of generally parallel adjacent heat conducting ducts, said ducts having first and second ends, one of said ducts connecting with another of said ducts at said first ends, a delivery duct connected with said one of said heat conducting ducts adjacent said second end, and a return duct connecting with another one of said heat conducting ducts adjacent said second ends, said delivery and return ducts being disposed on the exterior of said wall and means extending through said eaves for connecting said delivery and return ducts at their upper ends with the heat conducting ducts.

4,098,261
FLAT PLATE SOLAR COLLECTOR PANEL HAVING EXTRUDED THERMAL CONDUCTORS

Richard Edwin Watt, 6384 Rockhurst Dr., San Diego, Calif. 92120

Filed Feb. 23, 1977, Ser. No. 771,198
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **5 Claims**



1. A solar collector panel wherein heat absorbed in a collector plate may be conducted to a fluid flowing through pipes that are arrayed over the surface of the plate, comprising

a collector plate for absorbing radiant heat; and

a plurality of pipes in an array over a surface of the collector plate for transporting a fluid for conducting heat energy from the solar collector panel;

wherein the collector plate has a broad uniformly flat surface area over which the pipes are arrayed;

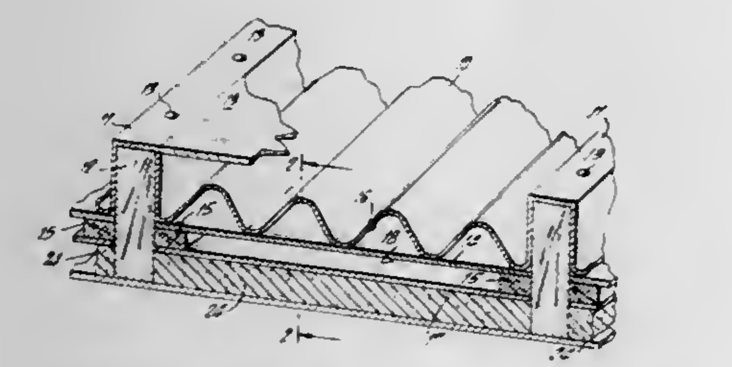
characterized by

a plurality of thermal conductors for conducting heat energy from the collector plate to the pipes, wherein each of the thermal conductors has broad flat surfaces in contact with the flat surface of the flat collector plate on opposite sides of the pipe, and an inner surface in mating contact with most of the pipe; with the thickness of the thermal conductor increasing from the extreme ends of its broad flat surface toward its inner surface, wherein the thermal conductors are extrusions.

4,098,262
HEATING APPARATUS USING SOLAR ENERGY

Melville F. Peters, Livingston, N.J., assignor to Walter Todd Peters; Margot Elizabeth Peters, both of East Dennis, Mass. and Albert F. Kronman, Locust Valley, N.Y.

Filed Sep. 26, 1975, Ser. No. 617,041
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—270 **3 Claims**

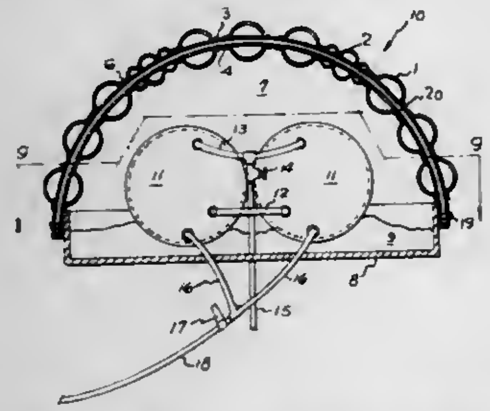


1. Apparatus for converting solar rays into usable heat energy comprising: a sheet of infrared ray transmitting material, an infrared energy absorbing sheet spaced from the said transmitting material, lateral support means for the transmitting material and absorbing sheet enclosing the volume therebetween, a second sheet spaced from the energy absorbing sheet to form at least a first gas conduit therebetween, a rigid third sheet spaced from the second sheet to form a cavity below the second sheet, an output conduit to receive heated gas from the first conduit, an elongated passageway connected at one end to the cavity and in communication with the gas coming from the output conduit, and means for circulating the gas through the conduits, passageway, and cavity beneath the energy absorbing sheet.

4,098,263
SOLAR WATER HEATER FOR TRAILERS AND BUILDINGS

Joseph A. Lanciault, 520 Main St., Apt. 508, Fitchburgh, Mass. 01420

Filed May 23, 1977, Ser. No. 799,703
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **8 Claims**

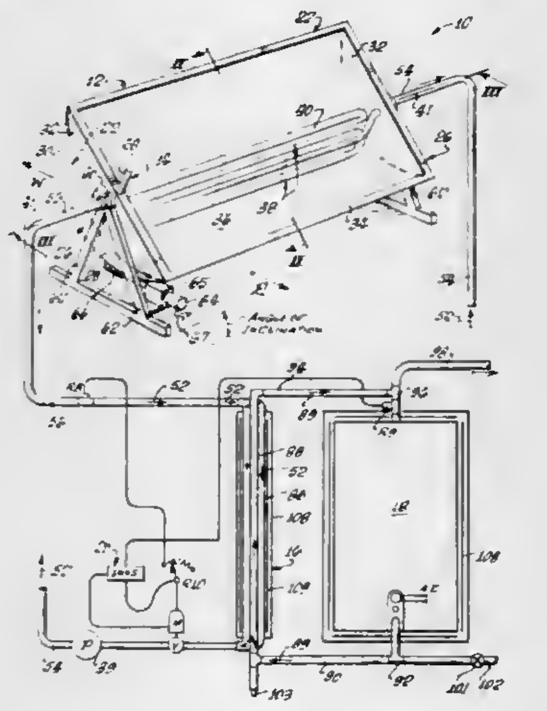


1. A solar water heater with heat-ray intensifiers comprising twin-tank water storage means, valve and conduit means connected to said storage means to permit ingress and egress of water, insulation means surrounding said twin water tanks, and a canopy overlying said water storage tanks provided with means on said canopy to focus, magnify, and intensify heat-wave radiation from the sun, said means on said canopy includes on its outer face a plurality of parallel rows of hemispherical discs and upstanding ridges having air pockets therein disposed upon said outer surface, said canopy defines a curvilinear surface which can therefore utilize radiation from all angular positions of the sun.

4,098,264
SOLAR LIQUID HEATING APPARATUS

Hal R. Brokaw, P.O. Box 273, Carmel, Calif. 93921

Filed Jun. 16, 1976, Ser. No. 696,668
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



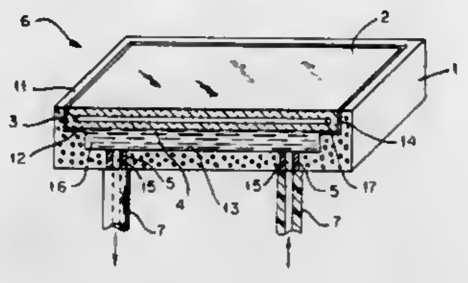
1. Solar heating and tracking apparatus comprising:
a solar concentrator having a parabolic reflecting surface;
a main heater pipe supported along the focal axis of said parabolic surface and being directly in the path of the reflected rays;
said pipe having an inlet and an outlet for the passage of a liquid heat absorbing medium;
a plurality of preheater pipes connected to the main heater pipe and disposed between the main heater pipe and the reflecting surface; means for supporting said solar concentrator for pivotal movement about at least one axis for tracking the movement of the sun;
means for driving said concentrator around said axis responsive to a given signal;
tracking control means for following the path of the sun and for generating the signal to control said driving means;
whereby the concentrator will be guided to track the sun's path to maximize the heat transfer throughout the daylight hours.

4,098,265
SOLAR ENERGY COLLECTOR

Ben T. Gravely, 7001 Buckhead Dr., Raleigh, N.C. 27609

Filed May 10, 1976, Ser. No. 684,758
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **4 Claims**

1. Solar energy collection apparatus, comprising:
a. an impervious surfaced, foamed plastic, thermally insulating, open-topped relatively shallow liquid container body having an integrally formed continuous, recessed inner ledge sealing surface;
b. said liquid container body having at least one inlet and one outlet aperture for admitting and removing liquid to and from the interior of said body;
c. a cover means for covering said open top of said container body, said cover comprising at least two parallel layers of light transmissive material, said layers being separated from one another by at least one quarter inch of open space, the lower layer of said cover being continuously sealed to said recessed inner ledge sealing surface of said rim in a liquid-impervious fashion;

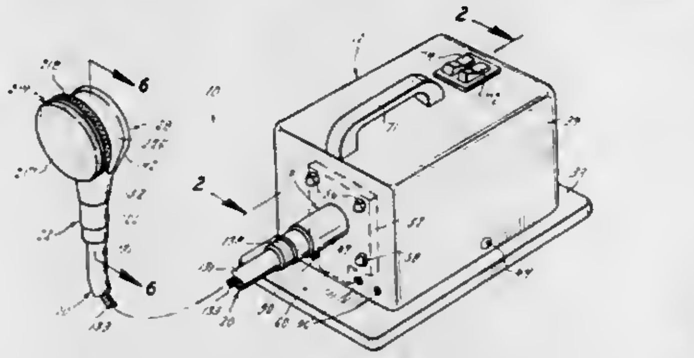


d. said cover and said container body forming an overall liquid-impervious, thermally insulated liquid container vessel; and
e. means for sealing said cover to said inner ledge sealing surface to retain liquid within said vessel in contact with the interior surfaces thereof.

4,098,266
MASSAGE APPARATUS

Thomas Peter Muchisky, 12153 Queen's Charter Ct., Creve Coeur, Mo. 63141, and Russel A. Nemer, Creve Coeur, Mo., assignors to Thomas P. Muchisky, Creve Coeur, Mo.

Filed Dec. 27, 1976, Ser. No. 754,503
Int. Cl.^{2} A61H *1/00*
U.S. Cl. 128—36 **20 Claims**

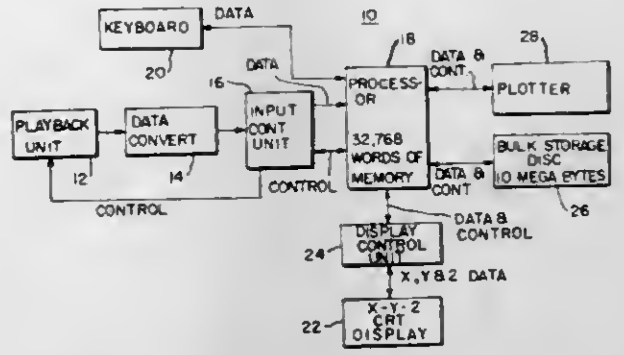


1. A massage apparatus for therapeutic use by an individual comprising an applicator head shaped as a generally flat disc and having an applicator surface formed as one side of the disc for application to a portion of the body of the individual, and drive means producing a generally circular movement of the applicator surface about an axis generally parallel to said surface while said surface maintains generally the same directional orientation, thereby imparting to that portion of the individual to which said applicator surface is applied an angular force produced by both perpendicular and parallel components with respect to said portion of the individual, said drive means including a drive member secured to the periphery of said disc, and comprising a resilient pad, means associated with said pad providing insertion of said applicator head therein for encasing the head in the pad, whereby said pad minimizes the transmission of vibration to the user's hand, or minimizes the impact of the massaging action transmitted to the patient's body.

4,098,267
SYSTEM FOR DISPLAY AND ANALYSIS OF PHYSIOLOGICAL SIGNALS SUCH AS ELECTROCARDIOGRAPHIC (ECG) SIGNALS

Israel M. Stein, Boston, and Ronald T. Peterson, Newton Upper Falls, both of Mass., assignors to Clinical Data, Inc., Boston, Mass.

Filed Jul. 5, 1977, Ser. No. 813,403
Int. Cl.^{2} A61B *5/04*
U.S. Cl. 128—2.06 G **27 Claims**



1. A system displaying physiological signals, such as signals which are reproduced at greater than real time after being recorded in real time for the observation of portions of said signals representing certain cardiac events, said system comprising
memory means for receiving and holding data representing said reproduced signals,
display means operated by data in said memory means for displaying on a plurality of separate, vertically displaced lines a plurality of successively occurring portions of said physiological signals, each of which portions have been recorded over a certain period of time, for observation, and
control means adapted to be operated after each said observation for transferring to said displaying means from said memory means, data representing the next plurality of successively occurring portions for display on said plurality of lines.

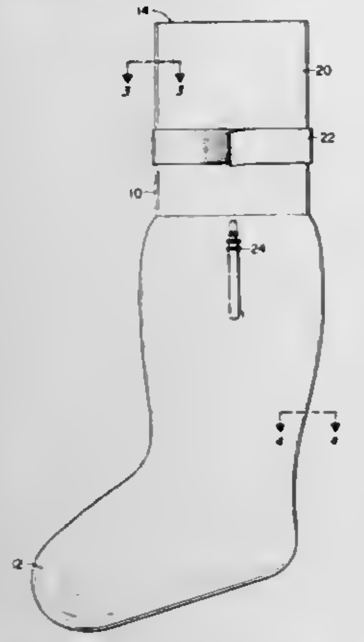
4,098,268
WATER IMPERVIOUS COVER FOR AN ARM CAST OR LEG CAST

Dalbert Byron Scott, 3201 Vista Cielo La., Spring Valley, Calif. 92077

Filed Jan. 6, 1977, Ser. No. 757,317
Int. Cl.^{2} A61F *13/00*
U.S. Cl. 128—82 **8 Claims**

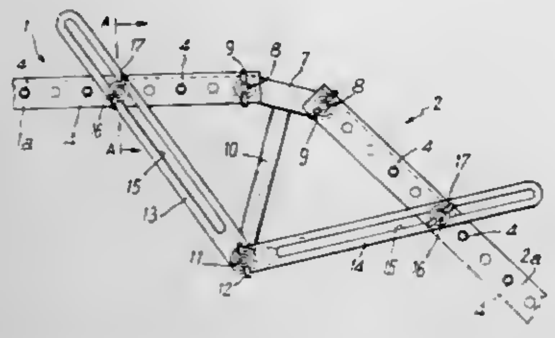
1. A water impervious cover for an arm cast or leg cast, comprising:
a shell consisting of a flexible, water impervious material that is shaped to fit over a portion of an arm or leg that has a cast secured thereto, the shell having a closed end that is shaped to fit over the extremity of said arm or leg, and an open end opposite thereto, wherein when the open end of the shell extends beyond the cast and the shell is tightly secured to the skin of said arm or leg beyond the cast, a pressure seal is created between the shell and said skin;
an inflation valve communicating through the shell for enabling the air pressure inside the shell when the shell is fitted over said arm or leg and the shell is tightly secured

to said skin beyond the cast, to be increased to thereby reinforce said pressure seal; and



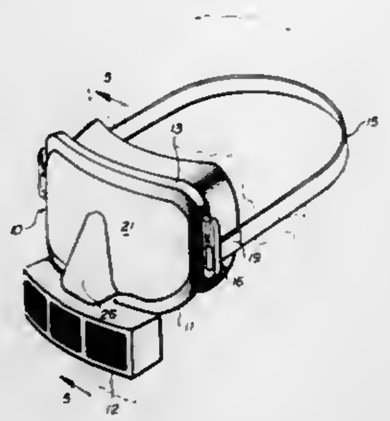
a layer of fabric on the exterior surface of the water impervious material of the shell for providing resistence to slippage when the exterior of the cover is wet.

4,098,269
ARTICULATED FIXATION DEVICE TO HOLD UNALIGNED BONY PARTS IN A FIXED RELATIVE POSITION
Robert Judet, 42 Avenue Bugeaud, Paris, France
Filed Mar. 24, 1977, Ser. No. 781,050
Claims priority, application France, Mar. 26, 1976, 76 08823
Int. Cl.² A61F *5/04;* A61B *17/18*
U.S. Cl. 128—92 A **7 Claims**



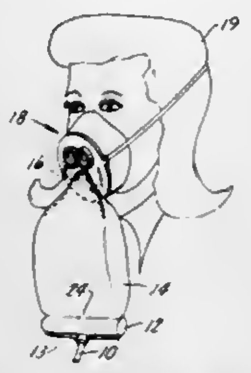
1. An articulated external fixator for bony parts comprising two bars each having U-shaped profile defining a pair of flanges, the flanges of said bars being formed with a plurality of spaced and aligned holes adapted to receive pins to be inserted in the bony parts, an intermediate piece forming a toggle joint, means for pivotally connecting one end of each of said bars to said intermediate piece, a brace piece attached substantially transverse to said intermediate piece, a pair of stays, means pivotally connecting one end of each of said stays to the end of the brace remote from said intermediate piece, and means for connecting a selected point of each of said stays to a respective bar at a point remote from the one end of the stay connected to said brace.

4,098,270
SMOKE MASK APPARATUS
John T. Dolby, Hubbard Woods, Ill., assignor to BBDM, Inc., Chicago, Ill.
Filed Oct. 26, 1976, Ser. No. 735,452
Int. Cl.² A62B *7/00*
U.S. Cl. 128—141 R **6 Claims**



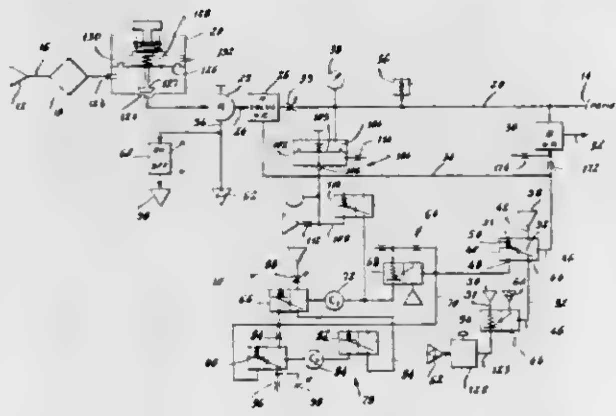
1. A smoke mask comprising a face piece provided with means to form a substantially airtight cover over the eyes and nose of a wearer, leaving the mouth exposed, at least a portion of said face piece to cover said eyes being transparent;
- head harness means for holding said face piece in position over said eyes and nose;
- a filtration cartridge holder attached to and depending below said face piece adapted to be front of said mouth;
- resilient means attaching said holder to said face piece, said resilient means permitting said holder to be moved toward and away from said mouth;
- a removable air filtration cartridge held in said holder;
- mouthpiece means adapted to be held in the mouth of a wearer and a conduit operatively connected between said cartridge and said mouthpiece means.

4,098,271
OXYGEN SUPPLY SYSTEM AND FLOW INDICATOR
Robert W. Maddock, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Continuation-in-part of Ser. No. 617,289, Sep. 29, 1975, abandoned. This application Dec. 3, 1976, Ser. No. 747,228
Int. Cl.² A62B *7/14*
U.S. Cl. 128—142.3 **6 Claims**



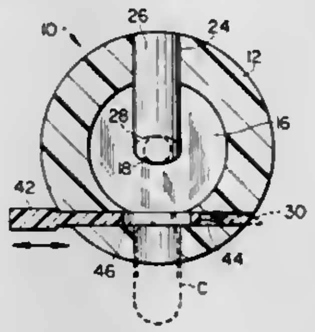
1. A continuous flow oxygen apparatus for personal use for distribution of oxygen from a supply comprising:
- a sheet of flexible material folded and sealed on the peripheral edge to provide a flexible inflatable indicator chamber;
- an entrance opening positioned in the chamber to receive oxygen from said supply and admit oxygen to the interior of the chamber;
- a restrictor positioned in the chamber to limit the flow of oxygen from the chamber and create a pressure in the chamber, the restrictor maintaining said chamber in an inflated condition when the desired oxygen flow is present through the chamber; and
- oxygen dispensing means fluidally connected to said restrictor, said means including an accumulation reservoir fluidically connected to said restrictor to store excess oxygen during the breathing cycle and means for delivering oxygen from said accumulation reservoir to the user.

4,098,272
RESPIRATOR
Jeffrey L. Stewart, Brookfield, Conn., assignor to Bio-Med Devices Inc., Stamford, Conn.
Filed Sep. 25, 1975, Ser. No. 616,660
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **10 Claims**



1. In a respirator using a plurality of pneumatic logic elements operated by a controlled pressurized gas supply to produce a respirator cycle including a patient supply circuit means to provide a breathable gas from a supply to a patient mask through an inspiratory valve and vent exhaled gas through an expiratory valve coupled to atmosphere, wherein the pneumatic logic elements are formed with a control port, a first and a second input port, an output port and means responsive to pressure in said control port for establishing flow between the first input port and the output port and preventing flow between the second input port and the output port and responsive to a lack of pressure in said control port for establishing a gas flow between the second input port and the output port and preventing gas flow between the first input port and the output port, the improvement comprising
- pneumatic oscillator circuit means to provide inspiratory and expiratory breathing phases and being formed with a plurality of elements,
- said pneumatic oscillator circuit means including a first inspiratory control volume and a first pair of elements formed of a first volume charging element and a first volume pressure responsive element, the first volume effectively interconnecting the output port of the first volume charging element to the control port of the first volume pressure responsive element;
- means for effectively coupling the output port of the first volume pressure responsive element to drive the inspiratory and expiratory valves and provide inspiratory and expiratory pressure levels to said inspiratory and expiratory valves;
- the second input port of said first volume pressure responsive element and the first input port of said first volume charging element effectively connected to said controlled gas supply and the first input port of said first volume pressure responsive element being coupled to atmosphere;
- a second expiratory control volume and a second pair of elements formed of a second volume charging element and a second volume pressure responsive element, said second expiratory control volume effectively interconnecting the output port of the second volume charging element to the control port of the second volume pressure responsive element;
- means for coupling the control port of said second volume charging element to the control port of said first volume charging element and to the output port of the first volume pressure responsive element;
- means for coupling a first input port of said first volume charging element with a supply of controlled gas at a first adjustable predetermined rate of gas flow;
- means for charging the second volume through the first input port of the second volume charging element with controlled gas at a predetermined rate during one of the breathing phases and store control gas therein at a pressure level related to the duration of said one breathing phase;
- second volume discharge means coupled to the second input port of said second volume charging element for discharging gas accumulated in the second volume during said one breathing phase at a discharge rate selected commensurate with that desired for the duration of the other breathing phase; and
- first volume discharge means coupling the second input port of said first volume charging element to the second input port of said second volume pressure responsive element for discharging the first volume when gas stored in the second volume has been discharged therefrom through the second volume discharge means for the desired duration of the other breathing phase,
- whereby a predetermined inspiratory to expiratory phase duration ratio is obtained by adjusting the rate of flow of control gas into the first input port of said first volume charging element.

4,098,273
INHALATION DEVICE
Albert S. Glenn, Los Angeles, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.
Continuation-in-part of Ser. No. 540,918, Jan. 13, 1975, Pat. No. 4,005,711. This application Nov. 5, 1976, Ser. No. 739,168
The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.
Int. Cl.² A61M *15/06, 15/08*
U.S. Cl. 128—206 **34 Claims**



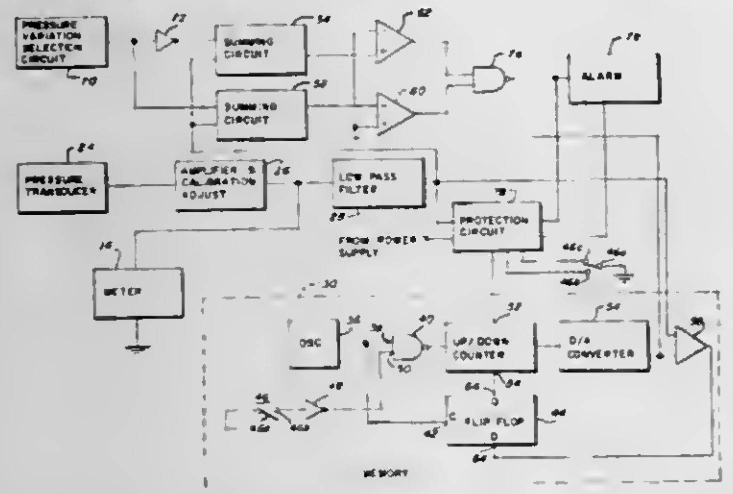
1. A breath-actuated inhalation device for dispensing a medicament from a medicament-holding container comprising a housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof; said passageway terminating in an emptying chamber adjacent the output end of said housing, the cross-sectional area of said passageway being less than the cross-sectional area of said emptying chamber; a first opening extending through a wall of said housing and opening into said emptying chamber for receiving a medicament-holding container; means to open said medicament-holding container as it is inserted into said first opening; and deflector means extending into said emptying chamber adjacent the interface thereof with said passageway for deflecting a portion of the air being drawn through said passageway during inhalation into the opened medicament-holding container whereby the medicament held therein is dispensed therefrom.

4,098,274

DIGITAL MEMORY WITH POWER OUTAGE AND MEMORY OVERLOAD LOGIC IN A DIALYSIS SYSTEM

Wendell victor Ebling; David Allan Witsoe, both of Libertyville, and Jan Soderstrom, Cary, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 18, 1976, Ser. No. 733,584
Int. Cl.² A61M *1/03*
U.S. Cl. 128—214 E **15 Claims**



15. In a dialysis machine capable of at least one type of malfunction an alarm means operative in response to particular blood pressure changes to operate, said alarm means including in combination:

blood pressure sensing means operative to develop a pressure signal which varies in accordance with blood pressure;

Memory means operative to receive said pressure signal, said memory means including storage means for storing said received pressure signal and means for developing a memory signal in response to said storage signal, said memory means having power from a source of power applied thereto and said received pressure signal stored in said memory means storage means being released therefrom upon a particular reduction of power for a first time period, said memory means storage means being operative to store only said received pressure signals below a particular value;

control circuit means coupled to said blood pressure sensing means and said memory means and operative in response to at least a first particular difference said memory signal and said pressure signal to operate for providing an alarm; and

protection circuit means including gating circuit means having a first gate coupled to said source of power and operative in response to said particular reduction of power for said first period of time and restitution thereof to develop a first gate signal, bistable means coupled to said first gate and operative in response to said first gate signal to develop a first bistable signal for providing said alarm, said first gate being further operative in response to a pressure signal in said memory in excess of said particular value to develop said first gate signal, said bistable means operative in response to said first gate signal to develop said first bistable signal for providing said alarm.

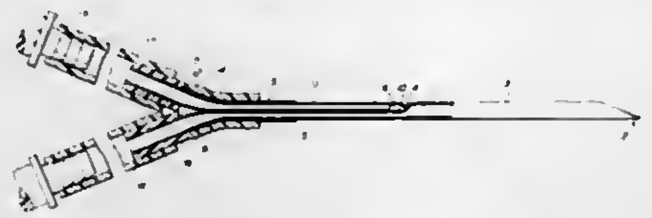
4,098,275

DUAL FLOW CANNULA SET

Dante Vincent Consalvo, Everett, Mass.

Continuation-in-part of Ser. No. 636,067, Nov. 28, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,274
Int. Cl.² A61M *1/03*
U.S. Cl. 128—214 R **5 Claims**

1. A cannula for insertion into a blood vessel comprising a first tube having a piercing tip on the forward end thereof and a second tube adjoining said first tube along a region of tangency and having a non-piercing tip on the forward end thereof, said non-piercing tip cooperating with the external wall of said first tube to form aperture means, said first tube having a longitudinal recess along said region of tangency adapted to receive said secood tube, said non-piercing tip being turned down and secured to said first tube at one end of and within said longitudinal recess, the cross-section of each of said tubes along said region of tangency being mutually congruent and mutually cooperating to form a cylindrical periphery, the internal cross-sectional area of each of said tubes being a minimum along said region of tangency, whereby said second tube can follow said first tube as the cannula is inserted into a blood vessel of a human or animal body, said aperture means being shielded against blood vessel collapse while still permitting effective withdrawal of blood therethrough, said first and second tubes together forming a substantially continuous, smooth external surface to said blood vessel.

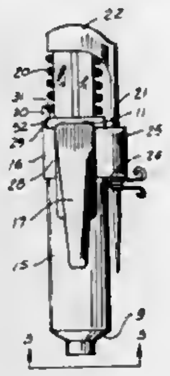


4,098,276

SYRINGE PUMPING HANDLE GRIP AND METHOD OF ASSEMBLING SAME

William George Bloom; Howard Fred Newman, both of Los Angeles, and Gerald Warren Schmidt, Studio City, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 6, 1976, Ser. No. 747,417
Int. Cl.² A61M *5/00*
U.S. Cl. 128—215 **13 Claims**



1. A handle grip for a hypodermic syringe that has a barrel with a finger flange, said handle grip comprising: a body member with a longitudinal opening of a size and dimension for axially receiving a syringe; and a snap lock including a flexible spring biased cam lug connected to the body member for securing the body member to a syringe and preventing relative axial movement between the body member and a syringe.

4,098,277

FITTED, INTEGRALLY MOLDED DEVICE FOR STIMULATING AURICULAR ACUPUNCTURE POINTS AND METHOD OF MAKING THE DEVICE

Sherwin Mendell, 2001 W. North Ave., Chicago, Ill. 60647

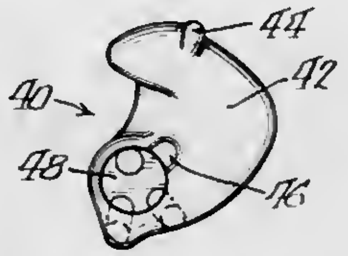
Filed Jan. 28, 1977, Ser. No. 763,411
Int. Cl.² A61B *17/00*; B29C *1/02, 1/14*
U.S. Cl. 128—303 R **13 Claims**

1. A method for forming a device for selectively applying pressure to discrete selected auricular acupuncture pressure points without penetrating skin, comprising:

marking selected acupuncture points on the auricular surface by depositing thereon a transferable marking substance;

forming an impression of the auricular surface of the ear by impressing on the auricular surface a malleable material capable of being marked by contact with the marking substance deposited on the selected acupuncture points, and applying pressure to the malleable material to form a surface of complementary configuration to the auricular surface, the points on the complementary surface of the malleable material contacting the marked pressure points being marked by the marking substance;

removing the marked impression from the auricular surface and supplying projections to the marked points on the complementary surface to form a projection-bearing surface;



forming a mold having a molding surface complementary to the projection-bearing surface of the impression;

filling the mold with a moldable substance;

hardening the moldable substance to form a solid device having a surface generally complementary to the auricular surface and having projections located in correspondence with the selected acupuncture pressure points; and

removing the solid device from the mold.

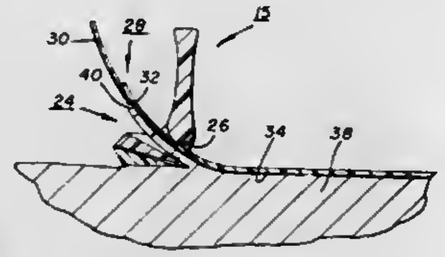
3. The method of claim 1 wherein the malleable material is a thermoplastic substance.

4,098,278

DERMATOME APPARATUS AND METHOD

Boris Schwartz, 400 Park Ave., Paterson, N.J. 07504

Filed Jan. 11, 1977, Ser. No. 758,425
Int. Cl.² A61B *17/32*
U.S. Cl. 128—305.5 **11 Claims**



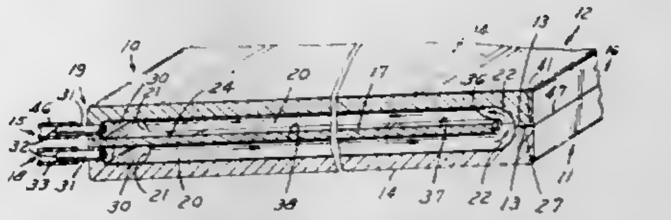
1. A dermatome apparatus combination adapted for a onetime use and operation by one person such as a surgeon or attendant for the removal of a selected area of skin of a determined thickness from a patient, this apparatus combination including: (a) a blade holder having a handle portion for assisting with grasping and moving the holder in and with a reciprocating motion; (b) a blade having a sharpened edge and carried in and by said holder and movable with the holder as it is moved, said reciprocating motion being parallel to said sharpened blade edge; (c) a guideway of a selected opening formed in the blade holder and with the sharpened edge of the blade projecting forwardly adjacent the bottom of the guideway to define a determined spaced opening; (d) a curved portion provided by the blade holder and defining a side of the guideway into which said cutting edge of the blade enters, the cutting edge of the blade being substantially parallel to the curved portion; (e) and in association and combination with said blade holder a plastic strip including a tongue end which is tapered to provide an easy entering portion into and through the guideway in the blade holder, the strip having a midportion of determined width, length and thickness, this width of the midportion being substantially less than the length of the guideway in the blade holder so that reciprocation of the blade holder can occur while the plastic strip is in the guideway; (f) an adhesive surface applied to this midportion of the plastic strip and on one side thereof to provide an adhesive attraction to that portion of skin to be removed by a cutting action of the blade, the plastic strip on that surface opposite the adhesive surface providing a slidable surface over and on which the curved portion slides, and (g) a release sheet applied to the adhesive surface and providing a protection for said adhesive surface until removed for placing the adhesive face of the strip on the skin to be removed from the patient whereby the cutting of and removal of the outer skin may be accomplished by a reciprocating movement of the blade holder and blade after threading the tongue of the plastic strip through the guideway of the blade holder and after pressing the adhesively coated portion of the strip to the skin of the patient with the holder positioned with the blade edge toward the adhered plastic strip on the skin and with the adhered skin lifted whereby a cutting motion of the blade allows the plastic strip and thickness of adhered, removed skin to be pulled through the guideway, the combination of the plastic strip and removed skin being of a thickness equal to the spaced opening in the guideway.

4,098,279

THERAPEUTIC THERMAL PACK UNIT

Theodore Alan Golden, 1063 Ardmore, Birmingham, Mich. 48084

Filed Apr. 1, 1977, Ser. No. 783,815
Int. Cl.² A61F *7/00*
U.S. Cl. 128—400 **10 Claims**



1. A Therapeutic thermal pack unit for maintaining a relatively constant temperature gradient over a predetermined area of the human body to which it is applied comprising a first and a second pack unit section, each of said sections having generally open interior portions adapted to be secured together in a fluid tight face-to-face manner, said first pack unit section including a plurality of elongated, substantially parallel channels, substantially flat land portions about said channels, and input header means adjacent a first end of said channels for simultaneously supplying a thermal fluid to said channels for initiating fluid flow toward the opposite ends thereof, separator sheet means adapted to be disposed upon said flat land portions so as to overlay substantially all of said plurality of parallel channels from said header means to a predetermined spaced distance from the opposite blind opposite ends of said channels to seal the top of said channels except for the uncovered blind end portions thereof, said second pack unit section including channel means and an output header disposed at the same end of said pack unit as said input header, said channel means being sealed by said separator sheet means from said output header means to a predetermined distance from the blind ends of said channels so that the thermal fluid received into said input header and passing through said plurality of parallel channels then passes around the opposite end of said separator sheet means and into the blind end of said channel means and then through said channel means and out of said output header means so as to provide a substantially constant temperature gradient along the length of said pack unit when said first and second pack unit sections are operatively secured together with said separator sheet therebetween.

4,098,280

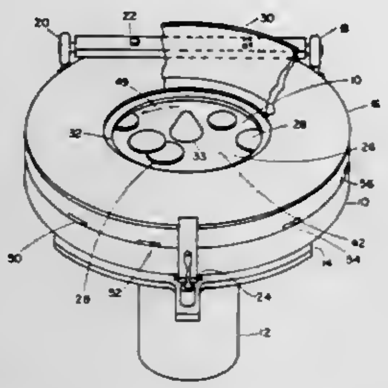
COIN HANDLING MACHINE

Victor G. Ristvedt, Rte. 6, and Roy B. Johnson, Rte. 6, Belmar Cir., both of Manchester, Tenn. 37355

Filed Oct. 22, 1976, Ser. No. 735,060

Int. Cl.² G07D *3/00*

U.S. Cl. 133—3 A **6 Claims**



1. A coin handling device comprising:

a horizontally positioned rotating disc having a resilient upper surface over at least an outer annular portion of said disc;

an annular horizontal guide plate centrically positioned above said rotating disc and generally having a flat surface over said disc at a selected height, said height being approximately the width of the thickest coin to be handled, and extending there below:

at least one horizontal stationary peripheral limit guide extending downward to approximately the resilient surface of said disc and horizontally extending only part way around an outer region of said disc, and having a tapered inner edge to effect a wedging action on coins against said flexible surface of said disc, and

at least one horizontal, generally arcuate inner guide above said disc and extending down approximately to the surface of said disc, and having a radius smaller than that of said peripheral limit guide and being circumferentially spaced from said peripheral limit guide; and

at least one exit guide above said disc and extending downward at a taper to approximately the surface of said disc, said direction of extension being measured with respect to the direction of rotation of said disc, and said exit guide being located just beyond, measured along the direction of rotation of said disc, said inner guide;

whereby a coin striking the tapered region of said exit guide is gradually pressed down into the resilient surface of said disc and held at a corresponding radial position until rotated beyond engagement by said exit guide, and a coin passing radially outward of said exit guide is free to be hurled by centrifugal force from said disc to an exit at an end of said peripheral limit guide.

4,098,281

COLLAPSIBLE SHELTER

Paul Bonfilio, 47-25 198th St., Flushing, N.Y. 11358

Filed Mar. 31, 1977, Ser. No. 783,250

Int. Cl.² A45F *1/16*; E04F *10/04*

U.S. Cl. 135—4 R **9 Claims**

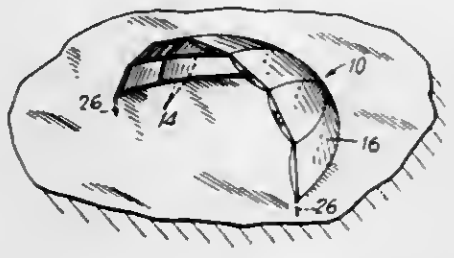
1. A collapsible shelter comprising:

a central hub;

a multiplicity of ribs radially spaced about at least a portion of said hub and extending radially outwardly therefrom, each of said ribs having an outer free end and an inner end, the inner end of which is pivotably mounted on said hub to permit movement of said ribs between an open position, in which the outer end of the ribs are moved laterally away from one another, and a collapsed, closed position in which the outer ends of said ribs are disposed closely adjacent one another;

a cover material secured to each of said ribs and interconnecting adjacent ones thereof; and

locking means for releasably securing said ribs in said open position, said locking means comprising at least one locking assembly, including a pair of elongated rods, each having an outer and an inner end, and each of which is pivotably secured at its inner end to one of the outermost ribs to permit pivotal movement thereof, between a collapsed position, in which said rods lie generally closely adjacent, and parallel, to said outermost ribs, and a locking position, in which one of said rods transversely spans several of the inwardly-disposed ribs and the other of said rods transversely spans the remaining inwardly-disposed ribs, means for demountably securing said rods to the respective ribs which they span, and a pair of elongated bars which are pivotably joined together at their inner ends, said bars each having an outer end which is pivotably secured to the outer end of one of said rods.



4,098,282

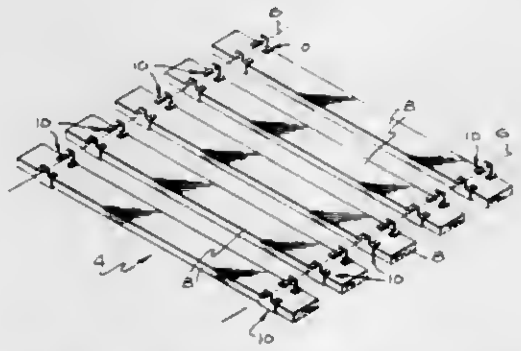
CONSTRUCTION ELEMENT CLAMP

Billy John Nigh, 4446 Laurel Grove, Studio City, Calif. 91604

Filed Nov. 5, 1976, Ser. No. 739,248

Int. Cl.² E04F *10/10*

U.S. Cl. 135—5 R **16 Claims**



1. A clamp for securing an elongate element to a cable, comprising a rectangular blank having two oppositely disposed end edges including:

a first tab means depending from a first of said end edges and a second tab means depending from the oppositely disposed, second of said end edges, said first tab means and said second tab means each for securing the elongate element against the blank, at least said first tab means including at least a first tab depending from one end edge of the blank;

a third tab means adapted for moveable connection to a cable, the third tab means including a third tab depending from an end edge of the blank.

4,098,283

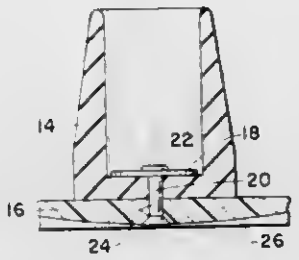
SPECIALIZED CRUTCH TIPS

Robert C. Tritle, Jr., Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 16, 1977, Ser. No. 769,229

Int. Cl.² A45B *9/04*

U.S. Cl. 135—77 **6 Claims**



1. A specialized crutch tip, comprising:

a crutch tip,

a disk attached to a bottom surface of the crutch tip,

the disk forming a convex lower surface, &

the convex lower surface extending to form a flat peripheral ridge.

4,098,284

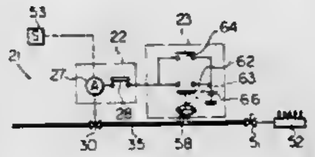
SAFETY DEVICE FOR GAS SUPPLY PIPE

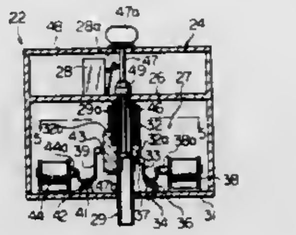
Masafusa Yamada, 10-9 Azuma-bashi 3-chome, Sumida-ku, Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,676

Int. Cl.² F16K *17/36*

U.S. Cl. 137—39 **7 Claims**





1. A safety device for a gas pipe having a terminal shutoff valve comprising:

an automatic shutoff valve provided to the gas pipe upstream of the terminal shutoff valve including an actuator member and biasing means urging the actuator member toward a valve closing position;

first latch means for latching the actuator member in a valve opening position and being actuatable by an electrical shutoff signal to release the actuator member allowing the actuator member to be moved to the valve closing position by the biasing means;

second latch means for latching the actuator member in the valve closing position; and

sensor means for generating and feeding an electrical reset signal to the second latch means to actuate the second latch means to release the actuator member for manual movement to the valve opening position against the force of the biasing means when the terminal shutoff valve is closed.

4,098,285

DEVICE FOR REGULATING THE DIFFERENTIAL PRESSURE BETWEEN TWO DIFFERENT PRESSURE POINTS OF A FLUID CIRCUIT

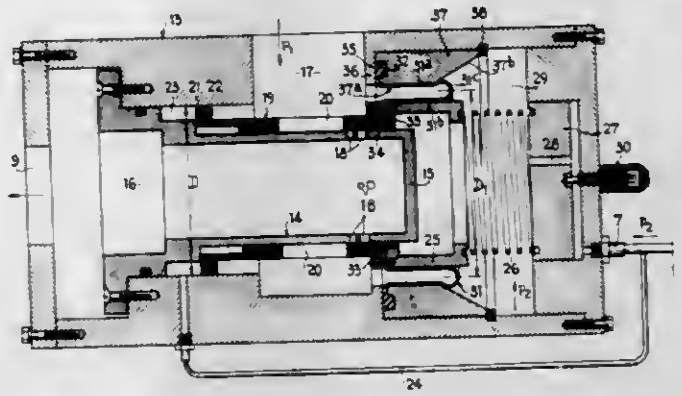
Paul Karing, Denzlingen, Germany, assignor to Bronzavia, Courbevoie, France

Filed Jan. 21, 1977, Ser. No. 761,031

Claims priority, application France, Jan. 20, 1976, 76 01344

Int. Cl.² G05D *13/06*

U.S. Cl. 137—117 **13 Claims**



1. A device for regulating the differential pressure between two points of different pressure of a fluid circuit, comprising means defining a case, means defining an inlet orifice for the case for connection to the first point of pressure, means defining a fluid return orifice, and means defining a passage of a variable section interposed between said orifices, a slide valve member movably mounted in said case, a spring for biasing the valve member, the valve member being capable of regulating said passage as a function of the differential pressure of the two points of pressure in opposition to the action of the spring, means defining a detecting chamber in said case for connection to the second point of pressure, and a sealing means for separating the detecting chamber from said inlet orifice, the sealing means having a section which is capable of varying as a function of the displacement of said slide valve member and being exposed to said differential pressure, said device further comprising a counter-pressure chamber for being subjected to the pressure of said second point of pressure and communicating with said detecting chamber, whereby said sealing means alone is exposed to said differential pressure.

4,098,286

HYDRAULIC CONTROL VALVE ASSEMBLY

Derek Arthur Prime, Uttoxeter, England, assignor to J.C. Bamford Excavators Limited, England

Filed Dec. 16, 1976, Ser. No. 751,075

Claims priority, application United Kingdom, Dec. 19, 1975, 52037/75

Int. Cl.² F15B *13/06*

U.S. Cl. 137—270 **8 Claims**

1. A fluid control valve assembly comprising:

a. a base structure,

b. first and second control valves mounted on the base structure,

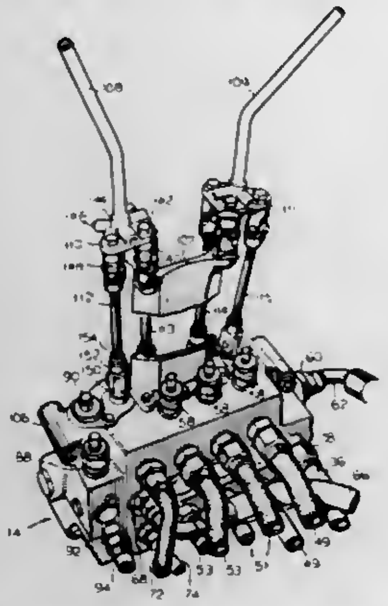
c. a first operating member provided for the first valve, a second operating member provided for the second valve, movement of an operating member controlling flow of fluid through the associated valve,

d. an operating lever,

e. a first means supporting the lever for movement in a first direction and in a second direction,

f. a second means supporting the first means relative to the base structure,

g. a mechanism operatively connecting the operating lever to both operating members, movement of the operating lever in said first direction operating the first operating member movement of the operating lever in said second direction operating the second operating member, said second means permitting adjustment of the orientation of the first means relative to the base structure whereby said



first and second directions are rotatable with respect to the base structure.

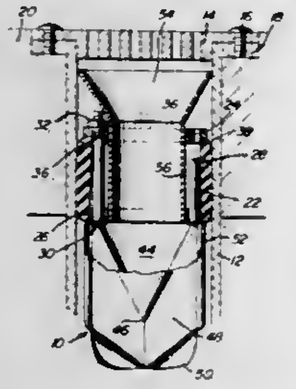
4,098,287
DRAIN CONTROL DEVICE

William J. Baumbach, 11612 Fairfax Station Rd., Fairfax Station, Va. 22039

Filed Apr. 2, 1976, Ser. No. 672,961

Int. Cl.² F16K *15/14*

U.S. Cl. 137—362 **5 Claims**



1. A floor drain control device comprising a generally cylindrical resilient body adapted to be inserted into a floor drainpipe, means connected to said body for longitudinal compression thereof for circumferentially expanding the body into sealing and mounting engagement with the interior of a drainpipe, a depending conical body of flexible resilient material integral with the cylindrical body and including a plurality of radial vanes integral therewith to enable expansion and contraction of the conical body for enabling passage of liquid passing downwardly through the drainpipe but preventing backflow of liquid up through the drainpipe, said means connected with the cylindrical body for longitudinal compression thereof including a rigid annular ring at the upper end of said cylindrical body and a rigid annular ring at the lower end of said body and being connected thereto, threaded members interconnecting said rings for moving said rings toward and away from each other for enabling expansion of the cylindrical body, and a funnel insertable into the upper end of the cylindrical body, said funnel including an upper end portion having a major diameter upper end larger than the internal diameter of the cylindrical body and a lower end portion of cylindrical configuration extending downwardly into the interior of the cylindrical body and having a diameter substantially equal to the internal diameter of the annular ring for guiding liquid material into the conical portion of the control device.

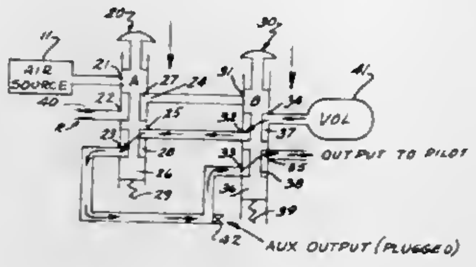
4,098,288
AIR LOGIC CONTROL CIRCUIT

Warren Arthur Waxham, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Jan. 21, 1977, Ser. No. 760,711

Int. Cl.² F15B *13/04*

U.S. Cl. 137—596.1 **7 Claims**



1. An air logic system comprising:

a multiple port first air valve selectively operable between a first and a second position;

an exhaust orifice coupled to one port of said first valve;

a multiple port second air valve selectively operable between a first and a second position;

a volume chamber means coupled to one port of said second valve;

an output means coupled to one port of said second valve;

said exhaust orifice providing an exhaust port to the atmosphere for said volume chamber, said exhaust orifice having a sufficiently small cross section so that a connection to said volume chamber during a relatively small duration of time does not substantially change the pressure within said volume chamber thereby maintaining the pressure within said volume chamber at a level sufficient to provide an output at said output means; and

connecting means for passing air between ports of said first and second valves so when said first and second valves are in said first position an air supply path is coupled through the combination of said first and second valves to said volume chamber means; when said first valve is in said second position and said second valve is in said first position said volume chamber means is coupled through the serial combination of said first and second valves to said exhaust orifice; when said first valve is in said first position and said second valve is in said second position said volume chamber means is coupled through the serial combination of said first and second valves to said exhaust orifice; and when said first and second valves are in said second positions an output air path is coupled from said volume chamber through the serial combination of said second valve, said first valve and said second valve to said output means for supplying an output air pressure level, suitable for actuating the operation of a machine, after substantially simultaneous operation of said first and second valves to said second positions; said output path being coupled to said exhaust orifice when said first and said second valves are in said first position.

4,098,289
CHANGEOVER DEVICE FOR CONTROLLING THE MOVEMENT OF DOSING FRAMES

Herman Schlüter, and Manfred Blase, both of Essen, Germany, assignors to Didier Engineering GmbH, Essen, Germany

Filed Mar. 30, 1977, Ser. No. 782,787

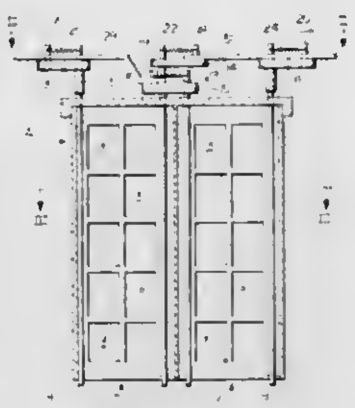
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 7613370[U]

Int. Cl.² C10B *27/06*

U.S. Cl. 137—601 **26 Claims**

1. A changeover device for controlling the movement of a pair of dosing frames in a valve chamber, wherein each dosing frame is mounted on a pivot which is rotatable to move the respective dosing frame between a closed position in front of openings of flues communicating with the valve chamber and an open position withdrawn from such openings, said dosing frames being alternately movable between said respective closed and open positions thereof, said changeover device comprising:

a plurality of eccentrics, one each adapted to be attached to a respective said pivot;



means, attached to each of said eccentrics, for selectively pivoting said eccentrics, and for thereby moving the respective dosing frames between said open and closed positions thereof; and

a plurality of spring means, one each attached to a respective said eccentric, for urging said respective dosing frames into the respective closed or open position thereof dependent on the position of said moving means.

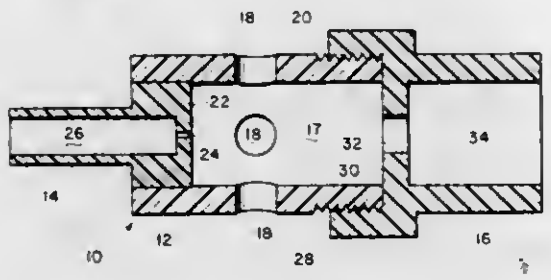
4,098,290
MINIATURE INTERMITTENT POSITIVE PRESSURE BREATHING VALVE

Joseph G. Glenn, Rte. 1, Box 1221, Broken Arrow, Okla. 74012

Filed Dec. 2, 1976, Ser. No. 746,736

Int. Cl.² A61M *15/00*; A62B *7/02*

U.S. Cl. 137—604 **4 Claims**



1. A miniature IPPB valve apparatus, which comprises:

an annular body, providing a substantially cylindrical chamber and having a plurality of circumferentially spaced apertures;

a plug member sealably mounted to one end of the annular body forward of the circumferentially spaced apertures, said plug member having an inlet bore means for receiving compressed gas in the one end thereof and a centrally disposed axial jet orifice in the opposite end thereof, in open communication with the interior of the cylindrical chamber and said inlet bore means; and

a hollow cylindrical cap member sealably mounted in substantially axial alignment to the opposite end of the annular body, providing a baffle wall across the end of said annular body, said baffle wall having a centrally disposed axial port, said cylindrical cap member being interchangeable with other cap members having axial ports of varying sizes.

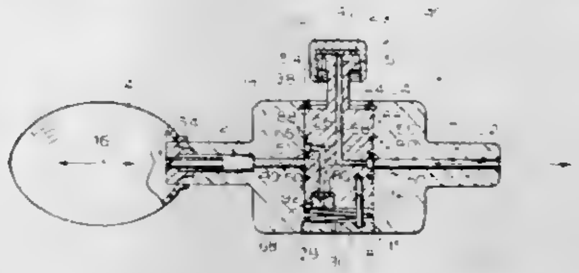
4,098,291
PRESSURE RELIEF VALVE

Thomas W. Clark, Clearwater, and William E. Hale, Dunedin, both of Fla., assignors to Manoscope, Inc., Clearwater, Fla.

Filed Oct. 12, 1976, Ser. No. 731,455

Int. Cl.² F16K *11/18*

U.S. Cl. 137—871 **14 Claims**



1. A valve assembly of the type primarily designed for control of fluid flow to and from a point of use, said valve assembly comprising: a housing including fluid conduit means disposed in fluid communicating relation between said housing and a fluid source and a point of fluid use; cylinder means formed in said housing and disposed in fluid communication with said conduit means; valve block means movably disposed within said cylinder means; fluid flow path means comprising a first and second path of fluid flow disposed in spaced apart relation to one another formed in said valve block means and disposable in interconnecting relation with said conduit means; and a fluid exit assembly formed at least in part on said valve block means and disposed in fluid communication between the exterior of said valve assembly and said second path of fluid flow, said valve block means being movable into and out of fluid communicating position between said conduit means and both said first and second paths of fluid flow and said fluid exit assembly, said fluid exit assembly further comprising aperture means having a predetermined dimension, whereby flow of fluid from said valve assembly is metered dependent upon the predetermined dimension of said aperture means.

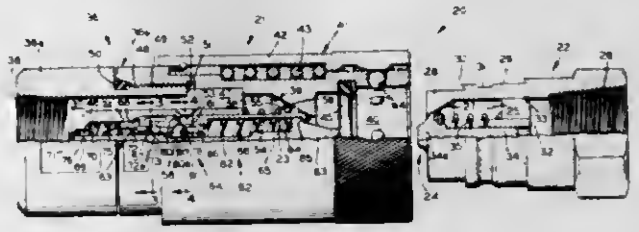
4,098,292
LOCKING MEANS FOR SELF-SEALING QUICK DISCONNECT COUPLINGS

Bryce B. Evans, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jan. 24, 1977, Ser. No. 761,852

Int. Cl.² F16L *37/28*

U.S. Cl. 137—614.04 **17 Claims**



1. In a self-sealing quick disconnect coupling of the type to be coupled and uncoupled while subject to high internal pressures and including a pair of interconnectable body members each having a bore extending therethrough, a normally seated valve within each said bore, said valves having members engagable with each other when said bodies are coupled together, and connecting means for initially interconnecting said body members without unseating either of said valves, the improvement comprising:

a. means for interlocking one of said valves to its said body member when it is in its seated position;

b. means for releasing said interlocking means when said bodies are coupled together for permitting one valve to move from its seated position;

c. means connected to said releasing means for moving said one valve to an unseated position;
d. means for moving the other said valve to an unseated position; and,
e. means for mechanically interlocking said one valve to its said body member when it is in its unseated position whereby said other valve is positively held against movement towards its seated position.

4,098,293
FLUID PRESSURE COUPLING ARRANGEMENT

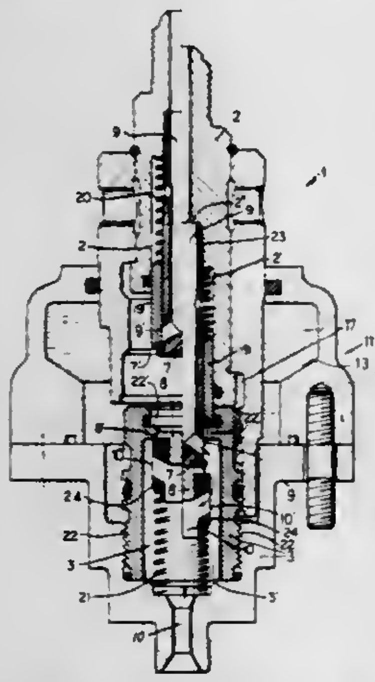
Volker Kramer, Erdmannhausen; Siegfried Rispeter, Plochingen, and Rolf-Peter Marlow, Ditzingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,562

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2542919

Int. Cl.² F16L *37/28*

U.S. Cl. 137—614.03 **12 Claims**



1. A coupling arrangement for pressure fluid lines, the arrangement comprising:
at least two coupling members adapted to be selectively coupled and uncoupled, and
separator means provided at least in the connecting area of said coupling members for preventing the introduction of a non-compatible medium in the pressure fluid lines during a coupling operation, said separator means defining a chamber surrounding a coupling end of one coupling member and containing a medium compatible with the medium in the pressure fluid lines,
whereby, upon another coupling member being inserted into said chamber during a coupling opération, a connecting of the coupling members occurs beneath a surface line of the compatible medium in said chamber.

4,098,294
FLOW CONTROL VALVE

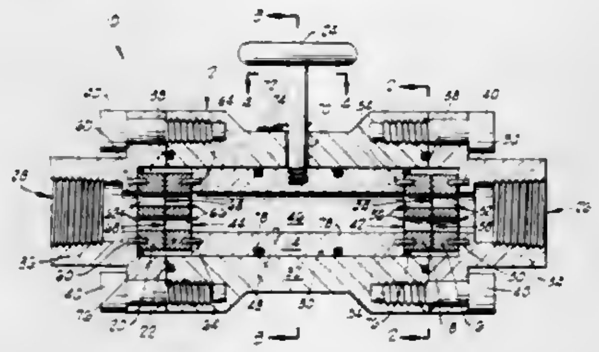
John B. Woods, 1755 E. 61st Pl., Tulsa, Okla. 74136

Filed Oct. 15, 1976, Ser. No. 732,592

Int. Cl.² F17D *1/00;* **F15D** *1/00*

U.S. Cl. 137—614.11 **11 Claims**

1. A flow control valve comprising:
a valve body having an inlet port, an outlet port, a cylindrical bore extending therethrough between the inlet and outlet ports of the valve body, and an arcuate slot extending radially through the valve body from the medial portion of the cylindrical bore;
means connected to the valve body between the inlet and outlet ports thereof for forming an expansion chamber having a length at least four times the diameter of the inlet port, said means having an inlet orifice providing fluid communication between the inlet port and the expansion chamber, and an outlet orifice providing fluid communication between the expansion chamber and the outlet port, the cross-sectional area of each of the inlet and outlet orifices being less than the cross-sectional area of the expansion chamber, said means comprising:
a cylindrical sleeve disposed in the bore through the valve body for rotation abont the longitudinal axis of the sleeve, the sleeve having an inlet port adjacent to the inlet port of the valve body, an outlet port adjacent to the outlet port of the valve body, and a bore extending axially therethrough between the inlet and outlet ports of the sleeve;
a first inlet disc connected to the valve body across the bore therethrough between the inlet port of the valve body and the inlet port of the sleeve, the first inlet disc having an inlet-orifice defining hole extending therethrough in fluid communication with the inlet port of the valve body, the hole having a cross-sectional area less than the cross-sectional area of the expansion chamber with the longitudinal axis of the hole being parallel to but radially offset from the rotational axis of the sleeve a distance greater than the radius of the hole; and
a first outlet disc connected to the valve body across the bore therethrough between the outlet port of the valve body and the outlet port of the sleeve, the first outlet disc having an outlet-orifice defining hole extending therethrough sized and positioned the same as the hole through the first inlet disc but in fluid communication with the outlet port of the valve body;
inlet valve means movably disposed in the valve body adjacent to the inlet orifice for varying the cross-sectional area of the portion of the inlet orifice providing fluid communication between the inlet port and the expansion chamber, said inlet valve means comprising:
a second inlet disc connected to the sleeve across the inlet port of the sleeve, the second inlet disc being sized to slidably engage the first inlet disc and having a hole extending therethrough sized and positioned the same as the hole through the first inlet disc but in fluid communication with the inlet port of the sleeve;
outlet valve means movably disposed in the valve body adjacent to the outlet orifice for varying the cross-sectional area of the portion of the outlet orifice providing fluid communication between the expansion chamber and the outlet port, the outlet valve means comprising:
a second outlet disc connected to the sleeve across the outlet port of the sleeve, the second outlet disc being sized to slideably engage the first outlet disc and having a hole extending therethrough sized and positioned the same as the hole through the first inlet disc but in fluid communication with the outlet port of the sleeve; and
valve actuating means connected to the inlet and outlet valve means for simultaneously moving the inlet and outlet valve means by equal amounts, the valve actuating means comprising:
a handle connected to the sleeve and extending through the slot through the valve body.



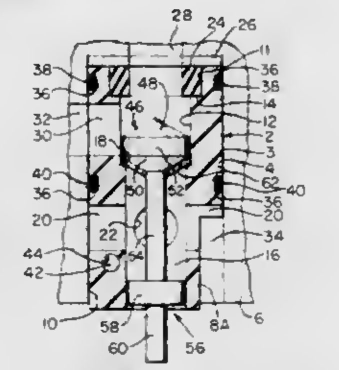
4,098,295
CONTROL VALVES

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billerica, Mass.

Filed Dec. 27, 1976, Ser. No. 754,733

Int. Cl.² F16K *1/44, 1/38*

U.S. Cl. 137—625.27 **14 Claims**



1. A control valve comprising:
a hollow valve casing having (1) a bore for accommodating a slide valve unit, said bore having an enlarged section defining a valve chamber, (2) first, second and third openings for conducting flow of fluid into and out of said casing via said valve chamber, and (3) first and second axially aligned valve seats at opposite ends of said valve chamber, said first valve seat being a ring that is comprised of a resilient material so as to act as a fluid seal and is located in a counterbore of said bore at said first opening, and said second valve seat being located between said second and third openings; and
a slide valve unit having a valve stem slidably disposed within said bore and a valve head attached to the inner end of said stem and movable by said stem into engagement alternately with said first and second valve seats, said valve head having (1) a first conically tapered section for contacting and making a fluid seal with said first seat, and (2) a second frusco-conical section including a peripheral groove and a resilient coating disposed within said groove and covering said second section for contacting and providing a fluid seal with said second valve seat.

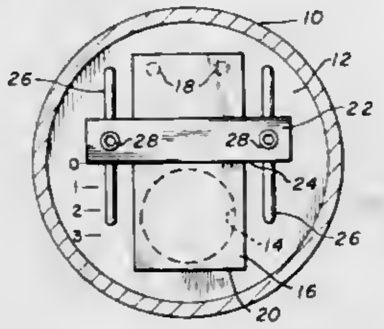
4,098,296
VARIABLE AREA REED FLOW RESTRICTOR

Albert P. Grasso, Vernon, and Paul F. Berg, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,269

Int. Cl.² F16K *15/14*

U.S. Cl. 137—855 **8 Claims**



1. A variable area flow restrictor, including:
orifice defining means having an opening for the passage of fluid;
flexible spring means connected to said orifice defining means and extending over at least part of said opening, part of said spring means being free to move relative to said opening to define a variable flow area;
fulcrum means bearing against said spring means to define a flex axis for said part of said spring means free to move to determine a low versus pressure drop relationship for fluid flow through said variable flow area; and
means for adjusting the position of said fulcrum means to vary the flow versus pressure drop relationship of said restrictor.

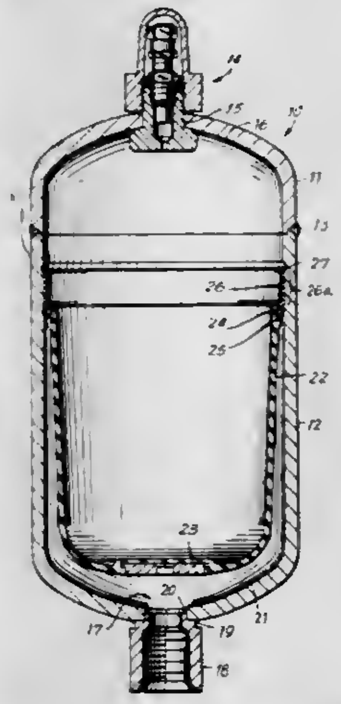
4,098,297
PRESSURE ACCUMULATOR AND METHOD OF FORMING THE SAME

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 11, 1976, Ser. No. 685,315

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **2 Claims**

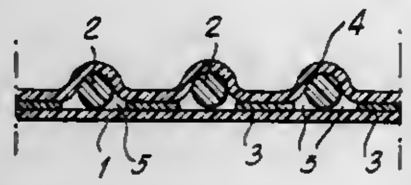


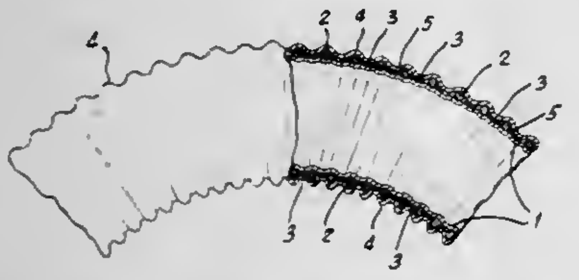
1. A pressure accumulator device including first and second shell members, circular in section, each said shell member including an open mouth portion and a closed end portion, a gas charging valve in the end portion of said first member communicating with a gas chamber, a fluid port in the closed end of said second shell member communicating with a fluid chamber, said chambers being separated by an elastomeric bladder means, the open mouth portions of said shell members being welded together under heat to define a sealed casing, said accumulator being characterized by its adaptability of assembly without said heat adversely affecting said bladder and wherein one of said shell members including in an inner wall surface thereof an integral annular groove having one wall thereof defining a radially extending shoulder disposed in a plane normal to the longitudinal axis of said casing, an axially elongated cylindrical bladder retainer sleeve member mounted within said one section, said bladder means being permanently bonded to a lower end portion of said sleeve member in spaced relation to said shoulder, said sleeve member including a circular upper end portion disposed in registry with said shoulder and a continuous fused weld area defining a connection between said wall portion and said upper end portion of said sleeve, said connection securing said sleeve against axial movement within said casing and defining an fluid-tight seal between said sleeve and said one shell section, said sleeve, in the area between said upper end and said retainer, including annular portions intimately engaged against adjacent inner wall

portions of said shell whereby heat generated in the formation of said fused weld area is conducted into the body of said shell which serves as a heat sink and away from said bonded connection of said bladder and sleeve.

4,098,298
HOSE

Herbert Vohrer, Hattsteiner Strasse 22, D-6243 Falkenstein, Fed. Rep. of Germany
Continuation of Ser. No. 424,703, Dec. 14, 1973, abandoned. This application Dec. 30, 1975, Ser. No. 645,442
Int. Cl.² F16L *11/08*
U.S. Cl. 138—122 **7 Claims**

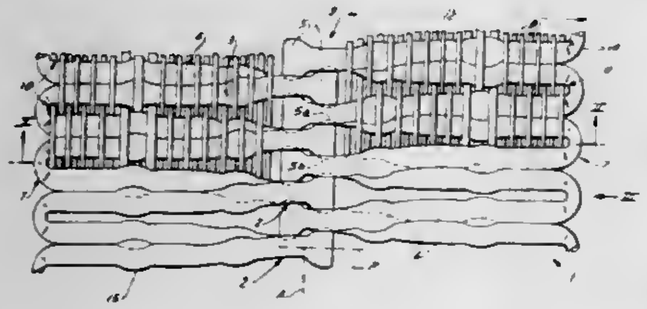




1. In a reinforced pressure and suction hose of the type having a flexible inner hose wall, a flexible outer hose wall and a wire helix disposed between said walls, the improvement comprising strip means, of a relatively hard and stiff material as compared to that of said hose walls, said strip means being bonded to and disposed between said hose walls intermediately within the space between the turns of the wire helix, for forming a helical cavity between said hose walls containing said helix unbonded therein, and said strip means being of a width and thickness so as to be spaced from the turns of said helix to permit movement of the unbonded helix in said cavity and to prevent bending and folding of the inner and outer hose walls except at the cavity.

4,098,299
SLIDE FASTENER

Alfons Fröhlich, Essen, Germany, assignor to OPTI Patent-Forschungs- und Fabrikations-AG, Glarus, Switzerland
Filed Sep. 10, 1976, Ser. No. 722,265
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 2540272; Sep. 10, 1975, 2540190
Int. Cl.² A44B *19/12*
U.S. Cl. 139—384 B **14 Claims**

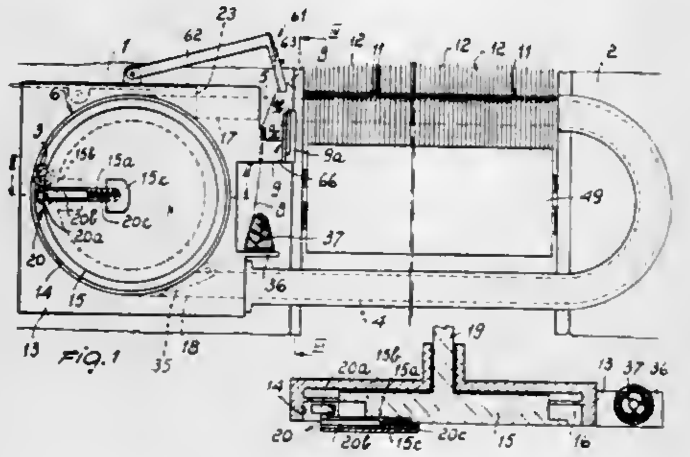


1. In a slide fastener comprising two rows of interdigitatable coupling elements formed by respective synthetic-resin monofilaments, wherein each coupling element of each row has an eye-shaped coupling head adapted to be received between the heads of the other row, a pair of connecting shanks extending away from the coupling head, and respective bights joining each shank to a shank of the next coupling element, and wherein each row of coupling elements is held by longitudinal textile threads in a tape-like support structure with the coupling heads projecting laterally along an edge of the support structure, the improvement wherein:

each coupling head lies in a plane substantially perpendicular to the plane of the tape-like support structure;
the shanks of each coupling element lie in a plane parallel to the slide-fastener plane beyond transition regions at which the shanks join the respective coupling head;
the shanks of each coupling element extending away from said transition regions laterally and directly abut one another in the plane of the abutting shanks which is parallel to the slide-fastener plane;
the longitudinal textile threads form transverse pockets each receiving a respective one of said pairs of shanks; and
the respective bights extend out of each pocket into adjacent ones of said pockets.

4,098,300
SHUTTLELESS LOOM WITH UNIDIRECTIONAL WEFT THREAD CARRIERS

Francesco Mollica, Via Cairoli, 5, Varese, Italy
Filed Jul. 25, 1977, Ser. No. 818,895
Claims priority, application Italy, Aug. 3, 1976, 25966 A/76
Int. Cl.² D03D *49/24*
U.S. Cl. 139—437 **7 Claims**

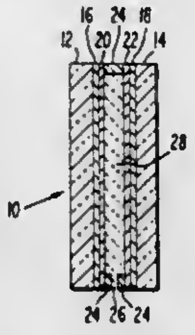


1. A shuttleless loom of the type having unidirectional weft thread carriers, comprising a throwing and recovering device for at least one of said carriers, wherein said device includes a guide for causing said at least one of said carriers to move along a closed path one portion of which passes through the shed, said guide including a linear throw portion and a linear return portion and two arcuate portions connecting said linear portions at opposite sides of the loom, said device comprising at at least one of said arcuate portions a circular guide portion substantially tangent to said linear return portion and to said linear throw portion, a flywheel rotatably arranged within said circular guide portion and defining the inner wall thereof, said flywheel being provided with entraining means for said at least one of said carriers, and means for causing said at least one of said carriers to make at least one complete revolution within said circular guide portion and to be thrown out of said circular guide portion into said throw portion after said at least one complete revolution, wherein said loom comprises at least one substantially cylindrical weft thread carrier, movable in said arcuate portions with its own axis substantially parallel to the axes of said arcuate portions and adapted to accomodate circumferentially the weft thread as positioned at the exit of said throw portion of said guide in a direction substantially perpendicular to said carrier axis, said device including also gripping

and cutting means for the weft thread located at said exit of said throw portion respectively on opposite sides with respect to the throwing path to hold the weft thread engaged on one side by said carrier at least for the whole time during which said carrier is moving through the shed and to cut the weft thread on the other side substantially when said carrier reaches the midpoint of the travel thereof through the shed.

4,098,301
METHOD TO PROVIDE HOMOGENEOUS LIQUID CRYSTAL CELLS CONTAINING A DYESTUFF

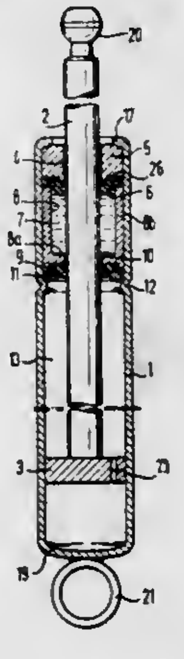
Allen Bloom, East Windsor, and Howard Sorkin, Berkeley Heights, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Dec. 23, 1976, Ser. No. 753,879
Int. Cl.² G02F *1/13;* C09K *3/34;* B65B *31/02*
U.S. Cl. 141—7 **3 Claims**



1. A method of improving the homogeneity of liquid crystal cells containing mixtures of a liquid crystal composition and a soluble, pleochroic dyestuff filled under vacuum through a single port which comprises heating a filled cell to a temperature above the nematic to isotropic transition temperature of the liquid crystal mixture until a uniform color is obtained throughout the cell.

4,098,302
METHOD OF CHARGING PNEUMATIC SUSPENSION ELEMENT

Herbert Freitag, Koblenz-Metternich, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany
Division of Ser. No. 592,787, Jul. 2, 1975, Pat. No. 4,030,716. This application Jan. 5, 1977, Ser. No. 757,046
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1974, 7422901[U]
Int. Cl.² B65B *3/04*
U.S. Cl. 141—9 **3 Claims**

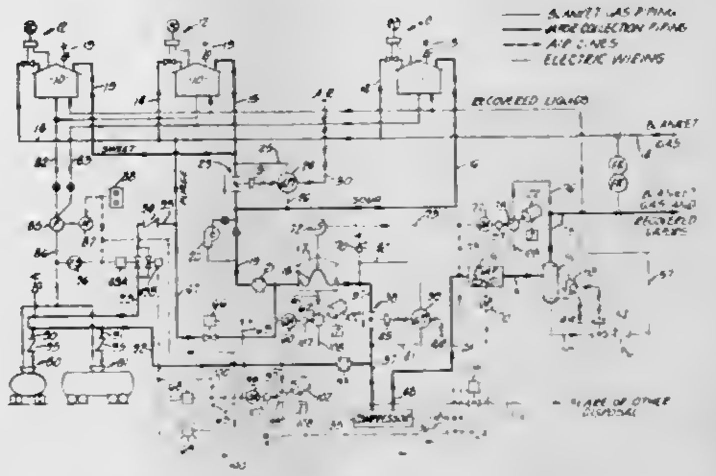


1. A method of charging an suspension element having a cylinder, a partition axially dividing the cavity of the cylinder into two chambers, a piston rod movably extending from one of said chambers through the partition, through the other chamber, and through an apertured wall of the cylinder outward of the cavity, first pressure-responsive sealing means preventing flow of fluid from said other chamber outward of said cavity, and second pressure-responsive sealing means preventing flow of fluid between said chambers in the absence of a predetermined pressure differential, which method comprises:

(a) forcing a gas under pressure sequentially through said first and second sealing means until said chambers are filled with said gas at a first pressure higher than atmospheric pressure; and
(b) thereafter forcing a liquid through said first sealing means into said other chamber at a pressure higher than said first pressure until gas is displaced from said other chamber by said liquid and forced through said second sealing means into said one chamber.

4,098,303
VAPOR RECOVERY SYSTEM FOR LOADING BACKS AND STORAGE TANKS

Donald M. Gammell, Arcadia, Calif., assignor to Robert Brown Associates, Carson, Calif.
Filed Sep. 17, 1976, Ser. No. 724,332
Int. Cl.² B65B *31/00*
U.S. Cl. 141—52 **38 Claims**



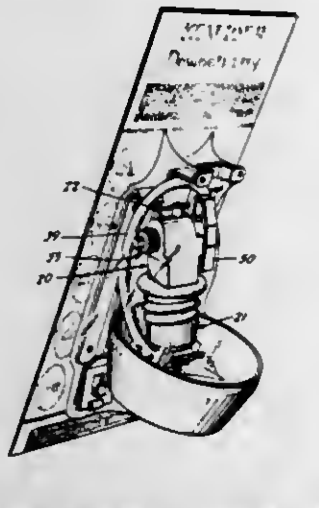
1. A vapor recovery system for a volatile liquid storage facility of the type having closed liquid storage means connected to means for maintaining the ullage thereof filled with a blanketing gas from a source of blanketing gas and including means for maintaining the blanketing gas pressure in said ullage within a predetermined pressure range, holding tank means connected to the ullage of said liquid storage means to receive a mixture of vapor and blanketing gas therefrom, oxygen analyzer means in communication with said last mentioned means operable to monitor and analyze said vapor and gas mixture for oxygen and including means to activate control means to supply additional blanketing gas to said mixture of vapor from said source of blanketing gas, blanketing gas and oxygen automatically upon detection of an oxygen content in said vapor and gas mixture in excess of a predetermined value.

4,098,304
LIQUID-DISPENSING VACUUM BOTTLE OR THE LIKE

Frederick L. Nestrock, Avon, Conn., assignor to Union Manufacturing Company, Meriden, Conn.
Filed Jan. 17, 1977, Ser. No. 760,016
Int. Cl.² B65B *3/04*
U.S. Cl. 141—84 **15 Claims**

1. A combined spigot and plug for unitary inserted closure of the open end of a thermos or the like bottle, said combined spigot and plug comprising a unitary single-piece injection-molded plastic body member extending between a plug end

and a spigot end on essentially a single axis, said plug end having a circumferentially extending base flange for limiting the longitudinal extent of plug insertion into a bottle neck, said plug end having external thread formations for threaded engagement to corresponding formations in the bottle neck, and said plug end having a circumferential seal-retaining groove between said flange and said thread formations, said body member having two spaced straight parallel passages extending longitudinally through both said ends and a single tapered spigot opening intersecting both said parallel passages and extending transversely through said body member near the spigot end thereof; a single-piece injection-molded plastic spigot member comprising a tapered stem having liquid-sealing but rotatable fit in the spigot opening, said spigot member having two axially spaced straight parallel passages extending transversely through said stem at the respective regions of spigot-opening intersection with said body-member passages, and said spigot member including externally projecting manualactuating means at the larger end of said stem and externally projecting threads at the smaller end of said stem; a vent tube connected to said body member at one of said body member-passages and extending axially beyond the plug end of said body member; and an externally accessible nut engaged to the threads of said spigot member and having compressional reference to the adjacent surface of said body member to hold said liquid-sealing but rotatable fit.



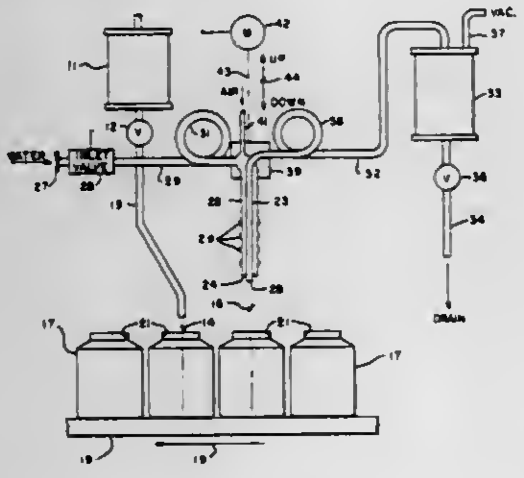
4,098,305
CONTINUING LIQUID SAMPLING APPARATUS AND METHOD

Wendall C. Gates, Santa Cruz, Calif., assignor to Manning Environmental Corporation, Santa Cruz, Calif.

Filed Mar. 18, 1976, Ser. No. 667,990

Int. Cl.^{2} B65B *3/04, 55/10;* B67C *1/00*

U.S. Cl. 141—92 **1 Claim**



1. A liquid sampler for obtaining predetermined number of samples from a flow to be sampled and for storing the samples for a predetermined period of time, comprising a sample container carrier, a plurality of sample containers supported on said sample container carrier in a predetermined array, said plurality of sample containers having access openings therein, means in communication with a liquid flow for withdrawing, measuring, and transferring liquid samples from the fluid flow to ones of said sample containers at a sampling position, a wash probe, an exhaust probe, said wash and exhaust probes being located in a cleaning position adjacent to said sampling position and further being configured to pass through said access openings, means for positioning each of said wash and exhaust probes in a lowered wash and exhaust position and a raised remote position, means coupled to said exhaust probe for withdrawing liquid sample and wash solution from ones of said sample containers, means coupled to said wash probe for conducting a wash solution to ones of said sample containers, means for driving said sample container carrier for positioning ones of said sample containers in said cleaning position and thereafter in said sampling position, means for controlling operating to actuate each of said means for positioning, means for withdrawing sample and wash solution, means for conducting wash solution, and means for driving during a cleaning cycle, whereby ones of said sample containers are exhausted and cleaned in said cleaning position and thereafter advanced to be filled with a liquid sample in said sampling position, and means for inhibiting said means in communication with a fluid flow, said means for inhibiting being controlled by said means for controlling and operating so that samples cannot be delivered to ones of said sample containers positioned in said sampling position during the exhausting and cleaning of ones of said sample containers in said cleaning position.

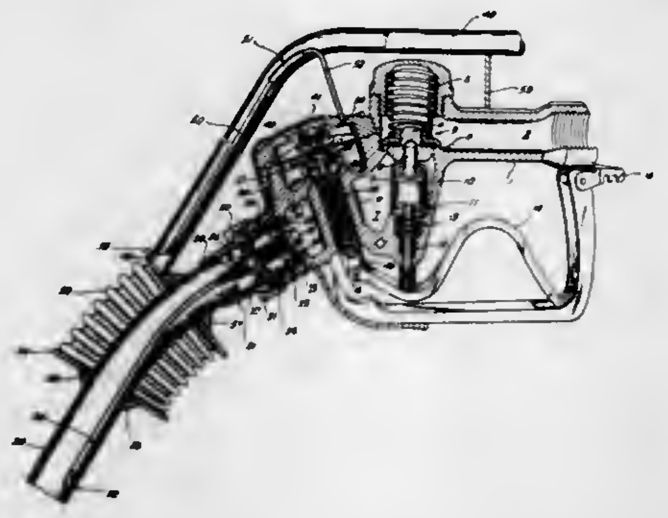
4,098,306
AUTOMATIC SHUT-OFF LIQUID DISPENSING NOZZLE

Robert J. Askevold, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 1, 1976, Ser. No. 701,568

Int. Cl.^{2} B65B *57/14*

U.S. Cl. 141—218 **8 Claims**



1. A liquid dispensing nozzle comprising:
(a) a body having an inlet port, a discharge port, and a liquid communication passageway housed within said body connecting said inlet port and said discharge port;
(b) a valve within said body for controlling the flow of liquid through said liquid communication passageway;
(c) operating means for opening and closing said valve;
(d) a venturi, situated within said liquid communication passageway, said venturi having a throat opening thereinto for the aspiration of gases into a liquid passing through said liquid communication passageway;
(e) vapor transporting means comprising:
(1) means, mounted on said body, for collecting vapors displaced from a receiving vessel during the filling thereof with liquid passing through said discharge port; and
(2) a vapor removal line connected at one end in vapor-tight engagement with said vapor collecting means and adapted at the other end to be connected to means for removing vapors transported through said vapor removal line;
(f) a gas communication passageway connecting said venturi throat opening with a first and second orifice through which gases are drawn into said gas communication passageway when liquid is passing through said discharge port, said first orifice being disposed adjacent to said discharge port so that gases in said gas communication passageway are in communication with fluids surrounding said discharge port, and said second orifice being disposed in said vapor transporting means such that said gas communication passageway is in fluid communication with said vapor transporting means; and
(g) means for activating said operating means to close said valve when either of said orifices is filled with liquid, said activating means comprising (1) a chamber, housed within said body of said nozzle, which chamber is divided by a pressure responsive diaphragm into a first and second chamber, said first chamber being a portion of said gas communication passageway, and (2) means, attached to said diaphragm, for closing said valve in response to the flexing of said diaphragm into said first chamber when a reduced pressure, caused by the suction produced by said venturi when liquid passes therethrough and either of said orifices is filled with liquid, is present in said first chamber.

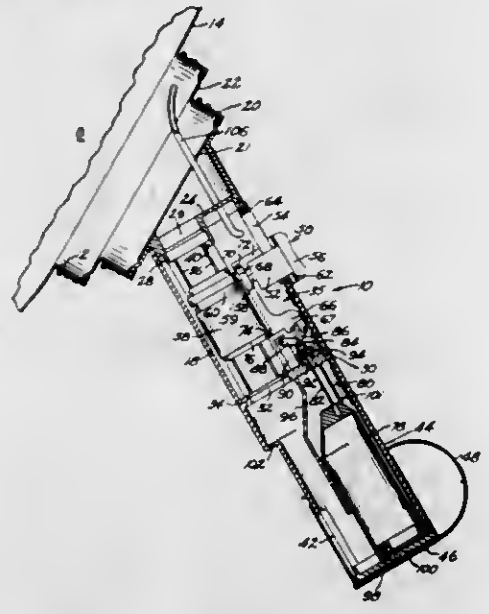
4,098,307
AUTOMATIC SHUT-OFF LIQUID DISPENSING NOZZLE

Clarence R. Taylor, Penfield, N.Y., assignor to David M. Goodrich, Avoca, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,050

Int. Cl.^{2} B65B *57/14*

U.S. Cl. 141—220 **10 Claims**



1. An automatic shut-off dispensing nozzle comprising:
a conduit defining a chamber having axially spaced inlet and outlet valve ports through which a liquid can be dispensed into a receptacle when the nozzle is tilted downwardly into a liquid dispensing position;
a freely sliding valve piston reciprocally movable within said chamber between a normal first position for sealing said inlet valve port and preventing liquid flow into said chamber, a second position for sealing said outlet valve port and preventing liquid flow out of said chamber, and an intermediate latched position between said inlet and outlet valve ports for allowing liquid flow through said inlet and outlet valve ports of said chamber into the receptacle;
slide means manually movable into engagement with said valve piston for moving said valve piston into and out of said normal first position;
latch means for releasably holding said valve piston in said latched position when said valve piston has been moved by said slide means, liquid flow and gravity out of said normal first position and into said latched position while said nozzle is tilted downwardly into said liquid dispensing position; and
latch control means coupled to said latch means and movable in response to the rising liquid in the receptacle from a normal extended position to a retracted position for releasing said latch means when the liquid has reached a predetermined level whereupon said valve piston is moved by the liquid being poured through said chamber to said second position for sealing said outlet valve port and shutting off the liquid flow through the chamber.

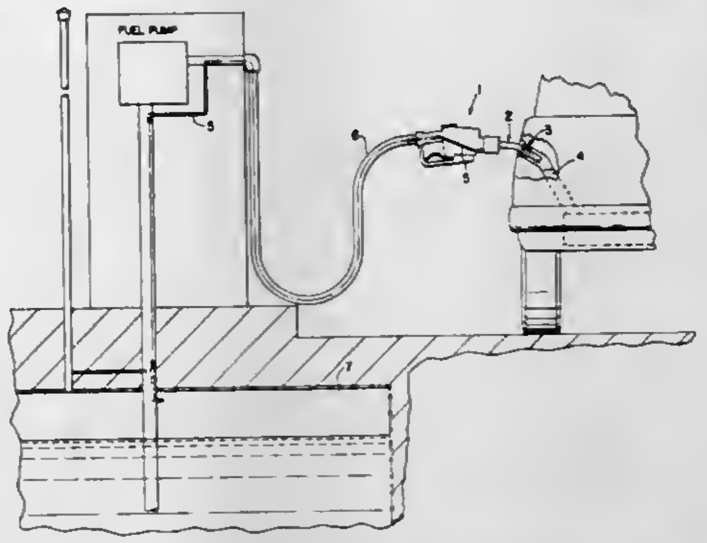
4,098,308
VAPOR RECOVERING FUEL DISPENSING NOZZLE

Charles R. Purdum, Bay Village, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 7, 1976, Ser. No. 693,255

Int. Cl.^{2} B65B *3/04*

U.S. Cl. 141—285 **4 Claims**



1. A dispensing nozzle for dispensing fuel into a tank filler neck, said dispensing nozzle having a dispensing conduit, an expandable annulus on said conduit for effecting a seal between the conduit and the inside surface of the tank filler neck, said annulus defining with said dispensing conduit a continuously closed chamber for receiving fuel and thereby expanding said annulus, said dispensing conduit defining in the side walls thereof at least one hole communicating with said closed chamber whereby said annulus can be expanded by the flow of fuel through said dispensing conduit only, said annulus located on said conduit so that said annulus can be completely received in said neck when fuel is dispensed.

4,098,309
FUEL CONTAINER WITH FILLING VALVE

Walter Mohr, Frankfurt am Main, Germany, assignor to Braun AG, Frankfurt am Main, Germany

Filed Jun. 29, 1976, Ser. No. 700,778

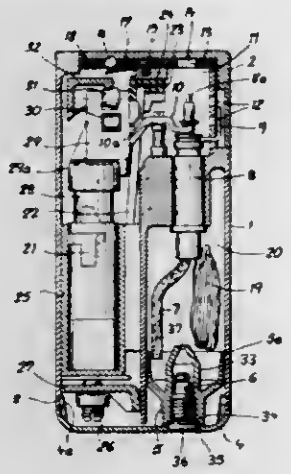
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543255

Int. Cl.^{2} B65B *1/04*

U.S. Cl. 141—291 **9 Claims**

1. In a fuel container provided with a valve for filling said container from a filling tank, said valve comprising a valve member with a sealing surface biased against a seat by a spring, the improvement which comprises a partition surrounding said sealing surface and said seat and separating same from the

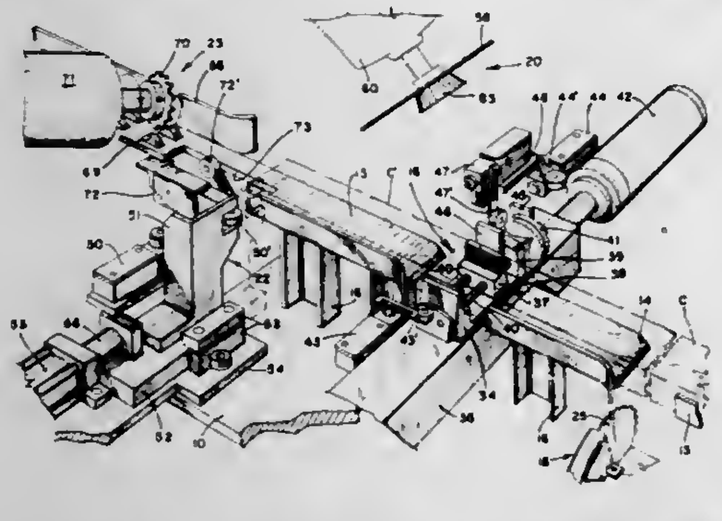
interior of said container, said partition being elongated and projecting into the interior of said container, and at least one passage with a diameter between 0.2 and 0.8 mm formed in said partition for enabling fuel to pass from said valve into the interior of said container, said valve being disposed within said partition, said partition having a generally conical tip with one such passage being provided at the apex of said tip, said tip and said passage being dimensioned to admit fuel from said valve to the interior of said container while preventing contaminants from entering said partition.



4,098,310
APPARATUS FOR BEVELING TRUSS COMPONENTS

Arthur Carol Sanford, Pompano Beach, and Fritz Waechter, Coconut Creek, both of Fla., assignors to Arthur Carol Sanford, Pompano Beach, Fla.

Filed Mar. 14, 1977, Ser. No. 776,828
Int. Cl.² B27M ***3/00***
U.S. Cl. 144—3 R **6 Claims**

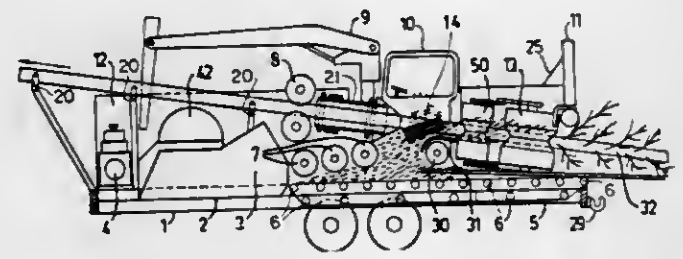


1. Apparatus for cutting wood components to accurate length and beveling the ends, comprising a frame, longitudinal guide means on said frame, stop means extendable into alignment with said guide means for limiting movement of a length of component lumber in said guide means, laterally reciprocable vise means on the frame for clamping a component portion of said lumber positioned in said guide means, a cutoff saw movable reciprocably on the frame transversely of said guide means to cut off a wood component to required length, means automaticaly to retract said stop means at the end of the return stroke of said cutoff saw, a pair of longitudinally spaced beveling saws mounted on the frame laterally opposite the ends of said component, each saw comprising a rotary blade for beveling in one direction and a tapered routing cutter mounted at the axis of said blade for simultaneously beveling in another direction, and means to bodily move said vise means reciprocably transversely to move the ends of a component clamped therein across the beveling saws.

4,098,311
FORESTRY MACHINES

Carl Larsson, Kisa, Sweden, assignor to Kisa Tra AB, Kisa, Sweden

Filed Nov. 26, 1976, Ser. No. 745,298
Int. Cl.² A01G ***23/08;*** **B27L** ***1/00***
U.S. Cl. 144—309 AC **7 Claims**



1. A base machine for on-site recovery of felled trees, said trees having an elongate trunk comprising (1) a root end, (2) a top end, and having (3) bark and elongate branches and twigs attached thereto, said machine comprising in combination:

a chassis:

debranching means supported on said chassis for severing said branches and twigs from said trunk close to said bark;

chipping means for chipping said severed branches and twigs;

a first feed means for feeding said tree, root end leading through said debranching means, said first feed means being arranged to press said branches and twigs against said trunk thereby to orient the unattached ends of said branches and twigs towards the top end of said tree and generally parallel to one another in their elongate dimension for severing by said debranching means;

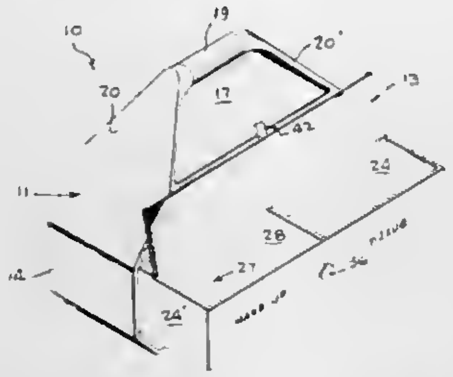
a second feed means for feeding said severed, generally parallel oriented branches and twigs into said chipper wherein said branches and twigs may be cut substantially at right angles to their elongate dimension; and

means for driving said debranching, chipping, and first and second drive means.

4,098,312
PURSE FOR ORGANIZING PERSONAL ARTICLES

Elizabeth G. McCain, 6006 Pollard Dr., Richmond, Va. 23226

Continuation-in-part of Ser. No. 698,602, Jun. 22, 1976, abandoned. This application Sep. 27, 1977, Ser. No. 837,704
Int. Cl.² A45C ***3/06***
U.S. Cl. 150—35 **5 Claims**

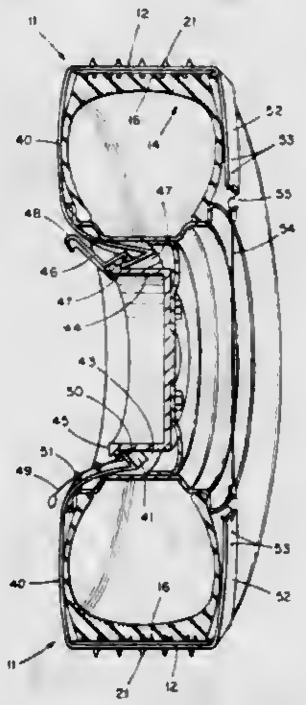


1. An improved purse for keeping personal articles, said purse comprising a carrying case including opposed end walls connecting a top wall and a bottom wall and a rear wall connecting rear edges of the end walls, a handle disclosed above the top wall and secured to the case, said case additionally including a plurality of partitions spaced apart, parallel to the bottom wall and connected to the carrying cases; a plurality of drawers which fit between the partitions and the case with each drawer being of box-like construction and including a bottom wall, two side walls, a rear wall, and a front wall, a mirror having a hinge attached to one of said drawers with the axis of said hinge spaced apart from said front wall of said drawer and parallel to said bottom wall of said drawer, said mirror pivotable downward to a position adjacent the upper edges of said drawer to permit the drawer to be closed when the mirror is in said position, and means for retaining the drawers in a closed position thereby providing an efficient and convenient purse with a mirror which can be pivoted upwardly to a use position and pivoted downwardly to a storage position which permits closing of the drawer.

4,098,313
TRACTION DEVICE FOR VEHICULAR WHEELS

Philip E. Ingerson, 4825 W. 96th St., Oak Lawn, Ill. 60453

Filed Feb. 12, 1976, Ser. No. 657,611
Int. Cl.² B60C ***27/04***
U.S. Cl. 152—213 R **4 Claims**



1. A traction device for a vehicular wheel and a tire mounted on the wheel, the tire having a tread portion and a pair of opposed spaced apart sidewalls between said tread portion and said wheel wherein the vehicular wheel is rigidly attached with respect to a brake drum thereby defining an annular space between the wheel and the brake drum, the brake drum having a flange associated therewith in said annular space, said traction device comprising;

a relatively flat, elongated gripper tread defining an inner surface, an outer surface, and a first and a second ends thereto;

a pair of arms attached to the ends of said gripper tread in a spaced apart, opposing relationship, said side arms being substantially at right angles to said gripper tread wherein at least one of said side arms comprises a metal strap having an extreme end;

attachment means cooperating with said side arms about said tire, said attachment means not penetrating into said sidewalls wherein said attachment means for one of said side arms comprises a portion of said extreme end bent back upon itself at an oblique angle of greater than 90° but less than 180° thereby defining a wedge-shaped end of said strap, said wedge-shaped end being flexible and adapted for insertion into an annular space between a brake drum and said wheel, an edge of said portion adapted to engage a flange on said brake drum to secure said wedge-shaped end in said annular space;

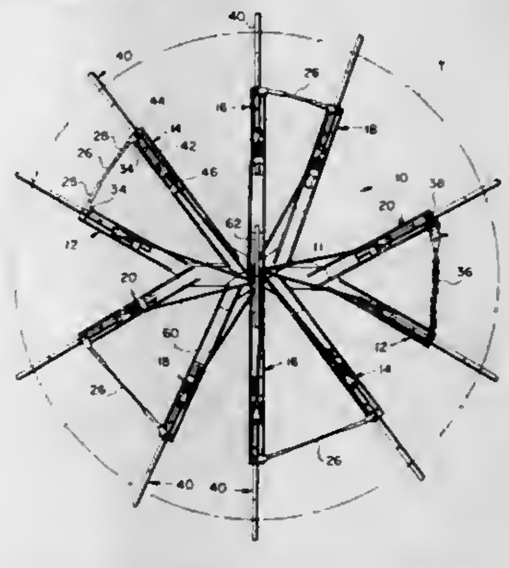
a plurality of relatively short protrusions projecting from the inner surface of said gripper tread for limited penetration into the tread of said tire to prevent radial or circumferential slip of the traction device about said wheel; and

a plurality of larger protrusions projecting from the outer surface of said gripper tread to provide improved traction in mud, ice, snow, sand and the like.

4,098,314
EMERGENCY TRACTION APPARATUS FOR AUTOMOBILE WHEELS

Norman F. Welsh, 460 W. Lake Sammamish Pkway. NE., Bellevue, Wash. 98008

Filed May 24, 1976, Ser. No. 689,556
Int. Cl.² B60C ***27/04***
U.S. Cl. 152—216 **16 Claims**

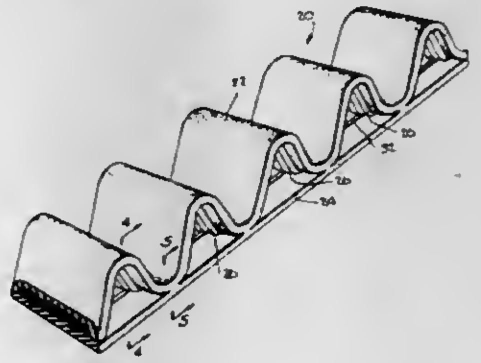


1. Traction apparatus for attachment to a vehicle wheel, said apparatus comprising at least three generally diametrical arms, with each arm extending entirely across the diameter of said wheel, with central sections of said arms connected to a common pivot having an axis about which said arms may be turned to form an arm assembly that may be collapsed or spread, flexible coupling means interconnecting said arms for spreading all of said arms from a collapsed condition of said arm assembly to radiate over 360° when one of said arms is in said collapsed assembly turned relative to another of said arms in said collapsed assembly through less than 180°, and means for keeping said arms spread apart, said arms having outer sections with associated traction elements engageable with a vehicle tire.

4,098,315
BELTED PNEUMATIC TIRES WITH ZERO DEGREE BREAKER REINFORCEMENT, AND METHOD OF BUILDING SUCH TIRES

Wesley Ferrell, Southbury; Daniel Shichman, Trumbull, and Mark W. Olson, Newtown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,802
Int. Cl.² B60C ***9/22***
U.S. Cl. 152—361 R **43 Claims**



1. An uncured belted pneumatic tire, comprising a carcass composed of at least one body ply, and a belt-forming structure

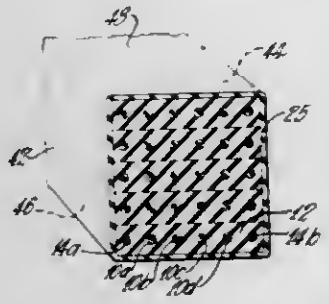
surrounding said body ply in the medial region of said carcass, said belt-forming structure being constituted by a tape of cords wound substantially helically around said medial region of said carcass with a multiplicity of turns having a pitch of substantially zero degrees relative to the median equatorial or mid-circumferential plane of said carcass, said tape initiating and terminating in a respective end turn that extends circularly and non-helically over a full 360° around said body ply and overlaps itself at least partially, and said tape comprising a crimped strip having continuous undulations, a plurality of said cords extending side by side in parallel relation longitudinally along said crimped strip, each of said cords having respective undulations corresponding to and nesting in the undulations of said crimped strip, first means for anchoring the apexes of the undulations of each of said cords to corresponding ones of the apexes of the undulations of said crimped strip, a flat strip having a width substantially corresponding to the width of said crimped strip, second means for anchoring said flat strip to alternate ones of the apexes of the undulations of said crimped strip, and frangible means interposed between said flat and crimped strips for releasably reinforcing and stabilizing said flat strip against inadvertent expansion that would prematurely reduce the amplitude and frequency of the undulations of said crimped strip and of said cords.

4,098,316

BEAD STRUCTURE FOR PNEUMATIC TIRES

Robert L. Carvalho, and Gustav E. Benson, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 10, 1976, Ser. No. 749,510
Int. Cl.² B60C *15/04*
U.S. Cl. 152—362 R **2 Claims**



1. A bead ring for a pneumatic tire having
a structure comprising an elastomeric material having a plurality of metal members and at least one strand of continuous glass filaments positioned between the metal members, each lateral edge of the structure having at least one of the members located therein.

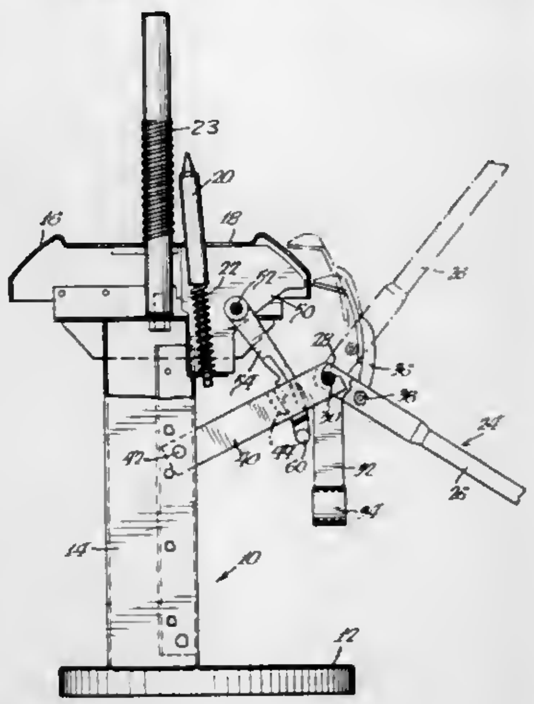
4,098,317

TIRE CHANGING APPARATUS

Charles L. Cunningham, Nashville, Tenn., assignor to The Coats Company, Inc., La Vergne, Tenn.

Filed Jul. 8, 1976, Ser. No. 703,682
Int. Cl.² B60C *25/06*
U.S. Cl. 157—1.24 **5 Claims**

1. For use in a tire changing apparatus,
a base;
elevated tire supporting means mounted on said base;
an arm having one end pivoted to said base, bead breaker tool receiving means adjacent its opposite end, and a pawl intermediate its ends; and
a ratchet having upwardly opening plural teeth pivoted to said base above said arm and below said supporting means and depending in adjacency to said arm so that said pawl may selectively engage any one of said teeth to adjust the position of said tool receiving means relative to said supporting means.

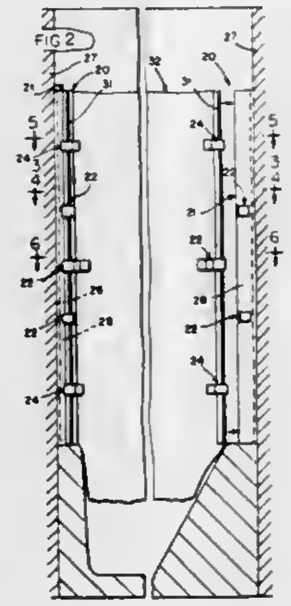


4,098,318

CURTAIN EDGE RETAINER

Ted W. Ruegsegger, 533 Longwood Ave., Glencoe, Ill. 60022

Filed Apr. 5, 1977, Ser. No. 784,661
Int. Cl.² A47H *23/00;* E06B *3/80*
U.S. Cl. 160—327 **13 Claims**



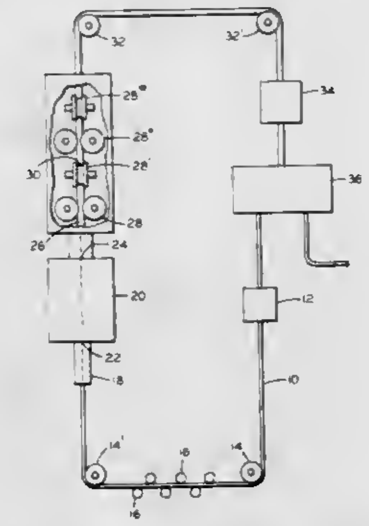
1. A curtain edge retainer for releasably securing a marginal edge portion of a pliant hanging curtain in position contiguous to a wall comprising an elongated flexible corner member having a base strip attached in sealing engagement to said wall and a fastener strip attached to said base strip and projecting outwardly from said wall, a latch member attached to said fastener strip and having a receiving portion facing away from said wall and a retaining portion adjacent said wall, an elongated rigid curtain stiffener rolled within said marginal edge portion of said pliant hanging curtain, said elongated rigid curtain stiffener and said rolled marginal edge portion adapted to be engaged with and disengaged from said latch member, a clip member attached to said elongated rigid certain stiffener over said rolled marginal edge portion to hold said rolled marginal edge portion on said elongated rigid curtain stiffener, and handle means operatively associated with said elongated rigid curtain stiffener whereby said marginal edge portions of said pliant hanging curtain can be releasably secured in position contiguous to said wall.

4,098,319

CONTINUOUS CASTING AND SIZING APPARATUS, AND METHOD THEREOF

Joseph Bernard Brinkmann, Oxford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,637
Int. Cl.² B22D *11/00;* B05C *3/12;* B05D *7/20*
U.S. Cl. 164—86 **8 Claims**



1. A method of continuously casting and sizing metals comprising copper comprising the steps of: passing a core member of a metal comprising copper into and through a crucible containing molten metal comprising copper and thereby accreting and solidifying molten metal comprising copper on the core member of a metal comprising copper producing a cast product, and passing the cast product through a series of pairs of counterpoised sizing rolls having working surfaces composed of a steel consisting essentially of the approximate composition, in percent by weight, of:

Iron	77.00 - 86.00
Tungsten	5.00 - 7.50
Molybdenum	3.75 - 6.25
Chromium	3.50 - 4.50
Vanadium	1.00 - 3.00
Carbon	0.80 - 0.90

hardened to at least about 63 on the Rockwell "C" scale, to consolidate and smooth the surface of the cast product.

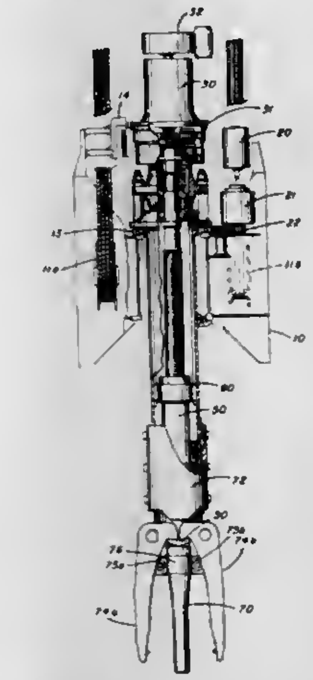
4,098,320

INGOT STRIPPER STRUCTURE

Edward J. Kinkopf, Alliance, Ohio, assignor to The Alliance Machine Company, Alliance, Ohio

Filed Nov. 8, 1976, Ser. No. 739,438
Int. Cl.² B22D *29/08*
U.S. Cl. 164—407 **10 Claims**

1. An apparatus for stripping a metal ingot from its casting mold comprising:
a. a column frame;
b. a tubular column housing rotatably mounted within said column frame;
c. means on said column frame for rotating said column housing relative to said column frame about a vertical axis;
d. a single stripping screw rotatably mounted within said column housing;
e. means on the column housing for rotating said stripping screw relative to said column housing;
f. a nut mounted on the threads of said stripping screw and non-rotatable relative to said column housing but free to travel vertically within and relative to said column housing;
g. a bull nose fixably attached to said nut for penetrating a mold;
h. a plurality of tongs pivotally attached to said column housing for holding a mold;



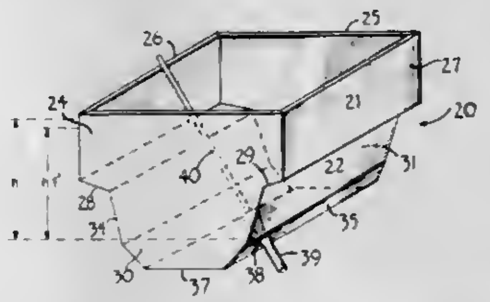
i. means connecting said bull nose and tongs operable by movement of said nut for closing said tongs; and
j. means on said column housing operable by gravity to open said tongs.

4,098,321

POURING POT FOR POURING MOLTEN METAL AT CONSTANT FLOW RATE

Thomas Noell Wilson, Carrollton, and James R. McCammon, Marietta, both of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Jun. 26, 1975, Ser. No. 590,491
Int. Cl.² B22D *11/06*
U.S. Cl. 164—434 **10 Claims**



1. In combination with a continuous casting machine including means for feeding molten metal to a pouring pot means having a molten metal discharge outlet and means for shaping the molten metal discharged from said outlet, said pouring pot means being of a given volume and adapted to contain the molten metal up to a given head, said pouring pot means comprising an upper section and a lower section, means defining an inlet opening into said upper section for receiving a substantially continuous supply of molten metal, said discharge outlet being located in a lower portion of said lower section;
the improvement wherein said upper section is delimited by an uppermost free edge, opposed end walls and opposed vertical side walls extending downwardly from said free edge, said lower section being delimited by a bottom wall, opposed end walls and opposed downwardly converging side walls, said lower section end walls and converging side walls extending downwardly from the lower ends of the upper section end walls and vertical side walls, respec-

tively, said lower section including an effective lower section delimited by said lower section end walls, converging side walls and a horizontal plane through the discharge outlet, said effective lower section having an effective volume and an effective average cross-sectional area, the average cross-sectional area of the upper section being greater than the effective average cross-sectional area of the effective lower section and the volume of the upper section being 20% to 40% greater than the effective volume of the effective lower section, whereby the rate of change of the head resulting from changes in the unit volume rate of flow of metal out of the pouring pot means is decreased as compared with prior art pouring pots having the same volume and head.

4,098,322

STARTER BAR TO BE USED IN CONTINUOUS CASTING PLANTS

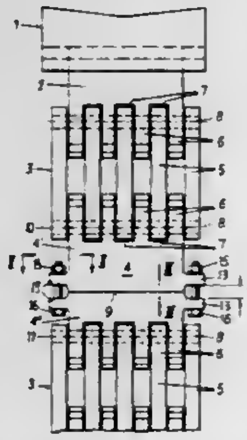
Gerhard Reithner, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Apr. 5, 1977, Ser. No. 784,833

Claims priority, application Austria, Apr. 30, 1976, 3174/76

Int. Cl.² B22D *11/08*

U.S. Cl. 164—446 **5 Claims**



1. In an elongated starter bar to be used in continuous casting plants for extracting cast strands, of the type including a starter bar head and link bodies interconnected by joints and following upon the starter bar head, the improvement which is characterized in that at least one of the link bodies is divided between the joints connecting it with its neighboring link bodies and along a plane transverse to the longitudinal axis of said starter bar thus forming two link body parts, said parts having laterally arranged connecting elements for securing said link body parts together.

4,098,323

SEAL FOR A REGENERATIVE HEAT-EXCHANGER

Klaus Wiegard, Esslingen-Zollberg, and Johann Heil, Winnenden, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

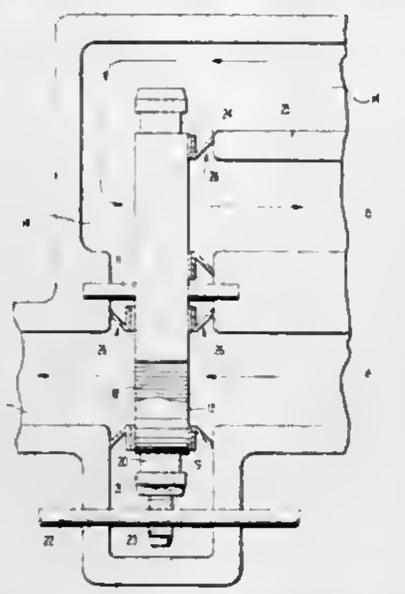
Filed Oct. 17, 1975, Ser. No. 623,254

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1974, 2451247

Int. Cl.² F28D *19/00*

U.S. Cl. 165—9 **14 Claims**

1. A seal for gas channels of a regenerative heat-exchanger, the gas channels leading to a rotatable disk-shaped storage body means arranged in an interior space of a housing means surrounding the gas channels and the storage body means, the seal comprises a sealing bar means abutting with a slide layer thereof at the storage body means and a sealing diaphragm means extending obliquely over a gap between the sealing bar means and an oppositely disposed wall of the housing means, the sealing diaphragm means having an edge abutting at the oppositely disposed wall of the housing means, characterized in that a support means is provided for supporting said sealing diaphragm means, said support means is provided with notches and includes a pair of leg means forming an acute angle in cross section, one of said pair of leg means abuts substantially flat at the sealing bar means and is secured thereat within the area of an edge opposite an apex of the acute angle, the other of said pair of leg means having the sealing diaphragm means secured at an inside surface thereof, said sealing diaphragm means including individual sealing lamella means which mutually overlap between two adjacent notches of the support means, and in that angularly bent leaf spring means are provided within an area of overlap of the individual lamella means for forcing said lamella means against the support means.



4,098,324

WATER-COOLED, HIGH-TEMPERATURE GASIFIER AND METHOD FOR ITS OPERATION

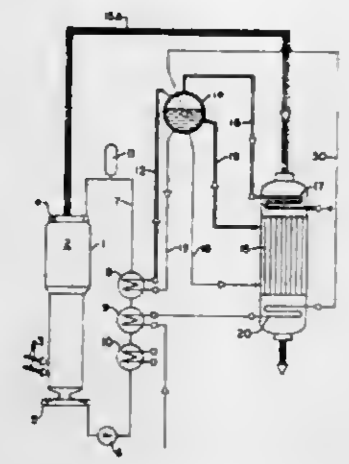
Joachim Kümmel, Kaarst; Heinz Dressen, Willich; Wilhelm Danguillier; Paul Gernhardt, both of Bochum; Wolfgang Grams, Herne, and Siegfried Pohl, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum and Saarbergwerke A.G., Saarbrucken, both of, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,400

Claims priority, application Fed. Rep. of Germany, May 12, 1975, 2554666

Int. Cl.² F22B *1/00*

U.S. Cl. 165—1 **5 Claims**



1. A method for cooling the walls of a high-temperature gasifier, which comprises providing in said walls a plurality of tubular conduits interconnected at their opposite ends, causing cooling water to flow through said conduits in a closed-water circulation circuit, maintaining the flow velocity of the water through the conduits to between 5 and 7 meters per second at a pressure of at least 40 bar, and maintaining the exit temperature of the water from the conduits at least 10° C below its boiling temperature at the pressure of the cooling system.

4,098,325

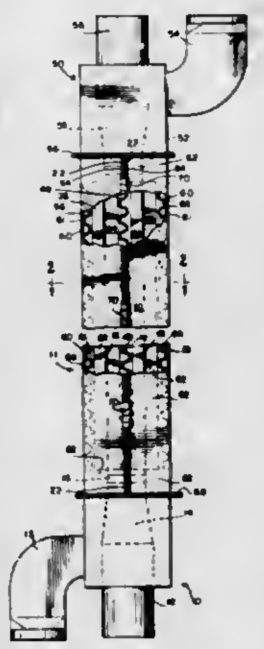
FLUID HEAT EXCHANGER

John R. Scheel, deceased, late of Ocqueoc, Mich. (by Marie M. Scheel, executrix), assignor to Hawley Manufacturing Corporation, Indianapolis, Ind.

Filed Jul. 6, 1976, Ser. No. 702,978

Int. Cl.² F28F *3/08*

U.S. Cl. 165—76 **9 Claims**



1. A fluid heat exchanger comprising an interior duct having a first pair of opposed sidewalls and a second pair of opposed sidewalls extending therebetween for defining a space within said interior duct and a partition centrally disposed between and extending generally parallel with said sidewalls of said second pair and having corrugated surfaces exposed to the interior of said interior duct, means providing communication with said interior duct for permitting flow of a first fluid therethrough, an exterior duct enclosing said interior duct, said interior duct extending longitudinally and centrally through said exterior duct, said exterior duct having a first pair of opposed sidewalls and a second pair of opposed sidewalls extending therebetween for defining a space within said exterior duct, said sidewalls of said second pair having corrugated surfaces exposed to the interior of said exterior duct, means providing communication with said exterior duct for, permitting flow of a second fluid therethrough, the second pair of sidewalls of said exterior duct extending generally parallel to the second pair of sidewalls of said interior duct, and a plurality of fins or vanes projecting generally perpendicularly of said second pair of sidewalls of said interior duct into the spaces defined within said interior and exterior ducts and extending longitudinally of said interior and exterior ducts, the corrugations of said corrugated surfaces extending generally transversely of the directions of fluid flow in said interior and exterior ducts for increasing turbulent flow of said first and second fluids respectively therethrough for increasing convection heat exchange within said first and second fluids.

4,098,326

HEAT EXCHANGER GAS SEPARATOR

E. Dale Waters, Richland, Wash., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 30, 1976, Ser. No. 728,303

Int. Cl.² F28D *15/00*

U.S. Cl. 165—76 **15 Claims**

1. A heat exchanger assembly comprising:

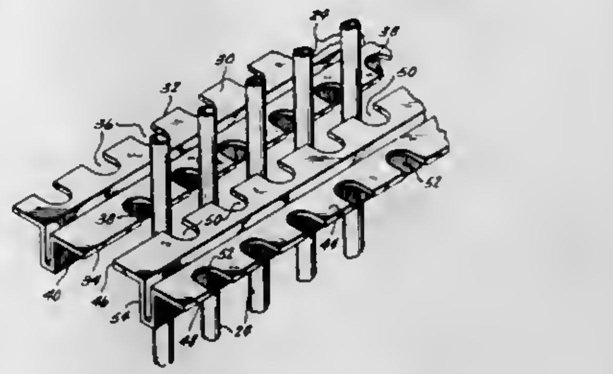
gas conduit means including top, bottom and two side walls;

a plurality of heat exchanging elements;

a plurality of individually movable elongated spacing means for securing the plurality of heat exchanging elements in spaced relationship with each other, wherein each one of the plurality of spacing means is positionable between the side walls and in parallel, adjacent relationship with each other to define a separator wall dividing the conduit means into upper and lower gas passages, each one of the spacing means being overlapped in sealing relationship with an adjacent spacing means to define therewith a plurality of openings for the heat exchanging elements;

each spacing means including an elongated beam extending between the side walls and having a row of generally U-shaped indentations extending inwardly from first and second longitudinal edges, each U-shaped indentation adapted to receive one of said heat exchanging elements in perpendicular, contacting relation therein; and

means for supporting the elongated beam along its extent.



4,098,327

RADIATOR WITH DUAL HEAT EXCHANGE FOR HEATING INSTALLATIONS

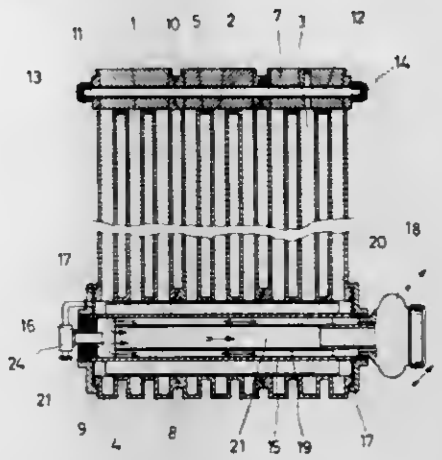
Vincenzo Reato, Via Mazzini 169/A1, Vicenza, Italy

Filed Mar. 24, 1976, Ser. No. 669,828

Claims priority, application Italy, Apr. 2, 1975, 85542 A/75

Int. Cl.² F28D *15/00;* F28F *9/26;* F24H *3/00, 9/14*

U.S. Cl. 165—76 **4 Claims**



1. A radiator for heating installations with dual heat exchange which comprises a container partially filled with a fluid at atmospheric pressure, said fluid constituting the secondary fluid, a heat exchanger positioned within the container, the heat exchanger being filled with the fluid of a heating installation, an inlet for the fluid, said fluid being the primary fluid, whereby heat exchange occurs to the fluid in the interior of the radiator and between the fluid in the interior of the radiator and the external atmosphere, the external container consisting of a plurality of component elements, provided with shaped flanges, spaced apart from each other, the flanges being inserted one in the other, the heat exchanger being a finned tube, said finned tube being provided with an internal coaxial tube for the return of the primary fluid towards the inlet whereby the fluid is supplied to the finned tube by means of a connector which serves as inlet and outlet, said heat exchanger being

arranged along the entire length of said container and constituting at least a tie beam going through and connecting said elements, and a second tie beam connecting the elements at the end opposite to the heat exchanger.

4,098,328

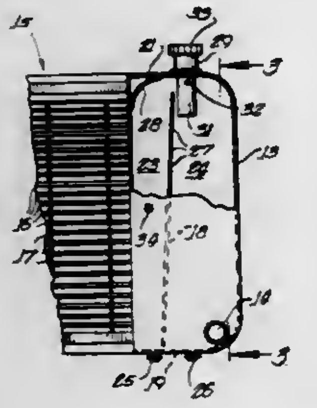
CROSS-FLOW RADIATOR DEAERATION SYSTEM

Alex Shu-Ki Cheong, Mississauga, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 806,971

Int. Cl.² F01P *11/00*

U.S. Cl. 165—107 **11 Claims**



1. A deaerating radiator comprising a core having a plurality of parallel tubes extending horizontally, a first vertical tank communicating with the first ends of the horizontal tubes, a second vertical tank communicating with the opposite ends of said tubes, a fluid coolant inlet communicating with said first tank and a fluid coolant outlet communicating with said second tank, a baffle in the second tank dividing the tank into a receiver tank adjacent the core and a reservoir tank, said baffle being slightly inclined upwardly away from the core and having perforations in a portion thereof, and a filler neck in said second tank and having a depending extension.

4,098,329

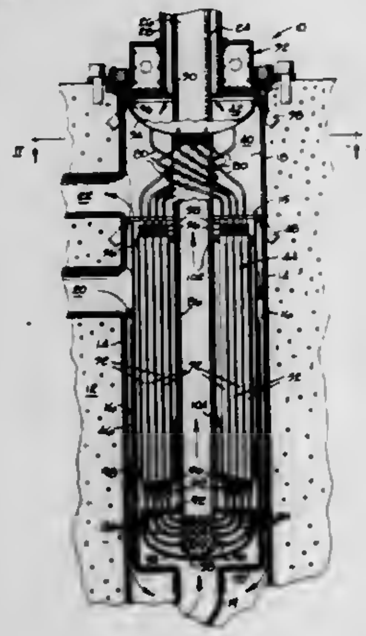
MODULAR HEAT EXCHANGER

Donald W. Calver, Poway, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 29, 1976, Ser. No. 709,787

Int. Cl.² F28D *7/10*

U.S. Cl. 165—140 **16 Claims**



1. A heat exchange element for permitting heat exchange between relatively high and low temperature fluids comprising,

a modular, elongated heat exchanger tube bundle, including
  a plurality of elongated shrouds each having a hexagonal configuration in cross-section permitting said shrouds to be clustered into a substantially continuous assembly,
  a plurality of thermally conductive tubes arranged in each shroud, and
  inlet and outlet headers respectively associated with each shroud and in communication with said tubes in said shroud, each of said inlet and outlet headers being formed with a pyramidal portion having separate means for connection with each of said thermally conductive tubes,
an inlet manifold means in communication with said inlet headers,
an outlet manifold means in communication with said outlet headers,
each of said inlet and outlet headers further comprising a transition portion for interconnecting said pyramidal portion with a tubular portion suitable for interconnection with one of said inlet and outlet manifold means,
means for communicating a first fluid to said inlet manifold means and for reciving said first fluid from said outlet manifold means, and
means for causing circulation of a second fluid along said clustered assembly of shrouds for intimate heat exchange with said thermally conductive tubes.

4,098,330

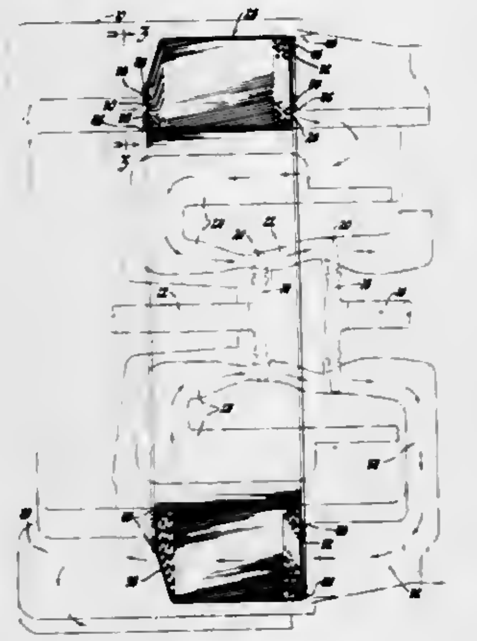
ANNULAR METAL RECUPERATOR

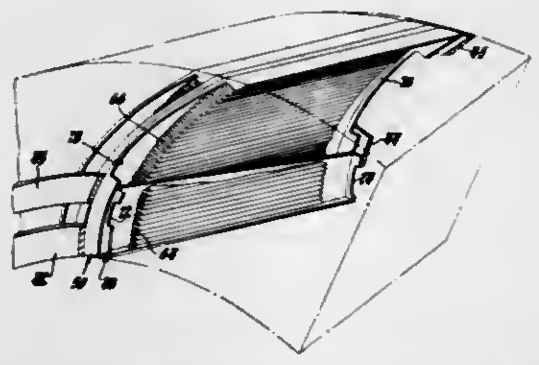
Robert J. Flower, and Marshall E. Seddon, both of Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 23, 1976, Ser. No. 708,051

Int. Cl.² F28F *3/04*

U.S. Cl. 165—166 **4 Claims**





1. An annularly configured heat exchanger having opposite end surfaces through which two distinct fluids may simultaneously pass and flow parallel to one another in the axial direction, comprising: air and exhaust gas plates alternately stacked in side-by-side relation to one another forming air passages and exhaust gas passages alternately therebetween, each plate having a central portion spaced from the central portion of the next adjacent plate and a peripheral edge portion extending laterally from said central portion into engagement with an adjacent plate so as to space said plates, the peripheral edge portions in opposite axially facing sides being recessed toward the central portion of its associated plate to form openings to the spaces between the plates, the openings to said air passages and the openings to said gas passages being radially spaced and separated by a continuous annular surface on each end adapted to be contacted by seal means for separated introduction and discharge of said two fluids to and from the heat exchanger in the axial direction.

4,098,331

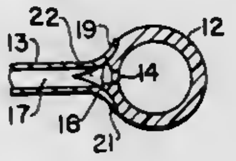
SOLAR HEAT EXCHANGE PANEL AND METHOD OF FABRICATION

Freeman A. Ford, Atherton; Errol Armstrong, Glen Ellen, and Richard O. Rhodes, San Francisco, all of Calif., assignors to Fafco, Incorporated, Menlo Park, Calif.

Continuation of Ser. No. 512,492, Oct. 7, 1974, abandoned, which is a division of Ser. No. 410,630, Oct. 29, 1973, Pat. No. 3,934,323. This application Jan. 31, 1977, Ser. No. 764,296

Int. Cl.² F28F *3/12, 9/22, 27/02;* F24J *3/02*

U.S. Cl. 165—170 **6 Claims**



1. A solar heat exchange panel for exchanging heat energy between a fluid passing through the panel and an external environment, comprising

a unitary heat exchange panel of a predetermined length and having a plurality of internal parallel passages extending lengthwise through the ends thereof,
opposite substantially parallel surfaces on said unitary heat exchange panel in contact with the external environment,
means for impeding flow through each of said plurality of internal parallel passages, so that impedance to preferential flow routes through said unitary heat exchange panel is provided and heat exchange between the flow and the surrounding environment is substantially uniform,
first and second hollow headers having a plurality of spaced openings therethrough along one side thereof, and a fluid impervious bond between said hollow headers and the ends of said unitary heat exchange panel, said fluid impervious bond being astraddle said plurality of spaced openings, whereby said plurality of internal parallel passages is in communication with the interior of each of said first and second hollow headers, and fluid introduced into said first hollow header traverses said plurality of spaced openings therein, said passages, said means for impeding flow, and said plurality of spaced openings in said second hollow header to emerge therefrom at an outlet temperature induced by the environment surrounding said unitary heat exchange panel.

4,098,332

FINNED TUBE HEAT EXCHANGER CONSTRUCTION

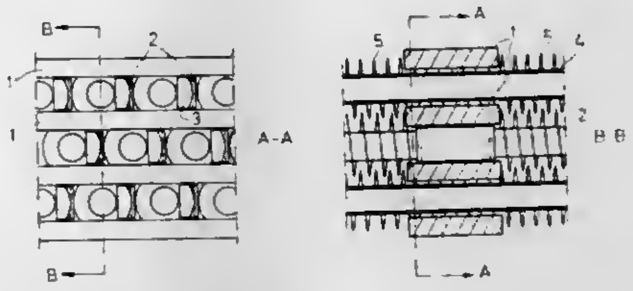
Lars Bratthäll, Linköping, and Bernt Lindström, Karlskoga, both of Sweden, assignors to Stal-Laval Apparat AB, Linkoping, Sweden

Filed Nov. 2, 1976, Ser. No. 738,085

Claims priority, application Sweden, Nov. 4, 1975, 7512303

Int. Cl.² F28F *9/00, 1/36*

U.S. Cl. 165—172 **3 Claims**



1. A heat exchanger comprising at least two tubes each encircled by a substantially continuous series of radially extending interspaced fins attached to the tube, the series extending longitudinally along the tube, said tubes being positioned closely together so that the peripheries of oppositely extending segments of their respective fins are not substantially interspaced, at least one of said segments of one of said fins being radially at least shortened to form a transverse passage between the tubes and through which a tube support member may be transversely passed, said one of said fins having at least one unshortened segment.

4,098,333

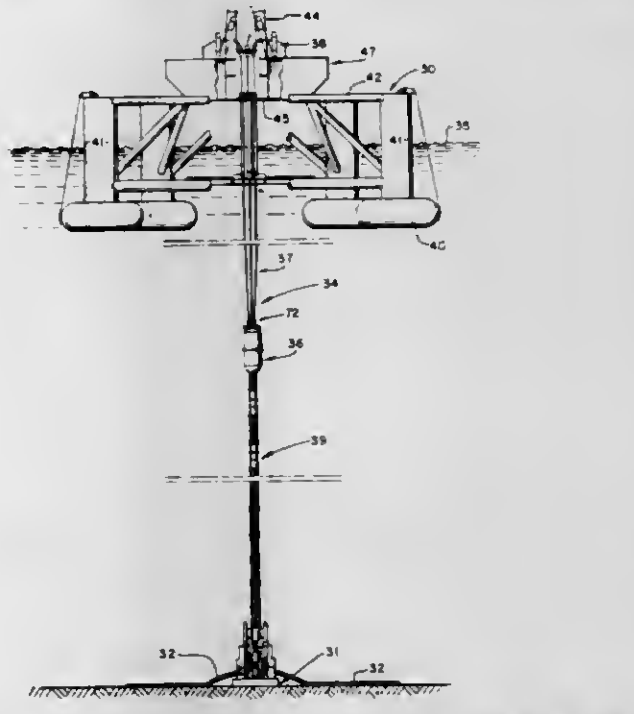
MARINE PRODUCTION RISER SYSTEM

Donald R. Wells, Villa Park, and Raymond W. Walker, Huntington Beach, both of Calif., assignors to Compagnie Francaise des Petroles, Paris, France

Filed Feb. 24, 1977, Ser. No. 771,799

Int. Cl.² E21B *33/035, 43/01*

U.S. Cl. 166—0.5 **29 Claims**



1. A deep water production riser system comprising in combination:

a floating platform;
a manifold base means on the seabed underneath said platform and including actuating and monitoring equipment for remote wells associated with said base means;
and riser means for conducting hydrocarbon fluids between said base means and said platform;

said riser means including

a central riser pipe and a plurality of peripherally spaced satellite riser pipes arranged around said central pipe,

said satellite pipes conducting unprocessed hydrocarbon fluids to said platform,

said central riser pipe conducting processed hydrocarbon fluid to said manifold base means;

a buoyant structure between said floating platform and said manifold base means and attached to said central riser pipe and cooperably associated with said satellite riser pipes;

said buoyant structure supporting said central riser pipe therebelow and providing guide passageways for said satellite riser pipes to extend therethrough;

means above said buoyant structure for separating central and satellite riser pipe portions above said buoyant structure from the corresponding central and satellite riser pipes below and at said buoyant structure;

and a control means on said platform for actuation and monitoring of equipment on said manifold means and said remote wells and for actuating said separating means;

said buoyant structure and said riser pipes therebelow being self-supporting when separated from the riser pipes above said buoyant structure.

4,098,334

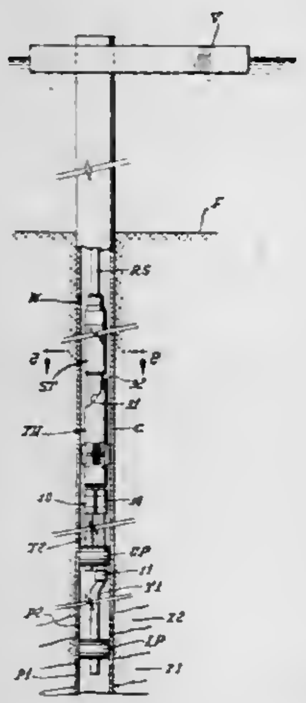
DUAL STRING TUBING HANGER

Talmadge L. Crowe, Houston, Tex., assignor to Baker International Corp., Orange, Calif.

Filed Feb. 24, 1977, Ser. No. 771,562

Int. Cl.^{2} E21B *23/06, 33/122*

U.S. Cl. 166—208 **12 Claims**



1. A tubing hanger adapted to be lowered in a well casing disposed in a well bore and to support a tubing string depending therefrom, comprising a body structure, supporting means carried by said body structure and engageable with the well casing to support said tubing hanger in the well casing, a tubular mandrel freely swivelly mounted in and supported by said body structure above said supporting means, the upper end of said mandrel terminating within said body structure, said mandrel having connecting means at its lower end adapted for connection to the upper end of a tubing string depending therefrom in response to rotation of said mandrel relative to said body structure and depending tubing string.

4,098,335

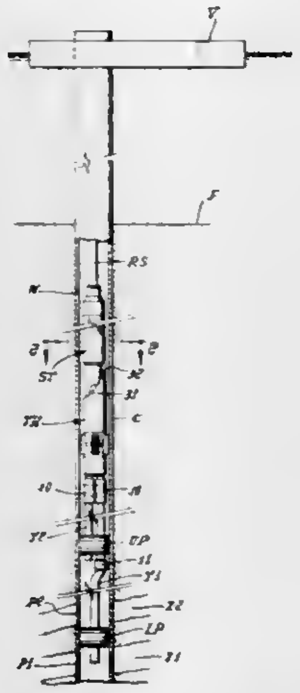
DUAL STRING TUBING HANGER AND RUNNING AND SETTING TOOL THEREFOR

Bobby F. Goad, Spring, Tex., assignor to Baker International Corp., Orange, Calif.

Filed Mar. 24, 1977, Ser. No. 780,603

Int. Cl.^{2} E21B *23/06, 33/122*

U.S. Cl. 166—120 **38 Claims**



1. A setting tool for a tubing hanger to be anchored in a well casing disposed in a well bore, comprising a body structure connectable to a running string and having cylinder means, means on said body structure adapted to releasably connect said body structure to the tubing hanger to enable the setting tool to be disconnected from the tubing hanger and removed from the well bore, piston means shiftable in one direction in said cylinder means to set the hanger in the well casing, releasable lock means in said cylinder means for preventing shifting of said piston means in said one direction, means for conducting fluid under pressure through said body structure to said cylinder means for action on said lock means to release the same and for action on said piston means to shift said piston means in said one direction.

4,098,336

OIL RECOVERY PROCESS UTILIZING AIR AND SUPERHEATED STEAM

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 595,652, Jul. 14, 1975, Pat. No. 4,048,078. This application Mar. 10, 1976, Ser. No. 665,585

Int. Cl.^{2} E21B *43/25*

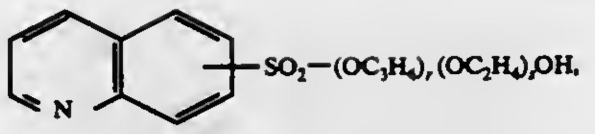
U.S. Cl. 166—261 **9 Claims**

1. A method for recovering petroleum from subterranean, viscous petroleum containing formations including tar sand deposits, said formations being penetrated by at least one injection well and by at least one production well, comprising:

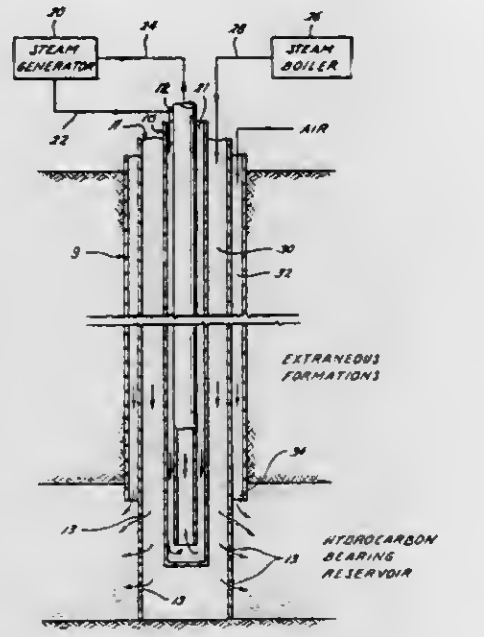
(a) establishing a fluid communication path in the formation between the injection well and the production well;

(b) injecting via an injection well a fluid comprising superheated steam and air into the formation whereby in-situ combustion is initiated in the formation providing heat and pressure for driving the petroleum in the formation toward the production well; and

(c) recovering petroleum from the formation via the production well, and wherein a solubilizing agent having the formula:



wherein r is an integer of about 3 to about 10, s is an integer of about 5 to about 50 and wherein the sum of r plus s is



not more than 55, is present in the said fluid in an amount ranging from about 0.001 to about 0.02 weight percent.

4,098,337

METHOD OF IMPROVING INJECTIVITY PROFILES AND/OR VERTICAL CONFORMANCE IN HETEROGENEOUS FORMATIONS

Perry A. Argabright, Larkspur; John S. Rhudy, and Brian L. Phillips, both of Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jul. 1, 1977, Ser. No. 812,212

Int. Cl.^{2} E21B *33/138, 43/22*

U.S. Cl. 166—270 **18 Claims**

1. A process for improving the injectivity profile and/or vertical conformance of a hydrocarbon bearing subterranean formation having relatively high permeability zones and relatively lower permeability zones, the process comprising injecting an aqueous polyacrylamide solution into the formation, injecting an aqueous formaldehyde solution into the formation, displacing the aqueous solutions into the relatively high permeability zones, and allowing the polyacrylamide and the formaldehyde to react in the relatively high permeability zones to form a gel which reduces the permeability of the relatively high permeability zones to obtain the improved injectivity profile and/or vertical conformance.

4,098,338

JARRING METHOD AND APPARATUS FOR WELL BORE DRILLING

Lee E. Perkins, Houma, La., assignor to Kajan Specialty Company, Inc., Houma, La.

Filed Dec. 27, 1976, Ser. No. 754,885

Int. Cl.^{2} E21B *1/10*

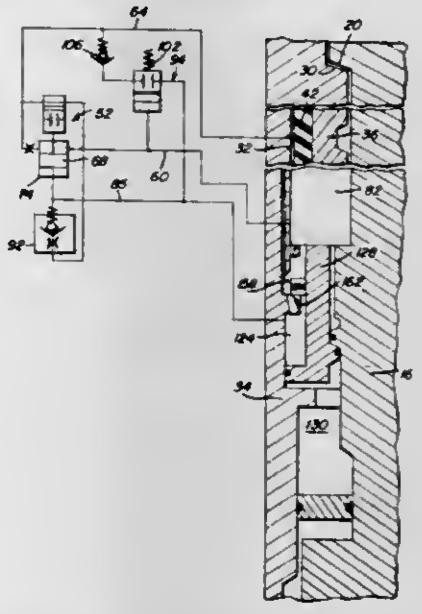
U.S. Cl. 166—301 **30 Claims**

28. In a jarring apparatus including a pair of longitudinally telescoping members, releasable holding means for retaining said members against relative displacement with respect to each other under an amount of applied tension to one of said members, and control means for operating said releasable holding means, the improvement which comprises said control means operating said releasable holding means independently of the amount of applied tension.

30. A method for imparting a jarring blow between a pair of telescoping engaged longitudinal bodies one of which is secured in position, the steps comprising:

(1) locking said bodies in a locked position which prevents relative longitudinal movement;

(2) applying an amount of tensional load to the other of said bodies which is not secured in position;



(3) determining a period of time for releasing said bodies, the determination being based solely upon pressure unrelated to the amount of tensional load applied relative to said bodies; and

(4) releasing said bodies from said locked position after said predetermined period of time unrelated to said amount of tensional load to impart a high velocity to said other of said bodies for impact against said one of said bodies.

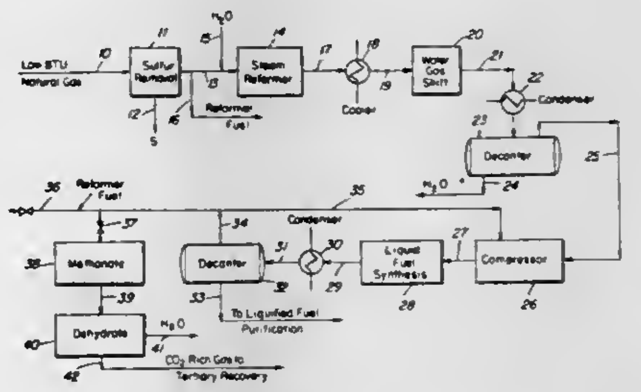
4,098,339

UTILIZATION OF LOW BTU NATURAL GAS

Paul B. Weisz, Yardley, Pa., and John C. Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y. Continuation-in-part of Ser. No. 698,449, Jun. 21, 1976, abandoned. This application Oct. 13, 1976, Ser. No. 731,613

Int. Cl.^{2} E21B *43/16*

U.S. Cl. 166—305 R **5 Claims**

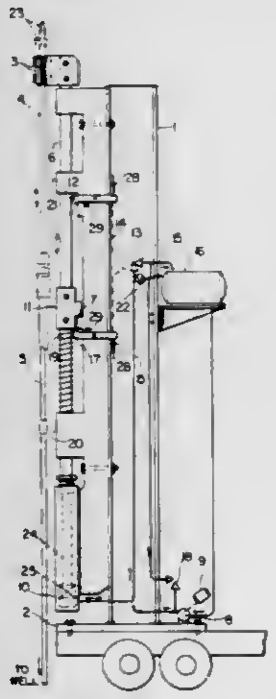


1. A process for economic utilization of natural gas having low heating value by reason of containing carbon dioxide in admixture with the methane content thereof, which process comprises subjecting a natural gas having substantial methane content in admixture with at least fifty volume percent of carbon dioxide based on total volume of said gas to the following steps in the sequence recited:

(a) mixing said gas with water and reacting the mixture in contact with a catalyst to promote the reforming reaction of methane and water to produce carbon monoxide and

hydrogen under temperature and pressure conditions conducive of said reforming reaction;
(b) reacting the product of step (a) in contact with a catalyst to promote the water gas shift reaction of a portion of the carbon monoxide with water to produce carbon dioxide and hydrogen under temperature and pressure conditions conducive of said shift reaction; and
(c) reacting the product of step (b), in contact with a carbon monoxide reduction catalyst for promotion of synthesis reaction between carbon dioxide, the unreacted carbon monoxide and hydrogen, to produce methanol or hydrocarbons, which are liquid at normal temperature of 70° F and atmospheric pressure, under conditions of temperature and pressure conducive of said synthesis reaction thereby producing as the product of said synthesis reaction a mixture comprising:
(1) said methanol or hydrocarbons which are liquid at normal temperature of 70° F and atmospheric pressure, and
(2) a gaseous by-product enriched in carbon dioxide as compared with said natural gas.

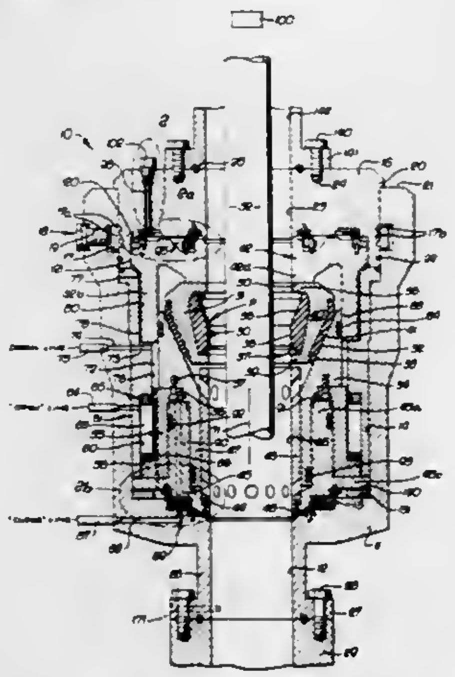
4,098,340
METHOD OF AND APPARATUS FOR CLEANING DOWN WELL VALVES OF WELL PUMPS IN SITU
Barney Raymond Steele, 804 Pacific, and William E. Holiman, P.O. Box 66284, both of Houston, Tex. 77006
Filed Jul. 12, 1977, Ser. No. 814,885
Int. Cl.² E21B *37/00, 43/00*
U.S. Cl. 166—311 **13 Claims**



1. The method of cleaning debris from down-well valves of well pumps having pump rods coupling the valves to a top-side pumping mechanism, comprising the steps of,
connecting the pump rods to an alternative pumping mechanism for providing an accelerated down-stroke with a rod speed on downstroke of the order of at least ten times the downstroke rod speed effected by said top-side pumping mechanism,
disconnecting the pump rods from the first said pumping mechanism,
and forcing fluids at an accelerated rate through said down-well valves by operation of said alternative pumping mechanism through said accelerated down-stroke.

7. Apparatus operational to clean debris from down-well valves of well pumps having pump rods coupling the valves to a top-side pumping mechanism by forcing fluids through said valves at an accelerated rate, comprising in combination,
a portable pump mechanism having grasping means for connection to said pump rods to provide a stroke substantially the same distance normally provided by said top-side pumping mechanism,
means powering said portable pump mechanism to lift said pump rods on a first slower stroke,
means producing a second higher speed down-stroke of the order of a least ten times the speed of said top-side pumping mechanism on the down-stroke,
and means programming the apparatus for cyclic pumping through said first and second strokes, thereby to force fluids through said valves at an accelerated rate thereby to dislodge debris.

4,098,341
ROTATING BLOWOUT PREVENTER APPARATUS
George E. Lewis, Arcadia, Calif., assignor to Hydril Company, Los Angeles, Calif.
Filed Feb. 28, 1977, Ser. No. 772,355
Int. Cl.² E21B *43/00, 33/06*
U.S. Cl. 166—314 **33 Claims**

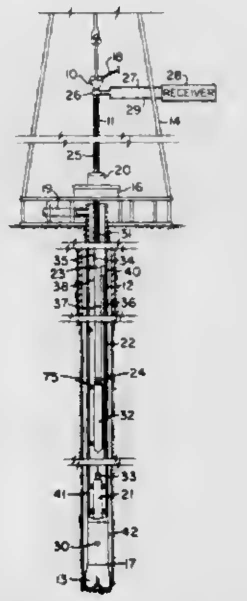


1. In rotary well blowout preventer apparatus, the combination comprising
(a) an upright tubular body adapted to receive an annular packer to be constricted about a rotating well element,
(b) and a rotary annular assembly carried in the body to rotate relative thereto and with the packer when the packer is constricted about said rotating element, said assembly including an actuator movable in the body to effect said constriction of the packer, and a piston surface carried by the actuator,
(c) said assembly also including an annular head member having a shoulder located to receive vertical thrust exerted by the packer when the actuator effects constriction thereof,
(d) the assembly including a lower member extending in generally axially spaced relation to the head member,
(e) there being a lower thrust bearing means including a chamber located between said lower member and the body to receive vertical thrust transmitted by the lower member during rotation thereof,
(f) there being an upper thrust bearing means including a chamber located between the head member and the body to transfer vertical thrust while the head member is rotating,
(g) and means for supplying pressurized hydraulic fluid to the upper and lower thrust bearing chambers and to said piston surface and at a pressure greater than well pressure during constriction of the packer.

31. In the method of operating a well blowout preventer that includes an annular packer to be constricted about a rotating well element, the steps that include

(a) constricting said packer about said element to engage the element and seal off thereabout, and
(b) allowing the packer to be rotated by and with said element during constricted engagement of the packer therewith, and
(c) applying hydraulic fluid pressure greater than well pressure to provide thrust bearings for the packer, above and below the packer.

4,098,342
METHOD AND APPARATUS FOR MAINTAINING ELECTRIC CABLE INSIDE DRILL PIPE
Leon H. Robinson; Jerry M. Speers; Adelbert Barry, all of Houston, and Daniel J. Campbell, Bellaire, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed May 25, 1977, Ser. No. 800,367
Int. Cl.² E21B *7/00, 47/12*
U.S. Cl. 166—315 **13 Claims**

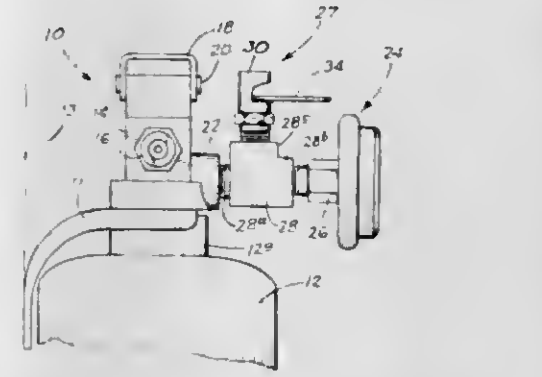


1. In a cable mounting method for wellbore telemetry wherein an electric cable extends from a subsurface location within a rotary pipe string to an upper support assembly, from said upper support assembly downwardly to a lower pulley asembly, and from said lower pulley assembly upwardly to the surface, said cable being anchored at said subsurface location, the improvement comprising mounting rotation limiting means at selected pipe joints over a predetermined interval of said pipe string, and extending a rectangular weight from said lower pulley assembly downwardly in said pipe string more than the distance between adjacent rotation limiting means.

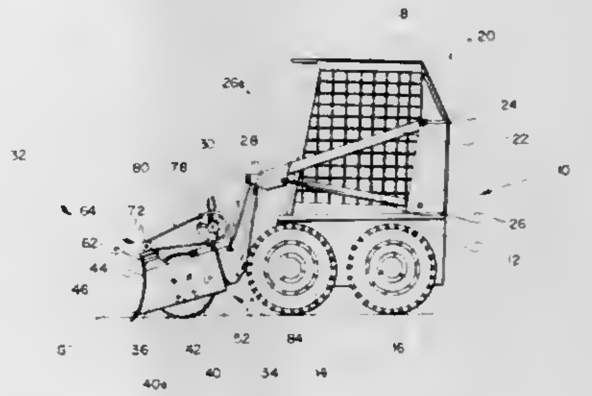
5. In a cable system for conducting telemetry operations between a subsurface location and the surface in a pipe string which includes a cable extending within said pipe string, from said subsurface location up to and around an upper support assembly secured to said pipe string down and around a lower pulley assembly, and upward to the surface, the improvement wherein said pipe string includes a plurality of rotation limiting assemblies spaced longitudinally in said pipe string, and said lower pulley assembly includes a longitudinal weight which extends within said pipe string a distance at least equal to the spacing of adjacent rotation limiting assemblies, said rotation limiting assemblies each being operative to prevent rotation of said weight relative to said pipe string.

4,098,343
AUTOMATICALLY AND MANUALLY CONTROLLED FIRE EXTINGUISHER
John L. Carroll, 2034 SE. Sherman, Portland, Oreg. 97214
Filed Jan. 19, 1977, Ser. No. 760,624
Int. Cl.² A62C *37/12, 23/02*
U.S. Cl. 169—74 **11 Claims**

1. In a fire extinguisher including a container for holding chemical fire retardant material under pressure, a first outlet communicating with the interior of said container including means for selectively delivering the material outwardly from said container and a second independent outlet also communicating with the interior of said container including means for coupling a pressure gauge thereto for indicating container pressure,
thermally responsive valve means disposed between said second outlet and said gauge automatically operable at a predetermined temperature for releasing the material from said container.



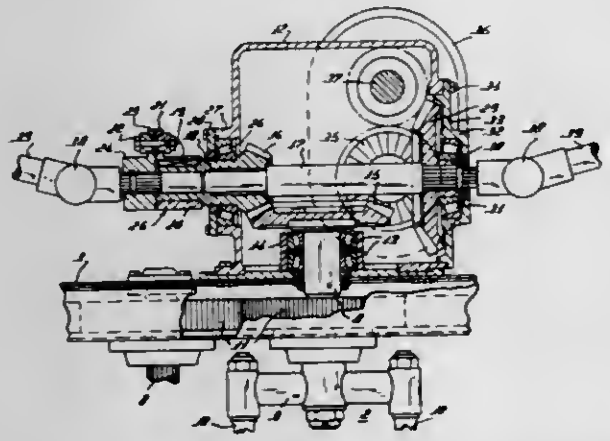
4,098,344
EARTHWORKING IMPLEMENT
Victor Ray Johnson, Box 181, Erwin, N.C. 28339
Filed Oct. 7, 1976, Ser. No. 730,166
Int. Cl.² A01B *35/18*
U.S. Cl. 172—40 **8 Claims**



1. An earthworking implement comprising:
a. a prime mover;
b. power actuated boom means secured to said prime mover and extending forwardly thereof and movable between a lower position and a raised position;
c. a frame structure secured to said boom means and including a pair of laterally spaced side members and blade means extending forwardly across said side members;
d. an earth tamping roller rotatively mounted rearwardly of said blade means about a transverse axis between said side members of said frame structure;
e. said frame structure further including a rear attaching assembly mounted on the rear portion of said frame structure and including attaching means extending therefrom and connected to said boom means;
f. said frame structure being pivotably mounted about said transverse axis of said earth tamping rollers such that said blade means may be moved from a first lower earth leveling position to an upper inoperative position; and
g. counterweight means rotatively mounted on said frame structure and drive means for driving said counterweight means so as to impart a vibrating like massaging action to said earth tamping roller supported within said frame structure such that said earth tamping roller may be used to compact earth that is passed over thereby, whereby

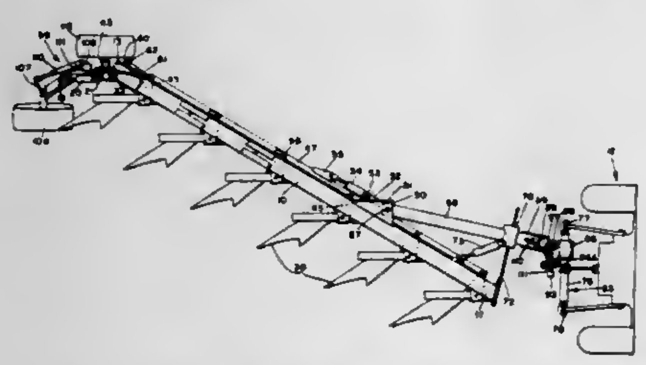
said earthworking implement may perform an earth leveling operation or an earth tamping operation wherein either operation may be performed independently of the other by selectively pivoting said frame structure between said first and second positions about the transverse axis of rotation of said earth tamping roller.

4,098,345
SOIL CULTIVATING IMPLEMENTS
Ary van der Lely, Weverskade, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands
Filed Jan. 21, 1977, Ser. No. 760,862
Claims priority, application Netherlands, Jan. 21, 1976, 7600577
Int. Cl.² A01B *33/08*
U.S. Cl. 172—59 16 Claims



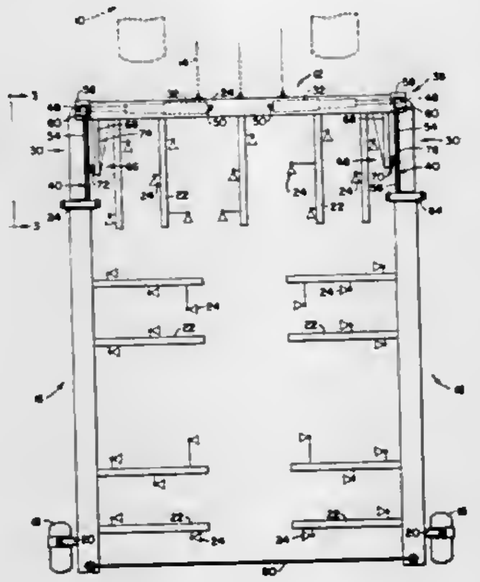
1. A soil cultivating implement comprising a frame and a plurality of rotatable soil working members mounted on corresponding upwardly extending shafts that are supported on a portion of said frame, driving means connected to rotate said members about axes defined by said shafts, said driving means including imput means that engages a first pinion on a substantially horizontal driving shaft within gear box means, a second pinion being spaced from the first pinion within said box and connected to said driving shaft through an external overload release mechanism, said second pinion engaging a third pinion on one of said upwardly extending shafts within said box means, whereby the drive to said one shaft is interrupted upon overload.

4,098,346
STEERING FOR PLOW WITH ADJUSTABLE PLOW BOTTOMS
Ralph Everette Stanfill, Bettendorf; James Gerald Steinbach, Davenport, both of Iowa; Gary Allen Rehn, Andover; George Frederick Oelschlaeger, Rock Island, both of Ill., and William Wayne Jackson, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Oct. 1, 1976, Ser. No. 729,612
Int. Cl.² A01B *69/00*
U.S. Cl. 172—283 29 Claims



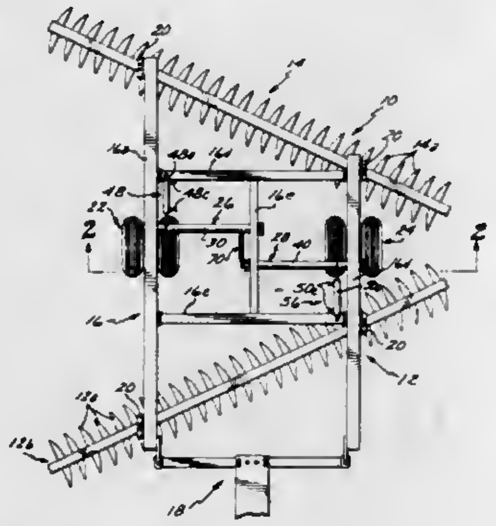
1. A plow adapted to be pulled by a tractor comprising: a main frame extending diagonally with respect to the direction of travel between forward and rear ends; a fore-and-aft extending wheel frame supported at its forward end on the rear end of the main frame for lateral swinging movement about a substantially vertical axis; a steerable wheel assembly mounted on the rear end of said wheel frame; a hitch structure for connecting the main frame to a tractor including a forward portion connectible to a tractor and shiftable therewith, a rear portion connectible to the main frame and shiftable therewith, said forward and rear portions being connected to one another by vertical pivot structure permitting relative lateral swinging between the protions; a plurality of plow bottoms spaced along said main frame, each being vertically pivotally supported thereon, said vertical axis about which the wheel frame swings being offset rearwardly from the vertical axis about which the rearwardmost plow bottom is vertically pivotally supported; means connecting the plow bottoms and said wheel frame so that the plow bottoms and said wheel frame shift laterally in unison on said main frame; power means on the main frame connected to and for shifting said plow bottoms so as to selectively adjust the width of cut of said plow bottoms; and master and slave cylinders connected respectively to the forward and rear portions of said hitch structure and said wheel frame and wheel assembly for adjusting the latter in response to relative lateral swinging movement between the hitch portions.

4,098,347
REAR FOLDING IMPLEMENT
Darrel Lee Honnold, Winterset, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Jan. 12, 1977, Ser. No. 758,664
Int. Cl.² A01B *73/00*
U.S. Cl. 172—311 25 Claims



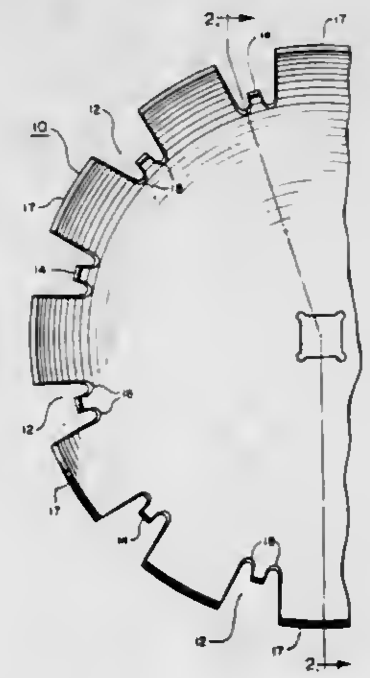
1. In the combination of a foldable agricultural implement having a transverse main section and at least one outer section normally aligned transversely with the main section, each section having rearwardly projecting tools thereon, the improvement comprising: a transversely elongated carrier slidably supported for transverse shifting on the main section and shiftable between a transverse retracted and an extended position with respect to the transverse outer end of the main section; vertical pivot means between the carrier and main section about which the carrier swings to and from a rearwardly projecting position upon it being shifted to and from its extended position; means connecting the inner end of said outer section with the carrier for movement therewith; powered means carried by the main section for shifting the carrier between its transverse retracted position whereat the tools on the outer section project rearwardly and are aligned with the tools on the main section and its extended and rearwardly projecting position whereat the tools on the outer section project transversely behind the tools on the main section.

4,098,348
DISC HARROW WITH SUPPORT WHEELS HAVING INTERCONNECTED SEPARATE MOUNTING MECHANISMS
Leroy S. McChesney, Memphis, Tenn., assignor to Tnwner Manufacturing Company, Santa Ana, Calif.
Filed Mar. 3, 1977, Ser. No. 773,939
Int. Cl.² A01B *63/22*
U.S. Cl. 172—406 10 Claims



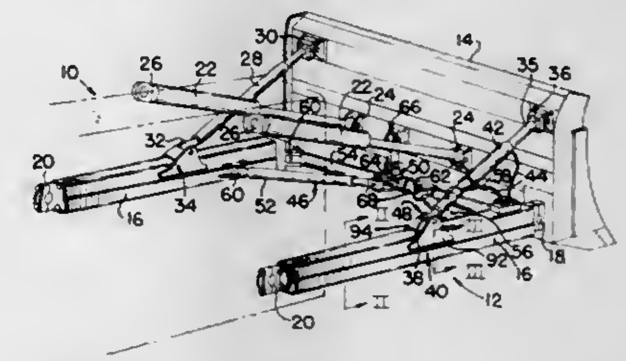
1. A disc harrow comprising,
a pair of disc gangs each having a plurality of discs and fixed to a frame to be pulled over the ground to be disced,
at least two spaced support wheels for said frame,
a separate mounting mechanism for each of said wheels attached to said frame and operable to move the respective wheel toward and away from said frame,
a separate hydraulic actuator for each of said mechanisms,
and link means interconnecting said mechanisms to cause substantially simultaneous operation of said mechanisms but only in moving said wheels away from said frame.

4,098,349
HIGH-SPEED AGRICULTURAL DISC
Atiq A. Jilani, Oak Lawn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jun. 27, 1977, Ser. No. 810,124
Int. Cl.² A01B *15/16*
U.S. Cl. 172—555 7 Claims



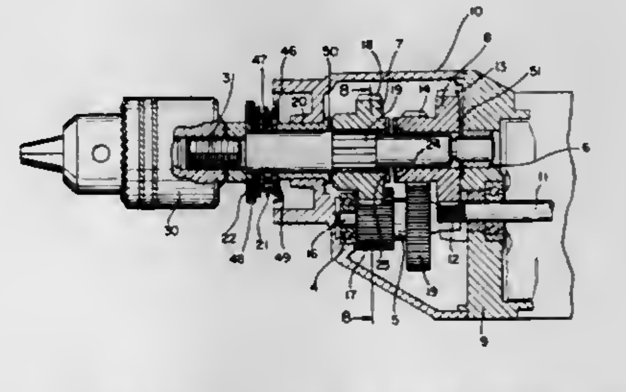
1. A circular, dished earth-cutting agricultural disc having a series of equally spaced, relatively deep W-shaped notches around its circular periphery, the center portion of each W-shaped notch constituting a tooth which extends radially outwardly to a point substantially short of the disc's circular periphery.

4,098,350
BULLDOZER BLADE PUSH ARMS
Larry G. Eftefield, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 13, 1977, Ser. No. 759,215
Int. Cl.² E02F *3/76*
U.S. Cl. 172—776 14 Claims



1. A frame, comprising:
(a) a first, elongated C-shaped plate having a first base and first and second legs,
(b) a second, elongated C-shaped plate having a second base and third and fourth legs, said first and second legs overlapping said third and fourth legs, respectively, wherein one leg of only one pair of said first and third legs or said second and fourth legs has a chamfer to form a wedge fit between said legs of said one pair; and
(c) a weld joining said first and third legs and said second and fourth legs where said legs overlap.

4,098,351
HAMMER TOOL
Lorenzo Ercole Alessio, Lecco, Italy, assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Jul. 29, 1977, Ser. No. 820,284
Claims priority, application Italy, Aug. 9, 1976, 26154 A/76
Int. Cl.² B23Q *5/027*
U.S. Cl. 173—13 51 Claims

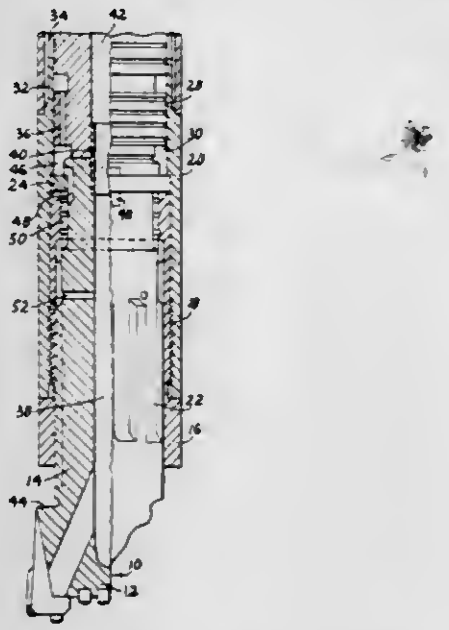


1. A portable hammer tool such as a rotary hammer, hammer drill or the like comprising:
a motor housing;
a gear case secured to said motor housing forwardly of said motor housing;
a motor in said motor housing having a shaft projecting into said gear case;
a pinion formed on the end of said motor shaft;
first ratcheting means rotatably journaled in said gear case;
an output spindle for holding a tool bit, said output spindle having a longitudinal axis and being rotatably journalled in said gear case so as to be also slideable in the direction of said longitudinal axis;

second ratcheting means fixedly mounted to said output spindle so as to be in confronting relation to said first ratchet means;
resilient means providing a resilient force for holding said first and said second ratcheting means in spaced apart relation to each other; and,
gear transmission means operatively connected to said pinion for simultaneously rotating said first ratcheting means at a predetermined first angular velocity and for rotating said second ratcheting means at a predetermined second angular velocity whereby one of said ratcheting means ratchets over the other one of said ratcheting means thereby imparting longitudinal impact blows to said output spindle when said first ratcheting means and said second ratcheting means mutually engage in response to an axial movement of said output spindle caused by the tool being pressed toward a work surface against the resilient force developed by said resilient means.

4,098,352
PERCUSSION BIT WITH BYPASS CHANNEL THEREIN

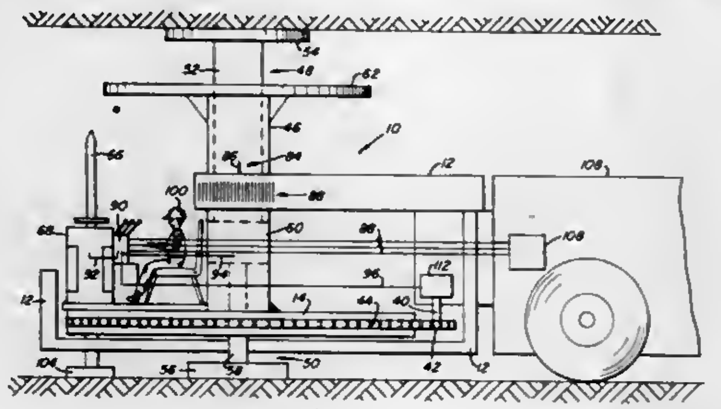
John F. Kita, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Dec. 17, 1976, Ser. No. 751,277
Int. Cl.² B23Q *5/027*
U.S. Cl. 173—17 **6 Claims**



1. In a bit for mounting in the lower end of a percussion drill for reciprocal movement therein between a lower idle and an upper working position, said drill having a casing forming a working chamber with the upper end of the bit and a hammer reciprocable in the casing for impacting the upper end of the bit; said bit having an upwardly facing shoulder near the lower end which engages the lower end of the casing when the bit is in working position and a flange forming a downwardly facing shoulder near the upper end which engages a split ring in the casing when the bit is in idle position, and means for exhausting said working chamber when the bit is in idle position comprising axial recess means formed in the side of said bit and terminating in closed ends which are disposed on opposite sides of said split ring when said bit is in idle position and on the same side of said split ring when said bit is in working position, and exhaust passage means leading from the underside of said ring to the atmosphere when said bit is in idle position.

4,098,353
ROTATABLE MINE DRILLING APPARATUS

Walter Hood; Joseph Sabrick, both of Gary, W. Va., and Woods G. Talman, Upper St. Clair Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed May 14, 1976, Ser. No. 687,112
Int. Cl.² E21C *11/02, 27/22*
U.S. Cl. 173—20 **33 Claims**



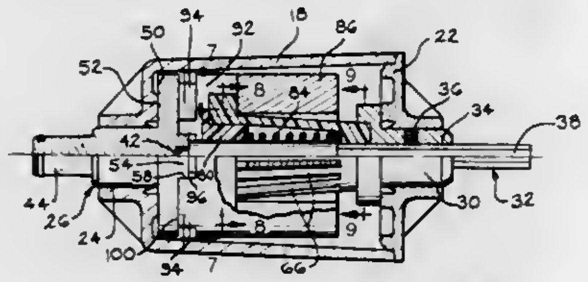
1. A rotatable roof drilling apparatus for drilling multiple holes in a mine roof from a given position, said rotatable roof drilling apparatus comprising:
a housing;
a base connected to a portion of said housing and adapted to be rotated about a given pivot relative to the mine roof and floor;
a roof support, connected to said base, having an upper portion adapted to be moved into engagement with the mine roof and a lower portion adapted to be moved into engagement with the mine floor for providing support between the mine floor and roof;
means for moving said upper portion of said roof support into engagement with the mine roof and the lower portion of said roof support into engagement with the mine floor;
drilling means for drilling holes in said mine roof, said drilling means being positioned on said base and movable with said base as said base is rotated about its said given pivot;
downwardly extending retractable support means, located on said base under said drilling means for transferring thrust from said drilling means to the mine floor during the time that upward drilling force is applied by said drilling means;
power means for rotating said base about its pivot so as to move said drilling means in a circular locus of travel between a plurality of positions at which holes may be bored into the mine roof; and
protective canopy means, formed as a portion of said base, for protecting an operator of said apparatus located on said base during drilling.

4,098,354
IMPACT DRIVER FOR ELECTRIC DRILL

Thomas F. Alcenius, Jackson, Mich., assignor to Technical Research Corporation, Jackson, Mich.
Filed Jun. 4, 1976, Ser. No. 692,803
Int. Cl.² B25D *15/00*
U.S. Cl. 173—93.5 ***9* Claims**

1. A rotary impact driver attachment for an electric drill comprising, in combination, a casing having first and second ends, an input shaft rotatably mounted in said casing about an axis and having a portion extending from said first end for chucking to an electric drill, an output shaft rotatably mounted in said casing coaxial with said input shaft having a wrench socket-receiving portion extending from said second end, a hammer support mounted upon said input shaft within said casing formed of a flexible resilient material, said support including an anchor portion drivingly connected to said input shaft for rotation therewith and a hammer support portion

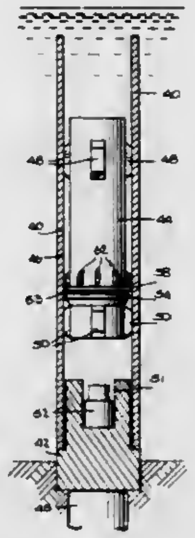
axially spaced from said anchor portion and rotatably and axially movable with respect to said anchor portion, a plurality of elongated flexible elements having ends and radially spaced from said input shaft axis homogenously formed on said hammer support, said elements connected only at their ends to said anchor and hammer support portions and being free of adjacent flexible elements and defining radially open slots between adjacent elements and capable of twisting relative to said axis to reduce the axial distance between said portions, an annular hammer solely supported upon said hammer support portion for rotation and axial movement therewith radially spaced



from said input shaft axis having an axially extending projection extending toward said casing second end radially spaced from said input shaft axis, an axially extending anvil defined on said output shaft within said casing axially extending toward said projection in axial alignment therewith and radially spaced from the axis of said output shaft for intermittent engagement by said hammer projection, twisting of said elements producing the sole force for axially translating said hammer support portion and hammer to an anvil by-pass position, and biasing means axially biasing said hammer toward an anvil engaging position.

4,098,355
UNDERWATER HAMMER WITH CIRCUMFERENTIAL FLOW SEAL

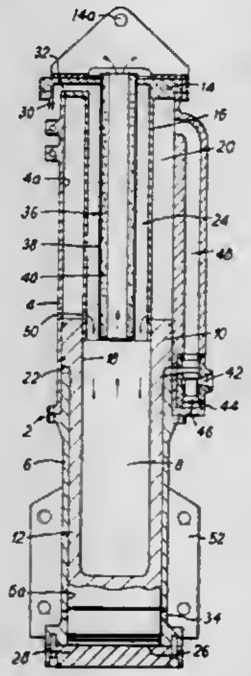
George J. Gendron, and Henry A. Nelson Holland, both of Houston, Tex., assignors to Raymond International Inc., Houston, Tex.
Filed Jan. 27, 1977, Ser. No. 763,085
Int. Cl.² E02D *7/10*
U.S. Cl. 173—127 **27 Claims**



1. A pressurized gas discharge hammer comprising an elongated tubular sleeve, a massive ram guided for movement up and down in the sleeve, said ram being dimensioned to allow a finite circumferential clearance between the ram and the sleeve, an anvil under the ram to receive impacts of said ram, said anvil and sleeve defining a region for retaining water therein, a pressurized gas discharge device located under said ram and operable to release charges of pressurized gas within the sleeve under the ram to drive the ram upwardly, and circumferential valve means extending around the ram in said circumferential clearance, said valve means being operative to allow substantially free flow of water and gas through said clearance upwardly with respect to said ram and to restrict flow of water through said clearance downwardly with respect to said ram.

4,098,356
PILE DRIVERS

Anthony Edward Walter Last, Stowmarket, England, assignor to BSP International Foundations Limited, Ipswich, England
Filed Feb. 7, 1977, Ser. No. 766,611
Claims priority, application United Kingdom, Feb. 20, 1976, 6872/76
Int. Cl.² B25D *9/00*
U.S. Cl. 173—131 **8 Claims**



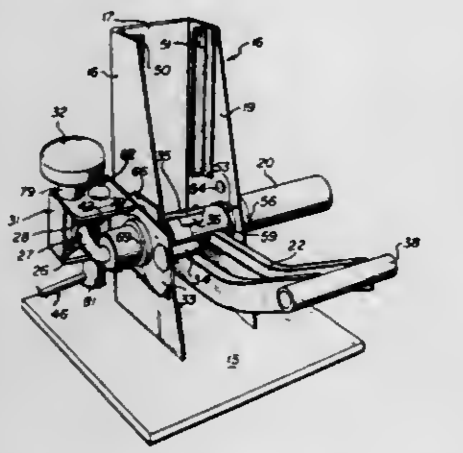
1. A pile driver comprising a casing, a piston slidably mounted in the casing, upper and lower annular working chambers formed within the casing for a compressible working fluid, the piston being reciprocable in the casing by the fluid for generating a series of driving pulses, a lower space in the casing under the piston means for containing compressible fluid in said lower space in each descending driving stroke of the piston whereby to transmit a driving pulse through the contained fluid under pressure, the driver further comprising muffler means and respective connection means from the working chambers and the lower space leading released fluid therefrom to the muffler means for an exhaust flow from the driver.

4,098,357
VERTICALLY ADJUSTABLE, PRE-LOADABLE TORSION BAR SUSPENSION

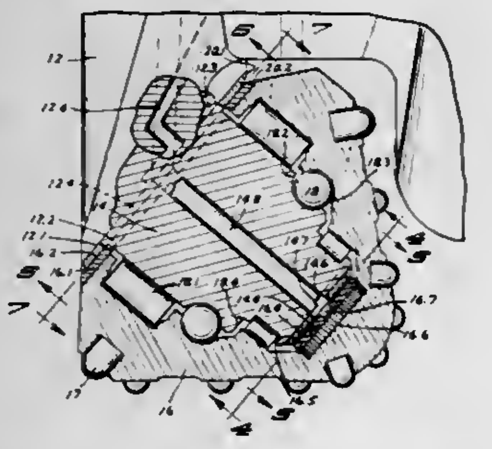
Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.
Filed Nov. 10, 1976, Ser. No. 740,477
Int. Cl.² A45D *19/04*
U.S. Cl. 248—399 **7 Claims**

1. In a seat suspension:
a first member;
a horizontally disposed second member;
means mounting said second member on said first member for pivotal movement of said second member about a horizontal axis;
an elongated link member;
means attaching one end of said link member to said second member with said link member extending from said second member in a direction transverse to the pivotal axis of said second member;
said attaching means comprising means mounting said link member for pivotal movement with said second member to change the angular elevation of said link member;

an elongated torsion bar extending coaxially with said second member;
means fixing one end of said torsion bar to said second member;
an arm secured to said torsion bar for rotation therewith, said arm extending radially from the torsion bar at a location thereon remote from said one end of the torsion bar;
means for pre-loading said torsion bar, said pre-loading means comprising first adjustable means for exerting against said arm a force tending to rotate said arm about the axis of said torsion bar;
height-adjusting means comprising means for pivoting said pre-loading means, together with said second member and said torsion bar, about the mutual axis of said second member and torsion bar, without changing the pre-load on said torsion bar;
a chassis;
means on said chassis for carrying said pre-loading means;
means on said chassis for carrying at least part of said height-adjusting means;
said height-adjusting means comprising means mounting said chassis on said first member for pivotal movement of the chassis about the axis of said torsion bar;
and first stop means on said chassis, unconnected to said link member and independent of any shock absorbing structures in said seat suspension, for limiting upward pivotal movement of said link member.



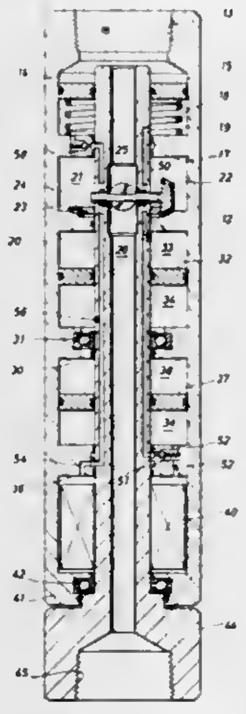
4,098,358
DRILL BIT WITH HARD-FACED BEARING SURFACES
Frank J. Klima, 1401 W. Chestnut St., Virginia, Minn. 55792
Continuation-in-part of Ser. No. 679,212, Apr. 22, 1976, abandoned. This application Feb. 24, 1977, Ser. No. 771,520
Int. Cl.² E21B *9/10*
U.S. Cl. 175—65 **17 Claims**



1. A rotary drill bit highly resistant to failure from axial loading and comprising a body with a projecting journal, a conical cutter having an axially recessed open end receiving the journal, and interior antifriction bearings rotatably mounting the cutter to the journal for rotation of the cutter about its axis, the rim of the conical cutter and the adjacent drill bit body having respective outer large, hard annular bearing layers providing bearing surfaces in sliding relationship with one another at the open end of the cutter and substantially normal to its axis of rotation, a plurality of grooves in the surface of the annular bearing layer on said cutter, said grooves extending across said annular bearing layer whereby heat generated by friction between said hard bearing surfaces may be easily transferred to the environment of the hole being drilled to cool said surfaces.

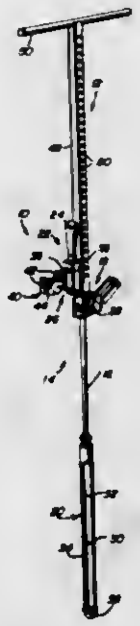
11. Method of drilling a hole through hard rock strata comprising providing a rotary drill bit including a body with a projecting journal and a conical cutter having an axially recessed end and mounted to the journal by internal antifriction bearings, the journal and cutter having mutually facing, large bearing surfaces in sliding, bearing contact at the open end of the cutter and the bearing surfaces having a hardness substantially greater than the rock strata to be drilled, the surface of said cutter having grooves therein which come into overlying, relationship with the opposed bearing surface as the cutter is rotated, and during the well drilling procedure, passing a cooling fluid through the grooves to cool the opposed bearing surface.

4,098,359
HYDRAULICALLY OPERATED DOWNHOLE MOTOR
J. C. Birdwell, 8535 Glencrest, Houston, Tex. 77061
Filed Jun. 13, 1977, Ser. No. 805,748
Int. Cl.² E21B *3/08*
U.S. Cl. 175—93 **10 Claims**



1. A downhole drilling fluid driven motor which comprises:
(a) an elongate, hollow, tubular body adapted to be connected in a drill string to impart rotation to a drill bit therebelow which body incorporates an elongate, hollow tube axially located thereof;
(b) a movable piston supported by said body and having two faces, one of which is exposed to drilling fluid flowing through the drill string and the other face being exposed to hydraulic fluid;
(c) a hydraulic circuit extending from said piston to a motor connected for rotating relatively the hollow tube of said elongate hollow body;
(d) a return from said motor to said piston to define a closed hydraulic circuit;
(e) resilient means for urging said piston against the mud which resilient means works against movement of said piston in response to mud pressure variations which variations pump hydraulic fluid on movement of said piston through said closed hydraulic circuit; and
(f) means for controlling the flow of hydraulic fluid from said piston through said closed hydraulic circuit to said motor and in return utilizing said closed hydraulic circuit.

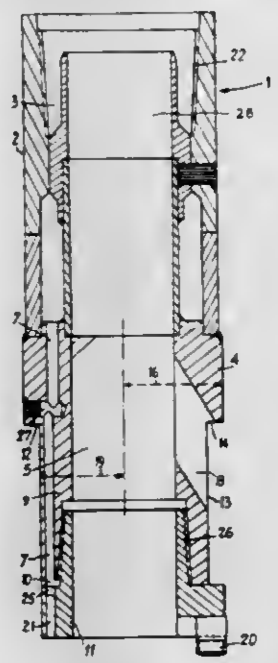
4,098,360
SOIL SAMPLE CORE EXTRACTION TOOL
James M. Clements, R.R. #1, (P.O. Box 162A), Newton, Iowa 50208
Filed Mar. 26, 1976, Ser. No. 670,977
Int. Cl.² E21B *49/02*
U.S. Cl. 175—313 **15 Claims**



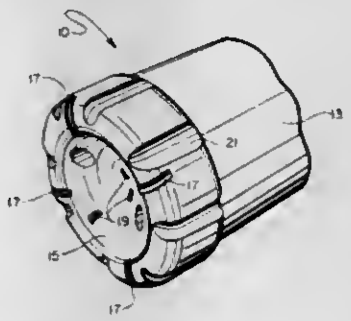
1. A soil sample core extraction tool, comprising, in combination:
(a) a handle member;
(b) a soil probe member having a receptacle for retention of a soil sample, said probe movably mounted on the handle member; and
(c) clutch means for selectively providing for extension, retraction and prevention of movement of the soil probe member with respect to the handle member to permit manipulation of the handle member to a constant convenient position during an entire sampling operation, the handle member being provided with a longitudinal socket, and the soil probe member including a shaft slidably disposed in the socket of the handle member, with the clutch means being mounted on the handle member for movement relative to said longitudinal socket and arranged for selectively engaging and releasing the shaft of the soil probe member said clutch having means to urge said clutch to a pull position wherein said shaft is non-extendable but is retractable, and further having a neutral position wherein said shaft is both extendable and retractable and a push position wherein said shaft is locked to prevent retraction.

4,098,361
DRILLING HEAD CONNECTION FOR USE IN A REVERSE CIRCULATION SYSTEM
Andrė Lamothe, Paris, France, assignor to Foraco Forage Rational Construction, Paris, France
Filed Sep. 20, 1976, Ser. No. 724,834
Claims priority, application France, Sep. 19, 1975, 75 28797
Int. Cl.² E21B *9/20*
U.S. Cl. 175—325 **3 Claims**

1. A drilling head connection having connecting means at one end for the attachment of an annular drilling tool having a central passage therethrough and connecting means at the opposite end for connection to a drilling pipe, said drilling head connection having a central passage extending therethrough adapted to communicate with the central passage of said drilling tool and an annular passage surrounding said central passage for directing a drilling fluid toward said drilling tool, external annular shoulder means located on said drilling head connection spaced from said one end thereof and lateral passage means extending between said central passage of said drilling head connection and the exterior surface thereof at said annular shoulder means whereby a plug cut by an annular drilling tool can pass upwardly through the central passage of the drilling tool and the central passage of said drilling head connection while excavated material passing about the outer circumference of the annular drilling tool will be directed by said annular shoulder means through said lateral passage means to said central passage of said drilling head connection for conveyance to the surface by means of said drilling fluid.



4,098,362
ROTARY DRILL BIT AND METHOD FOR MAKING SAME
Phillip E. Bonnice, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio
Filed Nov. 30, 1976, Ser. No. 746,044
Int. Cl.² E21B *9/36*
U.S. Cl. 175—329 **5 Claims**



1. A drill bit comprising:
(a) an elongated shaft;
(b) a crown fixed to one end of said shaft, said crown comprised of metal powder and a braze alloy infiltrant with a flow point of less than 700° C;
(c) a plurality of diamond compacts mounted in said crown, each compact comprising a planar layer of bonded polycrystalline diamond particles, said diamond layer oriented at a rake angle between −10° to −25°.

4,098,363

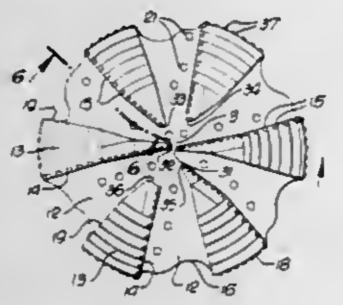
DIAMOND DRILLING BIT FOR SOFT AND MEDIUM HARD FORMATIONS

Heino J. Rohde, Nienhagen, and Rainer Juergens, Celle, both of Fed. Rep. of Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Apr. 25, 1977, Ser. No. 790,684

Int. Cl.^{2} E21B *9/36*

U.S. Cl. 175—329 **15 Claims**



1. A bit comprising a central bore and a face formed about said bore, fluid channels extending from adjacent the center of the bit to the gage of said bit and separating said face into wedge shaped blades, cutting elements positioned in the leading edge of said blades and a plurality of passageways positioned in said face and each passageway connecting to said bore and opening into each of said fluid channels in a longitudinal array in each of said fluid channels and positioned adjacent the leading edge of said blades, said openings being arranged in a spiral array extending from adjacent the central portion of the face to adjacent the gage of the bit.

4,098,364

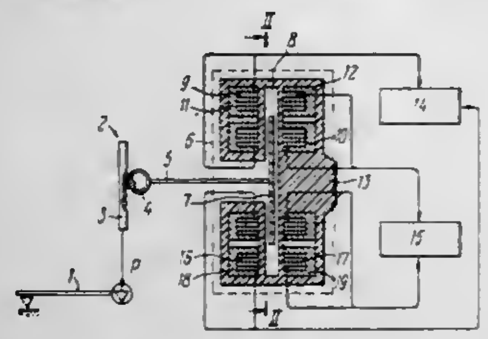
WEIGHT MEASURING APPARATUS

Savely Solomonovich Schedrovitsky; Vladimir Mikhailovich Glebov; Nadezhda Mikhailovna Sidorova; Jury Mikhailovich Dubrovin; Elena Ivanovna Shrubek, all of Moscow; Ivan Semenovich Tarada, Kokchetav; Agnia Alexandrovna Belyaeva, Moscow; Dmitry Matveevich Mash, Moscow; Alexei Pavlovich Lebedev, Moscow, and Alexandr Gershevich Belfor, Kiev, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Stroitelnogo I Dorozhnogo Mashinostroenia, U.S.S.R.

Filed Oct. 15, 1976, Ser. No. 732,595

Int. Cl.^{2} G01G *3/14, 23/14;* **H01F** *21/02, 21/06*

U.S. Cl. 177—210 EM **2 Claims**



1. A weight measuring apparatus comprising; a casing; a weight sensitive element positioned in said casing; an inductive transducer converting displacements of said weight sensitive element into electrical signals; a moving member of said inductive transducer comprising a metallic plate connected to said weight sensitive element; two inductance coils of said inductive transducer secured on said casing with a clearance wherein said metallic plate is positioned; armour cores of said inductance coils; windings of said inductance coils arranged on said armour cores; a high frequency oscillator connected to said winding of one of said inductance coils; a metering circuit electrically connected to said winding of said other inductance coil;

a weight balancing and metering mechanism; means defining an axis of said mechanism kinematically connected to said weight sensitive element and whereon said metallic plate is rigidly fastened; a pointer rigidly secured on said axis; a scale calibrated in weight units with respect to which said pointer moves; said metallic plate having a working edge defining a curve of a radius increasing from R_{min} to R_{max} in the angle α corresponding to the maximum angle said pointer can turn within a specified measurement range;

said metallic plate having a working edge provided with cutout portions equal in number to the number of measurement subranges, their length being determined by the difference between R_{max} and R_{min} with the angle $\alpha = 0$ for each subrange; two discrete pointer angle pickups secured on said casing in one plane with said plate and at an angular distance to each other greater than the angle α and interacting with said working edge of said plate to determine the sign of the weight change; a weight indicator having a group of inputs, some of said inputs being electrically connected to said metering circuit; an electric counter connecting said pointer angle pickups to said outputs of said weight indicator;

a second inductive transducer converting displacements of said weight sensitive element into electrical signals; two inductance coils of said second inductive transducer; armour cores of said inductance coils secured on said casing with a clearance relative to each other; windings of said inductance coils arranged on said armour cores, one of said coils being connected to said high frequency oscillator and the other coil being connected to said metering circuit; a metallic plate of said second inductive transducer comprising a ratchet wheel provided with teeth equal in number to the number of measurement subranges and secured on said axis of said weight balancing and metering mechanism and positioned in said clearance between said amour cores of said inductance coils of said second inductive transducer; each said teeth being provided with a working edge and having a portion defining a curve of a radius diminishing from R_{max} to R_{min} and a portion whose length is determined by the difference between R_{max} and R_{min} with the angle $\alpha = 0$ for each subrange.

4,098,365

DEVICE FOR THE MEASUREMENT OF WHEEL OR AXLE LOADS OF ROAD VEHICLES

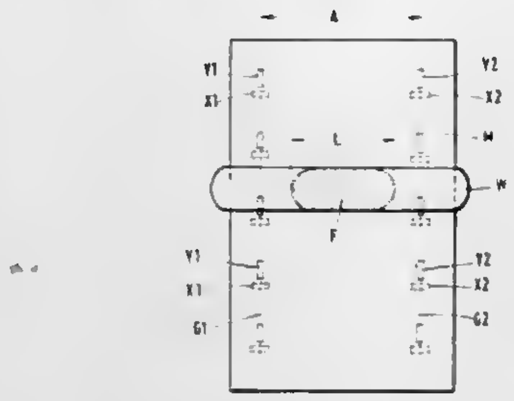
Ludwig Pietzsch, rittnerstr. 36, 7500 Karlsruhe 41, Germany, and Knut Overlach, Karlsruhe, both of many, assignors to Ludwig Pietzsch, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 15, 1976, Ser. No. 723,614

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615289; Apr. 9, 1976, 2615516

Int. Cl.^{2} G01G *19/02*

U.S. Cl. 177—211 **29 Claims**



1. In a device for the measurement of wheel or axle loads of road vehicles by electrical evaluation of the change of resistance respectively of at least two wire strain gauges, which are fastened to a measuring support arranged on or in the driving track surface and of which one is mounted with its grid in direction of travel and the other displaced through 90° thereto, by means of a bridge circuit, the improvement wherein two pairs of such wire strain gauges are mounted along at least two imaginary lines of a plate constituting said support and in turn supported outwardly of said lines, and the two strain gauges of each pair are so connected that their measuring signals which are selected to differ by a multiplication factor *a* are added.

4,098,366

DEVICE FOR MOUNTING A STORAGE BATTERY

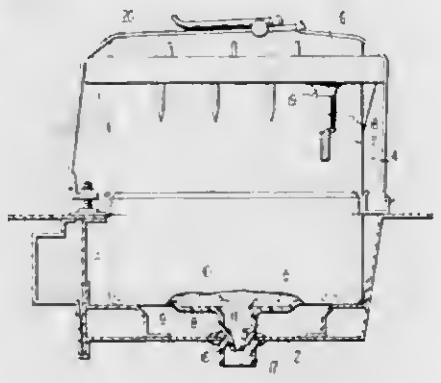
Theodor Reinhard, Boblingen; Ernst Haug, Sindelfingen, and Manfred Schulz, Gultlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,561

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543308

Int. Cl.^{2} B62D *25/00*

U.S. Cl. 180—68.5 **17 Claims**



1. An installation for the accommodation of a storage battery within a closed-off space, which comprises a covering hood means holding back gases and acids escaping out of the battery cells, characterized in that the covering hood means forms a cover for a trough means surrounding the storage battery, said cover abutting sealingly against the trough top side so that a container is produced which is gas-tight within the vehicle interior and which is only connected with the outside air via a discharge opening, said discharge opening being provided in a recess formed in the bottom of the container for conducting away said gases and acids.

4,098,367

AUTOMOTIVE VEHICLE SPEED CONTROL SYSTEM

Helmut Fleischer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 10, 1976, Ser. No. 722,211

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546529

Int. Cl.^{2} B60K *31/00*

U.S. Cl. 180—105 E **11 Claims**

1. Vehicle speed control system having

means (10,) generating an actual vehicle speed signal representative of vehicle speed and having outputs (11, 12) providing said signal in digital (*n/f*) and in analog (*n/V*) form, said digital speed signals having a pulse frequency proportional to vehicle speed;

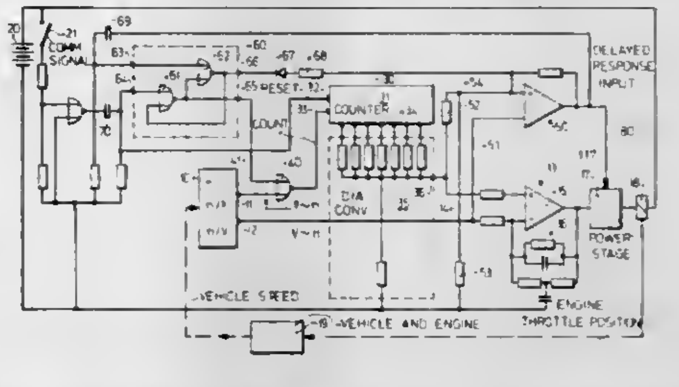
means (40, 31, 60, 21) generating a command speed signal connected to the digital speed signal output (11) of said actual speed signal generating means including a digital counter (31) forming a memory (30) and a command transfer switch (21) transferring the actual speed signal in digital form into the counter (31) when the transfer switch (21) is operated;

a vehicle speed control output (17, 18) connected to the vehicle engine to control the engine in accordance with the output signal from the vehicle speed control output;

a digital/analog converter (35) connected to the counter (31) and generating the command signal;

a control comparator (50) connected to, and comparing the actual speed signal in analog form (*n/V*) from the analog terminal (12) of the vehicle speed generating means (10), with the command speed signal from the digital/analog converter (35);

means (69, 60, 65, 41, 40) connected to the output of the control comparator and to the count input of the counter (31) and terminating further counting when the comparison of the actual and commanded speed signal has a predetermined relationship so that the then existing actual speed signal is stored in the counter as a count state thereof;



safety means (60, 66, 67, 68) connected to one of the inputs of the control comparator (50) to change the relationship between the input signals thereto representative of actual and commanded speed and at which the comparator provides an output in a direction to cause said control comparator (50) to provide an output when the difference between command speed and actual speed exceeds a predetermined value;

and automatic speed control disabling means (80, 117) connecting the output of said comparator (50) to the vehicle speed control output (17, 18) to disable said speed control output (17, 18) if the speed difference exceeds said predetermined value.

4,098,368

ROAD SPEED CONTROL WITH REDUNDANT RELEASE

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,402

Int. Cl.^{2} B60K *31/00*

U.S. Cl. 180—108 **5 Claims**

1. A vehicle road speed control system comprising:

means for producing a first fluid pressure;

means for producing a second fluid pressure less than said first fluid pressure;

a control valve;

first conduit means interconnecting said first fluid pressure producing means and one side of said control valve for delivering said first fluid pressure thereto;

second conduit means interconnecting said second fluid pressure producing means and said control valve;

a restrictive orifice in said second conduit means for delivering a restricted value of said second fluid pressure to the other side of said control valve,

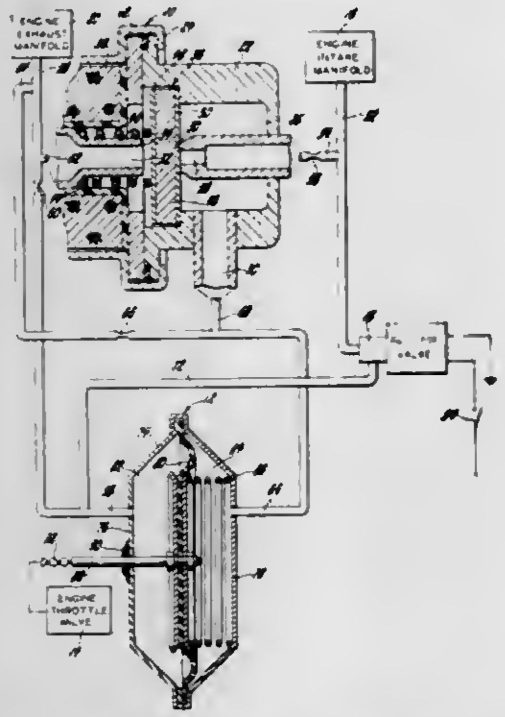
said control valve variably combining said first fluid pressure and said restricted value of said second fluid pressure in response to vehicle speed to produce a control pressure;

a servomotor including a housing and a movable power wall dividing said housing into two chambers, movement of said power wall affecting vehicle road speed;

third conduit means interconnecting said first fluid pressure producing means and one of said chambers;

a restrictive orifice in said third conduit means for delivering a restricted value of said first fluid pressure to said one chamber;

fourth conduit means interconnecting said control valve to the other of said chambers to deliver said control pressure thereto;



and a normally closed release valve interconnecting said third conduit means and said second fluid pressure producing means for communicating said restricted value of said first fluid pressure and said second fluid pressure when said release valve is actuated to an open position.

4,098,369
UNDERWATER SOUND GENERATOR

Samuel Altschuler, Tarzana, Calif., and Jerre A. Hitz, Annandale, Va., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 29, 1975, Ser. No. 644,778

Int. Cl.² G01V *1/06*

U.S. Cl. 181—118 **10 Claims**

1. Method of generating underwater sound pulses, comprising:
   (a) catalytically gasifying liquid monopropellant within a confined volume to produce pressurized gas; and
   (b) releasing the compressed gas underwater in a series of controlled pulses.

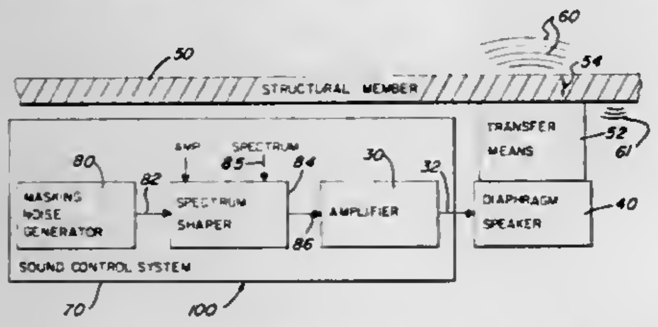
4,098,370
VIBRATION MASKING NOISE SYSTEM

Howard Norman McGregor, 6651 S. Wellington Ct., Littleton, Colo. 80121, and Robert Charles Chanaud, 1708 Hillside Rd., Boulder, Colo. 80302

Continuation-in-part of Ser. No. 595,671, Jul. 14, 1975, abandoned. This application Apr. 19, 1976, Ser. No. 678,368

Int. Cl.² H05K *5/00*

U.S. Cl. 181—150 **7 Claims**



1. A system for delivering masking noise into an area, said area containing a plurality of structural members in close association therewith, said system having means for generating electrical masking noise signals and a diaphragm speaker for converting said electrical signals into acoustical waves, said system comprising:
   means for supporting the opening of said speaker in close spaced relation to the surface of said member, and
   means affixed to said member and in spaced relation to the sides of the inverted conical surface of the diaphragm of said speaker for enhancing the compliance of the air between the diaphragm and said member so that said acoustical waves impart greater vibration to said member.

3. A system for delivering masking noise into adjacent rooms, said adjacent rooms having a separation space between the adjoining walls of each of said rooms, and means for generating masking noise, said system comprising: means in said separation space receptive of said masking noise for vibrating both of said adjoining walls so that said masking noise is extended into said adjacent rooms.

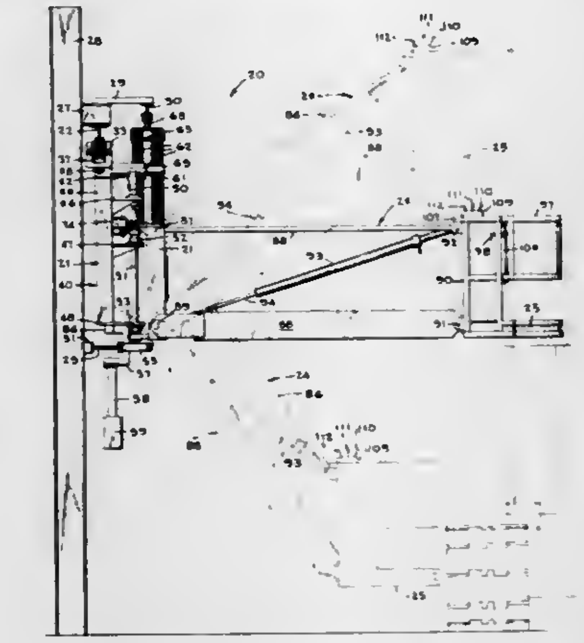
4,098,371
MOBILE SCAFFOLD

Edward G. Cox, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 20, 1976, Ser. No. 752,237

Int. Cl.² B66F *11/04*

U.S. Cl. 182—2 **4 Claims**



1. A mobile scaffold comprising a carriage movable along a predetermined path defined by rails on a wall, a vertical shaft rotatably mounted on the carriage, a parallel-arm type crane mounted at one end for swinging about the axis of the vertical shaft, an operator's cage and control panel mounted at the opposite end of the crane, drive means for rotating the vertical shaft, and a drive wheel mounted upon the vertical shaft below the crane to engage one of said rails and apply traction for moving the carriage along the rails.

4,098,372
COLLAPSIBLE LADDER

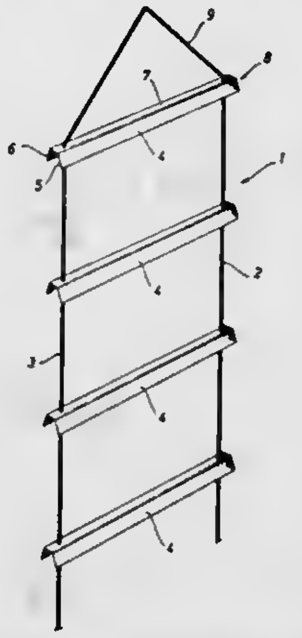
Wilhelm Lackey, Heidenbergstrasse 31, 3538 Marsberg, Fed. Rep. of Germany

Filed Mar. 3, 1977, Ser. No. 774,133

Int. Cl.² E06C *1/56*

U.S. Cl. 182—196 **6 Claims**

1. In a collapsible ladder of non-combustible material having two flexible lines and a plurality of rungs spaced along and between said lines, the rung improvement comprising a tread section having divergent limbs extending therefrom to form a U-shaped cross section for nesting astride adjacent rungs relative to one another in spaced fashion, and to provide intermediate spaces for receiving and uncovering said two flexible lines in stowage position, and said lines pass through and are respectively held in openings proximate the ends of each rung.



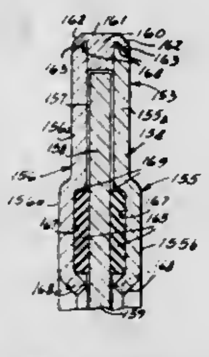
4,098,373
TUNED TORSIONAL VISCOUS DAMPERS

William J. Troyer, Orchard Park, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Division of Ser. No. 705,158, Jul. 14, 1976, Pat. No. 4,046,230. This application Jul. 29, 1977, Ser. No. 820,213

Int. Cl.² F16F *15/12*

U.S. Cl. 188—1 B **10 Claims**



1. A tuned torsional viscous damper, comprising:
   a flat supporting disk having a radially outwardly extending circular body and a radially inner hub portion adapted to be secured to a rotary member such as a crankshaft subject to vibrations to be damped by the damper;
   a ring shaped inertia mass having an inner diameter and a radially inward annular opening through said inner diameter and leading from an annular working chamber into which said body extends concentrically through said opening;
   a viscous damping medium in said chamber;
   said inertia mass comprising a pair of complementary stamped heavy gauge annular sheet metal inertia plates each of which has a radially outer axially facing annular portion in parallel shear film spaced relation to said disk body having regard to the viscosity of the viscous damping medium;
   means at the radially outer extremities of said radially outer annular portions maintaining an accurate spaced relation between said radially outer portions;
   means at said radially outer extremities securing said plates fixedly together;
   radially inner annular axially facing portions of substantial width of said stamped inertia plates substantially offset axially away from said disk body;
   annular transversely angular integral offsetting bends connecting said radially inner portions to said radially outer portions, whereby said radially inner portions define concentric annular recesses of substantially greater depth than said shear film spacing and facing toward said disk body;
   and elastic turning spring, spacing and sealing rings substantially filling said recesses and extending across said shear film spacing into face-to-face engagement with said disk body and thereby maintaining said shear film spaced relation between said disk body and said radially outer stamped inertia plate portions;
   said rings being bonded at their opposite axial faces to respectively said radially inner plate portions and to said disk body and sealing said inward opening against loss of viscous damping medium, and providing tuning spring coupling between the inertia mass and the disk.

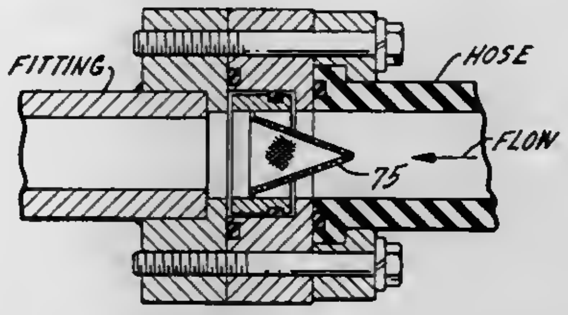
4,098,374
RAILROAD CLASSIFICATION YARDS

Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,380

Int. Cl.² B61K *7/08*

U.S. Cl. 188—62 **18 Claims**



7. In a railroad classification yard where a hydraulically operated car retarder is installed at a classification track supported by rail ties, a distribution system for hydraulic fluid comprising:
   a pair of support means located outward of the rail ties at each side of the classification track;
   a pump housing supported by one support means at one side of the classification track, said pump housing containing a pump and a reservoir for supplying hydraulic fluid under pressure to the retarder;
   a housing containing a directional flow control valve means supported on the other support means at the other side of the same track;
   a single conduit communicating with the control valve means and extending longitudinally between the rails of the classification track to both supply hydraulic fluid under pressure thereto and receive return fluid therefrom; and
   a pair of flexibly supported conduits between the two housings and so connected to the pump, the reservoir and the control valve means as to enable fluid to be returned from the retarder to the reservoir and fluid under pressure to be pumped to the retarder from the reservoir.

4,098,375
SILICONE PUTTY RETARDER

Andrew T. Kornylak, 400 Heaton St., Hamilton, Ohio 45011

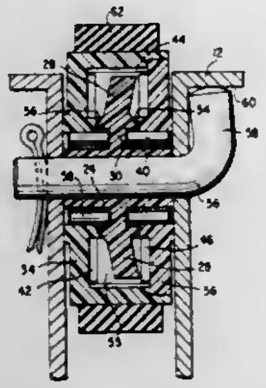
Continuation-in-part of Ser. No. 351,061, Apr. 13, 1973, abandoned, which is a continuation of Ser. No. 176,742, Aug. 31, 1971, abandoned, which is a continuation of Ser. No. 850,835, Aug. 18, 1969, abandoned. This application Sep. 27, 1973, Ser. No. 401,420

Int. Cl.² F16D *57/02*

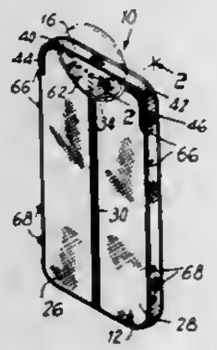
U.S. Cl. 188—290 **14 Claims**

1. A retarder roller comprising a stator, a rotor surrounding the stator and forming an enclosed housing having walls, sili-

cone putty in the housing, and means on the rotor and stator for deforming the material, wherein the deforming means comprises vanes on the stator and means on all the walls of the housing for holding the putty for rotation therewith, the vanes on the stator comprising members extending radially into the putty, each having a wedge shaped portion presenting a sharp edge opposite to the direction of rotation of the rotor and putty, the edges on consecutive vanes being on opposite sides of a common plane normal to the rotor axis.

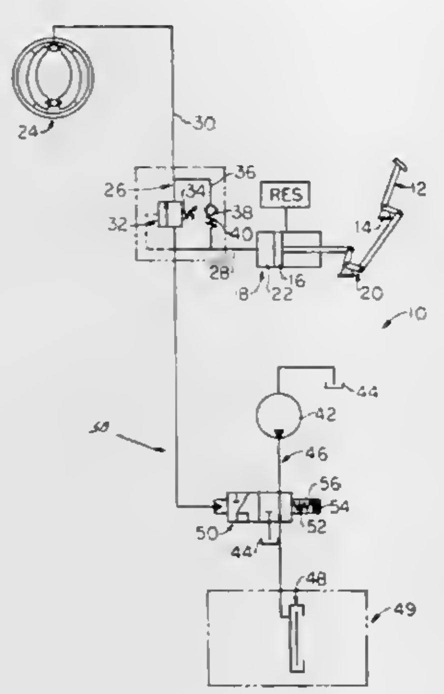


4,098,376
GARMENT BAG
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation, New York, N.Y.
Filed May 19, 1977, Ser. No. 798,511
Int. Cl.² A45C *3/00*
U.S. Cl. 190—43 **5 Claims**



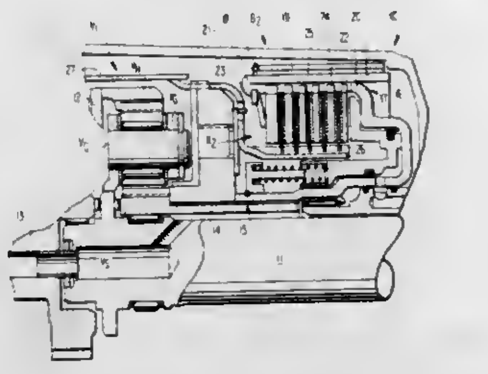
1. In a foldable garment bag of the type wherein a forward wall includes a longitudinal opening defining first and second front panels and first releasable closure means are provided for sealing the longitudinal opening, the improvement comprising second releasable closure means located proximate to at least the outer, upper periphery of said first front panel for releasably securing the upper periphery of said first front panel to permit transverse as well as longitudinal opening of said panel, third closure means located proximate to at least the outer, upper periphery of said second front panel for releasably securing the upper periphery of said second front panel to permit transverse as well as longitudinal opening of said second front panel and each of said first and second front panels are formed with an upper, outer curved corner, said second and third closure means each extending along the associated upper, outer curved corner of the associated front panel into the respective side peripheries of the front panels.

4,098,377
SYNCHRONIZED CREEP AND BRAKE CONTROL
William I. Callaghan, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Apr. 8, 1977, Ser. No. 785,796
Int. Cl.² B60K *41/24;* F16D *67/02*
U.S. Cl. 192—13 R **6 Claims**



1. Hydraulic brake and transmission apparatus comprising:
hydraulically actuated brake means;
hydraulic cylinder means;
- first conduit means interconnecting the brake means and cylinder means and including first valve means allowing hydraulic fluid flow from the cylinder means to the brake means, but blocking hydraulic fluid flow from the brake means to the cylinder means;
- first resilient spring means biasing the first valve means to a closed position, but allowing hydraulic fluid flow therethrough upon sufficient fluid pressure buildup in the cylinder means;
- a branch conduit in parallel with the first conduit means and including second valve means allowing hydraulic fluid flow from the brake means to the cylinder means, but blocking hydraulic fluid flow from the cylinder means to the brake means;
- a source of pressurized fluid;
- hydraulic transmission means engageable upon application of fluid pressure thereto and disengageable upon release of fluid pressure therefrom;
- second conduit means interconnecting the source and transmission means and including infinitely variable valve means movable between relatively open and relatively closed positions for providing relatively greater or less fluid pressure being applied to the transmission means from the source;
- second resilient spring means for biasing the infinitely variable valve means toward its open position; and
- third conduit means communicating with the first conduit means on the cylinder means side of the first valve means, and communicating with operating means for the infinitely variable valve means, so that fluid pressure in the third conduit means tends to urge the infinitely variable valve means against the resilience of the second resilient spring means toward a relatively closed position.

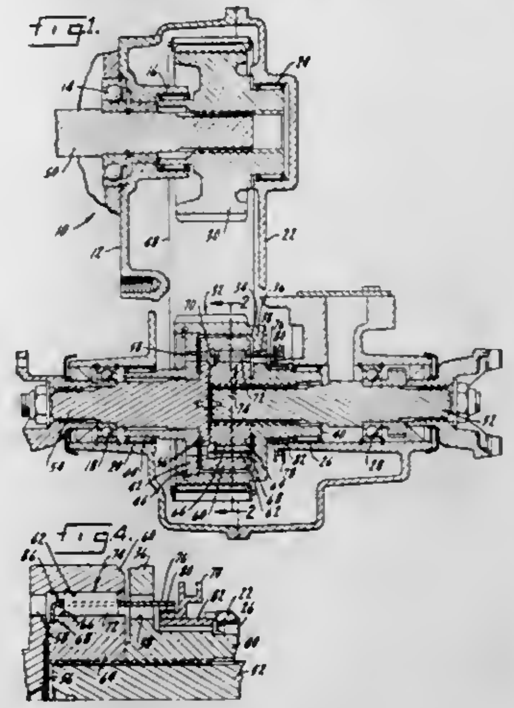
4,098,378
BRAKE DRUM FOR ROTATING GEAR CHANGE-SPEED TRANSMISSION
Josef Helmer, Aich, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Jul. 1, 1976, Ser. No. 701,550
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1975, 2530700
Int. Cl.² V16D *67/04;* F16D *13/62*
U.S. Cl. 192—17 A **7 Claims**



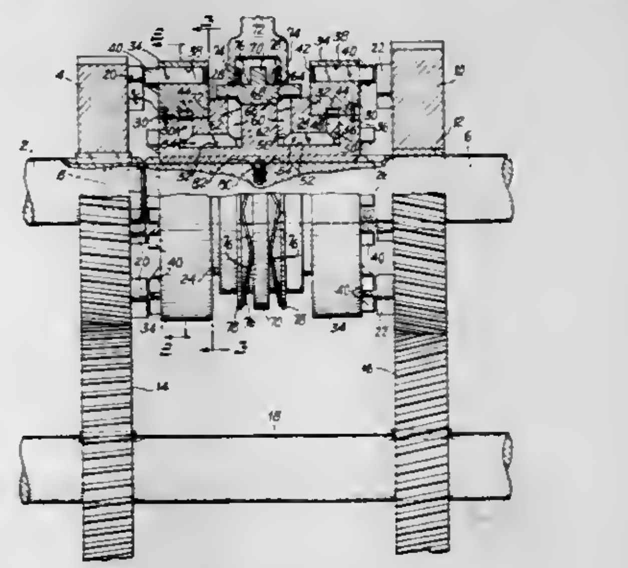
1. A brake drum for braking a transmission member of a planetary gear change-speed transmission, the brake drum comprising a cylinder, a substantially cylindrical brake surface provided on an outside portion of the cylinder, a transmission brake including a brake band engageable with the brake surface, engaging surface means provided on an inside portion of the cylinder for a non-rotatable mounting support of clutch lamellae of a transmission clutch, the transmission clutch operating on a transmission member of the transmission, and a drive flange arranged substantially coaxial with the cylinder and non-rotatable with respect thereto, the drive flange is operatively connected with the transmission member, characterized in that a collar is provided on the cylinder, the collar is outwardly turned over the cylinder so as to provide for a double-walled construction, the brake surface is provided on an external surface of the collar, and in that a cylinder section is disposed inside of the collar and is made in one piece with the drive flange.

4,098,379
AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE
Mark John Fogelberg, and John William Holdeman, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 18, 1975, Ser. No. 641,781
Int. Cl.² F16D *15/00*
U.S. Cl. 192—38 **19 Claims**

1. A torque transfer assembly comprising a housing, an input shaft and first and second output shafts supported for forward and reverse rotation in said housing, and means coupling said input shaft with said output shafts for transfer of torque thereto, said coupling means including an overrunning clutch having wedging means movable between first and second clutch engaging positions wherein torque is transferred to said second output shaft and a clutch disengaging position wherein torque is not transferred to said second output shaft, and means engageable with said housing for biasing said wedging means toward said first and second clutch engaging positions respectively upon said forward and reverse rotation, said biasing means being engageable with said second output shaft for biasing said wedging means toward said second and first clutch engaging positions respectively upon said forward and reverse rotation.



4,098,380
GEAR SELECTOR MECHANISM
Dalton A. Thomas, Alpine Rte. 1, Box 97, Winterboro, Ala. 35014
Filed Apr. 7, 1977, Ser. No. 785,677
Int. Cl.² F16D *21/04, 11/12, 47/00*
U.S. Cl. 192—48.5 **7 Claims**

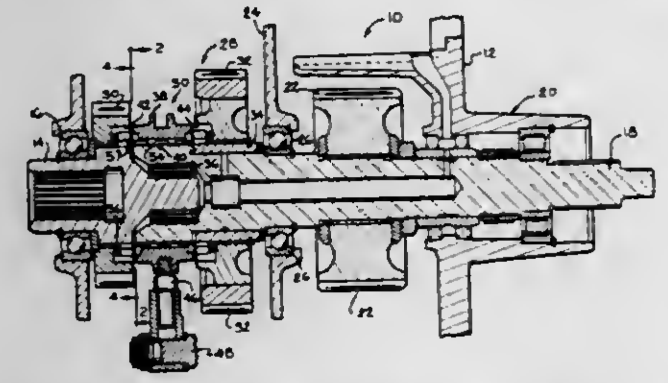


1. A gear selector mechanism for selectively clutching either of adjacent members to a shaft relative to which both members are rotatable, comprising:
- a circular series of lugs on that axial face of each member facing the other member;
- a sleeve axially slidable but nonrotatable on said shaft between said members;
- a clutch ring mounted on each end of said sleeve for rotation thereon and for axial movement therewith, each clutch ring having clutch dogs thereon engageable with said lugs on the adjacent member to drivingly connect said clutch ring and member;
- interengaging positive clutching means for each clutch ring and selectively operable to positively clutch either of said rings to said sleeve;
- a selector ring axially slidable on said sleeve between said clutching rings and operable, when slid axially on said

sleeve, to first engage one of said positive clutching means of one clutch ring and to release the other then to engage said one clutch ring for sliding said rings and sleeve axially on said shaft to engage the clutch dogs of said one clutch ring into engagement with the lugs on one of said members; and

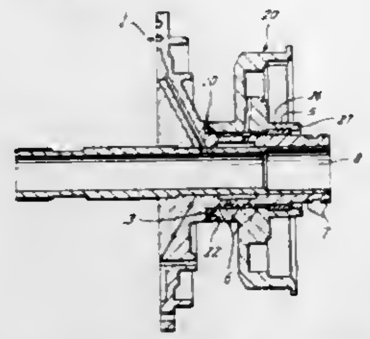
actuator means for selectively moving said selector ring in either direction on said sleeve.

4,098,381
TRANSMISSION SHIFT MECHANISM
Otto Mueller, 13 Byfield La., Dearborn, Mich. 48120, and Alvie V. Fox, 33555 Quaker Valley Rd., Farmington, Mich. 48024
Filed Feb. 23, 1977, Ser. No. 771,398
Int. Cl.² F16D *23/02*
U.S. Cl. 192—48.91 **7 Claims**



1. A shift mechanism for a transmission comprising first and second rotary members mounted for rotation adjacent to one another about a common axis, said rotary members having external splines around outer peripheries corresponding in numbers and dimensions, a shift collar having internal splines around an inner circumference mounted with its internal splines in mesh with the external splines of one of said rotary members, said shift collar being shiftable axially to a position so that its internal splines are also in mesh with the external splines of the other rotary member to provide corotation of said rotary members, and engagement means for synchronizing rotation of said other rotary member with said shift collar for uniform corotation during initial axial movement of said shift collar and thereafter for guiding the splines of said shift collar into the external splines of said other rotary member during further axial movement of said shift collar, said engagement means including a plurality of circumferentially spaced blocking members on one of the parts to be synchronized axially directed toward the other of the parts to be synchronized, each blocking member having uniform transverse dimensions throughout its length, and a plurality of circumferentially spaced cam members on the other of the synchronized parts axially directed toward said one synchronized part, each of said cam members having a surface inclined circumferentially away from said one part and terminating in a trailing edge spaced from the leading edge of the next adjacent cam member, and leading and trailing surfaces extending longitudinally from its leading and trailing edges to provide an axial slot of uniform transverse cross section throughout its length and of a dimension sufficient to accommodate a blocking member of said one part, the splines of said shift collar and said one rotary member being in alignment with one another for meshing when said blocking member is in axial alignment with said slot.

4,098,382
LUBRICATED BEARING FOR AUTOMATIC TRANSMISSIONS
Lonnie T. Reedy, and Eddie Smith, both of Freeport, Tex., assignors to Reedy and Smith, Inc., Lake Jackson, Tex.
Filed Jun. 3, 1976, Ser. No. 692,432
Int. Cl.² F16D *25/06, 13/74*
U.S. Cl. 192—110 B **5 Claims**



1. In an automobile automatic transmission which is characterized as having a direct clutch drum revolvable around a stator shaft and in which the inner surface of the rotor portion of said direct clutch drum is revolvable around a radial bearing surface encircling said stator shaft at a location which is near the distal end of said rotor portion, said stator shaft being characterized as having an oil-flow outlet communicating from the inside of the stator shaft to the external surface of the stator shaft at a location within the frontal end of said rotor portion,

the improvement which comprises providing a circular combination thrust-washer/radial-bushing encircling the stator shaft to serve as a bearing for the frontal end of said rotor portion,

said combination thrust-washer/radial-bushing having the configuration of a short cylinder having a flanged end, and being of a dimension to fit snugly around the stator shaft,

said flanged end having a distal surface which is operable as a thrust-washer portion for receiving the thrust forces of the frontal end of the rotor as it rotates,

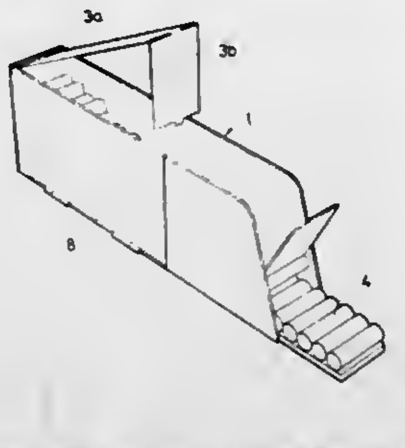
said short cylinder having a radial surface in a position distal to the thrust-washer portion which is operable as a radial-bushing portion for the inside frontal periphery of the rotor,

said combination thrust-washer/radial-bushing having oil-flow means comprising a first oil groove inscribed aroung the inner periphery of the radial-bushing portion, said first oil groove communicating with the oil outlet on the stator shaft, with at least one oil passageway communicating through said radial-bushing to provide flow of oil from the first oil groove to the outer surface of the radial-bushing,

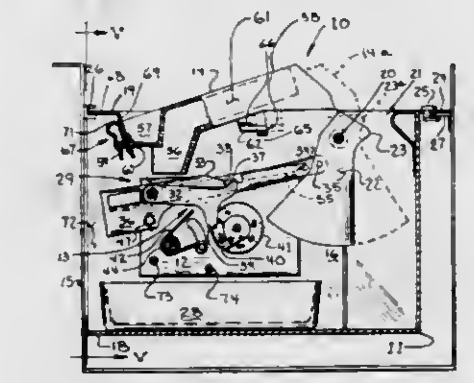
and a second oil groove inscribed around the distal surface of said thrust-washer portion with at least one oil passageway communicating from said outer radial-bushing surface to said second oil groove.

4,098,383
METHOD FOR THE FEED OF CYLINDRICAL OBJECTS TO A WORKING MACHINE
Lief Carpman, Askelyckevagen 17, 544 00 Hjo, Sweden
Filed Mar. 24, 1977, Ser. No. 780,786
Int. Cl.² B65G *1/02;* B65H *1/06*
U.S. Cl. 193—2 R **1 Claim**

1. Method of charging a chute for the feed of objects to a machine for treatment thereby using a casing for receiving said objects and transporting them to said chute which has a lid in its side adapted to be opened and uncover an opening adapted to receive said casing in said chute, said casing having a frame of band shape forming a wall surrounding said objects and two detachable end lids closing said frame at lateral edges opposite to each other, said frame at least at one point along its circumference being pliable apart, said method comprising removing one end lid of said casing, placing the remaining casing in the opening in said chute, removing the other end lid of said casing, closing said chute lid, and plying said frame apart to release the objects in the chute.



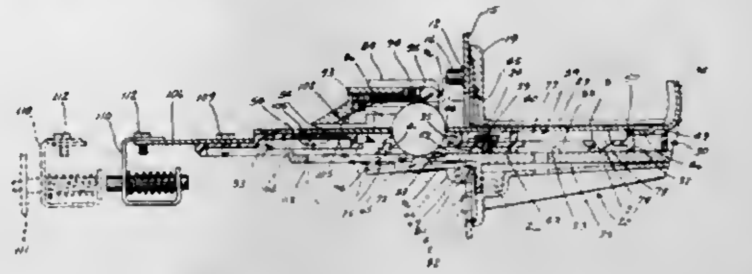
4,098,384
TOKEN ACTUATABLE VEND MECHANISM
Henry Charles Kovar, Anoka, Minn., assignor to The Cornelius Company, Minneapolis, Minn.
Filed Nov. 10, 1976, Ser. No. 740,643
Int. Cl.² G07F *3/06*
U.S. Cl. 194—37 **26 Claims**



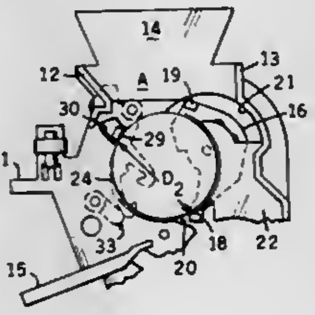
1. A token operable vending mechanism comprising:
(a) a frame;
(b) means in the frame for vending a goods;
(c) common mounting means fixed on and to the frame for mounting both of a token counter and a vending lock to the frame;
(d) a mechanical vending lock operatively mounted upon the common mounting means;
(e) a slide bar operatively connecting the vending lock to the vending means, the slide bar being lockable by the vending lock for rendering the vending means inoperable;
(f) a token counter rigidly mounted to the common mounting means; and
(g) a mechanical output means on the token counter, the output means being operable upon the vending lock for rendering the vending lock inoperable and releasing the slide bar, thereby making the vending means operable for release of a goods from the mechanism.

4,098,385
CONVERTIBLE COIN SLIDE APPARATUS
William J. McNally, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed Jan. 27, 1977, Ser. No. 763,049
Int. Cl.² G07F *5/08*
U.S. Cl. 194—55 **14 Claims**

1. A convertible coin slide apparatus, comprising: housing means for mounting said apparatus on a controlled appliance; a coin slide assembly defining at least one coin slot having predetermined dimensional characteristics for receiving a coin of a first predetermined denomination and effecting a preliminary coin measurement, said coin slide assembly being supported in said housing means for reciprocal movement between a coin receiving position and an appliance actuating position; slot modifying means for effectively altering the dimensional characteristics of said coin slot to effect a preliminary measurement of a coin of a second predetermined denomination; and coin authenticating means associated with said housing means and said slide assembly and including an abutment means supported in a first position on said housing means and engageable by said coin of said first denomination, said authenticating means further including cam means movably supported on said housing means in operative alignment with and spaced a first predetermined dimension from said abutment means to receive a coin of said first predetermined denomination therebetween, said cam means being movable from a first posture to a second posture responsive to said coin of said first predetermined denomination for permitting movement of said slide assmbly to said actuating position, said abutment means being disconnectable from said first position and movable to a second position on said housing means to change said first predetermined dimension to a second predetermined dimension for receipt of said coin of said second predetermined denomination between said abutment means and said cam means.



4,098,386
ADJUSTABLE OVERSIZE COIN DETECTOR ASSEMBLY
Bart G. Martin, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.
Continuation-in-part of Ser. No. 586,998, Jun. 13, 1975, Pat. No. 3,991,867. This application Oct. 21, 1976, Ser. No. 734,604
Int. Cl.² G07F *3/02*
U.S. Cl. 194—102 **1 Claim**

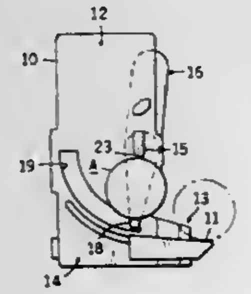


1. In a coin testing apparatus:
(a) a frame having means defining a coin passageway,
(b) a coin cradle pivotally mounted on the frame, the cradle including a pair of spaced cradle arms for conveying a coin to the passageway,
(c) a lever pivotally mounted on the frame adjacent the cradle, the lever having a shoulder disposed for contact with the edge of a coin carried in the cradle arms, the lever shoulder making contact wth the coin edge to pivot the lever and increase the distance between the lever shoulder and one cradle arm,
(d) a stop means on the frame and engaging the lever to limit pivotal movement of the lever and determine the maximum distance between the lever shoulder and said one cradle arm for allowing a coin of acceptable size to pass between the lever shoulder and said one cradle arm to the

passageway, and for precluding passage of an oversize coin between the lever shoulder and said one cradle arm,
(e) the stop means being adjustably mounted to engage and limit movement of the lever at selective rotated positions of the lever for selectively varying the predetermined distance between the lever shoulder and said one cradle arm, and thereby selectively determining the size of the coin that will pass between the lever shoulder and said one cradle arm to the passageway, and
(f) the stop means including:
  (1) a stop arm, and
  (2) a fastener pivotally mounting the stop arm on the frame, the fastener allowing the stop arm to be pivotally moved selectively toward and away from the lever and to be selectively fixed to engage and limit movement of the lever at a selective rotated position of the lever.

4,098,387
ADJUSTABLE COUNTERWEIGHT FOR ONE-ARMED COIN CRADLE

Bart G. Martin, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.
Filed Nov. 17, 1976, Ser. No. 742,601
Int. Cl.² G07F *3/04*
U.S. Cl. 194—102 **3 Claims**



1. In a coin testing apparatus for detecting both coin size and weight:
(a) a frame means defining a coin passageway,
(b) a cradle pivotally mounted on the frame means about a pivot axis, the cradle including an arm at one side of the pivot axis,
(c) a shoulder fixed to the frame means and spaced from the cradle arm a first predetermined distance slightly less than the diameter of a true value coin for carrying a coin having the diameter of a true value coin on and between the cradle arm and shoulder when the cradle is in an initial position, and spaced from the cradle arm a second predetermined distance slightly greater than the diameter of the true value coin for passing the coin having the diameter of the true value coin between the cradle arm and shoulder and to the coin passageway when the cradle is moved to a delivery position, so that only a coin of proper size is passed to the coin passageway, and
(d) a counterweight adjustably mounted on the cradle at the other side of the pivot axis for varying the location of the counterweight selectively from the pivot axis to counterbalance the weight of the true value coin so that the true value coin will move the cradle from the initial position to the delivery position and be delivered to the coin passageway at a predetermined momentum but a coin of proper size but of different weight carried on and between the cradle arm and shoulder will have a different momentum.

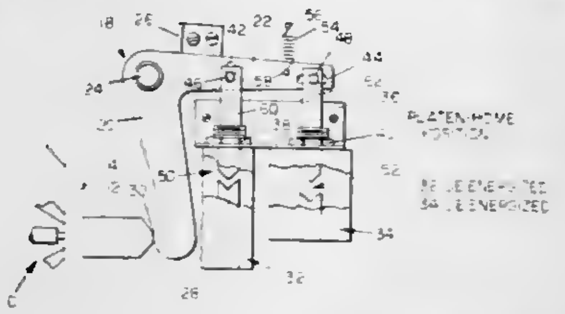
4,098,388
PRINTING WIRE FOR USE IN A MATRIX PRINTER AND METHOD FOR MAKING SAME

Jean-Pierre Dubois, Bole, Switzerland, assignor to Fabrique d'Horlogerie CHS, Tissot & Fils. S.A., Le Locle, Switzerland
Filed Nov. 4, 1976, Ser. No. 738,921
Int. Cl.² B41J *3/44;* **C25D** *5/02, 7/06*
U.S. Cl. 400—124 **3 Claims**

1. A printing wire; for use in a matrix printer of predetermined length, made from a hard metallic material on one end of which is moulded a cap member of organic plastic material wherein the aforesaid one end is initially provided with an enlarged supporting surface comprising a galvanic nickel deposit.

4,098,389
THREE POSITION PLATEN CONTROL MECHANISM

Okun Kwan, Trumbull, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Aug. 20, 1976, Ser. No. 716,310
Int. Cl.² B41J *11/20, 11/10*
U.S. Cl. 400—649 **6 Claims**

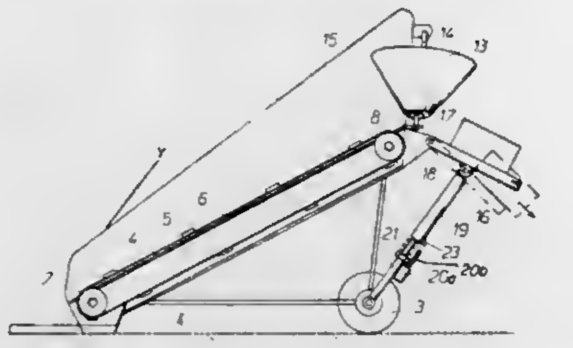


1. In a printer having a print head, a platen displaceable relative to the print head between a fully retracted position permitting insertion or removal of a document and a print position in which the document is engaged with the print head, and mechanical means for displacing the platen between said fully retracted and print positions, the improvement comprising:
plural power operated means connected to the mechanical means for effecting displacement of the platen,
said plural operating means comprising two electromagnetic devices driving a common output member associated with said mechanical means,
wherein:
said two electromagnetic devices are energizeable in various combinations including a combination wherein both of said devices are energized,
said common output member is displaced responsive to said combinations of energization of said two devices,
said mechanical means is displaced by displacement of said common output member associated therewith, and
said platen is displaced by said mechanical means to the fully retracted and print positions and to a third position intermediate the fully retracted and print positions to permit indexing of the document.

4,098,390
BALE UNLOADER

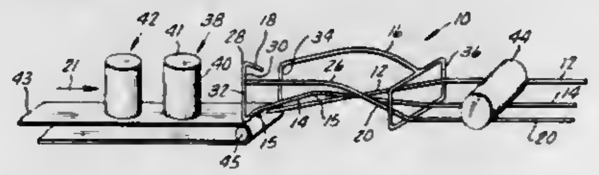
Georges Calvet, Villefranche-de-Rouergue, France, assignor to Ets Calvet, Villefranche-de-Rouergue, France
Filed May 10, 1976, Ser. No. 684,912
Claims priority, application France, May 12, 1975, 7514741; May 28, 1975, 7516645; Mar. 5, 1976, 7606350
Int. Cl.² B65G *47/14*
U.S. Cl. 198—396 **3 Claims**

1. Apparatus for unloading one by one bales of straw, hay or similar products stored in bulk, comprising:
an inclined passageway open at its upper end;
a longitudinal conveyor above the bottom of said passageway;
convergent deflectors at the upper end of the passageway forming an exit opening through which the bales can pass only one by one oriented lengthwise, the deflectors being arranged such that those bales which are located on top of other bales are sent back to the rear, a motor for said conveyor having a power supply circuit, cut-off means for cutting said power supply circuit in and for cutting it out, and a bale receiving device comprising a movable tray linked to said cut-off means so that the power supply circuit is cut out when a bale is on said movable tray and cut in when a bale is not on said movable tray.



4,098,391
ARTICLE ATTITUDE HANDLING APPARATUS

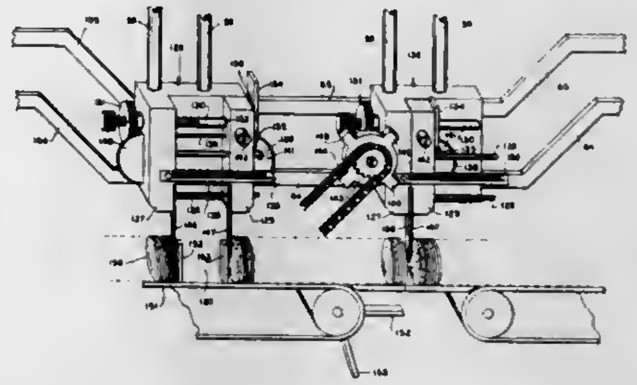
Jesus M. Hernandez, 135 Hughes Dr., Oxnard, Calif. 93030
Filed Jun. 16, 1976, Ser. No. 696,570
Int. Cl.² B65G *47/24*
U.S. Cl. 198—417 **7 Claims**



1. Article handling apparatus for rotating a procession of cans, each having at least one side wall and a bottom surface meeting at a sharp intersection, in a can conveyor line from a vertical to a horizontal attitude during traversal of the cans from the inlet end to the outlet end of the apparatus, the apparatus comprising:
a guide framework having a plurality of rods extending between an entrance portion with a bottom and opposed sides and an exit frame having a bottom, top and opposed sides;
a first rod of said plurality extending from the bottom of the entrance portion to a first side of the exit frame for elevating the bottom surfaces of the cans riding thereon;
a second rod of said plurality extending from a second side of the entrance portion to the bottom of the exit frame and having an elevated section between the ends of the second rod, the second rod being adapted to engage the at least one side wall at a point above the bottom surface but below the can center of gravity;
a third rod of said plurality extending from the entrance portion to the exit frame in the direction between the first and second rods and having a section positioned to engage the portion of the can below the center of gravity thereof for directing the lower portion of the can to ride along the first rod and for tilting the can so that the upper portion rides along the second rod; and
a fourth rod positioned to restrain the can on the at least one side wall opposite the second rod for tilting the can toward the second rod.

4,098,392
POTATO CHIPS PROCESSING MACHINE

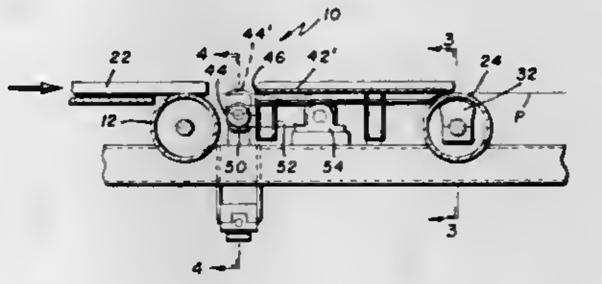
William F. Greene, Rte. 1, Hull, Ga. 30646
Filed Oct. 26, 1976, Ser. No. 735,826
Int. Cl.² B65B *35/30*
U.S. Cl. 198—425 **7 Claims**



1. A method of separating a series of shingle stacked edge standing aligned products each with an upwardly extending rectilinear dimension into groups of aligned products comprising moving an abutment along a horizontal path extending along the length of the aligned products at a predetermined velocity, urging the aligned products along the path at a velocity greater than the predetermined velocity in the same direction in which the abutment moves so that the abutment limits the velocity at which the products move along the path and the products are continuously urged into their shingle stacked edge standing relationship, moving a pair of juxtaposed separating elements at a velocity having a horizontal component approximately the same along the path as the velocity of the abutment along the path, inserting the pair of juxtaposed separating elements downwardly into the series of aligned articles between adjacent ones of the articles as the juxtaposed separating elements continue to move with a horizontal component of velocity approximately the same along the path as the velocity of the abutment along the path and as the products are continuously urged into their shingle stacked edge standing relationship, and continuing to move a first one of the separating elements along the path at the same velocity while temporarily reducing the velocity of a second one of the separating elements to form a space in the series of products whereby the second separating element becomes the abutment for the oncoming series of products.

4,098,393
APPARATUS FOR LATERALLY SEPARATING ELONGATED MAGNETIC ELEMENTS

Robert D. Wykes, and Colin Roy, both of Worcester, Mass., assignors to Morgan Construction Company, Worcester, Mass.
Filed Apr. 22, 1977, Ser. No. 790,052
Int. Cl.² B65G *47/26*
U.S. Cl. 198—458 **5 Claims**

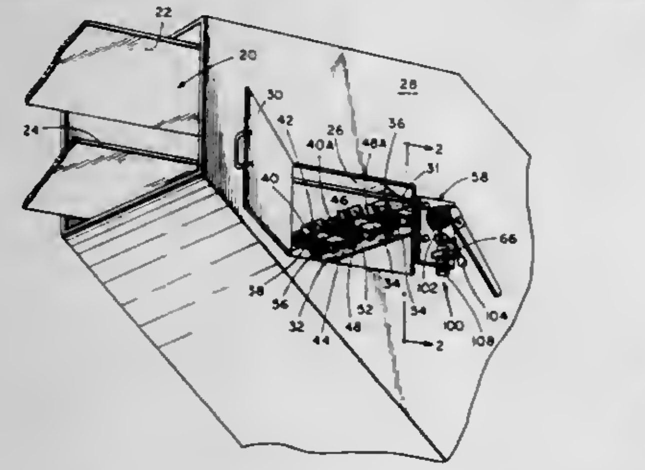


1. Apparatus for laterally separating a group of elongated magnetic elements moving longitudinally along a conveyor surface, comprising: a rotatable fanning roll extending trans-

versally across the path of the elements, said fanning roll having magnetic means associated therewith for attracting the elements against said fanning roll while simultaneously creating repulsion forces tending to laterally separate the elements; and deflecting means for lifting the longitudinally moving elements above the conveyor surface until the elements are attracted against the surface of said fanning roll by said magnetic means.

4,098,394
RATCHET TENSIONER FOR BELT CLEANERS

Richard Stahura, Indiana, Pa., assignor to Martin Engineering Company, Neponset, Ill.
Filed Nov. 22, 1976, Ser. No. 743,769
Int. Cl.² B65G *45/00*
U.S. Cl. 198—499 **2 Claims**



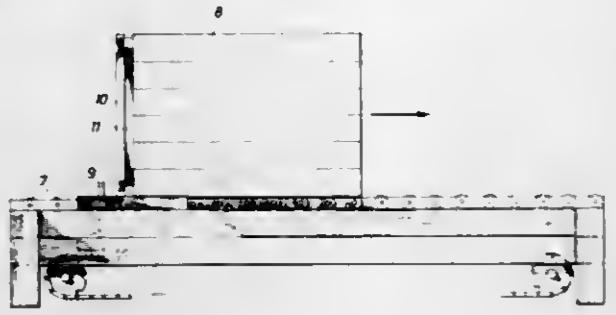
1. An adjustable mounting arrangement for conveyor belt cleaners including a shaft positioned transverse to the direction of travel of the belt to be cleaned; mounting means associated with said shaft adapted to carry a plurality of belt cleaner blades; a pair of mounting plates each defining an aperture through which said shaft extends, each of said mounting plates adapted to be secured on an opposite side of a housing for said conveyor belt and to rotatably support said shaft; a pawl mechanism associated with said shaft for providing selective incremental rotation of said shaft including a ratchet handle connectible to said shaft and positionable at any point on a 360° radius about the central axis of said shaft; a rotary gear element rotatably connected to said shaft, a coupling rotatable with said shaft adapted to provide a connection between said handle and said shaft for transmission of torque to said shaft, said pawl mechanism having at least one end thereof biased into engagement with said rotary gear element, and a lock member fixed on one of said mounting plates including a spring biased detent in engagement with the pawl to provide one way locking means associated with said shaft selectively operable to prevent rotation of said shaft in one direction.

4,098,395
FEEDING DEVICE ESPECIALLY FOR PULP BALES

Carl Fritjof Stanley Olsson, Kampastigen 4, S-352 52 Vaxjo, Sweden
Filed Jun. 24, 1976, Ser. No. 699,445
Claims priority, application Sweden, Jun. 26, 1975, 7507357
Int. Cl.² B65G *19/24*
U.S. Cl. 198—748 **3 Claims**

1. Apparatus for feeding goods of the type having a tendency to separate into layers into a processing machine in a direction generally parallel with the layers comprising:

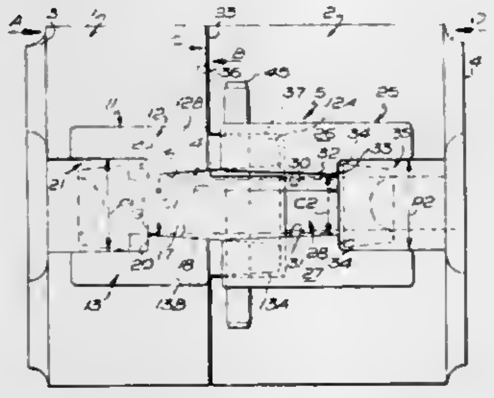
a roller conveyor for movably supporting the goods,
a pair of channel beams positioned on each side of said roller conveyor,
a carriage positioned between each pair of said channel beams,
each said carriage having a pair of rollers on each side thereof, said pairs of rollers being disposed respectively within said channels so as to guide said carriages,
a gate adapted to engage the goods supported on said roller conveyor,
a pair of vertical rods connected respectively to said carriages and positioned to engage said gate,



a pair of chains engaged by driven sprockets, said chains having link shafts separated by spaces, and
vertically movable pin means received in each said carriage, said pin means having lower ends in engagement respectively with said chains in the spaces between said link shafts and adapted to be released from said chains by the teeth of said sprockets.

4,098,396
CONVEYOR JOINT

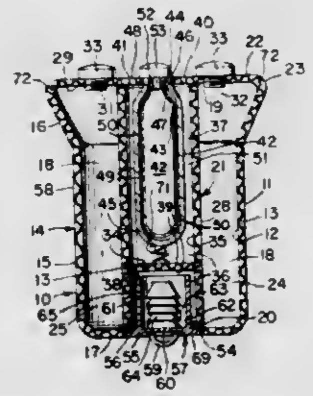
Brian Raymond Stoppani, and Nigel John Box, both of Doncaster, Great Britain, assignors to Mining Supplies Limited, England
Filed Dec. 13, 1976, Ser. No. 749,775
Int. Cl.² B65G *19/28*
U.S. Cl. 198—861 **13 Claims**



1. A joint for connecting together adjacent ends of individual elongate pans of an armoured scraper chain conveyor, said joint comprising adjacent conveyor pan end piece formations provided on the exterior of adjacent sidewall surfaces of said pans, said end piece formations including interengaging male and female formations having overlapped segments thereof, each formation being provided with one or more abutment surfaces forming part of a laterally open pocket connected to a laterally open channel, a common laterally inserted connector received in said pocket and channel of the adjacent end piece formations, said connector having a shank located within respective channels and at each end of said shank an enlarged head located within respective pockets so as to be engageable with an abutment surface of a respective pocket, thereby to prevent longitudinal separation of said adjacent elongate pans while providing for articulated movement therebetween, said shank having a portion disposed laterally beyond said overlapped segments of said male and female formations, and pin means extending generally transverse from said laterally disposed shank portion, and projection means on at least one of said male or female formations also disposed laterally beyond said overlapped segments, and embracing said pin means to restrain said connector from lateral displacement with respect to said pocket, thereby to maintain said connector disposed within said channels and pockets, such that said pin means does not interconnect said overlapped segments, which would unduly restrict the relative longitudinal movement of said formations.

4,098,397
MULTI CHAMBERED THERMAL CONTAINER

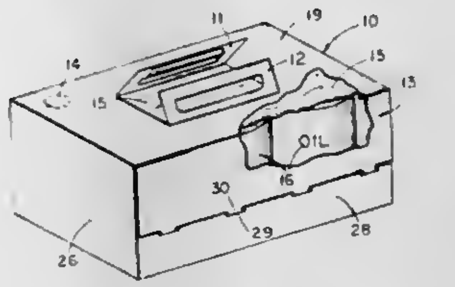
William Mann, Jr., and Willa L. Mann, both of Box A 901 3636-16th St. NW., Washington, D.C. 20010
Filed Mar. 17, 1975, Ser. No. 558,928
Int. Cl.² B65D *81/38, 25/04*
U.S. Cl. 206—217 **3 Claims**



1. A multi chambered thermal container, which comprises:
(a) an outer casing having a cylindrically shaped lower portion, a flat lateral base, a frustum shaped upper portion, and a horizontally placed annular member affixed to a top inside periphery of said frustum shaped upper portion;
(b) an open ended vertically placed cylinder sleeve affixed between said flat lateral bottom base and said horizontally placed annular member, said open ended sleeve having an interior chamber therein;
(c) a first and a second vertically placed divider affixed in a trans alignment to a longitudinal sidewall of said open ended sleeve and an interior periphery of said outer casing forming a right and a left semi-annular chamber therein;
(d) two female threaded apertures contained within said annular member and communicating with said left and said right semi-annular chambers;
(e) a male threaded cap threadably engaging each said female threaded aperture;
(f) said outer casing having an outer aluminum wall with a plastic coating and an interior plastic wall;
(g) an internal fiberglass layer disposed between said interior plastic wall and said outer aluminum wall;
(h) female threads contained on an inside periphery of said annular member;
(i) a horizontally placed disc contained in said interior chamber dividing said interior chamber into a large upper chamber and a small bottom chamber;
(j) a second circular disc having male threads on the outside periphery of said second circular disc, said second circular disc threadably engaging said female threads of said annular member, said second circular disc having a center circular aperture therein;
(k) a rubber ring affixed in said center circular aperture;
(l) a cylindrically shaped vessel having a convergent top end portion, an open top, and a rounded closed bottom, said convergent top end portion anchored within said rubber ring, said cylindrically shaped vessel contained within said large upper chamber; and
(m) a cork having a plastic top positioned in said open top of said cylindrically shaped vessel.

4,098,398
CONTAINER FOR RECYCLE OF MOTOR OIL

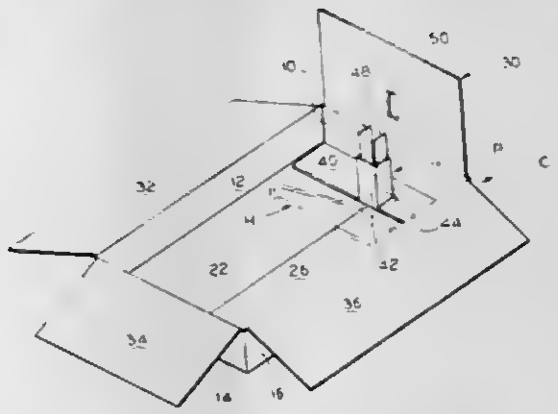
Gene P. Meyers, Conroe, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.
Filed May 9, 1977, Ser. No. 794,908
Int. Cl.² B65D *81/36;* **F16N** *33/00*
U.S. Cl. 206—223 **20 Claims**



1. A packaging system for motor oil and similar liquids which comprises a semirigid outer package having inside dimensions sufficient to permit the inclusion therein of a containerized supply of liquid within said outer package; means for removing said containerized supply from said outer package; an empty bag of flexible, impervious material contained within said outer package and of sufficient size, on the introduction of used liquid into said bag following the removal of said containerized supply of liquid, to substantially fill said outer package; means for introducing used liquid into said bag while the bag is in said outer package; and means for preventing the escape of used liquid from said bag.

4,098,399
CONTAINER WITH INTEGRAL HANGER BAR

Billy R. Bethune, Chattanooga, Tenn., and Larry M. Balkin, Decatur, Ga., assignors to Container Corporation of America, Chicago, Ill.
Filed Aug. 9, 1977, Ser. No. 823,033
Int. Cl.² B65D *85/18*
U.S. Cl. 206—288 **1 Claim**

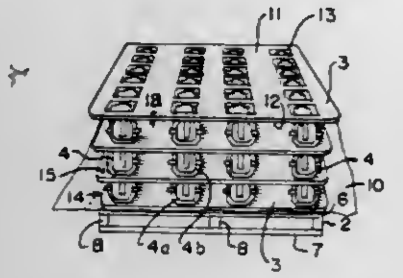


1. In a garment container, formed of a unitary blank of foldable paperboard, having an integral hanger bar, the combination of:
(a) top, bottom, and side body walls foldably interconnected to form a tubular construction open at the front and rear;
(b) front and rear sidw walls joined to the front and rear edges of respective top, bottom, and side body walls for closing the front and rear sides of tubular structure;
(c) an integral hanger bar extending transversely between and secured to front and rear walls adjacent the top end of said container for supporting at least one garment hanger thereon;
(d) said hanger bar being generally U-shaped in cross-section.

4,098,400
RETURNABLE PACKAGING SYSTEM

Frank C. Brown, St. Charles, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 18, 1977, Ser. No. 779,063
Int. Cl.² B65D *19/00, 85/68*
U.S. Cl. 206—319 **7 Claims**



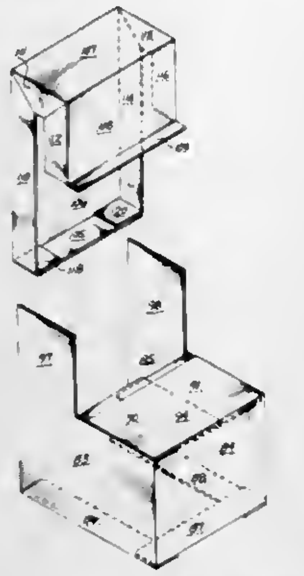
1. A returnable packaging system, comprising:
a pallet;
a plurality of trays on said pallet, said trays being constructed from a relatively thin thickness of material, said trays having a first generally planar outer surface and a second generally planar outer surface, with the material thickness of said trays therebetween and means along said outer surfaces of said trays for receiving a plurality of parts, said receiving means including a plurality of receptacle cut-outs extending inwardly of said first and second planar surfaces through said thickness, each cut-out being seized to nest each individual parts therein and to receive parts on opposite sides of said trays, whereby said cut-outs being designed to prevent intimate contact between each part on opposite sides of said trays and whereby the nesting provided by said cut-outs prevents shifting of each individual parts;
said plurality of parts on said trays being arranged in a tray-part-tray layer relationship, the top of a part of a first layer being spaced from a bottom of a part of a succeeding layer in said layered relationship by individual ones of said tray plurality; and
a heat shrinkable cover about layered parts, said cover engaging at least a portion of said pallet below the initial tray of said stacked plurality of parts in the heat shrunk size thereof.

4,098,401
FURNITURE CONTAINER

Jimmie L. Brown, Florence, Ala.; Gordon L. Hinton, Savannah, Tenn., and John T. Magazzu, Florence, Ala., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 18, 1976, Ser. No. 715,364
Int. Cl.² B65D *85/64*
U.S. Cl. 206—326 **9 Claims**

1. A shipping container comprising a lower body and an upper neck formed from
a unitary front section comprising
a front wall, a pair of generally L-shaped side walls, and closure flaps, said L-shaped side walls attached to said front wall,
each of said side walls having a front edge adjacent said front wall, a rear edge spaced from said front wall, and an upwardly extending neck portion adjacent said rear edge, said body closure flap attached to said walls; and
a separate unitary back section comprising
a back panel, a neck top panel, a neck front panel, and securing flaps on each side of each panel, said back panel interconnecting said rear edges of said side walls,
said neck top panel interconnecting the upper edges of said neck portions of said side walls,
said neck front panel interconnecting the front edges of said neck portion of said side walls;

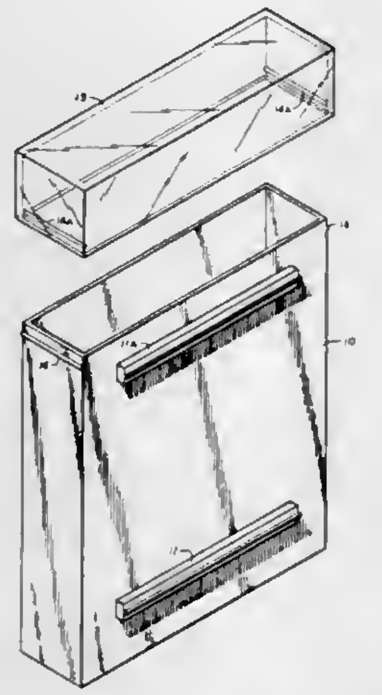


said securing flaps connecting said panels to said L-shaped side walls to give added strength to said panels.

4,098,402
MODULAR TYPE CARTRIDGE STORAGE

Roger W. Rogg, Box 490, Hutchinson, Kans. 67501

Filed Mar. 15, 1976, Ser. No. 652,971
Int. Cl.² B65D *85/672*
U.S. Cl. 206—387 **6 Claims**

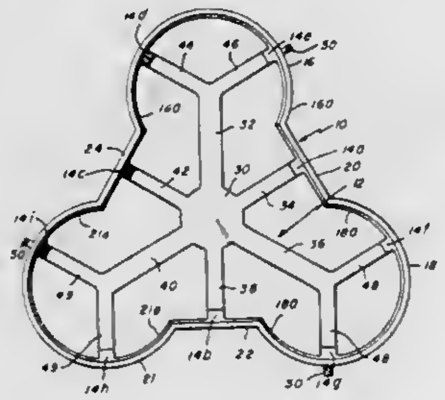


1. A modular container system for visible storage and display of tape cartridges comprising:
(a) closeable container means having a front face, rear face, opposite side edges and a bottom wall, said container means having an open top end for reception of tape cartridges;
(b) closure means separate from said connecting means and adapted for engagement on the exterior surface surrounding said container at the open top end thereof for closing said container and protecting the contained cartridges;
(c) connecting means disposed on the exterior of said front and rear faces and externally of said closeable container for connecting multiple containers in stacked flat face-to-face relationship, said connecting means including:
(i) an elongate male connector member on one said face having a tongue section;
(ii) an elongate female member on the other of said face having a groove therein to receive said male member;
said male and female connector members' being dimensioned for slideable engagement for securing adjacent closed containers in interlocking uniformally spaced-apart engagement to accommodate said closure means between said front and rear faces.

4,098,403
BEVERAGE CARRIER

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Dec. 20, 1976, Ser. No. 752,409
Int. Cl.² B65D *21/02, 81/26, 25/10*
U.S. Cl. 206—519 **7 Claims**



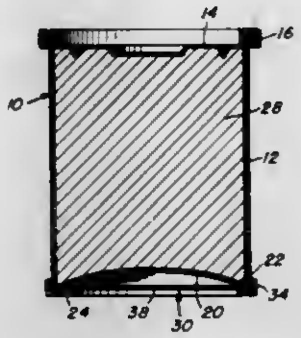
1. A cup carrier comprising
an upper band adapted to engage the side walls of a plurality of cups intermediate their tops and bottoms,
said band forming at least two cup engaging sections each being generally arcuate in shape and having an angular extent of more than 180° so as to surround more than half the circumference of the cup, said cup engaging sections being flexible to enable the sections to be flexed outwardly to effectively increase their diameter so that they may receive any one of a plurality of different cups of a diameter greater than the normal diameter of each section,
a plurality of strips connected and extending downwardly from spaced points on the band,
a web connected to the strips for supporting the bottoms of cups in the carrier,
said band, strips and web being integrally molded of a plastic material,
and said strips converging in a downwardly direction enabling identical carriers to be nested with the band, strips and web of one carrier being disposed in close proximity to the band, strips and web of another carrier.

4,098,404
VACUUM PACKAGE WITH FLEXIBLE END

Herman Rupert Markert, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Continuation-in-part of Ser. No. 335,393, Feb. 23, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,500
Int. Cl.² B65D *3/10, 3/22*
U.S. Cl. 206—525 **5 Claims**

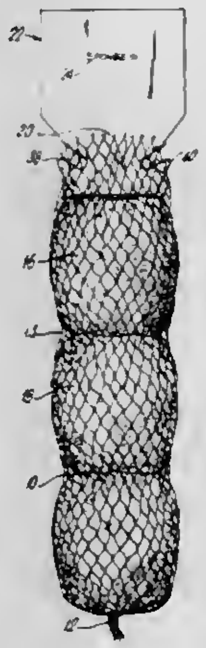
1. An air impermeable vacuum package comprising a body having opposed ends, said body being of composite construction and having at least one air impermeable liner, an air impermeable end cap sealing one end of the body, an air impermeable force transmitting membrane sealed to the impermeable liner and sealing the other end of the body, said membrane being readily deformable relative to said body, a compactable product sealed within the body by the end cap and the membrane, a reduced pressure environment within the package sufficient to effect a pressure differential relative to external atmospheric pressure such that said membrane is inwardly deformed into force transmitting compacting engagement with the product, said product being compacted by said pressure deformed force transmitting membrane against the inner surfaces of the body and end cap and internally rigidifying and strengthening the package.



4,098,405
MESH CONTAINER AND HEADER

George Botvin, Cumberland, R.I., assignor to A.C.S. Industries, Inc., Woonsocket, R.I.

Filed May 31, 1977, Ser. No. 802,045
Int. Cl.² B65D *29/00, 33/06*
U.S. Cl. 206—527 **3 Claims**



1. A container for articles including a package having mesh-like openings at at least a portion adjacent its upper end, the lower end of said package being closed, and a header inserted into the upper end of said package, said header comprising an upper portion having a width greater than the width of the upper end of said package, a base, and a pair of opposed tapering camming side walls extending upwardly and outwardly from said base and defining a pair of opposed wing-like members extending from said base, the width of said base being less than the width of the upper opening of said package to permit the insertion of the lower part of said header into said package, the distance between the ends of said wing-like members being less than the width of said upper portion and the ends of said winglike members having one dimension less than one dimension of said mesh-like openings, such that when the lower end of said header is inserted into the upper end of said package, the ends of said winglike members respectively project through opposed ones of said openings, thereby retaining said header in said package and closing the upper end of said package.

4,098,406
POLYMER FILM HAVING LINEAR TEAR PROPERTIES

Norman J. Otten, Prospect Heights, and Eldrige J. Pressell, Round Lake, both of Ill., assignors to Tower Products, Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 486,082, Jul. 5, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,703

Int. Cl.² B65D *33/00;* **B29C** *17/06;* **B32B** *27/08*

U.S. Cl. 206—601 **15 Claims**

1. A method of imparting linear tear properties in the direction of extrusion to a polymer film comprising the steps of preparing a blend of resins consisting essentially of from about 12% to about 95% ionomer resin and from about 5% to about 88% low density polyethylene resin, and extruding said blend of resins into a film, whereby said film exhibits linear tear properties in a direction parallel to the direction of extrusion.

6. An extruded polymer film consisting essentially of from about 12% to about 95% of ionomer and the remainder as polyethylene having a density of from about 0.910 to about 0.960, said film being capable of being torn in substantially a straight line in the direction of extrusion at a deviation of less than 20° from said straight line.

12. A pouch composed of an extruded polymer film, said pouch having a top edge, bottom edge and side edges, said top and bottom edges being substantially parallel with the direction of extrusion of said film, the film of said pouch consisting essentially of from about 12% to about 95% ionomer with the remainder as polyethylene having a density of 0.910 to about 0.960 and containing from about zero to 7.5% vinyl acetate, said pouch being capable of being torn from side to side in substantially a straight line parallel with the direction of extrusion.

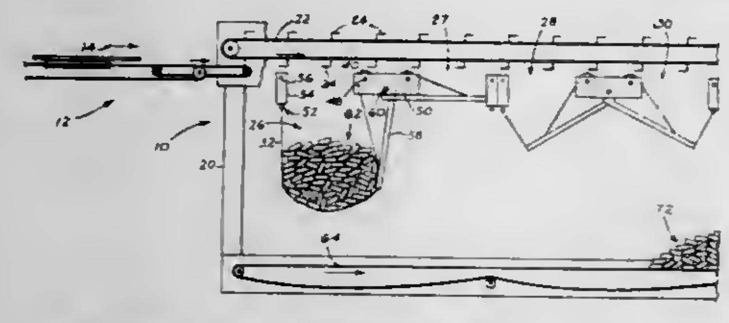
4,098,407
LUMBER SORTING APPARATUS

Jack Moore, Portland, Oreg., assignor to Lumber Systems, Inc., Portland, Oreg.

Filed Sep. 13, 1976, Ser. No. 722,638

Int. Cl.² B65G *47/34*

U.S. Cl. 209—74 R **13 Claims**



1. In a lumber sorter including a frame,
an elongated flexible sling for forming at least a portion of an open-topped bin for the receipt of sorted lumber,
first mounting means nonreleasably mounting one end of said sling at one fixed position on said frame, and
second mounting means releasably mounting the other end of said sling at another fixed position on said frame for selective release and recapture of said other end.

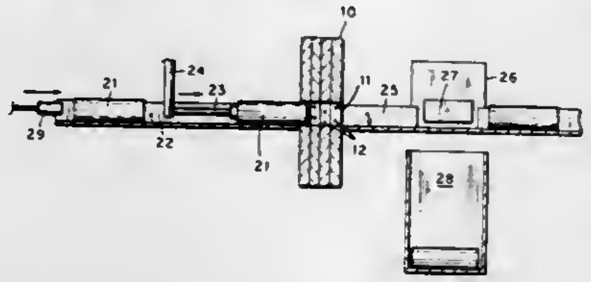
4,098,408
AUTOMATIC INSPECTION SYSTEM FOR NUCLEAR FUEL PELLETS OR RODS

William H. Miller, Jr., Oak Ridge; John D. Sease, Knoxville; William R. Hamel, Concord, and Ronnie A. Bradley, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 734,835, Oct. 22, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 791,257

Int. Cl.² B07C *5/08;* **G01B** *13/04*

U.S. Cl. 209—82 **3 Claims**



1. A diameter and surface inspection gage system for sequentially inspecting a plurality of respective cylindrical objects, comprising an inspection ring provided with a cylindrical passageway; a plurality of respective sets of equally spaced, pneumatic jets exiting into said passageway, each of said sets of jets being oriented at different respective polar orientations to the axis of said passageway with respect to each of the other sets of jets; a plurality of pneumatic circuits with each of said sets of jets being connected by separate annular headers into a respective one of said pneumatic circuits; a source of constant pneumatic pressure coupled to said pneumatic circuits, a respective pressure transducer coupled to each of said pneumatic circuits; a pneumatic operated conveyor means including a rejection system and affixed to said inspection ring, said conveyor means adapted to sequentially move each of said cylindrical objects to be inspected through said passageway of said inspection ring; each of said respective pressure transducers adapted to sense the respective average back pressure from each of said respective pneumatic circuits and provide a respective electrical signal output as a function of said respective average back pressure; and an electronic comparator connected to the electrical outputs of said transducers, said comparator adapted to provide an electrical output signal as a function of any imbalance in back pressure as sensed by said transducers which is indicative of any diameter variations or surface imperfections of any given one of said objects being inspected.

4,098,409
FOLDABLE SHIPPING RACK

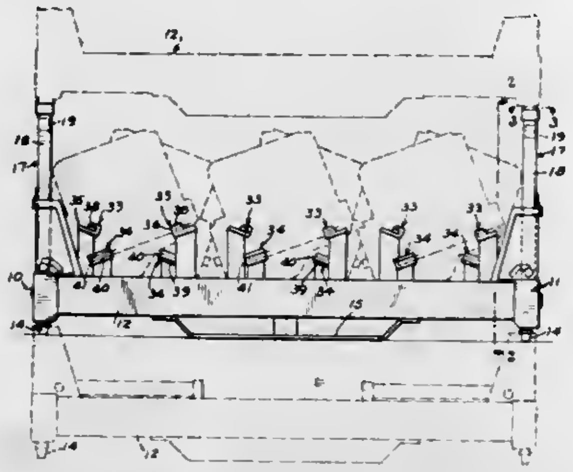
Cleo E. Massey, Flint, Mich., assignor to Moore Iron Works, Flint, Mich.

Filed Mar. 4, 1977, Ser. No. 774,388

Int. Cl.² A47F *5/10*

U.S. Cl. 211—195 **10 Claims**

1. In a foldable shipping rack, the combination comprising a base frame,
said base frame having portions adapted to engage a flat surface,
and end frames,
means for supporting each end frame on the base frame and for guiding said end frame for movement between a first locked position wherein the end frame is in upright position with respect to the base frame and a folded position wherein the end frame is in substantial parallel relation to the base frame,
said means for mounting and guiding said end frame comprising a frame support on said base frame,
said frame support including a generally inverted U-shaped slot having side edges defining a first leg extending generally vertically,
a second leg extending generally horizontally and inwardly, and a third leg extending downwardly and inwardly of the base frame,



a pin mounted on said end frame and extending through said slot in a position such that when the end frame is in upright position, the pin is at the lower end of the first leg, and when the end frame is elevated, the pin is guided by the side edges of said second and third legs of the slot to guide the end frame to the folded position.

4,098,410
SAFE LOAD INDICATOR FOR JIB CRANES

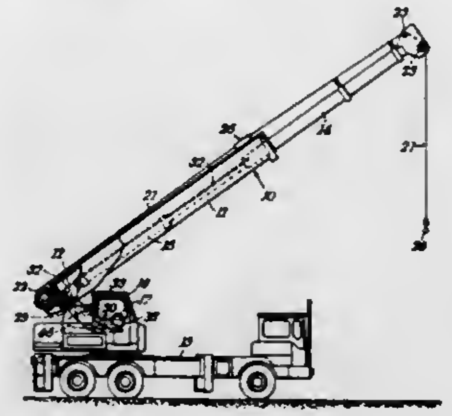
Brian George Nixon, Twickenham, and Ian William Stimpson, Yateley, near Camberley, both of England, assignors to Weighload Limited, London, England

Filed Feb. 15, 1977, Ser. No. 768,731

Claims priority, application United Kingdom, Feb. 25, 1976, 07446/76

Int. Cl.² B66C *13/48*

U.S. Cl. 212—39 MS **6 Claims**



1. In a crane having a telescopic jib, means for changing the length of said telescopic jib, an overload warning device having means to warn the crane operator when the load on the jib approaches the maximum safe load on the jib corresponding to any length of the telescopic jib, pointer means for indicating the maximum safe load on the jib for any given jib length by the position of said pointer means, pointer control means including a slave jib which is turned to the same angle with the horizontal as said telescopic jib, a transmission between said slave jib and said pointer means, the improvement comprising a bank of cams, each one of the cams corresponding to a different length of the telescopic jib, a common follower cooperable with said cams to impart movement to said pointer means, and a selector mechanism operable automatically and without manual intervention in response to a change in the length of the telescopic jib for effecting relative movement between the follower and the cams to bring the follower into contact with the cam corresponding to the newly selected jib length.

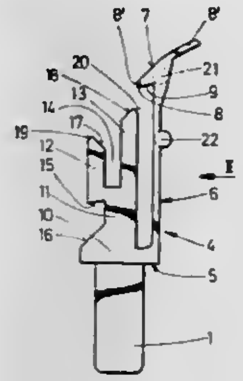
4,098,411
COUPLING FOR MODEL VEHICLES

Heinz Röesler, Dr.-Sylvester-Strasse 18, 5034 Salzburg-Morzg, Austria

Filed Mar. 28, 1977, Ser. No. 782,083

Int. Cl.² A63H *19/00*

U.S. Cl. 213—75 TC **11 Claims**



1. A coupling for model vehicles, particularly model rail vehicles, comprising a supporting member to be secured to a vehicle or a locomotive, and a coupling member which is formed with a receptacle suitable for the entry of a correspondingly constructed counter-coupling member, a coupling hook, and a resilient lug which is movable in a substantially horizontal plane and has at its free end a ramp with an obliquely forwardly and outwardly directed guide feeler, characterised in that the resilient lug (6) carries the coupling hook (8) and that the receptacle (14) comprises a coupling fork (11, 12, 13) which is rigidly connected to the supporting member and on the outside of which there is provided a coupling catch (15).

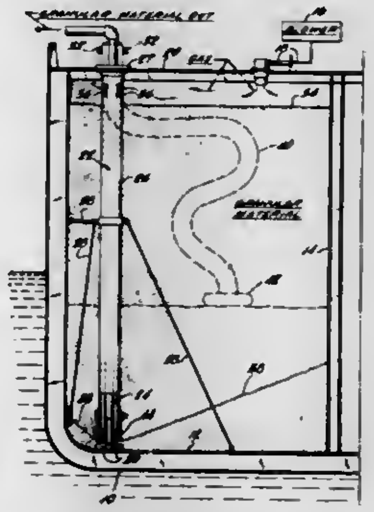
4,098,412
PNEUMATIC OFFLOADING SYSTEM FOR TANKER

MacLean C. Shaksbober, Chadds Ford, Pa., assignor to Sun Shipbuilding & Dry Dock Company, Chester, Pa.

Filed Oct. 12, 1976, Ser. No. 731,275

Int. Cl.² B65G *53/16*

U.S. Cl. 214—15 D **6 Claims**



1. A system for removing granular material such as wheat from a pressurized hold in a tanker which consists of:
(a) a single input source of pressurized gas coupled to the pressurized hold near its top;
(b) a continuous pipe for transporting granular materials out of the pressurized hold said pipe having a discharge end

outside the presurized hold and a pickup section near the bottom of the pressurized hold;

(c) a pressurized gas pipe concentric with said discharge pipe, conpled to the pressurized gas, for transporting pressurized gas to the pickup section of the discharge pipe where the pressurized gas will flow into and entrain the granular material and transport it out of the pressurized hold through the discharge pipe, whereby the pressurized hold of the tanker is advantageously utilized to remove granular materials from the hold.

4,098,413

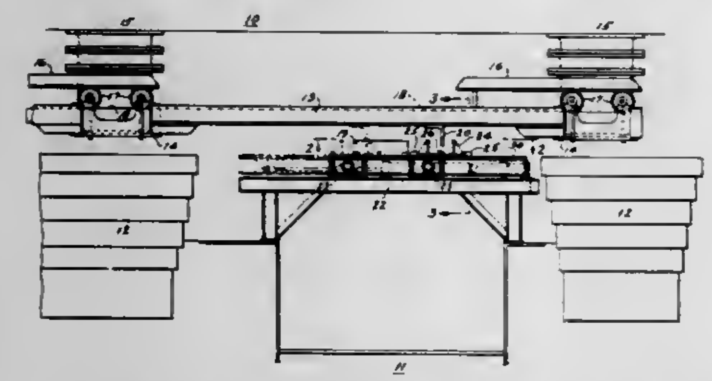
BIN GATE OPERATING APPARATUS

William E. Barron, Johnstown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 9, 1976, Ser. No. 740,274

Int. Cl.² B65G *65/66*

U.S. Cl. 214—17 R **4 Claims**



1. In apparatus for operating a bin gate on a material storage bin to control the flow of material stored therein into a material receiving hopper which is mounted in alignment with and beneath the material storage bin, the apparatus including a frame rigidly connected to the bin gate adapted for back and forth movement, a lever arm mounted on and projecting beneath the frame, a carriage mounted beneath and spaced from the frame, an upwardly projecting guiding element mounted on the carriage adapted to contact the downwardly projecting lever arm on the frame, the improvement comprising:

a double acting duplex hydraulic cylinder mounted on the material receiving hopper having first and second pistons moving freely of one another within the hydraulic cylinder and having rods extending in the same direction, the rod of the first piston attached to the carriage to move the carriage to open and close the bin gate when the first piston is actuated and the rod of the second piston, when the second piston is actuated, moves the first piston a distance to relocate the carriage and allow travel clearance between the guiding element and the lever arm.

4,098,414

PICKUP TRUCK LOADING RAMP

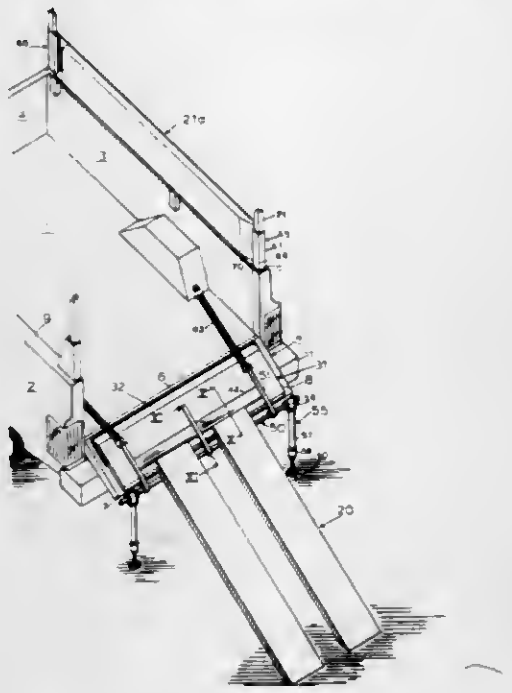
Primitivo A. Abiera, 4441 13th St., NE., Washington, D.C. 20017

Filed Mar. 15, 1977, Ser. No. 777,657

Int. Cl.² B60P *1/00*

U.S. Cl. 214—85 **15 Claims**

1. In a vehicle having a horizontal load carrying bed including mounting means disposed in predetermined spaced relationship along at least one side of the bed for ordinarily mounting a conventional substantially vertical side barrier, and at least one substantially planar loading ramp for disposition against a loading point associated with said bed when in an operative loading position, the improvement wherein said loading ramp has a longitudinal extent approximately equal to the predetermined spaced relationship of the mounting means, and ramp storage means comprising a pair of rack elements engageable with said mounting means and having means for removably retaining said loading ramp in a vertical plane with its longitudinal extent bridging the space between said rack elements when said ramp is in an inoperative storage position whereby said ramp functions as a side barrier in lieu of said ordinarily employed side barrier.



4,098,415

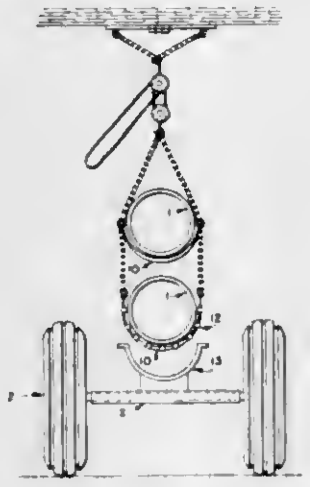
METHOD FOR ROTATING HOSE

Charles E. Mason, Fairmont, W. Va., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 658,647, Feb. 17, 1976, abandoned. This application Mar. 9, 1977, Ser. No. 775,804

Int. Cl.² B65G *53/30*

U.S. Cl. 214—152 **5 Claims**



1. A method for rotating hose sections to allow uniform interior wear, said hose sections being movably supported by a plurality of carts in a underground mine, the method comprising:

(a) attaching a plurality of reversible hoist means to the roof of the mine,

(b) passing at least one flexible support means having roller means incorporated therein under said hose,

(c) connecting said support means to said hoist means, and

(d) lifting said hose from said carts using the hoist means, rotating said hose as desired, and,

(e) reversing said hoist to lower said hose to said carts in a rotated position.

4,098,416

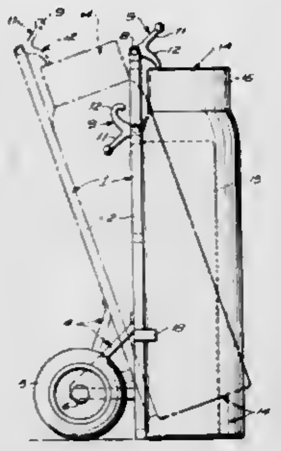
CARRIER FOR COMPRESSED GAS CYLINDERS

Norman C. Fewley, 10460 Hickson St., El Monte, Calif. 91734

Filed Feb. 3, 1977, Ser. No. 765,418

Int. Cl.² B62B *1/06*

U.S. Cl. 214—380 **4 Claims**



1. A carrier for compressed gas cylinders of the type having a valve at its upper end and a cylindrical valve protector extending upwardly around the valve and terminating in an annular internal downwardly directed hook flange, said carrier comprising:

a. an essentially flat frame structure having a front side, a back side, a lower portion and an upper portion;

b. a pair of wheels having a common axis of rotation;

c. a wheel supporting structure for securing the wheels at the back side of the frame structure in tangent relation to a plane essentially perpendicular to the lower end of the frame structure whereby the frame structure may be moved while in an inclined position into point contact with the gas cylinder then tilted to a vertical position placing the upper and lower portions of the frame structure in side contact with the gas cylinder while the gas cylinder rests freely on an underlying surface;

d. and pivotally mounted hook means at the upper portion of the frame structure movable between a position clearing and a position underlying the gas cylinder hook flange of the valve protector, whereby upon subsequently tilting the frame structure about the axis of the wheels, the gas cylinder becomes suspended by the hook means and remains in side contact with the frame structure.

4,098,417

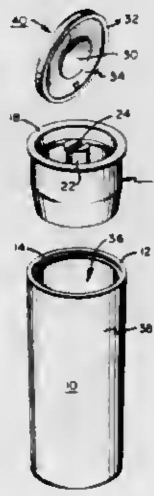
CHILD PROOF PLUG FITMENT

Robert A. Bennett, 170 Sturbridge Rd., Easton, Conn. 06424

Filed Nov. 11, 1977, Ser. No. 850,616

Int. Cl.² B65D *55/02, 85/56*

U.S. Cl. 215—204 **6 Claims**



1. A plug fitment adapted to be removably inserted in a circular port to seal same in a substantially air tight manner, said fitment comprising:

a somewhat flexible body of generally cylindrical shape with a vertical axis, said body having an open upper end and an interior region bounded by an inner wall and communicating with the open end, said upper end having a circular peripheral lip lying in a horizontal plane with an inner periphery defining the periphery of a circular opening centered on said axis;

slightly flexible means disposed in said upper end and said region and including a vertical member spaced from the inner wall and aligned with said axis, said member having a top end disposed below said horizontal plane, said member having a vertical slit extending downwardly from the top end to a bottom position intermediate the top end and the bottom of said member; and

a circular generally flat slightly flexible key disc disposed horizontally and removably in said opening, said disc having a lower surface resting upon said top end of the member and an upper surface essentially coplanar with said lip, said disc, when removed from said opening and oriented vertically, being removably insertable in said slit, the thickness of the disc and the width of the slit having relative values at which the disc, when inserted in the slit, cannot be separated from the body until the body and disc are removed as a unit from said port, whereby after the unit is so removed, the body and disc can be pulled apart manually.

4,098,418

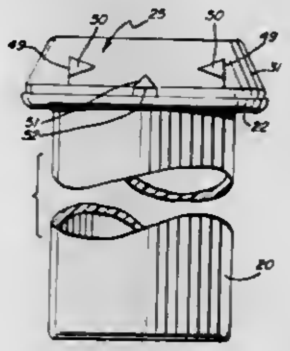
SAFETY CLOSURE

Mack Robert Fields, 1624-2 Lake Dr., Clearwater, Fla. 33516

Filed Oct. 11, 1977, Ser. No. 840,547

Int. Cl.² B65D *55/16*

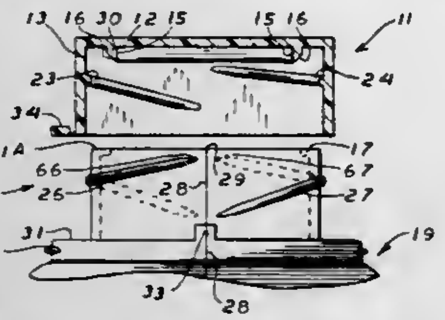
U.S. Cl. 215—206 **18 Claims**



1. A closure device for selectively opening and closing a container, said device comprising in combination, a body portion having a circular seal depending therefrom, a skirt flared outwardly and depending downwardly from said body portion, means for supporting a relatively long portion of said skirt relative to said seal, two segments of said skirt being unsupported by said supporting means, a shorter portion of said skirt separating adjacent ends of said segments, and means for supporting said shorter portion of skirt relative to said seal, whereby pressure on said two segments distorts said portion of skirt outward.

4,098,419
BLOW MOLDED PLASTIC BOTTLE AND ANTITAMPER CAP

John J. Virog, Jr., Massapequa Park, and Leo Von Hagel, North Massapequa, both of N.Y., assignors to Maxcap Inc., New York, N.Y.
Filed Feb. 18, 1977, Ser. No. 770,025
Int. Cl.² B65D *55/02*
U.S. Cl. 215—252 **29 Claims**



1. A combination of a blow molded plastic milk bottle and a plastic cap, comprising

- (a) a neck at the mouth of said bottle, said neck having an external screw thread and an upper inwardly directed circumferential lip,
- (b) said plastic cap adapted to be screwed onto said neck to cover said mouth and having an upper wall, a cylindrical side wall with an internal thread corresponding to said external thread, and a downwardly directed circular plug for engaging said lip when said cap is screwed onto said neck, and to form an anti-leak seal by pressing against said lip,
- (c) cooperating antitamper means on said cap and bottle and including a permanently deformable element, said antitamper means permitting said cap to be rotated in one direction to screw said cap onto said neck to bring said plug into sealing relation to said lip and then preventing rotation in an unscrewing direction unless said element is visibily deformed,

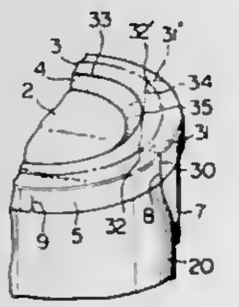
said threads being multiple-start threads comprising

a plurality of external threads of identical pitch having effective portions substantially symmetrically disposed around the periphery of said neck and

a plurality of internal threads of identical pitch having effective portions substantially symmetrically disposed around the internal periphery of said cap.

4,098,420
CAP FOR A BOTTLE

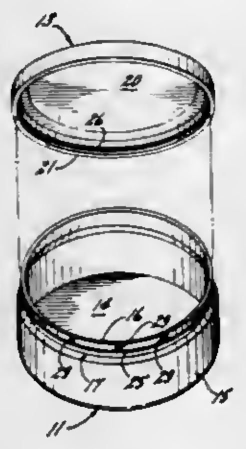
Eitoku Torii, Ibaragi, Japan, assignor to Daiwa Can Company, Ltd., Tokyo, Japan
Filed Dec. 10, 1976, Ser. No. 749,295
Claims priority, application Japan, Dec. 16, 1975, 50-169789[U]
Int. Cl.² B65D *41/42*
U.S. Cl. 215—253 **4 Claims**



1. In a cap made of a thin metallic sheet capable of being torn and adapted for use on a bottle in which a negative pressure is generated by the contents, said cap having (a) a top wall provided with a central circular flat portion, an annular raised portion for receiving a sealing member, and a sloping wall portion connecting said central circular flat portion with said annular raised portion; (b) a skirt portion depending downward from the outer peripheral edge of said raised portion; and (c) a tab member depending downward from a part of the lower edge of said skirt portion; said cap further having (d) a pair of first separating lines extending toward said top wall from the vicinity of the intersection of the peripheral edge of said tab member and the lower edge of said skirt portion; and (e) a pair of second separating lines extending to the vicinity of the upper end of said skirt portion from the lower edge thereof; said second separating lines being arranged diametrically opposite each other with respect to said top wall and spaced respectively equally distant from said first separating lines; the improvement wherein the character of said thin metallic sheet is selected such that in the absence of said separating lines it is nevertheless readily tearable by manual lifting of said tab member, and the spacing between and respective orientation of said first separating lines are chosen relative to the dimensions of said cap such that grasping and manually lifting said tab member produces tear lines coinciding at least at their beginning with said first separating lines and terminating at points in said raised portion of said top wall on an imaginary line tangent to the circle at the top of said sloping wall portion, the distance between such points being such that the resistance imposed by said points is sufficient to interrupt further tearing of said top wall along projections of said tear lines whereby further lifting of said tab member causes separation of said second separating lines and folding back of half of said cap along the line joining said second separating lines.

4,098,421
CONTAINER FOR SNUFF OR THE LIKE

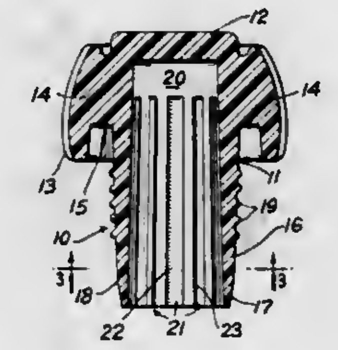
John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.
Filed Jun. 24, 1977, Ser. No. 809,560
Int. Cl.² B65D *41/18*
U.S. Cl. 215—321 **3 Claims**



1. A snuff container comprising a plastic cup-shaped body of circular cross-section, said body having a bottom wall and having a circular side wall molded integrally with and upstanding from said bottom wall, a circular neck of reduced diameter formed integrally with and projecting upwardly from the upper end of said side wall, said container further comprising a plastic cup-shaped cover of circular cross-section, said cover having a top wall and having a circular skirt molded integrally with and depending from said top wall, said skirt being sized to telescope downwardly over the neck of said body with the outer side of said skirt disposed substantially flush with the outer side of the side wall of the body, an outwardly projecting rib formed integrally with and extending circumferentially around the outer side of said neck intermediate the upper and lower ends thereof, and a continuous inwardly projecting rib formed integrally with and extending circumferentially around the inner side of said skirt and sized to snap past said outwardly projecting rib and engage and seal resiliently against a continuous circumferentially extending and radially facing portion of the outer side of said neck with an interference fit when said cover is telescoped downwardly over said body whereby said inwardly projecting rib establishes a seal between said cover and said body and engages said outwardly projecting rib to hold said cover releasably on said body, said interference fit being established by virtue of the relaxed inside diameter of said inwardly projecting rib being less than the relaxed outer diameter of that portion of said neck engaged by said inwardly projecting rib, said container further including several upright ribs formed integrally with and spaced angularly around the outer side of said neck, said upright ribs being located above said outwardly projecting rib and holding said inwardly projecting rib out of contact with the outer side of said neck as said cover is initially telescoped downwardly over said neck thereby to allow air to escape from said body during such initial telescoping.

4,098,422
PLASTIC BOTTLE STOPPER

Lawrence J. Slomski, 810 E. 11th St., Erie, Pa. 16503
Continuation-in-part of Ser. No. 678,624, Apr. 20, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,542
Int. Cl.² B65D *39/00*
U.S. Cl. 215—355 **2 Claims**



1. A stopper comprising,

a hollow, generally tubular body adapted to be inserted into the mouth of a bottle neck,

said hollow body being closed at one end and having an open end,

said hollow body having a generally cylindrical inside surface, tapering outward toward said open end,

and only five circumferentially spaced, axially-extending grooves in said inside surface extending from adjacent the closed end to the open end providing flexibility for said stopper whereby said stopper is less likely to be forced out of said bottle mouth,

said body having a generally cylindrical first outside surface adjacent said closed end and a second generally cylindrical outside surface joining said first said surface,

and a third outside surface extending from said second outside surface to the open end of said hollow body,

said first outside surface tapering slightly inwardly and toward said open end,

said second outside surface being cylindrical and said third outside surface tapering inwardly and toward said open end at a greater angle than said first outside surface,

said grooves having relatively flat bottoms and relatively flat side edges,

the depth of said grooves increasing from said open end toward said closed end,

the wall thickness of said body at said grooves adjacent said closed ends being between 0.027 inches and 0.100 inches and said grooves adjacent said open ends being approximately 0.020 inches deep and are approximately ⅛ inch wide,

said hollow body having a flange supported thereon concentric to said hollow body at said closed end,

cylindrical flange extending generally concentric to said hollow body and spaced outwardly therefrom and adapted to receive the end of the neck of the champagne bottle between said flange and said hollow body,

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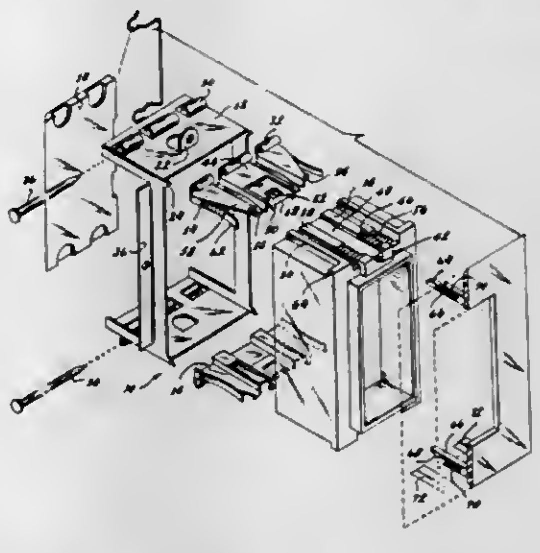
4,098,423
SELF-ALIGNING OUTLET BOX ASSEMBLY

Louis Marrero, 1209 Via Ramon, Escondido, Calif. 92025
Filed Mar. 10, 1977, Ser. No. 738,678
Int. Cl.² H02G *3/12*
U.S. Cl. 220—3.6 **10 Claims**

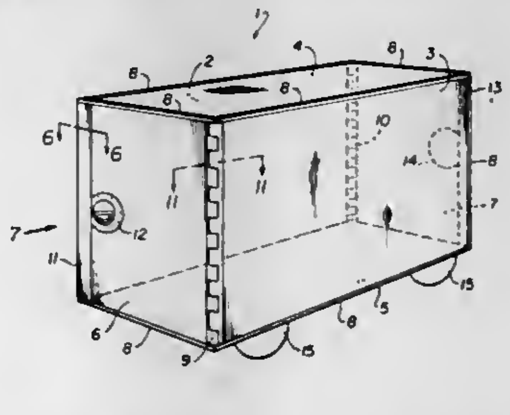


1. An electrical outlet box comprising:

- a. a mounting bracket element;
- b. a wiring box element received in said mounting bracket and slidably in a longitudinal direction therein;
- c. means biasing said wiring box element away from said bracket;
- d. restraining means operative to restrain said wiring box and said bracket element against said biasing means;
- e. a facia plate having at least one trigger means operative with said restraining means to release said restraining means upon said facia plate being installed, permitting said wiring box element to spring forward under the action of said biasing means into operative position in a wall when said facia plate is installed.

4,098,424
TRANSPORT CONTAINER

Günther Liebscher, and Günter Christ, both of Wiesbaden, Fed. Rep. of Germany, assignors to Lermer GmbH, Wiesbaden, Fed. Rep. of Germany
Filed Dec. 29, 1976, Ser. No. 755,178
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643859
Int. Cl.² B65D *7/00, 7/24;* B65J *1/02*
U.S. Cl. 220—4 F **14 Claims**



1. A container comprising frame means, wall panel means, door means operatively secured to said frame means, and locking means, said frame means comprising corner brace means including arm means, sectional connecting means, and

pressure applying means, for operatively securing said sectional connecting means to said arm means of said corner brace means to form said frame means, movable hinge means and immovable hinge means, journal means operatively connecting said movable hinge means to said immovable hinge means, first connecting means operatively connecting said door means to said movable hinge means, second connecting means operatively connecting said immovable hinge means to said wall panel means, said locking means comprising actuation means and slidable latch means operatively connected to said actuation means so that a motion of said actuation means causes a respective motion of said latch means to open and lock the door means, recess means in said frame means, said latch means operatively engaging said recess means in the closed position of said door means, said hinge means comprising stop means limiting the opening angle for said door means to 270° and wherein each of said sectional connecting means comprises two U-channels (26,27) extending at a right angle to each other and a substantially closed hollow channel (25) having open ends and a wall merging into said U-channels, said U-channels having walls mitered at their ends, said arm means of said corner brace means having slots therein, said arm means fitting into said hollow channel (25), and wherein said pressure applying means comprise wedging means extending through said wall of said hollow channel and into a respective one of said slots in the corresponding arm means of the corner brace means, whereby said wedging means perform a double locking action by their wedging effect and by extending through said wall of said hollow channel into the corresponding arm means of the corner brace means.

4,098,425

LOW TEMPERATURE LIQUEFIED GAS TANK

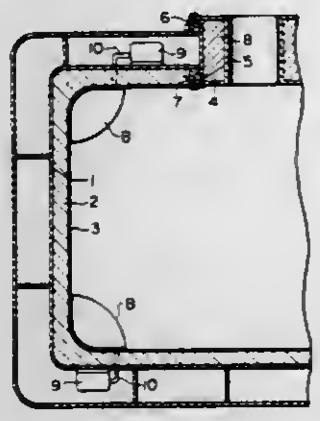
Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Co., Ltd., Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,790

Claims priority, application Japan, May 28, 1973, 48-59584

Int. Cl.² B65D *87/24;* B63B *25/16*

U.S. Cl. 220—9 LG **9 Claims**



1. A low temperature liquefied gas tank comprising a rigid outer vessel, a compression-resistant, heat-insulating layer provided at the inside of said outer vessel and an inner membranous vessel provided at the inside of said heat-insulating layer, said inner membranous vessel having substantially spherical corner portions, said spherical corner portions being provided with a membranous patch member which covers only said corner portions, said patch member being shaped to follow said corner portion and being connected to said inner vessel at its rim portion in a fluid-tight manner, and means for evacuating a space confined between said inner membranous vessel and said patch member.

4,098,426

DOUBLE-WALLED TRANSPORT CONTAINER FOR FLOWABLE MEDIA

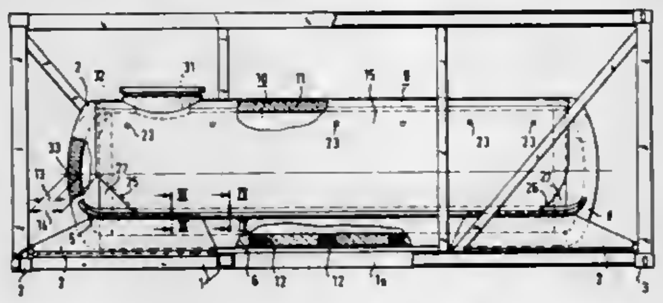
Helmut Gerhard, Weitefeld, Sieg, Fed. Rep. of Germany, assignor to Westerwalder Eisenwerk Gerhard GmbH, Fed. Rep. of Germany

Filed Oct. 20, 1976, Ser. No. 734,317

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1975, 2548356

Int. Cl.² B65D *87/24*

U.S. Cl. 220—401 **21 Claims**



1. A double-wallet transport container for flowable media, comprising a prismatic framework having corner fittings for stacking and hoisting the container and saddle members arranged in at least the lower corner regions of the latter; a substantially cylindrical pressure-proof receptacle; support flanges applied to the outer sides of the latter, said support flanges extending longitudinally and being secured to the saddle members, the receptacle comprising an inner vessel, an outer vessel, said outer vessel comprising an upper shell, a lower shell and two dome-shaped endwalls which are formed as one piece with the lower shell, and a shock-absorbing and thermally insulating layer between the outer and the inner vessel, the support flanges being so constructed that they extend over the entire length of the outer vessel and the sum of the distances between the endwalls of the inner and the outer vessel being at least equal to the distance, measured in the axial direction of the receptacle, from the crest of the dome-shape to the edge of an endwall of the outer vessel.

16. A double-walled transport container for flowable media, comprising a pressure-proof receptacle; the receptacle comprising an inner vessel, an outer vessel, said outer vessel comprising an upper shell, a lower shell and two dome-shaped endwalls formed as one piece with the lower shell, and a shock-absorbing and thermally insulating layer between the outer and the inner vessel.

4,098,427

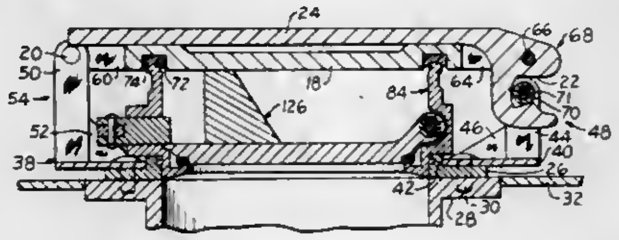
SEALING CAP ASSEMBLY FOR AIRCRAFT LAVATORY DRAIN PORT

Milton Donald Duckworth, Jr., 1316 Orchard Lakes, St. Louis, Mo. 63141

Filed Mar. 17, 1977, Ser. No. 778,614

Int. Cl.² B65D *43/16, 43/18*

U.S. Cl. 220—259 **17 Claims**



1. A cap assembly for sealing aircraft lavatory drain ports, comprising:

a first sealing door being of a construction sufficient for pivoting between an open position and a closed sealing position;

a second sealing door being of a construction sufficient for pivoting between an open position and a closed sealing position in spaced sealing relationship with the first door in the closed sealing position;

first door securing means connected for securing the first door in the closed position; and

second door securing means connected for securing the second door in the closed position.

4,098,428

TANK FOR PITCH IMPREGNATION THEREIN

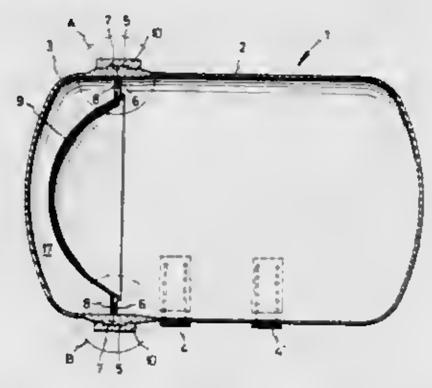
Toru Taniguchi, Kyoto, Japan, assignor to Nikku Industry Co., Ltd., Itami, Japan

Filed Sep. 12, 1977, Ser. No. 833,749

Claims priority, application Japan, Jan. 8, 1977, 52-957

Int. Cl.² B65D *45/32*

U.S. Cl. 220—319 **5 Claims**



1. A horizontally installed tank in which to operate heated pitch impregnation, comprising a body portion having at least one open end and a lid member to sealably close said open end of the body, said body having an inner weir member provided about its open end portion for preventing the unused portion of pitch from flowing out of the tank, said lid member comprising a double wall structure providing between the outer and the inner walls a cavity for receiving melted pitch therein, said lid member having with respect to its inner wall a pitch-flow guide portion protruding toward inside of the body beyond the location of its weir member when said lid member is in condition to close the opening of the body.

4,098,429

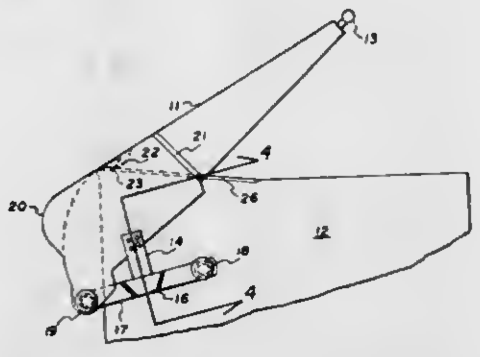
TRASH CONTAINER LID SYSTEM

Allan M. Hodge, 5852 Lomond Dr., San Diego, Calif. 92120

Filed Jun. 27, 1977, Ser. No. 810,493

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—331 **11 Claims**



1. A trash bin and lid assembly comprising:

a trash bin having an upper rim;

a lid for said trash bin having a first pivot point located on said lid near the rear of said lid;

means for mounting said lid for support and rotation about a second pivot point on said bin located below the upper rim thereof, when said assembly is in the upright position, with the center of gravity of said lid being forward of said second pivot point when said lid is in the closed position and to the rear of said second pivot point when said lid is in a partially open position;

means for stopping rearward movement of said lid in said partially open position when said bin is in the upright position;

linkage means interconnecting said two pivot points; and

means for constraining said lid to move with said linkage means to pivot about said second pivot point upon normal opening of said lid to said partially open position with the bin in the upright position, and for permitting said lid to pivot about said first pivot point to swing wide open when said lid is rotated to the up-side-down or dumping orientation.

4,098,430

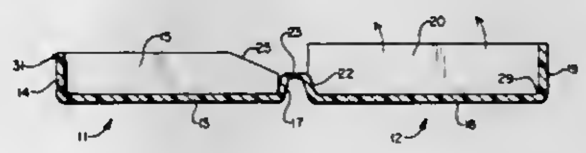
PLASTIC CONTAINER

Harley H. Mattheis, Verona, N.J., and Edward J. Potter, Madison, Ohio, assignors to Ethyl Development Corporation, Baton Rouge, La.

Continuation of Ser. No. 543,659, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 400,730, Sep. 26, 1973, abandoned. This application May 11, 1976, Ser. No. 685,290

Int. Cl.² B65D *43/16, 51/04*

U.S. Cl. 220—339 **4 Claims**



1. In an integrally formed, one-piece plastic container the combination comprising:

a. a generally rectangular bottom section having a planar bottom wall, two opposed, upturned sidewalls, and an upturned front wall, all of which are integrally formed and connected to each other, and an upturned back wall integrally formed and connected to said bottom wall;
b. a generally rectangular top section having a planar top wall, two opposed, downturned sidewalls, and a downturned front wall, all of which are integrally formed and connected to each other, and a downturned back wall integrally formed and connected to said top wall;
c. integrally formed hinge means connecting said back wall of said top section to said back wall of said bottom section; and
d. said top section adapted to overlie said bottom section and to be frictionally engaged therewith when said container is in the closed position;

wherein both of said back walls are less than one-half the height of the adjacent sidewalls and wherein the upper portion of said back wall of said bottom section terminates short of said sidewalls and the lower portion thereof is integrally connected to said sidewalls of said bottom portion.

4,098,431

CHEMICAL REPLENISHING SYSTEM

Jack Palmer, and Sidney Weisser, both of Mamaroneck, N.Y., assignors to Cine Magnetics Inc., Mamaroneck, N.Y.

Filed Jan. 13, 1977, Ser. No. 759,062

Int. Cl.² B67D *5/32*

U.S. Cl. 222—39 **8 Claims**

1. A chemical replenishing system for supplying fixer and developer chemicals to a processor, comprising:

(A) a developer portion including
  a plurality of developer containers, each containing chemical fluids for providing photographic developing action, each container having a predetermined geometric outline, each container having a pierceable seal at one end thereof;
  a developer tank;
  a first support element bearing a plurality of stationary

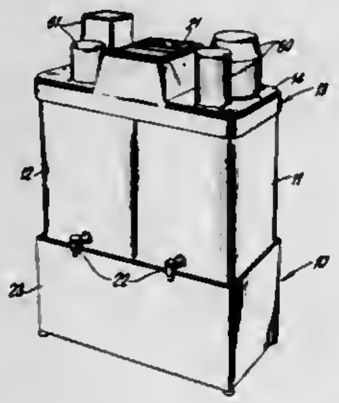
knives disposed above said developer tank, said element having openings therein below said knives;

a container-coded developer template having openings therein, each opening corresponding to a respective one of said developer containers, each of said openings being arranged above a corresponding knife, each opening for providing loading indentification of an associated container and for providing means to guide said container onto its respective knife; and

(B) a fixer portion including

a plurality of fixer containers, each containing chemical fluids for providing photographic fixing action, each container having a predetermined geometric outline, each container having a pierceable seal at one end thereof;

a fixer tank;



a second support element bearing a plurality of stationary knives disposed above said fixer tank, said element having openings therein below said knives; and

a container-coded fixer template having openings therein, each opening corresponding to a respective one of said fixed containers, each of said openings being arranged above a corresponding knife, each opening for providing loading identification for an associated container and for providing means to guide said container onto its respective knife; and

means for supplying water to each of said tanks at a pressure greater than incoming line pressure, said water supplying means for mixing a solution of water and chemicals in each of said tanks;

whereby the loading of a container into a template opening and onto a knife will cause the knife to pierce the seal of the container and allow the fluid contained therein to pass through the corresponding support element opening into the corresponding tank.

4,098,432

DEVICE COMPRISING AN ADJUSTABLE DOSING MEMBER FOR SPREADING DISTRIBUTABLE MATERIAL

Pieter Adriaan Oosterling, and Gijsbert Jan Mijnders, both of Nieuw-Vennep, Netherlands, assignors to Vicon N.V., Nieuw-Vennep, Netherlands

Filed Sep. 24, 1974, Ser. No. 508,902

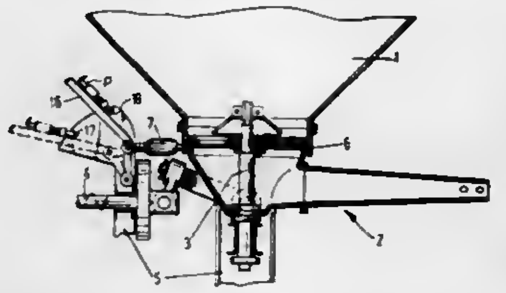
Claims priority, application Netherlands, Sep. 26, 1973, 7313291; Apr. 17, 1974, 7405225

Int. Cl.² A01C *15/00*

U.S. Cl. 222—43 **10 Claims**

1. In a spreading device including a frame, a hopper on said frame having at least one outlet port, an adjustable dosing member having at least one opening, said dosing member being movable between a fully closed position in which said opening does not overlap said outlet port and a dosing position in which said opening at least partially overlaps said outlet port, and a spreading member receiving material through said opening when said dosing member is in a dosing position;

control means connected between said frame and said dosing member for adjusting the overlap between said opening of the dosing member and said outlet port when said dosing member is in a dosing position, said control means including a hand-operated member movable to one of two positions corresponding respectively to said fully closed and dosing positions of said dosing member and means for positively holding said hand-operated member in that one of its two positions to which it is moved, a threaded spindle with cooperating sleeve threaded thereon connecting said hand-operated member to said dosing member to determine the amount of overlap between said opening and said outlet port when said hand-operated member is moved to that position corresponding to said dosing position of the dosing member, and indicating means formed between said spindle and sleeve for indicating said amount of overlap.



4,098,433

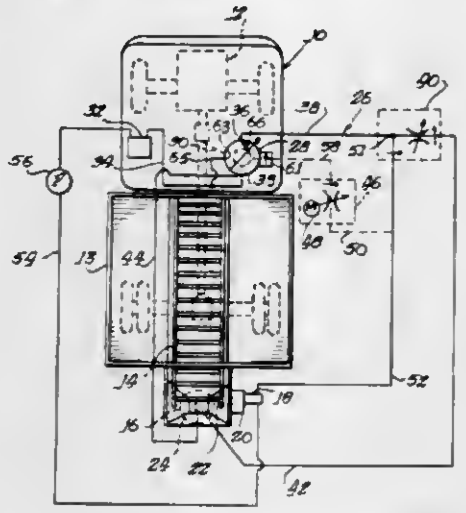
HYDRAULIC SYSTEM FOR BROADCAST SPREADER

Frederick Frank Oligschlaeger, Springfield, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Feb. 9, 1977, Ser. No. 766,981

Int. Cl.² F04B *17/06*

U.S. Cl. 222—63 **9 Claims**



1. A hydraulic drive system for a spreader vehicle having an engine, a dispensing mechanism and conveyor means for delivering material to be spread to the dispensing mechanism; said system comprising first hydraulic motor means connected with said dispensing mechanism for driving said dispensing mechanism; second hydraulic motor means connected with said conveyor means for driving said conveyor means; a variable displacement pressure compensated pump for delivering hydraulic fluid at a variable rate substantially in accordance with demand by said motor means; hydraulic circuit means connecting said pump and said motor means and including a first hydraulic power line connected to the pump outlet, a first control valve connected to said power line for controlling fluid flow to said first motor means, a second power line in parallel with said first control valve for supplying fluid to said second motor means, and means connected to said second power line and to said pump including control valve means for providing a fluid pressure signal to said pump responsive to fluid flow through said valves for adjusting the pump displacement.

4,098,434

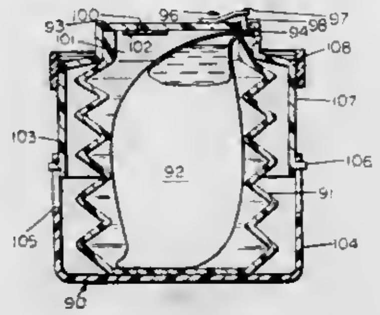
FLUID PRODUCT DISPENSER

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 588,751, Jun. 20, 1975. This application Apr. 6, 1977, Ser. No. 785,028

Int. Cl.² B65D *37/00*

U.S. Cl. 222—94 **9 Claims**



1. A fluid product dispenser comprising, in combination, a first container, a second container positioned within said first container, said second container comprising a flexible bag for receiving a fluid product, a cap removably mounted on said first container, a product dispensing means defined by said cap in communication with said second container for dispensing the fluid product located in said second container, said first container and said second container defining therebetween a pressure chamber, and means in communication with such chamber for introducing fluid into such chamber, said cap including a depending sidewall, a base for telescopic interaction with said cap, said product dispensing means including valve means for retarding flow.

4,098,435

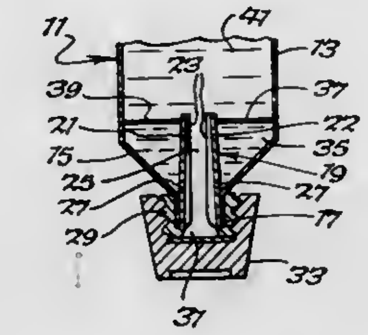
STABILIZED DENTRIFICE CONTAINING INITIALLY PHYSICALLY SEPARATED NORMALLY REACTIVE COMPONENTS

Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,736

Int. Cl.² B65D *35/22*

U.S. Cl. 222—94 **8 Claims**



1. A stabilized dentifrice comprising two paste or gel dentifrice portions, both of which are extrudable from a collapsible dentifrice tube and each of which includes a component which is chemically reactive with the other said component in the other portion, which dentifrice portions are maintained separate from each other by an intervening separating composition which is unreactive with the reactive components of said portions and which is extrudable with one or both of them through an opening in the collapsible dentifrice tube, in a dispensing container from which said portions are dispensable together through a closable opening therein in response to pressure, the first portion being from 2 to 50% of the dentifrice and the second portion being from 98 to 50% thereof, one portion including an alkali metal fluorine-containing salt and the other including a water-insoluble alkaline earth metal salt which is chemically reactive with said fluorine-containing salt and which inactivates such salt and decreases its utility as a tooth enamel hardening agent when stored in contact with it in a homogeneous dentifrice formulation of the same composition as the present dentifrice when dispensed.

4,098,436

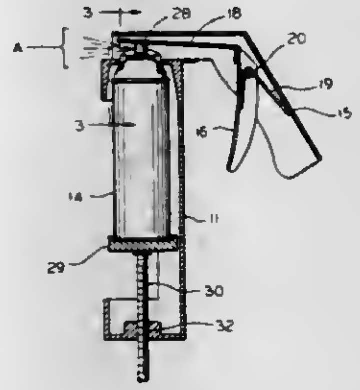
HOLDER TO CONVERT SPRAY CAN INTO SPRAY GUN

Anthony J. Kohlbeck, 2929 N. 84th St., Milwaukee, Wis. 53222

Filed Jul. 29, 1976, Ser. No. 709,656

Int. Cl.² B67D *5/54*

U.S. Cl. 222—182 **4 Claims**



1. A hand held holder for an aerosol spray can of the type actuated by a valve button, said valve button positioned at the top of said can, said holder comprising:

a unitary body shaped to accommodate said can, said body having two ends;

a clamp threadably cooperating with the first of said ends,

said clamp being adapted to engage said can and urge said can toward the second of said two ends;

a hood,

said hood being integral with said body at said second of said two ends,

said hood including at least one internal shoulder shaped to non-clampingly abut the top of said can,

said hood being shaped to surround said valve button;

a handle integral with said hood; and

a trigger mechanism mounted within said handle,

said trigger mechanism including a trigger extension rod positioned to extend above said valve button,

said rod adapted to contact and depress said valve button when said trigger is actuated.

4,098,437

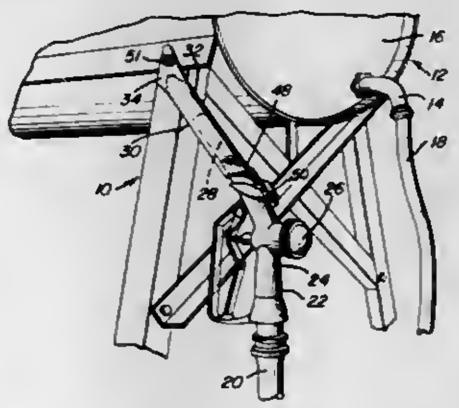
FUEL NOZZLE SUPPORT AND CAP

Elmer E. Reinke, R.R. 1, Davenport, Nebr. 68335

Filed Apr. 4, 1977, Ser. No. 784,623

Int. Cl.² B67D *5/365*

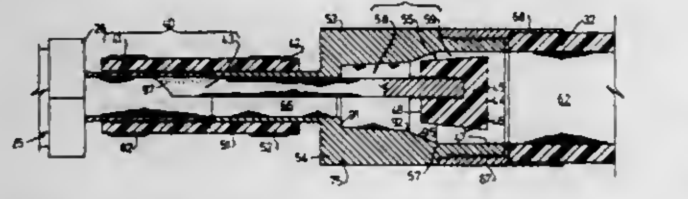
U.S. Cl. 222—529 **8 Claims**



1. A fuel nozzle support including an elongated generally straight tubular member, one end portion of said tubular member being flattened to close the same, the other end portion of said tubular member being open and bevelled at an angle of

between 20° and 70° relative to a plane normal to the center line of said other end portion and substantially on a plane normal to the plane of said flattened end portion, the extended lip defined by said bevelled end portion including a slot formed therein opening laterally outwardly of one side of said lip at one outer end and closed at its other inner end, said slot being adapted to slidingly and retentively receive a hook portion carried by the base end portion of a fuel delivery nozzle telescoped into said other end portion of said tubular member.

4,098,438
GASOLINE SPILL PREVENTION SYSTEM AND APPARATUSES
Loyd G. Taylor, Rte. 1, Box 3, Canyon, Tex. 79015
Filed Dec. 29, 1975, Ser. No. 644,487
Int. Cl.² F16L *35/00, 37/28*
U.S. Cl. 222—529 **4 Claims**



1. A fluid fuel dispensing system comprising, in operative combination:
- a. a container for fuel;
- b. a pump with an inlet operatively connected to said container and a pump outlet;
- c. an elongated flexible conduit having a proximal end connected to said pump outlet and another distal end;
- d. a nozzle assembly comprising a proximal inlet and a distal outlet; and,
- e. an automatic sealing unit one, proximal, end of which is connected to said distal end of said conduit and another, distal, end of which is connected to the proximal end of said nozzle assembly and wherein the automatic sealing unit comprises, in operative combination, a proximal sealable conduit unit and a distal seal actuating unit and connector, the proximal sealable unit comprising a proximal conduit attachment attached to the distal end of the conduit and a sealing chamber, the distal seal actuating unit and connector comprising a rigid cylindrical inlet tube firmly attached at its distal end to the nozzle assembly and a seal closing means actuated by distal movement of the nozzle assembly from the conduit, and wherein the nozzle assembly includes between the inlet and outlet thereof a cut-off valve, and wherein

said proximal sealable unit is firmly attached to the distal end of said flexible conduit,

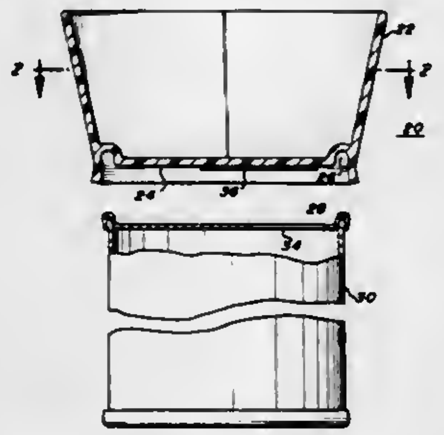
and the proximal end of an intermediate connector tube comprising a firm imperforate sleeve is attached with a gasoline-tight fit firmly to one end of the proximal sealable unit and the distal end of said connector tube is releasably attached to the proximal end of the distal seal actuating unit with a gasoline-tight fit and releasably yet firmly connects the distal unit to the proximal sealable unit, and

the proximal sealable unit comprises a rigid cylindrical shoulder and a rigid hollow cylindrical wall firmly joined together and a sealing chamber is located between said wall and shoulder and said wall is firmly yet releasably attached to the flexible conduit in a gasoline-tight manner, said sealing chamber having a distal narrow portion and a proximal enlarged portion of greater diameter than said distal portion, and,

a rigid seal spacer arm of transverse cross-section diameter that is a minor portion of the diameter of the transverse cross section of said inlet tube of said distal seal actuating unit is firmly connected at its distal end to the interior surface of a proximal portion of said inlet tube and the proximal end of the rigid seal spacer arm is firmly yet releasably connected to a moveable seal having a maximum transverse diameter greater than the maximum transverse diameter of said distal sealing chamber portion and supports such seal at a position located within but spaced away from the interior surface of the walls of the enlarged portion of said sealing chamber, said seal being wider at its proximal end than its distal end and a resiliently deformable surface joins said ends thereof, and

the intermediate connector tube extends distally of the proximal end of said inlet tube for the distal seal actuating unit for a distance greater than the distance at which said seal is held by said seal spacer arm to a position of said seal whereat the narrow distal chamber portion of said sealing chamber is engaged thereby, whereby the length of the seal spacer arm provides for movement of said seal into a locking relation with a portion of the wall of said sealing chamber prior to movement of the proximal edge of said inlet tube past the distal end of the intermediate connector.

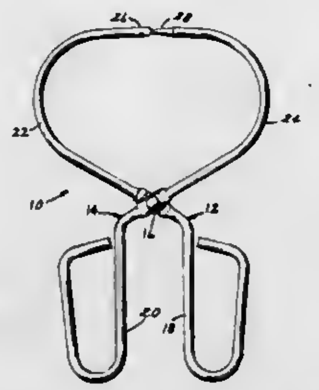
4,098,439
ATTACHMENT FOR BEVERAGE CAN HAVING ROTATING CLOSURE WITH FLOW GUIDE
James H. Blow, Jr., 23 Palisade Ave., Piscataway, N.J. 08854, and Louis C. Blow, 115 Lincoln St., Tallahassee, Fla. 32301
Division of Ser. No. 698,369, Jun. 22, 1976, Pat. No. 4,054,205. This application May 31, 1977, Ser. No. 802,124
Int. Cl.² B65D *25/48*
U.S. Cl. 222—531 **5 Claims**



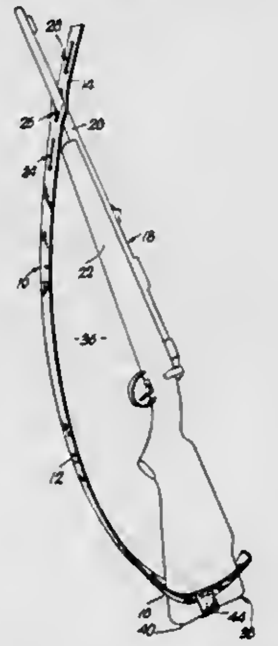
1. A drinking attachment for a beverage can comprising: an annular cup-shaped vessel having sidewalls and a generally planar bottom portion; said bottom portion having an annular recess disposed about the periphery thereof for removably receiving the rim portion of a beverage can, said recess being arranged to fit tightly about the rim portion of such beverage can while permitting said vessel to rotate thereabout, said bottom portion having a selectively configured slotted opening extending radially outwardly from the center of said bottom portion along a first axis to provide access to a corresponding aperture aligned therewith in such beverage can or said vessel is attached to such beverage can; and a first rib portion extending about the periphery of said slotted opening adjacent the underside of said bottom portion and adapted to sealingly contact the lid of such beverage can about such beverage can aperture to direct the flow of the contents of such beverage can solely into said slotted opening and into said vessel for consumption therefrom.

4,098,440
COLLAR POINT FORMER
George J. Rosenberg, St. Paul, Minn., assignor to Fashion Services, Inc., Minneapolis, Minn.
Filed Mar. 21, 1977, Ser. No. 779,332
Int. Cl.² A41H *43/00*
U.S. Cl. 223—39 **4 Claims**

1. A device for turning collar points and tubular parts of garments comprising first and second members crossing each other and being pivotally attached at a point in scissors fashion, each said member including a handle portion and a head portion on opposite sides of the pivot point, the head portions each terminating in end portions moveable from abutting to non-abutting relationship by a scissors movement of the first and second members, the end portion of the first member tapering to a fine tip having a first contact area, the end portion of the second member defining a second contact area, wherein the second contact area is greater than the first contact area, whereby the tips cannot become misaligned under normal working conditions.



4,098,441
QUICK-ATTACH, UNIVERSAL GUN SLING
Max L. Campbell, 5109 Brentwood Rd., Topeka, Kans. 66618
Filed Dec. 13, 1976, Ser. No. 749,626
Int. Cl.² F41C *33/00*
U.S. Cl. 224—1 A **4 Claims**



1. In combination with a firearm having a stock provided with a butt at one end thereof and a barrel projecting from the stock at the opposite end thereof, a shoulder sling for upright carriage of the firearm against the back of the user, said sling comprising:

a single, elongated, flat strap having opposite planar faces and a pair of longitudinal edges extending along lateral extremities of said faces;

an eyelet at one end of the strap removably receiving said barrel,

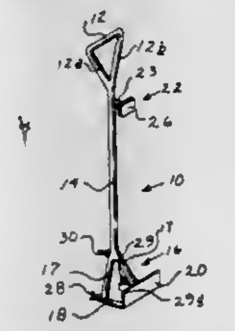
said eyelet comprising a perforation in said strap through said opposite faces thereof having a fixed dimension that permits the strap to be freely slipped along the barrel between the outermost tip of the latter and the stock; and

a socket at the opposite end of the strap removably receiving said butt so as to present a loop between the strap and the firearm for insertion of the user's arm and shoulder,

said socket comprising an opening in said strap through said opposite faces thereof and a web bridging said opening in a manner to permit acceptance of the butt into the opening but prevent complete passage of the butt therethrough,

the distance between said perforation and said opening being less than the length of the firearm so that the strap cannot accidentally slip off the barrel once the hutt is inserted into the socket and the firearm is slung over the user's shoulder in an upright manner.

4,098,442
PANEL CARRIER
Dillon L. Moore, 428 NW. Albermarle Terr., Portland, Oreg. 97210
Filed Apr. 28, 1976, Ser. No. 680,911
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 P **1 Claim**



1. A carrier for facilitating the substantially upright, manual transport of a panel comprising:

a handle;

an elongate member having a first end thereof connected to said handle;

ledge means rigidly secured to the other end of said elongate member and projecting therefrom, said ledge means including a base dimensioned for supporting a panel in upright position along an edge thereof while preventing it from substantial tilting movement in a vertical plane, and a retaining member connected to said base and extending upwardly therefrom, said retaining member being spaced apart from said elongate member;

at least one pointed member disposed adjacent said ledge means for at least partially penetrating a face of a substantially horizontally disposed panel so that the panel may be laterally shifted when a force is directed along the axis of said elongate member;

at least one additional pointed member disposed adjacent said elongate member and angled away from said handle; and

resilient means rigidly mounted adjacent the first end of said elongate member and projecting a fixed distance therefrom for providing a cushion against which a panel may abut when the panel is being transported.

4,098,443
SAMPLE BOOK WITH INTEGRAL HANDLE
Manus Coen, Passaic, and Joseph Bonfield, Clifton, both of N.J., assignors to Eastern Bindery, Inc., Paterson, N.J.
Filed Oct. 12, 1976, Ser. No. 731,425
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 P **10 Claims**

1. A sample book comprising:

a page bundle;

an internal spine;

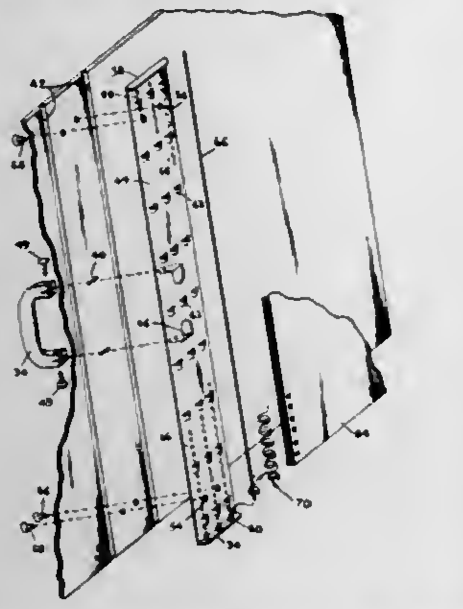
fastening means, fastening said internal spine to said page bundle;

a cover having a spine with passage means therein said cover disposed about said internal spine so as to position said internal spine between said cover and said page bundle;

mounting means on said internal spine extending away from said page bundle through said passage means in said cover;

handle means;

means connecting said handle means to said mounting means on said internal spine externally of said cover means so that said handle means is connected to said pages of said book through said internal spine; and



said mounting means comprise a pair of spaced fingers which are formed from the body of said internal spine that extends parallel to said cover provided with said passage means.

4,098,444

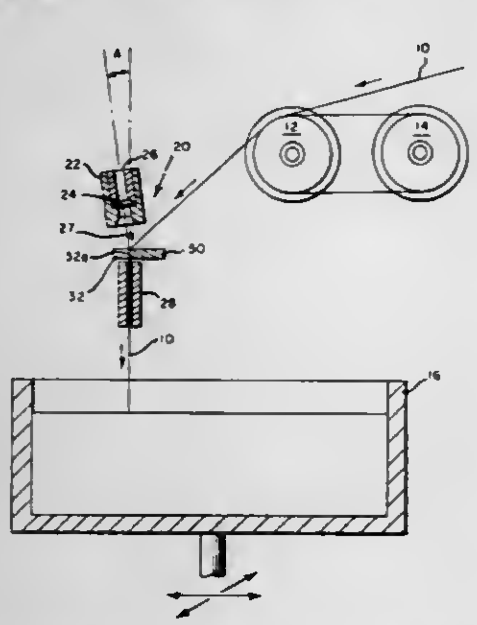
HYDROJET FOR PROPELLING YARN

Paul Morrison Cole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 17, 1977, Ser. No. 807,737

Int. Cl.² B65H ***17/32***

U.S. Cl. 226—97 **2 Claims**



1. An apparatus for forwarding yarn comprising: an elongated tube having an entrance and an exit through which the yarn passes from a source to a collector; a jet spaced from said entrance for directing a high pressure stream of water into said tube at an angle of from about 6° to about 15° with the central axis of the tube at the entrance of the tube whereby the stream grazes one inside wall of the tube at its entrance and ricochets off the opposite side of the inside wall of the tube at a location along its length and fills the tube at its exit; and a plate having a slot therein open at one end and closed at the other end positioned between the jet and the entrance of the tube, said slot having its closed end aligned with the central axis of the tube, said yarn passing from said source over the closed end of said slot into said tube, said stream passing through said slot and engaging said yarn as the yarn passes over said closed end.

4,098,445

CONTROLLABLE-FORCE WIRE ADVANCE ARRANGEMENT FOR ELECTRIC-ARC WELDING APPLICATIONS

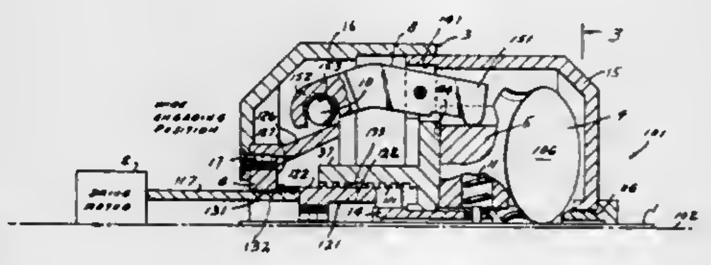
David Albert Samokovliski; Petko Kostadinov Grozdanov; Alfred Emmerich Nemechek; Peter Dimitrov Petrov, and Simeon Georgiev Punchev, all of Sofia, Bulgaria, assignors to Institute Po Zavaryavane, Sofia, Bulgaria

Filed Sep. 24, 1976, Ser. No. 726,279

Claims priority, application Bulgaria, Sep. 24, 1975, 33770

Int. Cl.² B65H ***17/20***

U.S. Cl. 226—186 **3 Claims**



1. In an apparatus for converting a rotational force of a motor shaft to a controlled linear force along a first axis for selectively advancing an elongated wire along the first axis, a substantially cylindrical hollow feed housing axially divided into front and rear parts axially movable with respect to each other and disposed coaxial with the first axis and through which the wire may be advanced in a forward direction, the front part of the feed housing having a threaded rear portion, first and second pistons individually supported in the front portion of the feed housing forwardly of the threaded portion for radial reciprocation on generally opposite sides of the first axis, first and second wire-advancing rollers carried by the respective first and second pistons for planetary rotation about the first axis during a rotation of the front part of the feed housing, the first and second rollers individually having axes that are skewed in symmetrically opposite directions with respect to the first axis to engage and advance the wire along the first axis when the rollers engage the wire, an integral motion translating element having a cylindrical inner portion and a conical outer portion mounted in the rear part of the feed housing, a surface of the cylindrical inner portion having a first surface threadedly engaged with a surface of the projecting rear portion of the front part of the feed housing, first and second levers individually pivotally supported in the front part of the housing intermediate their respective ends on generally opposite sides of the first axis and extending longitudinally in the front and rear parts of the housing, corresponding first ends of each lever terminating opposite the conical portion of the translating element and corresponding second ends of the levers terminating opposite the outer end of the respective first and second pistons, resilient means coupled to each piston for urging the outer end of the piston against the opposed second end of the associated lever, means associated with the first end of each lever for coupling such first end to the outer conical portion of the translating element, and means for connecting the motor shaft to the cylindrical inner portion of the translating element, relative rotation of the front and rear parts of the feed housing in a wire feeding direction causing the rollers to move toward each other.

4,098,446

PROCESS FOR THE MANUFACTURE OF TAPE GUIDES OF LARGE AREA FOR TAPE TRANSPORT APPARATUS, AND TAPE GUIDES OBTAINED BY THE SAID PROCESS

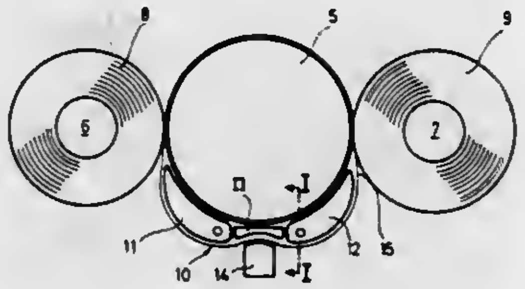
Klaus Schoettle, Heidelberg; Heinrich Wittkamp, Mannheim, and Lothar Gliniorz, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 5, 1976, Ser. No. 711,817

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535276

Int. Cl.² G03B ***1/04***

U.S. Cl. 226—196 **11 Claims**



1. A tape guide for tape transport apparatus, said guide comprising at least two distinct parts, namely at least one backing member and separately therefrom, a strip of resilient material, elastically deformed below the elastic limit of the material to provide a dimensionally stable guide surface, and attached to the backing member at longitudinally spaced points so as to maintain the deformation.

4,098,447

BONDING METHOD AND APPARATUS

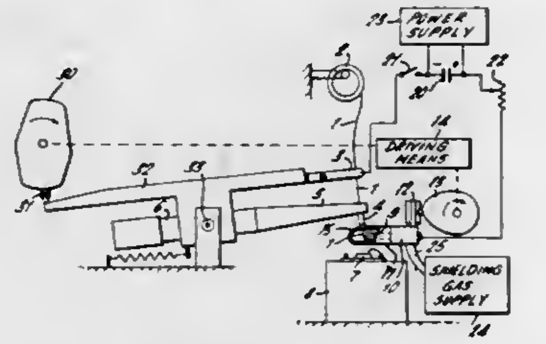
Donald A. Edson; Keith I. Johnson, and Michael H. Scott, all of Cambridge, England, assignors to The Welding Institute, England

Filed May 14, 1976, Ser. No. 686,410

Claims priority, application United Kingdom, May 15, 1975, 20701/75

Int. Cl.² B23K ***37/04;*** **H01L** ***21/60***

U.S. Cl. 228—4.5 **4 Claims**



1. Apparatus for connecting a wire of aluminium or aluminium alloy to a component or terminal, comprising a wire holder including means for gripping the wire, means for receiving the component or terminal to which the wire is to be bonded, and ball-forming means, the ball-forming means comprising:

a reusable electrode;

means supporting said reusable electrode within a slotted housing;

a supply circuit for applying between the wire and the electrode a voltage not exceeding 200 volts;

driving means for effecting relative movement of the wire and electrode by displacing the slotted housing to permit temporary contact between the wire and the electrode through the slot, whereby a spark discharge is produced when said temporary contact is broken;

a shielding gas inlet and means for conveying shielding gas from the inlet to the neighborhood of the wire end during the spark discharge;

the apparatus further comprising means for effecting relative movement of the wire, on which a ball has been formed by the spark discharge process, and a component or terminal received in the apparatus to bring the ball into contact with the component or terminal for bonding.

4,098,448

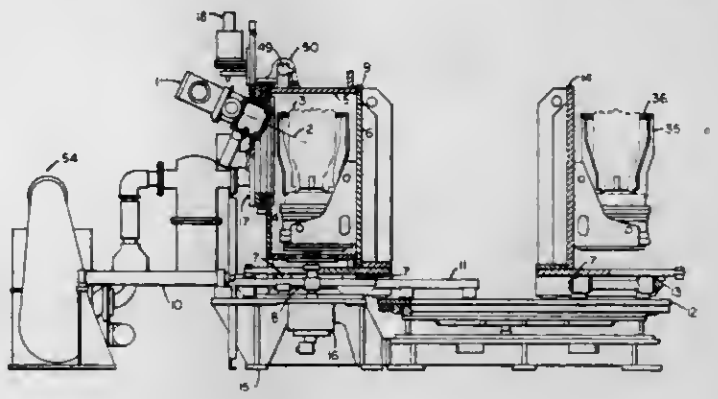
METHOD AND APPARATUS FOR MANUFACTURING ROTARY DRILL BITS

Albert M. Sciaky, Palos Park, and William R. Mello, Lockport, both of Ill., assignors to Sciaky Bros., Inc., Chicago, Ill.

Filed Sep. 27, 1976, Ser. No. 727,162

Int. Cl.² B23K ***15/00, 37/04***

U.S. Cl. 228—102 **13 Claims**



1. A method of constructing a drill bit from a multiplicity of like segments comprising the steps of:

machining a cavity into the end of the shank portion of each segment;

placing a multiplicity of said segments into a fixture with adjoining segment faces separated except at one point and so that registration pins mounted upon said fixture lie within the said cavities;

causing rolling cutters mounted upon the bit leg portion of each segment to make contact at a point on each of the said cutters periphery with a sizing gauge ring;

applying a force to each of the segments to cause each segment to rotate about an axis passing through its respective registration cavity so as to bring the faces of adjacent segments in abutment, while maintaining the gauged surface of the cutters in contact with the sizing gauge ring;

clamping the segments in fixed relationship to one another; and, welding the abutting faces between segments.

4,098,449

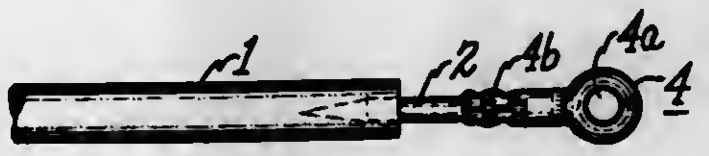
TERMINAL CONNECTION FOR ALUMINUM CONDUCTOR AND METHOD OF MAKING

Stanley J. Noesen, Hendersonville, N.C., assignor to General Electric Company

Filed Mar. 28, 1977, Ser. No. 782,101

Int. Cl.² B23K ***21/00;*** **H01R** ***13/20***

U.S. Cl. 228—115 **9 Claims**



1. A method of making an electrical connection with a solid aluminum conductor which comprises forcing an electrical

conducting metal member having a tapered portion into said solid aluminum conductor, so that the surface of said tapered portion which penetrates into the interior of said solid aluminum conductor is scraped clean by the friction of such formed penetration and forms thereby a cold welded joint with the contiguous substantially non-oxidized surface of said solid aluminum conductor.

4,098,450

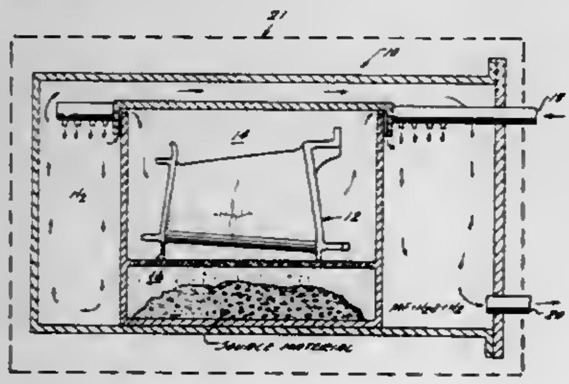
SUPERALLOY ARTICLE CLEANING AND REPAIR METHOD

Donald L. Keller, Cincinnati, and David L. Resor, Mount Orab, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 17, 1977, Ser. No. 778,493

Int. Cl.^{2} B23K *31/00*

U.S. Cl. 228—119 **6 Claims**



1. A method for repairing a narrow crevice in the surface of a Ni-base superalloy article, the crevice having an opening at the surface in the range of about 0.001 - 0.1 inch and including a complex oxide which includes at least one metal selected from the group consisting of A1 and Ti, comprising the steps of:

providing a non-oxidizing atmosphere about the oxide;

contacting the oxide with gaseous active fluoride ions while heating the oxide at a temperature no greater than about 2000° F and at which the oxide will react with the fluoride ions to convert the oxide to a gaseous fluoride, without substantially affecting detrimentally the structure and mechanical properties of the article;

applying a powdered repair alloy which melts and flows at a temperature less than that which will affect detrimentally mechanical properties of the article on the article surface over the crevice;

providing a vacuum about the article; and then

heating the article and repair alloy at temperature less than that which will affect detrimentally the mechanical properties of the article for a time sufficient to melt the bonding alloy and to flow the repair alloy into the crevice to fill the crevice and to diffuse the repair alloy with walls of the crevice.

4,098,451

WELDING METHOD

Christopher John Smith, Maidenhead, and David John Lythall, Hertford, both of England, assignors to BOC Limited, London, England

Filed Apr. 28, 1977, Ser. No. 791,874

Claims priority, application United Kingdom, Apr. 30, 1976, 17849/76

Int. Cl.^{2} B23K *31/06*

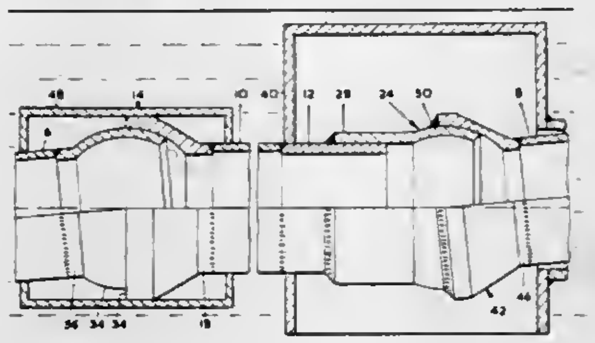
U.S. Cl. 228—119 **8 Claims**

8. A method of repairing an under water pipeline from which a defective or damaged length of pipe has been cut away to form two longitudinally spaced-apart, exposed, pipe ends which method includes the steps of:

(a) butt-welding to one exposed pipe end a tubular end portion end portion of a first hollow, open-ended member having an inner or outer part-spherical mating surface;

(b) butt-welding a sleeve to the other exposed pipe end;

(c) mounting on the sleeve a tubular end portion of a second hollow open-ended member which has a part-spherical mating surface complementary to that of the first open-ended member; and



(d) fillet welding the sleeve to the tubular end portion of the second open-ended member, and the mating surfaces of the open-ended member to each other;

Wherein the sleeve and the tubular portions of the open-ended members have internal diameters and radial wall thickness such that the butt welds are able to be made irrespective of where in the range of external diameters specified for the pipeline the actual external diameters of the pipeline lies.

4,098,452

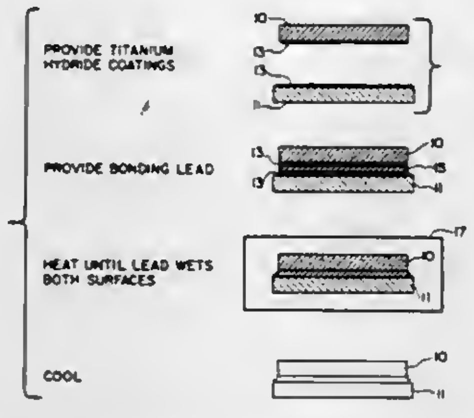
LEAD BONDING METHOD

Harold F. Webster, Scotia, and Dominic A. Cusano, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 563,821, Mar. 31, 1975, abandoned, and Ser. No. 697,983, Jun. 21, 1976, abandoned, which is a division of Ser. No. 563,821,. This application Oct. 7, 1976, Ser. No. 730,646

Int. Cl.^{2} B23K *1/20;* H01L *21/58*

U.S. Cl. 228—123 **39 Claims**


PROVIDE TITANIUM HYDRIDE COATINGS
PROVIDE BONDING LEAD
HEAT UNTIL LEAD WETS BOTH SURFACES
COOL

1. A method for forming a bond between a suitable metal and a semiconductor selected from the group consisting of silicon, germanium and group III-V compounds comprising:

coating the surfaces to be bonded with a substantially uniform layer of refractory metal wetting agent selected from the group consisting of titanium, zirconium and hafnium,

providing a source of bonding metal selected from the group consisting of substantially pure lead, tin, bismuth and indium between said coated surfaces, said coated surfaces having a thickness which substantially prevents interaction between said bonding metal and said semiconductor,

heating the bonding metal and the surfaces to be bonded to a temperature sufficiently high to cause melting of the bonding metal and wetting of the surfaces by the bonding metal in the presence of the refractory metal wetting agent, whereby a bond is formed having a low melting point and low residual strain.

4,098,453

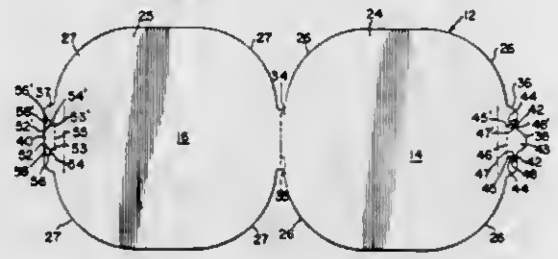
PACKAGING CONTAINER WITH LATCHING ARRANGEMENT

Edwin L. Arneson, Morris, Ill., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Dec. 20, 1976, Ser. No. 752,082

Int. Cl.^{2} B65D *1/34, 5/66*

U.S. Cl. 229—45 **1 Claim**



1. A readily disposable container which is formed from a single blank of cut and scored paperboard, or similar sheet material of a character which enables forming the container elements by die shaping, said container comprising a tray-like product accommodating member and a cover member of like configuration, with cooperating sidewalls having a hinged connection along one side thereof and cooperating latch elements, said container forming members each having peripherial flange formations extending outboard of the free edges of the sidewalls which flange formations are disposed so as to overlie each other in the closed position of said members, the hinged connection being at the outer edges of the flange formations and said latch elements being cut in outboard extensions of said flange formations which are brought into registry with each other when said cover member is closed on said product accommodating member so as to permit interengagement of said latch elements, said latch elements comprising a hinged tab member cut in the flange extension of said container cover member and a cooperating slot cut in the flange extension of said product accommodating member, said hinged tab member being defined by laterally spaced cuts extending inboard of the free outer edge of said flange extension, which cuts have their innermost portions converging toward each other and terminating at short parallel cutting lines which extend to a hinge line which is approximately aligned with the outermost edges of the flange formation adjoining the flange extension so as to form small ear formations extending from opposite side edges and adjacent the free outer edge portions of said tab member, the latch forming slot which is cut in the flange formation of the product accommodating member being defined by laterally spaced cuts extending inboard of the free outer edge thereof so as to form a portion at the free margin thereof of lesser width than the distance between the ear formations on said tab member and so as to leave small ear formations on the adjoining flange portions which extend inwardly toward each other and interengage with the ear formations on said tab member when said tab member and said latch forming panel are swung into position, and a small hinged panel member formed in the area which is cut out to form said latch forming slot which hinged panel member serves as a catch for holding the latching ears in engagement.

4,098,454

NEWSPAPER RECEPTACLE

Robert C. Easter, 705 Little Oak, Austin, Tex. 78753

Filed Nov. 8, 1976, Ser. No. 739,345

Int. Cl.^{2} A47G *29/12*

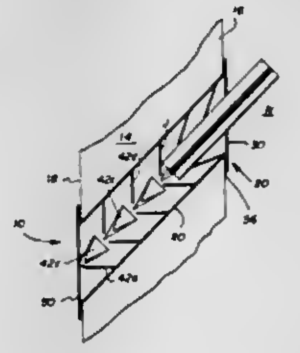
U.S. Cl. 232—19 **2 Claims**

1. A receptacle in a wall structure for receiving, retaining, and transmitting in a unidirectional path a newspaper or the like, comprising:

(a) an elongated chute comprising:
  (i) an external end for receiving the newspaper or the like into the chute;
  (ii) a unitary body including top, bottom and opposed side walls for retaining the newspaper or the like within the chute; and
  (iii) an internal end for transmitting the newspaper or the like from the chute, the external end of the chute being elevated in relation to the internal end of the chute when positioned in the wall structure;

(b) resilient fingers extending from the walls of the body and converging downwardly toward the internal end of the chute and capable of expansion or contraction for allowing passage of newspapers or the like through the body of the chute while preventing withdrawal of newspapers or the like from the external end of the chute;

(c) a first collar means mateable to the external end of the chute and having a plurality of radial extending slots to define a plurality of resilient fingers perpendicularly extending from the peripheral portion of the first collar means and converging radially inwardly toward the center of the first collar means, the fingers being mateable to define a coplanar configuration, such that the first collar means provides a weatherproof closure for the external end of the chute, the fingers being yieldably drawn inwardly into the chute in the direction of an inserted newspaper or the like into the chute and the fingers returning to the coplanar configuration after passage of the newspaper or the like through the first collar means; and



(d) a second collar means mateable to the internal end of the chute and having a plurality of radial extending slots to define a plurality of resilient fingers perpendicularly extending from the peripheral portion of the second collar means and converging radially inwardly toward the center of the second collar means, the fingers being mateable to define a coplanar configuration, such that the second collar means provides a closure for the internal end of the chute, the fingers being yieldably drawn outwardly of the chute in the direction of an inserted newspaper or the like as the newspaper or the like exits from the chute and the fingers returning to the coplanar configuration after passage of the newspaper or the like through the second collar means.

4,098,455

ROTARY SEAL DISTRIBUTOR MEMBER FOR A CENTRIFUGE

David W. Ammann, Lindenhurst; David A. Bates, Libertyville, and Daniel B. Granzow, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

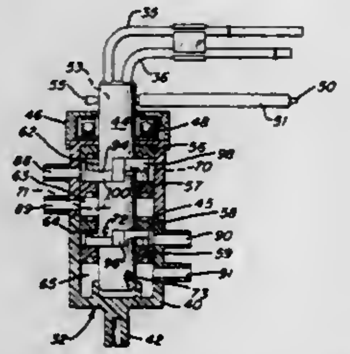
Filed Mar. 29, 1977, Ser. No. 782,490

Int. Cl.^{2} B04B *7/00*

U.S. Cl. 233—1 A **4 Claims**

1. In a rotary distributor seal for a centrifuge which comprises a tubular housing having sealed ends, a relatively rotatable, fluid-containing apertured spindle coaxially mounted in said housing and projecting from an end thereof, and a plural-

ity of resilient, spaced ring seals positioned about said spindle to seal the annular space between said spindle and the inner surface of said housing, and to subdivide said annular space into a plurality of axially spaced, annular chambers; and ports communicating with said chambers through said housing, to provide fluid flow paths from said ports to said separate chambers and through said spindle, the improvement comprising,



support members positioned in alternate, spaced chambers between pairs of ring seals to prevent collapse of said ring seal pairs together, each support member comprising a rigid ring positioned about said spindle and spaced therefrom, a first opposed pair of sections of said ring occupying a first plane, and a second opposed pair of sections of said ring occupying a second plane.

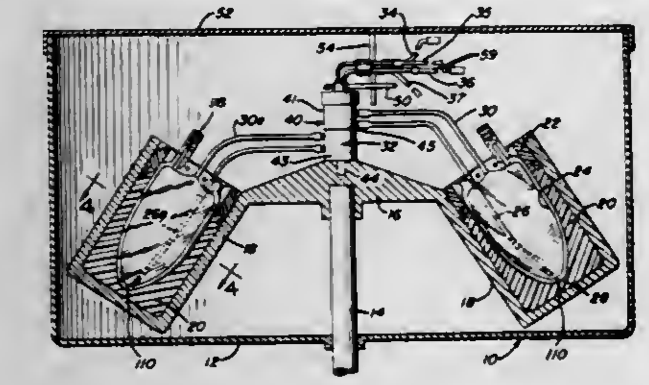
4,098,456
CENTRIFUGE SYSTEM HAVING COLLAPSIBLE CENTRIFUGE BAGS

Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 29, 1977, Ser. No. 782,488

Int. Cl.² B04B *15/12*

U.S. Cl. 233—14 R **12 Claims**



1. In combination with a centrifuge cup having a mouth-defining rim, the improvement comprising:

a pair of separable cap member halves carried at the rim of said centrifuge cup and positioned together to define a cap over the mouth of said cup, and means, associated with said cap member halves for gripping the upper end of a flexible bag positioned in said cup to prevent the bag from collapsing in said cup upon centrifugation, and in which said gripping means includes pins carried by said cap member halves and proportioned to pass through and retain a flexible bag adjacent to its upper end while the bag is positioned in said centrifuge cup.

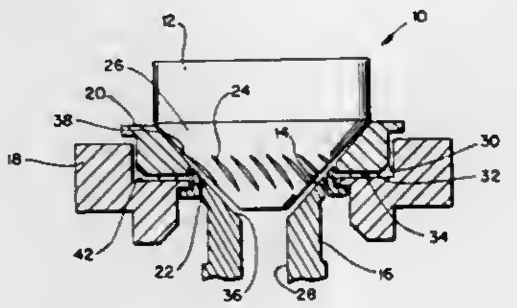
4,098,457
FRICTION PRODUCING STATOR PAD FOR AN AIR DRIVEN CENTRIFUGE

Lee Gropper, Los Altos Hills, and Kenzo Ishimaru, San Jose, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 28, 1977, Ser. No. 781,915

Int. Cl.² B04B *9/12*

U.S. Cl. 233—23 R **8 Claims**



1. A centrifuge rotor seat for an air driven centrifuge rotor, said seat comprising:

a stator mounted within said centrifuge, said stator having a generally cylindrical central portion and an upper annular flanged portion extending outward from said central portion;

a stator pad movably positioned on said annular flanged portion of said stator; and

means attached to the bottom of said pad for increasing friction forces between said stator pad and said stator during relative movement between said stator and said stator pad so that said increased friction forces between said stator and said pad with said friction increasing means will provide greater stability to said air driven centrifuge rotor during its operation than the friction forces generated between said stator and said bottom of said pad.

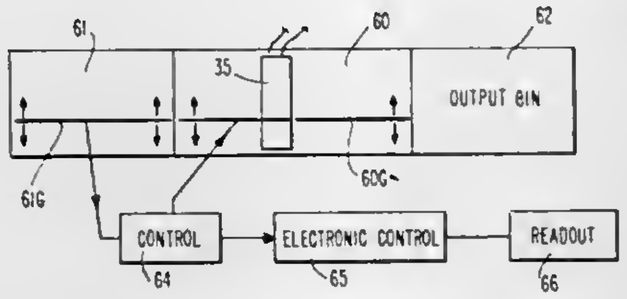
4,098,458
ADJUSTABLE WIDTH DOCUMENT READER

Richard J. Anchinleck, Norristown, Pa., assignor to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Oct. 27, 1976, Ser. No. 736,063

Int. Cl.² G06K *13/20;* **B65H** *9/16*

U.S. Cl. 235—475 **17 Claims**



1. Document reader apparatus comprising:

a. input means for inputting a document to said reader;
b. read means, for reading information encoded on said document;
c. transport means for transporting said document along a predetermined path relative to said read means so that said encoded information can be read, said transport means having a channel extending along said path and defining the width of said path; and
d. means for adjusting said width to correspond to the inputted document, said adjusting means being adapted to adjust and maintain said path width to one of a plurality of selectable fixed predetermined widths.

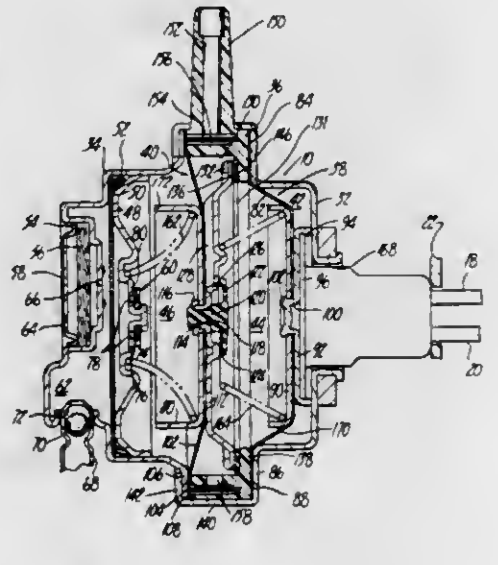
4,098,459
VACUUM BREAK DEVICE

Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Jul. 30, 1976, Ser. No. 709,970

Int. Cl.² G05D *23/01*

U.S. Cl. 236—87 **19 Claims**



1. A vacuum break comprising; a housing; a pair of movable diaphragm assemblies forming first, second and third chambers in said housing, said second chamber having opposed walls formed by said pair of diaphragm assemblies, means associated with each diaphragm assembly preventing initial movement in one direction, said second and third chambers being connected to separate sources of vacuum, said first diaphragm assembly being movable in the other direction in a first range in response to a vacuum pressure in said second chamber acting on said first diaphragm assembly independently of and relative to said second diaphragm assembly which remains stationary, said first diaphragm assembly being movable in the same direction in a second range in unison with said second diaphragm assembly upon subsequent establishment of vacuum pressure in said third chamber, and plunger means connected to said first diaphragm assembly for movement therewith in said first and second ranges.

11. A vacuum break device comprising; a housing, a pair of first and second diaphragm assemblies disposed in said housing and forming first, second, and third chambers in said housing, said second chamber being disposed between said pair of diaphragm assemblies, said second chamber being connected to one source of vacuum and said third chamber being connected to another source of vacuum, said first diaphragm assembly being biased towards said second diaphragm assembly while the latter remains stationary in response to pressure differential upon establishment of vacuum in said second chamber for movement of said first diaphragm in a first range, said first diaphragm assembly being movable in a second range together with said second diaphragm assembly upon subsequent establishment of a vacuum pressure in said third chamber, first delay means operatively controlling fluid flow in said second chamber to delay movement of said first diaphragm assembly in said first range, and second delay means operatively controlling fluid flow to said third chamber to delay movement of said first diaphragm assembly in said second range.

4,098,460
CONCRETE UNIT PRESTRESSED USING TENDONS STRESSED BEFORE CONCRETING, MORE PARTICULARLY A RAILWAY SLEEPER

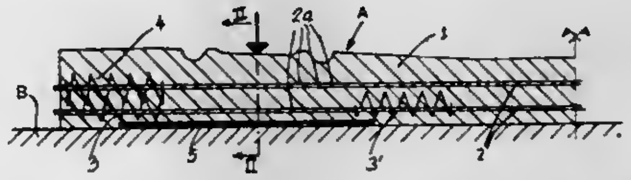
Jean Olivier-Martin, Vaucresson, France, assignor to Societe Technique pour l'Utilisation de la Precontrainte, France

Filed Jul. 9, 1976, Ser. No. 703,960

Claims priority, application France, Jul. 17, 1975, 75 22403

Int. Cl.² E01B *3/34*

U.S. Cl. 238—91 **3 Claims**



1. In a prestressed concrete railway sleeper, comprising an elongated concrete body, straight parallel steel tendons coextensive with and distributed and embedded in the lower portion of said body, said tendons being in a pretensioned state and having therealong distributed surface unevenness, the improvement which comprises at least one helical wire winding of limited length surrounding each of said tendons, said winding being symmetrically arranged with respect to the location of the medial plane of each rail on the sleeper, said helical wires being of the same pitch and two by two mutually interpenetrated by screwing.

4,098,461
PIPE NIPPLE FOR THE DISCHARGE OF A SOLID WATER JET

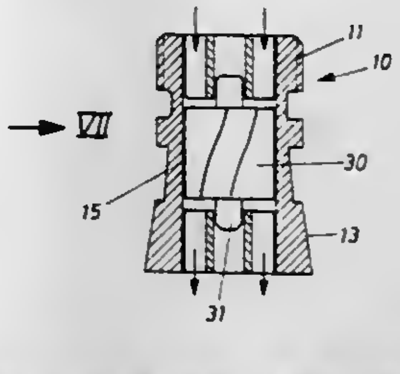
Kurt Weller, Menden, Fed. Rep. of Germany, assignor to Franz Scheffer oHG, Menden, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,574

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630860

Int. Cl.² B05B *1/08*

U.S. Cl. 239—101 **6 Claims**



1. A pipe nipple for the discharge of a solid water jet, particularly from the center of a shower bead having an internal screw thread, said pipe nipple comprising:

(a) a water entry end and a water exit end;
(b) an external screw thread on said entry end adapted for threaded engagement with said internal screw thread;
(c) tool engaging means on said exit end for engagement by a tool to screw and unscrew said pipe nipple into and out of said shower bead;
(d) a first inset in said entry end defining a central bore and a plurality of open axial grooves in the peripheral surface of said first inset;
(e) a second inset in said exit end spaced from and axially aligned with respect to said first inset and defining a central bore and a plurality of open axial grooves in the peripheral surface of said second inset;
(f) said axial grooves in said second inset being larger than said axial grooves in said first inset, and corresponding of

said axial grooves of said insets being in axial alignment parallel to the axis of said pipe nipple;

(g) a spinner having a pair of pins axially projecting from opposite ends thereof, said pins engaging respective of said central bores of said insets, said spinner having at least two blades extending obliquely with respect to the rotational axis of said spinner with open sectors between said blades, each blade having a cross section at least equal to the cross section of said axial grooves in said first inset;

(h) whereby water flowing through said axial grooves in said first inset impinges tangentially on the pitched surfaces of said blades causing said spinner to rotate, alternately opening and closing said grooves in said first inset and resulting in solid jets of water being pulsed through said grooves in said second inset at a frequency corresponding to the rotational speed of said spinner.

4,098,462

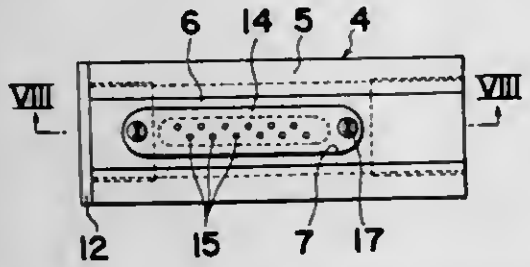
APPLICATOR NOZZLE FOR USE IN CENTRIFUGAL CASTING

Hiroshi Izaki, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Division of Ser. No. 664,892, Mar. 8, 1976, Pat. No. 4,084,632. This application Jan. 19, 1977, Ser. No. 760,662

Int. Cl.² B22D *13/10*

U.S. Cl. 239—557 **4 Claims**



1. A nozzle for use in centrifugal casting wherein a coating solution is applied onto a molding surface of a rotating metal mold for formation of a mold coating on the molding surface through the nozzle mounted on a lance as the lance advances into the metal mold, said nozzle comprising a nozzle main body communicated with such a lance and a plurality of nozzle openings which are arranged on said nozzle main body at a predetermined pitch to each other such that the pitch between the nozzle openings is given by the equation:

$$P = 6000/NXY \text{ (cm)}$$

wherein P is the pitch between the nozzle openings, N is the number of revolutions of the metal mold in r.p.m., X is the number of nozzle openings and Y is the moving speed of the lance in sec./m. by which relationship a uniform coating can be applied without any spiral patterns on the surface of the metal mold, said plurality of nozzle openings being formed in a separate plate member releasably mounted on said nozzle main body.

4,098,463

TEMPERATURE-CONTROLLED COMMINUTING METHOD AND APPARATUS

George W. Lowry, Fremont, Ind., assignor to Metals & Plastics, Inc., Ashley-Hudson, Ind.

Filed Feb. 3, 1977, Ser. No. 765,421

Int. Cl.² B02C *23/18*

U.S. Cl. 241—17 **6 Claims**

1. In a process for reclaiming plastic insulation from scrap wire having an internal metal conductor and a core of nylon fibers, said process comprising the steps of:

comminuting the scrap wire in a cutting chamber;

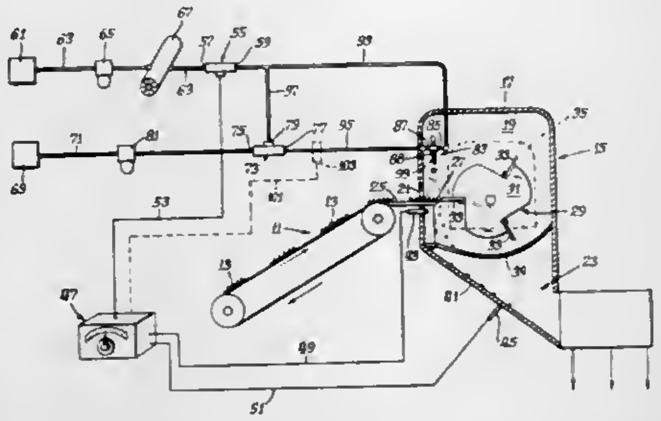
separating the plastic pieces from the metal and the nylon fibers;

the improvement for reducing the amount of plastic pieces with nylon fiber embedded therein comprising during comminuting

sensing a temperature indicative of the temperature in the cutting chamber and of the temperature of plastic insulation pieces,

limiting the temperature in the cutting chamber to a temperature to maintain said plastic insulation hard to resist embedding of nylon fibers therein by discharging a spray of cooling liquid into said cutting chamber in response to said sensed temperature which exceeds a predetermined temperature, and

controlling the temperature of the discharging pieces such that the cooling liquid will evaporate to provide substantially dry particles for separation with a minimal amount of pieces of plastic embedded with nylon.



4,098,464

METHOD OF TREATING REFUSE FOR RECLAMATION OF VALUABLE COMPONENTS THEREOF

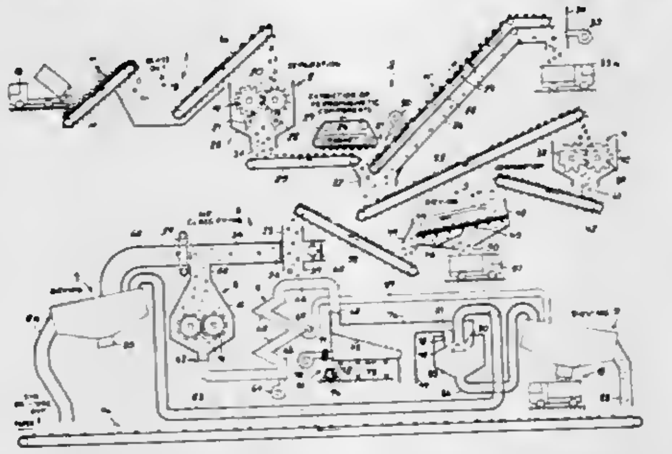
Peter Niedner; Klaus Hillekamp, both of Munich, and Hubert Kindler, Grobenzell, all of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 624,777, Oct. 20, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,286

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1974, 2449689

Int. Cl.² B02C *23/14*

U.S. Cl. 241—24 **2 Claims**



1. A method of treating bulk municipal waste collected at least in part in the form of bundles, boxes and bags, which comprises the steps of:

(a) removing glass articles from the collected municipal waste;

(b) breaking up bundles and boxes and ripping open bags in the refuse to produce a bulk product;

(c) magnetically extracting ferromagnetic articles from said bulk product;

(d) coarsely comminuting the refuse remaining after step (c) without destroying the basic characteristics of the components thereof by cutting large pieces of refuse into smaller pieces having generally widths and thicknesses up to 300 mm but substantially unreduced lengths;

(e) air classifying the coarsely comminuted refuse from step (d) according to weight and aerodynamic resistance into three fractions, namely

a light fraction comprised mainly of loose paper in sheet form, synthetic-resin foils and light textiles,

a medium heavy fraction comprised mainly of cardboard, heavier synthetic-resin articles, heavy fabrics and wadded paper, and

a heavy fraction comprised mainly of pieces of wood, stones, books and paper bundles, by passing the coarsely comminuted refuse from step (d) through a horizontally directed stream of air;

(f) recovering from said light fraction of step (e) substantially all synthetic-resin pieces contained therein and separately recovering paper from said light fraction; and

(g) subjecting said medium heavy fraction to a vertically flowing stream of air along a rising zigzag path to recover paper from said medium heavy fraction and removing the paper from the air stream in a cyclone to recover the paper.

4,098,465

DEVICE FOR WET GRINDING

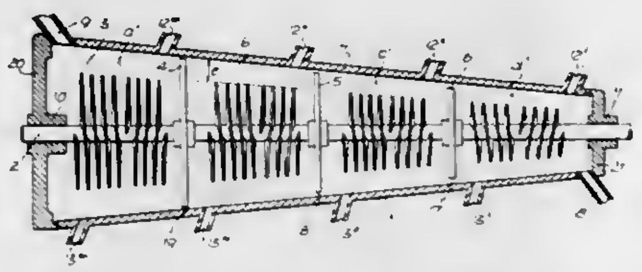
Karl Heinz Meller, Ernst-Merck-Strasse 12-14, D-2000 Hamburg 1, Fed. Rep. of Germany, and Jacques Brenot, 24, Rue Taclet, F-75 020 Paris, France

Filed Apr. 8, 1977, Ser. No. 785,842

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616155

Int. Cl.² B02C *23/36*

U.S. Cl. 241—43 **13 Claims**



1. A wet grinding device having a container for receiving therein products to be ground as weel as grinding balls, the container being equipped with a mixer, a delivery device for feeding the products to be ground into the container, a discharge outlet for the broken-up products, as well as a drive device for the mixer, comprising

an operating chamber divided into a plurality of grinding zones of increasing diameter and volume,

a mixer shaft rotatably extending through and supported by said operating chamber and substantially horizontally disposed, said shaft constituting a mixer and including a plurality of blades in said plurality of grinding zones having a diameter proportional to the diameter of said grinding zones, respectively.

4,098,466

IMPACT MILL FOR REDUCING SOLIDS

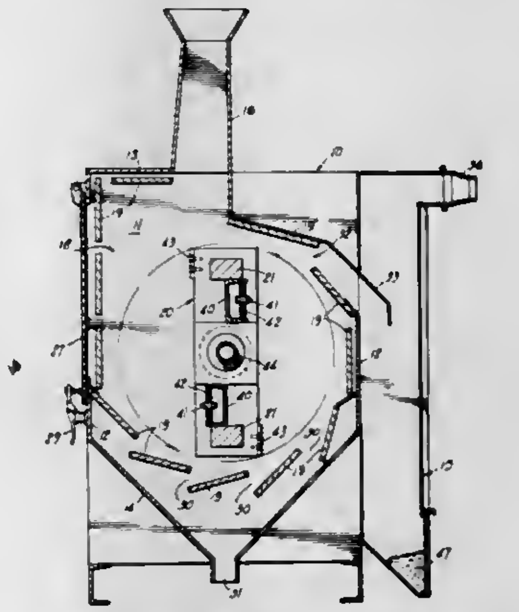
Robert C. MacElvain, and Ford M. MacElvain, both of 3009 Lafayette Pkwy., Opelika, Ala. 36801

Continuation-in-part of Ser. No. 554,596, Mar. 3, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 760,000

Int. Cl.² B02C *13/09*

U.S. Cl. 241—57 **10 Claims**

1. An apparatus for reducing solids by impact comprising means forming a reduction chamber having a top inlet for solids and a bottom outlet for reducing solids, an impact rotor in the chamber and spanning the chamber substantially between opposing side walls of the chamber, a generally circumferential array of fixed impact members in said reduction chamber near the periphery thereof, said impact members having generally flat surfaces facing generally in directions toward said rotor, at least the lowermost impact members being below said rotor and near said bottom outlet and spaced apart to form reduced solids discharge passages, the impact rotor including at least a pair of impact bars spaced from the rotational axis of said rotor and revolving inwardly of said fixed impact members, said fixed impact members being so arranged circumferentially about said rotor that an annular space is provided between said fixed impact members and the path of travel of said impact bars whereby solids introduced by gravity into the top of the reduction chamber will be struck by the impact bars of the rotor and propelled against the fixed impact members and be directed back toward the part of said impact bars by said impact members and against other solids continually and progressively throughout said annular space surrounding said rotor and its impact bars in the reduction chamber from the top to the bottom thereof, until said solids are reduced in size enough to pass through said discharge passages.



4,098,467

APPARATUS FOR WINDING FILAMENTARY MATERIAL

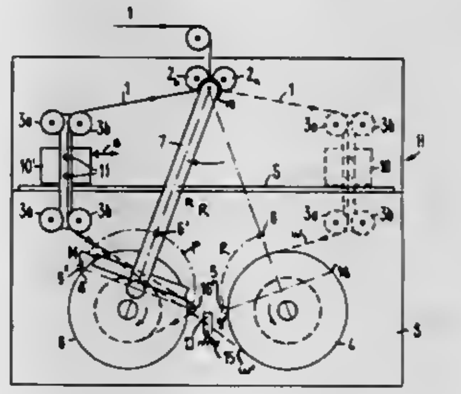
Gunther Engmann, Schwabach; Karl Jorg, Georgensgmund, and Hermann Heider, Kammerstein nr. 76, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Niehoff, KG, Schwabach, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,309

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610393

Int. Cl.² B65H *54/00, 67/04*

U.S. Cl. 242—25 A **11 Claims**



1. Apparatus for continuously winding strand material onto spools comprising a pair of parallel spool shafts, a set of main and auxiliary spools removably mounted on each shaft for

rotation about the axis thereof, pulley means for laying said strand onto said spools, said pulley means being movable in a direction parallel to the axes of said spool shafts to traverse the spools in each set, and in a direction perpendicular to the axes of said spool shafts to transfer the strand from one set of spools to the other, means operative upon transfer of said strand from one set of spools to sever said strand and attach said strand to the auxiliary spool of the other set, and excursion means movable in advance of the transfer of said strand, alternately between said sets of spools to form a loop of strand about said auxiliary spool, for subsequent traverse of said strand about said main spool after said strand is attached to said auxiliary spool.

4,098,468
REELING DEVICE FOR CABLES

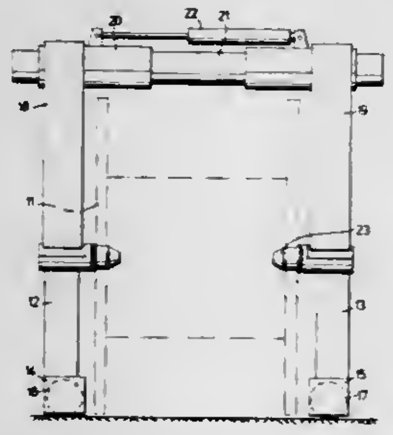
Öysten Skalleberg, Järfälla, Sweden, assignor to Skaltek AB, Kungsangen, Sweden

Filed Mar. 25, 1977, Ser. No. 781,133

Claims priority, application Sweden, Mar. 29, 1976, 7603752

Int. Cl.^{2} B65H *75/00*

U.S. Cl. 242—54 R **10 Claims**



1. A cable reeling device for winding cable and the like upon a flanged reel having central spindle-receiving openings, said device comprising a pair of laterally spaced vertical side-frames two support members each slidable vertically along one of said side-frames, a pair of spindles each supported by one of said support members, longitudinally adjustable means interconnecting said support members for holding the side-frames in position to receive a reel between the spindles, power means supported by said support members for moving the spindles between a first position in which they are freely movable relative to the support members within a zone around the intended position of the reel axis to permit insertion of the spindles into the reel openings when the side-frames are adjusted toward each other, and a second position fixed in relation to the support members for then rotatably supporting a reel on the spindles.

4,098,469
TOILET PAPER ROLL HOLDER

Joseph J. McCarthy, P.O. Box 326, Antrim, N.H. 03440

Filed Oct. 21, 1977, Ser. No. 844,479

Int. Cl.^{2} A47K *10/22*

U.S. Cl. 242—55.3 **6 Claims**

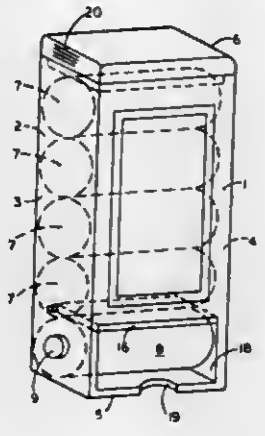
1. A toilet paper bolder comprising:

(a) an elongated vertically extending chute of suitable dimension for bolding in vertical stacked relation a plurality of rolls of paper, said rolls being mounted on a hollow core, said chute having front and back walls, side walls, and top and bottom walls, each said roll having an axis that extends horizontally from side wall to side wall and is substantially parallel to the axis of each other roll;

(b) an opening in said front wall adjacent said bottom wall, said opening being sufficiently large to permit insertion and removal of said rolls;

(c) a groove in the inner face of each said side wall proximate to said opening, each said groove extending from a point adjacent to but spaced from the upper end of said opening toward said back wall, each said groove being parallel to the other said groove;

(d) a door having a pair of hinge pins each extending horizontally from the upper side edge of said door, said pins being disposed in said grooves and guided thereby when the door is pivoted upwardly on said pins and slid towards said back wall; and



(e) a removable spindle adapted to extend through the hollow core of the lowermost roll and hold it in position, said spindle being supported by said side walls.

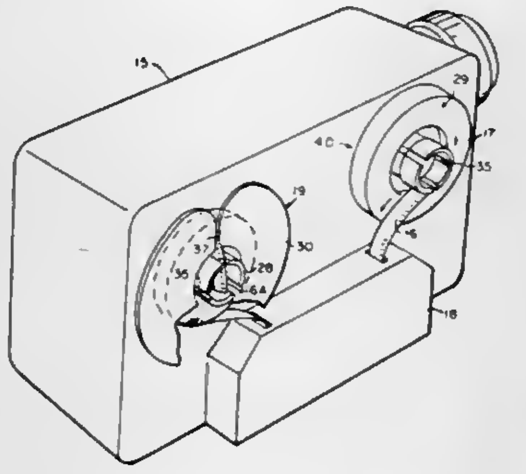
4,098,470
MOVIE REEL SYSTEM

Dexter C. Clark, 1091 Franquette Ave., San Jose, Calif. 95125

Filed Apr. 4, 1977, Ser. No. 784,426

Int. Cl.^{2} B65H *17/48;* **G03B** *1/02*

U.S. Cl. 242—55.18 **10 Claims**



1. A reel device for holding a film and adapted to fit on a supporting shaft, said reel device comprising, in combination:

a first member having a hub forming a center opening to receive the shaft and having fixed to one end a first planar sidewall;

a second member having a second planar sidewall forming a center opening sized to fit over the hub and including means for attachment thereto with the second sidewall being in spaced relationship with the first sidewall such that the film can be wound therebetween and adjacent the first sidewall;

a third member having an outer wall including means for attachment to the first member sidewall and also having a third sidewall member attached in a position extending parallel to but spaced from the first sidewall when the first and third members are attached so as to enclose and hold in place the film wound adjacent the first sidewall on the center hub whereby the film can be wound on the combination of the first and second members and thereafter by removal of the second member from the first member leaving the film on the first member, the third member can be attached to the first member to enclose the film on the first member.

4,098,471
APPARATUS FOR SEVERING A CONTINUOUS CLOTH WEB MOUNTED ON A ROLLER

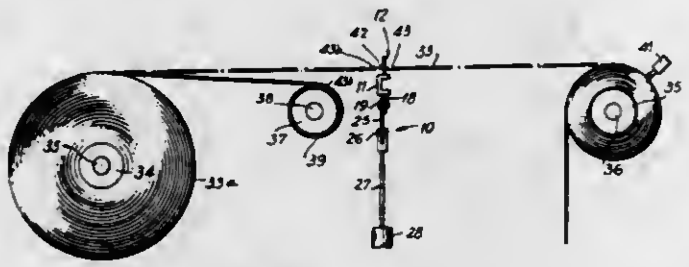
Hans Peter Simm, and Gerhard Voswinckel, both of Aachen, Fed. Rep. of Germany, assignors to Fa. H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,747

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 760720[U]

Int. Cl.^{2} B65H *19/20*

U.S. Cl. 242—56 R **6 Claims**



1. Apparatus for cutting through a cloth web stretched between a supply roller and a takeup roller, each of said rollers being mounted on parallel shafts, comprising an elongated cutting member of length at least equal to the width of said web and means to move the cutting member against and transversely across the width of the web to sever the latter, said means comprising a parallelogram linkage in which said elongated cutting member includes a beam comprising one leg of said linkage, a pair of crank arms are provided each having a fixed pivotal mount at one end and being pivotally mounted at their other ends to the beam and means simultaneously to pivot said crank arms to effect simultaneous transverse and vertical movement of said beam.

4,098,472
SPIN FISHING REEL WITH ADJUSTABLE BAIL ARM RETURN SPRING

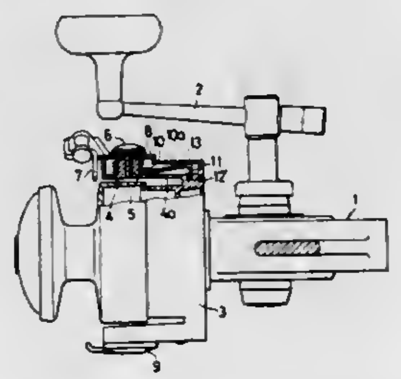
Kounin Sazaki, Fukuyama, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Feb. 28, 1977, Ser. No. 772,883

Claims priority, application Japan, Mar. 3, 1976, 51-25623[U]

Int. Cl.^{2} A01K *89/01*

U.S. Cl. 242—84.2 G **4 Claims**



1. In a spin fishing reel including a reel body (1), a rotor (3) journalled for rotation in the body and drivenly engaged with a handle (2) mounted on the body, a pair of diametrically opposite support members (4) on the rotor, a pivot post (5) extending radially outwardly from each support member, bail arm means (6, 7, 8, 9) pivotally mounted on and extending between the posts, and a coil spring (10) mounted around one of the posts, one end of the spring being engaged with the bail arm means and the other end of the spring being engaged with the support member of said one post, whereby the spring biases the bail arm means toward a line retrieval position, spring tension adjustment means characterized by:

(a) a plurality of circumferentially spaced spring end engagement means (12) disposed in said support member, and

(b) said other end of the spring being configured to be selectively engageable with one of the spring end engagement means.

4,098,473
BAIL LATCHING AND RELEASING MECHANISM FOR SPIN FISHING REEL

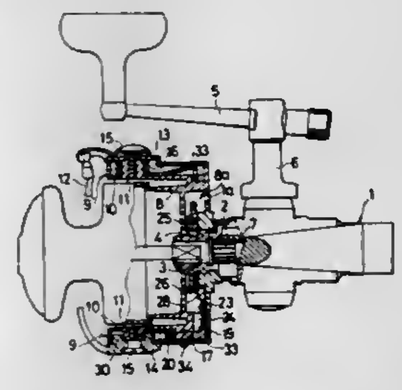
Kounin Sazaki, Fukuyama, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Mar. 2, 1977, Ser. No. 773,737

Claims priority, application Japan, Mar. 4, 1976, 51-25654[U]

Int. Cl.^{2} A01K *89/00*

U.S. Cl. 242—84.2 G **6 Claims**



1. A bail latching and releasing mechanism for a spinning reel, which includes a bail arm (12) pivotally mounted at both ends on diametrically opposite sides of a rotor (8) for swinging movement thereacross between a cocked and a rewind position, a torsion spring (16) biasing the bail arm toward the rewind position, a kick lever (19), a pivot cam (14) mounted on one end of the bail arm, the kick lever and the pivot cam being slidably and pivotally mounted, respectively, on a support housing (9) of the rotor, a spring (20) biasing the kick lever toward the pivot cam and into engagement therewith, the kick lever locking the pivot cam and bail arm in the cocked position, and adapted to be cammed toward a reel body (1) to a retracted position, following rotation of the rotor, to thereby release the bail arm and pivot cam; characterized in that;

(a) the kick lever has an L-shaped configuration including a radially extending upright portion (23),

(b) a key plate (25), which also serves as a retainer for a rotor bearing, is mounted to the reel body and disposed in the rotational path of the upright portion of the kick lever when the bail arm is cocked, and

(c) the pivot cam has a cam face (31) having a C-shaped contour of changing radius with respect to the axis of the pivot cam, said cam face having a recess (32) therein in the smallest radius portion for engaging the kick lever to lock the pivot cam and bail arm in the cocked position.

4,098,474
TAPE DRIVE FOR A CASSETTE IN A SOUND REPRODUCER AND/OR RECORDER

Fritz Lehnert, Gross Giesen, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed Dec. 22, 1976, Ser. No. 753,564

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557798

Int. Cl.^{2} G03B *1/04;* **G11B** *15/32*

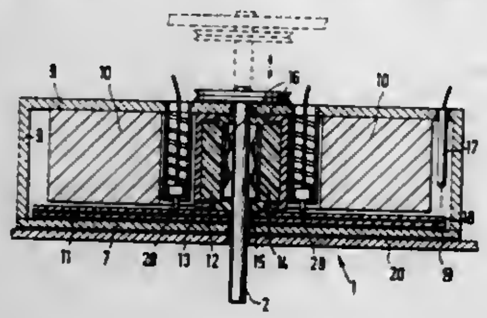
U.S. Cl. 242—200 **20 Claims**

1. Tape drive for a magnetic tape cassette record and/or

player having both steady speed and low inertia, as well as small axial dimensions, comprising in combination:

a direct current motor of the axial air-gap type having an annular multipolar permanent magnet stator and a substantially disc shaped rotor of non-magnetic material and a shaft concentric with and driven by said rotor having an extension disposed and shaped as a tape transport capstan;

means, including take-up and pay-out spindles for insertion in a cassette and a pressure roller facing said capstan, for driving of tape contained in the cassette past at least one magnetic transducer head at a rate determined by the rotation rate of said shaft,



all of the movable portions of said motor, shaft, and driving means having low moment of inertia, and

means, including features at or near the periphery of said rotor and non-rotary elements fixed in said motor at locations suitable for cooperation with said features of said rotor, for generating an electric signal of a frequency proportional to motor speed for use by a motor speed regulating circuit.

4,098,475

PARACHUTE WITH SELECTIVELY ADJUSTABLE BRAKE FLAPS FOR CONTROLLING ANGLE OF DESCENT

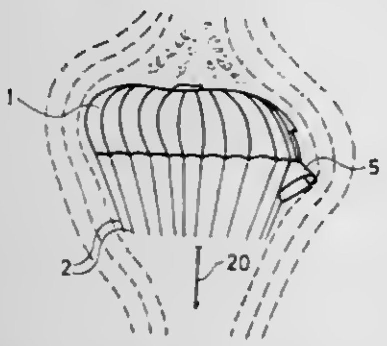
Helmut G. Heinrich, Minneapolis, Minn., assignor to Bruggemann & Brand KG, Fed. Rep. of Germany

Filed Aug. 18, 1976, Ser. No. 715,513

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536841

Int. Cl.^{2} B64D *17/16*

U.S. Cl. 244—152 **10 Claims**



1. A parachute comprising: a canopy having front and rear sections and a base; shroud lines attached to said base at circumferentially spaced-apart locations therearound; and braking means for selectively controlling the angle of descent of the parachute by braking the forward velocity thereof comprising a plurality of brake flaps disposed below the canopy base and between said shroud lines at the canopy rear section and selectively adjustable between the inactive position wherein said brake flaps are fully slackened and interfere minimally with the inherent flight characteristics of the parachute and an active position wherein said brake flaps are fully extended and effectively brake the forward velocity of the parachute to thereby increase the parachute angle of descent, and a set of control lines attached to said brake flaps to selectively and adjustably effect actuation thereof between said active and inactive positions to accordingly control the parachute angle of descent.

4,098,476

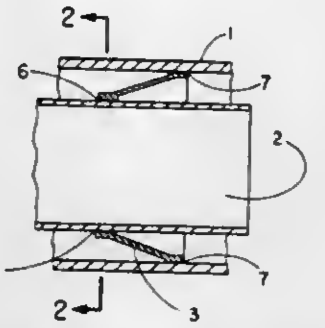
MECHANICAL SUPPORT

Herbert F. Jutte, Garden Grove, and Charles J. Starkus, Malibu, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,411

Int. Cl.^{2} F16B *4/00;* **G02B** *23/16*

U.S. Cl. 248—1 **4 Claims**



1. A support apparatus which can be assembled and disassembled at a given temperature and which prevents rotational and translation motion at temperatures below the given temperature comprising:

a. a housing to be supported;
b. tapered support means having a narrow end and a wide end, and having a coefficient of thermal expansion which is greater than said housing;
c. an outer support means;
d. said narrow end of said tapered support means shaped to fit loosely around said housing; and
e. said wide end of said tapered support means secured to the outer support means, whereby responsive to said apparatus being exposed to temperatures below said given temperature the coefficient of thermal expansion of said tapered support means causes contraction thereof to provide a radial interference fit between said narrow end of said tapered support means and said housing.

4,098,477

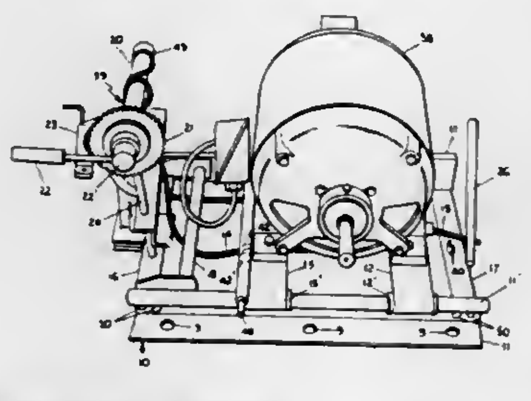
ADJUSTABLE MOTOR MOUNT

Juan Perez, R.R. 3, 72nd St., South Haven, Mich. 49090, assignor to Thomas W. Litts, Pullman and Juan Perez, South Haven, both of, Mich., a part interest to each

Filed Aug. 12, 1976, Ser. No. 713,678

Int. Cl.^{2} F16M *7/00*

U.S. Cl. 248—23 **18 Claims**



1. A motor mount comprising:

a base including a pair of elongated side rails and a side rail connector coupled to each of said side rails and supporting said side rails in a spaced, generally parallel relationship;

a motor support means movably positioned on said side rails of said base for supporting and securing a motor;

a cable means coupled to said motor support means for transmitting a force to said motor support means thereby acting to move said motor support means and tighten a power transmission belt associated with the motor;

a cable take-up means coupled to said base and to said cable means for applying a force to said cable means and causing movement of the cable means;

said motor support means including a cross bar support slidably mounted on said side rails for movement along said side rails and for receiving a motor and coupling means included in said cross bar support for connecting said cable means to said cross bar support; and

said cable means including a tensioning cable coupled to said cross bar support and to said cable take-up means for applying a force in a first direction to said cross bar support and means for releasing the tension on said cable,

said means for releasing the tension on said cable including a release cable coupled to said cross bar support for applying a force in a second direction, opposite from said first direction, to said cross bar support,

and means coupled to said release cable, independent of said tensioning cable take-up means, for tensioning said release cable to apply said force in said second direction.

4,098,478

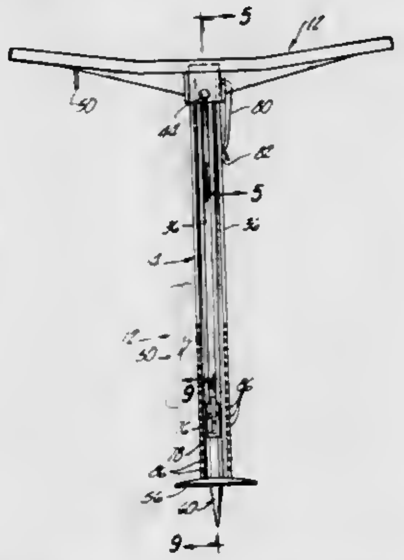
PORTABLE FOLDING SEAT

Arthur Spitzke, Troy, Mich., assignor to Matrix Corporation, Troy, Mich.

Filed Apr. 1, 1977, Ser. No. 783,866

Int. Cl.^{2} A47C *9/10*

U.S. Cl. 248—156 **17 Claims**



1. A portable seat comprising; a seat member, support member for supporting said seat member in an elevated position above the ground, a socket means formed at the underside of said seat member for receiving the upper end of said support member to hold said members in a fixed relative position for use, pivot means associated with said seat member, guide means associated with said support member and receiving said pivot means to permit sliding movement of said pivot means relative to said support during displacement of said support from said socket means to a folding position, said support member being pivotal relative to said seat member from said folding position to a folded position wherein said support member and seat member are disposed generally parallel to each other, said seat member being slidable from said folded position longitudinally of said support member to selected storage positions with said pivot means movable to positions between the opposite ends of said support member, latch means associated with said seat member and support member to limit said sliding movement of said seat and support members relative to each other and maintain said members in said selected storage positions.

4,098,479

BRACKET

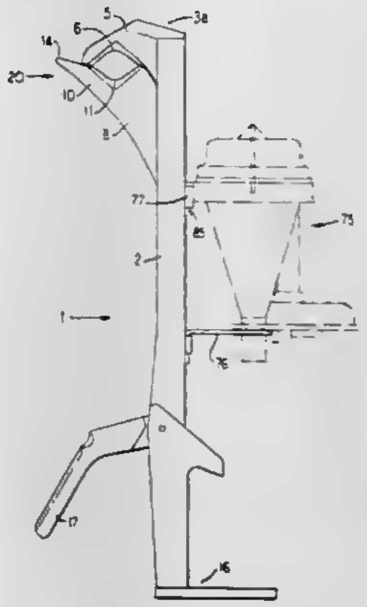
John Lewis Hartstone, 11 Brookfield St., Auckland, New Zealand, and Johannes Cornelis Wilhelmus Zwezerynen, Auckland, New Zealand, assignors to John, Lewis Harstone, Auckland, New Zealand

Filed Nov. 22, 1974, Ser. No. 526,432

Claims priority, application New Zealand, Nov. 23, 1973, 172700

Int. Cl.^{2} E04G *3/00*

U.S. Cl. 248—214 **2 Claims**



1. A bracket comprising an elongate body member having an at least partially open face; clamping means being provided adjacent one end of said body member; operating means being spaced from said clamping means and being located adjacent a further end of said body member; said clamping means including a fixed jaw member and a movable jaw member having a base slidably mounted within said body member; said operating means including a handle pivotally mounted to said body member and being attached to, so as to operate, a pawl; elongate connecting means being positioned within the body member and extending from a position substantially adjacent and below the operating means to a recess in the base of said movable jaw member; a portion of the connecting means adjacent said operating means being provided with a plurality of spaced apart, transverse ribs thereon, and such that in use, operation of the handle will permit the pawl to engage with the ribs; a primary spring passing between a butt end of the connecting means and an inner surface of said body member at the opposite end of said body member from the clamping means, the primary spring being so biased as to normally urge the connecting means towards the base of the movable jaw member; a compensating spring being provided within the recess in the base of the movable jaw member so as to abut against and run between said movable jaw member and an adjacent end of said elongate connecting means in order to compensate for excess pressure applied to said connecting means; and a locating lip on said movable jaw member extending outwardly beyond a lip on said fixed jaw member.

4,098,480

UNIVERSAL SHELF SYSTEM

Leonard H. Neumann, Omaha, Nebr., assignor to Lozier Store Fixtures, Omaha, Nebr.

Filed Oct. 26, 1976, Ser. No. 735,887

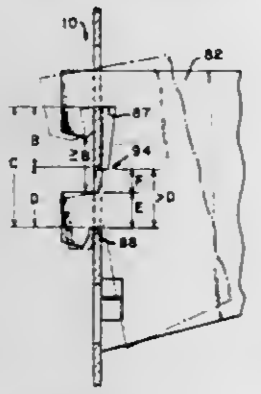
Int. Cl.^{2} A47G *29/02;* **E04G** *3/08;* **E06B** *7/28*

U.S. Cl. 248—243 **6 Claims**

1. A shelf supporting assembly comprising

(a) a slotted upright support having at least two spaced slots formed in a face thereof, said at least two slots being spaced from each other a vertical distance B, and

(b) a bracket assembly for connection to said upright support to extend generally perpendicular to said support face, and for supporting a shelf extending generally perpendicular to said upright support, said bracket assembly including (i) a pair of locking flanges vertically spaced from each other and the bottom of the topmost flange being spaced a distance ≧ B from the top of the bottommost flange, (ii) a bracket body portion, and (iii) means disposed between said flanges and said body portion for providing an interference free area to allow said bracket assembly to drop freely into place in locking engagement with said upright support, said means including beveled edge surface portions of said bracket body portion adjacent said bottommost locking flange on either side thereof, and extending away from said bottommost locking flange and said upright support.



4,098,481

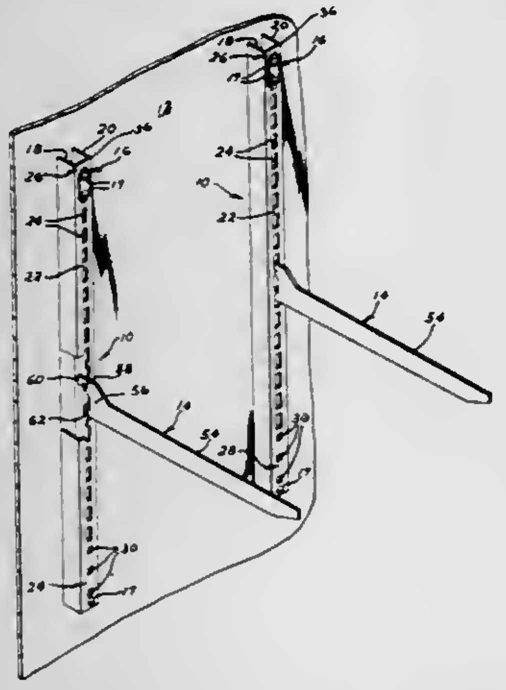
TRACK ASSEMBLY

Thomas O. Johnson, and Charles J. Slayman, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed May 9, 1977, Ser. No. 795,062

Int. Cl.² A47B ***9/00***

U.S. Cl. 248—243 **10 Claims**



1. A track assembly for securing to a wall and receiving shelves:

(a) two spaced, parallel, elongated strips having a plurality of slots along their lengths;

(b) an adaptor member located at one end of each of said strips, said adaptor member being U-shaped as viewed in cross-section along its longitudinal axis to provide depending legs connected by a body, the body having at least one circular hole therethrough and being dimensioned for each of the legs to be received through the slots in the strips such that the circular hole overlies one of the slots;

(c) an attachment element having a body through the circular hole of each of the adaptors and underlying strip slot into the wall and a headed portion larger than the circular hole abutting the adaptor member body to secure each of the strips to the wall; and

(d) shelf brackets for each of the strips, said brackets having a hook-shaped attachment means at one end removably inserted in the slots for support of the bracket.

4,098,482

SHELF SUPPORTS

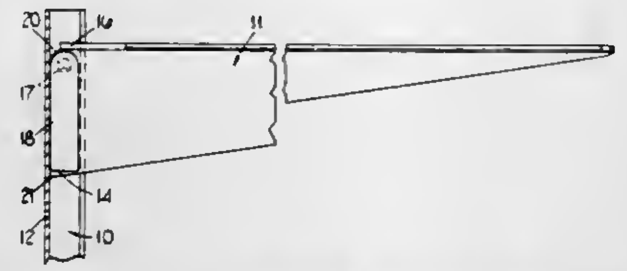
Richard David Hamblin, Birmingham, England, assignor to Archibald Kenrick and Sons Limited, West Midlands, United Kingdom

Filed Sep. 9, 1977, Ser. No. 831,874

Claims priority, application United Kingdom, Sep. 10, 1976, 37569/76

Int. Cl.² A47G ***29/02***

U.S. Cl. 248—246 **3 Claims**



1. A shelf support comprising a member adapted for attachment vertically to a wall or other structure, said member including an internal channel of uniform dimensions throughout its length and an outwardly facing slot formed by a pair of opposing lips, a bracket having a shelf-supporting portion and a generally triangular flange depending from the shelf-supporting portion, said flange including a blade portion extending into said channel through said lips, a pair of projections extending outwardly from the upper edge of said blade portion for engaging the inner surfaces of said lips, and a pair of channel-engaging wedges pivotably supported by said blade portion and extending along the surfaces of the blade portion extending into said channel, said blade portion being frictionally inserted between said wedges and having a surface for engaging the inner rear surface of said member for rigidly supporting said bracket against movement in said channel, both by the oppositely acting purely frictional engagement between the lip-engaging projections and the channel-engaging surface of the blade portion, and the frictional engagement of said wedges with the channel by insertion of the blade portion for stepless adjustability of said bracket, characterised in that the wedges are pivotably supported by said blade portion by means comprising frictionally inter-engageable pegs formed integrally with the wedges respectively, said pegs passing through an opening in said blade portion of the bracket and together forming a bearing on which said wedges pivot with respect to said blade portion of the bracket.

4,098,483

SWIVEL PLANT HANGER

Jeannette E. Pesola, and Oiva J. Pesola, both of 29 Normal Rd., Fitchburg, Mass. 01420

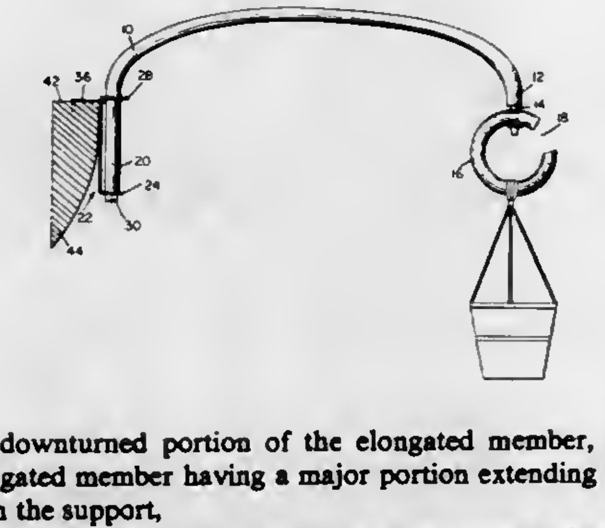
Filed Oct. 28, 1976, Ser. No. 736,509

Int. Cl.² A47G ***29/00***

U.S. Cl. 248—311.1 R **1 Claim**

1. A plant hanger comprising a flat co-planar plate, means to fasten the plate to a horizontal surface of a support with a portion of the plate extending out from the surface, a slot in the extending portion of the plate, said support having a vertical surface intersecting the horizontal surface, said slot having an edge substantially coinciding with the intersection of the two surfaces,

an elongated member having a downturned end portion that extends through the slot and directly impinges on the vertical surface of the support, along a major portion of



the downturned portion of the elongated member, the elongated member having a major portion extending out from the support,

and a partial ring swivelly mounted on the member at its end opposite the said end portion.

4,098,484

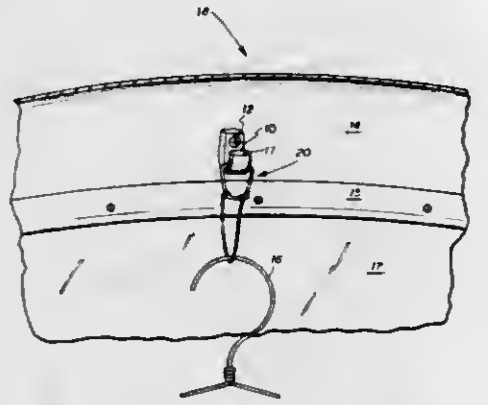
CLOTHES RING

Carlos Thomas Gray, 422 Cottonwood, Ardmore, Okla. 73401

Filed Jul. 22, 1976, Ser. No. 707,528

Int. Cl.² A47Q ***29/00***

U.S. Cl. 248—317 **2 Claims**



1. In combination with a clothing hook, a device for coupling at least one clothing hanger to said clothing hook, said clothing hanger comprising:

a trapezoidal portion in a plane roughly parallel to the supporting plane of the clothing hook, formed from a single continuous strand of a rigid material of the size of fit over and hang from the clothing hook with the longer parallel side engaged by the clothing hook and the shorter parallel side positioned there below to prevent disengaging upward movement, each of said parallel sides being continuous along their entire length and composed of a single strand of said rigid material; and

a helical portion, formed from the same continuous strand of the rigid material, of the size to releasably retain the clothing hanger, the helical portion extending transverse to the plane of the trapezoidal portion.

4,098,485

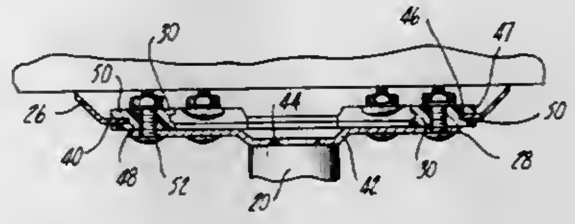
SWIVEL APPARATUS

Ned W. Mizelle, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Jul. 2, 1976, Ser. No. 702,137

Int. Cl.² F16M ***13/00***

U.S. Cl. 248—425 **5 Claims**



1. Swivel apparatus comprising a plurality of bearing bodies, support means secured to said bearing bodies maintaining said bodies in fixed positions, each of said bearing bodies having an arcuately shaped side having generally horizontal arcuate groove means formed therein, a swivel plate, and a horizontally projecting circular extension on said swivel plate projecting radially inwardly into said groove means to be slidably engaged therein, said extension being arranged in a coaxial relation with said groove means to be restrained in said groove means so as to rotatably support said swivel plate on said bearing bodies.

4,098,486

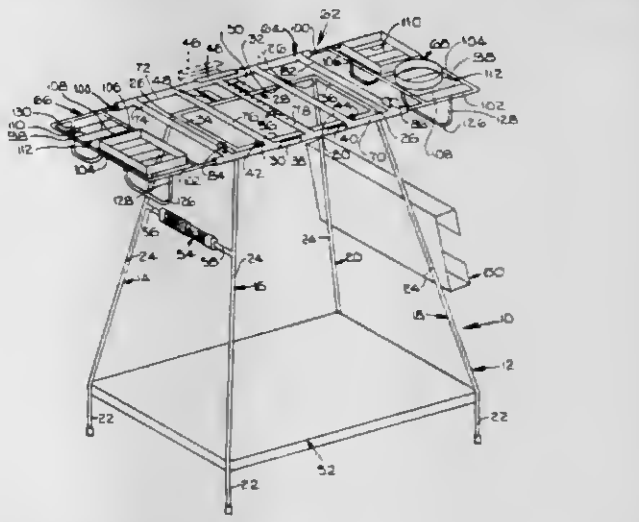
BATHROOM CADDY

Isaac W. Hornsby, 2706 Anza St., Bakersfield, Calif. 93305

Filed Mar. 31, 1977, Ser. No. 783,181

Int. Cl.² A47B ***97/04***

U.S. Cl. 248—452 **5 Claims**



1. A bathroom caddy comprising:

a base member having legs and a supporting surface at the upper ends of said legs;

a tray;

means for readily and easily coupling said tray to said supporting surface;

a book support;

means swingably connecting said book support to said tray;

means connected to said book support for maintaining it at various acute angles with respect to said tray, said tray including a frame portion to which said book support is pivotably connected, said frame portion having a first end and a second end, first and second end pieces adjustably connected to said first and second ends, respectively, for adjusting the width of said tray, and means depending from each of said end pieces for engagement with the inner walls of a bathtub, whereby said tray may be used to support a book in reading position on said bathtub;

first and second pairs of short legs; and means provided at the upper ends of each pair of short legs for coupling them to an associated one of said means depending from each of said end pieces, whereby said tray may be used to support a book in reading position for a person in a bed.

4,098,487
DEVICE FOR CONTROLLING OIL INJECTION TO A SCREW COMPRESSOR

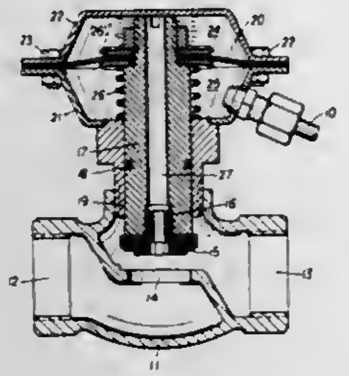
Friedrich Bauer, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Mar. 2, 1977, Ser. No. 773,676

Claims priority, application Austria, Mar. 3, 1976, 1578/76

Int. Cl.² F16K *31/365*

U.S. Cl. 251—61.4 3 Claims



1. A device adapted for controlling oil injection to a screw compressor, the device comprising a housing divided by a diaphragm into two chambers, a stop valve including a valve stem having an axial bore and a closing element mounted at one end of the valve stem, the diaphragm mounted on the other end of the valve stem, and a bore between the closing element of the valve and the housing, the valve stem slidably and sealingly received in the bore, one chamber of the housing being adapted to be connected to the output of the compressor and serving when pressurised to act on the diaphragm to open the valve, and the other chamber communicating with the valve via the axial bore in the valve stem and serving when pressurised to act on the diaphragm to close the valve, the valve stem in its portion received in the bore having a cross-sectional area approximately equal to the effective sealing surface area of the closing element of the valve.

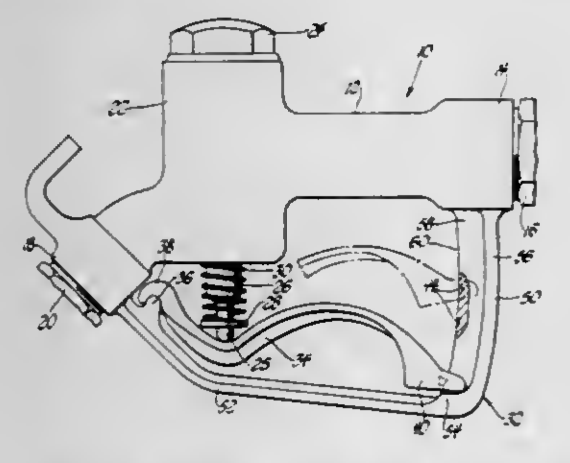
4,098,488
NOZZLE LATCH MECHANISM

Richard A. Forrest, Muskegon, Mich., assignor to Enterprise Brass Works, Muskegon, Mich.

Filed Jan. 2, 1976, Ser. No. 646,405

Int. Cl.² F16K *31/44*

U.S. Cl. 251—240 3 Claims



1. A nozzle latch assembly comprising; a housing having an inlet and an outlet with a fluid passage extending therebetween, valve means disposed in said passage for controlling fluid flow therethrough and including valve actuating means extending exteriorly of said housing, handle guard means extending from said housing adjacent said valve actuating means, a handle pivotally supported at a front end thereof and extending to a rear end adjacent said handle guard means and engaging said valve actuating means for moving said valve actuating means upon pivotal movement thereof, and detent means operatively interconnecting said rear end of said handle and said handle guard means for frictionally holding said handle in a selected position until said handle is subjected to a predetermined force, said detent means including at least one recess and a plunger for frictionally engaging said recess and biasing means for urging said plunger into said recess while allowing said plunger to retract from said recess in response to said predetermined force, said rear end of said handle including a bore extending thereinto, said biasing means and said plunger being disposed in said bore with said biasing means being disposed between the inward end of said plunger and the bottom of said bore and said plunger extending from said bore, said recess being disposed in said handle guard means, said handle guard means including a guide portion extending downwardly from said housing to a lower end and a guard portion extending forwardly from said end to said housing, said handle being pivotally supported adjacent the connection of said guard portion to said housing, said handle guard means including a stop adjacent the connection of said guide portion to said guard portion for limiting downward pivotal movement of said handle, said guide portion has a cross section including a base and a forwardly extending rib having a front edge, said recess being disposed in said front edge of said rib, said rear end of said handle being bifurcated to define a pair of spaced flanges disposed on either side of said rib and said plunger being disposed in the space between said flanges.

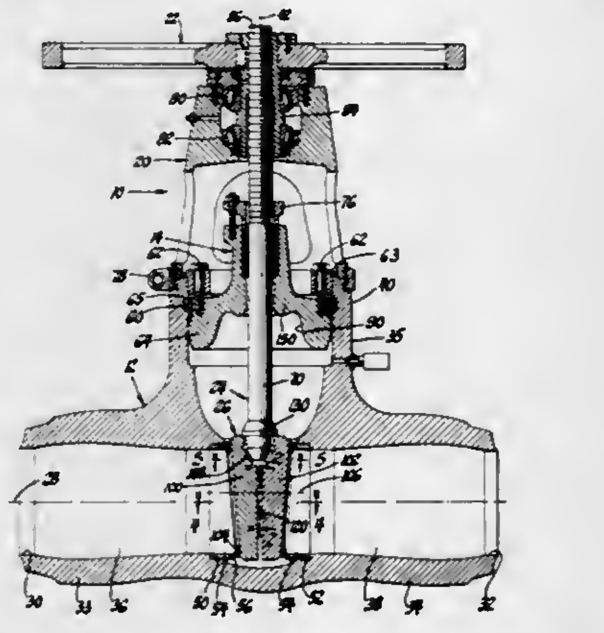
4,098,489
SEGMENTED HUB FOR RETAINING THE SPACER RING OF A TWO PIECE GATE VALVE

Ronald James Anders, Raleigh, N.C., and Ramesh Mohan, Warrensville Heights, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1976, Ser. No. 715,086

Int. Cl.² F16K *3/12*

U.S. Cl. 251—327 9 Claims



1. In a double disc gate valve of the type having individual gate discs with juxtaposed surfaces separated by a predetermined distance to thereby establish an operative width for the gate which width is such that a sealing surface on each said gate disc is respectively against a valve seat to prevent flow along a flow axis through said valve, the improvement comprising: a spacer member having a predetermined length and being disposed between said gate discs as its opposite ends respectively make contact with said juxtaposed surfaces, spacer member retention means projecting perpendicularly from each of the juxtaposed surfaces interfitting in assembly, each of said retention means including at least one segment thereof which overlaps along said axis said segment of the other of said retention means, said gate discs and said segments thereof being capable of relative movement along said axis with said segments being combined to provide a segmented surface peripherally retaining the spacer member in operative position between said gate discs, and said predetermined length of said spacer member being selected to establish said predetermined distance.

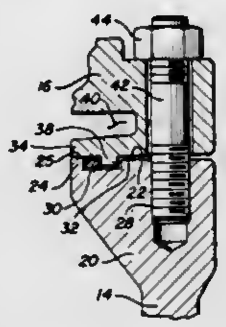
4,098,490
VALVE BODY-BONNET JOINT

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,731

Int. Cl.² F16K *27/12*

U.S. Cl. 251—329 8 Claims



1. In a gate valve having a valve body defining a valve chamber, inlet and outlet fluid passageways and containing a valve member movable between open and closed positions wherein said valve body has a bonnet mounted on one end portion thereof, a valve body-bonnet connection joint, comprising:

(a) a valve body flange on one end of said valve body, said body flange having an essentially planar sealing surface and having a raised radially inner portion extending beyond the plane of said sealing surface;

(b) a bonnet flange on said bonnet having a substantially rigid radially outer portion and an inwardly extending deflectable cantilever portion, said bonnet flange having a planar sealing surface on an exposed side thereof to contact said valve body flange surface; and

(c) a plurality of fasteners spaced around said valve body and extending from said body flange and through said bonnet flange substantially rigid radially outer portion, said fasteners tightening said bonnet to said valve body and thereby deflecting said cantilever portion upon tightening of said fasteners to urge said raised portion into sealing contact with said bonnet flange sealing surface and to initially bring said body flange sealing surface into contact with said bonnet flange sealing surface, said fasteners being adapted to relax upon exposure to high temperature a small amount insufficient to cause disengagement of said bonnet flange sealing surface and said raised portion.

4,098,491
METHODS AND APPARATUS FOR THE CONTROL OF A SUSPENDED WEIGHT FROM A FLOATING VESSEL

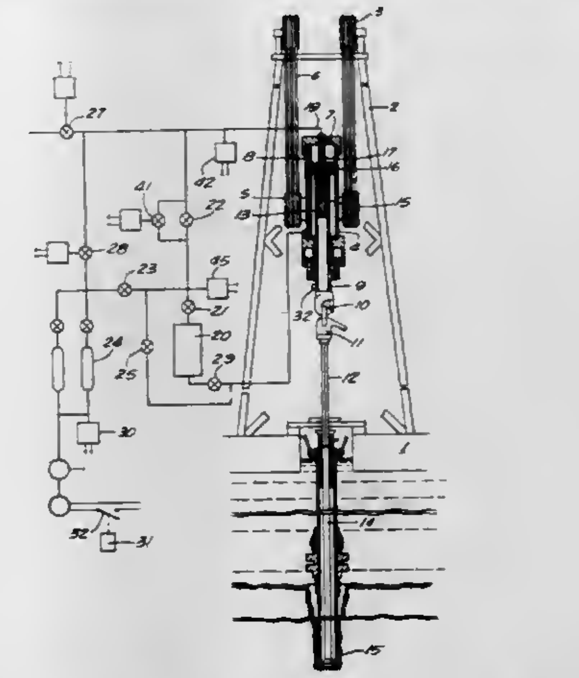
Edward Larralde, Santa Barbara, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Jan. 9, 1975, Ser. No. 539,618

Int. Cl.² B66D *1/48*

U.S. Cl. 254—172 13 Claims

5. An apparatus adapted to be mounted on a vessel subject to heave due to wave action comprising a first cylinder, a first piston and a first piston rod in said first cylinder, means to connect a load to said first piston rod, a second cylinder and a second piston in said second cylinder; said second piston operatively connected to said first piston, means to apply a load to said piston rod, a source of gas pressure, means to introduce and maintain gas pressure in said cylinders, a first pipe system connecting each of the cylinders to said source of gas pressure and a second pipe system connected to each of said cylinders and to a space of lower pressure, valve means in said pipe systems, means to separately and alternately open one of said valves and close another of said valves, means to vary the pressure in said cylinders, to modulate the pressure in said first cylinder to compensate for change in pressure in said second cylinder on variation in load on said piston rod, whereby the forces on said piston rod are maintained substantially constant, said means to modulate said pressure including a control means for selectively opening said valve means between a first one of said cylinders systems and said source and selectively closing the first valve means in the pipe system between said first cylinder and said space and selectively closing the second valve means in the pipe system between another of said cylinders and said space when said first valve means is opened, said control means comprising a signal means responsive to the forces imposed on the first piston rod by said load when said apparatus is mounted on said vessel, means to generate a signal responsive to the forces predetermined to be maintained on the first piston rod by said load, means to generate an error signal responsive to the differences between said first and second-mentioned signals and means to open selectively and close selectively the aforesaid valve means responsive to said error signal.



4,098,492
QUICK CHANGE TRAVELING BLOCK

Alvin H. Wilkinson, Talala, Okla., assignor to Auto Crane Company, Tulsa, Okla.

Filed Feb. 11, 1977, Ser. No. 767,797

Int. Cl.² B66D *3/08*

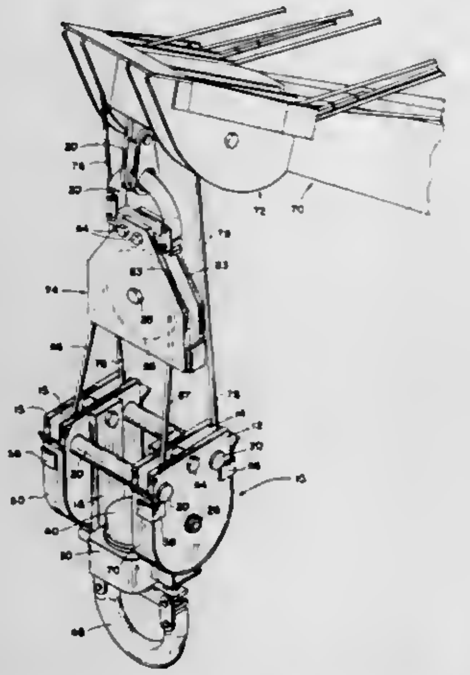
U.S. Cl. 254—189 2 Claims

1. A quick change four-line to two-line travelling block system for support from the crown of a boom, comprising:

(a) a two sheave block means comprising:
  (1) a frame including two spaced, parallel, vertical support bars supporting a swivel between said bars and a first hook;
  (2) said frame supporting two vertical, spaced, parallel inner sheave plates outside of said bars, two sheaves outside of said inner sheave plates, and two outer sheave plates outside of said sheaves, said sheaves supported on appropriate sheave pins passing through said sheave plates;
  (3) two guard strips, one each adapted to be removably supported by said sheave plates and to enclose the sides

and bottom of each sheave; said guard strips being retained independently of any other removable structure;

whereby the guard strips can be removed and cables looped over the sheaves or removed therefrom over the outer sheave plates without removing any other part of said block;



(b) a single sheave block and a second hook, and means to removeably attach said hook to said crown; and

(c) means to loop the line from a winch drum over a crown pulley; then under a first sheave of said four-line travelling block, then over said single sheave block, then under the second sheave of said four-line travelling block, and to an attachment point on said boom.

4,098,493

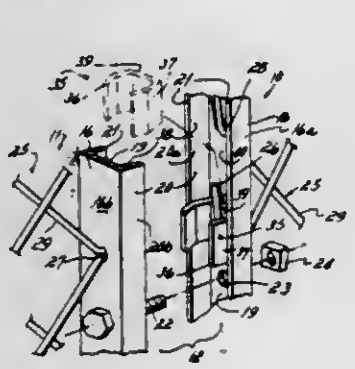
WOVEN WIRE PARTITION

Zack H. Logan, Louisville, Ky., assignor to A-T-O Inc., Willoughby, Ohio

Filed Mar. 11, 1977, Ser. No. 776,504

Int. Cl.² E04H *17/16*

U.S. Cl. 256—24 **8 Claims**



1. A woven wire partition comprising

a frame having at least one channel member as a part thereof, said channel member being oriented to face outwardly relative to the center of said partition,

a woven wire panel connected with that channel member, the wire ends of that panel connected with said channel member overlying the interior face of said channel member's center web, and

a U-shaped clip mounted within the trough of said channel member, a portion of said U-shaped clip's exterior configuration and size being substantially identical to the interior configuration and size of the trough of said channel member with the base of said U-shaped clip thereby being seated against the center web and sides of that channel member to which it is mounted, said U-shaped clip also having legs that extend beyond the side edges of said channel member, said U-shaped clip's legs being configured to establish an interference fit with the legs of an adjacent outwardly facing channel member during connection of those adjacent channel members in side edge-to-side edge relation, that interfit initially establishing the side edge-to-side edge relation, and thereafter preventing lateral movement between said adjacent channel members during connection of said channel members one with the other.

4,098,494

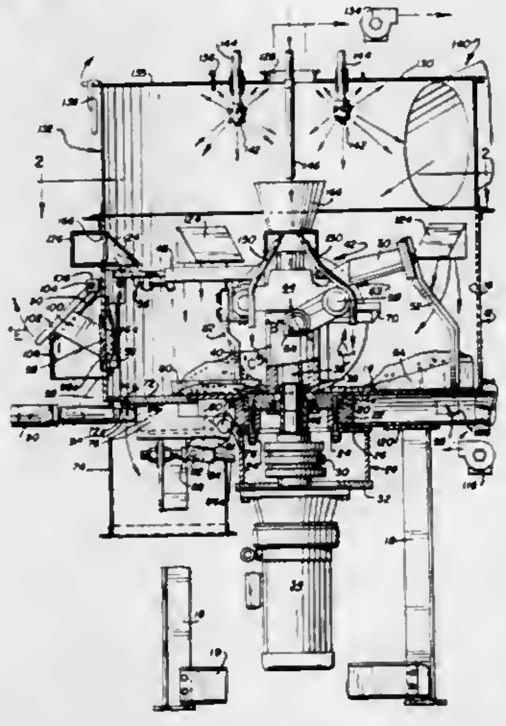
METHOD AND APPARATUS FOR MAKING BATTERY PASTE

Philip C. Howlett, Wheaton, Ill., assignor to National Engineering Company, Chicago, Ill.

Filed Sep. 2, 1976, Ser. No. 719,822

Int. Cl.² B01F *7/16*

U.S. Cl. 366—144 **7 Claims**



1. Apparatus for making battery paste comprising:

an enclosed mixing chamber having a floor, a cylindrical upstanding side wall and a top cover,

a mixing head mounted for rotation in said chamber including at least one mulling wheel for mulling said battery paste against said floor and at least one plow for moving said battery paste into the path of said mulling wheel,

means for cooling said mixing chamber and contents including a plenum chamber in contact with the underside of said floor, a plurality of riser ducts extending upwardly of said plenum chamber in contact with said side wall, a plurality of air outlets adjacent the upper end of said risers for injecting cooling air downwardly into said mixing chamber and outlet means in said cover for removing heated air from said chamber, and

liquid supply means for washing the interior surfaces of said chamber and supplying liquid for said battery paste including at least one spray nozzle having outlets directed toward said cover, said side wall and said floor of said chamber and conduit means for supplying liquid to said nozzle unit.

4,098,495

METHOD OF AND APPARATUS FOR QUENCHING SHEET METAL

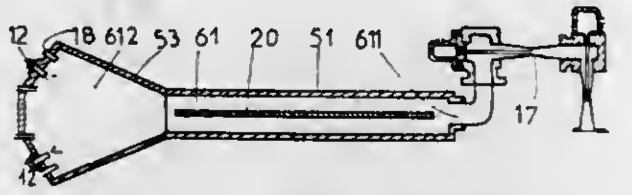
Bernard Lhenry; Michel Toitot, and Régis Blondeau, all of Le Creusot, France, assignors to Creusot-Loire, Paris, France

Filed Nov. 5, 1975, Ser. No. 629,092

Claims priority, application France, Nov. 22, 1974, 74 38378

Int. Cl.² C21D *9/46*

U.S. Cl. 266—115 **8 Claims**



1. An apparatus for quenching sheet metal, the sheet metal having a predetermined plane of travel and comprising at least two pairs of rolls, each of the pairs of rolls having an axis, one at least of the rolls of each pair being movable vertically, means for applying at least one of said rolls of one said pair against said sheet metal, housing means located above and below the plane of travel of the sheet metal, said housing means being located each between two of the rolls, and including lateral housing means for forming an enclosure with at least said lateral housing means, said enclosure being formed with at least one lateral outlet for exhaust of a fluid, means for providing in said enclosure an aerosol having a liquid phase and a gaseous phase, for said aerosol to be divided into an upper stream and a lower stream, upon the sheet metal passing through the enclosure, and means for producing a pressure at one side of the enclosure for causing circulation of said aerosol in a direction parallel to the axes of the rolls.

4,098,496

APPARATUS FOR DIRECT REDUCTION OF IRON ORE

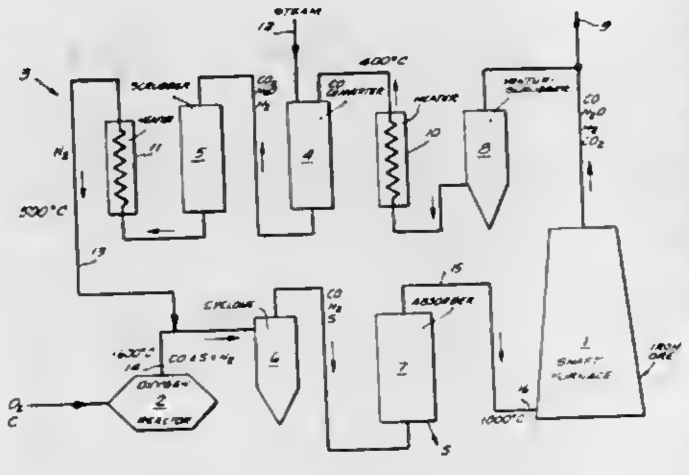
Georg Lange, Voerde, Fed. Rep. of Germany, assignor to Thyssen Purofer GmbH, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 603,196, Aug. 8, 1975. This application Sep. 9, 1976, Ser. No. 722,062

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1974, 2438790

Int. Cl.² C21B *11/00*

U.S. Cl. 266—156 **1 Claim**



1. A plant for reducing iron ore, said plant comprising:

a shaft furnace having a stack-gas output and a reducing-gas input;

a reactor for coal or oil and oxygen for producing a synthetic gas having a carbon-monoxide/hydrogen ratio of at least 1.5:1 and at a temperature of about 1600° C;

convertor means connected to said output for cooling and treating said stack gas with steam for transforming carbon monoxide in said stack gas into carbon dioxide and water;

means connected to said means for scrubbing said carbon dioxide out of said stack gas and leaving relatively pure hydrogen;

means connected to the scrubbing means, the reactor, and said input for mixing said hydrogen with said synthetic gas to give same a carbon-monoxide/hydrogen ratio of at most 1:1 and feeding same to said furnace;

means for heating said hydrogen to a temperature of between 400° and 600° C prior to mixing of same with said synthetic gas;

means for removing sulfur from said synthetic gas prior to introduction of same into said furnace;

a venturi scrubber at said output for cooling said stack gas and removing particles therefrom; and

a heater between said scrubber and said converting means for heating the particle-free and cooled stack gas to a temperature of of at least 400° C.

4,098,497

MEDIUM-CONDUIT-SYSTEM TO BE USED IN TILTABLE-METALLURGICAL-VESSEL-ARRANGEMENT

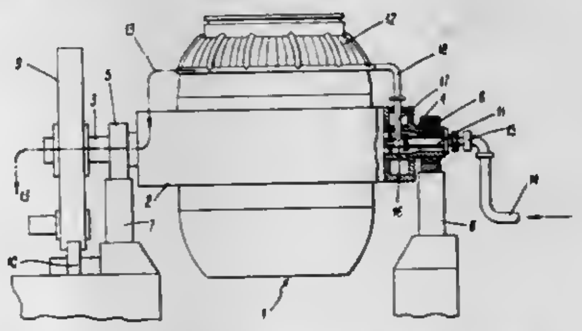
Heinz Weihbold, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Jan. 24, 1977, Ser. No. 762,193

Claims priority, application Austria, Feb. 3, 1976, 727/76

Int. Cl.² C21C *5/42*

U.S. Cl. 266—241 **13 Claims**



1. In a medium-conduit-system to be used in a tiltable-metallurgical-vessel-arrangement, in particular converter arrangement in a steel making plant, of the type including a carrying ring receiving the vessel therein, tilting trunnions provided on the carrying ring, and base-supported bearings rotatably accommodating the tilting trunnions therein, at least one of the trunnions being hollow to receive a first pipe therein, the improvement which is characterised in that a second pipe is provided to extend through the carrying ring, a first flange is provided on said first pipe and a second flange is provided on said second pipe, said second pipe extends in a direction different from that of said first pipe, flange connection screws are provided to connect said first flange with said second flange thus forming a flange connection, each one of said flange connection screws has an extension projecting to the outside of the metallurgical-vessel-arrangement, and a supply-conduit-system connected to said second pipe.

4,098,498

VARIABLE RESILIENCE VEHICLE SUSPENSION

Joaquim Jorge Da Silva, Rua Breno Guimarnes No. 118, Rio de Janeiro, state of Rio de Janeiro, Brazil

Filed May 25, 1976, Ser. No. 691,556

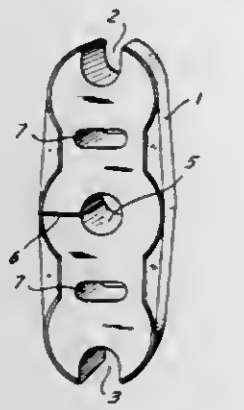
Claims priority, application Brazil, Aug. 13, 1975, 17505178

Int. Cl.² B60G *11/14*

U.S. Cl. 267—61 S **13 Claims**

1. In a suspension to be mounted in a vehicle, particularly a motor vehicle, a combination comprising at least one helical compression spring which is resiliently compressed from an initial partially compressed condition attained when only the attributed part of the full weight of the vehicle acts on the suspension and thus subjects said spring to an initial compres-

sion force, the compression progressively increasing through a first and a second range of increasingly compressed conditions of said spring in dependence on additional compression forces acting on said spring during the use of the vehicle; and varying



means mounted on said spring and so arranged as to be inoperative within said first range while becoming operative only in said second range to augment the resistance of said spring to compression in said second range as compared to that existing in said first range.

4,098,499

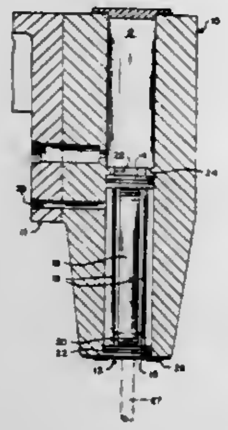
VACUUM CASTING HEADS AND CLAMPS

H. Joseph Klein; William C. Hord; James C. Allor, and Sankar P. Iyer, all of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Aug. 1, 1977, Ser. No. 820,860

Int. Cl.^{2} B23Q *3/00*

U.S. Cl. 269—22 10 Claims



1. A casting head and clamp arrangement for vacuum aspiration casting of metal rods in glass tubes comprising a casting head having a generally vertical vacuum passage, a removable fluid pressure chuck in the lower end of said vacuum passage adapted to receive and hold the end of a glass tube, said chuck including a pair of spaced annular support discs, spaced elongate members connecting said support discs, sleeve members having an internal diameter larger than a glass tube to be held fixed on each of support disc annulus and projecting beyond said discs between the elongate members, an elastomer tube fixed at its opposite ends to the sleeve members and having an internal diameter larger than the diameter of the glass tube to be held and fluid pressure means acting between said discs to cause the elastomer tube to decrease in internal diameter under pressure to engage and hold the glass tube ends and to release the tube ends when the fluid pressure is released.

4,098,500

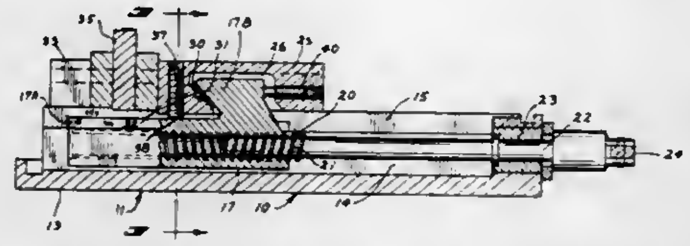
ADJUSTABLE MEMBER FOR REDUCING CLAMP LOAD LOSSES IN A LOCKING JAW VISE

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Nov. 25, 1977, Ser. No. 855,019

Int. Cl.^{2} B23Q *3/02*

U.S. Cl. 269—136 4 Claims



1. A vise comprising a frame, a fixed jaw, first means mounting said fixed vise jaw adjacent one portion of said frame, a movable jaw mounted on said frame for sliding movement toward and away from said fixed jaw, second means for moving said movable jaw comprising a shiftable nut mounted on said body for shifting movement relative to the fixed jaw, said frame having way means thereon for supporting said movable jaw, at least portions of said nut being mounted on the opposite side of said way means from portions of said jaw, said movable jaw nut transmitting forces to said jaw at a force angle so that the movable jaw and nut are both urged toward the way means as the nut is shifted, an actuating screw for engaging said nut for shifting the nut relative to the frame, and third means between said nut and said movable jaw to limit the amount that said movable jaw and nut can move toward each other in direction tending to clamp the opposite surface of the way means between the movable jaw and nut.

4,098,501

CASSETTE TYPE SHEET FEED APPARATUS FOR COPYING MACHINE OR THE LIKE

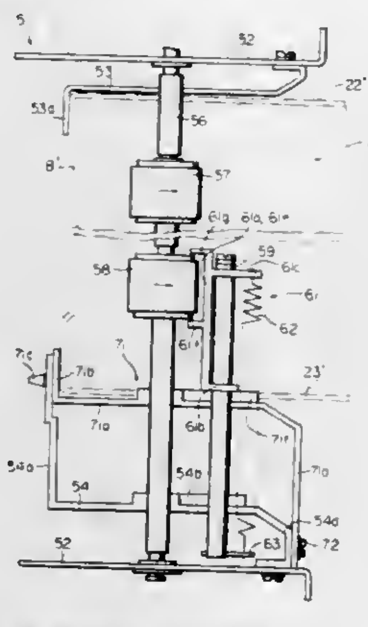
Tatsuo Tani; Mitsuo Tanaka, and Toshiaki Kameyama, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,205

Claims priority, application Japan, Nov. 6, 1975, 50-133207

Int. Cl.^{2} B65H *3/06, 1/26*

U.S. Cl. 271—117 9 Claims



1. A sheet feed apparatus comprising:

a frame having first and second parallel side walls;

a sheet cassette detachably inserted into the frame and engaging at a first side wall thereof with the first side wall of the frame and at a second side wall thereof with the second side wall of the frame;

a first axially fixed feed roller operatively disposed above said cassette and spaced from the first side wall of said cassette by a predetermined distance;

a second axially movable feed roller operatively disposed above said cassette; and

means for axially positioning the second feed roller so as to be spaced from the second side wall of said cassette by the predetermined distance;

said means comprising an axially movable roller carrier embracing the second feed roller, and biasing means urging the roller carrier into engagement with the second side wall of the frame.

4,098,502

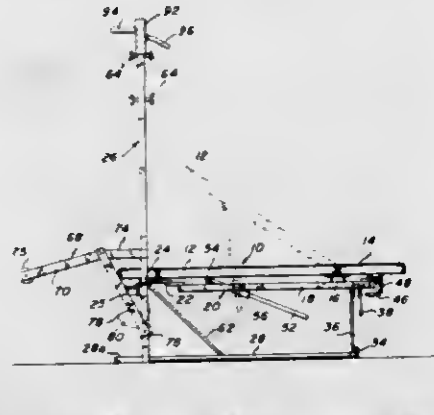
MULTI PURPOSE EXERCISE BENCH

Reginald O. Faust, 41 Oak Ct., Annapolis, Md. 21401

Filed May 17, 1977, Ser. No. 797,634

Int. Cl.^{2} A63B *23/00*

U.S. Cl. 272—144 11 Claims



1. A multi-purpose exercising bench comprising a fixed horizontal ground engaging frame having front and rear ends, a vertical frame rigidly fixed to the front end of said horizontal frame, a moveable frame having front and rear ends, means pivoting the front end of said moveable frame to said vertical frame at a position spaced above said horizontal frame, a padded bench having a front and rear ends carried by the upper side of said moveable frame, a plurality of differene length legs pivotally connected at one end to the under side of said moveable frame adjacent the rear end thereof, socket means carried by said fixed frame adjacent the rear end thereof and adapted to receive therein the respective opposite ends of selected ones of said different length legs for adjusting the decline position of said moveable frame and said bench, one of said legs having a length supporting said moveable frame in a flat or horizontal position.

4,098,503

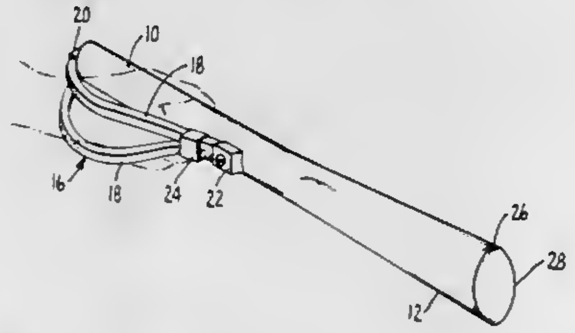
ONE-HAND BAT

Howard J. Antone, 12284 Adine Ct., Glen Ellen, Calif. 95442

Filed Oct. 15, 1976, Ser. No. 732,723

Int. Cl.^{2} A63B *69/40*

U.S. Cl. 273—26 C 3 Claims



1. In combination, a tool adapted to be manually gripped and manipulated with one hand, said tool having a grip portion, and connector means carried by the grip portion comprising a pair of double-ended flexible strap members adjacently disposed, extending lengthwise of said grip portion, and each fastened at both ends to said grip portion, and an adjustable slide jointly carried by said strap members intermediate the fastened ends thereof enabling said members to be disposed in enclosing and entrapping relation to the user's hand when it is inserted between said strap members and positioned beneath said strap members in gripping relation to said grip portion.

4,098,504

TENNIS BALL

Dale Lee Koziol, Marion, Ind., and Thomas Freeman Reed, Akron, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 31, 1975, Ser. No. 627,721

Int. Cl.^{2} A63B *41/00*

U.S. Cl. 273—61 R 1 Claim

1. A tennis ball having improved pressure retention properties comprising an elastomeric gas-permeable wall defining a hollow cavity containing a compressible inflation gas under pressure, said inflation gas including:

(a) air having a partial pressure equal to ambient pressure; and

(b) sulfur hexafluoride in an amount sufficient to significantly improve the pressure retention properties of said ball as compared to the pressure retention properties of said ball when filled with air.

4,098,505

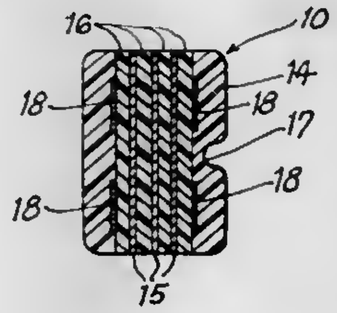
LAMINATED FIBER SPORT RACKET

Dale F. Thompson, 5215 Chollas Pkwy., San Diego, Calif. 92105

Filed Nov. 4, 1976, Ser. No. 738,873

Int. Cl.^{2} A63B *49/10*

U.S. Cl. 273—73 F 6 Claims



1. An improved frame for sport rackets, of the type having frame and strings, and used in games such as racquet ball, tennis, and badminton, said frame having a laminated piece formed to constitute the head of the frame and both sides of the handle, the laminated piece comprising a plurality of thermoplastic laminae and at least one fibrous tape lamina, said strings passing through the longitudinal axes of all of said laminae, the improvement comprising: a thermoplastic lamina formed before lamination with two longitudinal channels, one on each side of the plane of said strings; and two fibrous tape laminae contained in said channels, the thermoplastic lamina and the two fibrous tape laminae forming a combination having a rectangular cross section.

4,098,506

HAND GRIP SLEEVE FOR HAND TOOLS AND THE LIKE

Conrad J. Gaiser, P.O. Box 534, Zephyr Cove, Nev. 89448

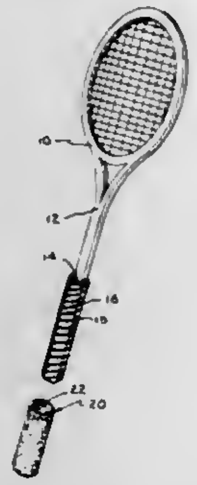
Filed Dec. 27, 1976, Ser. No. 754,444

Int. Cl.^{2} A63B *49/08*

U.S. Cl. 273—75 7 Claims

1. A manual tool having a handle with a hand grip for grasping by a user and a cover member received over said hand grip,

having a wall thickness no greater than about 0.3 inch and loosely received over said hand grip for direct hand contact by the user and formed of at least 50 percent open-celled, non-capillary, porous, elastic and resilient material having a density from 0.1 to about 6 pounds per cubic foot and a water holding capacity no greater than about 20 volume percent.



4,098,507

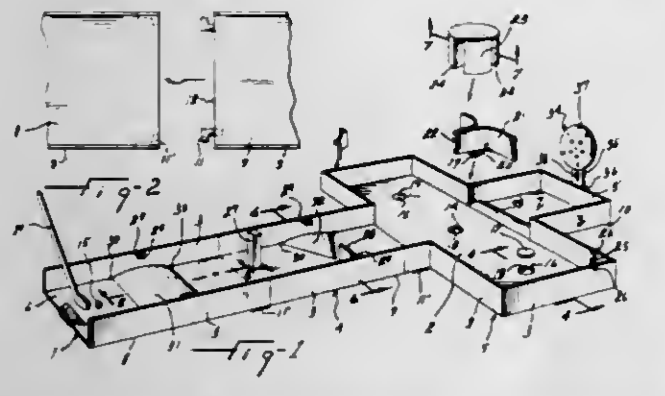
PORTABLE MINIATURE GOLF GAME

Jean-Paul Hudon, 130 des Tulipes St., Farnham, Canada

Filed Feb. 7, 1977, Ser. No. 766,178

Int. Cl.² A63B *69/36;* A63F *7/06*

U.S. Cl. 273—87 C **10 Claims**



1. A miniature golf game comprising a panel defining a flat playing surface having generally the shape of a cross, when seen in top plan view with a main leg and a cross leg intersecting said main leg intermediate the ends of the latter and nearer one end and substantially at right angles to said main leg, an upstanding side wall along the edges of said playing surface for confining a ball to said surface and said other end of said surface defining a starting zone of play, said cross leg defining a finishing zone of play and provided with at least two cups for receiving a ball, one of said cups located in the intersecting portion of said two legs, so that a straight path can be delineated from said starting zone to said one cup, and the other of said cups being located in a part of said cross leg, such that said wall constitutes an obstacle in any straight path from said starting zone to said second cup, means to removably plug one or the other of said cups, and pairs of blocks secured to the panel at the junction of the playing surface and the side walls and at a predetermined distance apart, and ball rises of different arcuate shape but each having a base width equal to said predetermined distance so as to make said arcuate ball rises interchangeable as to their position along the fairway.

4,098,508

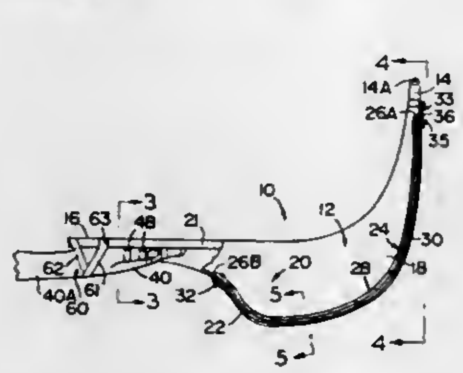
BALL HANDLING ARTICLE

Robert W. Gandy, 2902 Waterway Ct., Apt. 1556, Tampa, Fla. 33612

Filed Dec. 15, 1976, Ser. No. 750,644

Int. Cl.² A63B *59/02*

U.S. Cl. 273—96 R **9 Claims**



1. An article for catching and throwing a ball; comprising in combination:

an integral body member having a tip portion, and a hand receiving portion;

hand securing means for securing the hand of a player to said hand receiving portion,

said hand securing means including means for recieving at least the fingers of the hand of the player;

said hand securing means further comprising indentation means in said hand receiving portion of said body member for receiving a web for securing the wrist of the player to said hand receiving portion of said integral body member;

said body member having integral side wall means extending between said tip portion and said hand receiving portion forming a ball receiving region therebetween;

said ball receiving region having a first curvature extending from said tip portion and having a second and greater curvature extending from said first curvature to enable the player to catch and throw the ball from said first curvature with said second curvature providing a stop for ctaching and throwing the ball; and

resilient layer means secured to said integral body member to cover substantially all of said first curvature of said ball receiving region for absorbing a portion of the impact of a moving ball to facilitate catching the ball.

4,098,509

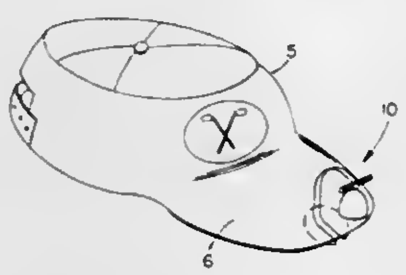
GOLFING DEVICE

Nellis D. Van Krevelen, 1932 Jefferson St., Muskegon, Mich. 49441

Filed Jun. 8, 1977, Ser. No. 804,583

Int. Cl.² A63B *69/36;* G08B *3/00*

U.S. Cl. 273—183 B **18 Claims**



1. A golfing device for audibly indicating improper head movement of a golfer during a golf swing comprising attachment means for attaching the device to an item of clothing worn on the head such as a hat, headboard or the like; support means extending from said attachment means for supporting an audible signal-producing means; an audible signal-producing means for producing a sound audible to the human ear upon movement in generally any direction when the device is attached to a golfer's head and the golfer's head is moved beyond a predetermined amount during a golf swing; and securing means for movably securing said audible signal-producing means to said support means whereby said signal-producing means is adjustable to a nonsignal-producing position as the golfer assumes his or her stance and addresses the golf ball preparatory to swinging.

4,098,510

RECORD PLAYER

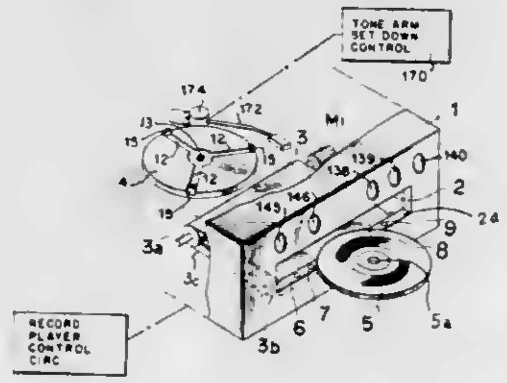
Toru Suzuki, Chigasaki; Masao Toyosawa, and Chiaki Toyoda, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,752

Claims priority, application Japan, Mar. 2, 1976, 51-21823; Mar. 6, 1976, 51-26918[U]

Int. Cl.² G11B *3/00, 25/04*

U.S. Cl. 274—9 B **9 Claims**



1. A phonograph record player comprising a housing having a slot for the insertion of a phonograph record therein, a turntable rotatably mounted within said housing for supporting a phonograph record, a tone arm within said housing for reproducing sound recorded on a phonograph record as the latter is rotated on said turntable, transport means within said housing extending from said slot to said turntable and being operative to transport a phonograph record from said slot onto said turntable, detecting means in the vicinity of said slot for detecting a phonograph record inserted in said slot, means responsive to said detecting means for causing operation of said transport means, centering means operative for establishing the concentric orientation of a phonograph record on the turntable with respect to the axis of rotation of the latter, means for effecting an operation of said centering means after said transport means has transported a phonograph record onto said turntable, turntable drive means for rotatably driving said turntable, and means for effecting operation of said turntable drive means upon completion of said operation of the centering means.

4,098,511

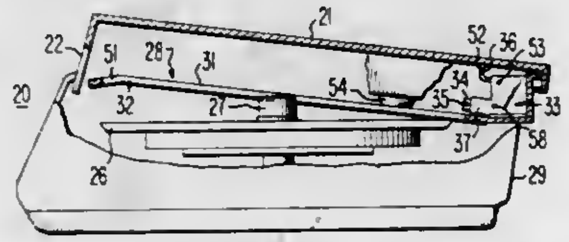
VIDEO DISC HANDLING SYSTEM FOR A VIDEO DISC PLAYER

Marvin Allan Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,865

Int. Cl.² G11B *17/04, 17/26*

U.S. Cl. 274—9 B **11 Claims**



1. A player for recovering pre-recorded signals from a disc record removably subject to occupancy of a protective cover comprising:

(A) a housing having an input slot dimensioned to permit insertion of a protective cover into said player and its removal therefrom;

(B) a turntable rotatably mounted in said housing for supporting a disc record during playback;

(C) guide means mounted in said housing subject to motion between an elevated position and a depressed position;

said guide means being aligned with said input slot when said guide means is occupying said elevated position;

(D) clamping means for causing a removal of a disc record from said cover during a cover withdrawal subsequent to an occupied cover arrival at a fully inserted position in said player in such manner that a disc record is retained in said player resting on said guide means upon conclusion of said cover withdrawal;

said clamping means being mounted in said player such that it is positioned in the path of the contents of an occupied protective cover during cover passage to said fully inserted position in said player;

(E) means for causing motion of said guide means to said depressed position; and

(F) means for freeing said retained record from said clamping means, whereby said retained record is deposited on said turntable, for rotation therewith with independence from said clamping means, during motion of said guide means to said depressed position.

4,098,512

PHONOGRAPH RECORD PLAYER

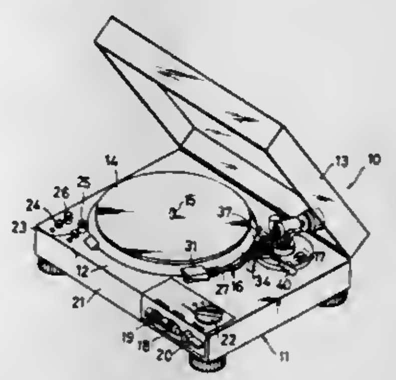
Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,317

Claims priority, application Japan, Nov. 10, 1975, 50-135989

Int. Cl.² G11B *17/06, 17/08*

U.S. Cl. 274—15 R **3 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism operative in a lead-in mode for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and in a return mode for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a control gear having a cam groove therein and being turned by said drive gear in said lead-in and return modes of operation;

a main lever having a cam follower engaging said cam groove for effecting swinging movements of said lever in first and second directions in response to the turning of said control gear in said lead-in and return modes of operation, respectively;

tone arm drive means for effecting swinging of said tone arm in said lead-in and return movements in response to said swinging movements of said main lever in said first and second directions, respectively, said tone arm drive means including an engaging member coupled with said tone arm assembly for swinging of said tone arm upon movement of said engaging member in an arcuate path, a lead-in lever pivoted for swinging movements both with, and in respect to said main lever and being movable against said engaging member for moving the latter in one direction in said arcuate path upon swinging movement of said lead-in lever with said main lever in said first direction, return drive means on said main lever movable against said engaging member for moving the latter in the opposite direction in said arcuate path upon swinging movement of said main lever in said second direction, a coupling pin on said lead-in lever spaced from, and extending parallel to the axis of said swinging movements of the lead-in lever, a lead-in drive member pivoted at one end on said main lever for movement with the latter and for angular displacement of said lead-in drive member relative to said main lever about an axis parallel to the axis of said swinging movements of the main lever, said lead-in drive member extending from said axis of its angular displacement generally in said second direction of the swinging movement of said main lever and having a substantially triangular nose extending from one side of the free end portion of said lead-in drive member, said nose having oppositely angled first and second flanks facing generally in said first and second directions, respectively, of said swinging movements of the main lever, and spring means acting on said lead-in drive member to urge the latter to be angularly displaced in the direction moving said one side against said coupling pin so that said first and second flanks of said nose are engageable with said coupling pin to cause swinging movements of said lead-in lever with said main lever in said first and second directions, respectively; and

stop means for limiting the swinging movement of said lead-in lever with said main lever in said first direction, whereupon said first flank cams over said coupling pin and said second flank engages the coupling pin and under the influence of said spring means causes incremental swinging of said lead-in lever in said second direction to separate said lead-in lever from said engaging member when said stop means establishes the set-down position of said stylus on a record by said limiting of the movement of said lead-in lever in said first direction.

4,098,513

SUSPENSION DEVICES FOR THE CHASSIS OF A RECORDING AND/OR REPRODUCING APPARATUS

Ludwig Klapproth, Lahr; Gerhart Metzler, Offenburg, and Peter Rother, Lahr, all of Germany, assignors to Geratewerke Lahr GmbH, Lahr, Germany

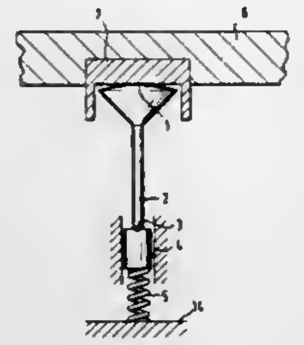
Filed Sep. 17, 1976, Ser. No. 724,225

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1975, 2542185

Int. Cl.^{2} G11B *3/60*

U.S. Cl. 274—39 A **19 Claims**

1. A recording and/or reproducing apparatus comprising a stationary structure, a chassis which carries means for recording and/or reproducing, and at least one suspension means including resilient means which mounts said chassis to said structure in a manner permitting oscillating movement of said chassis with respect to said structure in three orthogonal directions, the oscillatory movements experienced by said chassis in the three orthogonal directions being decoupled from each other, said chassis being spaced vertically above the part of said stationary structure mounting said chassis, said suspension means including a pivotal joint, a support member pivotally mounted at said pivotal joint, a first support surface provided on said support member, and a second support surface associated with one of said stationary structure and said chassis, said first and second support surfaces being positioned in such manner that during oscillating movement of said chassis in a horizonal plane different points on said first and second support services meet at a support point, the support point being in vertical alignment with said pivotal joint in any relative position of said chassis and structure occupied during said oscillating movement of said chassis with respect to said structure.



4,098,514

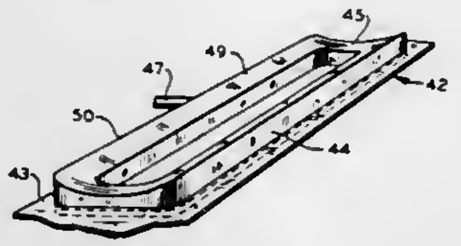
STRATIFIED CHARGE ENGINE VALVE SEAL

William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 449,241, Mar. 8, 1974, Pat. No. 3,948,227. This application Nov. 21, 1975, Ser. No. 634,080

Int. Cl.^{2} F16J *15/16*

U.S. Cl. 277—30 **2 Claims**



1. Sealing apparatus for sealing a curvilinear surface having at least one passage defined therein, comprising, a heat-resistant diaphragm gasket having at least one opening therein for registry with said passage, sealing and lubricating means comprising a liquid permeable sintered metal valve seal body, an oil conduit in communication within said valve seal body for delivering lubricating oil, an oil passageway defined circumferentially within said valve seal body, whereby delivery of oil through said oil conduit to said oil passageway effects uniform saturation of said liquid permeable sintered metal, said sealing and lubricating means being located circumferentially about said gasket opening and defining an arcuate surface for contacting registry with the curvilinear surface.

4,098,515

ABRASION RESISTING MATERIAL AND USE OF THE SAME

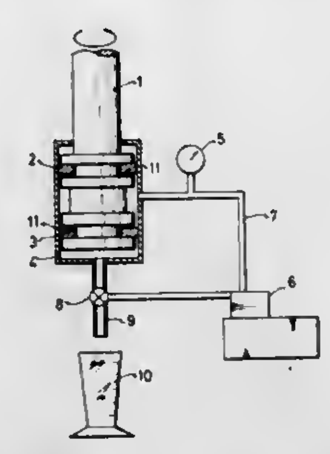
Tatsuei Sakata, Nishiyama, Japan, assignor to Riken Piston Ring Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,349

Int. Cl.^{2} F16J *15/20;* **F16C** *33/74*

U.S. Cl. 277—165 **6 Claims**

1. A sliding mechanism including a first sliding surface, a sliding member having a second sliding surface which contacts with said first sliding surface and slides relatively to said first sliding surface, and a holding member being made of aluminum alloy or aluminum and holding said sliding member in contact, while moved, in which at least a contact portion of said sliding member with said holding member is made of polytetrafluoroethylene resin containing 50 to 65% by weight of cast iron powder having a grain size of 100 to 400 mesh, or 45 to 75% by weight of chromium-molybdenum steel powder having a grain size of 150 to 325 mesh.



4,098,516

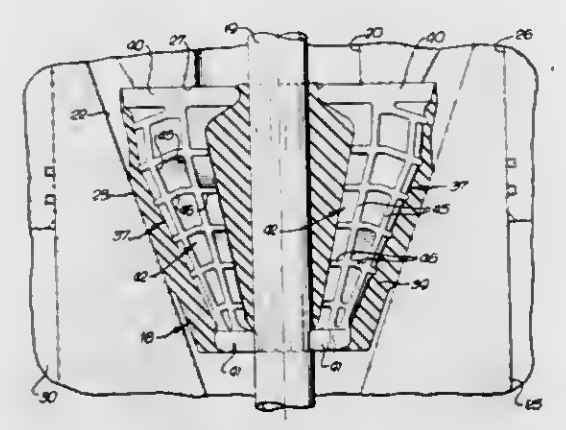
BLOWOUT PREVENTER PACKING UNIT WITH SLANTED REINFORCING INSERTS

Fernando Murman, Rancho Palos Verdes, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed Aug. 15, 1977, Ser. No. 824,748

Int. Cl.^{2} B65D *53/00;* **E21B** *33/12*

U.S. Cl. 277—235 R **27 Claims**



1. In an annular blowout preventer packing unit having a longitudinal axis, the packing unit adapted to be compressively displaced inwardly toward said axis the improvement combination comprising

(a) metallic inserts generally circularly spaced about said axis, the inserts having webs that extend both longitudinally and in directions about said axis to define surfaces which have longitudinally facing extents,

(b) an annulus of elastomeric material extending about said axis and embedding said webs, the material extending in contacting relation with said surface extents so that the webs anchor the material and resist longitudinal displacement thereof during said compressive displacement of the packer.

4,098,517

CONVERTIBLE RIDING TOY

Adam J. Sortini, 6204 E. Gettysburg, Clovis, Calif. 93612

Filed Apr. 14, 1977, Ser. No. 787,554

Int. Cl.^{2} A63G *19/00*

U.S. Cl. 280—1.12 **9 Claims**

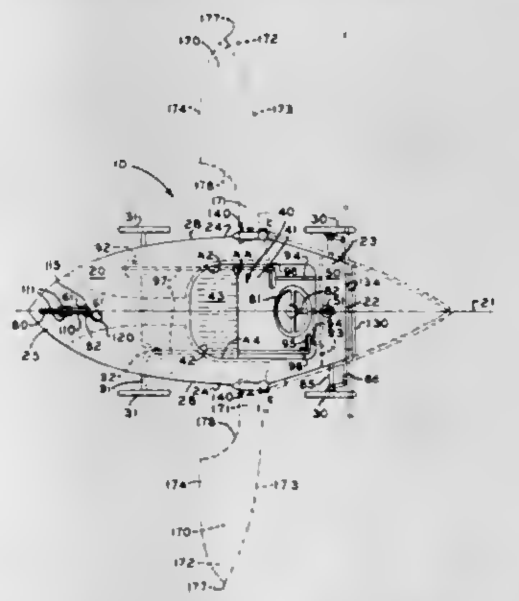
1. A toy comprising:

(A) a body mounted for traversing a supporting surface having a forward portion, a rearward portion, a longitudinal axis substantially parallel to the supporting surface, and a pair of oppositely laterally outwardly opening longitudinal slots, the forward portion of the body extending forwardly of the slots and curving convergently inwardly therefrom;

(B) a pair of plate-like members each having a root portion and an opposite tip portion; and

(C) swivel means individually mounting the root portions of the plate-like members on opposite sides of the body forwardly of the slots for selective positioning of the platelike members longitudinally substantially parallel to the support surface

(1) extending transversely inwardly substantially concealed within the slots and with the tip portions rearwardly of their respective root portions,



(2) disposed with the tip portions extending laterally outwardly of the body from their respective root portions, and

(3) disposed transversely substantially perpendicularly to the supporting surface with the tip portions forward of the root portions and with said members forwardly convergent so that the tip portions are closely adjacent, the plate-like members being curved substantially to conform to the shape of the forward portion of the body when said plate-like members are in their position transversely substantially perpendicularly to the supporting surface with the tip portions closely adjacent to each other forwardly of the root portions, the slots being curved to conform to and to receive the plate-like members.

4,098,518

TRANSPORT MEANS

William Minkoff, 15703 Redington Dr., Redington Beach, Fla. 33708

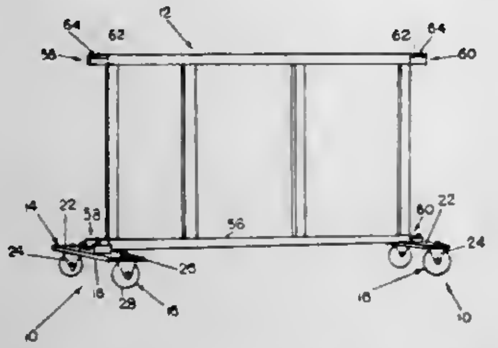
Filed Feb. 7, 1977, Ser. No. 766,253

Int. Cl.^{2} B62B *1/14*

U.S. Cl. 280—47.13 R **8 Claims**

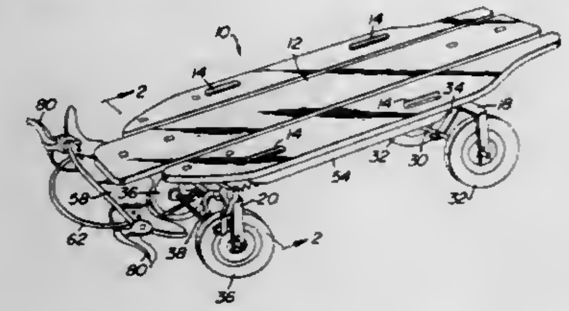
1. A transport means comprising at least one dolly device for moving a bed or the like, said dolly device comprising an elongated base plate, a pair of swivel mounted casters attached to opposite ends of said elongated base plate and an attachment means disposed on the upper surface thereof to engage the bed, said attachment means comprises a first and second retainer element extending upwardly from said upper surface of said elongated base plate, said first and second retainer elements being disposed relative to each other to cooperatively form a channel therebetween to receive the bed, said first retainer element extending across said elongated base plate substantially perpendicular to the elongated extent of said elongated base plate and said second retainer element extending diagonally across said elongated base plate relative to said first retainer element to cooperatively form a first and second re-

tainer opening therebetween at opposite ends of said channel, said first and second retainer openings being disposed in horizontally spaced relation to each other, said first retainer opening being greater than said second retainer opening.



4,098,519
WHEELED SLED

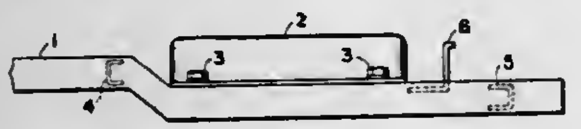
Thomas J. Reid, Jr., 506 Morley Pl., Elmira, N.Y. 14904
Filed Jul. 18, 1977, Ser. No. 816,224
Int. Cl.² B62B *7/00*
U.S. Cl. 280—87.01 **10 Claims**



1. A wheeled sled comprising a generally flat platform having a front end and a rear end, front and rear axle braces, said rear axle brace being pivotably connected to a bottom of the platform adjacent the rear end about a vertical pivot, said front axle brace being pivotably connected to a bottom of said platform adjacent the front end about a vertical pivot, an axle supported by each axle brace, a pair of wheels on each axle, a steering handle pivotably supported by said platform adjacent the front end thereof about a vertical pivot spaced longitudinally from said axle brace pivots, crossed steering bars, each steering bar being pivotably coupled to each of the axle braces and to said steering handle.

4,098,520
PROTECTIVE FRAME STRUCTURE FOR AN AUTOMOBILE GAS TANK

Toshi Ezaki, and Masanobu Tsutsumi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyn Kabushiki Kaisha, Toyota, Japan
Filed Sep. 27, 1976, Ser. No. 727,028
Claims priority, application Japan, Jul. 26, 1976, 51-99469[U]
Int. Cl.² B62M *27/00*
U.S. Cl. 280—784 **7 Claims**



1. A protective frame structure for a motor vehicle gas tank comprising:

a pair of frame side members extending longitudinally along the sides of said gas tank and coupled to said gas tank;

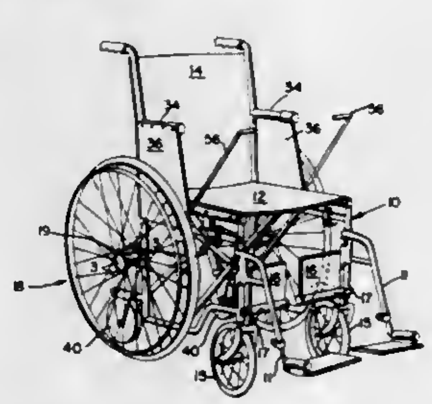
a pair of frame crossing members disposed in front of and rear of said gas tank, said pair of frame crossing members being coupled at each end to said frame side members;

a protective crossing member disposed between the rear of said gas tank and said rear frame crossing member, said protective crossing member having no corners adjacent said gas tank; and

a shock absorber means disposed between said gas tank and said front frame crossing member.

4,098,521
WHEELCHAIR ADAPTABLE FOR PASSAGE IN NARROW SPACES

Andrew Marvin Fergason, Merritt Island, Fla., and Ernest Voshell Keith, Dover, Del., assignors to Reme Enterprises, Inc., Dover, Del. and National Patent Search Associates, Inc., Arlington, Va.
Filed Aug. 9, 1976, Ser. No. 712,969
Int. Cl.² B62M *1/14*
U.S. Cl. 280—242 WC **8 Claims**



1. A wheelchair convertible to a narrow mode while the occupant is seated therein, comprising:

a frame;

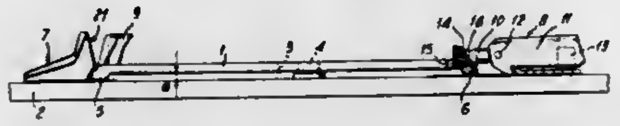
wheel means mounted on said frame near the front portion thereof;

main drive wheels removable mounted on said frame near the rear portion thereof, quick disconnect means on said drive wheels and said frame to enable said drive wheels to be mounted on and removed from said frame by the occupant while seated in the wheelchair in a lateral direction substantially parallel to the axis of rotation of said drive wheels; and

secondary wheels mounted on said frame near the rear portion thereof and disposed rearwardly of the axis of said main drive wheels, said secondary wheels and said wheel means being disposed laterally inwardly of said main drive wheels, said secondary wheels being positioned to be out of engagement with the support surface for the wheelchair when it is supported by said wheel means and said main drive wheels, and said secondary wheels being positioned to be engagable with said support surface upon predetermined rearward tilting movement of said wheelchair to lift said main drive wheels out of contact with said support surface to enable said main drive wheels to be quickly laterally removed from said frame by the occupant while seated in the tilted wheelchair and to enable said wheelchair to be supported thereafter by said secondary wheels and said wheel means in a narrow mode.

4,098,522
SAFETY SKI BINDING

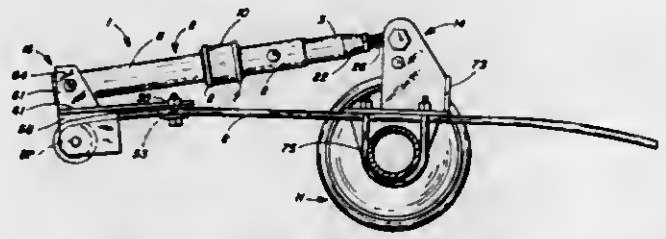
Jean Joseph Alfred Beyl, Boulevard Victor-Hugo, Nevers, Nievre, France
Filed Jan. 22, 1976, Ser. No. 651,570
Claims priority, application France, Jan. 28, 1975, 75 02536; May 23, 1975, 75 16101
Int. Cl.² A63C *9/08*
U.S. Cl. 280—618 **4 Claims**



1. In a safety ski binding of the type in which an elongated plate is pivotally and disengageably mounted on a ski, binding means at the front and rear ends of said plate hold the corresponding ends of the ski boot thereto, resilient retaining means are mounted on said ski and register with one end of said plate to keep said plate in its normal operative position while permitting the movement of said plate away from the ski and a fixed abutment member is mounted on said ski registering with the other end of said plate to retain the latter on said ski, the improvement which comprises providing said abutment member with a pair of inclined faces having a common horizontal edge substantially transverse of and parallel to said ski, the upper of said faces being inclined upwardly and away from the adjacent end of said plate, and the lower of said faces being inclined downwardly and away from the adjacent end of said plate, both of said faces having a circular-shaped concave curvature, and in which said plate is of a length slightly greater than the distance between said horizontal edge of said abutment member and the operating end of said resilient retaining means, and is provided with a downwardly declining face with a circular shaped convexity at its said other end, the radius of curvature of all of said faces being smaller than the length of said plate and at least as long as the difference between the other end of said plate and the center of the pivot, whereby downward pressure upon said plate causes the same to move downwardly along the upper face of said abutment member and longitudinally against said resilient retaining means, over said horizontal edge, and thence inwardly against the lower face of said abutment member, and the curvature of said faces centers said plate on said ski.

4,098,523
TRACTION DEVICE

Michael R. Valerio, 1780 Benjiman Rd., North Madison, Ohio 44057
Filed Jun. 7, 1976, Ser. No. 687,866
Int. Cl.² B60G *11/04*
U.S. Cl. 280—718 **9 Claims**



1. A traction bar assembly for a motor vehicle comprising,

an inner elongated member having a longitudinal axis,

a first hollow outer elongated member encompassing a portion of said inner elongated member,

a second hollow outer elongated member encompassing a portion of said inner elongated member and spaced from said first hollow member along said longitudinal axis,

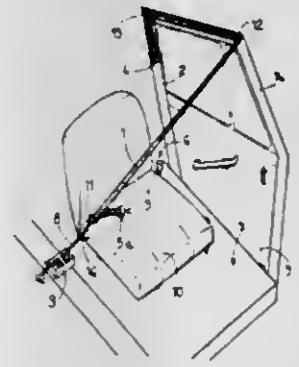
a compressable member disposed between said outer elongated members,

one of said elongated members being adapted for connection to a vehicle's wheel axle housing, and

another of said elongated members being adapted for connection to a vehicle's spring.

4,098,524
SAFETY BELT FOR MOTOR VEHICLE

Pierre Ardizio, Rue de Saint-Jean 21, 1203 Geneva, Switzerland
Filed Jan. 31, 1977, Ser. No. 764,159
Claims priority, application Switzerland, Feb. 5, 1976, 1398/76
Int. Cl. B60r *21/02*
U.S. Cl. 280—744 **7 Claims**



1. A safety belt system for a motor vehicle comprising:

a main belt having both ends anchored to the frame of said motor vehicle on the external side of a user's seat, a first one of said ends removably secured to an anchoring point substantially at the same level as the seat, a second one of said ends fixedly secured at a different level from said first end;

an auxiliary strap situated on the inner side of said user's seat, a first end of said auxiliary strap connected to a self-rolling device applying tension to said strap, the second end of said auxiliary strap connected to a sliding strap buckle;

said main strap being slidably engaged through said sliding strap buckle, said buckle exerting tension against said main strap; and

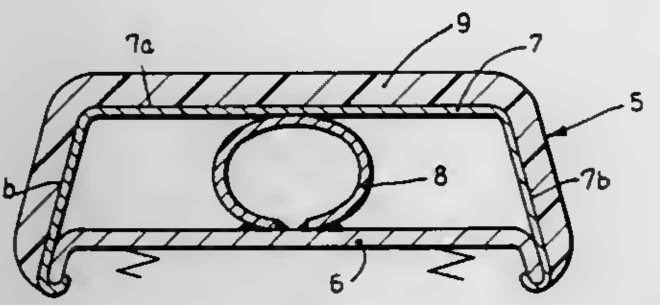
first fastening means located substantially at the level of the top of the door on the external side of said user's seat for retaining the main strap when the strap is not in service so that a user may freely leave said seat.

4,098,525
VEHICLE STEERING WHEEL SAFETY DEVICE

Wilfried Schwanz, Ahnsen; Ulrich Seiffert, Braunschweig; Peter Beher, Wolfsburg, all of Fed. Rep. of Germany, and Hannu Paitula, Sodertalje, Sweden, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 18, 1976, Ser. No. 697,690
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529920
Int. Cl.² B60R *21/02*
U.S. Cl. 280—750 **8 Claims**

1. A safety device for a vehicle steering wheel having a hub, a rim, and spokes interconnecting the hub and the rim, for protecting a vehicle operator from injury upon impact of the operator's head with the steering wheel, comprising an impact energy dissipating member arranged over said spokes, said member including a first thin wall crushable hollow shell having an impact surface and side walls mounted to a supporting structure, said first shell being substantially larger in one direction parallel to said impact surface than in the direction perpendicular to said impact surface, and only one second thin wall crushable hollow shell mounted to said supporting structure, said shell being mounted to the central portion of said supporting structure in said parallel direction and in contact

with the center of said impact surface within said first shell and spaced from said side walls, said shells having substantially equal thickness in said perpendicular direction and said second shell being substantially smaller than said first shell in said parallel direction and supporting said central portion of said impact surface to render the impact characteristic of said surface substantially uniform over said surface.



4,098,526

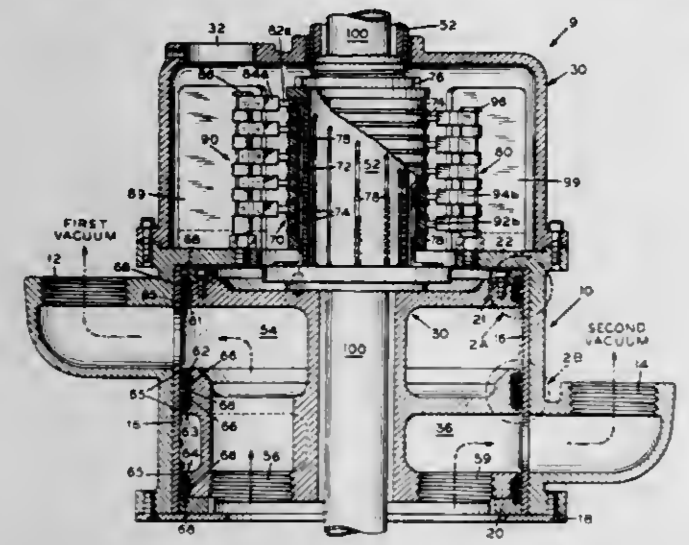
ROTARY CONNECTING DEVICE

Donald E. DuBois, Ashokan, N.Y., assignor to The De Laval Separator Company, Poughkeepsi, N.Y.

Filed Jun. 7, 1976, Ser. No. 694,052

Int. Cl.² F16L ***55/00***

U.S. Cl. 285—119 **6 Claims**



1. A rotary connecting device for establishing fluid connections between rotary and fixed structures comprising a stationary casing and a rotor, the casing having attachment means for plural separate stationary fluid conduits, the rotor having attachments for plural separate revolvable fluid conduits, said rotor having separate fluid chambers each in fluid communication with a stationary and a revolvable fluid conduit, polytetrafluoroethylene O-ring seals separating and sealing said chambers, said O-ring seals being biased radially outwardly to provide sliding, sealing bearing surfaces for journaling said rotor in said casing, said O-ring seals being positioned in V-grooves of the rotor, each of said grooves being defined on one side by a sloping surface of the rotor and on the other side by a divergent sloping surface on a seal exapnder ring, and means to axially bias said seal expander ring toward said rotor sloping surface to narrow the groove to force the O-ring radially outwardly of the groove.

4,098,527

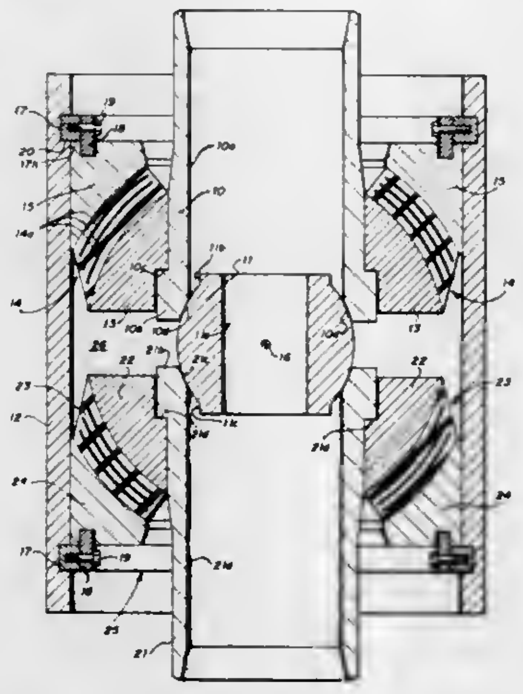
TENSION BEARING CONNECTOR

John T. Herbert; Frank J. Kovitch, both of Arlington, and Paul E. Sullivan, Euless, all of Tex., assignors to Murdock Machine & Engineering Company, Irving, Tex.

Filed Jan. 21, 1977, Ser. No. 760,867

Int. Cl.² F16L ***27/04***

U.S. Cl. 285—167 **12 Claims**



1. A flexible connector for accommodating tensile loads at a junction between structural members, which comprises:

(a) a hollow cylinder;

(b) a pair of nipples depending into said cylinder from opposite ends thereof, said nipples having outwardly flared ends and longitudinal bores subtended by internal spherical surfaces adjacent said flared ends;

(c) a rigid spacer located in said cylinder and interposed between said nipples, said spacer having outer spherical surfaces slidably mating with said internal spherical surfaces;

(d) a pair of elastomeric bearings each encircling one of said nipples and captured against movement out of the ends of said cylinder, each of said bearings having spherical surfaces concentric to said internal spherical surfaces; and

(e) annular confronting surfaces on each of said nipples and on each of said bearings exterior of said flared ends and lying in planes normal to said axis to transfer to said bearings forces which would urge said nipples away from said spacer.

4,098,528

PIPE COUPLING

John M. Stanley, Milledgeville, Ga., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,130

Int. Cl.² F16L ***21/00***

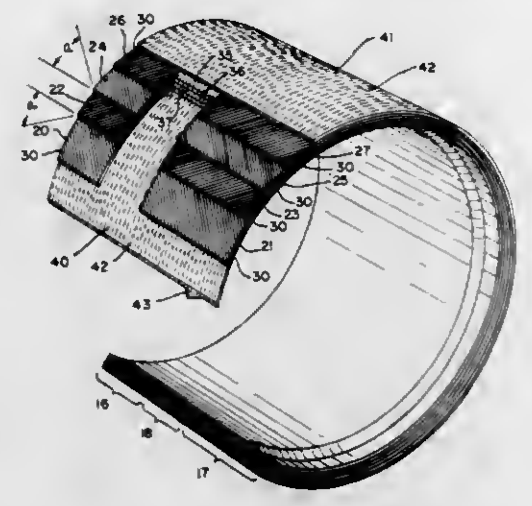
U.S. Cl. 285—235 **13 Claims**

1. A pipe coupling for coupling adjacent ends of a first rigid plain end pipe section and a second rigid plain end pipe section disposed in end to end relationship comprising a tubular member including:

a pair of axially spaced gripping zones of relatively soft material for grippingly engaging said plain end pipe sections, one of said gripping zones being disposable over the exterior circumferential surface of one end of one of said pipe sections and the other of said gripping zones being disposable over the exterior circumferential surface of the adjacent end of the other of said pipe sections;

a central zone having a substantially constant inner diameter, said central zone disposed between said gripping zones to

overlay the adjacent ends of both pipe sections, said central zone being of a material which is relatively hard with respect to said relatively soft material so as to resist axial misalignment of the adjacent ends of said plain end pipe sections; and



means connecting said spaced gripping zones and said central zone to form a unitary coupling structure.

4,098,529

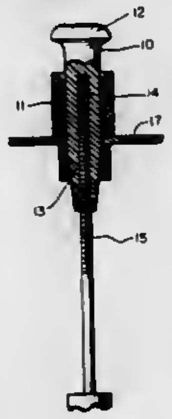
AUTOMOBILE DOOR LOCK

Richard Bingham, 2549 W. Eastwood, Chicago, Ill. 60625

Filed Jun. 30, 1977, Ser. No. 811,777

Int. Cl.² E05C ***19/00***

U.S. Cl. 292—1 **2 Claims**



1. In combination with a handle for an automobile door lock of the type having a shank extending downwardly into an opening in the window sill of an automobile door, an enlarged upper end or knob of diameter larger than said window sill opening, and means establishing an adjustable screw threaded attachment to a rod or stem serving as the operating means for said door lock, a collar of suitable material having an outside diameter at least equal to the diameter of said enlarged end or knob and an inside diameter which slidably accommodates said shank, said collar surrounding said shank, and having an upper annular surface shaped to conform to the underside of said enlargement or knob and substantially filling the space between the underside of said handle and said sill when said handle is adjusted and depressed into door-locking position, said collar being freely movable with respect to said sill whereby it can be gripped by the thumb and finger and lifted and thus impart a lifting movement to said handle and yet remain free to drop downwardly with respect to the lifted handle when the manual grip is released to allow the collar to fall while surrounding the shank of said handle until the collar comes to rest on said sill, said collar thus serving as a convenient means for manually unlocking the associated door and at the same time serving as a means for converting said handle when locked to one that cannot be engaged by a hooked wire extended into said automobile through the space surrounding the window, for lifting said handle and unlocking the automobile door.

4,098,530

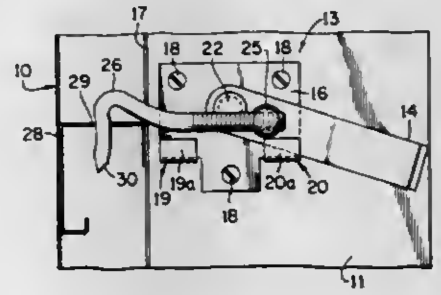
SLIDING DOOR LATCH

James A. Edens, Rock Falls, Ill., assignor to National Manufacturing Co., Sterling, Ill.

Filed Oct. 12, 1976, Ser. No. 731,637

Int. Cl.² E05C ***5/00, 19/12***

U.S. Cl. 292—113 **10 Claims**



1. A latch for use with a sliding door, comprising

a mounting plate having means thereon for mounting said plate to a vertical door jamb with a first edge of said plate facing toward the path of said sliding door,

an elongated arm mounted to said mounting plate for pivotal movement about a first axis extending perpendicularly to said plate,

a pivot rod carried by said arm at a position displaced from said first axis,

said rod extending parallel to said first axis,

a hook mounted to said rod for free pivotal movement about the axis of said rod,

a stop extending from said mounting plate between said first axis and said first edge across the path of movement of said arm for supporting said arm in an extended, substantially horizontal position across the path of said door, and

said hook being freely movable past said stop.

4,098,531

BODY FOR MOTOR VEHICLES

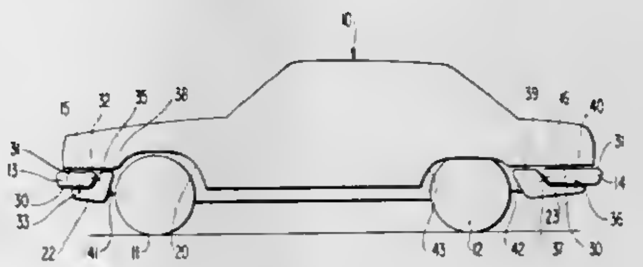
Hermann Renner, Magstadt, and Wolfgang Klie, Korntal, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 729,982

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544713

Int. Cl.² B61F ***19/04***

U.S. Cl. 293—63 **25 Claims**



1. A body for motor vehicles comprising bumper means arranged in at least one of front and rear areas of the vehicle and body cover panel means adjoining the bumper means, characterized in that cover panel means above the bumper means which form upper body cover panel means are devoid of any connection with the corresponding bumper means, and body cover panel means which form lower body cover panel means forms a separate structural part independent of the

upper body cover panel means, a lower terminal edge of the upper body cover panel means has an at least approximately parallel extension with respect to a surface of the bumper means under a formation of a spacing gap with respect to the bumper means and the lower body cover panel means, the lower terminal edge of the upper body cover panel means and the surface of the bumper means extend each in an at least approximately horizontal plane, the lower body cover panel means is secured at a part rigid with the bumper means, and in that the lower body cover panel means is drawn up laterally at ends of the bumper means following contours thereof and simultaneously forms a lower extension of a wheel cutout contour surrounded by the upper body cover panel means.

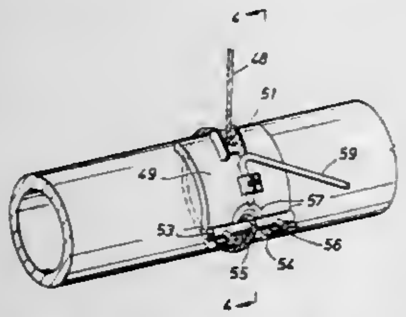
4,098,532
QUICK ENGAGE AND RELEASE SLING FOR TUBULAR MEMBERS

William H. Phillips, Rte. #2, Carthage, Tex. 75633

Division of Ser. No. 659,478, Feb. 19, 1976, which is a continuation of Ser. No. 500,915, Aug. 27, 1974, abandoned. This application Feb. 16, 1977, Ser. No. 768,994

Int. Cl.² B66C *1/12;* E21B *19/00*

U.S. Cl. 294—75 **3 Claims**



1. A quick engage and release sling for tubular members including:

(a) curved means for encircling at least a portion of the tubular member;

(b) said curved means terminating at one end in an arcuate projection extending laterally of said curved means;

(c) means on said curved means for receiving a flexible line therethrough to enable the flexible line to engage with said curved means and encircle a portion of the tubular member;

(d) lock bar means for engaging with the end of the flexible line and with said arcuate projection when said curved means and flexible line are encircled about a tubular member and a tension applied to the flexible line to thereby secure the tubular member in the flexible line and curved means;

(e) projection means on said lock bar means for releasing said lock bar means from said arcuate projection; and

(f) handle means connected to said lock bar means to move said lock bar means out of said arcuate projection and effect release between said curved means and lock bar means to disengage the sling from the tubular member.

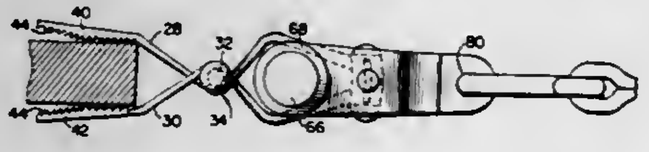
4,098,533
ARTICLE MOVING ATTACHMENT

John P. Hanlon, Jr., Scott Rd., Concordville, Pa. 19331

Filed Oct. 19, 1976, Ser. No. 733,912

Int. Cl.² B66C *1/48*

U.S. Cl. 294—116 **8 Claims**



1. An article moving attachment comprising a pair of opposed arms in side by side relationship, hinge means interconnecting said arms intermediate their ends, first portions of said arms on one side of the hinge means initially diverging at an angle from one another, and thence converging at a reversed angle, the free ends of said first portions being in substantial longitudinal alignment and constituting coacting grappling jaws, said arms having second portions, on the opposite side of the hinge means, initially diverging at an angle from one another, thence converging at a reversed angle toward one another, an open space defined between the initially diverging and thence converging, second portions of said arms, an actuating member in said space, the converging second arm portions defining, in said space, converging camming surfaces toward the outer ends thereof and engageable by said actuating member, said member coacting with said camming surfaces to spread the outer ends, of said arms upon longitudinal displacement of said member when a longitudinal force is applied on said actuating member in a direction away from the hinge means, a line operatively connected to the actuating member and adapted to apply force to said member to resultantly move the attachment, and simultaneously said grappling jaws being pivoted toward each other to forcefully engage an article therebetween upon spreading of the outer ends of said arms by movement of said member along said camming surfaces, said outer ends of said arms, beyond said space, being provided with overlapping coacting similarly curvilinear shaped slots, a pin engaged in and between said slots, said slots and said pin coacting with said second arm portions and hinge means to define an end closure for said open space wherein said actuating member is mounted, and to delineate limits of pivoted angular movement in one direction of one said arm with respect to the other said arm by engagement of said pin and ends of said slots, and, by closing the space, restraining said actuating member from displacement therefrom.

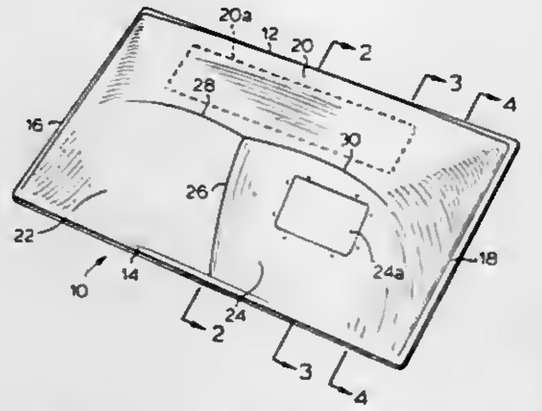
4,098,534
BLISTER AIR DEFLECTOR

William J. Wood, 106-3735 Sheppard Ave. East, Agincourt, Ontario, Canada (M1T 3L1)

Filed Oct. 29, 1976, Ser. No. 736,998

Int. Cl.² B62D *35/00*

U.S. Cl. 296—1 S **11 Claims**



1. In combination, a trailer for use in articulated coupling having a forwardly facing upstanding wall, a blister air deflector carried on said wall

said deflector having a generally rectangular plan-form, and including upper, lower and vertical side edges, the upper edge of said plan-form being generally coincident with the upper margin of said wall, a convex major surface downwardly divergent from the upper edge of said plan-form,

a minor surface upwardly convergent from the lower edge of said plan-form,

said minor surface comprising two portions intersecting in a leading apex and diverging therefrom in a shallow V-shape towards the vertical side edges of said plan-form,

said major surface intersecting said minor surface abruptly to define the leading edge of said air deflector.

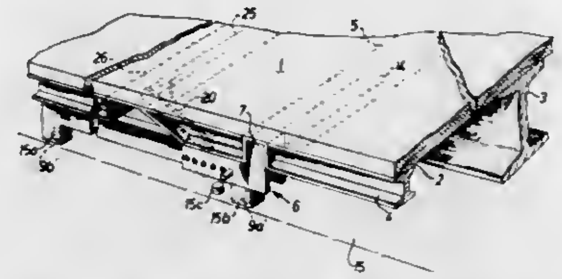
4,098,535
LOAD CARRIER HAVING SUPPORTING LEGS

Gunvald Magnus Svante Berger, Helmfeltsgatan 4A, Malmo, Sweden (S-211 48)

Filed Oct. 7, 1976, Ser. No. 730,170

Int. Cl.² B60P *1/64*

U.S. Cl. 296—35 A **6 Claims**



1. A cargo carrier unit for a vehicle including a longitudinally extending support surface having longitudinal side edges, said cargo carrier unit being provided with at least two supporting legs and at least one supporting beam extending longitudinally of the vehicle support surface at a substantial distance inwardly of the longitudinal side edges thereof, said supporting beam extending downwardly from the cargo carrier more than any other supporting elements thereon and having an undersurface resting on the vehicle support surface, means mounting the supporting legs for pivotal movement from a substantially vertical position wherein they support the cargo carrier unit on the ground to a substantially horizontal position wherein they are on either side of and mainly parallel with the beam, means mounting the supporting legs for movement between an extended position outwardly of a longitudinal side edge of the support surface and a retracted position between the cargo carrier unit and the vehicle immediately inside the outer boundaries of the longitudinal side edges of the cargo carrier unit when said legs are in said horizontal position, and each supporting leg being provided with at least one bearing surface supporting the longitudinal sides of the cargo carrier unit on the vehicle support surface, the bearing surfaces of said legs being in substantially the same horizontal plane as the underside of the beam.

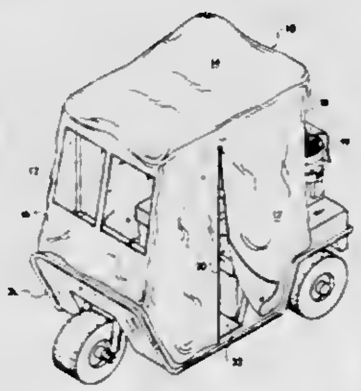
4,098,536
WEATHERSHIELD FOR GOLF CARTS

Marion T. Mills, P.O. Box 460, Morehead City, N.C. 28557

Filed Nov. 24, 1976, Ser. No. 744,732

Int. Cl.² B60J *9/00*

U.S. Cl. 296—78 R **8 Claims**



1. A removable weathershield for use on golf carts of the type having a roof, open sides, and a passenger compartment, used to transport passengers and their equipment around a golf course, said weathershield comprising a sheet of flexible, water repellent material in a configuration including:

(a) a top wall having outer dimensions at least equal to the outer dimensions of the roof of the golf cart;

(b) front, side and rear walls all depending downwardly from the outer edges of said top wall portion and being of a length sufficient to enclose the open sides of the golf cart, said rear wall including means associated therewith for covering the club compartment of said golf cart;

(c) a transparent portion in at least the front wall for visibility in guiding the cart;

(d) access means in at least one of said side walls for moving in and out of the cart;

(e) means along the lower edges of said front, side and rear walls for maintaining said weathershield substantially adjacent the body of the golf cart;

whereby said weathershield may be placed down over the open sides of said golf cart during inclement weather to completely enclose said cart and removed for storage during fair weather.

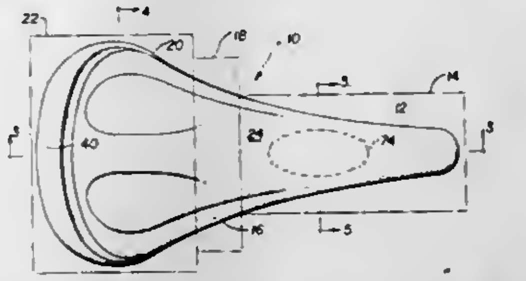
4,098,537
BICYCLE SADDLE

David L. Jacobs, Boulder, Colo., assignor to The Jacobs Corporation, Boulder, Colo.

Filed Mar. 7, 1977, Ser. No. 775,230

Int. Cl.² B62J *1/00*

U.S. Cl. 297—195 **4 Claims**



1. A bicycle saddle including a narrow, leading end portion having a downwardly turned tip; a central transition portion; a flaired, trailing end portion, wherein an adjustable frame may be operably positioned between said trailing end portion and said leading end portion to underlie and support said saddle and impart longitudinal stiffening tension to said saddle; and downwardly contoured side panels on each side of said saddle, wherein the improvement comprises:

a central, longitudinal tension rib extending at least approximately from said central transition portion to approximately said trailing end portion;

a first relatively thin and flexible pelvic zone lying along one side of said tension rib for flexibly supporting one portion of the pelvic area of a cyclist,

a second relatively thin and flexible pelvic zone lying along the other side of said tension rib for flexibly supporting another portion of the pelvic area of a cyclist, wherein said central, longitudinal tension rib carries longitudinal stiffening tension from at least the central transition portion of the saddle to the trailing end portion while said first and second relatively thin pelvic zones provide a degree of resiliency and cyclist comfort; and wherein

said bicycle saddle is fabricated as a unitary composition wherein said central longitudinal tension rib and said first and second relatively thin and flexible pelvic zones are an integral part of the saddle structure.

4,098,538

EARTH WORKING MACHINE HAVING INDEPENDENT TOOLS AND ROOF ENGAGING BRIDGE

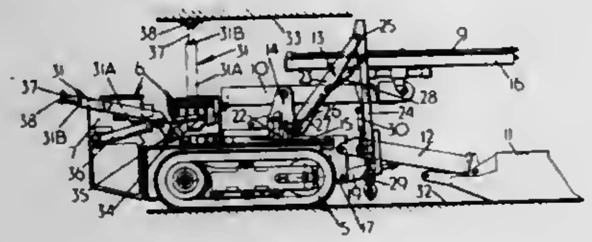
Allan Richard Hilton, Heaton, England, assignor to Mining Developments Limited, Bolton, Great Britain

Filed Apr. 13, 1977, Ser. No. 787,179

Claims priority, application United Kingdom, Apr. 14, 1976, 15342/76

Int. Cl.² E21C *33/00*

U.S. Cl. 299—33 **5 Claims**



1. A mobile earth working machine for use underground in mines or for tunnelling, comprising:

(a) a tracked vehicle,
(b) at least two separate and independently operable earth working tools mounted on the tracked vehicle,
(c) means for separately moving and actuating each earth working tool,
(d) a bridge structure pivotally mounted on the tracked vehicle towards the rear thereof and including a crossbar,
(e) means for pivoting the bridge structure from a substantially horizontal out-of-use position to an upright in-use position, and vice versa,
(f) clamping plate means carried by the crossbar of the bridge structure, and
(g) means for urging the clamping plate means against a mine or tunnel roof when the bridge structure is in an upright position.

4,098,539

CUTTING MACHINE

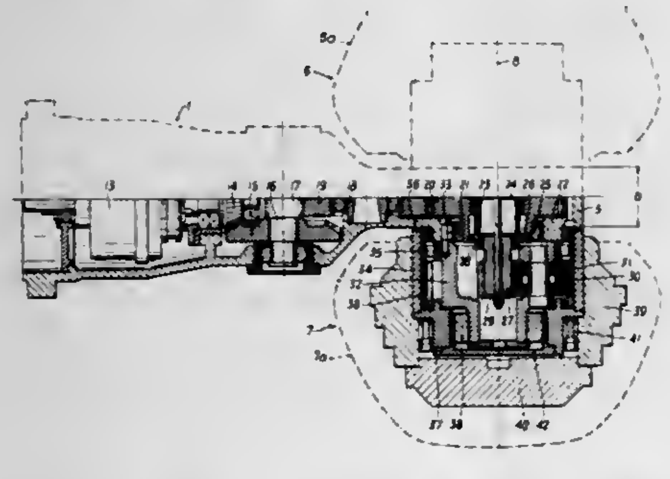
Alfred Zitz; Otto Schetina, both of Zeltweg; Peter Kogler, Knittelfeld, and Arnulf Kissich, Zeltweg, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Aug. 31, 1976, Ser. No. 719,156

Claims priority, application Austria, Sep. 2, 1975, 6768/75

Int. Cl.² E21C *27/24*

U.S. Cl. 299—75 **6 Claims**



1. Cutting machine comprising a universally pivotable hollow cutter boom which carries at each side a hollow cutting head rotatably supported around a common axis extending transversally to the longitudinal direction of the cutter boom whereby the cutting heads are advanced in direction of said common axis when swivelling the cutter boom, the cutting heads being propelled by a drive unit via reduction gearing, said reduction gearing including a driving gear within the boom and including a planetary gear set arranged within each cutting head, each planetary gear set having a central gear driven by said driving gear about said common axis, a ring gear rotatable about said common axis and drivingly connected to the respective cutting head, pinion gears drivingly connected to said central gear and to said ring gear and a pinion gear carrier fixed to said boom, the arrangement thereby permitting the distance between the cutting heads to be maintained small.

4,098,540

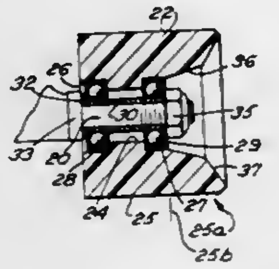
ROLLER SKATE WHEEL HAVING A DEFLECTING OUTER EDGE

Robert R. Willis, 15 Standish Ave., Barrington, R.I. 02806

Continuation-in-part of Ser. No. 691,348, Jun. 1, 1976, abandoned. This application May 24, 1977, Ser. No. 799,999

Int. Cl.² A63C *17/22*

U.S. Cl. 301—5.7 **3 Claims**



1. A wheel for use in a roller skate or the like having an axle, said wheel comprising a cylindrical body consisting of resilient plastic material having an axial opening for receiving said axle, said cylindrical body having opposed ends, bearing means comprising a pair of spaced bearings received within the axial opening and situated closer to one of said ends than the other of said ends of said cylindrical body, said body being formed with a recessed area comprising a series of at least two adjoining tapered substantially straight sided annular counterbores extending a major portion of the distance from said other end of said body into the area of the bearing means, said outer counterbore having a greater angle with the rotational axis than the inner counterbore, said recessed area from said bearing means to said other end exhibiting an axial distance to deflection slope characteristic outwardly from said bearing of between 6 to 8, said recessed portion being capable of resiliently flexing and situated in its entirety beyond the bearing means carried within the cylindrical body.

4,098,541

APPARATUS FOR EVACUATING MANURE

Camille Côte, St-Félix de Kingsey, co. Drummond, Quebec, Canada

Filed Mar. 24, 1977, Ser. No. 780,825

Int. Cl.² B65G *53/40*

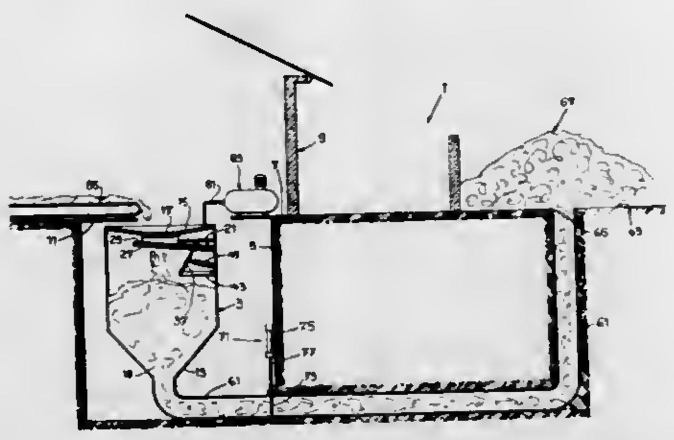
U.S. Cl. 302—53 **5 Claims**

1. An apparatus for evacuating manure, comprising:

a container having a bottom, a side wall and a top wall, said top wall having an inlet opening for admitting manure into the container, the perimeter around the underside of said opening lying in a generally horizontal plane;

a conduit connected to the bottom of said container, and leading away therefrom to a collection area;

means mounted within said container for opening and closing said inlet opening, including: a closure plate having an area greater than that of said inlet opening; inclined rail means extending laterally and generally downwardly from the region of said inlet opening toward said container side wall; bracket means carried by said closure plate and movably engaged with said inclined rail means for mounting said closure plate in a generally horizontal plane parallel to the plane containing said underside perimeter of said inlet opening, said closure plate being movable upwardly and linearly along said inclined rail means between a lowered, open position laterally removed from said inlet opening and an upper, closed position in sealing engagement with said underside perimeter of said inlet opening; and means operable for moving said closure plate between said open and closed positions thereof;



valve means connected in said conduit, and operable for opening and closing said conduit; and

means connected with said container for introducing fluid under pressure into the top of said container after said closure plate has been moved to a closed position and said valve means has been opened, to move manure out of the container to said collection area via said conduit.

4,098,542

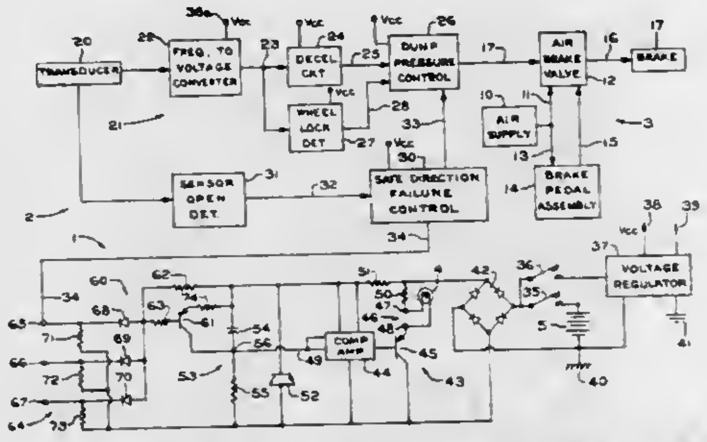
INDICATOR ENERGIZING MONITOR CIRCUIT FOR ANTI-SKID BRAKE CONTROL SYSTEMS AND THE LIKE

Yudh Vir Rajput, Dayton, Ohio, and Kirby Dean Fickle, Columbia, S.C., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 16, 1977, Ser. No. 777,991

Int. Cl.² B60T *8/00*

U.S. Cl. 303—92 **15 Claims**



1. A monitor circuit for monitoring detection of a fault condition or the like to control energization of an indicator, comprising

power supply means for supplying electric power to the monitor circuit,

output circuit means for controlling energization of the indicator,

timer circuit means for operating said output circuit means each time said power supply means powers up the monitor circuit to energize the indicator for a predetermined duration and thereafter while said power supply means continues to supply electric power to the monitor circuit to maintain the indicator de-energized,

input circuit means for bypassing said timer circuit means upon receipt of an input signal indicative of detection of a fault condition or the like to operate said output circuit means for energization of the indicator to indicate such detection, and

said timer circuit means including delay means for delaying completion of such bypassing of said timer circuit means to preclude inadvertent energization of the indicator in response to electrical noise signals received by said input circuit means.

4,098,543

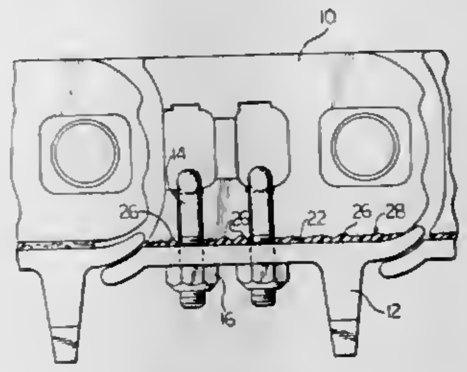
ADAPTER PAD FOR TRACK LINK AND TRACK SHOE

James R. Sturges, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 15, 1977, Ser. No. 787,815

Int. Cl.² B62D *55/28*

U.S. Cl. 305—54 **6 Claims**



1. For use with an endless track assembly, the combination of:

a track component; and

a hardenable insert abutted against one side of said track component and including

a pad including a matrix of deformable binder or filler material;

an uncured resin flowable in its uncured state and rigid when cured, said resin impregnating said pad; and

a plurality of rupturable capsules dispersed throughout said pad, said capsules containing a curing agent for said resin,

whereby when said track component is abutted against another, differing track component such that said pad is interposed between the two components, and the track components are clamped together, said pad will deform to conform to irregularities at its interface with the track components and said capsules will rupture to cause said curing agent to cure said resin to rigidify said pad and thereby provide a smooth interface to prevent loosening of said track components.

4,098,544

SKI-TYPE STABILIZER FOR DRILLING APPARATUS, AND METHOD OF USE

Norman H. Still, and Robert W. Berry, both of Brea, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 13, 1977, Ser. No. 787,284

Int. Cl.² F16C *1/26*

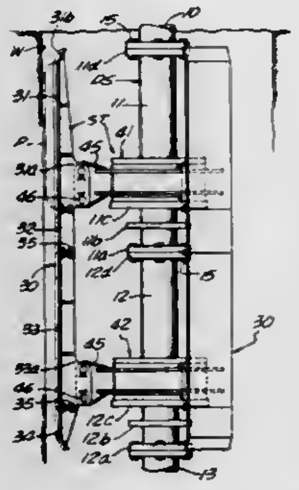
U.S. Cl. 308—4 A **8 Claims**

1. In a drill stem assembly for drilling a hole in the earth, the combination of apparatus comprising:

first and second drill stem sections secured together in end-to-end relationship, each of said drill stem sections having a first circumferential flange secured thereon near one of its ends and a second circumferential flange secured thereon and spaced longitudinally inwardly from said first flange;

first and second rotating bearing means each having inner and outer parts, said bearing inner parts being secured to said second flanges of said two drill stem sections, respectively;

three elongated ski-like members whose length is substantially equal to the combined length of said two drill stem sections, said members being disposed parallel to each other and to said drill stem sections and being circumferentially spaced in an annular arrangement so that their outer surfaces engage the wall of the hole; and



means securing each of said outer bearing parts to the inner sides of said ski-like members for supporting them from said drill stem sections.

4,098,545

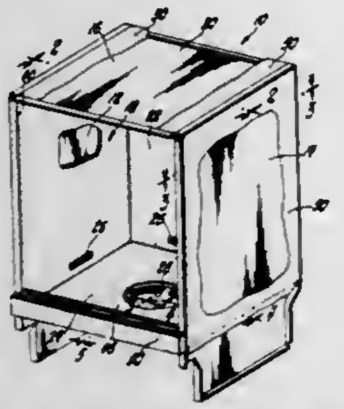
ARRANGEMENT FOR PREVENTING MOISTURE BLISTER OF ORGANIC COATING ON IMPERMEABLE SUBSTRATES

Eugene F. Gaiser, Kettering, and Norman W. James, Jr., Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1976, Ser. No. 711,428

Int. Cl.² A47B *81/00*

U.S. Cl. 312—214 **1 Claim**



1. A dishwasher having a dishwashing chamber formed by a plurality of impermeable metal walls connected by welds along the jointures therebetween, each wall having one side thereof exposed to atmosphere and an opposite side facing toward the interior of said dishwashing chamber, a permeable organic coating such as acrylics, epoxys, polyesters and plastisols adhering to said opposite side, said coating being adapted for exposure to water, water vapor or dilute aqueous solutions at temperatures higher than said atmosphere, a layer of insulation such as urethane or the like selectively insulating said one side of said wall exposed to atmosphere and completely covering only those areas adjacent said jointures to a sufficient thickness that the temperature gradient across said coating is reduced to the point that the partial pressure difference driving force of the vapor across said coating is negligible and not more than the adhesion forces of said coating to said wall, thereby to reduce or eliminate the formation of blisters between said coating and said wall at said jointure.

4,098,546

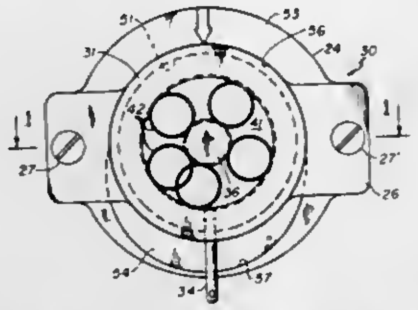
ELECTRICAL CONDUCTOR ASSEMBLY

Harold L. Swartz, Glendale; Peter E. Jacobson, Phoenix, and Robert L. Pirman, Scottsdale, all of Ark., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,294

Int. Cl.² H01R *39/00*

U.S. Cl. 339—5 R **12 Claims**



1. A full rotational freedom conductor assembly for conducting electrical energy between a pair of members relatively rotatable about a common axis thereof comprising

first and second circular, coplanar electrically conductive rings, one of said ring being disposed on one of said members and the other of said rings on the other of said members for relative rotation about said axis, the respective diameters of said rings providing a relatively large radial gap therebetween and at least one of the facing surfaces of said rings have a relatively shallow, arcuately concave configuration, and

a resilient, filamentary, electrically conductive circular loop comprising a solid annulus having a generally rectangular radial cross section and a free diameter greater than the radius of said gap, said loop being compressed within said gap such that the spaced outer edges of said loop may contact said concave ring surface, along varying lines of contact dependent upon any limited axial, radial, and angular misalignments between said rings upon relative rotation of said members, said free diameter being such that said loop rolls along said lines of contact substantially without friction upon relative rotation between said members, said compressed loop producing preload forces between said spaced outer edges and said lines of contact with said concave ring surface having force components in directions to maintain said loop within said concave surface in the presence of said misalignments.

4,098,547

FAN MOUNTING ARRANGEMENT WITH SNAP-TYPE SOCKET

Günter Wrobel, Villingen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen im Schwarzwald, Fed. Rep. of Germany

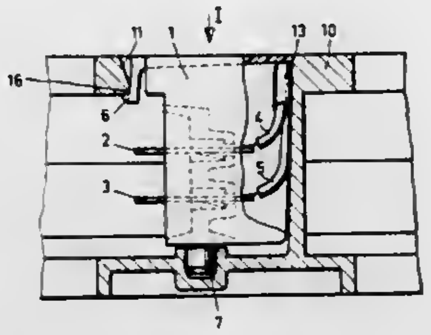
Filed Mar. 15, 1977, Ser. No. 777,920

Claims priority, application Switzerland, Mar. 18, 1976, 003385/76

Int. Cl.² H01R *13/54*

U.S. Cl. 339—91 R **14 Claims**

1. In a mounting arrangement, particularly for mounting electrical motor wires in a fan, a combination comprising a housing having a cutout portion and a channel-shaped rib for receiving electrical motor wires; a socket member having an insert portion insertable into said cutout portion in predetermined direction and being formed with a slot for receiving said rib; and interengaging means on both of said portions for connecting the latter with snap-type action, including a resiliently yieldable element on one of said portions, said element being operative for resiliently engaging the other of said portions upon insertion in said predetermined direction, and also for resiliently disengaging from said other portion in direction opposite to said predetermined direction for disconnecting said portions from each other.



4,098,548

LIGHT OPTIC DATA HANDLING SYSTEM

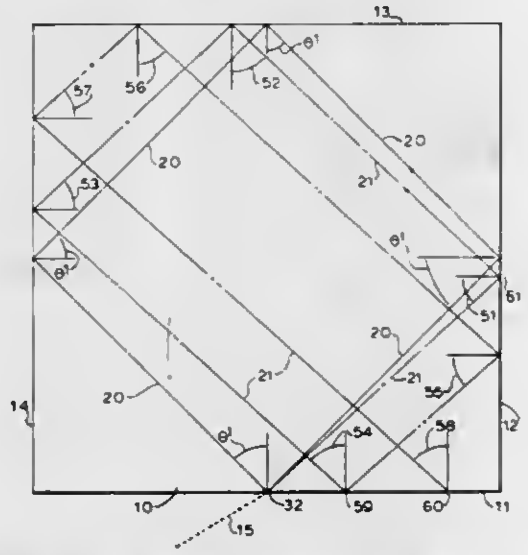
Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Oct. 4, 1976, Ser. No. 729,310

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.² G02F *1/16*

U.S. Cl. 350—359 **2 Claims**



1. A light optic data handling system comprising:

(a) a light input surface, a light output surface and an array of light reflecting surfaces intermediate said input and output surfaces;

(b) a source of light and means for directing light therefrom along an input path toward said input surface and thereupon along an optical path while undergoing a series of light reflections within said array of light reflecting surfaces so as to establish an availability of light from said source coincident with at least one predetermined location along said optical path for an optically controlled redirecting of said light at said location and a reflecting of said light within said array of reflecting surfaces toward said output surface, said location representative of a light output control position of said system;

(c) said array of light reflecting surfaces each angularly oriented so as to establish an optical relationship between said input surface and said control position and between said control position and said output surface, said optical relationship of said array allowing said light to follow said optical path forming a helix of plural revolutions extending from said input surface to said output surface of the array of light reflecting surfaces;

(d) light reflection control means operatively associated with said control position for establishing a light diffraction grating in the path of said light for thereby effecting said controlled redirecting of the light at said location and said reflecting of the light toward said output surface.

4,098,549

EYE BOTTOM CAMERA

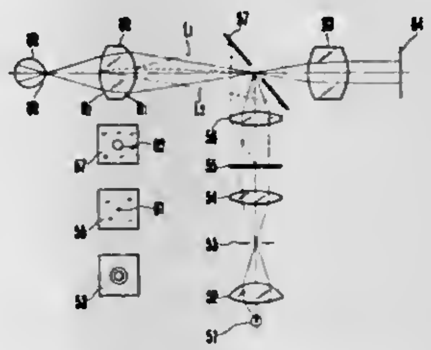
Isao Matsumura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1976, Ser. No. 658,874

Claims priority, application Japan, Feb. 24, 1975, 50-22601

Int. Cl.² A61B *3/14;* G03B *29/00*

U.S. Cl. 351—7 **3 Claims**



1. An opthalmoscopic camera comprising:

a photographic system defining an optical path; said system including biconvex objective lens means along the optical path, a photographic lens along the optical path, a mirror along the optical path between said lens and said lens means, said mirror having a central aperture and being inclined relative to said path, said biconvex objective lens means having a first surface R_1 facing the mirror and a second surface R_2 away from the mirror;

an illumination system forming an illuminating light path; said system including a light source, a condenser lens and relay lens means in succession along the illuminating path and directing light at said mirror, said mirror being inclined for deflecting light from said illuminating system along the optical path and through the objective lens means so that the light can be directed onto the cornea of an eye to be inspected, light from positions in the illumination system being reflected by the mirror through the objective lens means where part of the light may be reflected by the first surface R_1 of the biconvex objective lens means and part of the light is reflected by the second surface R_2 of the biconvex objective lens means,

said illumination system having a transparent plate with a black spot, the aperture of said mirror and the black spot on said transparent plate being optically conjugate with respect to a first path that includes said mirror and said transparent plate as well as said surface R_1 as a reflection surface and a second path that includes said mirror and said transparent plate as well as the surface R_2 as a reflection surface.

4,098,550

OMNI-DIRECTIONAL MOVING PICTURE TAKING AND EXHIBITING APPARATUS

John W. Randolph, 1446 Jellick Ave., Roland Heights, Calif. 91748

Filed Mar. 29, 1976, Ser. No. 671,316

Int. Cl.² G03B *37/00*

U.S. Cl. 352—69 **3 Claims**

1. Omni-directional moving picture apparatus for conducting a visual image from one place to another comprising the combination of:

a housing having lens means for sensing the image and means remote from said lens means for storing the sensed image;

a plurality of elongated light wave carriers intercommunicating between said lens means and said storage means for conducting the image therebetween;

dynamic scanning means operably connected to the opposite ends of said light wave carriers for providing synchronous movement of said opposite light wave carrier ends in a random pattern for improved image resolution;

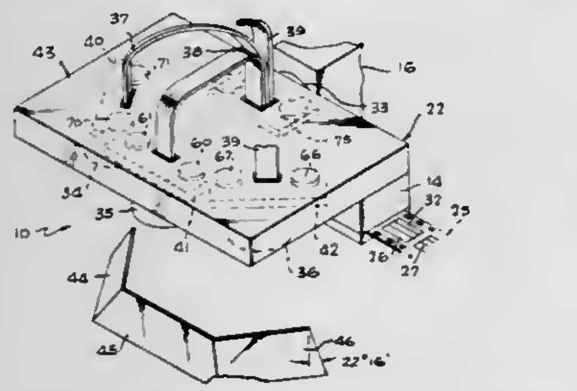
each of said light wave carriers is a coherent multiple optical fiber bundle for conducting the visual image between the opposite ends of said bundle;

said dynamic scanning means includes a fixed housing and plates carrying the opposite ends of each of said bundles so as to be movably mounted with respect to said housing;

means carried on said housing for moving said plates in said synchronous random pattern with respect to said housing;

an image storage means for holding the visual image conducted by said coherent optical fiber bundles;

said plate moving means includes a plurality of eccentric means carried on each of said plates and means operably coupled to each of said eccentric means for imparting movement thereto;



a selected end of all of said fiber bundles are carried on a common one of said movable plates and said fiber bundles radiate outwardly therefrom whereby the opposite ends of said bundles are carried on individual and spaced apart plates;

said storage means is a substantially curved screen and said moving picture apparatus is a film image projector having said housing and said lens systems at the center thereof;

said lens means includs a projection mirror arrangement for conducting the respective number of film images from said light wave carriers to said screen; and

said screen is composed of two or more flat screens arranged with their opposing adjacent ends together at an acute angle.

4,098,551

BOTH SIDE COPYING MACHINE

Shigehiro Komori, Yokohama; Kimiaki Hayakawa, Tokyo; Hiroshi Nitanda, Tokyo, and Tsuneki Inuzuka, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1976, Ser. No. 656,631

Claims priority, application Japan, Feb. 13, 1975, 50-18134; Feb. 18, 1975, 50-24559; Apr. 14, 1975, 50-45080; Dec. 15, 1975, 50-150022

Int. Cl.² G03G *15/30*

U.S. Cl. 355—3 R **15 Claims**

1. A copying machine comprising:

a photosensitive member;

means for applying an electrostatic charge to said photosensitive member;

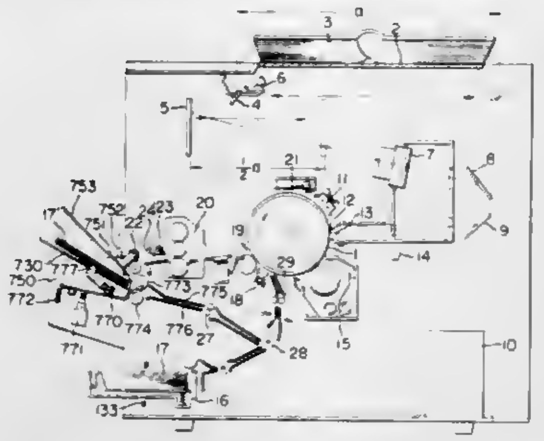
an optical system for projecting an original image onto said photosensitive member to form an electrostatic latent image of the original image;

means for developing the electrostatic latent image to form a developed image;

means for transferring the developed image to a copy material;

first feeding means for feeding a copy material toward and past the transferring means, wherein a first end thereof constitutes the leading end during movement thereof by said first feeding means;

means for reversing the copy material fed by said first feeding means, after the developed image is transferred onto a first side of the copy material to move the copy material with its opposite end as the leading end;



means for engaging the said opposite end of the copy material after it is reversed, to stop the copy material and to allow it to be stacked; and

second feeding means for feeding the said stacked copy material to the transferring means with said opposite end thereof as the leading end.

4,098,552

COPYING MACHINE

Yasutoshi Okukawa, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Apr. 12, 1977, Ser. No. 786,931

Claims priority, application Japan, Apr. 23, 1976, 51-050029[U]

Int. Cl.² G03G *15/12, 15/28*

U.S. Cl. 355—8 **5 Claims**

1. In an electrostatic copying apparatus having a photosensitive member adapted to receive an electrostatic image, a platen and an illumination means for exposing an original document on said platen, the improvement comprising:

regulator means for preventing overheating of said illumination means and stabilizing the light output thereof;

wherein said platen and said illumination means are relatively movable to provide a forward imaging scanning direction and a reverse non-imaging scanning direction; and

wherein said regulator means comprises means for turning off said illumination means during movement through said reverse non-imaging scanning direction and turning on said illumination means during movement through said forward imaging scanning direction.

4,098,553

OBJECT RECONSTRUCTION BY USE OF PLURAL LENSES

Howard K. Stern, 89 Derby Ave., Greenlawn, N.Y. 11740

Filed Nov. 15, 1976, Ser. No. 741,763

Int. Cl.² G01C *11/12*

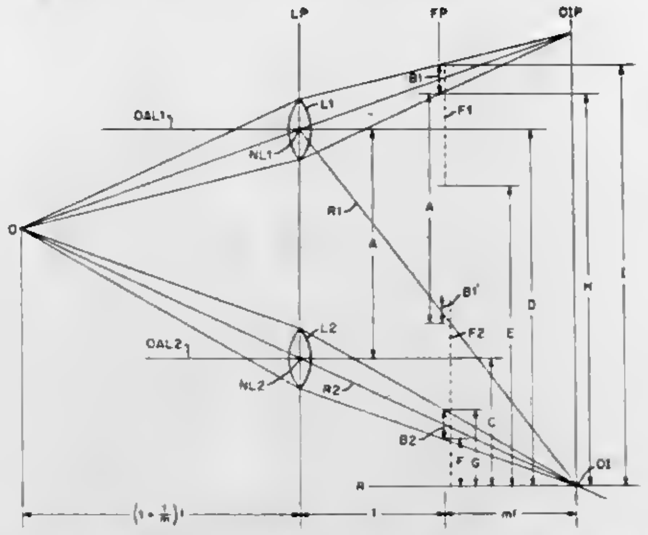
U.S. Cl. 356—2 **5 Claims**

1. In a method for spatial reconstruction of an object surface point, the steps of:

(a) disposing first and second lenses in spaced relation in a common plane with each such lens in viewing relation to radiant energy issuing from said object surface point;

(b) exposing first and second recording members to said radiant energy issuing respectively from said first and second lenses for providing first and second recorded representations of said object;

(c) preselecting a measure of displacement of such first recorded object representation toward the optical axis of said second lens as a function of the spacing between said first and second lenses in said common plane; and



(d) displacing such first recorded object representation toward the optical axis of said second lens in such preselected measure.

4,098,554

DEVICE FOR ATOMIZING A SAMPLE FOR FLAMELESS ATOMIC ABSORPTION MEASUREMENTS

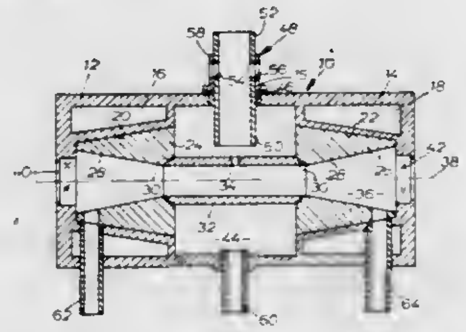
Bernhard Werner Huber, Uberlingen; Rolf Günter Tamm, Salem, and Klaus Joachim Braun, Uberlingen, all of Germany, assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 20, 1974, Ser. No. 453,114

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1973, 2314207

Int. Cl.² G01J *3/02, 3/30*

U.S. Cl. 356—85 **11 Claims**



1. A sample atomizing device for flameless atomic absorption measurements comprising:

a tube of electrically conducting material which is heatable by passing an electric current therethrough, said tube having at least one port exceeding through a wall thereof generally at the longitudinal center of the tube, means for causing the tube to be surrounded by an inert protective gas;

said causing means comprising means for generating a flow of said protective gas generally into the ends of said tube (32, 82) so that the gas flows out of said tube through said central port (34, 84);

housing means (10, 66) generally enclosing said tube to define an annular chamber (44, 114) which surrounds the exterior of said tube and is therefore in communication with said port (34, 84); and

a protective gas outlet means (48, 116) provided so as to allow said protective gas ultimately to flow from said annular chamber (44, 114) to the exterior of said housing;

a second protective gas flow generating means (60) supplying protective gas directly into said annular chamber (44).

4,098,555

DEVICE FOR JOINING TWO STRUCTURAL PARTS

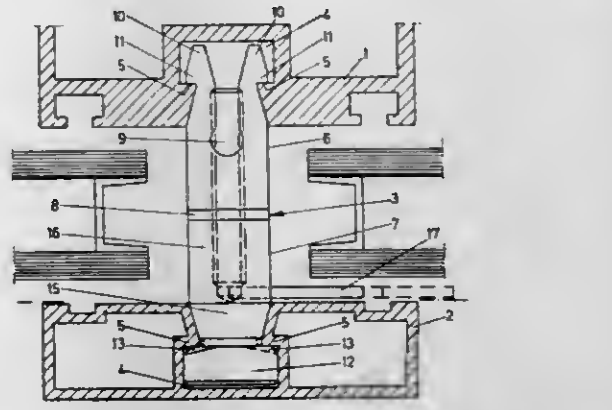
Karl Vollenweider, Wagenhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 2, 1976, Ser. No. 663,081

Claims priority, application Switzerland, Mar. 11, 1975, 3098/75

Int. Cl.² B25G *3/00*

U.S. Cl. 403—20 **5 Claims**



1. A device for releasably joining together two abutting structural unit frames, the facing sides of which are provided with grooves, undercut on each side thereof, in which the device engages, comprising

a spindle, one end of which carries releasable means adapted to engage the undercut of a groove of said frame, and the other end of which carries a parallelopipedon of transverse rhomboidal cross-section rigidly and transversely attached thereto, the diagonal of said parallelopipedon being sufficiently long so that said parallelopipedon, when centered axially in said groove, engages the shoulders of said undercut when said spindle is rotated less than ¼ revolution.

4,098,556

HOLE MAKING POSITION CONTROL UNIT WITH A MARKED PLATE FOR A HOLE MAKING MACHINE

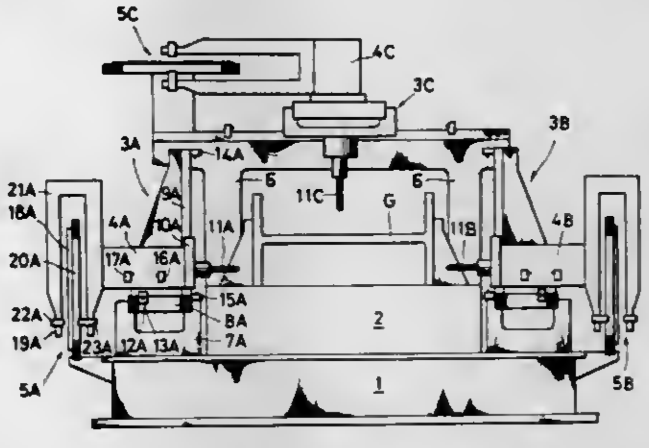
Tadahiro Sugimoto, Amagasaki, Japan, assignor to Daito Seiki Company, Limited, Osaka, Japan

Filed Oct. 13, 1976, Ser. No. 731,923

Claims priority, application Japan, Oct. 13, 1975, 50-123516; Oct. 13, 1975, 50-123517; Oct. 13, 1975, 50-123518; Oct. 14, 1975, 50-124000

Int. Cl.² B23B *39/08, 39/24, 39/26*

U.S. Cl. 408—3 **10 Claims**



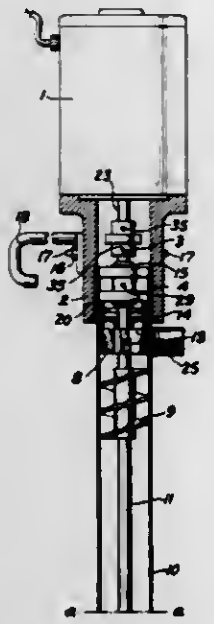
1. A hole making position control unit for a hole making machine having a hole making tool, and wherein a fixedly placed material is drilled therein to produce a hole by the hole making tool, comprising:

at least one marked plate having first marks arranged along detecting lines on said marked plate each in correspondence to each hole making position, and a second mark at

each point where each said detecting line intersects with a limiting line at one end of each said detecting line;
a mark detector fixedly connected with said hole making tool and driven along both said detecting lines and said limiting line above said marked plate, to produce mark signals when one of said first marks and one of said second marks is detected;
an electric circuit device to produce mark detecting signals in response to said mark signals;
return signals means to provide return signals after a series of holes have been made in said material in correspondence to each of said first marks on one of said detecting lines;
limitation detecting means to provide limitation signals when said mark detector is along said limiting line;
driving means to drive said mark detector; and
control means for said driving means to cause said mark detector to be driven along said limiting line in response to said limitation signals, to cause said mark detector to be driven along said detecting line in response to said mark detecting signals due to said second mark, to cause said mark detector to stop upon cessation of said mark detecting signals due to said first mark for enabling said hole making tool to carry out a hole-making operation in said material, and to cause said mark detector to return along said detecting line to a starting position above the limiting line in response to said return signals.

4,098,557
ACID PUMP

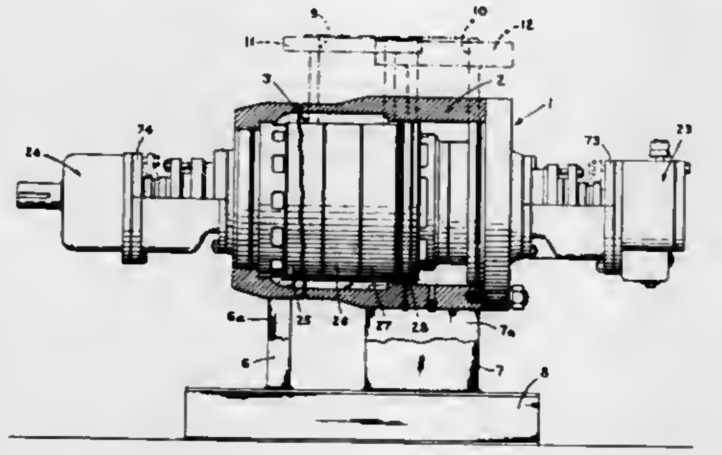
C. Kenneth Claunch, and Robert Bailey Way, both of Erie, Pa., assignors to Finish Engineering Company, Erie, Pa.
Filed Jul. 30, 1976, Ser. No. 710,261
Int. Cl.² F01D *11/00*
U.S. Cl. 415—111 **4 Claims**



1. A pump for corrosive materials comprising,
a tubular body 10 having an inlet at its lower end and an outlet (25) at its upper end and a shaft 11 in said tubular body,
an impeller (8) on the shaft (11) adjacent said outlet (25),
first bearing means (4),
said first bearing means (4) having a body on said shaft 11 adjacent said outlet (25) and supporting said shaft against radial motion in said body,
second bearing means (23) on said shaft (11) at the lower end thereof,
motor means 1 connected to said shaft (11),
a seal (14) between said outlet (25) and said first bearing means (4),
said seal (14) comprising a cylindrical body pressed into said tubular body (10) adjacent said outlet (25),
said seal (14) having a cylindrical first bore therethrough and a first radially-directed flange (31) in said first bore and a second radially-directed flange (33),
said first radially-directed flange (31) terminating in spaced relation to the outer periphery of said shaft 11 and integrally attached to the inner periphery of said cylindrical body of said seal (14),
said first radially-directed flange (31) having a relatively large bore (32) therethrough,
said first radially-directed flange (31) providing reinforcement for said cylindrical body of said seal (14),
said second radially-directed flange (33) being spaced axially from said first radially-directed flange (31),
said second radially-directed flange (33) having an axially-extending flange (30) integrally attached to said second radially-directed flange (33) adjacent the center thereof and a second bore 34 extending through said axially-extending flange 30 and through said second radially-extending flange (33),
said second bore (34) being of a lesser diameter than the diameter of said shaft (11), whereby when said shaft 11 is pushed through said second bore, it expands said axially-extending flange (30), thereby causing said axially-extending flange 30 to resiliently engage said shaft (11) in sealing engagement with the outer periphery of said shaft (11) preventing fluid from flowing from said tubular body (10) to said first bearing means (4).

4,098,558
PREASSEMBLED UNIT OR CARTRIDGE FOR MULTI-STAGE BARREL TYPE CENTRIFUGAL PUMPS

Austin R. Bush, Madison, and William C. Krutzsch, Convent Station, both of N.J., assignors to Worthington Pump, Inc., Mountainside, N.J.
Filed Aug. 23, 1976, Ser. No. 716,664
Int. Cl.² F01D *1/06;* **F04D** *1/06, 29/44*
U.S. Cl. 415—199.1 **6 Claims**

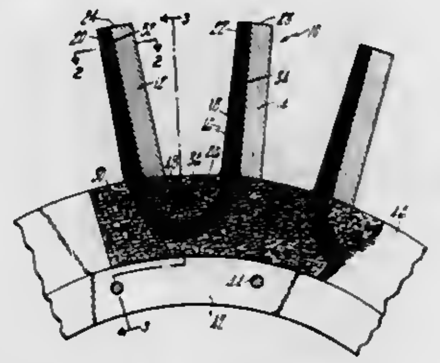


1. A preassembled pumping unit to be mounted in the outer casing of a multi-stage barrel type centrifugal pump includes,
a. a driven shaft,
b. a plurality of pumping stages mounted about said driven shaft each including, a pump casing defining a pump chamber, and an impeller fixedly connected to and rotatable with the driven shaft,
c. a suction inlet end casing disposed about one end of said driven shaft for communication with the first of said plurality of pumping stages,
d. an end cover mounted about said driven shaft and disposed for operative association with the last of said plurality of pumping stages and,
e. other working pump parts for said preassembled pumping unit mounted about said driven shaft,
f. compression means disposed between the last of said plurality of pumping stages and said end cover,
g. means operatively connected to said compression means for placing the same under compression stresses and,

h. means for transmitting the compression forces from said compression means to said driven shaft whereby said driven shaft acts as a tie-bolt to hold the suction inlet end casing, the plurality of pumping stages, the end cover member and other working pump parts in assembled relation to permit the same to be moved as a single unit for installation and removal from said outer casing of the multi-stage barrel type centrifugal pump.

4,098,559
PAIRED BLADE ASSEMBLY

Jerry Lee Price, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jul. 26, 1976, Ser. No. 708,680
Int. Cl.² F01D *5/30*
U.S. Cl. 416—230 **2 Claims**

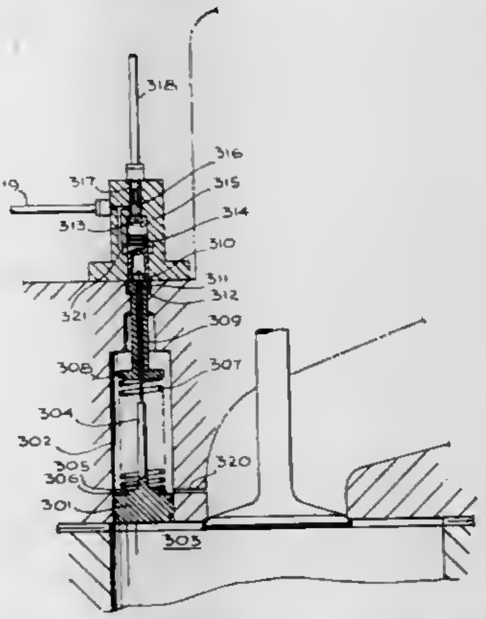


1. A rotor assembly for a gas turbine engine, which comprises:
- a rotor disk having a front plate and a rear plate which are contoured to form an outwardly facing circumferentially extending channel therebetween; and
- a plurality of unitized blade assemblies mounted in and extending outwardly from said channel, each assembly including
  - a central platform block adapted for mechanical attachment to the rotor disk,
  - a core of continuous fibers having a central portion which extends around said platform block, and having a first end and an opposite end which extend outwardly from said block in essentially the same direction;
  - an outer platform block adapted to hold, in cooperation with the central platform block, the central portion of the core of continuous fibers therebetween;
  - a first shell having an airfoil-shaped contour which encases said first end of the core of continuous fibers to form a first rotor blade; and
  - a second shell having an airfoil-shaped contour which engages said opposite end of the core of continuous fibers to form a second rotor blade.

4,098,560
FUEL INJECTION PUMPS FOR INTERNAL COMBUSTION ENGINES

Cormac G. O'Neill, Lafayette, Calif., assignor to Physics International Company, San Leandro, Calif.
Continuation-in-part of Ser. No. 481,666, Jun. 21, 1974, Pat. No. 3,927,652. This application Dec. 22, 1975, Ser. No. 642,768
Int. Cl.² F04B *17/00, 35/00;* **F16J** *1/10*
U.S. Cl. 417—214 **11 Claims**

1. A fuel pump comprising:
inlet passageway means communicating with said fuel chamber for supplying fuel thereto;
outlet passageway means communicating with said fuel chamber for withdrawal of fuel therefrom;
a first piston means reciprocally moveable within said fuel chamber in a first direction for enabling fuel to enter said fuel chamber and in a second direction, opposite said first direction, for compressing fuel for enabling it to be withdrawn from said fuel chamber, said first piston means having a first end which defines one side of said fuel chamber and a second opposite end;
a single spring;
control means responsive to gas pressure from a gas source for moving in said second direction when the gas pressure exceeds a selected level, said control means including an extension member adapted to come in contact with said first piston means; and
coupling means including said single spring for mechanically coupling said first piston means to said control means, with said spring being continually in a compressed state for continuously biasing said first piston means and said control means in said second and first directions, respectively, to thereby urge said first piston means toward said extension member whereby when said gas pressure exceeds said selected level, said control means moves in said second direction and the spring urges said first piston means in said second direction to compress the fuel in said fuel chamber, and when the gas pressure is not greater than said selected level said spring biases said control means and thereby moves it in said first direction, with said first piston means following said control means in said first direction.

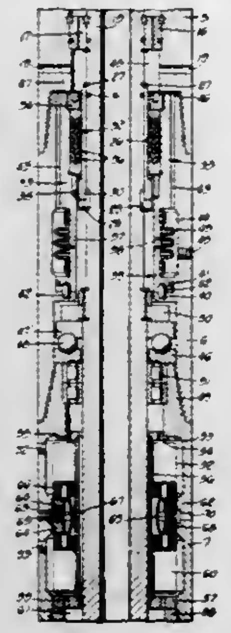


4,098,561
SEALED BEARINGS

John E. Tschirky, Long Beach, and Gary Monroe Crase, Cypress, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Mar. 10, 1975, Ser. No. 556,622
Int. Cl.² F01C *1/10, 5/04, 19/00*
U.S. Cl. 418—48 **7 Claims**

1. A sealed shaft assembly comprising a rotatable shaft member, a housing member for said shaft, a floating sleeve mounted on said housing for radial displacement relative to said housing, means providing a flexible connection between said housing and said sleeve including a sealing boot spaced from said housing member, said sleeve being otherwise unsupported by either of said members to enable said radial displacement, a packing gland including packing elements and opposed walls

engaging said packing elements, one of said walls being said shaft member and the other of said walls being said sleeve, and



means on said sleeve and on said housing holding said sleeve and said gland against rotation relative to said housing.

4,098,562

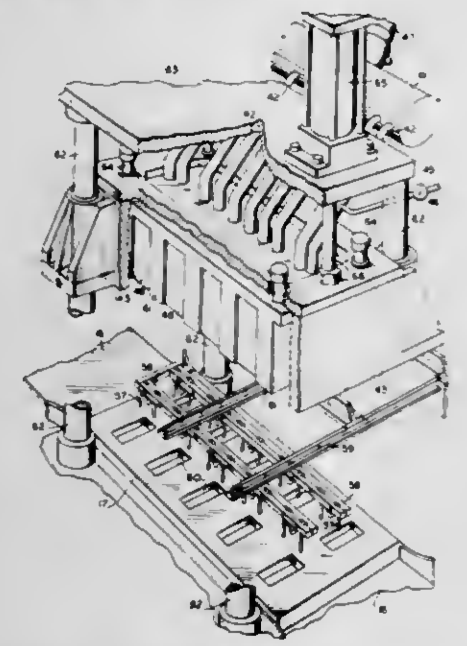
REINFORCED CONCRETE BLOCK MAKING MACHINE

Albert R. Levin, Wilton, Conn., assignor to Energy Conservation Techniques Inc., Wilton, Conn.

Filed Dec. 14, 1976, Ser. No. 750,432

Int. Cl.^{2} B28B *1/24*

U.S. Cl. 425—121 **8 Claims**



1. An apparatus for the continuous production of reinforced concrete blocks comprising

(1) a plurality of like pallets, each having a substantially planar upper surface with at least one opening defined therein;

(2) a molding station, said station including (a) block molding means comprising upper and lower molding forms, said forms being separated moveable along a common vertical axis from a first molding position in which said lower molding form is indexed through the opening of one of said pallets at said molding station and together with said upper molding form and said pallet defines a block forming cavity, to a second, retracted position in which said lower molding form is at a position below said pallet and said upper molding form is at a position above said pallet at a height greater than the maximum height of the block being produced, (b) means operable to reciprocally move said upper molding form between said first and second position, (c) means operable to reciprocally move said lower molding form between said first and second position, (d) means operable to insert, when said upper molding form is in said second, retracted position, a reinforcement member into the area corresponding to said block forming cavity, (e) means operable to introduce under pressure a beated slurry of concrete fluid into said block forming cavity when both said upper and lower molding forms are in their first positions, and (f) means operable for applying pressure to said slurry in said cavity;

(3) a curing area disposed downstream from said molding station, said curing area including means operable to remove excess moisture from said blocks;

(4) an ejector station disposed downstream from said curing area and having means operable to remove a cured block from said pallet; and

(5) circular conveyor means operable to carry said pallets through said molding station, said curing area and said ejector station, said circular conveyor means providing intermittent motion for said pallets at least through said molding station.

4,098,563

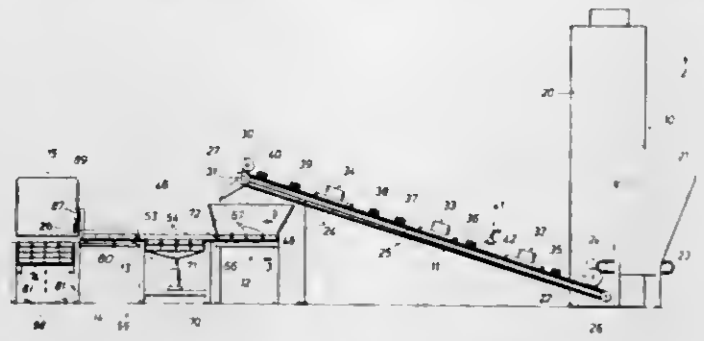
CONCRETE PRODUCT MANUFACTURING SYSTEM

Douglas F. Prince, Houston, Tex., assignor to Castone Development Corporation, Houston, Tex.

Division of Ser. No. 584,713, Jun. 9, 1975, Pat. No. 4,036,575, which is a division of Ser. No. 307,154, Nov. 16, 1972, Pat. No. 3,904,723. This applicatioo Jan. 13, 1977, Ser. No. 758,915

Int. Cl.^{2} B28B *13/02*

U.S. Cl. 425—204 **7 Claims**



1. Concrete product manufacturing system comprising:

(a) storage means for supplying raw materials, including aggregates and cement;

(b) mixer means positioned to receive said raw materials from said storage means and for mixing said raw materials with liquids to continuously form wet concrete mixture;

(c) receiver means adjacent said mixer means and in position at all times for continuously receiving said wet concrete mixture from said mixer means;

(d) substantially stationary mold means adjacent said receiver means for repeatedly receiving charges of said wet concrete mixture from said receiver means to form precured concrete products, said receiver means being mounted for reciprocal movement between a first position in which said mold means is directly beneath said receiver means to a second position in which said mold means is not beneath said receiver means; and

(e) cubing means adjacent said mold means for successively receiving said precured products from said mold means and stacking said precured products in layers.

4,098,564

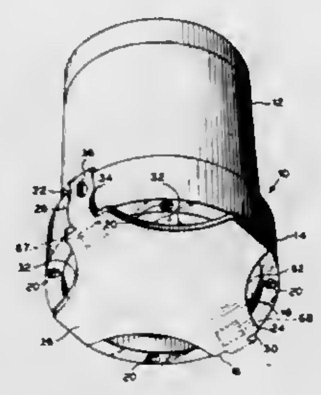
APPARATUS SUITABLE FOR PROTECTING A SPINNERET IN A SPINNERET PACK

Arnold Michalski, Easley, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 18, 1976, Ser. No. 733,665

Int. Cl.^{2} B29F *3/00*

U.S. Cl. 425—461 **6 Claims**



1. Apparatus comprising:

a spinneret pack having a spinneret face,

a plate which covers the spinneret face of the spinneret pack, and

attaching means connected to said plate suitable for temporarily securing said plate to said spinneret pack so that said plate substantially covers said spinneret face, wherein the spinneret pack is round and the plate comprises a square, flat steel plate having a length approximately equal to the largest diameter of the spinneret pack and having the four corners of the square removed.

4,098,565

FLASHLAMP UNIT

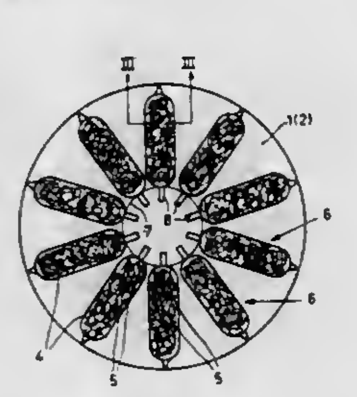
Martinus Henricus Adrianus Van de Weijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 12, 1975, Ser. No. 586,516

Claims priority, application Netherlands, Jun. 17, 1974, 7408035

Int. Cl.^{2} G03B *15/03*

U.S. Cl. 431—93 **6 Claims**



1. A flashlamp unit for cooperating with an associated reflector having an elongated slot, the elongated slot having reflective surfaces on each elongated side disposed about a first plane and associated indexing means, said unit comprising: a module which includes a plurality of flashlamps each having a longitudinal axis and a support having a geometric center carrying said flashlamps arranged in fixed predetermined relationship to each other, said support including a first planar generally disk shaped member with each of said flashlamps carried thereon with the longitudinal axis thereof (a) in a second plane which is parallel and spaced from said disk and (b) in radial relation to the geometric center of said support, said member extending over at least half of each of said flashlamps to provide support and being translucent, said module having a thickness which is substantially equal to the largest transverse dimension of one of said flashlamps, said module including means for cooperating with the associated indexing means to selectively position one of said flashlamps proximate the associated reflector, said second plane and the first plane being generally coplanar when said module is cooperating with the reflector.

4,098,566

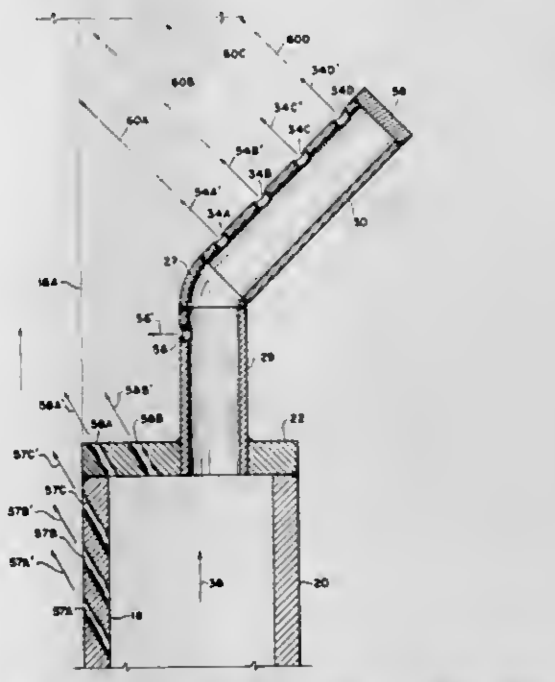
RADIALLY-INJECTED STEAM FOR SMOKELESS FLARING

John S. Zink, and Robert D. Reed, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Mar. 21, 1977, Ser. No. 779,355

Int. Cl.^{2} F23L *7/00*

U.S. Cl. 431—202 **9 Claims**



1. In a flare stack of selected height and selected inner diameter D, through which waste combustible gases flow upwardly to the top of the stack, and including pilot flame means for ignition of the gas, the improvement in steam injection apparatus for smokeless combustion, comprising:

(a) an annular steam chamber of rectangular cross-section, the inner wall of said chamber of diameter D, forming a vertical extension of said flare stack, said chamber having an outer wall of selected height, and selected radius greater than D, and top and bottom closure plates in the form of annular rings; and including conduit means to conduct steam to said chamber;

(b) a plurality of circumferentially spaced pipes set into and sealed to said top closure plate of said chamber at selected angles;

(c) a first plurality of orifices drilled through the inner wall of said chamber inwardly in radial plans, said orifices spaced circumferentially in at least one horizontal row at a selected distance upstream of said top plate;

(d) a second plurality of orifices drilled through said top plate of said chamber radially inwardly and upwardly, spaced circumferentially in at least one circle concentric with said top plate, and at a selected radial distance from the inner edge thereof;

(e) a third plurlaity of orifices drilled through the inner walls of said pipes, said orifices providing steam jets radially and inwardly directed from points a selected distance above said top plate of said chamber;

whereby the first steam jets from said first orifices turbulently mix with the waste gases upstream of the flame zone; the second steam jets from said second orifices intersect the column of gas and flame above said top plate, after transmission through the air over selected short distance; and the third steam jets from said third orifices intersect said flame column after travel through the air for selected longer distances.

4,098,567

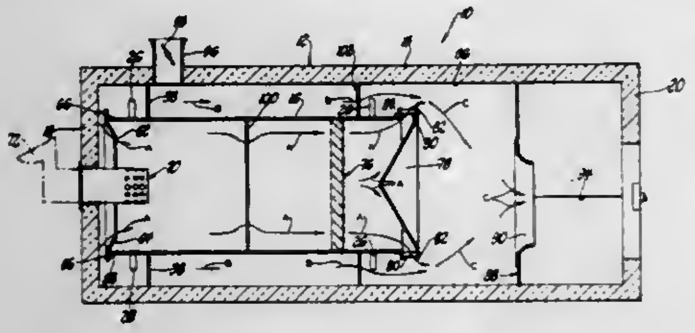
RECIRCULATING PROCESSING OVEN HEATER

Gordon F. Hubbert, Plymouth, Mich., assignor to Gladd Industries, Inc., Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,659

Int. Cl.² F23J *15/00*

U.S. Cl. 432—72 **5 Claims**



1. A recirculating processing oven heater comprising: a housing for receiving processing gas from a processing oven; said housing defining first and second paths along which the gas flows; a direct fired burner disposed along the first path to heat gas flowing therealong; a catalytic converter disposed along the first path downstream from the burner to remove unburned combustible gas therefrom and to thereby provide additional heating of gas flowing therealong; the second path of the housing means being in a parallel relationship to the first path along the flow length thereof over which the burner and the catalytic converter are disposed; the first and second flow paths having a junction downstream from the catalytic converter where mixing of the gas flowing along the two paths takes place in preparation for delivery to the processing oven; the housing including a hollow outer portion and a hollow inner portion received within the outer portion in a spaced relationship thereto so as to define the second gas flow path therebetween; said inner housing portion having a first end receiving the burner and a second end located at the junction of the first and second gas flow paths; the inner housing portion defining the first flow path between its ends and receiving the catalytic converter therebetween; a wall extending between the outer housing portion and the inner housing portion at the first end thereof such that the housing portions cooperate to define the first gas flow path upstream of the burner within the first inner housing portion end; a mixing member at the second end of the inner housing portion; the outer housing portion defining a chamber about the second end of the inner housing portion whereby the mixing member causes mixing within the chamber of the heated gas flowing along the first path with the gas flowing along the second path; the housing including first and second baffles respectively located along the first and second flow paths upstream from the mixing chamber; the inner and outer housing portions having elongated shapes that are round in cross section; the first and second baffles having annular shapes respectively mounted within the inner housing portion and between the inner and outer housing portions; the mixing member having a conical shape pointing toward the first end of the inner housing portion from the second end thereof to provide uniform mixing of the gas within the chamber; means for controlling the relative mass flow rates of gas along the first and second paths; a blower received within the outer housing portion downstream from the junction of the first and second flow paths at the mixing chamber; and an adjustable fresh air inlet located along the second flow path upstream from the second baffle.

4,098,568

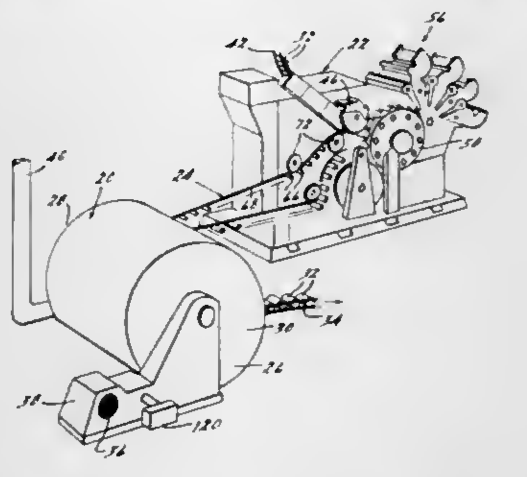
ROTARY CONVEYING APPARATUS

John W. Neumann, Birmingham, Mich., assignor to Oxy Metal Industries Corporation, Detroit, Mich.

Filed Nov. 22, 1976, Ser. No. 743,765

Int. Cl.² F24J *3/00*

U.S. Cl. 432—230 **26 Claims**



1. A rotary conveying device for circular cylindrical articles comprising a framework, a plurality of conveying rails fixedly supported on said framework in longitudinally extending spaced substantially parallel relationship and arranged with the inlet and outlet ends thereof on a circle in equal circumferentially spaced increments, means for supporting said framework for rotation about an axis extending through the center of the circle on which said inlet and outlet ends are arranged, means for rotating said framework and said rails thereon, transfer means for transferring articles into said inlet ends of said rails in sequential ordered sequence, and receiving means for receiving articles discharged from said outlet ends of said rails in sequential ordered sequence, each of said rails comprising a member fixedly supported on said framework and having a supporting surface formed with a plurality of cavities extending in longitudinally spaced relationship therealong, fluid supply means on said framework disposed in communication with said cavities for supplying a fluid thereto for discharge from said cavities outwardly beyond the supporting surface and against the articles on said rail for supporting the article in translatory spaced relationship from said supporting surface on a cushion of said fluid.

CHEMICAL

4,098,569

STABLE CONCENTRATED LIQUID PREPARATION OF PAPER DYES OF THE DISAZO CLASS

Roger Lacroix, Huningue, France, and Roland Haberli, Wurenlingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

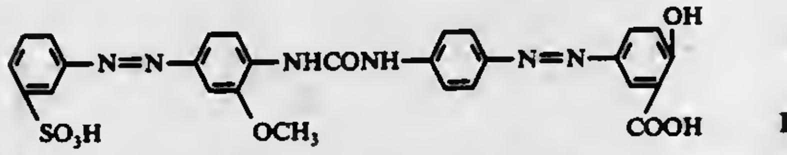
Filed Jun. 30, 1976, Ser. No. 701,435

Claims priority, application Switzerland, Jul. 3, 1975, 8675/75

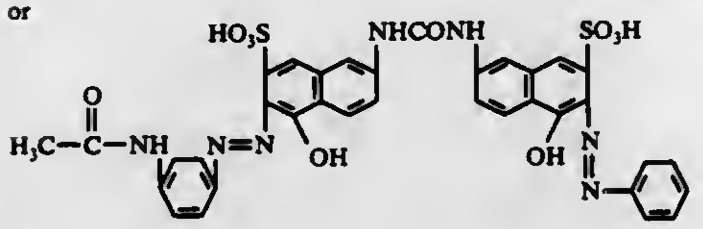
Int. Cl.² C09B *27/00, 67/00*

U.S. Cl. 8—41 R **6 Claims**

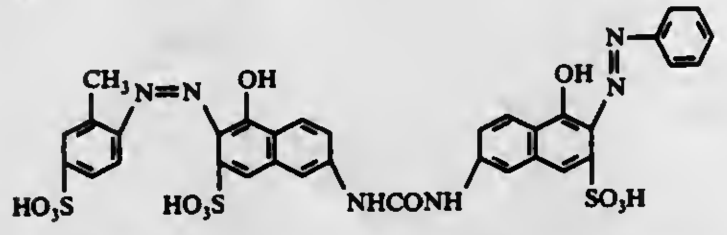
1. A stable concentrated liquid preparation of paper dyes of the disazo class, which preparation consists essentially of 15 to 40 percent by weight of a dye of the formula



or



or



or the alkali salt thereof, dissolved in 40 to 80 percent by weight of diethylene glycol C_1–C_4-monoalkyl ether, alone or in admixture with up to 30 percent by weight of mono-, di-, tri- or tetra-C_1–C_4-alkylene glycol.

4,098,570

PROCESS FOR DYEING OR PRINTING POLYAMIDE MATERIAL

James Kenneth Skelly, Wilmslow, and David George Evans, Rochdale, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 4, 1977, Ser. No. 783,994

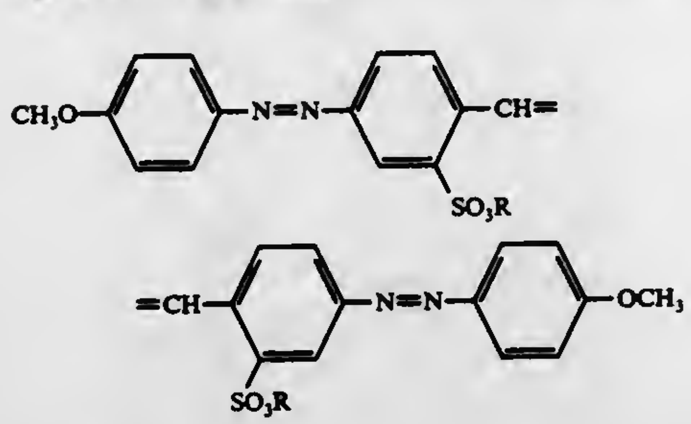
Claims priority, application United Kingdom, Apr. 9, 1976, 14487/76

Int. Cl.² G09B *27/00*

U.S. Cl. 8—41 B **7 Claims**

1. A process for dyeing or printing materials made from natural or synthetic polyamide, which process comprises treating these materials with a dye liquor or printing paste containing the dye of the formula I

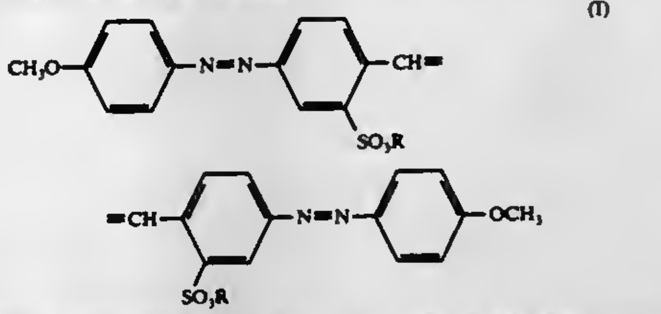
(I)



wherein R represents hydrogen or a metal cation, as well as water and, with or without further additives.

3. An aqueous dye liquor or printing paste which contains water, the dye of the formula I,

(I)



wherein R represents hydrogen or a metal cation, and with or without further additives.

4,098,571

SUBSTITUTE BLOOD VESSEL AND A PROCESS FOR PREPARING THE SAME

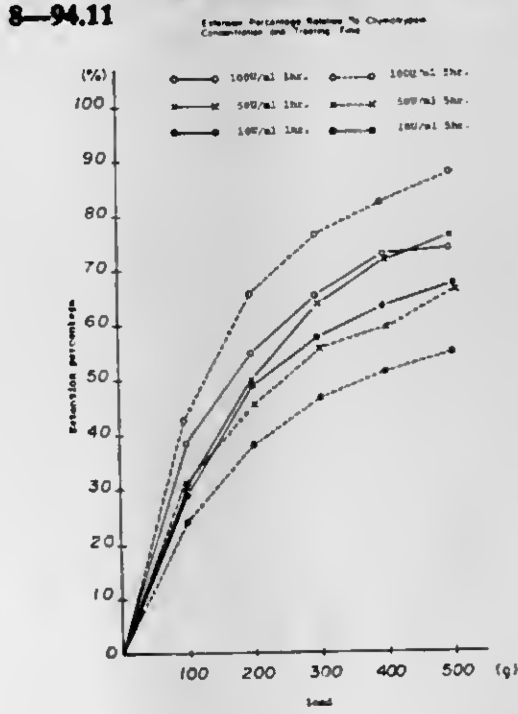
Kaneyasu Miyata, 93-2 Aza-Higashiyama, Oaza-Kamiyashiro, Idaka-cho, Meito-Ku, Nagoya City, Aichi Prefecture, Japan; Izumi Amano, No. 301, Murakami Bldg., 5-48 Yatomi-Dori, Mizuho-ku, Nagoya City, Aichi Prefecture, Japan; Takehiko Iwai, Osaka, and Tetsuya Asahi, Toyonaka, both of Japan, assignors to Kaneyasu Miyata; Izumi Amano, both of Nagoya and Kohei Toda, Osaka, all of, Japan

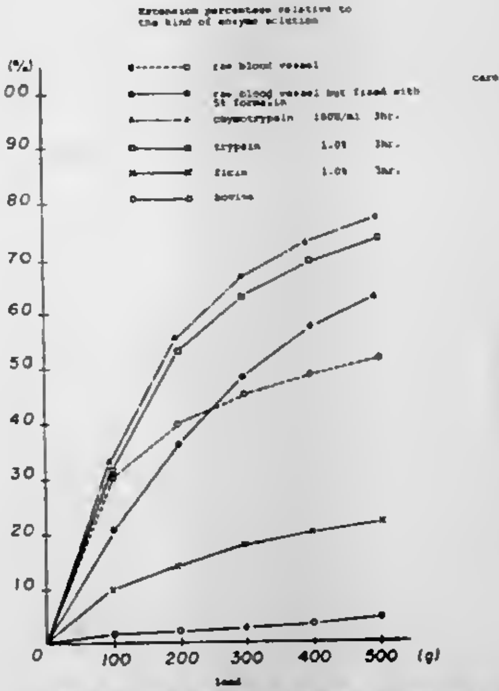
Filed Aug. 4, 1976, Ser. No. 711,599

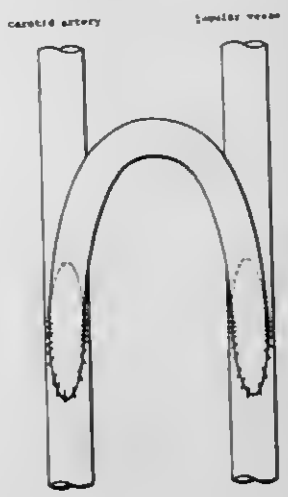
Claims priority, application Japan, Sep. 2, 1975, 50-106626

Int. Cl.² A61F *1/24*

U.S. Cl. 8—94.11 **10 Claims**







1. A process for preparing a heterbgraft substitute blood vessel comprising digesting a properly pretreated pig blood

vessel with a digesting solution containing an animal proteolytic enzyme so as to retain collagenous and elastic fiber constituents substantially in the original state and substantially remove away other tissue constituents of said blood vessel than said two kinds of constituents, and then fixing the resulting digested blood vessel into a desired shape with a liquid fixing agent.

4,098,572

CURABLE POLYSILOXANE AQUEOUS EMULSION WITH Na OR Mg SULFATE, AND TREATING OF KERATINOUS FIBRES

Charles Smith, South Glamorgan, Wales, assignor to Dow Corning Limited, Barry Glamorgan, Wales

Filed May 27, 1977, Ser. No. 801,192

Claims priority, application United Kingdom, Jun. 11, 1976, 24214/76

Int. Cl.² D06M *15/66;* C08L *83/08*

U.S. Cl. 8—128 A **9 Claims**

1. An aqueous siloxane-in-water emulsion containing (A) a polydiorganosiloxane having a molecular weight of at least 2500 and terminal —OX radicals wherein X represents a hydrogen atom, an alkyl radical having from 1 to 15 carbon atoms or an alkoxyalkyl radical having from 3 to 15 carbon atoms, at least two of the silicon-bonded substituents present in said polydiorganosiloxane being monovalent radicals composed of carbon, hydrogen, nitrogen and, optionally, oxygen, which radicals contain at least two amine groups and are attached to silicon through a silicon to carbon linkage, and at least 50 percent of the total substituents in said polydiorganosiloxane being methyl radicals, any remaining substituents being monovalent hydrocarbon radicals having from 2 to 20 inclusive carbon atoms, (B) an organosiloxane having at least three silicon-bonded hydrogen atoms in the molecule and in which the organic substituents are alkyl radicals having less than 19 carbon atoms, (C) one or more emulsifying agents selected from cationic and nonionic emulsifying agents and (D) magnesium sulphate, sodium sulphate or both.

4,098,573

PORTABLE MOISTURIZATION AND STERILIZATION

Donald A. Gunther, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Jul. 16, 1976, Ser. No. 705,805

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.² A61L *5/00, 3/00*

U.S. Cl. 21—93 **1 Claim**

1. An apparatus for moisturizing and sterilizing articles comprising:

a chamber adapted to be loaded and sealed,

a first container for water in said chamber,

a second container outside said chamber,

means to evacuate said chamber,

means for introducing a microbiocidal chemical sterilizing gas into said chamber,

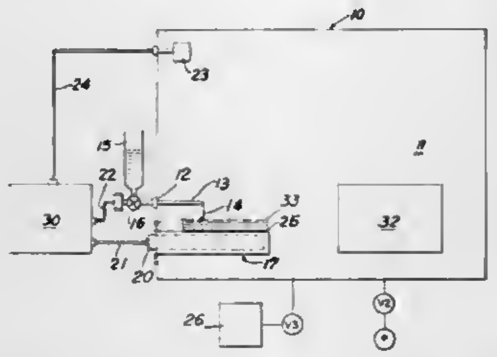
capillary tube means connecting said first container to said second container,

heating means operatively thermally connected to said first container for evaporating water contained therein,

valve means operatively connected to said capillary tube means for controlling the flow of water from said second container to said first container,

pressure control means in said chamber connected to said valve means for actuating said valve means for allowing water to flow through said capillary tube means into said chamber when the pressure in said chamber falls below a predetermined level due to absorption of water vapor by the articles located within the chamber,

said control means deactivating said valve means when the pressure in the chamber rises in excess of said predetermined level.



4,098,574

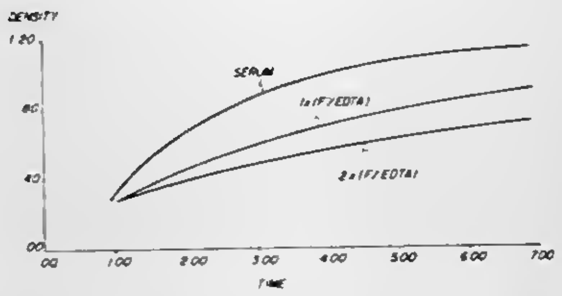
GLUCOSE DETECTION SYSTEM FREE FROM FLUORIDE-ION INTERFERENCE

Glen Marshall Dappen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1977, Ser. No. 821,028

Int. Cl.² G01N *21/06, 33/16*

U.S. Cl. 23—230 B **8 Claims**



1. In a method for assaying for glucose in aqueous liquids by applying a sample of the aqueous liquid to a test element comprising a spreading layer and a reagent layer containing a reagent composition comprising a buffer, glucose oxidase, a substance having peroxidative activity and an indicator composition comprising 4-aminoantipyrine and a phenolic or naphtholic coupler such that glucose contained in the liquid sample is oxidized in the presence of said reagent composition to produce a colored product, the improvement comprising performing the said assay at a pH of between about 4.5 and 6.0 to reduce or eliminate interference with the assay due to fluoride ion which may be contained in the aqueous liquid sample.

4,098,575

PEROXIDE VALUE DETERMINING TEST FOR OILS AND FATS

Setsuro Matsushita, Kyoto, Japan, assignor to Zaidan-hoijin Sugiyama Sangyo Kagaku Kenkyusho, Yokohama, Japan

Filed Apr. 13, 1976, Ser. No. 676,630

Claims priority, application Japan, Jun. 19, 1975, 50-75309

Int. Cl.² G01N *31/22, 33/02*

U.S. Cl. 23—230 R **7 Claims**

1. A method for determining the peroxide value of oils and fats, comprising:

placing a predetermined amount of oil or fat on a glass fiber-made paper or cloth impregnated with a starch and potassium iodide reagent solution which has subsequently been dried;

placing a predetermined amount of water on said paper or cloth on which the oil or fat has been placed; and

comparing the color on said paper or cloth to a predetermined standard.

4,098,576

METHOD FOR ANALYZING THE LATENT GAS CONTENT OF METAL SAMPLES

James R. Judge, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1976, Ser. No. 701,029

Int. Cl.² G01N *31/10, 31/12*

U.S. Cl. 23—230 PC **19 Claims**

1. A method for determining the latent gas content of a metal sample which comprises charging a crucible with a metal specimen taken from the sample and a sufficient amount of metallic germanium to wet and alloy with the metal specimen upon heating, pyrolyzing the contents of the crucible in the presence of carbon so as to induce substantially complete disassociation of compounds having metal and latent gaseous constituents within the sample, and to produce the formation and release from the metal specimen of gaseous carbonaceous compounds, collecting and analyzing said gaseous carbonaceous compounds.

4,098,577

METHOD AND INDICATOR FOR DETECTING THE LOSS OF INTEGRITY OF A PACKAGE

Donald F. Halpern, New Providence, N.J., assignor to Bio-Medical Sciences Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 418,486, Nov. 23, 1973, Pat. No. 3,899,295. This application May 27, 1975, Ser. No. 580,574

The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl.¹ B65D *73/00;* G01N *21/06, 31/22*

U.S. Cl. 23—232 R **25 Claims**

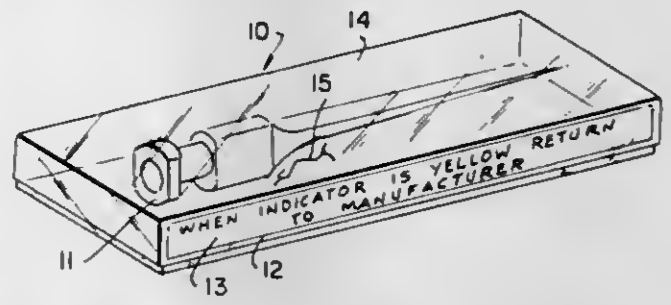
22. A process for detecting the loss of integrity of a sealed package which comprises:

(a) filling the package prior to sealing with an artificial atmosphere comprising an acidic gaseous material;

(b) incorporating in the package a sensor comprising a pH sensitive dye, said dye displaying a first color when in equilibrium with normal air and a second color when in equilibrium with said artificial atmosphere; and

(c) sealing the package;

said acidic gaseous material being sufficient to maintain the dye in its second color whereby damage to the package results in loss of artificial atmosphere, resulting in the reversion of the dye to its first color.



4,098,578

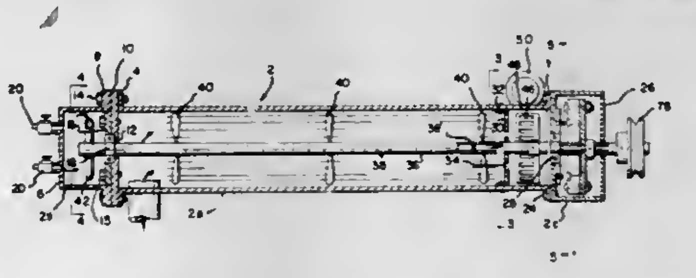
IONIZATION OF EXHAUST GASES

Anthony A. Stanton, 1412 Boston Ave., Fort Pierce, Fla. 33450

Continuation-in-part of Ser. No. 543,150, Jan. 21, 1975, abandoned. This application May 28, 1976, Ser. No. 690,875

Int. Cl.² F01N *3/10;* F02M *27/04;* B01J *1/10*

U.S. Cl. 23—277 C **24 Claims**



1. Apparatus for electrically treating exhaust gases emanating from an internal combustion engine comprising:

a closed elongated casing having inlet means adjacent one end for the exhaust gases,

means for establishing a high intensity electrical field radially of the casing comprising,

electrical conductor means extending longitudinally within the casing radially spaced from the inner wall thereof, and mounted for rotation about a longitudinal axis,

the wall of said casing being provided interiorly thereof with a conductive surface extending entirely about the path of the conductor means,

means for connecting said conductor means and conductive surface to a high voltage source to establish an electrical field therebetween,

means for rotating the conductor means about said longitudinal axis to sweep the field in a path normal to the flow of gases within the casing, and

means at the other end of the casing for receiving the gases subjected to said rotating electric field.

4,098,579

INSTALLATION FOR CONDUCTING A SYNTHESIS REACTION OF UREA

Janusz Starzycki; Jadwiga Starzycka; Janusz Sobczak; Stanislaw Golembiowski, all of Pulawy; Ernest Pieczora; Stanislaw Kolanek, both of Kedzierzyn; Jerzy Simonides, Opole, and Jozef Jendrzej, Kedzierzyn, all of Poland, assignors to Instytut Nawozow Sztucznych Zjednoczenie "Petrochemia", Pulawy, Poland

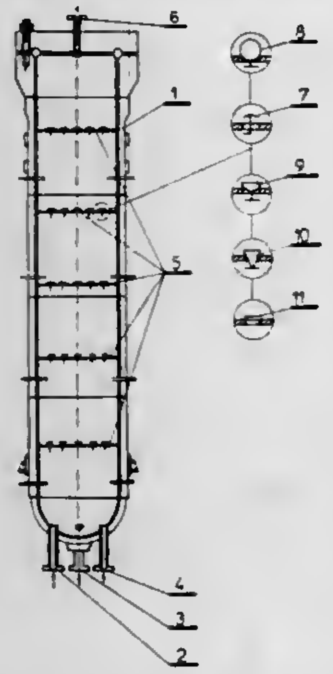
Filed Mar. 3, 1977, Ser. No. 774,068

Int. Cl.² B01J *1/00, 3/00;* C07C *126/02*

U.S. Cl. 23—283 **6 Claims**

1. In an apparatus for the synthesis of urea comprising (a) a vertically disposed reaction vessel having at least two fluid inlets thereto near the base thereof and at least one fluid outlet therefrom near the top thereof, and (b) a plurality of vertically

spaced, horizontally disposed overflow-preventing baffle plates having a plurality of orifices therein and being mounted within said vessel, each of said baffle plates extending across the entire interior horizontal cross section of said vessel, (c) the improvement comprising non-return valves mounted in each of said orifices whereby reaction fluid flows upward through said vessel and through said orifices and valves, said valves preventing the downward backflow of reaction fluid and thus providing for unidirectional upward flow through the reaction vessel.



4,098,580

CANISTER FOR CATALYST CONVERTER AND MANUFACTURING PROCESS THEREFOR

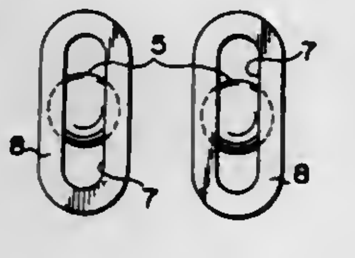
Shigeru Shimizu, Toyota, and Hiroki Yamauchi, Kariya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 23, 1976, Ser. No. 753,826

Claims priority, application Japan, Jun. 10, 1976, 51-668066

Int. Cl.² B01J *8/02;* **F01N** *3/15*

U.S. Cl. 23—288 F **4 Claims**



1. A canister for a catalyst converter which comprises
opposing upstream and downstream plate members defining said canister;
gas inlets and outlets provided as numerous openings in said upstream and downstream plate members, respectively, with rounded portions given by plastic deformation of the inside edge of said openings such that said rounded portions of said opposing plate members face each other; and
a pellet catalyst housed in said canister such that said rounded portions of said opposing plate members contact said pellet catalyst.

4,098,581

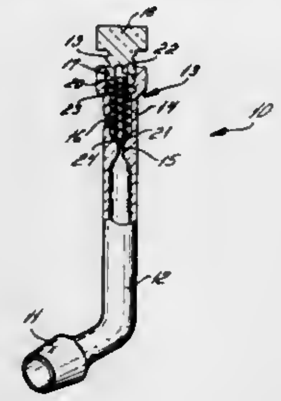
GAS RELEASE DEVICE FOR USE WITH LABORATORY GLASSWARE

Jack A. Kraft, 119 Elm La., New Hyde Park, N.Y. 11040, and Harold D. Kraft, 147-14 70th Ave., Flushing, N.Y. 11367

Filed Aug. 30, 1976, Ser. No. 718,588

Int. Cl.² B01L *3/00;* **F16K** *15/06*

U.S. Cl. 23—292 **6 Claims**



1. For a separatory funnel of the type adapted to be shaken horizontally and having a stopcock for release of gases developed furing the horizontal shaking, the invention comprising a gas release device for airtight connection with the mouth of said separatory funnel for sealing the article against the entry of air from the abmient while permitting the escape of gases generated in the funnel, said device comprising a fitting means for effecting an air-tight seal with said mouth, check valve means for preventing the entry of air from the ambient and permitting the escape of gases generated in the funnel, conduit means integrally formed with said fitting means communicating between the fitting means and the check valve means, said check valve means including a housing being integral with the conduit means and a valve seat means, said check valve means including an aperture formed through the housing upstream from the valve seat means for permitting the release to the ambient of gases passing through the valve seat when the valve is open, and closure means for sealing the valve seat and means biasing the closure means against the valve seat on the upstream side of the valve seat, further comprising said conduit being angulated whereby when the device is connected to said mouth and said separatory funnel contains a fluent material and is shaken in a horizontal direction and the funnel is positioned with the axis of the mouth oriented substantially horizontally the check valve means is substantially above the level of the fluent material to permit the automatic release of gases in the funnel to the ambient while maintaining the liquid in the funnel.

4,098,582

METHOD OF ACCELERATING CONTACT REACTIONS IN FLUIDS AND APPARATUS THEREFOR

Masahiro Takeda, No. 16-14, 4-chome, Shimouma, Setagaya-ku, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,140

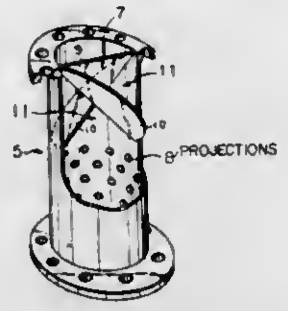
Claims priority, application Japan, Nov. 14, 1975, 50-137074

Int. Cl.² C08K *5/17*

U.S. Cl. 23—293 R **9 Claims**

1. An apparatus for facilitating reaction in a fluid mixture having gas and liquid constituents comprising:
a fluid conduit;
means for imparting circular motion to fluid passing through the conduit to form at least two concentric layers including a radially outer, substantially liquid layer and a radially inner, substantially gaseous layer; and,
a plurality of projections on a radially inner wall of said conduit, said projections having a relatively smaller cross-sectional area in a plane adjacent the wall and normal to a

radial, than in a plane radially inwardly displaced from the wall and normal to the radial; whereby said projections disperse fine liquid particles in the substantially gaseous layer.



4,098,583

METHOD OF REMOVING ASH COMPONENTS FROM HIGH-ASH COALS

Kurt Tippmer, Recklinghausen, Germany, assignor to Firma Carl Still Recklinghausen, Germany

Filed Mar. 17, 1977, Ser. No. 778,473

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611620

Int. Cl.² C10L *9/00, 9/10*

U.S. Cl. 44—1 B **8 Claims**

1. A method of removing ash components from high-ash bituminous and sub-bituminous coals comprising the steps of grinding the coal to form particles having a grain diameter of less than 400 microns, mixing said ground coal with water to form a raw coal-water slurry, preheating said coal-water slurry to a predetermined temperature, fusing said preheated slurry in an autoclave by heating said preheated slurry to a temperature ranging between 250° C and 350° C at a pressure in the range of 50 to 80 atm for a period ranging between 60 minutes to 360 minutes to form a heated fusion suspension, cooling said fusion suspension by successive stages to a predetermined temperature whereby at least one of said cooling stages is affected by a heat exchange between said fusion suspension and said raw coal-slurry to effect the preheating of said slurry, and separating the coal substance and aqueous phase of said fusion suspension.

4,098,584

REMOVAL OF IMPURITIES FROM COAL

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Feb. 10, 1977, Ser. No. 767,659

Int. Cl.² C10L *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 R **32 Claims**

1. In a process for improving coal wherein the coal is treated with a metal containing compound in order to enhance the magnetic susceptibility of certain impurity components contained in the raw coal permitting their removal by magnetic separation, the improvement comprising:
treating the coal with a gas selected from the group consisting of hydrogen and carbon monoxide during the metal containing compound treatment.

9. The process of claim 1 wherein the metal containing compound comprises a substantially undecomposed carbonyl selected from the group consisting of iron carbonyl, nickel carbonyl, cobalt carbonyl, molybdenum carbonyl, tungsten carbonyl, chromium carbonyl, and derivatives of these carbonyls.

30. A process for beneficiating coal, including reducing sulfur and ash, increasing calorific value, and improving other properties, which comprises contacting a coal which contains impurities, such as pyrite or marcasite or other ash-forming minerals, which are substantially liberated from the coal particles, with an iron carbonyl and a member selected from the group consisting of hydrogen and carbon monoxide under reaction conditions which substantially preclude the general thermal dissociation of the carbonyl into iron and carbon monoxide, in order to increase the apparent magnetic susceptibility of the impurities so that a magnetic separation between the coal and impurities may be effected.

4,098,585

AMINE-ALKENYLSUCCINIC ACID OR ANHYDRIDE REACTION PRODUCT

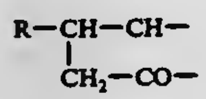
Paul F. Vartanian, and Joseph B. Biasotti, both of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,459

Int. Cl.² C10L *1/18;* **C07D** *207/24*

U.S. Cl. 44—63 **31 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range and a minor detergent amount of a reaction product prepared by the process which comprises reacting an alkenylsuccinic acid or anhydride compound, having the structural unit represented by the formula:



$$\begin{array}{l} R{-}CH{-}CH{-} \\ \phantom{R{-}}| \\ \phantom{R{-}}CH_2{-}CO{-} \end{array}$$

in which R is an alkenyl radical having a molecular weight ranging from about 250 to 3000, with an amine, represented by the formula:

$$R'R''N-X-Y$$

in which R′ and R″ represent hydrogen or a monovalent alkyl, aminoalkyl or hydroxyalkyl radical having from 1 to 8 carbon atoms, X is a divalent hydrocarbon radical having from 2 to 8 carbon atoms and Y is a radical, selected from the group consisting of hydrogen, amino, hydroxy and a radical having the formula $O(R'''O)_xH$ in which R‴ is an alkylene radical having from 2 to 3 carbon atoms and x is an integer from 1 to 5, in the presence of a free radical initiator, selected from the group consisting of organic peroxides, azo and diazo compounds, the molar proportion of said amine to said succinic acid or anhydride being greater than one.

4,098,586

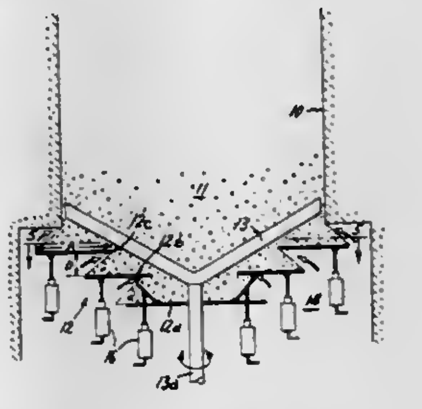
GRATE FOR COAL GASIFIER

Donald E. Woodmansee, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,798

Int. Cl.² C10J *3/38*

U.S. Cl. 48—76 **10 Claims**



1. In an apparatus for producing a fuel gas from coal including a vertical shaft disposed over an enclosed grate whereby coal moving by gravity down said shaft is subjected first, to carbonization, and then, to reduction, the improvement wherein the grate comprises in combination:
a plurality of fixed plate members generally annular in shape and having different radii, said plates being substantially concentrically disposed in spaced relationship in a verti-

said pellet catalyst.

sectional area in a plane adjacent the wall and normal to a

cally and generally conical stacking arrangement defining throat volume, therebetween;

rotatable means mounted for movement adjacent said plate members for promoting the movement of solids from said shaft to pass over the surfaces of said plates,

adjustable means mounted on and located at space locations along each plate for varying the restriction to flow of solids through the throat volume thereabove; and

means for controllably positioning said restriction-to-flow varying means.

4,098,587

COMPACT MULTI-TUBE CATALYTIC REACTION APPARATUS

George R. Krar, Suffield; Ole L. Olesen, South Windsor; Richard A. Sederquist, Newington, and Donald F. Szydlowski, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

tween said shield means and said outer cylindrical wall means of said chambers.

4,098,588

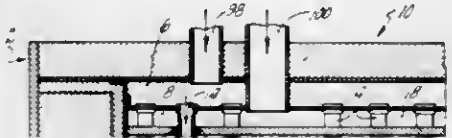
MULTI-TUBE CATALYTIC REACTION APPARATUS

Richard F. Buswell, Glastonbury; Richard A. Sederquist, Newington, and Daniel J. Snopkowski, Wethersfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 753,334, Dec. 22, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,802

Int. Cl.² B01J *7/00, 8/06*

U.S. Cl. 48—94 6 Claims



cally and generally conical stacking arrangement defining throat volume, therebetween;

rotatable means mounted for movement adjacent said plate members for promoting the movement of solids from said shaft to pass over the surfaces of said plates,

adjustable means mounted on and located at space locations along each plate for varying the restriction to flow of solids through the throat volume thereabove; and

means for controllably positioning said restriction-to-flow varying means.

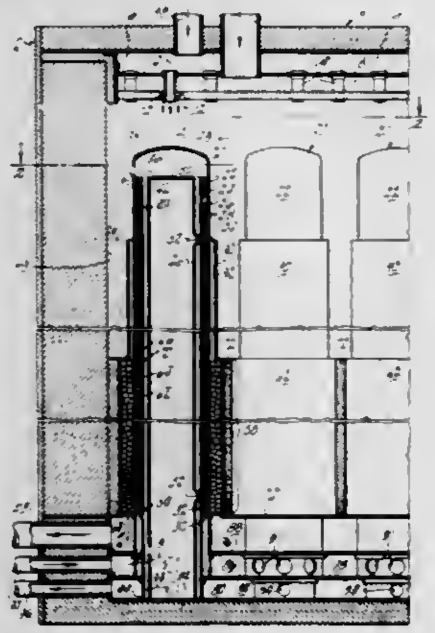
4,098,587
COMPACT MULTI-TUBE CATALYTIC REACTION APPARATUS

George R. Krar, Suffield; Ole L. Olesen, South Windsor; Richard A. Sederquist, Newington, and Donald F. Szydlowski, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 753,335, Dec. 22, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,803

Int. Cl.^{2} B01J *7/00, 8/06*

U.S. Cl. 48—94 **11 Claims**



1. Endothermic reaction apparatus comprising:

a furnace for supplying heat for an endothermic reaction including an enhanced heating portion and wall means defining a burner cavity, said furnace also including exhaust means associated therewith and means associated with said burner cavity for introducing fuel and an oxidant into said burner cavity to produce hot gases therein;

a plurality of closed packed tubular reactors disposed within said furnace, each of said tubular reactors including an axially extending reaction chamber substantially filled with catalyst, said chamber including outer cylindrical wall means exposed to the hot gases in said furnace, a first part of said chamber extending into said burner cavity and a second part of said chamber extending into said enhanced heating portion of said furnace, said second part being an extension of said first part said enhanced heating portion including inlet means and outlet means, said inlet means being in gas communication with said exhaust means, said furnace including means for directing the hot gases within said burner cavity into said inlet means and through said enhanced heating portion; and

baffle means disposed within said burner cavity for reducing temperature differences among said reactors, said baffle means including shield means disposed between said burner cavity wall means and said reactors adjacent said wall means constructed and arranged to reduce radiant heating of said first part of said reaction chambers adjacent said wall means, said shield means at least partially surrounding said first part of each of said reaction chambers adjacent said wall means and defining a space between said shield means and said outer cylindrical wall means of said chambers.

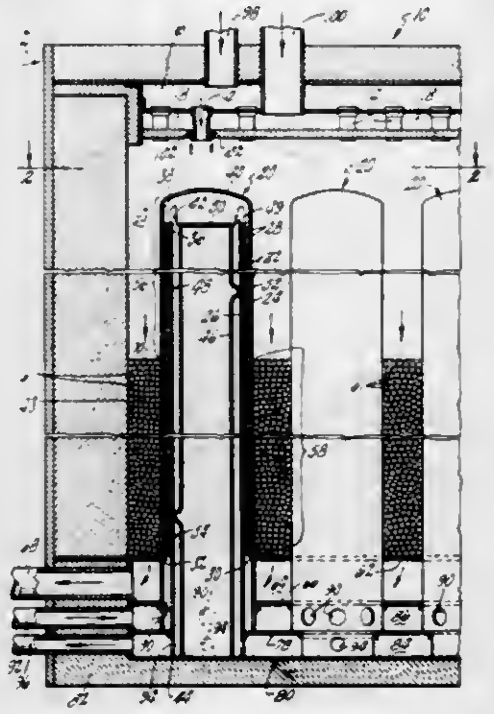
4,098,588
MULTI-TUBE CATALYTIC REACTION APPARATUS

Richard F. Buswell, Glastonbury; Richard A. Sederquist, Newington, and Daniel J. Snopkowski, Wethersfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 753,334, Dec. 22, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,802

Int. Cl.^{2} B01J *7/00, 8/06*

U.S. Cl. 48—94 **6 Claims**



1. Catalytic reaction apparatus comprising:

a furnace including wall means defining a furnace volume, said volume consisting essentially of an enhanced heat transfer portion and a burner cavity, said furnace also including exhaust means associated with said heat transfer portion and means for introducing fuel and an oxidant into said burner cavity;

a plurality of closely packed tubular reactors disposed within said furnace volume each including a first portion extending into said burner cavity and a second portion disposed within said enhanced heat transfer portion, each of said reactors requiring heat to be supplied thereto and including catalyst disposed therein, each of said reactors including an outer wall and an inner wall, said inner wall spaced from said outer wall defining an annular reaction chamber therebetween for holding said catalyst, said reaction chamber having an inlet end and an outlet end, said outlet end being disposed in said first portion, said apparatus also including means spaced inwardly from said inner wall of each of said reactors and defining a narrow annular heat regeneration chamber therebetween coaxial with and adjacent said annular reaction chamber, said annular regeneration chamber having an inlet end and an outlet end, each of said reactors including means for directing reaction products from said reaction chamber outlet end into said regeneration chamber inlet end and through said regeneration chamber countercurrent to the flow in said reaction chamber, said regeneration chamber being substantially isolated from heat in the burner cavity and enhanced heat transfer portion;

means for introducing process fuel into said reactors;

means for conducting reaction products away from said reactors; and

heat transfer means disposed within said volume around and between said reactors substantially filling said enhanced heat transfer portion and defining an interface between said enhanced heat transfer portion and said burner cavity, said heat transfer means being further constructed and arranged to enhance heat transfer to said reactors and to distribute heat uniformly among and around said reactors over that portion thereof which is disposed within said enhanced heat transfer portion, said furnace being constructed and arranged so that furnace gases travel from said burner cavity into and through said enhanced heat transfer portion in a direction substantially countercurrent to the flow in said reaction chamber, and from said heat transfer portion to said furnace exhaust means.

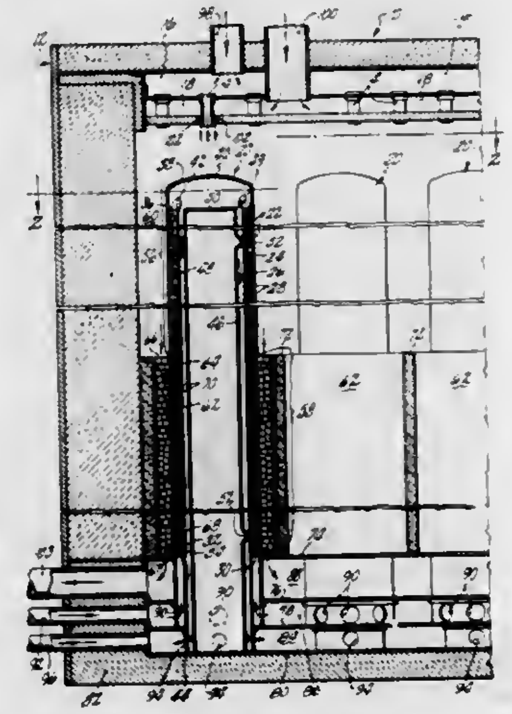
4,098,589
CATALYTIC REACTION APPARATUS

Richard F. Buswell, Glastonbury; Richard A. Sederquist, Newington, and Daniel J. Snopkowski, Wethersfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 753,348, Dec. 22, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,804

Int. Cl.^{2} B01J *7/00, 8/06*

U.S. Cl. 48—94 **13 Claims**



1. Catalytic reaction apparatus comprising:

means defining a burner cavity for burning fuel therein to produce hot gases;

at least one tubular reactor, said reactor including a first portion extending into said burner cavity and a second portion disposed outside said burner cavity, said reactor having an outer wall and an inner wall, said inner wall spaced from said outer wall defining an annular reaction chamber therebetween containing a reaction catalyst, said inner wall also defining a cylindrical conduit coaxial with said annular reaction chamber, said reaction chamber having an inlet end and an outlet end, said outlet end being disposed in said first portion;

wall means spaced from said outer wall of said reaction chamber surrounding said second portion of said reactor defining a narrow annular burner gas passageway therebetween extending coaxially with and adjacent said reaction chamber and in heat exchange relationship thereto, said passageway having an inlet end in gas communication with said burner cavity and an outlet end substantially adjacent said inlet end of said reaction chamber;

means for directing hot gases in the burner cavity into said burner gas passageway inlet end and through said burner gas passageway countercurrent to flow through said reaction chamber; and

cylindrical plug means disposed within said cylindrical conduit and having an outer wall surface spaced inwardly from said inner wall of said reactor defining a narrow annular heat regeneration chamber therebetween coaxial with and adjacent said annular reaction chamber and in heat exchange relationship thereto, said annular regeneration chamber having an inlet end and an outlet end, said reactor including means for directing reaction products from said reaction chamber outlet end into said regeneration chamber inlet end and through said regeneration chamber countercurrent to the flow in said reaction chamber, said regeneration chamber being substantially isolated from heat in the burner cavity and burner gas passageway, wherein the spacing between the walls of the regeneration chamber is between 0.1 and 1.0 inch, the spacing between the walls of the burner gas passageway is between 0.1 and 3.0 inches, and the spacing between the walls of the reaction chamber is between 0.3 and 2.0 inches.

4,098,590
EXPLOSIVE GAS PIPELINE

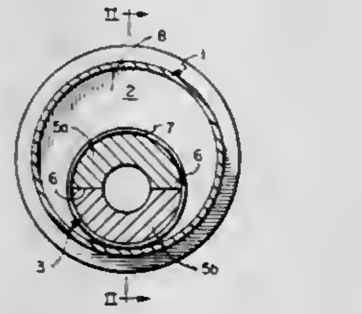
Manfred Blase, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Continuation of Ser. No. 562,155, Mar. 26, 1975, abandoned. This application Aug. 26, 1976, Ser. No. 718,192

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1974, 2416358

Int. Cl.^{2} F17D *3/00*

U.S. Cl. 48—192 **14 Claims**



1. In a gas duct or pipeline of the type including a pipe having a gas conveying interior therein, said gas conveying interior having longitudinally passing therethrough an explosive gas or a gas mixture including an explosive gas component, particularly for use in supplying an installation alternately with an inflammable gas and an oxygen-containing gas, said installation including equipment capable of igniting an explosive gas; the improvement comprising:

means for limiting, in the longitudinal direction of said pipe, the velocity of propagation and pressure of an explosion of said gas occurring within said gas conveying interior of said pipe, said means consisting essentially of a hollow cylindrical loose gas displacement body formed of an elastic, resilient, noncombustible mineral wool material loosely positioned within said gas conveying interior of said pipe along substantially the entire length thereof, said displacement body having a transverse cross-sectional area substantially smaller than the transverse cross-sectional area of the interior of said pipe, and said displacement body having surfaces, extending in said longitudinal direction of said pipe, which are spaced from longitudinally extending inner surfaces of said pipe, whereby said displacement body fills a portion only of the volume of said gas conveying interior of said pipe, taken in a direction transverse to the direction of flow therethrough of said gas.

8. In a gas duct or pipeline of the type including a pipe having a gas conveying interior therein, said gas conveying interior having longitudinally passing therethrough an explosive gas or a gas mixture including an explosive gas component, particularly for use in supplying an installation alternately with an inflammable gas and an oxygen-containing gas,

said installation including equipment capable of igniting an explosive gas; the improvement comprising:

means for limiting, in the longitudinal direction of said pipe, the velocity of propagation and pressure of an explosion of said gas occurring within said gas conveying interior of said pipe, said means consisting essentially of a hollow cylindrical loose gas displacement body formed of an elastic, resilient, noncombustible glass wool material loosely positioned within said gas conveying interior of said pipe along substantially the entire length thereof, said displacement body having a transverse cross-sectional area substantially smaller than the transverse cross-sectional area of the interior of said pipe, and said displacement body having surfaces, extending in said longitudinal direction of said pipe, which are spaced from longitudinally extending inner surfaces of said pipe, whereby said displacement body fills a portion only of the volume of said gas conveying interior of said pipe, taken in a direction transverse to the direction of flow therethrough of said gas.

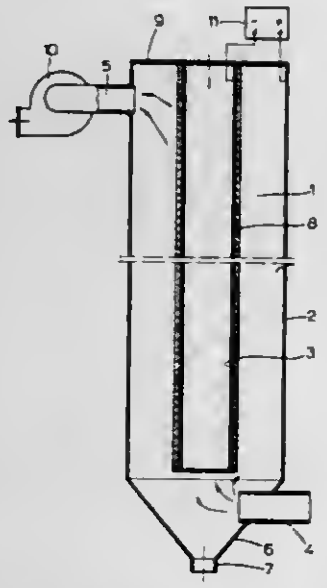
4,098,591
APPARATUS AND METHOD FOR REMOVING NON-CONDUCTIVE PARTICLES FROM A GAS STREAM

Alfred Erich Wilbrandt van Diepenbroek, Ermelo; Jan Hendrik Wormgoor, Amersfoort, and Cornelis Schilperoort, Ermelo, all of Netherlands, assignors to Bronswerk Heat Transfer B.V., Nijkerk, Netherlands

Continuation-in-part of Ser. No. 575,395, May 7, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,303

Int. Cl.² B03C *3/41*

U.S. Cl. 55—2 **10 Claims**



1. Apparatus for removing non-conductive particles from a gas stream, comprising a cylindrical inner electrode, a cylindrical outer electrode surrounding said inner electrode and coaxial with the same, said electrodes being insulated from each other and spaced with respect to each other so as to define a separating chamber between them, a gas inlet at one end of said separating chamber, a gas outlet at the other end of said separating chamber, means for passing the gas stream through said separating chamber from said gas inlet to said gas outlet in a substantially axial direction, means for supplying opposite D.C. voltages to the said electrodes so as to generate an electric field between them, said electric field having a relatively low intensity so that substantially no ionization occurs in the gas stream within said separating chamber and so that dipole charges are induced in the particles to be removed, and a covering layer on one of the said electrodes completely enclosing the same through at least a part of its length, said covering layer comprising a semi-conductive fibrous material and having a multitude of fibers projecting into said separating chamber.

10. A method of removing non-conductive particles from a gas comprising the steps of passing a stream of the gas through a separating chamber defined between two coaxial cylindrical electrodes and generating a D.C. electric field between the said electrodes having such an intensity that substantially no ionization occurs in the gas stream within said separating chamber whereby dipole charges are induced in the particles to be removed, the inner electrode being provided with a covering layer through at least a part of its length consisting of a semiconductive fibrous material with a multitude of fibers projecting into said separating chamber.

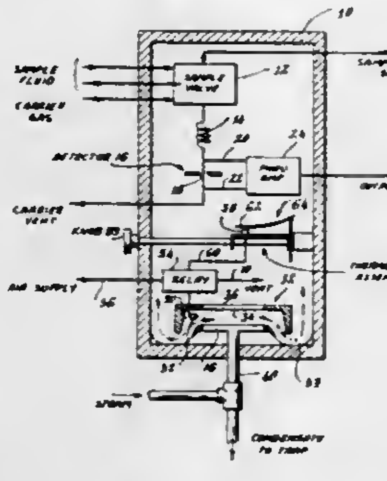
4,098,592
TEMPERATURE CONTROL SYSTEM FOR CHROMATOGRAPHIC APPARATUS

Robert C. Prescott, Foxboro, and Roy P. Lindquist, Norton, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 550,119, Feb. 14, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,730

Int. Cl.² B01D *15/08*

U.S. Cl. 55—67 **17 Claims**



14. In the art of heating instrumentation equipment for industrial processes by heat from a supply of heated fluid, the improved method of regulating the temperature of the spaces containing the equipment comprising the steps of:

supplying heated fluid to one section of a two-section heat exchanger;

transferring heat from said fluid in said one section to the other section;

flowing a gas through said other section at low velocity;

heating said gas while in said other section by heat transferred from said one section;

directing said flow of gas from said one section to the spaces containing said instrumentation equipment; and

controllably adjusting the flow rate of said gas so as to regulate the rate of transfer of heat into said spaces to maintain the temperature of said spaces at a desired temperature.

4,098,593
ADIABATIC VCM ADSORPTION ON CARBON

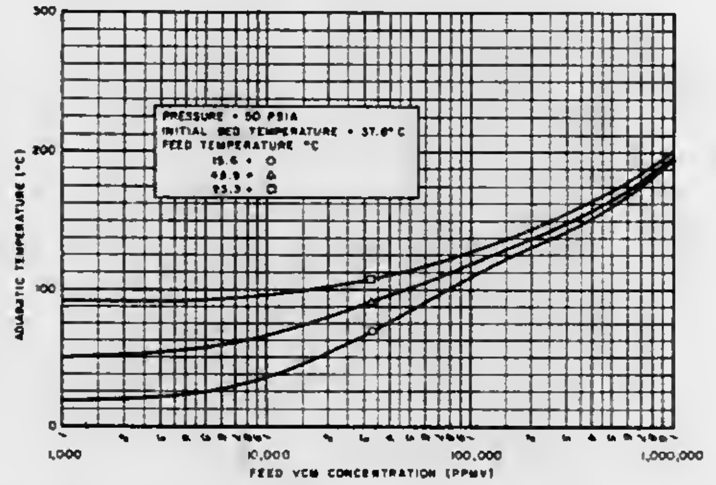
Andrew J. Eisenstein, Ponca City; Richard A. Frohreich, Norman, and John F. Scamehorn, Ponca City, all of Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 16, 1977, Ser. No. 769,375

Int. Cl.² B01D *51/10*

U.S. Cl. 55—71 **3 Claims**

1. An improved method for the adsorption of VCM from vapor gas on dry carbon beds wherein the initial concentration of VCM and said vapor gas is higher than 12,000 parts per million by volume (ppmv), the improvement comprising diluting the vapor gas with a gas inert with respect to the adsorption of VCM on carbon to a concentration of from about 4,000 ppmv to about 12,000 ppmv and carrying out the adsorption under essentially adiabatic conditions at pressures of from about 120 pounds per square inch gauge (psig) and initial bed temperatures of from about 60° F to about 200° F.



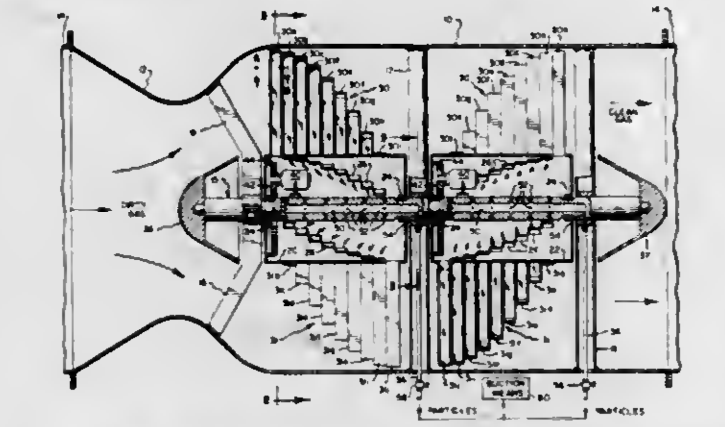
4,098,594
INERTIAL PARTICLE SEPARATOR

Morton Shorr, and George Rudinger, both of Williamsville, N.Y., assignors to Textron Inc., Providence, R.I.

Filed Dec. 13, 1976, Ser. No. 750,362

Int. Cl.² B01D *45/04*

U.S. Cl. 55—403 **11 Claims**



1. An apparatus for separation of pollutants such as dust or other solid or liquid particles from air and other gases, comprising a stationary cylindrical housing having a polluted gas inlet at one end and a cleaned gas discharge at its other end, a rotary separating member situated in said housing for rotation in one rotational direction and having its axis of rotation coincident with the longitudinal axis of said housing and means operatively connected to said separating member for causing said member to rotate in said one rotational direction, said separating member including a stationary axle mounted within said housing, a drum with a cylindrical wall portion and opposite end portions rotatably mounted on said axle, a plurality of elongate cups fixed to said drum to extend radially therefrom, said cups each comprising a channel having a U-shaped cross-section opening in said one rotational direction, said cups being arranged as to define between themselves restricted passageways for particle laden gases to flow from said inlet towards said discharge, said drum being perforated through the cylindrical wall portion thereof in fluid flow communication with said cups at their fixed connections with said drum, said axle being centrally bored and having apertures formed through the wall thereof intercommunicating interiors of said drum and said axle, a particle disposal conduit arranged in open communication with said bore, whereby pollutant particles entrapped within said cups may slide thereon into and through said drum and said apertures and through the bore of said axle into said disposal conduit, and suction means operatively coupled with said conduit to induce travel of intercepted pollutant particles radially inwardly and through the interior of said drum and of said bore of said axle and thence out through said disposal conduit.

4,098,595
PROCESS FOR THE PRODUCTION OF GRANULAR QUARTZ GLASS

Arnold Lenz, Cologne-Stammheim; Gerhard Kreuzburg, Niederkassel, and Rainer Haase, Bokel, Oldenburg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 20, 1976, Ser. No. 752,715

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557932

Int. Cl.² C03B *23/20;* **C03C** *15/00*

U.S. Cl. 65—17 **15 Claims**

1. A process for preparing quartz glass which consists essentially of:

A. Forming a silicic acid ester of an alcohol selected from the group consisting of a C_1–C_3 aliphatic alcohol, a C_2–C_4 alkanol wherein the carbon chain of the alkyl group can be interrupted by one or more oxygen atoms and a C_2 to C_6 glycol by reacting silicon or ferrosilicon with said alcohol;

B. Hydrolyzing said silicic acid ester by contacting the same with 105–500 percent of the stoichiometrically necessary amount of water, said water having a pH of 2–5 to thereby form a silica sol;

C. Gelling said silica sol by subjecting it to an elevated temperature up to 100° C;

D. Drying said gel by heating at increasing temperatures up to 300° C;

E. Comminuting the so dried gel; and

F. Heating the so-comminuted gel at increasing temperatures which can be up to a temperature of 1400° C.

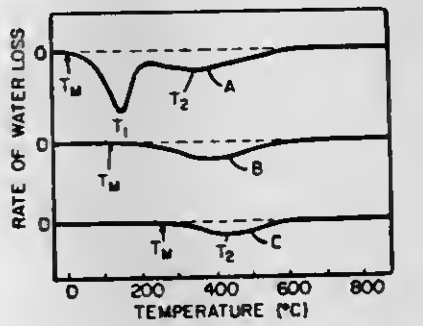
4,098,596
METHOD FOR PREPARING OPTICAL ARTICLES FROM HYDRATED GLASSES

Che-Kuang Wu, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 640,733, Dec. 15, 1975, Pat. No. 4,073,654. This application Jun. 13, 1977, Ser. No. 805,927

Int. Cl.² C03C *17/00, 3/10*

U.S. Cl. 65—30 R **9 Claims**



1. A method of forming a glass article comprising the steps of:

(a) preparing a base anhydrous glass material comprising, in mole percent on an oxide basis, about 72 to 82% SiO_2, 10 to 17% Na_2O and/or K_2O, and 5 to 15% of a member selected from ZnO, PbO, and mixtures thereof;

(b) hydrating the glass of step (a) under conditions sufficient to include into the glass a water content ranging from about 0.5 to 10% by weight; and

(c) molding the hydrated glass of step (b) against at least one die at a temperature ranging from about 250° to 500° C. and at a pressure ranging from about 4,000 to 20,000 psi wherein the smoothness of a molding portion of the die and at least one portion of the glass molded therewith is such that over a distance of at least 0.1 inch, on an arithmetic average basis, the Roughness Height is less than about 3.0 microinches.

4,098,597

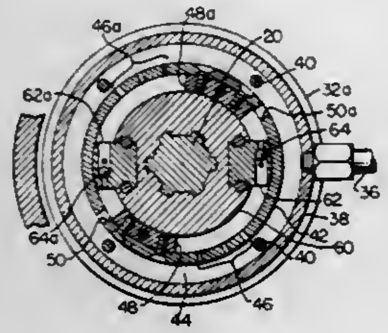
ROTARY SNUBBER FOR LINEAR ACTUATOR

Hermann Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Hartford, Conn.

Filed Mar. 17, 1977, Ser. No. 778,672

Int. Cl.^{2} C03B *9/40*

U.S. Cl. 65—181 **5 Claims**



1. In a glassware forming machine having an air driven actuator which includes a linearly reciprocable shaft, and cam means associated with said shaft for rotating it through a predetermined angular displacement as the shaft moves linearly for moving a component of the machine between an active position and an inactive position spaced linearly and angularly therefrom, the improvement comprising an hydraulic snubber for the angular motion, said snubber having a first housing part defining an annular chamber which is provided with hydraulic fluid, means for mounting said housing part to the fixed frame of the machine, an annular guide member defining two sets of circumaxially spaced openings so arranged that all of said openings are in communication with said annular chamber, an inner part rotatably received in said guide member and rotated directly by angular displacement of said shaft, said inner part having at least two vanes cooperating with said guide memter to define at least two inner chambers, said guide member having two abutments cooperating with said vanes to force the hydraulic fluid outwardly through said two sets of openings, said vanes defining passageway means to provide for the free flow of fluid into the space behind the vanes during angular motion in one direction, and one way ball check valves in said passageway means to provide for snubbed angular motion in the other direction.

4,098,598

CYANO CONTAINING BENZOXAZOLINYLIDINES AND USE THEREOF

Pierre Bocion, Winterthur; Wijitha de Silva, Schofflisdorf, and Pavol Winternitz, Greifensee, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

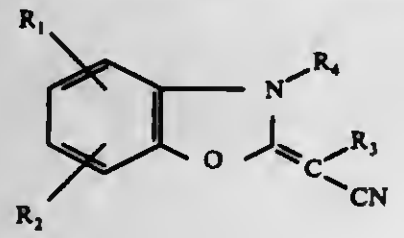
Division of Ser. No. 559,195, Mar. 17, 1975, Pat. No. 4,028,089. This application Jan. 10, 1977, Ser. No. 758,098

Claims priority, application Switzerland, Mar. 22, 1974, 4038/74

Int. Cl.^{2} C07D *263/56, 295/18;* A01N *5/00*

U.S. Cl. 71—76 **24 Claims**

1. Compounds represented by the formula



(I)

wherein

R_1 and R_2 each are hydrogen or a phenyl; R_3 is R_5OCO— in which R_5 is a lower alkyl having 1-8 carbons, cycloalkyl having 3-6 carbons, alkenyl having 2-8 carbons, alkynyl having 2-8 carbons or phenyl; R_6SO_2- in which R_6 is a lower alkyl having 1-8 carbons, cycloalkyl having 3 to 6 carbons or phenyl; $(R_7)(R_8)NCO$— in which R_7 and R_8 each are hydrogen or a lower alkyl having 1-4 carbons, cycloalkyl having 3-6 carbons, alkenyl having 2-4 carbons or phenyl, or R_7 and R_8 together with the nitrogen atom to which they are attached form a morpholine ring; or R_9CO— in which R_9 is a lower alkyl having 1-4 carbons, cycloalkyl having 3 to 6 carbons or phenyl; and R_4 is hydrogen or a lower alkyl having 1-4 carbons,

and salts thereof.

24. A method for the regulation of plant growth, which method comprises treating the plants whose growth is to be regulated with a plant growth regulating amount of a composition containing as the active ingredient a compound of claim 1.

4,098,599

ANTIDOTE COMPOSITIONS AND METHOD OF USE WITH HERBICIDES

Duane R. Arneklev, Sunnyvale, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 612,976, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 460,661, Apr. 12, 1974, abandoned, which is a division of Ser. No. 100,770, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 68,529, Aug. 31, 1970, abandoned. This application Nov. 17, 1976, Ser. No. 742,488

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 71—100 **23 Claims**

1. In the method of controlling weeds wherein a herbicidally effective amount of a thiolcarbamate herbicide is added to the habitat thereof the improvement comprising adding to the habitat thereof from about 0.01 to about 15 parts by weight for each part by weight of the herbicide an antidote compound represented by the generic formula

$$X—(CH_2)_n—O—SO_2—R$$

where X is halogen; R is selected from the group consisting of alkyl containing 1-6 carbon atoms, haloalkyl containing 1-6 carbon atoms, chloroethoxy, halogen, and methyl substituted phenyl; and n is a whole number ranging between 1 and 5.

4,098,600

ISOCYANOACYLAMIDES

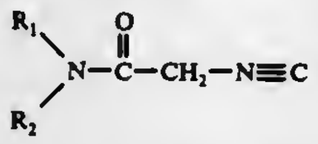
John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 689,214, May 24, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 778,305

Int. Cl.^{2} C07C *119/02;* A01N *9/20*

U.S. Cl. 71—105 **11 Claims**

1. A compound having the formula



$$(R_1)(R_2)N—\overset{O}{\overset{\|}{C}}—CH_2—N{\equiv}C$$

wherein R_1 is selected from the group consisting of phenyl and phenyl substituted by one or more halogen or alkyl substituents, said alkyl substituents having up to four carbon atoms, inclusive, benzyl and benzyl substituted on the benzene ring by two halogen or two alkyl substituents, said alkyl substituents having up to four carbon atoms, inclusive; and R_2 is selected from the group consisting of hydrogen and alkyl having up to four carbon atoms, inclusive.

4,098,601

BETA-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

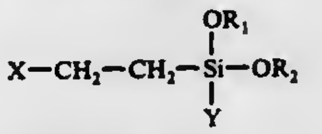
Division of Ser. No. 443,180, Feb. 15, 1974, Pat. No. 3,985,780, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Sep. 27, 1976, Ser. No. 727,182

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—124 **8 Claims**

1. A composition for facilitating fruit abscissing, fruit thinning and fruit ripening which comprises an effective amount of a compound corresponding to the formula



$$X—CH_2—CH_2—\underset{Y}{\underset{|}{\overset{OR_1}{\overset{|}{Si}}}}—OR_2$$

wherein X is chlorine or bromine, Y represents the radical $—OR_3$ and each of R_1, R_2 and R_3 is lower alkoxyalkyl, together with a suitable inert carrier therefor.

4,098,602

ALGAECIDAL COMPOSITION

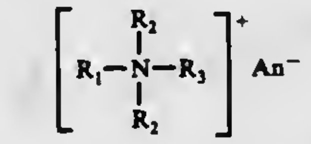
Donald E. Seymour, Milwaukee; James C. Schmidt, Wauwatosa, and Donald A. Bezella, Saukville, all of Wis., assignors to Applied Biochemists, Inc., Mequon, Wis.

Filed Jun. 28, 1976, Ser. No. 700,334

Int. Cl.^{2} A01N *9/02, 13/00*

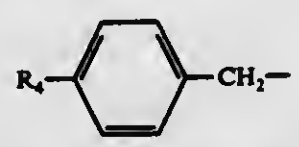
U.S. Cl. 71—67 **7 Claims**

1. A method of controlling the growth of an algae in a body of water, comprising the step of contacting algae in a body of water with a composition consisting essentially of an aqueous solution having dissolved therein (a) an ammonium quaternary compound and (b) a copper complex, said copper complex being formed by reacting a water insoluble copper compound selected from the group consisting of copper carbonate, copper hydroxide, copper bicarbonate, copper oxide, copper thiocyanate, copper oxychloride, tri basic copper sulfate, and mixtures thereof, with a material selected from the group consisting of alkanolamines having one or more alkanol groups containing 1 to 10 carbon atoms, ethylene diamine, N,N,N',N', tetrakis(2-hydroxy-propyl)ethylene diamine, ammonium hydroxide, and polyethylene glycols having an average molecular weight of 200 to 4000, said ammonium quatarnary compound being a salt having the following formula:



$$\left[R_1—\underset{R_2}{\underset{|}{\overset{R_2}{\overset{|}{N}}}}—R_3 \right]^+ An^-$$

where R_1 is an alkyl radical having 8 to 20 carbon atoms or a radical of the formula:



where R_4 is an alkyl group having 8 to 20 carbon atoms; each R_2 is an alkyl group containing 1 to 2 carbon atoms, R_3 is a methyl, ethyl, allyl, or benzyl radical and An$^-$is an anion, said ammonium quaternary compound comprises from 5% to 95% by weight of the combination and the copper complex comprises the balance, based on 100% active ingredients.

4,098,603

METHOD FOR MELTING STEEL

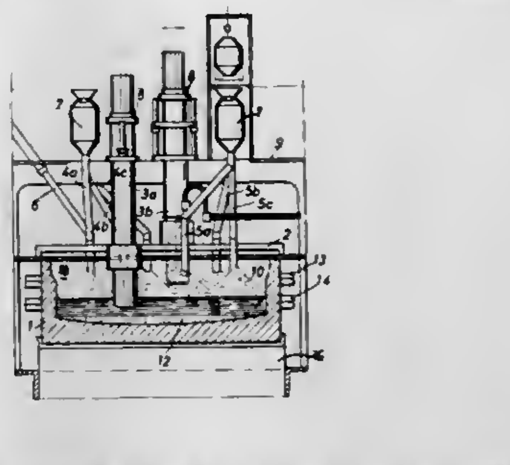
Haye Roth, Breitscheld, and Gero Rath, Mulheim, both of Germany, assignors to Demag A.G., Duisburg, Germany

Continuation of Ser. No. 562,350, Mar. 26, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 723,040

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1974, 2415967

Int. Cl.^{2} C21C *5/52*

U.S. Cl. 75—11 **4 Claims**



1. A method for melting steel in a closed electric arc resistance furnace on a continuous basis, the steps which comprise

- (a) establishing a molten bath of steel and a slag layer thereover in said furnace prior to the addition of a charge to be reduced, said slag layer containing desulphurizing, desphosphorizing and decarbonizing materials,
- (b) continuously maintaining said slag layer at a thickness within the range of between about 250 and 1500 mm,
- (c) continuously maintaining said molten steel bath at a predetermined quantity,
- (d) heating said slag layer by electrodes immersed in said slag layer and heating said molten bath by means of convection heat from said slag layer,
- (e) continuously adding to said furnace on the top surface of said slag layer a charge comprised of a member selected from the group consisting of iron ore and sponge iron, pre-reduced pellitized iron ore and pre-reduced briquetted iron ore,
- (f) continuously withdrawing a portion of said slag layer from said furnace to maintain the thickness thereof, and
- (g) continuously withdrawing a portion of said molten steel bath at a point vertically below the point where said slag layer is withdrawn to maintain the predetermined quantity of said molten bath in said furnace.

4,098,604

METHOD FOR REDUCTION IN A FLUID BED OF FINE GRAINED MATERIAL CONTAINING IRON OXIDE

Per Harald Collin, Falun, Sweden, assignor to Stora Kopparberg Bergslags Aktiebolag, Falun, Sweden

Filed Mar. 1, 1976, Ser. No. 662,912

Claims priority, application Sweden, Mar. 3, 1975, 7502369

Int. Cl.^{2} C22B *1/10*

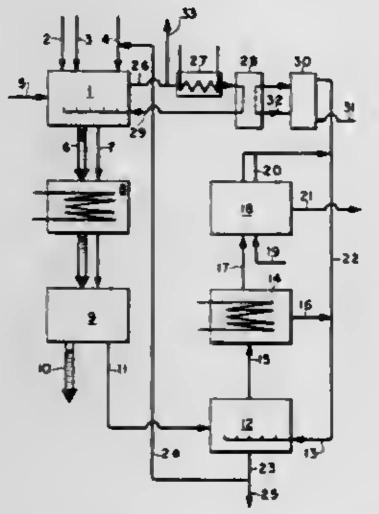
U.S. Cl. 75—26 **7 Claims**

1. A method for reduction of fine-grained, iron oxide containing material in the form of micro-aggregates in a fluid bed for manufacturing a low-sulphurous content, fine-grained mixture of partly reduced, iron oxide containing material and coke, using as a carbonaceous material a solid carbonaceous material containing sulphur, or a solid and liquid carbonaceons material containing sulphur comprising:

- A. maintaining a fluid bed at 800° to 1200° C,
- B. introducing into said fluid bed a stream of:
  - a. a member of the group consisting of fine-grained solid carbonaceous material and a mixture of fine-grained solid and liquid carbonaceous material,
  - b. fine-grained material containing iron oxide,

- c. fine-grained material containing a member of the group consisting of CaO, $CaCO_3$, and mixtures of both, and
- d. a reducing gas for fluidization, said material containing iron oxide being introduced within the limited zones around a plurality of inlet zones for the solid carbonaceous material where the volatile constituents of said carbonaceous material are expelled and partly gasified and coked, while the material containing a member of the group consisting of CaO, $CaCO_3$, and mixtures of both is introduced outside said zones,

C. tapping the material in said fluid bed, in the form of particles, at such an adjusted rate that the fluid bed material in said fluid bed has a constant hold-up amount therein,



D. cooling the tapped material, in the form of particles, below the Curie-point of iron and subsequently magnetically separating said tapped material into particles of
- a. a magnetic low-sulphurous fraction mainly containing partly reduced iron oxide containing material, coke and ashes, and
- b. a non-magnetic fraction mainly comprising at least one member selected from the group CaO, CaS, a mixture of CaO and CaS, and coke, at least part of the non-magnetic fraction being recycled in the form of particles after separation of sulphur content therefrom.

4,098,605
FERROMAGNETIC PALLADIUM ALLOYS

Daniel Andrew Nepela, Saratoga; Donald Winston Rice, San Jose, and James Carr Suits, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1976, Ser. No. 736,601
Int. Cl.² C22C *38/08, 5/04, 19/03*

U.S. Cl. 75—122 **3 Claims**

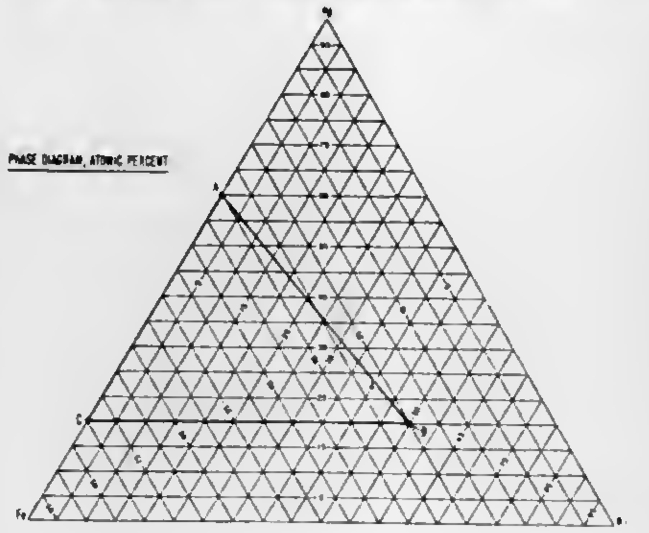
1. An improved corrosion resistant ferromagnetic film composition containing palladium adapted to provide a magnetization (4πM) of at least about 9.61 KG and a corrosion rate of not more than about 1.7 A°/hour consisting essentially of:

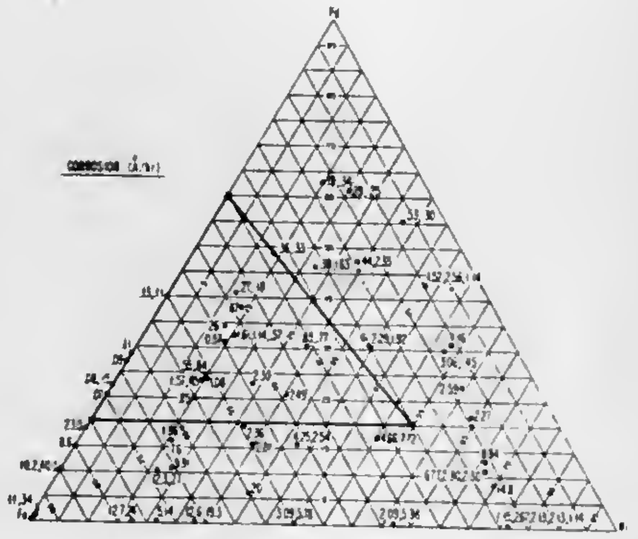
$Ni_zFe_yPd_x$

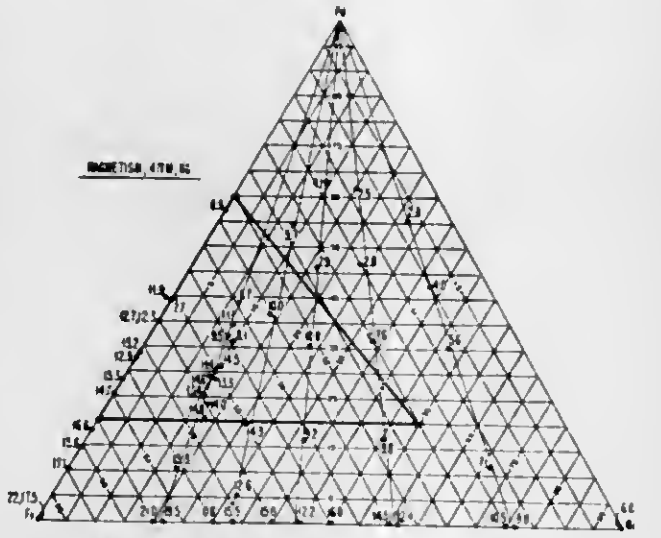
where

x = 20 to 65 atomic percent

y = the lower limit is a value along line AB in FIG. 1 (25 to 35%) and the upper limit is 80 atomic percent.







z = 0.1 to 55 atomic percent
$x+y \leqq$ 99.9 atomic percent.

4,098,606
ELECTROCHEMICALLY ACTIVE ALUMINIUM ALLOY, THE METHOD OF ITS PREPARATION AND USE

Aleksandar R. Despic; Dragutin M. Drazic, and Purenovic M. Milovan, all of Belgrade, Yugoslavia, assignors to Institut Tehnickih Nauka Sanu, Belgrade, Yugoslavia

Filed Dec. 1, 1975, Ser. No. 636,358
Claims priority, application Yugoslavia, Feb. 20, 1975, 405/75
Int. Cl.² C22C *21/00*

U.S. Cl. 75—138 **3 Claims**

1. The electrochemically active alloy of aluminum in which the alloy consists of, by weight percentage, from 0.01% to 0.5% of gallium, from 0.01% to 0.5% of indium and 0.01% to 0.5% of thallium, with the balance being aluminum with incidental impurities.

4,098,607
18% NI-MO-CO MARAGING STEEL HAVING IMPROVED TOUGHNESS AND ITS METHOD OF MANUFACTURE

Fortunato J. Rizzitano, Needham, Mass., and Ernest P. Abrahamson, II, Chebeague Island, Me., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 4, 1976, Ser. No. 738,797
Int. Cl.² B22F *3/00*

U.S. Cl. 75—243 **9 Claims**

1. A process for producing an 18% Ni-Mo-Co maraging steel alloy of improved toughness which comprises blending smooth surfaced particles of 18% Ni-Mo-Co maraging steel alloy, compacting said particles, consolidating said particles at the recrystallization temperature of said steel alloy particles in the range of 1625°–1675° F to form a consolidated product and aging said consolidated product.

9. An 18% Ni-Mo-Co maraging steel alloy having a Charpy V-Notch toughness of 23 ft.-lbs., an ultimate tensile strength of 282 ksi and having a normal fine grain fracture on the Charpy specimens.

4,098,608
METAL POWDER COMPOSITIONS

Michael Thomas Matty, Stratford upon Avon, and Philip James Ridout, Chipping Campden, both of England, assignors to B.S.A. Sintered Components Limited, Birmingham, England

Filed Nov. 8, 1976, Ser. No. 739,952
Claims priority, application United Kingdom, Nov. 12, 1975, 46670/75
Int. Cl.² C22C *1/05*

U.S. Cl. 75—251 **10 Claims**

1. In a mixture of metal powders from which ferrous alloy articles may be made by the process of powder metallurgy, the mixture consisting of the following in percentages by weight:

Nickel	0.5 to 4%
Manganese	0.5 to 6%
Carbon (graphite)	0.05 to 1.5%
Copper, if present	Up to 5%
Boron, if present	Up to 0.4%
Iron and usual impurities	Balance to 100%

the improvement consisting in that the nickel and manganese are in the form of a powdered binary alloy having a nickel to manganese ratio by weight in the range 15 : 85 to 65 : 35 and all of said powdered alloy passes through a 400 mesh B.S.S. sieve.

4,098,609
METHOD OF MAKING IMPROVED PHOTOCONDUCTIVE PARTICLES

Daniel R. Logue, Upland, and Terry G. Anderson, Pasadena, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 594,150, Jul. 7, 1975, Pat. No. 4,043,813, which is a continuation of Ser. No. 367,668, Jun. 6, 1973, abandoned. This application Jun. 10, 1977, Ser. No. 805,260
Int. Cl.² G03G *5/08, 5/04*

U.S. Cl. 96—1.8 **8 Claims**

1. A method providing improved photoconductive particles having panchromatic light sensitivity and improved resistance to spectral response shift upon repeated exposure to light, which method comprises:

substantially uniformly dispersing zinc oxide particles in a liquid medium;

chemically depositing a sensitizer compound on said dispersed particles while in said medium, said sensitizer compound comprising a compound selected from the group consisting of cadmium selenide, cadmium telluride, zinc selenide, zinc telluride, mercuric selenide and mercuric telluride, said sensitizer compound being deposited so as to be present in a concentration of at least about 0.5% and not in excess of 10% by weight of the total concentration of zinc oxide plus sensitizer compound as a surface deposit on and strongly adhered to the surface of said zinc oxide particles in the form of substantially discontinuous islands on each said particle, said islands having an average thickness of between about 100 and 500 Angstroms, and

separating said zinc oxide particles containing said sensitizer compound deposited thereon from said medium.

4,098,610
BIOCIDAL GLASS ADDITIVE FOR MARINE PAINTS

Dale R. Wexell, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 23, 1977, Ser. No. 799,189
Int. Cl.² C03C *3/04, 3/14, 3/30;* **C09D** *5/14*

U.S. Cl. 106—47 R **3 Claims**

1. Finely divided particles of glass suitable as a biocidal additive to coating subjected to marine environments exhibiting a rate of solution in sea water such that biocidal metal ions are released at a rate of at least 10 mg/m² of surface area/day, said glass having a composition selected from the groups consisting of SiO_2-based glasses and B_2O_3-based glasses,

said SiO_2-based glasses consisting essentially, as expressed in weight percent on the oxide basis, of about 30–65% SiO_2, 10–25% R_2O, wherein R_2O consists of 0–25% Na_2O, 0–25% K_2O, and 0–10% Li_2O, 0–15% BaO, and 0–50% CuO + ZnO + SnO_2 consisting of 0–50% CuO, 0–35% ZnO, and 0–20% SnO_2, the copper reported as CuO being present in the glass as Cu^+ ions, at least 10% CuO being present unless the sum of ZnO + SnO_2 exceeds about 30%, and

said B_2O_3-based glass consisting essentially, as expressed in weight percent on the oxide basis, of about 40–65% B_2O_3, 5–15% Al_2O_3, 0–15% R_2O, wherein R_2O consists of 0–15% Na_2O, 0–15% K_2O, and 0–10% Li_2O, 0–15% BaO, and 30–50% ZnO + SnO_2 consisting of 10–35% ZnO and 0–20% SnO_2.

4,098,611
SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 637,351, Dec. 3, 1975, Pat. No. 4,038,091, which is a division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, Apr. 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974, Pat. No. 3,967,973, which is a continuation of said Ser. No. 246,316. This application Jun. 27, 1977, Ser. No. 810,554
Int. Cl.² C03C *3/10, 3/12*

U.S. Cl. 106—53 **6 Claims**

1. In a PbO containing sealing glass frit for sealing two glass surfaces together, the improvement wherein said sealing glass frit contains an inorganic nitrate, having a melting point lower than the firing temperature of the PbO containing sealing glass and a thermal decomposition temperature higher than the firing temperature of the PbO containing sealing glass, in a powder form and in an amount sufficient to prevent reduction of the PbO in said sealing glass during sealing in the presence of said reducing condition, and wherein said inorganic nitrate is compatible with the fired sealing glass, said inorganic nitrate being selected from the group consisting of $LiNO_3$ and $AgNO_3$.

4,098,612

TRANSPARENT YTTRIA CERAMICS AND METHOD FOR PRODUCING SAME

William H. Rhodes, Lexington, and F. Joseph Reid, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 11, 1977, Ser. No. 814,342
Int. Cl.² C04B *35/50*

U.S. Cl. 106—73.2 **2 Claims**

1. An article of manufacture comprising a substantially transparent, high density polycrystalline yttria-based body consisting essentially of yttria and from about 0.01 to 5 wt. % alumina.

4,098,613

BASIC OIL WELL CEMENT

Sam Maravilla, Thornton Township, Cook County, Ill., and Stewart W. Tresouthick, North Township, Lake County, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1977, Ser. No. 763,444
Int. Cl.² C04B *7/35*

U.S. Cl. 106—89 **10 Claims**

1. Hydraulic cement useful in oil well cementing comprising
(a) cement clinker of a composition comprising from 45% to 68% tricalcium silicate (C_3S) and from 0 to 8% tricalcium aluminate (C_3A), and
(b) from about 2.0 to about 4.0% sulfur trioxide (SO_3) by weight of cement, said sulfur trioxide present in calcium sulfate hemihydrate and insoluble calcium sulfate anhydrite in a ratio of from about 20:80 to 45:55.

4,098,614

HYDRAULIC CEMENT MIXES AND PROCESS FOR IMPROVING HYDRAULIC CEMENT MIXES

James A. Ray, Mantua, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 21, 1977, Ser. No. 789,496
Int. Cl.² C04B *7/35*

U.S. Cl. 106—90 **20 Claims**

1. A hydraulic cement mix including hydraulic cement, aggregate, sufficient water to effect hydraulic setting of the cement, and an additive comprising glycerophosphoric acid or a salt of glycerophosphoric acid, said additive being present in an amount sufficient to increase the strength of the mix when hardened.

4,098,615

METHOD OF MANUFACTURING A RESIN-LIKE MATERIAL BY CROSSLINKING A SACCHARIDE-CONTAINING SUBSTANCE WITH GLYOXAL AND CONTROLLING THE REACTION BY THE USE OF AN ALKALI HALIDE

Robert G. Cummisford, Brookfield; Richard J. Wasielewski, Milwaukee, and Robert K. Krueger, Sheboygan, all of Wis., assignors to Krause Milling Company, Milwaukee, Wis.

Division of Ser. No. 551,882, Feb. 21, 1975, Pat. No. 4,013,629. This application Nov. 12, 1976, Ser. No. 741,571
Int. Cl.² C08L *1/00*

U.S. Cl. 106—162 **6 Claims**

1. A method of manufacturing a resinlike material suitable for formed articles comprising mixing a filler material and a heat-accelerated curable binder system wherein the binder system is produced by the following steps:
(a) crosslinking a saccharide-containing substance with glyoxal in water;
(b) controlling, by accelerating or retarding, the rate of the crosslinking reaction by the use of an alkali halide selected from the group comprising KCl, KBr, NaCl, and the reaction being at such a temperature and pressure relationship as to maintain liquid condition during the reaction; and said method including the following steps;
(c) dissolving or dispersing the alkali halide, saccharide-containing substance and glyoxal in water;
(d) dispersing fillers, extenders and pigments in the mixture referred to in (a) in an amount up to 80%;
(e) causing the mixture to react by the application of heat; and
(f) removing moisture from the reacted mixture.

4. The method claimed in claim 1 wherein the mixture used in parts (a) and (b) is within the limits of 15-95% water, 5-50% saccharide substance, 1-25% glyoxal, and 1-25% salt.

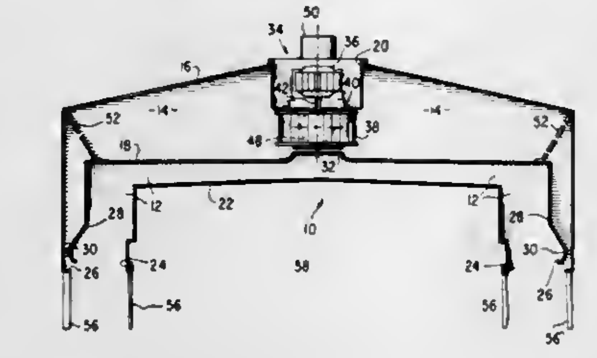
4,098,616

RECIRCULATING DISHWASHER HOOD

John Dorius, Glendale, and Daniel Moriarty, Burbank, both of Calif., assignors to Elsters, Inc., Hollywood, Calif.

Filed Mar. 7, 1977, Ser. No. 774,769
Int. Cl.² B08B *7/00;* **B67C** *1/100*

U.S. Cl. 134—25 A **6 Claims**



1. A recirculating exhaust hood for use with a dishwashing apparatus comprising:
an exhaust duct;
a first plenum communicating with said dishwashing apparatus through an inlet port, said first plenum for removing air from said dishwashing apparatus;
a second plenum communicating with said dishwashing apparatus through an outlet port, said plenum for delivering air to said dishwashing apparatus; and
means for recirculating air from said dishwashing apparatus, through said first plenum to said second plenum and back to said dishwashing apparatus, a portion of air drawn from said first plenum being exhausted to the external environmental through said exhaust duct by said means for recirculating air, said means coupled to said first and second plenum and said exhaust duct
wherein the means for recirculating air is a rotary fan assembly having an inlet coupled to said first plenum, a first outlet coupled to said second plenum and a second outlet coupled to said exhaust duct,
said rotary fan assembly having an internal intake region coupled to said first plenum and having a first sector of its output periphery circumscribed by said second plenum and a second sector of its output periphery circumscribed by said exhaust duct,
and wherein said rotary fan assembly is disposed within said second plenum, said second plenum providing a housing for said rotary fan assembly, and a sector of the output periphery of said rotary fan assembly is juxtapositioned next to the inlet port of said exhaust duct.

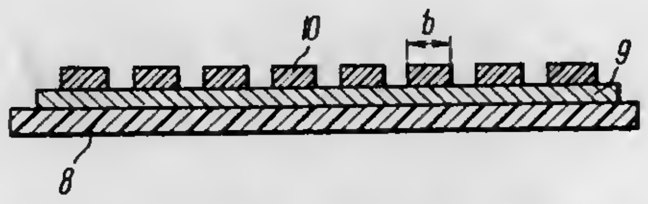
4,098,617

METHOD OF MANUFACTURING FILM THERMOPILE

Nikolai Stepanovich Lidorenko, 3 Mytischinskaya ulitsa, 14-a, kv. 127; Nikolai Vasilievich Kolomoets, ulitsa Kastanaevskaya, 61, kv. 22; Zinovy Moiseevich Dashevsky, ulitsa Marxa-Engelsa, 15, kv. 52; Vladimir Isaakovich Granovsky, ulitsa Bazhova, 15, kor. 1, kv. 84; Elena Alexandrovna Zhemchuzhina, ulitsa Raspletina, 4, kor. 3, kv. 85; Lev Nikolaevich Chernousov, ulitsa Tsentralnaya, 13, kv. 47; Igor Aronovich Shmidt, Leningradsky prospekt, 24, kv. 41; Ljudmila Alexeevna Nikolashina, ulitsa Kukhmisterova, 3, kor. 2, kv. 103; David Mendeleevich Gelfgat, ulitsa Nagornaya, 49, kor. 18, kv. 58, and Igor Vladimirovich Sgibnev, Frunzensky val, 38, kv. 6, all of Moscow, U.S.S.R.

Filed Sep. 23, 1975, Ser. No. 615,845
Int. Cl.² H01L *21/00, 35/16*

U.S. Cl. 148—1.5 **3 Claims**



1. A method of manufacturing a film thermopile having N-type and P-type arms, comprising the steps of:
depositing a film of a thermoelectric semiconductor material which is an N-type solid solution containing Bi_2Te_3 and Sb_2Te_3 on a substrate; and
processing said substrate in an inert medium by heating portions of the film, corresponding to the desired N-type arms, to a temperature of not above 300° C, thereby forming said n-type arms and simultaneously heating other areas of the film, which correspond to the desired P-type arms, to a temperature of not less than 350° C. thereby forming said p-type arms.

4,098,618

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES IN WHICH OXIDE REGIONS ARE FORMED BY AN OXIDATION MASK DISPOSED DIRECTLY ON A SUBSTRATE DAMAGED BY ION IMPLANTATION

Billy Lee Crowder, Putnam Valley; William Ralph Hunter, and Douglas William Ormond, Jr., both of Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,182
Int. Cl.² H01L *21/265, 21/76*

U.S. Cl. 148—1.5 **6 Claims**

1. A method of fabricating a semiconductor device comprising the steps of:
providing a semiconductor substrate,
ion implanting a surface of said semiconductor substrate to damage said surface to produce a dense dislocation network array layer,
providing a nitride oxidation mask layer directly on said damaged substrate surface,
patterning said nitride mask layer to form openings at the areas where it is desired to inset oxide,

FIG. 2A

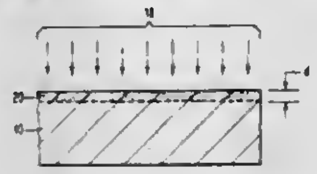


FIG. 2B

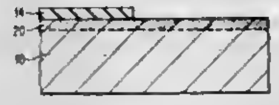


FIG. 2C

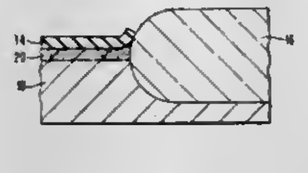
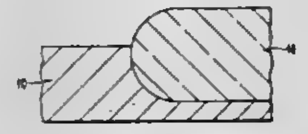


FIG. 2D



oxidizing said semiconductor substrate until an inset oxide is formed in the areas of said openings,
and removing said nitride oxidation mask.

4,098,619

ARCHITECTURAL ALUMINUM ALLOY SHEET AND METHOD THEREFOR

Edmund C. Franz, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 12, 1976, Ser. No. 657,444
Int. Cl.² C22F *1/04*

U.S. Cl. 148—2 **4 Claims**

1. In the production of an improved aluminum alloy sheet, the steps comprising:
(a) providing a body of an aluminum base alloy consisting essentially of, by weight, 0.40 to 0.60% Si, 0.20 to 0.40% Fe, 0.30 to 0.60% Mn, the balance essentially aluminum and incidental elements and impurities in an amount insufficient to render said alloy temper sensitive to anodizing;
(b) heating said body for a period of 4 to 24 hours at a temperature in the range of 950° to 1125° F;
(c) rolling said body to said sheet at a temperature in the range of 750° to 850° F; and
(d) anodizing said sheet in an electrolyte of organic and inorganic acids, the sheet characterized by being temper insensitive to said anodizing.

4,098,620

COMPOSITE COATING OF ENHANCED RESISTANCE TO ATTACK

Tatsuo Sato, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jun. 20, 1977, Ser. No. 807,785
Int. Cl.² B05D *1/38, 3/02, 7/14;* **B32B** *15/08*

U.S. Cl. 148—6.2 **6 Claims**

1. The method of preparing a chemical and corrosion resistant coated metal substrate which method comprises:
(1) establishing on the surface of said substrate an undercoating containing from about 50 to about 5,000 milligrams per square foot of coated substrate of pulverulent metal in intimate mixture with a substantially resin-free hexavalent chromium-containing coating composition containing a hexavalent-chromium-providing substance and reducing agent therefor in liquid medium, said composition being present in an amount sufficient to provide said coating

with from about 5 to about 500 milligrams per square foot of coated substrate of chromium;

(2) drying the resulting undercoated substrate at a temperature and for a period of time sufficient to vaporize volatile substituents from said coating composition, but insufficient to provide a water-resistant undercoating having substantial orientation of the hexavalent chromium towards reduction;

(3) applying on the dry undercoating a topcoat composition comprising hydroxyl-containing resin, particulate, electrically conductive pigment, and less than about 5%, basis total topcoat composition weight, of isocyanate adduct capable of unblocking at a temperature above about 350° F.; and

(4) heating the resulting coated article at a temperature above 350° F. and for a period of time sufficient to: (a) orient at least a portion of the undercoating hexavalent chromium toward reduction; commensurate with, (b) unblocking the isocyanate adduct and providing cross-linking reaction of resulting isocyanate with topcoat resin.

4,098,621

SOLDERING FLUXES

Rudolf Siegfried Strauss, and Peter David Teitz, both of London, England, assignors to Fry's Metals Limited, England

Filed May 9, 1977, Ser. No. 795,011

Claims priority, application United Kingdom, May 27, 1976, 22100/76

Int. Cl.^{2} B23K *35/34*

U.S. Cl. 148—23 **3 Claims**

1. A soldering flux which comprises an aqueous solution containing a mixture of 25–75% by weight of diethanolamine hydrobromide and 75–25% by weight of ethylamine hydrobromide.

4,098,622

EARTH-WORKING IMPLEMENT

Theodore M. Clarke, Western Springs, and Gordon H. Walter, Darien, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 14, 1976, Ser. No. 686,616

Int. Cl.^{2} C22C *38/00*

U.S. Cl. 148—36 **8 Claims**

1. A heat treated, straight rolled steel, earth-working implement disk having a carbon content of at least 0.65% and being substantially free of pearlitic microstructure, said disk having a sulphur content not exceeding a maximum of about 0.025%, a hardness in the range of approximately Rockwell "C" - 35 to 46, said disk containing a sulfide inclusion shape control agent selected from the group consisting of rare earth, Mischmetal and calcium containing additives, said shape control agent being present in an amount sufficient to render at least 40% of the retained sulfide inclusions globular in shape.

4,098,623

METHOD FOR HEAT TREATMENT OF TITANIUM ALLOY

Yoshiro Ibaraki; Akihiko Yamamoto, both of Niihari, and Toshimi Sasaki, Abiko, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 27, 1976, Ser. No. 709,119

Claims priority, application Japan, Aug. 1, 1975, 50-93100; Aug. 13, 1975, 50-97660

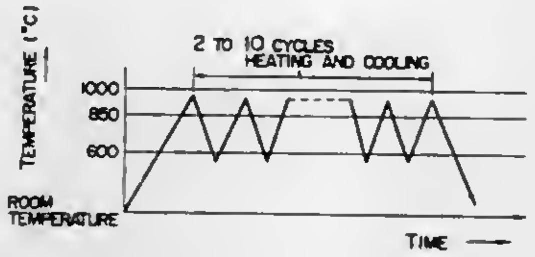
Int. Cl.^{2} C21D *1/00*

U.S. Cl. 148—133 **10 Claims**

1. A method of heat treating a wrought titanium alloy having an abnormal structure that is an α' single phase of the type depicted in FIG. *1a*, which comprises:

(1) subjecting the wrought titanium alloy, in a neutral atmosphere to from 2 to 10 cycles of heating and cooling, each cycle after the first cycle being in immediate succession to the preceding cycle, the titanium alloy being heated to a temperature ranging from 850° C to 1000° C and being cooled to a temperature ranging from room temperature to 600° C in each cycle, and then;

(2) when, at the end of all successive cycles, the temperature of the alloy is above room temperature, cooling the alloy to room temperature, the cycles being selected to yield a normal structure that is an α structure or $\alpha + \beta$ structure of the type depicted in FIG. *1b* having improved material characteristics.



4,098,624

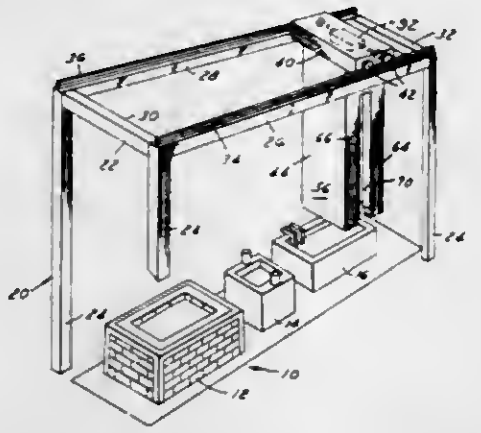
PROCESS FOR INCREASING THE VERSATILITY OF ISOTHERMAL TRANSFORMATION

W. James Laird, Jr., Sterling Heights, Mich., assignor to Upton Industries, Inc., Roseville, Mich.

Filed Dec. 28, 1976, Ser. No. 754,921

Int. Cl.^{2} C21D *1/18*; C22F *1/04, 1/18*

U.S. Cl. 148—153 **30 Claims**



1. In a method of heat treating a metal workpiece of a character such that the time-temperature-transformation or T-T-T diagram defines an isothermal transformation curve in which the nose of the curve is so closely adjacent the ordinate of the T-T-T diagram as to require entry of the workpiece into a cooling medium at a temperature which is substantially at least the solution treating transformation temperature, the steps of: heating the metal workpiece at a heating station to a temperature above the solution treating transformation temperature of the metal workpiece and holding said temperature until the workpiece is formed into a homogeneous solid solution; removing the workpiece from the heating station and immediately enclosing the workpiece in a generally closed container; transporting the container enclosing the workpiece to a cooling station while maintaining the temperature of the workpiece in the container above the solution treating transformation temperature during the period of time required to physically transport the container and the workpiece therein from the heating station to said cooling station; removing the workpiece from the container and immediately inserting the workpiece which still has a temperature above the solution treating transformation temperature into the cooling station; at said cooling station isothermally transforming the workpiece by cooling the workpiece to the desired mixed solids; and thereafter removing the workpiece from the cooling station.

4,098,625

EXPLOSIVE COMPOSITIONS BONDED WITH FLUOROCARBON POLYMERS

John W. French, and Judson B. Eldridge, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1968, Ser. No. 727,743

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.3 **9 Claims**

1. A plastic bonded explosive comprising a high explosive selected from the group consisting of trinitrotrimethylenetriamine, cyclotetramethylenetetranitramine and mixtures thereof and a fluorocarbon formulation consisting essentially of a copolymer of vinylidene fluoride and hexafluoropropylene in intimate admixture with polytetrafluoroethylene.

4,098,626

HYDROXY TERMINATED POLYBUTADIENE BASED POLYURETHANE BOUND PROPELLANT GRAINS

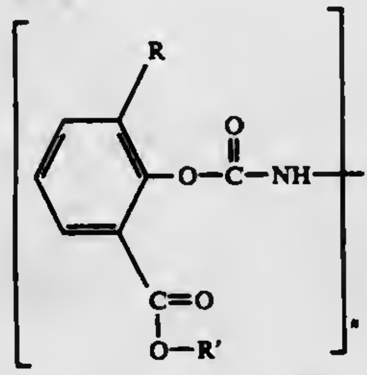
William Hardin Graham, and Inella Gatlin Shepard, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 15, 1976, Ser. No. 741,591

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.4 **2 Claims**

1. A cured hydroxy terminated polybutadiene based polyurethane bound propellant grain wherein the binder and plasticizer comprise the reaction products of a hydroxy terminated polybutadiene and the dissociation products of a compound of the formula:



wherein X is an $n + m$ valent organic radical; R is hydrogen or lower alkyl of from 1 to about 10 carbon atoms; R' is lower alkyl of from 1 to about 10 carbon atoms or carbocyclic aryl of from 6 to about 10 carbon atoms; n is on the average at least 1; m is 0 or 1; and n and m must be at least 2.

4,098,627

SOLVOLYTIC DEGRADATION OF PYROTECHNIC MATERIALS CONTAINING CROSSLINKED POLYMERS

Albert S. Tompa, Indian Head, Md.; David M. French, Alexandria, Va.; George B. Butler, Gainesville, Fla., and Melvin S. Kaufman, Augusta, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1976, Ser. No. 750,990

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—109.6 **22 Claims**

1. A method of decomposing pyrotechnic materials having a chemically crosslinked polymeric binder component, which comprises;

placing said pyrotechnic material into a liquid active hydrogen containing compound selected from the group consisting of primary amines, secondary amines, ammonia, mineral acids, alcohols, water and mixtures thereof;

heating said pyrotechnic material and said liquid active hydrogen containing compound to a temperature between about 50° C and about 160° C;

reacting said liquid active hydrogen containing compound with said chemically crosslinked polymeric binder component; and

cleaving the chemical bonds in said chemically crosslinked polymeric binder component.

4,098,628

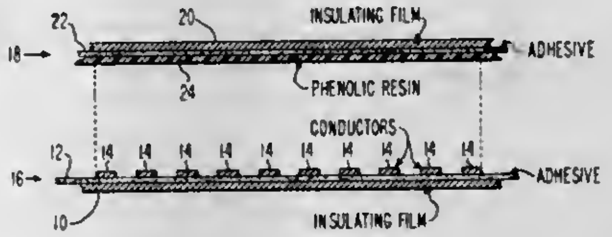
METHOD OF LAMINATING A COVER LAYER FOR FLEXIBLE CIRCUITS

Tommy L. Walton, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 608,457, Aug. 28, 1975, Pat. No. 4,075,420. This application Sep. 27, 1976, Ser. No. 726,800

Int. Cl.^{2} H01B *13/06*

U.S. Cl. 156—52 **2 Claims**



1. In a method of making an encapsulated flexible circuit having a plurality of spaced conductors affixed to a flexible substrate by a first thermosetting adhesive layer, the improvement comprising:

placing an insulating film with a second thermosetting adhesive layer on one surface thereof onto a sheet of phenolic resin adhesive with said second thermosetting adhesive layer in contact with said phenolic adhesive to form a tri-layered cover layer;

placing said tri-layered cover layer onto said flexible substrate to cover said conductors with said phenolic adhesive adjacent to said conductors; and

laminating said tri-layered cover layer to the flexible substrate thereby encapsulating said conductors with said phenolic resin adhesive being between said first and second thermosetting adhesive layers so as to inhibit the outgasing of said phenolic resin and reduce the thermoplastic characteristics of said phenolic resin so that it can withstand extremely high pressures and temperatures.

4,098,629

PROCESS FOR MAKING SOUND INSULATION COMPONENTS

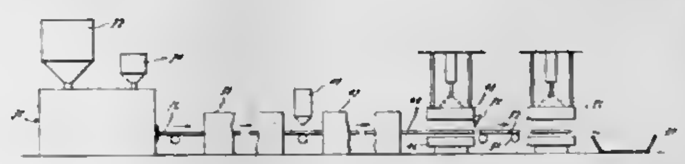
Edward G. Goldstone, Huntington Woods, Mich., assignor to Allen Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 673,737, Apr. 5, 1976, Pat. No. 4,035,215. This application May 26, 1977, Ser. No. 800,787

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—87 **32 Claims**



1. A process for making a composite contoured and embossed sound insulating panel which comprises the steps of forming a fibrous pad of substantially uniform density and thickness and impregnated with a controlled amount of a heat curable thermosetting binder and a heat softenable thermoplastic binder distributed therethrough, heating the impregnated said pad to an elevated temperature for a period of time sufficient to effect at least a partial curing of said thermosetting binder and a heat softening of said thermoplastic binder to bond the fibers of said pad together into an integral mass,

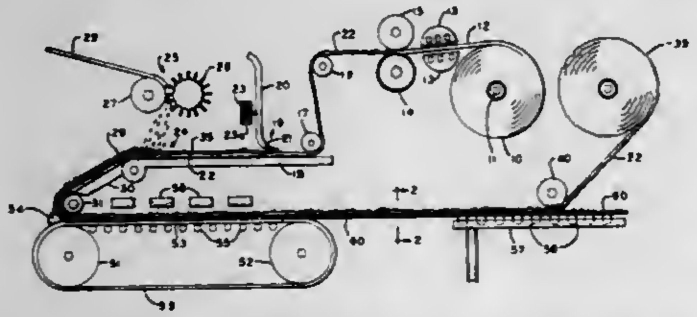
applying a dense liquid vinyl plastisol coating to at least one face surface of said pad, heating the coated said pad to an elevated temperature for a period of time sufficient to effect a fusion of said coating into an integral heat softened layer and a further curing of said thermosetting binder and a heat softening of said thermoplastic binder, positioning the heated said pad with said layer and said thermoplastic binder in a heat softened condition between contoured mold surfaces, cooling said contoured mold surfaces to a temperature below that at which a rigidification of said layer and said thermoplastic binder occurs, partially compressing said pad between said mold surfaces and applying fluid pressure against the inner surface of said layer of a magnitude greater than the fluid pressure at the mold surface against which the outer surface of said layer is disposed to obtain intimate contact therebetween and to impart a preselected contour to said pad and localized embossments therein and to apply a desired surface finish to said layer and simultaneously cooling said pad to effect a rigidification of said thermoplastic binder and said layer to retain the composite pad in said preselected contour incorporating said localized embossments therein, and thereafter discontinuing the application of the fluid pressure and extracting the cooled rigidified shape-retaining said composite pad.

4,098,630

PROCESS FOR MAKING DECORATIVE RESIN PANELS

Donald B. Morse, Joliet, Ill., assignor to Kemlite Corporation, Joliet, Ill.

Filed Aug. 4, 1976, Ser. No. 711,576
Int. Cl.² B32B *31/00*
U.S. Cl. 156—219 **9 Claims**



1. A process for making a glass fiber reinforced resin panel comprising embossing a film of polyoxyethyleneoxyterephthaloyl, depositing a liquid thermosetting resin on the embossed film to form a resin layer thereon, depositing glass fibers on said resin to form a laminated structure of glass fibers, resin and embossed polyoxyethyleneoxyterephthaloyl, passing said structure through the nip of a pair of spaced rolls to press said fibers into said resin and to press said resin against said embossed film, and heating said pressed structure to thereby cure said resin.

4,098,631

METHOD FOR MANUFACTURING A COMPLIANT ROLLER FOR USE IN AN ELECTROGRAPHIC APPARATUS

Walter Anthony Stryjewski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,365
Int. Cl.² B29D *3/00;* B29H *3/08*
U.S. Cl. 156—221 **10 Claims**

1. A method for producing a compliant roller for use in an electrographic apparatus comprising the steps of:

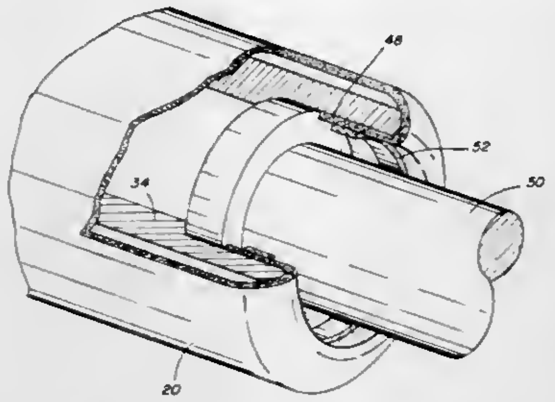
(a) disposing substantially the entire length of a shrinkable cylindrical sleeve about a cylindrical mandrel and shrinking said sleeve onto said mandrel, thereby forming a shrunken sleeve of uniform diameter;

(b) removing said shrunken sleeve from the mandrel and placing the shrunken sleeve about an inner surface of a mold defining a mold cavity;

(c) centering a rigid roller core in said mold cavity in spaced relation to the interior of said shrunken sleeve, said core having an outer diameter such that a cavity is provided between said core and said shrunken sleeve;

(d) filling said cavity between said core and said shrunken sleeve with an elastomer material, thereby expanding said shrunken sleeve against said mold defining said cavity; and

(e) hardening said elastomer material, thereby forming said roller.

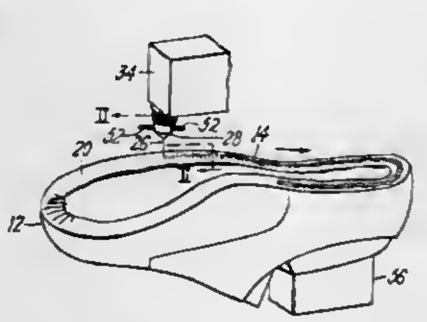


4,098,632

ADHESIVE PROCESS

Gordon V. Sprague, Jr., Danvers, Mass., assignor to USM Corporation, Farmington, Conn.

Division of Ser. No. 618,484, Oct. 1, 1975, Pat. No. 4,031,854, which is a division of Ser. No. 417,352, Nov. 19, 1973, Pat. No. 3,911,173, which is a continuation-in-part of Ser. No. 329,362, Feb. 5, 1973, abandoned. This application Dec. 9, 1976, Ser. No. 748,963
Int. Cl.² B29D *7/02*
U.S. Cl. 156—295 **11 Claims**



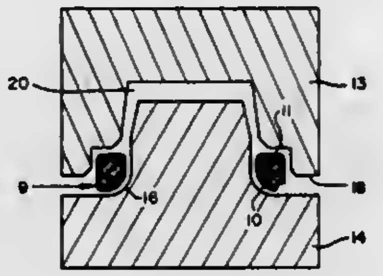
1. The process of bonding the attaching surfaces of two bodies in which adhesive is applied to the attaching surface of one of said bodies by a nozzle extruding viscous fluid adhesive as a filament from a point spaced from said one attaching surface comprising the steps of moving said one attaching surface in a path to receive the filament while the filament is still soft and adhesive, while applying a gaseous jet adjacent said point of extrusion to act on said filament to attenuate it and to impart a circular motion to said filament, said jet having one component of movement in the direction of said one attaching surface and a rotational component about an axis corresponding to the direction of said one component to form a band of overlapping loops of said filament directly on the attaching surface, assemblying the bodies with a band of adhesive between the attaching surfaces, applying pressure to bring said adhesive into wetting adhesive engagement with both surfaces and hardening said adhesive.

4,098,633

METHOD OF MAKING RADIATION SEAL

Gerard M. Kersten, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 762,084
Int. Cl.² B29H *3/00*
U.S. Cl. 156—245 **3 Claims**



1. In the process of manufacture of an electromagnetic radiation seal wherein a strip of elastomeric material is surrounded by a tube of woven metal fibers and formed into a roughly toroidal shape, the improvement comprising;

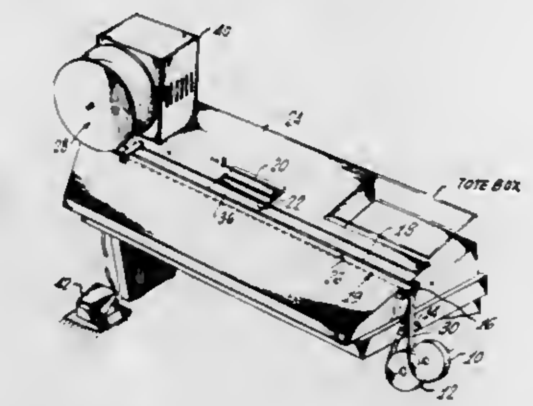
confining the roughly formed toroidal seal in a mold having the desired finished shape and size so as to form a gasket and mold assembly;
beating the gasket and mold assembly to about 350° F;
cooling the assembly to about 70° F; and
removing the seal from the mold.

4,098,634

REPRINT FILM CARRIER

John N. Harman, Glendale, Calif., assignor to Drewry Photocolor Corporation, Burbank, Calif.

Filed Mar. 24, 1977, Ser. No. 780,609
Int. Cl.² B32B *31/00;* B31F *5/00*
U.S. Cl. 156—302 **4 Claims**



1. Apparatus for assembling a plurality of individual film strip portions into a continuous film strip, comprising:

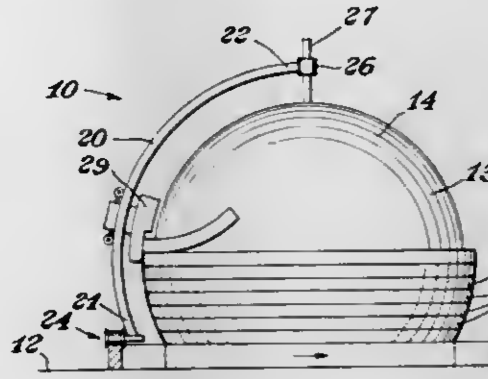
a source of a substantially continuous web of flexible material;
a source of substantially continuous adhesive tape;
means for joining said web and said adhesive tape along their longitudinal edges to form a film carrier having an adhesive stripe along one edge of said web;
film gate means for receiving said film carrier in successive stationary sections for assembling film strip portions on each successive section in turn;
indexing edge means for indexing said film strip portions within said film gate means;
film carrier positioning means for positioning said carrier with respect to said indexing edge within said film gate means whereby said film strip portions may be affixed to said film carrier by means of said adhesive stripe, take up means for accepting said successive film carrier sections and affixed film strip portions as a continuous film strip.

4,098,635

APPARATUS FOR INSULATION OF STRUCTURES

Robert A. Hay, II, Midland, and Edward V. Dettmer, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 302,837, Nov. 1, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,422
Int. Cl.² B29H *7/00;* E04B *1/32;* B29J *1/00*
U.S. Cl. 156—445 **7 Claims**



1. In an apparatus for the deposition of thermal insulation to a body, the apparatus comprising

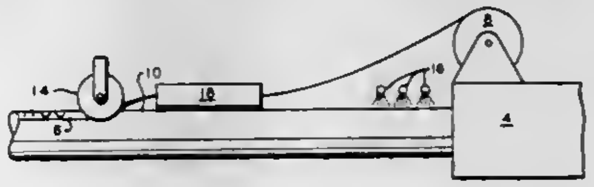
a foam depositing head, the foam depositing head adapted to be moveably supported on a moveable support means, the foam depositing means being selectively positionable at a location on the moveable support means, the moveable support means travels in a predetermined path and maintains the foam depositing head a generally fixed distance from the surface of a body to be insulated, the foam depositing head comprising in cooperative combination,
a first frame adapted to be moveably supported on a support means, the first frame having supported thereon
a second frame, the second frame being connected to the first frame by
a second frame positioning means to position the first and second frames relative to one another, the positioning being done in generally parallel planes, the second frame supporting
a third frame, the third frame being adjustably mounted on the second frame to permit positioning of the third frame in a non-parallel planar relationship to the second frame,
a fourth frame slidably mounted on the third frame and
means to selectively position the fourth frame on the third frame, the fourth frame having disposed thereon
means to deposit thermal insulation.

4,098,636

ARTICLE LABELING METHOD

Henry Gabriel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 206,356, Dec. 9, 1971, Pat. No. 3,843,438. This application Aug. 12, 1974, Ser. No. 496,875
Int. Cl.² B32B *31/00;* B29B *0/00;* B29D *3/00;* B29F *1/10*
U.S. Cl. 156—498 **5 Claims**



1. Apparatus comprising:
extruder means for continuously extruding a thermoplastic article therefrom;
cooling means for solidifying the thus extruded thermoplastic article;

reheating meams for reheating and plasticizing a portion of the external surface of the thus cooled article;

means for feeding a label onto a thus-plasticized external surface of said article; and

means for embedding said label in the plasticized surface of said article.

4,098,637
PROCESS FOR THE PRODUCTION OF A PLANAR CONDUCTOR PATH SYSTEM FOR INTEGRATED SEMICONDUCTOR CIRCUITS

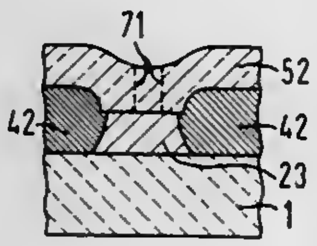
Guido Bell, Gilching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 16, 1976, Ser. No. 714,599

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539193

Int. Cl.² B23P *15/00, 25/06*

U.S. Cl. 156—644 **12 Claims**



1. Process for the production of a planar conductor path system for integrated semiconductor circuits which includes first applying a metal layer to substantially one entire surface of a base, covering the metal with a layer of masking material, removing all of the masking layer except over those areas where the conductor paths are to be, and thereafter oxidixing electrolessly in an acqueous solution the metal layer underneath the exposed surface.

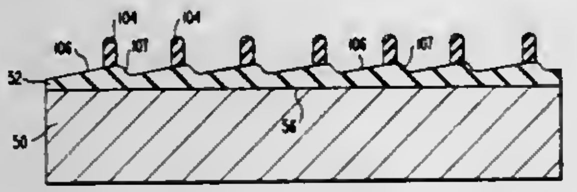
4,098,638
METHODS FOR MAKING A SLOPED INSULATOR FOR SOLID STATE DEVICES

Francis J. Kub, Glen Burnie, and Nathan Bluzer, Silver Spring, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1977, Ser. No. 806,400

Int. Cl.² H01L *21/306*

U.S. Cl. 156—657 **11 Claims**



1. A method for making an insulation layer for use in a solid state device, said insulation layer having one surface that includes first areas that are sloped with respect to the plane of another surface of said insulator layer that is oppositely disposed from said one surface, said one insulator layer surface also including second areas alternately disposed between said first areas, said method including the steps of:

depositing a layer of etching rate material on the one surface of the insulation layer, said etching rate material having a substantially higher etching rate than said insulation layer in a given etching solution,

forming channels through selected portions of said fast etching material;

forming an etch stop along a portion of the sidewalls of each of said channels in said fast etching material and over the surface of said fast etching material that is oppositely disposed from the interface of said fast etching material with said insulation layer,

etching the insulation layer in a direction normal to the plane of the another surface while simultaneously etching the edge surface of said fast etch rate material along the exposed portion of the sidewalls of said channel laterally with respect to the plane of the another surface such that the one surface of the insulation layer includes first areas that are sloped with respect to the another surface, the one surface of the insulation layer also including second areas that support said etch stops.

4,098,639
PROCESS FOR REDUCING THE REQUIREMENT OF FRESH CHEMICALS WITHOUT INCREASING EMISSIONS IN THE PULPING OF CELLULOSIC MATERIAL

Sture Erik Olof Noreus, Husum, and Lars Tage Uhlin, Ornskoldsvik, Sweden, assignors to Mo och Domajo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 696,017, Jun. 14, 1976, abandoned. This application Jul. 26, 1976, Ser. No. 708,781

Claims priority, application Sweden, Jun. 17, 1975, 7506965

Int. Cl.² D21C *11/10, 11/12*

U.S. Cl. 162—30 K **12 Claims**

1. In a process for reducing the requirement of fresh chemicals without increasing emissions in the pulping of cellulose material with alkaline sodium-and sulfur-containing sulfate pulping liquor; in which chemicals recovery comprises evaporating and burning spent sulfate pulping liquor to obtain a smelt; dissolving the resulting smelt in water to form a sodium sulfide-sodium carbonate-containing green liquor; regenerating pulping white liquor containing sodium sulfide-sodium hydroxide from said green liquor; and recirculating said regenerated white liquor to the pulping stage; the improvement which comprises oxidizing at least one of the green and white liqnors to form sodium thiosulfate therein; reacting the oxidized liquor with residual acid liquor, from the manufacture of chlorine dioxide by reduction of an alkali metal chlorate solution, at a temperature within the range from about 30° to about 130° C to convert thiosulfate to sulfur dioxide and sulfur; removing and recovering formed sulfur dioxide; and returning the residual acid liquor, freed from sulfur dioxide, to the pulping.

4,098,640
MANUFACTURE OF PAPER-LIKE AND TEXTILE-LIKE SHEETS

Bruno Sander, Ludwigshafen; Heinz Berbner, Moerlenbach; Rolf Steinberger, Schifferstadt; Eckhard Ropte, Ludwigshafen; Jenoe Kovacs, Bobenheim-Roxheim, and Joachim Kunde, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Sep. 28, 1976, Ser. No. 727,583

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543816

Int. Cl.² D21F *11/00*

U.S. Cl. 162—146 **7 Claims**

1. A process for the manufacture of paper-like and textile-like sheets, which have an initial wet strength of at least 80 g, which comprises suspending fibrids in water, and applying the suspension of said fibrids to a paper-forming machine or a wet-laid, non-woven machine to form a coherent self-supporting web of said fibrids thereon, at least a portion of said fibrids having been manufactured by dissolving a poly(amide-imide) resin in an organic solvent and introducing the resulting solution into water while at the same time exposing it to shearing forces, in which process the solution of the poly(amide-imide) resin in an organic solvent is mixed, before its introduction into water, with a liquid in a volume ratio of said solvent to said liquid of from 1:1.5 to 1:5, said liquid being a non-solvent for

the poly(amide-imide) resin but being homogeneously miscible in all proportions with water and with the organic solvent, and which liquid is selected from the group consisting of tetrahydrofurane and 1,4 dioxane, and which fibrids have a length of from 0.1 to 5 mm, a thickness of from 2 to 200 μm, a freeness of from 20 to 90° SR and a specific surface area of from 1 to 80 m²/g.

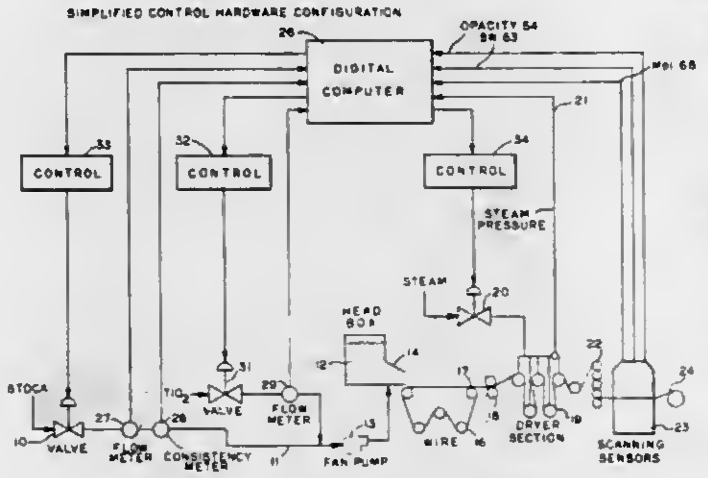
4,098,641
METHOD FOR THE ON-LINE CONTROL OF THE OPACITY OF A PAPER SHEET

Joseph M. Casey, and Erik B. Dahlin, both of Santa Clara, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 346,878, Apr. 2, 1973, abandoned. This application Sep. 25, 1974, Ser. No. 509,127

Int. Cl.² D21D *3/00;* **D21F** *7/00*

U.S. Cl. 162—198 **4 Claims**



1. A method of on-line control of opacity of a moving paper sheet which varies in basis weight and where an opacity additive also varies basis weight as well as opacity the method comprising the following steps: sensing the basis weight of said sheet material, comparing said basis weight to a basis weight target to produce a basis weight error signal, and adjusting stock flow which determines said basis weight to minimize said error signal; sensing the opacity of said paper sheet, comparing said opacity to an opacity target to produce an opacity error signal, and adjusting titanium dioxide flow which determines said opacity to minimize said opacity error signal; feeding forward said basis weight error signal to said titanium dioxide flow to hold said opacity constant while said basis weight is being changed; and feeding forward said opacity error signal to said stock flow to hold such stock flow constant while said opacity is being changed.

4,098,642
PRESSURE PULP WASHER WITH INLET PIVOT

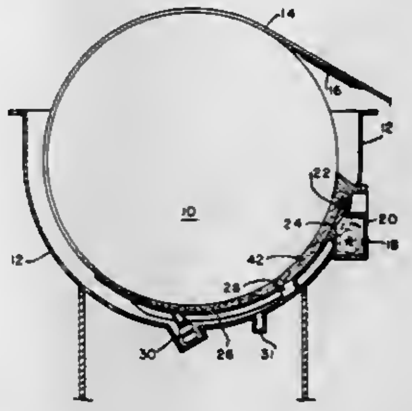
Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 18, 1977, Ser. No. 779,147

Int. Cl.² D21F *1/04, 1/60*

U.S. Cl. 162—259 **3 Claims**

1. In a pressure washer with a cylinder rotatable in a vat containing pulp slurry: a pulp slurry inlet box; at least one pivotable member pivotally mounted in the vat at the area where the pulp slurry leaves the inlet box and enters the vat, the radial inner surface of the pivotable member being spaced from the cylinder a predetermined distance, and the radial outer surface of the pivotable member being spaced from an inner surface of the vat and said radial outer surface being shaped to speed-up slurry flow between the outside of the pivotable member and the inside surface of the vat to minimize the forming of flocs and to break up any formed flocs, and means for establishing a predetermined pressure in the space between the cylinder and the radial inner surface of the pivotable member such that if fibers become stuck between said inner surface of the vat and said radial outer surface of the pivotable member, the pivotable member will automatically pivot away from said inner surface of the vat and toward the cylinder to thereby free the stuck fibers, said pivotable member automatically returning to its initial position after the pulp fibers become loosened.



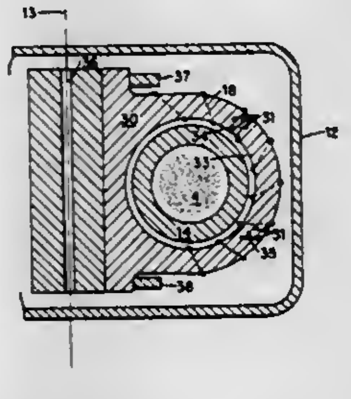
4,098,643
DUAL-FUNCTION MAGNETIC STRUCTURE FOR TOROIDAL PLASMA DEVICES

Robert L. Brown, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 486,925, Jul. 9, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,776

Int. Cl.² G21B *1/00*

U.S. Cl. 176—3 **4 Claims**



1. In a tokamak device for producing a plasma with a high ion temperature in the collisionless regime, said device including axially disposed central iron core, and a plurality of toroidal magnet coils defining a main torus, the improvement comprising a respective coil containment ring encompassing each of said torus magnet coils, each of said rings comprising a plurality of plastic coated, laminated iron sheets with alternate sheets being cut at different places so that no electrical path around the circumference of each sheet is possible, a plurality of insulated pins inserted through all of said laminations to prevent shearing apart thereof under the radial forces developed in its associated magnet coil, said laminated iron sheets starting from the center of the stack and on the side nearest the major axis of the torus being cut progressively smaller so that a wedge-like cross section is formed, all of said cross sections constituting a portion of said central iron core, a plurality of respective extra laminated iron shims positioned between each of the respective wedge-like cross sections of adjacent stacked laminations, all of said extra laminated iron shims constituting the remaining portion of said central iron core, each of said laminated iron sheets of each stack provided with a respective projection at the top and bottom thereof and extending beyond said wedge-like cross section, and respective compression rings encompassing said top and bottom projections of all of said stacked laminations, each of said stacks of laminated iron sheets serving not only as a respective magnet coil containment

ring but also as a respective magnetic return yoke for said central iron core.

4,098,644
NUCLEAR FUEL ELEMENT

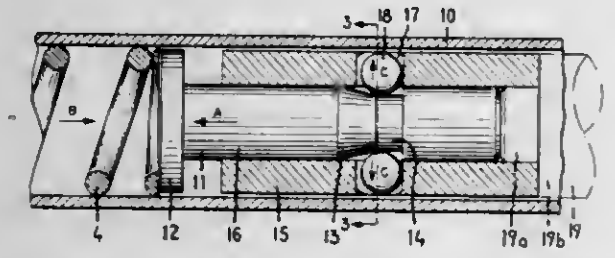
Hideo Hirama, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Feb. 24, 1977, Ser. No. 771,516

Claims priority, application Japan, Feb. 27, 1976, 51-21529

Int. Cl.^{2} G21C *3/02*

U.S. Cl. 176—68 **1 Claim**



1. A nuclear fuel element comprising: an elongated tube, upper and lower end plugs fixed to respective ends of said tube, nuclear fuel pellets disposed within said tube, a setting structure for securely setting and maintaining said pellets in position within said tube, and a spring interposed between and urging apart said pellets and said setting structure, said setting structure comprising a sleeve axially slidable in said tube and having a plurality of holes about the circumference thereof, a rod axially slidable in said sleeve and having a tapered portion thereon and having an end portion in engagement with said spring, and a plurality of balls each movably inserted in one of said holes and engageable between said tapered portion of said rod and the inner wall of said tube in response to axial sliding of said rod in a direction away from said pellets so as to releasably wedge said setting structure in place to thereby set and maintain said pellets in position within said tube.

4,098,645
IMMOBILIZATION OF PROTEINS WITH POLYURETHANE POLYMERS

Frank Joseph Hartdegen, Columbia, and Wayne Elliott Swann, Pasadena, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 660,982, Feb. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,674, Jun. 10, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 743,035

Int. Cl.^{2} C07G *7/00, 7/02*

U.S. Cl. 195—68 **24 Claims**

1. In a process for preparing an immobilized protein comprising admixing an isocyanate-capped liquid polyurethane prepolymer, the protein, and water to produce a polyurethane foam with the protein integrally bound to the polyurethane foam, the improvement comprising: (a) admixing the liquid polyurethane prepolymer and the protein in the absence of water to form a resulting solution; and (b) foaming the resulting solution by admixing it with an amount of water effective for producing foaming.

20. A method of preparing biologically active polyurethanes comprising dissolving an effective amount of a biologically active protein in an isocyanate-capped liquid urethane prepolymer in the absence of water, and allowing said protein and prepolymer to react to form a solid non-foamed product, said protein characterized as being both soluble in said prepolymer and reactive therewith to yield a solid polyurethane wherein the protein is bound to the polymer in active form.

4,098,646
METHOD OF IN VITRO CULTIVATION OF PATHOGENIC ORGANISMS OF *TREPONEMA PALLIDUM* AND MEDIUM THEREFOR

Ronald H. Jones, Melbourne Beach, Fla.; Mary A. Finn, Des Moines, Iowa; John J. Thomas, Satellite Beach, and Edward C. Folger, Melbourne, both of Fla., assignors to Florida Institute of Technology, Melbourne, Fla.

Filed Jan. 27, 1977, Ser. No. 762,920

Int. Cl.^{2} C12K *1/06*

U.S. Cl. 195—96 **28 Claims**

1. A tissue culture medium suitable for the growth of pathogenic organisms of *Treponema Pallidum* in the presence of cultured tissue cells wherein one liter of said medium comprises the solid components of:

(a) 100 ml of a balanced salt solution selected from modified Earle's balanced salt solution concentrated to between 9.5 and 17 times the standard strength and modified Hank's balanced salt solution concentrated to between 6.5 and 12.6 times standard strength,

(b) 20 ml of modified Eagle's MEM amino acid solution without glutamine concentrated to between 35 and 65 times standard strength, and

(c) 10 ml of modified Eagle's MEM vitamin solution concentrated to between 100 and 200 times standard strength

wherein the modified Earle's balanced salt solution has the following ranges of final standard strength:

	mg/l
NaCl	5557.5 - 9945
KCl	380 - 680
$NaH_2PO_4 . H_2O$	133 - 238
$MgSO_4 . 7H_2O$	190 - 340
$CaCl_2$	190 - 340
Glucose	950 - 1700

the modified Hank's balanced salt solution has the following ranges of final standard strength:

	mg/l
$CaCl_2$	91 - 176.4
KCl	260 - 504
KH_2PO_4	39 - 75.6
$MgCl_2 . 6H_2O$	65 - 126
$MgSO_4 . 7H_2O$	65 - 126
NaCl	5200 - 10,080
$NaHCO_3$	227.5 - 441
$Na_2HPO_4 . 2H_2O$	39 - 75.6
Glucose	650 - 1,260

the modified Eagle's amino acid solution without glutamine has the following ranges of final standard strength:

	mg/l
L-Arginine	73.5 - 136.5
L-Cystine	16.8 - 31.2
L-Histidine	21.7 - 40.3
L-Isoleucine	36.75 - 68.25
L-Leucine	36.68 - 68.12
L-Lysine	40.6 - 75.4
L-Methionine	10.5 - 19.5
L-Phenylalanine	22.4 - 41.6
L-Threonine	33.6 - 62.4
L-Tryptophan	7 - 13
L-Tyrosine	25.2 - 46.8
Valine	32.2 - 59.8

and the modified Eagle's MEM vitamin solution has the following ranges of final standard strength:

	mg/l
Choline Cl	1 - 2
Folic acid	1 - 2
i-Inositol	2 - 4
Nicotinamide	1 - 2
D-Ca pantothenate	1 - 2
Pyridoxal HCl	1 - 2
Riboflavin	0.1 - .2
Thiamine	1.0 - 2

-continued

all the foregoing four solutions being expressed in terms of milligrams per liter (mg/l)
and,
said medium further comprising:

- (d) L-Glutamine, 2 - 6.0 mg mols
- (e) Vitamin B_{12}, 0.15 mg to 15 mg,
- (f) Biotin, 0.1 mg to 1.0 mg,
- (g) Cobaltous Chloride, 0.05 mg to 0.5 mg,
- (h) an alkali metal salt of a mono-unsaturated fatty acid of 12 to 22 carbon atoms, 5 mg to 100 mg,
- (i) an alkali metal salt of a saturated fatty acid of 12 to 22 carbon atoms, 5 to 100 mg,
- (j) Bovine serum albumin 4 grams to 40 grams,
- (k) Mannitol, 1 gram to 10 grams,
- (l) Catalase, 3 times 10^5 units to 1 times 10^6 units,

and distilled water to dilute all of said foregoing components up to 1 liter of medium.

4,098,647
COMPOSITION OF MATTER AND PROCESS

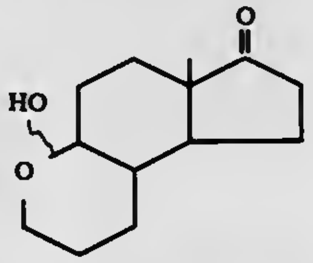
John C. Knight, Kalamazoo Township, Kalamazoo County, and Merle G. Wovcha, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 632,635, Nov. 17, 1975, Pat. No. 4,039,381. This application Feb. 10, 1977, Ser. No. 767,368

Int. Cl.^{2} C07B *29/02*

U.S. Cl. 195—51 S **12 Claims**

1. A process for preparing a compound of the formula



which comprises cultivating a mutant microorganism selected from the group consisting of Arthrobacter, Bacillus, Brevibacterium, Corynebacterium, Nocardia, Protaminobacter, Serratia, and Streptomyces, said mutant being characterized by its ability to selectively degrade steroids with or without a 17-alkyl side chain of from 2 to 10 carbon atoms, inclusive, and accumulate predominantly 3aα-H-4α-[3'-propanol]-7aβ-methylhexahydro-1,5-indandione hemiketal and 3aα-H-4α-[3'-propanol]-5α-hydroxy-7aβ-methylhexahydro-1-indanone, and traces of 3aα-H-4α-[3'-propanal]-5α-hydroxy-7aβ-methylhexahydro-1-indanone hemiacetal and 3aα-H-4α-[3'-propionic acid]-5α-hydroxy-7aβ-methylhexahydro-1indanone-δ-lactone in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid with or without a 17-alkyl side chain containing from 2 to 10 carbon atoms, inclusive; and recovering said compound from the cultivated medium.

4,098,648
ROTARY SEPARATING AND EXTRACTING DEVICES

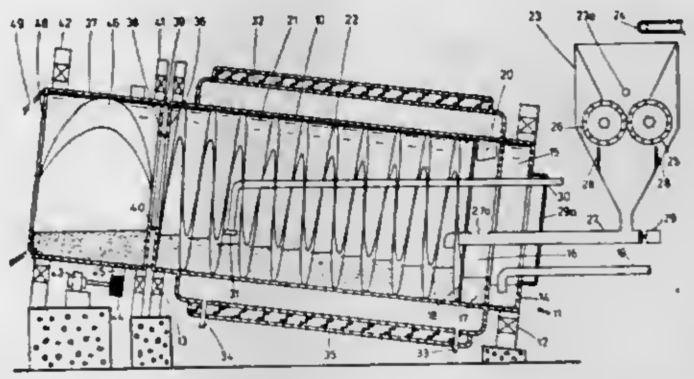
Philipp Kraemer, 34 Kendleton Dr., Rexdale, and Otto Meresz, 8 Wallingford Rd., Don Mills, both of Ontario, Canada

Filed Mar. 9, 1976, Ser. No. 665,173

Claims priority, application United Kingdom, Mar. 25, 1975, 12518/75

Int. Cl.^{2} B01D *11/02;* **C10G** *1/04*

U.S. Cl. 196—14.52 **13 Claims**



1. Apparatus for separating organic content from bituminous-inorganic material, which comprises:
a rotatable inclined washer vessel;
means rotatably mounting said vessel and means for rotating said vessel about an inclined axis;
means for introducing bituminous-inorganic material wetted with solvent for the organic content thereof, into the washer vessel whilst the washer vessel rotates;
solvent introduction means for introducing additional solvent for the organic content of the bituminous-inorganic material into the washer vessel at a location downstream of the location of introduction of the bituminous-inorganic material with respect to the direction of flow of solid material within said washer vessel, whilst the washer vessel rotates;
an open centered helical conveyor within the inclined washer vessel and rotatable therewith, the helical conveyor being adapted to convey solid material in the upwardly inclined direction within the washer vessel;
the conveyor having apertures extending through the individual flights of the conveyor at the radially outer portions of said flights, said apertures being disposed at an inclined angle with respect to the rotational axis of the washer vessel so as to present crooked pathways for liquid flow therethrough in a direction upstream with respect to the direction of flow of solid material within the washer vessel;
means for removing liquid organic solution from the washer vessel upstream of said means for introducing the bituminous-inorganic material with respect to the direction of flow of solid material within the washer vessel;
and means for recovering residual solvent from the solid material separated from liquid solution of organic material.

4,098,649
CONVERSION OF ORGANIC WASTE MATERIAL

Donald S. Redker, Haslett, Mich., assignor to Redker-Young Processes, Inc., Lansing, Mich.

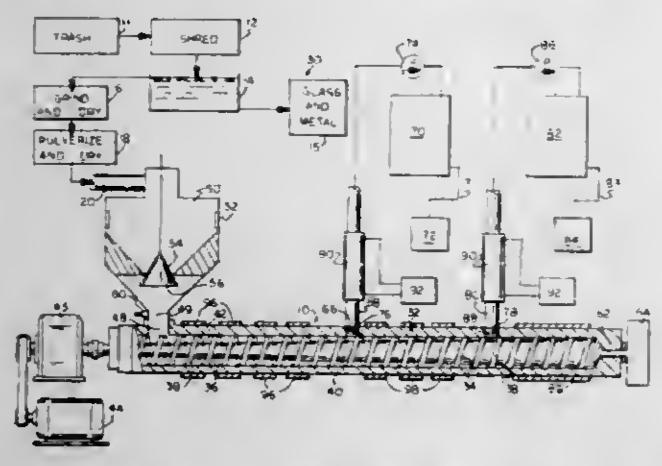
Continuation-in-part of Ser. No. 467,124, May 6, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,395

Int. Cl.^{2} C10B *53/02*

U.S. Cl. 201—2.5 **9 Claims**

1. The method of destructive distillation of organic waste material comprising; the steps of pulverizing and drying said organic material, continuously delivering said pulverized and dried material to one end of an extruder having an elongated barrel and a screw therein in which the volume within said barrel is greater at said one end than the other, continuously advancing said material from one end of said barrel to the other

in the absence of air, exerting force on said material by said screw while it being advanced in said barrel to compress the material, heating the material in a first zone of said barrel to a first temperature to initiate volatilization of the material, extracting gases from said barrel at the end of said zone, heating the material in a second zone of said barrel to a second and substantially higher temperature, extracting gases from said barrel at the end of said second zone, cooling the material in a final zone of said barrel, and extracting residue of said material from said final zone.



4,098,650

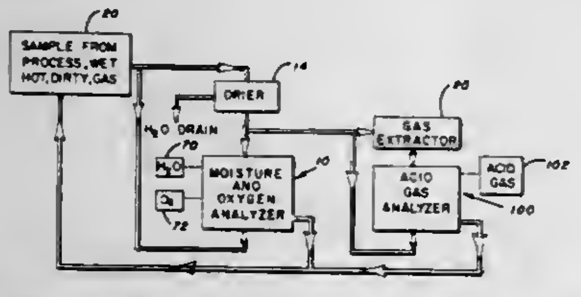
METHOD AND ANALYZER FOR DETERMINING MOISTURE IN A MIXTURE OF GASES CONTAINING OXYGEN

Donald A. Sayles, Pittsburgh, Pa., assignor to Thermo-Lab Instruments, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1976, Ser. No. 739,713

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—1 T **7 Claims**



1. A method for determining the total amount of water vapor in a mixture of gases containing oxygen which comprises,

- providing a first stream of said mixture of gases,
- providing a second stream of said mixture of gases,
- treating said second stream in a condenser to remove a portion of said water vapor and reduce the concentration of said water vapor in said second stream to a known level to form a treated second stream containing a known concentration of said water vapor,
- introducing said first stream and said treated second stream into a heated ceramic electrochemical cell, and
- measuring the ratio of oxygen partial pressures of said first stream and said treated second stream of gases.

6. Apparatus for determining the total amount of water vapor in a mixture of gases containing oxygen which comprises,

- means for providing a first stream of said mixture of gases,
- means for providing a second stream of said mixture of gases,
- means for treating said second stream in a condenser and removing a portion of said water vapor to provide a treated second gas stream containing a known level of said water vapor,
- means to introduce said first stream and said treated second stream into a heated ceramic electrochemical cell, and
- means for measuring the ratio of oxygen partial pressures of said first stream and said treated second stream of gases.

4,098,651

CONTINUOUS MEASUREMENT OF ELECTROLYTE PARAMETERS IN A CELL FOR THE ELECTROLYSIS OF A MOLTEN CHARGE

Hanspeter Alder, Flurlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

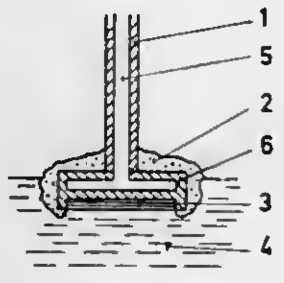
Filed Dec. 5, 1974, Ser. No. 529,754

Claims priority, application Switzerland, Dec. 20, 1973, 17892/73

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—1 T **22 Claims**



1. In a process for the continuous measurement of electrolyte parameters in an electrolysis cell during the production of aluminum therein by electrolysis of a melt containing an aluminum compound such as aluminum oxide, said cell having an anode and counter-electrode which carry the current for said electrolysis,

the steps comprising:

- inserting in said melt the measuring surface of a measuring probe whereof said measuring surface is ceramic oxide, said probe having a coating of an inert refractory electrically non-conductive material around its three-phase zone and over all inward surfaces thereof outside of said measuring surface adapted to prevent contact of said melt with said probe;
- mantaining said measuring surface at a positive electrical potential with respect to a counter electrode therefor in said cell, said potential providing a current density of at least 0.01 amperes per square centimeter of measuring surface, whereby a measuring current is passed through at least a portion of said melt, and
- monitoring said measuring current and thereby determining the electrical parameters of said cell.

4,098,652

METHOD OF ELECTROFORMING

Myron Koenig, Mamaroneck, N.Y., assignor to M. Argueso & Co., Inc., Mamaroneck, N.Y.

Filed Feb. 8, 1977, Ser. No. 766,673

Int. Cl.^{2} C25D *1/00, 1/10*

U.S. Cl. 204—4 **10 Claims**

1. In a method of forming articles by depositing metal onto the cathode of an electrodeposition circuit, the improvement which comprises forming the cathode from an electrically conductive thermoplastic wax composition including a thermoplastic wax material capable of retaining a molded shape at ambient temperature and silver coated glass microspheres, said glass microspheres being coated with at least 4% silver by weight, said silver coated glass microspheres having a size of 44 microns in diameter or less and being present in the thermoplastic wax material in an amount effective to render the wax material electrically conductive and producing a low electrical resistance wax composition.

4,098,653

OXYGEN SENSOR HAVING PROTECTIVE HOOD AND METHOD OF USING SAME

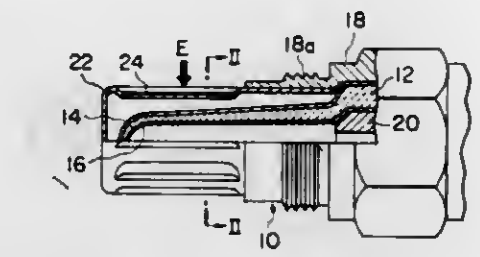
Toru Kita, and Takeshi Fujishiro, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 24, 1977, Ser. No. 771,780

Claims priority, application Japan, Feb. 24, 1975, 51-18524

Int. Cl.^{2} G01N *27/46*

U.S. Cl. 204—1 T **17 Claims**



17. A method of detecting the oxygen content of a gas stream which comprises the steps of:

(a) providing an oxygen sensor having an oxygen ion conductive solid electrolyte tube which is closed at one end, anode and cathode layers porously coated respectively on the outer and inner surfaces of said electrolyte tube, and a tubular metal shell which receives the electrolyte tube therein such that a closed end portion of the electrolyte tube protrudes from said shell and is adapted to be disposed in an exhaust gas stream, a protective hood which has the shape of a cylindrical tube with a closed end and is fixed at an open end portion to the shell, the inside of said hood being spaced from the anode electrode layer outside of said shell, said hood comprising a single outlet aperture and an outlet comprising at least one aperture, said inlet aperture being spaced from said outlet apertures by approximately 180°; said inlet aperture having a larger area than the total area of said outlet apertures;

(b) arranging said sensor in said gas stream such that said inlet aperture is arranged normal to the direction of flow of said gas stream and such that said outlet apertures are downstream of said inlet aperture in the direction of flow of said gas stream; and

(c) measuring the oxygen content of said gas stream.

4,098,654

CODEPOSITION OF A METAL AND FLUOROCARBON RESIN PARTICLES

Kees Helle, Bennekom; Robert Cornelis Groot, Rheden (G.), and Andries Kamp, Zevenaar, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sep. 30, 1976, Ser. No. 728,227

Claims priority, application Netherlands, Oct. 4, 1975, 7511699; Apr. 26, 1976, 7604398

Int. Cl.^{2} C25D *15/00, 15/02*

U.S. Cl. 204—16 **19 Claims**

1. In a process for applying to an electrically conductive substrate acting as a cathode a composite coating made up of a polyfluorocarbon resin and a metal, wherein the resinous particles have an average particle size of less than about 10 μm and are kept dispersed in a concentration of about 3 to 150 grammes per liter of bath solution in the presence of a cationic fluorocarbon surfactant and a nonionic surfactant, the improvement comprising:

a. using for the nonionic surface active compound a fluorocarbon compound;

b. maintaining the molar ratio between the cationic surface active compound and the nonionic surface active fluorocarbon compound between 25:1 and 1:3.5; and

c. maintaining the total amount of surface active fluorocarbon compounds above 3×10^{-3} mmoles per m^2 of surface area of the polyfluorocarbon particles.

4,098,655

METHOD FOR FABRICATING A PHOTORECEPTOR

Anthony T. Ward, Webster; Donald J. Teney, Rochester; James M. Ishler, Ontario, all of N.Y., and Aleksandar Damjanovic, Morristown, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1977, Ser. No. 836,125

Int. Cl.^{2} G03G *5/05*; C25D *11/34*

U.S. Cl. 204—38 A **10 Claims**

1. A method for fabricating a photoreceptor comprising

(a) providing a substrate comprising a metal which is less positive than selenium in the electrochemical series, said substrate having a thin layer of an oxide of said metal on at least one surface thereof;

(b) contacting said metal oxide layer with an aqueous selenious acid solution in the absence of applied electrical potential whereby said metal oxide is dissolved and a thin layer of selenium is formed on said surface of said substrate by electrochemical displacement; and

(c) vacuum evaporating a photoconductive layer comprising selenium or its alloys over said thin selenium layer formed in step (b).

4,098,656

BRIGHT PALLADIUM ELECTROPLATING BATHS

John Martin Deuber, Nutley, N.J., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 665,971, Mar. 11, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,349

Int. Cl.^{2} C25D *3/52*

U.S. Cl. 204—47 **5 Claims**

1. A stable aqueous electroplating bath, which comprises essentially pure palladium free of alloying elements thereof and being in electrodeposital form, and a Class I brightener selected from the group consisting of methylene bis(naphthalene sodium sulfonate), sodium benzene sulfonate, benzene sulfonamide and phenol-sulfonic acid, and a Class II organic brightener selected from the group consisting of benzaldehyde-o-sodium sulfonate, 2 butyne-1,4-diol, 2 butene-1, 4-diol and allyl sulfonate, and which exhibits a pH value of from 4.5 to 12.

4,098,657

ELECTROLYTE DEHYDROHALOGENATION OF α-HALOALCOHOLS

Ian Trevor Kay, Wokingham, and Alfred Glyn Williams, Basingstoke, both of England, assignors to Imperial Chemical Industries Limited, London, England

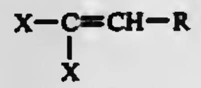
Filed Nov. 29, 1976, Ser. No. 745,781

Claims priority, application United Kingdom, Dec. 17, 1975, 51615/75

Int. Cl.^{2} C25B *3/00*; C07C *17/00, 21/06, 29/00*

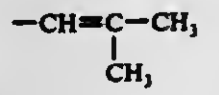
U.S. Cl. 204—59 R **11 Claims**

1. A process for the preparation of a compound of formula:



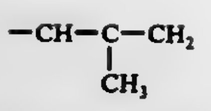
$$X-\underset{\displaystyle X}{\underset{|}{C}}=CH-R$$

wherein X is chloro or bromo and R is either a group of formula:



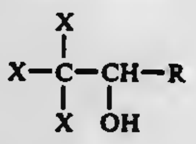
$$-CH=\underset{\displaystyle CH_3}{\underset{|}{C}}-CH_3$$

or a group of formula:



$$-CH-\underset{CH_3}{\underset{|}{C}}-CH_2$$

which comprises subjecting a haloalcohol of formula:



$$X-\overset{X}{\overset{|}{\underset{X}{\underset{|}{C}}}}-\underset{OH}{\underset{|}{CH}}-R$$

to electrolysis at a high hydrogen overvoltage cathode in the presence of a liquid diluent and a strong mineral acid selected from the group consisting of sulphuric acid, hydrochloric acid and phosphoric acid.

4,098,658
METHOD OF EXTRACTING METALS FROM SPENT ELECTRIC STORAGE BATTERIES

Marco V. Ginatta, Corso Alberto Picco, 35, Torino, Italy

Continuation-in-part of Ser. No. 584,833, Jul. 21, 1975, Pat. No. 3,985,630. This application Sep. 29, 1976, Ser. No. 727,391

Claims priority, application Italy, Jul. 25, 1974, 69363 A/74

Int. Cl.² C25B *1/00;* C25F *5/00;* C25C *1/18*

U.S. Cl. 204—114 **17 Claims**

1. A method of extracting lead from the positive electrodes, negative electrodes, and electrical connections of spent lead-acid electric storage batteries, which comprises the steps of:

recharging the spent lead-acid batteries to reduce the $PbSO_4$ content thereof;

removing sulphuric acid from the recharged batteries;

opening the battery containers to gain access to all battery electrodes;

washing the electrodes and the inside and outside of the battery containers with water;

drying the washed batteries;

immersing the batteries in an electrolyte which will form a complex with lead so that all battery electrodes are simultaneously in contact with the electrolyte; and

circulating the electrolyte inside and outside the battery containers;

each immersed battery being an electrochemical system composed of a series of electronically connected positive and negative couples of electrodes all immersed in the same electrolyte in which the negative electrodes naturally anodically dissolve to release lead ions into the electrolyte and electrons which go to the positive electrodes and reduce Pb++++ to Pb++, which dissolves in the electrolyte as lead complex, wherein said electrolyte is a fluoborate-based aqueous solution.

4,098,659
ELECTROCHEMICAL MILLING PROCESS TO PREVENT LOCALIZED HEATING

Anthony J. Inverso, Ogden, Utah, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 13, 1977, Ser. No. 815,134

Int. Cl.² C25F *3/00, 3/14*

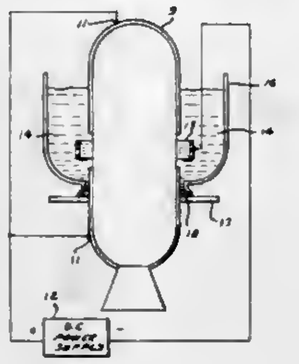
U.S. Cl. 204—129.65 **2 Claims**

1. A process for removing a metallic cover from an underlying nonconductive ignitible solid material comprising:

a. coating the cover with a maskant;

b. successively removing at regular intervals adjacent elemental areas of the maskant to incrementally expose the cover; and

c. electrochemically removing a thickness of metal from the total exposed area of said cover during each interval that does not exceed a small fraction of the initial cover thickness.



4,098,660
METHOD OF PURIFYING WATER

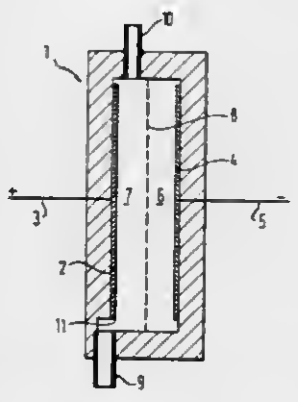
Volker Eibl, and August Reis, both of Munich, Germany, assignors to Sachs Systemtechnik GmbH, Schweinfurt am Main, Germany

Continuation-in-part of Ser. No. 619,696, Oct. 6, 1975, which is a continuation-in-part of Ser. No. 473,389, May 28, 1974, Pat. No. 3,923,632. This application Jun. 28, 1977, Ser. No. 810,867

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1973, 2329628

Int. Cl.² C02B *1/82, 3/10*

U.S. Cl. 204—151 **10 Claims**



1. A method of purifying water contaminated with microorganisms and having a specific resistance of approximately 0.5 $\times 10^3$ ohm · cm to approximately 6.6 $\times 10^3$ ohm · cm which comprises:

(a) passing a stream of said water over a surface of conductive, silver-containing material,

(1) the thickness of said stream at right angles to said surface being not greater than 4 millimeters; and

(b) passing direct electric current between said surface as an anode and said contaminated water at a density of 1.5 to 3.0 mA per square centimeter of said surface,

(1) the area F of said surface in square centimeters and the flow rate V of said stream in cm^3/second satisfying the relationship $F \geqq c \times V$, wherein c is a factor whose numerical value, in sec/cm, is at least equal to the numerical value of said thickness, in millimeters, plus one.

4,098,661
METHOD OF PRODUCING NEOSCHIZOPHYLLAN HAVING NOVEL PHARMACOLOGICAL ACTIVITY

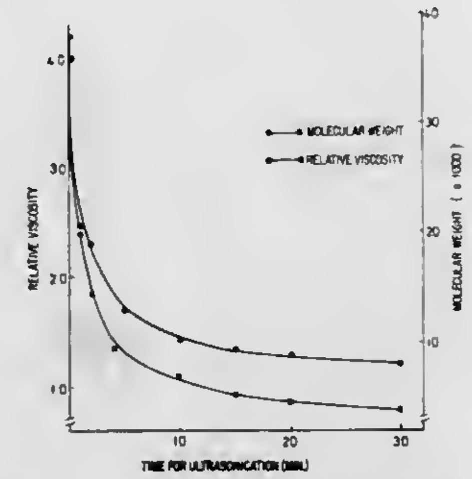
Syoichi Kikumoto, Handa; Osamu Yamamoto, Kobe; Nobuhiko Komatsu, Tokyo; Haruhiko Kobayashi, Mitaka, and Teruo Kamasuka, Kodaira, all of Japan, assignors to Taito Co., Ltd. and Kaken Chemical Co., Ltd., both of Tokyo, Japan

Filed Oct. 19, 1976, Ser. No. 734,008

Claims priority, application Japan, Oct. 31, 1975, 50-131229

Int. Cl.² B01J *1/12*

U.S. Cl. 204—160.1 **3 Claims**



1. A process for producing Neoschizophyllan which comprises treating a solution or a dispersion of Schizophyllan by a ultrasonication at a frequency of 5 to 50 KHz with stirring without incorporating bubbles.

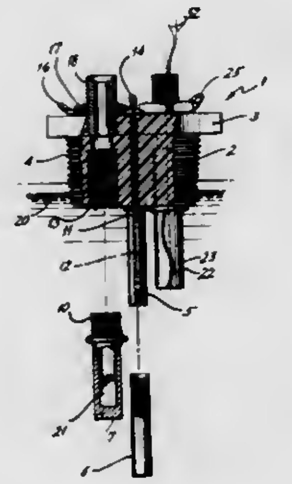
4,098,662
CORROSION PROBE FOR USE IN MEASURING CORROSION RATE UNDER SPECIFIED HEAT TRANSFER CONDITIONS

Charles E. Schell, Levittown; Dennis C. Deegan, Glenside, and Donald F. Jacques, Cornwells Heights, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 24, 1975, Ser. No. 644,201

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 C **11 Claims**



1. An assembly for measuring corrosion rate under specified heat transfer conditions, said assembly comprising:

corrosion probe housing means for insertion into a conduit through which corrodant fluid flows,

a plurality of corrosion rate meter electrodes located on said housing means for exposure to said corrodant fluid, said electrodes comprising a reference electrode, an auxiliary electrode, and a first hollow test electrode, said test electrode containing heat transfer fluid with a heat transfer coefficient similar to that of the test electrode,

electrical heating means located within said first hollow test electrode for heating an inside wall surface thereof, said heating means having an electrical input and being at least partially submersed in said heat transfer fluid,

first temperature sensing means located inside said first hollow test electrode between said heating means and said inside wall surface, said first temperature sensing means being submersed in said heat transfer fluid for sensing the temperature of said fluid,

second temperature sensing means for sensing the temperature of the corrodant fluid adjacent an outside wall surface of the test electrode,

corrosion rate meter means conductively connected to said reference, auxiliary and first test electrodes for instantaneously measuring the corrosion rate of said first test electrode, and

heat transfer coefficient meter means conductively connected to said electrical heating means input and said first and second temperature sensing means for instantaneously measuring the heat transfer coefficient across a wall of said first test electrode.

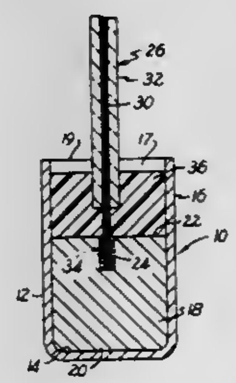
4,098,663
ANTI-CORROSION ANODE CONNECTOR SYSTEM

Robert Baboian, Johnston, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1976, Ser. No. 673,177

Int. Cl.² C23F *13/00*

U.S. Cl. 204—196 **14 Claims**



1. Apparatus for connecting a current carrying conductor cable to a permanent anode comprising a cup-shaped housing made from a chemically inert, electrically conductive material having a closed end portion, a side wall extending from the closed end portion, the side wall having a free end forming an open end portion, the side wall having a thickness which is generally uniform along its length, an electrically conductive plug member secured in said housing having one end adjacent said closed end and having a second end facing toward said open end while being substantially removed from the open end, said plug member having an electrical connection means to provide for electrical connection between said conductor cable and said plug member and a chemically insulating material entirely within said housing rounding said electrical connection between said conductor cable and said plug member and filling said cup-shaped housing to provide a tight, leakproof seal.

4,098,664
ROTATING VERTICAL PLATING TABLE

Richard E. Butler, 801 Santa Clara Ave., Apt. A, Alameda, Calif. 94501

Filed Jul. 25, 1977, Ser. No. 818,356

Int. Cl.² C25D *17/06, 7/04*

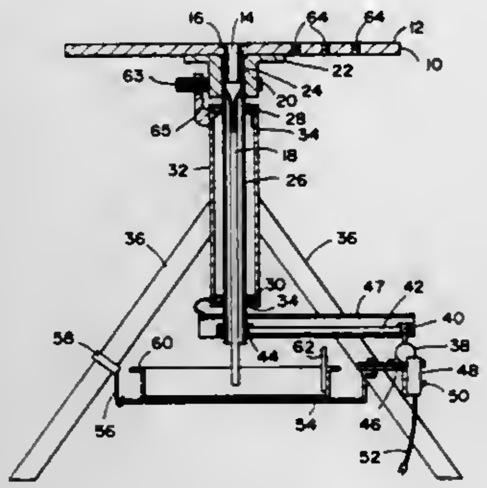
U.S. Cl. 204—212 **10 Claims**

1. A rotating vertical plating table comprising:

a. a body having an axial hole therethrough;

b. an approximately circular worktable of electrically conductive material with a corrosion resistant coating on one side to form a working surface, said worktable having a

central hole and being rotatably mounted on said body such that said axial hole is alined with said central hole;
c. means for fixedly supporting said body;
d. means for rotating said worktable relative to said body about the central axis of said worktable;

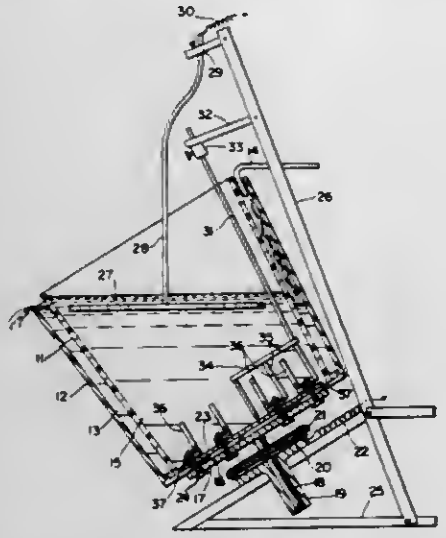


e. a catch tray situated beneath said axial hole to catch material which flows from said worktable through said central hole and said axial hole; and
f. means for electrically grounding said worktable.

4,098,665

DEVICE FOR PREPARING FIBROUS METAL MATERIALS BY ELECTROLYTIC DEPOSITION AND THE RESULTING FIBROUS METAL MATERIAL

Lucette Freckin, Darnac, France, assignor to Office National D'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon sous Bagneux, France
Division of Ser. No. 610,762, Sep. 5, 1975, Pat. No. 4,014,757. This application Dec. 28, 1976, Ser. No. 755,028
Claims priority, application France, Sep. 17, 1974, 74 31399
Int. Cl.² C25D *17/16, 17/24*
U.S. Cl. 204—213 **3 Claims**

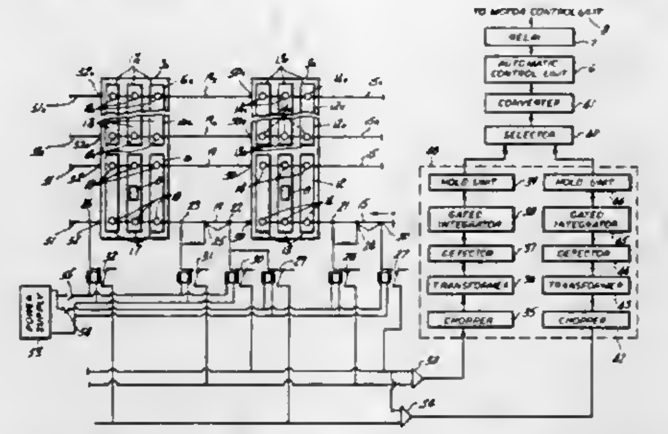


1. A device for depositing electrolytically a metal on conductive fibers forming a skeleton, said device comprising an electrolytic cell for lodging the electrolytic bath and said conductive fibers, a carding apparatus situated in said electrolytic cell and comprising at least two sets of teeth, and means for continuously imparting to said two sets of teeth a relative movement with respect to each other.

4,098,666

APPARATUS FOR REGULATING ANODE-CATHODE SPACING IN AN ELECTROLYTIC CELL

Richard W. Ralston, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.
Continuation-in-part of Ser. No. 489,647, Jul. 18, 1974, Pat. No. 3,900,373, Continuation-in-part of Ser. No. 272,240, Jul. 17, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,582
Int. Cl.² C25B *9/00, 15/04*
U.S. Cl. 204—228 **4 Claims**

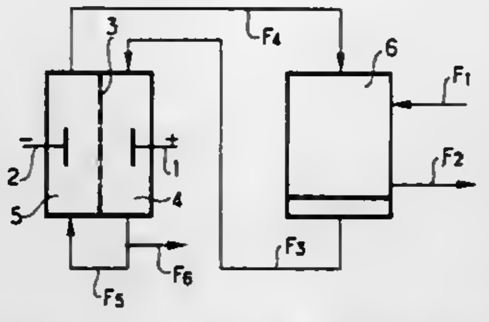


1. In a mercury cell circuit having a plurality of flowing mercury amalgam cathode electrolytic cells in series, each of said cells being electrically connected to the cells adjacent thereto by bus bars, and a control circuit having a storable program digital computer, the improvement comprising shunts responsive to current flow on each of said bus bars; and first level multiplexing means and second level multiplexing means interposed between said bus bars and said storable program digital computer.

4,098,667

ELECTROCHEMICAL METHOD AND DEVICE FOR PRODUCING OXYGEN

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France
Division of Ser. No. 676,751, Apr. 14, 1976, Pat. No. 4,061,554. This application Feb. 22, 1977, Ser. No. 770,908
Claims priority, application France, Apr. 24, 1975, 75 12848
Int. Cl.² C25B *15/00*
U.S. Cl. 204—234 **6 Claims**

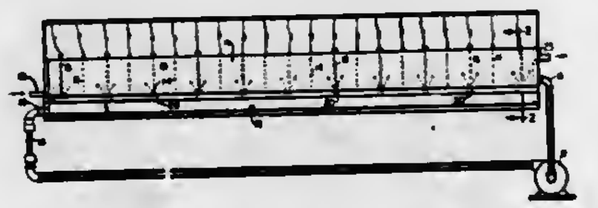


1. Apparatus for electrochemically producing pure oxygen comprising
at least one electrochemical cell, each of said electrochemical cells comprising an anode compartment and a cathode compartment separated by a porous membrane;
an oxidation reactor coupled to said at least one electrochemical cell for peroxidizing the reduced form of the anthraquinone-2,7-disulphonate salt of an alkali metal in a basic medium to form the peroxide of said anthraquinone which decomposes to form a hydrogen peroxide and the oxidized form of said anthraquinone, said oxidation reactor having a source of an oxygen containing gas and exit means for removing gas depleted of oxygen;
means coupling said oxidation reactor to the anode compartment of each of said at least one electrochemical cell;
electrochemical means in the anode compartment of each of said at least one electrochemical cell for oxidizing said hydrogen peroxide to form oxygen;
means for removing said oxygen from the anode compartment of each of said at least one electrochemical cell;
means for transferring material from the anode compartment to the cathode compartment of each of said at least one electrochemical cell;
electrochemical means in the cathode compartment of each of said at least one electrochemical cell for reducing the oxidized form of said anthraquinone transferred thereto from the respective anode compartment; and
means for coupling the cathode compartment of each of said at least one electrochemical cell to said oxidation reactor to recycle said reducing anthraquinone.

4,098,668

ELECTROLYTE METAL EXTRACTION

Allen K. Andersen, Arvada, Colo., and Vsevolod Archipov, Decatur, Ala., assignors to Continental Copper & Steel Industries, Inc., New York, N.Y.
Continuation of Ser. No. 499,257, Aug. 21, 1974, abandoned, which is a continuation of Ser. No. 266,644, Jun. 27, 1972, abandoned, which is a continuation of Ser. No. 851,518, Jun. 23, 1969, abandoned, which is a division of Ser. No. 611,198, Dec. 12, 1966, Pat. No. 3,483,568, which is a continuation-in-part of Ser. No. 530,147, Feb. 25, 1966, abandoned. This application Aug. 23, 1976, Ser. No. 717,057
Int. Cl.² C25C *1/12, 7/00*
U.S. Cl. 204—237 **5 Claims**



1. Electroseparation apparatus for extracting metal from an electrolyte solution containing ions of said metal comprising:
a relatively elongate vessel having end walls and side walls adapted to receive a quantity of electrolyte,
an anode plate and a cathode plate arranged in the vessel in proximity to each other with the wide faces of the plates being at substantially right angles to the side walls and with the plates being at a level adapted to be at least partially immersed in such quantity of electrolyte, and
means for continuously circulating the electrolyte through the vessel, including a pump, inlet means located beneath the plates and arranged adjacent the anode plate and remote from the cathode plate for introducing the electrolyte initially upwardly along the anode plate and thence downwardly along the cathode plate, and outlet means separated from the inlet means for withdrawing the electrolyte from the vessel for circulation by the pump back to the inlet means,
whereby the electrolyte flows from the inlet means to the outlet means in an arc successively across the corresponding faces of the plates to deposit relatively pure metal onto the cathode plate from the electrolyte solution.

4,098,669

NOVEL YTTRIUM OXIDE ELECTRODES AND THEIR USES

Vittorio De Nora, Nassau, The Bahamas; Placido M. Spaziante, and Antonio Nidola, both of Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland
Continuation-in-part of Ser. No. 672,279, Mar. 31, 1976, abandoned, and Ser. No. 673,460, Apr. 5, 1976, abandoned, and Ser. No. 681,279, Apr. 28, 1976, abandoned, and Ser. No. 686,943, May 17, 1976, abandoned. This application Mar. 7, 1977, Ser. No. 774,103
Int. Cl.² C25B *1/34, 11/00*; C25C *1/00, 7/00*
U.S. Cl. 204—252 **18 Claims**

1. An electrode comprising a self-sustaining body of sintered powders of a major amount of yttrium oxide and at least one electroconductive agent being provided over at least a portion of its surface with at least one electrocatalyst.

7. A bipolar electrode comprising a self-sustaining body of sintered powders of a major portion of yttrium oxide and at least one electroconductive agent, said electrode being provided over at least a portion of its anodic surface with at least one anodic electrocatalyst and over at least a portion of its cathodic surface with a layer of cathodic material selected from the group consisting of metal carbides, borides, nitrides, sulfides and carbonitrides and mixtures thereof.

17. An electrode for electrochemical reactions comprising a self-sustaining body of sintered powders with the major portion being comprised of yttrium oxide, said electrode being provided over at least a portion of its surface with at least one electrocatalyst selected from the group consisting of oxides of cobalt, nickel, rhodium, iridium, ruthenium, silver, manganese, and mixtures thereof.

4,098,670

SEALING MEMBER FOR AN ELECTROLYTIC CELL

Harry S. Custer, Barberton, and Brian H. Oliver, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 27, 1975, Ser. No. 563,000
Int. Cl.² C25B *1/16, 1/26, 9/00*
U.S. Cl. 204—252 **18 Claims**

1. In an electrolytic cell for the electrolysis of brines, said cell comprising a cell can for containing a brine solution, a rigid cell base for supporting said can, anode members disposed within said can, and a heat and chemically resistant sealing member comprised of a composition including at least one vulcanized rubbery polymer to provide a compressive seal between rigid members of said cell with said polymer being selected from the group consisting of ethylene propylene terpolymer rubber, ethylene propylene rubber, chlorinated polyethylene and ethylene vinyl acetate copolymer rubber, said sealing member subjected to heat within the cell and after long periods of exposure to this heat is of a relatively flexible, resilient rubbery nature and has a relatively high resistance to compression set to thereby retain its sealing properties, said sealing member when heat treaded at 250° F (121° C) for the following periods of time and tested in accordance with ASTM D-395, Method B, will exhibit a compression set less than about the following values:

Heat Treatment (Time)	Compression Set (%)
70 hours	35
7 days	50
14 days	65
28 days	80

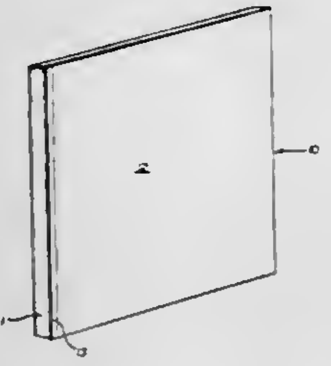
4,098,671
CATHODE FOR ELECTROLYTIC PROCESS INVOLVING HYDROGEN GENERATION

H. Benny Westerlund, Squamish, Canada, assignor to Gow Enterprises Limited, Vancouver, Canada

Filed Apr. 18, 1977, Ser. No. 788,499

Int. Cl.² C25B *11/03, 11/10*

U.S. Cl. 204—284 **14 Claims**



1. A cathode comprising:
(a) a microporous titanium sheet having a central core and surfaces, the pores in the central core being of greater diameter than the pores at the surfaces thereby providing a central core of less porosity than the surfaces; and
(b) one exposed surface thereof being microporous hydrided titanium, the hydrided titanium having pores of greater diameter than those of the porous titanium sheet and thus being more porous than the surface of the porous titanium sheet on which it is provided.

4,098,672
POROUS DIAPHRAGMS

David Stephen Riley, Tollerton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 484,935, Jul. 1, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,704

Claims priority, application United Kingdom, Jul. 18, 1973, 484935/73

Int. Cl.² C25B *13/04;* **B29D** *27/00*

U.S. Cl. 204—296 **31 Claims**

1. A process for the manufacture of a porous diaphragm of a synthetic material for use in an electrolytic cell which comprises forming a sheet of the synthetic organic polymeric material selected from the group consisting essentially of polytetrafluoroethylene and polyvinylidene fluoride in admixture with a solid particulate additive to be removed therefrom, assembling said sheet into an electrolytic cell, filling the cell with the working electrolyte and removing solid particulate additive from the sheet in situ in the cell by electrolysing the said electrolyte, said additive being insoluble in said electrolyte.

4,098,673
METHOD AND APPARATUS FOR REMOVING COLLOIDAL SUSPENSIONS FROM A LIQUID

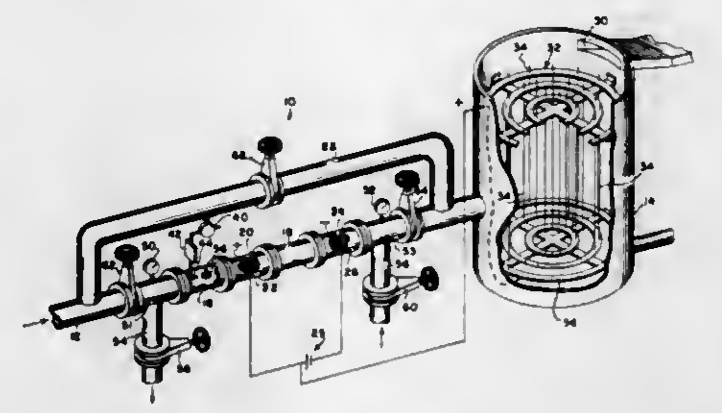
Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.

Continuation-in-part of Ser. No. 688,029, May 19, 1976, abandoned. This application May 10, 1977, Ser. No. 795,537

Int. Cl.² C02C *5/12;* **B03C** *5/00;* **C25B** *1/02*

U.S. Cl. 204—302 **37 Claims**

1. In a system for removing particles from a liquid wherein the particles are of a type which receive an electrical charge in the liquid, the combination of, means providing a flow path for a stream of the liquid including an upstream zone and a downstream zone; electrical isolation means for insulating said upstream zone from said downstream zone, a first electrical conductor in said flow path at said upstream zone, a second electrical conductor in said flow path at said downstream zone, and means for connecting the positive side of a direct current source to said first electrical conductor and for connecting the negative side of said source to said second electrical conductor, whereby the particles in said stream receive a positive electrical charge when passing through said upstream zone, agglomerate when passing toward and to said downstream zone, and discharge electrical charges to said second electrical conductor.



4,098,674
RECOVERY OF HYDROCARBONACEOUS MATERIAL FROM TAR SANDS

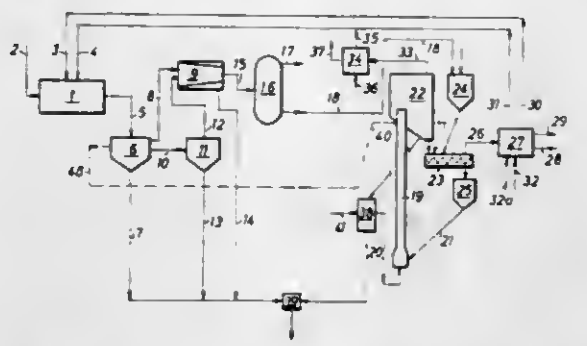
Roland Rammler, Königstein; Paul Schmalfeld, Bad Homburg, and Hans-Jürgen Weiss, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 28, 1977, Ser. No. 782,472

Claims priority, application Canada, Apr. 2, 1976, 249420

Int. Cl.² C10G *1/02, 1/04*

U.S. Cl. 208—11 R **14 Claims**



1. A process for the recovery of hydrocarbonaceous materials from tar sand comprising dividing the tar sand into first and second portions, mixing the first portion with hot water, separating from the mixture wet solids and bituminous hydrocarbonaceous material, subjecting the second portion to dry distillation at a temperature above about 400° C, thereby forming a distillation residue and gaseous and vaporous distillation products, cooling and condensing such gaseous and vaporous distillation products and withdrawing hydrocarbonaceous material therefrom, and effecting a heat exchange between water and at least one member selected from the group consisting of the distillation residue and the gaseous and vaporous distillation products so as to heat the water, the water then being used in the treatment of the first portion.

4,098,675
PREVENTING AMMONIUM CHLORIDE DEPOSITION

Max D. Pope, Woods Cross, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

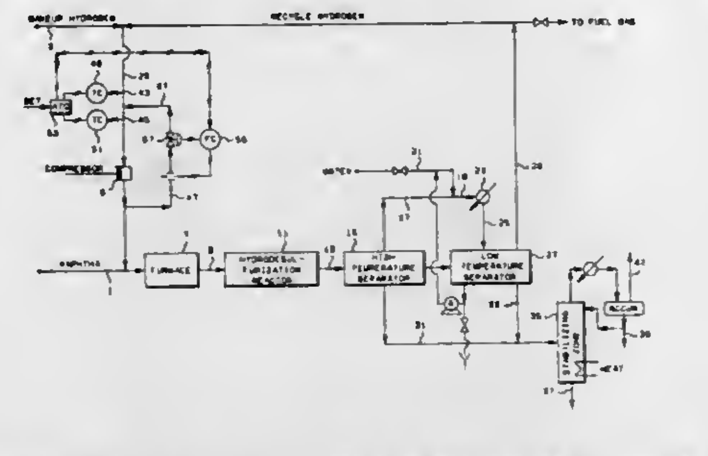
Filed Jul. 7, 1977, Ser. No. 813,553

Int. Cl.² C10G *9/16, 13/00;* **B65G** *53/04*

U.S. Cl. 208—108 **9 Claims**

1. A method for preventing depositing of ammonium chloride from a gaseous stream containing ammonium chloride or ammonium chloride-forming constituents as the gaseous

stream is passed through a compression means, said method comprising recycling to the compression means inlet an amount of compression means discharge sufficient to maintain the temperature of the compression means inlet above deposition temperature for ammonium chloride at the operating pressure.



4,098,676
SYNTHETIC HALLOYSITES AS HYDROCARBON CONVERSION CATALYSTS

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 525,205, Nov. 19, 1974. This application Nov. 11, 1976, Ser. No. 740,868

Int. Cl.² C10G *13/04;* **B01J** *8/24;* **C01B** *29/28*

U.S. Cl. 208—111 **7 Claims**

1. A process for the conversion of hydrocarbons, which comprises contacting said hydrocarbons at hydrocarbon converting conditions with a synthetic, non-acid treated halloysite containing less than 0.05 wt. % iron and having a surface area greater than 85 sq. meters/gram.

4,098,677
CATALYTIC CRACKING PROCESS WITH CO_2-STRIPPED REGENERATED CATALYST

Robert H. Waghorne, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 22, 1977, Ser. No. 780,247

Int. Cl.² C10G *11/04;* **B01J** *8/24*

U.S. Cl. 208—113 **13 Claims**

1. In a catalytic cracking process wherein a hydrocarbonaceous oil feed is contacted with a cracking catalyst under catalytic cracking conditions in a catalytic cracking zone whereby a carbonaceous deposit is formed on said catalyst and wherein said catalyst with said carbonaceous deposit is contacted with an oxygen- and nitrogen-containing gas in a regeneration zone to remove at least a portion of said carbonaceous deposit, said regenerated catalyst having entrained nitrogen, and wherein the regenerated catalyst is recycled to said catalytic cracking zone, the improvement which comprises:
(a) contacting the regenerated catalyst having entrained nitrogen with a stripping gas comprising at least about 80 mole percent of carbon dioxide for a time sufficient to remove said entrained nitrogen from said catalyst prior to recycling the regenerated catalyst to said catalytic cracking zone, and
(b) recovering from said catalytic cracking zone a C_2— gaseous effluent substantially free of nitrogen.

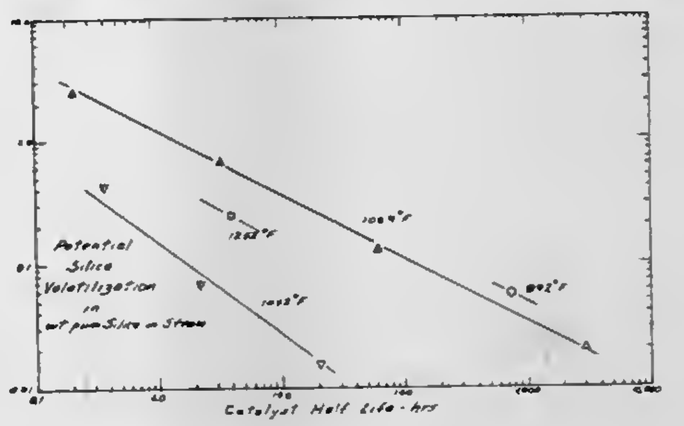
4,098,678
CRACKING CATALYST ACTIVITY MAINTENANCE FOR CATALYTIC CRACKING PROCESS

Eugene F. Schwarzenbek, 3 Seacrest Dr., Lavallette, N.J. 07450

Filed Aug. 22, 1977, Ser. No. 826,378

Int. Cl.² C10G *11/04;* **B01J** *8/24, 29/12*

U.S. Cl. 208—120 **7 Claims**



1. A method of minimizing the deactivation of silica containing catalysts employed in catalytic cracking operations by feeding to the reactor, stripper and regeneration sections steam saturated with silica.

4,098,679
HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 663,417, Mar. 3, 1976, abandoned, which is a division of Ser. No. 475,691, Jun. 3, 1974, Pat. No. 3,960,709, which is a continuation-in-part of Ser. No. 391,428, Aug. 24, 1973, abandoned, which is a division of Ser. No. 225,634, Feb. 11, 1972, Pat. No. 3,775,301, which is a division of Ser. No. 839,086, Jul. 3, 1969, abandoned. This application Feb. 28, 1977, Ser. No. 773,021

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **13 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 2 wt. % rhenium, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium, rhenium, and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium, rhenium and rhodium are present in the elemental metallic state; and wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal.

4,098,680
METHOD OF REGENERATING A CRACKING CATALYST

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 538,738, Jan. 6, 1975, Pat. No. 4,006,075. This application Dec. 22, 1976, Ser. No. 753,269

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.² C10G *11/18*

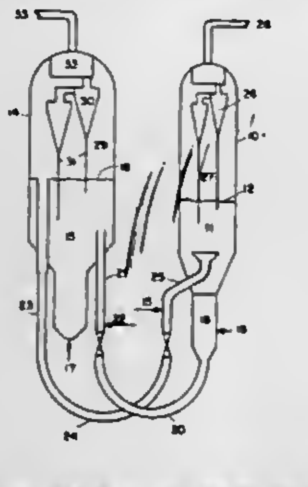
U.S. Cl. 208—164 **17 Claims**

1. In a fluidized catalytic cracking process comprising contacting a hydrocarbon feedstock with cracking catalyst in a reaction zone under cracking conditions to produce cracked

hydrocarbon vapors and coke contaminated catalyst, wherein said coke contaminated catalyst is regenerated in a regeneration zone at elevated temperature with an oxygen-containing regeneration gas, the catalyst in the regeneration zone being fluidized by the upward flow of the regeneration gas to form a dense phase catalyst bed and a dilute catalyst phase, the improvement which comprises regenerating the coke contaminated catalyst according to the following steps, all of which are accomplished at a substantially constant regeneration gas rate;

(a) increasing the temperature of the dense phase catalyst bed to a level ranging from about 1250° to about 1450° F. so as to increase the rate of conversion of coke to carbon monoxide and carbon dioxide, said temperature increase being effected while reducing the coke make in the reaction zone;

(b) further reducing the coke make in the reaction zone while maintaining the temperature of the dense phase bed substantially that of step (a) for a time sufficient to maintain an oxygen concentration in the substantially catalyst-free flue gas of at least 0.1 vol. % to burn at least an additional portion of coke from the coke contaminated catalyst to obtain in the regeneration zone a regenerated catalyst having a residual carbon content of less than about 0.2 wt. % and a substantially catalyst-free flue gas containing less than about 0.5 vol. % of carbon monoxide; and



(c) reducing the temperature of the dense phase catalyst bed to a level ranging from about 10° to about 130° F. below that employed in step (b) in order to maintain the carbon monoxide content in the substantially catalyst-free flue gas at no greater level than that obtained in step (b), steps (a), (b) and (c) being effected while maintaining the temperature of the dilute catalyst phase at least that of the dense phase catalyst bed and within the range of from about 1250° to 1450° F. so as to avoid excessive afterburning in that portion of the regeneration zone wherein the flue gas is substantially catalyst free.

4,098,681

OXIDATION OF MERCAPTANS IN A PETROLEUM DISTILLATE WITH A SUPPORTED METAL PHTHALOCYANINE CATALYST

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 714,073, Aug. 12, 1976. This application Apr. 21, 1977, Ser. No. 789,757

Int. Cl.^{2} C10G *27/06*

U.S. Cl. 208—206 10 Claims

1. A method for treating a sour petroleum distillate which comprises oxidizing mercaptans contained in the distillate by contacting said distillate with a supported metal phthalocyanine catalyst and an oxidizing agent in the presence of an alkali metal hydroxide, said catalyst having been prepared by forming an aqueous metal phthalocyanine dispersion containing a soluble acid amide, contacting a solid adsorptive support with said dispersion at conditions to adsorb at least a catalytic amount of said metal phthalocyanine thereon, and drying the resulting composite.

4,098,682

HYDRODESULFURIZATION CATALYST AND METHOD OF PREPARATION

Mark J. O'Hara, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 697,800, Jun. 18, 1976, Pat. No. 4,048,115. This application May 18, 1977, Ser. No. 798,220

Int. Cl.^{2} C10G *23/02*

U.S. Cl. 208—216 6 Claims

1. A process for desulfurizing a sulfurous hydrocarbon charge stock which comprises reacting said charge stock and hydrogen, at desulfurization conditions selected to convert sulfurous compounds into hydrogen sulfide and hydrocarbon, in contact with a desulfurization catalyst comprising an inorganic oxide carrier material, from about 0.1% to about 20% by weight of a Group VIB metal component and from about 0.1% to about 10% by weight of a Group VIII metal component, calculated as the elemental metals, prepared by the method which comprises the steps of:

(a) extruding said carrier material in admixture with a salt of a Group VIII metal in an amount sufficient to supply at least 10% but not all of said Group VIII metal component;

(b) drying the resultant extrudate;

(c) calcining said dried extrudate at 700–1200° F.;

(d) impregnating the calcined extrudate with Group VIB and Group VIII metal salts in sufficient amount to supply the remainder of said Group VIII metal component and all of said Group VIB metal component;

(e) drying the thus impregnated extrudate, and

(f) calcining the said impregnated extrudate at 800–1400° F.

4,098,683

PROCESS FOR HYDRODESULFURIZING OR HYDROGENATING A HYDROCARBON DISTILLATE

John E. Conway, La Grange, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 628,012, Nov. 3, 1975, abandoned, which is a division of Ser. No. 571,339, Apr. 24, 1975, Pat. No. 3,956,105, which is a continuation-in-part of Ser. No. 484,519, Jul. 1, 1974, Pat. No. 3,935,127. This application Jan. 26, 1977, Ser. No. 762,891

Int. Cl.^{2} C10G *23/02*

U.S. Cl. 208—216 3 Claims

1. A process for desulfurizing a sulfurous hydrocarbon distillate containing mono-olefinic hydrocarbons and aromatics hydrocarbons which process comprises reacting said distillate with hydrogen in contact with a catalytic composite of from about 4 to about 30 weight percent Group VI-B metal, from about 0.1 to about 30 percent Group VIII metal and a refractory inorganic oxide carrier material which is prepared in the following manner:

(a) dry mixing a finely divided Group VI-B metal compound, a Group VIII metal compound and a refractory inorganic oxide, said metal compound being utilized in an amount to provide from about 25 to about 90% of the Group VI-B metal component of the final catalytic composite, and from about 25 to about 90% of the Group VIII metal component;

(b) peptizing the mixture and forming an extrudable dough;

(c) extruding said dough and calcining the extrudate;

(d) impregnating the calcined extrudate with a Group VI-B metal compound and a Group VIII metal compound, said metal compound being utilized in an amount to provide a final catalytic composite containing from about 4 to about 30 weight percent Group VI-B metal and from about 0.1 to about 10 weight percent Group VIII metal; and,

(e) calcining the resulting composite in an oxidizing atmosphere.

4,098,684

PURIFICATION OF LIQUID N-PARAFFINS CONTAINING CARBONYL SULFIDE AND OTHER SULFUR COMPOUNDS

Robert A. Innes, Wilkins Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 29, 1976, Ser. No. 745,631

Int. Cl.^{2} C10G *25/00*

U.S. Cl. 208—245 10 Claims

1. A process for the removal of COS and at least one other sulfur containing compound from a paraffinic feedstock containing at least 10 percent n-paraffins and wherein COS is present in said feedstock initially or is formed during the process, which process comprises

passing said feedstock in the liquid phase through an adsorption zone containing two different adsorbent materials, the first portion of the zone containing an activated zeolitic molecular sieve having a pore diameter large enough to adsorb benzene and the second portion of the adsorption zone containing an activated sodium zeolite A having an effective pore diameter of about 4 Å;

and recovering from said adsorption zone a product substantially free of sulfur compounds.

4,098,685

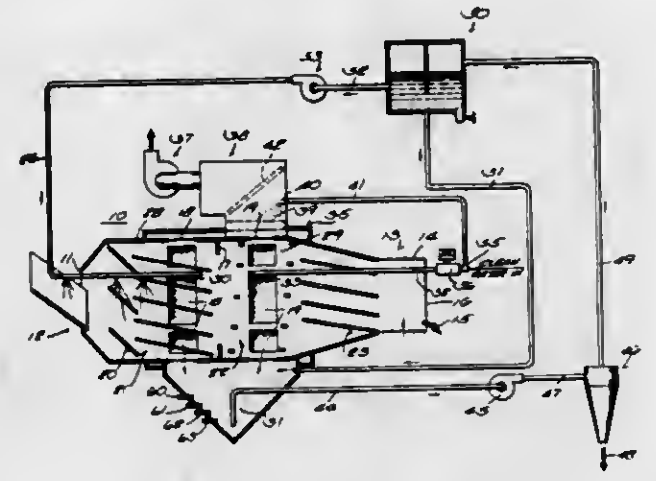
APPARATUS AND METHOD FOR SEPARATING LEAD BATTERY MATERIALS

Earl V. Akerlow, Grafton, and Kenneth M. Buchholz, Milwaukee, both of Wis., assignors to Akerlow Industries, Inc., Grafton, Wis.

Filed Jan. 6, 1977, Ser. No. 757,173

Int. Cl.^{2} B07B *1/24*

U.S. Cl. 209—10 1 Claim



1. Apparatus for separating lead compound materials and metallic lead grid materials which compose the plates of lead batteries, comprising:

a drum having a wall and being mounted for rotation about a generally horizontal axis, said drum having a first end in which there is an inlet for introducing the unseparated materials into said drum and having a second end in which there is an outlet for the separated metallic lead materials to discharge from the drum,

means in said drum for advancing materials introduced into said drum from its inlet end toward its outlet end and for tumbling said materials,

means for spraying water into said drum and onto said materials,

first and second axially spaced apart screen means in the wall of said drum, said first screen means being at a lesser distance from said inlet than said second screen means,

shroud means sealingly enclosing at least the part of said drum which includes said screen means, the bottom of said shroud means being constructed and arranged as a sump for collecting the compounds and water strained through screen means,

suction generating means having outlet means and having inlet means communicating with said shroud means and sump and being operative to induce subatmospheric pressure in said sump and shroud means, in said drum through said screen means and, at said inlet and outlet of said drum,

dryer means immediately adjacent said drum outlet, said dryer means receiving the metallic lead material advanced from the region of said second screen means and exposing said material to the inrush of air due to said subatmospheric pressure at said drum outlet to thereby dry said material,

said dryer means comprising hollow generally cylindrical screen support means including a concentric screen, said cylindrical support means being coaxial with and mounted to said drum for rotation therewith,

a stationary band surrounding a major part of the circumference of said cylindrical screen support means but spaced therefrom to define an air passage outside of said screen,

enclosure means including an element for producing a sliding seal relative to the end of said cylindrical support means which is most axially remote from said drum means, said enclosure means closing most of the axial end opening of said cylindrical means and leaving an opening for said metallic lead material to discharge from said dryer means.

4,098,686

FROTH FLOTATION METHOD FOR RECOVERING OF MINERALS

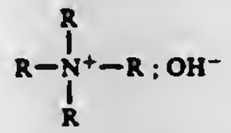
Vojislav Petrovich, 1935, W. Schiller St., Chicago, Ill. 60622

Division of Ser. No. 668,645, Mar. 19, 1976, abandoned. This application Sep. 16, 1976, Ser. No. 723,779

Int. Cl.^{2} B03D *1/06*

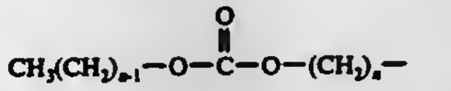
U.S. Cl. 209—166 2 Claims

1. A method of beneficiating ores selected from the group of vanadates, molybdates, wolframates, and uranates-uranyls by froth flotation process to produce a froth concentrate of desired metal values which comprises; effecting froth flotation of said ores in the presence of phosphorous acids selected from phosphoric acid, pyrophosphoric acid, phosphorous acid, and hypophosphorous acid, and collectors consisting of quaternary ammonium hydroxide of the generic formula



$$\begin{array}{c} \mathrm{R} \\ | \\ \mathrm{R}-\mathrm{N}^{+}-\mathrm{R}\ ;\ \mathrm{OH}^{-} \\ | \\ \mathrm{R} \end{array}$$

wherein one or two R's consist of dialkylcarbonate of the formula



$$\mathrm{CH_3(CH_2)_{n-1}-O-\overset{\overset{\displaystyle O}{\|}}{C}-O-(CH_2)_n-}$$

wherein *n* is an integer from 2 to 8, and one two, or three R's consist of straight or branched hydrocarbon chain with 1 to 8 carbon atoms, or one or two R's consist of phenyl or substituted phenyl; said quaternary ammonium hydroxides acting as collector-frothers in conjunction with said phosphorus acids added to the mineral slurry; said quaternary ammonium hydroxides and said phosphorus acids are added to the mineral slurry as quaternary ammonium phosphate, pyrophosphate, phosphite, or hypophosphite; said quaternary ammonium bases and phosphorus acids acting in conjunction forming at the mineral surface of said vanadates, molybdates, wolframates, and uranates-uranyls mineral-hydrocarbon complexes; said complexes attaching to bubbles provided by agitating the pulp of mineral slurry; and recovering a froth concentrate relatively rich in the desired metal value leaving tailing relatively poor in desired metal value.

4,098,687

BENEFICIATION OF LITHIUM ORES BY FROTH FLOTATION

David C. Yang, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Jan. 13, 1977, Ser. No. 759,092

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **13 Claims**

1. A method of beneficiating lithium-containing ores by froth flotation of lithium values from gangue including the steps of

forming an aqueous pulp of the ore having a particle size suitable for froth flotation;

conditioning the pulp by adding thereto a pre-mixed conditioning reagent, formed by mixing a water-soluble polyvalent metal salt with an aqueous solution of an alkali metal silicate, in an amount sufficient to provide from about 0.05 to about 4 pounds of alkali metal silicate per ton of ore, calculated as SiO_2 equivalent, and from about 0.02 to about 2 pounds of polyvalent metal salt per ton of ore and by adding thereto an effective amount of an anionic collector selective to flotation of lithium values; and

subjecting the conditioned pulp to a flotation operation whereby a concentrate containing a major portion of lithium value and a tailing relatively rich in gangue are produced.

4,098,688

BRIGHTENING OF CLAY BY FROTH FLOTATION

Alan J. Nott, Crantock nr. Newquay, England, assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Filed Jul. 21, 1976, Ser. No. 707,713

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.² B03D *1/02*

U.S. Cl. 209—166 **6 Claims**

1. A method for removing titaniferous discoloring contaminants from a kaolin clay, to thereby increase the brightness of said clay, said method comprising:

forming an aqueous dispersion of said clay, and blunging and conditioning said dispersion in the presence of a collector agent for said titaniferous contaminants, said agent comprising a complex phosphate ester or salt thereof, of a non-ionic surface active compound; said phosphate ester being selected from the group consisting of mono-esters, di-esters, and mixtures thereof; and said non-ionic surface active compound being the condensation product of an organic hydroxy compound of from 8 to 50 carbon atoms selected from the group consisting of alkyl phenols and alkanols with at least one mole of an alkylene oxide having from 2 to 3 carbon atoms, the non-ionic surface active compound containing a maximum of about 50% by weight of alkylene oxide based on the weight of the non-ionic surface active compound; and

subjecting said blunged and conditioned slurry to a froth flotation treatment to effect separation with said froth of said collected titaniferous contaminants.

4,098,689

METHOD OF TREATING WASTE WATER WITH ACTIVATED SLUDGE

Yasushi Kobayashi; Minoru Iwata, both of Himeji; Sadao Yoshida, Ichihara, and Hisashi Akatsuka, Himeji, all of Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

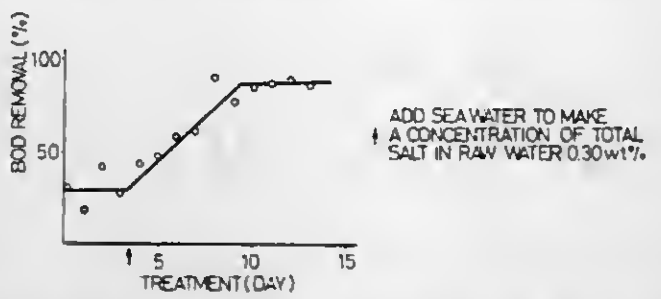
Continuation-in-part of Ser. No. 592,948, Jul. 3, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,173

Claims priority, application Japan, Jul. 5, 1974, 49-76481

Int. Cl.² C02C *1/06, 5/10*

U.S. Cl. 210—15 **8 Claims**

1. In a method for treating an oil-containing waste water with an activated sludge in an aeration tank, wherein the waste water is passed into the aeration tank at a rate of from about 50 to about 140 m³/hr. per 1000 m³ of the capacity of the aeration tank and wherein the concentration of the activated sludge in the aeration tank is from about 1000 to 8000 ppm, followed by sedimentation of the waste water and the activated sludge in a settling tank, the improvement which comprises adding to said waste water a treating agent consisting of a sea water to maintain therein a salt concentration (calculated as NaCl) of from about 0.3 to about 0.5 weight percent, to accelerate sludge sedimentation rate and to improve BOD and COD removal.



4,098,690

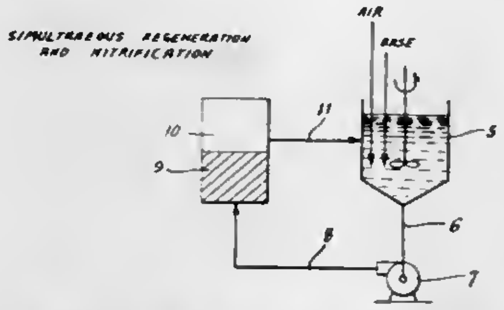
WATER PURIFICATION PROCESS

Michael J. Semmens, Champaign, Ill., assignor to The University of Illinois Foundation, Urbana, Ill.

Filed Mar. 29, 1976, Ser. No. 671,328

Int. Cl.² C02C *5/08, 5/10*

U.S. Cl. 210—18 **8 Claims**



5. A process for treating wastewaters to reduce the ammonia content thereof comprising the steps of:

a. contacting wastewater, having a dissolved ammonia content, with an ion exchanger having an affinity for ammonium ions whereby ammonium ions become sorbed onto said ion exchanger;

b. removing said ion exchanger containing sorbed ammonium ions from contact with the wastewater and then simultaneously regenerating said ion exchanger and converting said ammonium ions to nitrate ions by contacting said ion exchanger with a concentrated salt solution containing nitrifying bacteria, said salt solution comprising a brine having a concentration of 200 to 500 milliequivalents of sodium nitrate per liter, whereby the ammonium ions in the ion exchanger are replaced with ions from the salt solution and the displaced ammonium ions are oxidized by said nitrifying bacteria; and

c. recycling the regenerated ion exchanger for further contact with wastewater.

4,098,691

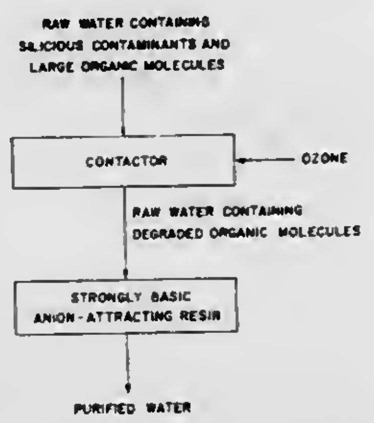
PURIFICATION OF WATER FOR BOILER

John Filby, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; Ontario Energy Corporation, Toronto; Imperial Oil Limited, Toronto; Canada-Cities Service, Ltd., Calgary and Gulf Oil Canada Limited, Toronto, all of, Canada

Filed Feb. 10, 1977, Ser. No. 767,438

Int. Cl.² C02B *1/38, 1/60*

U.S. Cl. 210—29 **4 Claims**


RAW WATER CONTAINING SILICIOUS CONTAMINANTS AND LARGE ORGANIC MOLECULES
CONTACTOR
OZONE
RAW WATER CONTAINING DEGRADED ORGANIC MOLECULES
STRONGLY BASIC ANION-ATTRACTING RESIN
PURIFIED WATER

1. In the process in which raw water, containing silicious contaminants and dissolved organic molecules having a molecular weight in excess of 6000, is treated with strongly basic anion-attracting exchange resin to remove substantially all said silicious contaminants to prepare said water for use as boiler feed, said resin being subjected to periodic regeneration when its ion exchange capacity is reduced by use, the improvement which comprises:

dispersing ozone in said raw water, before the water is contacted with the strongly basic resin, said ozone being added in sufficient quantity as to degrade the organic molecules to species of lower molecular weight whereby the resulting degraded organic molecules after adsorption on said strongly basic resin may be removed by regeneration with a strong base.

4,098,692

DEMULSIFICATION

Alan Stuart Baker, Slough, and Roger Ian Hancock, Middlesbrough, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 20, 1976, Ser. No. 752,792

Claims priority, application United Kingdom, Dec. 29, 1975, 52997/75

Int. Cl.² B01D *17/04;* **C02B** *1/18*

U.S. Cl. 210—43 **4 Claims**

1. A method of demulsifying a water-in-oil emulsion which comprises contacting the water-in-oil emulsion with an alkyd resin which is the condensation product of a polybasic acid selected from the group consisting of aliphatic dibasic acids containing up to 20 carbon atoms, aromatic dibasic acids containing up to 20 carbon atoms, aromatic tribasic acids containing up to 20 carbon atoms, aromatic tetrabasic acids containing up to 20 carbon atoms and dimer acid with a polyhydric alcohol and an aliphatic asturated or unsaturated mono-basic acid containing 6 to 22 carbon atoms, the polyhydric alcohol comprising a water soluble polyethylene, polypropylene or a poly(ethylene/propylene) glycol of molecular weight 400 to 10,000 and a polyhydric alcohol selected from the group consisting of mono-, di- and tri-ethylene glycol, mono-, di- and tri-propylene glycol, mono-, di- and tri-butylene glycol, neopentyl glycol, glycerol, tri-methylolpropane, trimethylolethane, pentaerythritol, dipentaerythritol, sorbitol, polypropylene glycol and polybutylene glycol, the alkyd resin containing at least 10% w/w of the water-soluble polyethylene, polypropylene or poly(ethylene/propylene) glycol and the level of application of the alkyd to the water-in-oil emulsion being 5 to 750 parts per million of emulsion.

4,098,693

CATIONIC CHLORINE-RESISTANT POLYMERIC FLOCCULANTS AND THEIR USE

Richard G. Tonkyn, Cornwells Heights, and Norman Vorchheimer, Buckingham, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 393,367, Aug. 31, 1973, abandoned. This application Jan. 2, 1976, Ser. No. 646,299

Int. Cl.² C02B *1/20*

U.S. Cl. 210—52 **6 Claims**

1. The process of flocculating undesirable particulate matter from an aqueous medium, which comprises, adding to said medium an effective amount of a quaternary, cationic, polymeric material consisting essentially of the reaction product of a caustic addition free reaction mixture of an epihalohydrin, ammonia and a lower dialkylamine, wherein said amine has from 1 to 3 carbons per alkyl group, wherein the amount of the ammonia ranges from about 15% to 33% of the total molar amount of the ammonia-amine concentration, wherein the ratio of the epihalohydrin to said ammonia-amine concentration is from about 0.9 up to the functional limit of said concentration, and wherein said polymeric material has a viscosity of from about 50 cps to about 4000 cps (Brookfield, spindle 1, 12 rpm) at a real solids content of from about 45% to about 55%.

4,098,694

METHODS AND COMPOSITIONS FOR DISPERSING OIL FILMS

Charles Perlaky, Crafton Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 13, 1972, Ser. No. 306,092

Int. Cl.² B01F *17/34, 17/36;* **C02C** *5/02*

U.S. Cl. 210—59 **12 Claims**

1. An oil film dispersing composition comprising a solution of

(a) about 3 to about 50% by weight of a non-ionic dispersant selected from the group consisting of fatty acid condensates of an alkanol amine, polyalkylene glycol ethers, poly-carboxylic acid esters and mixtures of the same, and

(b) about 50 to about 97% by weight of a water-insoluble oxygenated organic compound, said oxygenated organic compound being selected from the class of

  1. mixtures having 65 to 95% by weight of mixed alcohols having 4 to 13 carbon atoms in their molecule and 5 to 35% by weight of alkyl or aromatic acid esters of said alcohols, and
  2. oxo bottoms obtained from the production of oxo alcohols having 6 to 13 carbon atoms, and
  3. mixtures of 1 and 2.

10. A method for dispersing oil films on bodies of water wherein said oil has a bulk concentration in said water of less than about 100 ppm of oil comprising the steps of:

(i) forming a solution of

  a. about 3 to about 50% by weight of a non-ionic dispersant selected from the class consisting of fatty acid condensates of an alkanol amine, poly-alkylene glycol ethers, poly-carboxylic acid esters, or mixtures of the same, and
  b. about 50 to about 97% by weight of a water-insoluble oxygenated organic compound, said oxygenated organic compound being selected from the class of
    1. mixtures having 65 to 95% by weight of mixed alcohols having 4 to 13 carbon atoms in their molecule and 5 to 35% by weight of alkyl or aromatic acid esters of said alcohols, and
    2. oxo bottoms obtained from the production of oxo alcohols having 6 to 13 carbon atoms, and
    3. mixtures of 1 and 2, and

(ii) adding the solution of step (i) to the mixture of oil and water in an amount sufficient to disperse said oil film.

4,098,695

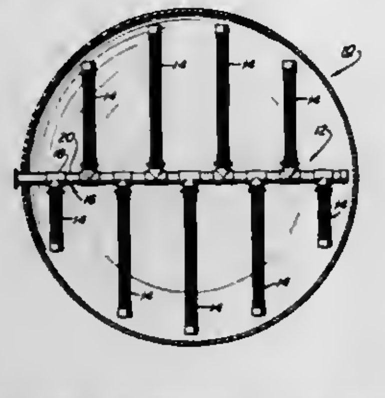
DISTRIBUTOR-COLLECTOR ASSEMBLY

Charles J. Novotny, Hickory Hills, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Apr. 27, 1977, Ser. No. 791,290

Int. Cl.^{2} B01D *35/02, 35/14*

U.S. Cl. 210—85 **2 Claims**



1. A distributor-collector assembly, comprising in combination

a rigid conduit provided with a row of precisely dimensioned apertures accurately located in the wall thereof,

an axially rigid tubular grid fitted over said conduit with one end of said conduit extending beyond one end of said grid,

a fine mesh flexible sleeve fitted over said grid and extending outwardly beyond said one end of said grid,

said sleeve and said grid obscuring said apertures,

closure means secured to the other end of said conduit for closing said other end of said conduit and for sealing said sleeve to said conduit in proximity to said other end,

an annular resilient gasket positioned over said sleeve adjacent to and beyond said one end of said grid,

said one end of said conduit being provided with an external screw thread,

an annular connector element having an internal screw thread mating with said external thread on said conduit removably to secure said connector element to said conduit,

said annular connector element having means thereon which cooperates with said gasket to seal said sleeve to said conduit beyond said one end of said grid,

a manifold having an internally screw threaded port,

said annular connector element having an external screw thread mating with said internally threaded port sealably to affix said conduit to said manifold,

said annular connector element having externally disposed visible indicia angularly located at a predetermined position relative to said row of apertures to show the precise angular location of said row of apertures relative to said manifold after assembly of said connector element to said manifold.

4,098,696

CENTRIFUGAL OIL PURIFYING MEANS

Geoffrey John Humphrey, Yeovil, and James Edwin Saunders, Sherborne, both of England, assignors to Westland Aircraft Limited, Yeovil, England

Filed Jul. 26, 1976, Ser. No. 708,319

Claims priority, application United Kingdom, Jul. 31, 1975, 32153/75

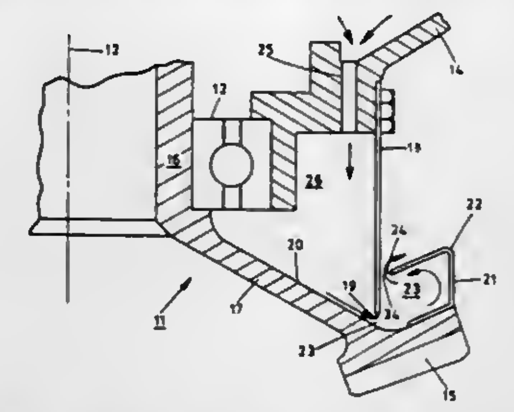
Int. Cl.^{2} B01D *33/00*

U.S. Cl. 210—168 **12 Claims**

1. In a splash type lubrication system in which oil is pumped to an upper area of a housing and lubricates parts as the oil falls through the housing, a gear assembly in the housing, the stationary housing supporting the gear for rotation about an axis with the gear having a central portion and a web extending between the central portion and peripheral gear teeth, and oil purifying means comprising in combination,

a first impervious screen attached to the housing and extending generally concentrically of said axis, said screen terminating at a boundary spaced-apart from a surface of the web to define a first spacing distance,

a second impervious screen attached adjacent a periphery of the web surface for rotation with said gear and disposed externally of said first screen, said second screen defining an annular cavity and including an inwardly directed lip terminating at a free edge spaced-apart from an external surface of said first screen to define a second spacing distance,



passageways in the housing arranged so that, during operation lubricating oil is directed into a space defined by said first screen, and on to said web surface, rotation of the gear causing the oil to be centrifuged through said first spacing distance into said cavity wherein the direction of the flow is reversed so that the oil exhausts through said second spacing distance while contaminent particles in the oil are retained in said cavity.

4,098,697

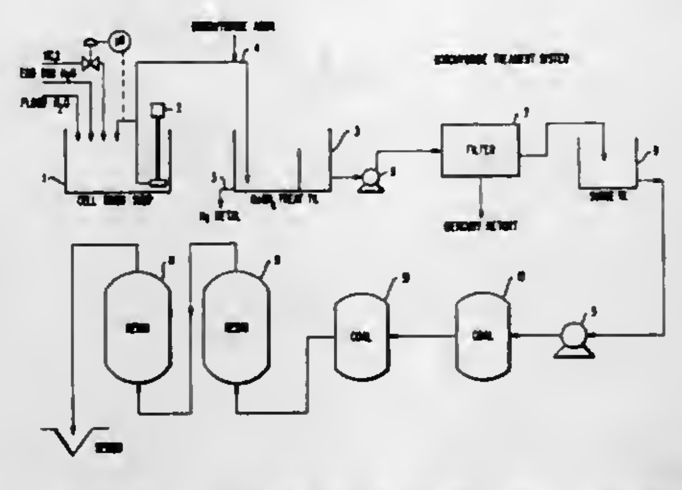
APPARATUS FOR REMOVING MERCURY FROM WASTE WATER

Peter DeAngelis; Alfred R. Morris, both of Brewer, and Alan L. MacMillan, Belfast, all of Me., assignors to Sobin Chlor-Alkali, Inc., Orrington, Me.

Continuation of Ser. No. 324,770, Jan. 18, 1973, abandoned, which is a division of Ser. No. 242,326, Apr. 10, 1972, Pat. No. 3,736,253. This application Sep. 13, 1974, Ser. No. 505,775

Int. Cl.^{2} C02B *1/18*

U.S. Cl. 210—202 **6 Claims**



1. Apparatus for treating the aqueous waste of industrial processes comprising in combination:

(a) means for providing a flowpath for a stream of aqueous waste to be treated;

(b) reducing means disposed at a first point along said flowpath; said reducing means comprising a reducing agent capable of reducing nonmetallic mercury to the metallic form and means for treating said waste stream with said reducing agent;

(c) filter means interposed in said flowpath at a second point downstream from said reducing means, and

(d) postfiltration treatment means comprising a bed of finely divided anthracite coal interposed in said flowpath at a third point downstream from said filter means.

4,098,698

AUTOMATIC RECOVERY SYSTEM FOR PLUGS AND EXCAVATION MATERIALS

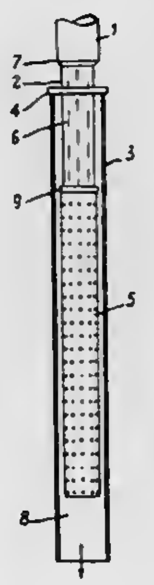
André Lamothe, Paris, France, assignor to Foraco Forage Rationnel Construction, Paris, France

Filed Sep. 20, 1976, Ser. No. 724,840

Claims priority, application France, Sep. 19, 1975, 75 28798

Int. Cl.^{2} B01D *23/06*

U.S. Cl. 210—309 **3 Claims**



1. An automatic recovery system for materials excavated during a drilling or plug removing operation comprising pipe means adapted to be connected to the inner pipe of a two pipe pressurized drilling system for receiving and conveying said materials, a strainer pipe having one end connected to said pipe means having a plurality of relatively fine slots disposed about the circumference thereof through which the pressurizing medium may be dissipated, a recovery sheath having a closed end and an open end connected to the other end of said strainer pipe for receiving and holding said materials and a sleeve open at at least one end secured to said strainer pipe and disposed in radially outwardly spaced concentric relation to said strainer pipe and said sheath for limiting the dissipation of the pressurizing medium and collecting fine loose material which may have passed through said slots.

4,098,699

LOW TURBULENCE SETTLING TANK

Dukecal Jenner Harding, Jackson Point, Canada, assignor to Magna International Inc., Downsview, Canada

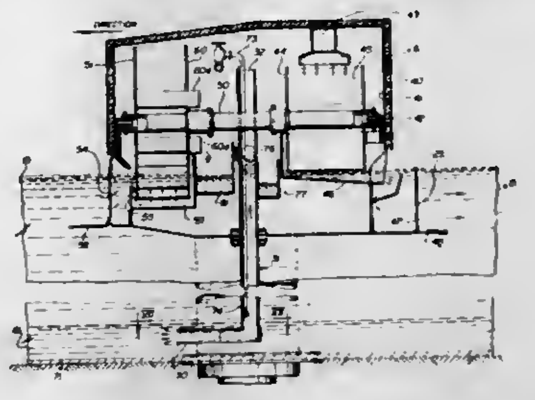
Filed Dec. 14, 1976, Ser. No. 750,489

Claims priority, application Canada, Dec. 18, 1975, 242059

Int. Cl.^{2} B01D *21/18*

U.S. Cl. 210—520 **9 Claims**

1. A settling tank system adapted for low-turbulence settling of solids from water, said system comprising a tank for retention of water during settling, a radial boom mounted at the level of the surface of the water for rotation around a central hub, means for rotating the boom, said boom having a leading edge and a trailing edge, said leading edge having a horizontal forwardly projecting shelf below the level of the water, said trailing edge having a horizontal rearwardly projecting shelf also below the level of the water, said leading edge shelf, trailing edge shelf and boom bottom presenting a smooth, streamline continuous surface for non-turbulent passage through the water, said boom being divided into a plurality of sections with each section having metering means for non-turbulently supplying solids containing water to the trailing edge of said boom section at a metered volume flow rate substantially equal to the rate of horizontal displacement of the moving boom section, and each section having pumping means for non-turbulently removing cleared water from the leading edge of said boom section at a flow rate substantially equal to the rate of horizontal displacement of the boom section, said metering means comprising a rotor adapted to be driven by incoming solids-containing water at a speed proportional to the flow rate thereof, and said pump being coupled to said rotor to have a constant speed relationship thereto and such as to remove the cleared water from the leading edge of the boom section at a flow rate proportional to the rotor speed.



4,098,700

CLAY-FREE, THIXOTROPIC WELLBORE FLUID

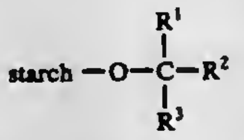
Arlyan H. Hartfiel, Houston, Tex., assignor to Chemical Additives Company, Houston, Tex.

Division of Ser. No. 472,982, May 24, 1974, Pat. No. 3,988,246. This application Sep. 25, 1975, Ser. No. 616,561

Int. Cl.^{2} C09K *7/02*

U.S. Cl. 252—8.5 A **5 Claims**

1. An aqueous clay-free thixotropic wellbore fluid for use in subterranean formations in the earth comprising water, at least 1% by weight of a brine forming soluble salt or mixture of salts of potassium, sodium or calcium, at least about 0.50 grams of MgO, 0.15 to 30 grams of amino ether starch having the formula



$$\text{starch}-O-\overset{\displaystyle R^1}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{C}}}}-R^2$$

where R^1 is H; R^2 is hydrocarbyl or H; R^3 is NR^5R^6 and R^5 and R^6 are H or hydrocarbyl each of said hydrocarbyl having 1 to 8 carbon atoms and 0.72 to 7.14 grams of a heteropolysaccharide prepared by the action of bacteria of the genus Xanthomonas on carbohydrates and an inorganic insoluble, particulate weighting material.

4,098,701

PROCESS FOR TREATING FIBRES

Peter Martin Burrill, Cowbridge, and William Samuel Kohnstamm, Rhiwbina, both of Wales, assignors to Dow Corning Limited, Barry, Wales

Filed Jun. 10, 1977, Ser. No. 805,261

Claims priority, application United Kingdom, Jun. 26, 1976, 26721/76

Int. Cl.^{2} D06M *15/66*

U.S. Cl. 252—8.6 **9 Claims**

1. A process for the treatment of fibres selected from cellulosic and synthetic fibres which comprises applying thereto a composition comprising (A) a polydiorganosiloxane having a

molecular weight of at least 2500 and terminal -OX radicals, wherein X represents a hydrogen atom, an alkyl radical having from 1 to 15 carbon atoms or an alkoxyalkyl radical having from 3 to 15 carbon atoms, at least two of the silicon-bonded substituents present in said polydiorganosiloxane being monovalent radicals composed of carbon, hydrogen, nitrogen and, optionally, oxygen, which radicals contain at least two amine groups and are attached to silicon through a silicon to carbon linkage, and at least 50 per cent of the total substituents in the polydiorganosiloxane being methyl radicals, any remaining substituents being monovalent hydrocarbon radicals having from 2 to 20 inclusive carbon atoms, (B) an organosiloxane having at least three silicon-bonded hydrogen atoms in the molecule and in which the organic radicals are alkyl radicals having less than 19 carbon atoms, and (C) a siloxane curing catalyst.

4,098,702

YARN FINISH FORMULATION

Roger John Crossfield, Matthews, and Norman Robert Cohen, Charlotte, both of N.C., assignors to George A. Goulston Company, Inc., Monroe, N.C.

Filed Apr. 9, 1976, Ser. No. 675,421

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² D06M *15/26*

U.S. Cl. 252—8.6 **12 Claims**

1. A yarn finish comprising (1) either (A) a mineral oil having a viscosity of 40 to 70 or (B) a blend of a mineral oil of desired viscosity with a mineral oil of reduced viscosity of 25 to 70 viscosity, the blend having a viscosity of 60 to 100, said viscosity of (A) and (B) being below the desired viscosity of a conventional yarn finish mineral oil formulation, (2) about .001 to 5% by weight of the finish of a long molecular chain polymeric viscosity index improver selected from the class consisting of polyisobutylene of 20,000 to 2,000,000 molecular weight Flory, polyalkylstyrenes of 20,000 to 2,000,000 molecular weight of Flory, polymethacrylate of 300,000 to 800,000 molecular weight Flory and ethylene-propylene copolymers of 300,000 to 800,000 molecular weight Flory and (3) an emulsifier, said viscosity index improver being present in an amount sufficient to raise viscosity of the blend to the level of conventional yarn finish mineral oil formulations, said mineral oil (A) or mineral oil blend (B) being the major component of the finish.

4,098,703

YARN FINISH FORMULATIONS

Roger John Crossfield, Matthews, and Norman Robert Cohen, Charlotte, both of N.C., assignors to George A. Goulston Company, Inc., Monroe, N.C.

Continuation-in-part of Ser. No. 397,338, Sep. 14, 1973, Pat. No. 3,977,979. This application Jun. 2, 1976, Ser. No. 692,076

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² D06M *15/26, 15/38*

U.S. Cl. 252—8.6 **12 Claims**

1. A yarn finish consisting essentially of a major amount of mineral oil, a minor, viscosity improvement amount of 0.1 to 15 percent by weight based on weight of the finish of a hydrocarbon soluble, long molecular chain polymeric viscosity index improver selected from the group consisting of polyisobutylene having an average viscosity molecular weight of about 7500 to 150,000 (Standinger), polyalkylstyrene having a molecular weight of about 300,000 to 800,000 (Flory), polymethacrylate having a molecular weight of about 300,000 to 800,000 (Flory), and ethylene-propylene copolymer having a molecular weight of about 300,000 to 800,000 (Fory), and a minor amount of a compatible emulsifier.

4,098,704

POLYOXYALKYLENE TETRAHALOPHTHALATE ESTER AS TEXTILE FINISHING AGENT

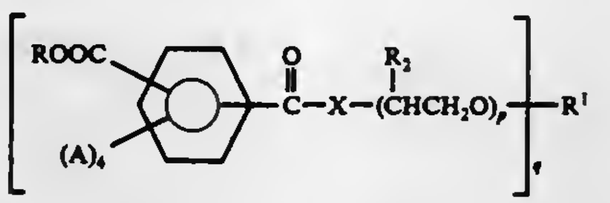
Stanley Robert Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 25, 1977, Ser. No. 772,043

Int. Cl.² D06M *13/20*

U.S. Cl. 252—8.6 **11 Claims**

1. A composition consisting essentially of the formula:

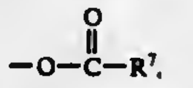


wherein

(a) the ring can have all possible isomeric arrangements;

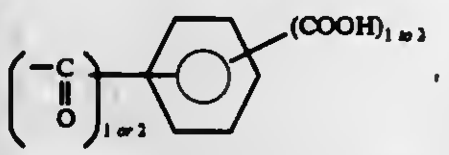
(b) R is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 10 carbons, hydroxyalkyl of 2 to 10 carbons, and polyhydroxyalkyl of 3 to 10 carbons;

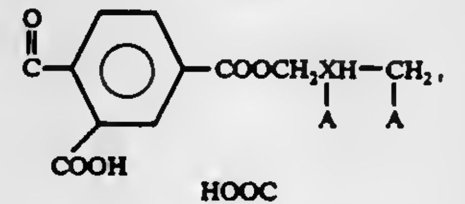
(c) R^1 is selected from the group consisting of an alkyl or substitued alkyl of 1 to 12 carbons,

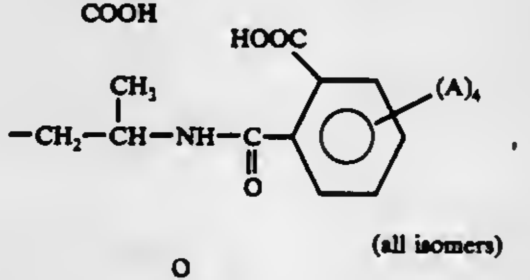


$$-O-\overset{\overset{O}{\parallel}}{C}-R^7,$$

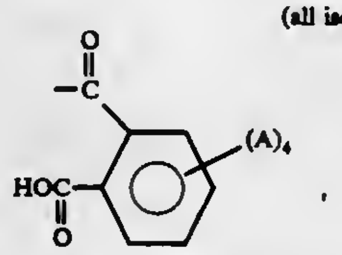
where R^7 is an alkyl of 1 to 18 carbons, a polyhydroxyalkyl of 3 to 12 carbons,



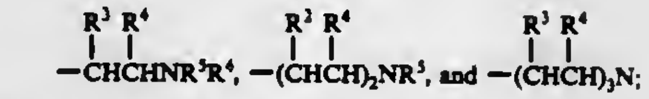




(all isomers)



(all isomers)



$$-\overset{R^3}{CH}\overset{R^4}{CH}NR^5R^6,\ -(\overset{R^3}{CH}\overset{R^4}{CH})_2NR^5,\ \text{and}\ -(\overset{R^3}{CH}\overset{R^4}{CH})_3N;$$

(d) R^2 is independently selected from the class consisting of H and CH_3—;

(e) R^3, R^4, R^5, and R^6 are independently selected from the class consisting of H and an alkyl of 1 to 18 carbons;

(f) *p* is an integer of 4 to 50;

(g) *q* is an integer of 1 to 6;

(h) *x* is selected from O or NH, and

(i) A is selected from Cl— or Br—.

4,098,705

SULFUR CONTAINING MOLYBDENUM DIHYDROCARBYLDITHIOCARBAMATE COMPOUND

Toshio Sakurai, Yokohama; Akio Nishihara, Tokyo; Takuro Handa, Tokyo; Hidekatsu Katoh, Tokyo; Yoshiro Tomoda, Tokyo; Kazumi Aoki, Tokyo, and Makoto Yoto, Tokyo, all of Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

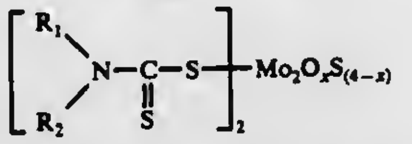
Filed Jul. 29, 1976, Ser. No. 709,856

Claims priority, application Japan, Aug. 7, 1975, 50-96135; Aug. 7, 1975, 50-96136; Mar. 3, 1976, 51-22749

Int. Cl.² C10M *1/54, 3/48, 5/28;* C07F *11/00*

U.S. Cl. 252—33.6 **17 Claims**

1. A composition having the formula:



wherein R_1 and R_2, which are the same or different, are selected from the group consisting of hydrocarbyl having from one to 24 carbon atoms and hydroxy-substituted hydrocarbyl having from one to 24 carbon atoms, and *x* is a number of from 0.75 to 2.1.

4,098,706

LUBRICATING AGENTS FOR THERMOPLASTIC MATERIALS AND PROCESS FOR PREPARING THE SAME

Jean Boussely, Paris; Marie-Madeleine Chandavoine; Michel Chignac, both of Sisteron; Claude Grain, Volonne, and Charles Pigerol, Saint-Ouen, all of France, assignors to Sapchim-Fournier-Cimag, Paris, France

Filed May 5, 1976, Ser. No. 683,415

Claims priority, application France, May 7, 1975, 75 14359

Int. Cl.² C10M *1/24*

U.S. Cl. 252—40.5 **7 Claims**

1. New lubricating compositions for thermoplastic materials comprising thiodiglycol dibehenate and an ester lubricating agent selected from the group consisting of 1,4-butanediol dibehenate, pentaerythritol tetrabehenate, and 1,2-propanediol dibehenate and mixture thereof, the compositions being formulated so that thiodiglycol dibehenate is present in the proportion of eight to ten parts by weight to three parts by weight of the other ester or esters.

4,098,707

LUBRICANT COMPOSITION

Gerassimos Frangatos, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,172

Int. Cl.² C10M *1/10, 3/02, 5/02, 7/02*

U.S. Cl. 252—49.9 **8 Claims**

1. A lubricant composition comprising a lubricant and an antiwear amount of a product prepared by reacting a chlorinated wax and a trihydrocarbyl phosphite.

4,098,708

SUBSTITUTED HYDROXYAROMATIC ACID ESTERS AND LUBRICANTS CONTAINING THE SAME

Carl Walter Stuebe, Beachwood, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 16, 1975, Ser. No. 587,513

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **23 Claims**

1. A composition comprising esters of substituted hydroxyaromatic carboxylic acids in which at least one substituent is a hydrocarbon-based radical containing at least about 10 carbon atoms.

4,098,709

POLYMERIC ANTIOXIDANT VISCOSITY INDEX IMPROVERS

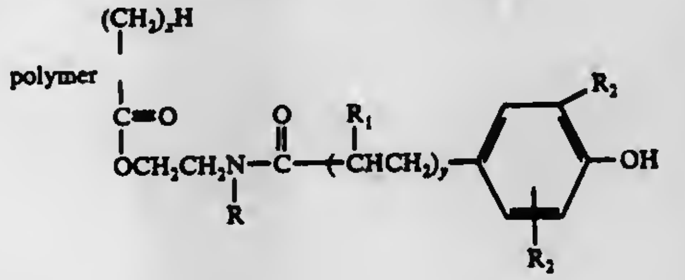
Richard H. Hanauer, Furlong, Pa., and Gordon L. Willette, Kingston, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 639,739, Dec. 11, 1975, which is a division of Ser. No. 541,973, Jan. 17, 1975, Pat. No. 3,951,831. This application Jun. 10, 1977, Ser. No. 805,257

Int. Cl.² C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 A **12 Claims**

1. A lubricant composition effective at high temperatures comprising (1) a major amount of a lubricating oil and (2) a minor antioxidant amount of a carboxylic acid-containing oil soluble polymer post-esterified with a hindered phenol antioxidant moiety and having the structure:

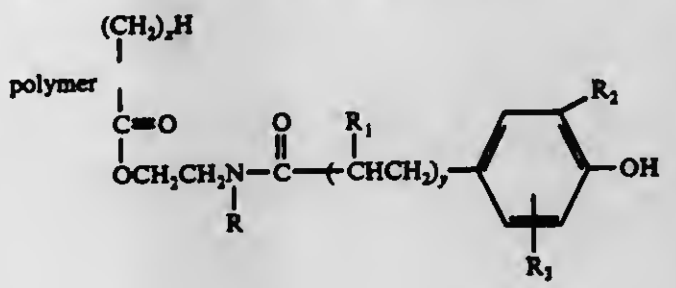


where

x is 0 or 1, R is H or C_1–C_{12} alkyl,

y is 0 or 1, R_1 is H or methyl, and R_2 and R_3 independently are C_1–C_{12} alkyl.

6. A polymeric antioxidant comprising a carboxylic acid-containing oil soluble polymer post-esterified with a hindered phenol antioxidant moiety and having the structure:



where

x is 0 or 1, R is H or C_1–C_{12} alkyl,

y is 0 or 1, and R_1 is H or methyl, and R_2 and R_2 independently are C_1–C_{12} alkyl.

4,098,710

OIL-SOLUBLE ADDITION PRODUCTS OF AN ETHYLENE-PROPYLENE COPOLYMER AND ANIONICALLY POLYMERIZABLE MONOMER HAVING UTILITY AS MULTIFUNCTIONAL V.I. IMPROVER FOR LUBRICATING OILS

Robert L. Elliott, Scotch Plains, and Brooke Gardiner, Jr., Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 680,077, Apr. 26, 1976, Pat. No. 4,051,050. This application Jun. 16, 1978, Ser. No. 696,786

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **18 Claims**

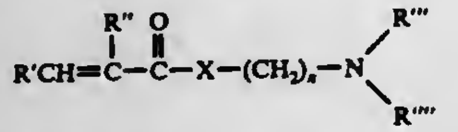
1. A lubricating oil composition comprising a major amount of lubricating oil and about 0.1 to 10 wt. % of an oil soluble addition product having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to about 10 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said oil soluble addition product being a condensation reaction product of:

(1) an anionically polymerizable monomer containing in the range of about 3 to 50 carbon atoms and at least one

electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being selected from the group consisting of:

(a) N,N (di C_{1-10} hydrocarbyl) carbodiimides;

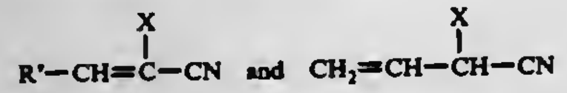
(b) monomers of the formula:



$$R'CH{=}\overset{R''}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-X-(CH_2)_n-N\begin{matrix}R'''\\R''''\end{matrix}$$

wherein X is oxygen or an NR'' group; *n* is 2 to 5; R' and R'' are hydrogen or a C_1 to C_4 alkyl group; and R''' and R'''' are C_1 to C_{12} hydrocarbyl groups; and

(c) nitrile monomers of the formulae:



$$R'-CH{=}\overset{X}{\overset{|}{C}}-CN \quad \text{and} \quad CH_2{=}CH-\overset{X}{\overset{|}{C}}H-CN$$

wherein R' is hydrogen or lower alkyl and X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl;

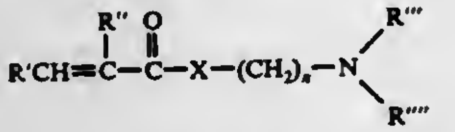
and (2) an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene;

said reaction product being formed by reacting said monomer and copolymer either thermally at about 100° to about 200° C., or catalytically in the presence of an aqueous solution of strong base having a pH of at least 8 as catalyst.

8. A process of preparing an oil soluble addition product having a number average molecular weight in the range of about 1,000 to 500,000 and containing in the range of about 0.005 to about 10 wt. % nitrogen, comprising the steps of reacting an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene and having an oxygen content of from about 0.005 to 6%, with an anionically polymerizable monomer, either thermally at a temperature between about 100° and about 200° C., or catalytically at about 0° to 100° C. in the presence of an aqueous solution of strong base having a pH of at least 8 as catalyst, and then recovering said product, and wherein said anionically polymerizable monomer is selected from the group consisting of:

(a) N,N (di C_{1-10} hydrocarbyl) carbodiimides;

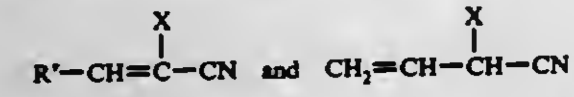
(b) monomers of the formula:



$$R'CH{=}\overset{R''}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-X-(CH_2)_n-N\begin{matrix}R'''\\R''''\end{matrix}$$

wherein X is oxygen or an NR'' group; *n* is 2 to 5; R' and R'' are hydrogen or a C_1 to C_4 alkyl group; and R''' and R'''' are C_1 to C_{12} hydrocarbyl groups; and

(c) nitrile monomers of the formulae:



$$R'-CH{=}\overset{X}{\overset{|}{C}}-CN \quad \text{and} \quad CH_2{=}CH-\overset{X}{\overset{|}{C}}H-CN$$

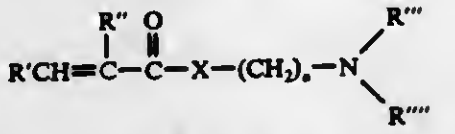
wherein R' is hydrogen or lower alkyl and X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl.

13. An oil soluble addition product having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to about 10 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said oil soluble addition product being a condensation reaction product of:

(1) an anionically polymerizable monomer containing in the range of about 3 to 50 carbon atoms and at least one electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being selected from the group consisting of:

(a) N,N (di C_{1-10} hydrocarbyl) carbodiimides;

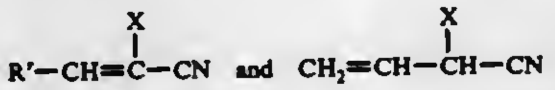
(b) monomers of the formula:



$$R'CH{=}\overset{R''}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-X-(CH_2)_n-N\begin{matrix}R'''\\R''''\end{matrix}$$

wherein X is oxygen or an NR'' group; *n* is 2 to 5; R' and R'' are hydrogen or a C_1 to C_4 alkyl group; and R''' and R'''' are C_1 to C_{12} hydrocarbyl groups; and

(c) nitrile monomers of the formulae:



$$R'-CH{=}\overset{X}{\overset{|}{C}}-CN \quad \text{and} \quad CH_2{=}CH-\overset{X}{\overset{|}{C}}H-CN$$

wherein R' is hydrogen or lower alkyl and X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl;

and (2) an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene;

said reaction product being formed by reacting said monomer and copolymer either thermally at about 100° to about 200° C., or catalytically in the presence of an aqueous solution of strong base having a pH of at least 8 as catalyst.

4,098,711

SENSOR WIRE THERMOPLASTIC COMPOUNDS

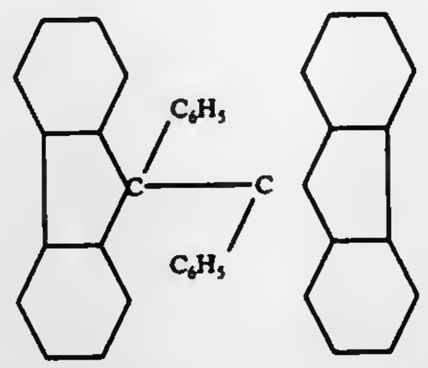
Charles H. Rogers, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 29, 1976, Ser. No. 671,217

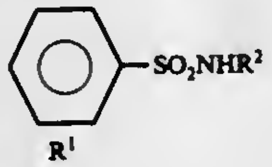
Int. Cl.² H01B *3/44, 3/18;* **H05B** *3/10, 3/18*

U.S. Cl. 252—63.2 **7 Claims**

1. An improved polyvinyl chloride (PVC) electrical insulating composition for insulating spaced metallic conductors, said composition insulating said conductors at room temperature and allowing an electrical current to flow between said conductors at elevated temperatures, the improvement comprising incorporating into the polyvinyl chloride composition at a level where each is effective to impart reduced volume resistivity at elevated temperatures to said polyvinyl chloride composition, at least one material selected from the group consisting of calcium and magnesium salts of linear C_{10}-C_{24} alcohol sulfates, the dimer of 9-phenylfluoryl radical having the general formula:



and ortho, para sulfonamides having the general formula:



wherein R^1 and R^2 are the same or different alkyl groups containing from 1 to 5 carbon atoms.

4,098,712

PROCESSING SOLUTION FOR METAL IMAGE-FORMING MATERIAL

Tomoaki Ikeda; Yasuo Washizawa; Masamiti Sigyo; Sadaharu Ikeda, and Satoshi Yoshida, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 11, 1977, Ser. No. 767,875

Claims priority, application Japan, Feb. 16, 1976, 51-16304

Int. Cl.² C23F *1/02*

U.S. Cl. 252—79.5 **23 Claims**

14. A processing solution consisting essentially of an alkaline solution and at least one compound of the formula (I) or (II):

$$M(BrO_2)_p \qquad (I)$$

$$M_m(IO_n)_p \qquad (II)$$

where M represents a hydrogen atom or a metal having a valence of 1 to 3, *m* represents 1, 2, 3 or 5, *n* repesents 3 or 6, and *p* represents 1, 2 or 3 and having a pH of 10 to 14.

17. A process for forming a metallic image comprising imagewise exposing a metal image-forming material comprising a support, a thin metallic layer composed mainly of aluminum on the support, and a photosensitive resin layer on the metallic layer; immersing said exposed metallic image forming material in a processing solution comprising (1) an alkaline solution, (2) at least one compound of the formula (I) or (II):

$$M(Br0_3)_p \qquad (I)$$

$$M_m(IO_n)_p \qquad (II)$$

wherein M repesents a hydrogen atom or a metal having a valence of 1 to 3, *m* repesents 1, 2, 3 or 5, *n* represents 3 or 6 and *p* represents 1, 2 or 3.

4,098,713

DETERGENT COMPOSITIONS

Kenneth L. Jones, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

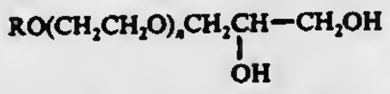
Division of Ser. No. 644,271, Dec. 24, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,647

Int. Cl.² C11D *1/02, 1/66*

U.S. Cl. 252—89 **8 Claims**

1. A detergent composition, having a pH of from about 8 to about 11 when used in the laundry solution, consisting essentially of:

(a) from 2% to about 95% of a compound of the formula



$$RO(CH_2CH_2O)_nCH_2\underset{OH}{\underset{|}{CH}}-CH_2OH$$

wherein R is an alkyl or alkenyl group of from about 8 to about 18 carbon atoms or an alkaryl group having from about 5 to about 14 carbon atoms in the alkyl chain, and n is from about 2 to about 5;

(b) from 0 to about 98% of detergency builders;
(c) from 0 to about 98% of anticaking agents;
(d) from 0 to about 98% of filler materials;
(e) from 0 to about 98% of soil suspending agents;
(f) from 0 to about 98% of optical brighteners;
(g) from 0 to about 98% of antispotting agents;
(h) from 0 to about 98% of dyes;
(i) from 0 to about 98% of perfumes;
(j) from 0 to about 98% of suds boosters;
(k) from 0 to about 98% of suds depressants;
(l) from 0 to about 98% of bleaching agents;
(m) from 0 to about 98% of alkalinity sources;
(n) from 0 to about 98% of enzymes;
(o) from 0 to about 98% water; and
(p) from 0 to about 98% of C_1–C_3 alkanols.

4,098,714

WATER SOFTENING MATERIALS

Helmut Derleth; Maria Hansen; Ingeborg Lange, and Artur Kürs, all of Nienburg, Germany, assignors to Kali-Chemie AG, Hanover, Germany

Filed Jun. 18, 1976, Ser. No. 697,616

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1975, 2527243

Int. Cl.² C02B *5/02, 1/22*

U.S. Cl. 252—181 **11 Claims**

1. A process for preparing a water softening composition which comprises the steps of:

(a) applying to finely divided solid carrier particles of an inorganic material selected from the group consisting of aluminosilicates having an Al_2O_3 content of from 1 to 75% by mole, kieselguhr, a silicic acid composition containing 67 mole % of SiO_2, 1 mole % of Al_2O_3 and 278 mole % of H_2O, a silica gel containing 12.24% of SiO_2, 7.35% of N_2SO_4, 0.41% of Na_2O and 80% of H_2O, aluminum oxide, alumina hydrate, bentonite and sodium sulfate, a solution of sodium aluminate having a concentration of from about 0.02% to 25% by weight and a molar ratio Na_2O/Al_2O_3 of from about 0.3 to 47, in an amount which is sufficient to coat said particles with an outside layer of sodium aluminate amounting from about 0.5 to about 50% by weight of said particles; and,

(b) drying the coated particles at a temperature of from about 20° to 120° C. to residual moisture content of from about 5% to 30% by weight.

4,098,715

PROCESS FOR BLENDING LIQUID RUBBER AND CARBON BLACK

Tatsuo Masuko; Osami Yanagida, and Shunji Yamamoto, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 541,717, Jan. 17, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,485

Claims priority, application Japan, Jan. 30, 1974, 49-11748

Int. Cl.² C09D *3/00*

U.S. Cl. 252—182 **7 Claims**

1. In a process for blending liquid rubber and carbon black by stirring and dispersing a mixture of the carbon black in the liquid rubber, the improvement consisting essentially of initially dispersing carbon black in a liquid rubber using a mixer or a kneader for highly viscous material which is equipped with a stirrer by mixing 60 to 150 parts by weight of carbon black in 100 parts by weight of the liquid rubber and then diluting the resultant dispersion with said liquid rubber to prepare the final proportion of less than 50 parts of carbon black per 100 parts of liquid rubber using said mixer or kneader, where the dilution is carried out at a diluting ratio of less than 40 parts of carbon black per 100 parts of liquid rubber.

4,098,716

CATALYST FOR SULFITE SCAVENGERS

James R. Stanford, Sugar Land; John H. Martin, Fresno, and George D. Chappell, Rosenberg, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 683,974, May 6, 1976, Pat. No. 3,996,135. This application Jul. 1, 1976, Ser. No. 701,842

Int. Cl.² C09K *3/00*

U.S. Cl. 252—188 **2 Claims**

1. A stable aqueous concentrate of sodium chlorite having the following composition:

Ingredients	Weight Percentage
Tap Water	74.0

-continued

Ingredients	Weight Percentage
Sodium Carbonate	5.0
Sodium Chloride	5.0
Sodium Chlorite	16.0

4,098,717

PROCESS OF DEMULSIFICATION EMPLOYING OXYALKYLATED CYCLIC PHENOL-ALDEHYDE RESINS

Rudolf S. Burfka; Allen R. Fanke, and Franklin E. Mange, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 686,094, May 13, 1976, Pat. No. 4,032,514, which is a continuation-in-part of Ser. No. 172,917, Aug. 18, 1971, abandoned. This application Mar. 24, 1977, Ser. No. 780,886

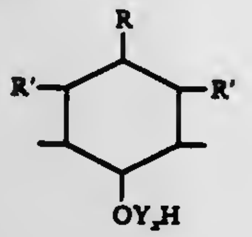
Int. Cl.² B01D *17/04*

U.S. Cl. 252—331 **14 Claims**

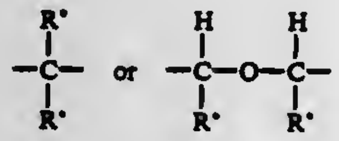
1. A process of demulsification of petroleum emulsions which comprises adding to said emulsion an amount effective to bring about demulsification, of an oxyalkylated, thioalkylated or aminoalkylated infusible cyclic phenol-aldehyde resin having a melting point above 300° C. and the idealized formula

$$-(\phi A^*)_n-$$

where n is 4 to 16, ϕ is



where A* is



$$-\underset{R^*}{\overset{R^*}{C}}- \text{ or } -\underset{R^*}{\overset{H}{C}}-O-\underset{R^*}{\overset{H}{C}}-$$

and the A* s are the same or different, R is alkyl, alkenyl, aryl, cycloalkyl, heterocyclic, alkaryl, aralkyl, halo, alkoxy or phenoxy and the Rs are the same or different, R' is hydrogen, alkyl, alkenyl, aryl, cycloalkyl, heterocyclic, alkaryl, aralkyl, halo, alkoxy, or phenoxy and the R's are the same or different, Y is AO, AS, AI or combinations or mixtures thereof, x is 1 to about 2000, AO being alkylene oxide, arylene oxide, alkarylene oxide, cycloalkene oxide or combinations or mixtures thereof, AS being alkylene sulfide, AI being alkyleneimine, 1 being NR" where R" is hydrogen, alkyl, cycloalkyl, aryl, aralkyl or alkaryl, and R* is hydrogen, alkyl, aryl, cycloalkyl, alkaryl, aralkyl or heterocyclic and the R* s are the same or different.

4,098,718

SOAPS OF MALEIC ANHYDRIDE ADDUCTS OF ALPHA-METHYLSTYRENE AND ALPHA-METHYLSTYRENE DIMER

Mario D. Zadra, Barberton, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

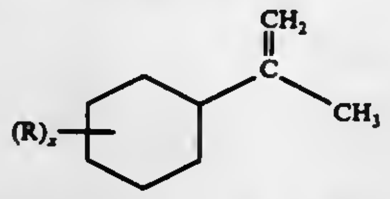
Filed Apr. 22, 1977, Ser. No. 790,112

Int. Cl.² B01F *17/00*

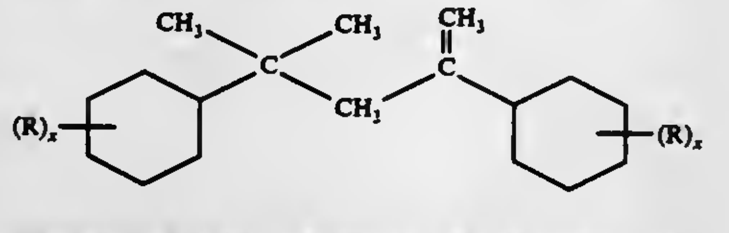
U.S. Cl. 252—356 **9 Claims**

1. An organic oligomer surface-active agent made by the process steps comprising:

(a) reacting a styrene derivative selected from the group consisting of (1) alpha-methylstyrene derivatives having the following molecular structure:



wherein R is selected from the group consisting of hydrogen, methyl, ethyl, isopropyl, t-butyl, and isobutyl, and x is 1, or 2; and (2) alpha-methylstyrene dimer derivatives having the following molecular structure:



with maleic anhydride, wherein the reaction is carried out:

(1) in the absence of a free radical catalyst;

(2) at a molar ratio of maleic anhydride to styrene derivative of 1.5 to 3 in the case of alpha-methylstyrene derivatives and 0.5 to 3 in the case of alpha-methylstyrene dimer derivatives; and

(3) at a temperature from 150° to 210° C. in the case of alpha-methylstyrene derivatives and 100° to 210° C. in the case of alpha-methylstyrene dimer derivatives; and

(b) neutralizing the oligomer reduction product in (a) by treating it with water and an alkali metal hydroxide.

4,098,719

POLYVINYL CHLORIDE SOLVENT WELD PRIMER COMPOSITION

Henry R. Huslebeck, North Wales, Pa., assignor to Certain-Teed Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 713,647, Aug. 12, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 779,273

Int. Cl.² B01F *1/00*

U.S. Cl. 252—364 **2 Claims**

1. A solvent welding primer composition for joining thermoformed polyvinyl chloride pipe and fittings or for joining polyvinyl chloride elements to acrylonitrile-butadiene-styrene elements consisting essentially of an organic solvent consisting essentially of tetrahydrofuran and dimethylformamide, the weight ratio of tetrahydrofuran to dimethylformamide being within the range of from about 1.64:1 to 1:1, said solvent having dissolved therein an amount within the range of from about 0.5 percent by weight to about 2.5 percent by weight of polyvinyl chloride homopolymer having an inherent viscosity of 0.80–0.98.

4,098,720

CORROSION INHIBITION

Chih M. Hwa, Arlington Heights, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Continuation of Ser. No. 409,513, Oct. 25, 1973, abandoned, which is a continuation of Ser. No. 169,483, Aug. 5, 1971, abandoned. This application Jan. 14, 1976, Ser. No. 649,126

Int. Cl.² C23G *11/16, 11/18*

U.S. Cl. 252—389 R **9 Claims**

1. A corrosion inhibiting composition free of any polyphosphate, chromate and borate and consisting essentially of:

	Weight Percent based on total weight, dry weight basis
Alkali metal nitrite	4 to 80
Alkali metal carbonate	2 to 60
Water-soluble mercaptobenzothiazole compound	0.1 to 10
Alkali metal hydroxide	0.1 to 20
Alkali metal silicate	0.1 to 30

4,098,721

TREATMENT OF DESULFURIZATION CATALYST AND ITS USE

Charles A. Ganster; Mary E. Callaghan, Port Arthur; Lee K. Gilmer; Gerald V. Nelson, both of Nederland, and Kenneth D. Miller, both of Port Neches, all of Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 537,033, Dec. 27, 1974, Pat. No. 3,953,321. This application Nov. 3, 1975, Ser. No. 628,455

Int. Cl.² B01J *27/02*

U.S. Cl. 252—439 **9 Claims**

1. A process for improving the properties of a desulfurization catalyst comprising an oxide of an iron group metal and an oxide of a Group VI metal on a refractory inorganic oxide support which comprises contacting said catalyst with a normally liquid petroleum fraction having an end boiling point not greater than about 625°–650° F. containing an added sulfur compound at a temperature between about 200° and 500° F. and a pressure between about 100 and 300 psig to at least partially sulfide said catalyst, heating the so-treated catalyst and maintaining it at a temperature between about 750° and 850° F. for a period of at least one hour in the presence of a petroleum hydrocarbon fraction and then reducing the catalyst temperature to desulfurization temperature.

4,098,722

METHODS OF FABRICATING BODIES

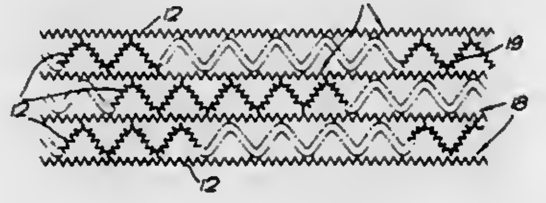
James Anthony Cairns, Wantage, and Michael Leaney Noakes, Reading, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 5, 1976, Ser. No. 711,970

Claims priority, application United Kingdom, Aug. 20, 1975, 34671/75

Int. Cl.² B01J *21/04*

U.S. Cl. 252—466 J **19 Claims**



1. A method of making a catalyst body having a plurality of channels extending therethrough comprising the steps of:

working at least one sheet of metal to provide at least one generally planar region and at least one region of first corrugations;

working said at least one sheet of metal to superimpose on each generally planar region and on each region of first corrugations, a set of second corrugations smaller than the first corrugations;

laying each generally planar region onto a region of first corrugations to fabricate a body having planar regions alongside regions of first corrugations with said second corrugations superimposed on the planar regions and the regions of first corrugations;

dipping the body into an aqueous wash coating composition comprising a carrier material for a catalyst, removing the body from the aqueous solution, and drying the body to provide a wash coated layer of said carrier material thereon; and

depositing a catalytic material on the wash coating of carrier material;

the size of said second corrugations being such that when the body is removed from the aqueous wash coating composition, a uniform layer of the wash coating composition is retained on the body.

4,098,723

CATALYST FOR DEHYDROGENATION

Gregor H. Riesser, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 27, 1977, Ser. No. 763,180

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.² B01J *23/78, 23/84*

U.S. Cl. 252—474 **16 Claims**

1. A catalyst for the dehydrogenation of hydrocarbons to more unsaturated hydrocarbons comprising a mixture having:

(a) from about 35 to about 67 percent by weight of an iron oxide, measured as iron metal;

(b) from about 4 to about 25 percent by weight of potassium oxide, measured as potassium metal;

(c) from about 0.5 to about 3.5 percent by weight of a vanadium oxide, measured as vanadium metal; and

(d) from about 0.0075 to about 8 percent by weight of a cobalt oxide measured as cobalt metal.

4,098,724

ELECTRICALLY CONDUCTIVE COMPOSITE MATERIALS

Peter Douglas, Weedon, and Thomas Ian Stewart, Melbourn Near Royston, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Aug. 4, 1976, Ser. No. 711,557

Claims priority, application United Kingdom, Aug. 6, 1975, 32801/75

Int. Cl.² H01B *1/02*

U.S. Cl. 252—514 **24 Claims**

1. An electrically conductive composite material consisting of a mixture of silver; not more than 50 percent by weight of cadmium oxide and not greater than 2,000 parts per million of compounds of potassium, the source of origin of said potassium consisting of potassium compounds and not including elemental potassium.

4,098,725

LOW THERMAL EXPANSIVE, ELECTROCONDUCTIVE COMPOSITE CERAMICS

Hirotaka Yamamoto; Hideaki Ninomiya, and Makoto Kobayashi, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1975, Ser. No. 634,150

Claims priority, application Japan, Nov. 28, 1974, 49-136811; Sep. 9, 1975, 50-109162

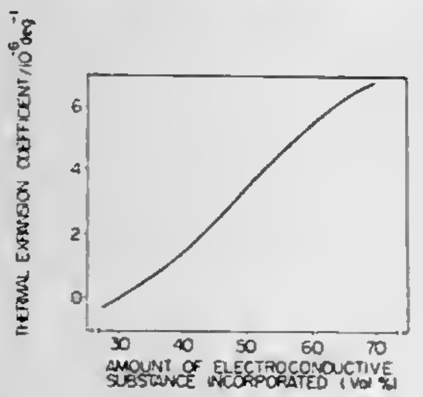
Int. Cl.² H01B *1/08*

U.S. Cl. 252—519 **1 Claim**

1. A low thermally expansive, electroconductive composite

sintered ceramic comprising a phase of at least one ceramic selected from the group consisting of

(a) low thermally expansive ceramics selected from the group consisting of spodumene series ceramics, eucryptite series ceramics, aluminium titanate series ceramics, cordierite series ceramics, mullite series ceramics and zircon series ceramics having a thermal expansion coefficient of about 5 × 10^{-6}/degree or less and



(b) negatively thermally expansive ceramics selected from the group consisting of eucryptite series ceramics and aluminium titanate ceramics and

said sintered ceramic having dispersed therein at least 10% by volume of a phase of $NiFe_2O_4$ substantially in a continuous state.

4,098,726

POLY[{ALKYL-(3-AMMONIOPROPYL)IMINIO}• TRIMETHYLENE DIHALIDES] AND PROCESS

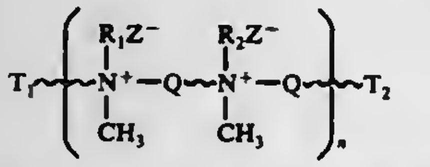
Arthur F. Wagner, Princeton; Nathaniel Grier, Engelwood, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 570,910, Apr. 23, 1975, Pat. No. 4,016,209, and Ser. No. 462,263, Apr. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,042, Jan. 11, 1973, abandoned. This application Apr. 1, 1977, Ser. No. 783,886

Int. Cl.² C08G *73/00*

U.S. Cl. 528—403 **11 Claims**

1. A linear unbranched non-cross-linked polymer of the formula:



$$T_1\sim\left(\underset{CH_3}{\overset{R_1Z^-}{N^+}}-Q\sim\underset{CH_3}{\overset{R_2Z^-}{N^+}}-Q\sim\right)_n\sim T_2$$

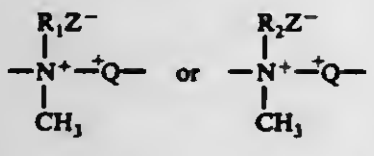
wherein R_1 and R_2 are the same or different and are ammonioloweralkyl, loweralkylammonioloweralkyl; diloweralkylammonioloweralkyl, triloweralkylammonioloweralkyl, or lower alkyl with the proviso that only one of R_1 and R_2 may be lower alkyl where said ammonio cation is countered with the anion Z; wherein *n* is an integer such that the number average molecular weight is from 300–50,000;

T_1 and T_2 are end groups;

Z^- is monovalent or polyvalent counter anion;

Q is trimethylene; and

the symbol indicates a bond to a plurality of the groups



$$-\underset{CH_3}{\overset{R_1Z^-}{N^+}}-Q-\quad\text{or}\quad-\underset{CH_3}{\overset{R_2Z^-}{N^+}}-Q-$$

where R_1, R_2, Q and Z^- are previously defined.

4,098,727

INSOLUBLE POLYMERS HAVING FUNCTIONAL GROUPS CONTAINING CHEMICALLY BONDED GROUP VIII METAL

Werner O. Haag, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 57,796, Jul. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 672,008, Oct. 2, 1967, abandoned, said Ser. No. 57,796, is a continuation-in-part of Ser. No. 672,009, Oct. 2, 1967, abandoned, and Ser. No. 860,807, Sep. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 672,010, Oct. 2, 1967, abandoned. This application Jan. 19, 1971, Ser. No. 107,863

Int. Cl.² C08F *8/42, 12/36*

U.S. Cl. 521—53 **3 Claims**

1. A composition of matter consisting essentially of an intrinsically porous solid organic styrene-divinyl benzene copolymer; a substituent selected from the functional group consisting of amine, thiol, phosphine and arsine chemically bonded through nitrogen, sulfur, phosphorus and arsenic respectively, to a carbon atom of said polymer; and a Group VIII metal chemically bonded to said substituent functional group which composition is substantially insoluble in a mixture of olefins, and alcohols and aldehydes corresponding to said olefins but having one additional carbon atom.

4,098,728

MEDICAL SURGICAL SPONGE AND METHOD OF MAKING SAME

Solomon Rosenblatt, 46 After Glow Ave., Montclair, N.J. 07042

Filed Jan. 2, 1976, Ser. No. 646,400

Int. Cl.² C08J *9/30*

U.S. Cl. 521—141 **9 Claims**

1. A biocompatible, polymeric, elastomeric, lint-free, uniformly swellable hydrophilic sponge for medical purposes having a uniform pore geometry and pore size distribution throughout its volume comprising the inorganic acid-catalyzed reaction product of formaldehyde and polyvinyl alcohol, said sponge being characterized by an initial water absorbtion and a wicking point of a maximum of 10 seconds of contact with the body fluid and by a variation in the size of the diameter of the pores of less than about 8 to 1 as determined by a stereoscopic microscope eyepiece.

4,098,729

PROCESS OF PRODUCING CROSS-LINKED URETHANE-GROUP COMPRISING FOAMS OF OPEN-CELL STRUCTURE

Hans-Joachim Kollmeier, Essen-Werden, and Gerd Rossmy, Haltern-Lavesum, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Continuation-in-part of Ser. No. 564,052, Apr. 1, 1975, and a continuation-in-part of Ser. No. 656,829, Feb. 10, 1976, abandoned. This application Jul. 13, 1976, Ser. No. 704,810

Claims priority, application Switzerland, Apr. 8, 1974, 4894/74; United Kingdom, Feb. 14, 1975, 6460/75

Int. Cl.² C08J *9/00*

U.S. Cl. 521—128 **13 Claims**

1. A process for producing cross-linked, resilient, urethane-group comprising foams of open-cell structure which comprises foaming a system of

(a) di or trifunctional active hydrogen atom comprising a polyetherpolyol of hydroxy equivalent weights of between about 700 -5,000;
(b) a di or trifunctional polyisocyanate;
(c) catalyst;
(d) blowing agent; and
(e) a cross-linker, said cross-linker being a crystalline saturated or unsaturated, aliphatic, cycloaliphatic, heteroaliphatic or arylaliphatic polyhydroxy compound having at least three hydroxy groups which, at room temperature, is insoluble or only slightly soluble in the system to be foamed and which melts in a temperature range of about 60° to 160° C, said cross-linker being used in quantities of 0.1 to 5.0 hydroxy equivalent weights calculated on one hydroxy equivalent weight of the polyol in the system,

and wherein about 0.5 to 50% by weight, based on the amount of water in the foaming system, of compounds which break down the association of water molecules, are added to the foaming system prior to foaming.

4,098,730

NON-FLAMMABLE ORGANO-RED MUD POLYMERS, SOME OF WHICH ARE ELECTRICALLY CONDUCTIVE, AND PROCESS FOR THEIR MANUFACTURE

Karl Heinz Hilterhaus, Georgsmarienhutte, and Franz Gottfried Reuter, Lemforde, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt; Chemie-Anlagenbau Bischofsheim GmbH and Reuter Technologie GmbH, all of, Fed. Rep. of Germany, part interest to each

Filed Aug. 27, 1976, Ser. No. 718,327

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1975, 2542288

Int. Cl.² C08G *18/00, 18/14*

U.S. Cl. 521—107 **36 Claims**

1. A method of making a red mud containing organo polymer which comprises reacting a compound possessing at least two isocyanate groups in the presence of a catalyst and red mud.

2. A red mud containing organo polymer produced by the process of claim 1.

4. A method according to claim 1 wherein the reaction mixture includes a blowing agent present in an amount sufficient to form a foamed polymer.

4,098,731

PROCESS FOR THE PRODUCTION OF FOAMS

Wulf von Bonin; Helmut Kleimann, and Jozsef Ivanyi, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 588,537, Jun. 19, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,090

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1974, 2431968

Int. Cl.² C08G *18/18*

U.S. Cl. 521—51 **7 Claims**

1. In a process for the production of mold-formed foam having an impervious outer skin with self-releasing properties, said process comprising:

(A) introducing a foamable reaction mixture into a closed mold, said mixture consisting essentially of:
  (i) an organic polyisocyanate,
  (ii) a compound having reactive hydrogen atoms and having a molecular weight of from 62 to 10,000,
  (iii) water and/or organic blowing agents,
  (iv) an isocyanate addition catalyst, and
  (v) an internal mold release agent,
(B) allowing said foamable reaction mixture to foam in said mold, and
(C) removing the resultant product from said mold, the improvement wherein said mold release agent consists of salts of saturated or unsaturated aliphatic or cycloaliphatic, carboxylic acids having at least 8 carbon atoms and tertiary amines of the type in which the atom ratio of the tertiary amine nitrogen to carbon in the molecule is between 1:3 and 1:12 and being devoid of amide or ester linkages.

4,098,732

PROCESS FOR PRODUCTION OF FLAME-RESISTANT AND SMOKE-RETARDANT POLYURETHANE FOAMS

Toshio Yukuta, Kodaira; Takashi Ohashi, Iruma; Minoru Kojima, Kodaira, and Masumi Saito, Tanashi, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 535,280, Dec. 23, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,143

Claims priority, application Japan, Dec. 25, 1973, 48-143692

Int. Cl.² C08G *18/32, 18/66, 18/22, 18/14*

U.S. Cl. 521—125 **16 Claims**

1. A process for the production of a flame-resistant and smoke-retardant polyurethane foam which comprises reacting, in the presence of an alkaline earth metal salt of aliphatic carboxylic acid and a foaming agent a polyisocyanate with a polyhydroxyl compound selected from the group consisting of

(a) a mixture of polyol containing more than 50% primary hydroxyl groups and having a number average molecular weight equal to or more than 3,000 and a low molecular weight polyhydroxyl compound; and
(b) a mixture of polyol containing more than 50% secondary hydroxyl groups and having a number average molecular weight equal to or more than 3,000 and a low molecular weight polyhydroxyl compound, wherein the low molecular weight polyhydroxyl compound is diethanol amine in an equivalent ratio of amine to polyol ranging from 0.5 to 2.0 and the amount of alkaline earth metal salt being from 0.1 to 5.0 parts by weight per 100 parts by weight of the polyhydroxyl compound.

4,098,733

COMPOSITES OF POLYURETHANES AND VINYL POLYMERS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 592,854, Jul. 2, 1975, abandoned. This application May 23, 1977, Ser. No. 799,480

Int. Cl.² C08G *18/14*

U.S. Cl. 521—123 **32 Claims**

1. A non-cellular polyurethane/vinyl polymer composite article which

(I) has a density of at least about 1 g/cc,
(II) has a percent elongation of less than about 100 and
(III) can be demolded and used for its intended purpose, after cooling to a suitable handling temperature, within a period of about 15 minutes or less without the application of an external source of heat after admixture of the components forming said article; said article resulting after admixture of the components of a composition which comprises:
  (A) a liquid polyol, or mixture of such polyols having from about 2 to about 8 hydroxyl groups and an OH equivalent weight of from about 30 to about 250;
  (B) an organic polyisocyanate or mixture of such polyisocyanates having an NCO equivalent weight of less than about 300, with the proviso that when Component (A) has an average of about 2 hydroxyl groups per molecule, said polyisocyanate or polyisocyanate mixture has an average of at least about 2.5 NCO groups per molecule;
  (C) from at least about 15% to less than about 65% by weight of the combined weight of Components (A), (B), (C), (D) and (E) of a polymerizable ethylenically unsaturated monomer having an atmospheric boiling point above about 80° C or mixtures of such monomers;
  (D) an effective quantity of a catalyst for polymerizing Component (C);
  (E) an effective quantity of a catalyst for urethane formation such that the composition reaches an exotherm temperature of at least about 80° C; and
  (F) from 0 to about 50% by weight based upon the combined weight of Components (A), (B), (C), (D), (E) and

(F) of a modifier substance free from groups reactive with Components (A), (B), or (C) at the conditions employed herein, said modifier substances being selected from the group consisting of

- (1) liquid substances having an atmospheric boiling point of at least about 150° C;
- (2) solid substances having a surface area of less than about 0.8 m^2/gram and a particle size such that said substance will pass through a ¼-inch square opening is substantially free of any absorbed or occluded water and will not decompose at a temperature below the maximum exotherm temperature generated by the urethane forming reaction;
- (3) polymers of one or more ethylenically unsaturated monomers, said polymers having
  - (a) a molecular weight such that the polymer has a grease melt flow index as determined with a 0.02 inch orifice employing a total weight of 2160 grams at 80° C of from about 1 to about 250 decigrams/-minute;
  - (b) a solubility parameter of at least about 8;
  - (c) and a specific heat of at least about 0.35 calories/-gram/° C; and
- (4) mixtures thereof; and

wherein Components (A) and (B) are present in quantities such that the NCO:OH equivalent ratio is from about 0.75:1 to about 1.5:1 and with the following provisos:

- (a) that the urethane exotherm temperature does not greatly exceed the boiling point of the monomer or mixture of monomers employed as Component (C);
- (b) that when Component (A) is an amine initiated polyol, Component (E) need not be present;
- (c) that when Component (B) is an aromatic polyisocyanate and Component (C) contains a tertiary amino vinyl compound, then Component (E) may be omitted;
- (d) that the combined quantity of Components (C) and (F) be less than about 60% by weight based upon the combined weight of Components (A), (B), (C) and (F);
- (e) that when Component (F-3) is employed as Component (F), it is employed in quantities of ≦20% by weight of the combined quantities of Components (A), (B) and (F);
- (f) that when Component (E) contains only a tertiary aliphatic amine, Component (B) must contain an aromatic polyisocyanate.

4,098,734

POLYMERIC ALLOY COMPOSITION

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 17, 1977, Ser. No. 778,802

Int. Cl.² C08L ***1/10***

U.S. Cl. 260—17 R **10 Claims**

1. A fusible polymeric alloy composition comprising a blend of:

- A. a matirx interpolymer comprising polymerized monovinylidene aromatic and ethylenically unsaturated nitrile monomers,
- B. a grafted rubber copolymer having a diene rubber as a substrate grafted with said monomers as superstrate interpolymers,
- C. a polymer other than (A) or (B) having a solubility parameter in the range of 8.5 to 13, said polymer (C) being selected from the group consisting of polymethylmethacrylate, polycarbonate, polyphenylene ether, cellulose butyrate, polyester, polyamide and mixtures thereof, and
- D. an inorganic filler.

4,098,735

WATER REDUCIBLE EPOXY ESTER USING MONOCARBOXYLIC ACID TO CONTROL MOLECULAR WEIGHT

Michael Allan Tobias, Bridgewater, N.J., assignor to Mobli Oil Corporation, New York, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,312

Int. Cl.² C08G ***51/24***

U.S. Cl. 260—18 EP **27 Claims**

1. An epoxy ester comprising an ester adduct of a polyfunctional 1,2-epoxy resin and an aliphatic monocarboxylic acid having between about 8 carbon atoms and 18 carbon atoms or mixtures thereof and an aliphatic dicarboxylic acid having between about 6 and about 10 carbon atoms, the ratio of dicarboxylic acid to monocarboxylic acid being between about 2 and about 5, based upon the equivalent weight of each acid, the ratio of total aliphatic carboxylic acid equivalents (monocarboxylic acid plus dicarboxylic acid) to epoxide equivalents being between 1.0 and 1.2, and trimellitic anhydride, the ratio of anhydride equivalents in said trimellitic anhydride to equivalents of epoxy being between 0.15 and 0.35; the reaction between said epoxy resin, said monocarboxylic acid, and said dicarboxylic acid being carried out in a solvent under reflux at an elevated temperature until the acid number is 3–22 and the epoxy content is 0.025–0.035 meq./g. to obtain an initial ester and reacting said initial ester with trimellitic anhydride at a lower elevated temperature until the alcoholic acid number and the aqueous acid number are substantially equal.

4,098,736

LIQUID MEMBRANE ENCAPSULATED REACTIVE PRODUCTS

Norman N. Li, Edison, and Adam L. Shrier, Montclair, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jul. 13, 1972, Ser. No. 271,398

Int. Cl.² C08L ***91/00***

U.S. Cl. 260—18 PN **23 Claims**

1. A composition of matter, comprising droplets of an emulsion suspended in a continuous liquid phase, said continuous phase comprising at least one reactant, and said emulsion comprising an interior phase, said interior phase comprising a coreactant, which is capable of reacting with said reactant upon the breaking of the emulsion, and an exterior phase, said exterior phase being immiscible with said continuous liquid phase, an said exterior phase being impermeable to said reactant and coreactant.

2. The composition of claim 1, wherein said emulsion comprises a surfactant.

4. The composition of claim 2, wherein said reactant comprises an amine hardener, said coreactant comprises an epoxy resin.

4,098,737

TREATMENT OF VULCANIZED RUBBER

Timothy Charles Philip Lee, and William Millns, both of Shrewsbury, England, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 431,623, Jan. 8, 1974, Pat. No. 4,046,834. This application Dec. 9, 1975, Ser. No. 639,013

Int. Cl.² C08L ***91/00***

U.S. Cl. 260—23.7 A **12 Claims**

1. A method of converting vulcanised rubber into finely-divided vulcanised rubber which comprises the steps:

- (1) contacting vulcanised rubber with a fatty acid,
- (2) contacting the product of step (1) with a solid alkali,
- (3) forming a dispersion of the product of step (2) by passing the product of step (2) together with water through an abrasive disc mill, and
- (4) removing the finely-divided rubber from the dispersion.

4,098,738

IMAGE DEVELOPING MEANS

Donald D. Buerkley, Inver Grove Heights, and Richard S. Law, Newport, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 207,646, Dec. 13, 1971. This application May 25, 1976, Ser. No. 689,841

Int. Cl.² C08L ***91/00***

U.S. Cl. 260—28.5 AV **6 Claims**

1. A composition molded into an imaging means, said composition comprising

- (1) 5 – 25% by weight of an oily liquid solvent phase comprising a liquid polyoxyalkylene aryl ether blended with a liquid organic phosphate ester, said solvent phase containing ferric benzoate dissolved therein,
- (2) at least 65% by weight of a wax blend, said blend comprising a major amount of microcrystalline wax and a substantial minor amount of a wax with some paraffin character,
- (3) 0.1 – 10% by weight of a wax-compatible, amorphous vinyl resin wax toughening agent, said toughening agent being intimately blended with said wax blend, said wax blend being intimately blended with said oily liquid solvent phase, and said ferric benzoate being present in sufficient quantity to provide from about 0.1 to about 1% by weight of elemental iron, as ferric ion, in said composition.

4,098,739

BLENDS CONTAINING MODIFIED POLYETHYLENE

Peter Henry Westermann, Dorking, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 21, 1977, Ser. No. 779,496

Claims priority, application United Kingdom, Mar. 26, 1976, 12226/76

Int. Cl.² C08L ***91/00***

U.S. Cl. 260—28.5 D **18 Claims**

1. A blend of chlorosulphonated polyethylene elastomer and hardened extract, said hardened extract being obtained by blowing a gas containing free oxygen at elevated temperatures into a solvent extract of a distillate petroleum fraction or a deasphalted petroleum residue, said hardened extract having a boiling point above 350° C at atmospheric pressure, containing a major proportion of aromatic hydrocarbons and having a saturated hydrocarbon content of not more than 10% by weight, the weight ratio of said chlorosulfonated polyethylene to hardened extract being in the range of from about 4:1 to 1:10.

4,098,740

AQUEOUS ACRYLIC-CARBOXYLATED POLYETHER COMPOSITIONS

David R. Wallace, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,005

Int. Cl.² C08L ***63/02***

U.S. Cl. 260—29.6 NR **12 Claims**

1. An aqueous composition comprising a mixture of:

- (A) 20 to 80 percent by weight of a water-borne acrylic polymer latex in which the acrylic polymer has a molecular weight of at least 250,000 on a weight average basis and which is composed of 35 to 100 percent by weight of esters of organic acids having terminal methylene groups, 0 to 10 percent by weight of unsaturated carboxylic acids and 0 to 60 percent by weight of a copolymerizable monomer containing a $CH_2{=}C<$ group in the terminal position other than the acids and esters mentioned above, the percentages by weight being based on total weight of the monomer charge,
- (B) 20 to 80 percent by weight of a carboxylated polyether formed from reacting and then hydrolyzing
  - (1) a polyepoxide having an epoxide equivalency greater than 1.0,
  - (2) a compound containing at least one phenolic hydroxyl group and containing at least one group hydrolyzable to a carboxyl group.

4,098,741

PHOSPHORUS-CONTAINING POLYESTER AND SIZE COMPOSITIONS

Robert Bernard Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 30, 1976, Ser. No. 727,991

Int. Cl.² C08J ***3/06;*** **C08L** ***67/02;*** **C08G** ***63/68***

U.S. Cl. 260—29.2 E **21 Claims**

1. A polyester consisting of the condensation product of:

- (a) a dicarboxylic reactant consisting of isophthalic acid, the corresponding ester, acyl halide, and mixtures thereof or said dicarboxylic reactant in admixture with up to equal parts on a molar basis of (1) at least one aliphatic dicarboxylic acid, a corresponding acid anhydride, ester and acyl halide or mixtures thereof, (2) at least one other aromatic dicarboxylic acid, a corresponding acid anhydride, ester and acyl halide, or (3) mixtures of (1) and (2),
- (b) at least one diol or polyoxyalkylene glycol, and
- (c) a phosphorus acid reactant selected from the group consisting of phosphorus pentoxide, phosphoric acid and mixtures thereof

wherein said polyester is solid, branched, contains repeating carbonyl-oxy units and phosphate units wherein each of said units is an integral part of said polyester chain and said polyester has a carboxylic acid number of about 5 to about 15, a molecular weight of about 4,000 to about 11,000, and wherein said dicarboxylic reactant (a) is present in the proportion of about 45 to about 35 mole percent; said diol or polyoxyalkylene glycol (b) is present in the proportion of about 50 mole percent; and said phosphorus acid reactant (c) is present in the proportion of about 5 to about 15 mole percent.

4,098,742

FLUORINE AND SILICONE CONTAINING POLYMERS

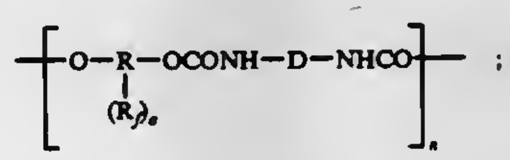
Karl Friedrich Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1977, Ser. No. 762,061

Int. Cl.² C08G ***77/04;*** **C08L** ***75/04;*** **C08J** ***3/06***

U.S. Cl. 260—29.2 M **21 Claims**

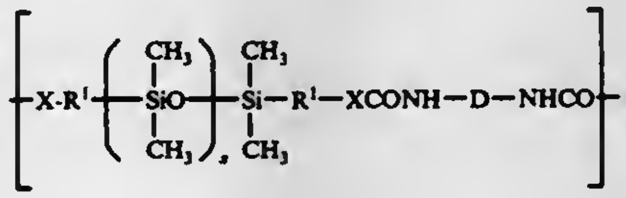
1. A polyurethane comprising 5 to 60% of a perfluoroalkyl-containing segment and 40–95% of a siloxane-containing segment, wherein the perfluoroalkyl-containing segment is selected from those of the structure:



$$-\!\!\left[O-\underset{(R_f)_a}{\underset{|}{R}}-OCONH-D-NHCO\right]_n\!\!-$$

; and

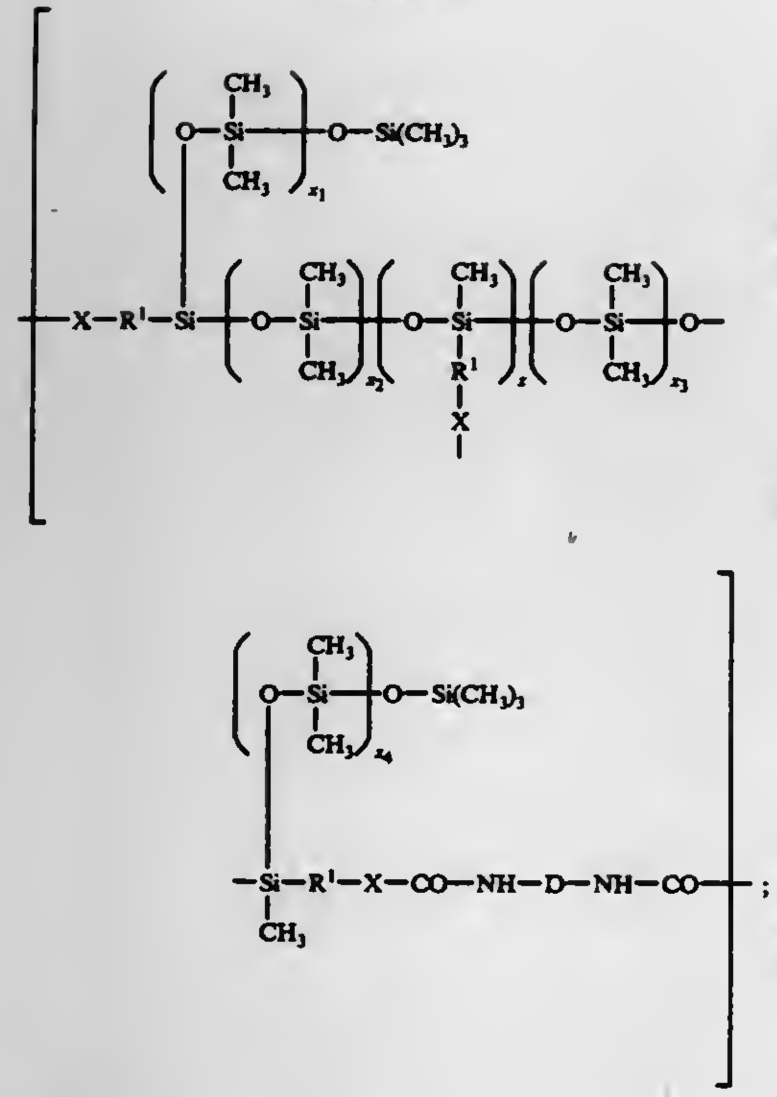
the siloxane-containing segment is selected from those of the structures



$$\left[-X\text{-}R^1-\left(\underset{CH_3}{\overset{CH_3}{\overset{|}{\underset{|}{SiO}}}}\right)_x-\underset{CH_3}{\overset{CH_3}{\overset{|}{\underset{|}{Si}}}}-R^1-XCONH-D-NHCO-\right]$$

and

-continued



wherein

D is lower alkylene, cycloalkylene, phenylene or naphthylene,

R is a branched or straight chain bridging group selected from alkylene of 1 to 12 carbon atoms, alkylene thioalkylene of 2 to 12 carbon atoms, alkylene polyoxyalkylene of 4 to 80 carbon atoms and 1 to 40 oxygen atoms, alkyleneiminoalkylene of 1 to 12 carbon atoms where the nitrogen atom contains as a third substituent hydrogen or an alkyl or hydroxy-alkyl group of 1 to 6 carbon atoms,

R_f is perfluoroalkyl of 4 to 18 carbon atoms or a perfluoroalkoxyperfluoroalkyl of 4 to 24 carbon atoms,

X is oxygen or sulfur or NH,

n is 1 to 5,

a is 1 or 2,

x_1, x_2, x_3 and x_4 are independently of each other 1 to 40 with $x_1 + x_2 + x_3 + x_4 = 5$ to 75,

z is 0 or 1,

R^1 is alkylene of 3 to 5 carbon atoms or a polyalkoxy chain of 1 to 15 alkoxy units of 2 or 3 carbon atoms each, and

x is 5 to 50.

18. An aqueous dispersion containing a polyurethane of claim 1.

4,098,743

POLYLACTONE-POLYURETHANES AND AQUEOUS DISPERSIONS THEREOF

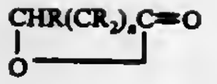
Roger L. Scriven, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 26, 1976, Ser. No. 690,338

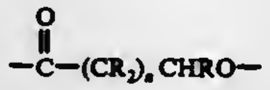
Int. Cl.² C08G *18/42, 63/08;* C08K *3/02*

U.S. Cl. 260—29.2 TN **20 Claims**

1. In a process which comprises reactting a lactone of the formula:



wherein n is an integer of from 4 to 6, and wherein at least $(n+2)$ R's are hydrogen and wherein the remaining R's are of the group consisting of hydrogen, alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radical with an active hydrogen-containing material so as to produce a polylactone having recurring

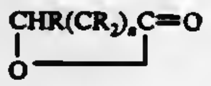


$-\overset{\overset{O}{\|}}{C}-(CR_2)_n\,CHRO-$

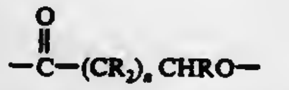
moieties in the polymer backbone, wherein the variables n and R have the aforesaid meanings, the improvement comprising:

reacting the lactone with an active hydrogen-containing material having at least 2 active hydrogen groups per molecule selected from the class consisting of hydroxyl, primary amine, secondary amine and thiol and having anionic water-solubilizing groups or groups which are readily reacted to form anionic water-solubilizing groups; said active hydrogen-containing material having an ionic equivalent weight of less than 1000, the equivalent ratio of lactone to active hydrogen-containing material being at least 0.5:1.

10. In an ungelled polyurethane comprising the reaction product of an organic polyisocyanate and a polylactone, the improvement comprising employing a polylactone formed from reacting a lactone of the formula:



where n is an integer of from 4 to 6, and where at least $(n+2)$ R's are hydrogen, and the remaining R's are of the group consisting of hydrogen, alkyl, cycloalkyl, alkoxy and single ring aromatic hydrocarbon radicals with an active hydrogen-containing material so as to produce a polylactone having recurring



$-\overset{\overset{O}{\|}}{C}-(CR_2)_n\,CHRO-$

moieties in the polymer backbone, wherein the variables n and R have the aforesaid meanings; said active hydrogen-containing material having at least 2 active hydrogen groups per molecule selected from the class consisting of hydroxyl, primary amine, secondary amine and thiol and having anionic water-solubilizing groups or groups which are readily reacted to form anionic water-solubilizing groups and having an ionic equivalent weight of less than 1000, the equivalent ratio of lactone to active hydrogen-containing material being at least 0.5:1.

4,098,744

CURABLE WATER-BORNE EPOXY RESIN COATING COMPOSITIONS

Roy A. Allen, and LeRoy W. Scott, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 28, 1977, Ser. No. 782,206

Int. Cl.² C08L *61/06, 63/00*

U.S. Cl. 260—29.3 **12 Claims**

1. A hydrolytically-stable, heat-curable composition comprising:

(1) a water-soluble composition prepared by (a) condensing near chemical equivalent amounts of an epoxy resin having more than one 1,2-epoxy group with an amino-containing aromatic carboxylic acid, and (b) solubilizing the resulting condensate by reacting the pendant carboxyl groups with an amine or ammonia, and

(2) a curing amount of a water-miscible aminoplast or phenoplast resin.

4,098,745

WATER-BORNE BONDABLE BASE COAT AND SIZE COAT FOR THREE PIECE, TIN-FREE STEEL BEVERAGE CONTAINERS

Robert F. Borman, Delaware, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 27, 1975, Ser. No. 608,370

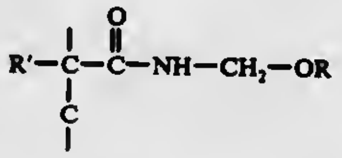
Int. Cl.² C08L *61/10, 61/28*

U.S. Cl. 260—29.3 **12 Claims**

1. An aqueous coating composition for use as a base coat or size coat in a three piece metal beverage container having an adhesive bonded side seam, said composition comprising a blend of an interpolymer and an aldehyde condensation resin wherein:

A. said interpolymer is an aqueous dispersion of an amine-neutralized or partially-neutralized interpolymer formed in the presence of a vinyl polymerization catalyst and in the absence of mercaptan, external surfactant and dispersion stabilizer, said interpolymer consisting essentially of:

(1) from about 5 percent to about 50 percent of a substituted carboxylic acid amide formed in units of the structure:



$R'-\underset{\underset{|}{C}}{\overset{|}{C}}-\overset{\overset{O}{\|}}{C}-NH-CH_2-OR$

where R′ is methyl or hydrogen and R is hydrogen or lower alkyl with at least 50 percent of the groups represented by R being lower alkyl;

(2) from about 3 percent to about 30 percent of units formed by vinyl polymerization of ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid and maleic acid and half esters of maleic and fumaric acids;

(3) from about 5 percent to about 75 percent of units derived by vinyl polymerization of hardening monomer selected from the group consisting of styrene, vinyl toluene and alkyl methacrylates having 1 to 4 carbon atoms; and

(4) from about 5 percent to about 75 percent of units formed by vinyl polymerization of flexibilizing monomer selected from the group consisting of alkyl acrylates having up to 13 carbon atoms in each alkyl group and alkyl methacrylates having from 5 to 16 carbon atoms in each alkyl group; and

B. said aldehyde condensation resin represents from about 5 percent to about 40 percent by weight of total resin solids and is selected from the group consisting of condensation products of an aldehyde with an amino- or amido-group carrying substance, condensation products of an aldehyde with a phenolic compound and mixtures thereof.

4,098,746

AQUEOUS VINYL ESTER COPOLYMER DISPERSIONS CAPABLE OF BEING CROSS-LINKED

Knut Henning Becker, Darmstadt; Karl Josef Rauterkus, and Detlev Seip, both of Kelkheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

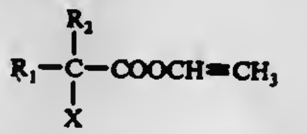
Filed Dec. 19, 1974, Ser. No. 534,376

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1973, 2364364

Int. Cl.² C08L *61/20*

U.S. Cl. 260—29.4 UA **4 Claims**

1. An aqueous copolymer dispersion containing from 70% to 30% by weight of water and from 30% to 70% by weight of a copolymer of from 50 to 99.9% by weight of at least one vinyl ester of a saturated aliphatic monocarboxylic acid having from 1 to 18 carbon atoms, 0.1 to 15% by weight of an α-haloalkane carboxylic acid vinyl ester of the formula



$R_1-\underset{\underset{X}{|}}{\overset{\overset{R_2}{|}}{C}}-COOCH{=}CH_3$

wherein R_1 represents hydrogen, halogen or an alkyl radical having from 1 to 16 carbon atoms, R_2 represents hydrogen, halogen or an alkyl radical having from 1 to 3 carbon atoms and X represents halogen, from 0 to 49.9% by weight of at least one further ethylenically unsaturated monomer selected from mono-olefin having 2 to 18 carbon atoms; acrylic, methacrylic, maleic and fumaric acid esters of saturated monovalent alcohols of 1 to 8 carbon atoms; vinyl chloride, vinylidene chloride, acrylamide and acrylonitrile, and from 0.05 to 10% by weight, based on the total weight of the dispersion of a cross-linking agent selected from the group consisting of aminoplast resins, polyamines, polyamidoamines, a mixture of formaldehyde and amine, a mixture of formaldehyde and ammonia and a mixture of formaldehyde, ammonia and amine.

4,098,747

POLYURETHANE ADHESIVES HAVING HIGH PEEL STRENGTH AT 70° C

Brian Edward Bailey, Redbourn, and Anthony John Bunker, Kempston, both of England, assignors to Interox Chemicals Limited, London, England

Filed May 24, 1976, Ser. No. 688,946

Claims priority, application United Kingdom, Jun. 20, 1975, 26291/75

Int. Cl.² C08K *5/15;* C08G *18/42*

U.S. Cl. 260—30.4 N **15 Claims**

1. An adhesive composition having a peel strength at 70° C of at least about 2.4 Kg/cm which comprises a polyurethane comprising (a) units derived from a diisocyanate, (b) units derived from a poly (ε-caprolactone) diol having a hydroxyl value of from 25 to less than 30, and (c) units derived from an alkane diol chain lengthening agent containing at least 2 carbon atoms, the mole ratio of alkane diol: poly(ε-caprolactone) diol being from greater than 0.7:1.0 to less than 1.2:1.0 and the ratio of moles of diisocyanate to the total of the number of moles of poly(ε-caporlactone) diol and the number of moles of alkane diol in the polyurethane is from 1.0:1.0 to 1.04:1.00.

4,098,748

PLASTICIZED POLYVINYL CHLORIDE RESIN COMPOSITION CONTAINING MOLYBDENUM FLAME RETARDANT AND ANTIMONY COMPOUND SMOKE SUPPRESSANT AGENT

Fred W. Moore, Plymouth, and George A. Tsigdinos, Ann Arbor, both of Mich., assignors to Amax Inc., New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,383

Int. Cl.² C08K *3/20, 5/52, 5/11*

U.S. Cl. 260—30.6 R **16 Claims**

1. A flame resistant and smoke suppressed plasticized polyvinyl chloride polymer composition consisting essentially of a polyvinyl chloride polymer, from about 20 phr to about 100 phr of a plasticizing agent comprising a mixture of a primary ester-type plasticizer and a secondary plasticizer selected from the group consisting of halogenated paraffins and organic phosphate esters, said secondary plasticizer present in an amount of from about 15 to about 50% of the total plasticizing agent present, and a flame retardant and smoke suppressant agent comprising a mixture of a molybdenum compound selected from the group consisting of molybdenum oxide and molybdate salts and an antimony compound selected from the group consisting of antimony oxide, sodium antimonate and potassium antimonate present in an amount of from about 1 phr up to about 8 phr, said antimony compound present in an amount of from 0.5 parts up to 2 parts per part molybdenum compound present.

4,098,749

ANTICORROSION PRIMER COATING COMPOSITION

Minoru Hoshino, Yokohama; Toshio Shinohara, Fujisawa; Yukio Kawahara, Yamato; Katsuji Takase, Yokohama; Toshimoto Tsuji, Yokohama, and Jun-ichi Fukuda, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Mar. 24, 1977, Ser. No. 780,994

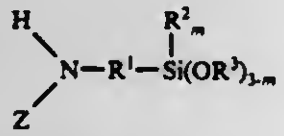
Int. Cl.² C08J *3/00;* C08K *3/18;* C09D *5/08;* C08K *5/49*

U.S. Cl. 260—30.6 R **10 Claims**

1. An anticorrosion primer coating composition comprising

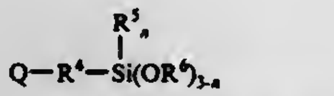
(i) 100 parts by weight of a polyvinyl butyral resin,

(ii) 1 to 25 parts by weight of at least one organo functional silane selected from the group consisting of aminoalkoxysilane compounds represented by the following general formula:



(1)

wherein R^1 stands for a divalent hydrocarbon group having 1 to 4 carbon atoms, R^2 and R^3 represent a monovalent hydrocarbon group having 1 to 4 carbon atoms, Z stands for a hydrogen atom or an aminoalkyl group, and *m* is 1 or 0, and alkylalkoxysilane compounds represented by the following general formula:



$$Q-R^4-\overset{\overset{R^5_n}{|}}{Si}(OR^6)_{3-n} \quad (2)$$

wherein R^4 stands for a divalent hydrocarbon group having 1 to 4 carbon atoms, R^5 and R^6 represent a monovalent hydrocarbon group having 1 to 4 carbon atoms, Q stands for a methacryloxy, acryloxy, glycidoxy or epoxycyclohexyl group, and *n* is 1 or 0.

(iii) 20 to 350 parts by weight of at least one member selected from the group consisting of inorganic borate compounds and polyphosphate compounds and (iv) 5 to 50 parts by weight of phosphoric acid.

4,098,750

ORGANIC OXALATE PLASTICIZED POLYCARBONATE COMPOSITION

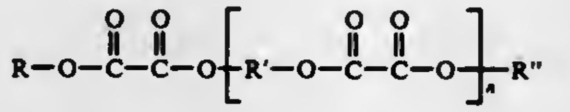
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1976, Ser. No. 748,465

Int. Cl.² C08K *5/36, 5/10*

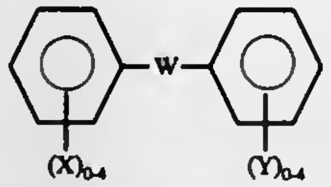
U.S. Cl. 260—30.8 R **8 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer prepared by reacting a dihydric phenol with a carbonate precursor and having an I.V. of 0.40 to 1.0 dl./g. in methylene chloride at 25° C, and a minor amount of an organic oxalate of the following formula:



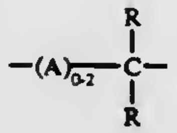
$$R-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-O\left[R'-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-O\right]_n R''$$

wherein R and R″ are independently selected from the group consisting of C_1 to C_{30} alkyl, aryl of 6 to 14 carbon atoms and substituted aryl wherein the substituents are C_1 to C_{30} alkyl, halogen, C_1 to C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, R′ is selected from the group consisting of C_1 to C_{30} alkylene, arylene of 6 to 14 carbon atoms, alkarylene of 7 to 30 carbon atoms,
aralkylene of 7 to 30 carbon atoms and



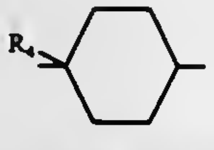
wherein W is selected from the group consisting of:

(a)



$$-(A)_{0-2}-\overset{\overset{R}{|}}{\underset{\underset{R}{|}}{C}}-$$

wherein A is



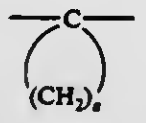
and R_4 is hydrogen of C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

(b) $—CH_2CH_2—$;

(c) $—CH_2B\text{-}CH_2—$;

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

(d)

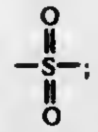


wherein *a* is an integer of 3 to 15;

(e) —O—;

(f) —S—;

(g)



$$-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-;$$

X and Y are independently selected from the group consisting of halogen and C_1–C_{12} alkyl; *n* is 0 or 1.

4,098,751

ORGANIC CARBONATE PLASTICIZED POLYCARBONATE COMPOSITION

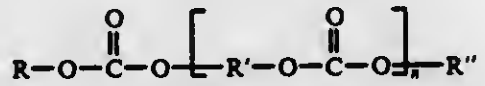
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1976, Ser. No. 748,466

Int. Cl.² C08K *5/36, 5/10*

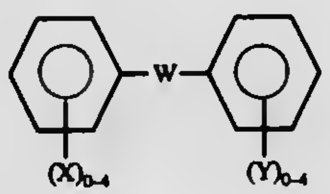
U.S. Cl. 260—30.8 R **8 Claims**

1. A plasticized polycarbonate composition comprising in admixture homopolymers, copolymers and mixtures thereof of a high molecular weight aromatic carbonate polymer having an I.V. of 0.40 to 1.0 dl/g in methylene chloride at 25° C and a minor amount of an organic carbonate of the following formula:

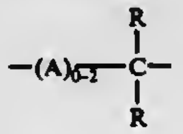


$$R-O-\overset{\overset{O}{\|}}{C}-O\left[R'-O-\overset{\overset{O}{\|}}{C}-O\right]_n R''$$

wherein R and R″ are independently selected from the group consisting of C_1 of C_{30} alkyl, aryl of 6 to 14 carbon atoms and substituted aryl wherein the substituents are C_1 and to C_{30} alkyl, halogen, C_1 to C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, R′ is selected from the group consisting of C_1 to C_{30} alkylene, arylene of 6 to 14 carbon atoms, alkarylene of 7 to 30 carbon atoms, aralkylene of 7 to 30 carbon atoms and



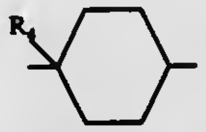
wherein W is selected from the group consisting of



$$-(A)_{0-2}-\overset{\overset{R}{|}}{\underset{\underset{R}{|}}{C}}-$$

(a)

wherein A is

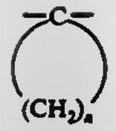


and R_4 is hydrogen of C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_{15} alkyl;

(b) $—CH_2CH_2—$

(c) $—CH_2B\text{-}CH_2—$

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

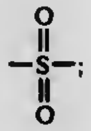


(d)

wherein *a* is an integer of 3 to 15;

(e) —O—;

(f) —S—;



$$-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}-;$$

(g)

X and Y are independently selected from the group consisting of halogen and C_1–C_{12} alkyl; *n* is 0 or 1 with the proviso that when *n* is 0 at least one of R or R″ is substituted aryl wherein the substituents are C_1 to C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms and arylthio of 6 to 14 carbon atoms.

4,098,752

THERMOPLASTIC RESIN COMPOSITION SUITABLE FOR EXTRUSION MOLDING

Hideo Ohkawa; Yoshinori Nagai; Shiro Kozakura; Yutaka Mugino; Noriki Fujimoto, and Masami Tomikawa, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 597,560, Jul. 21, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,743

Claims priority, application Japan, Jul. 20, 1974, 49-83581

Int. Cl.² C08K *5/11*

U.S. Cl. 260—31.4 R **8 Claims**

1. A resin composition for the production of filaments by extrusion molding without substantial deposit of residual resin composition on a die employed for said extrusion and without substantial yellowing thereof, consisting essentially of a blend of from 90 to 30 weight percent of a thermoplastic resin and from 10 to 70 weight percent of an inorganic filler, and a modifier selected from the group consisting of a sorbitan fatty acid ester and a polyoxyethylene sorbitan fatty acid ester in an amount of from 0.1 to 5.0 parts by weight based upon 100 parts by weight of the blend, the thermoplastic resin being selected from the group consisting of polyethylene and polypropylene, said inorganic filler being selected from the group consisting of calcium carbonate, calcium sulfate, calcium sulfite, talc and clay.

4,098,753

ESTER-PLASTICIZED POLYVINYL CHLORIDE RESIN COMPOSITION CONTAINING MOLYBDENUM FLAME RETARDANT AND SMOKE SUPPRESSANT AGENT

George A. Tsigdinos, Ann Arbor; Fred W. Moore, Plymouth, both of Mich.; Valerie J. Kuck, Upper Montclair, and Emanuele Scalco, Bridgewater Township, Somerset County, both of N.J., assignors to Amax Inc., New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,384

Int. Cl.² C08K *5/11, 5/12;* C09K *3/28;* E04B *1/94*

U.S. Cl. 260—31.8 R **13 Claims**

1. A flame resistant and smoke suppressed plasticized polyvinyl chloride polymer composition consisting essentially of a polyvinyl chloride polymer, from about 20 phr to about 80 phr of an ester-type plasticizer selected from the group consisting of phthalates, azelates, adipates, trimellitates, and mixtures thereof, and a flame retardant and smoke suppressant agent consisting of a mixture of a molybdenum compound selected from the group consisting of molybdenum oxides and molybdate salts and an antimony compound selected from the group consisting of antimony oxide, sodium antimonate, potassium antimonate, and mixtures thereof present in an amount of about

1 phr to about 8 phr, said antimony compound present in an amount of about 0.5 parts up to about 2 parts per part of said molybdenum compound present.

4,098,754

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR THERMOPLASTIC POLYCARBONATES OF LOW FLAMMABILITY

Dieter Neuray, Rumeln-Kaldenhausen; Hugo Vernaleken, Krefeld-Bockum; Claus Wulff, and Ralf Lange, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 11, 1975, Ser. No. 640,109

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1974, 2460052

Int. Cl.² C08G *63/62;* C08L *69/00*

U.S. Cl. 260—37 PC **14 Claims**

13. A polycarbonate prepared by a process comprising reacting in a self-cleaning twin-screw extruder the melt of a solution polycarbonate having a weight average molecular weight, M_w, of about 10,000 to 200,000 with a basic alkali metal salt, which is soluble in the melt, of an organic compound at an elevated temperature between about 280° and 380° C until the resulting polycarbonate has a Staudinger Index (measured in methylene chloride at 25° C) which is from about 3 to 30 cm³/g higher than the original polycarbonate and reinforcing the molding composition with about 10–40% by weight, relative to the total molding composition, of glass fibers.

4,098,755

SHAPED ARTICLES OF HYDRAULIC CEMENT COMPOSITIONS HAVING A REFLECTIVE SURFACE

Mark Plunguian, 6912 Columbia Dr., and Charles E. Cornwell, 7104 Marlan Dr., both of Alexandria, Va. 22307

Division of Ser. No. 649,895, Jan. 16, 1976, Pat. No. 4,036,839, which is a continuation-in-part of Ser. No. 591,095, Jun. 27, 1975, Pat. No. 3,995,086. This application Mar. 25, 1977, Ser. No. 782,763

Int. Cl.² C04B *7/35, 7/355*

U.S. Cl. 260—39 R **3 Claims**

1. A shaped article with a reflective glossy surface, formed by casting or filling in a synthetic polymer mold with a glossy water-repellent surface, an aqueous cementitious slurry comprising in cured composition, all in parts by weight, 100 parts hydraulic cement selected from the group of portland cement, calcium aluminate cement, and gypsum cement; 10–400 parts aggregate; 0.25–2.0 parts, on a dry basis, of cement dispersing agents or cement water reducers selected from the group of polymers consisting of the alkali metal salts of melamine sulfonic acid partially condensed with formaldehyde, the alkali metal salt of naphthalene sulfonic acid partially condensed with formaldehyde, and 30–90 percent of the alkali metal salt of a high molecular weight condensation product of naphthalene sulfonic acid and the balance 70–10 percent being the alkali metal salt of gluconic acid; 0.01–0.1 parts of a cement curing retarder; 0–10 parts of color pigment; curing the casting and then removing the cured cementitious product from the plastic mold.

4,098,756

FLUOROPOLYMER PRIMER COMPOSITIONS

William Albert Miller, Bridgewater; John Paul Opsasnick, Edison, and William Anthony Miller, Parsippany, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 12, 1976, Ser. No. 704,158

Int. Cl.² C08K *3/22*

U.S. Cl. 260—42.27 **10 Claims**

1. A composition in powder form suitable for use as a primer coating comprising a copolymer of ethylene, a halogenated comonomer selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene and mixtures thereof and 0 to 10 mol percent of an additional monomer selected from the group consisting of 3,3,3-trifluoro-2-trifluoromethyl propene, a vinyl monomer which is free of telogenic activity and which provides a side chain having at least two carbon atoms, said side chain being aromatic or having its elements bonded together by a single bond only, or mixtures thereof, and containing from about 5 to 60 percent by weight of the composition of an epoxy resin and about 1 to 25 percent by weight of the composition of an oxide of cobalt, nickel, manganese, tungsten and mixtures thereof.

4,098,757

POLYOLEFIN FIBERS CONTAINING BASIC PIGMENTS AND PROCESS FOR PREPARING SAME

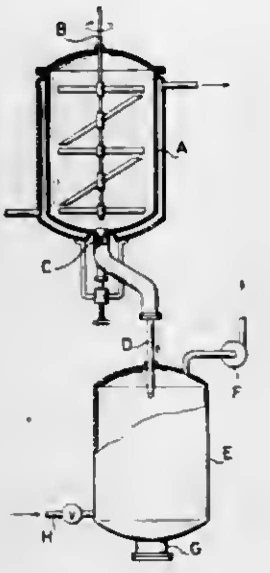
Wolfgang Gordon, Hofheim, Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 25, 1976, Ser. No. 661,495

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1975, 2508455

Int. Cl.² C08J *3/20*

U.S. Cl. 260—42.55 **12 Claims**



1. A process for making hydrophilic clay-containing polyolefin fibers which comprises preparing a suspension consisting essentially of

(a) from 30 to 90% by weight of a non-pre-hydrophobized basic pigment, said pigment in aqueous suspension having a pH value of from 8 to 12,

(b) an emulsion of a solution of a polyolefin in a readily boiling solvent for said polyolefin, said solvent being a hydrocarbon having from 5 to 7 carbon atoms or a chlorinated hydrocarbon having from 1 to 2 carbon atoms and an aqueous solution of a hydrophilizing agent containing a group or groups selected from amine-, amide-, carboxyl- and hydroxyl groups and

(c) from 0.1 to 10% by weight, based on the weight of said basic pigment, of an organic acid of 3 to 30 carbon atoms having a terminal mono-carboxylic or mono-sulfonic acid group, superheating said suspension under at least an autogenous pressure and flowing said suspension through a restricted passage to a relatively low pressure zone to cause flash evaporation of said solvent and to form said hydrophilic pigment-containing polyolefin fibers.

4,098,758

INORGANIC-ORGANIC COMPOSITES AND METHODS OF REACTING THE SAME WITH ORGANO-TITANIUM COMPOUNDS

Salvatore J. Monte, Staten Island, and Paul F. Bruins, Douglaston, both of N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Continuation of Ser. No. 556,879, Mar. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,331, Apr. 12, 1974, abandoned. This application Jun. 10, 1976, Ser. No. 694,576

Int. Cl.² C04B *31/00;* C09C *3/00;* C11C *1/00;* C08K *9/00*

U.S. Cl. 260—42.14 **12 Claims**

1. A mixture of organo-titanates represented by the formula $\mathrm{Ti(OR)}_{4-n}\mathrm{(OCOR')}_n$ formed by the reaction of a titanate having the formula $\mathrm{Ti(OR)}_4$ with n moles of an organic acid having the formula R'COOH, wherein R represents an alkyl group having from 1 to 5 carbon atoms and the organic acid has from 6 to 24 carbon atoms and n is between 3.1 and 3.25.

5. A composition of matter comprising a comminuted inorganic material, the surface of which is reacted with a mixture or organo-titanates represented by the formula $\mathrm{Ti(OR)}_{4-\lambda}$ $_{n}\mathrm{(OCOR')}_n$ formed by the reaction of a titanate having the formula $\mathrm{Ti(OR)}_4$ with n moles of an organic acid having the formula R'COOH, wherein R represents an alkyl group having from 1 to 5 carbon atoms and the organic acid has from 6 to 24 carbon atoms and n is between 3.1 and 3.25.

9. A process for producing a dispersion of comminuted inorganic material in a polymeric medium which comprises: admixing an inorganic material; an organo-titanate having the formula $\mathrm{Ti(OR)}_{4-n}\mathrm{(OCOR')}_n$ formed by the reaction of a titanate having the formula $\mathrm{Ti(OR)}_4$ with n moles of an organic acid having the formula R'COOH, wherein R represents an alkyl group having from 1 to 5 carbon atoms and the organic acid has from 6 to 24 carbon atoms and n is between 3.1 and 3.25; and a polymeric medium; thereby forming a dispersion of the inorganic material, the surface of which has been reacted with the organo-titanate in the polymeric medium.

12. A mixture of organo-titanates represented by the formula $\mathrm{Ti(OR)}_{4-n}\mathrm{(OCOR')}_n$ formed by the reaction of tetraisopropyl titanate with n moles of isostearic acid, wherein n is about 3.19.

4,098,759

BROMINE-CONTAINING CYCLIC PHOSPHONIC ACID ESTERS

Siegfried Noetzel, Kelkheim, Taunus; Horst Jastrow, Niederhochstadt, Taunus, and Edgar Fischer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

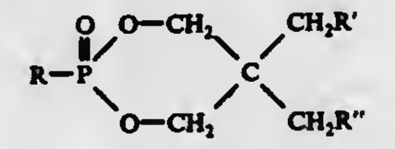
Division of Ser. No. 494,877, Aug. 5, 1974, Pat. No. 3,966,849. This application Jan. 27, 1976, Ser. No. 652,842

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1973, 2339863

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.8 R **16 Claims**

1. A flame resistant composition comprising a readily inflammable plastic material and a flame retardant amount of a bromine-containing phosphonic acid ester of the formula



in which R is an aliphatic hydrocarbon radical of 1 to 8 carbon atoms and containing a member selected from the group consisting of chlorine and bromine and R' and R" are hydrogen, chlorine, bromine, or are joined to form a dibromocyclohexyl radical, and the ester contains at least one bromine atom.

4,098,760

SUBSTITUTED HALOACETAMIDE ANTIOXIDANTS FOR ELASTOMERS AND PLASTIC POLYMERS

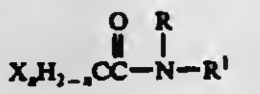
Robert J. Cornell, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 758,972

Int. Cl.² C07C *103/44, 103/38*

U.S. Cl. 260—45.9 NC **23 Claims**

1. A substituted haloacetamide having the formula



$$X_nH_{3-n}C\overset{O}{\overset{\|}{C}}-\overset{R}{\overset{|}{N}}-R^1$$

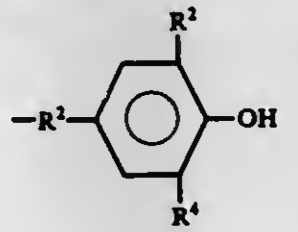
wherein:

X is chlorine;

n is 2 or 3;

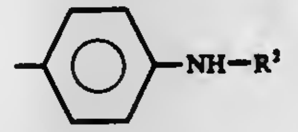
R is hydrogen, C_1–C_6 alkyl, cyclohexyl or phenyl;

R^1 is a group having the structural formula:



II.

or



III.

wherein:

R^2 is methylene, ethylene, propylene, isobutylene, isopropylidene or phenylene;

R^3 and R^4 are tertiary butyl; and

R^5 is phenyl.

4,098,761

HALOGEN CONTAINING FIRE RETARDANT ADDITIVE WITH IMPROVED HEAT STABILITY

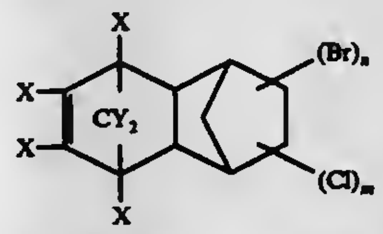
James J. Maul, and Richard D. Carlson, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 447,807, Mar. 4, 1974, Pat. No. 3,941,758. This application Feb. 2, 1976, Ser. No. 654,244

Int. Cl.² C08K *3/22, 5/02*

U.S. Cl. 260—45.75 B **21 Claims**

1. A fire retardant polymeric molding composition comprising a nitrogen-free polymer, selected from the group consisting of polymers of mono-α-olefins, polystyrene, and high impact polystyrene and an effective fire retardant amount of a compound of the formula



wherein X is a halogen selected from the group consisting of fluorine, chlorine and bromine, Y is independently selected from the group consisting of fluorine, chlorine, bromine, alkyl of 1 to 10 carbon atoms, alkyloxy wherein the alkyl group contains 1 to 10 carbon atoms, haloalkyl and haloalkyloxy wherein said alkyl groups contain from 1 to 10 carbon atoms and said halo is fluoro, chloro or bromo, n has an average value from 0 to 6 and *m* has an average value from 0 to 6 and the total of *n* plus *m* has an average value from 1 to 6.

4,098,762

MAGNESIUM HYDROXIDES HAVING NOVEL STRUCTURE, PROCESS FOR PRODUCTION THEREOF, AND RESIN COMPOSITIONS CONTAINING THEM

Shigeo Miyata, Takamatsu; Masataka Kuroda, Kagawa; Akira Okada; Toshihumi Okazaki, both of Takamatsu, and Mitsuo Takasu, Marugame, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,778

Claims priority, application Japan, May 30, 1975, 50-65049; Mar. 25, 1976, 51-31919

Int. Cl.² C08K *3/22, 9/04*

U.S. Cl. 260—45.7 R **3 Claims**

1. Solid particles of a magnesium hydroxide coated with an anionic surface active agent, said magnesium hydroxide having (i) a strain in the <101> direction of not more than 3.0×10^{-3}, (ii) a crystallite size in the <101> direction of more than 800 A, and (iii) a specific surface area, determined by the BET method, of less than 20 m^2/g.

4,098,763

TECHNIQUE FOR STABILIZATION OF VINYL CHLORIDE POLYMERS USING ORGANIC THIOLS

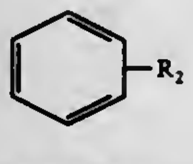
William Herbert Starnes, Jr., Roselle Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 8, 1976, Ser. No. 721,239

Int. Cl.² C08F *6/00;* **C08J** *3/00*

U.S. Cl. 260—45.7 S **6 Claims**

1. In the method for the preparation of a stable vinyl chloride polymer which comprises reacting a polyvinyl chloride polymer having a number average molecular weight ranging from 30,000 to 100,000 with an organic compound, adding a solvent to the reaction mixture to effect polymer precipitation, and subjecting the polymer to solvent extraction to yield the desired polymer, the improvement which comprises effecting said reaction at a temperature within the range of 160°-185° C for a time period ranging from 150 to 18 hours, the longer time periods corresponding with the lower temperatures and the converse, the organic compound being a thiol of the formula R_1SH wherein R_1 is selected from the group consisting of (a) alkyl groups of 8–14 carbon atoms, (b) an α-naphthyl group, (c) a β-naphthyl group, (d) a substituted aryl group of the formula



wherein R_2 is selected from the group consisting of hydrogen, alkyl groups of 1–4 carbon atoms, alkoxy groups of 1–4 carbon atoms, chlorine and bromine, and (e) $HS(CH_2)_n$ wherein *n* is an integer from 6–10, the resultant polymer being free of chemically bound and occluded sulfur.

4,098,764

1,5-BIS(3′,5′-DI-HYDROCARBYL-4′-HYDROXYPHENYL)-PENTYL AMINES

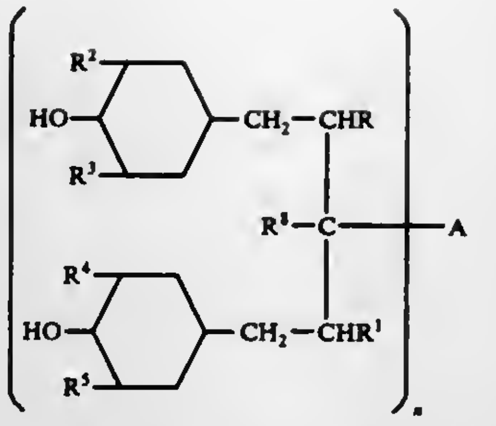
Richard A. Gencarelli, Cheshire, and Edward L. Wheeler, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 553,338, Feb. 26, 1975, Pat. No. 3,996,194, and a continuation-in-part of Ser. No. 285,969, Sep. 5, 1972, abandoned. This application Sep. 1, 1976, Ser. No. 719,540

Int. Cl.² C08K *5/20;* **C07C** *109/04*

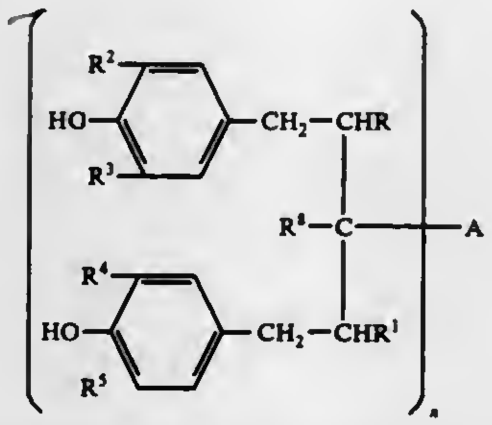
U.S. Cl. 260—45.85 S **17 Claims**

1. A compound having the formula:



wherein R and R¹ may be the same or different and are hydrogen, alkyl having 1 to 4 carbon atoms, or alkylene or alkylidene having 1 to 3 carbon atoms and participating in a carbocyclic ring having 5 to 7 carbons, said ring including the carbon to which A is attached, R², R³, R⁴ and R⁵ are hydrogen, alkyl of from 1 to 9 carbons, cycloalkyl having 5 to 7 carbon atoms, aryl having 6 to 10 carbon atoms, or aralkyl or alkaryl of from 7 to 10 carbon atoms; A is $—N(R^6)2$, $—N(R^6)R^7N(R^6)—$, wherein R⁶ is hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms, aryl having 6 to 10 carbons, or aralkyl having 7 to 10 carbon atoms; and when A comprises a plurality of R⁶ groups they may be the same or different; R⁷ is an alkylene or alkylidene having 1 to 8 carbon atoms, or arylene having from 6 to 10 carbon atoms; R⁸ is hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, aryl having 6 to 10 carbon atoms, or alkaryl or aralkyl having 7 to 10 carbon atoms; and *n* has a value of 1 to 2 corresponding to the functionality of A.

9. A composition comprising an organic material normally subject to deterioration caused by air, heat or light in intimate admixture with, an amount effective to protect said organic material against such deterioration, a chemical of the formula



wherein the meanings of R through R⁵, R⁸ and *n* are as set forth in claim 1.

4,098,765

PECAN NUT BY-PRODUCTS AND PROCESSES

Stanley J. Kays, 515 Milledge Heights, Athens, Ga. 30601, and George V. Odell, P.O. Box 485, 11 Summit Cir., Stillwater, Okla. 74074

Filed May 2, 1977, Ser. No. 792,702

Int. Cl.² C09G *8/04*

U.S. Cl. 528—1 **25 Claims**

1. A condensation product comprising a reaction product of a pecan nut shell extract and a reactant comprising an aldehyde.

4,098,766

METHOD OF OXIDATIVELY COUPLING ALKYL PHENOLS UTILIZING A TETRAVALENT MANGANESE-CARBON CATALYST

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Apr. 14, 1977, Ser. No. 787,507

Int. Cl.² C08G *65/44*

U.S. Cl. 528—217 **9 Claims**

1. A method of preparing a self condensation product from an alkyl phenol which comprises contacting a solution of the alkyl phenol with oxygen or an oxygen containing gas in the presence of a heterogeneous catalyst composition consisting essentially of about 1 to 10 percent by weight of tetravalent manganese precipitated on porous carbon, which is substantially free of mineral impurities.

4,098,767

COPOLYMERS OF ETHYNYL TERMINATED POLYIMIDES AND DIETHYNYLBENZENE

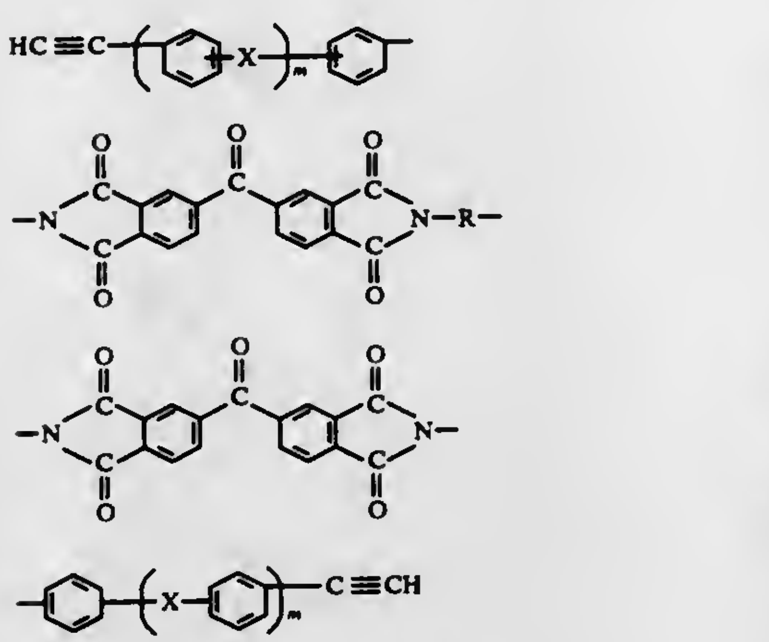
Norman Bilow, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 25, 1974, Ser. No. 526,775

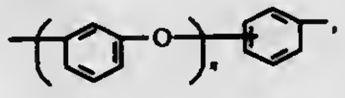
Int. Cl.² C08G *73/12*

U.S. Cl. 526—262 **6 Claims**

1. Composite materials prepared from copolymers comprised of an ethynyl-substituted polyimide oligomer comprised of the following general structure



Wherein R =



n=0 to 5,
m=0 to 5, and
x=O, S, CH_2, CO, SO_2

coreacted with less than 20% of a di- or polyethynyl-substituted diluent and a reinforcing fabric, filler or chopped fiber.

4,098,768

BISPIPERAZIDO PHOSPHORUS POLYAMIDES

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

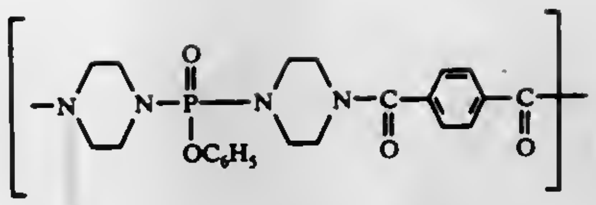
Filed Nov. 3, 1975, Ser. No. 628,262

Claims priority, application United Kingdom, May 21, 1975, 21794/75

Int. Cl.² C08G *69/26*

U.S. Cl. 528—337 **12 Claims**

7. A solid polymer consisting essentially of repeating units of the formula:



4,098,769

LINEAR COPOLYESTERS

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 690,484, May 27, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,922

Int. Cl.² C08G *63/18*

U.S. Cl. 528—99 **5 Claims**

1. As a composition of matter, a linear copolyester suitable for use as a beverage bottle, said polyester having a glass transition temperature higher than that of poly(ethylene terephthalate) and over 75° C. and having O_2 and CO_2 permeabilities, respectively, of less than 7 and less than 52 cc.mil/100 in².day.atm., said copolyester being the polymeric reaction product of reactants consisting essentially of:

A. isophthalic acid and, optionally, terephthalic acid and,
B. bis(4-beta-hydroxyethoxyphenyl) sulfone and ethylene glycol,

the amount of said A reactants being between about 40 to 100 mole percent of isophthalic acid and between about 60 to zero mole percent terephthalic acid, the amount of said bis(4-beta-hydroxyethoxyphenyl) sulfone being at least 15 and up to about 90 mole percent of the combined amount of said A reactants; and the combined amounts of said B reactants being about 110 to about 300 mole percent of the combined amounts of said A reactants.

4,098,770

SPRAY-DRIED PHENOLIC ADHESIVES

Antoine Berchem, St-Hippolyte; Krishan Kumar Sudan, Le-Corbusier, and Edward Michael Gres, Weston, all of Canada, assignors to Reichhold Chemicals Limited, Islington, Canada

Filed Sep. 15, 1976, Ser. No. 723,250

Claims priority, application United Kingdom, Sep. 30, 1975, 39958/75

Int. Cl.² C08G *4/00, 8/10;* **C08J** *3/12*

U.S. Cl. 528—130 **24 Claims**

1. A method of preparing a phenol-formaldehyde resin in particulate form comprising reacting together, in an aqueous medium, phenol and formaldehyde, in a ratio of 1.0 mole phenol to between 1.8 and 3.5 moles formaldehyde, in the presence of between 0.1 and 1.0 mole of a basic catalyst; continuing this reaction until a desired viscosity is reached; spray-drying the solution or dispersion of phenol-formaldehyde resin thus produced through a pressure nozzle into a heated gas; and chilling the spray dried particulate solid.

4,098,771

PROCESS FOR THE PREPARATION OF POLYMERS OF VINYLENE CARBONATE

Heinrich Huemer, Marburg, Lahn, and Karlheinz Burg, Naurod, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 15, 1976, Ser. No. 750,583

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556759

Int. Cl.² C08F *34/02, 134/02*

U.S. Cl. 526—209 **3 Claims**

1. In a process for the preparation of polymers of vinylene carbonate by polymerization of vinylene carbonate together with 0 to 25 mole %, calculated on vinylene carbonate, of a

vinyl compound copolymerizable with vinylene carbonate, in the presence of a free radical forming initiator. at a temperature of 40° to 170° C, the improvement which comprises carrying out the polymerization in a dispersing agent which is an organic liquid in which the vinylene carbonate and the product polymer are essentially insoluble under the polymerization conditions.

4,098,772
THERMOPLASTIC POLYURETHANES PREPARED WITH SMALL AMOUNTS OF MONOHYDRIC ALCOHOLS

Henry W. Bonk, Wallingford; Benjamin S. Ehrlich, Cheshire, and Joseph Pleckaitis, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 11, 1976, Ser. No. 666,088

Int. Cl.^{2} C08G *18/30, 18/76*

U.S. Cl. 528—49 **8 Claims**

1. A thermoplastic polyurethane elastomer which is the product of a one-shot reaction of an organic diisocyanate, a polymeric diol, a difunctional extender and from 0.0005 equivalents to 0.05 equivalents, per equivalent of said diisocyanate, of a monohydric alcohol selected from the class consisting of dodecyl alcohol, stearyl alcohol, and the monobutyl ether of diethylene glycol.

4,098,773
PROCESS FOR PREPARING HEAT-RESISTANT POLYURETHANE ELASTOMERS HAVING NO SECONDARY SOFTENING RANGE

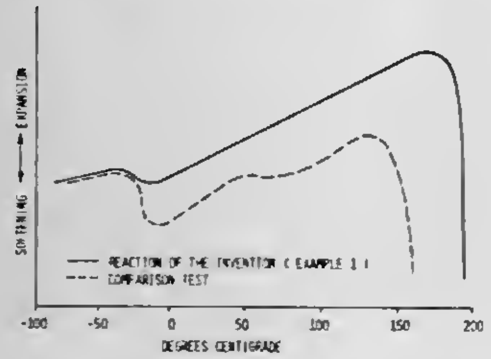
Karl Heinz Illers, Otterstadt, and Herbert Stutz, Karlsruhe, both of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 8, 1976, Ser. No. 730,945

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1975, 2547866

Int. Cl.^{2} C08G *18/10, 18/76*

U.S. Cl. 528—65 **3 Claims**



1. A process for the production of polyurethane elastomers with a start of softening temperature of about 160° C. or higher from substantially linear high-molecular-weight polyhydroxy compounds, polyisocyanates, and chain-extenders, wherein a substantially linear polyhydroxy compound of molecular weight of 800 to 20,000 is reacted with such a quantity of 4,4'-diphenylmethanediisocyanate that the ratio of OH:NCO groups amounts to 1:1.10 to 2, and the adduct obtained, containing terminal isocyanate groups, is subsequently mixed with 4,4'-diphenylmethanediisocyanate and the mixture is reacted with a diol containing 2 to 6 carbon atoms as a chain extender, provided that the ratio of the number of isocyanate groups to the total number of all hydrogen atoms capable of reacting the isocyanate groups amounts to 1.2 to 0.9:1, and the weight ratio of said adduct containing terminal isocyanate groups to the sum of 4,4'-diphenylmethanediisocyanate and said diol amounts to 65:35 to 95:5, the starting materials being reacted at a temperature of 80 to 220° C.

4,098,774
QUATERNARY AMMONIUM CATALYST SYSTEM FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 19, 1976, Ser. No. 687,968

Int. Cl.^{2} C08G *69/24*

U.S. Cl. 260—78 F **9 Claims**

1. A process for polymerizing 2-pyrrolidone to form a polymer suitable for forming fibers in a polymerization reaction zone which comprises contacting the 2-pyrrolidone with a catalyst comprising potassium pyrrolidonate, tetra alkyl ammonium halide and carbon dioxide in a mol ratio of 1:0.1–2:0-.1–0.5 and wherein the water content in the reaction zone does not exceed about 0.1–0.2 weight percent based on total 2-pyrrolidone feed.

4,098,775
NOVEL POLYAMIDEIMIDES

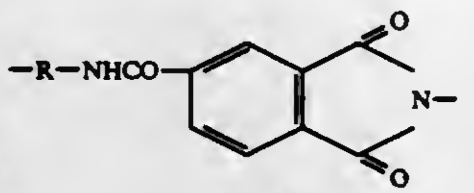
Kemal B. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 15, 1976, Ser. No. 742,076

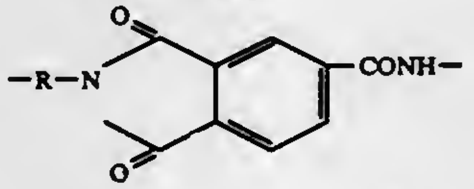
Int. Cl.^{2} C08G *73/14*

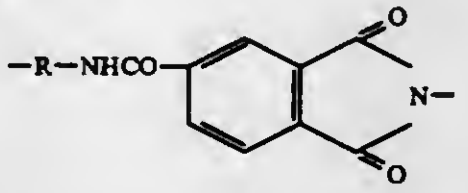
U.S. Cl. 528—350 **3 Claims**

1. A solvent soluble fusible polyamideimide characterized by having in random arrangement the recurring units having the formulae

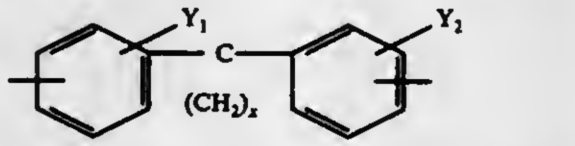


and





wherein R in each formula represents the divalent radical



wherein x has the value 4 or 5 and Y_1 and Y_2 are independently selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, and alkoxy having from 1 to 4 carbon atoms.

4,098,776
POLY(ARYLENE SULFIDE) FIBERS

Dale O. Tieszen, and Oren L. Marrs, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1976, Ser. No. 691,120

Int. Cl.^{2} C08F *28/00*

U.S. Cl. 528—481 **11 Claims**

1. A method for improving tenacity and boiling water shrinkage of poly(arylene sulfide) fibers and articles made therefrom which comprises:

subjecting spun poly(arylene sulfide) fibers or articles to temperatures of at least about 100° C (212° F), but less than the temperature at which fibers stick to each other,

for a time period sufficient to increase the tenacity and decrease the boiling water shrinkage.

4,098,777
PROCESS FOR THE PREPARATION OF PYROGLUTAMYL-ALA-LYS-SER-GLN-GLY-GLY-SER-ASN

Daniel F. Veber, Ambler, and Robert G. Strachan, Warrington, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 14, 1977, Ser. No. 777,226

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **8 Claims**

1. The process for the preparation of the peptide having the structure,

< Glu-Ala-Lys-Ser-Gln-Gly-Gly-Ser-Asn,

which comprises converting the blocked heptapeptide hydrazide having the structure,

< Glu-Ala-(ε-R)Lys-(O-R$_1$')Ser-Gln-Gly-Gly-NH-NH$_2$

to the corresponding azide and condensing said azide with the hydroxy blocked or unblocked dipeptide,

(O-R$_2$)Ser-Asn

to obtain the blocked nonapeptide having the structure,

< Glu-Ala-(ε-R)Lys-(O-R$_1$')Ser-Gln-Gly-Gly-(O-R$_2$)Ser-Asn

wherein

R is the protecting group for the ε-amino of the lysyl moiety selected from the group consisting of formyl, toluene sulfonyl, benzyloxycarbonyl; 2,6-dichlorobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl, 2-chlorobenzyloxycarbonyl; 2,2,2-trichloroethoxycarbonyl and isonicotinyloxycarbonyl,

R_2 is hydrogen or a protecting group for the hydroxy group of the seryl moiety, selected from the group consisting of benzoyl, t-butyl, benzyl,

R_1' is hydrogen or a protecting group for the hydroxy group of the seryl moiety selected from the group consisting of t-butyl and benzyl, and removing said protecting groups.

4,098,778
β-ENDORPHIN ANALOG

Choh Hao Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 776,568, Mar. 11, 1977, Pat. No. 4,081,434, and a continuation-in-part of Ser. No. 777,262, Mar. 14, 1977. This application Jun. 30, 1977, Ser. No. 811,651

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. An analog of β-endorphin of the sequence β-endorphin (6–31).

4,098,779
PROCESS FOR THE PURIFICATION AND MANUFACTURE OF SECRETIN

Wolfgang König, Hofheim am Taunus; Rolf Geiger, Frankfurt am Main; Rainer Obermeier, Hattersheim, and Volker Teetz, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,181

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615229

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **4 Claims**

1. In a method for purifying synthetic secretin by chromatography, the improvement wherein secretin hydrochloride or secretin hydrobromide is chromatographed on Sephadex LH 20 and is eluted therefrom with water, dilute aqueous hydrochloric acid, or dilute aqueous hydrobromic acid.

4,098,780
METHOD OF TREATING LIQUIDS CONTAINING BLOOD SUBSTANCES

Paul Göran Sigvard Lindroos, Erikgatan 37, 20100 Åbo 10, Finland

Continuation-in-part of Ser. No. 583,654, Jun. 4, 1975, abandoned. This application Dec. 7, 1976, Ser. No. 748,284

Claims priority, application Sweden, Dec. 11, 1975, 7513987

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **17 Claims**

1. A method for separating iron compounds from the protein in a hemoglobin solution comprising adding to said solution an organic solvent comprising ethanol in an amount such that the total ethanol content in the solution is at least 40% by volume, adjusting the pH of the solution to a value less than about 4.5 whereby iron compounds in the solution are agglomerated, and thereafter separating the agglomerated iron compounds from the solution.

4,098,781
POLYPEPTIDES WITH MORPHINE-LIKE ACTIVITY

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,181

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **3 Claims**

1. A polypeptide of the formula:

R-Tyr-Gly-Gly-Phe-Met-Thr-Ser-OH

in which R is hydrogen or arginyl, or a non-toxic salt thereof, all optically active amino acids being of the L-configuration.

4,098,782
(HIS^5)-SOMATOSTATIN AND ANALOGUES THEREOF

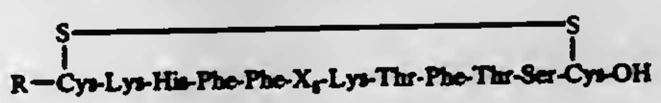
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,261

Int. Cl.^{2} C07C *103/52;* **A61K** *37/02*

U.S. Cl. 260—112.5 S **4 Claims**

1. A polypeptide of the formula:



$$\text{R}-\overset{\text{S}}{\text{Cys}}\text{-Lys-His-Phe-Phe-X}_8\text{-Lys-Thr-Phe-Thr-Ser-}\overset{\text{S}}{\text{Cys}}\text{-OH}$$

the linear precursor intermediates and non-toxic acid addition salts thereof, in which:

R is hydrogen, lower alkanoyl, benzoyl, Ala-Gly-, Ala-D-Ala-, or p-Glu; and

X_8 is L-Trp or D-Trp.

4,098,783

DYE SUBSTITUTED CYCLIC 1,3-SULFUR-NITROGEN COMPOUNDS AS DYE IMAGE-FORMING MATERIALS IN PHOTOGRAPHY

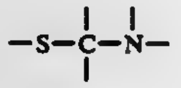
Ronald F. W. Ciecluck; Roberta R. Lahowy, both of Newton; Frank A. Meneghini, Arlington, and Howard G. Rogers, Weston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 465,694, Apr. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,168, Dec. 21, 1972, abandoned, which is a division of Ser. No. 155,123, Jun. 17, 1971, Pat. No. 3,719,489. This application Apr. 29, 1976, Ser. No. 681,620

Int. Cl.² C09B *29/36, 29/38, 45/04, 45/06*

U.S. Cl. 260—147 **50 Claims**

1. A dye substituted with a cyclic moiety containing the group

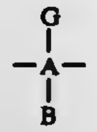


$$-\overset{|}{\underset{|}{S-C}}-\overset{|}{N}-$$

included in the ring and capable of undergoing cleavage between the S atom and the C atom common to the S and N atoms and between the N atom and the common C atom in the presence of silver ions, soluble silver complex or silver ions and soluble silver complex having the formula

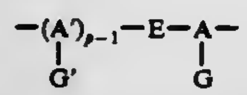
$$D'-[(L')_{m-1}Y']_n$$

wherein D' represents the radical of an organic dye; *m* is a positive integer 1 or 2; *n* is a positive integer from 1 to 4; L' represents a divalent organic linking group selected from



$$\begin{array}{c} G \\ | \\ -A- \\ | \\ B \end{array}$$

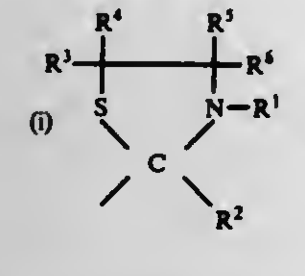
and



$$-\underset{G'}{\underset{|}{(A')}}_{p-1}-E-\underset{G}{\underset{|}{A}}-$$

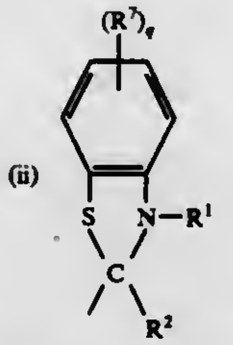
wherein A and A' each are selected from alkylene containing 1 to 6 carbon atoms, phenylene, phenylenealkylene, alkylenephenylene, phenylenealkylenephenylene and alkylenephenylenealkylene; B is selected from alkylsulfonamido and alkylcarboxamido wherein said alkyl groups contain 1 to 6 carbon atoms; E is selected from —CONH—, —SO_2NH—, —NHCO— and —$NHSO_2$—; G and G' each is hydrogen or a group selected from amino, hydroxy, carboxy and sulfo; *p* is a positive integer 1 or 2; and Y' is a cyclic moiety selected from

(i)



and

(ii)



wherein R^1 is hydrogen; alkyl containing 1 to 20 carbon atoms, unsubstituted or substituted with —OH, —SO_3H, —$COOR^8$, —SO_2NHR^8, —$NHCOR^9$, alkoxy containing 1 to 20 carbon atoms, —N,N-dialkylamino wherein said alkyl groups contain 1 to 20 carbon atoms, phenyl, unsubstituted or substituted with —OH, —SO_3H, —$COOR^8$, —SO_2NHR^8, alkoxy having 1 to 20 carbon atoms, —N,N-dialkylamino wherein said alkyl groups contain 1 to 20 carbon atoms, alkyl containing 1 to 20 carbon atoms and alkenyl containing 1 to 20 carbon atoms; —COR^9; and —$CONHR^9$, said R^8 being hydrogen or alkyl containing 1 to 20 carbon atoms and said R^9 being alkyl containing 1 to 20 carbon atoms; R^2 is hydrogen, alkyl containing 1 to 20 carbon atoms, phenyl or phenyl substituted with alkyl containing up to 20 carbon atoms; R^3, R^4, and R^5 each are hydrogen or alkyl containing 1 to 20 carbon atoms and R^4 and R^5 taken together are —$CH_2)_4$; R^6 is hydrogen, carboxy, sulfo or alkyl containing 1 to 20 carbon atoms; R^7 is hydrogen, alkyl containing 1 to 20 atoms, carboxy, sulfo or halo selected from chloro and bromo; and *q* is an integer 1 to 4, said cyclic moiety being attached to an aromatic nuclear carbon atom of said D' by a single covalent bond when *m* is 1 and being attached to a carbon atom of said A of said divalent organic linking group by a single covalent bond when *m* is 2 and said C atom common to said S and N atoms of said cyclic moiety being a tetrahedral carbon atom possessing 4 single covalent bonds.

4,098,784

RED-1-HYDROXY-3,6-DISULFO-8-ACETAMIDO-2-(3 PHOSPHONOPHENYLAZO)NAPHTHALENE DYES

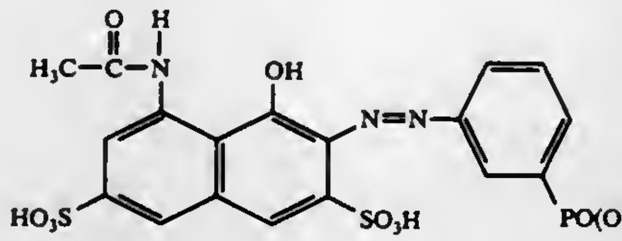
Ronald Swidler, and William A. Sanderson, both of Palo Alto, Calif., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 534,349, Dec. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 441,393, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 260,587, Jun. 7, 1972, abandoned. This application Jul. 30, 1976, Ser. No. 710,153

Int. Cl.² C09B *29/30;* **D06P** *1/06, 3/60*

U.S. Cl. 260—199 **2 Claims**

1. A dye of the formula:



or the ammonium or an alkali metal salt thereof.

4,098,785

THERMOPLASTIC DUPLICATION PLATE MAKING METHOD

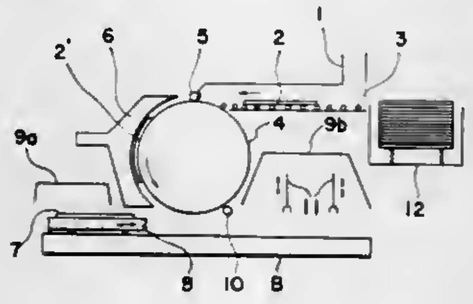
Yasuo Haruta, Nishinomiya; Kazumasa Nagasoe, Osaka; Norio Shiga, Neyagawa; Ikuo Morino, Toyonaka, and Nobuo Aisu, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jun. 23, 1976, Ser. No. 699,049

Claims priority, application Japan, Aug. 13, 1975, 50-98943

Int. Cl.² B41C *3/06*

U.S. Cl. 264—220 **9 Claims**



1. A method of manufacturing a thermoplastic duplication plate having a relief image formed at one surface thereof, which comprises:

feeding a thermoplastic resin sheet of a predetermined size onto a hollow cylinder of a type supported in position for rotation in one direction about the longitudinal axis thereof and having temperature-adjustable heating means for heating the cylinder to a predetermined adjustable temperature, said cylinder during each complete rotation thereof passing a receiving station, at which said thermoplastic resin sheet is mounted on the outer peripheral surface of said cylinder, and a transcription station spaced a predetermined angular distance from said receiving station;

causing said thermoplastic resin sheet to cling to the outer peripheral surface of the cylinder, upon contact of said thermoplastic resin sheet with said outer peripheral surface of said cylinder and as said cylinder during rotation thereof passes said receiving station, thereby transporting said thermoplastic resin sheet towards the transcription station by means of said cylinder;

heating said thermoplastic resin sheet on said cylinder by means of the temperature-adjustable heating means during the transportation of said thermoplastic resin sheet from said receiving station towards said transcription station to a point where said thermoplatic resin sheet becomes substantially semi-fluidized;

separately transporting a paper matrix, having a relief pattern complemental in shape to the relief image on the ultimate duplication plate towards the transcription station by means of a cooled carriage of a type supported in position for linear movement in a direction transversely of the imaginary plane passing through the longitudinal axis of said cylinder between first and second positions, said carriage having a flat support surface for the support of said matrix thereon and being moved from said first position towards said second position during the transportation of said matrix towards said transcription station;

registering said thermoplastic resin sheet, carried by said cylinder during the continued rotation thereof, with said matrix at said transcription station;

causing the substantially semi-fluidized thermoplastic resin sheet to penetrate into indentations in said matrix, which indentations define said relief pattern on said matrix, and then transferring said semi-fluidized thermoplastic resin sheet onto said matrix as said thermoplastic resin sheet and said matrix move past said transcription station in synchronized relation with each other;

cooling the thermoplastic resin sheet which has been transferred onto said matrix on said carriage; and

separating the cooled thermoplastic resin sheet from said matrix, thereby completing the thermoplastic duplication plate.

4,098,786

BENZODIAZEPIN DERIVATIVES

Wolfgang Milkowski, Bürgdorf; Renke Budden, Peine; Siegfried Funke; Rolf Hüschens, both of Hanover; Hans-Günther Liepmann, Hanover; Werner Stühmer, Eldagsen, and Horst Zeugner, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

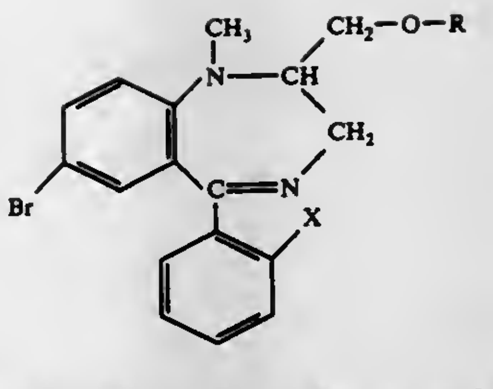
Continuation-in-part of Ser. No. 355,986, May 1, 1973, Pat. No. 3,998,809. This application Sep. 23, 1976, Ser. No. 725,989

Claims priority, application Fed. Rep. of Germany, May 3, 1972, 2221558

Int. Cl.² A61K *31/55;* **C07D** *243/16*

U.S. Cl. 260—239 BD **16 Claims**

1. 1,4-benzodiazepins of the formula



I

wherein R is straight or branched alkyl of 1 to 6 carbon atoms, each carbon being attached to at least one hydrogen,

X is halogen or trifluoromethyl; or a pharmaceutically acceptable acid addition salt of said benzodiazepin.

4,098,787

PROCESS FOR PREPARATION OF 9-(DIHALOBENZYL) ADENINES

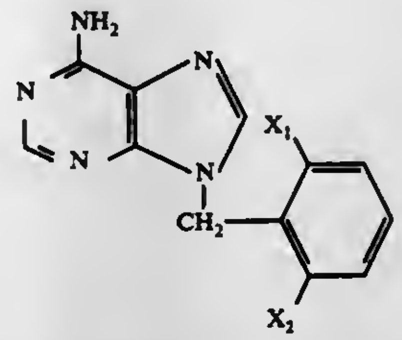
Roger J. Tull, Metuchen, N.J.; George D. Hartman, Lansdale, Pa., and Leonard M. Weinstock, Belle Mead, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 14, 1977, Ser. No. 768,235

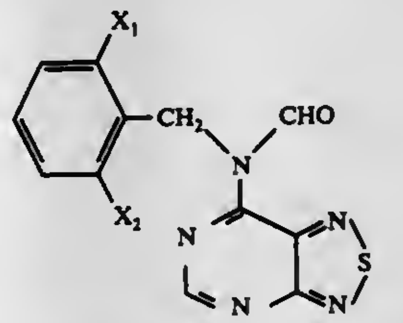
Int. Cl.² C07D *473/34*

U.S. Cl. 544—277 **1 Claim**

1. The process for the preparation of compounds having the structure:



wherein X_1 and X_2 are independently halogen by reacting the compound having the structure:



wherein X_1 and X_2 are as defined above with Raney nickel in aqueous-alcohol solvent at about room temperature to about 125° C. for a period of about 1 hour to 24 hours.

4,098,788

PROCESS FOR PREPARING QUINAZOLINES

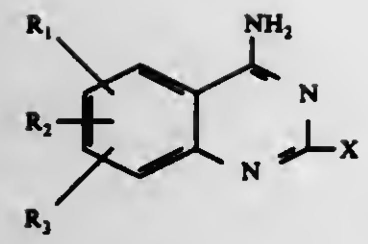
Ronnie Ray Crenshaw, Dewitt; George Michael Luke, Lafayette, and Richard Anthony Partyka, Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 807,941

Int. Cl.² C07D *239/94*

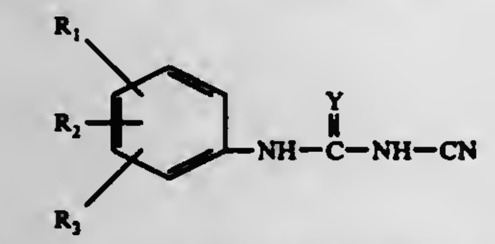
U.S. Cl. 544—293 **21 Claims**

1. A process for preparing compounds of formula I



(I)

wherein
X is halogen selected from the group consisting of chlorine and bromine; and
R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms inclusive and lower alkoxy of 1 to 4 carbon atoms inclusive;
which comprises the consecutive steps of
(a) treating a compound of formula II



(II)

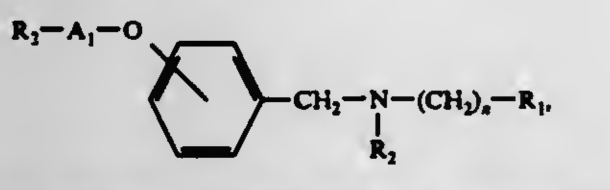
wherein R_1, R_2 and R_3 are as above and Y is oxygen or sulfur with a mixture of phosphorus halides and phosphorus oxyhalides selected from the group consisting of phosphorus trichloride or phosphorus pentachloride and phosphorus oxychloride, or phosphorus tribromide or phosphorus pentabromide and phosphorus oxybromide until the cyclization is essentially complete to provide a quinazoline phosphoramide intermediate;
(b) hydrolyzing said intermediate to produce the compound of formula I.

4,098,789
OMEGA-(N-AMINOALKOXYBENZYL-AMINO)-(N-HYDROCARBONOYL-AMINO)-ALKANOIC ACID ESTERS

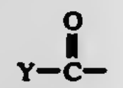
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 2, 1977, Ser. No. 773,561
Int. Cl.² C07D *239/28*
U.S. Cl. 544—299 **8 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein
R_1 is alkoxycarbonyl;
R_2 is



$$Y{-}\overset{\overset{\displaystyle O}{\|}}{C}{-}$$

wherein Y is alkyl, cycloalkyl, aryl, arylalkyl, styryl, or styryl wherein the phenyl group is substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group;
R_3 is alkylamino or dialkylamino;
A_1 is an alkylene group having 2 to 5 carbon atoms; and
n is 1, 2 or 3;
wherein the term aryl refers to phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group; alkly and alkoxy are groups having 1 to 6 carbon atoms; and cycloalkyl is a group having 3 to 7 carbon atoms.

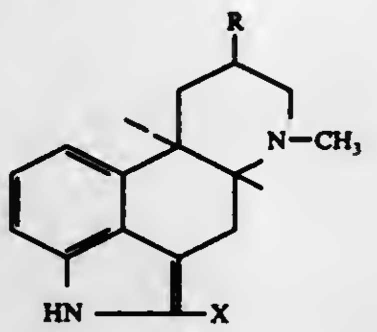
6. The compound in accordance with claim 1 having the name [(4-chlorobenzoyl)[[2-[3-(dimethylamino)propoxy]-phenyl]-methyl]amino]acetic acid, ethyl ester, barbiturate salt (1:2).

4,098,790
ERGOLINE CHLORINATION PROCESS

Nicholas J. Bach, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 15, 1976, Ser. No. 723,378
Int. Cl.² C07D *457/02, 457/04*
U.S. Cl. 260—285.5 **4 Claims**

1. The process which consists essentially of the step of chlorinating an ergoline of the formula:



wherein R is carbo-C_1—C_3 alkoxy, (C_1—C_4-alkoxycarbonyloxy) methyl, hydroxymethyl, halomethyl, (C_1—C_4 -alkylsulfonyloxy) methyl or cyanomethyl and X is H with sulfuryl-chloride in the presence of boron trifluoride etherate in an inert solvent to yield a compound of the above formula wherein R is as defined and X is Cl.

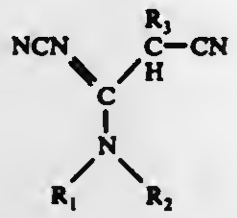
3. D-6-methyl-8-n-butylsulfonyloxymethylergoline.

4,098,791
PROCESS FOR PREPARING 3-(CYANIMINO)-3-AMINO-PROPIONITRILES

Thomas A. Hylton, Kalamazoo, and Muniraj D. Pillai, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

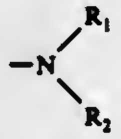
Filed Jul. 29, 1977, Ser. No. 820,161
Int. Cl.² C07D *295/14, 211/14*
U.S. Cl. 260—293.87 **19 Claims**

1. A process for the production of a compound of formula V:

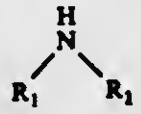


V

wherein R_1 and R_2 are alkyl of 1 to 4 carbon atoms, inclusive, alkenyl of 3 or 4 carbon atoms, inclusive, cycloalkyl from 3 to 7 carbon atoms, inclusive, phenylalkyl in which the alkyl group is defined as above, or the group

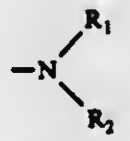


is 1-azetidinyl, pyrrolidino, piperidino, hexahydroazepino, heptamethyleneimino, each of which can be substituted with 1 or 2 methyl groups, or 4-morpholinyl, 4-thiomorpholinyl, or N-alkylpiperazino, in which the alkyl group is defined as above; wherein R_3 is hydrogen or alkyl as defined above, which comprises:
(1) treating a compound of the formula 1

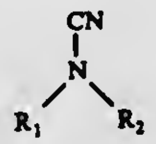


1

wherein R_1 and R_2 or

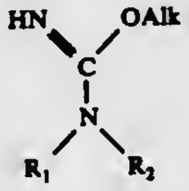


are defined as above, with a cyanogen halide in which the halogen is chlorine, bromine or iodine, in the presence of a base to obtain the compound of formula II:



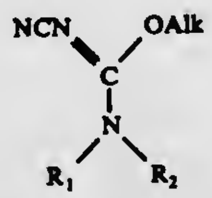
II

wherein R_1 and R_2 are defined as above;
(2) treated compound II with a metal alkoxide wherein the alkyl group Alk of the alkoxy moiety is of 1 to 4 carbon atoms, inclusive, and the metal is lithium, sodium, potassium, magnesium, or aluminum, in an alkanol of 1 to 4 carbon atoms, inclusive, to obtain compound III:



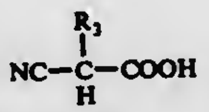
III

wherein R_1, R_2 and Alk are defined as above;
(3) treating compound III with cyanogen halide and a base to obtain compound IV:



IV

wherein halogen, R_1, R_2 and Alk are defined as above; and
(4) treating compound IV with a cyanoacetic acid of the formula:



X

$$NC{-}\underset{H}{\overset{R_3}{C}}{-}COOH$$

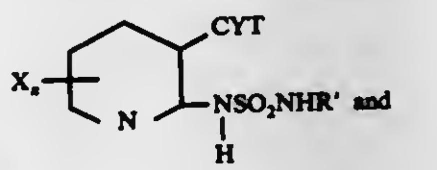
wherein R_3 is hydrogen or alkyl as defined above, and a base followed by acid treatment to obtain the compound of formula V above.

4,098,792
SUBSTITUTED PYRIDINE CARBOXYLIC ACIDS AND DERIVATIVES

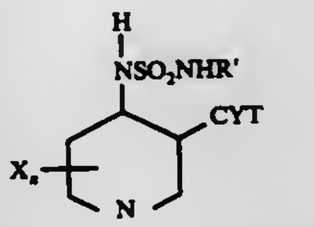
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 747,663, Dec. 6, 1976, Pat. No. 4,058,533, which is a division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Jul. 20, 1977, Ser. No. 817,330
Int. Cl.² C07D *213/54*
U.S. Cl. 260—294.8 F **1 Claim**

1. A compound of the formulae:



III



IV

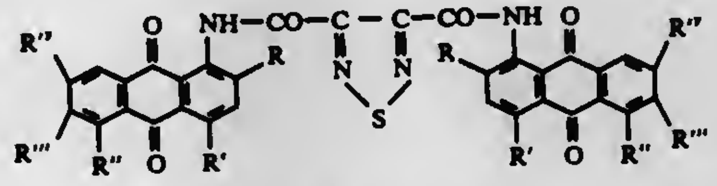
wherein:
each X independently represents loweralkyl of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;
n represents an integer of 0 to 3, inclusive;
Y represents oxygen;
T represents halo;
R' represents aryl wherein aryl is phenyl, halophenyl, tolyl or benzyl;
each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;
R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,098,793
ANTHRAQUINONE COMPOUNDS AND PROCESS FOR PREPARING SAME

Giuseppe Ribaldone, Gallarate (Varese); Renato Greco, Cameri (Novara); Camillo Paffoni, Pogno (Novara), and Giuseppe Sironi, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

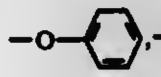
Filed Sep. 23, 1977, Ser. No. 836,087
Claims priority, application Italy, Sep. 27, 1976, 27683 A/76
Int. Cl.² C07D *285/10*
U.S. Cl. 260—303 **12 Claims**

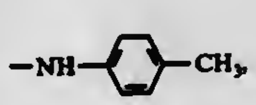
1. Anthraquinone derivatives characterized by the general formula:



where R, R' , R'', R''', R'' are indifferently

H or Chlorine, Bromine, —OH, $—OCH_3$,

, —NH—Alkyl having 1 to

4 carbons atoms, 

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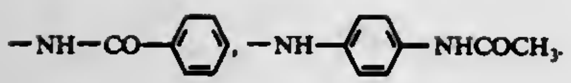


4,098,794

N-THIAZOLYL-5,6-DIHYDRO-4-OXO-4H-THIENO[2,3-b]THIOPRYAN-5-CARBOXAMIDES

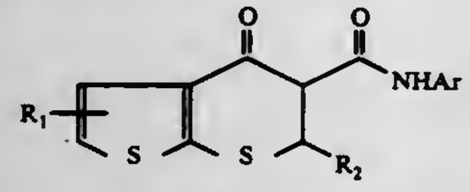
Jagadish C. Sircar, Dover; Stephen J. Kesten, Morris Plains, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 749,507, Dec. 10, 1976. This application Dec. 7, 1977, Ser. No. 858,232

Int. Cl.² C07D *495/04*

U.S. Cl. 260—306.8 R **2 Claims**

1. A compound of the Formula I:



I

wherein R_1 is hydrogen, halogen or lower alkyl; R_2 is hydrogen, lower alkyl or phenyl; and Ar is thiazolyl; or its pharmaceutically acceptable salts.

4,098,795

METHOD FOR THE PREPARATION OF X-FORM METAL FREE PHTHALOCYAMINE

Clifford H. Griffiths, Penfield, N.Y., and Richard C. Keezer, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1972, Ser. No. 308,914

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **9 Claims**

1. A method of preparing X-form metal-free phthalocyanine which comprises heating a metal-free phthalocyanine polymorph to from about 540° C to about 580° C and allowing said polymorph to cool.

4,098,796

P-TRIMETHYLSILYLOXYPHENYL GLYCYLOXYPHTHALIMIDE

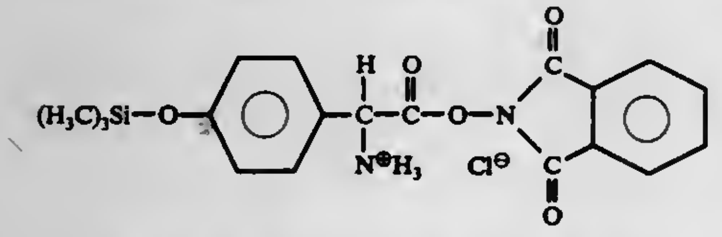
Erling Guddal, Skovlunde, Denmark, assignor to Novvo Industri A/S, Bagsvaerd, Denmark

Filed Jun. 7, 1976, Ser. No. 693,516

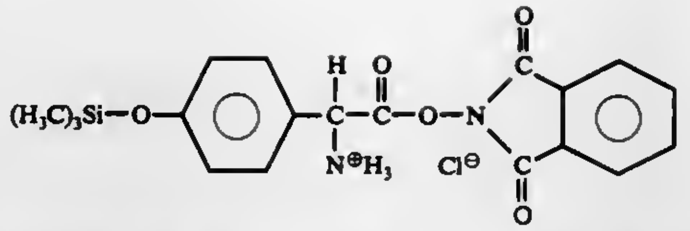
Int. Cl.² C07D *209/34*

U.S. Cl. 260—326 E **4 Claims**

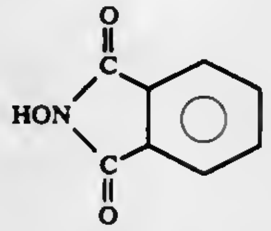
1. A chemical compound of the formula:



2. A process for preparing a chemical compound of the formula:



comprising the steps of reacting D-(−)-p-trimethylsilyloxyphenylglycin-N-carboxyanhydride with a N-hydroxyimide of the formula:



in the presence of a hydrochloride of a weak amine and in an inert solvent.

4,098,797

CYCLOPENTA[c]PYRROLE DERIVATIVES

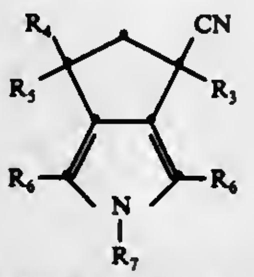
Malcolm R. Bell, and Rudolf Oesterlin, both of East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 558,807, Mar. 17, 1975, Pat. No. 4,008,250, which is a continuation-in-part of Ser. No. 346,005, Mar. 29, 1973, Pat. No. 3,928,380. This application Jul. 9, 1976, Ser. No. 703,949

Int. Cl.² C07D *209/02*

U.S. Cl. 260—326.62 **5 Claims**

1. A compound having the formula



where each of R_3, R_4 and R_5 is hydrogen or methyl; each R_6 group is the same or different hydrogen, formyl, and lower-alkane-1,3-diol ketals thereof, phenyl-lower-alkyl, carboxy, carbo-lower-alkoxy, chloromethyl, dichloromethyl, trichloromethyl, hydroxymethyl, hydroxycyanomethyl or lower-alkyl; and R_7 is di-lower-alkylamino-lower-alkyl, and wherein said lower-alkane, lower-alkyl and lower-alkoxy groups, all occurrences, have from one to four carbon atoms.

4,098,798

ADRIAMYCINS, PROCESS FOR THEIR PREPARATION AND USES THEREOF

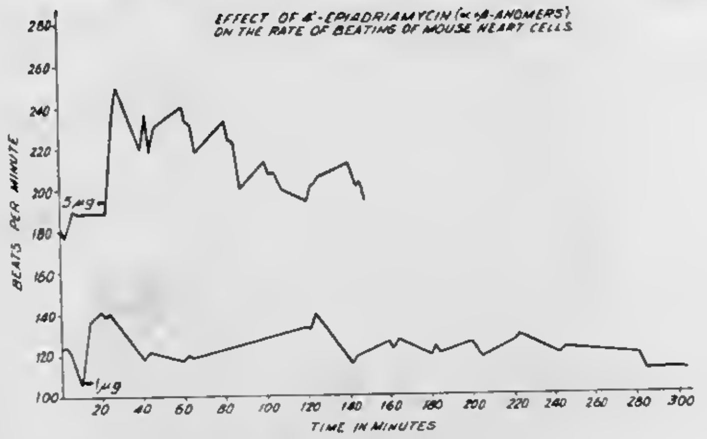
Federico Arcamone; Aurelio Di Marco, and Sergio Penco, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Division of Ser. No. 560,104, Mar. 19, 1975, Pat. No. 4,058,519. This application Aug. 11, 1977, Ser. No. 823,581

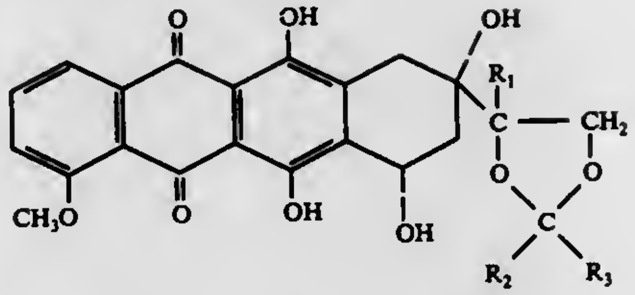
Claims priority, application United Kingdom, Mar. 22, 1974, 12783/74

Int. Cl.² C07D *317/10*

U.S. Cl. 260—340.9 R **2 Claims**



1. A compound of the formula



wherein each of R_1, R_2 and R_3 is independently selected from the group consisting of hydrogen and C_1–C_4 alkyl, or R_2 and R_3, together with the carbon atom to which they are bound may form a saturated or unsaturated ring of 3–8 carbon atoms.

4,098,799

3-FORMYLCHROMONES

Sylvester Klutchko, Hackettstown, N.J.; Daniel Kaminsky, deceased, late of Parsippany, N.J. (by Bernice R. Kaminsky, administratrix), and Maximilian von Strandtmann, Rockaway, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 352,149, Apr. 18, 1973, abandoned. This application Jun. 19, 1974, Ser. No. 480,983

Int. Cl.² C07D *311/22*

U.S. Cl. 260—345.2 **2 Claims**

1. 6-Acetyl-3-formyl-7-hydroxychromone.

2. 8-Acetyl-3-formyl-5,7-dimethoxychromone.

4,098,800

PROCESS FOR PREPARING POLYETHERAMIDE-ACIDS

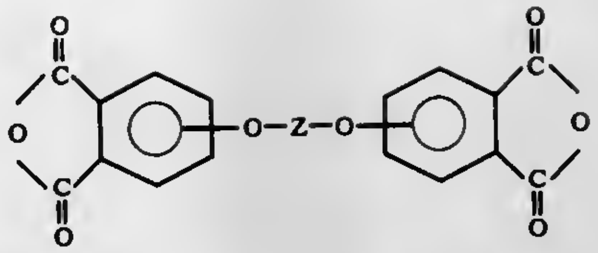
Eugene G. Banucci, Mt. Vernon, Ind., and Martin A. Byrne, Troy, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,248

Int. Cl.² C07D *307/91*

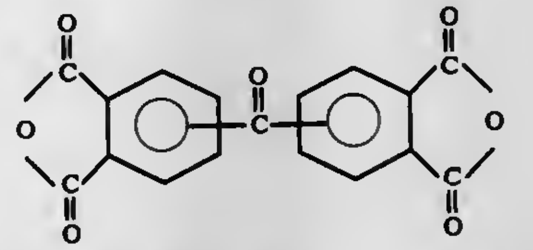
U.S. Cl. 260—346.3 **20 Claims**

1. A process for preparing oligomeric polyetheramide-acid, comprising reacting an aromatic dianhydride component selected from the group consisting of (a) aromatic bis(ether anhydride)s of the general formula



(I)

and (b) mixtures of one or more of said bis(ether anhydride)s with up to 30 mole percent benzophenone dianhydride of the general formula

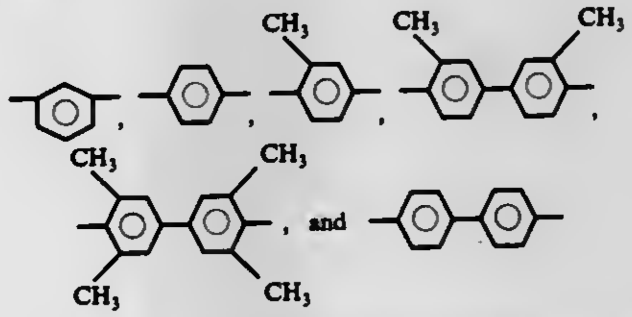


(II)

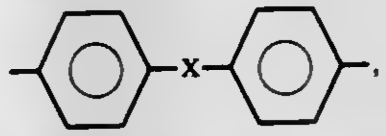
with at least one organic diamine of the general formula

$$H_2N—R—NH_2 \qquad \text{(III)}$$

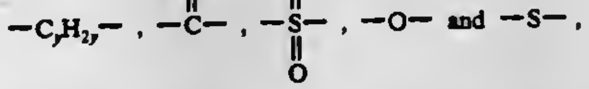
in an inert organic liquid selected from the group consisting of (c) chlorinated hydrocarbon selected from the group consisting of methylene chloride, chloroform, 1,2-dichloroethane, and mixtures thereof and (d) mixtures of said chlorinated hydrocarbon with up to 50% by weight of acetone to form oligomeric polyetheramide-acid which is substantially insoluble in said liquid, where Z is a member selected from the class consisting of (a) divalent organic radicals having the following formulas



and (b) divalent organic radicals of the general formula

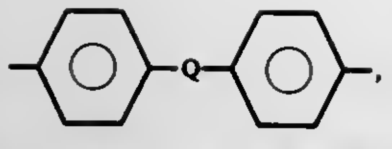


where X is a member selected from the class consisting of divalent radicals of the formulas



$$-C_yH_{2y}- \,,\quad -\overset{\overset{O}{\|}}{C}- \,,\quad -\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{S}}- \,,\quad -O- \text{ and } -S- \,,$$

where *y* is an integer from 1 to 5; and R is a divalent organic radical selected from the class consisting of aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C_2 to about C_8 alkylene terminated polydiorganosiloxane and divalent radicals of the general formula



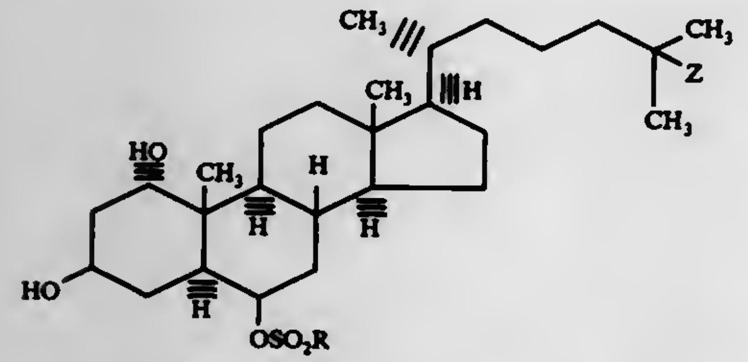
where Q is a member selected from the class consisting of
—O—, —S—, and —C_xH_{2x}—,
and x is an integer from 1 to 5.

4,098,801
SYNTHESIS OF 1α-HYDROXYLATED DERIVATIVES OF CHOLESTEROL

Robert Angelo Micheli, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

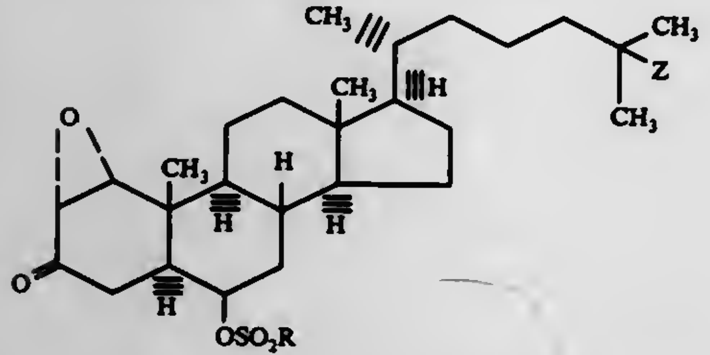
Filed Jan. 26, 1977, Ser. No. 762,604
Int. Cl.² C07J *5/00*
U.S. Cl. 260—397.2 **8 Claims**

1. A process for the preparation of a compound of the formula

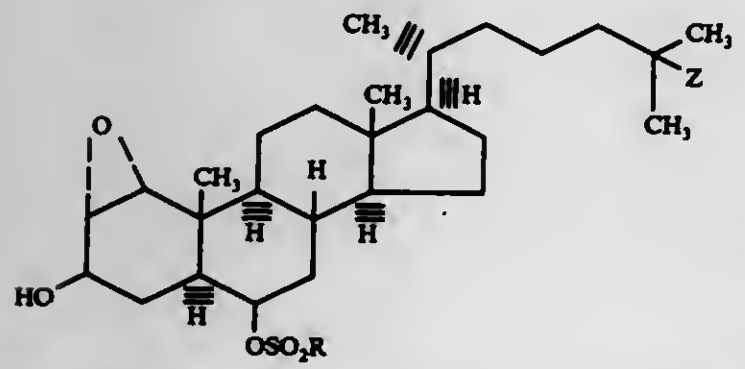


wherein R is lower alkyl or aryl and Z is hydrogen or hydroxyl and the 3-α-hydroxyl epimer thereof, which comprises the steps of

(a) contacting a compound of the formula



wherein R and Z are as above with diborane in an ethereal solvent selected from the group consisting of 1,2-dimethoxyethane, bis-(2-methoxyethyl)ether, dioxane and tetrahydrofuran at a temperature of −30° to +30° C to afford a compound of the formula



wherein R and Z are as above and the 3-α-hydroxy epimer thereof and

b. contacting the above-obtained compound with diborane in the presence of an alkali metal borohydride in an ethereal solvent selected from the group consisting of 1,2-dimethoxyethane, bis-(2-methoxyethyl)ether, dioxane and tetrahydrofuran at a temperature of −30° to +30° C.

4,098,802
ORAL PHARMACEUTICAL PREPARATION HAVING ANDROGENIC ACTIVITY

Johannes van der Vies, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 550,397, Feb. 18, 1975, abandoned. This application May 28, 1976, Ser. No. 691,103
Int. Cl.² C07J *1/00, 43/00*
U.S. Cl. 260—397.4 **2 Claims**

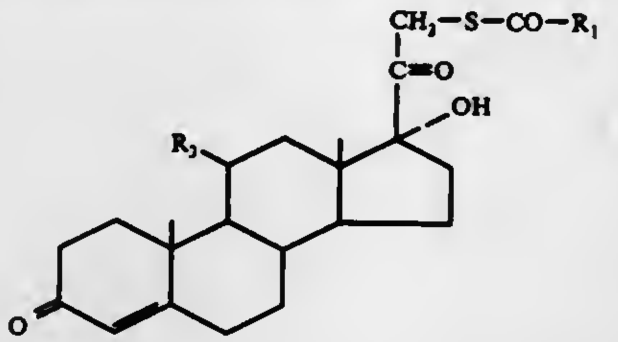
1. Testosterone α-methyl-β-cyclohexyl-propionate.

4,098,803
ESTERS OF 21-THIOL-STEROIDS HYDROCORTISONE AND CORTISONE

Dieran Robert Torossian, Bourg-la-Reine; Gilbert Gustave Aubard, and Jacky Marcel Legeai, both of Palaiseau, all of France, assignors to Jouveinal S.A., Val de Marne, France

Continuation-in-part of Ser. No. 473,388, May 28, 1974, Pat. No. 4,014,909. This application Jan. 4, 1977, Ser. No. 756,597
Claims priority, application France, May 30, 1973, 73 19734
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.² C07J *31/00*
U.S. Cl. 260—397.45 **29 Claims**

1. New steroids compounds of the general formula:



wherein:

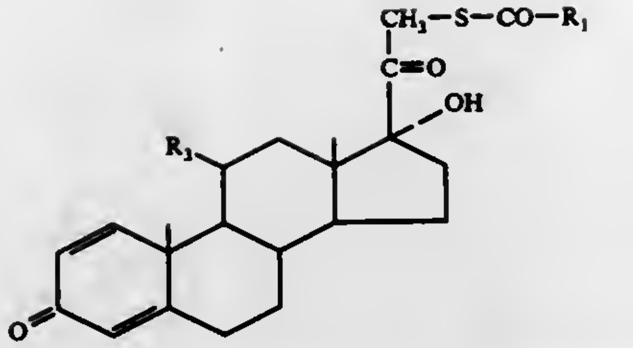
R_1 is an alkyl radical having from 4 to 9 carbon atoms or is the p. fluorophenyl radical and R_2 is an hydroxyl radical or a ketone fonction.

4,098,804
ESTERS OF 21-THIOL PREDNISONE AND PREDNISOLONE

Dieran Robert Torossian, Bourg-la-Reine; Gilbert Gustave Aubard, and Jacky Marcel Legeai, both of Palaiseau, all of France, assignors to Jouveinal S.A., Val de Marne, France

Continuation-in-part of Ser. No. 473,388, May 28, 1974, Pat. No. 4,014,909. This application Jan. 4, 1977, Ser. No. 756,599
Claims priority, application France, May 30, 1973, 73 19734
Int. Cl.² C07J *31/00*
U.S. Cl. 260—397.45 **29 Claims**

1. New steroids compounds of the general formula:



wherein:

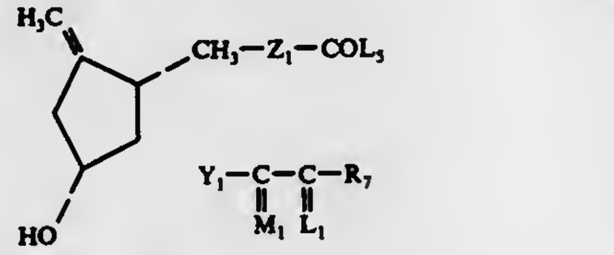
R_1 is an alkyl radical having from 4 to 9 carbon atoms or is the p. fluorophenyl radical and R_2 is an hydroxyl radical or a ketone function.

4,098,805
9-DEOXY-9-METHYLENE-PGF-TYPE AMIDES

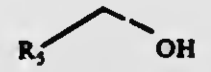
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 11, 1977, Ser. No. 786,250
Int. Cl.² C07C *103/19, 103/26;* A61K *31/16, 31/165*
U.S. Cl. 260—404 **38 Claims**

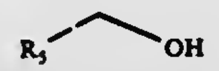
1. A prostaglandin analog of the formula



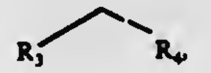
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—;
wherein M_1 is

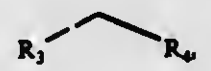


or

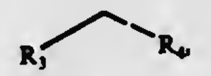


wherein R_5 is hydrogen or methyl;
wherein L_1 is

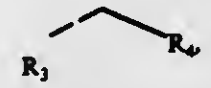




or a mixture of

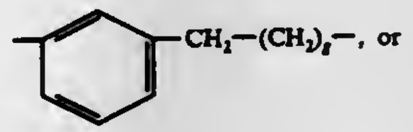


and

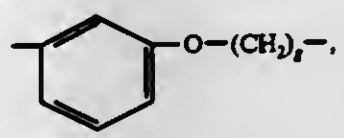


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—,
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,



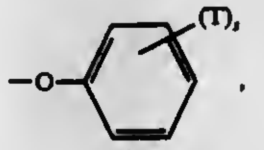
(9)



(10)

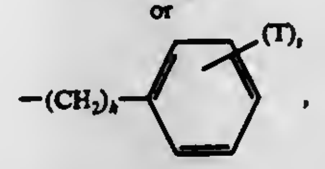
wherein g is one, 2, or 3;
wherein R_7 is

(1) —$(CH_2)_m$—CH_3,



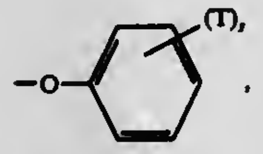
(2)

or



(3)

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



wherein T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein L_5 is

(1) amido of the formula —$NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; or
(2) carbonylamido of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above.

4,098,806

PROCESS FOR FUNCTIONALIZING PERFLUOROHALOGENOALKANES

Auguste Commeyras, Clapiers; Hubert Blancou, Montpellier, and Patrice Moreau, Saint Gely du Fesc, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 25, 1977, Ser. No. 772,107

Claims priority, application France, Mar. 5, 1976, 76 06303; Dec. 10, 1976, 76 37240

Int. Cl.² C07C *53/34, 145/00, 31/34, 21/18*

U.S. Cl. 260—405.5 **7 Claims**

1. A process of preparing perfluoro functional compounds which comprises; reacting

(a) a perfluorohalogenoalkane having the general formula:

R_FX

wherein R_F is a saturated, unsaturated, straight, or branched chain perfluoroalkyl radical having 2 to 12 carbon atoms, and X is a member selected from the group consisting of chlorine, bromine and iodine; and

(b) a functionalizing agent selected from the group consisting of carbon dioxide, sulfur dioxide, aldehyde and olefin;

(c) said reaction being effected in the presence of a metallic couple having the general formula:

M_1/M_2

wherein M_1 is metal selcted from Group IB, IIA, IIB, or IIIA of the Periodic Table, and M_2 is a metal having an electrochemical potential lower in the electromotive series of metals than said metals M_1; and

(d) said reaction being effected in a sulfoxide solvent.

4,098,807

PLATINUM AND PALLADIUM COMPLEXES

Francis Gordon Albert Stone; Michael Green, both of Bristol, and John Lionel Spencer, Horfield, all of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 17, 1975, Ser. No. 641,407

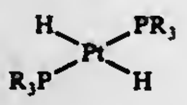
Claims priority, application United Kingdom, Dec. 9, 1974, 53120/74; May 12, 1975, 19837/75

Int. Cl.² C07F *15/00*

U.S. Cl. 260—429 CY **10 Claims**

1. A method of preparing bis(cis,cis-cyclo-octa-1,5 diene) platinum or palladium in which a reducing agent is allowed to react with $[PtCl_2(1,5\text{-}C_8H_{12})]$ or $[PdCl_2(1,5\text{-}C_8H_{12})]$ and excess cis, cis,cyclo-octa-1,5-diene in the presence of a solvent not having an active hydrogen atom.

4. A method of preparing



comprising reducing in solution $R_3P—Pt—PR_3$ with hydrogen wherein R is a bulky ligand such that not more than two of the phosphines R_3P can form a bond with the Pt atom.

4,098,808

SILYL ETHERS AND THEIR USE AS POLYMERIZATION INITIATORS

Heinrich Wolfers, Rheurdt; Hans Rudolph, and Hans Jurgen Rosenkranz, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

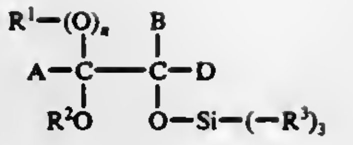
Filed Apr. 1, 1977, Ser. No. 783,935

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615039

Int. Cl.² C07F *7/18*

U.S. Cl. 260—448.8 R **2 Claims**

1. Silyl ethers of the formula



$$\begin{matrix} & R^1-(O)_n & & B & \\ & | & & | & \\ A- & C & — & C & -D \\ & | & & | & \\ & R^2O & & O-Si-(-R^3)_3 & \end{matrix} \qquad (I)$$

in which

A, B and D represent aryl radicals with 6–12 C atoms which are optionally substituted by methyl, methoxy or chlorine,

R^1 represents hydrogen, an alkyl radical with 1–18 C atoms, a cycloalkyl radical with 5–7 C atoms, an aralkyl radical with 6–8 C atoms or a phenyl, naphthyl or biphenyl radical which is optionally substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, or chlorine,

R^2 represents alkyl radicals with 1–6 C atoms, cycloalkyl radicals with 5–7 C atoms, aralkyl radicals with 6–8 C atoms and a phenyl radical which is optionally substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, or chlorine, R^3 represents a n-alkyl radical with 1–6 C atoms or a phenyl radical and

n represents 0 or 1 (but in the case where R_1 denotes hydrogen, represents only 0).

4,098,809

PROCESS FOR THE PRODUCTION OF DIMETHYL ETHER

Giorgio Pagani, Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 424,951, Dec. 17, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 642,983

Claims priority, application Italy, Dec. 20, 1972, 33276 A/72

Int. Cl.² C07C *27/06*

U.S. Cl. 260—449 R **4 Claims**

1. A process for the production of dimethyl ether in high yield wherein a feed mixture constituted by CO, CO_2 and H_2, in which the quantity of CO is in effective excess of the stoichiometric value, is reacted in a reaction zone in the temperature range of 220° C to 320° C and the pressure range of 30 to 500 kg/cm² over a Cu/Zn/Cr methyl alcohol synthesis catalyst having a carrier of alumina which is a methyl alcohol dehydration catalyst, so that methyl alcohol is formed as an intermediate which is then dehydrated into dimethyl ether in the same reaction zone.

4,098,810

N-(FLUORODICHLOROMETHYLTHIO)-BENZANILIDES

Sabine Thym, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof; Bernd Zeeh, and Friedrich Linhart, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

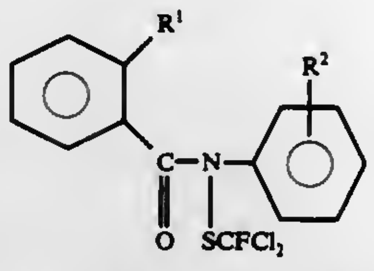
Filed Feb. 18, 1977, Ser. No. 770,226

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611902

Int. Cl.² C07C *69/00;* **A01N** *9/12*

U.S. Cl. 260—453 RW **3 Claims**

1. N-(fluorodichloromethylthio)-benzanilides of the formula



where R^1 denotes halogen, unsubstituted alkyl of 1 to 4 carbon atoms, or halogen-substituted alkyl of 1 to 4 carbon atoms, and R^2 denotes hydrogen, halogen an alkyl or alkoxy of 1–8 carbon atoms, allyl, isopropenyl, allyloxy, dodecyloxy, propargyloxy, benzyloxy or chlorobenzyloxy.

4,098,811

PERFLUOROALKYLTHIOAMIDO AMINE AND AMMONIUM COMPOUNDS

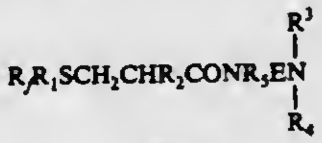
Robert A. Falk, New City, N.Y., assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Dec. 2, 1976, Ser. No. 747,113

Int. Cl.² C07C *141/04*

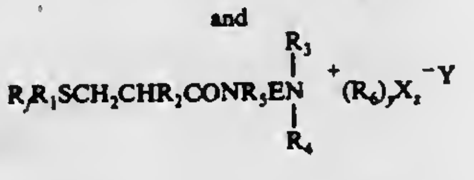
U.S. Cl. 260—459 A **9 Claims**

1. A compound having the structure



$$\begin{matrix} & R^3 \\ & | \\ R_fR_1SCH_2CHR_2CONR_5E & N \\ & | \\ & R_4 \end{matrix}$$

and



$$\begin{matrix} & R_3 & \\ & | & \\ R_fR_1SCH_2CHR_2CONR_5E & N & {}^{+}(R_6)_yX_z{}^{-Y} \\ & | & \\ & R_4 & \end{matrix}$$

wherein

R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 atoms;

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms of alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent hydrogen of alkyl of 1 to 6 carbon atoms;

R_2 is hydrogen or straight or branched chain alkyl of 1 to 6 carbon atoms;

R_3 and R_4 each is independently straight or branched chain alkylyl of 1 to 22 carbon atoms;

R_5 is hydrogen or straight or branched chain alkyl of 1 to 6 carbon atoms, or R_5 is a covalent bond if a heterocyclic ring formed between the two nitrogens as defined below;

R_6 is hydrogen or straight or branched chain alkyl of 1 to 22 carbon atoms that may also contain 1 or 2 hydroxyl groups, a free carboxylic acid gronp, an anionic function selected from sulfonate, sulfate, or carboxylate, or oxygen;

E is a straight or branched chain alkylene of 1 to 12 carbon atoms or alkylene polyoxyalkylene of formula

$C_mH_{2m}(OC_kH_{2k})_r$

where

m is an integer of 1 to 12

k is an integer of 2 to 6

r is an integer of 1 to 40;

X is an anion selected from the group consisting of Br, Cl, I, acetate, phosphate, sulfate, methosulfate or ethosulfate;

y is 1 to 2, depending on the valence of X, and

z is 0 or 1, with the proviso that when *z* is 0, *y* is 1 and R_6 must be oxygen or an anionic function; if *z* is 1 R_6 may not be oxygen.

4,098,812

4-CYANO-2,6-DINITROANILINES

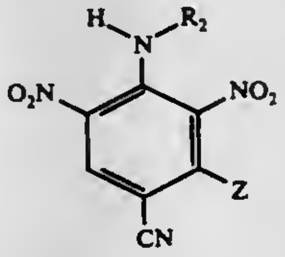
Albert William Lutz, Princeton, and Robert Eugene Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 705,864, Jul. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,288, Jul. 25, 1975, abandoned, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Dec. 20, 1976, Ser. No. 752,051

Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **5 Claims**

1. A compound of the formula:



wherein

R_2 is secondary alkyl C_3–C_5 groups free from quaternary carbon atoms and

Z is CH_3 or $—CH_2OCH_3$.

4,098,813

PREPARATION OF ALKALI METAL CHOLINE SALICYLATE SALT COMPLEXES

William Kelly, deceased, late of Liverpool, England (by Monica Kelly, joint personal representative); by John Kelly, joint personal representative, Great Sankey near Warrington, England, and Alfred Halpern, Lake Success, N.Y., assignors to Mundipharma AG, Rheinfelden, Switzerland

Division of Ser. No. 625,783, Oct. 24, 1975, Pat. No. 4,001,311, which is a division of Ser. No. 501,004, Sep. 3, 1974, Pat. No. 3,947,491, which is a division of Ser. No. 237,927, Mar. 24, 1972, Pat. No. 3,855,282. This application Dec. 22, 1976, Ser. No. 753,396

Claims priority, application United Kingdom, Jul. 24, 1971, 34941/71

Int. Cl.² C07C *91/00*

U.S. Cl. 260—501.15 **4 Claims**

1. The method for the preparation of a choline salicylate salt complex compound selected from the group consisting of choline salicylate sodium, potassium and lithium salt of bisulfite, metabisulfite, dithionate, hydrosulfite and hyposulfite comprising the steps of:

a. adding a sulfite-containing compound selected from the group consisting of sodium bisulfite, sodium metabisulfite, sodium dithionate, sodium hydrosulfite, sodium hyposulfite, potassium bisulfite, potassium metabisulfite, potassium dithionate, potassium hydrosulfite, potassium hyposulfite, lithium bisulfite, lithium metabisulfite, lithium dithionate, lithium hydrosulfite and lithium hyposulfite to an equimolecular quantity of choline salicylate,

b. mixing the same,

c. allowing to stand for at least one-half hour,

d. recovering the formed choline salicylate salt complex compound therefrom.

4,098,814

N-PHOSPHONO METHYLENE AMINO ALKANE PHOSPHONIC ACID COMPOUNDS, PROCESS OF PRODUCING SAME, AND METHOD AND COMPOSITIONS OF USING SAME

Klaus Sommer, Heidelberg, and Guenter Raab, Laudenbach, both of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Neckar, Fed. Rep. of Germany

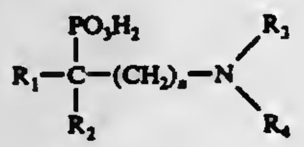
Filed May 23, 1977, Ser. No. 799,498

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625727

Int. Cl.^{2} C07F *9/38;* C02B *5/06;* C14C *3/00;* D06M *1/14*

U.S. Cl. 260—502.5 24 Claims

1. An N-phosphono methylene amino alkane phosphonic acid compound of the formula



$$R_1-\overset{\displaystyle PO_3H_2}{\underset{\displaystyle R_2}{C}}-(CH_2)_n-N{<}^{R_3}_{R_4}$$

in which

n is a numeral from 0 to 4;

R_1 indicates alkyl with 1 to 11 carbon atoms in its hydrocarbon chain,

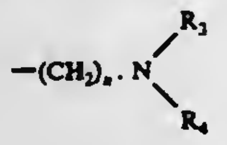
hydroxyl,

an alkylene phosphonic acid group of the formula $-(CH_2)_n.PO_3H_2$,

the hydroxyethylene group of the formula $-C_2H_4OH$,

an alkylene carboxylic acid group of the formula $-(CH_2)_n.COOH$,

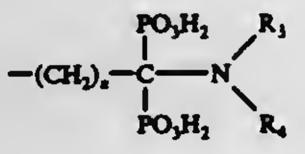
an amino alkylene group of the formula



$$-(CH_2)_n.N{<}^{R_3}_{R_4}$$

or

an 1-amino alkyl-1,1-diphosphonic acid group of the formula



$$-(CH_2)_n-\overset{\displaystyle PO_3H_2}{\underset{\displaystyle PO_3H_2}{C}}-N{<}^{R_3}_{R_4}$$

or

R_1 also indicates hydrogen in the case where *n* is 1–4 and in the case where *n* is 0 and R_2 is the phosphonic acid group;

R_2 indicates hydrogen or the phosphonic acid group;

R_3 indicates hydrogen or the methylene phosphonic acid group; and

R_4 indicates the methylene phosphonic acid group.

4,098,815

NOVEL ANALOGUES OF PROSTANOIC ACIDS NOT OCCURRING IN NATURE

Milos Babej, Frankfurt am Main; Wilhelm Bartmann, Neuenhain, Taunus; Gerhard Beck, Frankfurt am Main, and Ulrich Lerch, Hofheim, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

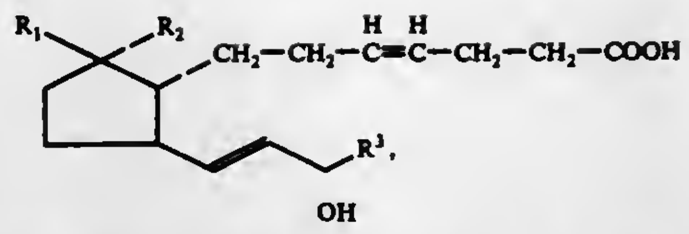
Division of Ser. No. 549,651, Feb. 13, 1975. This application Dec. 17, 1976, Ser. No. 751,951

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1974, 2407186

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D 3 Claims

1. A compound of the formula



a physiologically tolerated salt thereof with an organic or inorganic base, or a physiologically tolerated ester thereof with an aliphatic, cycloaliphatic or araliphatic alcohol having up to 8 carbon atoms, wherein

R_1 and R_2 taken alone are different and are hydrogen or hydroxy,

R_1 and R_2 taken together are oxygen, and

R_3 is saturated straight-chain or branched alkyl having 1 to 10 carbon atoms substituted by O-alkyl having 1 to 5 carbon atoms.

4,098,816

POLYCYCLIC OXY-AROMATIC ACID

David Edward Thorne, Cranleigh; Keith Howard Baggaley, Redhill, and Brian Morgan, Reigate, all of England, assignors to Beecham Group Limited, Great Britain

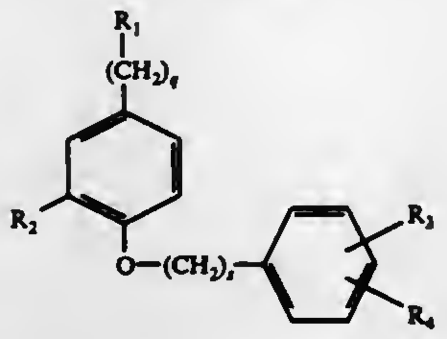
Division of Ser. No. 495,119, Aug. 5, 1974, Pat. No. 3,983,164. This application Jan. 9, 1976, Ser. No. 647,718

Claims priority, application United Kingdom, Aug. 23, 1973, 39902/73; Sep. 11, 1973, 42654/73; Mar. 26, 1974, 13911/74

Int. Cl.^{2} C07C *65/14*

U.S. Cl. 260—520 E 16 Claims

1. A compound of the formula:



wherein

R_1 is carboxylic acid or a pharmaceutically acceptable salt thereof converted in the human body to a carboxylic acid group;

R_2 is hydrogen;

R_3 is hydrogen, halogen, lower alkyl or lower alkoxyl;

R_4 is hydrogen, halogen, phenyl, lower alkyl, lower alkoxyl, halo-lower alkyl or nitro;

q is zero or an integer from 1 to 12; and

s is an integer from 2 to 6.

4,098,817

OXIDATION OF CYCLOALIPHATIC COMPOUNDS

Bruno J. Barone, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Dec. 11, 1970, Ser. No. 97,317

Int. Cl.^{2} C07C *51/00*

U.S. Cl. 260—533 C 1 Claim

1. A process for partial oxidation of cycloaliphatic compounds selected from the group consisting of cycloalkanes and cycloalkenes containing from 5 to 20 carbon atoms to produce acyclic diacids, cycloaliphatic ketones and cycloaliphatic alcohols having the same number of carbon atoms as said cycloaliphatic compounds, said cycloaliphatic compounds being unsubstituted or contain non-reactive ring substituents selected from the group consisting of tertiary alkyl groups, halogen, oxo, methoxy, carboxy, alkoxy, aryloxy and nitro groups, said process comprising reacting a solution of from about 1.0 to 10 molar of said cycloaliphatic compounds in organic ester solvent with molecular oxygen at a temperature of 70° to 160° C in the presence of a catalytic amount in the range of about 0.001 to 0.5 gram atom per mole of cycloaliphatic compounds of a catalyst consisting of Zr, wherein said organic ester solvent is selected from the group consisting of methyl acetate, ethyl acetate or t-butyl acetate, said organic ester solvent being present in an amount from about 0.3 to 10 moles per liter of solution.

4,098,818

PROCESS FOR MAKING CARBOXYALKYLATED ALKYL POLYETHER SURFACTANTS WITH NARROW POLYETHOXY CHAIN DISTRIBUTION

H. Karl Krummel, and Rodney Mahlon Wise, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 10, 1976, Ser. No. 749,503

Int. Cl.^{2} C07C *59/00*

U.S. Cl. 260—535 R 6 Claims

1. The process of preparing a carboxyalkylated alkyl polyether surfactant containing an alkyl group containing from about 8 to about 18 carbon atoms and a number of ethoxy groups averaging from about 1 to about 12 and having a narrow distribution of polyethoxylate chain lengths in which at least about 40% by weight of the surfactant has polyethoxy chains within ± 1 ethoxy groups of the average ethoxy group content in which a fatty alcohol containing from about 8 to about 18 carbon atoms is reacted with from about 1 to about 12 moles of ethylene oxide in the presence of an alkali metal or alkali metal hydride catalyst which is present in a molar ratio of catalyst to alcohol of from about 0.9 to about 1.5 and the resulting fatty alcohol polyethoxylate alkoxide is reacted with an alkali metal chloroacetate or chloropropionate in alkaline medium.

4,098,819

PROCESS FOR THE PRODUCTION OF PHOSPHORIC ACID-DIMETHYLAMIDE-DICHLORIDE OR PHOSPHORIC ACID-BIS-(DIMETHYLAMIDE)-CHLORIDE

Heinz Liberda; Hellmuth Spes, and Alfred Trommet, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,574

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558185

Int. Cl.^{2} C07F *9/26*

U.S. Cl. 260—543 P 12 Claims

1. A process for the production of phosphoric acid-dimethylamide-dichloride (A) and/or phosphoric acid-bis-(dimethylamide)-chloride (B) by reacting phosphorus oxychloride and dimethylammonium chloride at elevated temperature under anhydrous conditions, which comprises heating phosphorus oxychloride with a mixture of dimethylammonium chloride and at least one of the compounds A and B to temperatures ranging from 130° to 240° C using at least 1 mole dimethylammonium chloride per mole of phosphorus oxychloride.

4,098,820

PROCESS FOR THE PRODUCTION OF FORMAMIDES

Willy Couteau, Brussels, and Jean Ramioulle, Bierghes, both of Belgium, assignors to UCB, Societe Anonyme, Brussels, Belgium

Filed Mar. 10, 1977, Ser. No. 776,370

Claims priority, application United Kingdom, Mar. 12, 1976, 10027/76

Int. Cl.^{2} C07C *102/00*

U.S. Cl. 260—561 R 16 Claims

1. In a process for the production of a formamide, wherein a current of a gas containing carbon monoxide is reacted at elevated temperature and pressure in a reaction zone with a recycled current of liquid reaction mixture containing

(a) a nitrogen-containing compound selected from the group consisting of ammonia, a primary alkylamine and a secondary alkylamine,

(b) a methanolic solution of an alkali metal or alkaline earth metal methoxide as catalyst, and

(c) the formamide produced as reaction product,

part of the current of liquid reaction mixture being withdrawn in order to recover the formamide therefrom, the improvement which comprises using the recycled current of liquid reaction mixture for sucking and dispersing the current of gas in the reaction zone.

4,098,821

QUATERNARY AMMONIUM PHENATES CONTAINING A (3-CHLORO-2-PROPENYL) GROUP

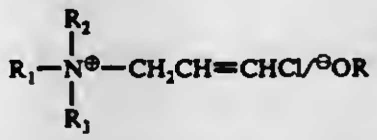
Thomas P. Brady, Holliston; Nancy L. Boardway, Ashland, both of Mass., and Joseph W. Whalen, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 18, 1976, Ser. No. 733,607

Int. Cl.^{2} C07C *87/26;* A01N *9/20*

U.S. Cl. 260—567.5 5 Claims

1. A compound represented by the formula



$$R_1-\overset{\displaystyle R_2}{\underset{\displaystyle R_3}{N^{\oplus}}}-CH_2CH{=}CHCl/{}^{\ominus}OR$$

wherein R_1 is a C_8–C_{18} alkyl group, R_2 is methyl, ethyl, a C_8–C_{18} alkyl or a 3chloro-2-propenyl group, R_3 is methyl, ethyl or a 3-chloro-2-propenyl group and R is phenyl or phenyl substituted with 1 to 5 halo groups, phenyl, phenoxy, C_1–C_4 alkyl or alkoxy, or amino, wherein only one of R_2 and R_3 can be 3-chloro-2-propenyl.

4,098,822

MIXTURES OF ALIPHATIC AMINES AND QUATERNARY AMMONIUM COMPOUNDS THEREOF

Richard R. Egan, Worthington, Ohio; Graham K. Hughes, Hackettstown, N.J., and Jack W. Sigan, Minneapolis, Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 113,070, Feb. 5, 1971, Pat. No. 3,803,137, which is a continuation-in-part of Ser. No. 670,753, Sep. 26, 1967, abandoned. This application Oct. 26, 1973, Ser. No. 409,965

Int. Cl.^{2} C07C *85/06*

U.S. Cl. 260—585 B 5 Claims

1. A process for the conversion of a C_8–C_{22} primary aliphatic hydrocarbon mono-alcohol to a C_8–C_{22} mono-amine containing from 60–85 wt. % secondary amine derivatives which comprises sparging said alcohol at a temperature of from 180°–220° C. in the presence of from 0.5–10 wt. % nickel hydrogenation-dehydrogenation catalyst with a gaseous mixture of ammonia and hydrogen having a volumetric ratio of 8:1 to 1:1, respectively, at a rate of from 2.2–6 wt. % ammonia per hour based on the weight of the alcohol and continuously removing water of reaction and excess ammonia, and wherein the ammonolysis reaction is carried out until the total amine nitrogen content of the reaction mixture remains substantially constant.

4,098,823

MONOSPIROALKYL DERIVATIVES OF PROSTAGLANDINS

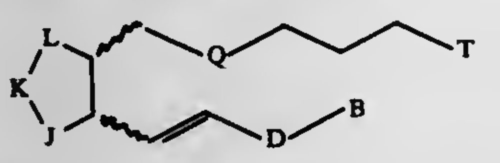
Henry Clifford Arndt; William Gerard Biddlecom, and Warren Dexter Woessner, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 657,222, Feb. 11, 1976, abandoned. This application Jan. 10, 1977, Ser. No. 758,124

Int. Cl.² C07C *49/46*

U.S. Cl. 260—586 G **7 Claims**

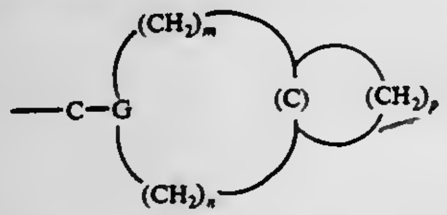
1. A compound having the formula:



III

wherein:

D is a R-hydroxymethylene or S-hydroxymethylene radical;
J is a R-hydroxymethylene or a S-hydroxymethylene radical;
K is a methylene radical;
L is a carbonyl radical;
Q is an ethylene radical;
T is an hydroxymethyl radical; and
B is a monospiroalkyl radical of the formula



where *m* is an integer having a value of from 0 to 2; *n* is an integer having a value of from 1 to 4; *p* is an integer having a value of from 3 to 11; and the sum of the integers *m* and *n* is less than or equal to 4, and wherein G is hydrogen or lower alkyl of 1 to 3 carbon atoms.

4,098,824

BENZHYDRYLSULPHINYL DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

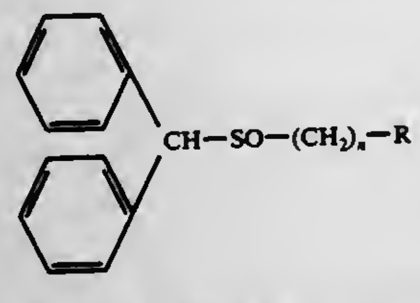
Division of Ser. No. 728,054, Sep. 30, 1976, Pat. No. 4,066,686. This application Aug. 3, 1977, Ser. No. 821,534

Claims priority, application United Kingdom, Oct. 2, 1975, 40419/75

Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 G **4 Claims**

1. Benzhydrylsulphinyl compounds of the formula:



I

in which *n* is 1, 2 or 3 and R is C(=NH)NHOH and their non-toxic acid addition salts.

4,098,825

ACETYLENE-SUBSTITUTED AROMATIC BENZILS AND ACETYLENE-TERMINATED QUINOXALINE COMPOSITIONS

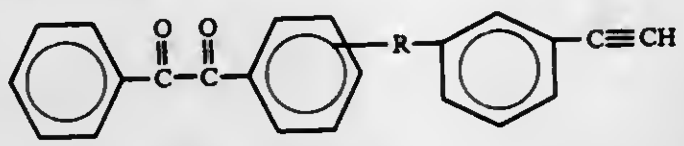
Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 762,078

Int. Cl.² C07C *49/84;* C07D *241/42*

U.S. Cl. 260—590 D **4 Claims**

1. An acetylene-substituted aromatic benzil having the following formula:



wherein R is oxygen or sulfur and R is ortho, meta or para to the carbonyl functionality.

4,098,826

PROCESS FOR THE PREPARATION OF FORMALDEHYDE

Heinz-Jürgen Alpers, and Heinz Jorg Rosenbaum, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 12, 1976, Ser. No. 731,488

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548908

Int. Cl.² C07C *45/16*

U.S. Cl. 260—603 C **14 Claims**

1. In a vapor phase process for the preparation of formaldehyde by oxidative dehydrogenation of methanol at 500° to 750° C with air in the presence of a silver catalyst at an elevated temperature, the improvement which comprises feeding a stream of gas into the reaction mixture containing a halogen or halogen compound, said halogen compound selected from the group consisting of, a hydrogen halide, an inorganic halide selected from the group consisting of ammonium iodide, phosphorus triiodide, silver bromide, silver iodide and boron trifluoride, a halogen alkane with up to 8 carbon atoms in the alkyl group, an aromatic halogenated hydrocarbon with up to 8 carbon atoms where the aromatic nucleus is a phenyl ring, or an araliphatic halogenated hydrocarbon with up to 8 carbon atoms in the aliphatic group where the aromatic group contains 6 carbon atoms.

4,098,827

1-(2,6,6-TRIMETHYL-3-HYDROXY-1-CYCLOHEXEN-1-YL)-3-METHYL-PENTA-1,4-DIENE[OR 1-YN-4-EN]-3-OLS

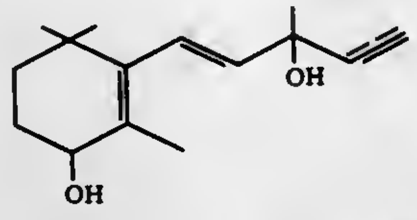
Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 17, 1977, Ser. No. 759,703

Int. Cl.² C07C *35/18*

U.S. Cl. 568—824 **2 Claims**

1. A compound of the formula



where the dotted bond is optionally hydrogenated.

4,098,828

BACTERICIDIC AND FUNGICIDIC CHLOROMETHYLISOPROPYLPHENOLS

Robert Marc Perrin, Saint-Didier-au-Mont d'or; Gisele Anreille, Champigny sur Marne; Marie-Francoise Vincent-Falquet, Caluire, and Edmond Collange, Saint-Martin-de-Valamas, all of France, assignors to Chrysa, Fontaines sur Saone, France

Filed May 7, 1973, Ser. No. 357,812

Int. Cl.² C07C *39/16*

U.S. Cl. 568—126 **2 Claims**

1. 6,6'-methylene-bis(4-chloro-3-methyl-2-isopropil)-phenol.

4,098,829

POLYMERIC HYDROQUINONE ANTIOXIDANT

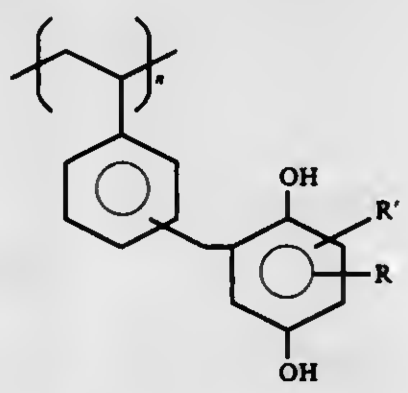
Ned M. Weinshenker, Palo Alto, and James A. Dale, Redwood City, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 529,325, Dec. 4, 1974, Pat. No. 4,054,676. This application May 19, 1977, Ser. No. 798,284

Int. Cl.² C07C *39/12;* C08G *83/00;* A23D *5/04*

U.S. Cl. 568—744 **5 Claims**

1. Polymeric hydroquinones represented by the structural formula



wherein R and R' are independently selected from the members of the group consisting of hydrogen and lower saturated alkyls of from 1 to 5 carbon atoms inclusive and *n* has a value of from 3 to 10,000 inclusive.

4,098,830

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF DICARBOXYLIC ACID COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,209

The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.² C07C *27/00, 37/00, 41/00, 45/00*

U.S. Cl. 568—730 **17 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting a mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7-9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, nickelous, ferric or chromic metal complex of a dicarboxylic acid compound.

4,098,831

NITROBENZOTRICHLORIDE OR BROMIDE PROCESS

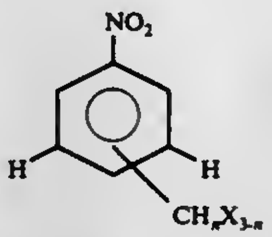
Frank Dennis Marsh, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1977, Ser. No. 822,998

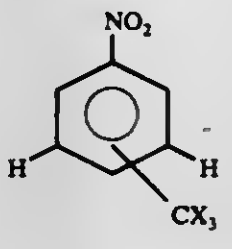
Int. Cl.² C07C *79/12*

U.S. Cl. 260—646 **10 Claims**

1. The process of reacting, in a two-phase aqueous-organic solvent system in which the aqueous phase contains 7-50% by weight of an alkali metal hydroxide or carbonate, a nitro compound of the formula



with a compound of the formula ROX to produce a compound of the formula



wherein

each X is independently chlorine or bromine;
R is alkali metal, alkaline earth metal or alkyl or cycloalkyl of 1-10 carbons; and
n is 1 or 2,

which comprises carrying out the reaction in the presence of 0.01 to 20% by weight of the starting nitro compound of a quartenary ammonium salt or quaternary phosphonium salt, or carrying out the reaction where the organic solvent system comprises an alkanol of 4-8 carbons.

4,098,832

FLUORINATION PROCESS CATALYSED BY MOLYBDENUM PENTACHLORIDE

Yusuf A. Baxamusa, Tonawanda, and Stephen Robota, N. Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,626

Int. Cl.² C07C *25/00, 17/20*

U.S. Cl. 260—651 F **31 Claims**

1. A process for the preparation of compounds of the formula

$$R_nAr(CF_{w'}X_{p'})_Z$$

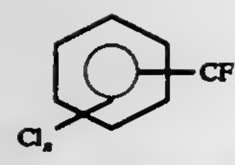
comprising contacting compounds of the formula

$$R_nAr(CF_wX_p)_Z$$

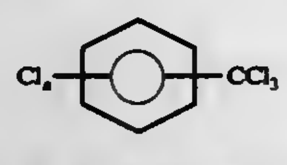
in liquid phase, with hydrogen fluoride in the presence of molybdenum pentachloride wherein

Ar is aryl;
R is a substituent on the aryl nucleus selected from the group consisting of aryl, substituted aryl, halogen, alkyl, alkoxy, and substituted alkyl;
n is 0 to 9;
X is a halogen atom other than fluorine;
w is 0 to 2;
p is 1 to 3;
w' is 1 to 3, and is greater than *w;*
p' is 0 to 2, and is less than *p;*
w + *p* is 3;
w' + *p'* is 3;
Z is 1-10; and
the maximum value of *n* + Z is 10.

29. A two step process for the preparation of compounds of the formula



wherein *n* is 0 to 2 which comprises first, partially fluorinating compounds of the formula



wherein *n* is 0 to 2 in the liquid phase, by reaction with a mixture of hydrogen fluoride and hydrogen chloride effluent gas from a vapor phase fluorination reactor, in the presence of molybdenum pentachloride to replace an average 1 to 2 α-chlorine atoms with fluorine atoms and second, further reacting the partially fluorinated compounds with anhydrous hydrogen fluoride in a vapor phase reaction.

4,098,833

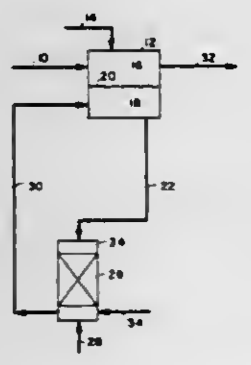
REGENERATION OF HYDROCARBON CONVERSION CATALYSTS

Joe Wristers, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 577,351, May 14, 1975, Pat. No. 4,025,459. This application Nov. 5, 1976, Ser. No. 739,303

Int. Cl.² C07C *5/24, 3/50;* **B01D** *15/06*

U.S. Cl. 260—666 P **26 Claims**



1. In a hydrocarbon conversion process which comprises contacting a hydrocarbon feedstock with a substantially liquid phase acid catalyst comprising (a) a metal halide selected from the group consisting of the fluorides, chlorides and bromides of tantalum, niobium, antimony and boron and the chlorides and bromides of aluminum and gallium and (b) a Bronsted acid containing fluoride, thereby forming a hydrocarbon phase and a catalyst phase, said catalyst phase having become at least partially deactivated due to the presence of a compound selected from the group consisting of allylic carbonium ions, alkylaromatic carbonium ions and mixtures thereof in said acid catalyst, the improvement which comprises regenerating at least a portion of said catalyst by contact with a noble metal selected from the group consisting of platinum, palladium, iridium, ruthenium, rhodium and mixtures thereof and hydrogen at a temperature in the range of from 0° to about 150° C. for a period of time sufficient to obtain an acid catalyst possessing a greater activity for hydrocarbon conversion than that possessed by said deactivated catalyst.

4,098,834

OPTICALLY ACTIVE 3-SUBSTITUTED CYCLOOCTENE BICYCLO-[6.0.3.]-UNDECENE-3 AND EXO-2-VINYL NORBORNANE

Günther Wilke; Borislav Bogdanovic, and Horst Pauling, all of Mulheim an der Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 413,722, Nov. 7, 1973, Pat. No. 3,978,147, which is a continuation-in-part of Ser. No. 166,957, Jul. 28, 1971, abandoned. This application Jan. 14, 1976, Ser. No. 649,164

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1970, 2039125

Int. Cl.² C07C *3/00*

U.S. Cl. 260—666 A **5 Claims**

1. Optically active 3-vinyl-cyclooctene.

4,098,835

VINYL NORTRICYCLANE

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 31, 1977, Ser. No. 829,301

Int. Cl.² C07C *15/00*

U.S. Cl. 260—666 PY **12 Claims**

1. Process for the catalytic codimerization of norbornadiene and ethylene comprising:

(a) contacting norbornadiene and ethylene in the presence of a catalytic amount of a homogeneous catalytic system of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range from between about −20° to about 100° C; and

(c) continuing the contacting until vinyl nortricyclane is prepared.

4,098,836

VAPOR-PHASE ISOMERIZATION PROCESS

Francis G. Dywer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 776,013

Int. Cl.² C07C *5/24*

U.S. Cl. 260—668 A **21 Claims**

1. In a process for effecting catalytic isomerization of monocyclic alkyl aromatic hydrocarbon feedstock which comprises contacting said feedstock in the vapor phase with hydrogen at a temperature of from about 450° to about 900° F, a pressure of from about 50 psig to about 500 psig, a hydrogen/hydrocarbon mole ratio of from about 0.1 to about 100 and a weight hourly space velocity of from about 0.1 to about 200 in the presence of a crystalline aluminosilicate zeolite characterized by a silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12 and containing cations which are predominantly hydrogen or a hydrogen precursor and a metal of Group VIII of the Periodic Table of Elements, the improvement which comprises having said Group VIII metal cations present in minimum amount of 2.0 percent by weight of said zeolite.

4,098,837

DISPROPORTIONATION OF TOLUENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 680,998, Apr. 28, 1976, Pat. No. 4,011,276. This application Oct. 21, 1976, Ser. No. 734,701

Int. Cl.² C07C *3/62*

U.S. Cl. 260—672 T **13 Claims**

1. A process for effecting disproportionation of toluene to produce benzene and xylenes in which the proportion of para-xylene isomer is in exces of its normal equilibrium concentration which comprises contacting toluene under conditions effective for accomplishing said disproportionation in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having been modified by initial treatment with an ammonium phosphate followed by treatment with a magnesium compound to yield a composite containing phosphorus oxide and magnesium oxide, each in an amount of at least about 0.25 percent by weight.

4,098,838

PROCESS FOR OBTAINING SULFUR FREE PURE NAPHTHALENE FROM BITUMINOUS COAL TAR AND THIONAPHTHENE AS A BY-PRODUCT

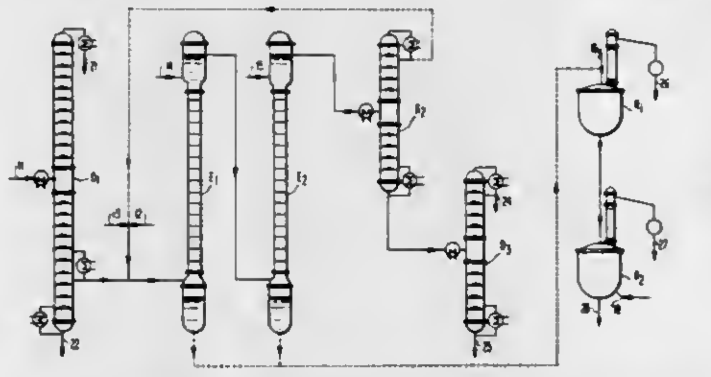
Georg Grigoleit, Dorsten, Rhade; Helmut Köhler, Duisburg; **Gerd Collin, and Kurt Matern, both of Duisburg-Meiderich,** all of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 4, 1976, Ser. No. 711,678

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535192

Int. Cl.² C07C *7/01;* **C07D** *333/52*

U.S. Cl. 260—674 N **5 Claims**



1. Process for the preparation of substantially pure naphthalene substantially free of sulfur from bituminous coal tar and for the recovery of thionaphthene as a by-product, said process comprising:

(a) separating a thionaphthene-containing naphthalene fraction from a dephenolized naphthalene material with a naphthalene content of 92 to 96% by weight obtained by distillation from bituminous coal tar by fractional distillation or oxidative purification in a gaseous phase;

(b) dissolving said thionaphthene-containing naphthalene fraction in cold benzene to form a solution containing about 1 kg of naphthalene per about 1.8 to about 3.0 l benzene;

(c) mixing said solution from step (b) with acetic acid anhydride;

(d) treating the solution resulting from step (c) with concentrated sulfuric acid in an extraction column to convert thionaphthene to a sulfonic acid derivative thereof, wherein flow of said solution is countercurrent to flow of said concentrated sulfuric acid and said concentrated sulfuric acid is employed in an amount of about 1 mole H_2SO_4 per 1 mole thionaphthene;

(e) extracting the solution resulting from step (d) with water in a second extraction column from which an aqueous phase and a benzene solution are obtained;

(f) distilling the benzene solution from step (e) to remove benzene and recover substantially pure naphthalene;

(g) concentrating the aqueous phase from step (e) to adjust the density of said phase to about 1.3;

(h) contacting the concentrated aqueous phase from step (g) with superheated steam at about 115° to about 140° C in order to liberate thionaphthene, wherein said acetic acid anhydride is employed in an amount sufficient to bind reaction water and water in said sulfuric acid.

4,098,839

OLIGOMERIZATION OF UNSATURATED HYDROCARBONS WITH A MOLYBDENUM CATALYST

Elmar Wilms, Düsseldorf-Benrath, and Georg Michalczyk, Neukirchen-Vluyn, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Oct. 28, 1975, Ser. No. 625,966

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1974, 2451127

Int. Cl.² B01J *23/64, 23/84, 27/02;* **C07C** *3/10*

U.S. Cl. 260—683.15 D **8 Claims**

1. a process for oligomerizing an olefin having 2 to 5 carbon atoms which comprises contacting said olefin in the presence of a sulfur containing molybdenuum supported catalyst comprising from about 5.0 to 11.0 weight percent molybdenum, 3.0 to 7.0 weight percent sulfur and the remainder support, said catalyst prepared by heating a composite comprising a sulfur-containing molybdenum compound on a support at a temperature of about 300° to 700° C. in an oxidizing atmosphere.

4,098,840

THERMOSETTING RESIN COMPOSITION

Masaru Yoshida; Isao Kaetsu; Hiroshi Okubo, and Akihiko Ito, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 603,991

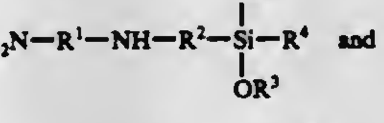
Claims priority, application Japan, Aug. 21, 1974, 49-95096

Int. Cl.² C08L *83/06, 83/08, 43/04;* **C08F** *2/46*

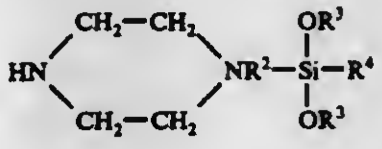
U.S. Cl. 260—827 **14 Claims**

1. A thermosetting resin composition forming transparent, anti-fogging abrasion-resistant coating comprising a mixture of:

A. 95 - 45% by weight of the hydrolysate of an alkoxysilane represented by either of the general formulas:

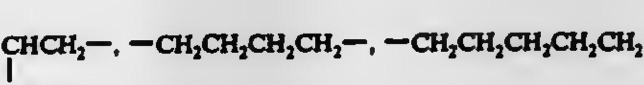


$$H_2N-R^1-NH-R^2-\overset{\displaystyle OR^2}{\underset{\displaystyle OR^3}{Si}}-R^4 \quad \text{and}$$

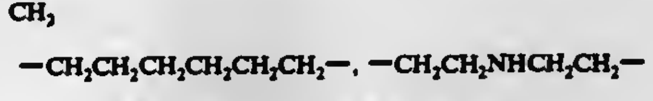


wherein:

R¹ is a divalent group selected from



$$-CH_2-,\ -CH_2CH_2-,\ -CH_2CH_2CH_2-,\ -CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}H-,$$

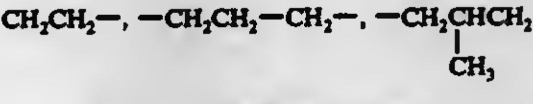


$$-\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2-,\ -CH_2CH_2CH_2CH_2-,\ -CH_2CH_2CH_2CH_2CH_2-,$$

$-CH_2CH_2CH_2CH_2CH_2CH_2-$, $-CH_2CH_2NHCH_2CH_2-$

and $-CH_2CH_2CH_2NHCH_2CH_2CH_2-$;

R² is a divalent group selected from



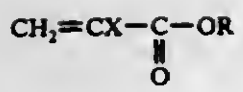
$$-CH_2CH_2-,\ -CH_2CH_2-CH_2-,\ -CH_2\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2-$$

and $-CH_2CH{=}CHCH_2CH_2-$;

R³ is any of methyl, ethyl, propyl and isopropyl; and

R⁴ is either of R³ and OR³, and

B. 5 - 55% by weight of a polymer or copolymer of monomers of the general formula:

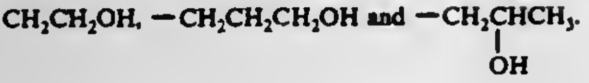


$$CH_2{=}CX{-}\underset{\underset{O}{\|}}{C}{-}OR$$

wherein:

X is either of hydrogen and methyl; and

R is a monovalent group selected from



$$-CH_2CH_2OH,\ -CH_2CH_2CH_2OH \text{ and } -CH_2\underset{\underset{OH}{|}}{C}HCH_3.$$

4,098,841

THERMOPLASTIC COPOLYMERS AND PREPARATION THEREOF

Nobuyoshi Nagata, Hirakata, and Shu Taniguchi, Minoo, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

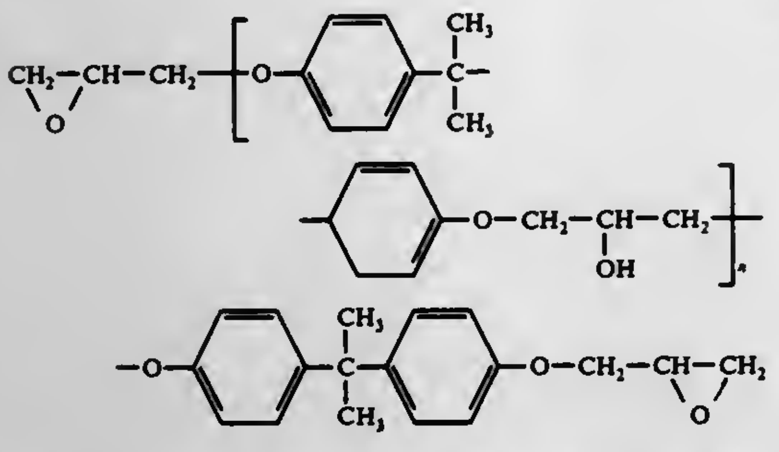
Continuation of Ser. No. 84,944, Oct. 28, 1970, which is a continuation of Ser. No. 781,681, Oct. 28, 1968, abandoned, which is a continuation of Ser. No. 333,197, Dec. 24, 1963, abandoned. This application Feb. 26, 1975, Ser. No. 553,191

Claims priority, application Canada, Dec. 23, 1963, 891961/63

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—837 R **16 Claims**

1. A process for preparing an organic solvent soluble copolymer having at least one unreacted epoxy radical and at least one unreacted carboxyl radical per molecule, said process comprising a first step of reacting an epoxy resin of the formula:



where n = 0 to 6, with an α, β-ethylenically unsaturated carboxylic acid or an acid anhydride while heating at 120° to 200° C until the epoxy resin is reacted to such an extent that there is a decrease in acid value between the start of the first step and the conclusion of the first step of at least 26.8% and up to about 64%; and a second step of copolymerizing in solution 0.1 to 31.7 parts by weight of the resulting reaction product with 68.3 to 99.9 parts by weight of at least one other copolymerizable monomer at a temperature lower than the heating temperature of the first step to form a resin, such that in said first step:

(a) said epoxy resin has an epoxide equivalent of 180–195 and said acid is acrylic acid in a ratio of equivalents of epoxy to equivalents of acid of 1.81 to 1.95; or

(b) said epoxy resin has an epoxide equivalent of 425–550 and said acid is methacrylic acid in a ratio of equivalents of epoxy to equivalents of acid of 1.64 to 2.12; or

(c) said epoxy resin has an epoxide equivalent of 425–550 and said anhydride is maleic anhydride in a ratio of equivalents of epoxy to equivalents of anhydride of 1.61 to 2.08.

4,098,842

PROVIDING POLYMER WITH ANTISTATIC PROPERTIES

Robert B. Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

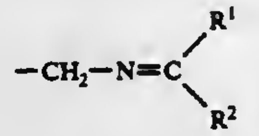
Division of Ser. No. 616,183, Sep. 24, 1975, Pat. No. 4,045,510. This application Dec. 13, 1976, Ser. No. 750,057

Int. Cl.^{2} C08L *77/00, 75/00, 67/00*

U.S. Cl. 260—857 PG **6 Claims**

1. The process of improving the antistatic properties of a polymer material reactive towards free amino groups and selected from the group consisting of polyamides, polyesters and polyurethanes which comprises bringing into contact with said polymer material a proportion, effective to improve antistatic properties, of a modifying polymer having in its molecular structure a pendant group containing a structure selected from the group consisting of

$$-CH_2-NH_2 \quad \text{and}$$



where R^1 is selected from the group consisting of hydrocarbon radicals containing 1 to 12 carbon atoms and R^2 is selected from the group consisting of hydrogen and hydrocarbon radicals containing 1 to 12 carbon atoms, said modifying polymer further containing a plurality of oxyalkylene units selected from the group consisting of oxyethylene, oxypropylene and oxybutylene effective to impart to said modifying polymer a hydrophilic nature and such that said modifying polymer has an oxyalkylene content of 20 to 95 weight percent, said modifying polymer being derived by reaction of a diamine or polyamine and a polyalkylene glycol or oxide plus a minor amount of blocking agent, said modifying polymer, as is or hydrolyzed if necessary, being reacted with said polymer material reactive towards free amino groups.

4,098,843

STABILIZED POLYOXYMETHYLENE MOLDING COMPOSITIONS

Robert William Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1976, Ser. No. 752,803

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—857 F **8 Claims**

1. A stabilized molding composition consisting essentially of an admixture of

(a) a major portion of oxymethylene polymer, and

(b) a minor portion of a dispersion of polyamide in a carrier resin, the polyamide comprising about from 10 to 50 wt. % of the dispersion and being present in the carrier resin as particles no greater than about 5 microns; the carrier resin being inert to the oxymethylene polymer and having a melting point at or below the processing temperature of the oxymethylene polymer; and the melting temperature of the semi-crystalline polyamide or the glass transition temperature of the amorphous polyamide being higher than the melting temperature of the oxymethylene polymer.

4,098,844

THERMOSETTING POLYMER DISPERSIONS AND PROCESS FOR PRODUCTION THEREOF

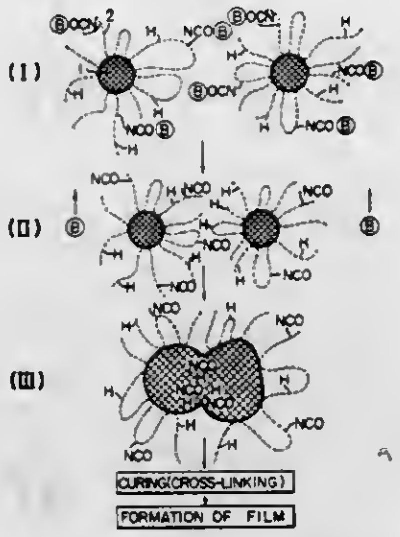
Hideyoshi Tsugukuni, Sakai; Masafumi Kano, Kyoto, and Mitsuhiro Matsuda, Tondabayashi, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division of Ser. No. 374,656, Jun. 28, 1973, Pat. No. 3,926,875. This application Aug. 8, 1975, Ser. No. 603,115

Claims priority, application Japan, Jul. 3, 1972, 47-66432

Int. Cl.^{2} C08G *18/06, 18/80*

U.S. Cl. 260—859 R **6 Claims**



1. A thermosetting synthetic polymer dispersion comprising a non-polar organic liquid or an organic liquid having a low polarity as a dispersion medium and particles of a copolymer formed by copolymerization of copolymerizable unsaturated monomers, said copolymer particles having around the periphery thereof a protective layer of a stabilizer which is a vinyl polymer (a) having a component compatible with said copolymer or being chemically bonded to said copolymer and (b) being solvated in said organic liquid and containing blocked isocyanate and active hydrogen groups, and formed by reacting a partially blocked ioscyanate compound having a free isocyanate group and a blocked isocyanate group with an active hydrogen-containing polymer compound, wherein the sum of the number of the free and blocked isocyanate groups in one molecule of the partially blocked isocyanate compound and the number of the active hydrogen groups in one molecule of the active hydrogen-containing polymer compound is at least 5, and they are reacted at such a ratio that the amount of the active hydrogen groups of the active hydrogen-containing polymer compound is at least equivalent to the amount of the free isocyanate groups of the partially blocked isocyanate compound; the ratio of the active hydrogen groups in the active hydrogen group-containing polymer compound to the free isocyanate groups in the partially blocked isocyanate compound being 1.0 to 3, and the ratio of the active hydrogen groups in the active hydrogen-containing polymer compound to the sum of the free and blocked isocyanate groups in the partially blocked isocyanate compound being 0.5 to 1.5; and the amount of stabilizer being from 30 to 80% by weight of the total dispersed solids, said copolymer being made in the form of particles of a size 0.1 to 10 μstably dispersed in said organic liquid by said protective layer.

4,098,845

METHOD FOR ACCELERATING THE CRYSTALLIZATION RATE OF CRYSTALLIZABLE POLYESTER RESIN

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1976, Ser. No. 665,843

Int. Cl.^{2} C08L *67/00*

U.S. Cl. 260—860 **4 Claims**

1. A composition comprising a crystallizable polyethylene terephthalate homopolymer and copolymers thereof containing up to about 15 weight percent of repeat units of a copolymerizable monomer selected from the group consisting of saturated aliphatic dicarboxylic acids having from 4 to 10 carbon atoms and from 0.5 to 5 percent by weight of the polyester resin of a polymer selected from the group consisting of a polymer derived from meta diisopropylbenzene diol, para diisopropylbenzene diol, para diisopropylbenzene diol, meta düsopropenylbenzene, para diisopropenylbenzene, para teritary butyl styrene and polymers of meta diisopropenylbenzene and a polymer of para diisopropenylbenzene terminated by α-methyl styrene.

4,098,846

POLYPHENYLENE OXIDE POLYSTYRENE PRODUCT-BY-PROCESS

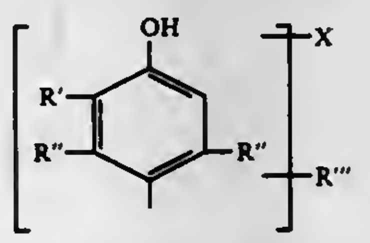
Walter K. Olander, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 582,910, Jun. 2, 1975, Pat. No. 4,054,553. This application Aug. 19, 1977, Ser. No. 825,926

Int. Cl.^{2} C08L *25/06, 25/10, 25/12*

U.S. Cl. 260—874 **4 Claims**

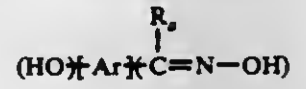
1. A polyphenylene oxide-styrene resin blend comprising a polyphenylene oxide of the process of forming self-condensation products of a phenol having the structural formula:



where X is a substituent selected from the group consisting of hydrogen, chlorine, bromine, and iodine; R′ is a monovalent constituent selected from the group consisting of hydrogen, hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, hydrocarbonoxy radicals, and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, R″ and R‴ being the same as R′ and, in addition, halogen under reaction conditions which comprise contacting said phenol with oxygen in the presence of a basic reaction medium, a secondary aliphatic amine, and a Type (A) or a mixture of Type (A) and Type (B) manganese chelate complexes selected from Type (A) complexes of the formulas:

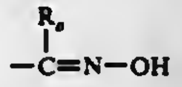
$$(L^1)_xMn \qquad \text{Type (A),}$$

where L^1 is a ligand derived from an ortho-hydroxyareneoxime of the general formula



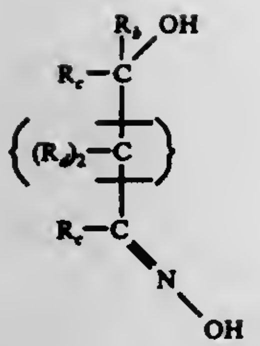
$$(HO)\!\!+\!Ar\!+\!\overset{\overset{R_a}{|}}{C}{=}N{-}OH)$$

wherein R$_a$ is independently selected from the group consisting of hydrogen and lower alkyl radicals having from 1–5 carbon atoms, Ar is at least a divalent arene radical having at least one —OH radical and at least one



$$-\overset{\overset{R_a}{|}}{C}{=}N{-}OH$$

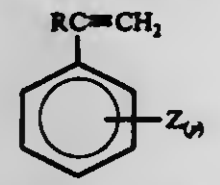
radical attached directly to ortho-positioned arene ring carbon atoms, and an ω-hydroxyoxime of the formula



wherein each R_b, R_c, R_d and R_e is independently selected from the group consisting of hydrogen, acyclic and cyclic organic radicals, and n is a positive integer equal to 0 or 1, Mn is the transition metal manganese, and x is a positive number at least equal to about 0.5, and selected from Type (B) complexes of the formula:

$$(L^2)_x\text{Mn} \qquad \text{Type (B),}$$

wherein L^2 is a ligand other than an L^1 ligand, Mn is the transition metal manganese, and x is a positive number at least equal to about 0.5 and a styrene resin having at least 25 percent by weight of polymer derived from a compound of the formula



where R is hydrogen, lower alkyl or halogen; Z is a member selected from the class consisting of vinyl, hydrogen, chlorine and lower alkyl; and p is a whole number equal to from 0 to 5.

4,098,847

PROCESS FOR MAKING HIGH IMPACT POLYMERS FROM DIENE POLYMER AND VINYL AROMATICS

John L. Stevenson, and Robert A. Fuller, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Continuation-in-part of Ser. No. 449,689, Mar. 11, 1974, abandoned, which is a continuation of Ser. No. 206,134, Dec. 8, 1971, abandoned. This application Jun. 7, 1976, Ser. No. 693,623

Int. Cl.² C08F *279/02*

U.S. Cl. 260—880 R **13 Claims**

1. In a process for the preparation of a rubber-modified, high impact vinyl aromatic hydrocarbon polymer which comprises subjecting a solution of rubber and a vinyl aromatic hydrocarbon monomer to mass polymerization conditions in the presence of from about 0.06 to 0.4% by weight based on the initial vinyl aromatic monomer-rubber solution of a mercaptan chain transfer agent for a period of from about 4 to 10 hours until from about 20 to 50% of the reaction mixture has been polymerized, suspending the resulting reaction mixture in an aqueous suspension containing a suspending agent, a surface active agent and a peroxy free radical initiating catalyst and thereafter polymerizing the resulting suspension to obtain substantially complete conversion of the vinyl aromatic monomers to polymer material, the improvement which comprises decrementally adding said mercaptan chain transfer agent to said mass polymerization solution in first and second portions, said first portion representing from at least 55 to 80% of the total chain transfer agent and being added to the mass polymerization reaction solution at or before the beginning of said mass polymerization step, said second portion of said mercaptan chain transfer agent representing from about 20 to 45% of the total chain transfer agent and being added to the mass polymerization reaction solution at a point in time at which said reaction mass reaches a viscosity of from about 1800 to 2000 cps., and recovering from the suspension polymerization step a rubber-modified vinyl aromatic polymer having a substantially higher gloss together with impact and melt flow properties maintained at desirably high levels.

4,098,848

FLAME RETARDANT THERMOPLASTIC ELASTOMER

Harris L. Morris, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,541

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **3 Claims**

1. A flame retardant thermoplastic elastomer comprising a blend of

(A) an ethylene-propylene-5-ethylidene-2-norbornene terpolymer rubber having an ethylene/propylene weight ratio of from 70/30 to 85/15 and a 5-ethylidene-2-norbornene content of from 4 to 20% by weight,

(B) a polyolefin resin,

(C) 1,2,3,4,7,8,9,10,13,13,14,14-dodecachloro-1,4,4a,6a,7,10,-10α, 12α-octahydro-1,4:7,10-dimethanodibenzocyclooctane, and

(D) antimony oxide, the weight ratio of the said rubber (A) to the said resin (B) being from 50/50 to 95/5, the amount of (C) plus (D) being from 80 to 120 parts, per 100 parts by weight of (A) plus (B), and the weight ratio of (C) to (D) being from 1/1 to 10/1.

4,098,849

ALPHA-AMINO PHOSPHONIC ACIDS

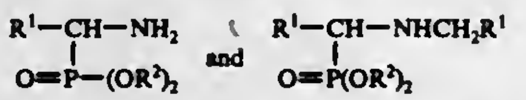
Derek Redmore, Ballwin, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 574,262, May 5, 1975, Pat. No. 4,005,160. This application Oct. 12, 1976, Ser. No. 731,753

Int. Cl.² C07F *9/40*

U.S. Cl. 260—944 **10 Claims**

1. Compositions of the formulas



$$\begin{array}{c} R^1-CH-NH_2 \\ | \\ O{=}P-(OR^2)_2 \end{array} \quad \text{and} \quad \begin{array}{c} R^1-CH-NHCH_2R^1 \\ | \\ O{=}P(OR^2)_2 \end{array}$$

where R^1 is an aryl radical selected from the group consisting of phenyl, alkyl phenyl or halophenyl and R^2 is an ester moiety.

4,098,850

ORIFICE DEVICE FOR AIR FLOW RESTRICTION

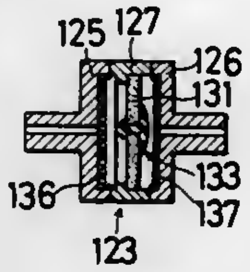
Tooru Tamura, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 606,932, Aug. 22, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,270

Claims priority, application Japan, Sep. 4, 1974, 49-107072

Int. Cl.² F02M *3/04*

U.S. Cl. 261—65 **1 Claim**



1. In an air flow control system including a carburetor comprising a throttle valve and a vacuum inlet, a diaphragm case, and an orifice device interposed between said vacuum inlet and said diaphragm case via a pneumatic flow passage,

the improvement wherein said orifice device comprises

a housing provided with an inlet port communicable with said vacuum inlet and an outlet port communicable with said diaphragm case;

a sintered metal element secured to said housing; and

a valve secured to said sintered element and including a flexible member for closing a central portion of said sintered metal element whereby air flow passing through said orifice device is restricted by said sintered metal element in one direction while it is restricted only by a portion of said sintered metal element other than said central portion in the other direction.

4,098,851

DEVICE FOR MIXING GASES AND LIQUIDS

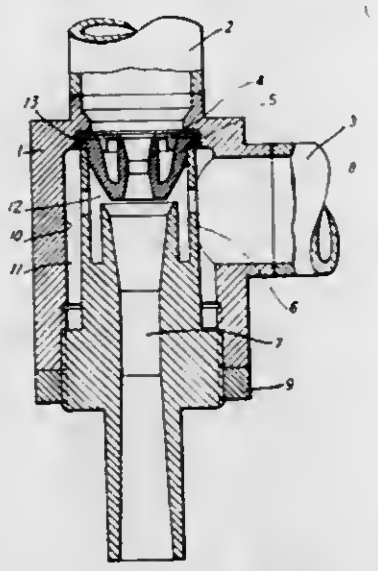
Franz-Josef Schulte, Leverkusen; Werner Bruch, Dormagen, and Erwin Diers, Opladen, all of Fed. Rep. of Germany, assignors to Erdölchemie Gesellschaft mit beschränkter Haftung, Cologne and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 546,831, Feb. 3, 1975, abandoned. This application Jul. 26, 1976, Ser. No. 708,824

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1974, 2408064

Int. Cl.² C02B *3/08;* **C02C** *5/04*

U.S. Cl. 261—76 **3 Claims**



1. A device for mixing a gas and a liquid comprising: a housing and a bore therethrough; a liquid feed conduit connected to the housing at the upstream end portion of the housing and in communication with the bore; a tubular shroud within the housing to define within the bore an outer chamber and an inner chamber in alignment with the liquid feed conduit, a mixing nozzle integral and concentric with the shroud, the shroud projecting upstream of the mixing nozzle, the mixing nozzle including external threads engaging said housing so that the mixing nozzle is held in alignment with the liquid feed conduit and spaced apart therefrom for being supplied with liquid by the liquid feed conduit; an injector nozzle disposed within the housing bore and having an inlet fed by the conduit and an outlet projecting into the inner mixing chamber adjacent to the inner end of the mixing nozzle; said injector nozzle being friction fit within the upstream end of the shroud; a gas feed conduit connected to the housing and communicating with the outer chamber; and means defining an array of apertures in the tubular shroud to allow gas supplied from the gas feed conduit to the outer chamber to be substantially uniformly distributed by the apertures into the inner chamber; whereby the mixing nozzle, shroud and injector nozzle can be unscrewed from the housing as a unit by means of the threads, and the injector nozzle can thereafter be simply pulled out from the shroud for ease of disassembly.

4,098,852

PROCESS FOR CARRING OUT A GAS/LIQUID HEAT-EXCHANGE

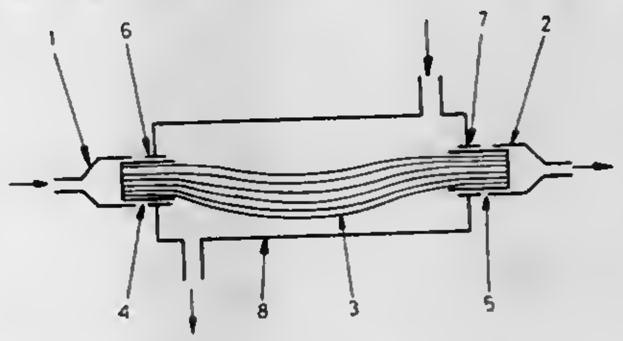
Gilbert Christen, Lyon; Bernard Favre, Ecully; Xavier Marze, Lyon, and Michel Salmon, Mions, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Continuation of Ser. No. 375,180, Jun. 29, 1973, abandoned. This application May 1, 1975, Ser. No. 573,798

Claims priority, application France, Jul. 4, 1972, 72 24153

Int. Cl.² B01F *3/04*

U.S. Cl. 261—104 **18 Claims**



1. A gas-liquid heat exchange process which comprises

(a) causing a gas to flow on one side of the walls of the hollow fibres of a heat exchanger which comprises a gas and/or liquid circulator and a plurality of spun flexible hollow fibres having an external diameter of less than 1 mm, adapted to receive said gas or said liquid, said fibres being of an organic polymeric material which is inert with respect to said liquid and are permeable to said liquid;

(b) causing a liquid to flow on the other side of the walls of the fibres relative to the gas;

(c) applying a differential pressure across the walls of the hollow fibres such that the absolute pressure of the liquid is substantially greater than the absolute pressure of the gas, said differential pressure being greater than the drip point of the hollow fibres; and

(d) adjusting the rate of flow of gas in the heat exchanger relative to the rate of flow of liquid therein such that the liquid which passes through the walls of the fibres is at least partially vaporised in the gas.

4,098,853

HUMIDIFIER AND AUTOMATIC CONTROL SYSTEM THEREFOR

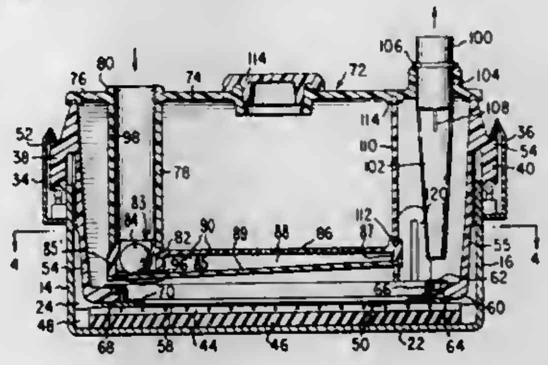
Allen C. Brown, Acton; Neil R. Hattes, Danvers, and Theodore B. Eyrick, Reading, all of Mass., assignors to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 454,503, Mar. 25, 1974, Pat. No. 4,028,444. This application Mar. 30, 1976, Ser. No. 671,787

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.² B01F *3/04;* **A61M** *15/00*

U.S. Cl. 261—122 **5 Claims**



1. An improved system for humidifying breathing gases, comprising:

a support housing defining a recess;

heater means in said recess and carried by said support housing;

container means for holding a supply of water, said container means including gas inlet and gas outlet means;

means removably securing said container means in said recess in heat transfer relationship with said heater means;

diffuser means within said container and spaced therefrom to define a diffuser chamber, said chamber being so located as to be below the surface of the supply of water during operation of said system and so located as to permit a free flow of water therearound, said diffuser means including a diffuser plate defining the upper surface of said diffuser chamber and including a multiplicity of apertures, each said aperture having the shape of a truncated cone with its smallest diameter being at the upper surface of said diffuser plate and its largest diameter being at the lower surface of said diffuser plate, said apertures passing said breathing gas upwardly out of said diffuser chamber through said diffuser plate and into the water thereabove in the form of minute bubbles;

means including said gas inlet means communicating with said diffuser chamber for directing said breathing gas into said diffuser chamber below the surface of the supply of water, said breathing gas thereafter passing upwardly through said diffuser plate and the supply of water;

means including said gas outlet means communicating with the interior of said container to direct said breathing gas out of said container; and

a contaminant trap connected to said gas outlet means and located within said container receiving and retaining backflowing contaminated liquid which returns from said outlet means to said container.

4,098,854

COMBINED WET AND DRY LIQUID COOLING SYSTEM AND METHOD

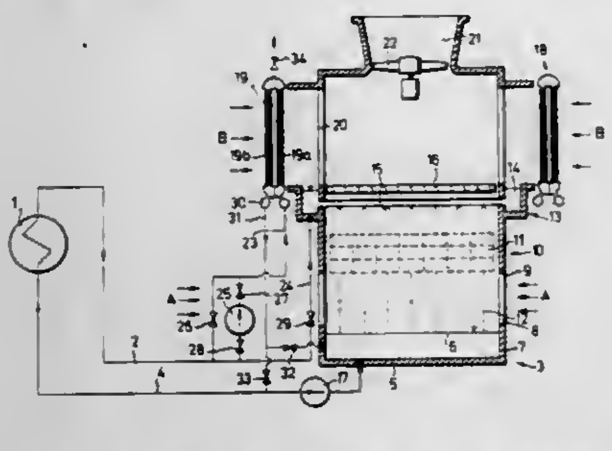
Hermann Kuirsch, and Hans-Bernd Gerz, both of Wattenscheid, Fed. Rep. of Germany, assignors to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,023

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602485

Int. Cl.² B01F *3/04*

U.S. Cl. 261—161 **10 Claims**



1. A system for cooling a liquid used in a liquid-heating machine, said system comprising:

a conduit forming a fluid flow path passing through said machine and having a pair of ends;

a pair of parallel branches interconnecting said ends and each having a respective upstream end portion connected to one of said ends of said path and a respective downstream end portion connected to the other of said ends of said path;

pump means for circulating said liquid through said path and through said branches with a portion of said liquid passing through one of said branches and the remainder of said liquid passing through the other branch;

a closed dry-type heat exchanger in said one branch between the respective upstream and downstream end portions thereof;

a wet-type evaporative cooler in said other branch between the respective upstream and downstream end portions thereof;

means for forming a pair of parallel streams of air;

means for passing one of said air streams over said heat exchanger for cooling of the liquid therein by heat exchange through said exchanger; and

means for passing the other of said air streams directly over said liquid in said evaporative cooler to directly contact said other air stream and said liquid in said other branch and thereby evaporatively cool said liquid in said other branch.

8. A method of cooling a liquid used in a liquid-heating machine by circulation of said liquid in a path passing through said machine and through a closed dry-type heat exchanger and a wet-type evaporative cooler, said method comprising the steps of simultaneously and concomitantly:

subdividing said endless path passing through said machine at a location spaced from said machine into a pair of parallel branches in one of which circulates a portion of said liquid and in the other of which circulates the balance of said liquid;

continuously circulating said liquid in said path so that on each circuit of said path a portion of said liquid passes only through said one branch and the balance circulates only through said other branch;

passing the liquid in said one branch through the interior of said closed dry-type heat exchanger

passing the liquid in said other branch through said wet-type evaporative cooler;

forming a pair of parallel air streams;

passing one of said air streams over said heat exchanger to cool the liquid in said one branch by heat exchange through said heat exchanger only;

passing the other of said air streams directly over said liquid in said other branch to directly contact and evaporatively cool same; and picking up humidity in said evaporative cooler from the liquid therein with said other air stream.

4,098,855

METHOD OF MOLDING FOAMED POLYURETHANE ARTICLES

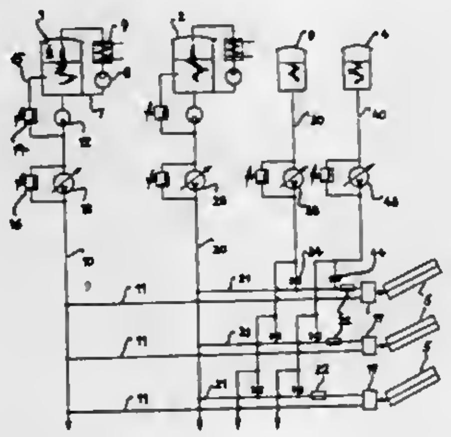
Bernd Fries, Ernst-Heinkel-Weg 21, Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 477,364, Jun. 7, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,718

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1973, 2331241

Int. Cl.² B29D *27/04*

U.S. Cl. 264—50 **11 Claims**



1. A method of molding foamed polyurethane articles from a plurality of liquid components including main components

comprising a polyol and an isocyanate, and additional components comprising at least a volatile liquid blowing agent, said method comprising:

(a) bringing said main components to a substantially constant temperature of between about 30° and 45° C;

(b) charging at least one of said main components with a gas in a proportion of about 10 to 80 volume percent of gas;

(c) mixing said main and additional components by introducing them under elevated pressure in the form of jets into a confined chamber; and

(d) introducing the resultant mixture into a mold for shaping the articles, which has been brought to a substantially constant temperature of between about 55° and 70° C.

4,098,856

METHOD OF MAKING A COMPOSITE MOLD FOR MAKING POLYURETHANE FOAM DECORATIVE PARTS

Clifford M. Roseuau, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 644,752, Dec. 29, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 831,992

Int. Cl.² B29C *1/02;* **B29F** *5/00*

U.S. Cl. 264—80 **3 Claims**

1. A method of making a composite rubber mold comprising the steps of:

(a) spraying a silicone rubber compound on the surface of a master which is to be copied;

(b) curing the silicone rubber covering over the master to be copied to form a layer with a thickness of 0.005 to 0.020 inches;

(c) flame treating the back surface of the silicone rubber layer to make it receptive to bonding with other materials;

(d) forming a solid non-compressible during molding use flexible polyurethane backing layer on the silicone rubber surface; and

(e) permitting the composite plural layer mold to cure so that it may be subsequently used to mold articles in the shape of a master in the mold so constructed.

4,098,857

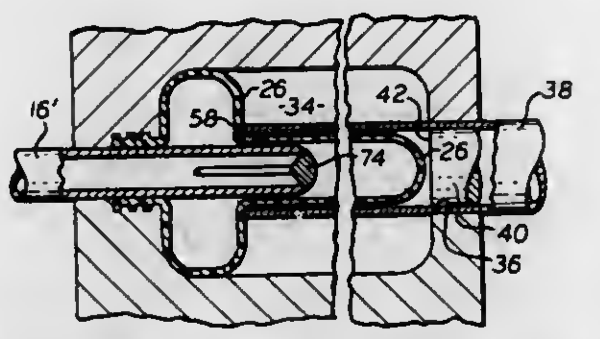
METHOD FOR MAKING BLOW MOLDED CONTAINERS WITH HIGH LENGTH TO DIAMETER RATIO

John J. Farrell, Greenbrook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Division of Ser. No. 512,294, Oct. 4, 1974, Pat. No. 3,936,260. This application Jan. 28, 1976, Ser. No. 653,230

Int. Cl.² B29C *17/07*

U.S. Cl. 264—89 **11 Claims**



1. A method for injection blow molding a container having a substantially greater length than diameter comprising;

(a) injection molding a parison on a core rod;

(b) providing a blow mold comprising a tube being formed with a substantially greater length longer than diameter cavity, said tube being disposed about the parison and core rod;

(c) providing an air flow between the tube and the parison to maintain a clearance between the parison and the tube;

(d) first blowing the parison to increase the length to diameter ratio of the parison so that said parison length approaches the length of the container being formed; and then

(e) final blowing the parison while progressively withdrawing the tube with the progressive blowing of the parison to the final diameter of the container.

4,098,858

DUSTLESS FREE FLOWING RUBBER ADDITIVES

Theodore R. Ten Broeck, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 578,684, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,380, Jan. 2, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 761,559

Int. Cl.² B01J *2/16*

U.S. Cl. 264—117 **8 Claims**

1. A process for forming dustless free flowing agglomerates consisting essentially of (1) forming a damp mass or cake of at least one finely divided material selected from the group consisting of 2-mercaptobenzothiazole, 2,2'-dithiobis(benzothiazole), 2-morpholinodithio)benzothiazole, zinc 2-benzothiazolyl mercaptide, copper 2-benzothiazolyl mercaptide, zinc dimethyldithiocarbamate, zinc diethyldithiocarbamate, zinc dibutyldithiocarbamate, zinc diethyldithiocarbamate, zinc dibutyldithiocarbamate, copper (II) dimethyldithiocarbamate, copper (II) diethyldithiocarbamate, cadmium diethyldithiocarbamate, lead diethyldithiocarbamate, tetramethylthiuram disulfide, tetramethylthiuram monosulfide, tetraethylthiuram disulfide, mixtures of tetraethylthiuram disulfide, tetramethylthiuram disulfide, N-cyclohexyl-2-benzothiazolesulfenamide, N-t-butyl-2-benzothiazolesulfenamide, N-(3-methylcyclopentamethylene)-2-benzothiazolesulfenamide, 2-(N-hexamethyleneiminothio)-benzothiazole, morpholine disulfide, blends of 2-mercaptobenzothiazole, tetramethylthiuram disulfide, 4-morpholino-2-benzothiazyl disulfide, asbestos, sulfur, minastral, blue, phthalo green and pyrrazolone red, said damp mass or cake of finely divided material having a dry solids content of from about 60 to about 95 percent by weight of said finely divided material, (2) placing said damp mass or cake in a gas suspension apparatus which divides and crumbles the damp mass or cake into small particles while suspending said particles in a gaseous medium and (3) slowly adding to the gaseous suspension an amount of a finely divided spray of a rubber latex having a solids content of from about 9 percent to about 70 percent by weight of total weight of the latex to provide from about 1 to about 30 parts dried rubber for 100 parts of dry finely divided material and (4) mixing the particles of latex and particles of damp mass or cake while both are suspended in said gaseous medium for a time sufficient to allow the particles of latex spray to collide with the small particles of the damp finely divided material and form composite particles or agglomerates comprising rubber and said small particles of damp finely divided material, said composite particles having an average diameter of from about 0.003 inch to about 0.10 inch, and (5) drying said composite particles at a temperature and time sufficient to drive off excess moisture and to provide a dustless, free flowing agglomerate of rubber and normally finely divided material.

4,098,859

METHOD OF MANUFACTURING A BONDED PARTICULATE ARTICLE BY REACTING A POLYOL AND A POLYALDEHYDE

Robert G. Cummisford, Brookfield; Richard J. Wasielewski, Milwaukee, and Robert K. Krueger, Sheboygan, all of Wis., assignors to Krause Milling Company, Milwaukee, Wis.

Division of Ser. No. 551,882, Feb. 21, 1975, Pat. No. 4,013,629. This application Nov. 12, 1976, Ser. No. 741,252

Int. Cl.² B01D *47/02*

U.S. Cl. 264—122 **15 Claims**

1. The method of manufacturing a bonded particulate article comprising the steps of admixing particulate material with a

binder system, the binder system being formed by admixing a polyol selected from the group comprising a saccharide, a saccharide polymer, and a glyco protein with glyoxal, with a solvent, and with an alkali halide; forming the admixture in a heated mold; removing the bonded article from the mold; and allowing it to cool.

4,098,860

PRODUCTION OF BIAXIALLY DRAWN FILM OF POLYAMIDE BLEND

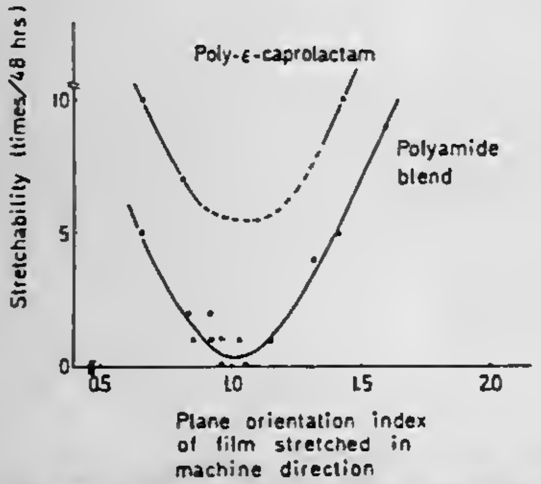
Yoshitaka Etou; Mikio Matsuoka; Shizuo Matsumoto; Takamichi Zoda; Katsumi Genji, all of Inuyama; Toshihiko Ohta, Otsu; Kazuo Tamaki, Otsu; Koichi Matsunami, Otsu, and Tetsushi Murakami, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1976, Ser. No. 711,613

Claims priority, application Japan, Oct. 11, 1975, 50/122600; Feb. 27, 1976, 51/21703

Int. Cl.^{2} B29D *7/24*

U.S. Cl. 264—171 **8 Claims**



1. A process for preparing a biaxially stretched film of polyamide blend which comprises extruding a polyamide blend in melt to make an unstretched film, stretching the unstretched film in a machine direction with a stretch speed of about 40,000 to 60,000,000%/minute in a draw ratio of about 2 to 6 to make a uniaxially stretched film having a plane orientation index of about 0.6 to 1.5 and then stretching the uniaxially stretched film in a transverse direction with a stretch speed of about 500 to 100,000%/minute in a draw ratio of about 2 to 6, said polyamide blend comprising:

(1) an aliphatic polyamide and

(2) a polyamide containing in the molecule at least about 70 mol % of the repeating units constituted with metaxylylenediamine or its mixture with paraxylylenediamine,

wherein when paraxylylenediamine is present, its amount is not more than about 30 mol % based on the combined amount of metaxylylenediamine or paraxylylenediamine and at least one α,ω-aliphatic dicarboxylic acid having 6 to 10 carbon atoms, said aliphatic polyamide and polyamide (2) being present in a proportion of about 97 : 3 to 80 : 20 by weight.

4,098,861

WIRE COATING USING A LIQUID POLYMER

Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 30, 1976, Ser. No. 728,345

Int. Cl.^{2} B29F *3/10*

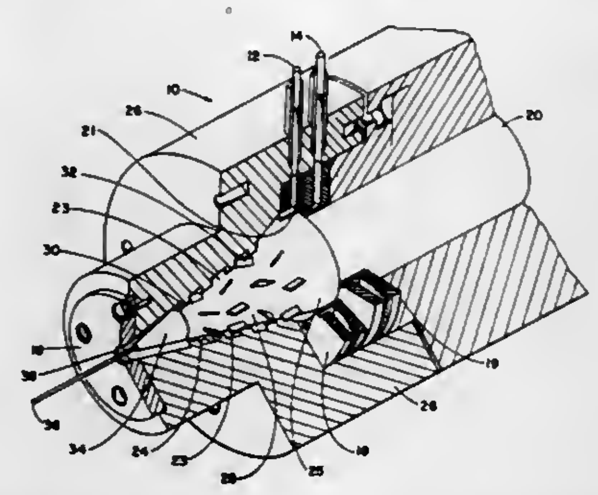
U.S. Cl. 264—174 **2 Claims**

1. An improved method of rapidly coating a wire with a crosslinked elastomer which is formed by mixing under heat and pressure multiple components of a liquid polymer system, said method comprising the steps of:

(a) separately heating the components of the liquid polymer system to a temperature at which when the components are mixed the curing reaction will require from about 0.5 to about 3.0 seconds, said components having a viscosity of from about 20 to about 4000 centipoises;

(b) separately pumping under pressure the heated components into an extruder barrel through separate inlet ports thereof, each port adapted to receive one of the heated components;

(c) passing a wire to be coated axially through a hollow rotatable mandrel located within said barrel and through a die attached to one end of said barrel, said mandrel having a tapered end tapering toward said die, said barrel and the outer surface of the tapered end of said mandrel forming a mixing chamber,



(d) distributing the heated components around the circumference of said mandrel in said barrel,

(e) rotating said mandrel to cause mixing of the components in said mixing chamber, whereby pressure from said pumps causes extrusion of the mixed components onto said wire as it cures and passes through the die and coats said wire.

4,098,862

PROCESS FOR THE MANUFACTURE OF POLYGONAL CARDBOARD TUBE SEGMENTS

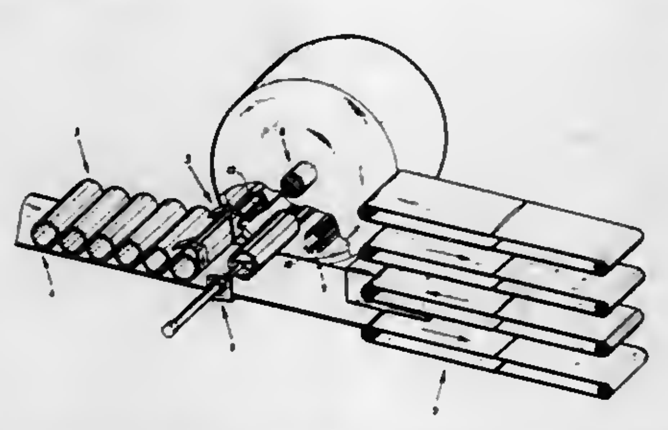
Robert Lambertus Markhorst, Markeweg 5, Bergentheim, Netherlands

Filed Jul. 12, 1976, Ser. No. 704,318

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1975, 2537705

Int. Cl.^{2} B29D *23/00, 23/12*

U.S. Cl. 264—257 **7 Claims**



1. In a process for the manufacture of paper-layer wound tube segments having a substantially rectangular cross section, where paper strips are first wound on a flexible spindle of circular shaped cross section and then the tube thus obtained is transformed into a substantially rectangular cross section, the improvement comprising the steps of setting the round tube onto an interior spindle consisting of a pair of cooperating expandable support elements, each support element comprising a substantially U-shaped member, the outer profile of said elements defining a desired substantially rectangular profile, said support elements movable between a first retracted position for insertion of said tube thereon and a second expanded position wherein said tube is deformed into said desired substantially rectangular profile, expanding the support elements and finally, after removal from the interior spindle, drying the deformed substantially rectangular tube segment with cold air.

4,098,863

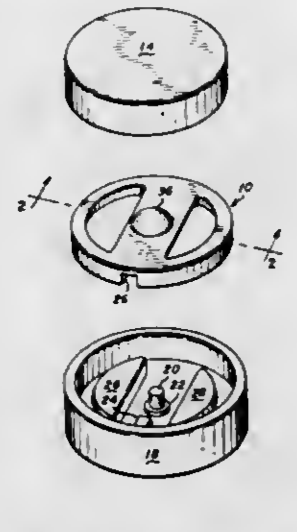
METHOD FOR MAKING MOUNTING RING FOR DENTAL ARTICULATOR

Milton G. Deemer, 148 Best Ave., San Leandro, Calif. 94577

Filed Jan. 17, 1977, Ser. No. 760,035

Int. Cl.^{2} B28B *3/02;* **B29D** *3/00*

U.S. Cl. 264—275 **5 Claims**



1. The method for producing a mounting ring having a threaded insert for securing dental arch-supporting plaster casts to a dental articulator, said method comprising the steps of:

providing a resilient mold having substantially cylindrical side walls and a floor portion having a vertical post for supporting a threaded nut, and at least one island having a substantially flat top surface at a distance above said floor corresponding to the desired thickness of said mounting ring;

providing a piston having a substantially circular cross-section corresponding to the inside diameter of the cylindrical side wall of said resilient mold;

placing a threaded nut on said vertical post;

pouring dental plaster in liquid form into said resilient mold to a level that covers the top surface of said island;

forcing said piston into said resilient mold to the position where it is stopped by the top surface of said island; and removing said piston and said mounting ring from said mold.

4,098,864

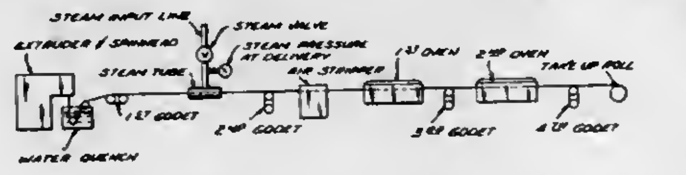
STEAM DRAWING OF POLYESTER MONOFILAMENT TO IMPROVE LOOP STRENGTH AND RESISTANCE TO FIBRILLATION

William E. Morris, Barranquilla, Columbia, and Charles Jay Nelson, Munroe Falls, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 658,960, Feb. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 588,764, Jun. 20, 1975, abandoned, which is a continuation of Ser. No. 345,621, Mar. 28, 1973, abandoned. This application Apr. 7, 1977, Ser. No. 785,373

Int. Cl.^{2} B29C *17/02*

U.S. Cl. 264—290 T **11 Claims**



1. The method of improving the loop strength and resistance to fibrillation of a polyethylene terephthalate monofilament which comprises the sequential steps of:

(a) passing, prior to any previous orientation drawing thereof, an extensible spun linear polyethylene terephthalate monofilament having an instrinsic viscosity of at least 0.6 and having a denier in the range of from 500 to 50,000 through an elongated chamber;

(b) exposing the monofilament to a vapor medium at an elevated temperature and pressure within said chamber whereby the temperature of said monofilament is raised above the apparent second order transition temperature, but below the apparent melt temperature of the particular polyethylene terephthalate;

(c) drawing the monofilament in a first drawing operation while exposed to said vapor medium at a draw ratio of from 1.5:1 to 4:1 and controlling the pressure of said vapor medium to optimize the loop strength of the monofilament; and

(d) further drawing the monofilament in a subsequent drawing operation to an aggregate draw ratio of from 4:1 to 10:1 and, thereby increasing the loop strength of the monofilament to at least 2.5 grams/denier.

4,098,865

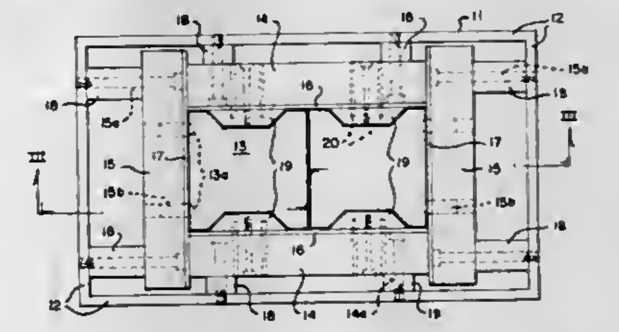
METHODS OF MAKING PAVING BLOCK

John Repasky, Hanover, Pa., assignor to Hanover Prest-Paving Co., Hanover, Pa.

Filed Jan. 26, 1976, Ser. No. 652,042

Int. Cl.^{2} B28B *3/00*

U.S. Cl. 264—333 **3 Claims**



1. A method of forming paving block and the like from aqueous concrete slurry comprising the steps of:

(a) placing an aqueous concrete slurry in a metal mold having a cavity in the general shape of a rectangle with two spaced indentations along each long side edge, each indentation being the size of the portion of block between the adjacent end and the indentation and its mirror image;

(b) subjecting the slurry to an external pressure of at least 1000 pounds per square inch over its entire external surface for about 5 to 10 seconds; by a die face plate entering the cavity

(c) expelling a large portion of water from said slurry under said pressure between the mold and die face plate sufficient to permit removing and handling of the green product;

(d) relieving the pressure from said slurry;

(e) removing the formed concrete article from the mold; and

(f) curing the formed article.

4,098,866

RECOVERY OF URANIUM FROM REFRACTORY ORES

Thomas G. Carnahan, and Kenneth P. V. Lei, both of Sparks, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 15, 1977, Ser. No. 788,060

Int. Cl.^{2} C01G *43/00*

U.S. Cl. 423—7 **4 Claims**

1. A process for recovery of uranium from a refractory ore or concentrate containing about 0.05 to 25 percent carbona-

ceous material and about 0.05 to 25 percent sulfidic material comprising treating the ore or concentrate with a nitric acid solution at a temperature of about 80° to 140° C to provide a uranium-containing leach solution.

4,098,867

WATER-INSOLUBLE CHELATE EXCHANGE RESINS FROM AMINOPYRIDINES AND PROCESS FOR THE SELECTIVE EXTRACTION OF VALUABLE METALS USING THE SAME

Robert R. Grinstead, Walnut Creek, and Wilmonte A. Nasutavicus, Lafayette, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

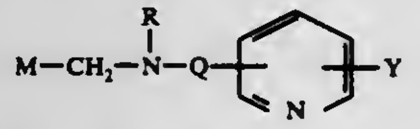
Division of Ser. No. 587,185, Jun. 16, 1975, Pat. No. 4,031,038. This application Mar. 25, 1977, Ser. No. 781,100

Int. Cl.² B01D *15/04;* B01J *1/04*

U.S. Cl. 423—24 **11 Claims**

1. A process for the selective recovery of valuable metals selected from the group consisting of copper, nickel, iron (III), cobalt, silver, gold, mercury, platinum, vanadium, molybdenum, chromium (VI) and cadmium from an aqueous acid liquor comprising:

A. Contacting the acid liquor at a pH of about 1–5 with a water-insoluble chelate exchange resin having a cross-linked polymer matrix and pendent thereto a plurality of methyleneaminopyridine groups of Formula III:



(III)

wherein M is the matrix resin;

Y is H or C_1–C_4 alkyl;

Q is

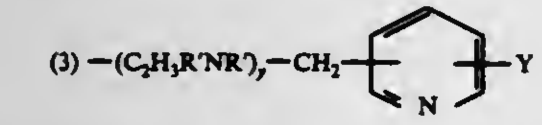
(1) —CH_2—;

(2) —$(C_2H_3R'NR')_x$—CH_2—where each R′ is H or CH_3 and x is 1 or 2; or

(3) —, —NH—, —C_2H_4—; and

each R is (1) H, C_1–C_4 alkyl, or C_2–C_4 hydroxyalkyl; and when Q is —CH_2—, R can also be:

(2) allyl, benzyl or o-hydroxybenzyl;



wherein each R′ is H or CH_3 and *y* is 0 or 1;

(4) —$(CH_2)_m$OY where *m* is 2 or 3;

(5) —$C_2H_3R'NR_1R_2$ where R′ is H or CH_3, R_1 is H, C_1–C_4 alkyl, C_2–C_4 hydroxyalkyl, phenyl or benzyl, and R_2 is H, C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl;

(6) —C_2H_4SR''' where R‴ is C_1–C_4 alkyl;

(7) —$C_nH_{2n}COOY$ where *n* is 1 or 2;

(8) —$C_nH_{2n}SO_3^-$ where *n* is 1 or 2; or

(9) —CH_2Z where Z is —$CONH_2$ or —$NHCONH_2$,

to thereby selectively remove said valuable metals, and then

B. Eluting the valuable metals in a more concentrated form with a strong inorganic acid or ammonium hydroxide.

4,098,868

PRODUCTION OF TITANIUM TRICHLORIDE FROM ILMENITE

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 27, 1977, Ser. No. 791,621

Int. Cl.² C01G *23/02*

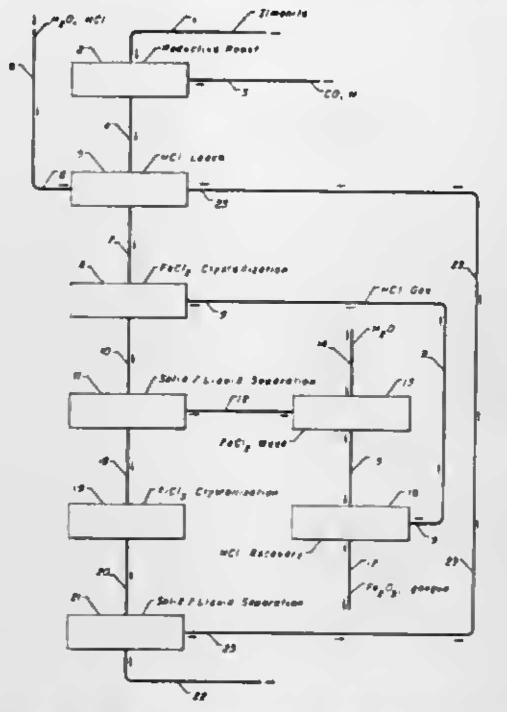
U.S. Cl. 423—83 **4 Claims**

1. A process for obtaining titanium metal values from ilmenite ore which comprises the steps of:

(a) subjecting said ore to a reductive roast at a temperature of from about 600° to about 900° C.;

(b) leaching the resultant roasted ore with aqueous hydrogen chloride at an elevated temperature to form a solution of titanium trichloride and ferrous chloride;

(c) cooling and saturating the leach solution with gaseous hydrogen chloride to precipitate ferrous chloride;



(d) separating the precipitated ferrous chloride from titanium trichloride solution;

(e) raising the temperature of the last-named solution to about 20° to about 30° C. to precipitate hydrated titanium trichloride; and

(f) separating and recovering the crystallized titanium trichloride from the leach liquor.

4,098,869

PROCESS FOR THE HYDROLYSIS OF TITANYL SULPHATE SOLUTIONS

Antonio Paolinelli, Milan; Tullio Pellizzon, Paderno Dugnano (Milan), and Luigi Piccolo, Milan, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Oct. 4, 1977, Ser. No. 839,471

Claims priority, application Italy, Oct. 5, 1976, 27991 A/76

Int. Cl.² C01G *23/06*

U.S. Cl. 423—85 **6 Claims**

1. In a process for the hydrolysis of a titanyl sulphate solution by heating, in which the hydrolysis is initiated by gradually adding the solution at a substantially uniform rate to an aqueous liquor, the improvement which comprises adding to said aqueous liquor a titanyl sulphate solution having an acid factor of from 0.5 to 0.85, a titre, expressed as TiO_2, of from 230 to 260 g/l, a concentration of free sulphuric acid of from 200 to 250 g/l and a concentration of active sulphuric acid of from 500 to 600 g/l over a period of from 10 to 20 minutes, the weight ratio between aqueous liquor and titanyl sulphate solution being regulated in dependence on the acid factor of the solution in such a way as to ensure in the resulting aqueous mixture after one minute of feeding of the solution an ionic concentration of from 75 to 105 g/l and a concentration of sulfuric acid in the final hydrolysis solution of from 310 to 330 g/l, said ionic concentration after one minute of feeding being set at a value of from 92 to 102 g/l in the case of a solution with an acid factor of from 0.5 to 0.65, at a value of from 90 to 100 g/l in the case of a solution with an acid factor of from 0.65 to 0.75 and at a value of from 82 to 97 g/l in the case of a solution with an acid factor of from 0.75 to 0.85, and adding water to the hydrolysis solution resulting from the addition of the titanyl sulphate solution to the aqueous liquor, from the commencement of clouding of said hydrolysis solution up to the

end of hydrolysis, to regulate the concentration of sulphuric acid in the final hydrolysis solution at a value of from 310 to 330 g/l.

4,098,870

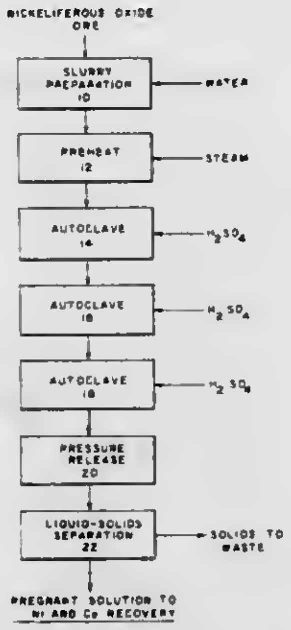
ACID LEACHING OF NICKELIFEROUS OXIDE ORES WITH MINIMIZED SCALING

Simon O. Fekete, Arvada; Gordon R. Wicker, Lakewood; Willem P. C. Duyvesteyn, Arvada, and Dien F. Shieh, Lakewood, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jul. 22, 1977, Ser. No. 818,130

Int. Cl.² C01G *53/10*

U.S. Cl. 423—124 **16 Claims**



1. A process for leaching nickeliferous oxide ore containing at least one metal selected from the group consisting of iron and aluminum which process comprises slurrying the ore with water, preheating the slurry to a leaching temperature between about 230° C and about 300° C, vigorously agitating the preheated slurry, and incrementally adding sulfuric acid to the preheated slurry to maintain the amount of said metal in solution at a value of less than about 4 grams per liter throughout the process, whereby nickel values are rapidly leached while scale formation is minimized.

15. The process as described in claim 1 wherein the preheated slurry is vigorously agitated during the incremental addition of acid to minimize the volume of slurry in contact with high acid concentration, and to provide high surface area to facilitate precipitation of iron and aluminum from solution.

4,098,871

PROCESS FOR THE PRODUCTION OF POWDERED, SURFACE-ACTIVE, AGGLOMERATABLE CALCINED MATERIAL

Fritz Schoppe, Max-Ruttgers-Str. 24, 8026 Ebenhausen, Isartal, Munich, Fed. Rep. of Germany

Filed Jun. 3, 1974, Ser. No. 475,874

Int. Cl.² C01F *11/06*

U.S. Cl. 423—177 **9 Claims**

1. A process for producing calcined lime from sludges containing organic material, comprising the steps of:

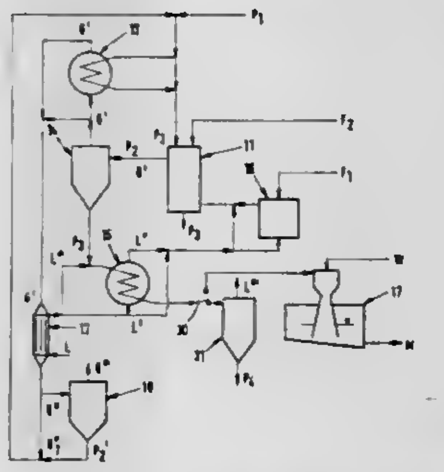
a. so introducing an oxygen-containing gas into the bottom of a rotationally symmetrical reaction zone as to produce an upward flow of the gas in the outer region of the zone and a downward flow of the gas in a central region of the zone surrounded by said outer region;

b. raising the temperature in said reaction zone to a calcining temperature by preheating the oxygen-containing gas and by introducing fuel into the downward flow of oxygen-containing gas at the upper end of the central region of the reaction zone and thereafter effecting the combustion of the fuel in said reaction zone;

c. preheating a lime-bearing, raw material to a temperature high enough to insure that said material is dry and pneumatically conveyable;

d. so introducing the preheated raw material into the upper end of the central region of the reaction zone that said preheated raw material will migrate downwardly through the central region of the reaction zone in admixture with the downwardly flowing gases therein and be deflected outwardly at the bottom of the reaction zone into the upwardly flowing gases in the outer region of the zone to thereby convert calcium compounds in said raw material to calcium oxide;

e. increasing the temperature of the raw material at a mean rate of not less than 400° C per second in said reaction zone to thereby disrupt the crystalline structure of and disintegrate the raw material into microcrystalline primary particles which have free surface valences and are therefore capable of agglomerating into larger, secondary particles in periods measured in fractions of a second;



f. limiting the time of residence of the material in the reaction zone and the time that said material is in contact with the hot gases flowing therethrough to a period of not more than one second to thereby maintain the tendencies toward agglomeration possessed by said primary particles;

g. removing those particles which are too large to be fully calcined in the time required for formation of the primary particles from the bottom of the reaction zone;

h. removing calcined particles and the gas in which they are entrained from said reaction zone at the upper end thereof, said particles being agglomerated into larger, secondary particles as they are removed from the combustion zone;

i. separating the secondary particles from the gases with which they are mixed at a temperature at or above said calcining temperature; and

j. immediately thereafter surrounding the secondary particles with a gas which is inert with respect to said particles to inhibit unwanted reactions between the calcined material and compounds present in the environment of said material.

4,098,872

STABILIZED RED PHOSPHORUS AND PROCESS FOR MAKING IT

Horst Staendeke; Franz-Josef Dany; Joachim Kandler, and Werner Klose, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,190

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622296

Int. Cl.² C01B *25/00*

U.S. Cl. 423—265 **17 Claims**

1. Stabilized pulverulent red phosphorus comprising a ho-

mogeneous blend of red phosphorus particles with a size of at most about 2 mm and as an oxidation stabilizer the aluminum, magnesium, calcium or zinc salt of an acid orthophosphoric acid ester of a long chain aliphatic alcohol or phenol, the salt being present in the homogeneous blend in a proportion of about 0.25 to 5 weight %.

4,098,873

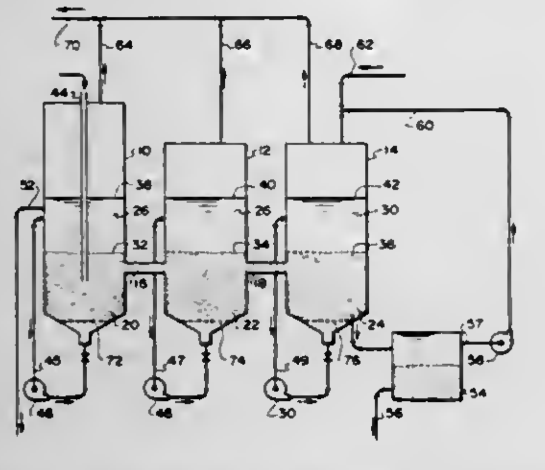
COUNTER-CURRENT PROCESS FOR PASSING A SOLID PARTICULATE REACTANT TO A LIQUID REACTANT

Clinton Allen Hollingsworth, Lakeland, Fla., assignor to Borden, Inc., Columbus, Ohio

Filed Aug. 18, 1975, Ser. No. 605,307

Int. Cl.² C01F *11/22;* C02B *1/56, 1/42;* C01B *9/08*

U.S. Cl. 423—490 **13 Claims**



1. A process for producing a solid product, which is insoluble in and heavier than liquid reactant, by passing a solid particulate reactant, which is insoluble in and heavier than the liquid reactant, counter-currently to the liquid reactant comprising adding the solid reactant to a first zone, adding the liquid reactant to a second zone, passing the liquid reactant from the second zone to the first zone through a conduit established between the zones while simultaneously counter-currently passing the solid reactant from the first zone to the second zone through the same conduit, establishing a slurry layer of liquid and solid particles in each zone extending from the bottom of the zone to a level above the conduit, establishing a clear liquid layer in each zone above the slurry layer which is defined by a visually recognizable interface between the slurry layer and the clear liquid layer, recirculating the clear liquid to the bottom portion of each zone in order to maintain the interface at the desired level and to maintain the particulate solid reactant in a turbulent state, withdrawing the clear liquid from the first zone at about the rate of adding the liquid reactant to the second zone and withdrawing the slurry containing the solid product from the second zone at a rate to allow maintenance of steady state conditions.

3. Process of claim 1 further including the step of uniformly distributing the flow of the recirculating clear liquid across the cross-sectional area of each zone.

5. Process of claim 3 wherein the solid product is calcium fluoride and the liquid reactant is selected from hydrofluoric acid, alkaline ammonium fluoride solution and mixtures thereof.

4,098,874

METHOD OF PREPARATION OF ALUMINA CATALYST SUPPORT OR CARRIER MATERIAL

Roy T. Mitsche, Wauconda, and George N. Pope, Mc Henry, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 18, 1977, Ser. No. 788,376

Int. Cl.² C01F *7/02;* B01J *21/04*

U.S. Cl. 423—628 **9 Claims**

1. An alumina preparation method comprising:

(a) admixing a finely divided alpha-alumina monohydrate with an aqueous ammonical solution having a pH of at least about 7.5 and forming a stable suspension;

(b) commingling a metal salt of a strong acid with said suspension and converting said suspension to a extrudable paste or dough;

(c) extruding said paste or dough; and

(d) drying and thereafter calcining the extruded alumina product at a temperature of from about 450°–850° C.

4,098,875

METHOD FOR THERMOCHEMICAL PRODUCTION OF HYDROGEN FROM WATER

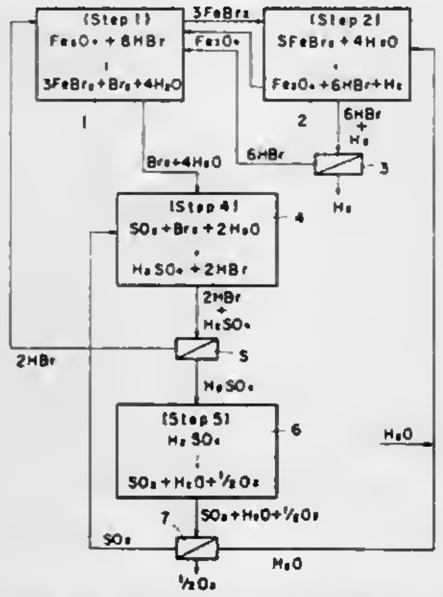
Eiichi Ishii, Toyonaka; Hiroshi Ishikawa; Itsuki Uehara, both of Ikeda; Masanori Nakane, Takatsuki, and Yoshizo Miyake, Toyonaka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,561

Claims priority, application Japan, Mar. 16, 1976, 51-28842

Int. Cl.² C01B *1/08*

U.S. Cl. 423—658 **10 Claims**



1. A method for the production of hydrogen by the thermochemical decomposition of water, which comprises the steps of

(a) preparing iron dibromide, bromine and water by reacting tri-iron tetraoxide with hydrogen bromide,

(b) hydrolyzing the iron dibromide obtained in step (a), thereby producing tri-iron tetraoxide and a mixture of hydrogen bromide and hydrogen,

(c) separating the mixture to hydrogen bromide and hydrogen, the hydrogen thus obtained being recovered as the product,

(d) reacting the bromide obtained in step (a) to regenerate hydrogen bromide, and

(e) cycling the tri-iron tetraoxide obtained in step (b) and the hydrogen bromides obtained in steps (c) and (d) to step (a).

4,098,876

REVERSE SANDWICH IMMUNOASSAY

Roger N. Piasio, Medfield, Mass.; James W. Ryan, Miami, Fla., and James E. Woiszwillo, Milford, Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,740

Int. Cl.² G01N *33/16;* A61K *43/00*

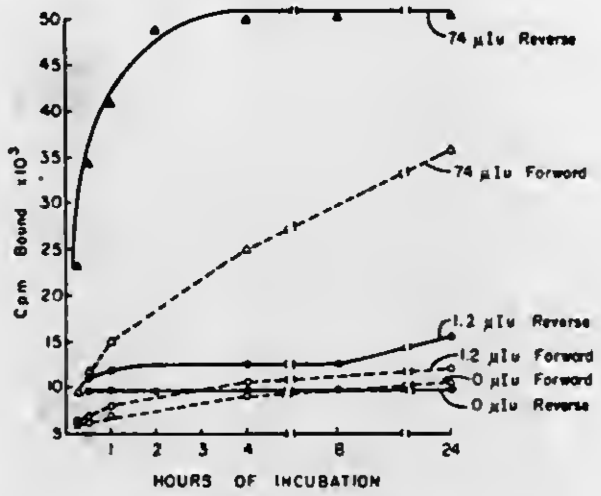
U.S. Cl. 424—1 **31 Claims**

1. A method of determining the presence or concentration of a polyvalent antigenic substance in a fluid sample which comprises the steps of:

(a) incubating the fluid sample with labeled antibodies to the substance under conditions sufficient to form a first labeled immunochemical complex;

(b) incubating that complex with a composite comprising antibodies to the substance immobilized on a water insoluble carrier material, the incubation being under conditions sufficient to form a second labeled complex comprising the first complex complexed to the composite;

(c) separating the second labeled complex from the incubation medium;



(d) determining the amount of label associated with the second complex;

(e) relating the determination of step (d) to a standard to determine the presence or concentration of the substance in the fluid.

4,098,877

ANTIMICROBIAL COMPOSITION (ENHANCED ACTIVITY FROM COMBINATION OF PHENOL AND A QUATERNARY COMPOUND)

William L. Ball, Kinnelon, and Eugene E. Wiese, Wyckoff, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 613,659, Sep. 15, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,825

Int. Cl.² A01N *9/02, 9/20, 9/26*

U.S. Cl. 424—45 **4 Claims**

1. A composition having disinfectant and antiseptic activity comprising an effective amount of the mixture of 5-chloro-2-(2,4-dichlorophenoxy)phenol and dodecyl dimethyl(2-phenoxyethyl)ammonium bromide, the ratio of phenolic compound to ammonium bromide compound being about 4:1 to 6:1.

4,098,878

TOOTHPASTE CONTAINING MILLED ALPHA-ALUMINA TRIHYDRATE

Eric Baines, Manchester; Peter Platt, Tottington, Near Bury, and Kenneth Tomlinson, Bramhall, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,218

Claims priority, application United Kingdom, Oct. 29, 1974, *46827/74*

Int. Cl.² A61K *7/16, 7/18*

U.S. Cl. 424—52 7 Claims

1. Toothpaste comprising an aqueous vehicle and about 5 to 60% of dental abrasive particles of about 2 to 20 microns diameter individually dispersed therein, said particles comprising milled alpha-alumina trihydrate which has been surface-treated with about 0.1 to 2%, based on the weight of said milled trihydrate, of a hydrophobic long chain fatty carboxylic acid having 10 to 25 carbon atoms or a mixture of said acids, said toothpaste having a pH of about 5 to *9* and being in an unlined aluminum tube.

4,098,879

N-ALKYL-3-PYRIDINIUM-METHANOL FLUORIDES AND DERIVATIVES THEREOF

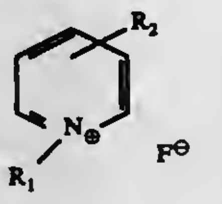
Henri Cousse; Gilbert Mouzin; Jean-Claude Vezin; Lucien Dussourd d'Hinterland, and Jacques Dubois, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Filed Jan. 3, 1977, Ser. No. 756,016

Int. Cl.² C07D *213/30;* A61K *7/18*

U.S. Cl. 424—52 **23 Claims**

1. A compound of formula



in which

R_1 = H or alkyl

R_2 = CH_2OH, in 2 or 3 position on the pyridyl ring,

"alkyl" containing a maximum of twelve carbon atoms.

10. Orally-acceptable antiplaque composition containing an effective amount of compound of claim 1 and a bactericidal chemical compound, having properties inhibiting the formation of dental plaque.

4,098,880

ANTIBACTERIAL ORAL COMPOSITION

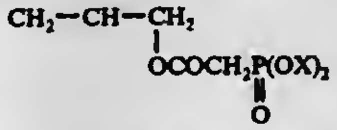
Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,780

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **11 Claims**

1. An oral composition comprising an oral vehicle, a nitrogen containing antibacterial antiplaque agent tending to stain dental surfaces selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms and a water soluble polymeric polyphosphonic compound antistain additive having the recurring group:



$$-CH_2-CH-CH_2- \quad \text{with } OCOCH_2P(O)(OX)_2 \text{ on CH}$$

wherein X is selected from the group consisting of hydrogen and an orally acceptably cation and said compound has a molecular weight of at least about 2,000.

4,098,881

COMPOSITIONS TO CONTROL THE CHRONIC EFFECTS OF EXPOSURE TO SUNLIGHT COMPRISING CONJUGATED DIENES

Satyanarayana Majeti, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 544,432, Jan. 27, 1975, abandoned. This application Oct. 28, 1975, Ser. No. 625,800

Int. Cl.² A61K *7/44*

U.S. Cl. 424—59 **2 Claims**

1. A composition adapted for topical application and capable of inhibiting chronic damage to skin induced by ultraviolet radiation in the range of 2,950 A to 4000 A, comprising an effective ultraviolet absorbing amount from about 0.001% to about 25%, by weight, of a conjugated diene ester or amide having an acid portion derived from p-methoxy cinnamic acid, p-aminobenzoic acid, salicylic acid, or p-dimethyl amino benzoic acid, and an alcohol portion derived from:

2,4-hexadien-1-ol,

3,5-heptadien-1-ol,
3,5-octadien-1,8-diol,
3-methylene-4-penten-1-ol,
3-ethylidene-4-hexen-1-ol,
6,7-bis(1-hydroxy-2-ethyl)-5,7-dodecadiene,
3-(1-hydroxy-2-ethyl)-1,8-dihydroxy-3,5-octadiene,
9,11-dodecadien-1-ol,
octa-5,7-dien-1,2-diol,
4,6-heptadien-2-ol,
2,9-dihydroxy-2-methyl-4,6-nonadiene,
2,9-dihydroxy-4,6-decadiene,
5-hydroxymethyl-1,3-cyclohexadiene,
2-(1-hydroxy-2-ethyl)-1,3-cyclohexadiene,
2,3-bis(1-hydroxy-2-ethyl)-1,3-cyclohexadiene,
2-(1-hydroxy-2-ethyl)-1,4-dimethyl-3-butyl-1,3-cyclohexadiene,
1-(1-hydroxy-2-ethyl)-1,3-cycloheptadiene,
2-(1-hydroxy-2-ethyl)-1,3-cycloheptadiene,
2,6-bis(1-hydroxy-2-ethyl)-1,3-cycloheptadiene,
6-(1-hydroxy-2-ethyl)-1,3-cycloheptadiene,
1-(1-hydroxy-2-ethyl)-cyclonona-1,3-diene,
7-hydroxy-1,3-cyclononadiene,
7-(1-hydroxy-2-ethyl)-1,3-cyclononadiene,
1-(1-hydroxy-2-ethyl)-1,3-cyclotetradecadiene,
2-(1-hydroxy-2-ethyl)-$\Delta^{1(2),8}$-hexalin,
$\Delta^{1(2),8}$-6-hexalol, or
1,1'-bis cyclohexene-4-ol;
or an amine portion derived from:
2,4-hexadien-1-amine,
1,6-diamino-2,4-hexadiene,
2-lower alkyl amino-1,3-butadiene,
1-amino-3,5-heptadiene,
1-amino-3,5-hexadiene,
1,8-diamino-3,5-octadiene,
3-methylene-4-hexene-1-amine,
3-(1-amino-2-ethyl)-2,4-hexadiene,
1-amino-4,6-dodecadiene,
1-di lower alkyl amino-3,5-hexadiene,
1,9-bis(di-lower alkyl amino)-4,6-nonadiene,
1-di-methyl amino-3-methylene-4-hexene,
1-N-phenyl-N-lower alkyl amino-3,5-hexdadiene,
1-N-piperidino-3,5-hexadiene,
1-lower alkyl amino-3,5-heptadiene,
1,2-dihydropyridine,
3-vinyl-1,2,5,6-tetrahydropyridine,
2,7-dihydroazepine,
2,3,8,9-tetrahydroazonine,
4-(1-hydroxy-3-butenyl)-1,2,5,6-tetrahydropyridine,
2,3,8,9-tetrahydro-N-lower alkyl azonine,
1-(2-amino-1-ethyl)-1,3-cyclononadiene,
2-(2-amino-1-ethyl)-1,3-cyclononadiene,
1-(2-di-lower alkyl amino-1-ethyl)-1,3-cyclononadiene,
1,4-bis(2-di-methyl amino-1-ethyl)-1,3-cyclononadiene, or
1-(2-piperidino-1-ethyl)-1,3-cyclononadiene;

in a skin compatible vehicle containing from about 0.1% to about 10%, by weight, surfactant wherein the surfactant is a nonionic, cationic or amphoteric surfactant or from about 0.01% to about 0.5%, by weight, of a non-soap anionic surfactant.

4,098,882
ANTI-SOLAR COMPOSITION

Gérard Lang, Epinay-sur-Seine, and Bernard Jacquet, Antony, both of France, assignors to L'Oreal, Paris, France

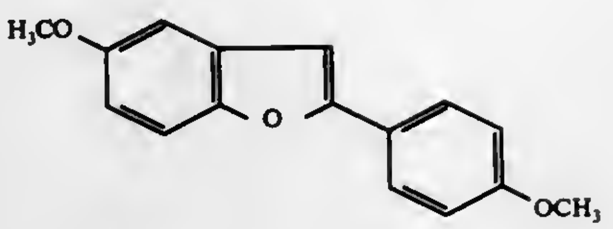
Filed Sep. 26, 1975, Ser. No. 617,158

Claims priority, application Luxembourg, Sep. 26, 1974, 71012

Int. Cl.² A61K *7/42;* **C07D** *311/02*

U.S. Cl. 424—59 **9 Claims**

1. An anti-solar cosmetic composition for application to human skin comprising a cosmetic vehicle easily spreadable on human skin to form a continuous film thereon, at least one protective agent against actinic rays, said agent having a formula selected from the group consisting of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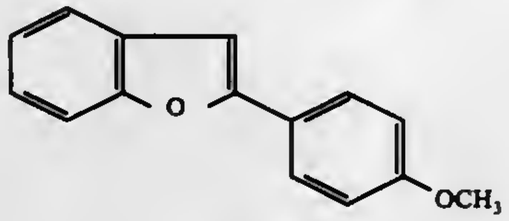
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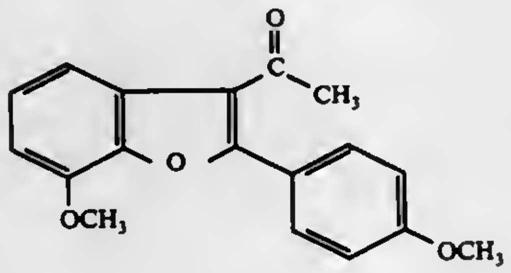
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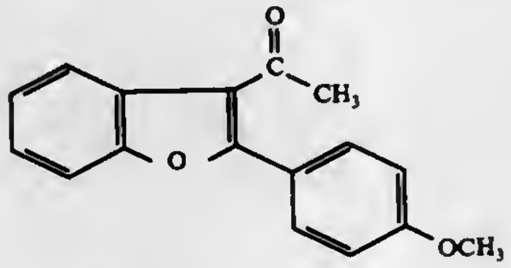
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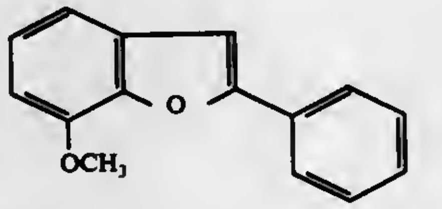
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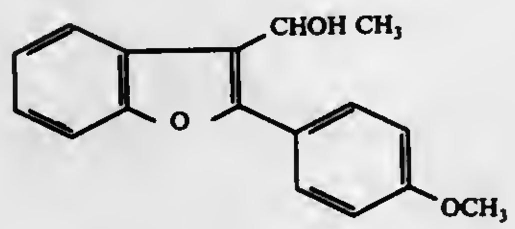
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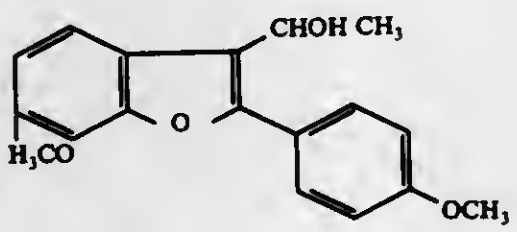
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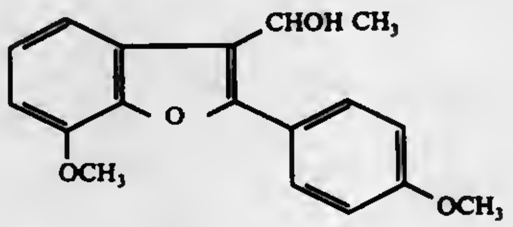
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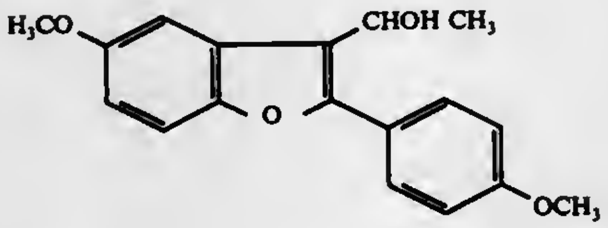
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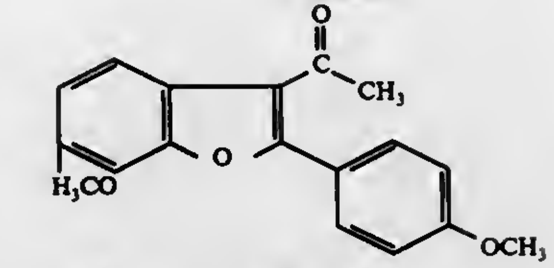
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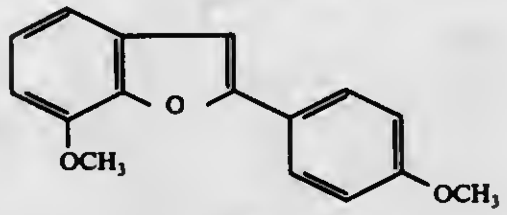
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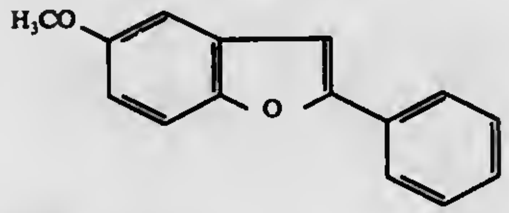
and


12

said agent being present in an amount effective to protect said skin against actinic rays, said cosmetic vehicle being selected from the group consisting of water, a lower alcohol, a hydroalcoholic mixture, an oil selected from colza oil, cocoa butter, triglycerides of fatty acids containing eight to 12 carbon atoms, isopropyl myristate, petroleum oil, petrolatum; vinyl polystearate lanolin, ricin oil, paraffin and oleyl alcohol, and a wax selected from microcrystalline wax and ozokerite.

4,098,883
ALUMINUM COMPOUND AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Rolf Madaus, Cologne-Bruck; Klaus Görler, and Werner **Stumpf, both of Bensberg-Refrath, all of Fed. Rep. of Germany,** assignors to Dr. Madaus & Co., Cologne-Merheim, Fed. Rep. of Germany

Filed Mar. 5, 1976, Ser. No. 664,111

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1975, 2510663

Int. Cl.² A61K *33/06, 33/08;* **C01B** *17/98;* **C01F** *7/74*

U.S. Cl. 424—157 **4 Claims**

1. Aluminum polyhydroxysulfate hydrate of the formula $[Al_7(OH)_{17}(SO_4)_2 \cdot n\ H_2O]$, wherein *n* is an integer from 10 to 15.

4. Pharmaceutical composition comprising a pharmaceutically acceptable carrier and, in an amount effective to combat phosphate conditions in the urinary passage, aluminum polyhydroxysulfate hydrate of the formula $[Al_7(OH)_{17}(SO_4)_2 \cdot n\ H_2O]$ wherein *n* is an integer from 10 to 15, as claimed in claim 1.

4,098,884
DOXORUBICIN THIOESTERS

Federico Arcamone; Luigi Bernardi, and Bianca Patelli, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

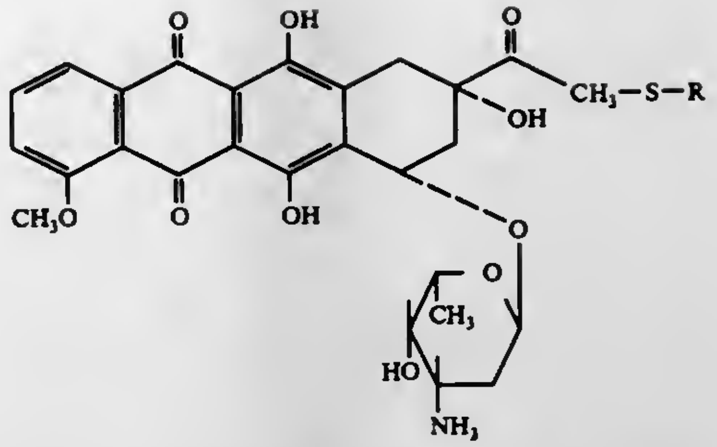
Filed Mar. 10, 1977, Ser. No. 776,821

Claims priority, application United Kingdom, Mar. 30, 1976, 12701/76

Int. Cl.² A61K *31/65;* **C07H** *15/24*

U.S. Cl. 424—180 **11 Claims**

1. A compound of the formula



wherein R is the acyl radical of an aliphatic carboxylic acid having 2 to 8 carbon atoms, benzoic acid, nicotinic acid or pyrazinoic acid and the hydrochlorides thereof.

10. A method of inhibiting the growth of P_{388} leukemia which comprises intraperitoneally administering to a host afflicted therewith, a compound according to claim 1, in an amount sufficient to inhibit the growth of said tumor.

4,098,885
EQUINE ANTHELMINTIC

Ralston Curtis, Los Altos, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Oct. 14, 1977, Ser. No. 842,126

Int. Cl.² A61K *31/66*

U.S. Cl. 424—212 **9 Claims**

1. An adhering gel composition for the control of equine endoparasites by application into the oral cavity which comprises in effective amounts

(a) butonate,
(b) a polyhydric alcohol ester of a hydroxy-substituted fatty acid as a primary thickening agent, and
(c) hydroxypropyl cellulose as a secondary thickening agent.

4,098,886
GAS PURIFICATION LIQUORS

Thomas Nicklin, Bamford, and Frederick Farrington, Stretford, both of England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 667,212, Mar. 15, 1976, abandoned, which is a continuation of Ser. No. 414,275, Nov. 9, 1973, abandoned. This application Feb. 16, 1977, Ser. No. 769,213

Claims priority, application United Kingdom, Nov. 10, 1972, 51970/72; Nov. 30, 1972, 55393/72; Dec. 14, 1972, 57874/72; Feb. 13, 1973, 6892/73

Int. Cl.² C01B *17/04*

U.S. Cl. 423—226 **16 Claims**

1. A process for the decomposition of thiosulphate ions present in aqueous gas purification liquors employed for removing hydrogen sulphide from fuel gases or liquid hydrocarbons by means of a wash liquor containing vanadium compounds and sodium anthraquinone disulphonate, concentrating and cooling said liquors so as to crystallize out the sodium anthraquinone disulphonate, recovering the sodium anthraquinone disulphonate and exposing the resulting liquor or a solid residue derived therefrom by evaporation to a hydrogen-rich gas at a temperature of 300° to 800° C in the absence of a catalyst.

4,098,887

PHARMACEUTICAL COMPOSITIONS AND METHODS OF PRODUCING ANTIARTHRITIC ACTIVITY WITH BIS(PYRIDINE)GOLD(1+) SALTS

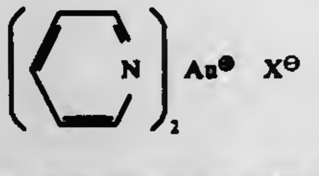
David T. Hill, North Wales, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 25, 1977, Ser. No. 772,033

Int. Cl.² A61K *31/555*

U.S. Cl. 424—245 6 Claims

4. A method of producing antiarthritic activity which comprises administering internally to an animal in an amount sufficient to produce antiarthritic activity a compound of the formula:



in which X is perchlorate, iodate, tetrafluoroborate or hexafluorophosphate.

4,098,888

THIAZOLYLACETAMIDO CEPHALOSPORIN TYPE COMPOUNDS

Michihiko Ochiai, Suita; Taiiti Okada, Kyoto; Osami Aki, Kawanishi; Akira Morimoto, Ikeda; Kenji Kawakita, Suita, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

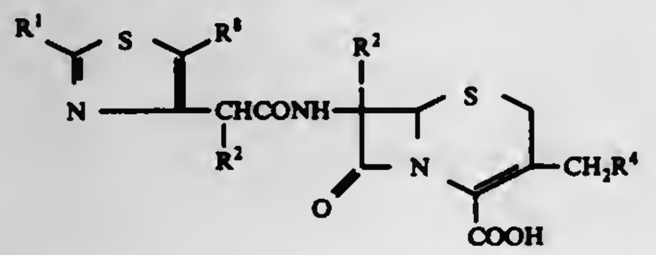
Filed Dec. 19, 1975, Ser. No. 642,356

Claims priority, application Japan, Dec. 19, 1974, 49-146567; United Kingdom, Jun. 9, 1975, 24611/75

Int. Cl.² C07D *501/36;* A61K *31/545*

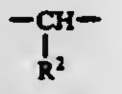
U.S. Cl. 424—246 12 Claims

1. A member selected from the group consisting of (a) a cephem compound of the formula



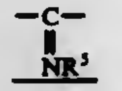
wherein

- R^1 represents amino, protected amino, hydroxy or protected hydroxy,
- R^2 represents amino, protected amino, hydroxy, protected hydroxy or the group



$$-\underset{\displaystyle R^2}{\underset{|}{\mathrm{CH}}}-$$

represents a group of the formula

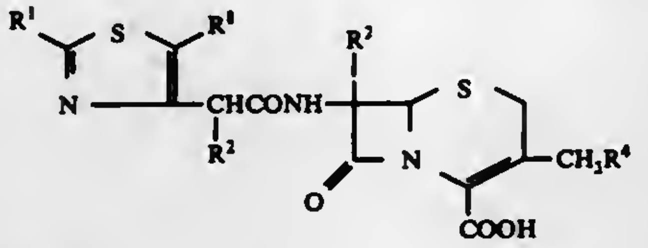


$$-\underset{\displaystyle NR^5}{\underset{\|}{\mathrm{C}}}-$$

wherein R^5 is hydroxy or protected hydroxy,

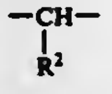
- R^3 represents hydrogen or methoxy,
- R^4 represents heterocyclic thio wherein heterocyclic is a 5 to 6 membered hetero ring containing 1 to 4 hetero atoms from the group of oxygen, sulfur and nitrogen, said ring being unsubstituted or substituted by lower alkyl, lower alkoxy, halogen, haloalkyl, amino, mercapto, hydroxy, carbamoyl or carboxy, and
- R^8 represents hydrogen or halogen,
- (b) a pharmaceutically acceptable salt thereof, and
- (c) a pharmaceutically acceptable ester of the 4-position carboxyl group selected from the group consisting of alkoxymethyl, α-alkoxyethyl, α-alkoxy-α-substituted methyl, alkylthiomethyl, acyloxymethyl and α-acyloxy-α-substituted methyl esters.

12. A pharmaceutical composition which contains a medicinally effective amount of a member of the group consisting of (a) a cephem compound of the formula



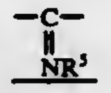
wherein

- R^1 represents amino, protected amino, hydroxy or protected hydroxy,
- R^2 represents amino, protected amino, hydroxy, protected hydroxy or the group



$$-\underset{\displaystyle R^2}{\underset{|}{\mathrm{CH}}}-$$

represents a group of the formula



$$-\underset{\displaystyle NR^5}{\underset{\|}{\mathrm{C}}}-$$

wherein R^5 is hydroxy or protected hydroxy,

- R^3 represents hydrogen or methoxy,
- R^4 represents heterocyclic thio wherein heterocyclic is a 5 to 6 membered hetero ring containing 1 to 4 hetero atoms from the group of oxygen, sulfur and nitrogen, said ring being unsubstituted or substituted by lower alkyl, lower alkoxy, halogen, haloalkyl, amino, mercapto, hydroxy, carbamoyl or carboxy, and
- R^8 represents hydrogen or halogen,
- (b) a pharmaceutically acceptable salt thereof, and
- (c) a pharmaceutically acceptable ester of the 4-position carboxyl group selected from the group consisting of alkoxymethyl, α-alkoxyethyl, α-alkoxy-α-substituted methyl, alkylthiomethyl, acyloxymethyl and α-acyloxy-α-substituted methyl esters together with at least one pharmaceutically acceptable carrier, said composition being administrable in a dosage unit form.

4,098,889

ANTITHROMBOTIC 2-(AMINOALKYLTHIO)-N,N'-P-PHENYLENEBISSULFONAMIDES

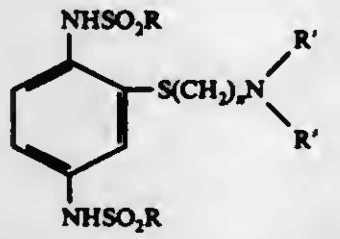
Joseph E. Dunbar, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 1, 1977, Ser. No. 829,755

Int. Cl.² C07C *143/75;* C07D *295/12;* A61K *31/18, 31/535*

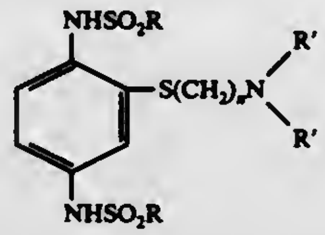
U.S. Cl. 424—248.52 18 Claims

1. A compound of the formula



wherein *n* represents the integer 1, 2 or 3; R represents an alkyl having from 1 to about 3 carbon atoms or phenyl; and R' represents an alkyl having from 1 to about 4 carbon atoms or the two R' groups taken together with the adjacent nitrogen represented a 6-membered heterocyclic ring which may optionally contain an oxygen in the 4-position of the ring whereby a piperidinyl or morpholinyl residue is formed and further including the pharmaceutically-acceptable salts thereof.

7. A method of inhibiting the aggregation of blood platelets in a mammal which comprises administering internally to said mammal an effective blood platelet aggregation inhibiting amount of a compound of the formula



wherein *n* represents the integer 1, 2 or 3; R represents an alkyl having from 1 to about 3 carbon atoms or phenyl; and R' represents an alkyl having from 1 to about 4 carbon atoms or the two R' groups taken together with the adjacent nitrogen represent a 6-membered heterocyclic ring which may optionally contain an oxygen in the 4-position of the ring whereby a piperidinyl or morpholinyl residue is formed and further including the pharmaceutically-acceptable salts thereof.

4,098,890

METHOD FOR TREATING ARRHYTHMIA

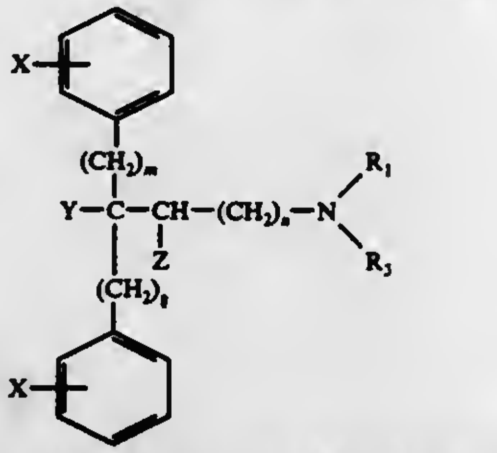
Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 536,283, Dec. 24, 1974, Pat. No. 3,987,201. This application May 27, 1976, Ser. No. 690,707

Int. Cl.² A61K *9/22, 31/445, 31/535, 31/40*

U.S. Cl. 424—248.4 8 Claims

1. A method for treating arrhythmia comprising administering to a subject suffering from an arrhythmia and in need of treatment an effective amount of a compound of the formula



wherein: *n* is 1, 2, or 3; *m* is 0, 1, 2, or 3; *q* is 0 or 2; and *m* plus *n* is greater than 1 and less than 6;

- X is hydrogen, fluorine, chlorine, bromine, or iodine;
- Y and Z each are hydrogen or, taken together, form a double bond;
- R_1 and R_2 taken together with the adjacent nitrogen atom form a heterocyclic ring system selected from the group consisting of piperidino, pyrrolidino, and morpholino; and the pharmaceutically acceptable salts thereof.

4,098,891

CERTAIN S-TRIAZINES AS LIPOGENESIS INHIBITORS

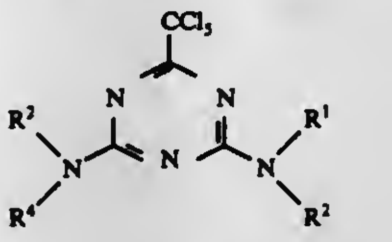
Dominick J. Tocco, Lansdale, Pa., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 17, 1977, Ser. No. 842,714

Int. Cl.² A61K *31/535, 31/53*

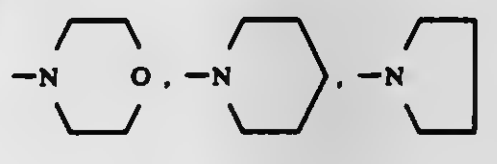
U.S. Cl. 424—248.56 1 Claim

1. A method of inhibiting lipogenesis in mammals which comprises administering, to a mammal in need of such treatment, an effective amount of a triazine of the formula

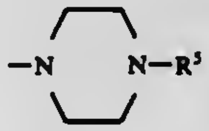


wherein

- R^3 is hydrogen, alkyl, hydroxylalkyl, alkoxylalkyl, alkanoyloxyalkyl, dialkylcarbamoyloxyalkyl, carboxyalkyl, carboxyalkanoyloxyalkyl, or alkoxycarbonylalkanoyloxyalkyl, morpholinoalkyl or morpholinocarbonylalkyl;
- R^4 is a moiety represented by R^3, other than hydrogen;
- R^3 and R^4 together with the indicated nitrogen atom represent



or



where

- R^5 is hydrogen, alkyl, hydroxyalkyl, alkanoyl, carboxyalkanoyl, mono- or di(hydroxyalkyl)carbamoyl, carbanilino, or carboxyalkanoyloxyalkyl;
- R^1 is hydrogen or alkyl;
- R^2 is a moiety represented by R^3, other than hydrogen.

4,098,892

NICOTINAMIDO-S-TRIAZINES

Hiromu Murai, Otsu; Katsuya Ohata, Uji; Kenji Sempuku, Suita; Yoshiaki Aoyagi, Kyoto, and Fusao Ueda, Shiga, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

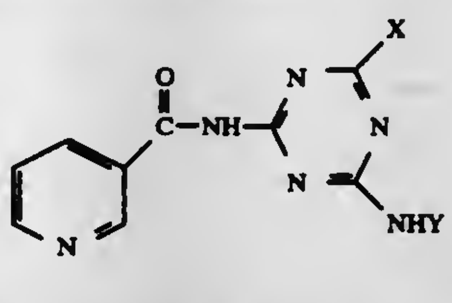
Filed Feb. 18, 1977, Ser. No. 769,948

Claims priority, application Japan, Mar. 29, 1976, 51-34949

Int. Cl.² A61K *31/53;* C07D *251/48, 251/70*

U.S. Cl. 424—249 11 Claims

1. A compound selected from the group consisting of a nicotinamido-s-triazine of the formula:



wherein

- X is amino, phenyl or nicotinamido; and
- Y is hydrogen or nicotinoyl, and the acid addition salts thereof.

10. The method of achieving an anti-ulcer effect in humans and other animals which comprises administering to a human

or animal in need thereof an anti-ulcer effective amount of a compound according to claim 1.

4,098,893

PYRIDINE DERIVATIVES AND THEIR USE AS ANTICOCCIDIAL AGENTS

Yasuhiro Morisawa; Mitsuru Kataoka; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

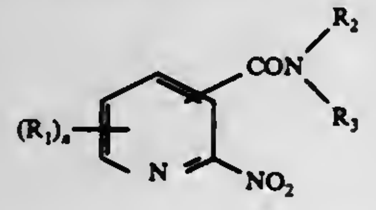
Division of Ser. No. 639,697, Dec. 11, 1975, Pat. No. 4,054,663. This application Jul. 15, 1977, Ser. No. 816,215

Claims priority, application Japan, Dec. 23, 1974, 49-147908; Mar. 18, 1975, 50-32739; May 21, 1975, 50-60519; Sep. 5, 1975, 50-107822

Int. Cl.² A61K *31/44; C07D 213/56*

U.S. Cl. 424—263 **42 Claims**

1. A compound having the formula



wherein

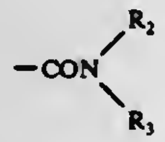
R_1 is an alkyl group having 1 to 3 carbon atoms;

R_2 is hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

R_3 is an alkanoyl group having 1-18 carbon atoms, an alkenoyl group having 3 to 11 carbon atoms, an aromatic acyl having 6 to 10 carbon atoms in the aromatic ring and optionally alkyl, alkoxy, acetylamino, cyano or halogen as a substituent;

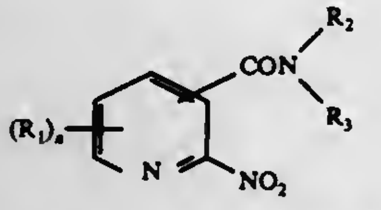
n is an integer of 0 to 2 inclusive; and, when n is 2, R_1's may be the same or different;

the group



is attached to the pyridine ring at the 4- or 5-position thereof.

29. An anticoccidial composition containing an amount, sufficient to inhibit coccidiosis, of a compound having the formula



intimately dispersed in an inert carrier wherein

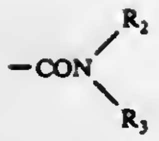
R_1 is an alkyl group having 1 to 3 carbon atoms;

R_2 is hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

R_3 is an alkanoyl group having 1-18 carbon atoms, an alkenoyl group having 3 to 11 carbon atoms, an aromatic acyl having 6 to 10 carbon atoms in the aromatic ring and optionally alkyl, alkoxy, acetylamino, cyano or halogen as a substituent;

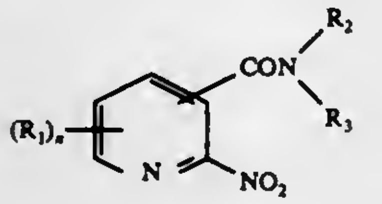
n is an integer of 0 to 2 inclusive; and when n is 2, R_1's may be the same or different;

the group



is attached to the pyridine ring at the 4- or 5-position thereof.

36. A poultry feed having dispersed therein for control of poultry coccidiosis at least 0.005% by weight of a compound having the formula



wherein

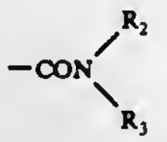
R_1 is an alkyl group having 1 to 3 carbon atoms;

R_2 is hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

R_3 is an alkanoyl group having 1-18 carbon atoms, an alkenoyl group having 3 to 11 carbon atoms, an aromatic acyl having 6 to 10 carbon atoms in the aromatic ring and optionally alkyl, alkoxy, acetylamino, cyano or halogen as a substituent;

n is an integer of 0 to 2 inclusive; and when n is 2, R_1's may be the same or different;

the group



is attached to the pyridine ring at the 4- or 5-position thereof.

4,098,894

TRIPHENYL-1,2,3-TRIAZOLYL-(1)-METHANES, AND COMPOSITIONS AND METHODS FOR COMBATING FUNGI AND BACTERIA EMPLOYING THEM

Karl Heinz Büchel, Wuppertal; Heinrich Gold, Schildgen; Paul-Ernst Frohberger, and Helmut Kaspers, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 5, 1975, Ser. No. 547,428

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407305

Int. Cl.² C07D *249/04;* A01N *9/22*

U.S. Cl. 424—269 **13 Claims**

1. A triphenyl-1,2,3-triazolyl-(1)-methane selected from the group consisting of

(3'-trifluoromethylphenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane,
(3'-nitrophenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane,
(3'-bromophenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane,
(4'-trifluoromethylphenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane,
(3'-iodophenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane,
(2'-isopropylphenyl)-bis-phenyl-1,2,3triazolyl-(1)-methane, and
(4'-nitrophenyl)-bis-phenyl-1,2,3-triazolyl-(1)-methane.

10. A composition for combating fungi and bacteria in agriculture, said composition containing as active ingredient a fungicidally or bactericidally effective amount of a compound according to claim 1 in admixture with a diluent.

12. A method of combating fungi or bacteria in agriculture which comprises applying to the fungi, bacteria or a habitat thereof a fungicidally or bactericidally effective amount of a compound according to claim 1.

4,098,895

TRIAZOLYLACETANILIDE COMPOUNDS AND MICROBICIDAL COMPOSITIONS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

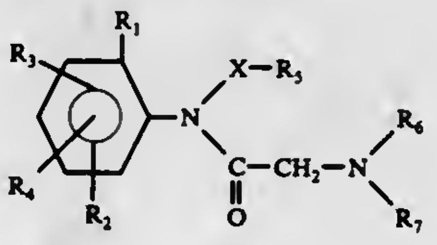
Filed Sep. 24, 1976, Ser. No. 726,320

Claims priority, application Switzerland, Sep. 30, 1975, 12650/75; Sep. 30, 1975, 12651/75

Int. Cl.² A01N *9/20, 9/22;* A61K *31/41;* C07D *249/08*

U.S. Cl. 424—269 **11 Claims**

1. A compound of the formula



(I)

wherein

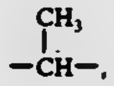
R_1 represents a C_1–C_4-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_2 represents a hydrogen atom, a C_1–C_3-alkyl group, a C_1–C_4-alkoxy group or a halogen atom,

R_3 represents a hydrogen atom, a C_1–C_3-alkyl group or a halogen atom,

R_4 represents a hydrogen atom or a methyl group, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 in the phenyl ring does not exceed 8, and

X represents —CH_2— or



$$-\overset{CH_3}{\overset{|}{C}H}-,$$

R_5 represents —COOR', or —COSR' wherein R' represents a methyl or ethyl group,

R_6 and R_7 together with the nitrogen atom to which they are attached can represent a 1,2,4-triazole ring which is unsubstituted or mono-or polysubstituted by halogen or C_1-C_3-alkyl, and salts of the compounds of the formula I with inorganic or organic acids.

8. A method of controlling phytopathogenic fungi or of preventing fungus attack, which comprises applying to said plants, parts of plants or their environment a fungicidally effective amount of a compound of the formula I as claimed in claim 1.

4,098,896

1-HALOHYDROCARBYLTHIO-3-HYDROCARBYLTHIO-4-SUBSTITUTED-1,2,4-DELTA²-TRIAZOLIDIN-5-ONES

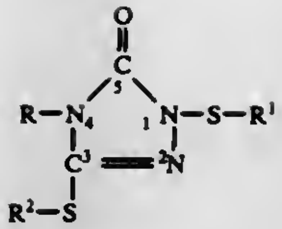
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 617,871, Sep. 29, 1975, abandoned. This application May 5, 1977, Ser. No. 794,280

Int. Cl.² A01N *9/12;* A61K *31/41;* C07D *249/12*

U.S. Cl. 424—269 **14 Claims**

1. A compound of the formula



wherein

R is alkyl of 1 to 4 carbon atoms; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms; cycloalkyl of 3 to 8 carbon atoms; phenyl; or phenyl substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms and 1 to 3 fluoro, bromo or chloro, alkoxy of 1 to 3 carbon atoms, and nitro; aralkyl of 7 to 14 carbon atoms, or aralkyl substituted with 1 to 3 halogen atoms from the group consisting of fluorine, chlorine and bromine;

R^1 is alkyl of 1 to 4 carbon atoms substituted with 2 to 5 of the same or different halogen atoms selected from the group consisting of fluoro, chloro and bromo; or alkenyl of 2 to 4 carbon atoms substituted with 2 to 5 of the same or different halogen atoms selected from the group consisting of fluoro, chloro and bromo; and

R^2 is alkyl of 1 to 4 carbon atoms; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4 carbon atoms; or said alkyl, alkenyl or alkynyl group substituted with 1 to 3 halogen atoms selected from the group consisting of fluorine, chlorine and bromine; aryl of 6 to 12 carbon atoms; aralkyl of 7 to 14 carbon atoms; alkaryl group of 7 to 14 carbon atoms; or said aryl, aralkyl or alkaryl group substituted with 1 to 3 halogen atoms selected from the group consisting of fluorine, chlorine and bromine, and/or a nitro group.

12. A fungicidal composition comprising a fungicidally effective amount of the compound of claim 1 and an inert carrier.

4,098,897

ANTI BACTERIAL AGENTS

Thomas Trefor Howarth, Reigate, England, assignor to Beecham Group Limited, Great Britain

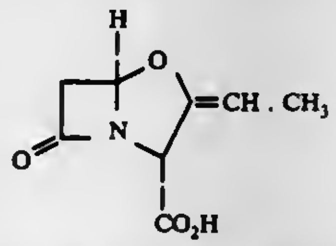
Filed Mar. 23, 1976, Ser. No. 669,697

Claims priority, application United Kingdom, Apr. 14, 1975, 15209/75; Sep. 27, 1975, 39663/75

Int. Cl.² A61K *31/42;* C07D *498/04*

U.S. Cl. 424—272 **40 Claims**

1. A compound of the formula (III)



(III)

or a pharmaceutically acceptable salt thereof.

4,098,898

IMIDAZOLYL ALKYLGUANIDINE COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City; Geoffrey Robert Owen, High Wycombe, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

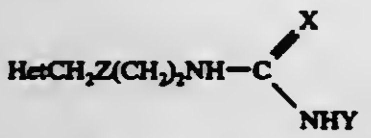
Filed May 13, 1976, Ser. No. 686,185

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47728/75

Int. Cl.² C07D ***233/64;*** **A61K** ***31/415***

U.S. Cl. 424—273 R **19 Claims**

1. A compound of the formula:



$\mathrm{HetCH_2Z(CH_2)_2NH{-}C({=}X){-}NHY}$

wherein X is N.CN or NH; Y is allyl, 2,2,2-trifluoroethyl, or $(CH_2)_nR$; Z is sulphur or methylene; Het is an imidazole ring which is attached at a ring carbon and which ring is optionally substituted by lower alkyl or halogen; *n* is an integer from 1 to 12; and R is hydroxy, lower alkoxy, amino or lower alkylamino; provided that when X is NH, Y is 2,2,2-trifluoroethyl or $(CH_2)_nR$ or a pharmaceutically acceptable acid addition salt thereof.

19. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim 1.

4,098,899

METHOD OF REDUCING PSYCHOGENIC IMPOTENCE

George R. Schwartz, 301 Dartmouth N.E., Albuquerque, N. Mex.

Filed Aug. 12, 1977, Ser. No. 823,969

Int. Cl.² A61K ***31/27***

U.S. Cl. 424—300 **5 Claims**

1. A method of reducing psychological impotence in man comprising administering to a psychologically impotent man by oral ingestion a cholinergic stimulant in a dosage and at a time prior to sexual attempt sufficient to product sensual stimulation, said stimulant being selected from the group consisting of neostigmine bromide and neostigmine methyl sulfate.

4,098,900

N,N'-DIPHENYL-GUANIDINE DERIVATIVES

Volker Dittrich, Zeiningen; Werner Töpfl, Dornach, and Odd Kristiansen, Mohlin, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

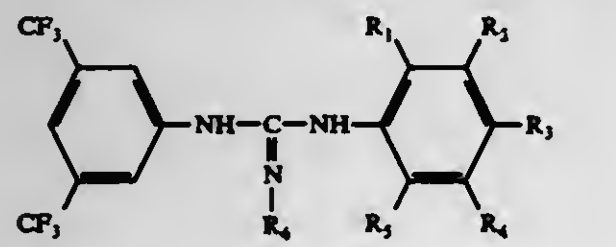
Filed Mar. 3, 1976, Ser. No. 663,414

Claims priority, application Switzerland, Mar. 10, 1975, 3028/75; Feb. 4, 1976, 1357/76

Int. Cl.² C07C ***143/75, 143/79;*** **A61K** ***31/18***

U.S. Cl. 424—304 **8 Claims**

1. A N,N'-diphenyl-guanidine derivative of the formula



(I)

wherein

R_1, R_2, R_3, R_4 and R_5 each represent hydrogen, halogen, C_1-C_5-alkyl, C_1-C_5-halogenoalkyl, C_1-C_5-alkoxy, (C_1-C_5-alkyl)-carbonyl, (C_1-C_5-alkoxy)-carbonyl, cyano or nitro, and

R_6 represents C_1-C_5-alkylsulphonyl, phenylsulphonyl or phenylsulphonyl substituted on the phenyl ring by halogen, C_1-C_5 alkyl, C_1-C_5 alkoxy, trifluoromethyl, nitro, amino or cyano.

8. A method for the control of insects comprising applying to the locus thereof an insecticidally effective amount of a compound according to claim 1.

4,098,901

TRIFLUOROMETHYL SUBSTITUTED COMPOUNDS HAVING ANTIDEPRESSIVE ACTIVITY

Ulf Henrik Anders Lindberg; Svante Bertil Ross, both of Sodertalje; Seth Olov Thorberg, Jarna, and Sven Ove Ögren, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

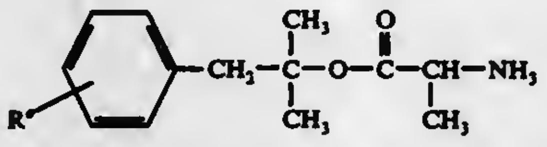
Filed Aug. 30, 1976, Ser. No. 718,569

Claims priority, application Sweden, Sep. 4, 1975, 7509814

Int. Cl.² C07C ***101/19;*** **A61K** ***31/22***

U.S. Cl. 424—311 **9 Claims**

1. A compound of the general formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, in which formula the group R^o is trifluoromethyl.

4. A pharmaceutical composition comprising as active ingredient between 0.1 and 95% by weight of a compound as claimed in claim 1, together with a pharmaceutically acceptable carrier, for use in the treatment of depressive disorders related to neuronal uptake of 5-hydroxytryptamine.

4,098,902

1-PHENYL-1,3,5,7-TETRAAZA-4-SULPHA-HEPT-1-EN-6-ONE DERIVATIVES

Manfred Böger, Weil am Rhein, Germany, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

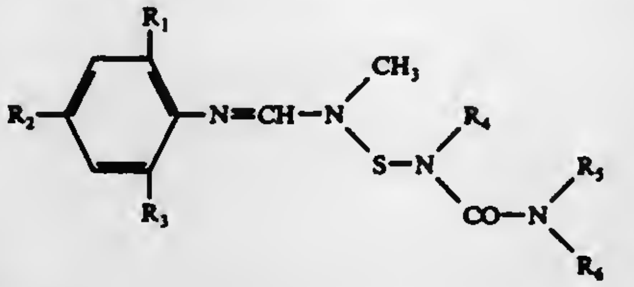
Filed Jul. 20, 1976, Ser. No. 707,149

Claims priority, application Switzerland, Jul. 24, 1975, 9674/75; Feb. 17, 1976, 1909/76; Jun. 3, 1976, 7020/76

Int. Cl.² C07D ***295/18;*** **A01N** ***9/12;*** **C07D** ***127/19***

U.S. Cl. 424—322 **28 Claims**

1. A compound of the formula



(I)

wherein

R_1, R_2 and R_3 independently of one another are hydrogen, halogen, methyl or ethyl,

R_4 is C_1-C_8-alkyl, C_3-C_6-cycloalkyl or (C_3-C_6-cycloalkyl)-methyl, and either

(i) R_5 is hydrogen, C_1-C_8-alkyl, C_1-C_4-alkoxy, C_3-C_6-cycloalkyl or (C_3-C_6-cycloalkyl)-methyl, while

R_6 is C_1-C_8-alkyl, C_1-C_4-alkoxy, C_3-C_6-cycloalkyl or (C_3-C_6-cycloalkyl)-methyl, or

(ii) R_5 and R_6 together with the nitrogen atom to which they are attached represent a 5- or 6- membered heterocyclic ring selected from the group consisting of pyrrolidinyl, piperidinyl, morpholinyl and thiomorpholinyl rings and the mono- and di-(C_1-C_4) alkyl derivatives thereof.

21. A method of combating pests of the class Insecta or of the order Acarina at a locus which comprises applying to said locus an insecticidally or acaricidally effective amount of a compound of the formula I as defined in claim 1.

4,098,903

ANTI-HYPERTENSIVE COMPOUNDS

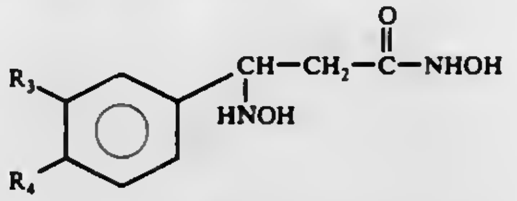
Kenneth R. Fountain; Horst Kehl, and Terry Early, all of Kirksville, Mo., assignors to Research Corporation, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,789

Int. Cl.² A61K ***31/165;*** **C07C** ***83/10***

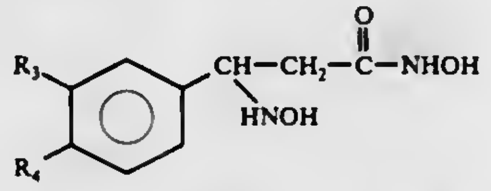
U.S. Cl. 424—324 **5 Claims**

1. Compounds having the structure:



wherein R_3 and R_4 are selected from the group consisting of hydrogen, halogen, amino, C_1—C_7 alkylamino, C_1—C_7 alkylamino, C_1—C_7 alkyl, C_1-C_7 alkoxy, hydroxyl, phenyl, NHOH, and nitro, with the proviso that only one of R_3 and R_4 is hydrogen, or pharmaceutically acceptable salts thereof.

4. A composition for use as an anti-hypertensive, consisting essentially of an anti-hyper-tensively effective amount of a compound having the structure:



wherein R_3 and R_4 are selected from the group consisting of hydrogen, halogen, amino, C_1-C_7 alkylamino, C_1-C_7 alkyl, C_1-C_7 alkoxy, hydroxyl, phenyl, NHOH, and nitro, with the proviso that only one of R_3 and R_4 is hydrogen, and a pharmaceutically acceptable carrier.

4,098,904

ANALGESIC N-(2-AMINOCYCLOALIPHATIC)BENZAMIDES

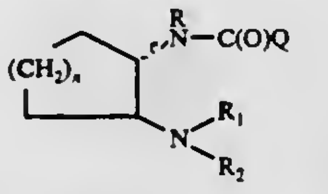
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 12, 1976, Ser. No. 741,467

Int. Cl.² A61K ***31/04, 31/03, 31/165;*** **C07C** ***103/82, 103/22***

U.S. Cl. 424—324 **21 Claims**

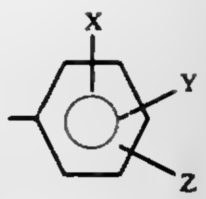
1. A compound of the formula



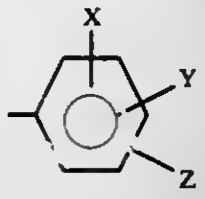
wherein the wavy line (~) at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring; *n* is 1 to 8;

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are hydrogen, C_1 to C_3-alkyl or when R_1 is hydrogen or C_1 to C_3-alkyl, R_2 is C_1 to C_6-alkyl, CH_2CF_3, C_2 to C_3-hydroxyalkyl, phenyl-C_2 to C_3-alkyl, C_3 to C_6-cycloalkyl, C_3 to C_4-cycloalkylmethyl, and Q is 1-naphthyl, 2-naphthyl or the radical



wherein each of X, Y and Z is hydrogen, a halogen having an atomic number of from 9 to 35, nitro, methanesulfonyl, C_1 to C_3-alkanoyl, trifluoromethyl, C_1 to C_3-alkyl, benzoyl or phenyl, and at least one of X, Y and Z is a substituent other than hydrogen, and when one of X, Y and Z is phenyl, the remaining X, Y or Z moieties are hydrogen, and when R is hydrogen, and *n* is 2 and Q is



which is monosubstituted X and Y are hydrogen and Z cannot be methanesulfonyl, or 3-chloro; and R must be C_1 to C_3-alkyl when *n* is 1, and when one of X, Y and Z is methanesulfonyl, R is C_1 to C_3-alkyl and the pharmaceutically acceptable salts thereof.

19. A method for alleviating pain in a warm blooded animal which comprises administering to the warm blooded animal suffering pain a compound of formula I in claim 1 in an amount effective to relieve the pain.

4,098,905

TRIFLUOROETHANOL AS A MALE CONTRACEPTIVE

David Blake, Ellicott, Md., and Louis Ferstandig, Hackensack, N.J., assignors to Halocarbon Products Corporation, Hackensack, N.J.

Filed Aug. 17, 1976, Ser. No. 715,074

Int. Cl.² A61K ***31/045***

U.S. Cl. 424—343 **4 Claims**

1. A method of preventing a male from impregnating a female comprising administering internally to said male a contraceptively effective amount of trifluoroethanol.

4,098,906

NON-FRIED DRY INSTANT COOKING NOODLES AND A METHOD FOR PRODUCING SAID NOODLES

Shigeru Hisaki; Ken Okada, and Sanpei Murakami, all of Osaka, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,659

Claims priority, application Japan, Apr. 19, 1976, 51-44778; Aug. 5, 1976, 51-93318

Int. Cl.² A23L ***1/16***

U.S. Cl. 426—94 **19 Claims**

1. Non-fried, dry, instant cooking noodles capable of obtaining the cooked state within 3 minutes were immersed in hot water at a temperature of 85° C, consisting essentially of a starch component and from one to 6% of sodium chloride, said starch component being comprised mainly of wheat flour and having an α conversion degree of at least 93% as measured by a diastase enzyme process, said noodles having a porous structure wherein the interior portions and the external surfaces of said noodles are connected by an irregular network of very fine cells, the surfaces of said noodles being coated with 0.2 to 5% of an edible oil and from 0.01 to 5% of an edible emulsifier, all percentages being based on the absolute dry weight of the noodles.

4,098,907

METHOD OF PREPARING THE CATALYST COMPONENT FOR α-OLEFIN POLYMERIZATION

Shoichi Tokunaga, Shinnanyo; Atsumi Kato; Yoshikazu Takahashi, both of Hikari, and Kiyoshi Yamane, Hohu, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Japan

Filed Dec. 9, 1976, Ser. No. 749,080

Claims priority, application Japan, Dec. 16, 1975, 50-149697

Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 526—116 **26 Claims**

1. A method of preparing reformed titanium trichloride catalyst for α-olefin polymerization which comprises simultaneously pulverizing

(1) a crystalline titanium trichloride compound comprising titanium trichloride and aluminum trichloride, and

(2) an organoaluminum compound of the formula $AlRnX_{3-n}$ wherein R represents a hydrocarbon radical of 1-16 carbon atoms, *n* is equal to or less than three but greater than zero, and X represents halogen or hydrogen, subsequently treating the pulverized mixture with an oxygen-containing organic solvent, separating the treated titanium trichloride from the solvent, and finally treating the thus treated titanium trichloride with a halide of a metal selected from the groups IV and V of the periodic table,

the weight ratio of said organoaluminum compound to said crystalline titanium trichloride compound being from 0.1:100 to 25:100, said oxygen-containing organic compound being at least one aliphatic ether selected from the group consisting of ethylether, propylether, n-butylether, n-amylether, iso-amylether, n-hexylether, ethylpropylether, ethylisopropylether, ethylbutylether, ethylisobutylether, ethylisoamylether and propargylether, at least one aromatic ether selected from the group consisting of anisole, phenetole and diphenylether, at least one ethyleneglycoldiether selected from the group consisting of ethyleneglycoldimethylether, ethyleneglycoldiethylether and ethyleneglycoldibutylether, at least one ethyleneglycolmonoether selected from the group consisting of ethyleneglycolmonobutylether, ethyleneglycolmonoethylether, ethyleneglycolmonohexylether, ethyleneglycolmonoisopropylether, ethyleneglycolmonomethylether and ethyleneglycolmonopropylether, or at least one cycloorganic compound selected from the group consisting of tetrahydrofuran, γ-butyrolactone, glucono-δ-lactone and propylene oxide.

4,098,908

PHENOXYPHENYL PYRIDYL KETONES AND DERIVATIVES AND THEIR USE AS HYPOLEPIDEMIC AGENTS

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

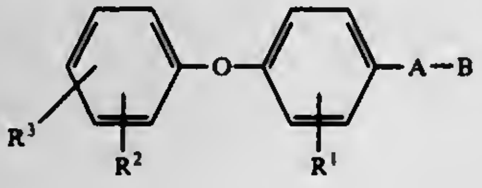
Continuation-in-part of Ser. No. 623,754, Oct. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 573,856, May 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 553,997, Feb. 28, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,161

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.² C07D *213/50;* A61K *31/44*

U.S. Cl. 424—263 **27 Claims**

1. A compound which is a member of the group consisting of a free organic base of the formula



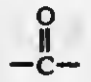
wherein

R^1 is a hydrogen atom, alkyl having from 1 to 4 carbons, fluoro or chloro;

R^2 is a hydrogen atom, alkyl having from 1 to 4 carbons, alkoxy having from 1 to 4 carbons, fluoro or chloro;

R^3 is a hydrogen atom, alkyl having from 1 to 4 carbons, alkoxy having from 1 to 4 carbons, fluoro or chloro;

A is



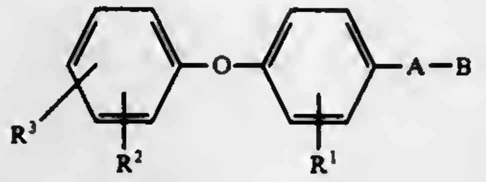
$$-\overset{\overset{\displaystyle O}{\|}}{C}-$$

and

B is an unsubstituted pyridyl radical which may be attached at its 2-, 3- or 4- position, and

pharmaceutically acceptable acid addition salts thereof; provided that when R^2 and R^3 are on adjacent carbons they are not both alkyl or alkoxy which are branched.

18. A method of obtaining a hypolipidemic effect in a mammal in need of such treatment, which comprises administering orally or parenterally to said mammal a hypolepidemic-effective amount of a compound which is a member of the group consisting of a free organic base of the formula:



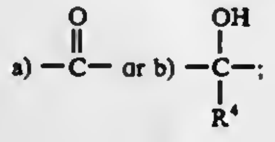
wherein

R^1 is a hydrogen atom, alkyl having from 1 to 4 carbons, fluoro or chloro;

R^2 is a hydrogen atom, alkyl having from 1 to 4 carbons, alkoxy having from 1 to 4 carbons, fluoro or chloro;

R^3 is a hydrogen atom, alkyl having from 1 to 4 carbons, alkoxy having from 1 to 4 carbons, fluoro or chloro;

A is either



$$a)\ -\overset{\overset{\displaystyle O}{\|}}{C}-\ \text{or}\ b)\ -\underset{\underset{\displaystyle R^4}{|}}{\overset{\overset{\displaystyle OH}{|}}{C}}-;$$

in which

R^4 is a hydrogen atom or alkyl having from 1 to 4 carbon atoms, and

B is an unsubstituted pyridyl radical which may be attached at its 2-, 3- or 4- position, and a

pharmaceutically acceptable acid addition salt thereof; provided that when R^2 and R^3 are on adjacent carbons they are not both alkyl or alkoxy which are branched.

4,098,909

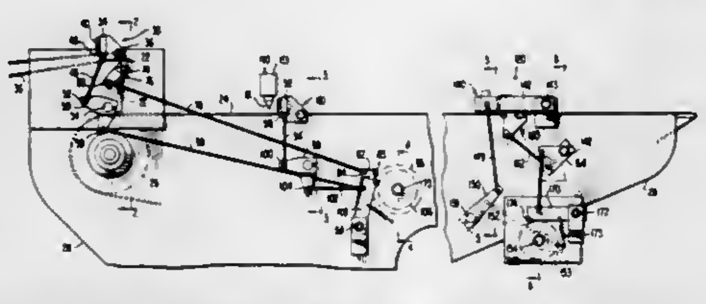
COOKIE CAPPER METHOD

Herman D. Mims, P.O. Box 26794, Charlotte, N.C. 28213

Division of Ser. No. 603,051, Aug. 8, 1975. This application Jan. 14, 1977, Ser. No. 759,524

Int. Cl.² A21D *13/00;* A21C *15/00*

U.S. Cl. 426—274 **2 Claims**



1. A method for producing filled cookies comprising feeding

a supply of baked cookie halves the opposite sides of which are not identical sequentially on a first conveyor means, allowing alternate baked cookie halves to fall freely off the end of said first conveyor means onto a second conveyor means said alternate baked cookie halves landing upon the second conveyor means in inverted position, engaging the other cookie halves with movable slide means to prevent said other cookie halves from being inverted during the free fall from the first conveyor means to a second conveyor means, placing a filling on the inverted cookie halves and transferring the non-inverted cookie halves onto the filled cookie halves to provide filled cookies.

4,098,910

FLAVORING WITH CERTAIN 3-FURYL ALKYL DISULFIDES

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Feb. 19, 1975, Ser. No. 551,045

Int. Cl.² A23L *1/231*

U.S. Cl. 426—535 **2 Claims**

1. A process for altering, or enhancing the liver flavor of a foodstuff comprising the step of adding to said foodstuff a liver flavor altering, modifying or enhancing quantity of a 3-furanalkyl disulfide selected from the group consisting of:

Ethyl(2-methyl-3-furyl) disulfide;
Isoamyl(2-methyl-3-furyl) disulfide;
Cyclohexyl(2-methyl-3-furyl) disulfide; and
Isoamyl(2,5-dimethyl-3-furyl) disulfide.

4,098,911

FOOD ANTIOXIDANTS

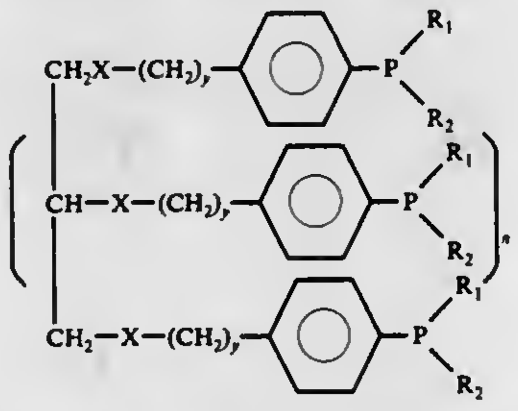
Joel Ira Shulman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 28, 1977, Ser. No. 781,823

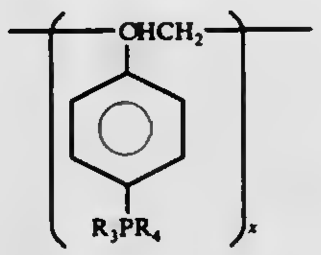
Int. Cl.² A23D *5/04*

U.S. Cl. 426—547 **3 Claims**

1. A food composition comprising fats or oils stabilized with an effective amount of a polymeric triarylphosphine or a polymeric substituted triarylphosphine of the formula:



wherein X is oxygen and R_1 and R_2 are each selected from the group of aryl and substituted aryl, *n* is an integer from 0 to 4, and *y* is an integer from 1 to 4; or



wherein *x* is an integer of from 2 to about 15 and R_3 and R_4 are each selected from the group of aryl and substituted aryl.

4,098,912

PROCESS FOR THE PRODUCTION OF COCONUT CREAM

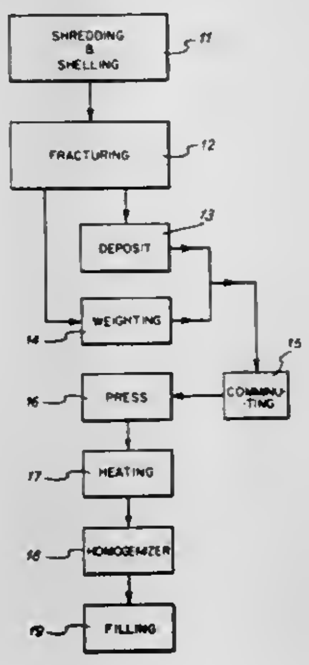
Ignacio Mercado-Flores; Sergio Carvallo-Garnica, and Luis Eduardo Lara-Sanchez, all of Mexico City, Mexico, assignors to Banco De Mexico, S.A., Mexico City, Mexico

Filed Jun. 30, 1976, Ser. No. 701,439

Claims priority, application Mexico, Jul. 14, 1975, 159584

Int. Cl.² A23B *7/08*

U.S. Cl. 426—617 **8 Claims**



1. An improved process for the production of coconut cream, which consists essentially of the steps of:

(a) shredding and shelling the fruit of the palm tree (*Cocous nucifera*) or coconut when the fruit is ripe, manually, to leave as only useful portion, the white fresh pulp containing juice in its inside;

(b) cracking the coconut (endosperm), separating the juice, which juice is thereafter utilized when it is clear and has no unpleasant odor, as otherwise the no good juice is discarded;

(c) weighting the pulp and establishing a weight of coconut juice plus fresh water, which equals the weight of the pulp;

(d) comminuting the coconut pulp while heating coconut juice plus water at the boiling temperature of the mixture so that the comminution takes place in the presence of hot aqueous liquid;

(e) expressing under a low pressure, the mixture of comminuted pulp plus hot aqueous liquid, whereby a liquid "coconut cream" is obtained;

(f) passing the coconut cream to a bucket having a vapor jacket wherein said coconut cream is heated;

(g) adding to the coconut cream, one or more additives selected from the group consisting of 5 to 15% glucose, 30 to 45% sucrose, 3 to 15% glyceryl monostearate, 0.31 to 0.49% carboxymethylcellulose and mixtures thereof,

(h) stirring the coconut cream and its additives and immediately heating the mixture;

(i) homogenizing the liquid product of the above step and

(j) bottling or canning the homogeneous product.

4,098,913

GELATINIZED FAT PARTICLES

William Lewis Baugher, Logan Township, Dearborn County, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 605,471, Aug. 18, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,361

Int. Cl.^{2} A23D *5/00;* **A23J** *3/00*

U.S. Cl. 426—104 **5 Claims**

1. The process of texturizing fat for use in meat analog products comprising:
   (a) mixing 100 parts of a triglyceride fat and from about 2 to about 20 parts of an oil-soluble gelling agent which is ethyl cellulose having a viscosity of from about 50 to about 200 centipoises, at a temperature above that of gelatinization;
   (b) cooling said mixture to a temperature below that of gelatinization while simultaneously agitating said mixture, said simultaneous cooling and agitation being effected by the addition of water to said mixture in order to form agitating steam within said mixture, thereby providing discrete, irregularly shaped particles of gelled fat.

4,098,914

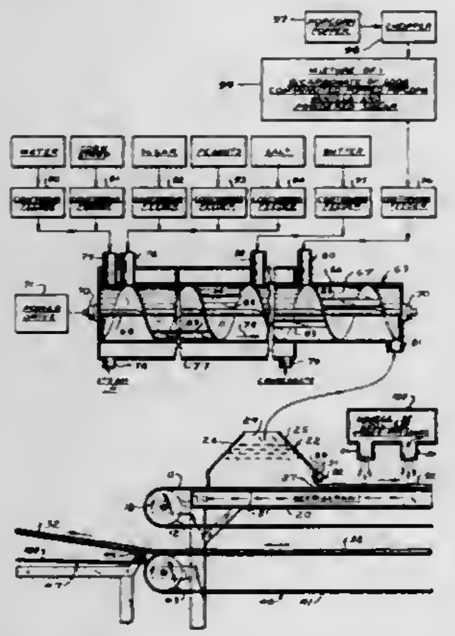
PEANUT BRITTLE MANUFACTURE

Herbert B. Knechtel, 2600 Windsor Mall, Park Ridge, Ill. 60068

Filed Aug. 2, 1976, Ser. No. 710,434

Int. Cl.^{2} A23G *3/00*

U.S. Cl. 426—632 **3 Claims**



3. Nut brittle which includes, in addition to the usual constituents thereof, including bicarbonate of soda, an amount of comminuted popped popcorn which amount is within the range of about three-tenths of one percent to about two percent by weight of the total constituents thereof and which has a size sufficiently small to pass through a No. 1 mesh screen and is characterized by being more tender to the bite while still retaining the characteristics of nut brittle.

4,098,915

METHOD FOR CONTROLLABLY APPLYING LIQUIDS TO A MOVING SURFACE

Walter B. Warning, Sr., Chicago, and Walter B. Warning, Jr., Schaumburg, both of Ill., assignors to Airprint Systems, Inc., Itasca, Ill.

Division of Ser. No. 562,679, Mar. 27, 1975, Pat. No. 4,013,037. This application Jan. 3, 1977, Ser. No. 756,415

The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.

Int. Cl.^{2} B05D *1/04;* **B05B** *12/00*

U.S. Cl. 427—8 **1 Claim**

1. A method of controlling the operation of a device for applying liquid in a predetermined pattern to a moving surface, comprising
   mounting a liquid applying device in a fixed position along the path of travel of said surface,
   feeding liquid from said device to said surface as said surface moves past said device,
   generating a pulse for each predetermined increment of movement of said surface,
   counting said pulses and controlling the initiation and termination of the feeding of liquid from said device to said surface in response to predetermined respective counts of said pulses, and
   varying the flow rate at which liquid is fed from said device to said surface in response to changes in the rate at which said pulses are generated.

4,098,916

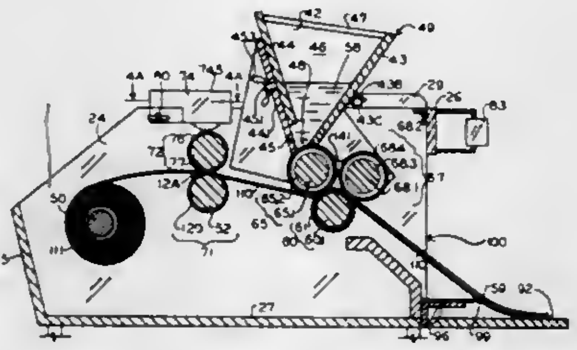
PROCESS OF DISPENSING, MEASURING, COATING AND CUTTING SHEET MATERIAL

Leonard Crawford Ruthart, 408 Taylor La., and Virgil Lynn Williams, 2611 Tenth Ave., both of Canyon, Tex. 79015

Continuation of Ser. No. 617,748, Sep. 29, 1975, abandoned, which is a division of Ser. No. 396,059, Sep. 10, 1973, Pat. No. 3,924,561. This application Jul. 15, 1977, Ser. No. 816,153

Int. Cl.^{2} C09J *7/04*

U.S. Cl. 427—8 **8 Claims**



1. In a process for measuring, coating, dispensing and cutting a textured sheet comprising an exterior textured surface layer with indentations therein on one side of said sheet and a rough backing layer on the opposite side of said sheet and firmly adherent to said first textured surface layer, the improvement comprising the steps of
   (a) rotatably supporting a generally cylindrical roll of said textured sheet along a first central longitudinal axis of said roll
   (b) unrolling portions of said sheet from said roll and sequentially passing each of such portions between a pair of generally cylindrical rollers each with a central longitudinal axis parallel to each other and to said first central longitudinal axis of said roll and spaced apart longitudinally from said first axis of said roll, said passing being accomplished by
      (i) driving one of said rollers to rotate about its axis while, on the surface of said one roller a plurality of fine resilient fibers of varied length and having a diameter smaller than the size of the indentations in said first surface of said textured sheet extend at an acute angle to the peripheral surface of said one roller and resiliently engage said exterior textured surface layer of said portion of said sheet and
      (ii) a second roller with a rough cylindrical surface layer yieldably presses on and directly engages the rough backing layer of said one portion of the textured sheet and yieldably forces the other textured surface layer of said one portion of the textured sheet against the elastic fibers on the surface of the first roller and resiliently deforms said fibers and said deformed fibers then engage and grip the textured surface layer without scratching or puncture thereof and said deformed fibers on said one roller then move all portions of said textured sheet across the width thereof at a uniform rate along its length and said second roller is then rotated by the rough backing layer of said textured sheet without slippage and
   (c) repeatedly sensing and measuring the rotary movement of said second roller and indicating a linear measurement thereof and
   (d) contacting a second portion of said exterior textured surface layer of said textured sheet by a third roller and driving said third roller while a fourth roller free of direct contact with said third drive roller contacts said backing layer of said second portion of said textured sheet and is rotated by engagement therewith and transfers adhesive on to the exterior backing layer of said second portion of said textured sheet and coats said exterior backing layer of said sheet therewith and
   (e) stopping the movement of said sheet by said rollers after a predetermined indication of amount of movement of said sheet along its length and, while continuing to hold said sheet between said rollers, cutting the coated sheet.

4,098,917

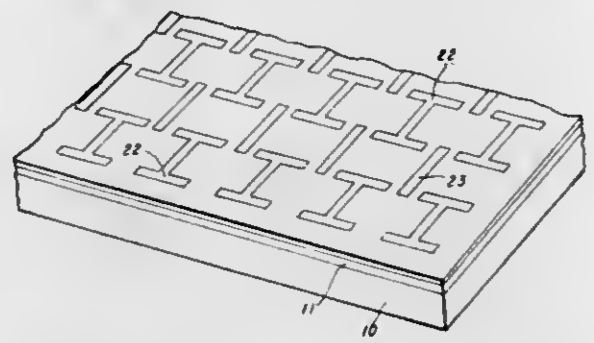
METHOD OF PROVIDING A PATTERNED METAL LAYER ON A SUBSTRATE EMPLOYING METAL MASK AND ION MILLING

David Carl Bullock, and Mohammed Sabir Shaikh, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1976, Ser. No. 721,249

Int. Cl. H01f *10/00*

U.S. Cl. 427—36 **12 Claims**



1. A method of providing a substrate with a patterned metal layer disposed thereon, said method comprising:
   depositing a metal layer to be patterned onto the substrate;
   depositing a layer of a metallic masking material taken from the group consisting of vanadium, tantalum, titanium and titanium-tungsten alloy to cover the metal layer;
   depositing a layer of photosensitive material onto the layer of the metallic masking material;
   selectively exposing the layer of photosensitive material to a source of light;
   developing the photosensitive material to define a pattern therein exposing selected regions of the layer of metallic masking material;
   subjecting the exposed regions of the layer of metallic masking material to a plasma etch to selectively remove said exposed regions of metallic masking material down to the level of the metal layer to be patterned;
   removing the remaining portion of the layer of photosensitive material to expose the remaining portions of the layer of metallic masking material as a patterned metallic mask which protects selected portions of the metal layer to be patterned;
   subjecting the exposed regions of the metal layer to ion milling for removing the said regions, thereby producing a pattern in the remaining portions of the metal layer to be patterned; and
   subjecting the patterned metallic mask to a plasma etch for stripping the metallic mask so as to expose the patterned metal layer previously covered thereby.

4,098,918

METHOD OF POLYMERIZING NON-LINEAR URETHANE DIACRYLATES USING RADIATION

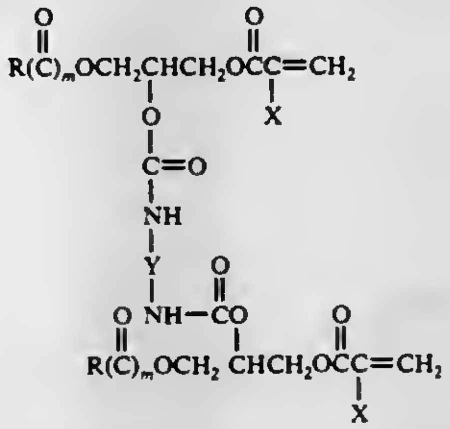
Robert DeMajistre, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 329,914, Feb. 5, 1973, Pat. No. 3,979,426, which is a continuation-in-part of Ser. No. 171,321, Aug. 12, 1971, abandoned. This application Apr. 21, 1976, Ser. No. 678,854

Int. Cl.^{2} C08G *18/00, 63/00*

U.S. Cl. 427—36 **26 Claims**

1. A method of obtaining a hard, stain resistant material comprising subjecting to ionizing irradiation or actinic light a compound represented by the general formula:



wherein R is an alkyl radical, Y is a divalent hydrocarbon having from 6 to 16 carbon atoms, X is hydrogen or methyl and *m* is 0 or 1.

4,098,919

PROCESS FOR PRODUCING A THIN FLUORESCENT FILM FOR ELECTROLUMINESCENCE

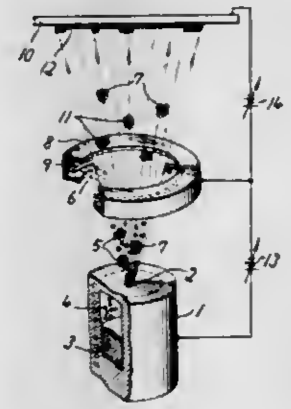
Kiyoshi Morimoto; Yukihiko Utamura, both of Mobara, and Toshinori Takagi, Nagaokakyo, all of Japan, assignors to Futaba Denshi Kogyo K.K., Japan

Filed Jan. 10, 1975, Ser. No. 585,597

Claims priority, application Japan, Jan. 10, 1974, 49-65077

Int. Cl.^{2} C09K *11/10, 11/14*

U.S. Cl. 427—42 **5 Claims**



1. A process for producing a thin fluorescent film for electroluminescence coated upon a base plate, which comprises the steps of:
   (a) placing a base material and an activator within an enclosed-type crucible having at least one injection nozzle;
   (b) placing the thus charged crucible into a vacuum chamber;
   (c) heating said base material and activator so as to generate

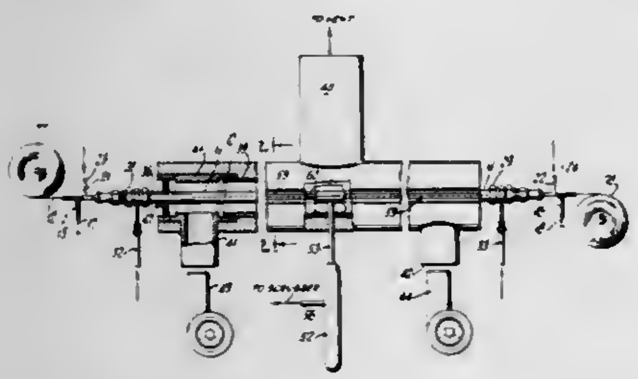
a mixed vapor within said crucible having a pressure greater than the vacuum outside the crucible;
- (d) injecting said mixed vapor into said vacuum zone through said injection nozzle provided upon said crucible to adiabatically expand said mixed vapor so as to attain a supercooled state and form a mixed vapor comprising atom groups or clusters;
- (e) projecting an electron beam into said injected mixed vapor comprising said atom groups or clusters so as to thereby ionize at least a portion of said atom groups or clusters;
- (f) accelerating said ionized atom groups or clusters by means of an electric field; and
- (g) permitting said mixed vapor comprising said ionized and accelerated atom groups or clusters and the non-ionized atom groups or clusters to collide with said base plate so as to thereby form a vapor-deposited film, acting as a fluorescent film, upon said base plate.

4,098,920
METHOD OF CONTINUOUS PRODUCTION OF SUPER CONDUCTING WIRE
Gordon H. Miller, Littleton, Colo., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,702

Int. Cl.² B05D *3/06*

U.S. Cl. 427—46 **1 Claim**



1. Method of continuous production of a superior superconducting compound in wire form, comprising the steps of
- passing a filament of niobium wire substrate through a plating chamber,
- heating said wire filament in said plating chamber to a temperature of about 1,200° C. by generating a standing half wave of radio frequency current in a predetermined length of said wire and by simultaneously passing a DC electric current through said wire in said chamber,
- introducing gaseous germanium chloride and niobium chloride and hydrogen in relative amounts to produce optimum rate of plating of the super conductor compound niobium-germanium on said niobium substrate and introducing an inert gas to assist in temperature control, and
- passing said plated filament out of said chamber for freezing said compound in place on said filament.

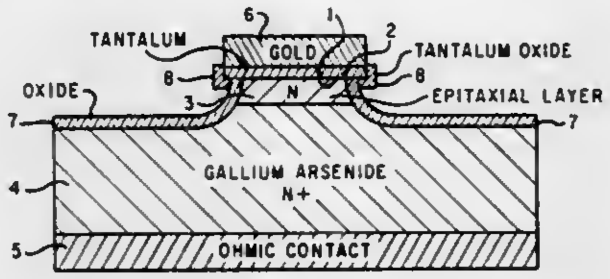
4,098,921
TANTALUM-GALLIUM ARSENIDE SCHOTTKY BARRIER SEMICONDUCTOR DEVICE
Joseph A. Calviello, Kings Park, N.Y., assignor to Cutler-Hammer, Milwaukee, Wis.

Filed Apr. 28, 1976, Ser. No. 681,197

Int. Cl.² H01C *7/00;* **H01G** *9/00*

U.S. Cl. 427—53 **5 Claims**

1. A method of producing a passivation film on the surface of a body of gallium arsenide comprising the steps of:
- (a) cleaning the surface of said body,
- (b) oxidizing said surface by immersion in a hydrogen peroxide solution under strong illumination impinging on said surface long enough to produce an oxide film of about 500A to 1000A thick.

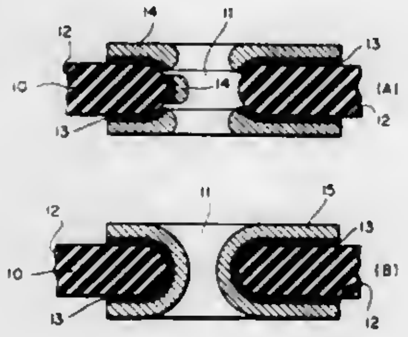


4,098,922
METHOD FOR DEPOSITING A METAL ON A SURFACE
Donald Dinella, Berkley Heights; John Allen Emerson, Alexandria Township, Hunterdon County, and Ted Dennis Polakowski, Jr., Fairview, all of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

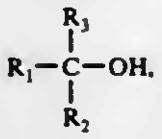
Filed Jun. 7, 1976, Ser. No. 693,600

Int. Cl. B44d *1/18*

U.S. Cl. 427—54 **53 Claims**



1. A method of depositing a metal on a surface of a substrate including the walls of at least one aperture contained in the substrate, which comprises:
- (a) coating the surface with a sensitizing solution comprising at least a reducible salt of a non-noble metal dissolved in a binary solvent, for providing a continuous metal deposit on the walls, consisting essentially of water and an alcohol having a structural formula of



$$R_1-\underset{R_2}{\overset{R_3}{\underset{|}{\overset{|}{C}}}}-OH,$$

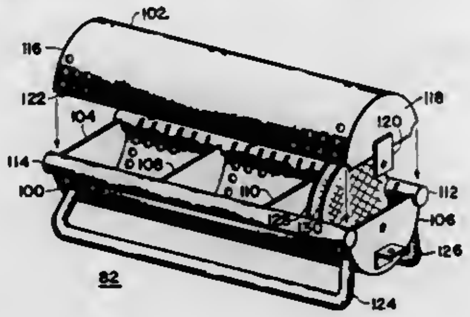
where R_1, R_2, and R_3 are members selected from the group consisting of an alkyl group having 1 to 7 carbon atoms and the hydrogen atom, where said alcohol has a total of 2 to 8 carbon atoms and where said alcohol is present in an amount of at least 5 weight percent when said alcohol has two carbon atoms and in an amount of at least 0.1 weight percent when said alcohol has more than two carbon atoms; and
- (b) treating said coated surface by (1) drying it and exposing it to a source of light radiant energy or (2) exposing it to a chemical reducing agent or (3) heating it to reduce said metal salt to metallic nuclei to form a catalytic layer thereon capable of directly catalyzing the deposition of a metal on said nuclei from an electroless metal deposition solution.

4,098,923
PYROLYTIC DEPOSITION OF SILICON DIOXIDE ON SEMICONDUCTORS USING A SHROUDED BOAT
Robert Stanley Alberti, and Jon Charles Goldman, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 7, 1976, Ser. No. 693,382

Int. Cl.² B05D *5/12*

U.S. Cl. 427—85 **11 Claims**



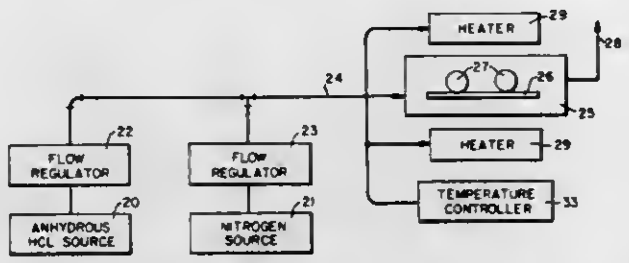
1. A method for pyrolytically depositing silicon dioxide on the surfaces of semiconductor substrates comprising the steps of:
- (a) loading said substrates in a boat;
- (b) surrounding said boat with a cylindrical shroud of perforated metal;
- (c) positioning said shrouded boat in the interior region of a furnace tube such that broad surfaces of said substrates are perpendicular to the longitudinal axis of said furnace tube and the cylindrical axis of said shroud is in the same direction as said longitudinal axis;
- (d) heating said substrate;
- (e) evacuating said furnace tube; and
- (f) injecting oxygen and reactant gas comprising silane into said evacuated furnace tube, each through separate injection tubes positioned in said interior region with said injection tubes having multiple ports located adjacent said shrouded boat to restrict the injection to occur in the vicinity of said shrouded boat and to enhance the mixing of said oxygen and said reactant gas in said vicinity.

4,098,924
GATE FABRICATION METHOD FOR MNOS MEMORY DEVICES
Raymond M. McLouski, Glen Burnie, and Philip R. Reid, Laurel, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1976, Ser. No. 733,746

Int. Cl.² B05D *5/12;* **H01L** *29/78*

U.S. Cl. 427—93 **20 Claims**



1. A method of growing an insulating layer from a thin oxide layer formed on a silicon substrate to improve the memory window and reduce the rate of memory decay of a device in which said layer and substrate is utilized, comprising the steps of:
- heating the substrate on which the layer is formed in a furnace chamber of approximately 600° to 900° centigrade through which a substantially pure inert gas is flowing at a selected rate;
- introducing anhydrous HCL into the furnace at a selected rate to subject the heated oxide layer to a predetermined percentage mixture of the inert gas and the anhydrous HCL;
- eliminating the anhydrous HCL from the mixture upon the expiration of a selected period of time; and
- permitting the substrate to cool.

4,098,925
METHOD FOR PROTECTING SHIPS AGAINST FOULING
Oystein E. Rasmussen, Hosleveien 119, 1340 Bekkestua, Norway

Filed Feb. 15, 1977, Ser. No. 768,891

Claims priority, application Norway, Feb. 26, 1976, 760651

Int. Cl.² B63B *59/00;* **B05D** *1/36, 3/12, 5/08*

U.S. Cl. 427—154 **10 Claims**

1. A method for protecting a ship against fouling and corrosion by applying a layer of wax to the underwater surfaces of the ship, characterized in that several successive layers of wax coating are applied to the underwater surfaces in sequence, each layer having a successively lower melting point and/or degree of hardness, so that the layers can be removed successively when the surface has been subjected to growth formation.

4,098,926
METHOD OF PRODUCING OPTICAL CABLES
Björn Nöthe, Ebersberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 22, 1977, Ser. No. 770,306

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606782

Int. Cl.² G02B *5/14, 5/16, 1/10;* **C03C** *17/32*

U.S. Cl. 427—163 **10 Claims**

1. A method of enveloping at least one optical fiber element by first enveloping such fiber element with a continuous layer of a soft cast synthetic resin and then hardening said resin about said fiber element by a chemical reaction to form a flexible and mechanically stable optical body.

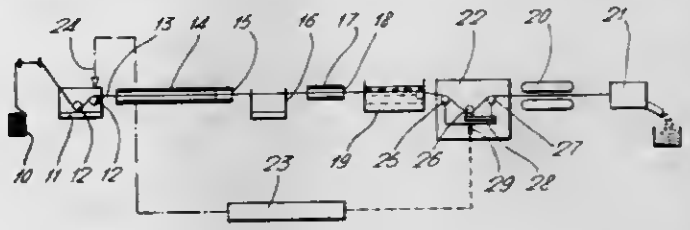
4,098,927
METHOD FOR PRODUCING FIBRE-REINFORCED THERMOPLASTIC POLYMER
George Derek Gray, Luton, England; Alastair Cox Harper, Powis, Wales, and Brian William Richard Tunnicliffe, Boreham Wood, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 15, 1976, Ser. No. 732,589

Claims priority, application United Kingdom, Nov. 7, 1975, 46208/75

Int. Cl.² B65C *17/00;* **B32B** *31/00*

U.S. Cl. 427—195 **11 Claims**



1. A method for the production of a fibre-reinforced thermoplastic lace comprising:
- (a) impregnating a roving with a supply of powdered thermoplastic polymer;
- (b) heating the impregnated roving in a chamber to melt the powdered polymer;
- (c) drawing the roving containing molten polymer through a forming surface to consolidate the product and remove excess polymer;

(d) monitoring the tension developed in the impregnated roving; and

(e) adjusting the amount of powdered thermoplastic polymer entrained with the roving before it enters the melting chamber in accordance with the magnitude of the tension in the impregnated roving so that the tension in the impregnated roving is controlled between predetermined upper and lower limits, the predetermined upper limit being below the breaking value of tension for the impregnated roving.

4,098,928

METHOD OF COATING UNDERWATER METAL SURFACES

Arie Noomen, Voorhout, and Leendert Anton Kik, Wassenaar, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Oct. 12, 1976, Ser. No. 731,575

Claims priority, application Netherlands, Oct. 14, 1975, 7512036

Int. Cl.^{2} B05D *1/12, 1/36*

U.S. Cl. 427—203 **15 Claims**

1. Method for applying a coating system comprising a primer and a top coat to a steel surface positioned underwater or in the splash zone in which the primer is applied to the steel surface as a result of a collision between the steel surface and carrier particles covered with priming material forming a hydrophobic coat, after which the top coat is applied.

4,098,929

METHOD FOR IMPROVED PARTING FROM HOT SURFACES

Louis Badone, Willowdale, and Alexander March, Mississauga, both of Canada, assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 12, 1973, Ser. No. 415,860

Int. Cl.^{2} B22D *41/02*

U.S. Cl. 427—236 **24 Claims**

1. The method of applying graphite to a surface for assuring improved parting therefrom, comprising the steps of:

heating a surface adapted to receive the graphite, applying a graphite suspension to the heated surface, the suspension consisting essentially of colloidal graphite suspended in a mineral spirits type of media which is, in turn, emulsified in water, whereby a coating consisting essentially of the graphite particles is formed on the heated surface.

4,098,930

METHOD FOR PRODUCING MICROPOROUS SEPARATOR FOR ELECTROCHEMICAL CELL

Shiro Nakayama; Kuniyuki Nakayama, and Ikuo Nakaya, all of Tokyo, Japan, assignors to The Fujikawa Cable Works, Ltd., Japan

Filed Nov. 22, 1976, Ser. No. 743,919

Claims priority, application Japan, Sep. 17, 1976, 51-110753

Int. Cl.^{2} B05D *3/10, 5/00*

U.S. Cl. 427—246 **15 Claims**

1. A method for making a micorporous separator for an electrochemical cell which comprises dissolving a copolymer of acrylonitrile with a small amount of comonomer into N,N-dimethyl formamide to form a solution consisting of 4 to 12% by weight of said copolymer and the balance N,N-dimethylformamide; applying the resultant copolymer solution to a fibrous web to impregnate said web with said solution, said web being resistant to acids, alkalis or both; and thereafter dipping the resultant impregnated web in an aqueous coagulating bath selected from the group consisting of water at a temperature of 15° C or below and aqueous solutions of a water-soluble acidic solute, basic solute, or neutral solute at a concentration of one mole/l or above, wherein if said basic solute is a strong base, said concentration is no greater than 15%, and if said basic solute is N,N-dimethylformamide, said concentration is no greater than about 60%; whereby said copolymer deposits on and between the fibers of said web by coagulation to form at microporous matrix.

4,098,931

PROCESS FOR COATING CELLULOSIC PLASTIC ARTICLES

Motoaki Yoshida, Takarazuka, and Nobuhiro Sakata, Nishinomiya, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 22, 1977, Ser. No. 780,187

Claims priority, application Japan, Mar. 31, 1976, 51/36546

Int. Cl.^{2} B44D *1/092*

U.S. Cl. 427—324 **6 Claims**

1. A process for coating a cellulosic plastic article which comprises contacting the surface of a cellulosic plastic article with an aqueous solution containing an alkali metal hydroxide or alkoxide in a concentration of 3 to 40% by weight calculated as the hydroxide and an alcohol in a concentration of 3 to 40% by weight, wherein the product of the alkali metal concentration in percent by weight multiplied by the alcohol concentration in percent by weight is 50 to 200; then coating a thermosetting resin on the treated surface and finally curing the coating.

4,098,932

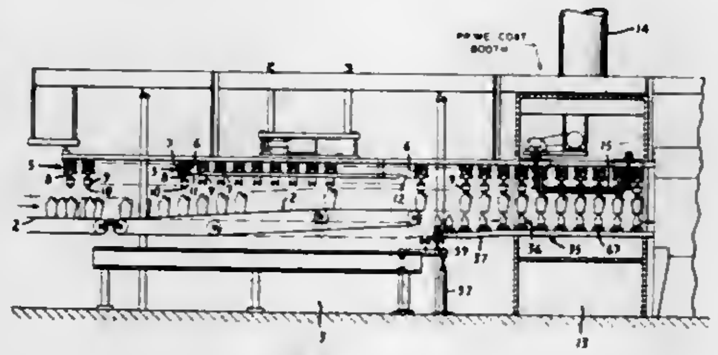
ULTRA HIGH SPEED BOTTLE COATING PROCESS

Dale George Frischbe, Belleville, Ill., assignor to Indian Head Inc., New York, N.Y.

Continuation of Ser. No. 579,776, May 22, 1975, abandoned, which is a division of Ser. No. 453,829, Mar. 22, 1974, Pat. No. 3,902,453. This application Apr. 18, 1977, Ser. No. 788,337

Int. Cl.^{2} B05D *1/02*

U.S. Cl. 427—374 R **2 Claims**



1. An ultra high speed coating process for spray coating about 90 to 100 suspended bottles per minute without wobble of the suspended bottles during the spray coating operation and without appreciable bottle breakage, each of which bottles has a dimple centrally located in the bottom of the bottle, which comprises sequentially and synchronously:

(1) unpacking the bottles from cartons at a bottle unpacking station into upright multi-files and conveying and directing said multi-files of bottles into single file onto a first single file bottle belt conveyor,

(2) conveying said single file of bottles in an upright position on said first single file bottle belt conveyor from said bottle unpacking station to a bottle loading station,

(3) loading the upright bottles by their finish from said first single file bottle belt conveyor into bottle chucks carried by an aligned and synchronized overhead chuck conveyor at a bottle loading station,

(4) engaging the bottle bottom dimples with engageable stabilizing pivot pins carried by a bottle bottom stabilizing conveyor, said pivot pins being in synchronized parallel alignment and registration with the bottle chucks,

(5) rotating and spray coating the sides and bottoms of the upright bottles at least once while suspended vertically from said overhead chuck conveyor and stabilized by said bottle bottom stabilizing conveyor, both conveyors traveling through at least one bottle rotating and spray coat station, the bottles being spray coated at an ultra high speed of about 90 to 100 bottles per minute,

(6) disengaging the stabilizing pivot pins from the bottle bottom dimples after the upright bottles exit from said at least one bottle rotating and spray coat station,

(7) heat drying the bottoms of the coated bottles while suspended vertically from said overhead chuck conveyor traveling through a bottle bottom dryer,

(8) unloading the coated bottles in single file upright position from said overhead chuck conveyor onto a second aligned and synchronized single file bottle belt conveyor at a bottle unloading station,

(9) conveying the single file of upright coated bottles on said second single file bottle belt conveyor from said bottle unloading station to a multi-file bottle stacking station,

(10) stacking said upright coated bottles at said multi-file bottle stacking station from said second single file bottle belt conveyor into multi-files onto a conveyor belt passing through a curing oven,

(11) curing and cooling the multi-files of upright coated bottles while passing through a curing oven having heating and cooling sections, and

(12) packing the cured and cooled coated bottles into cartons at a bottle packing station.

4,098,933

PROCESS FOR THE PRODUCTION OF WATER-SOLUBLE OR WATER-DISPERSIBLE BLOCKED POLYISOCYANATES

Tilo Burkhardt; Kuno Wagner, and Kurt Findeisen, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 10, 1975, Ser. No. 630,112

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456469

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—379 **9 Claims**

1. A process for the production of a water-soluble or water-dispersible blocked polyisocyanate, wherein from about 85 to 95% of the isocyanate groups of an organic polyisocyanate are converted into a partially blocked polyisocyanate in a known manner by reaction with a blocking agent selected from the group consisting of C-H-acid compounds and lactams, and the thus obtained partially blocked polyisocyanate is subsequently reacted with a compound which contains at least one isocyanate-reactive hydrogen atom and at least one hydrophilic group, or group which can be converted into a hydrophilic group, responsible for the solubility or dispersibility of the reaction product in water, said compound selected from the group consisting of

i. aliphatic hydroxy carboxylic acids, with molecular weights of less than about 300, aliphatic or aromatic amino carboxylic acids with primary or secondary amino groups and molecular weights less than about 300, aliphatic hydroxy sulphonic acids with molecular weights less than about 300, aliphatic or aromatic aminosulphonic acids with primary or secondary amino groups and molecular weights less than about 300 and the alkali metal salts of these acids,

ii. tertiary amines with aliphatically bound hydroxyl groups and molecular weights of less than about 300 and the corresponding ammonium salts of these tertiary amines, and

iii. monohydroxy polyalkylene oxides with molecular weights of between about 500 and 5000 and at least about 50% ethylene oxide units,

and said group convertible into a hydrophilic group, if present, being converted into a hydrophilic group on completion of the isocyanate addition reaction.

4. The use of the water-soluble or water-dispersible blocked polyisocyanates obtainable in accordance with claim 1, in the form of their aqueous solution or dispersion, in combination with aqueous solutions or dispersions of organic compounds with at least two isocyanate-reactive hydrogen atoms and optionally in conjunction with other auxiliaries and additives, for the production of sheet-form materials by coating suitable substrates with the combined aqueous solutions or dispersions, removing the water and simultaneously or subsequently cross-linking the thus-obtained coating under the action of heat.

4,098,934

SHATTER RESISTANT GLASS CONTAINER

M. Clifford Brockway, Columbus, and Robert E. Sharpe, Worthington, both of Ohio, assignors to Liberty Glass Company, Sapulpa, Okla.

Continuation of Ser. No. 364,094, May 25, 1973, abandoned. This application Oct. 23, 1975, Ser. No. 624,785

Int. Cl.^{2} B32B *17/10*

U.S. Cl. 428—35 **17 Claims**

1. A container possessing high mechanical service strength and shatter resistance consisting essentially of a glass container body and overlying the outside surface of said body a plastic containment coating including at least one film, the mechanical properties of said coating being such that, when subjected to tensile testing at room temperature and an extension rate of at least about 10 in./min. per 5 in. of film length, the entire coating exhibits a tensile strength of at least about 300 lbs./sq. in., an elongation of at least about 80%, and a modulus of elasticity in tension which is less than about 1,000 lbs./sq. in. substantially throughout the course of the extension of the film.

4,098,935

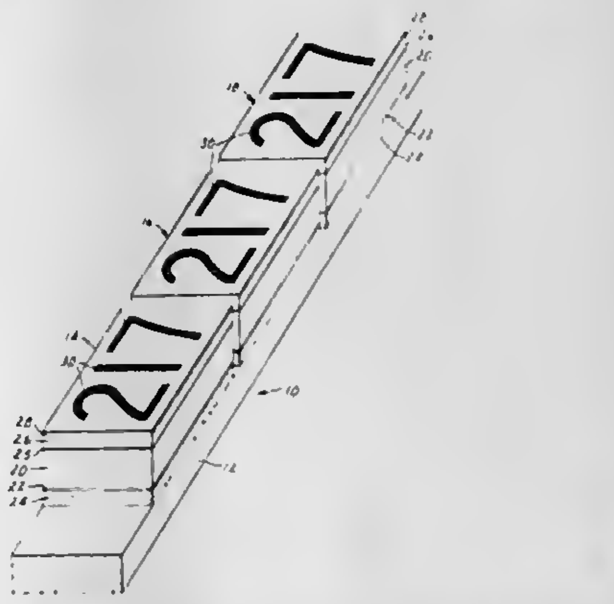
MAGNETIC IDENTIFICATION LABEL TAPE AND METHOD

James K. Knudsen, Woodbury Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1975, Ser. No. 611,235

Int. Cl.^{2} C09J *7/02*

U.S. Cl. 428—40 **16 Claims**



1. A tape for labeling vulcanizable rubber articles such as vehicle tires, said tape comprising a flexible temporary carrier web having a low-adhesion surface and a detachable label adhered thereto, which label comprises

(a) a flexible, non-porous substantially uniformly thick backing of polyimide or biaxially oriented polyester which has a thickness within the range of 10 to 100 micrometers, and which will during molding operations withstand vulcanization temperatures and pressure without appreciable dimensional change,

(b) an adhesion promoting primer of substantially uniform thickness on one surface of the backing, said primer hav-

ing a dry coating weight within the range of 0.1 to 3 grams/meter^2,
- (c) a substantially uniformly thick layer of pressure sensitive adhesive, the dry coating weight of which is within the range of 6 to 45 grams/meter^2, permanently adhered via the adhesion promoting primer to one surface of said backing and releasably adhered to said low-adhesion surface of said carrier web, and
- (d) a substantially uniformly thick magnetic recording layer secured to the other surface of the backing, which recording layer is less than 50 micrometers thick, comprises a major proportion by weight of magnetizable particles and a minor proportion of a polymeric binder and has a remanent flux of at least 0.4 maxwells per cm of width,

the characteristics of said label enabling a magnetic code to be recorded thereon prior to the application thereof to a said vulcanizable rubber article such that it becomes securely bonded to the article during vulcanization, and further enabling the recorded magnetic code to be readily detected after vulcanization.

4,098,936

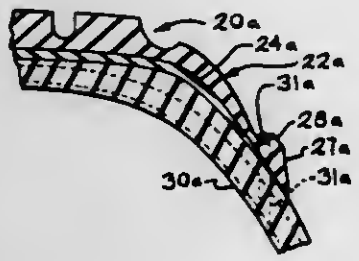
PRE-CURED TREAD FOR RECAPPING TIRES AND METHOD FOR THE USE THEREOF

Vaughn Rawls, Lima, Ohio, assignor to National-Standard Company, Niles, Mich.

Filed Mar. 1, 1976, Ser. No. 662,510

Int. Cl.^{2} B29H *17/37*

U.S. Cl. 428—40 16 Claims



1. A method for applying a pre-cured tread stock to a tire casing, said tread stock having a central portion adapted to have a tread pattern thereon and further having an outer annular ground contacting surface and terminal end portions at the edges of the central portion, each of said terminal end portions having seat means thereon adapted to receive retaining means, said seat means on each of the terminal end portions being positioned radially inwardly of the outer surface of the central portion, said method comprising the steps of:
- placing a sufficient length or lengths of said tread stock on the perimeter of a tire casing to circumscribe said casing with the central portion and outer annular ground contacting surface thereof overlying the central portion of said tire casing in ground contacting position,
- pressing the underside of said central portion of said tread stock tightly against the surface of said tire casing to exclude air from therebetween,
- positioning retaining means in each of said seat means in each of the terminal end portions for squeezing said terminal end portions tightly against the surfaces of said casing,

curing said tread stock into place on said casing and, removing said retaining means.

4,098,937

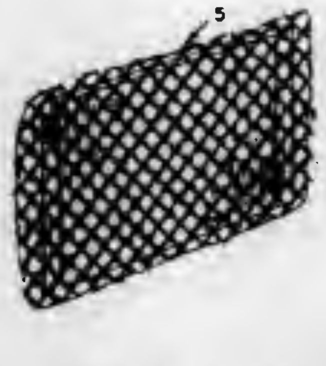
TREATMENT OF FABRICS IN MACHINE DRYERS

William G. Mizuno, St. Paul, Minn., and Iris N. Henderson, Parkridge, Ill., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 232,432, Mar. 7, 1972, Pat. No. 4,004,685, which is a division of Ser. No. 470,565, May 16, 1974, Pat. No. 3,967,008. This application Jul. 12, 1976, Ser. No. 704,459

Int. Cl.^{2} B32B *7/00, 9/04;* D06M *11/00*

U.S. Cl. 428—68 9 Claims



1. An article for conditioning fabrics in a machine clothes dryer by contact of the fabrics with a fabric-conditioning agent supplied by said article, said article characterized by having:
- (a) fabric conditioning agent in a three-dimensional consolidated reusable mass that is solid at normal room temperature and softens at the elevated temperatures reached during normal operation of a machine clothes dryer; said mass having a softening range of at least 10 Centigrade degrees;
- (b) a dispenser body surrounding or enclosing the fabric conditioning agent;
- (c) said dispenser body including a permeable outer surface through which only a small amount of said enclosed fabric conditioning agent can pass when it is softened by heating of said article in a dryer, thereby allowing the enclosed fabric-conditioning agent to act as a long lasting reservoir for fabric conditioning agent which, after it passes through the permeable surface, is transferred to the fabric being treated by contact between the fabric and the permeable surface of the article; and
- (d) said article being capable of substantial reuse in conditioning different batches of fabric without replenishing the fabric conditioner of paragraph (a) hereof.

4,098,938

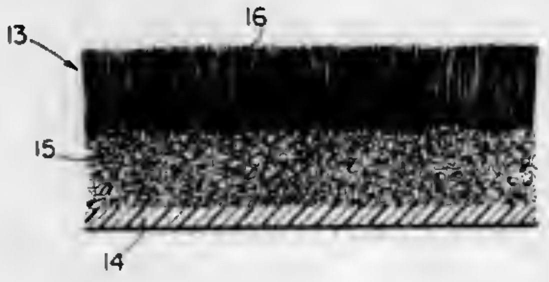
HEAT DEFORMABLE LAMINATES AND PROCESS OF MAKING SAME

James C. Arters, Parkside, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 92,869, Nov. 25, 1970, abandoned, which is a continuation of Ser. No. 860,168, Sep. 18, 1969, abandoned, which is a continuation of Ser. No. 524,509, Feb. 2, 1966, abandoned. This application Feb. 12, 1974, Ser. No. 441,797

Int. Cl.^{2} B32B *3/12, 3/26*

U.S. Cl. 428—160 20 Claims



12. A contoured support member having a contoured cushioning supporting surface of a desired configuration for supporting an article, said support member comprising:
- (a) a stable, contoured, thermoplastic sheet having an inner surface contour substantially the same as the contour of said supporting surface;
- (b) a layer of resilient, flecibly stretchable, cross-linked thermoset-type polyurethane foam having a surface secured to said inner surface of said thermoplastic sheet, said polyurethane foam layer having generally the contour of said inner surface of the thermoplastic sheet whereby the exposed surface of the polyurethane foam layer opposite from said secured surface has the same general configuration as the inner surface of the thermoplastic sheet and constitutes the supporting surface of the support member; and
- (c) said stable thermoplastic sheet retaining said polyurethane foam layer in its contoured configuration.

4,098,939

SUBSTRATE ASSEMBLY FOR A LUMINESCENT DISPLAY PANEL HAVING FIRED LIQUID GOLD LAYERS FOR SEGMENTED DISPLAY ELECTRODES

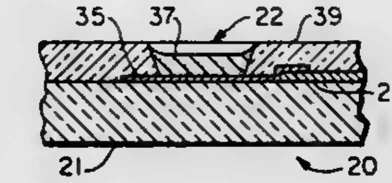
Toshiro Kuroda, and Susumu Kakami, both of Aichi, Japan, assignors to Narumi China Corporation, Aichi, Japan

Filed May 21, 1976, Ser. No. 688,900

Claims priority, application Japan, May 22, 1975, 50-61563; Aug. 22, 1975, 50-102292

Int. Cl.^{2} B32B *3/00, 7/14*

U.S. Cl. 428—201 14 Claims



1. In a substrate assembly for a luminescent display panel comprising a substrate of an electrically insulating material, a plurality of segmented electrodes on said substrate, masses of a luminescent material on said segmented electrodes, respectively, and a plurality of electroconductive leads for said segmented electrodes on said substrate, the improvement wherein each of said segmented electrodes comprises an electrode layer of fired liquid gold.

4,098,940

THERMOPLASTICS SHEETS OR COMPOSITE SHEETS WITH OPTICAL INHOMOGENEITIES

Rudolf Groh, Burgkirchen, Alz, and Gustav Meinel, Burghausen, Salzach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 31, 1976, Ser. No. 719,193

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539163

Int. Cl.^{2} B42D *15/00;* B32B *7/00;* A44C *3/00*

U.S. Cl. 428—218 10 Claims

1. Transparent sheet consisting of a vinyl chloride or styrene polymer, said sheet having optical inhomogeneities which become visible as optical patterns when the sheet is placed between two crossed polarization filters, said optical inhomogeneities being obtained by producing in said sheet thicker spots according to a desired pattern, which spots protrude from the sheet surface 20 to 300 μm at a temperature within the liquid-viscous range of the polymer, and subjecting the patterned sheet to compression at a temperature within the rubber-elastic range to obtain a smooth sheet for achieving optical inhomogeneities.

6. Transparent sheet consisting of a vinyl chloride or styrene polymer, said sheet having optical inhomogeneities which become visible as optical patterns when the sheet is placed between two crossed polarization filters, said optical inhomogeneities being produced by compressing the sheet together with a latticed sheet of a homopolymer of vinyl chloride or a copolymer thereof with at least 85 weight percent, calculated on the polymer of polymerized vinyl chloride, said latticed sheet having a thickness surpassing at least by 5% the thickness of the sheet to be compressed with it and having projections according to a predetermined pattern, said compression being carried out at a temperature within the rubber-elastic temperature range of the polymer to thereby obtain a smooth sheet in which the pattern of the lattice is transmitted as optical inhomogeneities.

4,098,941

POLYSTYRENE FOAM EXTRUSION

David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 526,015, Nov. 21, 1974, Pat. No. 4,009,976, which is a division of Ser. No. 394,039, Sep. 4, 1973, Pat. No. 3,864,444. This application Dec. 8, 1976, Ser. No. 748,577

Int. Cl.^{2} B32B *3/26*

U.S. Cl. 428—218 4 Claims

1. An integral polystyrene foam extrudate having a density gradient from the central core of said article to the surfaces of said article; said surfaces having a density of about 65 to about 55 lb/ft^3; and said core having a density of about 1.3 to about 3 lb/ft^3, said core representing not less than 95% of the thickness of said extrudate, said polystyrene foam having been produced in accordance with a method comprising extruding said foamable composition in tubular form directly into boiling water maintained at substantially the same height, both inside and outside said tubular extrudate; foaming said extrudate in said boiling water under cooling conditions whereby said tubular extrudate as formed has a density gradient decreasing from the external surfaces inwardly.

4,098,942

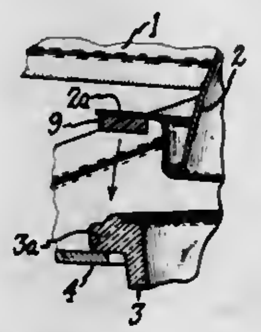
GASKET MATERIAL FORMED OF FELT CONTAINING POLYETHYLENE TEREPHTHALATE FIBERS

David K. Tart, Lenox, Mass., and Mitchell M. Osteen, Zirconia, N.C., assignors to General Electric Company

Division of Ser. No. 463,898, Apr. 25, 1974, Pat. No. 4,059,753. This application Sep. 20, 1976, Ser. No. 724,781

Int. Cl.^{2} D04H *1/08*

U.S. Cl. 428—280 3 Claims

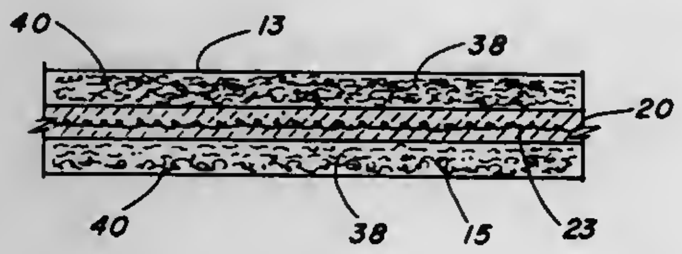


1. Gasket material having improved compression recovery characteristics under elevated temperature conditions formed of felt material comprising polyethylene terephthalate fibers which have been heated at a temperature of about 160°-200° C for at least 30 minutes to appreciably increase the compression recovery thereof.

4,098,943
FIBER REINFORCED MULTI-PLY STAMPABLE THERMOPLASTIC SHEET

Edward R. Degginger, Convent Station; Michael P. Dellavecchia, Sparta, and Albert H. Steinberg, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 25, 1975, Ser. No. 616,732
Int. Cl.^{2} B32B *5/16*
U.S. Cl. 428—283 **10 Claims**



1. A smooth surfaced thermoplastic composite laminated sheet being essentially free of surface waviness and long glass show-through, comprising, in terms of percent by weight of each layer:

(a) at least one layer comprising from about 40 to 70 percent of a synthetic thermoplastic polymer, a particulate filler present in an amount up to a maximum of about 50%, and 5 percent to 35 percent short glass fibers having a length ranging from 0.01 to ¾ of an inch and arranged generally parallel to the plane of the sheet surface,

(b) a reinforcing layer adjoining said one layer comprising 60 to 95 percent of synthetic thermoplastic polymer, a long glass fiber mat comprised of fibers having a length of at least 1.5 inches and having a weight ranging from 5 percent to 40 percent, said mat being substantially encased in a matrix of the thermoplastic polymer, said reinforcing layer being essentially free of short glass fibers.

4,098,944
SURFACE SPRAY COATING OF LATEX FOAMS

Richard Pollock, Grangemouth, Scotland, assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 534,340, Dec. 19, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 661,902
Int. Cl.^{2} B32B *27/32*
U.S. Cl. 428—284 **5 Claims**

1. In a latex foam-backed fabric structure comprising a fabric having coated on the undersurface thereof an elastomeric latex foam, the improvement wherein the surface of the foam is spray coated with from 20 to 90 g/sq. meter of a coating latex composition comprising a carboxylated styrene-butadiene latex and from 5 to 100 parts by weight based on 100 parts of latex solids of a hydrocarbon wax.

4,098,945
SOFT CONDUCTIVE MATERIALS

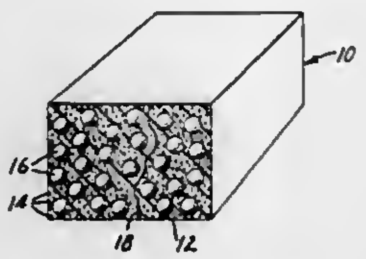
Richard W. Oehmke, Hudson Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 383,836, Jul. 30, 1973, abandoned, which is a continuation of Ser. No. 173,857, Aug. 23, 1971, abandoned. This application Aug. 16, 1976, Ser. No. 714,396
Int. Cl.^{2} B32B *5/16*
U.S. Cl. 428—327 **12 Claims**

1. A soft, conformable, electrically conductive composition comprising:

(a) a soft polymeric binder forming a coherent matrix and having a Shore A hardness of less than about 40,

(b) a plurality of insoluble, deformable, generally non-reactive and non-conductive, tacky, spherical domains having Shore A hardness less than about 40 consisting of elastic copolymer of at least one monomer selected from the group consisting of substantially oil-insoluble, water-soluble ionic monomers and maleic anhydride and at least one alkyl acrylate monomer which, as a homopolymer, has T_g below about -20° C. dispersed in said binder in an amount of from about 15 to 60 percent by volume of said composition; and



(c) an electrically conductive filler dispersed in said binder interjacent said domains in an amount effective to provide at least one electrically conductive pathway through said composition.

4,098,946
POLYESTER FILAMENT CONTAINING ORGANOPHILIC KAOLIN

John Frank Fuzek, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1977, Ser. No. 802,088
Int. Cl.^{2} B32B *27/02, 27/20;* **D02G** *3/02*
U.S. Cl. 428—357 **7 Claims**

1. Textile yarn comprising poly(1,4-cyclohexylenedimethylene terephthalate) fiber containing about 1 to 5% by weight of organophilic kaolin, said kaolin having a particle size of 90% less than one micron with a diameter to thickness ratio of about 6/1.

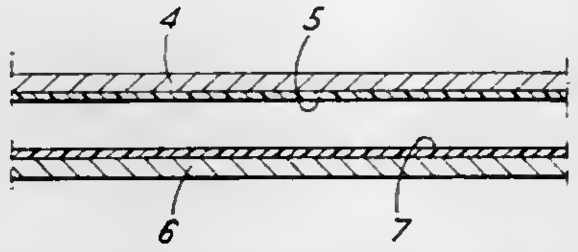
3. Textile yarn of claim 1 wherein said individual filaments have a non-round cross section.

4. Textile fiber comprising poly(1,4-cyclohexylenedimethylene terephthalate) containing about 1 to 5 percent by weight of organophilic kaolin.

4,098,947
COPY PAPER

Joachim Schmidt, Weilstrasse 22, 637 Oberursel, and Martin Unruh, Vannstrockestrasse 30, 763 Lahr, Sulz, both of Fed. Rep. of Germany

Division of Ser. No. 258,876, Jun. 1, 1972, Pat. No. 3,911,195. This application Feb. 20, 1975, Ser. No. 551,499
Claims priority, application United Kingdom, Oct. 23, 1970, 50530/70
Int. Cl.^{2} B32B *5/16*
U.S. Cl. 428—407 **4 Claims**



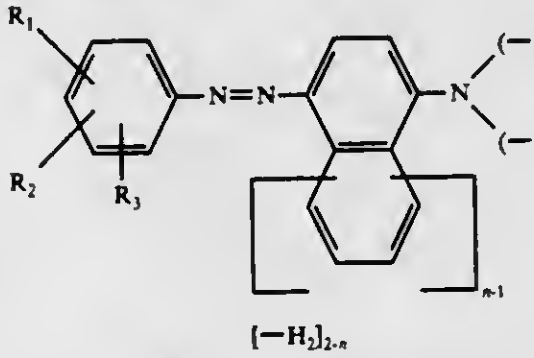
1. A sheet of paper consisting of a support layer and a substantially uniform donor layer of particulate mutually adherent particles of a vinyl chloride polymer, the polymer having been produced by emulsion polymerization, containing the range from 60 to 80, the particles having an average size of 50 μ or less and having sieve residues under standard DIN conditions of not more than 34% by weight, and said polymer having been dyed by a dye selected from the group consisting of anionic dyes, non-ionic dyes and mixtures thereof prior to incorporation onto said sheet of paper.

4,098,948
CHEMICAL COMPOSITION

James Kenneth Skelly, Wilmslow, and James Harry Astbury, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

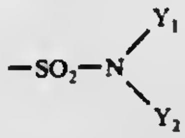
Continuation of Ser. No. 571,028, Apr. 23, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 746,906
Claims priority, application United Kingdom, Jan. 23, 1975, 2928/75
Int. Cl.^{2} B32B *9/06*
U.S. Cl. 428—411 **11 Claims**

1. An image producing system which comprises a neutral or alkaline sized paper impregnated or coated in a size press with a dispersion of a colour former in a mixture of water and a water-miscible organic solvent for the colour former in admixture with a polymer acrylic latex; and a carrier material impregnated with a solution of an organic acid in a weakly volatile high boiling solvent, said color former is an azo compound having the formula



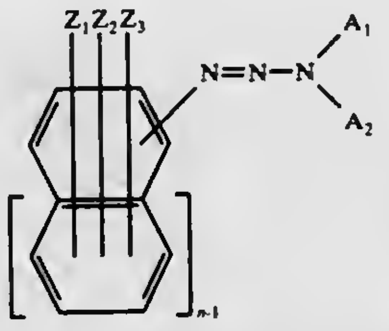
(I)

in which R_1, R_2 and R_3 each represents hydrogen, halogen, alkyl, alkoxy, aryloxy, alkoxycarbonyl, dialkylaminocarbonyl, acylamino, acyl(alkyl)amino,



$$-SO_2-N\left\langle{}^{Y_1}_{Y_2}\right. ,$$

in which Y_1 and Y_2 each represents alkyl or aryl, or in which Y_1 and Y_2 together represent an alkylene group; X_1 is hydrogen or an alkyl group, X_2 is an alkyl, cyanoalkyl or arylmethylene group or X_1 and X_2 together represent an alkylene group, X_3 is an alkyl or aryl group and *n* is 1 or 2, preferably 1, or the general formula II:



(II)

in which Z_1, Z_2 and Z_3 each represents hydrogen, alkyl, substituted alkyl, alkoxy, halogen, nitro, acylamino, aminoacyl or alkoxycarbonyl, A_1 and A_2 each represents alkyl or phenyl or A_1 and A_2 together with the nitrogen atom to which they are bound form a heterocyclic ring system and *n* is 1 or 2.

4,098,949
METALLIZING COMPOSITIONS AND THE PREPARATION OF ELECTRICALLY CONDUCTIVE ARTICLES

Raymond Stanley Koslorek, Houston, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 638,785, Dec. 8, 1975, Pat. No. 4,029,605. This application Dec. 13, 1976, Ser. No. 750,305
Int. Cl.^{2} B32B *15/04;* **H01B** *1/08;* **B32B** *17/06*
U.S. Cl. 428—434 **7 Claims**

1. An article comprising a heat resistant substrate having fused to at least a portion of its surface an electrically conductive metal film which does not adversely affect the overall strength of the substrate and is derived from a composition comprising by weight

(a) from 50 to 88% of at least one finely-divided electrically conductive metal;

(b) from 2 to 40% of a crystallizable glass frit binder consisting essentially of by weight 40 to 70% of SiO_2, 10 to 31% of Al_2O_3, 3 to 20% of Li_2O, 2 to 15% of B_2O_3, 0 to 4% of As_2O_3, 0 to 5% of Na_2O, 0 to 5% of K_2O, 0 to 6% of Bi_2O_3, and at least one oxide component selected from the group consisting of 4 to 19% of ZrO_2 and 1 to 10% of TiO_2;

(c) from 5 to 48% of an inert liquid vehicle; and

(d) from 0 to 20% of an inert filler or pigment.

4. A method for forming on a heat resistant substrate an electrically conductive metal film which does not adversely affect the overall strength of the substrate, which method comprises applying to at least a portion of the surface of said substrate a layer of a conductive metal composition comprising by weight

(a) from 50 to 88% of at least one finely-divided electrically conductive metal;

(b) from 2 to 40% of a crystallizable glass frit binder consisting essentially of by weight 40 to 70% of SiO_2, 10 to 31% of Al_2O_3, 3 to 20% of Li_2O, 2 to 15% of B_2O_3, 0 to 4% of As_2O_3, 0 to 5% of Na_2O, 0 to 5% of K_2O, 0 to 6% of Bi_2O_3, and at least one oxide component selected from the group consisting of 4 to 19% of ZrO_2 and 1 to 10% of TiO_2;

(c) from 5 to 48% of an inert liquid vehicle; and

(d) from 0 to 20% of an inert filler or pigment;

and firing said layer on the substrate to form an adherent film of the electrically conductive metal thereon.

4,098,950
THREE-DIMENSIONAL SUBSTRATES COATED WITH THE REACTION PRODUCT OF AN AMINO RESIN A CO-REACTANT AND A HIGH MOLECULAR WEIGHT SULFONIC ACID

Lawrence V. Gallacher, East Norwalk, Conn., assignor to King Industries, Inc., Norwalk, Conn.

Division of Ser. No. 466,079, May 1, 1974, Pat. No. 3,979,478. This application May 6, 1976, Ser. No. 683,777
Int. Cl.^{2} B32B *15/08, 27/00*
U.S. Cl. 428—458 **8 Claims**

1. A three-dimensional substrate comprising a material selected from the group consisting of metal, glass, cloth, paper and plastic, the surface of which has a coating thereover comprising a reaction product of (i) a convertible amino resin, (ii) a catalytically effective amount of a polyalkylaromatic polysulfonic acid having a molecular weight of at least about 500, and (iii) a polyfunctional co-reactant capable of combining with said amino resin during conversion into its cured state, said co-reactant containing hydroxyl groups, carboxyl groups or a combination thereof.

4,098,951
PROCESS FOR ELIMINATING SQUEAL IN DISC BRAKES

Norwin W. Wolff, Marshfield Hills, Mass., assignor to Interpolymer Corporation, Canton, Mass.
Filed Sep. 20, 1976, Ser. No. 724,508
Int. Cl.² B32B *15/08*
U.S. Cl. 428—463 **4 Claims**

1. A method for reducing squeak in disc brakes caused by contact between the metal surfaces of the friction pad and brake support comprising applying a high molecular weight, thermally stable polymer composition to at least one of said metal surfaces in an amount sufficient to eliminate squeak, said polymer composition comprising a high molecular weight acrylic copolymer containing at least about 50% of a C_1-C_8 ester of acrylic acid and at least about 1% of a monomer providing crosslinkable sites on the main polymer chain.

4,098,952
COATED POLYESTER FILM ASSEMBLY WITH A PRIMER LAYER

Roger Sidney Arthur Kelly, and John Robert Wilson, both of Knebworth, England, assignors to Imperial Chemical Industries Limited, Great Britain
Filed Jul. 22, 1976, Ser. No. 707,764
Claims priority, application United Kingdom, Aug. 4, 1975, 32487/75
Int. Cl.² B32B *27/06, 27/36*
U.S. Cl. 428—483 **19 Claims**

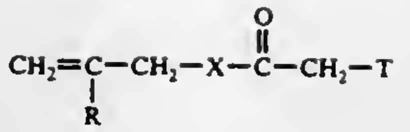
1. A coated film assembly, which comprises a support film of a linear polyester and a polymeric priming layer applied to at least one surface of the support film, said priming layer consisting essentially of a copolymer comprising:
3 to 25 mole % of glycidyl methacrylate or glycidyl acrylate,
35 to 95 mole % of one or more other copolymerisable monomers selected from the esters of acrylic and methacrylic acids, and
1 to 60 mole % of acrylonitrile.

17. A process for the production of a coated film assembly, which comprises applying a polymeric priming layer to at least one surface of a support film of a linear polyester, said priming layer comprising a copolymer comprising:
3 to 25 mole % of glycidyl methacrylate or glycidyl acrylate,
35 to 95 mole % of one or more other copolymerisable monomers selected from the esters of acrylic and methacrylic acids, and
1 to 60 mole % of acrylonitrile.

4,098,953
BIAXIALLY ORIENTED SYNTHETIC LINEAR POLYESTER FILM BASE MATERIAL WITH COPOLYMER SUBBING LAYER

Peter John Wright, Ilford; Geoffrey Michael Dodwell, and David Francis Jennings, both of Brentwood, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland
Filed Jul. 14, 1976, Ser. No. 705,237
Claims priority, application United Kingdom, Jul. 23, 1975, 30792/75; Apr. 14, 1976, 15164/76
Int. Cl.² B32B *27/06, 27/36*
U.S. Cl. 428—483 **7 Claims**

1. Film base material comprising essentially a film of biaxially oriented synthetic linear polyester of highly hydrophobic character having superimposed thereon adherent to said film a layer which comprises a copolymer of 20 to 90 mole percent of vinylidene chloride, of 5 to 50 mole percent of an alkyl acrylate or methacrylate, of 1 to 30 mole percent of an allyl or methallyl component containing an active methylene group the monomer of which has the general formula



$$CH_2{=}\underset{\substack{|\\ R}}{C}{-}CH_2{-}X{-}\overset{\substack{O\\ \|}}{C}{-}CH_2{-}T$$

wherein T is —CN or —$COCH_3$, X is O, NH or S, and R is a hydrogen atom or methyl group and of O to 20 mole percent of at least one copolymerisable acid.

4,098,954
METHOD FOR ELIMINATING OR PREVENTING THE BRIGHTENING EFFECTS OF ANIONIC OPTICAL BRIGHTENERS

Giuseppe Raspanti, Fiorano al Serio (Bergamo), Italy, assignor to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 516,579, Oct. 21, 1974, abandoned. This application Jan. 10, 1977, Ser. No. 758,134
Claims priority, application Switzerland, Oct. 19, 1973, 14808/73
Int. Cl.² D21D *3/00*
U.S. Cl. 428—537 **19 Claims**

1. A method of eliminating the brightening effect produced by or preventing the brightening effect from being produced by an anionic optical brightener on material comprising applying to the material substrate a water-soluble acid addition salt of quaternary ammonium salt of a compound produced by the acylation of an excess of a polyethylenepolyamine of formula,

$$H(HN{-}CH_2{-}CH_2)_p{-}NH_2$$

in which p is an integer 2 to 5, with isophthalic or terephthalic acid or a functional derivative thereof in a molar ratio exceeding 1.5:1, subsequently cyclizing the product to afford imidazoline groups, and optionally reacting the product further by: a) full alkylation, b) partial alkylation followed by acylation in a molar ratio of initial to present acylating agent of 1:0.3 to 1:1.0, with a bifunctional acylating agent which is a saturated aliphatic dicarboxylic acid of formula,

$$HOOC{-}(CH_2)_q{-}COOH$$

in which q is an integer 1 to 6, or a functional derivative thereof, or a functional derivative of carbonic acid, (c) acylation as described above with respect to (b), (d) acylation as described above with respect to (b) followed by alkylation, or (e) partial alkylation, which alkylation or quaternary ammonium salt formation is effected with an alkylating agent yielding a methyl, ethyl or phenyl- or naphthyl-substituted methyl or ethyl group, and which quaternary ammonium salt does not contain a nitrogen atom bearing more than two phenyl- or naphthyl-substituted methyl or ethyl groups.

4,098,955
PREVENTION OF SHIPWORM INFESTATION OF WOODEN MARINE STRUCTURES

Walter E. Partridge, Auburn, Wash., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 7, 1976, Ser. No. 730,516
Int. Cl.² B32B *21/04, 21/06*
U.S. Cl. 428—537 **5 Claims**

4. A wooden structure protected from infestation by wood-boring marine organisms wherein said protection consists essentially of a porous nonwoven fabric consisting essentially of self-bonded polypropylene fibers, the fabric having a grab tensile strength of at least 60 pounds, a trapezoidal tear strength of at least 30 pounds, a puncture resistance of at least 350 inch-pounds/square inch and an effective pore size of less than 200 microns and completely surrounding all portions of said structure exposed to sea water.

4,098,956
SPECTRALLY SELECTIVE SOLAR ABSORBERS

Robert Blickensderfer, Albany; Donald K. Deardorff, and Russell L. Lincoln, both of Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Aug. 11, 1976, Ser. No. 713,452
Int. Cl.² B32B *15/04;* **F24J** *3/02*
U.S. Cl. 428—627 **7 Claims**

1. An absorber stack consisting of a substrate having coated thereon a reflective metal film and having a solar energy absorptive film superposed upon said reflective metal film; said reflective metal film having a thickness of about 1500 Angstroms and consisting of a metal selected from the group consisting of gold, copper, silver, aluminum, beryllium, molybdenum and tungsten, and said absorptive film having a thickness of about 800 to 2400 Angstroms and consisting of a compound of the formula $MC_xO_yN_z$ wherein M is selected from the group consisting of titanium, zirconium and hafnium and mixtures thereof and wherein the sum of $x+y+z$ is greater than 0 but less than 2.

4,098,957
ALUMINUM BRAZING SHEET

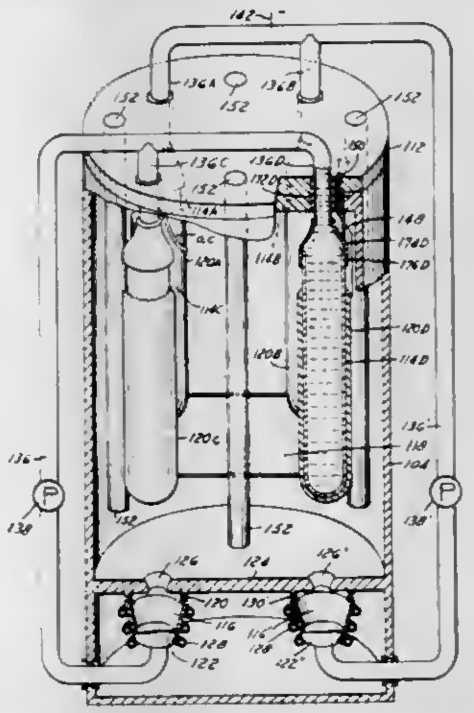
William D. Vernam, New Kensington, and Joseph W. Evancho, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Nov. 25, 1977, Ser. No. 854,799
Int. Cl.² B32B *15/20*
U.S. Cl. 428—654 **3 Claims**

1. An aluminum brazing sheet comprising:
(a) a core of an aluminum alloy;
(b) a first layer of an aluminum brazing alloy consisting essentially of 0.1 to 2.5 wt.% Mg, 5.0 to 13.0 wt.% Si, 0.8 wt.% Fe max., 0.3 wt.% Cu max., 0.3 wt.% Zn max. and 0.3 wt.% Mn max., the remainder aluminum, provided on at least one side of said core to form a composite; and
(c) a second layer of an aluminum alloy clad on both sides of the composite, said second layer consisting essentially of 0.5 to 1.2 wt.% Mg, 1.2 to 1.8 wt.% Si, 0.2 wt.% Cu max., 0.7 wt.% Fe max., 1.5 wt.% Mn max., the remainder aluminum said alloy in said second layer having a melting point substantially equivalent to the melting point of said brazing layer.

4,098,958
THERMOELECTRIC GENERATOR DEVICES AND METHODS

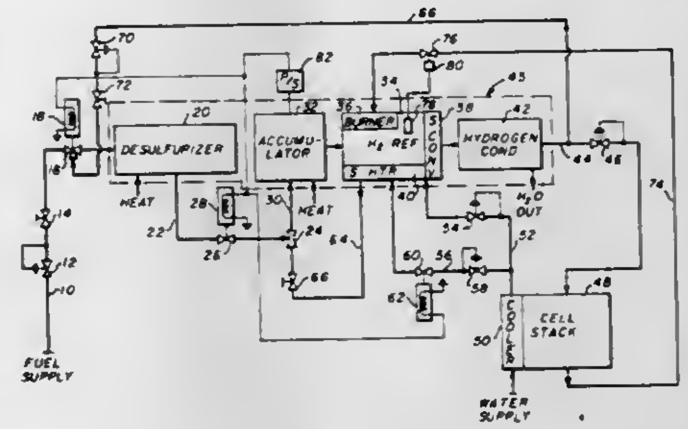
Max Bettman, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 7, 1977, Ser. No. 813,711
Int. Cl.² H01M *10/34, 10/39, 10/44*
U.S. Cl. 429—17 **22 Claims**

1. A method for converting heat energy to electrical energy with alkali metal serving as the working substance and which comprises: (1) ionizing said alkali metal to cations in a first reaction zone at one side of solid electrolyte while maintaining a temperature in said first reaction zone in a range in excess of 300° C; (2) reconverting said alkali metal cations in a second reaction zone at the other side of said solid electrolyte having porous electrode in electrical contact therewith to elemental alkali metal; (3) vaporizing said elemental alkali metal from said porous electrode to a furnace zone surrounded by a furnace wall having shaped opening means therein; (4) discharging from said furnace zone through said shaped opening means alkali metal vapor to cooling means for condensing alkali metal while maintaining said cooling means at a temperature in a range at least about 100° C below the temperature in said first reaction zone and at least a major portion of said furnace wall at a temperature in a range in excess of the temperature of said cooling means.



4,098,959
FUEL CELL FUEL CONTROL SYSTEM

Salvatore Fanciullo, Plainville, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 27, 1976, Ser. No. 754,181
Int. Cl.² H01M *8/04, 8/06*
U.S. Cl. 429—25 **8 Claims**



1. Apparatus for producing electricity through an electrochemical reaction comprising:
fuel cell means;
accumulator means, said accumulator means being adapted for storage of a mixture of steam and a fuel cell fuel stock;
means for delivering the fuel stock to said accumulator means, said fuel stock delivering means including a controllable valve, said valve being sized to deliver a greater flow than required for full power operation of said fuel cell means;
means for delivering steam to said accumulator means, said steam delivering means including a controllable valve, said steam delivering means valve being sized to deliver a greater flow than required for full power operation of said fuel cell means;
reformer means, said reformer means generating a gaseous fuel cell fuel from said fuel stock-steam mixture, said reformer means being in fluid communication with said accumulator means;
means for supplying the gaseous fuel from said reformer

means to said fuel cell means, said supplying means including a demand valve;

demand valve control means, said valve control means including means for sensing the load on the fuel cell means and generating a demand valve control signal commensurate therewith, said demand valve control signal being applied to said supplying means demand valve to regulate the flow of fuel to said fuel cell means as a function of the load thereon;

means for sensing the pressure in said accumulator means and generating a signal commensurate therewith; and

means responsive to the signal commensurate with accumulator pressure for controlling said delivering means valves for full fuel stock and steam flow when said accumulator pressure is below a predetermined level.

4,098,960

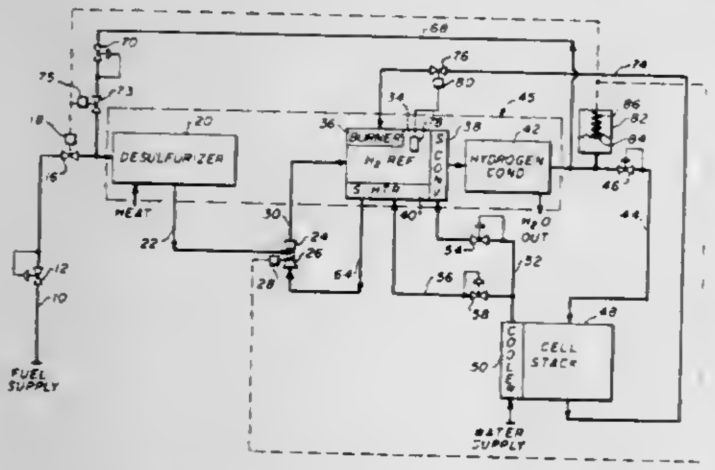
FUEL CELL FUEL CONTROL SYSTEM

Richard N. Gagnon, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,325

Int. Cl.² H01M *8/04, 8/06*

U.S. Cl. 429—25 **5 Claims**



1. Apparatus for producing electricity through an electrochemical reaction comprising:

fuel cell means;

fuel conditioning means, said fuel conditioning means generating a gaseous fuel cell fuel from a mixture of fuel constituents;

means for delivering a fuel stock to said fuel conditioning means, said fuel stock delivering means including first controllable valve means and being designed to deliver a greater flow of fuel stock than required for full power operation of said fuel cell means;

means for delivering at least one mixing ingredient for mixing with the fuel stock to said fuel conditioning means, said mixing ingredient delivering means including second controllable valve means and being designed to deliver a greater flow than required for full power operation of said fuel cell means;

means for supplying the gaseous fuel cell fuel generated in said fuel conditioning means to said fuel cell means, said fuel supplying means including controllable isolation valve means;

means for sensing the load on said fuel cell means and for generating a control signal commensurate therewith;

means responsive to said control signal commensurate with fuel cell means load for controlling said isolation valve means to vary the flow of fuel through said isolation valve means to said fuel cell means in response to the load on said fuel cell means;

means for sensing the fuel conditioning means fuel discharge pressure and for generating a signal commensurate therewith; and

means responsive to said signal commensurate with fuel conditioning means discharge pressure for controlling said first and second valve means of said delivering means to regulate the flow of fuel stock and mixing ingredient to said fuel conditioning means.

4,098,961

WATER ACTIVATABLE, LEAD-ACID STORAGE BATTERY AND METHOD FOR MANUFACTURING SAME

Anthony Sabatino, St. Paul, Minn., assignor to Gould Inc., Chicago, Ill.

Continuation of Ser. No. 587,955, Jun. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 486,661, Jul. 8, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,771

Int. Cl.² H01M *10/08*

U.S. Cl. 429—48 **9 Claims**

1. A method of manufacturing a lead-acid storage battery including a container having a plurality of cell compartments and a plurality of battery elements consisting of a plurality of positive and negative plates with separators positioned therebetween, the battery elements being electrically connected, to provide a battery capable of being stored and thereafter activated, by the addition of water and charging, which comprises forming said plates by bringing said plates into contact with a formation electrolyte and applying current thereto, draining the formation electrolyte from the battery, bringing said plates into contact with a development electrolyte to increase the specific gravity of the residual electrolyte retained in the battery elements, deep discharging the battery plates, reducing the amount of electrolyte in the battery to an amount in the range of from about 10% by volume of the total electrolyte capable of being added to the battery to the amount of electrolyte retained by the saturated battery elements, the amount of sulfate resulting from the deep discharge and the residual sulfuric acid electrolyte retained within the battery elements combining, upon the addition of water and charging, to yield an end-of-charge electrolyte having an acceptable specific gravity, and sealing the battery.

4,098,962

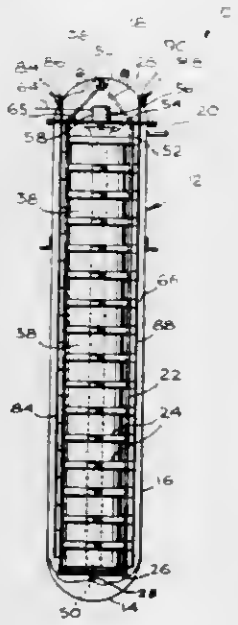
METAL-HYDROGEN SECONDARY BATTERY SYSTEM

Edward S. Dennison, Waterford, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Apr. 14, 1977, Ser. No. 787,666

Int. Cl.² H01M *12/06*

U.S. Cl. 429—72 **10 Claims**



1. An improved metal-hydrogen secondary battery system, said system comprising, in combination, a plurality of electrically interconnected power modules, each said module comprising, in combination:

A. a totally sealed pressure vessel having endwalls and sidewalls and containing a volume of hydrogen;

B. a plurality of substantially identical stacked batteries connected in parallel in each said vessel, each said battery comprising a pile of spaced series connected metal-hydrogen cells;

C. means holding said stacked betteries in said vessel for ready withdrawal therefrom; and,

D. means within said vessel for circulating and recirculating hydrogen around and between said cells and means external of said vessel for cooling said hydrogen by indirect heat exchange through said vessel walls.

4,098,963

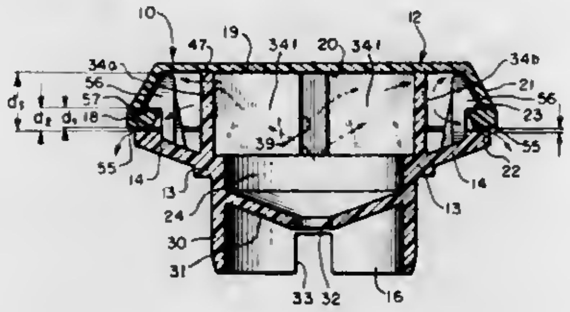
VENTED BATTERY CAP

Verlin A. Mocas, Indianapolis, Ind., assignor to The Richardson Company, Des Plaines, Ill.

Filed Feb. 9, 1977, Ser. No. 767,229

Int. Cl.² H01M *2/12*

U.S. Cl. 429—88 **19 Claims**



1. A vented cap for an electrical storage battery of the type having at least one filler well through which gas and electrolyte are discharged comprising, in combination:

a base member having a bottom portion, a peripheral side wall portion projecting upwardly from said bottom portion and defining an upwardly facing rim portion, at least one hollow vent plug portion projecting downwardly from said bottom portion for insertion into said filler well and including an orifice therein for establishing fluid communication between an interior chamber in said cap and said battery, and an interior wall portion projecting upwardly from said bottom portion and at least partially defining said interior chamber;

a cover member disposed over said base member, said cover member including a downwardly facing rim portion; and

means including a plurality of latch portions projecting from one of said base and cover members into snap-fit engagement with the other of said members to secure said cover member in abutting relationship to said interior wall portion, said interior wall portion being dimensioned to maintain said downwardly facing rim portion of said cover member in spaced relationship to the upwardly facing rim of said base member so as to form a vent aperture therebetween for escaping battery gas, said vent aperture having a dimension transverse to the direction of gas flow therethrough less than the flame quenching distance of the battery gas.

4,098,964

STORAGE BATTERY WITH RECOMBINATION CATALYST

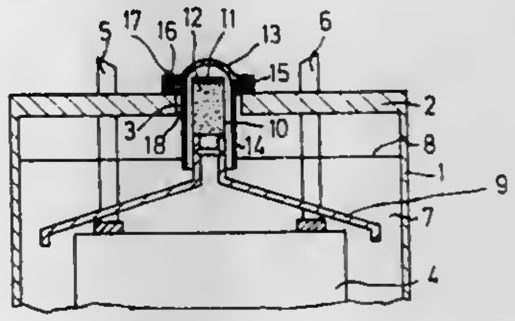
Harald Reber, Gorlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Gerlingen-Schillerbohe, Fed. Rep. of Germany

Continuation of Ser. No. 666,585, Mar. 15, 1976, abandoned, which is a continuation of Ser. No. 532,866, Dec. 16, 1974, abandoned. This application Jan. 4, 1977, Ser. No. 759,578

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408556

Int. Cl.² H01M *10/52*

U.S. Cl. 429—86 **11 Claims**



1. Storage battery containing battery plates and a liquid electrolyte which evolves hydrogen and oxygen gases, comprising

means (10) defining an upper enclosure above the plates and above the electrolyte of said battery;

a catalyst (12) in said upper enclosure (10) for recombining said evolved hydrogen and oxygen gases to form recombined water vapor;

means (9) defining a conduit for directing said evolved hydrogen and oxygen gases from said electrolyte to said catalyst in said upper enclosure;

means (14) surrounding and extending into a portion of the surface of said electrolyte and defining a water vapor condensing area at least at the upper liquid level of said electrolyte in said battery; and

conduit means (13) extending from said catalyst in said upper enclosure (10) to said condensing area defining means (14) to conduct the water vapor to said condensing area;

whereby said recombined water vapor is conducted to said condensing area and is condensed in said condensing area by contact with said electrolyte and is intermixed therewith.

4,098,965

FLAT BATTERIES AND METHOD OF MAKING THE SAME

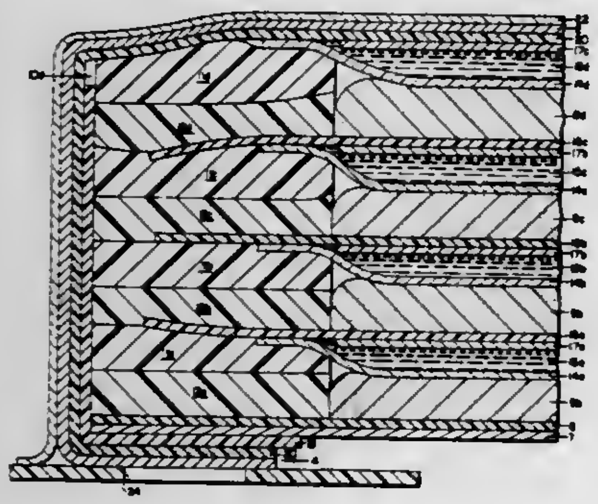
Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 761,652, Jan. 24, 1977, abandoned. This application Jan. 27, 1977, Ser. No. 809,976

Int. Cl.² H01M *6/46*

U.S. Cl. 429—153 **4 Claims**

1. In a thin, flat laminar battery, a subassembly comprising a frame of liquid impervious insulating material at least the exterior surfaces of which comprise a thermoplastic hot melt adhesive material, means forming an opening within the periphery of said frame adapted to receive the components of an electrical cell, a cellophane separator wet with electrolyte on one surface of said frame covering said opening, a layer of gel electrolyte on said cellophane separator, a conductive plastic intercell connector over said cellophane separator and projecting beyond the boundaries thereof on all sides and thermally



sealed to said frame, said intercell connector being within the boundaries of said frame, and a laminar zinc anode patch on said intercell connector in a region in registry with said opening and in contact with said gel electrolyte.

4,098,966

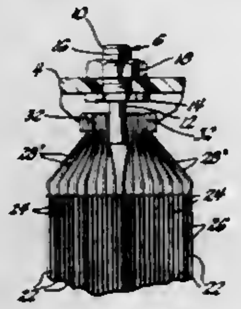
WELDED BATTERY ELEMENTS AND PROCESS

Richard C. Brown, Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1977, Ser. No. 850,968

Int. Cl.² H01M *2/26;* **B23K** *11/10*

U.S. Cl. 429—161 **5 Claims**



1. In a battery including a plurality of active elements, a case for containing said active elements, a terminal for electrically communicating said elements to a load external of said case, and a plurality of foil-like, metal tabs mechanically and electrically connecting said elements with said terminal, said tabs being bundled and welded together at the terminal, 'he improvement comprising: the end of the tab bundle remote from the terminal comprising a fold from at least one of the tabs near said end, said fold serving to space the outermost tab in the bundle from the welding electrode during resistance welding and thereby promoting welding of the outermost tab in the bundle to the next adjacent, penultimate tab in the bundle.

4,098,967

ELECTROCHEMICAL SYSTEM USING CONDUCTIVE PLASTIC

Royce E. Biddick, Edina, and Richard J. Rubischko, Minnetonka, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

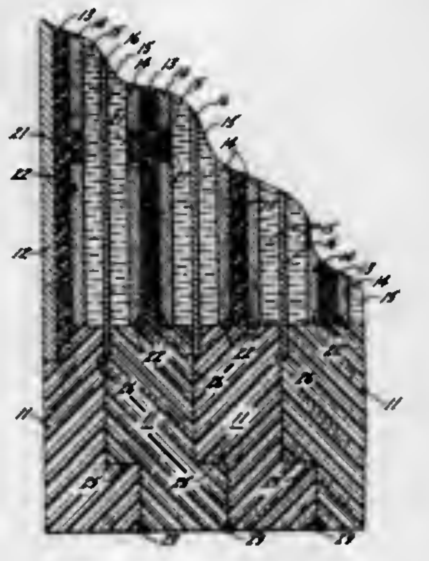
Division of Ser. No. 363,254, May 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,211

Int. Cl.² H01M *6/48*

U.S. Cl. 429—210 **12 Claims**

1. A bipolar electrode-container plate for use in storage batteries comprising, in combination, a planar central substrate surrounded by border portions, said substrate and said border portions being formed of a thermoplastic resistant to electrolyte and capable of being filled, said substrate being filled with electrically conductive material leaving said border portions nonconductive, an active electrode material overlying, supported by and in electrical contact with said substrate within said border portions, a layer of metal foil bonded to said substrate and interposed between said substrate and said active material, and said border portions being proportioned so as to interfit with other similar plates leaving space for separators and electrolyte within the container periphery defined by the border portions.

4. A bipolar electrode-container plate for use in storage batteries comprising, in combination, a planar central substrate surrounded by border portions, said substrate and said border portions being formed of a thermoplastic resistant to electrolyte and capable of being filled, said substrate being filled with electrically conductive material formed of finely divided vitreous carbon leaving said border portions nonconductive, an active electrode material overlying, supported by and in electrical contact with said substrate within said border portions, said border portions being proportioned so as to interfit with other similar plates leaving space for separators and electrolyte within the container periphery defined by the border portions.



4,098,968

PROCESS FOR IMPARTING ANTISTATIC PROPERTIES TO RUBBER

Joachim Wortmann, Turnich; Franz-Josef Dany, Erftstadt; Joachim Kandler, Erftstadt, and Hans Peter Beu, Erftstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 24, 1977, Ser. No. 780,988

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613126

Int. Cl.² C08K *3/04*

U.S. Cl. 526—1 **5 Claims**

1. In the process for imparting antistatic properties to rubber by blending the rubber with conductive carbon black, vulcanizing the resulting blend and forming the rubber, the carbon black having been made by subjecting hydrocarbons, which are liquid at room temperature, to thermal conversion at 1000° to 2000° C, under pressures within the range 1 and 80 atmospheres absolute, and in the presence of oxygen or an oxygen-containing gas, scrubbing the resulting carbon black-containing gas with water and separating the carbon black from the aqueous phase, the improvement which comprises intimately blending the aqueous, carbon black-containing phase with vaporizable liquid aliphatic or cycloaliphatic hydrocarbons at temperatures within the range 5 and 120° C, under pressures within the range 1 and 20 atmospheres absolute, at a pH-value of 7 to 10, and for a period of 1 to 20 minutes, separating liquid matter from the carbon black then heating and thereby freeing it from hydrocarbons and water, annealing the carbon black for 20 to 30 minutes at 200° C up to 2200° C and admixing the carbon black having a water absorption stiffness (AS-number) of 15 to 35, a specific electric resistance of 10^{-1} up to 10^{-3} ohms . cm under a moulding pressure of 100 to 180 atmospheres absolute, a bulk density of 100 to 180 g/liter, and a BET-surface area of 100 to 1000 m^2/g with rubber material in an amount of about 5 to 40 weight %.

4,098,969

PRODUCT AND PROCESS FOR PREPARING POLYVINYL ALCOHOL DEPOSITS OF REDUCED WATER SENSITIVITY

Wolfgang Zimmermann, Kelkheim, Taunus, and Hermann Schindler, Fischbach, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1976, Ser. No. 701,820

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529863

Int. Cl.² C08F *8/00*

U.S. Cl. 526—9 **2 Claims**

1. A process for reducing the water sensitivity of polyvinyl alcohol which comprises preparing a mixture containing polyvinyl alcohol and boric acid in aqueous solution and a buffer which at room temperature maintains the solution at a pH not exceeding 7 and which on heating only is altered irreversibly to cause the pH of the solution to shift to the alkaline range, said buffer being a compound selected from alkali metal and alkaline earth metal salts of trichloroacetic and tribromoacetic acids, and heating said mixture to a temperature sufficient to render it alkaline and decrease the water sensitivity of said polyvinyl alcohol.

4,098,970

TRIMELLITIC ACID MONOESTERS OF STYRENE ALLYL ALCOHOL COPOLYMERS

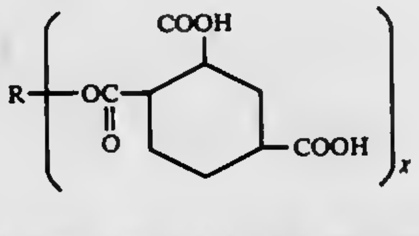
Frank J. Hahn, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 8, 1976, Ser. No. 739,679

Int. Cl.² C08F *8/14, 8/46*

U.S. Cl. 526—13 **7 Claims**

1. A trimellitic acid monoester of a hydroxy copolymer of the general formula



Wherein X is at least 1, and R is a copolymeric moiety remaining after reaction of X hydroxyl groups from the hydroxy copolymer with trimellitic anhydride to form X trimellitic acid monoester groups; wherein the hydroxy copolymer is a copolymer of styrene or a substituted styrene and allyl alcohol or methallyl alcohol having a hydroxyl content of from about 1.8 to 10 percent by weight and a styrene or substituted styrene content of from about 50 to 94 percent by weight; wherein from 20 to 80 percent of the hydroxyl groups of the hydroxy copolymer have been reacted with trimellitic anhydride and wherein the number average molecular weight of the hydroxy copolymer is in the range of 400 to 3000.

4,098,971

ORGANOTIN POLYMERS AND ANTIFOULING PAINTS CONTAINING SAME

Arpad T. Phillip, Doncaster; Gunter Bocksteiner, Avondale Heights; Russel W. Pettis, Windsor, and Geoffrey W. Glew, Caulfield, all of Australia, assignors to Commonwealth of Australia, Parkes, Australia

Continuation-in-part of Ser. No. 370,443, Jun. 15, 1973, abandoned. This application Jul. 28, 1975, Ser. No. 599,859

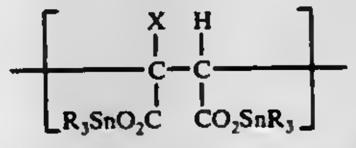
Claims priority, application Australia, Jul. 5, 1972, 9574/72

Int. Cl.² C08F *8/44*

U.S. Cl. 526—16 **1 Claim**

1. A film-forming antifouling agent consisting essentially of an organotin containing copolymer, which is composed of:

(a) a recurring organotin moiety consisting of:



$$-\left[\begin{matrix} & X & H & \\ & | & | & \\ — & C — & C & — \\ & | & | & \\ & R_3SnO_2C & CO_2SnR_3 & \end{matrix}\right]-$$

wherein R is a member selected from the class consisting of propyl and butyl; X is a member selected from the class consisting of hydrogen and methyl;

(b) recurring units of at least one comonomer selected from the group consisting of vinyl acetate, acrylic acid and acrylamide.

4,098,972

METHOD FOR BULK POLYMERIZATION OF VINYL CHLORIDE

Kinya Ogawa; Kazuhiko Kurimoto, both of Hazaki; Yoshitugu Eguchi, and Satoshi Kuwata, both of Kamisu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,303

Claims priority, application Japan, Mar. 24, 1975, 50/35076; Mar. 31, 1975, 50/38988

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.² C08F *2/02, 14/06*

U.S. Cl. 526—62 **36 Claims**

1. A method for the bulk polymerization of a vinyl chloride monomer or a monomeric mixture thereof with a copolymerizable monomer or monomers which comprises carrying out the polymerization in a polymerization reactor in which the inner walls and other surfaces coming into contact with the monomer or monomers are provided with coatings of a compound having a solubility greater than 0.5 g in 100 g of water at 25° C and having a boiling point higher than 60° C.

4,098,973

COMPOUNDS AND PROCESS

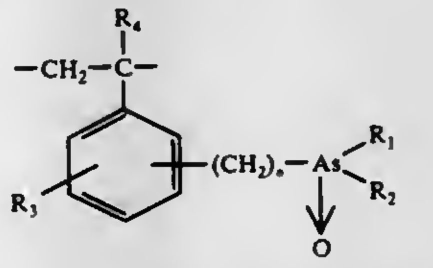
Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 31, 1977, Ser. No. 764,376

Int. Cl.² C08F *8/22, 8/24, 8/42*

U.S. Cl. 526—21 **3 Claims**

1. A polymer characterized by the presence therein of a recurring unit having the formula:



wherein *n* is 0 or 1, R_1 and R_2 each independently represents hydrocarbyl, said hydrocarbyl being free of substituents which are reactive with isocyanate, R_3 is selected from the class consisting of chlorine, methyl and hydrogen and R_4 is selected from the class consisting of hydrogen and methyl.

4,098,974

POLYALKENES OF WIDE MOLECULAR WEIGHT DISTRIBUTION

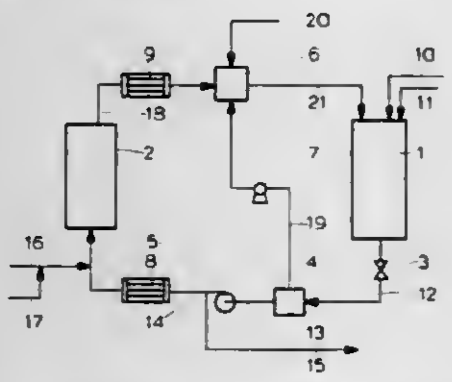
Dirk Klaassen, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Jul. 27, 1976, Ser. No. 709,081

Claims priority, application Netherlands, Aug. 5, 1975, 7509292

Int. Cl.² C08F *2/14, 2/38, 10/00, 10/02*

U.S. Cl. 526—65 **10 Claims**



1. A continuous multi-stage process for the suspension polymerization of at least one α-alkene of from 2 to 8 carbon atoms,
in the presence of a catalyst comprising at least one compound of at least one transition metal selected from the class consisting of the metals of Groups 4, 5, 6 and 8 of the Periodic Table, and,
in the presence of a molecular weight controller, and
under pressures of at most 100 kg per cm², and
in an inert liquid solvent,
which comprises conducting the suspension polymerization reaction in a system of at least two reaction stages, (a) and (b), wherein each such stage employs the same catalyst system,
while maintaining the molar ratio of said molecular weight controller to said α-alkene in stage (a) at a level higher than in stage (b),
whereby there is formed in stage (a) a polyalkene having a lower average molecular weight than that of the polyalkene formed in stage (b),
while also continuously passing polymer suspension formed in reaction stage (a) into reaction stage (b), and while continuously passing polymer suspension formed in stage (b) into stage (a),
whereby there is continuously produced a polyalkene having a wide molecular-weight distribution and an ASTM D-1238 melt index of below 100.

4,098,975

PROCESS FOR PREPARING POLYTETRAFLUOROETHYLENE FINE POWDERS

Tetsuo Shimizu, Osaka; Shigeru Ichiba, Kyoto; Shun Koizumi, Toyonaka, and Chuzo Okuno, Takatsuki, all of Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1977, Ser. No. 776,919

Claims priority, application Japan, Mar. 18, 1976, 51-30080

Int. Cl.² C08F *2/16, 14/26*

U.S. Cl. 526—73 **6 Claims**

1. In a process for preparing a polytetrafluoroethylene fine powder in which tetrafluoroethylene is polymerized in an aqueous medium containing a polymerization initiator and a dispersant to form a polytetrafluoroethylene polymer, coagulating the resulting polymer, washing the coagulated polymer, and drying the washed polymer, the improvement wherein at least 30% of a quantity of tetrafluoroethylene to be polymerized is polymerized at constant temperature in said aqueous medium and wherein further polymerization of said tetrafluoroethylene is effected in said aqueous medium at a different temperature at which said amount of tetrafluoroethylene produces a polytetrafluoroethylene polymer baving an amorphous index at least 0.01 higher than when said amount of tetrafluoroethylene is polymerized at said constant temperature.

4,098,976

PROCESS FOR THE PRODUCTION OF OLEFIN POLYMERS USING AN ORGANO-PHOSPHORUS CATALYST COMPOUND

Anthony David Caunt, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 475,840, Jan. 3, 1974, Pat. No. 3,969,269, which is a continuation of Ser. No. 268,505, Jul. 3, 1972, abandoned. This application Mar. 25, 1976, Ser. No. 670,134

Claims priority, application United Kingdom, Jul. 13, 1971, 32856/71

Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 526—77 **20 Claims**

1. A process for the production of an olefine polymer wherein at least one olefine monomer is contacted with an olefine polymerisation catalyst comprising (1) a solid halide of a transition metal wherein the said metal has a valency below its maximum, (2) an organometallic compound of aluminum, or of a non-transition metal of Group II of the Periodic System, or a complex of an organometallic compound of a non-transition metal of Group I or II of the Periodic System and an organo-aluminum compound; and (3) a trivalent phosphorus compound of the formula

$$PR'_{3-n}(X-A-Y)_n$$

wherein
R′ is halogen, a hydrocarbyl group or the group $—NR_2$ or —OR where R is a hydrocarbyl group;
X is —O—, —S—, or —NR—;
A is a bivalent organic radical such that X and Y are separated by not more than 3 carbon atoms;
Y is —OR, —SR, $—NR_2$, $—PR_2$ or heterocyclic ring system whereof the heteroatom is O, S, N or P; and
n is 1, 2 or 3.

4,098,977

METHOD FOR PREPARING POLYMERS FROM WATER SOLUBLE VINYL MONOMERS

Maurice L. Zweigle, and Samuel J. Kasley, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 593,157, Jul. 3, 1975, Pat. No. 4,020,256. This application Jan. 26, 1977, Ser. No. 762,593

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.² C08F *2/16, 2/10, 2/32, 4/40*

U.S. Cl. 526—77 **5 Claims**

1. A method for preparing a polymer from a water-soluble vinyl monomer which comprises forming a concentrated aqueous solution of said monomer containing a peroxygen catalyst, purging said solution until substantially free of inhibitory oxygen and spraying the purged solution at a temperature of from about 15° to about 30° C into an atmosphere substantially free of oxygen and containing sulfur dioxide gas, said peroxygen catalyst and sulfur dioxide being present in amounts effective to catalyze polymerization of the vinyl monomer.

4,098,978

PROCESS FOR EMULSION POLYMERIZATION OF VINYLIDENE HALIDES AND PRODUCT THEREOF

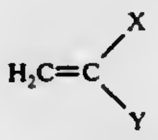
Bela Kalman Mikofalvy, Avon Lake, and James Wilson Turner, Bay Village, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 12, 1975, Ser. No. 630,981

Int. Cl.² C08F *2/26, 114/06*

U.S. Cl. 526—81 **11 Claims**

1. A process for preparing a polymer, said process comprising:
(A) polymerizing (1) from about 50 to 100 weight percent of at least one vinylidene halide monomer having the formula



wherein X is chlorine, and Y is hydrogen or chlorine, together with (2) from about 0 to 50 weight percent of at least one other unsaturated monomer copolymerizable therewith,
(B) in an aqueous emulsion medium in admixture with (1) an initiator consisting essentially of ammonium persulfate or a mixture of ammonium persulfate and hydrogen peroxide, and (2) at least one ammoniated anionic emulsifier, said emulsifier being substantially metal-free,
(C) said polymerization process being maintained at a pH of at least 8.5 using ammonium hydroxide, and
(D) polymerization being conducted in the presence of less than 100 ppm of alkali metal ions based upon total monomer weight, the amount of alkali metal ions also being less than 100 ppm after polymerization is complete.

4,098,979

METHOD FOR PREPARING EASILY PROCESSABLE POLYOLEFIN GRANULE

Kenichi Maemoto, Takatsuki; Takezo Sano, Ibaragi, and Akio Kobayashi, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 212,684, Dec. 27, 1971, abandoned. This application Dec. 12, 1973, Ser. No. 423,911

Claims priority, application Japan, Dec. 29, 1970, 45-124406

Int. Cl.² C08F *4/02, 10/00*

U.S. Cl. 526—100 **10 Claims**

1. A method for preparing easily pourable polyolefin granules, which comprises
polymerizing an olefin in the presence of a polymerization catalyst system comprising
a main catalyst component, selected from the group consisting of a reaction product of vanadium pentoxide with phosphoric acid and a reaction product of vanadium pentoxide with phosphoric acid, which was treated with an alcohol and which is supported on a spheroidal particle of a high molecular compound used as a carrier by contacting a solution containing the main catalyst component dissolved in a solvent with said high molecular compound and then removing the solvent therefrom by distillation, said spheroidal particle being a high molecular compound having a diameter of 1-1000 μ and selected from the group consisting of polyethylene, polypropylene, polybutene, poly-4-methylpentene-1, polystyrene, polyisoprene, polybutadiene, polyvinyl acetate, polyvinyl alcohol, polyacetal, polycarbonate, polyethylene oxide, polyacrylonitrile, polyacrylates, polyamides, polyesters, phenolformaldehyde resins, urea resins, melamine resins, ABS resins, polyurethanes, acetylcellulose and starch, the proportion of said main catalyst component supported on said high molecular compound being 0.5 to 30% by weight, and
an organoaluminum compound represented by the general formula

$$R_nAlX_{3-n}$$

wherein R represents a hydrocarbon group having 1 to 8 carbon atoms, X represents a group or an atom selected from halogen atoms, alkoxy groups and hydrogen atom, and n is a positive number of 3 or less,
under a pressure of no greater than 100 kg/cm² at a temperature lower than both of the melting points of the resulting polymer and said high molecular compound used as a carrier.

4,098,980

NON-AQUEOUS DISPERSION POLYMERIZATION OF CONJUGATED DIOLEFINS

Richard A. Markle, and Richard G. Sinclair, both of Columbus, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 24, 1976, Ser. No. 699,300

Int. Cl.² C08F *2/08, 2/12*

U.S. Cl. 526—201 **25 Claims**

1. In a process for the non-aqueous dispersion polymerization of a conjugated diolefin monomer in a liquid hydrocarbon dispersion medium with a Ziegler-Natta catalyst, the improvement which comprises carrying out the polymerization of conjugated diolefins in the presence of a block copolymer dispersion stabilizer comprising at least two polymer blocks linked by chemical valences wherein at least one of said polymer blocks ("A" block) is soluble in the dispersion medium and at least another of said polymer blocks ("B" block) is insoluble in the dispersion medium and the stabilizer acts to disperse polymers of conjugated diolefins which are formed in the stabilizer's presence.

4,098,981

POLYMERIZATION OF VINYL MONOMERS EMPLOYING LIQUID ACYL SULFONYL PEROXIDE FORMULATIONS DERIVED FROM SOLID ACYL ALKYLSULFONYL PEROXIDES

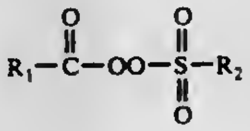
Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 596,115, Jul. 15, 1975, Pat. No. 4,043,940. This application May 4, 1977, Ser. No. 793,809

Int. Cl.² C08F *4/34, 14/06*

U.S. Cl. 526—204 **12 Claims**

1. In a method of polymerizing a vinyl monomer in the presence of an initiator, the improvement comprising using in an initiating amount in the temperature range of 0° C to 80° C a liquid solution composition which is a storable stable liquid at 0° to −40° C consisting essentially of
a. 10 to 70% by weight of a solid acyl alkylsulfonyl peroxide with a melting point between −10° and 70° C having the formula



$$R_1-\overset{\overset{\displaystyle O}{\|}}{C}-OO-\underset{\underset{\displaystyle O}{\|}}{\overset{\overset{\displaystyle O}{\|}}{S}}-R_2$$

where
(1) R_1 is an alkyl of 1 to 4 carbons and
(2) R_2 is selected from the group consisting of an alkyl or monochloroalkyl radical of 3 to 18 carbons and a cycloalkyl or cyclomonochloroalkyl radical of 4 to 12 carbons, and
b. 90 to 30% by weight of a polar or polarizable solvent or solvent system having a complete solidification temperature below about −10° C and a miscibility number of greater than 8 and less than 21, which solvent or solvent system possesses at least about 20% by weight based on the solid acyl sulfonyl peroxide of a solvent which has a boiling point of at least 165° C at 760 torr.

4,098,982

CATIONIC POLYMERIZATION OF PIPERYLENE USING AS THE CATALYST SYSTEM AN ALUMINUM HALIDE AND AN INORGANIC PHOSPHORIC ACID

Ronald Thomas Wojcik, Stamford, Conn., assignor to Arizona Chemical Company, Wayne, N.J.

Filed Mar. 8, 1977, Ser. No. 775,503

Int. Cl.^{2} C08F *4/00, 36/04*

U.S. Cl. 526—233 **7 Claims**

1. A process for polymerizing piperylene monomer or a mixture of said piperylene and at least another hydrocarbon monomer not to exceed 40% of said piperylene which comprises the steps of: establishing a catalyst system in an inert solvent therefor, said system comprising (1) a minor amount of from about 15% to about 30% of an inorganic phosphorus acid and (2) a major amount of from about 70% to about 85% of aluminum chloride or aluminum bromide or mixtures of aluminum chloride and aluminum bromide, adding thereto at a temperature between about 0° C and about 50° C piperylene monomer or a mixture of piperylene and other hydrocarbon monomers not to exceed 40% of said piperylene incrementally with agitation, adjusting and maintaining the temperature of said mixture between 0° C and 50° C for from about 1 to about 4 hours to obtain a piperylene polymer free from intractable gel.

4,098,983

HYDROCARBON-DERIVED RESINS OF PIPERYLENE AND METHYL BRANCHED TERTIARY OLEFIN HYDROCARBONS

Robert A. Osborn, Stow, and Herbert L. Bullard, Norton Village, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 506,387, Sep. 16, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,395

Int. Cl.^{2} C08F *4/14, 236/04, 240/00*

U.S. Cl. 526—237 **2 Claims**

1. A hydrocarbon-derived resin characterized by having a softening point in the range of about 5° C. to about 20° C. and a viscosity in the range of about 1000 to about 40,000 at about 25° C. which is the product of (i) polymerizing, in the presence of an inert diluent and a catalyst selected from at least one of boron trifluoride and boron trifluoride etherate derived from boron trifluoride and an ether having 2 to 6 carbon atoms, a mixture which consists essentially of (A) about 45 to about 65 weight percent piperylene and, correspondingly, about 55 to about 35 weight percent of at least one methyl branched tertiary monoolefin selected from at least one of the group consisting of 2-methyl-1-butene, 2-methyl-1pentene, 2-methyl-2-pentene, 2,3-dimethyl-1-butene, and 2,3-dimethyl-2-butene and, optionally, (B) up to about 10 parts by weight per 100 parts by weight of said piperylene/branched olefin monomer mixture of at least one of piperylene dimers, piperylene trimers or other unsaturated hydrocarbons selected from the group consisting of 3-methyl-2-pentene, isoprene, and cyclic unsaturated hydrocarbons selected from cyclopentene, cyclohexane and 1,3-cyclopentadiene and (ii) steam stripping the product to remove light oil-like products, unreacted hydrocarbons and diluent.

4,098,984

ELECTRON ACCEPTOR POLYMERS

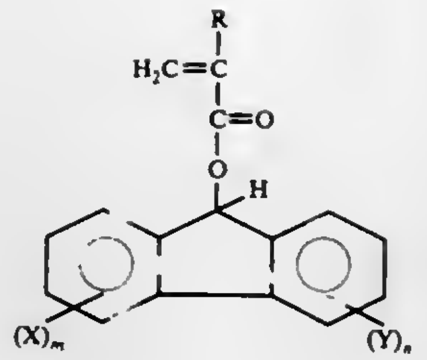
Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 596,689, Jul. 16, 1975, Pat. No. 4,046,564. This application Apr. 20, 1977, Ser. No. 789,165

Int. Cl.^{2} C08F *4/04, 18/20, 118/20;* **G03G** *5/04*

U.S. Cl. 526—245 **1 Claim**

1. Polymers comprising the product of the free radical addition polymerization of at least one monomer of the formula:



wherein

R is hydrogen or methyl;

X and Y are independently selected from the group consisting of NO_2, halogen, —CN and —CF_3; and

m and *n* can range from 0 to 3.

4,098,985

ESTER COPOLYMERS CROSS-LINKABLE UNDER ACID AND ALKALINE CONDITIONS

Hartmut Brabetz; Hubert Wiest, and Dieter Gorzel, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 608,445, Aug. 28, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,456

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1974, 2441892

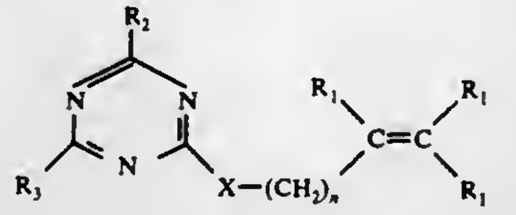
Int. Cl.^{2} C08F *226/06*

U.S. Cl. 526—261 **21 Claims**

1. A substantially-non-cross-linked ester copolymer which is cross-linkable under acidic, alkaline and heated conditions consisting essentially of a copolymerizate with

(i) from 75% to 99% by weight of said copolymerizate of ester monomer mixture units, said mixture having from 70% to 100% by weight of an ester monomer selected from the group consisting of (a) vinyl alkanoates having from 1 to 22 carbon atoms in the alkanoate, (b) alcohol esters of acrylic acid, (c) alcohol esters of methacrylic acid, wherein said alcohol is selected from the group consisting of alkanols having from 1 to 18 carbon atoms, cycloalkanols having from 5 to 8 carbon atoms, and mixtures thereof, and (d) mixtures thereof, and from 0 to 30% by weight of said mixture of monomers copolymerizable with said ester monomers selected from the group consisting of (a) vinyl halides, (b) vinylidene halides, (c) vinyl aromatic hyrocarbons, (d) vinyl pyridine, (e) vinyl pyrrolidone, (f) α,β-unsaturated, α-unsaturated alkenoic acids having from 4 to 10 carbon atoms, and (g) their esters with alcohols selected from the group consisting of alkanols having from 1 to 18 carbon atoms, cycloalkanols having from 5 to 8 carbon atoms and mixtures thereof, (h) α,β-unsaturated alkendioic acids having from 4 to 10 carbon atoms and (j) their esters with alcohols selected from the group consisting of alkanols having from 1 to 18 carbon atoms, cycloalkanols having from 5 to 8 carbon atoms and mixtures thereof, (k) alkenes having from 2 to 8 carbon atoms, (l) conjugated alkadienes having from 4 to 8 carbon atoms, (m) acrylonitrile and (n) mixture thereof;

(ii) from 0.2% by 15% by weight of said polymerizate of at least one olefinically unsaturated halotriazine monomer units of the formula



wherein R_1 is a member selected from the group consisting of hydrogen and methyl, R_2 is a halogen selected from the group consisting of bromo and chloro, R_3 is a member selected from the group consisting of hydrogen, hydroxy, lower alkyl, chloro and bromo, X is a bivalent linkage selected from the group consisting of oxygen, sulfur and —NH—, and *n* is an integer from 0 to 3;

(iii) from 0.2% to 10% by weight of said polymerizate of mono-olefinically unsaturated nitrogen-containing monomer units, said nitrogen-containing monomer containing a nitrogen group selected from the group consisting of (a) an N-methylol group selected from the group consisting of N-methylolacrylamide, N-methylolmethacrylamide and N-methylolallyl carbamate and (b) a protected N-methylol group which reverts to an N-methylol group when heated or treated with an acid or an alkali compound selected from the group consisting of alkyl ethers of the compounds of (a) above, esters of the compounds of (a) above, and Mannich bases of the compounds of (a) above;

(iv) from 0 to 10% by weight of said polymerizate of mono-olefinically unsaturated monomer units copolymerizable with said ester monomer mixture selected from the group consisting of alkenoic acid amides having from 3 to 8 carbon atoms, acrylic acid, methacrylic acid, esters of acrylic and methacrylic acids with alcohols selected from the group consisting of alkanediols having from 2 to 8 carbon atoms, alkanetriols having from 3 to 8 carbon atoms, alkanehalohydrins having from 2 to 8 carbon atoms, epoxyalkanols having from 3 to 8 carbon atoms, haloalkanediols having from 3 to 8 carbon atoms, aminoalkanols having from 2 to 8 carbon atoms, and alkylaminoalkanols having from 3 to 8 carbon atoms, and vinyl sulfonate; and

(v) from 0 to 0.5% by weight of said polymerizate of olefinically-unsaturated polyallyl cross-linking monomer units, said substantially non-cross-linked ester copolymer being produced by aqueous emulsion polymerization.

4,098,986

COPOLYMERIZABLE MONOETHYLENICALLY UNSATURATED PHOSPHONATES AND FIRE RETARDANT COPOLYMERS CONTAINING THE SAME

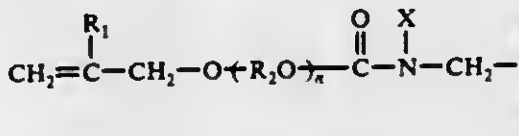
Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Mar. 31, 1976, Ser. No. 672,395

Int. Cl.^{2} C08F *30/02, 130/02, 2/00, 4/30*

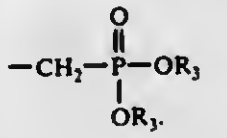
U.S. Cl. 526—278 **8 Claims**

1. An addition copolymer of a monoethylenic phosphonate with at least one other monoethylenically unsaturated monomer, said copolymer containing the phosphorus-carried alkoxy group, said monoethylenic phosphonate constituting at least 5% of the weight of the copolymer and having the formula:



$$CH_2{=}\overset{R_1}{\overset{|}{C}}-CH_2-O\left(R_2O\right)_n-\overset{O}{\overset{\|}{C}}-\overset{X}{\overset{|}{N}}-CH_2-\underset{OR_3}{\underset{|}{\overset{O}{\overset{\|}{P}}}}-OR_3$$

in which R_1 is hydrogen or methyl, R_2 is an alkylidene group containing from 2–4 carbon atoms, n is an integer from 0–10, R_3 is C_1–C_4 alkyl and X is hydrogen, methylol or



$$-CH_2-\underset{OR_3}{\underset{|}{\overset{O}{\overset{\|}{P}}}}-OR_3.$$

4,098,987

NON-IONIC SURFACTANTS FROM WATER SOLUBLE COPOLYMERS OF ACRYLAMIDE WITH HYDROPHOBIC MONOMERS

Girish Chandra Barua, and Daniel Elmer Nagy, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 14, 1976, Ser. No. 705,315

Int. Cl.^{2} C08F *220/56*

U.S. Cl. 526—304 **7 Claims**

1. A water-soluble polymer consisting of copolymerized monomers consisting of 40 to 70 percent by weight acrylamide and 30 to 60 percent by weight of at least one monomer selected from the group consisting of styrene, lower alkyl esters of acrylic acid, lower alkyl esters of methacrylic acid, and the alkyl and alkoxymethyl acrylamides in which alkyl contains 4 to 13 carbon atoms, said polymer having non-ionic surface active properties in aqueous solution.

4,098,988

ANIONICALLY POLYMERIZED COPOLYMERS OF METHYL α-N-ALKYLACRYLATE AND METHYL METHACRYLATE AND METHOD OF MAKING SAME

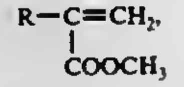
Henry Gisser, Philadelphia, and Helen Mertwoy, Dresher, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1977, Ser. No. 761,141

Int. Cl.^{2} C08F *4/46, 220/68, 220/10, 220/14*

U.S. Cl. 526—328 **4 Claims**

1. Copolymers which are reaction products of the sodium copolymerization of methyl methacrylate and methyl α-n-alkylacrylate having the formula



$$R-\underset{COOCH_3}{\underset{|}{C}}{=}CH_2,$$

wherein R is an alkyl having the formula C_nH_{2n+1}, where *n* is at least 10 and not greater than 22, said copolymers containing from about 10 to 50 mole % of monomer units originating from methyl α-n-alkylacrylate and from about 90 to 50 mole % of monomer units originating from methyl methacrylate, and having an average molecular weight of at least about 5000 as determined by vapor pressure osmometry.

4,098,989

POLYCHLOROPRENE POWDERS

Nathan L. Turner, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 711,768, Aug. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 571,957, Apr. 28, 1975, Pat. No. 3,988,306. This application May 20, 1977, Ser. No. 798,896

Int. Cl.^{2} C08F *6/22*

U.S. Cl. 528—486 **13 Claims**

1. In a process for producing particulate polychloroprene comprising preparing a polychloroprene latex using a resin or rosin soap emulsification system, acidifying said latex to a pH in the range of 5.5 to 6.3, dissolving in said latex, 1 to 10 parts by weight of an alkyl sulfate salt having 6 to 20 carbon atoms per 100 parts of polychloroprene, intimately mixing said latex with a coagulant solution to produce a resultant solution having a pH of less than about 4.5, adding a base solution to said latex to reduce the acidity, recovering particulate polychloroprene and drying said particles, wherein the improvement comprises dissolving 0.5 to 5.0 parts of additional emulsifier, which is stable in solutions having a pH of less than 4.5, per hundred parts of polychloroprene in said latex prior to or after said intimate mixing thereof with said coagulant, and separating said coagulated latex and the spent coagulant solution prior to adding the base to said coagulated latex.

4,098,990

PROCESS FOR THE PURIFICATION OF LOW PRESSURE POLYMERIZED POLYOLEFIN POWDER USING RECYCLED, ANION-EXCHANGE TREATED WATER

Siegfried Lutze, Gelsenkirchen; Hans Feichtinger, Dinslaken, and Hans-Walter Birnkraut, Oberhausen, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Continuation of Ser. No. 538,103, Jan. 2, 1975, abandoned. This application Jul. 14, 1976, Ser. No. 705,048

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1974, 2400977

Int. Cl.^{2} C08F *6/00*

U.S. Cl. 528—490 **8 Claims**

1. In a process for removing halogen-containing compounds from polyolefin powder produced using a catalyst containing halogen-containing compounds and an organic diluent, the improvement comprising the steps of separating the diluent from the polyolefin powder, placing the separated powder in a purification zone, contacting the separated powder with water, removing a portion of said water from said purification zone, contacting the removed water with an anion exchange resin to deionize the removed water, and returning the deionized water to said purification zone to again contact said polyolefin powder, repeating the steps of removing a portion of the water, contacting the removed water with said resin and returning said water to the purification zone while continuously separating the diluent from the powder, until the removed water contains a selected low amount of halogen-containing compounds and thus the powder will contain a selected low amount of halogen-containing compounds.

4,098,991

REMOVAL OF CATALYTIC RESIDUES FROM HYDROGENATED THERMOPLASTIC OR ELASTOMERIC POLYMERS

Jung Wong Kang, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 612,620, Sep. 12, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,374

Int. Cl.^{2} C08F *6/08;* C08C *2/04*

U.S. Cl. 528—492 **17 Claims**

1. A process for the removal of a metal catalytic residue, comprising;

precipitating a metal catalytic residue of a hydrogenated polymer by reacting said metal catalytic residue with an amine compound, said metal catalytic residue selected from the class consisting of nickel, cobalt and iron, said amine compound selected from the class consisting of,

an HCl salt of an amine, said amine selected from the class consisting of an amine having an alkyl group selected from the class consisting of ethyl, propyl, isopropyl, butyl, sec-butyl, tert-butyl, isobutyl, and an amine having a phenyl group,

an HCl salt of a diamine having an alkyl group selected from the class consisting of ethyl, propyl, isopropyl, butyl, sec-butyl, tert-butyl, isobutyl, or a phenyl group,

a substituted glyoxime compound selected from the class consisting of methylglyoxime, phenylmethylglyoxime, dimethylglyoxime and diphenylglyoxime, and

a heterocyclic nitrogen compound selected from the class consisting of pyrrole and the HCl salt of pyridine.

4,098,992

METHOD FOR CONTINUOUS SOLUBLE POLYPROPYLENE RECOVERY FROM HYDROCARBON POLYMERIZATION MEDIA

Benjamin P. Belies, St. Charles, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation of Ser. No. 597,388, Jul. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,721, Nov. 14, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,780

Int. Cl.^{2} C08F *6/12*

U.S. Cl. 528—500 **7 Claims**

1. A method for the continuous recovery of soluble polypropylene, having a number average molecular weight in excess of 5,000, from spent polymerization media comprising:

a. Steam stripping at a temperature between about 160° F. and

about 250° F. under a pressure between about 4 and about 25 psig said media to form a two-phase system comprising an organic phase and an aqueous phase wherein said organic phase comprises between about 50 and 70 weight percent soluble polypropylene;

b. decanting said organic phase from said aqueous phase while at a temperature and at a pressure of about said temperature and said pressure of said steam stripping, respectively; and

c. removing essentially all remaining volatile material from said organic phase by heating said organic phase to between about 300° F. and 475° F. by means of a heat transfer whereby there is recovered polypropylene of sufficient fluidity to be readily transferred.

5. A method for the continuous recovery of soluble polypropylene, having a number average molecular weight in excess of 5,000, from spent polymerization media consisting essentially of:

a. Steam stripping at a temperature between about 160° F. and about 250° F. under a pressure between about 4 and about 25 psig said media to form a two-phase system comprising an organic phase and an aqueous phase wherein said organic phase comprises between about 40 and 70 weight percent soluble polypropylene;

b. decanting said organic phase from said aqueous phase while at a temperature and at a pressure of about said temperature and said pressure of said steam stripping, respectively; and

c. removing essentially all remaining volatile material from said organic phase by heating said organic phase to between about 300° F. and 475° F. by means of a heat transfer surface whereby there is recovered polypropylene of sufficient fluidity to be readily transferred.

4,098,993

SEMI-SYNTHETIC 4-UREIDO-OLEANDOMYCIN DERIVATIVES

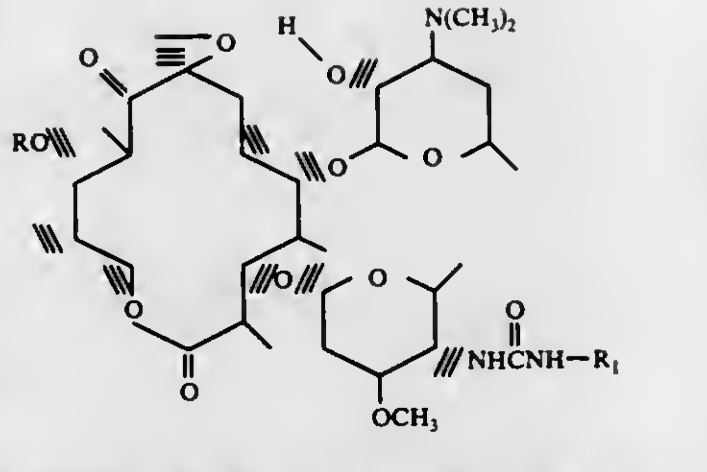
Gene M. Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,907

Int. Cl.^{2} C07H *17/08;* A01N *9/00*

U.S. Cl. 536—9 **15 Claims**

1. A compound selected from the group consisting of:



and a pharmaceutically acceptable acid addition salt thereof, wherein R is alkanoyl having from two to three carbon atoms; and R$_1$ is selected from the group consisting of hydrogen, pyridylmethyl, furylmethyl, thenyl, hydroxypyridyl, phenyl, benzyl and substituted phenyl and benzyl wherein said substituent is selected from the group consisting of methyl, chloro, fluoro, methoxy, amino and trifluoromethyl.

4,098,994

SULFAMIDE DERIVATIVES OF 4 -DEOXY-OLEANDOMYCIN

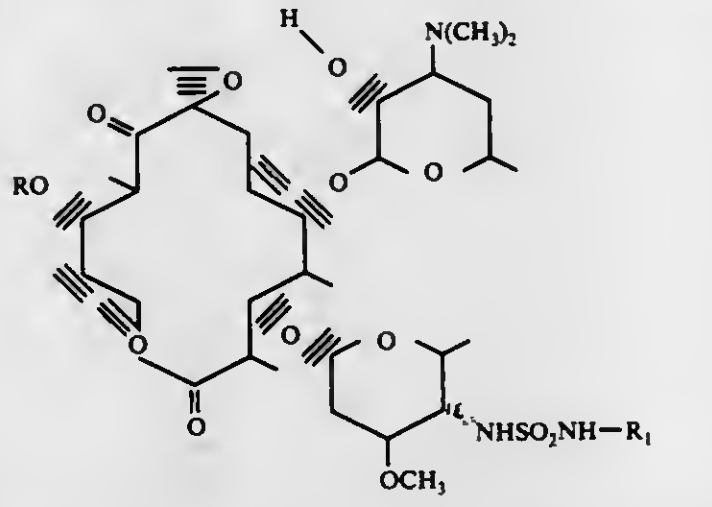
Gene M. Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 15, 1977, Ser. No. 833,405

Int. Cl.^{2} C07H *17/08;* A01N *9/00*

U.S. Cl. 536—9 **7 Claims**

1. A compound selected from the group consisting of:



and a pharmaceutically acceptable acid addition salt thereof, wherein R is alkanoyl having two to three carbon atoms; and R$_1$ is selected from the group consisting of alkyl having from one to four carbon atoms, phenyl and substituted phenyl wherein said substituent is selected from the group consisting of methyl, methoxy, chloro, fluoro and trifluoromethyl.

4,098,995

POLYGALACTOSIDO-SUCROSE POLY(H-)SULFATE SALTS

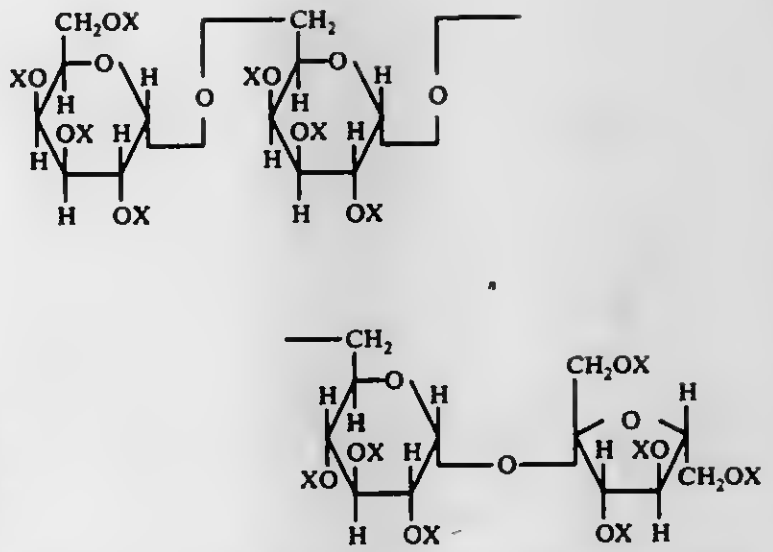
Vijay Gopalan Nair, Nanuet, N.Y.; Joseph Peter Joseph, Cliffside Park, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 12, 1976, Ser. No. 704,585

Int. Cl.^{2} C07H *13/12*

U.S. Cl. 536—54 **13 Claims**

1. A compound selected from those of the formula:



wherein X is —SO$_3$R; R is hydrogen, alkali metal, alkaline earth metal, ammonium and substituted ammonia selected from the group comprising trialkylamine (C$_1$–C$_6$); piperidine, pyrazine; cycloalkanolamine (C$_3$–C$_6$); alkanolamine (C$_1$–C$_6$); and *n* is 0 to 7.

4,098,996

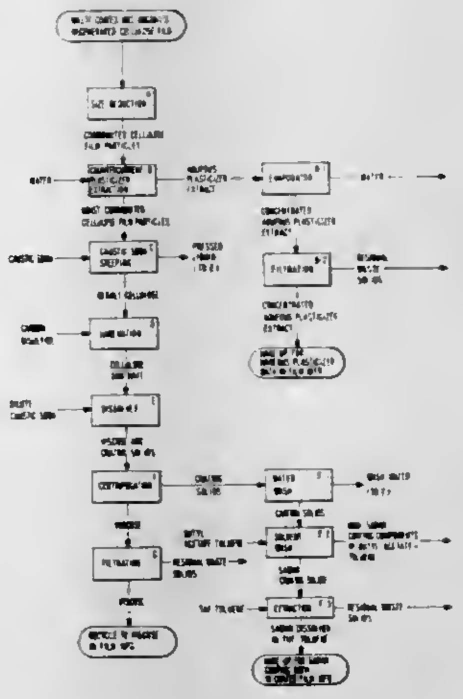
REGENERATED CELLULOSE FILM RECOVERY PROCESS

Daniel John Ryan, Chester, and Edward Andrew Wielicki, Philadelphia, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 22, 1977, Ser. No. 770,727

Int. Cl.^{2} C08B *3/32, 5/16, 16/00*

U.S. Cl. 536—57 **10 Claims**



1. A process for recovering regenerated cellulose from plasticized regenerated cellulose film, at least a portion being coated film, which comprises

(a) comminuting the regenerated cellulose film;

(b) extracting the plasticizer from the comminuted cellulose film particles by leaching the cellulose with water at a temperature of between 5° C to 70° C;

(c) after leaching, steeping the still moist comminuted cellulose film particles in caustic soda solution to form an alkali cellulose and thereafter xanthating the alkali cellulose with carbon bisulfide to provide a viscose which contains undissolved coating solids; and

(d) separating the coating solids from the viscose thereby obtaining a viscose suitable for use in the manufacture of regenerated cellulose film.

4,098,997

PROCESS FOR PREPARING CROSS-LINKED STARCHES

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

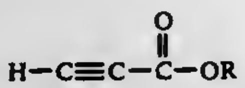
Filed Jan. 21, 1977, Ser. No. 760,866

Int. Cl.² C08B *31/16*

U.S. Cl. 536—106 **10 Claims**

1. A process for preparing granular, acetal cross-linked starches comprising of the steps of:

(a) reacting a granular starch base in an aqueous medium with 0.10 – 25%, by dry weight of the starch, of a propiolate ester of the general formula:



$$H-C\equiv C-\overset{\overset{\displaystyle O}{\|}}{C}-OR$$

wherein R is selected from the group consisting of alkyl (C_1 – C_8), alkenyl (C_3 – C_8) and cycloalkyl (C_3 – C_6), the reaction being carried out at a pH of 6.5 – 12.5 and at a temperature of 5° – 60° C. for a period of 0.2 – 24 hours; and

(b) isolating the resultant granular cross-linked starch.

4,098,998

ALDEHYDE, OXIME AND PHENYLHYDRAZONE DERIVATIVES OF ACID S, AN ANTIBIOTIC PRODUCED BY *POLYANGIUM CELLULOSUM* VAR. *FULVUM*

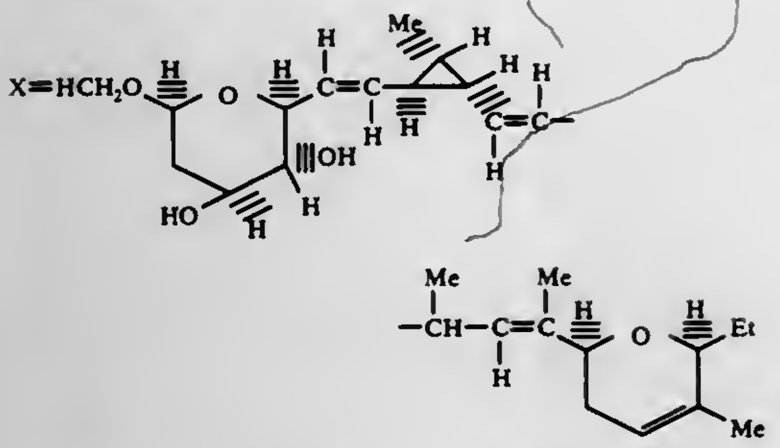
David T. Connor, Parsippany; Samuel M. Ringel, and Maximillian Von Strandtmann, both of Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 694,618, Jun. 10, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,567

Int. Cl.² C09B *23/00*

U.S. Cl. 542—447 **7 Claims**

1. A compound having the formula I:



wherein X is oxygen, oxime or phenylhydrazone, said compound being derived from the antibiotic acid S.

4,098,999

CERTAIN 2-SUBSTITUTED CEPHALOSPORINS

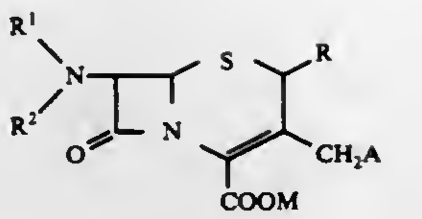
Joseph E. Dolfini, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 298,172, Oct. 16, 1972, Pat. No. 3,852,282, which is a continuation-in-part of Ser. No. 812,386, Apr. 1, 1969, abandoned. This application Aug. 21, 1974, Ser. No. 499,368

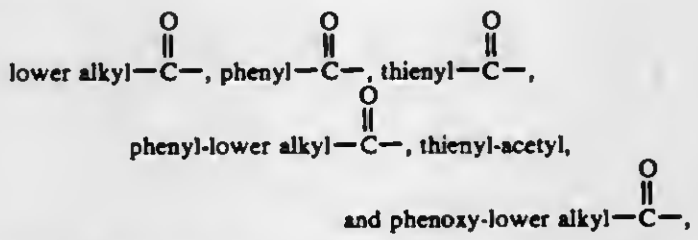
Int. Cl.² C07D *501/20*

U.S. Cl. 544—15 **20 Claims**

1. A compound of the formula



wherein A is selected from the group consisting of hydrogen, acetoxy, hydroxy, and pyridinium and when taken together with M, a monovalent carbon-oxygen bond; M is selected from the group consisting of hydrogen, sodium, potassium, ammonium, calcium, triethylamine, N-ethylpiperidine, dibenzylethylenediamine, N,N'-bis(dehydroabietyl)ethylenediamine, procaine, benzyl, trimethylsilyl, t-hutyl, trichloroethyl, an anionic charge when A is pyridinium, and when taken together with A, a monovalent carbon-oxygen bond; R¹ and R² are both hydrogen, or R² is hydrogen and R¹ is selected from the group consisting of



$$\text{lower alkyl}-\overset{\overset{\displaystyle O}{\|}}{C}-,\ \text{phenyl}-\overset{\overset{\displaystyle O}{\|}}{C}-,\ \text{thienyl}-\overset{\overset{\displaystyle O}{\|}}{C}-,$$

$$\text{phenyl-lower alkyl}-\overset{\overset{\displaystyle O}{\|}}{C}-,\ \text{thienyl-acetyl},$$

$$\text{and phenoxy-lower alkyl}-\overset{\overset{\displaystyle O}{\|}}{C}-,$$

or R¹ and R² taken together with the nitrogen atom to which they are attached form succinimido or phthalimido; and R is selected from the group consisting of lower alkoxy, phenoxy, lower alkenyloxy, lower alkynyloxy, lower alkylthio, phenylthio, lower alkenylthio and lower alkynylthio.

4,099,000

PROCESS FOR PREPARING DI-7-AZIDO CEPHALOSPORIN COMPOUNDS

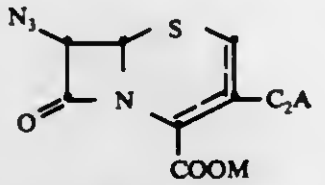
Burton G. Christensen, Metuchen, and Ronald W. Ratcliffe, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1976, Ser. No. 671,784

Int. Cl.² C07D *501/04*

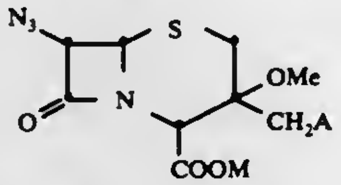
U.S. Cl. 544—17 **1 Claim**

1. The process of preparing a dl-7-azido cephalosporin of the formula



wherein A is hydrogen or acetoxy and M is benzyl, y-methoxy benzyl, or p-nitrobenzyl, which comprises

reacting a compound of the formula



wherein A and M are as defined, and Ms indicates methyl sulfonyl, with

(a) silica gel at room temperature for from about 12 hours to about 96 hours, in an anhydrous inert solvent; or

(b) an equimolar amount of triethylamine at 37° C. for from about 2 to about 8 hours in an anhydrous inert solvent;

and recovering the product thereby produced.

4,099,001

[[[IMIDAZOLIDINYL AMINO]CARBONYL]AMINO]ACETYL CEPHALOSPORIN DERIVATIVES

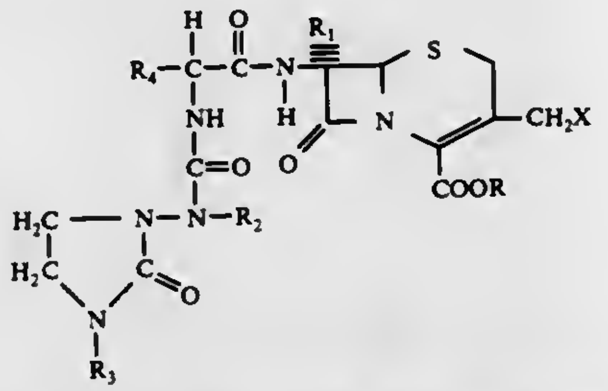
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 15, 1977, Ser. No. 777,873

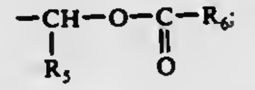
Int. Cl.² C07D *501/36*

U.S. Cl. 544—27 **11 Claims**

1. A compound of the formula

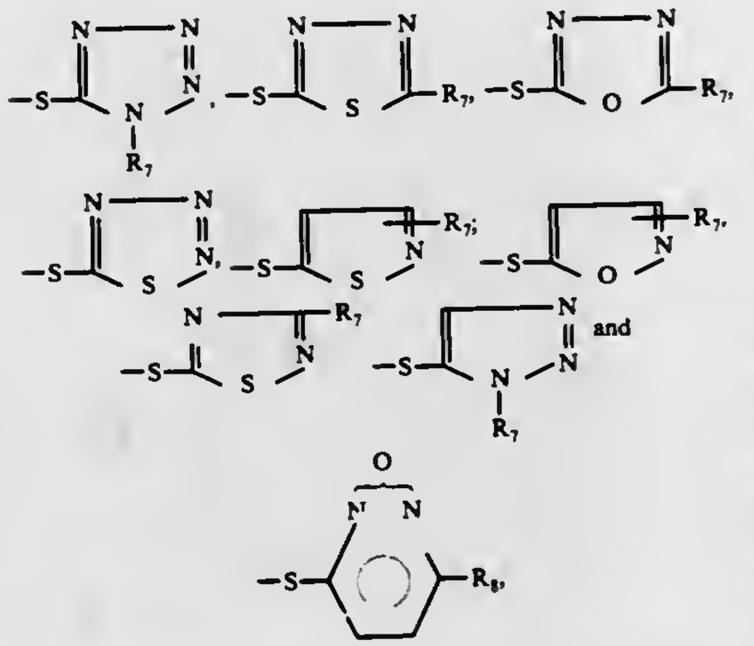


wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, aluminum, alkali metal, alkaline earth metal, phenyl-lower alkylamine, N,N-dibenzlethylenediamine, lower alkylamine, tri(-lower alkyl amine), N-lower alkylpiperidine or



$$-\underset{\underset{\displaystyle R_5}{|}}{CH}-O-\overset{}{\underset{\underset{\displaystyle O}{\|}}{C}}-R_6;$$

R_1 is in the α-configuration and is hydrogen or methoxy; R_2, R_3 and R_5 each is hydrogen or lower alkyl; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy and hydroxy, or a substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl; R_6 is lower alkyl; and X is a heterothio group selected from the group consisting of



wherein R_7 is hydrogen or lower alkyl and R_8 is hydrogen, lower alkyl, methoxy, hydroxy or halogen.

4,099,002

QUINAZOLINONE DERIVATIVES AND A PROCESS FOR PRODUCTION THEREOF

Shigeho Inaba, Takarazuka; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Masao Koshiba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

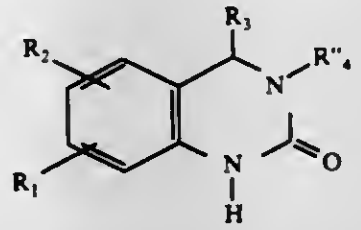
Continuation of Ser. No. 207,537, Dec. 13, 1971, abandoned. This application Aug. 8, 1974, Ser. No. 495,829

Claims priority, application Japan, Dec. 23, 1970, 45-118332; Jan. 19, 1971, 46-1477; May 21, 1971, 46-34897

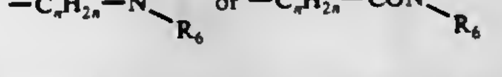
Int. Cl.² C07C *295/00*

U.S. Cl. 544—119 **11 Claims**

1. A 3,4-dihydro-2(1H)-quinazolinone derivative represented by the formula,



wherein R_1 and R_2 signify individually a hydrogen atom, a lower alkyl group, a lower alkoxy group, a nitro group, a trifluoromethyl group, a lower alkylthio group, a lower alkylsulfonyl group or a halogen atom; R_3 is phenyl, halophenyl, lower alkylphenyl, lower alkoxyphenyl, trifluoromethylphenyl or naphthyl; and R''_4 is a group of the formula



$$-C_nH_{2n}-N\begin{matrix}R_5\\R_6\end{matrix}\quad\text{or}\quad -C_nH_{2n}-CON\begin{matrix}R_5\\R_6\end{matrix}$$

wherein n signifies an integer of 1 to 4, and R_5 and R_6 signify individually lower alkyl.

4,099,003

NON-BLOOMING ACCELERATOR AND PROCESS FOR VULCANIZATION OF EPDM ELASTOMERS

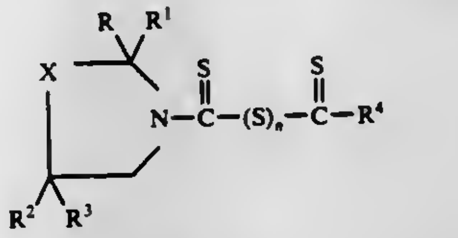
Ivan Christoff Popoff, Ambler; Everett A. Mailey, Norristown, and Paul Gordon Haines, Lafayette Hill, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 11, 1976, Ser. No. 695,274

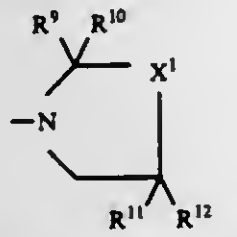
Int. Cl.² C07D *263/04, 263/06, 277/04*

U.S. Cl. 544—137 **25 Claims**

1. A compound having the following general structure:



wherein R, R¹, R² and R³ are independently selected from the group consisting of hydrogen; alkyl and chlorinated alkyl each having from 1 to 17 carbon atoms; alkenyl radicals having from 2 to 17 carbon atoms; phenyl, naphthyl, substituted phenyl and substituted naphthyl radicals having no more than two substitutents selected from the group consisting of —Cl, —OH, —OR⁵ and —NR⁵R⁶ wherein R⁵ and R⁶ are alkyl radicals having 1 to 8 carbon atoms; not more than one of R and R¹ or of R² and R³ is phenyl, naphthyl, substituted phenyl, substituted naphthyl, t-alkyl or t-alkenyl; *n* is an integer of from 1 to 4; R⁴ is selected from the group consisting of (a) —NR⁷R⁸ wherein R⁷ and R⁸ are independently selected from alkyl radicals having from 1 to 18 carbon atoms and together having a total of at least 5 carbon atoms, (b) —NZ which represents a morpholino or piperidino radical, and (c)



wherein R^{9}, R^{10}, R^{11} and R^{12} are independently selected from the same group from which R is selected and at least one of R^{9}, R^{10}, R^{11} and R^{12} is other than hydrogen; and X and X' are independently selected from oxygen and sulfur atoms.

4,099,004

MORPHOLINOMETHACRYLIC ACID SALT

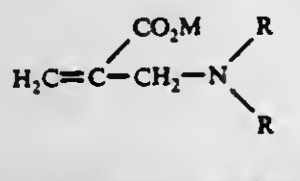
Robert L. Zimmerman; Edward E. McEntire, and Howard P. Klein, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 644,494, Dec. 29, 1975, Pat. No. 4,026,836. This application Dec. 3, 1976, Ser. No. 747,452

Int. Cl.^{2} C07D *295/14*

U.S. Cl. 544—171 **1 Claim**

1. A compound useful as an isocyanurate group formation catalyst which has a structural formula as follows:



where the radicals represented by R taken together with the adjacent nitrogen atom are morpholino or C-lower alkyl substituted morpholino, and M is selected from the group consisting of sodium, potassium, cesium, lithium, and rubidium.

4,099,005

APPARATUS AND METHOD FOR DISPENSING SOLIDS INTO A LIQUID MEDIUM

Michael C. Fullington, and Kurt H. Moller, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 30, 1977, Ser. No. 782,677

Int. Cl.^{2} C07D *251/31, 251/36*

U.S. Cl. 544—190 **8 Claims**

1. A system for dispersing a dry particulate blend of trichloroisocyanuric acid and isocyanuric acid and a sodium hydroxide solution liquid reactant into a reaction slurry in a reactor to produce sodium dichloroisocyanurate, said system comprising:

(a) a funnel having an inner surface;

(b) wash means for producing a vortical wash stream along said inner surface;

(c) liquid feed means for continuously introducing said liquid reactant into said reactor;

(d) solids feed means for continuously introducing said particulate blend into a central portion of said vortical stream so as to produce a slurry stream;

(e) slurry stream feed means connected to both said funnel and said reactor for transferring said slurry stream from said funnel to said reactor; and

(f) slurry recycle means attached to both said reactor and said wash means for withdrawing a portion of the contents of said reactor and accelerating said contents and supplying said accelerated reactor contents to said wash means.

4,099,006

PROCESS FOR THE PRODUCTION OF CHLORO-AMINO-S-TRIAZINES

Luciano Baldi, Turin; Corrado Ferrari, Parma, and Renato Francese, Turin, all of Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Dec. 29, 1975, Ser. No. 645,137

Claims priority, application Italy, Jan. 3, 1975, 67013 A/75

Int. Cl.^{2} C07D *251/44, 251/50*

U.S. Cl. 544—204 **15 Claims**

1. In a method for the production of 2-chloro-s-triazine substituted in at least one of the positions 4,6 of the triazine ring with an amino group, by reaction in a water-organic liquid medium between cyanuric chloride and an amine in the presence of sodium hydroxide, the improvement which comprises:

feeding gradually, contemporaneously and separately an aqueous solution of a primary or secondary amine and an aqueous solution of sodium hydroxide into a reaction medium containing a solution of cyanuric chloride in an organic liquid immiscible or partially miscible with water, having a boiling point of from 60° to 130° C; adjusting the feed rate of the amine and sodium hydroxide solutions so as to feed per unit of time from 1.05 to 1.30 moles of amine for each mole of sodium hydroxide;

stopping the feeding of the amine solution when an amount of from 1 to 2 moles of amine per mole of cyanuric chloride has been added to the reaction medium;

stopping the feeding of the sodium hydroxide solution when an amount of sodium hydroxide moles equal to or slightly higher than the amount of amine moles fed in is reached in the reaction medium;

maintaining during the feeding period the temperature of the reaction medium at a value of from 5°–15° C to 60°–70° C; and

recovering the resulting substituted 2-chloro-s-triazine from the reaction medium.

4,099,007

N,N-SUBSTITUTED 2,4,5-TRIKETOIMIDAZOLIDINES AND A PROCESS FOR THEIR PREPARATION

Kurt Kraft, Auringen, and Johannes Reese, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Germany

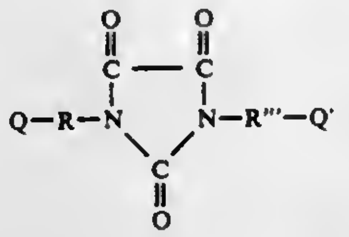
Division of Ser. No. 230,989, Mar. 1, 1972, Pat. No. 3,928,376, which is a continuation-in-part of Ser. No. 24,794, Apr. 1, 1970, abandoned. This application Jun. 11, 1975, Ser. No. 586,035

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1975, 1916932; Apr. 24, 1975, 1920845

Int. Cl.^{2} C07D *233/96;* **C08G** *18/06, 18/14*

U.S. Cl. 548—307 **4 Claims**

1. A process for the preparation of a monomer compound containing a structural unit of the formula



(I)

wherein one of Q and Q' are independently a urethane or an isocyanate group, the group NH—CO—OR^{IV} or hydrogen and the other —NH—CO—COOR^{V} or hydrogen, wherein R^{IV} and R^{V} are aliphatic hydrocarbon groups with up to 18 carbon atoms, cycloaliphatic hydrocarbon groups with up to 8 carbon atoms, mononuclear aromatic groups of 6 carbon atoms or such mononuclear aromatic groups of 6 carbon atoms substituted with hydrocarbon groups having up to 14 carbon atoms;

R is a radical selected from phenyl, naphthyl, benzeneazophenyl, anthraquinolyl, pyridyl, quinolyl, cycloaliphatic group that are unsubstituted or substituted with one or more groups selected from nitro, cyano, halo,

lower alkyl, lower alkoxy, lower diethylamino alkyl ester, cycloalkyl, alkylsulphonyl and haloalkyl,

R''' is a group as defined for R and additionally phenyl, naphthyl, phenylene, naphthylene, each of which can be substituted with alkyl, haloalkyl with up to 5 halogen atoms, trifluoromethyl, acyl such as acetyl or nitro groups comprising reacting at least one oxamidic acid ester as defined with a monoisocyanate or an isocyanate forming compound

(A) at a temperature of −20° to 280° C at a molar ratio selected from the group consisting of

(a) monoisocyanate to a monooxamidic ester being 1:1 to 2:1,

(b) monoisocyanate to bis-oxamidic ester being 2:1,

(c) diisocyanate to a monooxamidic ester being 1:1 and

(B) at a temperature of −20° to 150° C at a molar ratio of

(d) diisocyanate to bis-oxamidic ester being 1:1 to 2:1

both embodiments (A) and (B) are performed in the presence or absence of a catalyst.

4,099,008

PROCESS FOR THE PREPARATION OF 3-(3,5-DICHLOROPHENYL)-HYDANTOIN

Michel Sauli, Paris, France, assignor to Philagro, Lyon, France

Filed Aug. 12, 1976, Ser. No. 713,638

Claims priority, application France, Aug. 13, 1975, 75 25209

Int. Cl.^{2} C07D *233/76*

U.S. Cl. 548—314 **7 Claims**

1. In a process for the preparation of 3-(3,5-dichlorophenyl)-hydantoin by cyclizing 3-(3,5-dichlorophenyl)-ureidoacetic acid in the presence of an acid the improvement wherein, the acid is a dehydrating agent which is used in a catalytic amount less than stoichiometric relative to the ureidoacetic acid starting material, and the reaction is carried out in a sufficient amount of an organic solvent reaction medium which forms an azeotrope with water, whereby the water formed during the reaction is eliminated by azeotropic distillation and wherein on completion of the reaction, the reaction mixture becomes limpid.

4,099,009

1-(4-CHLOROPHENYL)-3-(1-UREIDO)-2-IMIDAZOLIDINONE

Thomas J. Schwan, and Ralph L. White, Jr., both of Norwich, N.Y., assignors to Morton-Norwick Products, Inc., Norwich, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,465

Int. Cl.^{2} C07D *233/48*

U.S. Cl. 548—319 **1 Claim**

1. The compound 1-(4-chlorophenyl)-3-(ureido)-2-imidazolidinone.

4,099,010

PHTHALOYL AMINO ACID HYDROXAMIC ACIDS

Dyral C. Fessler, Norwich, N.Y.; Edwin R. Micalizzi, Allegan, Mich., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 711,626, Aug. 4, 1976, which is a continuation-in-part of Ser. No. 625,915, Oct. 28, 1975, abandoned. This application Mar. 16, Ser. No. 777, 953

Int. Cl.$_2$ C07D *233/64*

U.S. Cl. 548—344 **1 Claim**

1. The compound N-(2-carboxybenzoyl)-D-histidine hydroxamic acid.

4,099,011

4-SUBSTITUTED PYRAZOLES

Eike Möller, Wuppertal, Fed. Rep. of Germany; Karl-August Meng, deceased, late of Wuppertal, Fed. Rep. of Germany (by Ilse Helde Frieda Meng, heir); Egbert Wehinger, Neviges, Fed. Rep. of Germany; Harald Horstmann, Wuppertal, Fed. Rep. of Germany, and Friedel Senter, Neviges, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

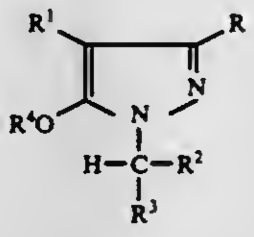
Filed Jun. 8, 1976, Ser. No. 693,970

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526467

Int. Cl.^{2} C07D *231/28*

U.S. Cl. 548—376 **11 Claims**

1. A compound of the formula



wherein

R — is hydrogen or lower alkyl;

R^{1} — is haloalkylthio of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 halo atoms;

R^{2} — is lower alkyl;

R^{3} is aryl of 6 to 10 carbon atoms unsubstituted or substituted by 1 to 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, mono- or di-alkylamino of 1 to 4 carbon atoms in each alkyl moiety, nitro, cyano, carboxamido, sulphonamido and SO$_{n}$-alkyl of 1 to 4 carbon atoms in the alkyl moiety and wherein *n* is 0 to 2; or phenyl having fused thereto a 5- to 7-membered isocyclic ring; and

R^{4} is R^{5}CO wherein R^{5} is lower alkyl, cycloalkyl of 5 to 7 carbon atoms, halo(lower alkyl), lower alkoxy, lower alkylthio, halo(lower alkoxy), halo (lower alkylthio), lower alkoxy(lower alkyl), mono- or di-(lower alkylamino), phenyl substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, nitro, cyano, carboxamido, sulphonamido, SO$_{n}$-(lower alkyl) wherein *n* is 0 to 2, and SO$_{n}$-CF$_{3}$ wherein *n* is 0 to 2; or phenyl having fused thereto a 5- to 7-membered isocyclic ring.

4,099,012

2-PYRAZOLYL-BENZOPHENONES

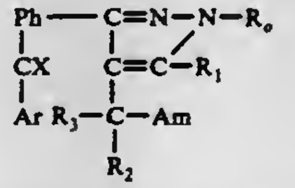
Heinz Werner Gschwend, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 608,796, Aug. 28, 1975, Pat. No. 4,022,800, which is a continuation-in-part of Ser. No. 475,475, Jun. 3, 1974, Pat. No. 3,939,271. This application Nov. 26, 1976, Ser. No. 745,316

Int. Cl.^{2} C07D *231/12*

U.S. Cl. 548—378 **7 Claims**

1. A compound of the formula



wherein Ph is 1,2-phenylene and Ar is phenyl, both of said radicals are unsubstituted or substituted by one or two of the same or different substituents selected from the group consisting of lower alkyl, lower alkoxy, halo and trifluoromethyl, R_o is lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, amino-lower alkyl, lower alkylamino-lower alkyl, di-lower alkylamino-lower alkyl, Ar or Ar-lower alkyl, wherein the additional chain-nitrogen or oxygen atom is separated from the ring-nitrogen by at least 2 carbon atoms, each of R_1, R_2, and R_3 is hydrogen or lower alkyl, Am is amino, lower alkylamino or di-lower alkylamino, and X is oxo or thioxo; simple or mixed, open or cyclic lower alkyl or alkylene ketals thereof; or a pharmaceutically acceptable acid addition salt thereof.

4,099,013
4,5,6-TRINOR-3,7-INTER-M-PHENYLENE PROSTAGLANDIN E_1 ANALOGS

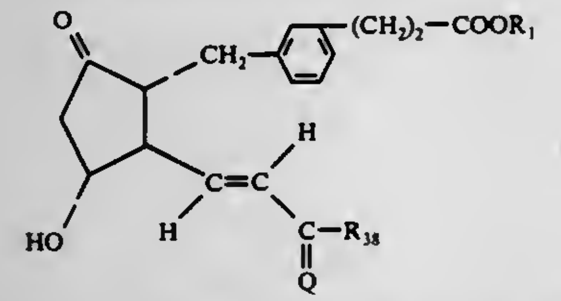
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 691,398, Jun. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 604,158, Aug. 13, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,331

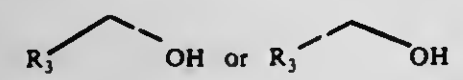
Int. Cl.² C07C *69/76*

U.S. Cl. 560—53 **89 Claims**

1. An optically active compound of the formula

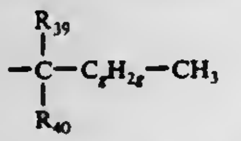


or a mixture comprising that compound and the enantiomer thereof, wherein Q is



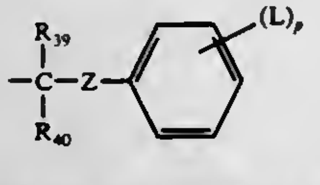
wherein

R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the pharmacologically acceptable salts thereof when R_1 is hydrogen; wherein R_{38} is

(1) 

$$-\overset{R_{39}}{\underset{R_{40}}{C}}-C_gH_{2g}-CH_3$$

or

(2) 

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_{39}R_{40}—$ and terminal methyl, wherein R_{39} and R_{40} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, of fluoro, being the same or different, with the proviso that one of R_{39} and R_{40} is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_{39} nor R_{40} is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $CR_{39}R_{40}—$ and the phenyl ring; and wherein L is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_{41}—$ wherein R_{41} is alkyl of one to 4 carbon atoms, inclusive, and *p* is zero, one, 2 or 3, with the proviso that not more than two L's are other than alkyl and when *p* is 2 or 3 the L's are either the same or different.

4,099,014
3,7-INTER-M-PHENYLENE-4,5,6-TRINOR-12,13(E)-DIDEHYDRO-13,14-DEHYDRO-PGD$_1$ COMPOUNDS

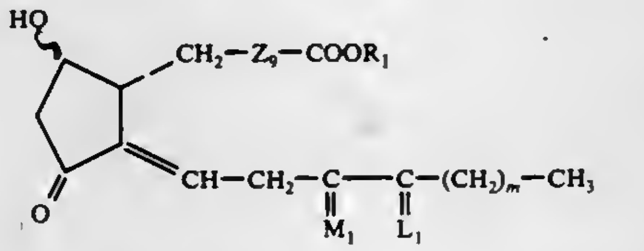
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,248

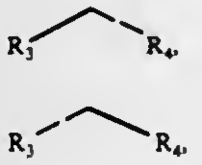
Int. Cl.² C07C *69/76, 177/00*

U.S. Cl. 560—53 **25 Claims**

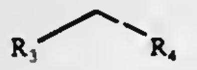
1. A prostaglandin analog of the formula



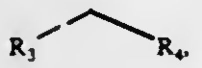
wherein *m* is 1 to 5, inclusive;
wherein M_1 is .
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



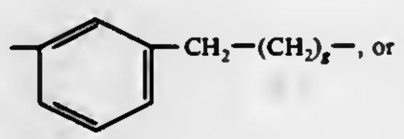
or a mixture of

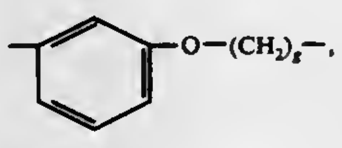


and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_9 is

 (1)

 (2)

wherein *g* is 1, 2, or 3.

4,099,015
2,2-DIFLUORO-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGE$_2$ COMPOUNDS

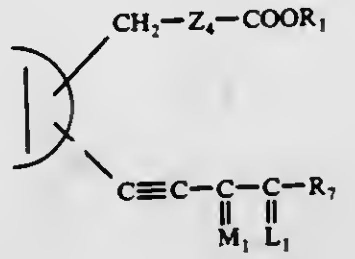
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

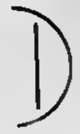
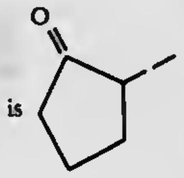
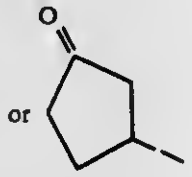
Continuation of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,974

Int. Cl.² C07C *177/00*

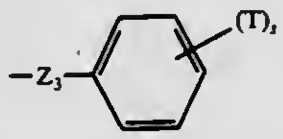
U.S. Cl. 560—53 **73 Claims**

1. A prostaglandin analog of the formula

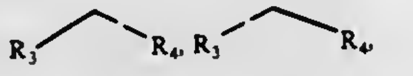


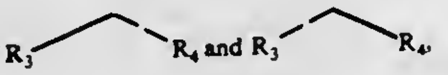
wherein  is  or  ;

wherein Z_4 is
cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—, wherein *g* is one, 2, or 3;
wherein R_7 is

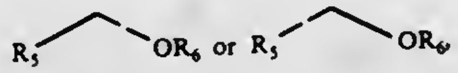


wherein Z_3 is oxa or methylene, *s* is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is 

or a mixture of 

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,099,016
DEPENTYL ANALOGUES OF PGE$_2$

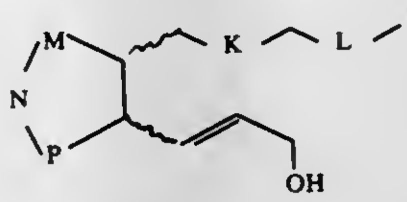
Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 684,569, May 10, 1976, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,479

Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula,



wherein:
L is methylene, ethylene, or trimethylene;
K is cis-vinylene;
M is carbonyl;
N is methylene;
P is α-hydroxymethylene; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

4,099,017
DEPENTYL ANALOGUES OF PGF$_1$

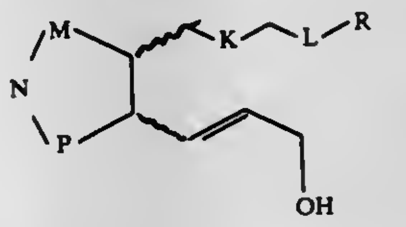
Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 684,569, Feb. 9, 1977, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,482

Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **3 Claims**

1. A compound of the formula,



wherein:
L is methylene, ethylene, or trimethylene;
K is ethylene or;
M is α-hydroxymethylene, or β-hydroxymethylene;
N is methylene;
P is α-hydroxymethylene; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

4,099,018
METHOD FOR THE OXIDATION OF A CONJUGATED DIOLEFIN

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1976, Ser. No. 676,258

Int. Cl.² C07C *67/05*

U.S. Cl. 560—246 **10 Claims**

1. A method for the production of a diacyloxyalkene comprising:
contacting a mixture comprising a conjugated diolefin, oxygen and at least one compound selected from the group consisting of a carboxylic acid and a carboxylic acid anhydride using a catalyst consisting essentially of a lead compound and an alkali metal salt wherein the number of carbon atoms in the conjugated diolefin ranges from about 4 to about 12, the conjugated diene is selected from unsub-

stituted compounds and substituted compounds wherein the substituents are selected from the group consisting of halogen, cyano and carbalkoxy radicals, the carboxylic acid and carboxylic acid anhydride are selected from the group consisting of mono- and dicarboxylic aliphatic and aromatic acids and acid anhydrides having from about 2 to about 18 carbon atoms per molecule, and the lead compound is selected from the group consisting of oxides, carboxylates, nitrates, halides and mixtures thereof.

ELECTRICAL

4,099,019

ELECTRIC FURNACE WASTE HEAT RECOVERY METHOD AND APPARATUS

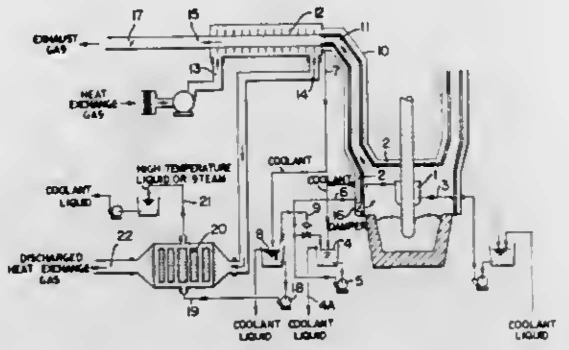
Koichi Horibe; Minoru Watanabe, and Tokuji Machida, all of Arai, Japan, assignors to Joetsu Denro Kogyo Co., Ltd., Arai-shi, Nigata, Japan

Filed Mar. 16, 1977, Ser. No. 777,912

Claims priority, application Japan, Aug. 24, 1976, 51-100845; Sep. 8, 1976, 51-120755[U]

Int. Cl.² F27D *9/00, 17/00*

U.S. Cl. 13—9 R **8 Claims**



1. In an electric furnace that discharges a high temperature exhaust gas laden with dust, said furnace comprising electrode means having first cooling means associated therewith, a cover having conduit means for discharging the exhaust gas from the furnace and having second cooling means associated with said conduit means, means for circulating a first liquid coolant through said first and second cooling means for cooling said electrode means and said conduit means whereby to discharge said first coolant in a heated liquid state under atmospheric pressure; a first heat exchanger having internal tube means connected to said conduit means for receiving exhaust gas therefrom, said internal tube means being constructed so as to repel adhesion of dust present in said exhaust gas and so as to be easily cleanable if dust is deposited thereon, said first heat exchanger including means to circulate a second gaseous coolant in indirect heat exchange relationship with said internal tube means whereby to discharge from said first heat exchanger a stream of second gaseous coolant heated to a temperature higher than the boiling point of said first coolant; and a second heat exchanger connected to receive and to effect heat exchange between said first coolant and said second coolant whereby said first coolant is heated to a higher temperature.

4,099,020

APPARATUS FOR SEALING PASSAGES THROUGH A CONCRETE FLOOR AND ABOUT A CONDUCTOR

John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 436,500, Jan. 25, 1974, Pat. No. 3,995,102. This application Nov. 29, 1976, Ser. No. 745,791

Int. Cl.² A62C *3/16*

U.S. Cl. 174—48 **2 Claims**

1. An insert device and apparatus for sealing passages through a floor, upon occurence of fire or excess temperatures, in a substantially solid structural member, said structural member having an opening formed therein and therethrough perpendicularly to the longitudinal axis thereof,

said insert device being adapted to be positioned in said opening, whereby cables may be passed through said insert device, and thereby through said structural member, said insert device comprising:

an insert housing proportioned to be so perpendicularly positioned in said opening in the structural member,

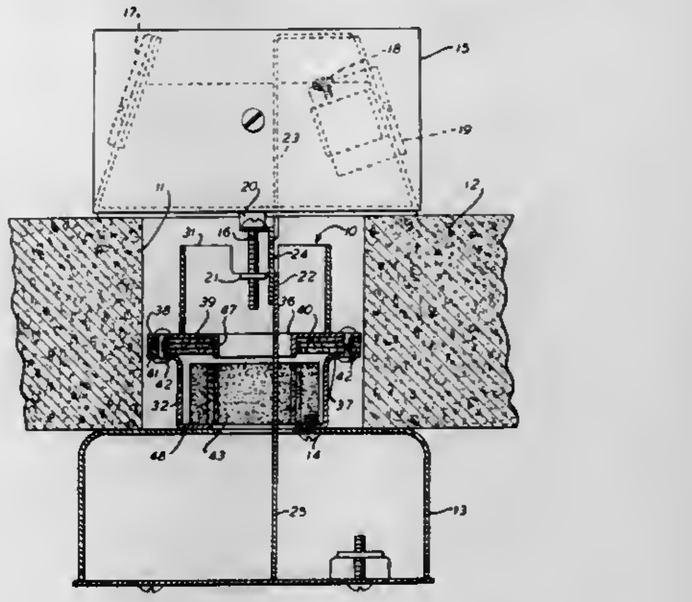
said insert housing including a wall member defining a continuous cable-receiving opening therein,

said wall member proportioned to be snugly positioned in said vertical opening in the structural member,

plate means in said housing positioned in said housing wall intermediate the length thereof and second plate means positioned at the lower end of said wall member,

said plate means having registering apertures therein for passage therethrough, and thus through the structural member, of cables,

an elongated hollow, cable-passage, fire-retarding member positioned on the second plate means and intermediate both plate means in alignment with said apertures therein,



said fire retarding means formed of material enabling passage of cables therethrough at normal room temperatures, but automatically expanding and closing the opening therethrough and in said wall member and sealing the cables therein on occurence of excess heat or fire, thereby sealing the housing and said structural member opening.

4,099,021

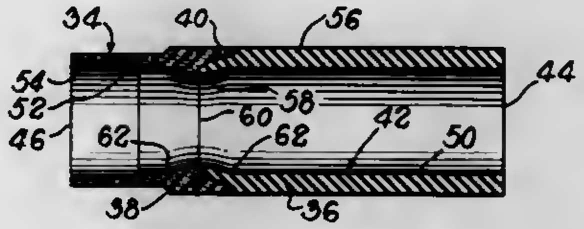
METHOD OF SPLICING HIGH VOLTAGE SHIELDED CABLES AND SPLICE CONNECTOR THEREFOR

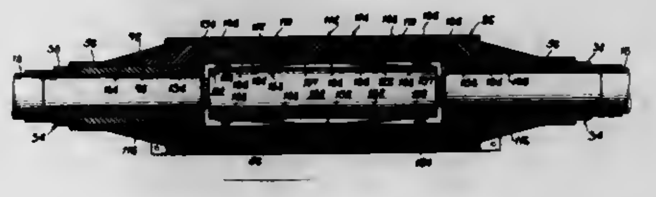
J. William Veoezia, Budd Lake, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Apr. 24, 1970, Ser. No. 31,500

Int. Cl.² H02G *15/08;* **H01R** *5/10;* **H02G** *1/14*

U.S. Cl. 174—73 R **21 Claims**





7. A composite sleeve for placement at the terminus of a shielded high voltage electrical cable, the cable having a conductor surrounded by an insulating jacket within a conductive shield, the shield terminating short of the cable terminus to expose a portion of the insulating jacket between the terminus and the termination of the shield, and the insulating jacket terminating short of the cable terminus to expose the conductor between the terminus and the termination of the insulating jacket, said composite sleeve comprising:

a first sleeve portion of insulating elastomeric material;

- a second sleeve portion of conductive elastomeric material integral with and axially related to said first sleeve portion;
- an axially extending external surface common to said first and second sleeve portions; and
- a resiliently dilatable internal bore extending axially from end to end of the sleeve through both said first and second sleeve portions, said bore having
- an internal diameter adjacent one end of the sleeve and coextensive with said first sleeve portion and at least a part of said second sleeve portion, the relative dimensions of said internal diameter and the diameter of the insulating jacket being such that the bore at said internal diameter thereof will be resiliently dilated and a corresponding portion of the sleeve will grip the insulating jacket to increase the dielectric strength of the creep path along said insulating jacket, and
- a portion of normally reduced diameter at the junction of said bore with said first and second axial sleeve portions, said bore gradually increasing in diameter to said internal diameter at at least one end of said portion of reduced diameter such that the normally reduced portion will be resiliently dilated to grip the insulating jacket in essentially void-free contact at said junction.

11. A splice connector having component parts capable of being assembled in the field at the terminus of high voltage shielded electrical cables for providing a splice connection between first and second such cables, said cables each having a conductor surrounded by an insulating jacket within a conductive shield, the splice connector comprising:

- a pair of sleeves of elastomeric material, each sleeve of said pair being fitted over the insulating jacket of one of said cables, each said sleeve having an external surface and a resiliently dilated internal bore gripping the insulating jacket to increase the dielectric strength of the creep path along the insulating jacket;
- a pair of housing members, said members each having an internal bore including a resiliently dilated portion gripping, in watertight relationship therewith, the corresponding external surface of the corresponding sleeve and a further portion, said further portions of the pair of housing members cooperating with one another to establish a sealed chamber enclosing the terminus of each cable;
- electrical contact means making an electrical connection between the conductors of the cables disposed within said sealed chamber;
- a pair of retaining rings; and
- means affixing each of said pair of retaining rings between a corresponding sleeve and the terminus of the corresponding cable in position for abutting the sleeve to maintain each corresponding sleeve in a substantially fixed position on said insulating jacket and to preclude axial movement of the sleeve along the insulating jacket toward the cable terminus.

4,099,022

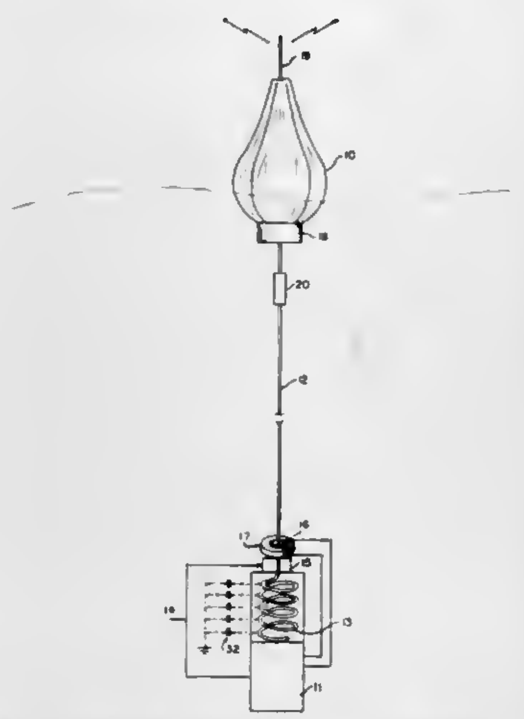
SYSTEM FOR PULSE DATA TRANSMISSION THROUGH WATER-RETURN CABLES

Robert A. Fullerton, Agoura, and George V. Podraza, Canoga Park, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 5, 1977, Ser. No. 757,034
Int. Cl.² H04L *25/02*
U.S. Cl. 178—63 R **12 Claims**

1. A method for transmitting pulses between two points in a body of water through a single-wire cable with return current through the water comprising the steps of

- providing capacitive coupling of said cable to said body of water at the transmission end thereof, and



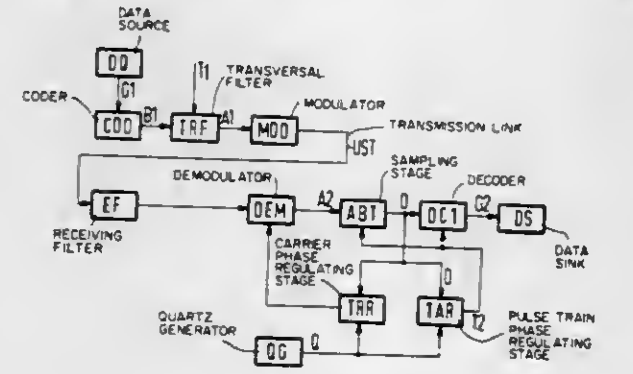
- inductively coupling said pulses from a signal line into said cable through a toroid core surrounding said cable with a number of turns of said signal line around said toroid.

4,099,023

METHOD FOR THE REGULATION OF THE PHASE OF A TIMING SIGNAL IN A DATA TRANSMISSION SYSTEM

André Gerges, Munich, and Joachim Siglow, Wolfratshausen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 10, 1976, Ser. No. 740,764
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551243
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **2 Claims**



1. A method of regulating the phase of timing signals in a data transmission system comprising the steps of:

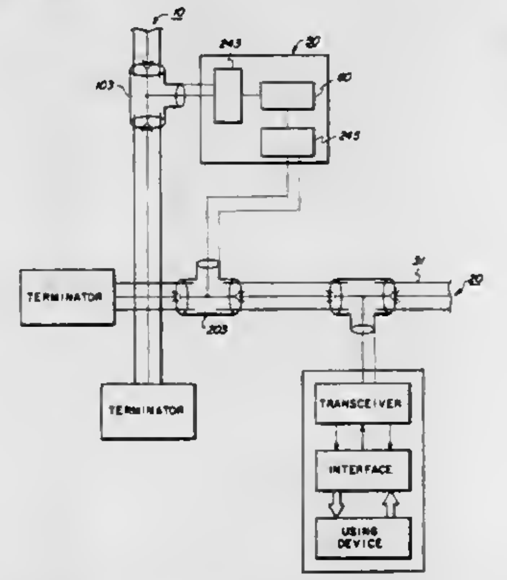
- producing from a data signal to be transmitted, a transmitted composite signal containing partial response pulses having amplitudes which, at predetermined sampling time, deviate from predetermined positive, negative or mean amplitudes,
- generating, at a receiver, a sampling signal having amplitudes corresponding to the deviations of the amplitudes of said transmitted composite signal from said predetermined mean amplitude,
- generating a received data signal by decoding the sampling signal,
- delaying the received data signal by two pulse train periods, gating the combination of the received data signal and the delayed data signal to produce a fator signal having amplitudes representing the binary values 0, −1 and +1 corresponding, respectively, to when the binary values of the received data signal and the delayed data signal differ from one another, are of the same first binary value and are of the same second binary value,
- multiplying the amplitudes of said sampling signal and said factor signal to produce a multiplicative signal,
- integrating said multiplicative signal and deriving therefrom a regulating signal, and
- regulating the phase of said timing signal response to the value of said regulating signal.

4,099,024

COMMUNICATIONS NETWORK REPEATER

David R. Boggs, Los Altos Hills, and Robert M. Metcalfe, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 16, 1977, Ser. No. 769,141
Int. Cl.² H04L *25/40*
U.S. Cl. 178—71 R **4 Claims**



1. A repeater for use in a data communication system of the type comprising a communicating medium, a plurality of transceivers connected to the medium, each transceiver capable of transmitting data onto the medium, receiving data communicated on the medium by another transceiver, and generating a collision signal whenever data communicated on the medium by another transceiver is received by the transceiver during the time the transceiver is transmitting data onto the medium, said repeater comprising:

- a first port connected to a first one of said transceivers for receiving data communicated on the medium and received by said first transceiver;
- a second port connected to said first transceiver for receiving collision signals generated by said first transceiver;
- a third port connected to a second one of said transceivers for applying data and collision signals to said second transceiver for transmission thereby onto the medium;
- first means for coupling data from said first port to said third port; and
- second means for coupling collision signals from said second port to said third port.

4,099,025

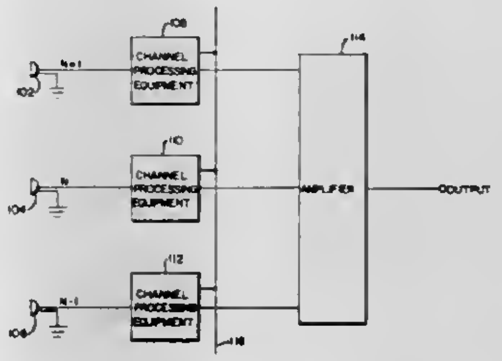
METHODS AND MEANS FOR AVOIDING FALSE INDICATIONS OF ACTIVITY IN A MULTIMICROPHONE SYSTEM

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Filed Sep. 27, 1976, Ser. No. 727,179
Int. Cl.² H04M *3/56*
U.S. Cl. 179—1 CN **11 Claims**

3. The method for preventing a false indication of microphone activity in a multi-microphone system; comprising,

- (a) amplifying a sample of each microphone output in individual variable gain amplifiers,
- (b) determining if the output of Step (a) amplification exceeds a first threshold level,
- (c) using the (b) step determination to initiate a control wave having the proper amplitude and polarity to cause a substantial reduction of gain in the individual variable gain amplifiers of Step (a),


CHANNEL PROCESSING EQUIPMENT
CHANNEL PROCESSING EQUIPMENT
CHANNEL PROCESSING EQUIPMENT
AMPLIFIER
OUTPUT

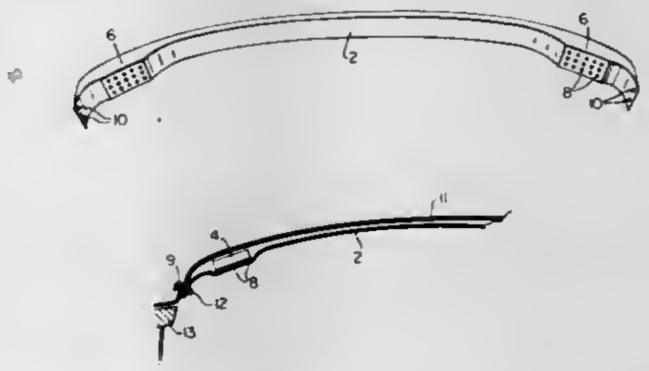
- (d) coupling said control wave to the gain reduction control circuits of all of the variable gain amplifiers except the amplifier associated with the microphone circuit that initiated the control wave,
- (e) determining if the output of Step (a) amplification exceeds a second threshold level; and,
- (f) using the (e) step determination to operate visual indication devices so as to assist the operator of a microphone switching system.

4,099,026

LOUDSPEAKER FOR VEHICLES

Per Persson, Radhusgatan 3, and Leo Koppelomaki, Almgatan 23, both of S-330 23 Smalandssenar, Sweden

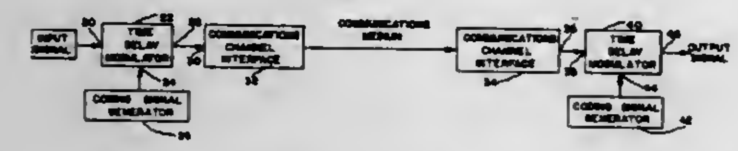
Filed Mar. 18, 1977, Ser. No. 778,856
Claims priority, application Sweden, Mar. 19, 1976, 7603422
Int. Cl.² H04R *1/02*
U.S. Cl. 179—1 VE **6 Claims**



1. A loudspeaker system for vehicles comprising at least two loudspeakers to be mounted on the ceiling of the vehicle, said loudspeakers being connected to each other and to the ceiling by means of an elongated element and characterized in that the top side of said element has a shape corresponding to the shape of the ceiling, end portions of said element being directed downwardly for permitting the element to be fastened to the vehicle above the level of the doors and side windows thereof and said element near its ends comprising cabinets for the loudspeakers.

4,099,027
SPEECH SCRAMBLER

James R. Whitten, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jan. 2, 1976, Ser. No. 646,248
Int. Cl.^{2} H04K *1/00*
U.S. Cl. 179—1.5 S **16 Claims**

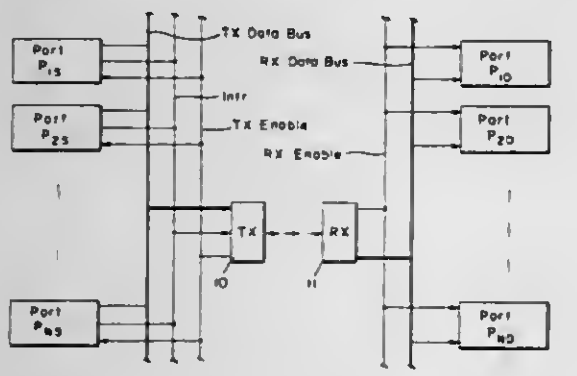


7. The speech scrambling apparatus of claim 6 wherein said electronically variable serial delay line means comprises:

charge transfer delay line means; and variable clock means having at least one output connected to said charge transfer delay line means for adjustably transferring charge along said charge transfer delay line as determined by the frequency of said preselected waveform.

4,099,028
ASYNCHRONOUS MULTIPLEXER-DEMULTIPLEXER

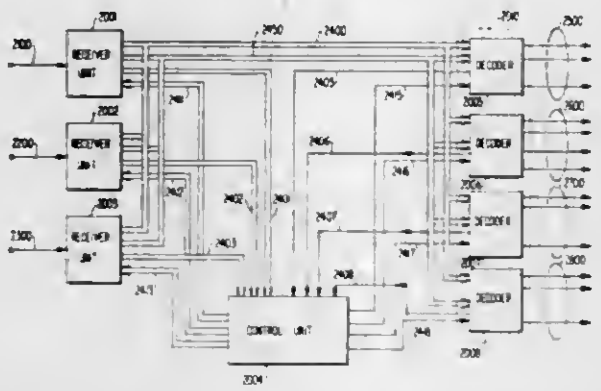
Jacob T. Towson, IV, Goleta, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Apr. 21, 1977, Ser. No. 789,594
Int. Cl.^{2} H04J *6/00*
U.S. Cl. 179—15 BA **10 Claims**



1. An asynchronous multiplexer for pulse-coded data transmission over a single communication link from a transmitter having a priority interrupt system for servicing a plurality of source ports, one source port for each of a plurality of data sources operating independently of each other, each at a data clock rate F_s sufficiently low as compared to a clock rate F_{TX} of transmission by said transmitter that their sum does not exceed EF_{TX}, where E is an efficiency factor, each source port including at least three input buffer memories to be used in rotation for accumulating successive blocks of data bits to be transmitted, means for generating a priority interrupt signal transmitted to said priority interrupt system of said transmitter each time an input buffer memory is filled with a block of data to be transmitted, and means responsive to said interrupt system of said transmitter for selecting said input buffer memories as filled in rotation for transmission over said link at said clock rate F_{TX}, one input buffer memory selected for each priority interrupt response to an interrupt signal.

4,099,029
ASYNCHRONOUS PCM COMMON DECODING APPARATUS

Rikio Maruta; Yasuo Itoh, and Atsushi Tomozawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Jan. 19, 1977, Ser. No. 760,790
Claims priority, application Japan, Jan. 20, 1976, 51-5328; Jan. 20, 1976, 51-5329; Jan. 20, 1976, 51-5330
Int. Cl.^{2} H04J *6/02*
U.S. Cl. 179—15 BA **11 Claims**



1. An asynchronous PCM common decoding apparatus in which a plurality of time division multiplexed digital signals asynchronous to each other are received and decoded, comprising:

a plurality of receiver means for generating at the output of each said receiver means, a digital signal to be decoded, a channel-number-designating signal for designating the number of the channel to which an analog signal obtained from the decoding of said digital signal is to be fed, and a decode-requesting signal for requesting the decoding of said digital signal,

one or more decoder means for producing at the output of each said decoder means a status signal for representing that said digital signals given from one of said receiver means are acceptable, and

a common control means responsive to said request signals given from said receiver means and said status signals given from said one or more decoder means, for successively allotting a combination of a given receiver means and a given decoder means and for sending a data transfer command signal to the allotted receiver means so that said digital signal to be decoded and said channel-number-designating signal may be transferred from the allotted receiver means to the allotted decoder means and also sending decode command signals to said allotted decoder means.

4,099,030
SPEECH SIGNAL PROCESSOR USING COMB FILTER

Yoshimutsu Hirata, No. 10-307, 842, Arai, Hino, Tokyo, Japan
Filed Apr. 29, 1977, Ser. No. 792,405
Claims priority, application Japan, May 6, 1976, 51/51561
Int. Cl.^{2} G11B *15/20;* **H04B** *1/66*
U.S. Cl. 179—15.55 T **28 Claims**

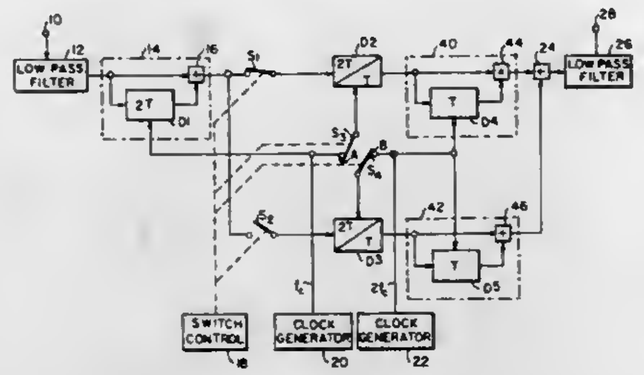
1. A signal processor for speech signals or the like, comprising:

speech signal channel means;

input means for applying a frequency altered speech signal to said channel means;

frequency transformation means connected in said speech signal channel means for subjecting the speech signal to

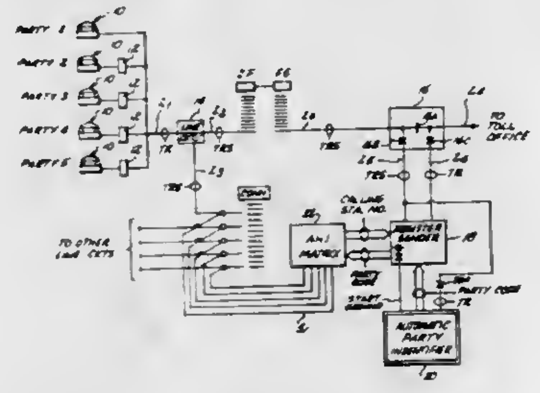
frequency transformation to restore the desired frequency components of the signal; and



comb filter means connected in said speech signal channel means to minimize noise components in the output signal of said signal processor.

4,099,031
METHOD AND APPARATUS FOR AUTOMATICALLY IDENTIFYING AN INDIVIDUAL CALLING PARTY ON A MULTIPARTY TELEPHONE LINE

D. Frederic Proctor, Redmond, and Darrell D. Cole, Seattle, both of Wash., assignors to Proctor & Associates Company, Redmond, Wash.
Filed Dec. 17, 1976, Ser. No. 751,994
Int. Cl.^{2} H04M *15/36*
U.S. Cl. 179—17 A **29 Claims**



1. A method for automatically identifying at a central office that one of a plurality of party stations interconnected with the telephone line from which a telephone call has been placed, said method comprising the steps of:

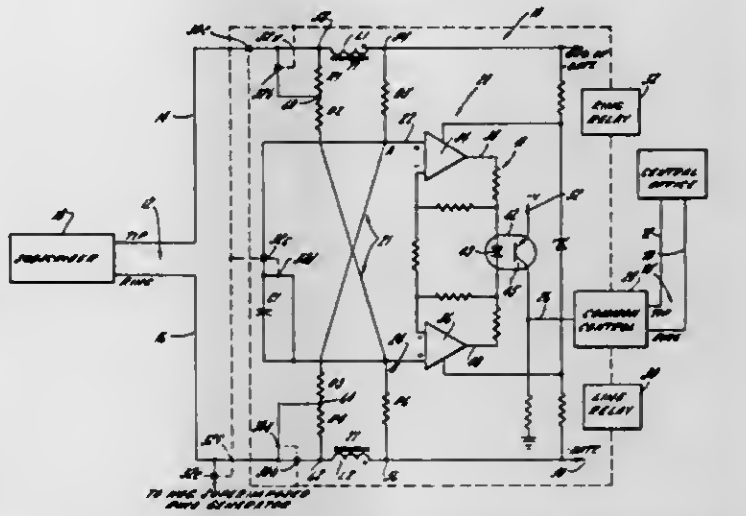
(a) at the central office, applying to the telephone line a voltage having a magnitude sufficient to produce a first predetermined value of loop current in the telephone line;

(b) at that one party station, responding to said voltage by initially regulating the value of said loop current at a second predetermined value, said second predetermined value being smaller than said first predetermined value but greater than a value of said loop current that would signify to the central office that an on-hook condition exists on the telephone line, and subsequently terminating said regulation after the passage of a predetermined time from the application of said voltage, said predetermined time being unique to that one party station, whereby the value of said loop current rises from said second predetermined value toward said first predetermined value; and

(c) at the central office, detecting said rise in the value of said loop current and comparing the time occurrence of said detected rise in loop current with a plurality of predetermined time intervals to provide identification of that one party station, each said predetermined time interval being subsequent to the application of said voltage and being unique to one party station interconnected with the telephone line.

4,099,032
LOOP CURRENT DETECTOR

Ralph R. Roge, Clarendon Hills, and Paul J. Curtis, Woodridge, both of Ill., assignors to Wescom, Inc., Downers Grove, Ill.
Continuation-in-part of Ser. No. 781,204, Mar. 25, 1977, abandoned. This application Oct. 20, 1977, Ser. No. 843,712
Int. Cl.^{2} H04M *3/02, 3/22*
U.S. Cl. 179—18 FA **6 Claims**



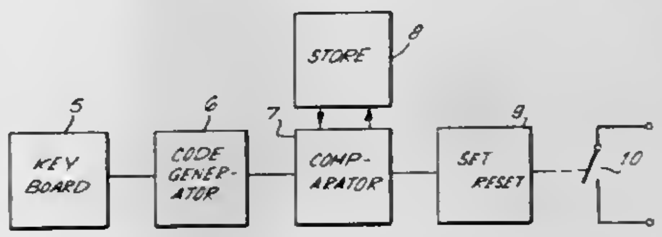
1. A ground start loop current detector for detecting the grounding of one of two leads of a battery energized telephone loop in presence of longitudinal interference currents in the loop, the detector comprising:

(a) differential sensing means having two differential input terminals and an output terminal which output terminal provides an output signal in response to a differential input signal level resulting when the one loop lead is grounded; and

(b) biasing means including first and second inductors, the biasing means interconnecting the differential input terminals and the one lead of the telephone loop and establishing the differential signal level at the input terminals when the one loop lead is grounded, and the inductors electrically connected to the differential input terminals respectively and magnetically coupled together, in phased relationship so that longitudinal interference currents in the one loop lead mutually induce nondifferential signals at the input terminals of the sensing means.

4,099,033
TELEPHONE SECURITY DEVICE

Leonard Quintin Murray, 20, Holland Park, London, W.11, United Kingdom
Filed Nov. 16, 1976, Ser. No. 742,090
Claims priority, application United Kingdom, Nov. 17, 1975, 47353/75
Int. Cl.^{2} H04M *1/66*
U.S. Cl. 179—90 D **10 Claims**



1. A telephone security device for preventing unauthorized use of a telephone subscriber's set, the device comprising:

inhibit means for connection to the called number selecting means of the subscriber's set for at least partly inhibiting the operation of said selecting means;

code signal recognition logic means which has an input for receiving code signals and which is operable for responding to the reception thereby of first and second predetermined multiple-digit numerical code signals to produce corresponding first and second mode output signals, and

mode register means which has two stable mode states, which is connected to said code signal recognition means and said inhibit means, and which is operable when it is in one of said two states to respond to the reception from the code signal recognition means of said first mode output signal to enter the other of said two states and to remain in the said other state even following disconnection of a subsequently made telephone call and when it is in said other state to respond to the reception of said second mode output signal from the code signal recognition means to enter said one state, the mode register means being further operable to control said inhibit means so that, for as long as the mode register means is in said one of said two states, the inhibit means prevents any successful attempt to use the said called number selecting means to make outgoing calls to at least some destination telephone numbers and, for as long as the mode register means is in said other state, the inhibit means is inoperative and hence allows any number of outgoing calls to be made normally.

4,099,034

FASTENING ARRANGEMENT IN A TELEPHONE INSTRUMENT OF THE ONE-PIECE TYPE

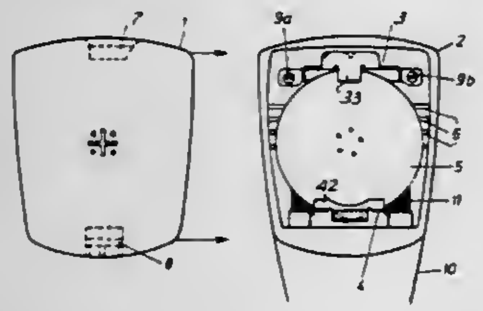
Sven Tage Peterson, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 28, 1977, Ser. No. 782,061

Claims priority, application Sweden, May 4, 1976, 7605076

Int. Cl.² H04M ***1/04***

U.S. Cl. 179—100 R **4 Claims**



1. In a telephone set of the one-piece type having a housing with an upper front opening, an earphone capsule in the opening and an outer cap for covering the opening wherein the inside of the outer cap is provided with oppositely positioned first and second guiding elements, a fastening arrangement for the earphone capsule and the cap comprising:

a first fastening element having a planar body with a middle part and two end parts, said end parts including means for firmly attaching said planar body to the inside of said housing and a portion of said middle part being shaped as a protruding part, said protruding part having two tongue-formed parts, one of said tongue-formed parts being directed upwards towards the top of the set and having an inner surface in contact with the upper front surface of said earphone capsule, the other tongue-formed part being directed opposite relative to said one tongue-formed part and shaped so as to facilitate the guiding and securing of the first guiding element of the outer cap in the fastened position; and a second fastening element having a planar body with a middle part which is formed with two tongue-formed parts, one of said tongue-formed parts being directed upwards towards the top of the set and having an inner surface in contact with the lower front surface of said earphone capsule, the other of said tongue-formed parts being directed opposite relative to said one tongue-formed part and shaped so as to facilitate the insertion of the second guiding element of the outer cap, and said planar body having two end parts each being shaped as a further tongue-formed part protruding in a direction downwards towards the bottom of the set and resiliently abutting the lower edge of said front opening.

4,099,035

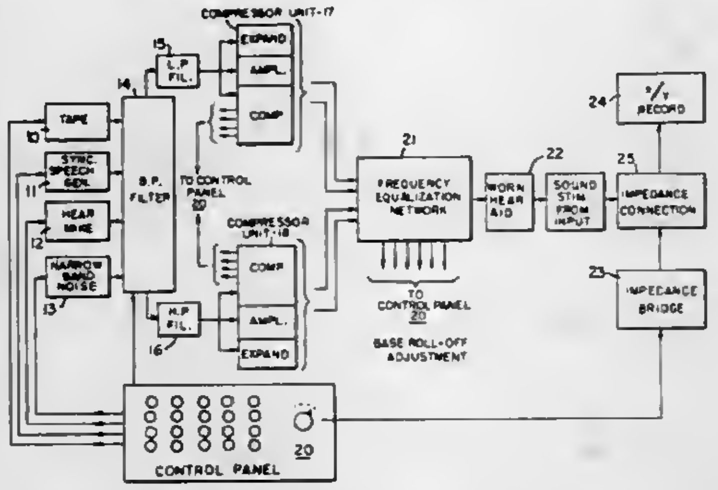
HEARING AID WITH RECRUITMENT COMPENSATION

Paul Yanick, 673 Wood Ave., Edison, N.J. 08817

Filed Jul. 20, 1976, Ser. No. 707,049

Int. Cl.² H04R ***29/00***

U.S. Cl. 179—107 FD **27 Claims**



1. An audio speech processor apparatus for aiding persons with sensorineural hearing loss, comprising:

(a) means responsive to a band of audio frequencies for splitting said band into a first low band of frequencies and a second high band of frequencies,

(b) a first compressor responsive to said low band of frequencies for compressing the same by a given predetermined factor,

(c) a second compressor responsive to said high band of frequencies for compressing the same by a different factor, and

(d) means for combining said compressed first and second frequency bands to provide a composite signal manifesting a distribution of said band of audio frequencies compensated according to said hearing loss.

4,099,036

REMOTE POWER SUPPLY SYSTEM FOR A COAXIAL LINE WITH REPEATERS SUBJECTED TO THE INFLUENCE OF EXTERNAL ELECTRIC FIELDS

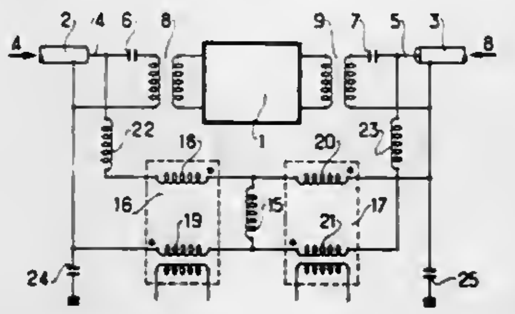
René Migeon, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Mar. 4, 1977, Ser. No. 775,969

Claims priority, application France, Mar. 30, 1976, 76 09192

Int. Cl.² H04B ***3/44***

U.S. Cl. 179—170 J **2 Claims**



1. A remote AC power supply system for repeaters of a coaxial transmission line in which the remote supply current flows through the line along an outward path and a return path which form a remote supply loop and are positioned between the repeaters by the inner conductors and the outer conductors of the intervening sections of the coaxial line, the local power supply circuit of each repeater being inserted between first and second sections of the coaxial line connected to the repeater and in parallel with said repeater, the local power supply circuit including at least one current transformer having a first primary winding and a second primary winding respectively inserted in the outward path and in the return path of the power supply loop so as to take the power necessary for supplying the repeater in equal proportions from each of the said paths and to ensure the continuity of the remote power supply loop at the repeater, said first primary winding being connected in a first series connection with a low-pass filter between the inner conductor of the first section of the coaxial line and the outer conductor of the second section of the coaxial line and said second primary winding being connected in a second series connection with a low-pass filter between the outer conductor of the first section of the coaxial line and the inner conductor of the second section of the coaxial line.

4,099,037

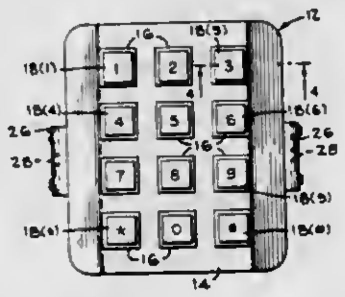
KEY BOARD SWITCH ASSEMBLY HAVING CANTI-LEVERED LEAF SPRING CONTACT ASSEMBLY ON COMMON CONDUCTIVE FRAME

Earnest D. Hartzler, San Jose, and Paul D. Levesque, Mountain View, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 21, 1976, Ser. No. 697,806

Int. Cl.² H01H ***13/70***

U.S. Cl. 200—5 A **7 Claims**



1. A push button keyboard switch assembly having at least first and second push button bodies for effecting selective momentary circuit closures comprising:

an insulative substrate,

a plurality of conductive circuit paths on said substrate forming first and second spaced apart fixed contacts,

first and second spaced apart fixed contacts,

first and second elongate conductive spring members, each said conductive spring member having a distal and a proximal end,

means for securing the respective proximal ends on said substrate at oppositely disposed points so that the elongate spring members reside in mutually parallel relation and span respective fixed contacts in opposite directions with the proximal end of said first conductive spring member adjacent the distal end of said second conductive spring member, each said spring member adjacent the proximal end thereof being bent upward so that the majority of the respective spring members diverge upward from the substrate toward the respective distal ends, each said spring member intermediate the ends thereof having at least one contact point in alignment with said fixed contact points,

means for constraining said push button bodies for movement toward and away from said substrate along paths aligned with the distal ends of respective said conductive spring members, said first push button body having a wall defining a first bearing surface for bearing on the distal end of said first conductive spring member and a second push button body having a wall defining a second bearing surface for bearing on the distal end of said second conductive spring member, said walls being laterally offset from one another so that said bearing surfaces bear on respective said conductive spring members, said push button bodies being aligned with one another in a direction longitudinally of said conductive spring members, said walls further defining stop members for limiting the movement of said push buttons toward said substrate by contact of said walls with said substrate.

4,099,038

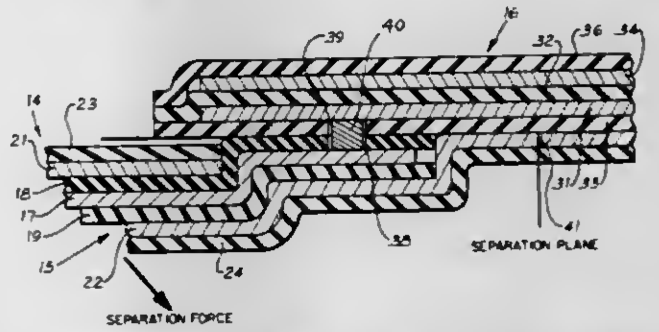
SEPARABLE ELECTRICAL FLEXIBLE CABLE ASSEMBLY FOR MOVING STORES SUCH AS MISSILES

Wilber D. Purdy, St. Charles, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1976, Ser. No. 753,036

Int. Cl.² H01H ***1/12;*** **F41F** ***3/04;*** **H01R** ***13/62***

U.S. Cl. 200—61.08 **4 Claims**



1. A peelaway flat cable assembly for providing a separable electrical connection to a movable store comprising,

a first thin and wide flat cable of insulating material having a plurality of parallel conductors spaced apart therein along the wide dimension of said thin and wide flat cable,

a second thin and wide flat cable of insulating material having a plurality of parallel conductors spaced apart therein along the wide dimension of said second thin and wide flat cable and equal in number to the number of spaced conductors in said first flat cable, one wide end portion of said first thin and wide flat cable being overlapped and bonded to one wide end portion of said second thin and wide flat cable and positioned such that said spaced conductors in said first flat cable are aligned above said spaced conductors in said second flat cable,

a first thin and wide metallic shield having a wide side bonded to both said first and second flat cables on the wide sides below said plurality of conductors and a second thin and wide metallic shield having a wide side bonded to both said first and second flat cables on the wide sides above said plurality of conductors whereby all of said conductors are positioned between said first and second metallic shields,

a plurality of holes in said insulating material in the overlapped areas of said first and second flat cables, one hole communicating with each conductor to provide passageways between aligned conductors in said first flat cable and conductors in said second flat cable and solidified solder in each said passageway and in electrical contact with each aligned pair of conductors, and

a plurality of perforations through said wide side of said first metallic shield for providing a breakaway joint for severing said flat cable assembly when a force is applied thereto.

4,099,039

MEANS FOR EFFECTIVELY CONTROLLING THE FORCES IMPOSED ON THE MOVABLE CONTACT OF A VACUUM-TYPE CIRCUIT INTERRUPTER

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 20, 1976, Ser. No. 752,956

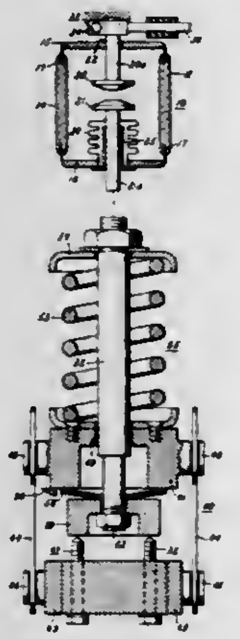
Int. Cl.² H01H ***33/66***

U.S. Cl. 200—144 B **24 Claims**

1. In a vacuum circuit beaker;

(a) a vacuum-type circuit interrupter comprising an evacuated housing, a generally stationary contact and a movable

contact within said housing, a generally stationary conductive rod on which said stationary contact is mounted and a movable conductive contact rod on which said movable contact is mounted for motion into and out of engagement with said stationary contact,
(b) an operating linkage for transmitting contact-closing and contact-opening forces to said movable contact rod,
(c) a contact-wipe mechanism for coupling said linkage to said movable contact rod and comprising:
  (c$_1$) a driving part coupled to said linkage,
  (c$_2$) a driven part coupled to said movable contact rod,
  (c$_3$) a preloaded wipe spring between said driving and driven parts through which contact-closing force is transmitted from said linkage to said movable contact rod,

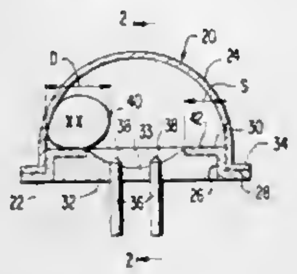


said driving part continuing to move in a closing direction after said contacts initially engage at the end of a closing stroke, thereby further loading said wipe spring and thus causing said wipe spring to apply added force in a closing direction to said movable contact,
(d) said contact-wipe mechanism further comprising a bounce-suppressing spring action in opposition to said wipe spring and discharging to aid said continuing motion of said driving part during the initial stages of said continuing motion following initial contact-engagement,
(e) said bounce-suppressing spring having a stiffness gradient sufficiently low to effectively prevent separation of said contacts immediately following said initial contact-engagement at the end of a closing stroke, and
(f) said operating linkage having a stiffness gradient that would permit said contact-separation immediately following said initial contact-engagement if said bounce-suppressing spring were absent.

4,099,040
MERCURY TYPE TILT SWITCH

Sheldon S. Bitko, East Brunswick, N.J., assignor to Fifth Dimension, Inc., Princeton, N.J.
Filed Mar. 30, 1976, Ser. No. 672,050
Int. Cl.^{2} H01H *29/20*
U.S. Cl. 200—220 **6 Claims**

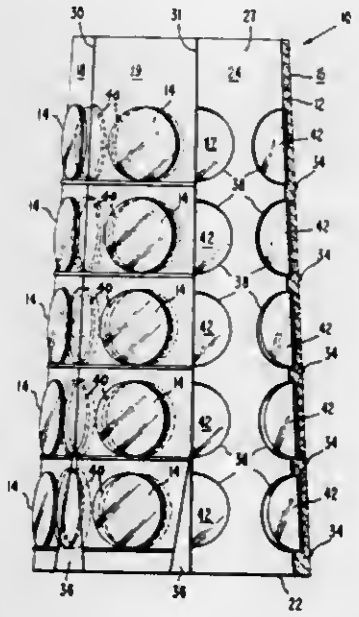
1. A tilt switch comprising:
a gravity responsive conductive ball;
a housing defining an enclosure for said gravity responsive conductive ball;
annular shelf means adjacent one end of said housing;
means defining a depression adjacent said one end of said housing and surrounded by said annular shelf;
contact means including:
  at least one switch extending through said housing and exposed at said depression, and
  at least one additional contact,
said gravity responsive conductive ball being freely movable in said enclosure in response to tilting of the switch between a first portion supported, out of contact with said at least one switch contact exposed at said depression, on said annular shelf means against a portion of the housing projecting therebeyond and a second position extending into said depression in contact with said at least one switch contact exposed at said depression and with said at least one additional contact;



said gravity responsive conductive ball being operable to assume said second position only when the switch is oriented within a solid angle including a generally upright position; and
said housing comprising:
  a header having an inwardly extending flange defining said annular shelf means, a central closure portion of insulating material by which said depression is defined, and an outwardly extending, metal peripheral portion; and
  a metal cap welded to said peripheral portion of said header to seal the enclosure.

4,099,041
SUSCEPTOR FOR HEATING SEMICONDUCTOR SUBSTRATES

Samuel Berkman, Florham Park, and Donald Bertram Irish, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Apr. 11, 1977, Ser. No. 786,403
Int. Cl.^{2} H05B *5/08*
U.S. Cl. 219—10.49 R **7 Claims**



1. In a susceptor of the type comprising a hollow polyhedron adapted to support a substrate on an outer planar surface of a wall thereof, said wall having corner portions thereof thicker than the central portions thereof, the improvement comprising said wall having a recessed cavity adjacent the inner surface thereof, said cavity having the floor thereof parallel to said outer planar surface.

4,099,042
APPLICATOR FOR APPLYING MICROWAVES

Olivier A. Jean, 12 avenue Lavoisier, 78600 Maisons Laffitte, France, and Georges Roussy, 17, rue Ernest Renan, 54520 Laxou, both of France
Filed Jun. 24, 1976, Ser. No. 699,311
Claims priority, application France, Jul. 4, 1975, 75 21065
Int. Cl.^{2} H05B *9/06*
U.S. Cl. 219—10.55 A **2 Claims**

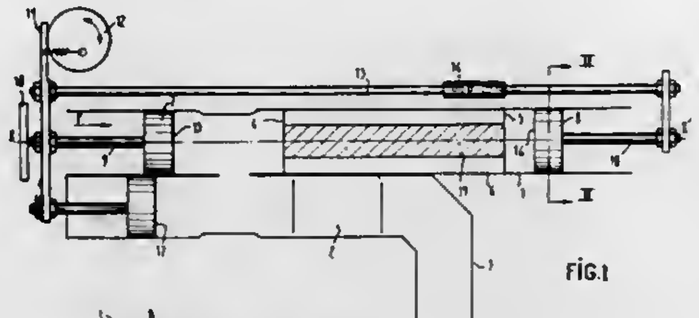


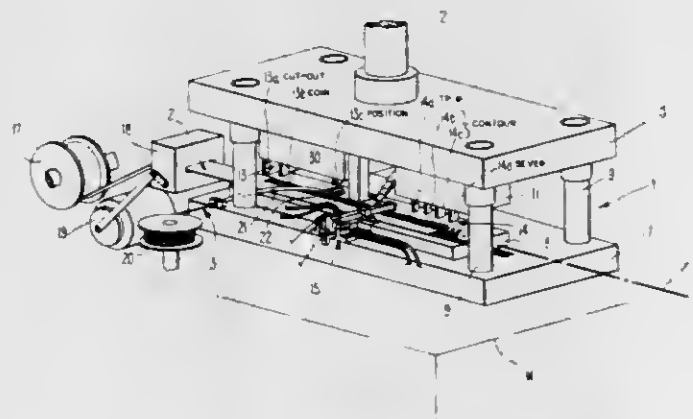
FIG.1

FIG.2

1. An applictor comprising:
a generator of microwaves, said microwaves having a mode of propagation and a wavelength,
an enclosure for receiving material to be treated,
a coupler coupling the generator and the enclosure so that the generator delivers microwave energy distributed in resonance for said mode of propagation in a given direction,
a first short-circuit device situated at one end of said enclosure with respect to said direction,
a device for displacing the first short-circuit device by a reciprocating movement in said direction, and
means for maintaining the resonance in spite of the displacements of the first short-circuit device.

4,099,043
PROGRESSIVE DIE WELDING OF ELECTRICAL CONTACTS

John J. Rozmus, 1030 Derwydd La., Berwyn, Pa. 19312
Filed Dec. 23, 1976, Ser. No. 753,923
Int. Cl.^{2} B23K *9/12*
U.S. Cl. 219—78.16 **7 Claims**



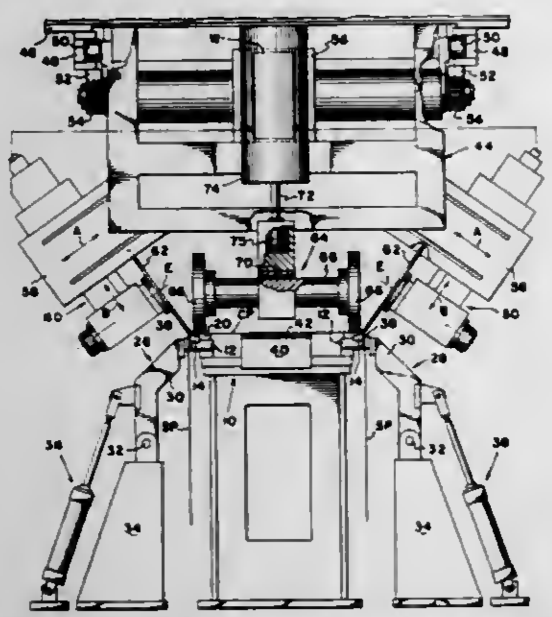
1. In a progressive die having a fixed die bolster and a reciprocating punch pad bolster for making electrical spring contacts by moving a body strip and a surface strip engaged therewith along an axis and working the same with punch and die means respectively mounted on the bolsters and the punch pad bolster being mounted to move in a working stroke from a return position toward the die bolster and in a return stroke away from the die bolster to the return position, welding mechanism operable simultaneously with the operation of the punch and die means for welding the surface strip to the body strip comprising:
first and second welding electrodes;
a first elongated, narrow arm extending between the bolsters in a direction transverse said axis and positioning said first electrode along said axis and fixedly mounting the first electrode on the die bolster, the first arm being a conductor to carry current for the first electrode and having duct means for circulating cooling fluid;
a second elongated, narrow arm extending between the bolsters in a direction transverse said axis and mounting said second electrode above said first electrode, the second arm being a conductor to carry current for the second electrode and having duct means for circulating cooling fluid;
mounting means connecting the second arm to the die bolster and mounting the arm for limited reciprocating motion whereby to move the second electrode toward and away from the first electrode;
an elongated, narrow, leaf spring extending between the bolsters above the second arm and in a direction transverse said axis, the spring having abutment means and one end of the spring having a lip;
first mechanism connected to said punch pad bolster and to said leaf spring and fixedly connecting the opposite end of the leaf spring to the punch pad bolster;
second mechanism connected to the punch pad bolster and including a flange engaging the underside of said lip, the engagement permitting the lip and flange to move relatively away from one another generally in the direction of movement of said punch pad bolster and the flange being positioned so that when it is engaged with the lip it maintains the lip with respect to the fixed end of the spring so that the spring is preloaded;
said first and second mechanisms providing for the leaf spring and its abutment means to reciprocate with the punch pad bolster;
said abutment means being positioned to move said arm and second electrode toward the first electrode with movement of the punch pad bolster in the working stroke whereby the second electrode engages the top of said surface strip and under such condition said engagement of the lip and flange providing for the flange to continue down with the punch pad bolster in the working stroke so the lip and flange move apart whereby to permit the spring to develop force to press the strips between the electrodes and maintain engagement thereof for the welding operation; and
said means mounting the second arm being operative, when the punch pad bolster is in the return position, to yieldably maintain the second arm in a position wherein said second electrode is spaced away from said first electrode.

4,099,044
WELDING APPARATUS

Robert H. Blair, and Donald J. Janiske, both of Bay City, Mich., assignors to Resistance Welder Corporation, Bay City, Mich.
Filed Oct. 12, 1976, Ser. No. 731,526
Int. Cl.^{2} B23K *11/06*
U.S. Cl. 219—82 **2 Claims**

1. In a resistance welding system for simultaneously seam welding a pair of side panels to opposite side edges of a central panel along widely transversely spaced parallel seams, a frame; clamping and support means thereon for clamping said panels in a fixed position with the edge portions of said panels which are to be welded to each other disposed in overlapped relationship with each other; a carriage supported by the frame, transversely spaced electrically conductive electrode means mounted on said carriage and movable with said carriage in welding contact longitudinally along the topside of the respective overlapped edge portions of said clamped panels, an opposite electrically conductive electrode for each means in planar

alignment therewith supported by said frame on the underside of the overlapped edge portions and in engagement therewith to provide pairs of electrodes at opposite side edges of the central panel, and a welding current supply source connected in series between said pairs of electrodes, the improvement wherein each opposite electrode extends on said clamping and support means generally the entire length of the respective overlapped portions of said panels and has a first elongate portion engaging the underside of the overlapped portions of the panels opposite the side traversed by the associated electrode means, a second electrically conductive elongate portion connected electrically with said first portion and engaging the underside of the central panel transversely adjacent said overlapped portions of said panels, and highly electrically conductive traveling means having a considerably greater electrical conductivity than said central panel is provided for conducting welding current from one pair of electrodes to the other, the traveling means being mounted to move with said carriage longitudinally along and engaged with the top side of said central panel along a path parallel to the path of said electrodes directly above said second portions to conduct current, serially in a confined path, from one of said second portions up through the central path and over to the other second portion back through said central panel.



4,099,045
ULTRASONIC TESTING METHOD AND APPARATUS FOR RESISTANCE WELDING

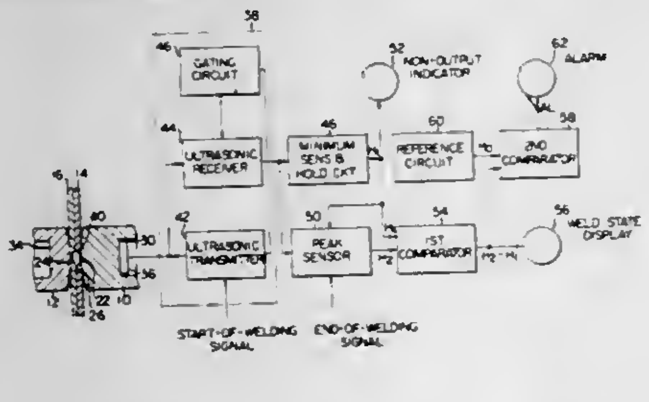
Takio Okuda, and Mikio Inada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,915

Claims priority, application Japan, Dec. 8, 1975, 50-146058

Int. Cl.^{2} B23K *11/00*

U.S. Cl. 219—109 **5 Claims**



1. A nondestructive testing method for determining the sufficiency of resistance welding of members welded between a pair of opposed electrodes having a welding current flowing therethrough, comprising the steps of intermittently transmitting a pulse-shaped ultrasonic wave from an ultrasonic vibrator disposed in one of said electrodes toward the other electrode, reflecting said ultrasonic wave from a reflecting surface located within said other electrode, sensing the minimum value of the peak magnitude of said reflected ultrasonic wave following an increase in the peak magnitude thereof after the start of the supply of the welding current to said electrodes, sensing the maximum value of the peak magnitude of said reflected ultrasonic wave during the time interval after the occurrence of said minimum peak magnitude and up to the time of cutoff of the welding current to said electrodes, subtracting said minimum value of the peak magnitude from said maximum value of the peak magnitude for estimating the dimension in the direction transverse to the transmitted ultrasonic wave of a nugget formed in the welded members, whereby the sufficiency of the weld of the welded members can be judged from the estimated dimension of the nugget.

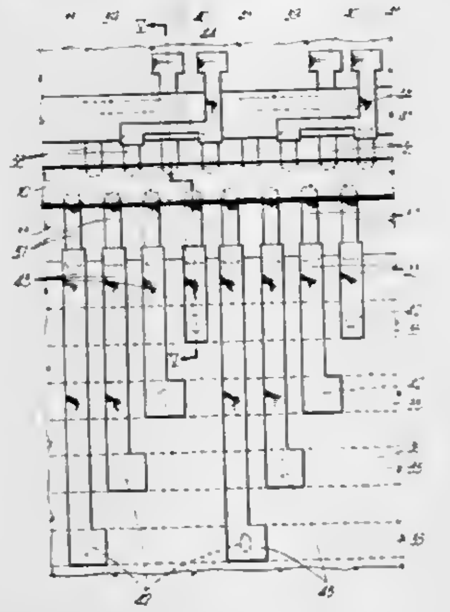
4,099,046
THERMAL PRINTING DEVICE

Robert James Boynton, Ottawa, and Frederick Caldwell Livermore, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 11, 1977, Ser. No. 786,445

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—216 **12 Claims**



1. A thermal printing device comprising:

a substrate of electrically insulating material;

a continuous bar of electrically resistive material on a surface of said substrate;

a first pattern of electrical conductors on said surface of said substrate and extending along one side of said bar and first electrical connectors extending from said first pattern to said bar, said first electrical connectors connected to said bar at said one side in a closely spaced predetermined arrangement extending along the bar, said first pattern of electrical conductors comprising first and second series of conductors, said second series overlying said first series, a dielectric layer interposed between said two series, and forming a plurality of columns, each column electrically separate from other columns, and a plurality of said first electrical connectors extending side-by-side from each of said columns to said bar of electrically resistive material said first electrical connections connected alternately to said first and second series of conductors;

a second pattern of electrical conductors on said surface of said substrate and extending along the other side of said bar, and second electrical connectors from said second pattern to said bar, said second electrical connectors connected to said bar at said other side in a closely spaced predetermined arrangement extending along the bar, said second electrical connectors connected to said bar at positions intermediate the positions at which said first electrical connectors are connected to said bar, said second pattern of electrical conductors comprising a plurality of rows, each row electrically separate from other rows, and a plurality of said second electrical connectors extending from each of said rows to said bar, each electrical connector from a row connected to said bar opposite a first electrical connector connected to a single different one of said columns, each row connected by said second electrical connectors to said bar at positions different from each other row;

means for connecting an electrical power supply to said patterns of electrical conductors to apply electric current to selected electrical connectors on each side of said bar to produce heated areas in said bar.

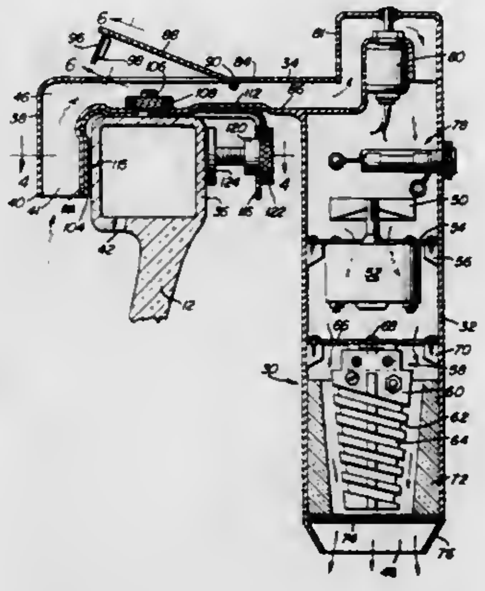
4,099,047
COMMODE VENTILATION SYSTEM

James R. Kirkland, Jr., 8703 Magnetic St., El Paso, Tex. 79904

Filed Nov. 19, 1976, Ser. No. 743,408

Int. Cl.^{2} H05B *1/00;* F24H *3/04*

U.S. Cl. 219—370 **2 Claims**



1. A commode ventilator for attachment to the upper edge of a commode bowl comprising a housing having a vertically extending outer portion for disposition alongside of the exterior of the upper portion of a commode bowl and an inwardly extending intermediate portion to extend between the upper edge of the commode bowl and a seat on the commode and an inner portion having a terminal end for disposition interiorly of the commode bowl and having an opening therein defining an intake, fan means in said housing for intake of air and odors into the housing, heating means in said housing engaged by the air and odors for neutralizing and deodorizing the odors, said housing including a discharge opening at the lower end of the vertically disposed outer portion for discharging the deodorized air into the ambient air in the bathroom, clamp means secured to the intermediate portion of said housing and including an adjustment means for clamping the clamp means to the upper rim of a commode bowl, thereby anchoring the ventilator thereto, the inner portion of said housing being downturned, and terminating in an open lower end providing an intake for air and odors, said intermediate portion including a top wall having a pivital acess door therein providing access to the interior of the intermediate portion, a lint screen mounted on the access door and forming a screen for incoming air, said fan means including an axial flow fan and motor supported in the vertically disposed outer portion of said housing, said heating means including an electric resistance type heating wire formed into a coil disposed in the flow path of air and odors passing through the vertical outer portion of said housing, a screen in the discharge opening at the lower end of the vertical portion of said housing to prevent access to the heating means, a timer control for said fan means and heating means to operate the ventilator for a predetermined time period and automatically deenergize the ventilator at the end of such a period, said clamp means being in the form of a downwardly opening channel-shaped member having generally parallel vertical leg portions extending downwardly from a generally horizontal web, a screw threaded clamp screw extending through the outer leg portion and including a clamp plate for engagement with the outer surface of the upper rim of the commode bowl in opposition to engagement of the inner leg portion with the inner surface of the upper rim of the commode bowl, said web including an upstanding screw threaded stub extending through a bottom wall of the intermediate portion of the housing and including a retaining nut on the upper end thereof, said access door in the upper wall of the intermediate portion providing access to the retaining nut to enable assembly and disassembly of the clamp means therewith.

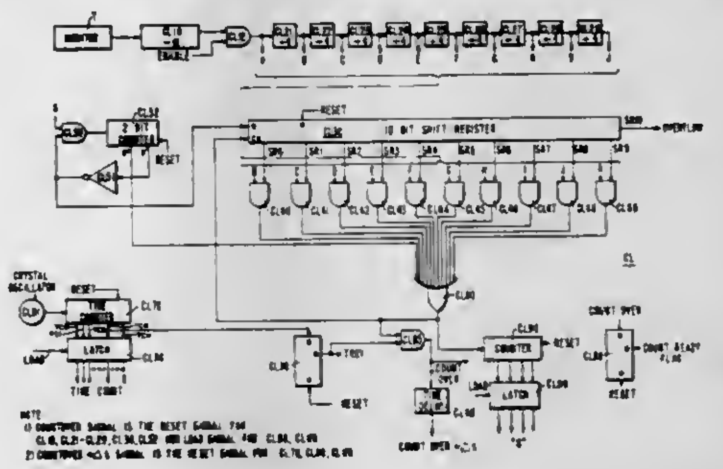
4,099,048
COUNT LOGIC CIRCUIT

Dennis P. Eichenlaub, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 9, 1976, Ser. No. 740,322

Int. Cl.^{2} H03K *21/08*

U.S. Cl. 235—92 DM **4 Claims**



1. Apparatus for determining the integer power of N input pulses or events, where N is a predetermined number, comprising;

input logic means for generating a logic output in response to a predetermined number of input pulses or events;

a plurality of series connected divide by N circuits, the first of said divide by N circuits transmitting a logic signal to the next divide by N circuit in response to N logic signals from said input logic means;

each successive divide by N circuit generating a logic signal in response to N logic signals from the preceding divide by N circuit;

a multistage counter means having logic gates associated with the output of each of said stages;

the logic gate associated with the first stage having as inputs the output from said first stage and the logic output from the first of said series connected divide by N circuits;

the logic gates associated with each of the successive stages of said multistage counter means having as inputs the outputs of the corresponding stage and the logic output of the next successive divide by N circuit; said multistage counter means having a data input and a clock input;

second logic means responsive to the logic output of said input logic means by entering a logic "1" at the data input of said multistage counter means;

a logic OR gate having as inputs the outputs of said logic gates associated with the multistage counter means, the output of said logic OR gate being supplied to the clock input of said multistage counter means, the simultaneous occurrence of a logic "1" data input at the first stage of said multistage counter means and a logic "1" output signal from said first divide by N circuit causing said logic gate associated with the first stage of said multistage counter means to transmit a logic "1" to said logic OR gate, said logic OR gate developing a logic "1" output indicative of the occurrence of an integer power of N pulses or events, said logic output of said logic OR gate functioning to clock said multistage counter means to advance the logic "1" data input from the first stage to the second stage of said multistage counter means, and

output circuit means coupled to said logic OR gate to manifest the integer power of N input pulses or events.

4,099,049

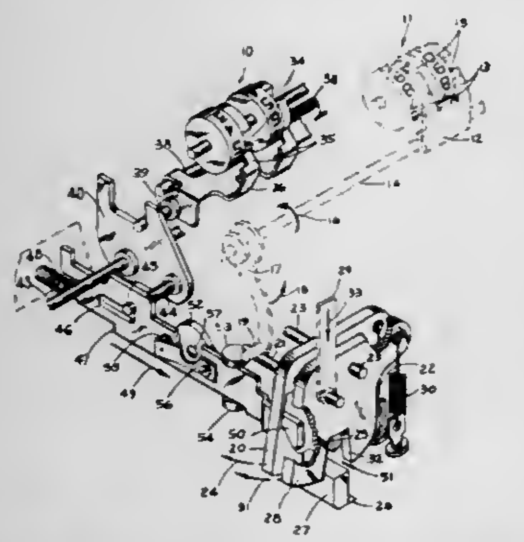
ASCENDING REGISTER LOCKOUT SYSTEM FOR A POSTAGE METER

Lynnwood Lowe, Noroton Heights, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 10, 1976, Ser. No. 740,377

Int. Cl.^{2} G07G *1/00*

U.S. Cl. 235—101 **14 Claims**



1. An ascending register lockout system for a postage meter, comprising:

an elongated slide bar member mounted within said postage meter for slidable movement between a meter lockout position, and a meter operative position;

biasing means disposed within said meter and acting upon said slide bar member for biasing said slide bar member to said meter lockout position;

a triggering sear disposed within said meter adjacent said slide bar member and movable between a slide bar member holding position and a slide bar member releasing position;

an ascending register disposed within said meter and comprising at least one rotatable counter lockout wheel having a lockout notch; and

a locking comb disposed adjacent said ascending register and having at least one locking tooth for receipt within said lockout notch of the counter lockout wheel when said counter lockout wheel attains a lockout value position, said locking comb being pivotably mounted within said postage meter and being pivotable to a lockout position when said locking tooth is received within said lockout notch, said locking comb further comprising camming means for camming said triggering sear from said slide bar member holding position when said locking comb is caused to pivot.

4,099,050

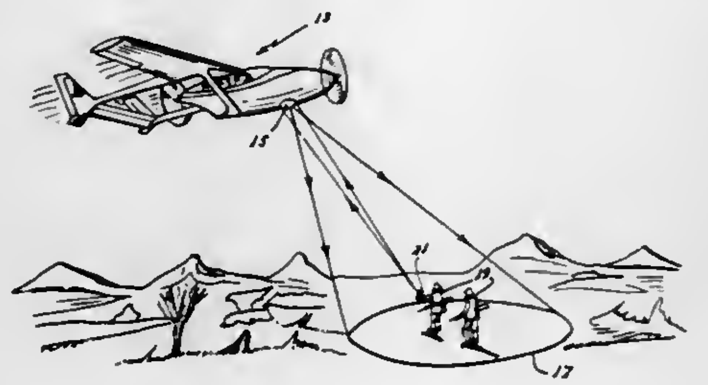
CODABLE OPTICAL TRANSPONDER

Gerhard O. Sauermann, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 10, 1970, Ser. No. 56,019

Int. Cl.^{2} H04B *9/08*

U.S. Cl. 250—199 **9 Claims**



1. In an optical line-of-sight communication system having an interrogator section and a receiver section both located in substantially the same general area for generating and receiving radiation signals, respectively; a remotely positioned codable optical transponder comprising, a corner reflector located in line-of-sight with said interrogator section for receiving and reflecting radiation therefrom, at least the narrow band optical filter positioned immediately in front of said corner reflector and operatively attached thereto to absorb all radiation from said interrogator except that of specific wavelengths, and a coded opaque mask positioned immediately in front of said filter in operative association therewith to prevent a predetermined portion of the radiation from the interrogator from from reaching said corner reflector, said corner reflector, optical filter and opaque mask being constructed as a portable unit capable of being handcarried by a person, the configuration of said mask being designed to allow radiation to reach only specified areas of said corner reflector thereby forming a signal containing intelligence corresponding to the mask configuration which is subsequently reflected back to the receiver section of the communication system.

4,099,051

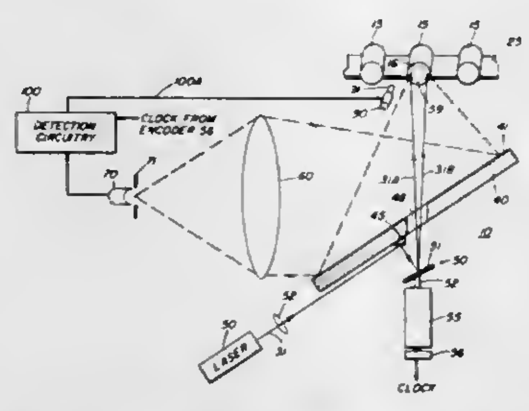
INSPECTION APPARATUS EMPLOYING A CIRCULAR SCAN

George Gugliotta, Ridgefield, Conn., assignor to Automation Systems, Inc., Brookfield, Conn.

Filed Nov. 18, 1976, Ser. No. 742,918

Int. Cl.^{2} G01N *21/32, 21/48*

U.S. Cl. 250—236 **17 Claims**



1. Apparatus for inspecting the surface of an object at an inspection position, comprising:

a. source means for generating a relatively narrow collimated beam of radiation;

b. scanning means, spaced from the inspection position, for effecting a substantially circularly shaped scan of said beam at the inspection position;

c. reflector means, disposed between said scanning means and the inspection position, said reflector means having an aperture therein to allow passage of the scanning beam travelling toward the inspection position and having its reflective surface oriented angularly with respect to the axis of said scan so as to receive radiation from said object and reflect it toward an off-axis region;

d. photodetector means located at said off-axis region; and

e. lens means disposed between said reflector means and said photodetector means for focusing radiation on said photodetector means.

4,099,052

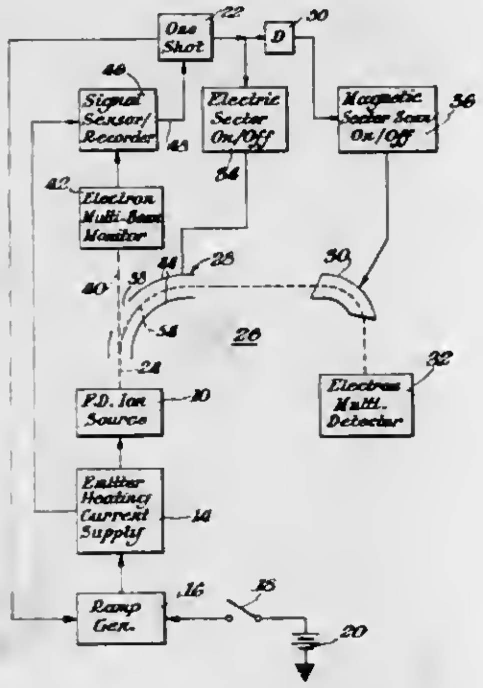
MASS SPECTROMETER BEAM MONITOR

Charles R. McKinney, Monrovia, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 7, 1976, Ser. No. 748,298

Int. Cl.^{2} B01D *59/44*

U.S. Cl. 250—283 **11 Claims**



1. In an ion beam analyzer having an ion source for generating ions of a sample to be analyzed, means for extracting said sample ions from said source, means for focusing the extracted sample ions into a beam, separation means positioned along the ion beam for selectively deflecting species of ions, and detecting means for detecting the selected species ions, the improvement comprising:

disabling means for disabling at least a portion of said separation means such that said ion beam from said source remains undeflected,

sensing means located along the undeflected ion beam for sensing said sample ions, and

enabling means coupled to said disabling means for reenabling said separation means.

4,099,053

DEVICE FOR THE SEPARATION OF GAS MIXTURES

Thomas I. Ress, Fullerton, and Frederick Hartmann, Rolling Hills Estates, both of Calif., assignors to Kreidl Chemico Physical K.G., Schaan, Liechtenstein

Filed May 2, 1977, Ser. No. 793,038

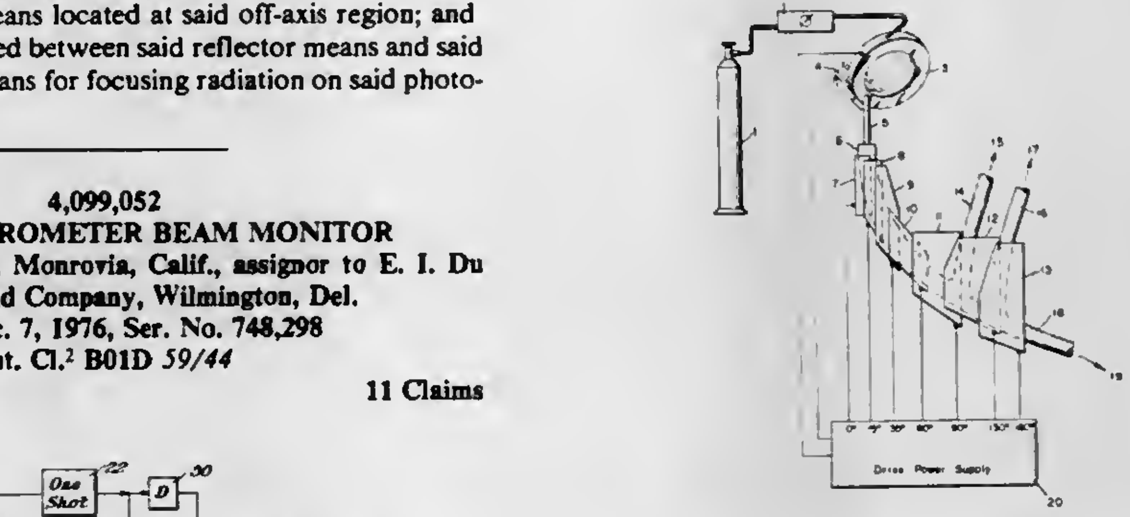
Int. Cl.^{2} B01D *59/44;* **H01J** *39/34*

U.S. Cl. 250—293 **7 Claims**

1. An apparatus for the separation of a gaseous plasma mixture into components in some of which the original concentration of a specific ion has been greatly increased or decreased, comprising:

a constant-frequency pulsed source for converting the gaseous mixture into a train of plasma packets,

an open-ended vessel with a main section and at least one branch section, adapted to enclose along predetermined tracks the original plasma packets in the main section, and the separated plasma components in each of its branch sections,



drive means for generating traveling magnetic waves along the predetermined tracks with the magnetic flux vector of the waves transverse to end of the tracks, and

means for maintaining phase coherence between the plasma packets and the magnetic waves on a value needed for accelerating the components of the mixed packets to different velocities and in such different directions that the mixed plasma is divided into distinctly separate packets in some of which the original concentration of a specific ion has been greatly increased or decreased, and which are collected from separate branches of the vessel.

4,099,054

SEM HAVING D-C BIAS OF VIDEO SIGNAL CONTROLLED BY MAXIMUM AND/OR MINIMUM OF CRT BEAM CURRENT

Masahide Okumura, Katsuta, and Yasushi Saito, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 631,720, Nov. 13, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,163

Claims priority, application Japan, Nov. 20, 1974, 49-132759

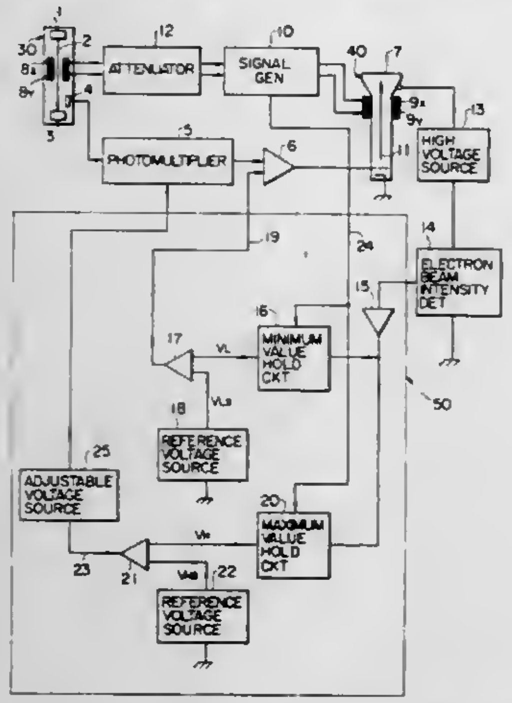
Int. Cl.^{2} G01N *23/00*

U.S. Cl. 250—306 **17 Claims**

3. In a charged particle beam apparatus having means for irradiating an object to be observed with a primary charged particle beam, a cathode ray tube having an electron beam irradiating a fluorescent screen thereof, means for scanning said primary charged particle beam and said electron beam in synchronism, means for detecting secondary emission particles emitted from said object, and means for amplifying the output signal of said detecting means to form a video signal modulating the electron beam current of said cathode ray tube, the improvement comprising means for detecting the minimum value of the electron beam current of said cathode ray tube during one video frame, and means for controlling the D.C. bias of said video signal in response to the minimum value detected during said video frame.

6. In a charged particle beam apparatus having means for irradiating an object to be observed with a primary charged particle beam, a cathode ray tube having an electron beam irradiating a fluorescent screen thereof, means for scanning said primary charged particle beam and said electron beam in synchronism, means for detecting secondary emission particles emitted from said object, and means for amplifying the output signal of said detecting means to form a video signal modulat-

ing the electron beam current of said cathode ray tube, the improvement comprising means for detecting the maximum value of the electron beam current of said cathode ray tube



during one video frame, and means for controlling the gain of said amplifying means in response to the maximum value detected during said video frame.

4,099,055

SCANNING TRANSMISSION ELECTRON MICROSCOPE

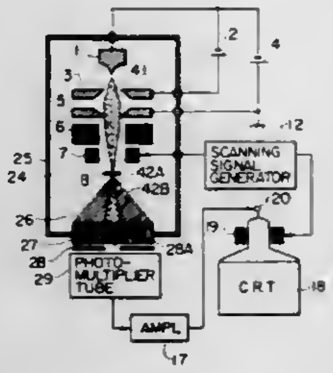
Hideo Todokoro, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 8, 1976, Ser. No. 730,854

Claims priority, application Japan, Oct. 17, 1975, 50-124386

Int. Cl.² H01J *37/26*

U.S. Cl. 250—311 **5 Claims**



1. A scanning transmission electron microscope comprising means for irradiating with a finely focussed primary electron beam, a sample to be observed with an evacuated chamber, means for scanning said sample with said primary electron beam, means for converting the electrons passing through said sample to a light image, light transmitting means for transmitting said light image out of said evacuated chamber, light interrupting means for passing a selected part of said transmitted light image while interrupting the remaining part, and photoelectric detecting means for detecting the light which has passed through said light interrupting means to detect bright or dark-field electrons.

4,099,056

X-RAY DIAGNOSTICS INSTALLATION COMPRISING AN X-RAY TUBE WITH A CONTROL GRID

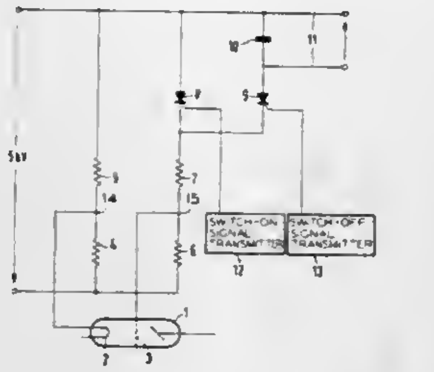
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 14, 1977, Ser. No. 787,485

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637064

Int. Cl.² G03B *41/16*

U.S. Cl. 250—403 **1 Claim**



1. X-ray diagnostics installation comprising an x-ray tube with a control grid, as well as comprising a circuit arrangement connected to said control grid for switching the x-ray tube on and off, characterized in the provision of a resistance bridge with input and output terminal means, and in that the grid and the cathode of the x-ray tube are connected to the output terminal means of the resistance bridge, and in that a high voltage is connected to the input terminal means of the resistance bridge which is sufficient for blocking the x-ray tube, and that, in one arm of the bridge, there is disposed the parallel-connection consisting of a switch-on current gate and the series-connection of a switch-off current gate with a quenching capacitor for connection to a voltage source for the purpose of being charged to a voltage sufficient for quenching the switch-on current gate.

4,099,057

X-RAY DIAGNOSTICS GENERATOR FOR X-RAY PHOTOGRAPHS

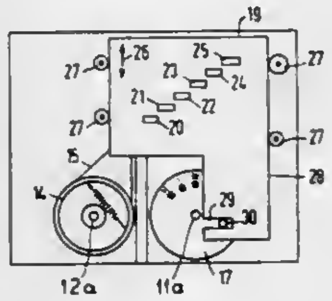
Franz Schramm, Moehrendorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 8, 1977, Ser. No. 785,734

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626083

Int. Cl.² G03B *41/16*

U.S. Cl. 250—416 R **3 Claims**



1. An x-ray diagnostics generator system for x-ray photographs comprising manually actuatable adjustment means for the x-ray tube voltage, the x-ray tube current, and the photographic exposure time, and comprising indicator means for the mAs-product resulting from the adjusted x-ray tube current and the adjusted photographic exposure time, characterized in that the manually actuatable adjustment means for the x-ray tube current and the photographic exposure time are operable to select respective sets of discrete values of x-ray tube current and photographic exposure time with each setting of exposure time corresponding to a set of mAs product values corresponding to the possible discrete values of x-ray tube current, the indicator means for the mAs product comprising a rotatably mounted cylinder with the respective sets of mAs product values recorded in successive rows about the cylinder and with each product value of a given row being aligned with a corresponding product value of other rows to form a column circumferentially about the cylinder with product values corresponding to a given x-ray tube current setting, the cylinder being mechanically coupled with the adjustment means for the photographic exposure time and being rotatable to a position with a row of product values aligned with the indicator means in accordance with the setting of exposure time, the indicator means further having an apertured mask adjustable by the adjustment means for the x-ray tube current and having apertures for selectively exposing the respective columns of product values in accordance with the setting of x-ray tube current, the apertures of the mask being constructed and arranged that, in each mask position, one aperture is positioned to expose the correct mAs product value at the indicator means.

4,099,058

METHOD OF OPTIMIZING RADIATION DOSES IN AN X-RAY EXAMINING DEVICE, AND A DEVICE FOR PERFORMING THE METHOD

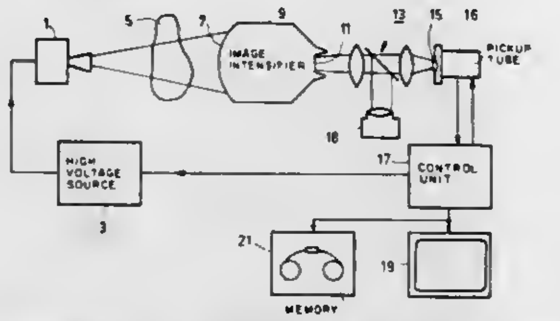
Hantje Reltsma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,713

Claims priority, application Netherlands, Jan. 23, 1976, 7600688

Int. Cl.² H05G *1/30*

U.S. Cl. 250—416 TV **6 Claims**



1. In the method for optimizing the exposure time of an X-ray image comprising the steps of passing X-ray radiation through an object and causing charge buildup on a radiation sensitive layer of an image pickup tube therewith, irradiating said charge image with electrons from a cathode in said tube, maintaining said cathode at an increased potential with respect to an operating potential until a signal current generated by the electrons exceeds a threshold and stopping the charge buildup and reducing the cathode potential when the threshold is reached, the improvement wherein the signal current is generated by scanning at least a part of the charge image, framewise, with an electron beam during the charge buildup.

4,099,059

TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Walter Distler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

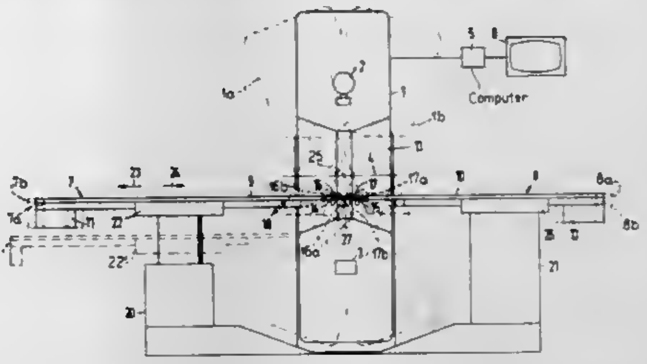
Filed Mar. 11, 1977, Ser. No. 776,767

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619482

Int. Cl.² A61B *6/00;* G03B *41/16*

U.S. Cl. 250—445 T **5 Claims**

1. Tomographic apparatus for producing transverse layer images of a radiographic subject, comprising an x-ray measuring arrangement including a radiation source which produces an x-ray beam penetrating the radiographic subject and having a predetermined extent perpendicular to the layer plane, and a radiation receiver which determines the intensity of radiation behind the subject during a scanning operation, a pivot mounting for the measuring arrangement accommodating rotational movements thereof during the scanning operation, and a housing for the measuring arrangement having an opening extending therethrough for receiving a patient supporting device with a patient, characterized by the patient supporting device comprising two individual patient supports for extending into the opening of the housing from opposite sides thereof, said supports having respective conveyors lying substantially in a common plane for moving the patient longitudinally and having a small gap therebetween with a width which is at least equal to the predetermined extent of the x-ray beam corresponding to the layer thickness to be examined.



4,099,060

X-RAY APPARATUS FOR PRODUCING TRANSVERSAL LAYER IMAGES

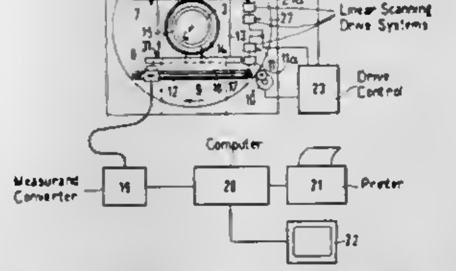
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1977, Ser. No. 782,188

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619719

Int. Cl.² A61B *6/02;* G01N *23/08*

U.S. Cl. 250—445 T **2 Claims**



1. An x-ray apparatus for producing transversal layer images of a photographic subject, comprising an x-ray source, a diaphragm for condensing the x-rays into a narrow x-ray beam whose cross-sectional spread is equal to the thickness of the layer in a direction perpendicular to the layer and substantially equal to or less than the thickness of the layer in a direction parallel to the layer, comprising a measuring arrangement for measuring the intensity of radiation, in which, for penetrating the subject from different directions, the x-ray source and the measuring arrangement are arranged together on a rotating frame which is rotatable through equidistant angular steps about a point situated on a central ray of the total radiation issuing from the x-ray source and in which the measuring arrangement is mounted on the rotating frame on a carriage which is displaceable by a motor perpendicularly of the central

ray and the axis of rotation, and further comprising a computer for determining the absorption values of the points of intersection of the radiation in the subject from the intensity of the radiation received by the measuring arrangement, characterized in that the x-ray source is fixedly arranged on the rotating frame, that the diaphragm is mounted for displacement parallel to the adjustment path of the measuring arrangement and in that a motor for displacing the diaphragm is connected to a control device which controls this motor and also the motor for displacing the measuring arrangement in such a way that, during its displacement, the measuring arrangement is struck by the x-ray beam in each position.

4,099,061

TOMOGRAPHIC X-RAY APPARATUS FOR PRODUCING TRANSVERSAL LAYER IMAGES

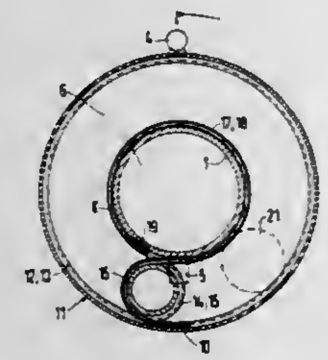
Roderich Zink, Herzogenaurach, and Walter Distler, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 6, 1977, Ser. No. 785,013

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621308

Int. Cl.^{2} G03B *41/16*

U.S. Cl. 250—445 T **6 Claims**



1. Tomographic x-ray apparatus for producing transverse layer images of a radiographic subject with an x-ray measuring arrangement comprising an x-ray source producing a beam of x-rays for penetrating the radiographic subject, and a radiation receiver for determining the intensity of radiation beyond the subject, with a pivot mounting accommodating rotational movement of the measuring arrangement about an axis running perpendicular the layer plane, with a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, and with cable means which join the measuring arrangement to an x-ray generator and to the measured value converter, characterized in that cable guiding means are provided comprising an epicyclically movable planetary member with inner and outer relatively rotatable members in driving relation to the planetary member, said cable means forming a loop about said planetary member and being attached to the rotatable members such that the cable means is fed from the inner member about the planetary member to the outer member in one direction of relative rotation of the inner and outer members, and is fed from the outer member about the planetary member to the inner member in the opposite direction of relative rotation of the inner and outer members.

4,099,062

ELECTRON BEAM LITHOGRAPHY PROCESS

James Robert Kitcher, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,310

Int. Cl.^{2} A61K *27/02*

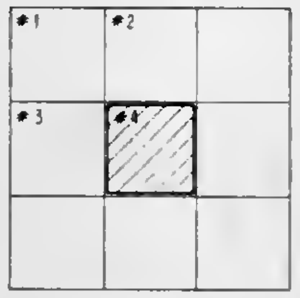
U.S. Cl. 250—492 A **3 Claims**

1. In a process of forming a patterned resist image on a substrate, the process including the steps of:

forming a layer of resist material, which becomes more soluble in a developer when struck by electrons, on the substrate;

exposing the layer to a scanning beam of electrons to form a pattern of exposed shapes, the beam having a fixed spot size which is moved step-wise on a two dimensional grid whose grid size is a fraction of the spot size; and

developing a patterned resist image by removing the resist material in the exposed shapes with a developer; the improvement which comprises forming first exposed shapes in the layer with a series of a non-overlapping exposures each at a first exposure dosage and forming a second exposed shape in the layer with multiple overlapping exposures, with each overlapping exposure being at a dosage less than said first exposure dosage; and then developing the patterned resist layer with a developer to completely remove the resist in the first exposed shapes down to the substrate while at the same time removing only a portion of the resist in the second exposed shape down to the substrate.



4,099,063

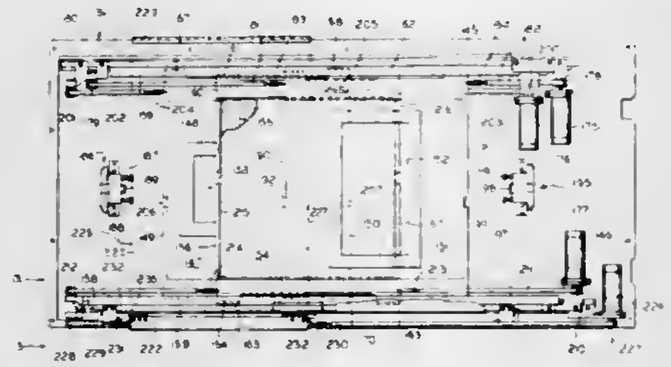
X-RAY FIELD DEFINING MASKS FOR A SPOT FILM DEVICE

Thomas Pury, Brookfield, and Marvin L. Sivertsen, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,572

Int. Cl.^{2} G21F *5/04*

U.S. Cl. 250—513 **4 Claims**



1. An x-ray field defining mask for translating on tracks that are spaced apart by a substantial width in an x-ray spot film device, said mask comprising:

a first generally planar sheet of stiff metal having sufficient width for spanning between said tracks,

a second generally planar sheet of soft, easily bendable and greater x-ray absorption properties than said first sheet and having lesser width than said first sheet and bonded to said first sheet at the interfaces of said sheets,

a third generally planar sheet of stiff metal having lesser width than said second sheet and bonded to said second sheet at the interfaces of said second and third sheets,

a fourth generally planar sheet of soft, easily bendable metal having greater x-ray absorption properties and lesser width than said third sheet and bonded to said third sheet at the interfaces of said third and fourth sheets,

said sheets being bonded together at their interfaces and each sheet having an aperture that is aligned with the others,

at least one margin of said first generally planar sheet being formed at an angle relative to the plane of said first sheet for engaging slidably in a complementarily formed groove in at least one of said tracks, whereby to prevent said mask from shifting in the direction of its width when translating on said tracks.

4,099,064

DEVICE FOR PRETESTING ORIGINALS TO BE COPIED FOR THEIR COPYABILITY

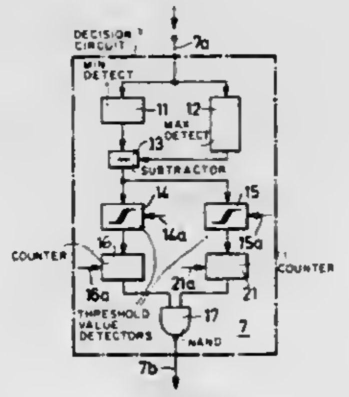
Walter Grossmann, Russikon, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,342

Claims priority, application Switzerland, Nov. 24, 1975, 15197/75

Int. Cl.^{2} G01N *21/30*

U.S. Cl. 250—559 **8 Claims**



1. A device for pretesting originals to be copied for their copyability, said device being provided with photoelectric means for measuring the original and a decision circuit connected to said photoelectric means which evaluates the resultant measured values in accordance with a given criterion and which produces a clear signal when this criterion is fulfilled and a skip signal when it is not, wherein the photoelectric means is a scanning means which operates point by point and produces scanning values in the points to be scanned corresponding to the density of the original, and wherein the decision circuit contains first means for detecting the minimum scanning value and second means connected to said first means which compares the scanning values with the minimum scanning value and produces the clear signal when at least one scanning value is higher than the minimum scanning value by at least a given first threshold value.

4,099,065

SMOKE DETECTOR WITH CHAMBER FOR PRODUCING EDDY CURRENTS

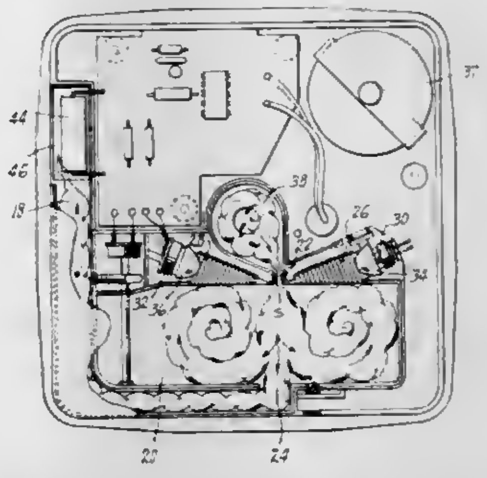
William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed Oct. 12, 1976, Ser. No. 731,626

Int. Cl.^{2} G01N *21/26*

U.S. Cl. 250—574 **3 Claims**

2. A smoke detector comprising a chamber, formed by end walls and side walls, one side wall having an exit aperture, the other side wall having an entrance aperture and recesses formed therein on opposite sides of one of the entrance apertures, the axis of said recesses being inclined toward each other and toward the chamber, a light source disposed in one recess, the light source and its associated recess being dimensioned and arranged to illuminate the chamber, a photo-responsive device disposed in the other recess, said photo-responsive device being positioned to view the chamber, and means causing ambient air to flow through the chamber by way of the entrance and exit apertures, said chamber being sufficiently large that eddies form on either side of a direct path between the entrance port and the exit port which fill with smoke when smoke is present in the ambient air, said eddies being illuminated by the light source and viewed by the photo-responsive device.



4,099,066

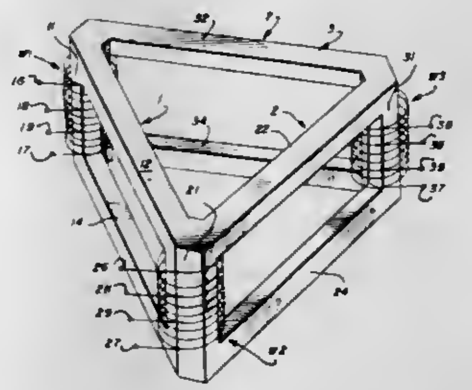
PULSE GENERATING SYSTEM WITH HIGH ENERGY ELECTRICAL PULSE TRANSFORMER AND METHOD OF GENERATING PULSES

William C. Beggs, 4110 Shawnee La., NE., Atlanta, Ga. 30319

Filed Aug. 17, 1976, Ser. No. 715,109

Int. Cl.^{2} H01F *33/00*

U.S. Cl. 307—88 MP **38 Claims**



1. In a pulse conversion and generating system for coupling to a load a multiphase source of electrical input pulses having a short duty cycle, a pulse transformer for electromagnetically transforming said input pulses to output pulses substantially undistorted, said transformer comprising:

input pulse receiving windings corresponding to each phase of the source for producing a pulse excitation magnetizing force in response to an input pulse;

output pulse generating windings corresponding to each phase of the source for producing a transformed output pulse in response to said magnetizing force; and

a core structure of ferromagnetic material having:

a plurality of legs, each of which is excitable to couple the magnetic energy induced by an input pulse in an associated input pulse winding to a corresponding output pulse winding to generate said transformed output pulse; and

means for magnetically coupling each of said legs to at least one other leg to at least partially share the magnetic energy induced by said input pulse in each excited leg with each unexcited leg such that each leg is reset to an initial magnetic state prior to the pulsed excitation of its corresponding input winding.

4,099,067

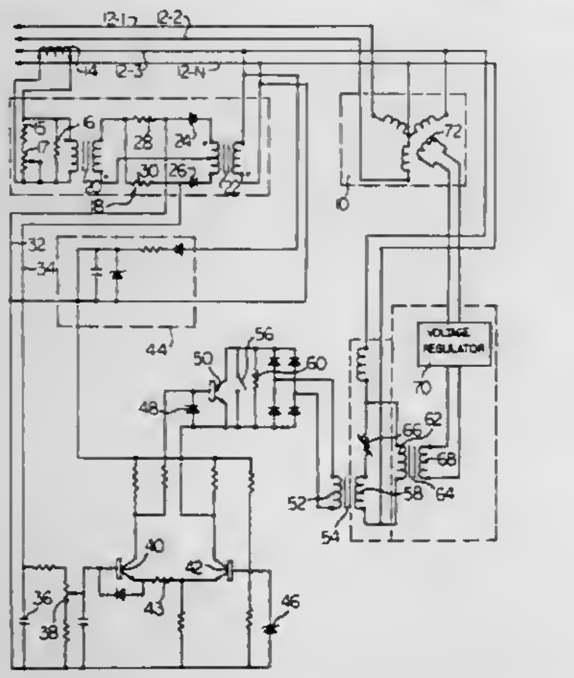
LOAD-SHEDDING CONTROL FOR DIESEL-ELECTRIC SETS

John Francis Szentes; Ward Welton Reeser, and Charles Leslie Zuck, Jr., all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1975, Ser. No. 607,524

Int. Cl.^{2} H02P *9/00*

U.S. Cl. 307—153 **12 Claims**



1. In an electrical generator set driven by an internal combustion engine and having a predetermined maximum load rating, the method of preventing engine lug under temporary overloads comprising the steps of:

(a) producing a load signal representative of a function of the line voltage and load current of the generating set;
(b) maintaining said line voltage essentially constant from no load to the maximum rated load; and
(c) using said load signal to progressively reduce said line voltage under increasing overloads, so as to maintain the power output of said generating set at or near the maximum rated power output allowable upon occurrence of an overload.

4,099,068

POWER SUPPLY INTERRUPTION DETECTING CIRCUIT

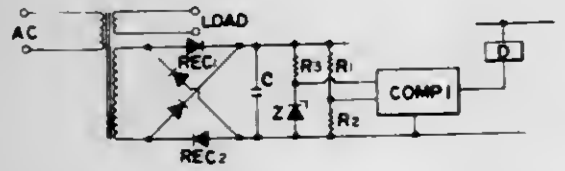
Tadahiro Kobayashi, Kawasaki, and Teloo Tomura, Warahl, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1976, Ser. No. 750,819

Claims priority, application Japan, Dec. 31, 1975, 50-158458

Int. Cl.^{2} H02M *1/18*

U.S. Cl. 307—200 A **3 Claims**



1. A power supply interruption detecting circuit in which a DC output voltage is picked up from an input AC power supply through a rectifying and smoothing circuit and the DC output voltage and a reference voltage are compared with each other to detect the interruption of the input AC power supply, comprising:

a rectifier circuit connected to the input AC power supply in addition to the rectifying and smoothing circuit;
a capacitance-resistance circuit having a smaller time constant than the rectifying and smoothing circuit, connected as a load of the rectifier circuit; and
a circuit for detecting that the terminal voltage of the capacitance-resistance circuit has dropped below a predetermined ratio with respect to the DC output voltage, using the terminal voltage of the capacitance-resistance circuit as the reference voltage.

4,099,069

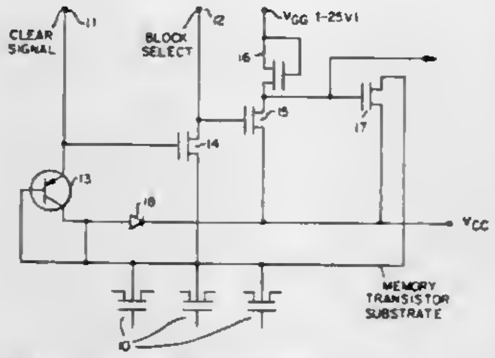
CIRCUIT PRODUCING A COMMON CLEAR SIGNAL FOR ERASING SELECTED ARRAYS IN A MNOS MEMORY SYSTEM

James R. Cricchi, Baltimore, and Joe E. Brewer, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 8, 1976, Ser. No. 730,890

Int. Cl.^{2} G11C *11/40, 8/00;* H01L *29/78;* H03K *17/30*

U.S. Cl. 307—238 **15 Claims**



1. An integrated circuit comprising:

a. first and second semiconductor islands isolated from each other by a PN junction and supported by a common substrate.
b. a plurality of memory transistors utilizing said first semiconductor island as a substrate,
c. a logic circuit having first and second logic inputs and a logic output, said logic output operatively coupled to the substrate of said memory transistors for applying thereto a first potential in response to first, second, and third preselected permutations of first and second logic signals applied to said logic inputs, and a second potential in response to a fourth preselected permutation of said first and second logic signals applied to said inputs, and including a plurality of semiconductor devices utilizing said second semiconductor island as a substrate, said devices including:
    (1) a first coupling diode for coupling said first logic input and said logic output,
    (2) a first switch means operatively coupled between said second logic input and said logic output for operating in response to logic signals, applied to said first logic input,
    (3) second switch means operatively coupled to said first potential for operating in response to logic signals applied to said second logic input,
    (4) load means coupled between said second switch means and a third potential for providing an impedance across which a potential is developed,
    (5) third switch means coupled to said first potential for opening and closing in response to the opening and closing of said second switch means,
    (6) a second coupling diode for coupling said first potential and said logic output.

4,099,070

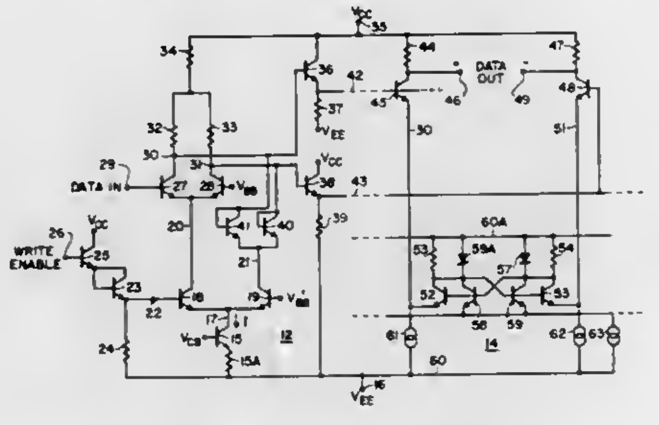
SENSE-WRITE CIRCUIT FOR RANDOM ACCESS MEMORY

John R. Reinert, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1976, Ser. No. 745,021

Int. Cl.^{2} G11C *7/00, 11/40;* H03K *3/286, 3/353*

U.S. Cl. 307—238 **13 Claims**



1. A sense-write circuit comprising:

first and second transistors having their emitters coupled together to a first current source means;
third and fourth transistors having their emitters coupled together to the collector of said first transistor;
the base of said first transistor being responsive to a write signal, and the base of said third transistor being responsive to a data input signal;
first and second rectifying means coupled between the collector of said second transistor and the collectors of said third and fourth transistors, respectively; and
means coupled to the collectors of said third and fourth transistors for writing information into a memory cell from said third and fourth transistors and establishing a pair of reference voltages for effecting reading information out of a memory cell.

4,099,071

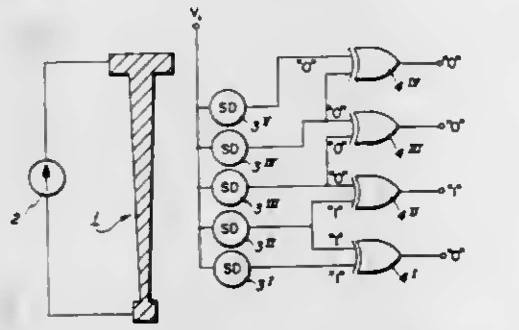
MONOLITHIC ELECTRONIC SCANNING DEVICE

David D. Thoroburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,123

Int. Cl.^{2} H03K *17/00;* H01C *3/08;* H03K *19/32;* G01R *21/02*

U.S. Cl. 307—239 **1 Claim**



1. An electronic indicating apparatus comprising:

a tapered resistor device comprised of an electrically insulating substrate and an electrical resistive element supported by said substrate, said resistive element having a tapered configuration whereby its cross-sectional area varies steadily along its length,
a plurality of heat sensitive devices adjacently positioned along the length of said resistive element, each of said heat sensitive devices having one resistance value and one output signal voltage level when at one temperature and a different resistive value and a different output signal voltage level when at a different temperature,
a plurality of multi-input terminal electronic gating devices, each of said gating devices having a pair of its input terminals connected to receive the output signals of a different adjacent pair of said plurality of heat sensitive devices, and
means for passing a current through said resistive element, whereby the voltage levels of the output signals of an adjacent pair of said heat sensitive devices are different and the output voltage of the gating device coupled to that adjacent pair of said heat sensitive devices changes value to reflect said voltage level difference.

4,099,072

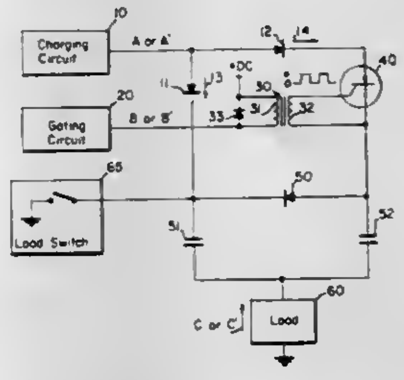
VARIABLE PULSE WIDTH CIRCUIT

J. Spencer Lee, Santa Barbara, and Leon E. Stoddard, Goleta, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 8, 1977, Ser. No. 766,651

Int. Cl.^{2} H03K *1/18*

U.S. Cl. 307—265 **5 Claims**



1. A dual charging mode network for feeding a load having an electronic switch, and first and second capacitors each having first and second terminals respectively, the first terminal of the second capacitor being connected to the electronic switch, said second terminals being joined to each other, and a rectifier bridging said first terminals, the improvement comprising:

first means electrically coupled to the electronic switch and said first capacitor for providing charging currents to said capacitors;
second means electrically coupled to the electronic switch for providing gating levels to the electronic switch thereby enabling the charging of at least one of said first and second capacitors during at least one of two modes of operation of said network;
a load switch connected to the first terminal of the first capacitor; and
an impedance connected to the second terminals of both of said capacitors.

4,099,073

FOUR-LEVEL VOLTAGE SUPPLY FOR LIQUID CRYSTAL DISPLAY

Shintaro Hashimoto, Shiki, and Yuuichi Sato, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1976, Ser. No. 717,921

Claims priority, application Japan, Aug. 27, 1975, 50-104423

Int. Cl.^{2} G06F *3/14, 1/00*

U.S. Cl. 307—296 R **12 Claims**

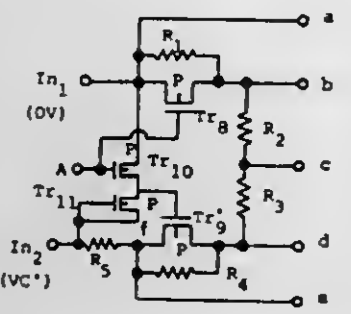
1. A power supply circuit for supplying a liquid crystal display energizing circuit with desired potentials for the purposes of energizing a liquid crystal display in accordance with combinations between first, second, third and reference potentials, comprising:

a first input terminal for supplying the first potential, connected to a constant voltage source;
a second input terminal connected to the reference potential;
first, second, third, fourth and fifth output terminals con-

nected for supplying the liquid crystal display energizing circuit with desired potentials;

impedance means connected between the first input terminal and the second input terminal for deriving the second potential and the third potential therefrom;

means for always supplying the first output terminal and the fifth output terminal with the first potential and the reference potential, respectively; and



switching means for controlling whether the second, third and fourth output terminals are respectively supplied with the first, second and third potentials or with the second, third and reference potentials; said switching means comprising field effect mode transistors of the same channel conductivity type.

4,099,074

TOUCH SENSITIVE ELECTRONIC SWITCHING CIRCUITRY FOR ELECTRONIC WRISTWATCHES

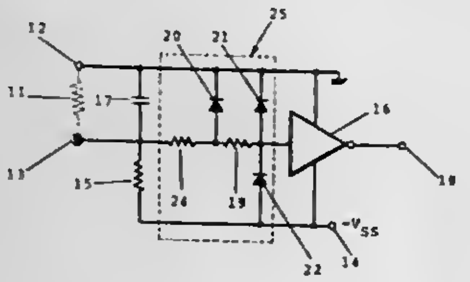
Hidetoshi Maeda, and Toshihiro Ohba, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 5, 1976, Ser. No. 664,283

Claims priority, application Japan, Mar. 6, 1975, 50-31015[U]

Int. Cl.^{2} H03K *3/353;* H02H *9/04;* G04B *19/00*

U.S. Cl. 307—308 **11 Claims**



1. A touch sensitive electronic switching circuit for electronic wristwatches including a C-MOS inverter having a gate electrode, a pair of source electrodes, and a drain electrode, first and second input terminals for said C-MOS inverter across which an operator's body completes an electrical circuit to initiate switching of said D-MOS inverter from one state to another, a bias voltage source coupled to at least one of said source electrodes and to one of said first and second input terminals through a first resistor means, the other of said first and second input terminals being directly coupled to the other of said source electrodes, a gate protective circuit coupled between said gate electrode and the respective source electrodes, wherein the improvement comprises:

second resistor means in the gate circuit of said C-MOS inverter coupled between said first resistor means and said gate protective circuit for preventing damage to said gate protective circuit from an erroneous application of high voltage to said input terminals.

4,099,075

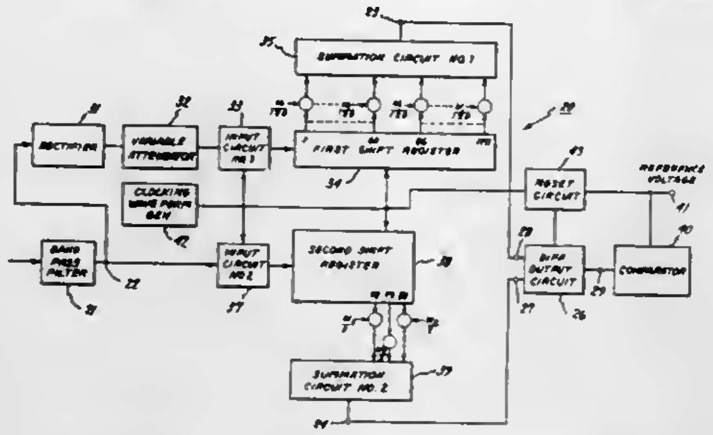
SIGNAL DETECTION APPARATUS USING AN ADAPTIVE THRESHOLD

Howard S. Goldberg, Schenectady; William E. Engeler, and Richard D. Baertsch, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,294

Int. Cl.^{2} H03K *5/20*

U.S. Cl. 307—352 **8 Claims**



1. Signal detection apparatus with adaptive threshold for sensing large excursions of a time varying signal from its average value comprising,

a first serial charge transfer shift register including a plurality of consecutive stages, said consecutive stages arranged into first, second and third consecutive groups of stages, each of said stages of said first shift register including a respective first storage region,

a second serial charge transfer shift register including a plurality of consecutive stages, said consecutive stages arranged into first and second consecutive groups of stages, said second group having at least one stage, each of said stages of said second shift register including a respective second storage region,

first sampling means for developing a first plurality of sequential first quantities of charge each related by a first constant of proportionality to a respective value of a sequential series of sampled values of a time varying signal,

first introducing means for introducing each of said first quantities of charge into a respective first storage region of said first shift register, said first quantities of charge, stored in said third group of stages corresponding to values of said signal occurring during a first interval of time and said first quantities of charge stored in said first group of stages corresponding to values of said signal occurring during a third interval of time subsequent to said first interval,

second sampling means for developing a second plurality of sequential second quantities of charge each related by a second constant of proportionality to a respective value of said sequential series of sampled values of said time varying signal,

second introducing means for introducing each of said second quantities of charge into a respective second storage region of said second shift register,

the number of stages of said first group of stages of said second shift register being set in relation to the number of stages of said first group of stages of said first shift register so that the quantities of charge stored in said second group of storage regions of said second shift register correspond to sampled values of said signal occurring during a second time interval of said signal occurring between said first and third time intervals of said signal,

first sensing means for summing the total charge stored in the first storage regions of said first and third groups of stages of said first shift register and developing a first output proportional thereto, said first output being proportional to the sum of said sequential values of said signal included in said first and third intervals thereof,

second sensing means for summing the total charge stored in the second storage regions of said second group of stages of said second shift register and developing a second output signal proportional thereto, said second output being proportional to the sum of said sequential values of said signal included in said second interval thereof,

means for deriving a resultant signal representing the difference of said first and second output signals,

means for deriving a threshold signal responsive to the change in polarity of said resultant signal.

4,099,076

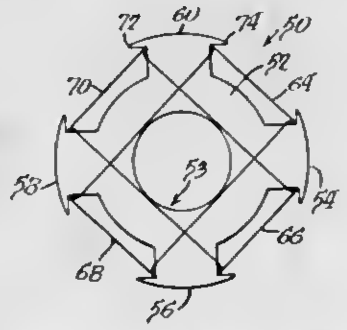
DAMPED ROTOR FOR A MULTI-CHANNEL GENERATING SYSTEM

David J. Hucker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 18, 1977, Ser. No. 798,074

Int. Cl.^{2} H02K *3/20*

U.S. Cl. 310—183 **8 Claims**



1. A rotor for an alternator in a multi-channel generating system comprising:

a plurality of laminated sections, each section having a center and N outwardly extending poles therefrom stacked to form a rotor;

field windings wound around the N poles; and

damper turns electrically insulated from the field windings wound around each pair of adjacent poles of opposite polarity for providing a short circuit current path linking the pair of adjacent poles of opposite polarity.

4,099,077

ROTOR FOR CORELESS MOTOR

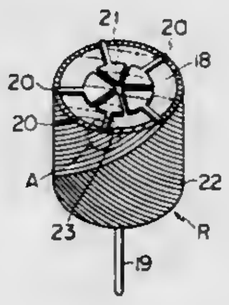
Noboteru Maekawa, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Japan

Filed Mar. 8, 1976, Ser. No. 664,759

Claims priority, application Japan, Mar. 15, 1975, 50-35016[U]

Int. Cl.^{2} H02K *13/04*

U.S. Cl. 310—237 **3 Claims**



1. In a miniature coreless motor the combination comprising a stator including a yoke member of magnetic material formed in cylindrical cup shape open at one axial end and a central magnetic member of cylindrical shape having a central bore and secured inside said yoke coaxially therewith so as to define an annular magnetic gap between the members, at least one of the members being permanently magnetized to provide poles having radial lines of flux through the gap, a rotor comprising a radially thin cylindrical coil formed of progressive uniform and smoothly continuous convolutions of insulated wire, the coil being disposed coaxially in the annular gap and presenting a narrow circular axially-facing end edge, the convolutions being sharply bent over at the end edge to form a continuous circular row of closely adjacent turning points, a disc of insulating material secured within the axially-facing end edge, a rotor shaft axially mounted in the disc for supporting the same, said shaft being extended through, and journaled in, the central bore for free rotation therein, a plurality of radially-extending conductive commutator segments supported on the insulating disc and having equal angular spacing, a pair of brushes secured to the yoke for wiping engagement by the commutator segments to form an armature circuit, each commutator segment terminating at its outer end in a narrow radial conductor which overlies the axially-facing end edge of the coil, the insulation being removed at respective ones of the convolution turning points to expose the turning points at locations aligned with the narrow radial conductors, the narrow radial conductors having a metal-to-metal bond with the respective exposed turning points.

4,099,078

QUARTZ CRYSTAL TUNING FORK WITH THREE ELECTRODES ON EACH MAJOR TINE FACE

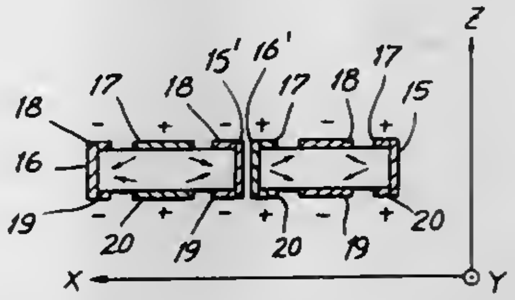
Shin Shibata, and Kikuo Oguchi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 2, 1976, Ser. No. 737,929

Claims priority, application Japan, Aug. 18, 1976, 51-98435

Int. Cl.^{2} H01L *41/04*

U.S. Cl. 310—361 **8 Claims**



1. A quartz crystal vibrator comprising a quartz crystal plate defining a tuning fork having two vibratory tines including first and second opposed substantially planar surfaces, both said surfaces of each tine having three electrodes disposed thereon, two of said electrodes being disposed on at least the lengthwise peripheral sides of said respective surfaces of said tines, said third electrodes being disposed intermediate and not in contact with said two peripherally disposed electrodes, each said intermediate electrode being short circuited to the peripheral electrode on the other tine, and fourth electrodes disposed on at least one lengthwise side edge portion of both of said respective tines, said fourth electrode electrically coupling said peripherally disposed electrodes on said opposed surfaces of said tine together.

4,099,079

SECONDARY-EMISSIVE LAYERS

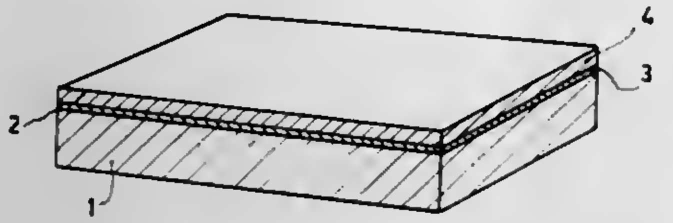
Alan George Knapp, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,929

Claims priority, application United Kingdom, Oct. 30, 1975, 54006/75

Int. Cl.² H01J ***43/00***

U.S. Cl. 313—103 CM **10 Claims**



1. An electrode having a secondary-emissive layer, said layer consisting essentially of a cermet comprising a readily-evaporable metal and an alkali aluminum fluoride.

4,099,080

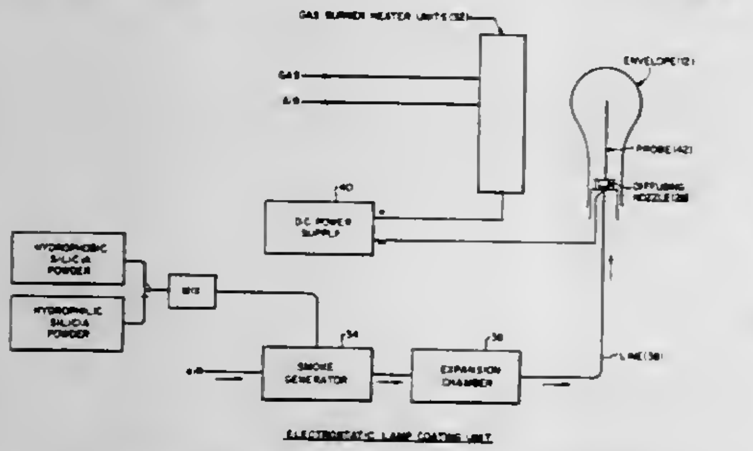
INCANDESCENT LAMP WITH IMPROVED COATING AND METHOD

Chester W. Dawson, Basking Ridge; Robert B. Parsons, Livingston, both of N.J., and Douglas M. Mattox, O'Hara Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1977, Ser. No. 783,256

Int. Cl.² H01K ***1/32;*** **B05D** ***3/06***

U.S. Cl. 313—116 **12 Claims**



1. An incandescent lamp having a light-transmitting envelope and carrying on the internal surface of said envelope a thin light-diffusing coating substantially comprising a mixture of very finely divided silica powders, said silica powders being a mixture of of from about 40% to about 99.5% by weight hydrophilic silica having less than 4% moisture loss on ignition and the balance hydrophobic silica.

9. The method of electrostatically coating the inner surface of an incandescent lamp envelope with a thin layer substantially comprising very low-moisture content, very finely-divided silica to provide a coating which is very adherent and is substantially free from agglomerations of said silica, which method comprises:

a. forming a composition comprising a finely divided mixture of from about 40% to about 99.5% by weight hydrophilic and the balance hydrophobic silica powders, and maintaining said mixture free from additional moisture until ready for coating;

b. heating said envelope to be coated to render same electrically conductive; and

c. introducing through a diffusing nozzle and into the interior of said envelope to be coated a smoke of said mixed hydrophobic silica and low-moisture content hydrophobic silica and applying an intense electric field between a location interiorly of said envelope to be coated and the conductive surface thereof to cause the silica of said smoke to deposit as a thin layer onto the interior surface of said lamp envelope.

4,099,081

ELECTRIC LAMPS AND THEIR PRODUCTION

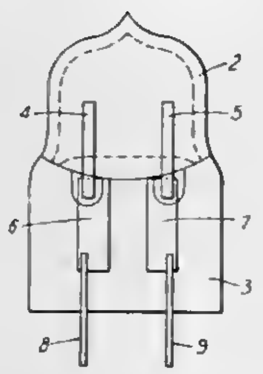
Thomas Somner Ainsworth, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Feb. 24, 1977, Ser. No. 771,603

Claims priority, application United Kingdom, Feb. 25, 1976, 7476/76

Int. Cl.² H01J ***61/26***

U.S. Cl. 313—174 **6 Claims**



1. An electrical discharge lamp comprising a lamp envelope, electrodes and leads therefor and a vapour fill including metal halide and a quantity of phosphorus in the form of a metal phosphide sufficient to effectively getter water vapour inside the envelope but insufficient to affect the luminous efficacy of light from said lamp.

4,099,082

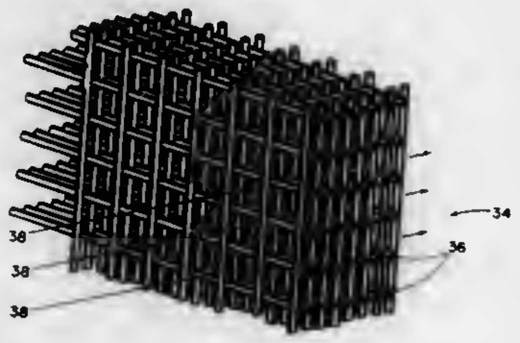
STACKED LATTICE SPACER SUPPORT FOR LUMINESCENT DISPLAY PANELS

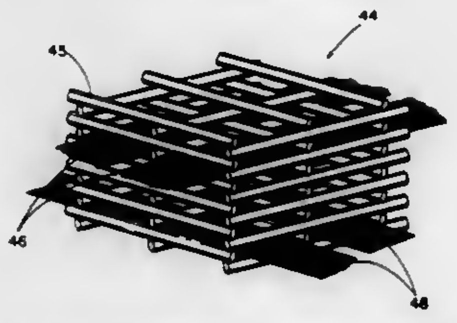
Gerald J. Chodil, Boulder, Colo., and Alan Sobel, Evanston, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 6, 1976, Ser. No. 730,114

Int. Cl.² H01J ***61/10, 61/30***

U.S. Cl. 313—217 **14 Claims**





1. In a luminescent display panel or the like, an extended-area, cellular spacer-support comprising a stack of mutually registered open lattices of insulative filaments adhered together to form a latticework having an array of narrow transverse openings therethrough which serve in the panel as radiation or particle passageways.

4,099,083

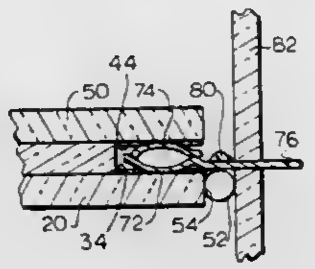
DISPLAY PANEL WITH INTEGRAL RIGID LEADS

Edward G. Barth, Union, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 5, 1977, Ser. No. 793,957

Int. Cl.² H01J ***61/06***

U.S. Cl. 313—217 **10 Claims**



1. A display panel comprising
- a gas-filled envelope including a base plate and face plate hermetically sealed together by a seal to form said envelope, with portions of said base plate and face plate extending beyond said seal to define one edge of said panel,
- a plurality of electrodes within said envelope and conductive runs extending from said electrodes through said seal to the exterior of said envelope where they terminate in contact pads, said contact pads being disposed outside said envelope on said portions of said base plate and face plate,
- an auxiliary member secured to the edge of one of said plates and extending along said edge of said panel to provide a support surface, said support surface being of insulating material,
- a flexible terminal in electrical contact with each contact pad and seated on said auxiliary member as a support surface, and
- an insulating cement securing said terminals to said support surface to form a rigid assembly thereof.

4,099,084

IMPULSE DISCHARGE LAMP WITH DISC SHAPED ELECTRODES

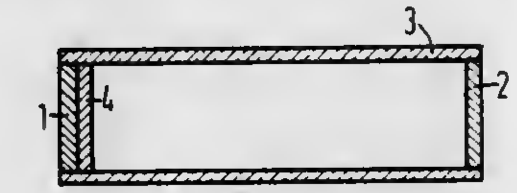
Ernst Ludwig Hoene, Singapore, Singapore, assignor to Helmann GmbH, Germany

Filed Dec. 27, 1976, Ser. No. 754,368

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602309

Int. Cl.² H01J ***61/06, 61/30, 61/36***

U.S. Cl. 313—217 **4 Claims**



1. An impulse discharge lamp comprising a hollow gas-filled cylindrical discharge receptacle of glass or quartz, preferably containing an inert gas, with each end of the receptacle provided with an electrode, directly secured in vacuum-tight relationship thereto, said electrodes having a disc-like configuration and an external diameter, which defines the effective areas of the respective electrodes, and which external diameter is slightly less than the internal diameter of the discharge receptacle, said electrodes being disposed within the receptacle at the outer ends thereof with the outer faces of the electrodes substantially flush with the respective adjacent end edges of the discharge receptacle whereby such effective electrode areas correspond substantially to the inner diameter of the receptacle, and the receptacle chamber, during operation, is filled from end to end with luminous plasma the internal surface of the receptacle at each end thereof being fused in vacuum-tight relation to the external edge surface of the associated electrode.

4,099,085

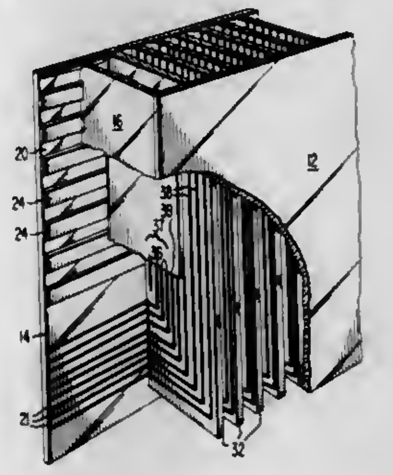
PARALLEL VANE STRUCTURE FOR A FLAT DISPLAY DEVICE

John Guiry Endriz, Plainsboro; Jan Aleksander Rajchman, and John A. van Raalte, both of Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,122

Int. Cl.² H01J ***29/52, 29/50, 29/46***

U.S. Cl. 313—400 **7 Claims**



1. An image display device comprising:
- an evacuated envelope including a transparent front panel and a substantially parallel back panel spaced from the front panel, the front panel having a cathodoluminescent screen thereon;
- a plurality of substantially parallel cathode stripes on the back panel; and
- a plurality of spaced substantially parallel vanes extending orthogonally between said panels, at least some of said vanes contacting both panels thereby providing intrasupport for said device, the vanes being substantially orthogonal to the cathode stripes so as to extend across a plurality of the cathode stripes;
- each of the vanes having stripe-shaped electron multiplier dynodes and electrodes for controlling the operation of the device thereon, said dynodes and electrodes being parallel to the back plate and extending orthogonally to the cathode stripes.

4,099,086

APERTURE MASK UNIT FOR COLOR TELEVISION PICTURE TUBE

Dieter Röder, and Heinz Tust, both of Neu-Ulm, Fed Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 5, 1976, Ser. No. 739,292

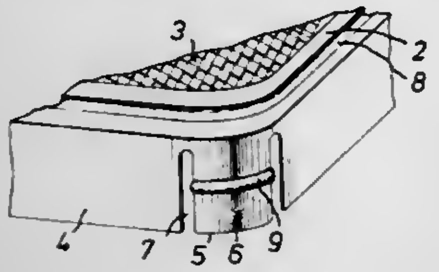
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 2549732

Int. Cl.² H01J ***29/07, 29/02***

U.S. Cl. 313—407 **10 Claims**

1. In a rectangular aperture mask structure for a color television picture tube composed of a thin metal sheet presenting a mask region of generally rectangular form and a peripheral flange surrounding the mask region and extending at an angle thereto, and a metal frame enclosed by the flange in a telescoping manner and fastened thereto by a plurality of spot welds distributed around the periphery of the flange, the flange being provided, at each corner of the structure, with two spaced

cutouts extending from the edge of the flange remote from the mask region and defining a tongue which is curved, and thus stiffened, in the direction of the periphery of the flange, the length of the cutouts being equal to at least one-half the height of the flange, and each tongue being fastened to the frame by at least one spot weld, the improvement wherein said mask region includes a central aperture region and an imperforate border region extending around the periphery of said aperture region and disposed between said aperture region and said flange and said border region is provided with a continuous, peripherally extending recess.



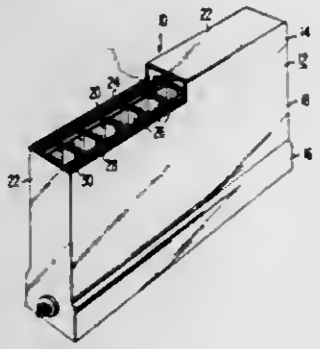
4,099,087
GUIDED BEAM FLAT DISPLAY DEVICE WITH FOCUSING GUIDE ASSEMBLY MOUNTING MEANS

Kenneth Donald Peters, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,218

Int. Cl.^{2} H01J *29/72, 29/08, 31/00*

U.S. Cl. 313—422 **11 Claims**



1. A display device comprising

an evacuated envelope including spaced, substantially parallel front and back walls, spaced, parallel support walls between and substantially perpendicular to said front and back walls forming a plurality of parallel channels extending across the front and back walls, and spacer means between each of said support walls and the back wall, said spacer means including spaced ledges extending into an adjacent channel but spaced from the back wall,

an assembly in each of said channels which assembly includes a pair of substantially rectangular plates secured together in spaced parallel relation, the assembly extending along but spaced from the back wall, and the assembly including spaced spring tabs disposed between the spacer means ledges and the back wall and holding the assembly in place with respect to the back wall and spacer means ledges.

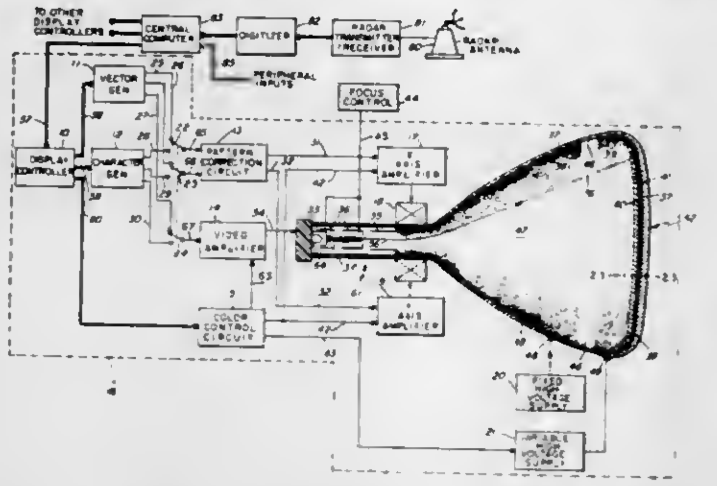
4,099,088
DISPLAY SYSTEM WITH RAPID COLOR SWITCHING

Harold M. Hart, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation-in-part of Ser. No. 721,252, Sep. 8, 1976, abandoned, which is a continuation of Ser. No. 601,852, Aug. 4, 1975, abandoned, which is a continuation of Ser. No. 485,415, Jul. 3, 1974, abandoned, which is a division of Ser. No. 319,968, Dec. 29, 1972, Pat. No. 3,840,773. This application Jun. 27, 1977, Ser. No. 809,967

Int. Cl.^{2} H01J *29/46, 29/26, 31/20*

U.S. Cl. 313—450 **6 Claims**



1. A cathode-ray tube comprising in combination:

an envelope, said envelope having a neck portion, an accelerating portion, said screen portion comprising beam penetration phosphor layers and a screen portion;

an electron gun for producing a beam of electrons, said electron gun being located in said neck portion and said beam of electrons being directed toward said screen portion;

a phosphor screen layer, said phosphor screen layer being disposed upon said screen portion of said envelope, the color of light emitted from said screen being dependent upon the velocity of electrons striking said screen layer;

a conductive layer, said conductive layer being contiguous to said phosphor screen layer;

a first accelerating electrode, said first accelerating electrode being disposed upon a first section of said accelerating portion of said envelope adjacent said neck portion and outside the region traversed by said beam; and

a second accelerating electrode, said second accelerating electrode being disposed upon a second section of said accelerating portion of said envelope adjacent said screen portion and coupled to said conductive layer, there being a gap between said first and second accelerating electrodes upon said accelerating portion of said envelope, the color of light emitted from said phosphor screen layer being determined by a voltage applied to said second accelerating electrode, the width of said gap being less than the distance from said electron beam at the nearest approach of said electron beam to said gap and being sufficiently great that substantially no pattern distortion is effected upon changing the magnitude of a voltage applied to said second accelerating electrode.

4,099,089
FLUORESCENT LAMP UTILIZING TERBIUM-ACTIVATED RARE EARTH OXYHALIDE PHOSPHOR MATERIAL

Jacob G. Rabatin, Chardon, Ohio, assignor to General Electric Company, Schenectady, N.Y.

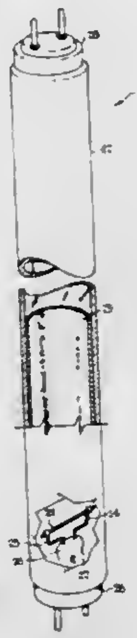
Filed Dec. 13, 1976, Ser. No. 749,925

Int. Cl.^{2} H01J *61/44*

U.S. Cl. 313—487 **6 Claims**

1. In a high-loaded low-pressure type fluorescent lamp construction having an operating temperature range of approximately 100° C or greater which comprises a light transmitting envelope containing an ionizing energy source, an ionizable gas atmosphere generating 2537 Angstrom radiation and a phosphor coating deposited on the inner surface of said light transmitting envelope, the improvement whereby said phosphor coating comprises a phosphor composition having the general formula:

$LnOx{:}Tb^{3+}$



wherein

Ln is one or more of La and Gd,

x is one or more of Cl, Br and I, and

Tb is present as the sole activator element in activator concentrations from about .001 mole to about 0.3 mole per mole of phosphor, said phosphor exhibiting greater lumen efficiency at chromaticity values for the x coordinate in the range from about 0.305 to about 0.329 and for the y coordinate with the range from about 0.444 to about 0.500.

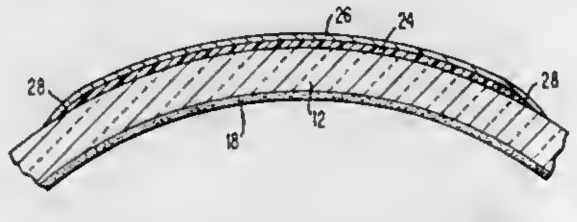
4,099,090
FLUORESCENT LAMP HAVING A LONGITUDINAL STRIPE OF PHOSPHOR ON OUTER ENVELOPE SURFACE WITH REFLECTOR LAYER THEREOVER

Richard Corth, Nutley, and Joseph W. Sausville, Glen Rock, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1977, Ser. No. 806,397

Int. Cl.^{2} H01J *61/35, 61/48*

U.S. Cl. 313—487 **13 Claims**



1. In combination with a low-pressure positive-column discharge lamp comprising a sealed elongated radiation-transmitting envelope having electrodes operatively positioned proximate the ends thereof and enclosing a discharge-sustaining filling, said electrodes adapted to have an energizing potential applied thereto to sustain a radiation-generating discharge therebetween, the improvement which comprises:

(a) finely divided preselected inorganic phosphor means carried on the interior surface of said envelope, said inorganic phosphor means being responsive to the radiations generated by said discharge to generate radiations which display a less-than-desired percentage of relatively long wavelength visible radiations;

(b) preselected additional phosphor means, the performance of which is impaired when such additional phosphor means is exposed to the environment enclosed by said envelope of said discharge lamp as operated, said additional phosphor means carried on the outer surface of said envelope as a stripe longitudinally disposed along the elongated dimension of said envelope and occupying only a predetermined proportion of the outer surface of said elongated envelope, said additional phosphor means operable to convert at least some of the radiations generated by said interiorly positioned inorganic phosphor means into visible radiations of relatively longer predetermined wavelengths, and said additional phosphor means stripe present in predetermined amount to provide a predetermined performance for conversion of said shorter wavelength radiations generated by said interiorly positioned inorganic phosphor means into said longer wavelength visible radiations; and

(c) reflector means overlaying said additional phosphor stripe, and said reflector means operable to reflect at least a substantial portion of the total radiations impinging thereon back through said lamp envelope, whereby additional desired longer wavelength visible radiations are added to the total light output from said lamp.

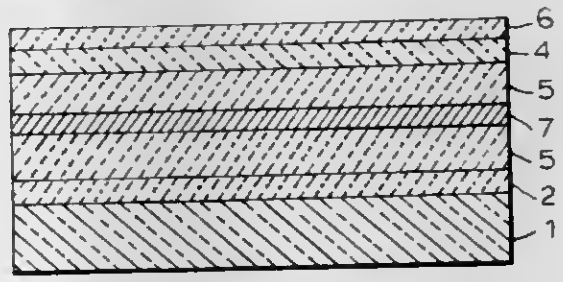
4,099,091
ELECTROLUMINESCENT PANEL INCLUDING AN ELECTRICALLY CONDUCTIVE LAYER BETWEEN TWO ELECTROLUMINESCENT LAYERS

Hiroshi Yamazoe, Katano; Hiroshi Kawarada, Hirakata; Hisanao Sato, Ibaragi, and Nobumasa Ohshima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 28, 1976, Ser. No. 709,529

Int. Cl.^{2} H05B *33/14, 33/22*

U.S. Cl. 313—509 **7 Claims**



1. An electroluminescent panel comprising a first electrode which is transparent, a second electrode and a multi-layer which is in intimate contact with and is sandwiched between said electrodes, said electrodes being adapted to receive a voltage therebetween, said multi-layer comprising in the following order:

(a) an insulating layer which is in contact with one of said electrodes,

(b) an A.C. electroluminescent layer which is in contact with said insulating layer,

(c) an intermediate layer formed of a conductive material and

(d) a further A.C. electroluminescent layer,

said intermediate layer being in intimate contact at both major surfaces thereof with said electroluminescent layers, whereby when said electroluminescent layer is supplied with a voltage between said first and second electrodes and said electroluminescent layer emits lights from said electroluminescent panel through said first electrode.

4,099,092

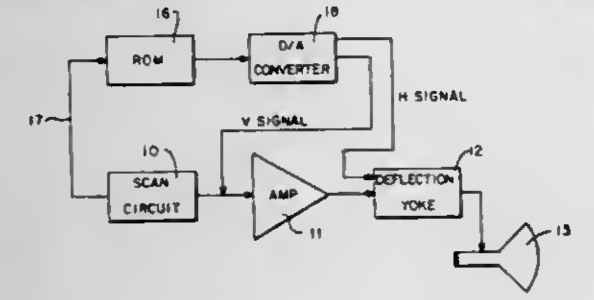
TELEVISION DISPLAY ALIGNMENT SYSTEM AND METHOD

Stephen D. Bristow, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Aug. 18, 1976, Ser. No. 715,290

Int. Cl.^{2} H01J *31/26*

U.S. Cl. 315—10 **8 Claims**



1. In a system for aligning a television display having a modulated beam scanning a viewing screen repeatedly along a predetermined path in accordance with a cyclical deflection signal to provide a visual output display on said screen: memory means for storing at individually addressable locations thereof a plurality of correction signals which when combined with the deflection signal serve to cause the beam to be deflected to predetermined points on the path, means for applying address signals to the memory means in synchronization with the deflection signal to address successive ones of the stored correction signals as the beam scans the screen, and means for combining the successively addressed correction signals with the deflection signal to effect deflection of the beam to the predetermined points.

4,099,093

ELECTRONIC TUBE FOR GENERATING MILLIMETRIC WAVE PULSES

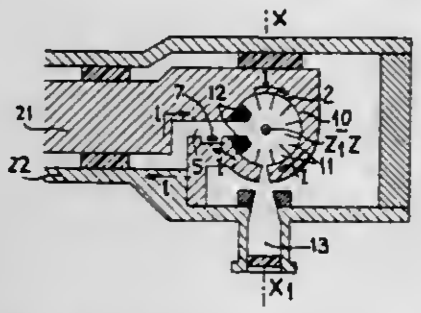
Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 8, 1976, Ser. No. 693,861

Claims priority, application France, Jun. 13, 1975, 75 18545

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—39.3 **5 Claims**



1. An electronic tube for generating millimetric wave pulses, comprising:

an evacuated enclosure, part of which is substantially cylindrical, said cylindrical part having an axis, and being slotted over the whole of its length, said enclosure furthermore comprising a first and a second plates, arranged at each side of said slot and opposite one another;

electron emissive means located outside said cylinder;

means for guiding said electrons towards said cylinder and for rotating said electrons in said cylinder, including means for supplying a current flowing transversely through said cylinder, successively through said first plate, said cylinder and said second plate, thus creating an electric field as well as a magnetic field, said fields guiding said electrons towards said cylinder and imparting to them a cycloidal motion about said cylinder axis;

resonant circuit means in which a millimetric wave is capable of oscillating, arranged and designed so that the electrons supply energy to the millimetric wave whilst rotating in said cylinder; and

means for picking off the millimetric wave energy.

4,099,094

ELECTRONIC TUBE OF MAGNETRON TYPE OPERATING AS A OSCILLATOR OR AN AMPLIFIER

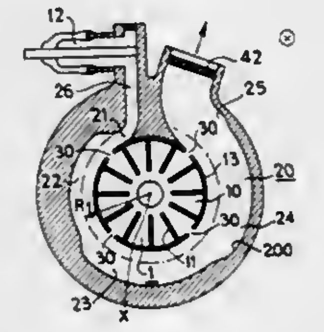
Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 17, 1976, Ser. No. 751,888

Claims priority, application France, Dec. 23, 1975, 75 39527

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—39.3 **8 Claims**



1. An electronic tube comprising:

a cathode;

an anode of the magnetron type including cavities and defining with said cathode a cathode anode space;

means for generating an electron beam and imparting to the electrons a rotary motion in said space;

a waveguide having two ends one of said ends being an output, said waveguide surrounding said anode and being coupled at coupling points to certain of the cavities of said magnetron and in which when operating an electromagnetic wave propagates in the direction of rotation of said electrons, said wave guide being formed by successive sections each extending from one of the coupling points to the next and each having a constant characteristic impedance, said wave guide is a rectangular section waveguide having a major side and a shorter side, said waveguide being attached by said major side to the external wall of said anode, its shorter side having a dimension which decreases, working from one of said sections to the next, from said output to the other of said two ends, said coupling being effected through mutually identical slots provided on said anode, said waveguide offering to said wave a characteristic impedance varying regularly from one section to the other.

4,099,095

OPERATING CIRCUIT FOR GASEOUS DISCHARGE AND INCANDESCENT LAMPS

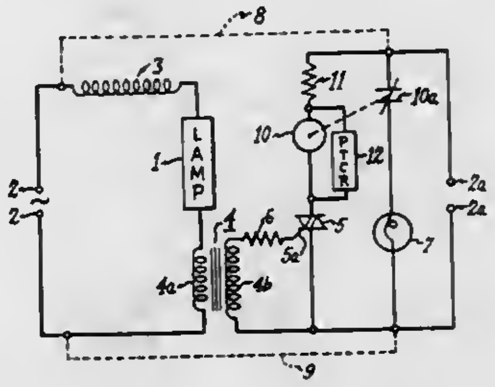
Charlie B. Turner, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,226

Int. Cl.^{2} H05B *41/46*

U.S. Cl. 315—92 **11 Claims**

1. Lighting system comprising, in combination, a source of alternating current, a gaseous discharge lamp connected to said source, ballast means connected to said source including impedance means connected in series with said gaseous discharge lamp, a current sensing transformer having a primary winding in series with said gaseous discharge lamp and having a secondary winding, an incandescent lamp, means for connecting said incandescent lamp to a current source, and actuating means connected to the secondary winding of said current sensing transformer and to said incandescent lamp for rendering said incandescent lamp inoperative during operation of said gaseous discharge lamp and for automatically rendering said incandescent lamp operative when said gaseous discharge lamp ceases operation, said actuating means comprising controlled switch means in parallel with said incandescent lamp and having a control electrode connected to said secondary winding for actuation thereby for controlling the operation of said incandescent lamp.



4,099,096

INFORMATION DISPLAY AND METHOD OF OPERATING WITH STORAGE

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 83,200, Oct. 22, 1970, abandoned, which is a continuation of Ser. No. 780,099, Nov. 29, 1968, abandoned. This application Dec. 22, 1975, Ser. No. 642,961

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.^{2} H05B *41/30, 41/14*

U.S. Cl. 315—169 TV **34 Claims**

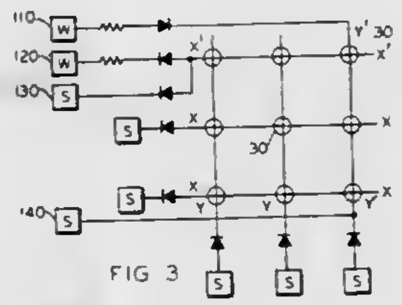
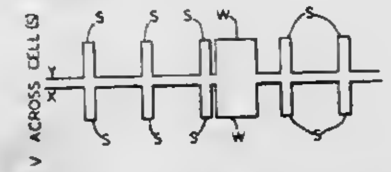


FIG 3



1. A method of initiating and sustaining a visible glow discharge in a plurality of selected gas-filled cells, comprising the steps of

forming a panel having a matrix of gas-filled cells with at least two electrodes in physical contact with the gas within each said cell, each cell having a characteristic firing voltage, for voltages applied between said two electrodes,

applying a write voltage between said two electrodes in selected ones of said cells to cause said selected cells to produce glow discharge having excited particles and charged gaseous particles therein,

discontinuing the application of said write voltage, and

applying successive spaced-apart sustaining pulses between said two electrodes in all of said cells to sustain said glow discharge in the selected cells without producing a glow discharge in any of the non-selected cells, the first such sustaining pulse being applied while said excited particles are still present, and each successive sustaining pulse being applied while excited particles from the preceding pulse are still present,

said sustaining pulses being insufficient in amplitude, duration, and repetition rate to initiate a glow discharge in the non-selected cells which do not contain excited particles, from the write voltage, but sufficient to sustain said glow discharge in the selected cells which contain excited particles.

4,099,097

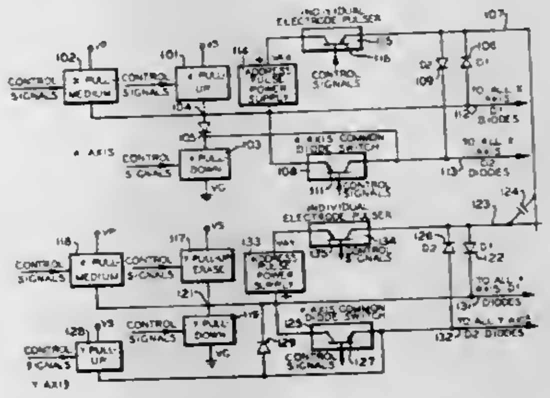
DRIVING AND ADDRESSING CIRCUITRY FOR GAS DISCHARGE DISPLAY/MEMORY PANELS

Jerry D. Schermerhorn, Swanton, Ohio, and Hiram G. Slottow, Urbana, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 2, 1976, Ser. No. 702,114

Int. Cl.^{2} H05B *37/00*

U.S. Cl. 315—169 TV **6 Claims**



1. In an operating system for a multicelled gas discharge display/memory device, the device including a pair of opposed spaced electrode arrays with proximate electrode portions of at least one electrode in each array defining the cells; an ionizable gas volume between the spaced electrode portions of each cell; a dielectric charge storage member in contact with the gas insulating at least one electrode portion of each cell from the gas; a plurality of electrode pulser means for generating address voltage pulses to manipulate the discharge state of individual cells between an "on state" and an "off state," each one of the plurality of electrode pulser means being connected to a respective one of the electrodes of the electrode arrays; a sustainer voltage source for cyclically imposing a pulsating voltage having a period and a predetermined maximum potential across each of the cells, the sustainer voltage source including a pull-up circuit which is connected between a source for the maximum potential sustainer voltage and a respective electrode array for applying the maximum potential sustainer voltage to the electrodes; a diode isolation circuit including a plurality of first diodes, each of the first diodes connected between the sustainer voltage source and a respective one of the electrodes to apply a sustainer voltage of one polarity as referenced from the cell neutral voltage to the cells and provide a path for the displacement currents generated thereby and a plurality of second diodes, each of the second diodes connected between the sustainer voltage source and a respective one of the electrodes and poled in a direction opposite the first diodes to apply a sustainer voltage of the other polarity as referenced from the cell neutral voltage to the cells and provide a path for the displacement currents generated thereby; and a clamping diode connected between the source of the maximum potential sustainer voltage and all of the second diodes connected to one of the electrode arrays, the clamping diode providing a path for the displacement current carried by the second diodes connected to the one electrode array, the improvement comprising:

switching means connected between the source of the maximum potential sustainer voltage and all of the second diodes connected to the one electrode array, said switching means being closed to maintain the displacement current path through the clamping diode during at least a portion of the sustainer voltage cycle and being open to break the displacement current path through the clamping diode when the electrode pulser connected to the electrodes defining at least one of the cells is turned on to change the discharge state of the cell from the "off state" to the "on state."

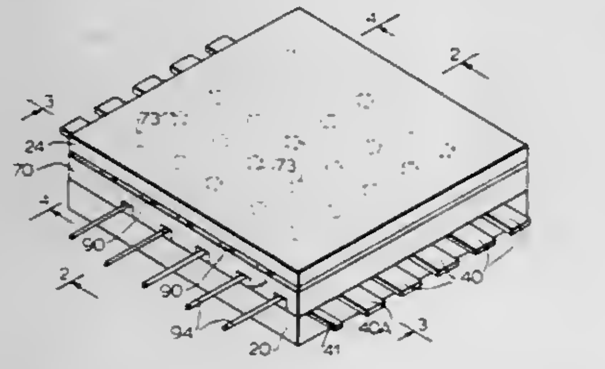
4,099,098
DISPLAY PANEL

Rudolph A. Cola, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 635,918, Nov. 28, 1975, abandoned. This application May 26, 1977, Ser. No. 800,781

Int. Cl.² H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—169 TV **21 Claims**



1. A display panel comprising

a gas-filled envelope including a base plate and a face plate having a viewing window,

a plurality of columns of coplanar operating cathode areas which are electrically connected in each such column, each column of operating areas including display cathode areas and printing cathode areas, said priming cathode areas providing excited particles for said display areas through restricted gas communication paths extending along said columns of cathode areas,

the areas of the cathodes which form the priming and display areas being exposed to the gas within said envelope, and the restricted gas communication paths being formed by additional surface areas on said cathodes which are also exposed to the ionizable gas and which interconnect the surface areas forming the display and scan areas,

each such gas communication path, between a scan and display region, being constricted in its width by a material different from that of the cathode resting on the cathode surface, to constrict, without completely blocking, the width of the cathode surface in the gas communication path, said display areas and priming areas being disposed in rows and columns,

a priming anode overlying each row of priming cathode areas, and

a display anode overlying each row of display cathode areas.

4,099,099
METHOD OF AND SWITCHING DEVICE FOR REDUCING FEEDBACK FROM A CONSUMER PERIODICALLY CONNECTED TO AN A.C. LINE

Hans-Dieter Grüdelbach, Plön, Germany, assignor to Poul Hahn Evers, Pura, Switzerland

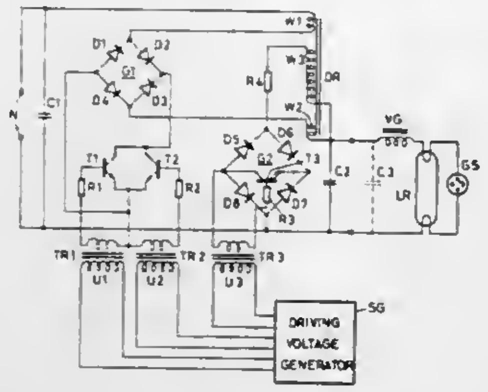
Filed Mar. 1, 1977, Ser. No. 773,280

Claims priority, application Switzerland, Oct. 19, 1976, 13236/76

Int. Cl.² G05F *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—194 **11 Claims**

1. In a method of polarity-independent reduction of feedback from a consuming means periodically connected to an A.C. line which includes disconnecting the consuming means from the line during a predetermined period in each half wave of the A.C. line voltage, the improvement including damping and discharging the consuming means during each half wave of the A.C. line voltage using a power switching means during said predetermined period when the consuming means is disconnected from the A.C. line.



4,099,100
NEON TUBE FLASHING DEVICE

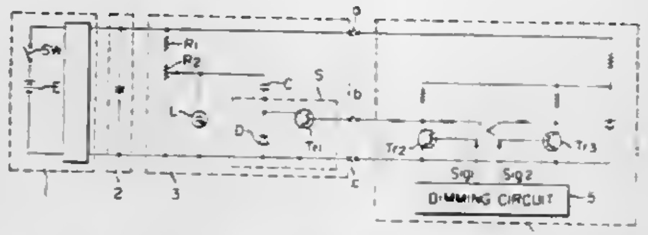
Koichi Takahata, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 6, 1976, Ser. No. 702,453

Claims priority, application Japan, Jul. 11, 1975, 50-96492

Int. Cl.² H05B *41/32*

U.S. Cl. 315—241 P **14 Claims**



8. In a flash device having a flash discharge tube, a main capacitor applying a voltage to the flash discharge tube and a light-emitting element which emits light when the charging voltage of the main capacitor reaches a level for which the flash discharge tube can emit light, the flash device being so designed that when light reflected from a scene reaches a predetermined level the emission of the flash discharge tube is stopped, the improvement comprising:

a flashing capacitor and an electronic switch means connected in series across the light-emitting element; and

a control means for rendering the switch means conductive in response to reflected light from the scene.

4,099,101
CIRCUIT IN A TELEVISION DISPLAY APPARATUS FOR PRODUCING A SAWTOOTH DEFLECTION CURRENT THROUGH A LINE DEFLECTION COIL

Dirk Johan Adriaan Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,070

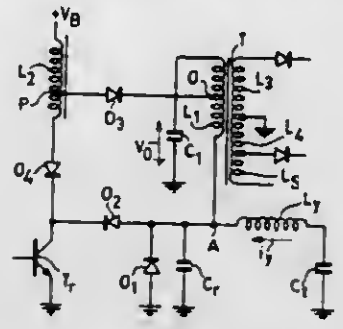
Claims priority, application Netherlands, Nov. 11, 1975, 7513160

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—408 **7 Claims**

1. A circuit for producing a sawtooth deflection current having trace and retrace periods through a line deflection coil from a supply voltage source, said circuit comprising a trace capacitor and a retrace capacitor both adapted to be coupled to said coil to form a resonant network therewith, a first diode means coupled in parallel with said network for conducting the deflection current during a first part of the trace period, means for conducting said deflection current during a second part of the trace period including a first series arrangement including

a second diode and a controllable switch, said first series arrangement being coupled in parallel with the first diode, the conduction time of the switch being adjustable and a second series arrangement including a winding of a first inductive element and a capacitor coupled in parallel with the first diode, said first inductive element adapted to be coupled to the deflection coil, a winding of a second inductive element direct current coupled between the junction of the second diode and the switch and to a terminal of said voltage supply source, switching means coupled to said second diode for blocking any current in the second diode in the retrace period, and a third diode having a first electrode connected to a point of the first inductive element, and a second electrode direct current connected to said terminal of the voltage supply source through said winding of the second inductive element, the winding sense of said winding of said second inductive element and the direction of conductivity of the third diode being such that current can flow therethrough in the retrace period of the deflection current.



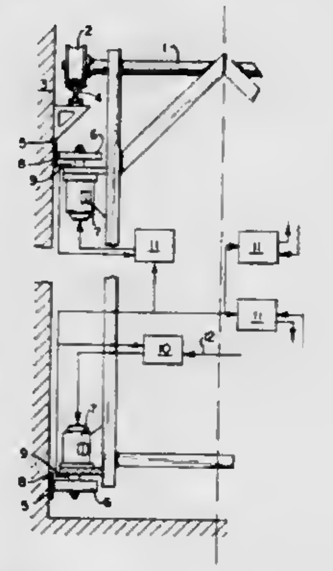
4,099,102
MOVABLE FEEDING APPARATUS FOR HIGH SHELF STORAGE DEVICES

Hans Moll, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 423,983, Dec. 12, 1973, abandoned. This application Aug. 15, 1975, Ser. No. 604,955

Int. Cl.² H02P *5/50*

U.S. Cl. 318—85 **12 Claims**



1. A high-shelf feeding apparatus which is movable on rollers and which has drive elements independent of the weight of the feeding apparatus in at least two superposed planes, where the improvement comprises means associated with each of the drive elements for measuring the distance travelled and regulating means associated with the measuring means for controlling the drive of each drive element by balancing each such measured distance in relation to a rated value common to the regulating means, and wherein electric guide magnet means are associated with said regulating means for keeping substantially constant the distance between the feeding apparatus and shelf.

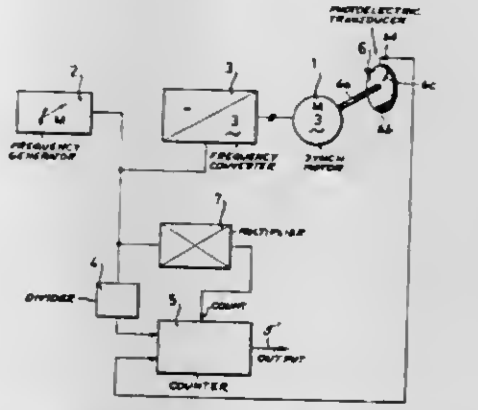
4,099,103
APPARATUS FOR CONTROLLING THE ROTORS OF SYNCHRONOUS MOTORS

Arnold Seeger, Herzogenrath, and Wilfried Schait, Jülich, both of Germany, assignors to Kernforschungsanlage Jülich GmbH, Julich, Germany

Filed Oct. 5, 1976, Ser. No. 729,875

Int. Cl.² H02P *7/36*

U.S. Cl. 318—85 **6 Claims**



1. A system for measuring the angular position of a rotor of a synchronous motor relative to the rotating field thereof, said system comprising:

a frequency generator energizing said motor;

a frequency divider connected to said frequency generator;

a counter having a count-starting input, a count-stopping input and a countable-pulse input, said count-starting input being connected to said divider, said divider having a divider factor equal to the number of poles of the motor;

an optoelectronic device responsive to rotation of the rotor and generating a pulse upon each rotation of the device, said optoelectronic device being connected to the count-stopping input of said counter whereby the interval between starting and stopping of the counter registers pulses therein; and

a frequency multiplier connected to said frequency generator and having its output connected to the countable-pulse input of said counter for registry of pulses from said multiplier during said interval.

4,099,104
BRUSHLESS D-C MOTOR SYSTEM

Rolf Müller, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Mar. 17, 1977, Ser. No. 778,674

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612464

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **13 Claims**

1. Brushless d-c motor system having a rotor including a rotating permanent magnet field structure (43, 143);

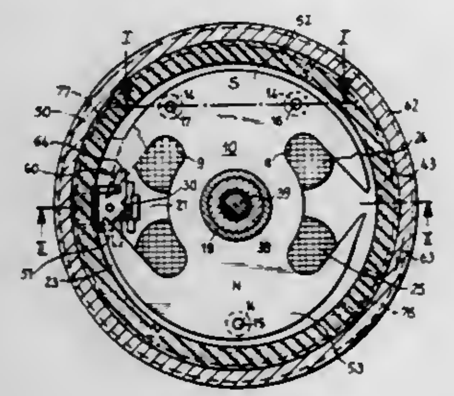
a stator including a stationary stator pole structure (52, 53) having adjacently located poles of opposite polarity;

at least one stator winding (24, 25) on the stator pole structure;

current control means (74, 75) connected in series with said stator winding to control current flow therethrough and hence the magnetic flux derived from the stator poles;

and a galvanomagnetic sensing element (30, 130) located on the stator, positioned to be within the magnetic field of the rotor, and electrically connected to the current control means (74, 75) to control current flow to the stator;

wherein, in accordance with the invention, the galvanomagnetic sensing element (30, 130) is magnetically exposed to the leakage flux from the stator poles and in magnetic coupling relation to said leakage flux such that the flux from the stator reaching the sensing element has a net flux



in a direction which opposes the flux from the rotor reaching the sensing element.

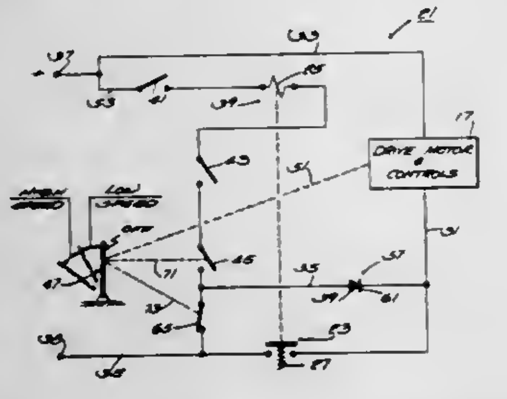
4,099,105
DIRECT CURRENT MOTOR CONTROL WITH PROTECTIVE LATCHING FEATURE

Gerald N. McAuliffe, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 23, 1977, Ser. No. 771,159

Int. Cl.² H02P *3/00*

U.S. Cl. 318—139 **8 Claims**



1. A direct current motor control comprising a direct current motor, a solenoid switch including an actuating coil, means connecting said drive motor and said solenoid switch in series relation to each other, means connected to said motor and adapted to be connected to one terminal of a direct current source, means connected to said solenoid switch and adapted to be connected to the other terminal of the direct current source, a sub-circuit assembly including said solenoid actuating coil and a solenoid coil actuating switch connected in series with said solenoid actuating coil, means connected to said sub-circuit assembly and adapted to be connected to the one terminal of the direct current source, a solenoid latching switch connected to said sub-circuit assembly in series relation thereto and also connected to said means connected to said solenoid switch and adapted for connection to the other terminal of the direct current source, unidirectional blocking means connected to said sub-circuit assembly in series relation thereto and in parallel relation to said solenoid latching switch and also connected to said means connecting said drive motor and said solenoid switch, and means for regulating the rate of energization of said drive motor to control the speed thereof, for opening said solenoid coil actuating switch when said drive motor is de-energized, for closing said solenoid coil actuating switch and said solenoid latching switch in response to regulation of said motor at slow speed, and for opening said solenoid latching switch in response to regulation of said motor at a higher speed.

4,099,106
COMPOSITE PULSE MOTOR FOR A TIMEPIECE

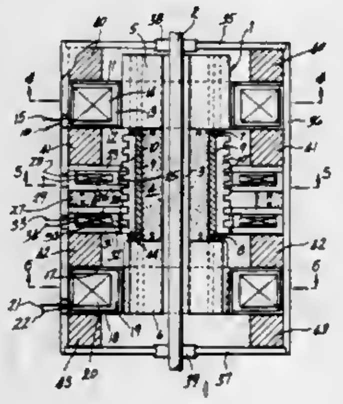
Akira Nikaido, Tachikawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,799

Claims priority, application Japan, Apr. 24, 1975, 50-50138

Int. Cl.² H02K *7/06*

U.S. Cl. 318—115 **3 Claims**



1. A compound pulse motor comprising:
a motor frame;
an armature rotatably and slideably coupled to said motor frame, said armature comprising linear magnetic poles and rotating magnetic poles, said linear magnetic poles comprising a magnetic member substantially tubular shaped having grooves of a predetermined pitch formed in said tubular magnetic member and being disposed substantially in the center of said armiture and said rotating magnetic poles comprising a pair of cylindrical magnetic members, each of said cylindrical magnetic members having a plurality of radially extending teeth, said pair of cylindrical magnetic members being of opposite magnetic polarity, said cylindrical magnetic members being disposed one on each side of said magnetic member of said linear magnetic poles; and
a stator fixed to said motor frame, said stator comprising stationery linear magnetic poles and stationery rotating magnetic poles;
whereby said armature rotates selectively clockwise or counter-clockwise when said stationary rotating magnetic poles are excited and linearally moves right or left when said stationery linear magnetic poles are excited.

4,099,107
APPARATUS FOR SYNCHRONIZING AC-MOTORS

Josef Eder, Leggiuno, Italy, assignor to European Atomic Energy Community (EURATOM), Luxembourg

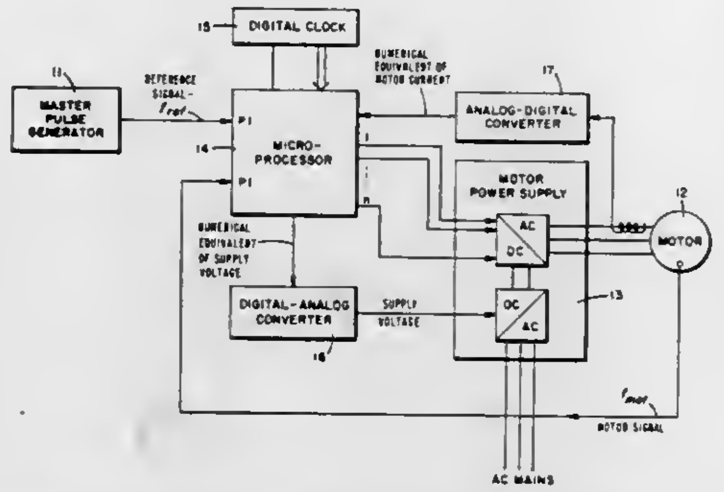
Filed May 17, 1976, Ser. No. 687,306

Claims priority, application United Kingdom, May 16, 1975, 20872/75

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **7 Claims**

1. An apparatus for controlling the frequency and phase of power signals supplied to an AC-motor having a rotating shaft comprising:
means responsive to said motor shaft rotations for providing a first feedback signal train from said motor representative of the angular velocity of said shaft,
means for supplying a reference signal representing a desired frequency and phase for said motor shaft rotation,
digital clock means for supplying time signals,
a microprocessor means for storing time signals from said digital clock means representative of the arrival times of signals in said first feedback signal train, for storing information signals representative of said reference signal, for calculating from said stored arrival time information and reference information signals the relative frequency and phase displacement of said first feedback signal train with respect to said desired frequency and phase as represented by said reference signal, and for providing first control output signals in dependence on said calculated frequency and phase displacement, and



means for controlling the frequency and phase of AC power applied to said motor under control of said first control output signals.

4,099,108
VARIABLE SPEED CONTROL APPARATUS FOR INDUCTION MOTOR

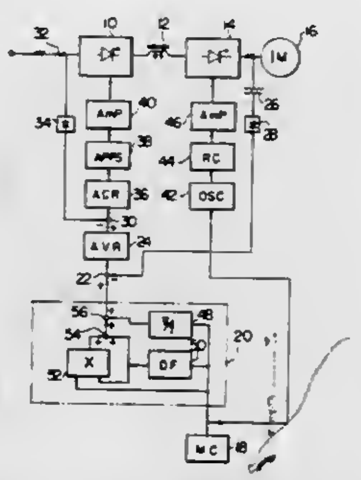
Tadashi Okawa; Yasoo Matsuda, both of Hitachi; Hiroshi Hayashida, Tokaimura, and Takeo Maeda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 20, 1976, Ser. No. 716,205

Claims priority, application Japan, Sep. 5, 1975, 50-107007

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **8 Claims**



1. In a variable-speed control apparatus for an induction motor, comprising variable-voltage variable-frequency power supply means for applying to the induction motor electric power with a substantially fixed ratio between the voltage and the frequency, voltage control means for controlling the output voltage of said power supply means, frequency control means for controlling the output frequency of said power supply means, and command means for applying a speed command signal to said voltage control means and said frequency control means; the improvement comprising voltage correction means for correcting said speed command signal applied from said command means to said voltage control means in accordance with a rate of change in said speed command signal corresponding to a rate of acceleration or deceleration of the speed of the induction motor and the magnitude of said speed command signal.

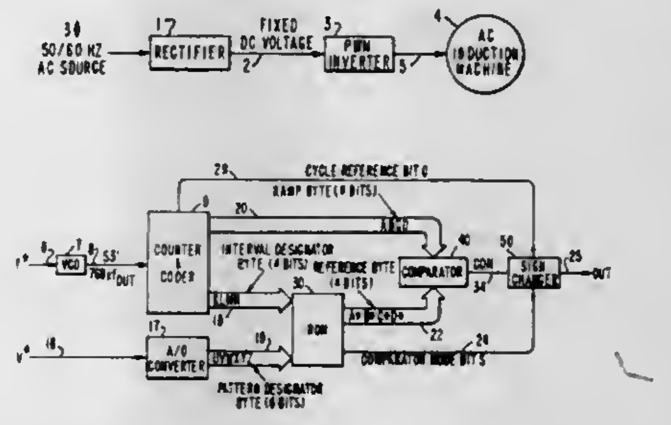
4,099,109
DIGITAL APPARATUS FOR SYNTHESIZING PULSE WIDTH MODULATED WAVEFORMS AND DIGITAL PULSE WIDTH MODULATED CONTROL SYSTEM

Alberto Abbondanti, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 1, 1976, Ser. No. 728,710

Int. Cl.² H02P *5/36, 7/58*

U.S. Cl. 318—227 **17 Claims**



15. In an AC motor drive including at least one AC motor, a DC supply, an inverter connected in circuit between said DC supply and said AC motor, and a pulse-width modulator responsive to a frequency reference signal representing a desired motor frequency and to a voltage reference signal representing desired motor voltage levels for controlling said inverter in accordance with an outputted pulse-width modulated signal to operate said AC motor at a speed determined by said frequency reference signal and under flux conditions determined by said voltage reference signal, the combination of:
Read-Only-Memory (ROM) means having stored therein a plurality of sets of digital representations, each of said sets being associated with respective discrete values of said voltage reference signal and defining corresponding pulse-width modulated (PWM) waves;
means responsive to said voltage reference signal for addressing said ROM means to drive therefrom one of said sets at a time; and
timing means responsive to said frequency reference signal for converting in real time said selected one set to generate a corresponding pulse-width modulated signal to control said inverter;
whereby said motor is controlled as a function of said voltage reference signal.

4,099,110
PROPORTIONAL CONTROL FOR GUIDANCE SYSTEM

Abraham Zeewy, University Heights, and Donald Geringer, Parma, both of Ohio, assignors to The Cecil Equipment Company, Medina, Ohio

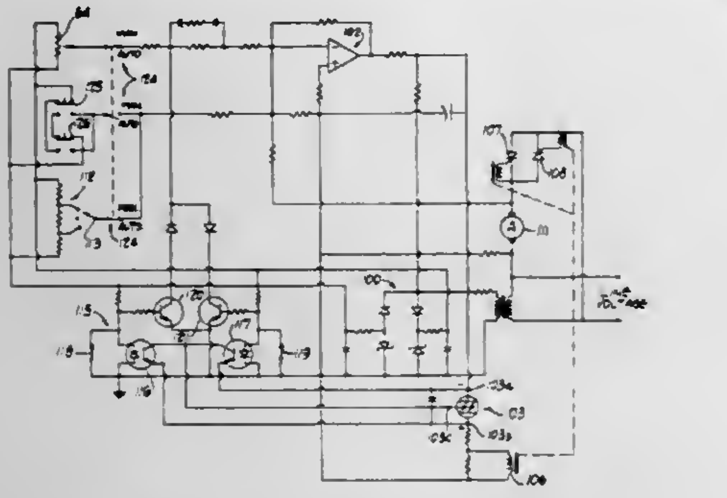
Division of Ser. No. 498,477, Aug. 19, 1974, abandoned, which is a division of Ser. No. 318,493, Dec. 26, 1972, Pat. No. 3,883,956. This application Dec. 1, 1975, Ser. No. 636,560

Int. Cl.² H02P *3/10*

U.S. Cl. 318—266 **3 Claims**

2. In a circuit for controlling the speed and direction of rotation of a positioning motor in response to a control signal by supplying voltage of one or the other polarity to said motor according to the polarity of said control signal, a circuit for braking said motor in response to a limit condition comprising:
means sensing said limit condition,
means responsive to said sensing means for interrupting control signals of one polarity,
means responsive to said interrupting means for such that a voltage of the other polarity is momentarily supplied to said motor to cause dynamic braking thereof, said inter-

rupting means including an optical transistor having a light-emitting diode rendered conductive by said sensing



means to cause conduction of said transistor for interrupting said control signals of one polarity.

4,099,111
CONTROL APPARATUS FOR DC MOTOR

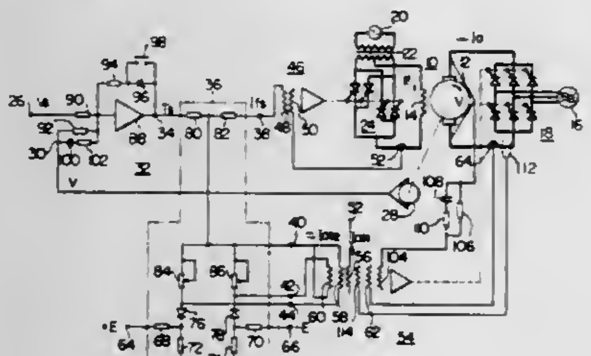
Hiromi Inaba, Hitachi; Seiya Shima, Katauta; Korefumi Tashiro, Hitachi, and Takeki Ando, Nakamachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 30, 1976, Ser. No. 710,162

Claims priority, application Japan, Aug. 8, 1975, 50-95765

Int. Cl.^{2} H02P *7/14*

U.S. Cl. 318—338 **14 Claims**



1. An apparatus for controlling a DC motor, comprising a unidirectional converter for permitting a current to flow only in one direction in the armature of said motor, a bilateral converter for allowing a current to flow in opposite directions in the field system of said motor, torque command generator means for generating a torque command for controlling said two converters, first means coupled to said bilateral converter for causing a field current corresponding to the torque command to flow when the torque command is not more than a predetermined value and causing a predetermined field current to flow when the torque command exceeds said predetermined value, and second means coupled to said unidirectional converter for causing a predetermined armature current to flow when the torque command is not more than said predetermined value and causing the armature current to increase, when said torque command exceeds said predetermined value, in accordance with the amount of excess from said predetermined value.

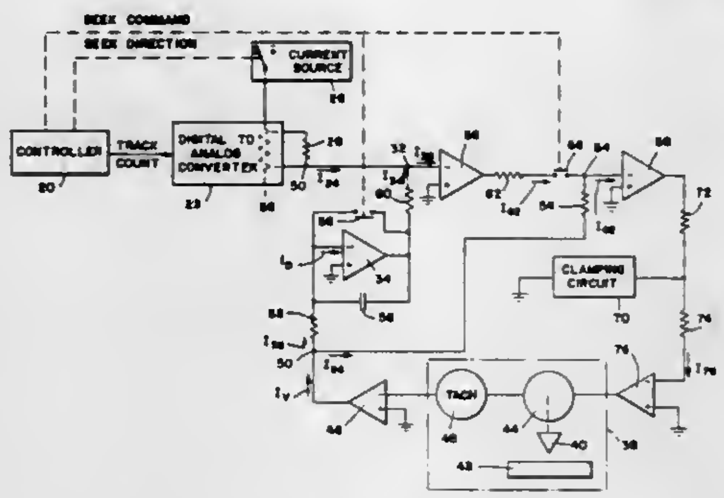
4,099,112
METHOD AND MEANS FOR SEEKING MAGNETIC TRACKS

Lance T. Klinger, Playa Del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,717

Int. Cl.^{2} G05B *13/00*

U.S. Cl. 318—561 **6 Claims**



1. In a disc drive having a head selectively alignable with any of a plurality of generally parallel data tracks, and means for performing a seek involving moving said head from one of said data tracks to another by accelerating said head at a constant maximum rate of acceleration until it reaches a maximum velocity, then decelerating it so as to reduce its velocity to a predetermined capture velocity in the vicinity of a target position just short of the destination track, apparatus for causing said head to approach said target position at a low rate of deceleration generally independent of the length of said seek, comprising:

(a) means for producing an algebraic seek distance signal having a magnitude representative of the length of said seek and a sign representative of its direction;
(b) velocity-sensing means associated with said head for producing an algebraic velocity signal having a magnitude representative of head velocity and a sign representative of the head's direction of movement;
(c) integrator means connected to integrate said velocity signal so as to produce a distance-traveled signal;
(d) first combining means connected to said seek-distance signal producing means and said integrating means to subtractively combine said seek-distance signal and said distance-traveled signal into a signal proportional to the distance remaining to target;
(e) second combining means connected to said first combining means and to said velocity-sensing means to subtractively combine said distance-remaining signal and said velocity signal to produce a torque signal; and
(f) means responsive to said torque signal for driving said head with an acceleration proportional to said torque signal in both magnitude and sign.

4,099,113
NUMERICAL CONTROL SERVO SYSTEM

Shigeki Hayashi, Tokyo, Japan, assignor to Nusco Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1976, Ser. No. 694,876

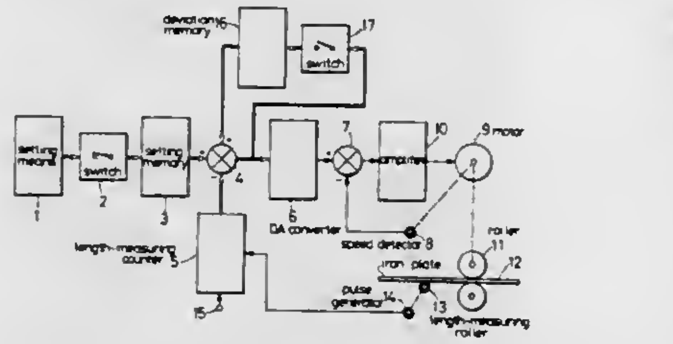
Claims priority, application Japan, Jun. 16, 1975, 50-73351

Int. Cl.^{2} G05D *23/275*

U.S. Cl. 318—632 **6 Claims**

1. A numerical control servo system comprising:
a setting memory for setting a set numerical value indicative of the amount by which a movable member to be controlled should be shifted in position;
means including a motor for shifting the position of said movable member;

a pulse generator for generating a pulse each time said member is shifted a predetermined distance;
a length-measuring counter for counting the pulses from said pulse generator to a measured numerical value;
a digital subtractor for obtaining a difference between the set numerical value and the measured numerical value from said length-measuring counter;
a D-A converter for converting the difference output from said digital subtractor into an analog speed reference signal;
means for obtaining another analog signal corresponding to the shift speed of said movable member;



an analog subtractor for obtaining a difference between said analog shift speed signal and said analog speed reference signal;
means for controlling said motor in response to the output from the analog subtractor to shift the position of said member so that the output from the digital subtractor approaches zero;
a deviation memory for writing therein the output from the digital subtractor at the start of the control operation; and
correcting means for correcting directly or indirectly the set numerical value in accordance with the value stored in the deviation memory.

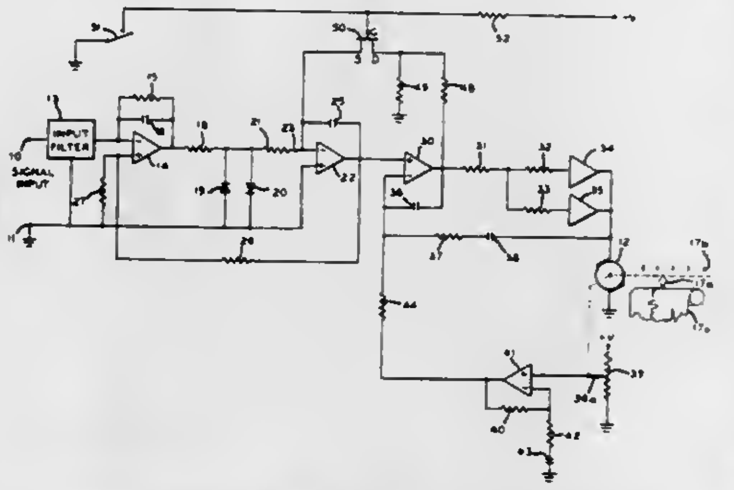
4,099,114
SERVO STOP SYSTEM

Howard Sherman Hoopes, Hilltown, and Thomas Joseph Walsh, Hatboro, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 29, 1976, Ser. No. 736,924

Int. Cl.^{2} G05B *11/01*

U.S. Cl. 318—676 **8 Claims**



1. A rebalanceable positional servo system comprising,
a first rebalanceable loop having an input and an output wherein the output signal varies at a uniform preset rate to be proportional in magnitude to the signal applied to the input of said loop,
a second rebalanceable loop system having an input connected to the output of said first rebalanceable loop and positioning an output element in accordance with the magnitude of the input signal, and
a stop circuit arresting the movement of the output element comprising a negative feedback connection from said second loop to said first loop and including switching means for completing and interrupting said negative feedback circuit.

4,099,115
CONSTANT-VOLTAGE REGULATED POWER SUPPLY

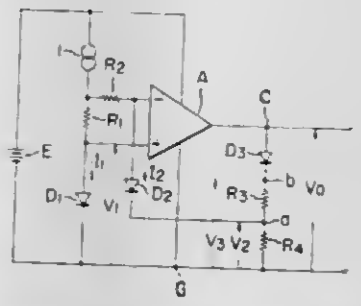
Sakuji Watanabe, Yono, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 22, 1976, Ser. No. 707,618

Claims priority, application Japan, Jul. 28, 1975, 50-91160; Sep. 5, 1975, 50-107098

Int. Cl.^{2} G05F *3/08;* **G01R** *19/16*

U.S. Cl. 323—19 **11 Claims**



1. A voltage generating circuit comprising:
(1) a first circuit for providing a temperature dependent output voltage, said first circuit including:
(A) an operational amplifier having first and second input terminals and an output terminal;
(B) first resistance means having one end connected to said first input terminal of said operational amplifier;
(C) second resistance means having one end connected to said second input terminal of said operational amplifier and the other end thereof connected to the other end of said first resistance means; and
(D) first and second logarithmic conversion means for generating a temperature dependent voltage proportional to the logarithm of the current flowing therethrough;
  said first logarithmic conversion means being connected between said second input terminal of said operational amplifier and a common terminal of said voltage generating circuit;
  said second logarithmic conversion means being connected between said first input terminal of said operational amplifier and said output terminal of said operational amplifier;
(2) a second circuit connected to the output terminal of said operational amplifier for providing a temperature dependent output voltage, said voltage having a temperature dependence opposite to that of said voltage provided by said first circuit; and
(3) a third circuit connected to both said first and said second circuits to combine the output voltages of said first and second circuits.

4,099,116
METAL DETECTOR WITH PHASE RELATED SELECTIVE DISCRIMINATION CIRCUIT

Jerry C. Tyndall, 907 Denise Ave., Coats, N.C. 27521

Filed Jan. 17, 1977, Ser. No. 759,916

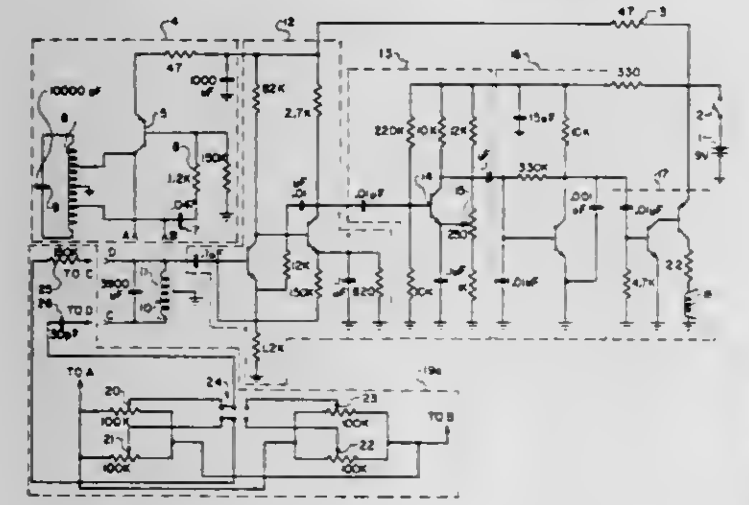
Int. Cl.^{2} G01V *3/10*

U.S. Cl. 324—3 **24 Claims**

1. In a metal detector apparatus having inductively coupled and electrically phase and amplitude balanced transmission and reception coils and having a high frequency oscillator connected to said transmission coil and a detector amplifier and high gain and audio amplifiers, respectively, connected in

series to one another and to said reception coil for amplifying radiated signals received therein from said transmission coil, the improvement comprising:

- a plurality of pairs of first variable electrical resistors connected in parallel across the inputs from said high frequency oscillator to said transmission coil to receive signals of opposite phase therefrom;
- a double pole double throw electrical switch means having its fixed contacts connected to the variable resistance taps of said pairs of first variable electrical resistors and having the movable blade contacts being switchable between at least two positions to selectively connect feedback signals of one or the other phase from two of said fixed contacts to the movable blade contacts of said switch;
- a second electrical resistance means connected to one of said movable blade contacts of said switch means and to one end input of said reception coil in a series connection;



- electrical capacitance means connected to the other of said movable blade contacts of said switch means and to the other end input of said reception coil in an electrical series connection;
- said pairs of first variable resistance providing, through said switch means for selecting the phase of said feedback selected to be fed said resistance and capacitance means, respectively, variable electrical feedback input signals of opposite and variable phase and magnitude from said high frequency osclllator to said reception coil for electrically unbalancing said transmission and reception coils by a phase and magnitude amount sufficient to algebraically cancel out unwanted signals of similar but algebraically opposite phase and magnitude which may be received by said reception coil.

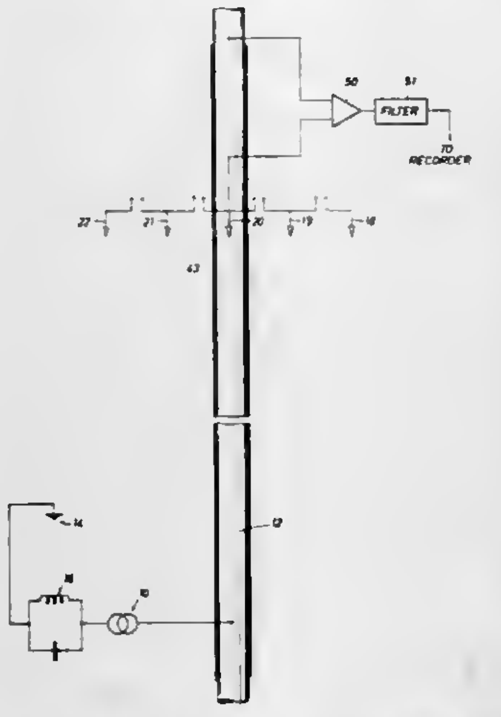
4,099,117
METHOD AND APPARATUS FOR MEASURING THE QUALITY OF INSULATION ON A BURIED PIPELINE AND THE QUANTITY OF METAL OXIDE PRESENT AT BREAKS IN THE INSULATION

Louis W. Erath, 5714 Green Ash, Houston, Tex. 77036, assignor to Dick Gant, Marrero, La.; Louis W. Erath and Maurice C. Bierman, Jr., both of Houston, Tex.

Filed Apr. 26, 1976, Ser. No. 680,487
Int. Cl.² G01R *31/12, 31/08*
U.S. Cl. 324—54 10 Claims

1. A method of inspecting in situ an externally coated metal pipeline that is buried in an electrically conductive medium, such as the ground, comprising connecting the pipeline to a source of alternating electrical voltage, connecting the voltage source to a ground bed located in the medium, and measuring along the pipeline the flow of electrical current through the medium between the ground bed and the pipeline to locate breaks in the coating of the pipeline by changes in the current flow, and measuring one of the harmonics in the signal that is produced by an oxide of the metal of the pipeline to obtain an indication of the amount of metal oxide formed at the break in the coating.

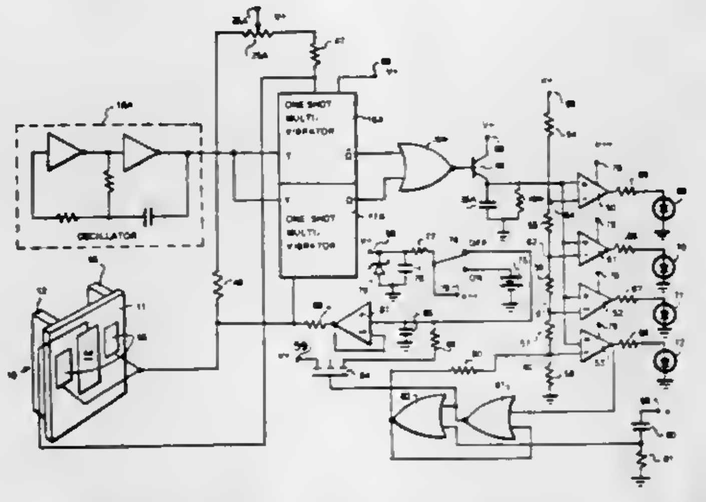
9. A method of inspecting the external coating of a pipeline buried in an electrically conductive medium comprising the steps of impressing an alternating voltage between the pipeline and ground, measuring the voltage between selected points in the medium along a line transverse the longitudinal axis of the pipeline, resolving the measured voltage into its resistive component and its reactive component, and obtaining a signal proportional to the ratio of the resistive component to the reactive component which indicates the quality of the external coating of the pipeline and is independent of the resistivity of the medium.



4,099,118
ELECTRONIC WALL STUD SENSOR

Robert C. Franklin, 914 Bicknell Rd., Los Gatos, Calif. 95030, and Frank I. Fuller, Rte. 1E, Box 31A, Scottsburg, Oreg. 97473

Filed Jul. 25, 1977, Ser. No. 818,988
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R 8 Claims



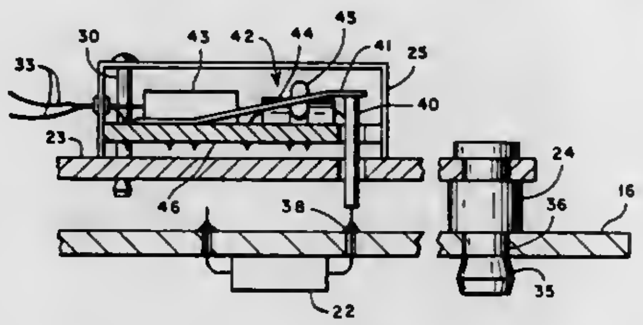
1. A portable device for locating a wall stud positioned behind a wall surface, comprising in combination:

- a housing having a flat surface;
- a capacitor plate mounted adjacent said housing flat surface;
- a circuit for detecting any change in the capacitance of the capacitor plate due to a change in the dielectric constant of the wall adjacent the housing flat surface; and
- means for indicating the change in the capacitance of the capacitor plate whereby by moving the device such that the flat surface thereof is in close proximity to the wall, the change in the dielectric constant caused by the stud in the wall changes the capacitance of the capacitor plate as indicated by the indicating means.

4,099,119
PROBE APPARATUS FOR IN PLACE TESTING OF ELECTRICAL CIRCUIT BOARDS

Heinz E. Goetz, Ontario, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 3, 1977, Ser. No. 765,149
Int. Cl.² G01R *31/02*
U.S. Cl. 324—73 PC 12 Claims



1. Probe apparatus for in situ testing of circuit boards of the type which carry electrical components interconnected at nodes accessible from at least one side of the board, said probe apparatus comprising:

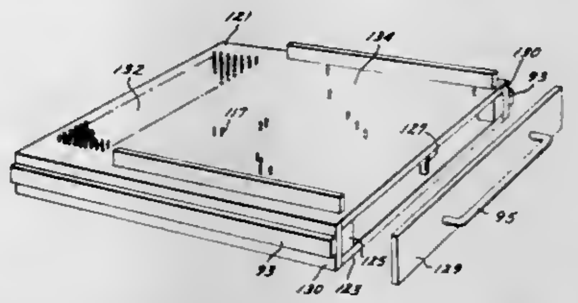
- a support member;
- first mounting means for locating said support member closely adjacent a circuit board under test and juxtaposed with a side of the board from which interconnection nodes are accessible;
- a probe module including signal conditioning means and at least one short signal interfacing element for carrying signals between at least one interconnection node and said signal conditioning means;
- second mounting means for mounting said probe module on said support member in close proximity to a predetermined interconnection node so that said signal interfacing element is positioned to interface with at least one predetermined node, whereby the length of the signal path between the node and said signal conditioning means is minimized; and
- readout means connected to said signal conditioning means for producing an indication of signals at said predetermined node.

4,099,120
PROBE HEAD FOR TESTING PRINTED CIRCUIT BOARDS

Akin Aksu, 1755 Port Hemly Cir., Newport Beach, Calif. 92660
Continuation of Ser. No. 678,202, Apr. 19, 1976, abandoned, which is a continuation of Ser. No. 496,385, Aug. 12, 1974, Pat. No. 3,970,934. This application Jun. 8, 1977, Ser. No. 804,804
Int. Cl.² G01R *1/06, 31/02*
U.S. Cl. 324—158 P 12 Claims

1. A probe head for the testing of the circuitry of a printed circuit board which comprises:

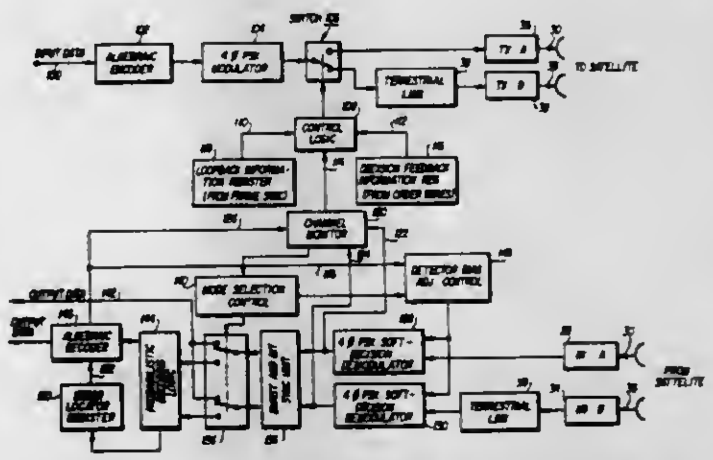
- first, generally flat plate means for bearing engagement with platen means of a circuit board test fixture;
- probe plate means presenting at least two, generally parallel, planar contact bearing areas and secured in a spaced-apart assembly to said first plate means by a plurality of spacing means carried therebetween;
- a plurality of spaced-apart, spring-biased contact units carried by said probe plate means with their probe ends extending exteriorly and their connector ends extending interiorly of said plate assembly and oriented about one of said two planar contact bearing areas to make contact to preselected points on a printed circuit board superimposed thereon;
- a plurality of interface contact members also carried by said probe plate means with their mating ends extending exteriorly and their connector ends extending interiorly of said plate assembly and oriented about the another of said at least two planar contact bearing areas to make mating contact to preselected opposite interface contact members carried by said test fixture; and
- a plurality of conductors, each extending from the connector end of one of said probe contacts to the connector end of one of said interface contact members.



4,099,121
SPATIAL DIVERSITY SATELLITE COMMUNICATIONS SYSTEM WITH ERROR CONTROL

Russell Jn Fu Fang, Brookeville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jun. 11, 1976, Ser. No. 695,211
Int. Cl.² H03K *13/32;* H04B *7/20*
U.S. Cl. 325—4 12 Claims



1. In a TDMA satellite communications system employing a plurality of earth stations separated by a substantial distance one from another, each earth station having a transmitter and a receiver, the improvement comprising:

- means for selecting one of said transmitters to transmit an encoded modulated burst of information to said satellite,
- a plurality of demodulator means each connected to a corresponding one of said receivers for demodulating the message bursts received from the satellite according to a plurality of preselected thresholds and for producing demodulated output signals,
- probabalistic decoding means connected to receive said demodulated output signals for producing decoded output signals and providing for error correction according to the probability of maximum likelihood of occurrance of said demodulated output signals, and
- parity check means adapted to receive the decoded output signals from said probablistic decoding means for performing a parity check on said decoded output signals and for producing a single output signal representing the message transmitted by said selected transmitter.

4,099,122

TRANSMISSION SYSTEM BY MEANS OF TIME QUANTIZATION AND TRIVALENT AMPLITUDE QUANTIZATION

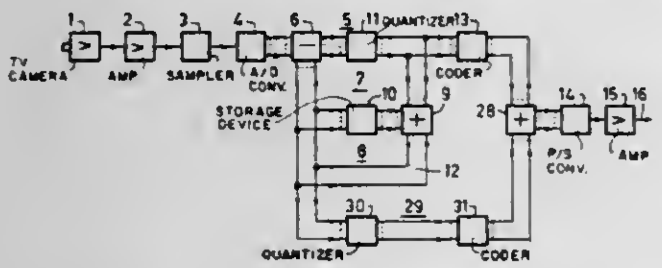
Marinus Cornelis Willem van Buul, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1976, Ser. No. 690,647

Claims priority, application Netherlands, Jun. 12, 1975, 7506987

Int. Cl.² H03K *13/22*

U.S. Cl. 325—38 B **10 Claims**



1. A transmitter for the transmission of an analog information signal in a digital format comprising:

an input terminal means for receiving said analog signal;

a subtractor having a first input coupled to said input terminal, a second input, and an output;

a first encoder means coupled to the output of said subtractor for encoding with a non-linear quatizing scale;

an output terminal means coupled to the output of said encoder for providing said digital format

sampling means coupled between the input terminal means and the output of said encoder

a prediction circuit having an input coupled to the subtractor output and having an output coupled to the second subtractor input, said prediction circuit comprising a first adder circuit having a first input coupled to said prediction circuit input, a second input and an output; delay means having an input coupled to the adder circuit output, and having an output coupled to said prediction circuit output and to the second adder circuit input;

a second adder circuit having a first input and an output coupled between said subtractor output and said output terminal, and having a second input; and

an auxiliary circuit arrangement means for providing a signal that reduces transmission errors having an input coupled to one of the inputs of the subtractor and having an output coupled to the second input of the second circuit.

4,099,123

ELECTRICAL MULTI-CHANNEL SIGNAL TRANSMISSION SYSTEMS

Edward W. Finlay, Agincourt, and John Cappon, Willowdale, both of Canada, assignors to Premier Cablevision Ltd., Vancouver, Canada

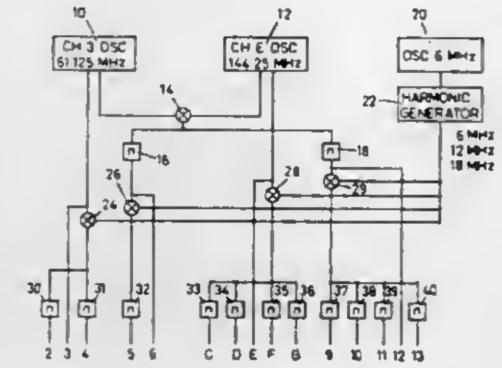
Continuation of Ser. No. 526,676, Nov. 25, 1974, abandoned. This application Sep. 22, 1976, Ser. No. 725,503

Claims priority, application Canada, Oct. 4, 1974, 210805

Int. Cl.² H04B *3/50*

U.S. Cl. 325—308 **8 Claims**

1. A cable television system for reducing second order intermodulation products caused by interaction between carriers in non-linear electrical devices in the system wherein the carrier frequencies of the channels shown in the first column of the following table are re-assigned as expressed in analytical form in the fourth column of the table, the standard frequencies given in the second column being expressable in analytical form as shown in the third column of the table where $x = 6$ and $y = 0.25$, and the values of x and y for the re-assigned frequencies being found by selecting frequencies for two channels, setting them equal to the corresponding expressions in the fourth column to form two simultaneous equations, and solving for x and y:



TABLE

Channel	Freq. MHz	Standard	New Assignment
2	55.25	9x + 5y	9x + 5y
3	61.25	10x + 5y	10x + 5y
4	67.25	11x + 5y	11x + 5y
5	77.25	13x − 3y	13x − 3y
6	83.25	14x − 3y	14x − 3y
C	133.25	22x + 5y	22x + 2y
D	139.25	23x + 5y	23x + 2y
E	145.25	24x + 5y	24x + 2y
F	151.25	25x + 5y	25x + 2y
G	157.25	26x + 5y	26x + 2y
H	163.25	27x + 5y	27x + 2y
I	169.25	28x + 5y	28x + 2y
7	175.25	29x + 5y	29x + 7y
8	181.25	30x + 5y	30x + 7y
9	187.25	31x + 5y	31x + 7y
10	193.25	32x + 5y	32x + 7y
11	199.25	33x + 5y	33x + 7y
12	205.25	34x + 5y	34x + 7y
13	211.25	35x + 5y	35x + 7y

said system comprising two oscillator means for generating the frequencies of said two channels, means for combining the two generated frequencies to produce a third frequency, – is inserted after the comma; a harmonic generator means for generating a channel spacing frequency and harmonics thereof, and means for combining and filtering frequencies from the two oscillator means, said third frequency and the harmonic generator means to derive other re-assigned channel frequencies.

4,099,124

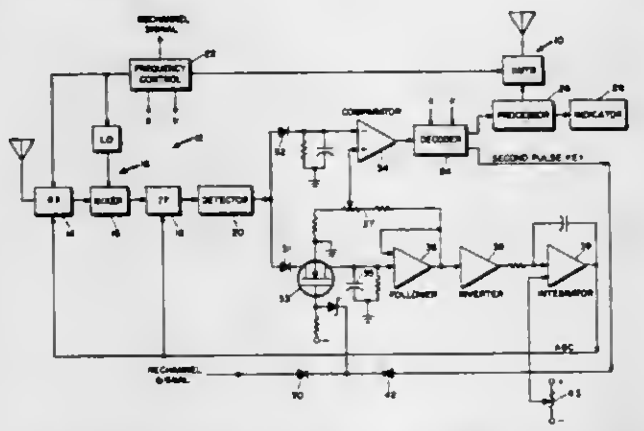
COMBINED KEYED AGC AND PULSE AMPLITUDE COMPARATOR CIRCUIT

Claude A. Sharpe, and Richard V. Frazier, Jr., both of Ft. Lauderdale, Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 19, 1977, Ser. No. 788,955

Int. Cl.² H04B *1/16*

U.S. Cl. 325—326 **5 Claims**



1. A combined keyed automatic gain control and amplitude threshold comparator circuit for use in a pulse modulated communications system wherein desired signals are distinguished, in part, from undesired signals by the existence of a predetermined spacing between pulse pairs, comprising:

a parallel circuit including two paths for pulses detected by said communications system;

switching means in one of said paths for conducting or blocking conduction of said detected pulses therethrough;

an amplitude comparator in the other of said paths for comparing the amplitudes of said pulses against a reference voltage applied thereto and for permitting conduction therethrough only of said pulses having amplitudes exceeding said reference voltage;

decoding means for determining the spacing between pulses conducted by said amplitude comparator and for producing a keying signal upon the appearance of a second pulse having said predetermined spacing from a first pulse;

means applying said keying signal to said switching means to render said switching means conductive during the persistence of said keying signal;

means utilizing pulses conducted by said switching means for developing an automatic gain control voltage for said communications system and to provide said reference voltage to said amplitude comparator; and

means temporarily operative for rendering said switching means conductive whereby initial transitory values of automatic gain control and reference voltages are established and thereafter such voltages are substantially wholly dependent upon the amplitude of said second pulse having a predetermined spacing from a first pulse.

4,099,125

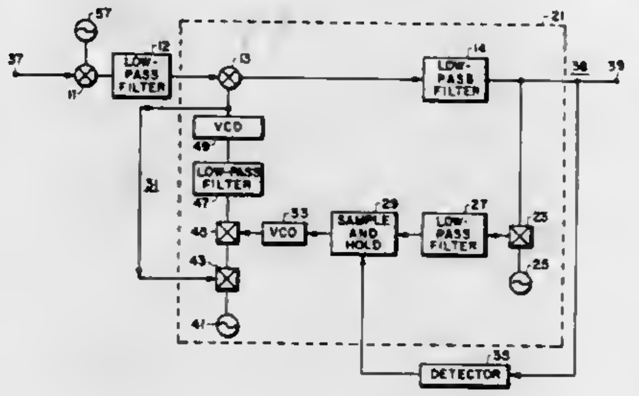
FREQUENCY ERROR CORRECTION CIRCUIT

Robert McKay Bennett, Jr., West Dundee, and James Leslie Osborn, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 23, 1976, Ser. No. 699,020

Int. Cl.² H04B *1/26;* **H03B** *3/06*

U.S. Cl. 325—419 **8 Claims**



6. A circuit for correcting frequency errors in an incoming signal having a composite of frequency spectrum including a particular frequency signal, coded signal and message signal, said circuit comprising:

a phase locked loop circuitry for providing a feedback control signal the incoming signal,

detection means for detecting the presence of the coded signal and generating a hold signal, and

means disposed in the feedback path of said phase locked loop circuitry responsive to the bold signal for setting the feedback control at a particular level to correct the frequency error for the particular frequency signal and maintain the feedback control signal at the same level for the entire spectrum of the incoming signal as long as the hold signal is present.

4,099,126

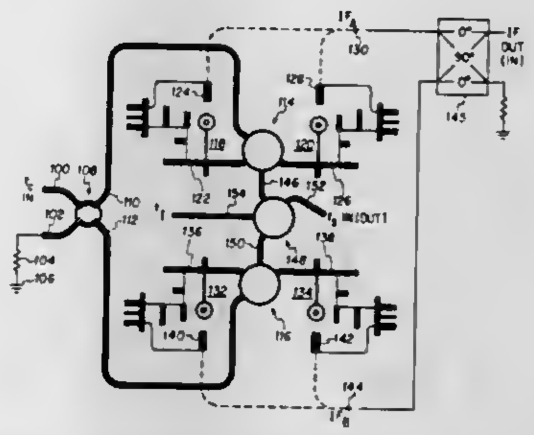
FREQUENCY CONVERTER APPARATUS

Ben R. Hallford, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 11, 1976, Ser. No. 740,903

Int. Cl.² H04B *1/26;* **H03D** *7/14*

U.S. Cl. 325—446 **8 Claims**



1. Frequency conversion apparatus comprising, in combination:

signal splitter means, including input means and first and second output means;

means for supplying local oscillator signals to said input means of said splitter means;

first and second mixer means, each including first, second and third terminal means;

180° signal hybrid means, including first, second and third hybrid terminal means and signal termination means, for affecting the phase of signals, applied to one of said hybrid terminal means and transmitted to others of said hybrid terminal means, in a predetermined manner wherein a signal applied to said third hybrid terminal means will appear at said first and second hybrid terminal means with substantially a 180° phase difference therebetween and cancel at said signal termination means;

means connecting said first output means of said signal splitter means to said first terminal means of said first mixer means;

means connecting said second output means of said signal splitter means to said first terminal means of said second mixer means;

means connecting said second terminal means of said first mixer means to said first hybrid terminal means of said hybrid means;

means connecting said second terminal means of said second mixer means to said second hybrid terminal means of said hybrid means;

means for supplying input signals to be converted to said third terminal means of one of said hybrid means or the pair of mixer means; and

means for receiving converted output signals from the remaining third terminal means.

4,099,127

AUDIO FREQUENCY AUTOMATIC MUTING ARRANGEMENT

Derek Stanley Juniper, Chelmsford, England, assignor to Elliott Brothers (London) Limited, England

Filed Nov. 30, 1976, Ser. No. 746,118

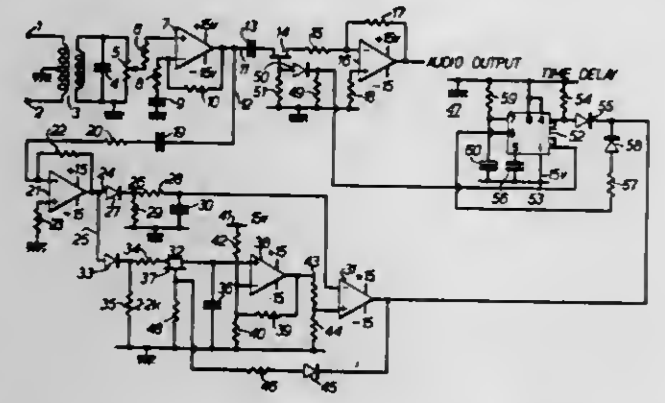
Claims priority, application United Kingdom, Dec. 29, 1975, 53043/75

Int. Cl.² H04B *1/10*

U.S. Cl. 325—478 **5 Claims**

1. An automatic audio frequency muting arrangement comprising a muting switch in a path for an audio frequency signal, first signal level detector means including a first capacitor which is charged to values determined by the instantaneous amplitudes of intelligence and noise signals in said audio fre-

quency signal with sufficient rapidity as to respond to the instantaneous amplitudes of said intelligence signals at a first predetermined rate, second signal level detector means including a second capacitor which is charged to values determined by the instantaneous amplitudes of intelligence and noise signals with sufficient slowness as to respond to the instantaneous amplitudes of said intelligence signals at a second predetermined rate which is slower than said first predetermined rate, means for comparing the detected levels of said first and second level detector means, means for utilizing the result of such comparison to control said muting switch and isolating means coupled to the output of said comparing means for isolating said second capacitor during times at which intelligence signals are present in said audio frequency signal.



4,099,128

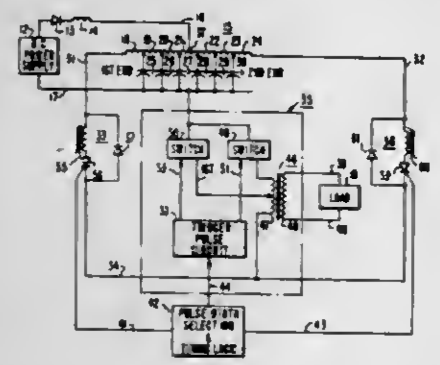
LINE TYPE MODULATOR FOR PROVIDING STEPWISE VARIABLE PULSE WIDTH

Edward H. Hooper, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 13, 1976, Ser. No. 714,217

Int. Cl.² 328 *67;* **H03K** *1/00, 3/04, 5/04*

U.S. Cl. 328—65 **8 Claims**



1. A method for providing constant energy pulses to a load wherein the pulse width is stepwise variable comprising the steps of:

charging a pulse forming network, coupling a load to a predetermined number of taps on said pulse forming network through a plurality of switches, selecting a number of switches corresponding to a predetermined pulse width, and closing simultaneously said selected switches to completely discharge the total energy in said pulse forming network across the load.

5. Apparatus for providing constant energy pulses to a load wherein the pulse width is stepwise variable comprising:

means for charging a pulse forming network, means for coupling a load to a predetermined number of taps on said pulse forming network through a plurality of switches, means for selecting a number of switches corresponding to a predetermined pulse width, and means for closing simultaneously said selected switches to completely discharge the total energy in said pulse forming network across the load.

4,099,129

CONTROL PULSE GENERATOR FOR THE CYCLICAL FAULT-FREE GENERATION OF AN ACCURATE SEQUENCE OF CONTROL PULSES

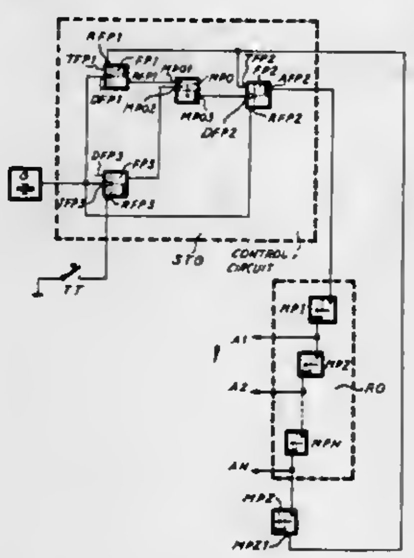
Heinz-Jüergen Lohmann, Brunswick, and Gerd Kopperschmidt, Cremlingen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 1, 1976, Ser. No. 746,620

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602169

Int. Cl.² H03K *17/26, 3/64*

U.S. Cl. 328—75 **4 Claims**



1. A control pulse generator for the fault-free cyclical generation of an accurate sequence of control pulses, comprising a quartz pulse generator operatively connected to a control circuit having a first pulse-edge controlled D-flipflop, the pulse input of which is connected to the output of the quartz generator, a first monostable multivibrator, to a first dynamic input of which the pulse output of said first D-flipflop is connected, said first monostable vibrator having an output connected to the pulse input of a second pulse-edge controlled D-flipflop, one output of said second D-flipflop being connected to the input of a first delay member of a plurality of serially connected delay members, a directly acting blocking input of said second D-flipflop being connected with said quartz pulse generator, a second monostable multivibrator which has its dynamic input connected with the output of the last delay member of said serially connected delay members, an output of the second monostable multivibrator being connected to a directly acting blocking input of said first pulse-edge controlled D-flipflop and to the D-input of said second pulse-edge controlled D-flipflop.

4,099,130

PHASE SYNCHRONIZING CIRCUIT

Yasuharu Yoshida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,878

Claims priority, application Japan, Mar. 22, 1976, 51-31023

Int. Cl.² H03D *13/00*

U.S, Cl. 329—104 **7 Claims**

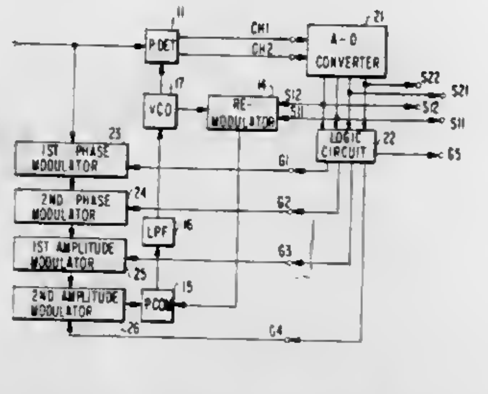
1. A phase synchronizing circuit for use in a multi-level, multi-phase, superposition-modulated carrier wave transmission system in which the carrier wave for transmission is formed by combining a first modulated carrier wave and a second modulated carrier wave synchronized with each other comprising

a voltage-controlled oscillator having frequencies varying in response to a phase error signal,

phase-detector means for detecting said superposition-modulated wave carrier by means of the output of said oscillator,

a logic circuit for processing the outputs of said phase-detector means to produce a signal representing a phase difference between said first and second modulated carrier waves, and

means responsive to the output of said logic circuit for controlling at least one of the phase variation and the amplitude variation in said phase error signal.



4,099,131

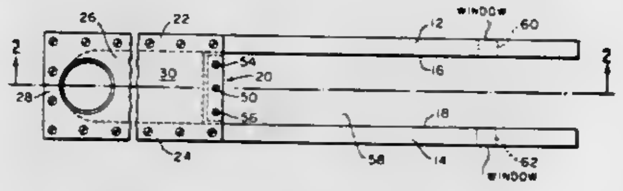
FREE JET LASER AMPLIFIER

Charles T. Pike, Lexington, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Sep. 2, 1975, Ser. No. 609,784

Int. Cl.² H01S *3/093, 3/20*

U.S. Cl. 330—4.3 **28 Claims**



1. A free jet laser amplifier comprising:

first and second guide members each having a surface for bounding a flowing sheet of laser medium;

said guide members having each a transparent portion;

a beam of radiation to be amplified applied to one of said transparent portions;

an orifice positioned between said first and second guide members and having an elongate opening with the long dimension oriented toward the surfaces of said guide members;

a fluid laser medium flowing through the opening of said orifice to provide a flowing sheet of laser medium bounded solely at its edges by the surfaces of said first and second guide members and extending across the transparent portions of said first and second guide members; and

excitation radiation applied to the flowing sheet of laser medium through an exposed surface thereof in the region between the transparent portions of said first and second guide members.

4,099,132

NEGATIVE DIFFERENTIAL MOBILITY AMPLIFIER FOR A PROGRESSIVE WAVE

Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 7, 1977, Ser. No. 831,350

Claims priority, application France, Sep. 7, 1976, 76 26873

Int. Cl.² H03F *3/04*

U.S. Cl. 330—5 **13 Claims**

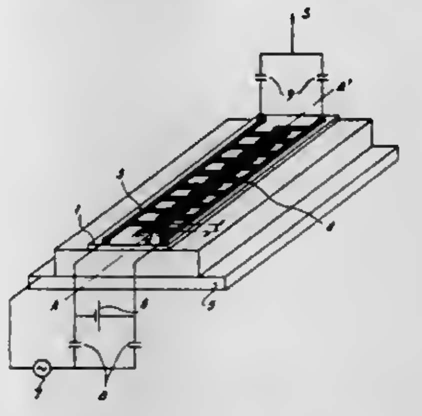
1. An amplifier for a high frequency progressive wave comprising:

a layer of semiconductor material of negative differential mobility,

two electrodes formed by two metallic combs of which the overlapping fingers are orthogonal to the propagation direction of the high frequency progressive wave, said two electrodes disposed on the free surface of said layer of semiconductor material and said overlapping fingers forming an ohmic contact with the free surface of the semiconductor layer,

a biassing source bringing in operation said two electrodes to different electrical d.c. biassing potentials,

a dielectric substrate with a first surface and a second surface opposite to said first surface, said layer of semiconductor material being deposited onto said first surface of the dielectric substrate and said second surface comprising a metallic plate, said metallic plate metallic combs and dielectric substrate forming a line of asymetric parallel bands the metallic combs being brought in operation to the high frequency potential of the progressive wave to be amplified.



4,099,133

KLYSTRON AMPLIFIERS

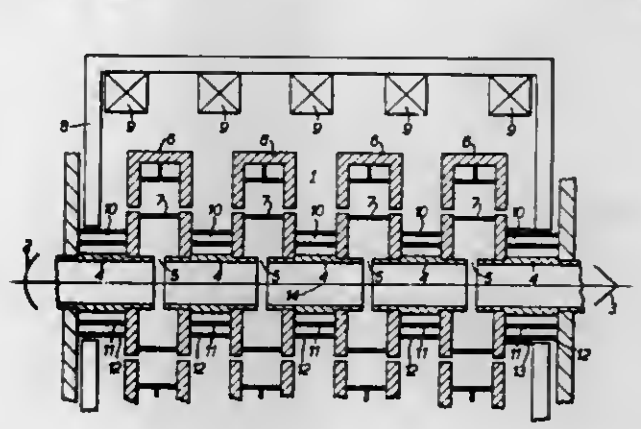
Roy Heppinstall, Witham, England, assignor to English Electric Valve Company Limited, United Kingdom

Filed Feb. 1, 1977, Ser. No. 764,545

Claims priority, application United Kingdom, Feb. 5, 1976, 4644/76

Int. Cl.² H03F *3/56*

U.S. Cl. 330—45 **22 Claims**



1. A klystron amplifier arrangement having at least one electro-magnetic solenoid operative to provide said klystron amplifier with a focussing magnetic field and including at least one electron gun and a collector electrode and wherein said arrangement is provided with means for producing a radial component of magnetic field operative to tend to direct relatively slowly moving beam electrons out of their path from the electron gun to the collector electrode while having an insubstantial effect upon the main focussing of the electron beam as provided by said solenoid.

4,099,134
AMPLIFIER WITH CONTROLLABLE TRANSMISSION FACTOR AND SWITCHABLE CONTROL CHARACTERISTIC

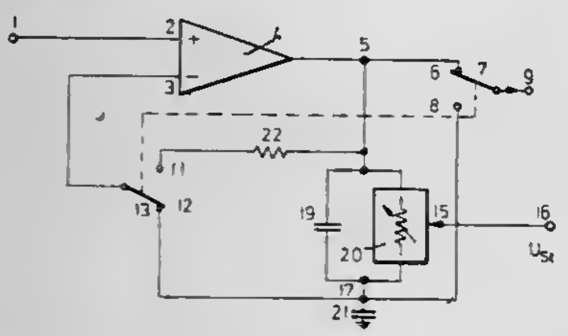
Ernst Schröder, Hannover, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 21, 1977, Ser. No. 808,628

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, 2629701

Int. Cl.² H03F *1/34*

U.S. Cl. 330—51 **4 Claims**



1. In an amplifier whose transmission factor is to be controlled in response to a control voltage and including means for switching the amplifier between two operating states providing mutually complementary control characteristics, an amplifier member having an inverting input, and an electronically controllable first impedance connected to receive the control voltage and to present an impedance which varies as a function of the control voltage and which determines the amplifier transmission factor, the impedance being connected, in one of the operating states, in a negative feedback path of the amplifier by the switching means, the improvement comprising: means connecting said first impedance to the output of said amplifier member; a second impedance connected to said first impedance to form therewith a series arrangement disposed between the output of said amplifier member and a point at the circuit reference potential of said amplifier; and means defining a direct current path connected to the output of said amplifier member, and wherein said switching means are connected in said amplifier for, in said one operating state, connecting the inverting input of said amplifier member to the point of connection between said first and second impedances and connecting the output of said amplifier member as the output from said amplifier, and the other operating state, connecting said direct current path in series between said amplifier member output and inverting input and connecting the point of connection between said first and second impedances as the output from said amplifier.

4,099,135
ELECTRONIC ECHO DEVICE

Robert Ronald Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands

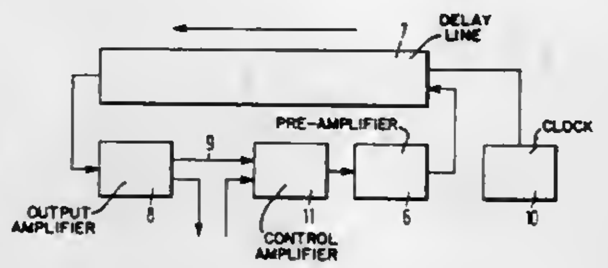
Filed Sep. 20, 1976, Ser. No. 725,145

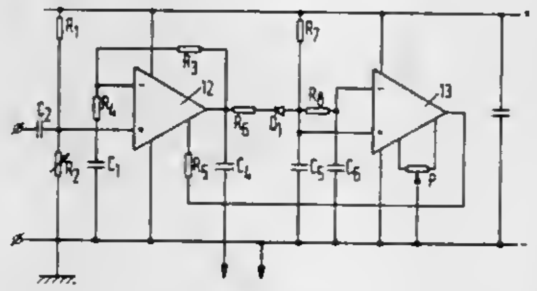
Claims priority, application Netherlands, Sep. 18, 1975, 7510999

Int. Cl.² H03F *1/36*

U.S. Cl. 330—109 **2 Claims**

1. An electronic signal processing device comprising: an input and an output terminal, a final amplifier, a delay device having an input and being connected through said final amplifier to said output terminal of said processing device, a feedback loop, and a control device for providing an echo effect, said control device being connected between said input of said processing device and said input of said delay device, the output of said final amplifier being connected to the input of said control device through said feed-back loop, said control device having means for varying the gain factor of said control device such that upon a sudden change in the input signal level applied thereto the gain factor is changed accordingly to counteract said change.





4,099,136
AMPLIFIER CIRCUIT FOR HIGH FREQUENCY SIGNALS, PARTICULARLY FOR CABLE DISTRIBUTION SYSTEMS, COMPRISING AT LEAST A FIRST TRANSISTOR CONTROLLED AT ITS BASE ELECTRODE BY A SIGNAL SOURCE, AND A DIFFERENCE AMPLIFIER

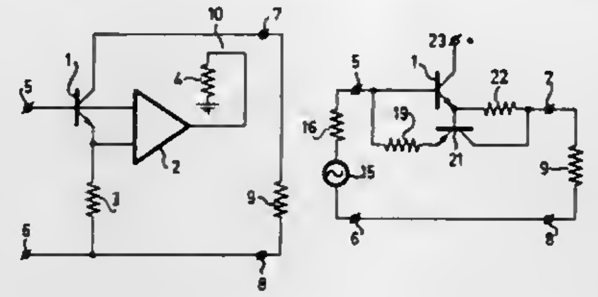
Dirk Blom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 643,703, Dec. 23, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,255

Claims priority, application Netherlands, Feb. 10, 1975, 7501531

Int. Cl.² H03F *3/04*

U.S. Cl. 330—304 **6 Claims**



1. An amplifier circuit for high frequency signals comprising at least a first transistor adapted to be controlled at its base electrode by a signal source, a difference amplifier having an input and an output, means for applying distortion generated at the base-emitter junction of said transistor to said difference amplifier and for ensuring that said difference amplifier generates substantially no distortion including means for coupling the base-emitter junction of said transistor in parallel with the input of the difference amplifier, and means for substantially eliminating distortion generated in said first transistor including means for applying the output signal from said difference amplifier to the output signal from the transistor with an amplitude and phase wherein the distortion therein is substantially eliminated.

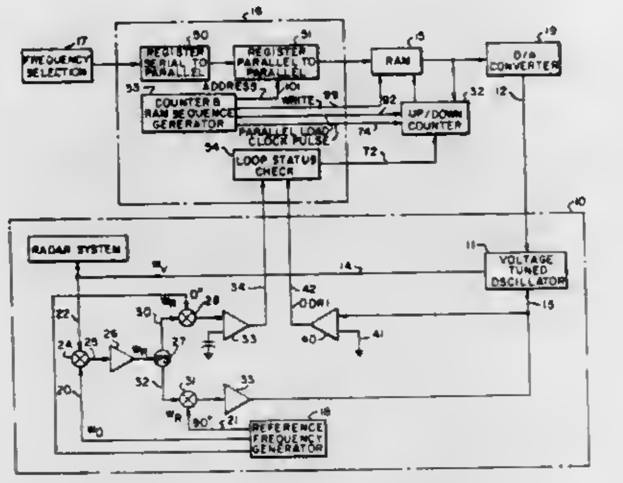
4,099,137
HIGH SPEED PHASE LOCK CONTROL FOR FREQUENCY SWITCHING

Benjamin C. Alm, Jr., Arnold; Francis W. Hopwood, Severna Park; Robert A. Jelen, Arnold; John P. Muhlbaier, Joppa, and Joseph F. Wright, Jr., Columbia, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1977, Ser. No. 805,498

Int. Cl.² H03B *3/08*

U.S. Cl. 331—16 **7 Claims**


FREQUENCY SELECTION
REGISTER SERIAL TO PARALLEL
REGISTER PARALLEL TO PARALLEL
RAM
D/A CONVERTER
ADDRESS
WRITE
COUNTER & RAM SEQUENCE GENERATOR
UP/DOWN COUNTER
PARALLEL LOAD CLOCK PULSE
LOOP STATUS CHECK
RADAR SYSTEM
VOLTAGE TUNED OSCILLATOR
REFERENCE FREQUENCY GENERATOR
17
18
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31
15
19
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11
14
16

1. A phase lock loop control system for switching rapidly between predetermined frequencies, comprising:

a voltage controlled oscillator having a coarse tuning port and a fine tuning port,

a digital to analog converter operative to apply an analog voltage to the coarse tuning port in accordance with a digital word applied to its input,

a reference frequency generator,

first means to generate an output in response to the locking of the phase of the oscillator with the reference frequency generator,

comparator means to compare the voltage on the fine tuning port with a predetermined voltage indicative of zero error,

a memory means for storing a plurality of said digital words, each of which corresponds to a single predetermined frequency, said memory means being connected to apply selectively addressed digital words to the digital to analog converter,

an up/down counter operative when activated to change the value of each stored digital word in a selected direction,

second means including the output of the first means and the comparison means to indicate the direction of error of the fine tuning voltage with respect to the zero error reference voltage, and

sequencing means operative to activate the counter to change the value of each selected digital word by one increment in accordance with the indication of the second means.

4,099,138
CHEMICALLY FUELED LASER

William Q. Jeffers, Florissant; John Daniel Kelley, St. Louis, and Charles E. Wiswall, Hazelwood, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation of Ser. No. 473,695, May 28, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,273

Int. Cl.² H01S *3/00*

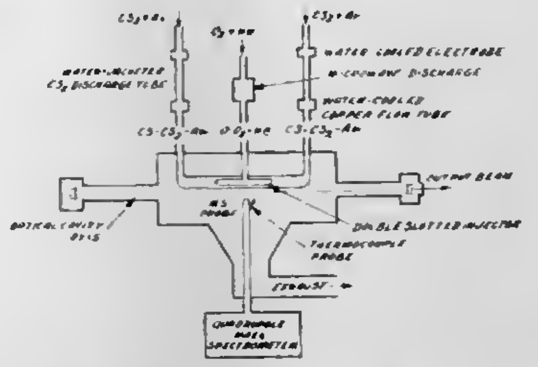
U.S. Cl. 331—94.5 P **2 Claims**

1. A method of producing a CO chemical laser which exhibits an increased rate of pumping reaction and reduced heating of the laser medium as compared with the use of CS_2 alone as fuel at the same molar flow rate, comprising the steps of:

A. producing a fuel which is a mixture of CS and CS_2 by dissociating CS_2 and feeding said fuel to a reaction chamber, said fuel having a CS/CS_2 ratio of at least 0.3,

B. simultaneously providing oxygen atoms in said reaction chamber,

C. reacting said fuel and said oxygen atoms to produce carbon monoxide in an active laser state,



D. and producing a laser beam from said carbon monoxide, said laser having a power output higher than the twofold increase expected from using CS rather than CS_2 as the fuel source at the same molar flow rate.

4,099,139
POWER AMPLIFIER CIRCUIT

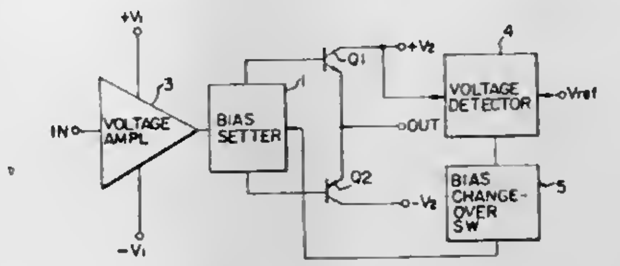
Kenro Oguri, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 8, 1977, Ser. No. 766,593

Claims priority, application Japan, Feb. 10, 1976, 51-12883

Int. Cl.² H03F *3/04*

U.S. Cl. 330—298 **6 Claims**



1. In a dual operational mode power amplifier of the type comprising a voltage amplifier, a current amplifier receptive at an input port of signals from said voltage amplifier, and change over means for selectively changing the voltage supply level and bias condition of said current amplifier to establish thereby the operational mode of said power amplifier, the improvement wherein said change over means comprises:

means for detecting the level of said current amplifier supply voltage level and generating a signal in accordance with the relative magnitude of said supply voltage level and a reference level; and

means responsive to said detecting means signal for establishing said current amplifier bias condition, such that changes in said biasing are effected only when said supply voltage level is in predetermined relation to said reference level, whereby excess currents in said current amplifier are avoided.

4,099,140

CHEMICAL LASER PROCESS AND APPARATUS

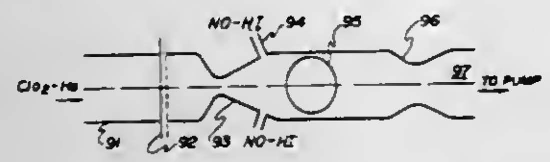
David R. Snelling, Ste-Foy; Robert D. Suart, and Kenneth D. Foster, both of Lac Beauport, all of Canada, assignors to Minister of National Defence, Ottawa, Canada

Filed Mar. 15, 1976, Ser. No. 667,260

Claims priority, application Canada, Mar. 14, 1975, 222092; Jan. 13, 1976, 243453

Int. Cl.² H01S *3/095*

U.S. Cl. 331—94.5 G **5 Claims**



1. A continuous wave chemical laser comprising:
(1) a channel defining a confined flow path, said channel containing a gaseous mixture consisting of the reactant gases hydrogen halide, nitric oxide and chlorine dioxide;
(2) an optical resonator cavity disposed in the said flow path;
(3) supply means for supplying the said reactant gases hydrogen halide, nitric oxide and chlorine dioxide, said halide being selected from the group consisting of hydrogen bromide and hydrogen iodide, said gases being respectively contained in said supply means;
(4) generating means for generating an excited gaseous lasing medium, said generating means consisting of first injecting means for injecting said nitric oxide into the channel flow path upstream of the optical cavity, and second separate injecting means for separately injecting said hydrogen halide and said chlorine dioxide into the channel flow path upstream of the optical cavity, wherein the nitric oxide reacts with the chlorine dioxide to produce chlorine atoms, which atoms in turn react with the hydrogen halide to form hydrogen chloride, said hydrogen chloride being at a sufficient elevated energy level that the population of some of the energy states are inverted, wherein the resulting gaseous medium is laseable and the sequence of injection of the hydrogen halide is such that the reaction of the said hydrogen halide with the said chlorine atoms is in a time period which is less than the time period for 63% loss of the chlorine atoms by recombining into chlorine molecules; and
(5) exhaust means for exhausting gases from the flow path downstream of the optical cavity.

4,099,141

LASER GENERATOR

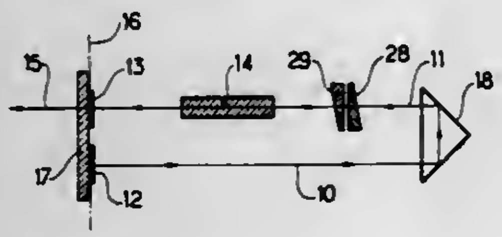
Michèle Leblanc, Orsay; Guy Ripart, Le Plessis Robinson, and Albert Brule, Issy-les-Moulineaux, all of France, assignors to Compagnie Industrielle des Lasers, Marcoussis, France

Filed Mar. 17, 1976, Ser. No. 667,799

Claims priority, application France, Apr. 3, 1975, 75 10410

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 C **4 Claims**



1. Laser generator comprising:
an optical resonant cavity of the folded type, limited by two plane mirrors, a first totally reflecting mirror and a second partly transparent mirror;
an active material arranged inside said cavity;
means for exciting that active material, suitable for generating an oscillating radiation in said cavity, a part of the radiation being able to emerge from said cavity through said second mirror to form a laser beam; characterized in that said two plane mirrors are arranged side by side substantially in the same plane, the reflecting faces of those mirrors being situated on the same side of that plane and in that said generator comprises a corner cube reflector arranged to send back, by successive reflections on the faces of that reflector, the radiation coming from one of said two plane mirrors towards the other mirror, said two plane mirrors being arranged so that their planes form, together, a small predetermined angle.

4,099,142

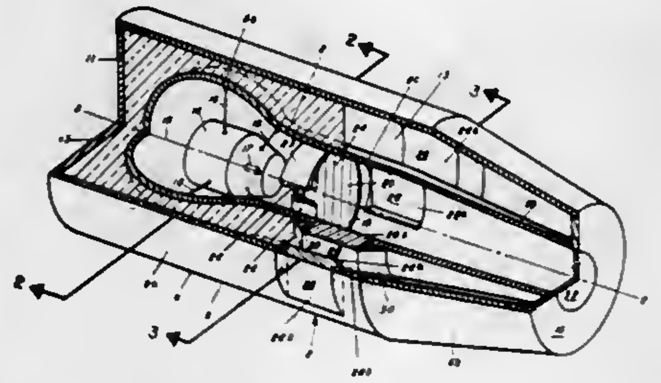
CONDENSED EXPLOSIVE GAS DYNAMIC LASER

Joseph Hershkowitz, West Caldwell, and Mary Y. DeWolf Lanzerotti, Morristown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 549,579, Feb. 13, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,661

Int. Cl.² H01S *3/095*

U.S. Cl. 331—94.5 G **14 Claims**



1. A method of forming a CO_2 lasting medium having a population inversion therein, comprising the steps of:
detonating a condensed explosive mixture consisting of at least one nonhydrogenous organic explosive compound containing carbon, nitrogen and oxygen and aluminum powder in a confining chamber, to produce explosion products constituting a predominantly gaseous medium therein including CO_2 and N_2 gases; and
directing the explosion products produced by said detonation through a nozzle and an expansion region in said chamber;
the percentage of said aluminum powder in said explosive mixture ranging from 7.5% to 17.5% and being effective to produce a pressure in said nozzle of not more than 10 atmospheres at a temperature of at least 1100° K, and to make the relaxation time τ_u of the upper lasing level, the characteristic expansion time τ_E of said lasing medium and the relaxation time τ_l of the lower lasing level satisfy the condition

$$\tau_u > \tau_E > \tau_l$$

whereby a population inversion is produced in said expansion region.

4,099,143

GAS RECIRCULATING STABILIZED LASER

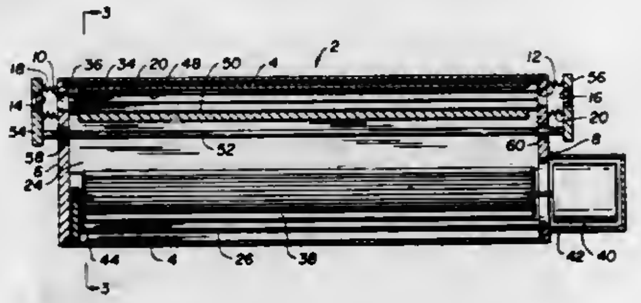
Jack D. Foster, Los Altos, Calif., assignor to Universal Laser Corp., Los Altos, Calif.

Filed Jan. 14, 1977, Ser. No. 759,460

Int. Cl.² H01S *3/086*

U.S. Cl. 331—94.5 C **6 Claims**

1. A recirculating gas laser comprising
a closed chamber containing a gas and having mirror means positioned adjacent longitudinal end portions thereof, said mirror means being mutually opposed and aligned along an optical axis to define the resonant laser cavity therebetween;
means defining a closed loop fluid path for recirculation of said gas within said chamber, a portion of said path extending transversely of said optical axis;
means for moving said gas in a predetermined direction along said fluid path;
means for producing an electrical discharge in said gas in a direction extending generally transversely of said gas movement and extending generally transversely of said optical axis;



heat exchanger means interposed in said fluid path, whereby the gas may be cooled after being heated by passage through the electric discharge;
means for supporting said opposed mirrors, at least a portion of said mirror support means extending longitudinally of said chamber and being positioned within a portion of said fluid path which receives said heat exchanger-cooled gas prior to said gas being recirculated through said electric discharge; and
means for mounting said mirror support means to said chamber while substantially isolating said support means from expansion and contraction of said chamber.

4,099,144

INJECTION-LOCKED ULTRA-HIGH FREQUENCY SOLID-STATE OSCILLATOR

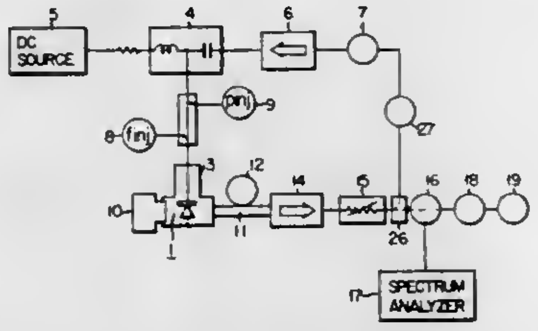
Hiroshi Okamoto, Tokyo, and Mutsuo Ikeda, Tachikawa, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Apr. 20, 1977, Ser. No. 789,220

Claims priority, application Japan, Apr. 26, 1976, 51-47469; Aug. 3, 1976, 51-92656

Int. Cl.² H03B *7/14*

U.S. Cl. 331—107 R **9 Claims**



1. An injection-locked ultra-high frequency solid-state oscillator comprising a solid-state oscillator including an oscillating element operative at ultra-high frequency; a bias supplying circuit connected to said solid-state oscillator for supplying bias current to said oscillating element; a low-frequency signal source connected to said solid-state oscillator for generating a low-frequency output power which is injected into said solid-state oscillator element through said bias supplying circuit; and a high-Q cavity resonator located in the vicinity of said solid-state oscillator body, having its resonant frequency in the vicinity of the frequency of one of sideband-waves produced accompanying an oscillation-wave from said solid-state oscillator when supplying the low-frequency signal, and trapping said one of the sideband waves.

4,099,145

MICROWAVE MODE TRANSDUCER

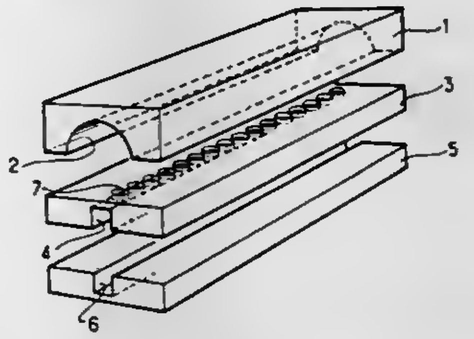
Jean-Pierre Boujet, Chatillon, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Sep. 16, 1976, Ser. No. 723,856

Claims priority, application France, Sep. 24, 1975, 75 29258

Int. Cl.² H01P *1/16*

U.S. Cl. 333—21 R **6 Claims**



1. A microwave mode transducer comprising a semi-circular wave guide, a rectangular wave guide coupled on its small side to the semi-circular wave guide, the improvement wherein: said semi-circular wave guide being devoid of a planar diametrical wall, one of the walls delimiting the small side of the rectangular wave guide constitutes the plane wall of the semi-circular wave guide, and said plane wall is pierced with orifices approximately joined to each other and opening commonly to said semi-circular wave guide, and being of a crosswise dimension approximately equal to the small side of the rectangular wave guide to constitute the coupling wall between the two guides.

4,099,146

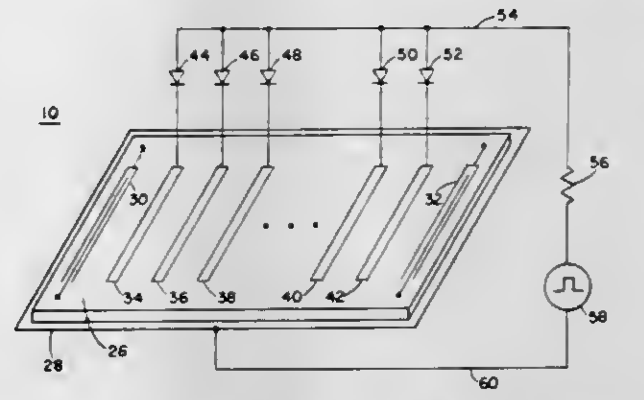
ACOUSTIC WAVE STORAGE CONVOLVER

Adrian J. DeVries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 4, 1977, Ser. No. 784,292

Int. Cl.² H03H *9/26, 9/30;* **G06G** *7/19;* **H03H** *9/02*

U.S. Cl. 333—30 R **10 Claims**



1. In an acoustic wave storage system of the type having means comprising a plurality of signal sampling elements disposed in association with the surface of an acoustic wave propagating medium for sampling surface waves propagated along said surface having an acoustic wavelength d_0 and having means for storing the values of said sampled surface waves for subsequent processing, the improvements wherein said elements are spaced for sampling said surface waves at succes-

sive points along said surface separated by substantially $(n/2 + \frac{1}{4})\, d_0$, where n is an integer.

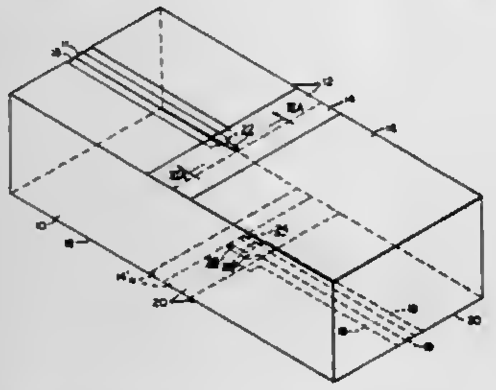
4,099,147
BULK ACOUSTIC DELAY DEVICE

Bruce R. McAvoy, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 2, 1977, Ser. No. 792,835

Int. Cl.^{2} H03H *9/26, 9/30;* **H01L** *41/04*

U.S. Cl. 333—30 R *6* **Claims**



1. Electroacoustic apparatus for delaying signals comprising:

a substrate having an upper and lower surface,
said substrate comprised of material suitable for propagating bulk acoustic waves,
a first transducer mounted on said upper surface for generating bulk acoustic waves toward said lower surface,
said first transducer electrode dimensions being of such size to provide a predetermined diffraction in said bulk acoustic waves,
said lower surface being planar and positioned to reflect the bulk acoustic waves incident upon said lower surface;
means for coupling an input signal to said first transducer,
a second transducer mounted on said upper surface and positioned for receiving bulk acoustic waves reflected from said lower surface and having a first acoustical path length from said first transducer to said second transducer for a bulk acoustic wave reflected twice from said lower surface,
a third transducer mounted on said upper surface and positioned for receiving only bulk acoustic waves reflected two or more times from said lower surface and spaced from said first transducer to provide a second acoustical path length from said first transducer to said third transducer for a bulk acoustic wave reflected twice from said lower surface,
said first and second acoustical path lengths being different to provide a phase difference of the bulk acoustic wave reflected two times from said lower surface and received at said second and third transducer, and
means for electrically coupling said second and third transducers to provide an output signal having a double transit response and an attenuated quadruple transit response due to the phase difference of the received bulk acoustic wave.

4,099,148
TRANSVERSAL FILTER PRIME SEQUENCE FREQUENCY SYNTHESIZER

James M. Alsup, and Harper J. Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

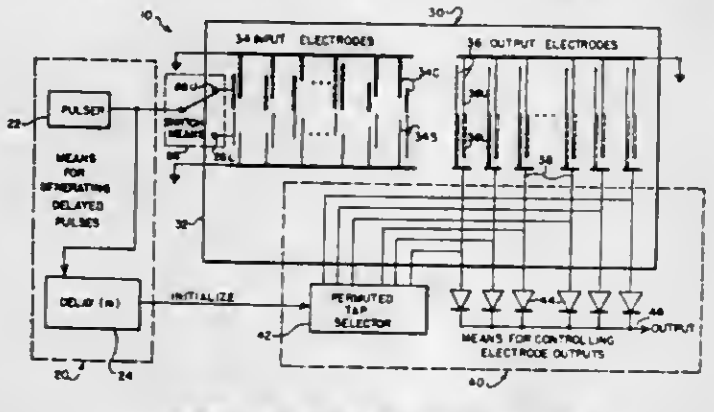
Filed May 2, 1977, Ser. No. 793,218

Int. Cl.^{2} H03H *9/04, 9/26, 9/30;* **H01L** *41/10*

U.S. Cl. 333—70 T **10 Claims**

1. A frequency synthesizer, for use with a means for generating two sequences of electrical pulses, one sequence having a delay with respect to the other, comprising:

a surface acoustic wave device, adapted to receive one of the sequences of electrical pulses from the generating means, comprising:
a substrate;
a first set of interdigitated electrodes, disposed on the surface of the substrate, the electrodes receiving the electrical pulses and transducing them to acoustic waves, which traverse the surface of the substrate, the lengths of the electrodes being configured as a function of m, where m is defined by the relation $m = R^n \bmod P$, where P is a prime number, R is a primitive root of P, and $n = 1, 2, \ldots, (P-1)$; and
a second set of interdigitated electrodes, approximately $P-1$ in number, disposed on the surface of the substrate, the electrodes of the first and second sets being parallel, the second set of electrodes being so disposed as to receive the acoustic waves generated by the first set of electrodes, and transduce them back to electrical signals, which are conducted on a set of leads connected to the electrodes;
the input and output electrodes being so disposed with respect to each other that the signal received from the top parts of the output electrodes has a phase shift 90°, at a frequency f_0, with respect to the phase shift of the signal received from the bottom parts of the output electrodes;
means adapted to receive pulses from the electrical pulse generating means, which selectively receives the electrical signals from the second set of electrodes, the receiving means having as an output a signal whose frequency is determined by the particular cyclic shift of the order in which the signals are received from the second set of electrodes.



TRANSVERSAL FILTER PRIME SEQUENCE FREQUENCY SYNTHESIZER

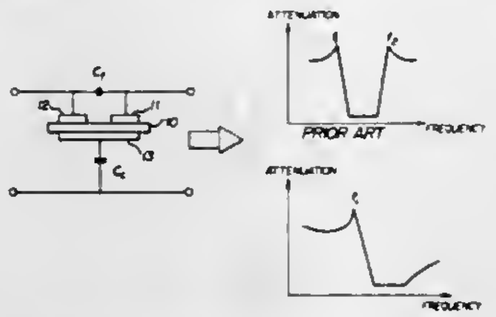
4,099,149
SINGLE SIDE BAND MONOLITHIC CRYSTAL FILTER

Henry Kai-Hen Yee, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 20, 1977, Ser. No. 789,267

Int. Cl.^{2} H03H *9/26, 9/32, 9/20, 9/04*

U.S. Cl. 333—72 **6 Claims**



1. A monolithic bandpass filter unit having an upper and a lower stopband comprising a monolithic piezoelectric crystal substrate having two adjacent electrodes on one surface thereof constituting two bilateral terminals of said filter unit, and a common electrode on the other surface opposite said two electrodes; a coupling capacitor between said two adjacent electrodes; and a capacitor interconnecting said one common electrode and a common terminal of said filter unit having a predetermined capacitance value to substantially cancel intracrystal coupling in said monolithic piezoelectric crystal substrate, and to introduce a pair of finite poles in only one of said upper and lower stopbands of said monolithic bandpass filter unit.

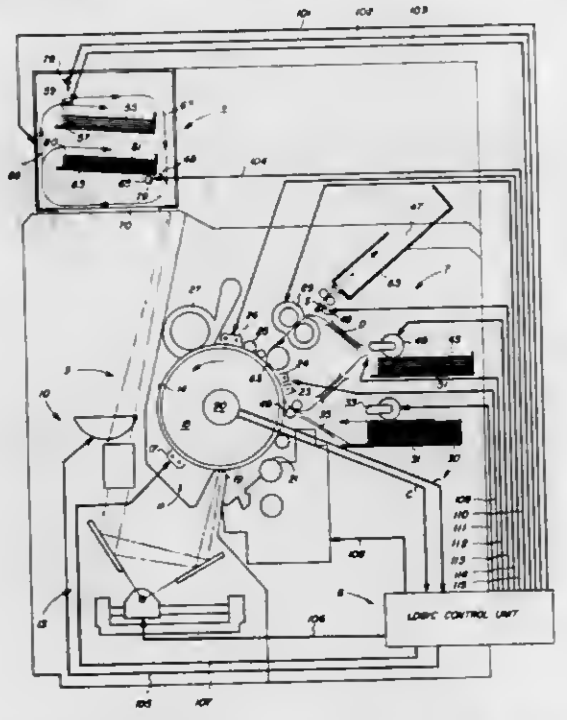
4,099,150
APPARATUS FOR PRODUCING DUPLEX COLLATED COPIES

John Lyman Connin, Canandaigua, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,937

Int. Cl.^{2} G03G *15/00;* **G03B** *27/32, 27/46;* **B65H** *5/26*

U.S. Cl. 355—3 R **14 Claims**



7. A convenience copier for copying multi-page masters, the masters and copies including a pluarity of support sheets having first and second sides, said copier comprising:

electrophotographic processing means for establishing image-wise distributions of marking particles and for transferring the distributions to copy support sheets, said processing means including a photoconductor, a corona-charger for sensitizing the photoconductor, an imaging device for exposing the photoconductor to form a latent image therein, a developing device for applying marking particles to the latent image and transfer means for transferring the marking particles from said photoconductor to the copy support sheets;
collating means for presenting the masters to said processing means, said collating means including first and second hoppers for receiving the master sheets in a stack, means for circulating the master sheets one-after-another, and once for each exposure, from said second hopper to the exposure platen for copying and back to said second hopper, said circulating means maintaining the sequence of the master in said second hopper after each circulation of the matters, and means for circulating the master sheets one-after-another from said second hopper to said first hopper and back to said second hopper, said last-mentioned means including a stacker-refeeder for inverting the master sheets returned to said second hopper; and
duplexing means for presenting the copy sheets to said processing means, said copy sheet presenting means including first, second and third hoppers, means for circulating the copy sheets one-after-another from said first hopper to said transfer means and then to said second hopper, means for feeding the copy sheets one-after-another from said second hopper to said transfer means and then to said third hopper, and means for inverting the copy sheets between said first and third hoppers.

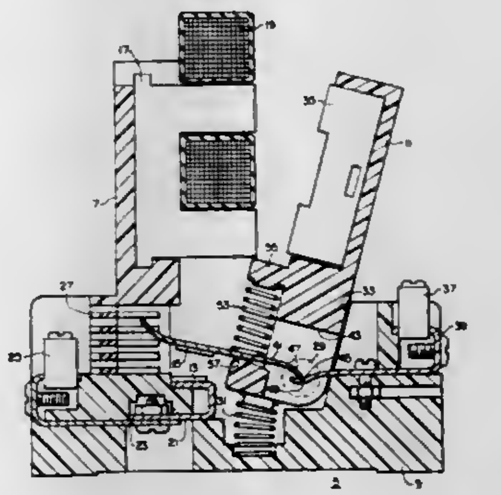
4,099,151
ELECTROMAGNETIC CONTACTOR

Kurt A. Grunert, Beaver; John P. Conner, Brighton Township, Beaver County, and Stephen S. Dobrosielski, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1977, Ser. No. 782,478

Int. Cl.^{2} H01H *3/46*

U.S. Cl. 335—189 **7 Claims**



1. An electromagnetic contactor comprising an insulating housing, a stationary contact structure within the housing, a movable contact structure within the housing and movable between open and closed positions relative to the stationary contact structure, support means for supporting the movable contact structure and pivotally mounted for movement between said positions, first bias means for holding the support means in one of said positions, electromagnetic means comprising a magnetic armature, a magnetic core, and a coil for actuating the support means to the other of said positions, one of the magnetic armature and the core being on the housing and the other of them being on the support means, the movable contact structure comprising a contact arm and a conductor, and a shuntless, pivotal, electrical connection between the contact arm and the conductor.

4,099,152
HEATER ATTACHMENT DEVICE FOR A WALL-MOUNTED THERMOSTAT

Robert A. Nichols, Xenia, Ohio, assignor to Fuel Sentry Corp., Mount Vernon, N.Y.

Continuation of Ser. No. 518,368, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 367,862, Jun. 7, 1973, Pat. No. 3,849,753. This application Mar. 16, 1976, Ser. No. 667,518

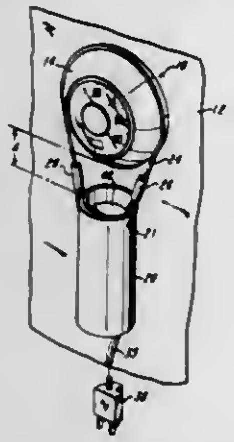
The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.^{2} H01H *61/02*

U.S. Cl. 337—102 **6 Claims**

1. For use with a thermostat projecting outwardly from a vertical wall surface of a room and having a temperature sensing element responsive to a preset air temperature for controlling a heating system which heats the room, a heating attachment device for providing a controlled reduction in the operation of the heating system to lower the room temperature below said preset air temperature, said heating attachment device comprising an elongated housing having an air passage at each end to provide a chimney effect when said elongated housing is in a substantially vertical position, means for supporting said housing in a substantially vertical position below the temperature sensing element of said thermostat, an electrical heating element electrically isolated from all of the electrical circuitry of said thermostat, means for supporting said electrical heating element within said housing for producing a

chimney-like upward current of heated air through said housing to the temperature sensing element of said thermostat, means for varying the amount of heated air flowing towards the temperature sensing element of said thermostat whereby the heating system is controlled so that the room temperature is a controlled number of degrees lower than the preset air temperature when said electrical heating element is electrically energized, and means for connecting said electrical heating element to an electrical power supply for electrically energizing said electrical heating element when the room temperature is to be lowered.



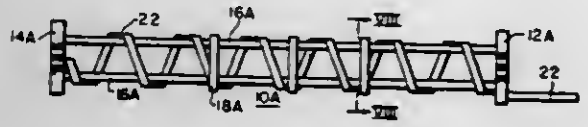
4,099,153
GAS EVOLVING CLAMP FOR CURRENT LIMITING FUSE

Frank L. Cameron, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 665,137

Int. Cl.^{2} H01H *85/04, 85/14*

U.S. Cl. 337—159 **6 Claims**



1. A current limiting fuse, comprising:
a. fuse housing means having an internal cavity;
b. spaced ferrule means disposed upon said fuse housing means for interconnection with external circuit means and for communicating with said internal cavity;
c. a plurality of longitudinally oriented radically spaced non-gas evolving electrically insulating rods disposed within said internal cavity for supporting a fuse element means thereon;
d. fuse element means disposed within said internal cavity and wound around said rods and in electrical contact with said spaced ferrule means for fusing when a predetermined amount of electrical current is passed therethrough and for limiting said current to thus protect said external circuit means;
e. pulverulent arc quenching material disposed within a substantial portion of said internal cavity for absorbing energy from said fuse element means during a fusing operation; and
f. a gas evolving member disposed within said internal cavity in physical contact with said fuse element means and proximate to said support means for providing a region where gas is evolved during a fusing operation for quenching the electric arc which occurs during fusing, said generated gas being generally expelled from said region to thus keep said region generally free from fused pulverulent arc quenching material after said fusing operation has been completed to thus deter the restriking of said arc therein.

4,099,154
STARTING RELAY CASING FOR MOTORCOMPRESSORS

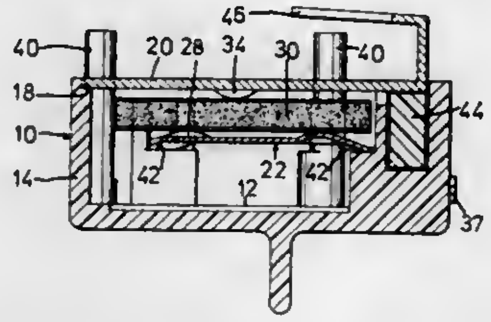
Alfredo Bar, Pavia, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

Filed Jun. 24, 1977, Ser. No. 809,760

Claims priority, application Italy, Jul. 2, 1976, 42910 A/76

Int. Cl.^{2} H01C *13/00, 7/02*

U.S. Cl. 338—220 **1 Claim**



1. Starting relay casing of molded plastic material for a monophase motor of motorcompressor assembly for refrigerating apparatuses, comprising a bottom wall and a side wall attached thereto, fitting within said walls, a lower contact plate having three vertexes uniformly distributed about the periphery thereof to which are attached three feet, a positive temperature coefficient resistance having a disc shape resting on said lower plate and an upper contact plate closing said casing and pressing against the upper surface of said disc, said side wall defining on the inside thereof, at a predetermined distance from said bottom wall, three ledges upon which may rest said three feet, said side wall also defining spaces therein for said feet to rest directly on said bottom wall, when said lower plate is alternatively positioned.

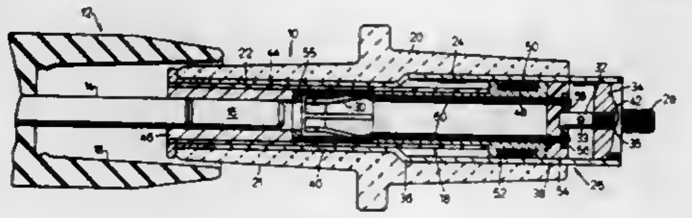
4,099,155
GAS ACTUATED HIGH VOLTAGE BUSHING

Richard P. Flatt, Oconomowoc, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Nov. 10, 1976, Ser. No. 740,375

Int. Cl.^{2} H01H *85/14*

U.S. Cl. 337—249 **9 Claims**



1. A gas-actuated high voltage bushing comprising:
a dielectric housing,
a bore contact,
an electrically conductive member in said housing supporting said bore contact for axial movement in said housing,
fusible means in said housing connected to said bore contact and to said conductive member, and electrically conductive means carried by said bore contact for conducting normal current flow around said fusible means to said conductive member, said fusible means fusing in response to fault current flow for increasing the pressure within said housing to move said bore contact axially in said bushing.

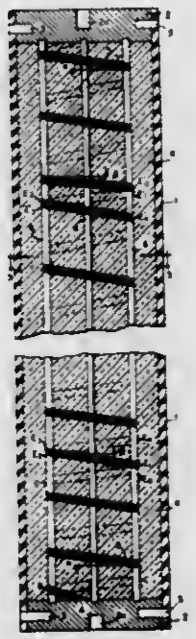
4,099,156
ELECTRIC FUSE CAPABLE OF INTERRUPTING SMALL CURRENTS

Erwin Salzer, Waban, Mass., assignor to Gould Inc., Newburyport, Mass.

Filed Mar. 23, 1977, Ser. No. 780,353

Int. Cl.^{2} H01H *85/04*

U.S. Cl. 337—290 **3 Claims**



1. An electric fuse calling for series multibreaks for the interruption of small overload currents including
(a) a tubular casing of electric insulating material;
(b) a pair of terminal elements closing the ends of said casing;
(c) a granular quartz filler inside said casing;
(d) a plurality of fusible elements conductively interconnecting said pair of terminal elements, said plurality of fusible elements being electrically connected in parallel, wound helically in rectangular turns around a common geometrical axis and embedded in said quartz filler; and
(e) the pitch of said turns remote from said pair of terminal elements being less than the pitch of said turns adjacent said terminal elements whereby series multibreaks are produced at regions of said reduced pitch following initiation of an arc adjacent the centers of said group of fusible elements.

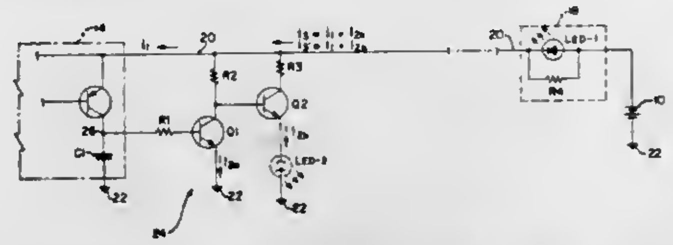
4,099,157
SINGLE WIRE POWER/SIGNAL SYSTEM FOR VEHICLE AUXILIARY DEVICES

Robert S. Enabnit, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 22, 1976, Ser. No. 753,660

Int. Cl.^{2} B60Q *1/00*

U.S. Cl. 340—52 F **7 Claims**



1. In a vehicle electrical system including a source of D.C. power, monitoring means providing an output signal indicative of a monitored condition, and a single wire line interconnecting the source and monitoring means such that line current provides continual power to the monitoring means with ground return through the vehicle frame, apparatus providing information indicative of the monitored condition using the single connecting line comprising:
A. A loading circuit connected and responsive to the output signal from the monitoring means and connected to the single interconnecting line to draw a line current of a first magnitude when the monitored condition and signal status are normal and a line current of a second magnitude when the monitored condition and signal status are abnormal; and
B. An indicator circuit connected in the line remote from the monitoring means and responsive to the magnitude of the line current such that a change in the magnitude switches the indicator to an alternate state for an indication of the abnormal monitored condition.

4,099,158
ELECTRONIC BURGLAR ALARM FOR VEHICLES

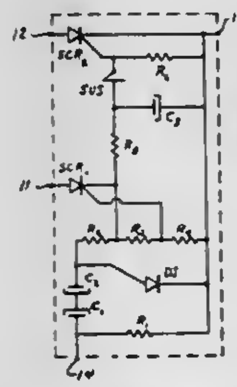
Efstathios Demetres Grammenopoulos, Rua Dr. Martinico Prado 90, apto 124, Sao Paulo, Brazil

Filed May 12, 1977, Ser. No. 796,426

Claims priority, application Brazil, Aug. 2, 1976, 7605037

Int. Cl.^{2} B60R *25/10*

U.S. Cl. 340—63 **7 Claims**



1. A solid state control unit that is adapted for use in an alarm system comprising a switch that is operated upon entry, a load connected to a voltage source and a security switch, said unit comprising:
a pair of first and second controlled diodes (SCR_1 and SCR_2);
a first control circuit connected to the gate of said first controlled diode (SCR_1) and including means for triggering said first controlled diode to conduct a current through the security switch, and a second control circuit connected to the gate of said second controlled diode (SCR_2) and including delay means permitting an interruption of said first and second control circuits by opening the secutiry switch prior to triggering of said second controlled diode;
the cathode of said first controlled diode being connected to the second control circuit to energize said second control circuit when said first controlled diode is conductive.

4,099,159
LIGHT SIGNALLING DEVICE FOR BICYCLES

Anthony J. Windisch, 3882 Walsh, St. Louis, Mo. 63116

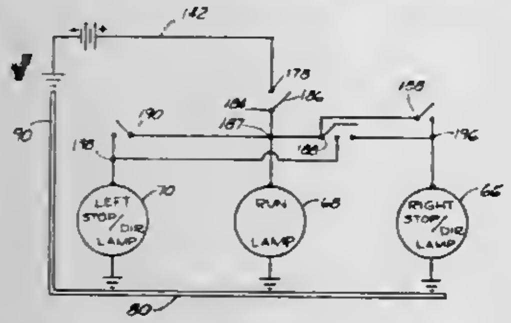
Continuation-in-part of Ser. No. 661,952, Feb. 27, 1976, Pat. No. 4,020,458. This application Mar. 15, 1977, Ser. No. 777,634

Int. Cl.^{2} B60Q *1/00;* H01H *3/16*

U.S. Cl. 340—134 **6 Claims**

1. A light signalling device for bicycles comprising, in combination:
a. a housing
b. a cover mounted on the housing;
c. a plurality of light penetrable portion in the cover including a center portion separating an adjacent portion left of cenfer and an adjacent portion right of center;
d. a plurality of light emitting lamp means mounted in the housing for separately illuminating each light penetrable portion;

e. a power source in the housing;
f. multi-positionable switch means connected for controlling illumination of the light penetrable portions in various arrays and positionable for:
  1. simultaneously interrupting illumination of each portion;
  2. illuminating only the center portion;
  3. simultaneously illuminating all portions;



  4. simultaneously illuminating the center portion and the portion to the right of the center portion; and
  5. simultaneously illuminating the center portion and the portion to the left of the center portion; and
g. means in the housing for retaining the lamp means in position and for electrically interconnecting the ground portion of each lamp with the ground portion of the power source.

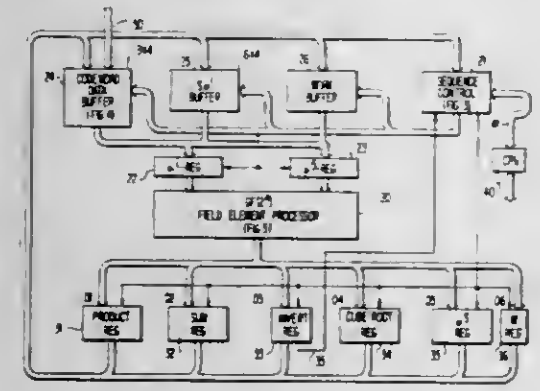
4,099,160
ERROR LOCATION APPARATUS AND METHODS

Howard Lang Flagg, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,645

Int. Cl.^{2} G06F *11/12*

U.S. Cl. 340—146.1 AL **2 Claims**



1. For an error locating decoder, means receiving a given number of data symbols and 2N check symbols, N being a positive integer, means generating 2N error syndrome signals using said received symbols and based upon a predetermined generator polynomial;
means including generator polynomial means receiving said data and 2N check symbols for indicating the number of symbols in error, up to N symbols in error;
the improvement being an error location apparatus, in combination:
means realizing an affine polynomial for receiving said 2N syndrome signals to generate a predetermined number of root symbol signals;
means selecting said root symbol signals exhibiting a predetermined Trace function; and
means combining said selected root symbol signals with said syndrome signals to indicate error location.

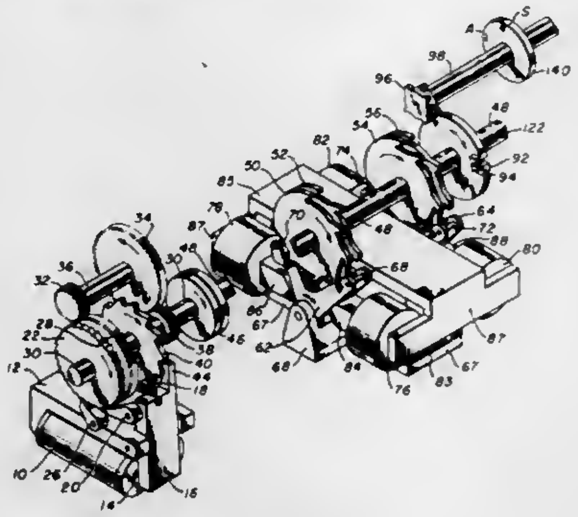
4,099,161
CODE OPERATED DEVICE

Raymood A. Wolski, New Britain, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Apr. 1, 1977, Ser. No. 783,869

Int. Cl.^{2} H04Q *3/00*

U.S. Cl. 340—147 R **26 Claims**



1. A code operated device including:
code means for storing a predetermined code;
lock means forming part of said code means;
locking means associated with said code means;
first actuating means for positioning said locking means relative to said code means in accordance with coded signals delivered to said first actuating means;
second actuating means for positioning said code means in response to actuating signals delivered to said second actuating means in synchronism with coded signals delivered to said first actuating means;
said locking means being positioned out of locking interference with said lock means upon delivery of a predetermined proper sequence of coded signals to said second actuating means, and said locking means coming into locking engagement with said lock means upon delivery of an improper coded signal to said second actuating means; and
output means coupled to said code means to perform an output function upon completion of receipt by said second actuating means of a predetermined proper sequence of coded signals.

4,099,162
DECODER CIRCUIT

Paul-Werner voo Basse, Wolfratshauseo-Farchet, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munieh, Germany

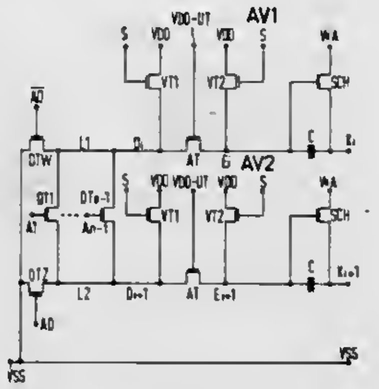
Filed Dec. 9, 1976, Ser. No. 749,010

Claims priority, applicatioo Fed. Rep. of Germany, Dec. 18, 1975, 2557165

Int. Cl.^{2} G11C *5/02;* H03K *13/243*

U.S. Cl. 340—166 R **4 Claims**

1. A decoder circuit for a storage module including storage oells constructed from MOS transistors connected between word lines and bit lines, comprising:
decoder transistors each including two terminal controlled paths and a control input for receiving an address signal of *n* address signals in negated and non-negated form;
a decoder output connected to one terminal of each of said controlled paths for providing a decoder output signal;
said decoder transistors comprising $n-1$ first decoder transistors arranged with their controlled paths in parallel;
a connection line connecting one terminal of each of said controlled paths of the $n-1$ first decoder transistors;
a second decoder transistor including a control input for receiving one of said address signals in negated form and a controlled path connected between the connection line and the operating voltage;
a second connection line connected to the other terminal of each of said $n-1$ first decoder transistors; and



a third decoder transistor including a control input for receiving said one address signal in non-negated form and a controlled path connected between the operating voltage and said second connection line,
said first and second connection lines defining respectively a decoder output line for selection of a word/bit line.

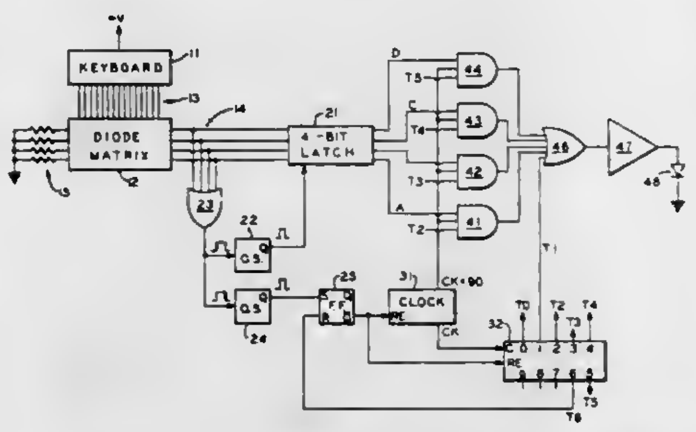
4,099,163
METHOD AND APPARATUS FOR DIGITAL DATA TRANSMISSION IN TELEVISION RECEIVER REMOTE CONTROL SYSTEMS

David W. Worley, and Paul D. Filliman, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 29, 1976, Ser. No. 671,204

Int. Cl.^{2} H04Q *9/14*

U.S. Cl. 340—168 B **3 Claims**



1. In a remote control transmitter of the kind suitable for remotely controlling a television receiver, apparatus for converting parallel digital coded signals to serial digital coded signals comprising:
a source of parallel digital coded signals;
a digital clock for producing first and second clock signals, said two clock signals being substantially identical in waveform and frequency and phase displaced from each other by 90 electrical degrees;
a digital counter for sequentially producing a plurality of enabling signals in response to said first clock signal, each enabling signal having a duration equal to one full cycle of said first clock signal;
sequential gating means for sequentially gating a sync pulse and a plurality of data pulses to a common output, said sync pulse being gated during a first of said enabling signals, said parallel digital signals being gated sequentially during second subsequent enabling signals by said second clock signal.

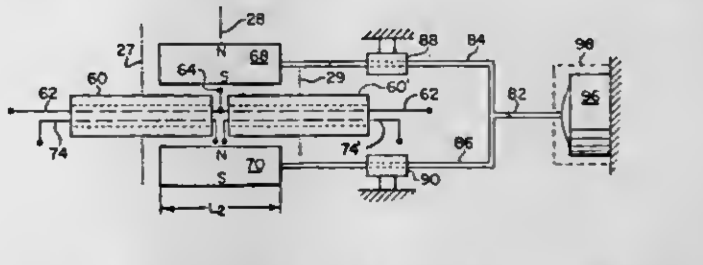
4,099,164
SENSORS FOR SENSING A PLURALITY OF PARAMETERS

Edward F. Sldor, Lombard, Ill.; Charles C. Camillo, La Jolla, Calif., and Glenn W. Bowen, Northbrook, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 668,093, Mar. 18, 1976. This application Feb. 28, 1977, Ser. No. 772,807

Int. Cl.^{2} G08C *19/06*

U.S. Cl. 340—197 **2 Claims**



1. A sensing device comprising first and second inductively wound magnetic cores having different inductance vs. ambient temperature characteristics so that the inductance vs. ambient temperature characteristics of the two cores intersect at a temperature which is to be sensed, a source of voltage coupled to said inductively wound cores, sensing means coupled to said cores to detect when said inductances of said cores are approximately equal, permanent magnet means positionable adjacent said cores, and a pressure responsive control means responsive to a pressure condition for positioning said magnet means relative to said cores.

4,099,165
FIRE DETECTION APPARATUS IN A PREHEATER

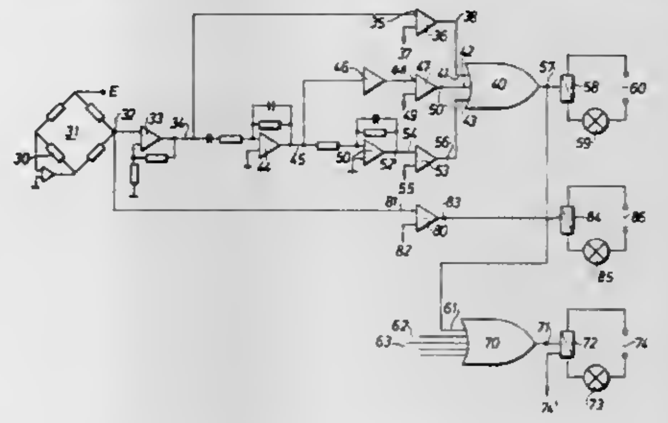
Trygve Botnen, Nacka, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed Dec. 16, 1976, Ser. No. 751,214

Claims priority, application United Kingdom, Dec. 19, 1975, 52114/75

Int. Cl.^{2} G08B *17/06*

U.S. Cl. 340—589 **9 Claims**



1. Fire detection apparatus in a preheater comprising:
a preheater housing (18) having an air duct (20) and an exhaust duct (22);
a mass of heat absorbent material in said housing;
means for imparting a relative rotation between the mass of material and the ducts;
a plurality of temperature sensitive detectors (30) for sensing the temperature of radially adjacent sections (16) of the material in said housing (18), each of said detectors producing a signal proportional to the temperature in its respective section (16); and
at least one indicating means coupled to said detectors and actuated by said detector signals for indicating when a rate of change of the temperature in any of said sections is in excess of a predetermined rate of change, said indicating means comprising:

a differentiating means (44) connected to said detectors for producing an output signal proportional to the derivative or rate of change of the input signal thereto;

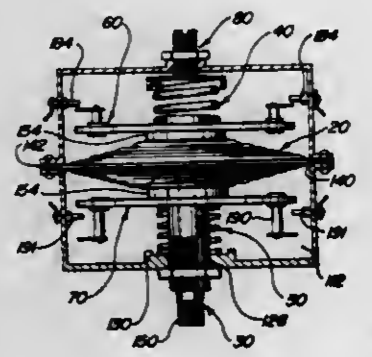
a low-pass filter means (50) coupled to receive said output signal of said differentiating means, said low-pass filter means having a large time constant as compared with the time constant of said detectors for producing a low-pass filter output signal;

comparator means (53) coupled to receive said low-pass filter output signal and for producing a further signal at its output (56) when said low-pass filter output signal exceeds a predetermined value; and

a signalling device coupled to said comparator means for signalling when said low-pass filter output signal exceeds said predetermined value.

4,099,166
FUEL SAFETY SWITCH

Charles Elbert Robinson, Livermore, Colo. 80536
Filed Jun. 1, 1976, Ser. No. 691,901
Int. Cl.² G08B *21/00*
U.S. Cl. 340—626 **7 Claims**



1. A fuel safety switch interconnected with the fuel delivery system of a motor and with the motor brake retarders, said fuel delivery system containing pressurized fuel, said fuel safety switch comprising:

means connected to said delivery system for extending said pressurized fuel,

a bellows having an internal cavity in fluid-tight communication with said extending means and receptive of said pressurized fuel for expanding and contracting in response to the pressure of said fuel,

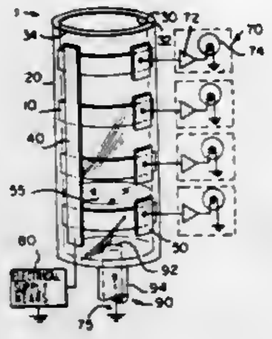
at least one spring responsive to said expansion of said bellows for biasing against said bellows, said biasing means further comprising means cooperative with said spring for adjusting the degree of the tension in said spring, and

means operative with said bellows for activating said brake retarders only wben said bellows is substantially contracted.

4,099,167
CAPACITIVE MEANS FOR MEASURING THE LEVEL OF A LIQUID

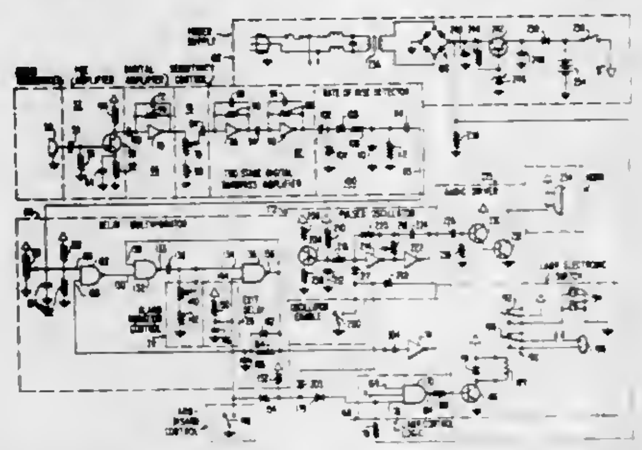
Daniel L Pomerantz, Lexington, and Louis M. Sandler, North Reading, both of Mass., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Feb. 10, 1977, Ser. No. 767,533
Int. Cl.² G08B *21/00;* G01F *23/00*
U.S. Cl. 340—620 **27 Claims**

1. A capacitive means for measuring the level of a liquid comprising a container at least a portion of which comprises dielectric material, at least one cluster of at least two electrodes each of which is disposed on an outer surface of said portion of said container, a means electrically coupled to at least one of said electrodes of said cluster for supplying an electrical signal thereto, and a means for shunting said electrical signal to ground potential when said liquid is in close proximity to at least one of said electrodes of said cluster.



4,099,168
INTRUSION ALARM AND EMERGENCY ILLUMINATION APPARATUS AND METHOD

Fred Dennis Kedjierski, Margate, and John Baillie, Ft. Lauderdale, both of Fla., assignors to Magnum Products, Inc., Ft. Lauderdale, Fla.
Filed Nov. 6, 1975, Ser. No. 629,664
Int. Cl.² G08B *13/22*
U.S. Cl. 340—517 **18 Claims**



1. An intrusion alarm and emergency illumination apparatus comprising:

an audible alarm;

an illumination device;

means for detecting sounds with waveforms having a relatively fast increase in amplitude as is associated with sharp noises such as pops, clicks, and the sounds of impact or breaking of wood, metal or glass and for producing an output signal in response thereto; and,

circuit means for energizing said illumination device and sounding said audible alarm in response to said output signal.

4,099,169
ALARM DEVICE FOR DETAINING USER

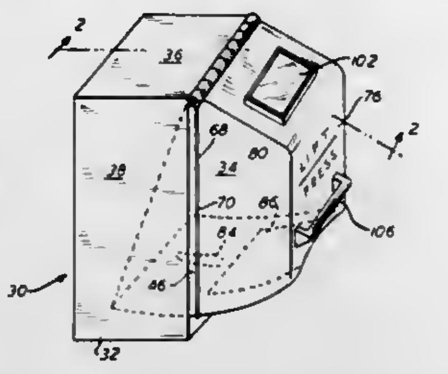
Robert J. Donnelly, 28 Grandview Ave., Suffern, N.Y. 10901
Filed Jul. 8, 1974, Ser. No. 486,475
Int. Cl.² G08B *25/00*
U.S. Cl. 340—304 **57 Claims**

1. An alarm providing device of the type requiring manual operation by the user and employing a source of electrical power, said alarm comprising:

(a) secondary signal means for providing a secondary signal in response to the manual operation;

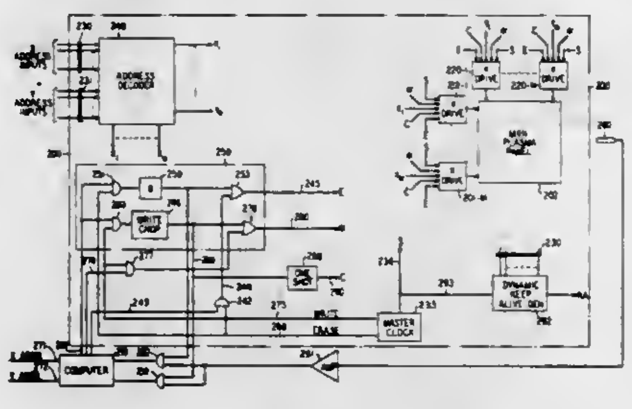
(b) means for detaining the user of the device; and

(c) primary signal means, responsive to said detaining means, and operative in dependence upon said response of said secondary signal means, for providing a primary signal upon the user being detained by said detaining means; said primary signal being indicative of the alarm.



4,099,170
LIGHT PEN DETECTION FOR PLASMA PANELS USING SPECIALLY TIMED AND SHAPED SCAN PULSES

Stephen Raymond Maliszewski, Leonardo, and Peter Dinh-Tuan Ngo, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Continuation-in-part of Ser. No. 599,766, Jul. 28, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 726,534
Int. Cl.² H01J *17/48*
U.S. Cl. 340—324 M **12 Claims**



1. Display apparatus comprising

an array of plasma discharge display cells,

sustain means for applying alternating polarity sustain signals to each of said cells, said sustain signals adding the memory signals stored in ON cells in said array to cause glow discharges thereat and to maintain said ON cells in the ON state, and

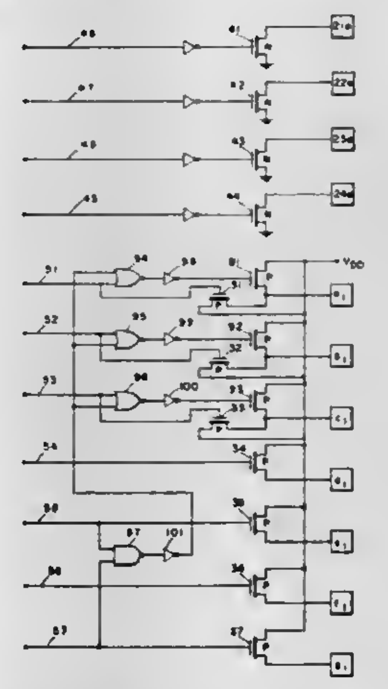
scan write means for applying a scan write pulse of a first polarity to at least a selected one of said cells, said scan write pulse having a predetermined magnitude sufficient to cause a glow discharge at said selected cell if it is in the OFF state, said scan write pulse having a predetermined duration, and said scan write pulse terminating at a predetermined time prior to the initiation of a respective one of said sustain signals of a second polarity,

said selected cell having a first flashing range if a pulse applied thereto has said predetermined duration, and terminates at said predetermined time and has an abrupt trailing edge, said selected cell further having a second flashing range if apulse applied thereto has said predetermined duration, terminates at said predetermined time and has a nonabrupt trailing edge, said first flashing range being greater than said second flashing range,

said scan write means characterized in that said predetermined magnitude lies within said first flashing range, and in that said scan write pulse has an abrupt trailing edge.

4,099,171
BRIGHTNESS CONTROL IN AN LED DISPLAY DEVICE

John Evert Meyer, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Jan. 28, 1977, Ser. No. 763,298
Int. Cl.² G09F *9/32*
U.S. Cl. 340—335 **28 Claims**



1. An LED display device, comprising;

a plurality of digit sections, each of which includes a plurality of LED segments in an array for providing illuminated displays of selected alphanumeric characters;

first circuit means for separately enabling each of the digit sections for display in response to a different predetermined first input signal; and

second circuit means for separately enabling given LED segments in a given digit section simultaneously for displaying a selected character in response to a predetermined combination of second input signals;

whereby the given LED segments in the given digit section are enabled to display the selected character in response to predetermined combinations of first and second input signals;

wherein the improvement comprises;

control means for controlling the amount of energy provided to each given digit section for illumination of the given LED segments in accordance with the selection of the character to be displayed by the given digit section as indicated by the second input signals, to compensate for apparent dimness in digit sections having more segments illuminated than others.

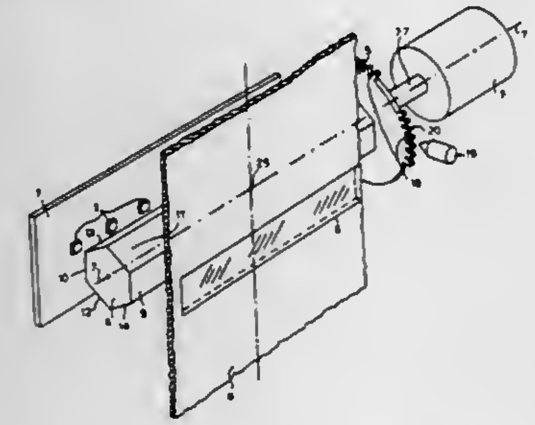
4,099,172
ELECTRONIC VISUAL DISPLAY UNIT FOR ALPHANUMERIC CHARACTERS

Lucio Montanari, Cascinette d'Ivrea (Turin), and Guido Florentino, Ivrea (Turin), both of Italy, assignors to Ing. C. Olivette & C., S.p.A., Ivrea (Turin), Italy
Filed Jul. 6, 1976, Ser. No. 702,790
Claims priority, application Italy, Jul. 11, 1975, 68807 A/75
Int. Cl.² H05B *33/00;* G09F *9/32*
U.S. Cl. 340—336 **13 Claims**

1. An electronic visual display unit for displaying alphanumeric characters in at least one display cell each defined by one dot matrix, each dot matrix comprising a number of dots, said unit comprising:

modulatable means for irradiating light including at least one light source for each individual display cell, wherein the number of dots in each dot matrix being greater than the number of light sources associated therewith;

scanning means receptive of the light from the light sources of each display cell for optically and variably deflecting directly to an observer the images of the light sources of each individual display cell in a number of successive dot positions defining a predetermined dot matrix whereby virtual images of the light sources are displayed to the observer; and



control circuit means receptive of character code signals for each display cell corresponding to characters to be displayed and synchronized to said scanning means for controlling the light irradiating means to modulate the light from the light sources for each display cell to selectively enable the irradiating of predetermined dot positions in each dot matrix corresponding to the character to be displayed in the display cell associated therewith.

4,099,173

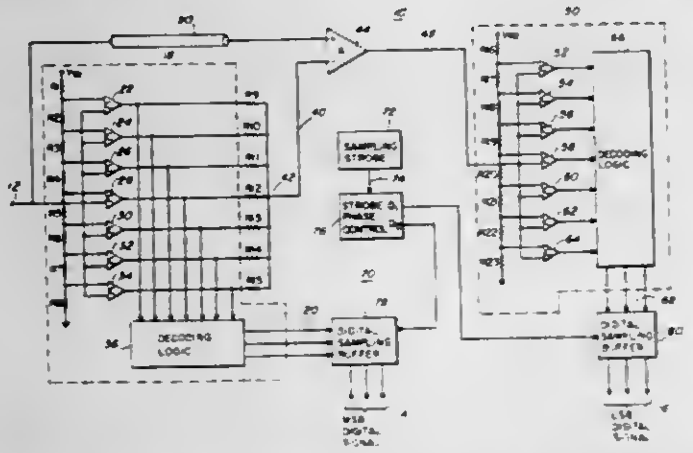
DIGITALLY SAMPLED HIGH SPEED ANALOG TO DIGITAL CONVERTER

Dale A. Zeskind, Arlington, and Bruce C. Anderson, Tewksbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 6, 1976, Ser. No. 712,445

Int. Cl.² H03K *13/175*

U.S. Cl. 340—347 AD **6 Claims**



1. A circuit for converting the amplitude of an analog signal into a digital signal including:

first analog parallel comparator means responsive to a continuously variable analog signal and a series of analog reference signals for continuously converting the amplitude of the analog signal into a portion of the digital signal representative of the most significant bits thereof;

said first analog parallel comparator means comprising

a series of analog comparators for continuously receiving the analog signal,

means for generating the first series of analog reference signals of varying amplitudes, each reference signal being coupled to one of the comparators so that each comparator continuously provides an output which distinguishes whether the amplitude of the continuously variable analog signal is greater than or less than the amplitude of the respective reference signal,

first decoder means responsive to the output of all of the comparators for continuously decoding the outputs into the most significant bits of the digital signal, and

first storage means coupled to the first decoder means and operable to sample and store the most significant bits of the continuously occurring digital signal in response to a strobe signal;

means for continuously generating an analog signal equivalent of the portion of the analog signal representative of the most significant bits of the digital signal;

subtraction means for continuously subtracting the analog signal equivalent from the analog signal to produce a continuously variable resulting analog signal representative of a fraction of the analog signal;

delay means for delaying the analog signal prior to the coupling thereof to the subtraction means to compensate for the delay in the analog signal equivalent due to the first analog parallel comparator means;

second analog parallel comparator means responsive to the resulting analog signal and a second series of analog reference signals for continuously converting the amplitude of the resulting analog signal into a portion of the digital signal representative of the least significant bits thereof;

said second analog parallel comparator means comprising

a series of analog comparators for continuously receiving the resulting analog signal,

means for generating the second series of reference signals of varying amplitudes, each reference signal being coupled to one of the comparators so that each comparator continuously provides an output which distinguishes whether the amplitude of the resulting analog signal is greater than or less than the amplitude of the respective reference signal,

second decoder means responsive to the output of all of the comparators for continuously decoding the outputs into the least significant bits of the digital signal, and

second storage means coupled to the second decoder means and operable to sample and store the least significant bits of the continuously occurring digital signal in response to a strobe signal; and

means coupled to the first and second storage means and responsive to a sampling pulse signal to apply a strobe signal to the first storage means and a strobe signal to the second storage means, the strobe signal to the second storage means being delayed with respect to the strobe signal to the first storage means to compensate for the difference in delays in the processing time of the delay means, subtraction means, and second analog comparator means and in the processing time of the first analog parallel comparator means whereby a digital signal representative of the amplitude of the analog signal is generated only at the occurrence of a sampling pulse.

4,099,174

LOGARITHMIC DIGITAL TO ANALOG CONVERTER

Lars Tommy Edvard Svensson, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 1, 1976, Ser. No. 719,508

Claims priority, application Sweden, Sep. 26, 1975, 7510801

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **3 Claims**

1. A digital to analog converter for converting a received multibit position binary word to a voltage whose amplitude ranges between negative and positive maximum values according to an expansion curve, the expansion curve consisting of a plurality of continuous substantially linear segments with each segment having a plurality of equally divided intervals, and the multibit position binary word having a first field for indicating a desired polarity, a second field for indicating a segment of the curve and a third field for indicating an interval of a segment, said converter comprising:

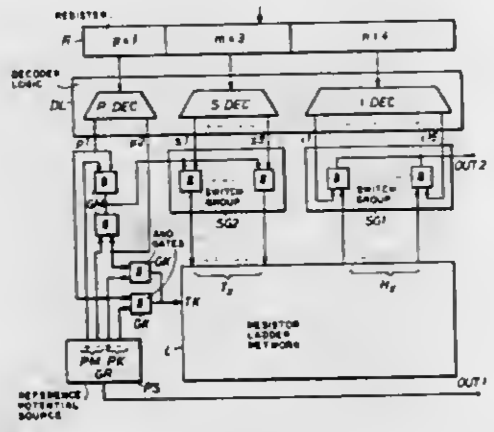
a converter input for receiving the binary words;

a converter outpt having first and second terminals;

a decoding logic means connected to said converter input for decoding binary words, said decoding logic means having a first decoder means for decoding the first field to produce polarity indicating signals on a first set of decoding logic means outputs, a second decoder means for decoding the second field to produce segment indicating signals on a second set of decoding logic means outputs, and a third decoder means for decoding the third field to produce interval indicating signals on a third set of decoding logic means outputs;

a potential source means including a source of positive and negative voltages having amplitudes directly related to said maximum values, and means connected to said first set of decoding means output terminals for emitting on a first potential-source-means output terminal one of the positive and negative voltages, a source of a compensating voltage for emitting on a second potential-source-means output terminal a compensating voltage whose polarity is determined by the signals on said first set of decoding means output terminals and a source of a reference voltage connected to the first terminal of said converter output;

a group of first switches, each of said first switches having a control input connected to one of the outputs of said second set of outputs, a voltage input connected to said first potential-source means output terminal, and an output terminal;



a group of second switches, each of said second switches having a control input connected to one of the outputs of said third set of outputs, a signal input and an output connected to the second terminal of said converter output; and

a resistor ladder network comprising a plurality of serially connected longitudinal resistors, a common bus connected to said second potential-source-means output terminal, a plurality of transverse resistors, each of said longitudinal resistors having the same resistance and each of said transverse resistors having the same resistance, each of said transverse resistors connecting one of the junctions of said longitudinal resistors to said common bus, means for connecting some of the junctions of said longitudinal resistors to an output terminal of one of said first awitches, one of said transverse resistors comprising a dividing resistor having one end connected to said common bus, a plurality of serially connected equivalued chain resistors, means for connecting one end of said plurality to the other end of said dividing resistor, means for connecting the other end of said plurality to the associated longitudinal resistor, and means for connecting each of the junctions of the resistors comprising said one transverse resistor to the signal input of one of said second switches.

4,099,175

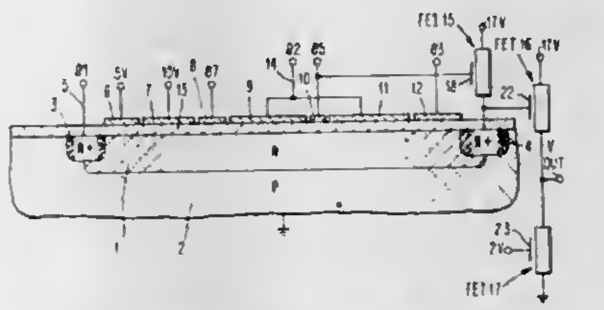
CHARGE-COUPLED DEVICE DIGITAL-TO-ANALOG CONVERTER

Barry Jay Rubin, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,970

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 DA **7 Claims**



1. A digital-to-analog converter comprising:

a semiconductor substrate,

an insulating layer on said substrate,

a source of charge carriers in said substrate,

a source of input serial digital signals, least significant digit first, said signals being applied to said source of charge carriers to produce a series of charge carriers corresponding to said input digital signals,

a first charge splitting gate on said layer,

a first control gate on said layer between said source and said first charge splitting gate,

a second charge splitting gate on said layer,

a second control gate on said layer between said first and second charge splitting gates,

a collector of charge carriers in said substrate, and

a third control gate on said layer between said second charge splitting gate and said collector,

said gates being adapted to receive a predetermined sequence of control signal pulses independent of the value of the number represented by an input digital signal whereby (1) a charge carrier corresponding to a respective one of said input signals is admitted, by action of said first control gate, to a first charge storage well beneath said first charge splitting gate, (2) said admitted charge carrier is additively combined with any charge carrier pre-existing in said well, (3) the additively combined charge carriers are equally divided, by action of said second control gate, between said first charge storage well and a second charge storage well beneath said second charge splitting gate, and (4) the divided charge carrier in said second well is admitted, by action of said third control gate, to said collector whereby serial digital-to-analog conversion is accomplished.

4,099,176

MAGNETIC KEY SWITCH HAVING A REMOVABLE SUPPORT ASSEMBLY

Victor M. Bernin, Mt. Prospect; Carl G. Knoll, Melrose Park, and Robert C. Madland, Mt. Prospect, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

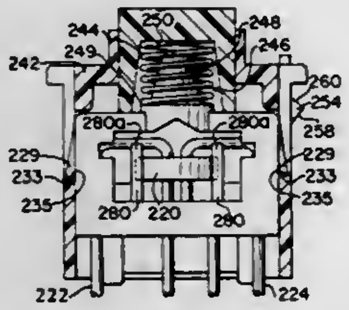
Continuation of Ser. No. 474,571, May 30, 1974, abandoned, which is a continuation of Ser. No. 388,510, Aug. 15, 1973, abandoned. This application Nov. 20, 1974, Ser. No. 525,416

Int. Cl.² H03K *17/02;* **H01C** *7/16*

U.S. Cl. 340—365 L **2 Claims**

1. A keyboard switch comprising a housing, an actuating member and at least one permanent magnet coupled to said actuating member so as to change from a first position to a second position when said actuating member is actuated, a unitary assembly comprising a toroidal shaped magnetic core, at least one drive wire threaded through said magnetic core, and a molded plastic support element for supporting said magnetic core and said drive and sense wires, said drive wires and

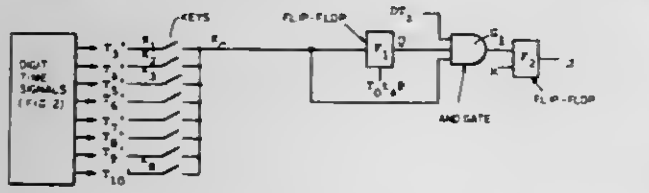
said sense wires being configurated such that said drive and sense wires may be connected to a printed circuit board, said magnetic core being magnetically saturated when said permanent magnets are in one of their positions and said magnetic core being magnetically unsaturated when said permanent magnets are in the other of their positions and said support element comprising at least one integrally formed brace member for supporting said magnetic core constructed to be flexible so as to relieve pressure on said core which would otherwise result from said molding of said support element.



4,099,177
KEYBOARD ENTRY CIRCUITRY OF THE KEY STROBING TYPE

Koji Maekawa, Yamatokoriyama, and Iwao Hamasaki, Miyazaki, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Aug. 6, 1976, Ser. No. 712,042
Claims priority, application Japan, Aug. 11, 1975, 50-97782
Int. Cl.^{2} G08C *25/00*
U.S. Cl. 340—365 E **4 Claims**



1. Keyboard entry circuitry of the key strobing type wherein one terminal of the respective keys of a keyboard is connected to receive digit time signals and the other terminals of the respective keys are connected in common whereby determinations as to which one of the keys is actuated are accomplished by sensing the digit time signal resulting from the actuated key, said key entry circuitry comprising:

first means for supplying key strobing digit time signals having different phases for the respective ones of the keys;

second means for supplying an additional digit time signal of the same fixed phase for all the respective keys; and

third means for determining coincidence with respect to both the key strobing digit time signals and the additional common digit time signal for each actuated key.

4,099,178
TEST MEANS FOR LIGHT RESPONSIVE SMOKE DETECTOR

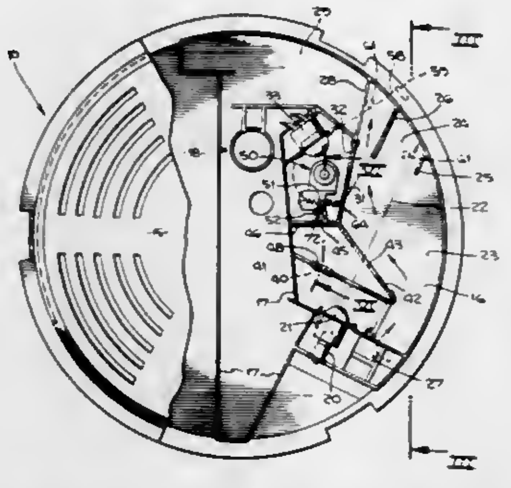
Richard D. Ranney, Hermosa Beach, and Gustav Hubert, San Gabriel, both of Calif., assignors to Emdeko International, Inc., Salt Lake City, Utah

Filed Apr. 7, 1977, Ser. No. 785,432
Int. Cl.^{2} G08B *29/00*
U.S. Cl. 340—515 **11 Claims**

1. Test means for a smoke detector device having a light source, a light responsive cell, and a smoke chamber therebetween, light from said light source being directed along a path to said smoke chamber and reflected from smoke in said chamber to said light responsive cell for activating an alarm at a selected smoke density, comprising:

means for selectively transmitting along a test light path different from said first path part of said light from said light source to said light responsive cell;

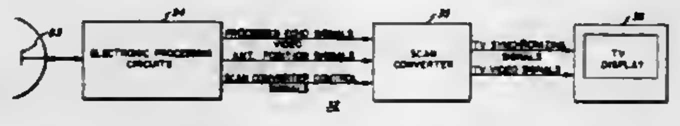
and means positioned in said test light path to modify the light being transmitted so that light reaching said light cell will cause said light cell to respond as if said preselected smoke density was in said chamber for actuating said alarm.



4,099,179
METHOD AND SYSTEM OF ELECTRONIC IMAGE STORAGE AND DISPLAY

Steven R. Hofstein, North Brunswick, N.J., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Continuation-in-part of Ser. No. 601,615, Aug. 4, 1975, Pat. No. 4,010,466. This application Nov. 16, 1976, Ser. No. 742,329
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.^{2} G01S *9/02, 7/04, 9/66;* H04N *5/30*
U.S. Cl. 343—5 SC **44 Claims**



1. A method of operating a system to display an image on a raster scan TV display wherein an incoming signal comprises a sequence of scan lines whose line rate is lower than the horizontal TV line rate within a field of the TV display, the method comprising:

selecting an incoming signal line rate to be an integer submultiple of the horizontal TV line rate; and

during each scan line of the incoming signal:

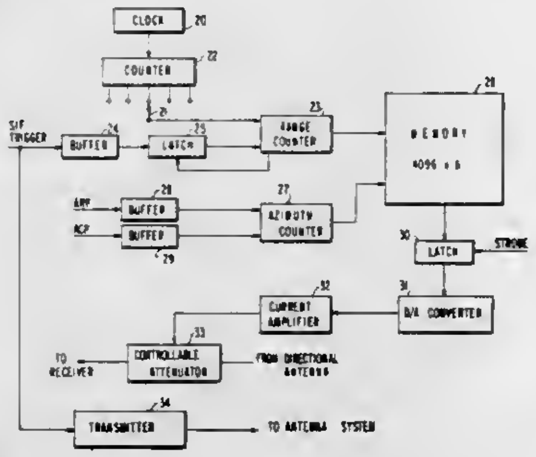
applying the incoming signal to a scan converter having a memory therein and storing the incoming signal in segments in the memory by writing each segment into the memory during the time required to scan one horizontal TV line in the field; and

scanning the memory and displaying the signal stored therein on the TV display by reading from the memory during the time required to scan the next horizontal TV line in the field to thereby write and read during alternate horizontal TV lines.

4,099,180
GEOGRAPHIC GAIN TIME CONTROL

Murray Kupersmith, Commack, and Curtis W. Symansky, Freeport, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,624
Int. Cl.^{2} G01S *9/56*
U.S. Cl. 343—6.5 R **6 Claims**



1. In an interrogator transponder system for locating targets carrying a transponder, triggered into operation by receipt of interrogation signals, with a receiver coupled to an antenna for determining target position as a function of range and azimuth as the locus of transmission of said interrogation multi-path effects to generate spurious target positions comprising:

a controllable attenuator coupled to said receiver in a signal path from said antenna,

memory means with a plurality of storage locations corresponding to a plurality of range cells, each of said storage locations storing a quantity related to the ability of multipath effects to generate a spurious reply at a corresponding range cell,

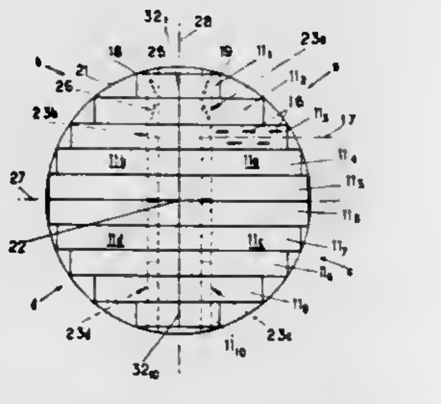
addressing means for addressing different storage locations of said memory means, and

memory output means for controlling said controllable attentuator in accordance with a quantity read from an addressed storage location.

4,099,181
FLAT RADAR ANTENNA

Antoine Scillieri, Houilles, and Jean Yves Anbry, Vancresson, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed Dec. 9, 1976, Ser. No. 749,186
Claims priority, application France, Dec. 9, 1975, 75 37622
Int. Cl.^{2} G01S *3/32*
U.S. Cl. 343—16 M **6 Claims**



5. A flat radar antenna with a center comprising:

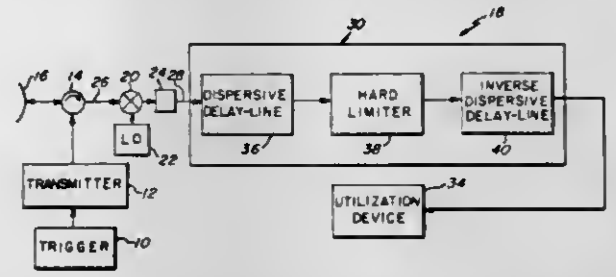
a plurality of slotted aligned waveguide elements disposed in parallel rows, with coplanar slotted radiated faces, said waveguide elements being grouped for their feeding according to four quadrants, and

four adjustable feed circuits, each connecting one of said quadrants with a common radar circuit, any given feed circuit connected to a corresponding quadrant being adapted to take on two conditions for adjusting the quantity of energy flowing between said waveguide elements and the radar apparatus circuit, a first condition in which it feeds all the waveguides in said corresponding quadrant a second condition in which it feeds only the rows nearest to the center of the antenna excluding the other waveguides in said corresponding quadrant.

4,099,182
SIGNAL RECEIVER

Harold R. Ward, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 549,585, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 329,239, Feb. 2, 1973, abandoned, which is a continuation of Ser. No. 148,560, Jun. 1, 1971, abandoned. This application Jan. 17, 1977, Ser. No. 760,196
Int. Cl.^{2} G01S *9/233*
U.S. Cl. 343—17.2 PC **2 Claims**



1. In a signal receiver for processing echo signals produced by reflections of a pulse of energy from a "point" target and from various extended background objects, the amplitude of the echo signals varying between adjacent ones of such background objects, the "point" target echo signal being characterized by an amplitude greater than the amplitude of adjacent background echo signals and a time duration smaller than the time duration of adjacent background echo signals, the combination comprising:

(a) a dispersive delay line, responsive to all echo signals, for dispersing the power in each one of the echo signals from its original time duration to a second longer time duration;

(b) hard limiter means, fed by the dispersed echo signals out of the dispersive delay line, for limiting the level of all the dispersed echo signals to normalize the gain of the receiver at a predetermined level; and

(c) an inverse dispersive delay line, fed by the limited and dispersed echo signals out of the limiter means, such inverse dispersive delay line having a time delay-frequency characteristic substantially inverse to the time delay-frequency characteristic of the dispersive delay line, each delay line having the same time-bandwidth product, for reconstituting the dispersed and limited echo signals from the second longer time duration to the original time duration.

4,099,183
SELF-DESTROYING LOCATION MARKING MEANS

Hanns H. Wolff, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1969, Ser. No. 854,809
Int. Cl.^{2} H01Q *15/18*
U.S. Cl. 343—18 B **8 Claims**

1. In a location marking system, the improvement comprising:

a radar marker, said marker being adapted to mark a selected location, said marker being adapted to contrast with said selected location so as to be readily detectable, chemically destructive means associated with said marker, said destructive means being adapted to be responsive to exposure to the environment to destroy the marking function of said marker within a predetermined time so that said marker ceases to mark said selected location after said predetermined time has elapsed,

said marker comprising a plurality of reflective elements,

said reflective elements being adapted to be placed by aircraft or missiles to mark said selected location, said destructive means comprising a destructive coating on each of said plurality of reflective elements, said coating being adapted to be activated when exposed to atmosphere, said coating being adapted to destroy the reflective properties of said reflective elements within said predetermined time after being activated, whereby signals are reflected from said marked location for a limited time only.

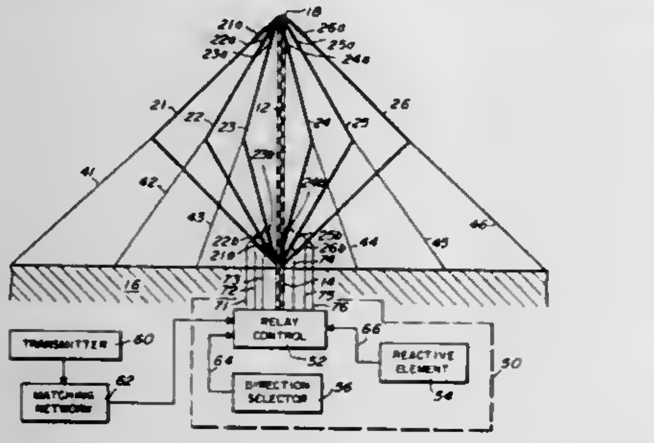
4,099,184
DIRECTIVE ANTENNA WITH REFLECTORS AND DIRECTORS

William Rapshys, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 29, 1976, Ser. No. 745,887

Int. Cl.² H01Z *21/12*

U.S. Cl. 343—875 **14 Claims**



1. A directive antenna system for radiating a signal in a selected direction comprising:

a vertically standing support means;

a plurality of antenna elements;

suspension means for suspending the elements from the support means in a predetermined spaced relationship such that each element is electrically insulated from the remaining elements and the support means;

selector means for selecting a desired radiating direction; and

control means responsive to said selector means to:

(a) apply the signal to be radiated to a predetermined pair of said antenna elements and adjust the electrical length of said elements to optimally radiate said signal,

(b) vary the electrical length of predetermined antenna elements to reflect said signal, and

(c) vary the electrical length of predetermined antenna elements to direct said signal.

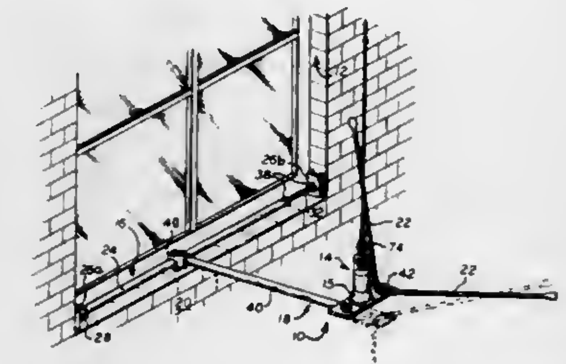
4,099,185
WINDOW MOUNT ASSEMBLY FOR VERTICAL CB ANTENNA

Morris Hacker, Bayside, and Dominick Padilla, Bronx, both of N.Y., assignors to RMS Electronics, Inc., Bronx, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,884

Int. Cl.² H01Q *21/00, 9/26, 1/08*

U.S. Cl. 343—880 **4 Claims**



1. A window mount assembly for a vertical CB antenna comprising:

(a) a bracing member adapted to be secured within a window frame;

(b) a plurality of angularly related ground plane elements for providing a ground plane for said vertical CB antenna;

(c) a boom assembly including

(i) a support member having a mount section, said supporting member being comprised of an electrically conductive material; means for securing the supporting member to said bracing member in outwardly extending relation from said window frame; and

(ii) means for securing said ground plane elements to said mount section for swivelling movement in a horizontal plane, said ground plane elements being secured to said mount section in electrical conducting relation with said supporting member, whereby said supporting member serves as an additional ground plane element; and

(d) means for removably securing said vertical CB antenna to said boom assembly substantially at the point of intersection of said angularly arranged ground plane elements, said securing means being disposed to orient said antenna vertically, whereby the swivelling of said ground plane elements in said horizontal plane will vary the directional strength of the signal radiated from said antenna.

4,099,186
MAGNETIC PRINTING PROCESS AND APPARATUS

Donald William Edwards, Wilmington, Del.; Emery John Gorondy, Chadds Ford, and Arend Van Roggen, Kennett Square, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 672,552, Mar. 31, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 771,061

Int. Cl.² G03G *19/00;* **G01D** *15/12*

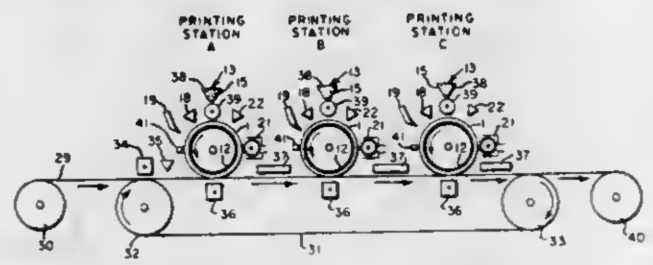
U.S. Cl. 346—74.1 **89 Claims**

1. Magnetic printing process comprising:

a. forming a magnetic image on a ferromagnetic material which is imposed on an electrically conductive support and subjecting the ferromagnetic material to the action of a charge dissipating means;

b. developing the magnetic image by decorating the image with a ferromagnetic toner comprising a ferromagnetic component, a dye and/or chemical treating agent and a water-soluble or water-solubilizable resin which substantially encapsulates the ferromagnetic component and the dye and/or chemical treating agent;

c. transferring the developed image to a substrate;



d. permanently fixing the dye and/or chemical treating agent of the image on the substrate; and

e. removing the ferromagnetic component and the resin from the image on the substrate.

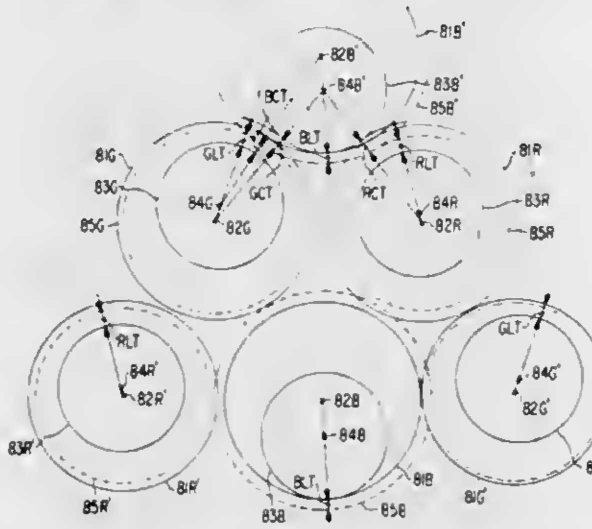
4,099,187
SHADOW MASK COLOR PICTURE TUBE HAVING A MOSAIC COLOR SCREEN WITH IMPROVED TOLERANCES

Walter David Masterton, Lititz, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 605,123, Aug. 15, 1975, abandoned, which is a division of Ser. No. 147,776, May 28, 1971, abandoned. This application Nov. 11, 1976, Ser. No. 741,057

Int. Cl.² G03B *41/00*

U.S. Cl. 354—1 **1 Claim**



1. In a pair of variable density filters for use in photoprinting a color picture tube screen, said screen comprising a mosaic of interleaved arrays of different coloremitting phosphor elements, one of said filters intended for use in printing one of the color arrays and the other of said filters intended for printing another of the color arrays, said filters having optical density variations for purposes taught in the prior art,

the improvement wherein each of said filters at at least one corresponding location thereon have modified densities to effect an enlargement of one color phosphor element of a given trio of phosphor elements and a corresponding decrease in size of another phosphor element of the same trio.

4,099,188
AUTOMATIC EXPOSURE CONTROL DEVICE FOR SINGLE LENS REFLEX CAMERA

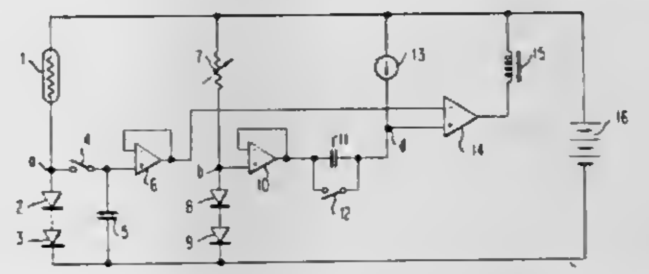
Naoyuki Uno, Urawa; Tetsuji Shono, Ranzan-machi Shiga; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 619,163, Oct. 3, 1975, abandoned, and Ser. No. 626,895, Oct. 29, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,637

Claims priority, application Japan, Oct. 29, 1974, 49-130666[U]; Oct. 9, 1974, 49-122493[U]

Int. Cl.² G03B *7/08*

U.S. Cl. 354—24 **6 Claims**



1. An automatic exposure mechanism for a single lens reflex camera of the type having stop blades for controlling the stop position of the camera, a brightness measuring element, film and shutter speed setting mechanisms, and a shutter release button for initiating picture taking operation, said automatic exposure mechanism comprising:

(a) an electromagnet,

(b) electronic circuit means for controlling said electromagnet in response to brightness of a scene to be photographed, and film speed and shutter speed settings, to alter the energization condition of said electromagnet at a time following depression of the camera shutter release button dependent upon the circuit — determined stop position of said camera's stop blades, said circuit performing a timing operation which is linearly proportional to the number of stop positions required for proper exposure,

(c) stop determining means biased to move in a predetermined direction when free to move, said means being linked to said stop blades whereby the position of said stop determining means determines the position of said stop blades,

(d) an engaging lever positioned in a normal position to prevent free movement of said stop determining means, said engaging lever being linked to said shutter release button to move away from its normal position to no longer prevent free movement of said stop determining means,

(e) magnetically controlled means responsive to said electromagnet for moving from a first position to a second position in response to said change of energization of said electromagnet, said first position permitting free movement of said stop determining means and said second position preventing free movement of said stop determining means, whereby the depression of said shutter button starts said circuit timing operation and permits free movement of said stop determining means and at the end of said time said stop determining means ceases movement and said stop blades move to a position determined by said stop determining means,

wherein said electronic circuit means comprises:

(i) photosensor means responsive to the scene brightness,

(ii) first log compression means connected in series with said photosensor means,

(iii) variable resistance means adjustable according to shutter speed and film speed,

(iv) second log compression means connected in series with said variable resistance means,

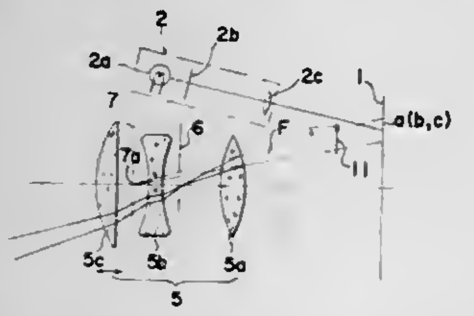
(v) timing means, including a capacitor and a constant current generator connected to said capacitor, connected to the junction of said variable resistance means and said second log compression means, and

(vi) switching means connected to the junction of said photosensor means and said first log compression means and also connected to said timing means for generating a switching signal when the output of said timing means exceeds the output at said junction of said photosensor means and said first log compression means, the time of switching t being a function of the APEX stop size A, according to the following formula:

$t = K_3(K_0 + A_v)$, where K_0 and K_3 are constants of proportionality.

4,099,189
DATA-RECORD BACKGROUND-DEFINING APPARATUS FOR DATA-RECORDING PHOTOGRAPHIC CAMERA

Makoto Kuboshima, Sagamihara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan
Filed Dec. 2, 1976, Ser. No. 746,770
Claims priority, application Japan, Dec. 2, 1975, 50-144408
Int. Cl.^{2} G03B *17/24*
U.S. Cl. 354—106 **10 Claims**



1. In a data-recording camera including a taking lens system for exposure of film material located at an exposure station to image-wise light reflected from an external scene, data specification means, and a data projection system for projection of data items at a data projection station onto a data recording area of said film material, the improvement wherein: said data projection system is independent of said taking lens system and said camera includes a data background-defining means comprising at least one blocking element and means for mounting said blocking element for movement into and out of the path of image-wise light of said taking lens system reflected from said external scene and at all times outside of the path of said data image light of said data projection system and means for shifting said blocking element from one position to the other for preventing passage of at least a portion of said external scene light rays to said data recording area of said film material; whereby, picture taking can be more freely achieved due to unrestricted optical positioning of the blocking element independent of data-record, and wherein data may be recorded on said data recording area of said film material with or without the employment of the blocking element to shield that area of said film material from light emanating from the external scene.

4,099,190
INDICATION DEVICE IN VIEWFINDER FOR A SINGLE LENS REFLEX CAMERA

Tomio Tsuruoka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Nov. 15, 1976, Ser. No. 742,065
Claims priority, application Japan, Nov. 19, 1975, 50-156230[U]
Int. Cl.^{2} G03B *13/02, 17/20*
U.S. Cl. 354—225 **5 Claims**

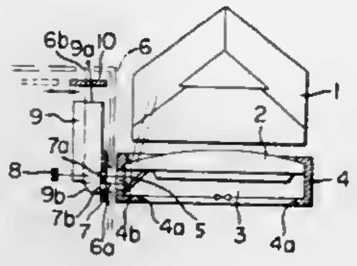
1. A single lens reflex camera comprising:

an objective lens for receiving light from the object to be photographed;

a view-finder eyepiece for observing an image of the object;

a visual field frame provided in the light path from the objective lens to determine a visual field of the view-finder eyepiece.

a view-finder optical system for guiding light from the objective lens to the view-finder eyepiece, which system includes a focusing screen member provided in the proximity of the visual field frame so that the image of the object may be formed on the focusing screen member; a condenser lens member having an extended portion out of the light path passing through the visual field frame; and a finder member for guiding light from the condenser lens member to the view-finder eyepiece;



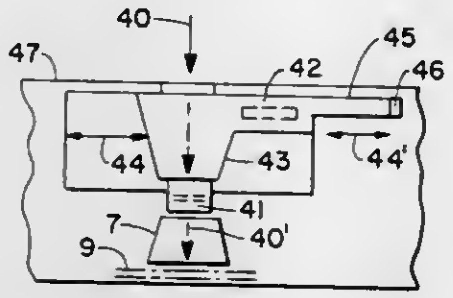
frame means for detachably mounting the view-finder eyepiece and the view-finder optical system onto the camera body;

information indicating means for indicating exposure information, which means is provided within the camera body; and

guide means for guiding the information indicated by the information indicating means to the extended portion of the condenser lens member so that the information may be made observable through the view-finder eyepiece.

4,099,191
TELESCOPIC CONVERTIBLE CAMERA

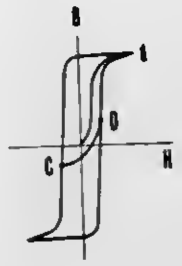
Joseph Danan, Kew-Garden, N.Y., assignor to Continental Camera Corp., Rahway, N.J.
Filed Mar. 24, 1977, Ser. No. 781,006
Int. Cl.^{2} G03B *9/08, 13/02, 9/10*
U.S. Cl. 354—226 **8 Claims**

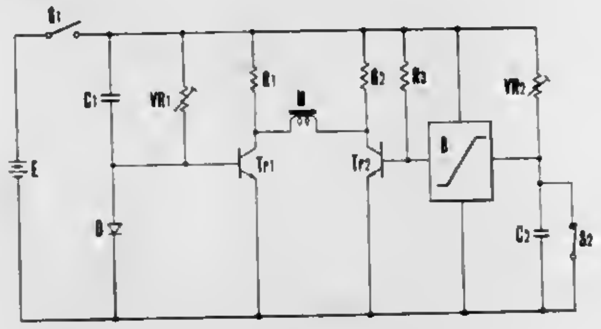


8. A camera shutter device comprising in combination: a camera means including lens means for alternately positioning between to to fro transversly lateral positions relative to a predetermined focusing point receivable of light-receiving and exposable picture film; and a door shutter means for alternately blocking focused light to the predetermined focusing point, positioned posterior to and separated from the lens means, said camera means being for the alternate taking of telescopic and non-telescopic pictures, and said door shutter means including a light barrier and a tubular light-channeling conduit-structure positioned in juxtaposition to the light-receiving and exposing position, and the light barrier being mounted within said tubular light-channeling conduit and adapted to be moved therewithin to and from the light-blocking positions.

4,099,192
PHOTOGRAPHIC CAMERA WITH AN ELECTROMAGNETIC CONTROL SYSTEM

Hiroshi Aizawa, Machida; Masanori Uchidoi, Kawasaki; Hideaki Miyakawa, Inagi; Masayoshi Yamamichi, Kawasaki; Yukio Iura, Yokosuka, and Masahisa Fukui, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 594,438, Jul. 9, 1975. This application Jan. 31, 1977, Ser. No. 764,291
Claims priority, application Japan, Jul. 12, 1974, 49-80010
Int. Cl.^{2} G03B *9/08*
U.S. Cl. 354—234 **5 Claims**





1. An electromagnetic actuating device adapted to control initiation of release of at least one internal mechanism of a photographic camera, which device comprises:

an electromagnet, having:

(a) a core made of a semihard magnetic substance having magnetizing characteristics forming a substantially rectangular hysteresis loop;

(b) coil wound around said core;

(c) an armature associated with said mechanism and arranged to be fixed in position when a magnetic flux is established in said core and to be movable with reference to said electromagnet when no magnetic flux is established in said core;

(d) biasing means for making said armature movable when there is no magnetic flux in said core;

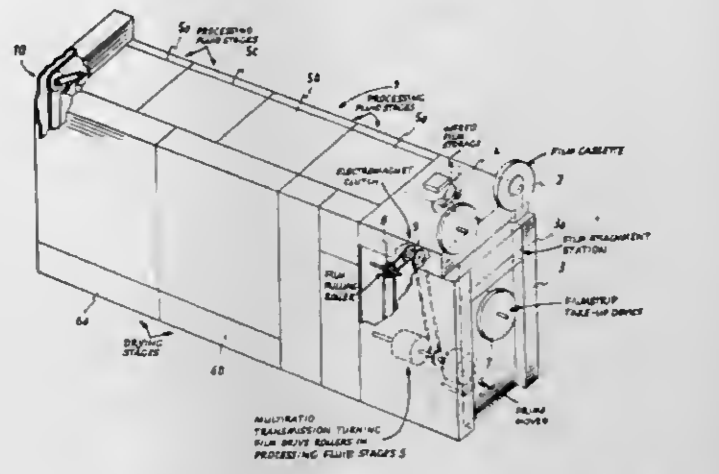
a first power supply means connected to said coil, wherein said means has a first switch and adds pulse current to said coil for only a short period of time in association with the action of said first switch to magnetize said core;

a second power supply means connected to said coil, wherein said means has a second switch and adds a pulse current, which is reverse to the pulse current from said first power supply means, to the coil in association with the action of said second switch to demagnetize said core,

whereby after said electromagnet core is maintained in the magnetized state for a period of time after the termination of the application of said actuating pulse, said deactuating pulse is applied to said coil to initiate the release of said mechanism.

4,099,193
CONTINUOUSLY OPERATING DEVELOPING MACHINE WITH FILMSTRIP TENSION CONTROL

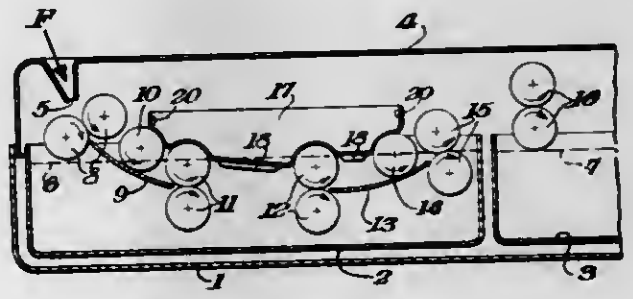
Jürgen Leuchter, Tutzing; Gerald Plursch, and Johannes Blerinckx, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Jan. 15, 1976, Ser. No. 696,294
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527559
Int. Cl.^{2} G03D *3/13*
U.S. Cl. 354—321 **15 Claims**


10
5a PROCESSING FLUID STAGES
5c
5d
PROCESSING FLUID STAGES
FILM CASSETTE
DRYING STAGES
MULTIRATIO TRANSMISSION TURNING FILM DRIVE ROLLERS IN PROCESSING FLUID STAGES 5
PRIME MOVER

1. In a continuously operating developing machine of the type comprised of at least one processing fluid stage and at least one drying stage arranged one after the other and means guiding filmstrips along a predetermined winding path through the processing fluid stages and then through the drying stages, in combination, pulling means located downstream of the most downstream drying stage and operative for pulling filmstrips through the developing machine along the predetermined path, and control means operative for controlling the operation of the pulling means in dependence upon the tension in filmstrips being pulled by the pulling means, the control means comprising tension-sensing means operative for sensing the tension in filmstrips being pulled through the developing machine at a tension-sensing location intermediate the most downstream processing fluid stage and the most upstream drying stage.

4,099,194
DEVICE FOR THE WET PROCESSING OF PHOTOSENSITIVE MATERIALS

Klaus Kümmerl, Nuremberg, Fed. Rep. of Germany, assignor to Durst AG. Fabrik Fototechnischer Apparate, Bolzano-Bozen, Italy
Filed Nov. 16, 1976, Ser. No. 742,175
Claims priority, application Italy, Nov. 20, 1975, 4858 A/75
Int. Cl.^{2} G03D *3/13*
U.S. Cl. 354—321 **6 Claims**



1. A device for the wet processing of photosensitive flexible strip or sheet material comprising a container for processing liquid, conveying rollers disposed in the container for conducting the strip or sheet material through the container and the liquid therein, at least some of the conveying rollers being

partially disposed in the liquid, characterized in that a cover piece having indentations in a lower surface is disposed in direct contact over at least a portion of the conveying rollers which are partially immersed in the liquid, the indentations in the cover piece corresponding to the surfaces of the conveying rollers with which it is disposed in contact wherein such surfaces of the conveying rollers are smoothly covered from contact with the air in the container, and at least a portion of the cover piece is constructed and arranged to be disposed below the level of the liquid in the container, whereby the liquid is shielded from oxidation from the air, and splashing out of the liquid is prevented.

4,099,195
CAMERA HAVING AUTOMATIC AND MANUAL EXPOSURE-TIME DETERMINATION

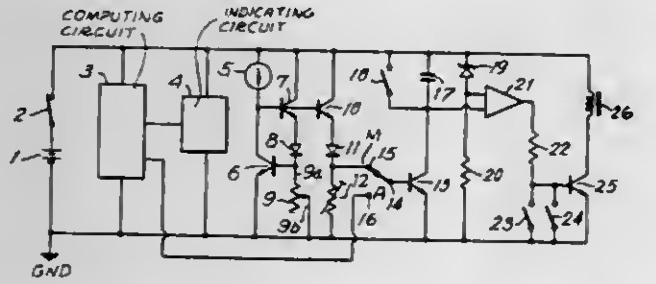
Fumio Urano, Omiya, and Yoshio Sawada, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 18, 1975, Ser. No. 641,933

Claims priority, application Japan, Dec. 27, 1974, 49-157185[U]

Int. Cl.² G03B *7/08*

U.S. Cl. 354—50 **9 Claims**



1. In a camera having an automatic exposure-time determining means which includes an electromagnet which is energized upon opening of a shutter of the camera to make an exposure and deenergized to close the shutter and terminate an exposure, the camera also having a manual exposure-time determining means including a manual-mechanical exposure-time range and a manual-electrical exposure-time range, and manually-operable means, including a single unit available to the operator to be manually moved to a selected one of a number of different positions including an automatic position, a plurality of manual-mechanical exposure-time positions, and a plurality of manual-electrical exposure-time positions, for setting the camera to make either an automatic determination of exposure time with said automatic means, when said unit is in said automatic position thereof, or a manual determination of exposure time in one of said ranges of said manual exposure-time determining means, when said unit is in a selected one of said plurality of manual-mechanical exposure-time positions or a selected one of said manual-electrical exposure-time positions, and electrical circuitry connected electrically with said electromagnet for controlling the energizing thereof, said electrical circuitry including a pair of parallel-connected switch means one of which is an automatic switch means and the other of which is a manual switch means, said automatic switch means cooperating, at all camera settings provided by said manually operable means, through said electrical circuitry with said electromagnet for assuming a position for energizing said electromagnet automatically by the time a shutter of the camera has opened, and said manual switch means being operatively connected with said manually operable means to be controlled thereby for preventing energizing of said electromagnet in said manual-mechanical range while having no influence on the control of the electromagnet in the manual-electrical range of said manual exposure-time determining means or when said manually operable means has been set to provide operation by said automatic exposure-time determining means, so that said electromagnet remains unenergized during the time when said manual switch means prevents energizing of said electromagnet in said manual-mechanical range, even though said automatic switch means assumes said position for energizing said electromagnet during the latter time.

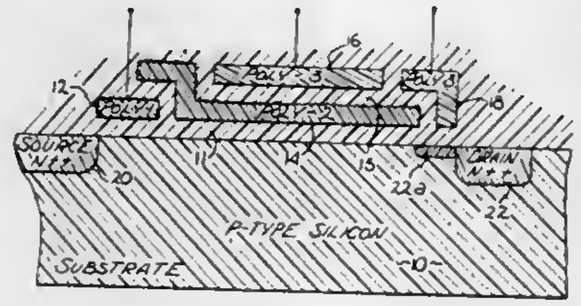
4,099,196
TRIPLE LAYER POLYSILICON CELL

Richard T. Simko, Los Altos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 29, 1977, Ser. No. 810,912

Int. Cl.² H01L *29/27*

U.S. Cl. 357—23 **12 Claims**



1. An MOS cell fabricated on a silicon substrate having three layers of polysilicon comprising:

a first gate insulated from said substrate;

a second gate comprising an electrically isolated floating gate, insulated from said substrate and from said first gate, said second gate overlapping at least a portion of said first gate;

a third gate insulated from said substrate, from said first gate and from said second gate; said third gate overlapping at least a portion of said second gate; and,

a fourth gate insulated from said substrate, from said first gate, from said second gate and from said third gate, said fourth gate overlapping at least a portion of said second gate;

whereby by the application of a potential between said first gate and said third gate, charge may be tunneled into said floating gate, and by the application of a potential between said third gate and said fourth gate, charge may be tunneled into said third gate from said second gate.

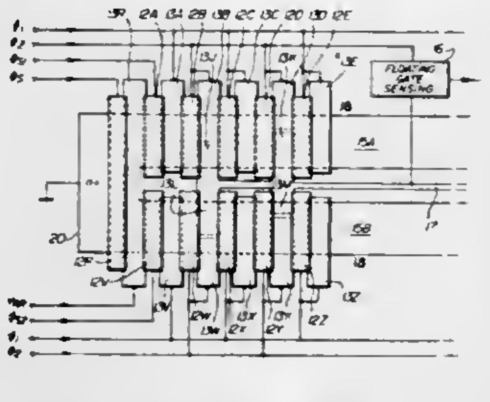
4,099,197
COMPLEMENTARY INPUT STRUCTURE FOR CHARGE COUPLED DEVICE

Abd-El-Fattah Ali Ibrahim, and Carl Neil Berglund, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 12, 1976, Ser. No. 713,661

Int. Cl.² H01L *29/78;* **G11C** *19/28;* **H03H** *7/28*

U.S. Cl. 357—24 **3 Claims**



1. A charge coupled device comprising:

a charge storage body;

a dielectric layer disposed over the body;

a pair of channels each having a plurality of electrodes disposed over the dielectric layer for controlling the sequential transfer of mobile charges along the length of each channel in said body in response to clock voltages applied thereto;

a common input electrode adjacent the head of each channel for controlling a charge of fixed magnitude in said body from an adjacent source;

each channel having a control electrode in juxtaposition with the common input electrode, and individually responsive to separate control signals for transferring a selected portion of said fixed magnitude charge to one channel and the balance of the charge to the other channel;

at least one electrode in each channel being preselectively divided into two disconnected portions by a gap along the length of the channel, to divide the charges being transferred therebeneath in preselected ratios, one portion of each of the divided electrodes in each of the pair of channels being connected in common;

whereby the total charge beneath the common portions of the divided electrodes is a function of the individual magnitude of the charges being transferred along the two channels and the relative division of each of the electrodes in the two channels.

4,099,198
PHOTOCATHODES

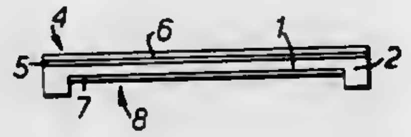
Jonathan Ross Howorth, and Peter James Pool, both of Maldon, England, assignors to English Electric Valve Company Limited, England

Filed May 14, 1976, Ser. No. 686,374

Claims priority, application United Kingdom, May 14, 1975, 20241/75

Int. Cl.² H01L *27/14*

U.S. Cl. 357—30 **9 Claims**



1. A photocathode including a membrane of p-type silicon having a first major surface for receiving illumination and a second major surface from which electrons are emitted in response to the received illumination, said first major surface comprising a surface region having a *p*+ impurity concentration, an exterior surface layer of silicon nitride overlying said surface region, and a coating on said second major surface of a material which reduces its work function.

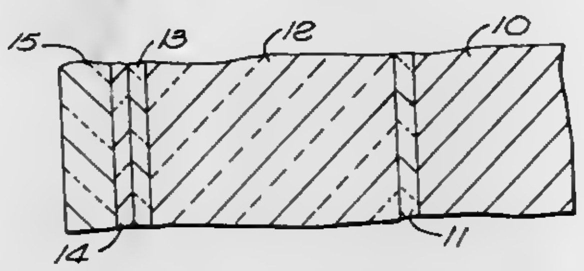
4,099,199
PHOTOVOLTAIC CELL EMPLOYING A PBO-SNO HETEROJUNCTION

David Beryle Wittry, Pasadena, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Apr. 29, 1977, Ser. No. 792,171

Int. Cl.² H01L *27/14*

U.S. Cl. 357—30 **11 Claims**



1. In a photovoltaic cell having photoconductive material disposed between first and second conducting members, the improvement according to which said photoconductive material comprises $Pb_{1-x}Sn_xO$ formed with a p-i-n heterojunction or n-i-p heterojunction, x varying in the range of 0 to 1 whereby said material decreases in PbO content from said first conducting member to said second conducting member.

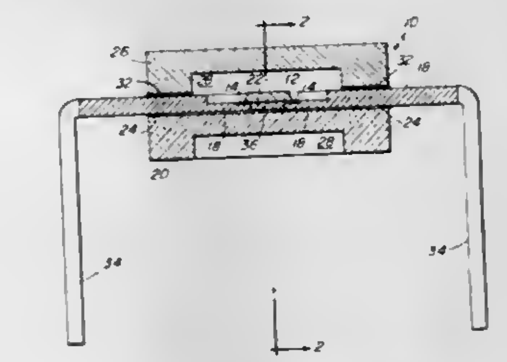
4,099,200
PACKAGE FOR SEMICONDUCTOR BEAM LEAD DEVICES

Andrew Kontalides, Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 670,927, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 554,795, Mar. 3, 1975, abandoned, which is a continuation of Ser. No. 421,004, Dec. 3, 1973, abandoned. This application Dec. 17, 1976, Ser. No. 751,496

Int. Cl.² H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—69 **5 Claims**



1. A semiconductor package comprising:

a rigid insulating support;

(b) a lead frame having a plurality of leads disposed in a plane, such lead frame being disposed on and bonded to the insulating support, each one of the plurality of leads having an end portion which extends beyond the edge of said insulating support to form a pin for insertion into an integrated circuit socket and another end portion which is thinner than the major portion of said lead, such thinner end portion being supported on the insulating support; and

(c) a semiconductor device having at least one active semiconductor element and having single, planar, beam lead conductive members of substantially uniform thickness extending beyond the edges of said device, such planar beam lead conductive members being disposed in the plane of the plurality of leads and being supported on and bonded directly to the thinner end portion of said leads.

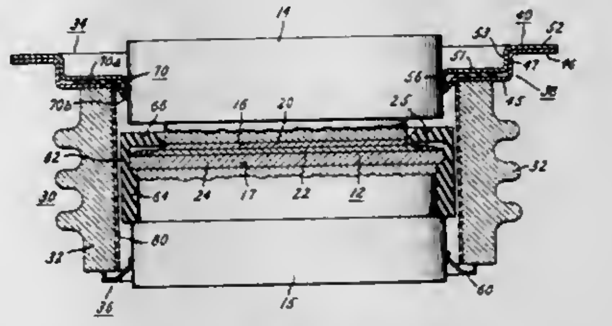
4,099,201
SEMICONDUCTOR RECTIFIER ASSEMBLY HAVING AN INSULATING MATERIAL THEREIN THAT EVOLVES GASES WHEN EXPOSED TO AN ARC

David Leonard Mueller, Media, Pa., assignor to General Electric Company, Phila., Pa.

Filed Apr. 11, 1977, Ser. No. 786,735

Int. Cl.² H01L *23/28, 23/02, 23/12*

U.S. Cl. 357—72 **10 Claims**

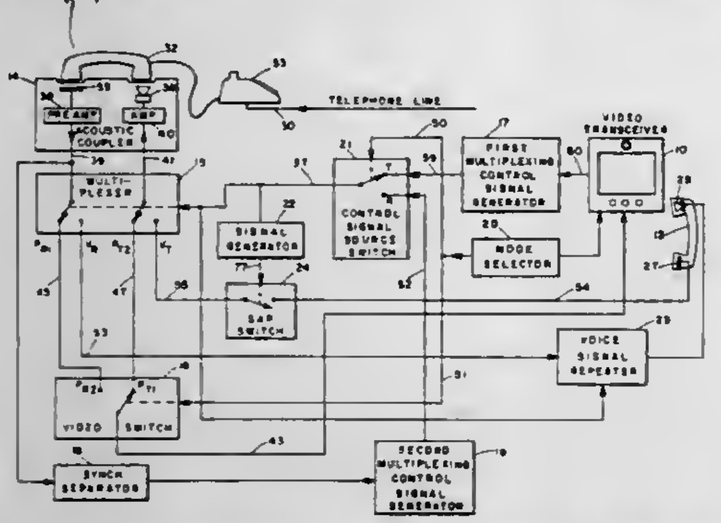


1. In a semiconductor rectifier assembly:

(a) first and second spaced-apart electroconductive posts having facing surfaces,
(b) a semiconductor body disposed mechanically between said facing surfaces and electrically in series with said posts,
(c) a sealed housing for said semiconductor body comprising: said posts, a generally cylindrical hollow insulator surrounding in radially spaced relationship said semiconductor body and those portions of said posts located adjacent to said semiconductor body, and sealing means located at axially opposed ends of said cylindrical insulator for respectively forming seals between said posts and said ends of said insulator,
(d) said sealing means at one end of said insulator comprising a pair of annular metal flanges joined together at their outer peripheries, a first one of said flanges being bonded adjacent its inner periphery to said insulator and a second one of said flanges being bonded adjacent its inner periphery to the adjacent post, and
(e) a thin annular disc of electrical insulating material having a first portion adjacent its outer periphery disposed between one end of said insulator and said second metal flange and a second portion located radially inwardly of said first portion extending between the inner periphery of said cylindrical insulator and said adjacent post, said insulating material being of a type that evolves gases when exposed to an arc.

4,099,202
MULTIPLEXED COMMUNICATION OF VOICE SIGNALS AND SLOW SCAN TELEVISION SIGNALS OVER A COMMON COMMUNICATION CHANNEL

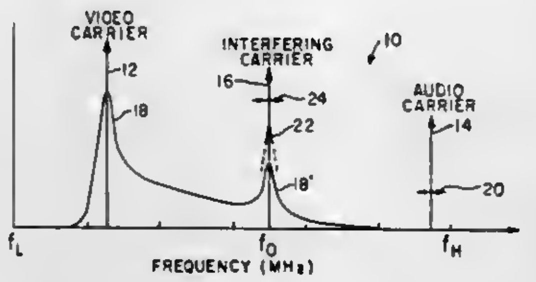
Leo Francis Cavanaugh, Dover, N.H., assignor to Robot Research, Inc., San Diego, Calif.
Filed May 2, 1977, Ser. No. 792,813
Int. Cl.² H04N *7/14*
U.S. Cl. 358—85 **12 Claims**



1. A system for coupling a video transceiver and an audio transceiver to a common communication channel for transmitting and receiving both a slow scan television signal and a voice signal over said common communication channel, wherein said slow scan television signal includes a horizontal sync pulses provided at a predetermined rate for defining a predetermined period and wherein said horizontal sync pulse and video information for a video scan line are contained within a first portion of said predetermined period, comprising
coupling means for connection to said communication channel;
multiplexng means for alternately connecting either said video transceiver or said audio transceiver to the coupling means;
means for providing a first multiplexing control signal in response to said slow scan television signal provided by said video transceiver, wherein said first multiplexing control signal has a duration corresponding to said first portion of said predetermined period;
means for detecting a horizontal sync pulse in a slow scan television signal received by the coupling means from said communication channel;
means for providing a second multiplexing control signal in response to said detector of said horizontal sync pulse, wherein the duration of said second multiplexing control signal corresponds to the duration of said first multiplexing control signal;
means for placing said video transceiver in either a receive mode for receiving slow scan television signals, or in a transmit mode for providing slow scan television signals, and for providing a mode indication signal for indicating which mode said video transceiver is in;
video switching means for connection between the said video transceiver and the multiplexing means, and responsive to said mode indication signal for connecting said video transceiver to receive slow scan television signals from the multiplexing means during said receive mode and to provide slow scan television signals to the multiplexing means during said transmit mode;
control signal source switching means connected between the multiplexing means and the means for providing said first and second multiplexing control signals, and responsive to said mode indication signal for providing said first multiplexing control signal to the multiplexing means during said transmit mode, and for providing said second multiplexing control signal to the multiplexing means during said receive mode;
wherein the multiplexing means connects said video transceiver to the coupling means during the duration of said first multiplexing control signal and during the duration of said multiplexing control signal.

4,099,203
TELEVISION SIGNAL SCRAMBLING WITH INTRODUCTION OF REPLACEMENT PROGRAM SIGNALS

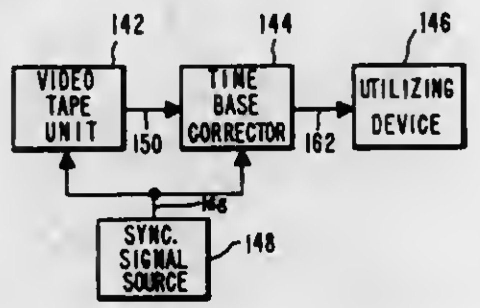
Joseph Garodnick, 1 Wall St., Fort Lee, N.J. 07024, and Joseph L. Stern, 45 Windsor Rd., Great Neck, N.Y. 11021
Filed Jan. 5, 1977, Ser. No. 756,816
Int. Cl.² H04N *1/44*
U.S. Cl. 358—118 **32 Claims**



1. In a television communication system transmitting normal program information by means of a radio frequency signal including separate frequency-spaced audio and video carrier signals, said audio and video carrier signals being modulated, respectively, with the audio and video portions of said normal program information, the method of conditioning said radio frequency signal so that said normal program information is blocked from reproduction in a television receiver having an intercarrier sound system while replacement program information including at least audio information is reproduced in place thereof, said method comprising the steps of:
generating only a single interfering carrier signal, said interfering carrier signal being at a frequency intermediate said audio and video carrier signals;
modulating said interfering carrier signal with said replacement program information; and
linearly combining the modulated interfering carrier signal with said radio frequency signal.

4,099,204
DELAY CIRCUIT

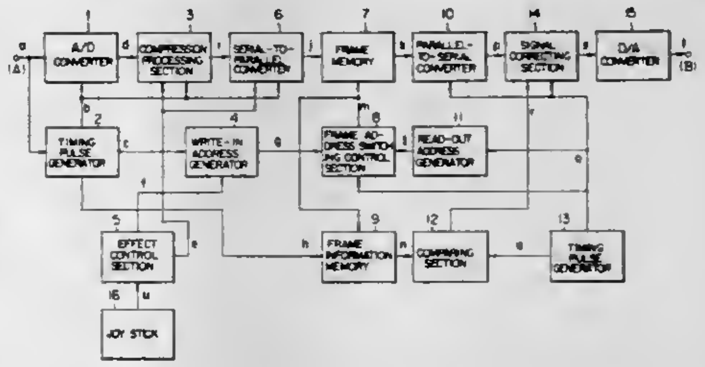
Virgil L. Lowe, and Philip V. C. Craig, both of Gainesville, Fla., assignors to Edutron Incorporated, Gainesville, Fla.
Filed Apr. 14, 1975, Ser. No. 568,029
Int. Cl.² H04N *5/04*
U.S. Cl. 358—149 **11 Claims**



3. A video signal time base corrector comprising:
input means for receiving an uncorrected video signal including a video message portion and a synchronization portion;
frequency modulation means connected to said input means for converting the uncorrected video input signal to a square wave pulse train having an instantaneous period dependent upon the instantaneous voltage level of the uncorrected video input signal;
a voltage controlled active variable delay circuit having a signal input terminal and a control input terminal, said voltage controlled active variable delay circuit delaying the square wave pulse train applied thereto by a time interval dependent upon the instantaneous level of voltage at said control input terminal;
first coupling means coupling said frequency modulation means to said voltage controlled active variable delay circuit signal input terminal for applying the square wave pulse train thereto;
frequency demodulator means connected to said voltage controlled active variable delay circuit for converting the delayed square wave to a time corrected video signal substantially reproducing the wave form of the uncorrected video signal;
output means coupled to the frequency demodulator means for applying the time corrected video signal to a utilizing device;
synchronization error detection means, having a first input to receive a reference synchronization signal and a second input coupled to the demodulator means for generating an error signal having a voltage level indicative of the time difference between the reference synchronization signal and the time corrected video signal synchronization portion; and
second coupling means coupling the synchronization error detector means to the voltage controlled active variable delay circuit control input means for application thereto of the error signal.

4,099,205
PHASE CONTROL SYSTEM

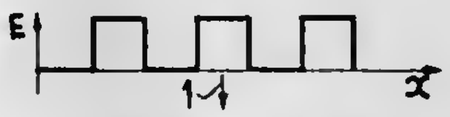
Hajime Hattori, Ichinomiya; Eiji Usui; Takashi Oya, both of Nagoya; Kaneyoshi Sugawa, Kawasaki; Eiji Kezuka, Yokohama; Tadashi Okada, Yokohama, and Toshiro Watanabe, Yokohama, all of Japan, assignors to Chubu-Nippon Broadcasting Co., Ltd., Nagoya and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan
Filed Oct. 26, 1976, Ser. No. 735,134
Claims priority, application Japan, Oct. 27, 1976, 50-129728
Int. Cl.² H04N *5/04*
U.S. Cl. 358—149 **9 Claims**


1
3
6
7
10
14
15
(A)
A/D CONVERTER
COMPRESSION PROCESSING SECTION
SERIAL-TO-PARALLEL CONVERTER
FRAME MEMORY
PARALLEL-TO-SERIAL CONVERTER
SIGNAL CORRECTING SECTION
D/A CONVERTER
(B)
2
4
8
11
TIMING PULSE GENERATOR
WRITE-IN ADDRESS GENERATOR
FRAME ADDRESS SWITCHING CONTROL SECTION
READ-OUT ADDRESS GENERATOR
5
9
12
13
EFFECT CONTROL SECTION
FRAME INFORMATION MEMORY
COMPARING SECTION
TIMING PULSE GENERATOR
16
JOY STICK

1. A phase control system for synchronizing unrelated video signals to reproduce a synchronized video signal comprising:
means for producing a first timing signal from at least one signal component contained in an incoming video signal,
means for digitally encoding said incoming video signal in accordance with said first timing signal,
first memory means for recording said encoded video signal,
second memory means for recording frame information or frame information and field information corresponding to said encoded video signal simultaneously with the recording of said encoded video signal in said first memory means,
means for producing a second timing signal from at least one signal component contained in a second video signal,
means for reading out said encoded video signal from said first memory means and said corresponding frame information or frame and field information from said second memory means under control of said second timing signal,
means for providing frame or frame and field information associated with said second video signal,
means for comparing the readout frame or frame and field information with frame or frame and field information associated with said second video signal and for determining whether a phase correction to said readout encoded video signal is required, and
correcting means responsive to the output of said means for comparing for correction the phase of the readout encoded video signal.

4,099,206
PIEZOELECTRIC DEVICE RESPONSIVE TO OPTICAL IMAGE FOR GENERATING AN ELECTRICAL SIGNAL

Jean Desbois, and Pierre Tournois, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Mar. 21, 1975, Ser. No. 560,925
Claims priority, application France, Mar. 26, 1974, 74 10300
Int. Cl.² H04N *3/14;* H01J *39/12;* H01L *41/04*
U.S. Cl. 358—213 **20 Claims**



1. A system for processing an optical image, comprising piezoelectric substrate having two opposite faces and means

which permanently develop between said two faces a high-frequency field of fixed radian frequency α;
- an acousto-electric transducer on one of said faces and providing, at its terminals when an acoustic wave travelling over said face reaches said transducer, an electrical signal corresponding to said wave;
- a network applied to said same face of the substrate, said network being a periodic network of aligned electrical conductors extending over a given length adjacent to said transducer, and means for applying to said face, between said conductors, pulses of a high-frequency electric field of radian frequency α_p;
- optical means for directing an optical beam coming from said image, towards said substrate at the location of said network, and means for changing at each point on said face of said substrate, along said network, the electrical conductivity in accordance with the illumination directed towards each point.

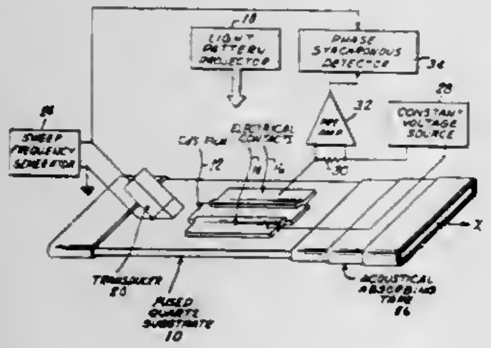
4,099,207
DIRECT ELECTRONIC FOURIER TRANSFORMS OF OPTICAL IMAGES

Philipp G. Kornreich, North Syracuse, and Stephen T. Kowel, Syracuse, both of N.Y., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 493,990, Aug. 1, 1974, Pat. No. 4,040,091, which is a continuation of Ser. No. 319,680, Dec. 29, 1972, abandoned. This application Jan. 21, 1977, Ser. No. 760,904

Int. Cl.^{2} H04N *3/14;* G06K *9/02;* H01L *31/08*

U.S. Cl. 358—213 **17 Claims**



1. A device for generating an electrical signal representation of an optical image comprising:
- a medium having an electrical property which varies as a function of an optical image formed on the medium and as a function of time and space varying strain disturbances in the medium, said medium being made of a material selected from the group consisting of degenerate semiconductors and metals;
- means for forming an optical image on the medium;
- means for causing a plurality of different time and space varying strain disturbances in the medium; and
- means for measuring said electrical property of the medium at a plurality of said different strain disturbances in the medium while the image is formed on the medium to derive a plurality of electrical signals, each signal representing an aspect of the entire image rather than of a point or an elemental area of the image, said measuring means including means for establishing a constant current across a portion of the medium and means for detecting the potential difference across at least a part of said portion of the medium at a plurality of said different strain disturbances in the medium while the image is formed on the medium.

4,099,208
FACSIMILE SCANNING SYSTEM

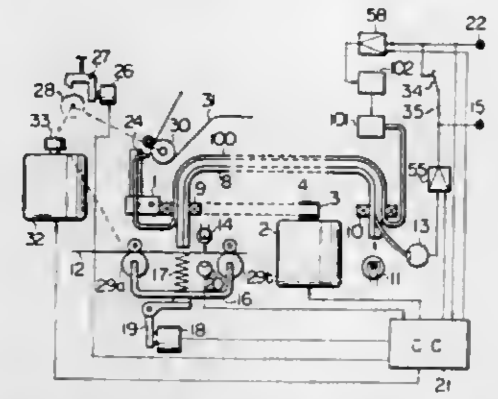
Wada Tasaku, Tokyo; Sasamoto Noboru; Oshima Shintaro, both of Musashino; Nakao Kozo, Hoya; Hattori Naohiko, Tokyo, and Azuma Nobuhiro, Tokorozawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,534

Claims priority, application Japan, May 25, 1976, 51-59579

Int. Cl.^{2} H04N *1/22;* G02B *5/16*

U.S. Cl. 358—296 **3 Claims**



1. A facsimile scanning system comprising a carrier movable linearly in both directions, a flexible optical fiber assembly one end of which is supported at said carrier and the other end of which is pivotably fixed at a bearing, said flexible optical fiber assembly composing a read head for reading optical information on an original paper and a write head for printing a pattern on a thermal paper by the thermal printing principle, said read head having a plurality of thick emission fibers one end of which are positioned in front of a lamp and a thin receiving fiber one end of which is positioned in front of a photoelectric convertor, the other end of the receiving fiber receiving the reflected light beam from the original paper illuminated by the other end of said emission fiber, said write head having a long optical fiber one end of which is positioned at the output of a laser beam source generating a laser beam modulated by the pattern to be printed and the other end of which is positioned for scanning thermal printing paper for emitting said laser beam on that paper.

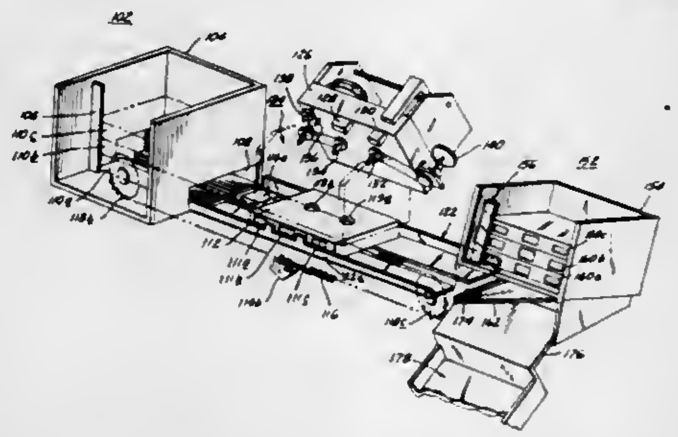
4,099,209
ELECTRONIC CONTROL SYSTEM FOR MULTIPLE CASSETTE RECORD AND/OR PLAYBACK APPARATUS

Willy M. Sander, Stamford, and James C. Whitney, Weston, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,162

Int. Cl.^{2} G11B *15/68, 23/04*

U.S. Cl. 360—92 **25 Claims**



1. In multiple cassette record and/or playback apparatus of the type having a supply of tape cassettes, motor driven means for conveying individual cassettes from said supply to a record/playback station and thence to an output store, said record/playback station having motor driven means for loading a conveyed cassette for a record and/or playback operation and said output store having motor driven means for loading a conveyed cassette in said output store, an electronic control system for controlling said apparatus, comprising:
- drive means for driving all of said motor driven means through an operating cycle;
- monitor means for monitoring the operation of each of said motor driven means to sense when a cassette has been conveyed to said record/playback station, when a cassette has been loaded for a record and/or playback operation and when a cassette has been loaded in said output store;
- sequence control means responsive to said monitor means for energizing said drive means in a predetermined sequential cycle; and
- timing means for detecting whether said sequential cycle is completed within a predetermined time and for preventing the initiation of another sequential cycle in the event that said sequential cycle has not been so completed.

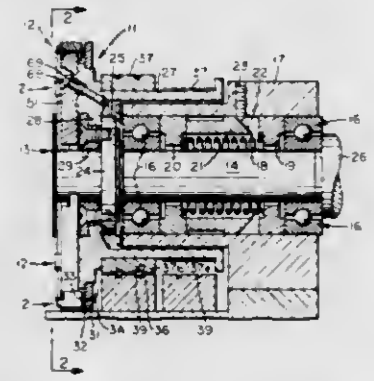
4,099,210
ROTATING TRANSDUCING HEAD ASSEMBLY

Dale P. Dolby, 22437 Elmhurst, Los Altos, Calif. 94022

Filed Oct. 4, 1976, Ser. No. 729,282

Int. Cl.^{2} G11B *5/52, 21/10, 21/24, 15/60*

U.S. Cl. 360—108 **6 Claims**



1. In a magnetic recording-reproducing machine of the type in which a drum is mounted for rotation on a stator portion of said machine and upon each revolution carries a plurality N=KP of peripherally mounted transducer heads in K>2 successive sets of P>1 successive sweeps across the surface of a record medium, a transformer apparatus for coupling record-reproduce signals between the transducer and the stator portion, comprising:
- a plurality of at least P rotating transformer halves coupled to said heads for transmission of said signals, each head in a set being coupled to a different rotating transformer half, and the rotating transformer halves corresponding to each head set being mounted in an arcuate array upon and coaxial with said drum, but each array upon a different circle on said drum; and
- a plurality of P stationary transformer halves mounted on said stator portion each in close signal-transmission proximity to a different one of said arrays, particularly in the sector swept by each rotating transformer half thereof, as the corresponding head performs said sweep across said record medium.

4,099,211
POSITIONABLE TRANSDUCING MOUNTING STRUCTURE AND DRIVING SYSTEM THEREFOR

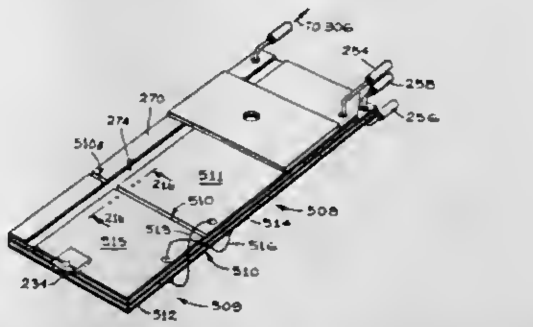
Richard Allen Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 13, 1976, Ser. No. 722,822

Int. Cl.^{2} G11B *5/52;* H04N *5/78;* G11B *21/18, 21/10*

U.S. Cl. 360—109 **39 Claims**

1. Structure for mounting a magnetic transducing head in transducing relation with an elongated track of a magnetic record medium, comprising:
- a support element;
- a magnetic transducing head; and



- a positioning member attached to said support element, said head mounted to said positioning member to be in transducing relation to the record medium, said positioning member having a plurality of independently deflectable portions for displacement of the mounted head in directions lateral to said elongated track.

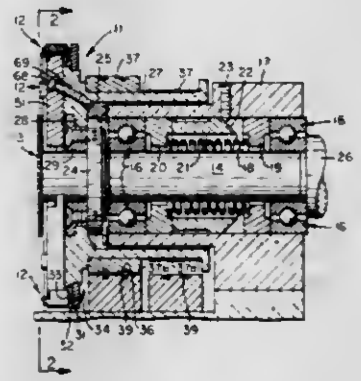
4,099,212
ROTATING TRANSDUCING HEAD ASSEMBLY

Dale P. Dolby, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 4, 1976, Ser. No. 729,283

Int. Cl.^{2} G11B *5/52, 21/10, 21/24, 15/60*

U.S. Cl. 360—109 **6 Claims**



1. In a magnetic recording-reproducing machine of the type in which a plurality of magnetic transducer heads are mounted upon a drum for sweeping rotation across the surface of a magnetic record medium, a head mounting assembly comprising:
- a gauge footing for mounting said heads, said footing being formed as a cylindrical element coaxial with, adjacent to and of smaller diameter than said drum;
- a mounting element for each of said heads, each mounting element being arranged to fit upon said drum with a first portion thereof engaging said cylindrical footing and a second portion thereof carrying the corresponding one of said heads for projection from said drum to engage said record medium;
- each of said head mounting elements being formed with a plurality of angled surfaces at said first portion for tangentially engaging said cylindrical gauge footing at circumferentially spaced generatrices thereof;
- each of said mounting elements being cut away to permit nesting of said mounting elements around said cylindrical footing with said heads all in the same plane normal to the axis of said drum; and
- circumferential and axial locating means for securing said mounting elements to said drum.

4,099,213
TAPE CASSETTE LOADING SYSTEM

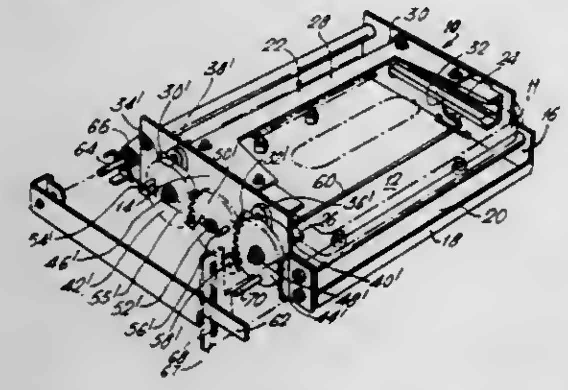
Etienne Arthur Marie Schatteman, Wemmel, Belgium, assignor to Staar, S. A., Brussels, Belgium

Filed Jun. 13, 1977, Ser. No. 805,973

Claims priority, application France, Jul. 5, 1976, 76 20498

Int. Cl.² G11B *23/04, 15/10, 15/24*

U.S. Cl. 360—137 **6 Claims**



1. In apparatus for loading and releasing cassettes of magnetic tape, for use in recording and playback equipment, said cassettes having openings in a main face for tape transport means which penetrate said openings, said apparatus comprising a housing into which a cassette is introduced by a sliding movement in a plane parallel to its main face and which is movably mounted for movement together with said cassette on an L-shaped path having one leg substantially parallel to and a second leg substantially perpendicular to said plane, in order to cause the cassette to engage said tape transport means in a cassette loaded position, a frame having a pair of said frame means, mounting means on the external lateral sides of said housing cooperating with guiding means on said side frame means for mounting said housing for forward movement on said path for said cassette loaded position at one extremity and for return movement on said path to a cassette released position at the opposite extremity,

the improvements comprising movable guide members for said housing mounting means supported on each said side frame means, control means coordinating the movement of said movable guide members on one side frame means with the movement of said movable guide members on the other side frame means, and spring means acting on said control means to resiliently force said housing toward its loaded and released positions at the extremities of said path.

4,099,214
ELECTRONICALLY CONTROLLED BRAKING MEANS FOR A DOCUMENT HANDLING MACHINE

Alan P. Jones, Levittown, Pa., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Division of Ser. No. 613,633, Sep. 15, 1975, Pat. No. 4,015,110. This application Nov. 22, 1976, Ser. No. 743,778

Int. Cl.² H02H *7/085*

U.S. Cl. 361—31 **7 Claims**

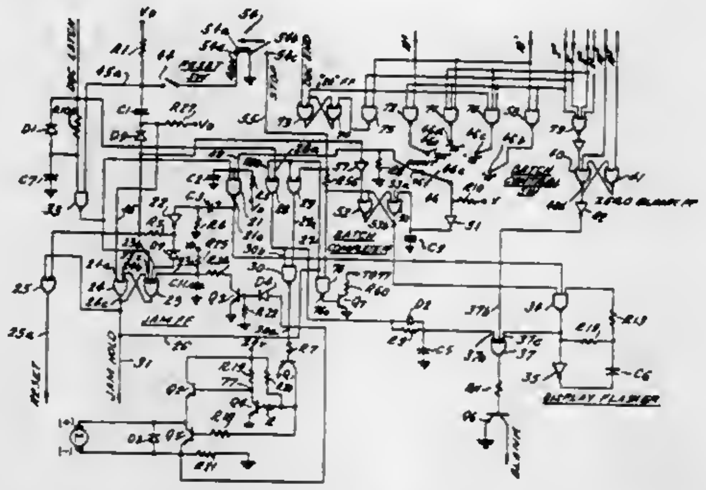
1. Electronic control means for a document handling and counting machine having: a drive motor;

means for sensing the load current on said drive motor to generate a signal having a magnitude representing the load current drawn by said drive motor;

braking means responsive to said sensing means for abruptly halting said drive motor when said sensing means signal reaches a predetermined threshold to protect the machine from being damaged and to protect the operator from being injured;

said braking means further comprising time delay means for halting the drive motor when the signal from said sensing means is at least equal to said threshold level for a predetermined time interval;

said sensing means comprising resistance means coupled in the motor supply circuit supplying current to the drive motor;



diode means coupled between said resistance means and the input of said time delay means whereby said diode means cooperates with said time delay means to establish the desired threshold level.

4,099,215
SECURITY APPARATUS FOR THE PROTECTION OF ELECTRIC MACHINES

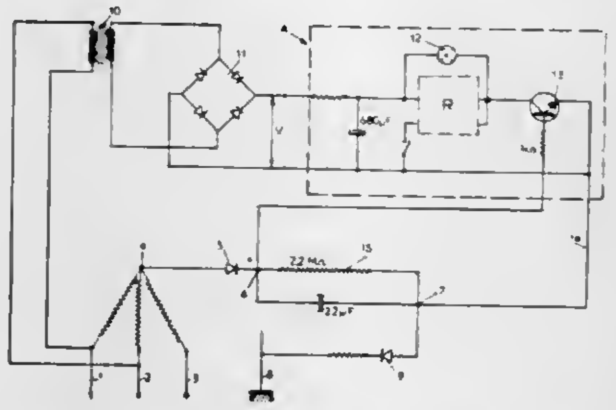
Jean Parrier; Henri Parrier, and André Parrier, all of Rue de la Sabliere, Saint-Genis les Ollieres (Rhone), France

Filed Feb. 2, 1976, Ser. No. 654,133

Claims priority, application France, Jan. 31, 1975, 75 03653

Int. Cl.² H02H *3/16*

U.S. Cl. 361—42 **6 Claims**



1. A security circuit for detecting an electrical defect of a machine under supervision comprising:

latch circuit means for generating an output signal in response to an input signal, said latch circuit means having an initial state not generating said output signal and switchable to a latched state generating said output signal in response to said input signal;

semiconductor circuit means in circuit relationship with said latch circuit means for generating said input signal in response to a fault signal indicative of an electrical defect of the machine;

fault signal generating means in circuit relationship with the machine for generating said fault current in response to an electrical defect of said machine, said fault signal generating means including a polarized high resistance having one end connected to ground to bias said fault signal with respect to ground.

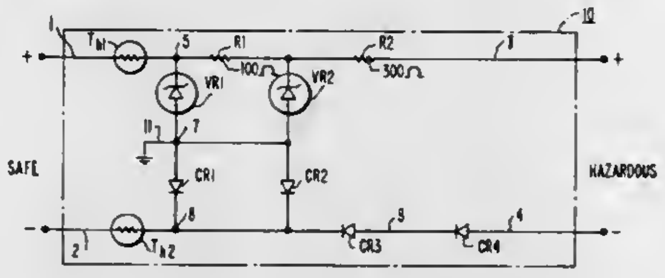
4,099,216
FUSELESS INTRINSIC SAFETY BARRIER

Lloyd E. Weberg, Phoenix, Ariz., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1976, Ser. No. 741,438

Int. Cl.² H02H *9/04*

U.S. Cl. 361—56 **1 Claim**



1. In an intrinsic safety barrier circuit module having:

a first pair of pole connectors adapted to be connected to an external power supply and to an external signal conditioning unit; and

a second pair of pole connectors adapted to be connected to at least one input of an industrial process situated in a hazardous area; the combination of:

a plurality of electrical components connected in circuit between said two pairs of pole connectors for conveying energy and information therebetween and for applying to said second pair of poles voltage and current of limited magnitude, said plurality including at least one positive temperature coefficient resistance device connected to one of said first pole connectors and operative in said module for limiting overcurrent from said connected one of said first pole under faulty conditions with said external power supply; with at least one of said electrical components being a voltage limiting device, said voltage limiting device being mounted in circuit after said one positive temperature coefficient resistance device, the time constant of said resistance device being smaller in response to an overcurrent than the time constant for which said voltage limiting device is exposed to destructive action by the same overcurrent; and with all of said electrical components of a plurality being encapsulated as a unit to form a fuseless intrinsic safety barrier circuit module.

4,099,217
PROTECTION CIRCUITS

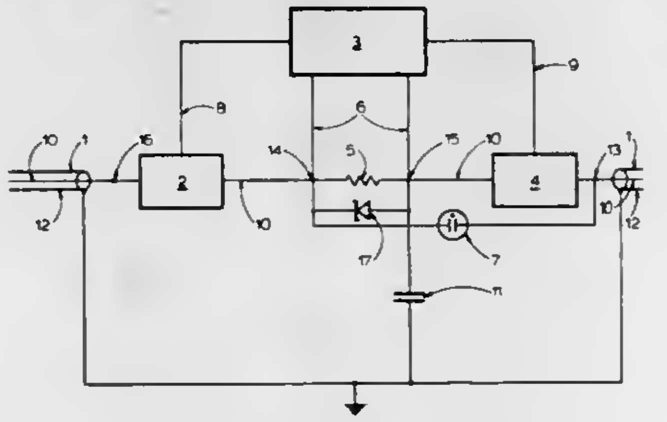
Kenneth David Fitchew, Ipswich, England, assignor to The Post Office, London, England

Filed Feb. 11, 1977, Ser. No. 767,950

Claims priority, application United Kingdom, Feb. 18, 1976, 6313/76

Int. Cl.² H02H *9/04*

U.S. Cl. 361—56 **6 Claims**



1. A surge protection circuit for a telecommunications cable repeater of the type wherein a voltage supply for the repeater is derived from a power-tapping resistor in series with a first conductor of said cable, said surge protection circuit comprising a voltage sensitive discharge means effectively connected in parallel with said power-tapping resistor and further comprising a capacitor connected directly between one terminal of said power-tapping resistor and earth.

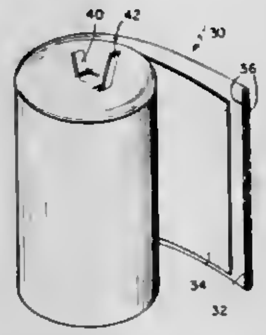
4,099,218
METHOD OF MAKING POROUS POLYMER CONTAINING SEPARATORS FOR ELECTROLYTIC ELECTRICAL DEVICES

Gerhart P. Klein, Manchester, and Ivan L. Wingood, Jr., Bedford, both of Mass., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sep. 13, 1976, Ser. No. 722,684

Int. Cl.² H01G *9/00;* **B23B** *3/00*

U.S. Cl. 361—433 **22 Claims**



18. A capacitor comprising at least two electrodes, a porous polymer containing separator having a network of voids and interspersed modifier material between adjacent electrodes, and electrolyte; wherein the separator is formed by loading a dissolved polymer containing material with at least one compound to be dissolved from said porous polymer containing separator and at least one modifier material, applying the loaded dissolved polymer containing material to an electrode, solidifying the loaded dissolved polymer containing material, and contacting the solidified polymer containing material with electrolyte capable of dissolving at least some of said one compound to yield said porous polymer containing separator capable of absorbing and retaining said electrolyte.

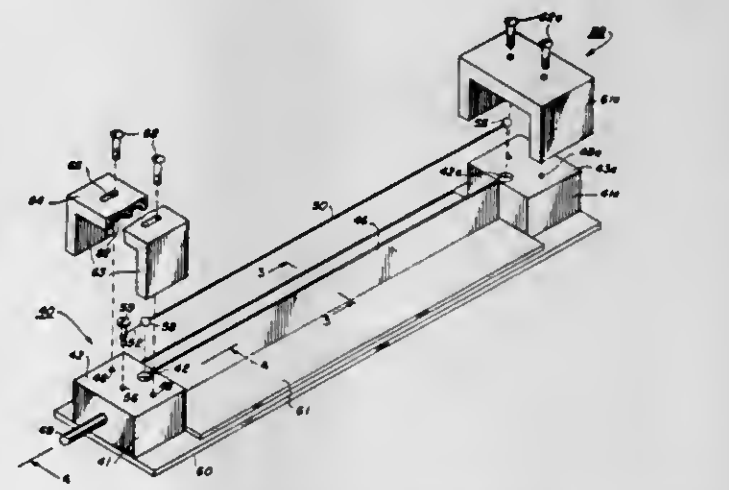
4,099,219
CORONODE TENSIONING AND SUPPORT ARRANGEMENT

Jean Wilcox Laing, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,827

Int. Cl.² H01T *19/04*

U.S. Cl. 361—230 **7 Claims**



1. A corona discharge device comprising a coronode including a wire coated with a dielectric material, and

means for applying a tension force directly to said dielectric material to aid in supporting said coronode.

4,099,220

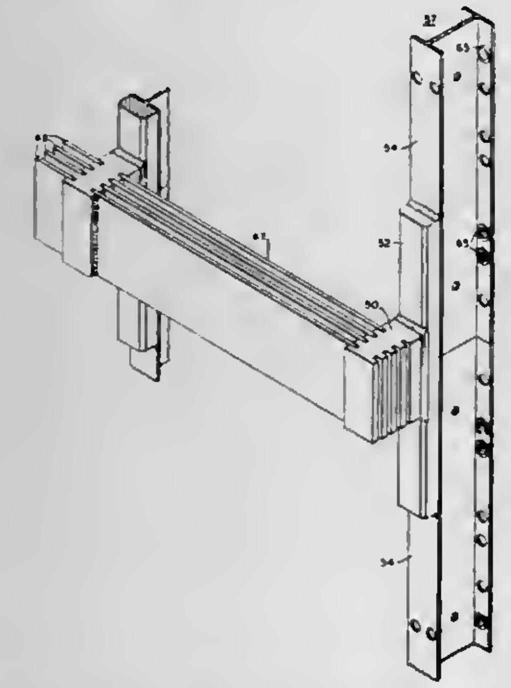
ELECTRICAL SWITCHBOARD APPARATUS INCLUDING WELDED BUS CONNECTOR

George N. Kovatch, Monroeville; Richard Rosey, Plum Borough, both of Pa., and Ned H. Simon, Queeny Township, St. Louis County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 756,035

Int. Cl.² H02B *1/04*

U.S. Cl. 361—341 **9 Claims**



1. Electrical power distribution apparatus, comprising:

a main bus connected to a source of electrical power, said main bus comprising a plurality of spaced parallel conducting bars;

a distribution bus perpendicular to said main bus;

circuit interrupter apparatus connected between said distribution bus and an electrical load; and

a connector block defined by two end surfaces, a bottom surface attached to said distribution bus, and side surfaces, at least one of said side surfaces comprising locating means adapted to receive a plurality of main bus bar ends;

the ends of said main bus bars being positioned by said connector block locating means and being welded thereto.

4,099,221

PORTABLE CEILING REFLECTOR FOR PHOTOGRAPHY

Alfred A. Carrillo, San Antonio, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,979

Int. Cl.² G03B *15/02*

U.S. Cl. 362—18 **1 Claim**

1. A portable photographic reflector assembly unit adaptable for attachement to a camera and to a photographic flash unit comprising.

a first mounting bracket, fitted with screw means to fasten to a camera

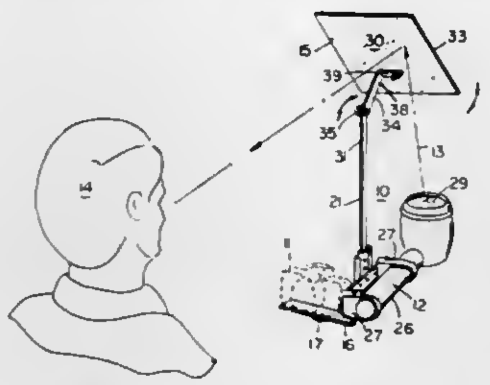
a support member,

a reflector member pivotably mounted to the support member, and,

a second mounting bracket, fitted with means to mount a flash unit to said bracket,

said first mounting bracket formed of two legs, generally perpendicular to each other, with the screw means rotatably fitted to a first leg of said bracket, and the support member fixed to the second leg of said bracket so as to extend along the axis of and beyond the said second leg,

said reflector member comprising a substantially flat sheet of material bolted to a first leg of an angle member, with a second leg of said angle member bent generally perpendicular to said first leg and pivotally mounted to the support member so that said second leg pivots in a plane perpendicular to the plane of the axes of the legs of the first mounting bracket, said pivotal travel of said second leg causing the flat sheet to be pivotable from a generally horizontal plane to a generally vertical plane or alternatively to be set in a desired diagonal plane between said horizontal and vertical planes when the support member extends along a vertical axis,



said second mounting bracket being pivotally mounted to said support member so as to be pivotally mounted in a plane parallel to the plane in which said second leg pivots such that a flash light unit attached to said second mounting bracket may be oriented with the light rays from said flash unit directed at an adjustable position towards a face of the reflector member.

4,099,222

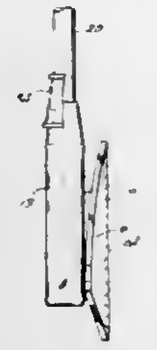
BICYCLE SAFETY LIGHT

James R. Cornell, 79832 Delight Valley School Rd., Cottage Grove, Oreg. 97424, and Tommy R. Kirk, 722 N. 71st, Springfield, Oreg. 97477

Filed Oct. 28, 1976, Ser. No. 736,747

Int. Cl.² F21V *33/00;* **B62J** *5/00*

U.S. Cl. 362—72 **4 Claims**



1. A bicycle safety light for installation on the front or rear axle of a bicycle, said light comprising in combination.

a contact member supported by the bicycle axle and biased by an axle installed nut,

a housing supported on said contact member and defining a socket at its upper end,

a flexible pole having a light at its upper end, and

said contact member having an offset outer marginal portion including an inwardly offset abutting surface for abutment with a bicycle fork or frame to retain the light pole in a desired rake position against impact loads encountered during bicycle operation.

4,099,223

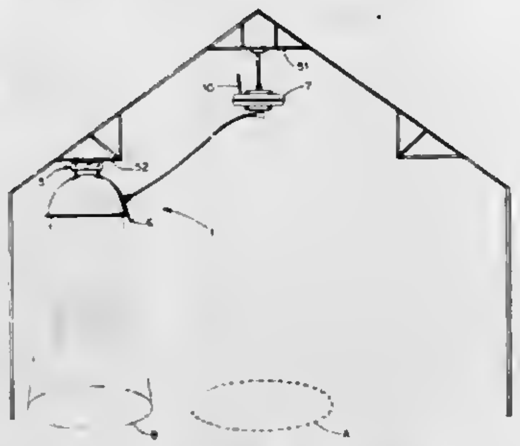
LIGHTING FIXTURE ARRANGEMENT

Hendrik A. J. de Vos, Swansea; Walter A. Gustafson, Fall River, and Elzear R. Labouliere, Swansea, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 14, 1977, Ser. No. 759,341

Int. Cl.² F21S *1/02;* **F21V** *21/00;* **F21S** *1/06*

U.S. Cl. 362—226 **3 Claims**



1. A lighting fixture arrangement comprising:

a lighting fixture including:

power supply means operative to produce operating voltages, said power supply means including a housing having supporting elements extending outwardly therefrom having first and second pairs of opposed openings therein;

optical assembly means for producing a predetermined output light pattern, said optical assembly means including:

a reflector;

a lamp-receiving socket means disposed within the reflector for receiving a lamp therein;

a pair of flexible resilient releasable spring members each having a pair of ends capable of being flexed with respect to each other to allow said ends to be inserted into and withdrawn from a corresponding one of the pairs of openings in the supporting elements of the housing of the power supply means for respectively suspending and releasing the optical assembly means from the power supply means; and

securing means fixedly and pivotally securing the spring members to the reflector for allowing the spring members to pivot thereby to facilitate the insertion and withdrawal of the spring members from the openings in the supporting elements of the housing of the power supply means;

an elongated cable coupled between the power supply means and the lamp-receiving socket means of the optical assembly means for coupling operating voltages produced by the power supply means to the lamp-receiving socket means and to a lamp received within the lamp-receiving socket means, said cable being operative when the optical assembly means is suspended from the power supply means to supply voltages to the optical assembly means to cause the optical assembly means to produce its predetermined output light pattern for illuminating an area adjacent to the lighting fixture, said cable being at all times completely external to the lighting fixture; and

support means for supporting the lighting fixture from a supporting structure; and

a hanger arrangement spaced remotely from the lighting fixture and mounted to a supporting structure, said hanger arrangement including portions having first and second pairs of opposed openings therein for receiving the ends of the spring members of the optical assembly means;

said cable having a length to permit the optical assembly means to be moved from the lighting fixture to the location of the hanger arrangement following release of the optical assembly means from the power supply means whereby the ends of the pair of resilient spring members may then be inserted into the pairs of openings in the hanger arrangement to suspend the optical assembly means from the hanger arrangement and thereby enable the optical assembly means to produce its predetermined output pattern for illuminating a second area adjacent to the hanger arrangement and the optical assembly means.

4,099,224

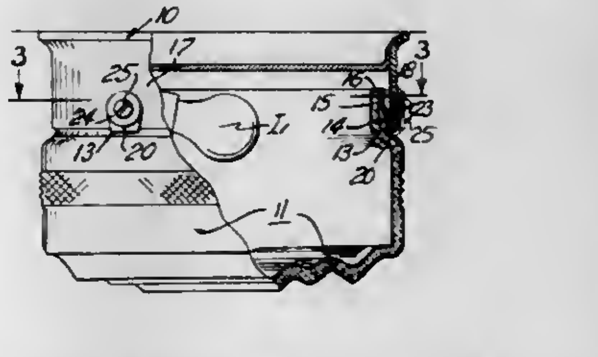
SNAP ON CONNECTION AND RELEASE MEANS BETWEEN LIGHTGLOBE AND FIXTURE

Lucy Latham Valpey, 11180 Enchanta Vista, San Jose, Calif. 95127

Filed Dec. 15, 1976, Ser. No. 750,619

Int. Cl.² F21V *17/06, 17/00*

U.S. Cl. 362—433 **2 Claims**



1. In combination with a conventional electric lamp fixture having an open ended globe receiving cylindrical sleeve portion including a plurality of threaded bores formed radially therethrough and a light diffusing globe having an open ended annular portion boardered by an outwardly projecting rim bead insertable into the open ended cylindrical sleeve portion for connection therewith; and means for releasably securing such light diffusing globe relative to such lamp fixture comprising:

(1) a plurality of resilient flat metal latching tabs arranged in spaced relation about the cylindrical sleeve portion of such lamp fixture, said latching tabs each including a mounting zone at one end provided with a bored opening registerable with a threaded bore in the sleeve portion of the lamp fixture;

(2) a headed bolt having a screw shank extending through the bored opening in the mounting zone of each said tab for threaded connection with a respective threaded bore in the sleeve portion of the lamp fixture for securing said tab thereto;

(3) each said resilient tab having its free end opposite its mounting zone bent back upon itself about the free edge of the sleeve portion of the lamp fixture and extending at an angle inwardly therefrom for yieldable engagement by the outwardly projecting rim bead on the open ended neck of the light diffusing globe as it is inserted into the sleeve portion of the lamp fixture for securing the light diffusing globe to the lamp fixture; and

(4) a plurality of applique type cam release means arranged on and about the annular portion of a conventional light diffusing globe and secured thereto adjacent the rim bead boarder thereof in spaced relation comparable to that of said resilient tabs for simitaneously registering with and cammingly urging said resilient tabs out of engagement with the rim head of the globe upon turning of said light globe relative to the light fixture.

4,099,225

PROTECTIVE CIRCUIT FOR AN INVERTER

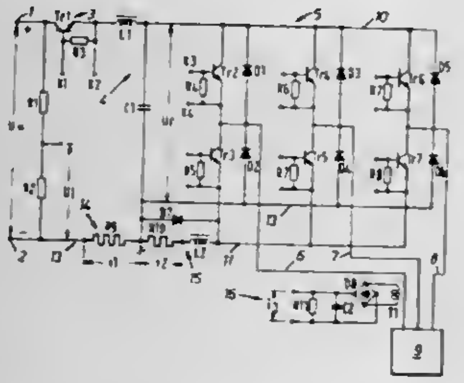
Nils Hansson Nygaard, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jul. 18, 1977, Ser. No. 816,812

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632380

Int. Cl.² H02M *1/18*

U.S. Cl. 363—56 **8 Claims**



1. A protective circuit having input and outlet branches for an inverter having semiconductor control elements, comprising, a series regulator in said input branch, an intermediate filter circuit between said regulator and said inverter including a capacitor extending between said branches, a first signal generator for controlling said regulator and a second signal generator for controlling said inverter, a control unit for controlling said first signal generator, a comparator unit having an input connected to a measuring point in said outlet branch for detecting an excessive current condition and an output connected to both of said signal generators, said comparator producing an error output signal while sensing said excessive current condition to effect the immediate turning off of said series regulator and said inverter upon the initiation of said output signal, said inverter being off concurrently with said output signal, switch means having a fixed time period off state disposed between said comparator output and said first signal generator for maintaining said series regulator in an off condition during said fixed time period independently of said output signal, and dissipating means for discharging said capacitor when said series regulator is in an off state and said output signal has terminated.

4,099,226

CIRCUIT ARRANGEMENT FOR GENERATING A CONTINUOUSLY VARIABLE DC VOLTAGE

Guenter Peltz, Emmendinger, and Wolfgang Kornberger, Oberwindeo, both of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

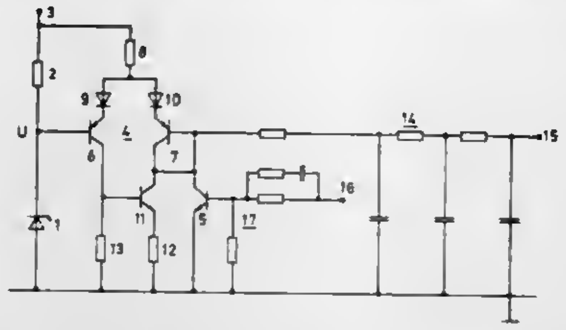
Filed Feb. 7, 1977, Ser. No. 766,179

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608266

Int. Cl.² H02M *7/537*

U.S. Cl. 363—124 **7 Claims**

1. A circuit for generating a continuously variable dc voltage, comprising:
- a differential amplifier of the type that has negative load resistance and an inverting input, a non-inverting input and an output;
- means for connecting the non-inverting input of the differential amplifier to a source of constant dc voltage;
- means for connecting the output of the differential amplifier directly to the inverting input;
- a filter circuit having an input connected to the output of the differential amplifier and an output for providing the variable dc voltage; and
- an electronic switch connected between the output of the differential amplifier and a reference potential, said electronic switch being responsive to a train of pulses having variable pulse duty factor for controllably connecting the output of the differential amplifier to the reference potential.



4,099,227

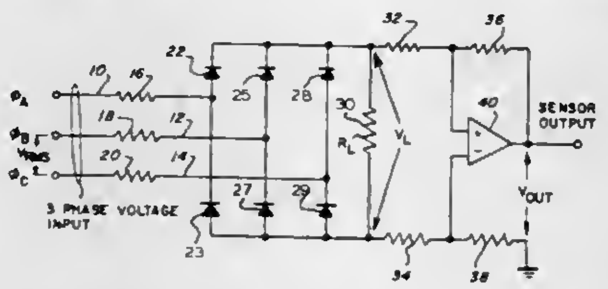
SENSOR CIRCUIT

Julius M. Liptak, Columbia, S.C., assignor to Square D Company, Park Ridge, Ill.

Filed Dec. 1, 1976, Ser. No. 746,279

Int. Cl.² H02M *7/08*

U.S. Cl. 363—126 **6 Claims**



1. A voltage sensing circuit for AC electrical drive systems having at least one electrical phase comprising:
- a resistive load;
- means responsive to each phase voltage for generating signals proportional to the magnitude of each phase voltage across the load;
- resistive means connected in series between each phase conductor and the generating means cooperating with the load for attenuating the peak voltage developed across the load to a predetermined value; and
- means responsive to the voltage across the load for generating an output signal which is proportional to the average applied system voltage of the electrical phases.

4,099,228

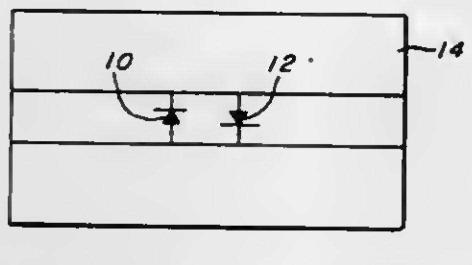
HARMONIC MIXING WITH AN ANTI-PARALLEL DIODE PAIR

Marvin Cohn, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 552,020, Feb. 24, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,991

Int. Cl.² H02M *5/20*

U.S. Cl. 363—159 **7 Claims**



6. In a harmonic mixer for mixing two signals $V_{LO}\sin\omega_{LO}t$ and $V_s\sin\omega_s t$, a microwave transmission line, a pair of anti-parallel diodes connected in shunt across elements of said transmission line, means for applying both of said signals to said line and means for deriving an output signal from said line, characterized in that said output signal has angular frequency components $m\,\omega_{LO} \pm n\,\omega_s$ where m equals 2 and n is an odd integer.

4,099,229

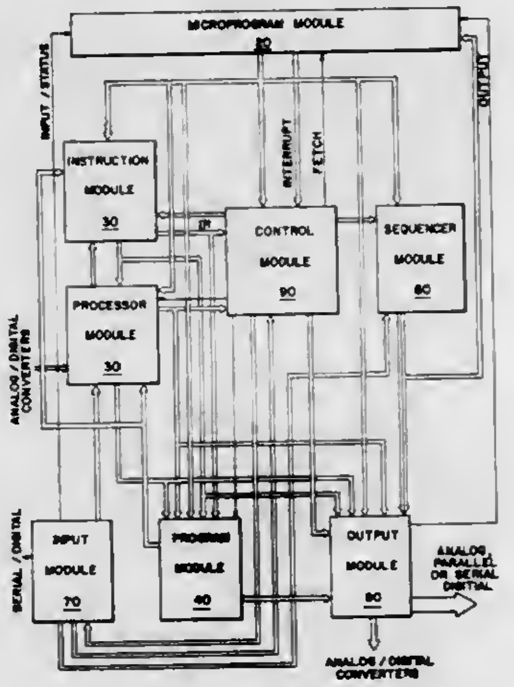
VARIABLE ARCHITECTURE DIGITAL COMPUTER

H. Clifford Kancler, Los Altos Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1977, Ser. No. 768,445

Int. Cl.² G06F *9/16, 13/00, 3/00, 1/00*

U.S. Cl. 364—200 **8 Claims**



1. A variable architecture digital computer comprising:
- a microprogram module containing a plurality of microprogram routines;
- an instruction module having an instruction register divided into a plurality of bytes in excess of the number of bytes of an instruction word, said instruction register capable of shifting the contents of said register in byte increments under the control of said microprogram routines;
- a program module having a memory divided into a program memory and a data memory, said program memory being the source of said instruction words;
- a processor module to perform operations on data from said data memory and said instruction register under the control of said microprogram routines;
- means for sequencing said microprogram routines;
- means for inputting and outputting data to and from said data memory under the control of said microprogram module; and
- means for controlling the operations of each element of said computer under the control of said microprogram module.

4,099,230

HIGH LEVEL CONTROL PROCESSOR

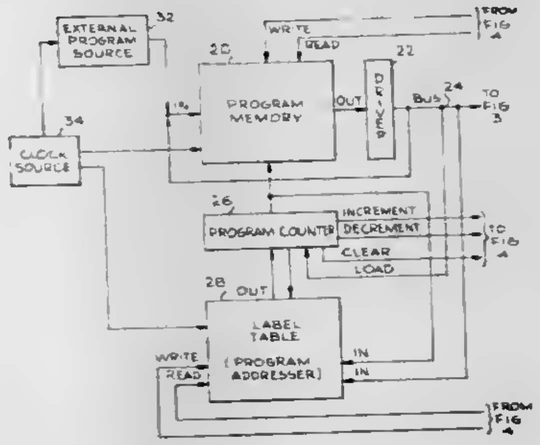
Carver A. Mead, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Aug. 4, 1975, Ser. No. 601,280

Int. Cl.² G06F *9/10*

U.S. Cl. 364—200 **10 Claims**

1. In a programmed digital computer, apparatus for loading a program into a memory in a manner to be location independent so that each segment of the program may be selectively accessed for modification or debugging without affecting the balance of the program, wherein each given program segment is identified by a program segment label comprised of a group of coded digital signals which precedes a plurality of instructions that follow said label and that comprise a program segment, comprising
- a program memory,
- a source of a plurality of program segments each including a program segment label followed by a plurality of instructions,
- means for sequentially transferring said plurality of program segments into and out of said program memory,
- a program counter means for counting storage addresses used in providing to said program memory the addresses for storage and for read out of program labels and instructions from said program memory,
- a label memory means, wherein each label memory address is represented by a program segment label,



- label detecting means for detecting when a program segment label has been transferred by said means for transferring said plurality of program segments,
- control means, responsive to a label being detected by said label detecting means, for loading in said program counter the address at which the first instruction after said detected program label is stored in said program memory, and for addressing said label memory means with the detected program segment label, and means responsive to said label detecting means and said control means for storing said loaded address in said label memory means at an address represented by said detected program segment label, whereby a program segment can be selectively read out for modification or debugging by addressing said label memory means with a programmed segment label to obtain the address in said program memory of the first instruction of the program segment.

4,099,231

MEMORY CONTROL SYSTEM FOR TRANSFERRING SELECTED WORDS IN A MULTIPLE MEMORY WORD EXCHANGE DURING ONE MEMORY CYCLE

Alan Kotok, Waltham; Patrick Sullivan, Stow; Paul M. Guglielmi, Westboro, and David A, Gross, Sudbury, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 1, 1975, Ser. No. 618,604

Int. Cl.² G06F *13/00*

U.S. Cl. 364—200 **21 Claims**

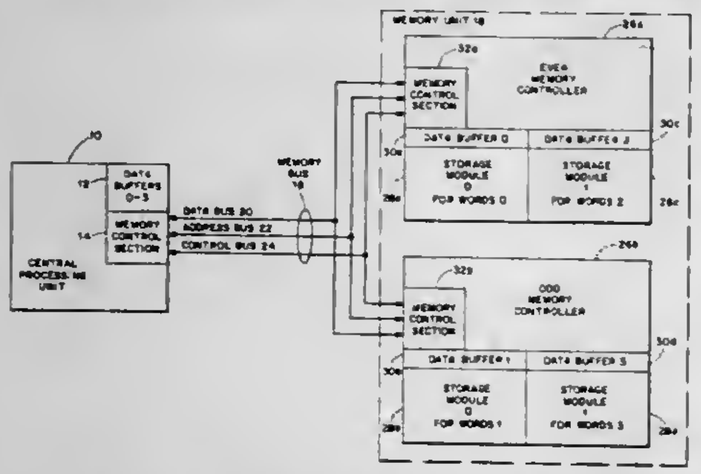
1. In a data processing system of the type including a central processing unit for addressing memory locations in a plurality of memory units, each of said memory units storing data in said memory locations, each memory location having a unique address, and bus means connecting the central processing unit and the memory units for transmission of data, memory address and control signals, an apparatus for controlling in a memory cycle the transfer of data between said processing unit and said memory units, said apparatus comprising:

A. first means coupled to said central processing unit and responsive to a memory start signal and a plurality of word request control signals from said central processing unit for simultaneously generating a plurality of memory request signals to said memory units, via said bus means, each of said memory request signals in conjunction with said memory address signals identifying one of said memory locations in said memory units;

B. second means coupled to said central processing unit and responsive to said memory address signals, said word request control signals and said memory start signal for storing identifiers of the order of the addressed memory location from which data is to be transferred;

C. third means coupled to said central processing unit and responsive to said word request control signals for storing a plurality of first signals equal to the number of said memory request signals transferred over said bus means to said memory units, said third means coupled to said memory start signal for disabling said memory start signal; and

D. fourth means coupled to said memory units and responsive to said first means for serially identifying to said central processing unit and transferring between said central processing unit and said memory units the data stored in each of said memory locations responsive to the combination of said memory address signals and said memory request signals.



4,099,232

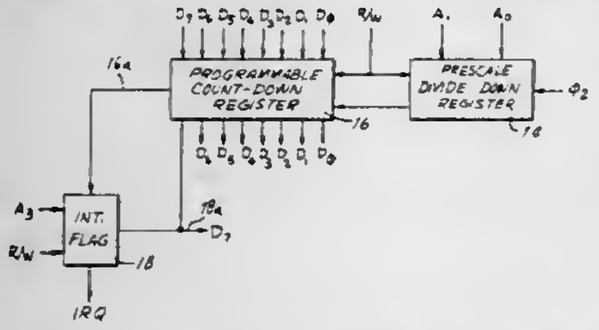
INTERVAL TIMER ARRANGEMENT IN A MICROPROCESSOR SYSTEM

William D. Mensch, Jr., Norriston, Pa., assignor to MOS Technology, Inc., Norristown, Pa.

Filed Sep. 14, 1976, Ser. No. 723,208

Int. Cl.² G06F *1/04*

U.S. Cl. 364—200 2 Claims


D7 D6 D5 D4 D3 D2 D1 D0
R/W
A1
A0
PROGRAMMABLE COUNT-DOWN REGISTER
PRESCALE DIVIDE DOWN REGISTER
Φ2
16a
16
18
A3
R/W
INT. FLAG
18a
D7
IRQ

1. An interval timer for a microprocessor system having a plurality of data bus lines, a plurality of address bus lines and a clock, said interval timer comprising:

a prescale divide-down register receiving the clock and providing a selectable one of a plurality of outputs which are divisions of the clock by noncontiguous powers of two;

means for applying a subset of the address bus lines to the prescale register to select one of said outputs thereof;

a countdown register;

means for loading the countdown register with a selected number through the data bus lines;

means for applying the selected output of the prescale register to the countdown register to cause a countdown of said number loaded therein;

an interrupt flag register; and

means for loading the interrupt flag register when the countdown register reaches the count of zero.

4,099,233

ELECTRONIC DATA-PROCESSING SYSTEM WITH DATA TRANSFER BETWEEN INDEPENDENTLY OPERATING MINIPROCESSORS

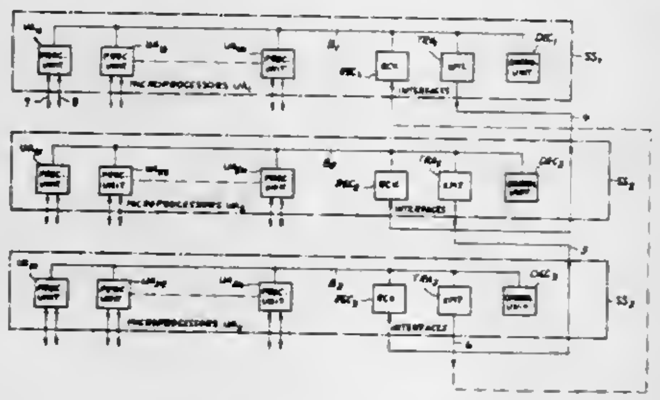
Giuseppe Barbagelata, Genoa; Bruno Conterna, Genoa-Rivarolo; Mauro Girardi, Savona, and Luigi Stringa, Arenzano (Genoa), all of Italy, assignors to Elettronica San Giorgio-ELSAG S.p.A., Genoa-Sestri, Italy

Filed Oct. 26, 1976, Ser. No. 735,219

Claims priority, application Italy, Oct. 24, 1975, 69631 A/75

Int. Cl.² G06F *15/16, 1/04*

U.S. Cl. 364—200 10 Claims



1. In an electronic data-processing system, in combination:

a plurality of mutually independent miniprocessors with individually programmed operating cycles, each miniprocessor including a data store containing a series of data blocks;

a control unit connected to all said miniprocessors and responsive to a request from an originating miniprocessor, designating a transmitting miniprocessor and a receiving miniprocessor, for establishing an exchange miniprogram for the consecutive transfer of a selected number of data block during respective transfer cycles from said transmitting miniprocessor to said receiving miniprocessor;

timing means in said control unit dividing each of said transfer cycles into a first phase and a second phase;

instruction-register means in said control unit for temporarily storing, during the execution of said exchange miniprogram, the identities of said transmitting and receiving miniprocessors together with information identifying the data block to be consecutively transferred;

a buffer register in said control unit responsive to signals from said timing means for temporarily storing a data block read out from said transmitting miniprocessor during said first phase of a transfer cycle and for forwarding the stored data block to the receiving miniprocessor during said second phase of the same transfer cycle; and

interface circuitry controlled by said timing means and responsive to the contents of said instruction-register means for establishing a transfer path for incoming data blocks from said transmitting miniprocessor to said buffer register during said first phase and a transfer path for outgoing data blocks from said buffer register to said receiving miniprocessor during said second phase.

4,099,234

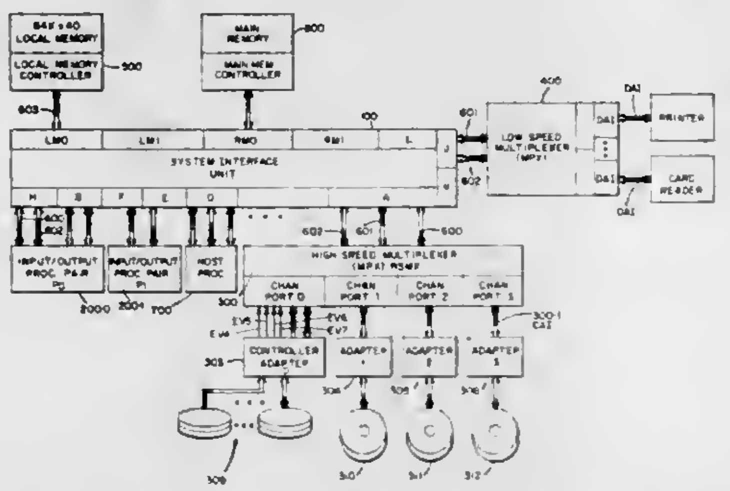
INPUT/OUTPUT PROCESSING SYSTEM UTILIZING LOCKED PROCESSORS

John M. Woods, Glendale; Marion G. Porter, Phoenix, both of Ariz.; Donald V. Mills, Rosenberg, Tex.; Edward F. Weller, III; Garvin Wesley Patterson, both of Glendale, Ariz., and Earnest M. Monahan, Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 15, 1976, Ser. No. 741,632

Int. Cl.² G06F *15/16, 11/00*

U.S. Cl. 364—200 41 Claims



1. An input/output system for controlling input/output operations involving a plurality of input/output devices, said system comprising:

a plurality of modules, each having an interface port said plurality of modules including at least one memory module and a plurality of command modules each including means for generating output signals including commands said plurality of command modules including a plurality of input/output processing units and a multiplexer module coupled to said plurality of input/output devices; and,

system interface means having a plurality of interface ports, each port being connected to a different one of said interface ports of said plurality of modules for communication of input and output signals by said system interface means between said modules, said system interface means further including:

configuration register means coupled to the ports of said input/output processing units for storing bit pattern signals coded for designating different configurations of said plurality of input/output processing units to be enabled for operation, said register means initially storing signals representative of an initial locked configuration bit pattern designating at least a pair of said identical plurality of input/output processing units as enabled for operation in a locked mode wherein each processing unit of said locked pair processes the same input signals in an identical manner to generate identical output signals including command to said multiplexer module and memory module required for execution of said input/output operations;

comparison circuit means individually connected to the interface ports of each of said plurality of input/output processing units, said comparison circuit means for comparing sets of said output signals from pairs of said interface ports of said input/output processing units paired for normal operation in said locked mode, said comparison circuit means being operative to generate signals indicative of a miscomparison between any one of said sets of output signals; and,

sequence control means connected to said comparison circuit means and to said register means, said sequence control means being operative in response to said signals indicative of said miscomparison to switch said register means from said locked mode configuration bit pattern to an unlocked mode configuration bit pattern wherein only one input/output processing unit of said pair is enabled for operation to permit first testing for reliably establishing which process unit of said pair is faulty.

4,099,235

METHOD OF OPERATING A DATA PROCESSING SYSTEM

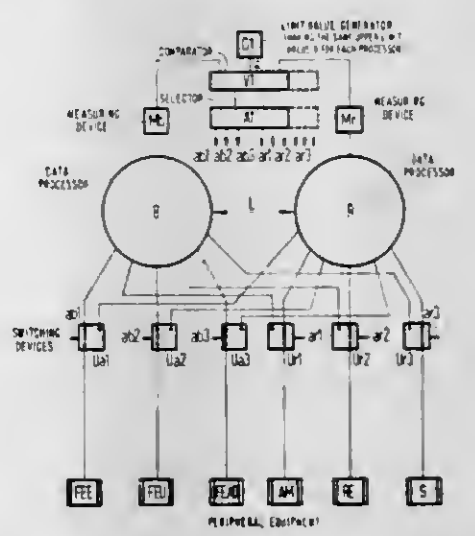
Hans Hoschler, Munich; Wolfgang Raimar, Riemerling, and Klaus Brandmaier, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 465,613, Apr. 30, 1974, which is a continuation of Ser. No. 330,705, Feb. 8, 1973. This application Mar. 14, 1977, Ser. No. 777,513

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1972, 2205914

Int. Cl.² G06F *15/16, 15/20*

U.S. Cl. 364—200 6 Claims



1. A method of operating a data processing system having a plurality of independent, program controlled, real-time data processors for regulating the flow of tasks to said data processors from a plurality of sources to facilitate the processing of the tasks with minimal delay, comprising the steps of:

coupling said tasks to said data processors,

monitoring and measuring, continually, the ratio of utilization of each of said data processors resulting from tasks received by them,

selecting an upper limit value for the utilization ratio of each said data processor, which value lies below a value for the utilization ratio at which the data processor is overloaded,

diverting the tasks coupled to one of said data processors to another of said data processors upon a determination that the utilization ratio of said one data processor exceeds its upper limit value and the utilization ratio of said another data processor does not exceed its upper limit value, and

processing said diverted tasks in said another data processor.

4,099,236

SLAVE MICROPROCESSOR FOR OPERATION WITH A MASTER MICROPROCESSOR AND A DIRECT MEMORY ACCESS CONTROLLER

William R. Goodman, Sunnyvale; Stephen P. Sample, Los Altos, and Allan L. Goodman, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 20, 1977, Ser. No. 798,849

Int. Cl.² G06F *15/16, 13/00*

U.S. Cl. 364—200 10 Claims

6. A slave microprocessor for operating on a bidirectional data bus which is coupled to a master microprocessor and to a direct memory access controller comprising:

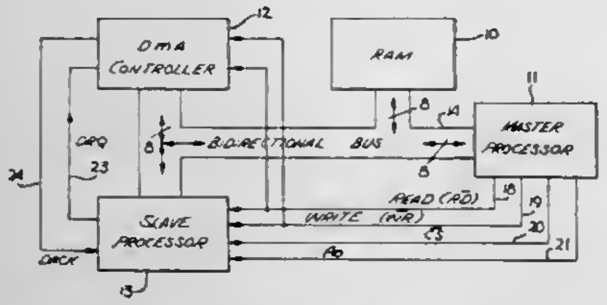
a first data register adapted to be coupled to said bus to receive signals from said bus;

a second data register adapted to be coupled to said bus to provide signals from said slave microprocessor to said bus;

a third register adapted to be coupled to said bus to provide signals to said bus representative of the status of said slave microprocessor;

a first circuit means for providing a signal for said slave microprocessor to indicate that said slave microprocessor has been selected to communicate with said bus, said circuit adapted to be activated by signals from either said master microprocessor or said controller, said first circuit means adapted to be coupled to said master microprocessor and said controller;

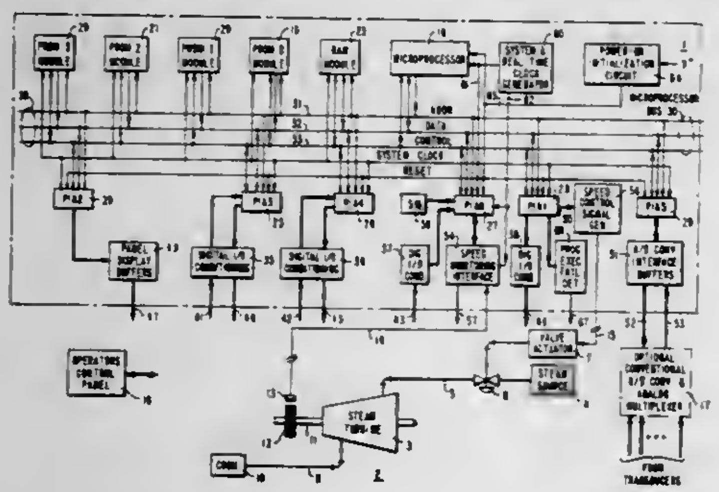
second circuit means adapted to be coupled to said controller to provide a signal to said controller indicating that data has been transferred from one of said first or second registers, said second circuit means coupled to said first and second registers;



third circuit means coupled to said third register and adapted to be coupled to said master microprocessor for providing signals to said third register to indicate that data has been transferred into one of said first or second registers;

whereby data may be transferred into and from said slave microprocessor under control by said master microprocessor or under control of said direct memory access controller.

4,099,237
PROGRAMMABLE TURBINE SPEED CONTROLLER
William E. Zitelli, Monroeville; James M. Mussler, Bethel Park, and Andras I. Szabo, Murrysville Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 23, 1977, Ser. No. 771,141
Int. Cl.² F01B *25/06;* F01K *13/02;* G05B *19/02*
U.S. Cl. 364—494 27 Claims



1. A programmable turbine speed controller apparatus comprising:

a plurality of permanently programmable memory devices for storage of addressably ordered sets of selected instructions and data words;

a microprocessor bus;

means for coupling said plurality of permanently programmable memory devices to said microprocessor bus in accordance with an addressable pattern;

a system clock for generating a first periodic timing signal;

a microprocessor coupled to said microprocessor bus and governed by said first periodic timing signal to process the instructions and data words of said plurality of permanently programmable memory devices;

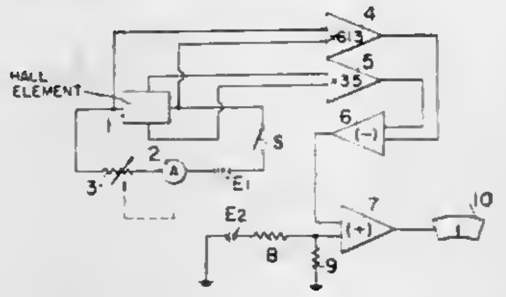
a real time clock for generating a second periodic timing signal;

a speed monitoring means coupled to said microprocessor bus and governed by the microprocessor in accordance with a first set of instructions processed thereby at a predetermined time in each period of the second timing signal to generate at least one speed measurement data word, representative of the actual speed of a turbine, during each period of the second timing signal;

a temporary memory means, coupled to said microprocessor bus, for storage of temporary data words resulting from the instruction processing operations of the microprocessor; and

means coupled to said microprocessor bus and governed by a data word from said microprocessor to generate an output signal proportional to said data word for controlling the speed of a turbine.

4,099,238
APPARATUS FOR DETERMINING A MAGNETIC FIELD
Tomoaki Suzuki, Funabashi, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Apr. 6, 1976, Ser. No. 674,088
Claims priority, application Japan, Apr. 7, 1975, 50-42515
Int. Cl.² G01R *33/06*
U.S. Cl. 364—481 7 Claims



1. Apparatus for determining the flux density of a magnetic field by using a Hall element comprising, in combination, a Hall element, having a pair of control current input terminals and a pair of Hall voltage output terminals, positioned in the magnetic field; a first potential source connected across said input terminals and operable to supply a constant magnitude control current therebetween; an analog calculation circuit having inputs and an output; means connecting said Hall voltage output terminals directly to one input of said calculation circuit to supply, to said one input, an electrical control signal corresponding to the Hall output voltage; and means supplying the voltage across said control input terminals, as an electrical signal corresponding to the temperature at the position of said Hall element, directly to another input of said calculation circuit; said analog calculation circuit deriving, at its output, an electrical signal corresponding to the flux density of the magnetic field.

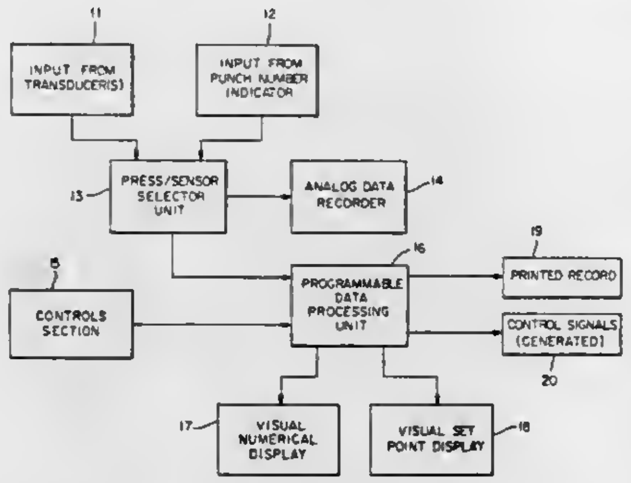
4,099,239
FORCE MEASUREMENT AND ANALYSIS PARTICULARLY RELATING TO ROTARY TABLET PRESSES
Joseph James Williams, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 666,734, Mar. 15, 1976, Pat. No. 4,030,868. This application Jan. 24, 1977, Ser. No. 761,844
Int. Cl.² G06F *15/46;* B29C *3/06*
U.S. Cl. 364—552 15 Claims

1. A method for selectively evaluating the quality of operation of any one or more of a plurality of tablet presses of the types which include high-speed, single die-station, multidie-single station, and multidie-station presses, comprising:

(a) providing identification of each tablet die/punch set combination and each tabletting station of each of said plurality of tablet presses;

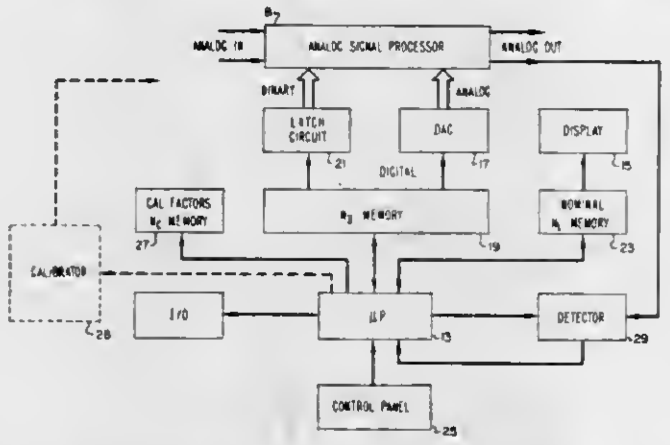
(b) providing in operative connection with each of said identified tablet presses first means for generating and making available in regard to each such tablet press, tablet formation information relating to one or more tabletting events;

(c) selecting a tablet press from said plurality for evaluation of tabletting characteristics thereof for a predetermined number of consecutive tabletting events and converting the tablet formation information obtained from said first means of the selected tablet press and relating to said predetermined number of tabletting events into a first convenient data form; and



(d) processing said converted tablet formation information by way of data processing means to determine the average and standard deviation of said predetermined number of consecutive tabletting events and to detect occurrences of tablet formation abnormalities, including comparing said converted tablet formation information with pre-established limits.

4,099,240
METHOD AND APPARATUS FOR PROGRAMMABLE AND REMOTE NUMERIC CONTROL AND CALIBRATION OF ELECTRONIC INSTRUMENTATION
France Rode, Los Altos; Peter Lindes, Palo Alto; Ralph F. Eschenbach, Los Altos, and Zvonko A. Fazarinc, Portola Valley, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 14, 1977, Ser. No. 759,308
Int. Cl.² G06F *3/14;* H01J *29/00*
U.S. Cl. 364—571 35 Claims



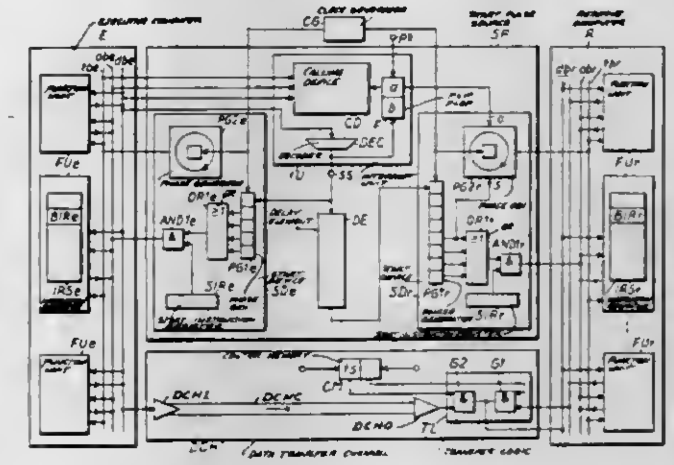
1. Electronic signal processing apparatus for processing analog signals comprising:

memory means for storing digital data representing control settings of the analog operational functions performed by the apparatus, and for storing digital data representing calibration factors for calibrating said analog operational functions;

computing means coupled to the memory means for computing the numerical value of digital data representing operational control signals for controlling said analog operational functions as a mathematical function of corresponding control settings and calibration factors, and for storing the digital data representing said operation control signals in the memory means; and

control means coupled to the memory means and computing means for producing operational control signals in response to the digital data representing said operational control signals, and applying the operational control signals to the analog operational functions associated with each of the control settings and calibration factors for processing the analog signals.

4,099,241
APPARATUS FOR FACILITATING A COOPERATION BETWEEN AN EXECUTIVE COMPUTER AND A RESERVE COMPUTER
Bengt Erik Ossfeldt, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Continuation-in-part of Ser. No. 514,077, Oct. 11, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,616
Claims priority, application Sweden, Oct. 30, 1973, 14713/73
Int. Cl.² G06F *15/16, 15/20*
U.S. Cl. 364—200 12 Claims



1. In a system having:

a clock generator for generating clock pulses,

an excutive computer having a bus system including a timing bus, an order bus, a data bus, and a plurality of function units, one of the function units having a set of selectable registers for storing instructions to be read and processed sequentially during processing cycles, each consisting of a given number of equal timing phases established by the clock generator and having means for selecting a register in response to a received address, said sets of registers storing the instructions for performing a procesing routine with a first of said registers storing the first instruction of said processing routine, said function units being connected to said timing bus for receiving timing signals, being connected to said data bus to receive and/or transmit data, and being connected to said order bus to receive and/or transmit instructions and/or addresses, and,

a reserve computer for working in parallel synchronism with the executive computer to perform the same processing routine, the reserve computer having a timing bus, an order bus, a data bus, and a plurality of function units, one of the function units having a set of selectable registers for storing instructions to be read and processed sequentially during processing cycles, each consisting of a given number of equal timing phases established by the clock generator and having means for selecting a register in reponse to a received address, said sets of registers storing the instructions for performing a processing routine with a first of said registers storing the first instruction of said processing routine, said function units being connected to said timing bus for receiving timing signals, being connected to said data bus to receive and/or transmit data, and being connected to said order bus to receive and/or transmit instructions and/or addresses;

the improvement comprising apparatus for controlling and initiating the parallel synchronous operation of the computers on the same data, said apparatus comprising, a unidirectional data transfer channel having an input and an output, means for connecting said input to the data bus of the executive computer, means for connecting said output to the data bus of the reserve computer, said data transfer channel introducing a known time delay in signals representing data transferred from the executive computer to the reserve computer, said time delay being greater than one of said timing phases, initial start means for generating a start signal to indicate the start of cooperation between the two computers, executive computer start means having an input and an output connected to the order bus of the executive computer, means for connecting the input of said executive computer start means to the initial start means, said executive computer start means further having means responsive to the receipt of said start signal at the input of said executive computer start means for transmitting from the output of said executive computer start means the address of said first of the registers of said set associated with the executive computer to said one function unit of the executive computer, time delay means for transmitting a delayed start signal from a time-delay output after a period of time substantially equal to said known time delay after the occurrence of the start signal, and reserve computer start means having an input and an output connected to the order bus of the reserve computer, means for connecting the input of said reserve computer start means to the time delay output of said time delay means for receiving the delayed start signal, said reserve computer start means further having means responsive to the receipt of the delayed start signal for transmitting from the output of said reserve computer start means the address of said first of the registers of said set associated with the reserve computer to said one function unit of the reserve computer, so that the transfer of the address of said first register from said reserve computer start means is delayed with respect to the transfer of the address of said first register from said executive computer start means by a time effectively equal to the time delay introduced by said data transferring channel so that each computer processes the same data with the same instructions.

4,099,242

ONE-PASS GENERAL ASSOCIATIVE SEARCH PROCESSOR

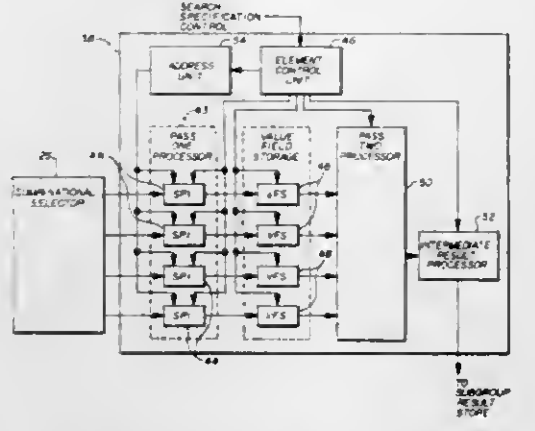
George B. Houston, 742 Boylston Ave. E., Seattle, Wash. 98102, and Roger H. Simonsen, 26840-8th Ave. S., Kent, Wash. 98031

Filed Nov. 3, 1976, Ser. No. 738,392
Int. Cl.^{2} G06F *7/28, 7/34;* **G11C** *15/00*
U.S. Cl. 364—200 **16 Claims**

1. An apparatus for searching data which is stored as a sequence of logical records on at least one data track in a memory device, in accordance with a search specification originated by a digital computer, wherein the search specification comprises first and second test criteria which are applied, respectively, against first and second designated data in each logical record on the data track, and wherein the results of applying the first test criteria against the first designated data must be known prior to applying the second test criteria against the second designated data, even though said second designated data may occur before, or be part of, said first designated data in a particular logical record, said apparatus comprising:

first processing means for (1) searching a logical record to find the first designated data therein, and for (2) applying the first test criteria against the first designated data in said logical record;

means for recognizing said second designated data in said logical record during the processing of said logical record by said first processing means;



means for temporarily storing said recognized second designated data; and

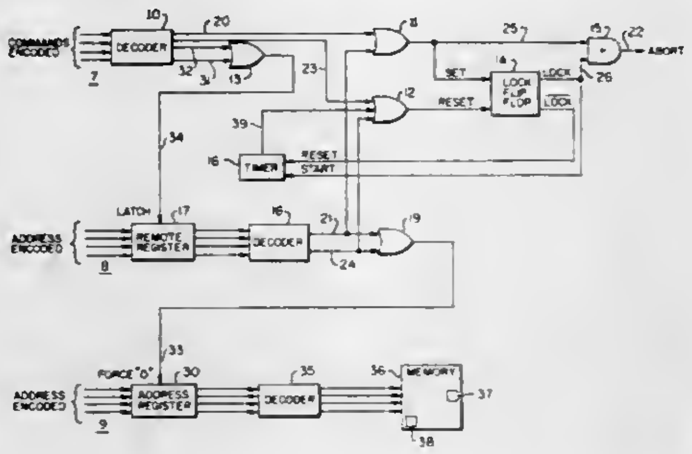
second processing means for applying the second test criteria against said temporarily stored second designated data following application of the first test criteria against the first designated data, whereby a search of said logical record using first and second search criteria against first and second designated data is accomplished in a single pass of the data comprising said logical record.

4,099,243

MEMORY BLOCK PROTECTION APPARATUS

Benedict A. Palumbo, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jan. 18, 1977, Ser. No. 760,299
Int. Cl.^{2} G06F *9/18, 13/00*
U.S. Cl. 364—200 **1 Claim**



1. In a data processing system comprising at least one memory and a plurality of devices adapted to interact therewith, said memory being organized to store data in blocks each including a plurality of memory locations, address register means coupled to said memory for addressing a specified location in a selected block of said memory in accordance with address signals provided by any of said devices seeking access to said specified memory location;

apparatus for locking out another device seeking access to said selected block to prevent it from carrying out any of a plurality of predetermined, unique sequences of operations while a first device is still engaged in said selected block, comprising:

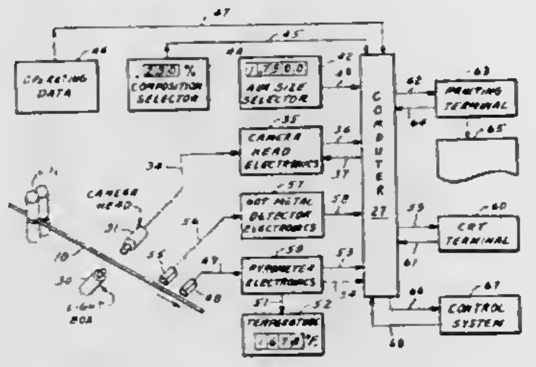
first decoding means for generating signals representative of Read Lock/Write Unlock and Read Remote Register/-Write Remote Register operation sequences respectively, in accordance with command signals received from an access-seeking device, means for coupling a Read Lock signal to a first OR gating means, means for coupling a Write Unlock signal to a second OR gating means, means for coupling a Read Remote Register signal and a Write Remote Register signal respectively to a third OR gating means, a Lock flip-flop having Set and Reset inputs for generating Lock and Lock output signals in response to signals applied to its Set and Reset inputs respectively, AND gating means coupled to receive said Lock signal at one of its inputs, the output of said first OR gating means being coupled to another input of said AND gating means and to said flip-flop Set input, the output of said second OR gating means being coupled to said flip-flop Reset input, a timing circuit for initiating a predetermined timing cycle upon energization by said Lock signal, said timing circuit being reset upon the occurrence of said Lock signal, said timing circuit applying an output signal to said second OR gating means upon the completion of said timing cycle, a remote register energized by input signals derived from said address signals and latched by the output of said third OR gating means, second decoding means coupled to the output of said remote register for providing signals representative to an XEC Lock/SXC Unlock operation sequence in accordance with said input signals, means for coupling an XEC Lock signal to said first OR gating means and to a fourth OR gating means, means for coupling an SXC Unlock signal to said second and fourth OR gating means respectively, the output of said fourth OR gating means for forcing said address register means to address a predetermined memory location; whereby said AND gating means, when rendered conductive, provides an abort output signal which is coupled to said other device representing a command or notification to abort the operation sequence attempted by said other device in said selected memory block.

4,099,244

RECALIBRATION SYSTEM FOR ELECTRO-OPTICAL GAGE

Tom L. Galanis; Joel L. Hoffner, and John C. Clymer, all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,811
Int. Cl.^{2} B21B *37/00;* **G06F** *15/46*
U.S. Cl. 364—571 **16 Claims**



1. A recalibration system for an electro-optical system which gages a dimension of a moving bar, comprising:

(a) electronic camera head means aimed to receive an image of the moving bar on a central portion of an electronically scanned image responsive device and generate a raw camera signal, each said image responsive device having one or more calibration masks alongside the central portion thereof;

(b) electronic circuit means including means for processing the raw camera signal to produce a bar size pulse, a sweep generator for driving the scanning of the image responsive device, and means for offsetting the scan from a central sweep to a calibration mask;

(c) calculator means assimilating the bar size pulse and calibration and/or recalibration command signals for:
  .1 calibrating the gaging system using a standard bar,
  .2 recalibrating the gaging system without a bar by controlling the selection and use of a calibration mask,
  .3 storing the recalibrated bar size data; and

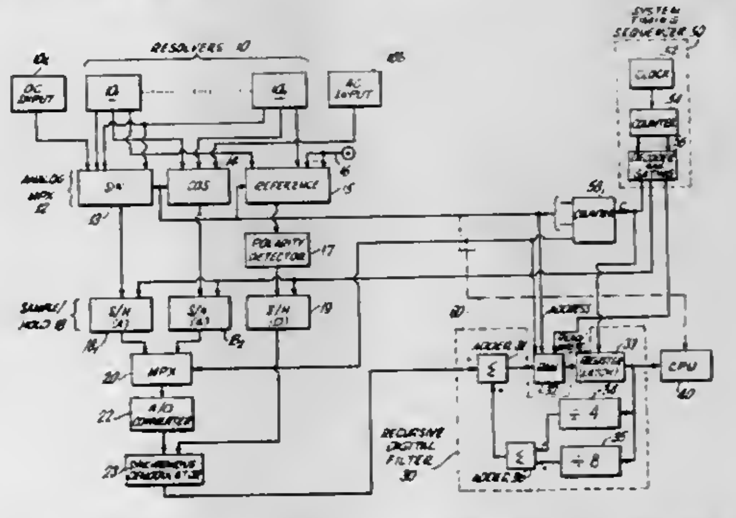
(d) means for utilizing the stored data to indicate and/or record recalibrated bar size measurement.

4,099,245

TRANSDUCER SIGNALLING APPARATUS

Anthony Maysonett, Fanwood, N.J., assignor to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed May 5, 1977, Ser. No. 794,073
Int. Cl.^{2} G06J *1/00*
U.S. Cl. 364—603 **7 Claims**



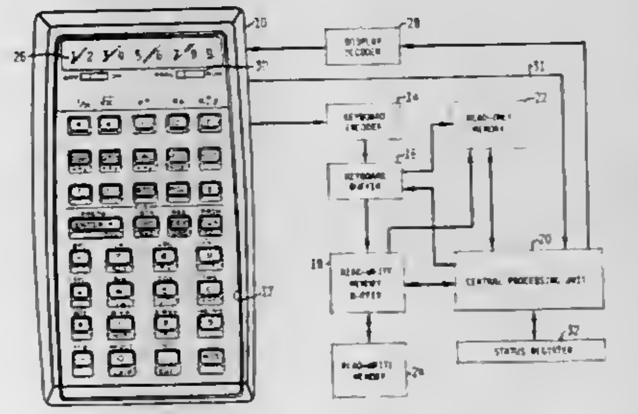
1. In combination, a plurality of signal sources including at least one resolver supplying sine, cosine and reference signals, an analog-to-digital converter, multiplexing and sampling means for serially and separately supplying each signal supplied by said signal sources to said analog-to-digital converter, memory means, and digital filter means connecting said analog-to-digital converter and said memory means.

4,099,246

CALCULATOR HAVING MERGED KEY CODES

Thomas E. Osborne, San Francisco, and Richard Kent Stockwell, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 17, 1973, Ser. No. 425,341
Int. Cl.^{2} G06F *13/00*
U.S. Cl. 364—709 **8 Claims**



1. An electronic calculator comprising:

a keyboard having a plurality of keys for entering information into the calculator;

encoder means connected to the keyboard for generating key codes corresponding to the keys on the keyboard, each key code having a predetermined length and being generated in response to a particular key being depressed; and

processing means connected to the encoder means for processing key codes, for producing a merged key code in response to receipt of a first selected key code followed by one of a plurality of second key codes, the merged key code having a length shorter than the combined lengths of the first selected key code and the one of the plurality of second key codes, and for substituting the merged key code for the first selected key code and the one of the plurality of second key codes.

4,099,247

ELECTRONIC INSTRUMENT WITH NON-VOLATILE DISPLAY

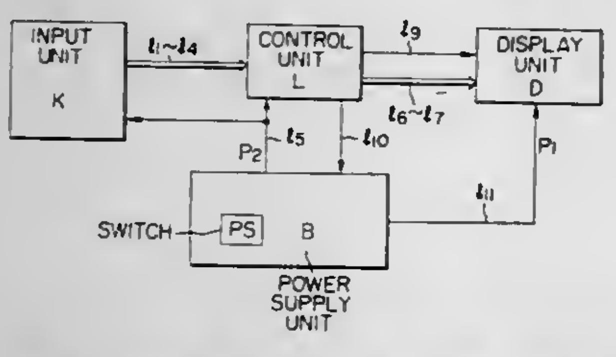
Hiroyuki Mikada, Kawasaki; Sakae Houryu, Chigasaki, and Jyuji Kishimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 545,702, Jan. 30, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 724,016

Claims priority, application Japan, Feb. 4, 1974, 49-14361; Feb. 8, 1974, 49-15967; Jan. 21, 1975, 50-9177

Int. Cl.² G06F *3/14*

U.S. Cl. 364—710 **20 Claims**



1. An electronic instrument having display means for displaying information entered therein, comprising:

persistent display means;

drive control circuit means for storing information and controlling the display of said persistent display means to enter said information therein;

a single clear instruction generating means for generating a signal operative to clear both of said persistent display means and said drive control circuit means;

first clearing means coupled to said clear instruction generating means and said display means and responsive to the signal from said single clear instruction generating means to clear information entered in said persistent display means; and

second clearing means coupled to said clear instruction generating means and said drive control circuit means and responsive to the signal from said single clear instruction generating means to clear the information stored in said drive control circuit means.

4,099,248

ONE'S COMPLEMENT SUBTRACTIVE ARITHMETIC UNIT UTILIZING TWO'S COMPLEMENT ARITHMETIC CIRCUITS

Barry R. Borgerson, Gwynedd Valley, and Garold S. Tjaden, Doylestown, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,745

Int. Cl.² G06F *7/50*

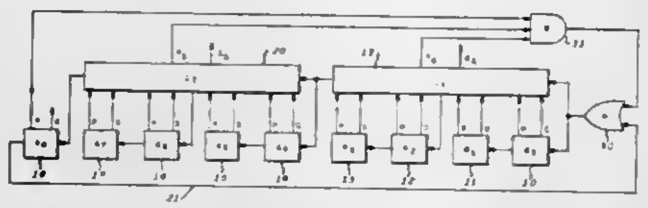
U.S. Cl. 364—787 **8 Claims**

1. Apparatus for performing one's complement addition and subtraction comprising

parallel multiple stage arithmetic means for linearly combining two binary number representations expressed in true and one's complement form, said arithmetic means including a least and a most significant stage, said most significant stage having a carry output and said least significant stage having a carry input,

said arithmetic means including carry propagate outputs associated with said stages,

correction means coupled to said carry output for providing an end-around carry signal from said carry output to said carry input, and



compensation means responsive to said carry propagate outputs for providing a compensation signal to said carry intput whenever all of said carry propagate outputs are energized,

said compensation means including look-ahead carry means responsive to said carry propagate outputs for providing at least one group propagate output, thereby providing said compensation signal to said carry input.

4,099,249

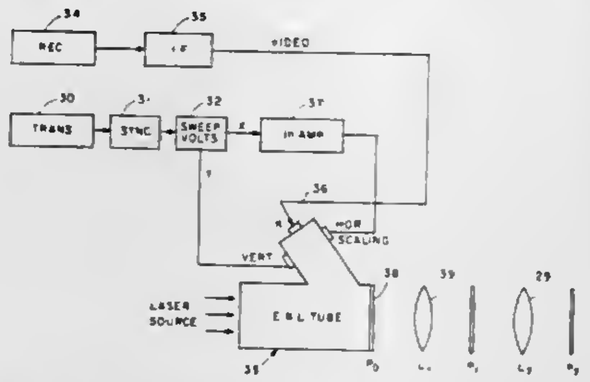
DOPPLER PROCESSING METHOD AND APPARATUS

David Paul Casasent, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 771,041

Int. Cl.² G06G *9/00;* G01S *11/00*

U.S. Cl. 364—822 **12 Claims**



1. In a method for determining the value of the frequency component *f* present in a composite signal *f* ± Δ*f*, the steps of

procuring a film transparency having a transmittance pattern that contains the term M_2^*, the conjugate of the Mellin transform of the signal *f*;

illuminating said film transparency with a light distribution pattern corresponding to M_1, the Mellin transform of the composite *f* ± Δ*f*, so as to form a light distribution pattern corresponding to the product $M_1M_2^*$;

Fourier transforming by optical means said light distribution pattern which corresponds to $M_1M_2^*$ so as to correlate the signal *f* and the composite signal *f* ± Δ*f*; and

determining the location of the resultant correlation peak with respect to a predetermined reference coordinate system,

said location providing an indication of the value of the frequency component Δ*f*.

9. In an arrangement for determining the value of Δ*f* present in a signal *f* ± Δ*f*, the combination of

means for converting said signal *f* ± Δ*f* into a corresponding transmittance pattern having a horizontal scale that is the natural log of that of said signal;

a frequency plane optical correlator;

a holographic matched spatial filter having recorded therein as an interference pattern a term corresponding to M*, said term M* being the conjugate of the Mellin transform of the signal *f*,

said transmittance pattern being positioned in the input plane of said correlator;

the correlation peak appearing in the output plane of said correlator when said transmittance pattern is illuminated having a horizontal displacement from a vertical reference axis that is proportional to the value of Δ*f*.

4,099,250

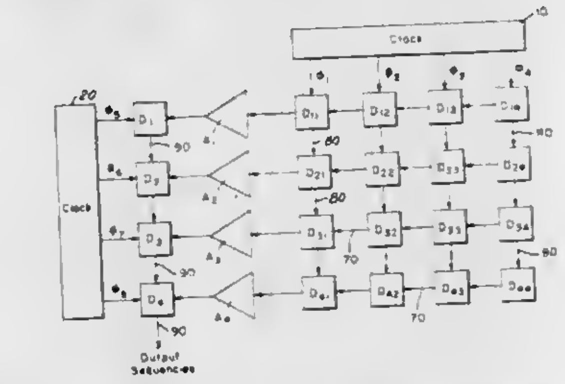
HADDAMARD ELECTRONIC READOUT MEANS

Ronald M. Finnila, and Dale G. Maeding, both of Carlsbad, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1976, Ser. No. 752,036

Int. Cl.² G06G *7/12;* H04N *3/14*

U.S. Cl. 364—826 **13 Claims**



1. A device for providing a Haddamard transform, comprising the combination:

a first matrix of interconnected electronic cells; and

a second matrix of interconnected electronic cells, different in structure from the electronic cells of the first matrix, the electronic cells of the first and second matrices including charge coupled devices,

said first matrix including a plural number of rows of said electronic cells, each row of said cells being serially coupled to each other, the output of each one of said rows being coupled to an input of one of the cells of said second matrix, one cell of the second matrix per one row of the first matrix.

4,099,251

ANALOG ACCUMULATOR MEMORY DEVICE

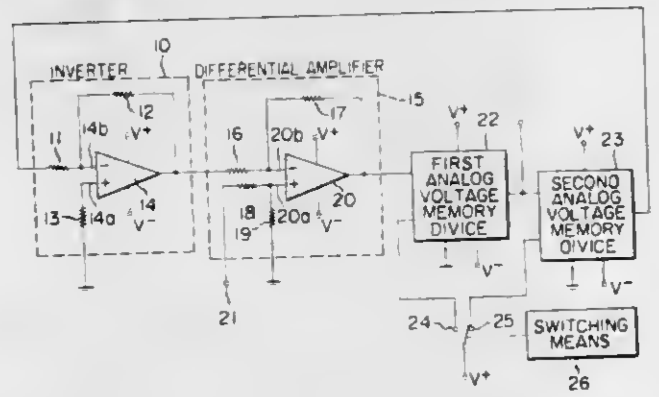
Shunji Minami, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1976, Ser. No. 754,005

Claims priority, application Japan, Dec. 26, 1975, 50-159390

Int. Cl.² G06G *7/14;* G11C *27/02*

U.S. Cl. 364—829 **5 Claims**



1. An analog accumulator memory device, comprising:

(a) an inverter circuit with a unit gain,

(b) a differential amplifier with a unit gain and with a noninverting input terminal connected to an external input terminal and an inverting input terminal connected to an output terminal of said inverter circuit,

(c) a first analog voltage memory device with its input terminal connected to an output terminal of said differential amplifier, whereby an output voltage equal in magnitude to an input voltage may be derived and held at an output terminal,

(d) a second analog voltage memory device with its input terminal connected to said output terminal of said first analog voltage memory device, whereby an output voltage equal in magnitude to an input voltage may be derived and held at an output terminal thereof, each of said devices having a gate terminal for receiving a driving signal to enable the corresponding device,

(e) driving signal application means for alternately applying a driving signal to the gate terminals of said first and second analog voltage memory devices, and

(f) a feedback connection between the output terminal of said second analog voltage memory device and the input terminal of said inverter circuit.

4,099,252

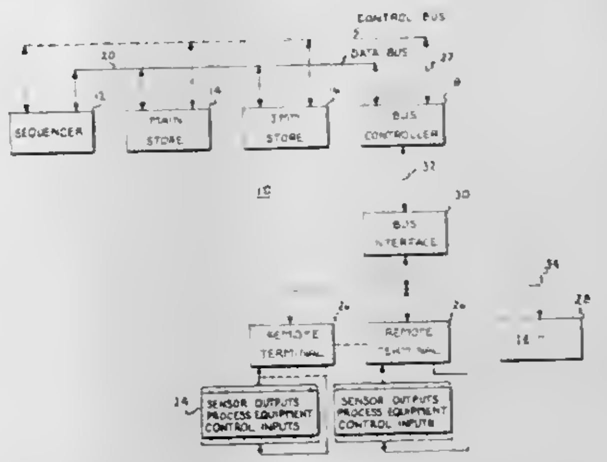
METHOD AND MEANS FOR ALTERING THE STATES OF CONTROL SIGNALS IN AN ON-LINE CONTROL SYSTEM

William J. Danco, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Jul. 3, 1974, Ser. No. 485,573

Int. Cl.² G06F *9/06*

U.S. Cl. 364—900 **17 Claims**



1. A method of altering the operation of a computer controlling equipment in a system of the type operable in response to signals representative of input and output conditions resulting from logical operations based upon operating parameters of the equipment in response to forcing signals provided to the computer from an operator console in communication therewith, comprising the steps:

(a) storing in a memory of said computer an executive program serving to,

(1) direct on-line communications between the computer and said equipment and between the computer and said console, and

(2) simulate an equipment control circuit having a format comprised of a plurality of logic strings, each logic string including at least one switch element of an identifiable type and logical condition controlled by the state of a related condition and a continuity status means having a conducting condition controlled by the logical condition of the switch elements of its associated logic string, said continuity status means generating output conditions for storage in said memory and serving to

effect the generation of output control signals for said equipment;

(b) repetitively storing in said memory, input conditions representative of the states of signals provided to said computer from said equipment;

(c) utilizing said console to selectively force the state of a one of plurality of input or output conditions in said memory in accordance with the forcing signals provided to said computer from said console subsequent to each repetitive storing of the input conditions whereby a plurality of input and output conditions may be selectively forced and stored in said memory;

(d) repetitively sending output control signals representative of the states of previously generated and forced output conditions from said computer to said equipment; and

(e) repetitively generating the states of output conditions in accordance with logical operations, performed on input and output conditions, as specified by the executive program simulating the equipment control circuit.

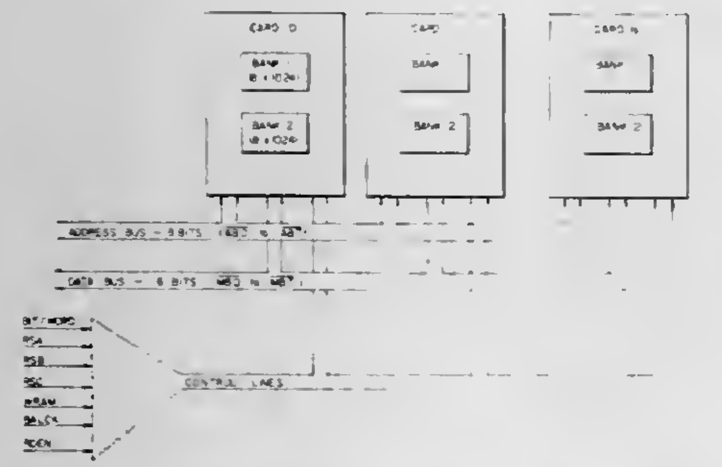
4,099,253
RANDOM ACCESS MEMORY WITH BIT OR BYTE ADDRESSING CAPABILITY

Philip G. Dooley, Jr., Bolton, Conn., assignor to Dynage, Incorporated, Bloomfield, Conn.

Filed Sep. 13, 1976, Ser. No. 722,886

Int. Cl.² G11C *7/00, 8/00*

U.S. Cl. 364—900 **5 Claims**



1. A random access memory operable in either a "word mode" in which a plurality of bit locations are accessed in parallel during a memory cycle or a "bit mode" in which one bit location is accessed during a memory cycle, said memory comprising: a plurality P of bit storage units each having 2^N addressable bit locations at each of which locations one bit may be stored, each of said bit storage units having N address terminals to which a set of N binary signals may be supplied to selectively address any one of its bit locations, a plurality N of bit location address lines, unit addressing means for addressing any selected one of said storage units, means responsive to a "word mode" control signal for simultaneously enabling all P of said bit storage units and for at the same time simultaneously supplying the set of bit location address signals appearing on said address lines to the address terminals all P of said storage units to gain parallel access to a plurality P of bit locations, and means responsive to a "bit mode" control signal for causing only the one of said storage units selected by said unit addressing means to be simultaneously enabled and supplied with the set of bit location address signals appearing on said address lines to gain access to only one bit location.

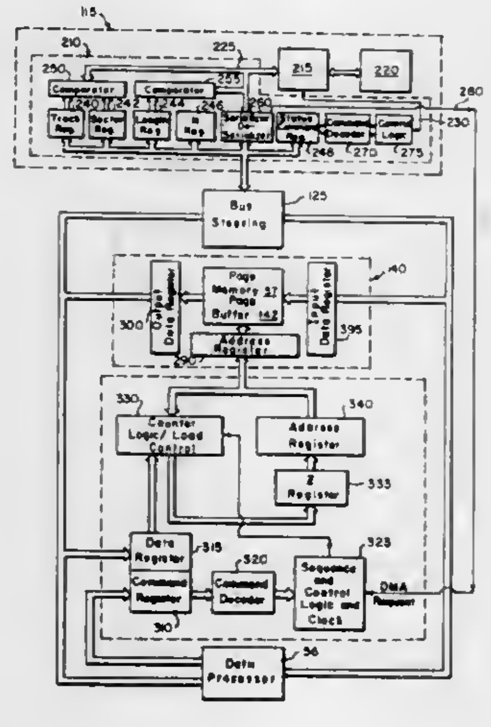
4,099,254
METHOD AND APPARATUS FOR ELECTRONIC COLLATION

Donald Richard Andrews, Longmont; Alan Fobes Neel, II, and Donald Ward Zegafuse, both of Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,533

Int. Cl.² G06F *3/12;* **G03G** *15/00*

U.S. Cl. 364—900 **47 Claims**



1. An electronic printer operable to print images on both sides of a recording medium in response to electrical signals representative of said images which are received at said printer, said electronic printer comprising

printing means for forming an image on the recording medium as the recording medium is fed through the printer,

means for controlling said printing means in response to said electrical signals to form on said recording medium an image represented by said electrical signals,

a memory for storing electrical signals representative of said images that are received at said printer;

a last-in first-out (LIFO) receptacle for temporary storage for the recording medium printed on one side prior to its being printed on a second side,

means for forming in said memory a first ordered sequence of the electrical signals representative of the pages to be printed on one side of the recording medium and a second ordered sequence of the electrical signals representative of the pages to be printed on the other side of the recording medium, and

means for writing the electrical signals in one of said sequences and then the other at least once into said control means, the first of said ordered sequences that is written being used to form images on one side of the recording medium fed through the printer into the LIFO receptacle and the second of said sequences that is written being used to form images of the other side of the recording medium fed through the printer from the LIFO receptacle, one of said ordered sequences being written into said control means in ascending page order and the other in descending page order.

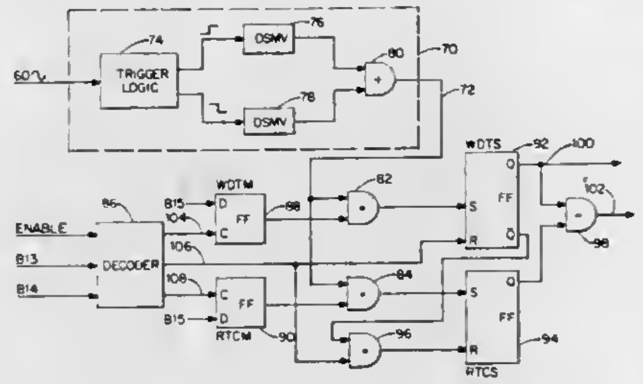
4,099,255
INTERRUPT APPARATUS FOR ENABLING INTERRUPT SERVICE IN RESPONSE TO TIME OUT CONDITIONS

Philip E. Stanley, Westboro, and William E. Woods, Natick, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 10, 1976, Ser. No. 749,572

Int. Cl.² G06F *1/04, 11/00*

U.S. Cl. 364—900 **8 Claims**



1. In a data processing system, interrupt apparatus comprising:

A. means for decoding a signal indicating whether or not interrupts will be enabled, said signal, as decoded, having a first state if interrupts are to be enabled and a second state if interrupts are to be disabled;

B. a mode register, coupled with said means for decoding, for storing the state of said signal as decoded;

C. means for generating a stream of pulses;

D. a time-out counter, the value of which may be changed until a predetermined value is indicated, said predetermined value indicative of an interrupt service request;

E. a service register coupled to enable the changing in value of said counter if said service register indicates a specified value; and

F. means, responsive to the storage of a first state of said signal in said mode register and responsive to one of said pulses, for enabling said service register to indicate said specified value.

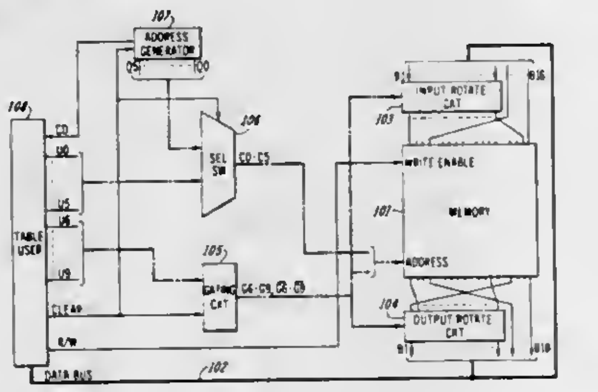
4,099,256
METHOD AND APPARATUS FOR ESTABLISHING, READING, AND RAPIDLY CLEARING A TRANSLATION TABLE MEMORY

Don Ray Draper, Lisle, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1976, Ser. No. 742,268

Int. Cl.² G11C *5/02*

U.S. Cl. 364—900 **17 Claims**



1. In combination:

a plurality of random access word organized memories wherein the word locations of each memory are separated into control and data locations defined by corresponding ranges of memory addresses;

a source of data words which each comprise one or more access control bits and associated data in a defined format, each data word being longer than a word length in one of said memories;

means connected to said memories for accessing a control location of at least one of said memories and a data location of at least an additional one of said memories;

means connected to said source of data words and to said memories and coordinated with said accessing means for distributing the individual bits of a data word to said memories such that said access control bits are provided to memories having access control locations accessed and said associated data are provided to said additional memories having data locations accessed;

means connected to said accessing means and to said memories and coordinated with said accessing means for associating the individual bits of the locations accessed in said memories into an output data word having said defined format; and

said accessing means including means for simultaneously accessing said plurality of memories at addresses within said control locations thereof whereby the time required to access all control bits stored in said memories is reduced by a factor equal to the number of said plurality of memories as compared with sequentially accessing then.

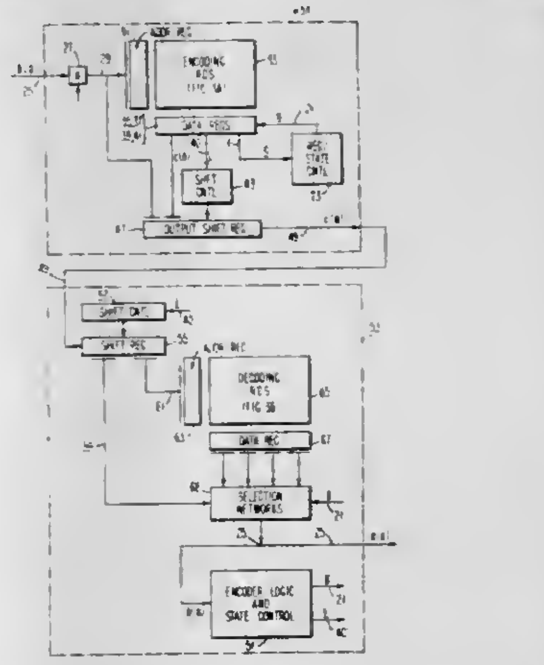
4,099,257
MARKOV PROCESSOR FOR CONTEXT ENCODING FROM GIVEN CHARACTERS AND FOR CHARACTER DECODING FROM GIVEN CONTEXTS

Richard Fairbanks Arnold, Palo Alto; Yitzhak Dishon; Norman Ken Ouchi, both of San Jose, and Marshall I. Schor, Menlo Park, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1976, Ser. No. 720,019

Int. Cl.² G06F *5/00*

U.S. Cl. 364—900 **5 Claims**



1. An apparatus (5) of the type having output means and means for generating variable length codewords $c(a_i)$ and $c(a_j)$ responsive to corresponding fixed length codewords $b(a_i)$ and $b(a_j)$, where a_i and a_j are source alphabet characters and where $a_i \in A_1$ and $a_j \in A_2$; comprising in combination:

a Markov processor (FIG. 2; FIG. 5-1,21,23,41) for resolving ambiguities by character sequence context recognition arising whenever any ones of a sequence of fixed length characters to be encoded can represent different source characters a_i and a_j drawn from dissimilar alphabets A_1 and A_2;' said processor including:

an *r* state register (7);

state transition means (23) responsive to a control signal (S_i or S_j) for changing a given present state of the register to one of a preselected number less than *r* next states (9, FIGS, 1B and 1C), said state transition means including means (9, 11, 19) for generating a second control signal signal (*g*);

means (31, 33, 35, FIG. 3A) responsive to each fixed length codeword and coacting with said processor for generating an ordered m-tuple comprising at least two variable length codewords and a counterpart control signal ($c(a_i)$, $c(a_j)$, S_i or S_j); and

means (37, 3, 9) for selecting and applying one of the variable length codewords from the m-tuple to the output means according to the value of said second control signal (*g*), said means further including means (1, 41, 21) for applying the counterpart control signal (S_i or S_j) to the state transition means.

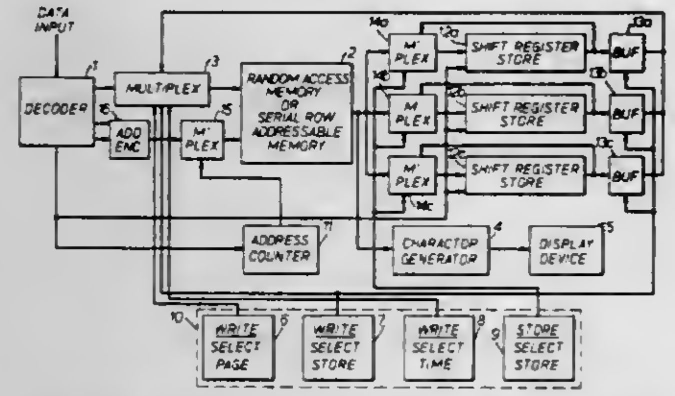
4,099,258
SYSTEM OF DATA STORAGE
Robert Parsons, St. Neots, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 12, 1976, Ser. No. 731,249

Claims priority, application United Kingdom, Oct. 8, 1975, 41217/75

Int. Cl.² G06F *13/06*

U.S. Cl. 364—900 **14 Claims**



1. A multi-address digital data store for storing at appropriate addresses in the store blocks of digits representing information, including input circuit means for receiving input data comprising blocks of information digits each representing a data row of a data page having a plurality of data rows, each said block having an associated group of address digits representing an address comprising first and second parts; decoder means connected for response to said groups of address digits to produce address selection signals corresponding to said first parts of said addresses, first store means having a capacity equivalent to a single full page of information digit rows and connected to receive said blocks of information digits for storage at addresses determined by said address selection signals; selector means for permitting storage by said first store means only of those said blocks of information digits having associated therewith a particular second part address; serial access storage means having storage capacity several times that of said first store means; and transfer means for transferring blocks of information digits from said first store means to a selected part of said serial access storage means in a predetermined order of addresses of said first store.

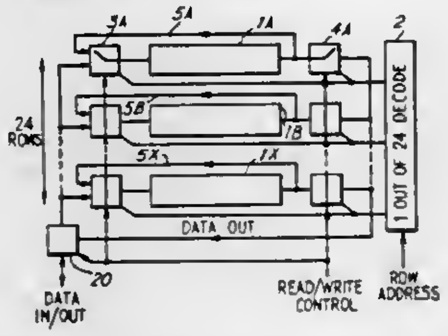
4,099,259
DATA STORES AND DATA STORAGE SYSTEM
Robert Parsons, St. Neots, and Howard Cook, Renhold, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 12, 1976, Ser. No. 731,248

Claims priority, application United Kingdom, Oct. 9, 1975, 41425/75

Int. Cl.² G06F *13/06*

U.S. Cl. 364—900 **14 Claims**



1. A multi-address digital data store organized for storage of input data cmprising respective multi-row groups of data, said input data comprising a plurality of blocks of data, each block including information digits and an associated group of two-part address code digits, each two-part address code digit comprising a data group identification part and a data row identification part; a plurality of serially accessed data storage register means each corresponding with an individual row of a multi-row data group and uniquely corresponding to a selected one of said two-part address code digits; individual first and second switch means for each said register means; address decode means for independently and individually addressing said shift register means via said first switch means and responsive to said input data two-part address code digits for routing said input data directly to the uniquely corresponding register means to write data into said store and via said second switch means to read data from said store.

4,099,260
BIPOLAR READ-ONLY-MEMORY UNIT HAVING SELF-ISOLATING BIT-LINES
Dennis Joseph Lynes, Madison, N.J.; Peter Theodore Panousis, Salisbury Township, Lehigh County, and Robert Leonard Pritchett, Bath, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 20, 1976, Ser. No. 724,652

Int. Cl.² G11C *17/06*

U.S. Cl. 365—105 **9 Claims**

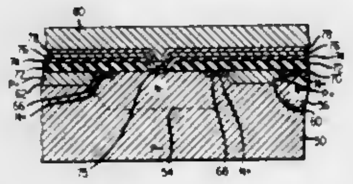
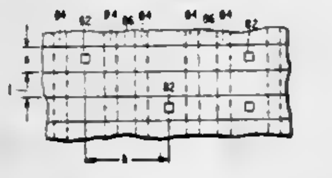


FIG. 7



1. In an integrated circuit read-only-memory unit for storing information in binary form including a semiconductor body having a plurality of highly doped channels forming multiple spaced-apart bit lines, and a plurality of spaced-apart metallic word lines overlying said body and insulated therefrom and orthogonally disposed to said bit lines, each one of said bit lines being interconnected by a separate Schottky diode to any selected ones of said word lines in accordance with the information stored in said memory;

a semiconductor body having

(1) a plurality of parallel spaced-apart surface regions of one conductivity type supported within a bulk portion of the opposite conductivity type to form multiple bit lines, each of the regions providing a plurality of regularly spaced-apart memory cell positions dispersed along the longitudinal extent of the bit line,

(2) channel-stop surface regions of the same conductivity type as the bulk portions in the spaces between said first-mentioned regions, and

(3) at least one surface portion in each of said first-mentioned regions of the same conductivity type but of higher conductivity to enhance the conductivity of said bit lines,

a selectively apertured insulating layer overlying the semiconductor body, the apertures in said layer overlying selected ones of regularly spaced-apart memory cell positions,

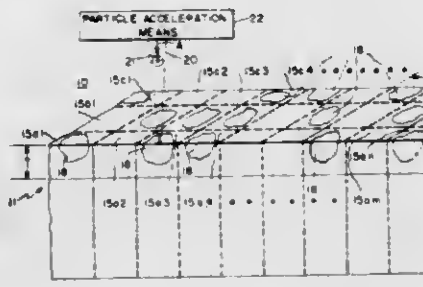
and a plurality of parallel spaced-apart metallic word lines disposed on said insulating layer orthogonal to said bit lines at said memory cell positions to form Schottky diodes wherever portions of said metallic lines extend through apertures in said layer to contact said bit lines, the pattern of apertures corresponding to the particular specified group of information words designed to be stored in said unit.

4,099,261
METHOD FOR WRITING ON ARCHIVAL MEMORY TARGET BY ION DAMAGE
Conilee G. Kirkpatrick, and George E. Possin, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,698

Int. Cl.² G11C *13/00*

U.S. Cl. 365—105 **12 Claims**



1. A method for essentially permanently storing binary data in an archival memory semiconductor target, comprising the steps of:

(a) providing a substrate of a semiconductor material having a first polarity type, said substrate having a surface;

(b) fabricating a layer of the remaining polarity type of the semiconductor material upon and substantially completely across the surface of said substrate;

(c) assigning a two-dimensional array of potential data storage sites upon a surface of the fabricated layer furthest from said substrate surface;

(d) damaging the lattice of the semiconductor layer over a portion of each data storage site at which a first value of binary information is to be stored; and

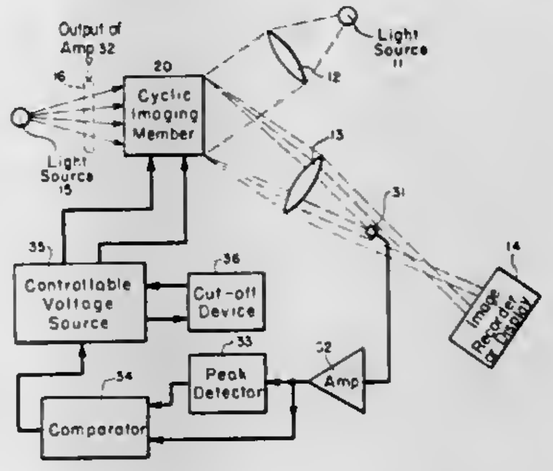
(e) maintaining the lattice of the semiconductor layer at the remaining data storage sites in undamaged condition to store a remaining value a binary information.

4,099,262
AUTOMATIC MEMORY CONTROL FEEDBACK SYSTEM FOR A CYCLING OPTICAL IMAGING SYSTEM
Clark I. Bright, Kula, Hi., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 24, 1977, Ser. No. 762,073

Int. Cl.² G11C *11/46*

U.S. Cl. 365—126 **32 Claims**



1. A system for altering the deformation of a cyclic imaging member comprising:

deformable means, having a deformable surface arranged to be placed in an initial deformed position by the application of an input; and

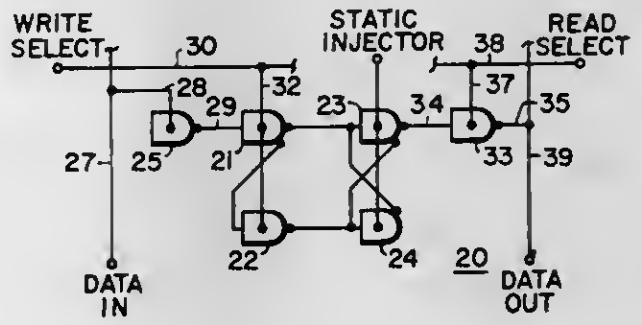
means, responsive to the extent of the deformation of the deformable surface, for altering the deformation of said surface.

4,099,263
BUFFERING FOR AN I²L MEMORY CELL
Paul Howard Scott, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 4, 1976, Ser. No. 738,779

Int. Cl.² G11C *11/40*

U.S. Cl. 365—155 **7 Claims**



4. A register cell having a plurality of integrated injection logic gates, comprising: a first integrated injection logic gate having an injector input coupled to a data input line for the register cell; and a second logic gate having an injector input coupled to a write enable line for the register cell to allow data to enter the register cell from the data input line through the injector input of the first logic gate when the write enable line is energized.

4,099,264

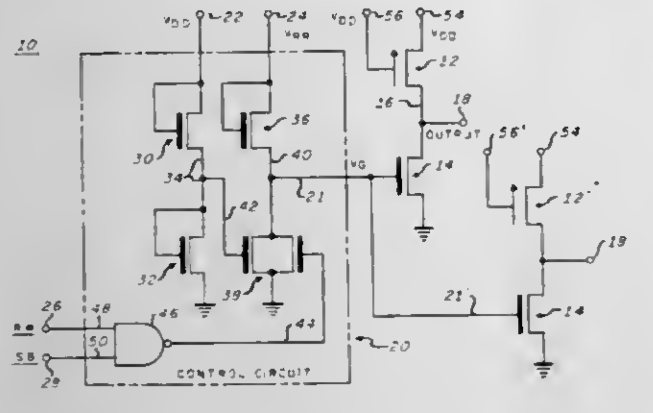
NON-DESTRUCTIVE INTERROGATION CONTROL CIRCUIT FOR A VARIABLE THRESHOLD FET MEMORY

Robert J. Lodi, Tewksbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,651

Int. Cl.^{2} G11C *11/40*

U.S. Cl. 365—189 **10 Claims**



2. A memory device of the type having a memory cell comprising,

a field effect transistor coupled in series with said memory cell for applying a current signal thereto, and

a control voltage source coupled to the gate of said field effect transistor for providing a control voltage thereto, said control voltage increasing or decreasing directly with changes in the threshold voltage of said field effect transistor thereby providing a fixed on drive voltage for maintaining the current signal constant.

4,099,265

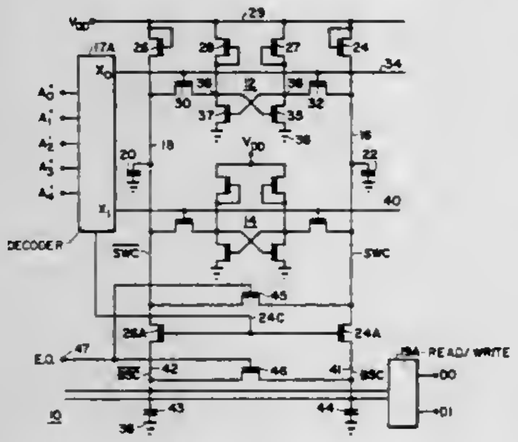
SENSE LINE BALANCE CIRCUIT FOR STATIC RANDOM ACCESS MEMORY

Kichio Abe, Yokohama, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1976, Ser. No. 753,234

Int. Cl.^{2} G11C *7/02, 11/40*

U.S. Cl. 365—190 **4 Claims**



1. A memory including: a plurality of storage cells, first means for selecting one of said storage cells in response to a change in an address input of said memory; first and second sense-write conductors coupled to each of said storage cells for writing information into and sensing information out of a selected one of said storage cells; a second means responsive to said change in said address input coupled to said first and second sense-write conductors for equalizing the voltages on said first and second sense-write conductors prior to completion of a read operation of said memory; first conductor means and second conductor means, a first selection field effect transistor coupled between said first sense-write conductor and said first conductor means and a second selection field effect transistor coupled between said second sense-write conductor and said second conductor means, said first and second selection field effect transistors having their control electrodes coupled to a selection conductor, and further including second balancing MOSFET coupled between said first and second conductors and having its gate electrode coupled to said second means fo equalizing the voltages on said first and second conductor means.

4,099,266

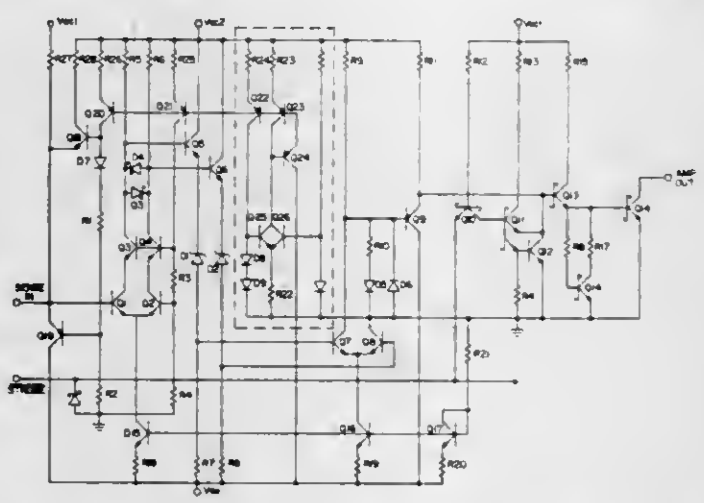
SINGLE-CHIP BI-POLAR SENSE AMPLIFIER FOR A DATA PROCESSING SYSTEM USING MOS MEMORY

Cliffnrd Biggers, Miltitas, Calif., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 25, 1977, Ser. No. 772,164

Int. Cl.^{2} G11C *7/06*

U.S. Cl. 365—208 **5 Claims**



1. In a data processing system including a CPU for processing said data and a main memory connected from said CPU by a memory bus for storing at least said data, an integrated circuit semiconductor chip energized by a power supply and forming a sense amplifier for receiving a signal input from said memory and for providing an amplified signal output to said CPU via said bus, said sense amplifier comprising:

constant current means for establishing reference levels which are identically influenced by variation of said power supply;

input clamp means biased by one of said reference levels and responsive to said signal input for generating a clamped representation of said signal input;

differential amplifier means biased by the other of said reference levels for receiving said clamped representation of said signal input and for providing intermediate amplification thereof;

means for receiving a STROBE signal; and,

gate means for combining said amplified representation of said signal input with said STROBE signal, and for providing said amplifier signal output at the time of simultaneous occurrence of both said amplified representation of said signal input and said STROBE signal.

4,099,267

APPARATUS FOR MIXING GRANULAR FERTILIZER AND/OR LAWN TREATMENT LIQUID IN WATER

Woodrow King, 2026 NW. 51 St., Miami, Fla. 33142

Filed Apr. 4, 1977, Ser. No. 750,184

Int. Cl.^{2} B01F *7/22, 15/02*

U.S. Cl. 366—142 **18 Claims**

1. An apparatus for mixing a granular fertilizer and/or a treatment liquid, such as insecticide, with water comprising:

an upstanding tank;

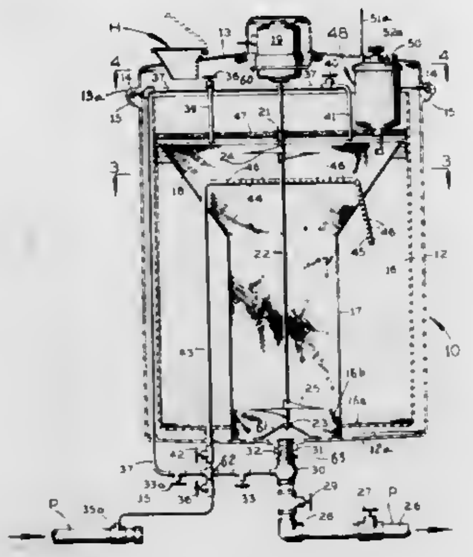
means for introducing water into the tank;

hopper means at the top of said tank for passing granular fertilizer down into the tank;

porous strainer means below said hopper means for straining the granular fertilizer going into the tank, said strainer means extending completely across the interior of the tank near the top;

a rotary motor-driven shaft extending substantially vertically in the tank, mixing blades attached to said shaft in the tank;

a reservoir for the treatment liquid at the top of said tank, said reservoir being located away from said hopper means and extending up from said strainer means;



a manually operated valve for passing the treatment liquid from said reservoir down into the tank, said valve including a vertically displaceable valve member which passes down below said strainer means, spring means biasing said displaceable valve member to a closed position blocking the flow of treatment liquid from said reservoir down into the tank, and a handle on the upper end of said displaceable valve member above said reservoir;

and means providing a fluid outlet at the bottom of the tank.

4,099,268

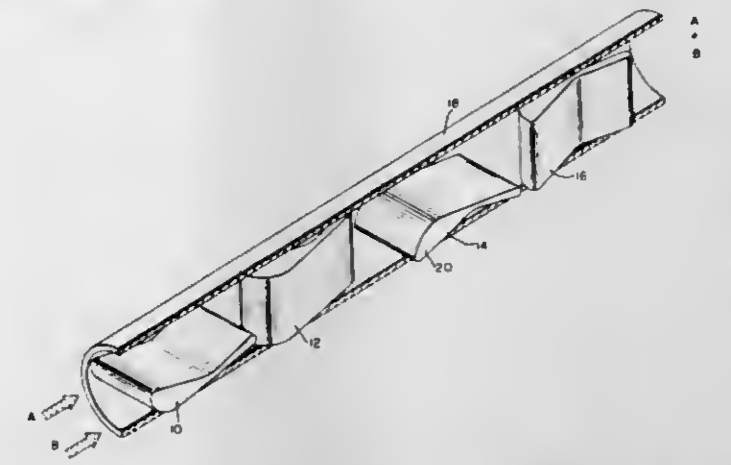
MIXING DEVICE

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 24, 1977, Ser. No. 761,631

Int. Cl.^{2} B01F *5/00*

U.S. Cl. 366—338 **3 Claims**



1. A device for mixing material comprising a solid-liquid with a fluid while conveying them comprising: a hollow conduit; a plurality of fixed elements extending in a series longitudinally within said conduit; each element being constructed to cause mixing by a shearing action and to divide said conduit into two separate channels, the cross-sectional areas of said two channels being unequal at substantially all transverse planes through the elements, each element having at least four sides, with two diametrically opposite sides of each element in full contact with the inside of the tube, and the two other sides of each element spaced from the inside of the tube, one of the two sides spaced from the inside of the tube being constructed to speed-up the material and including a curved surface of predetermined radius of curvature extending from the upstream end of the element toward the downstream end of the element, said curved surface being integral with a flat surface extending to the downstream end of the element; and the other side is constructed to slow-down the material.

DESIGN PATENTS

GRANTED JUL. 4, 1978

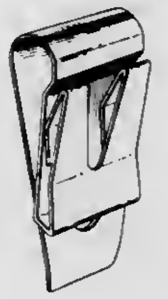
ERRATA

For CLASS	See PATENT NO.
012–008	248,403

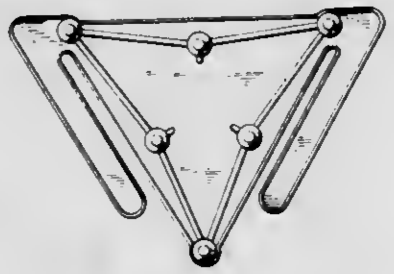
DESIGNS

JULY 4, 1978

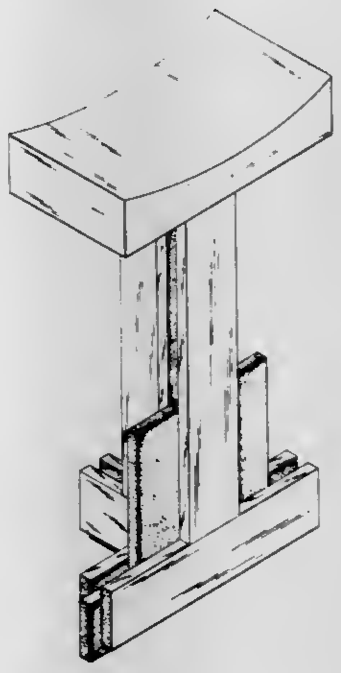
248,341
HOLDER FOR GOLF BALL MARKERS
Eugene Gillenwater, 1745 Carson Ave., Dorval, Quebec, Canada (H9S 1N2)
Filed May 21, 1976, Ser. No. 688,885
Term of patent 7 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



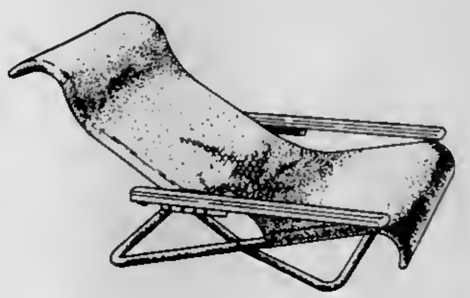
248,342
GAME BALL HOLDER
Daniel L. Young, 3250 Plumas #116, Reno, Nev. 89509
Filed Jun. 1, 1976, Ser. No. 691,950
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



248,343
STOOL
Steven Douglas Gageby, 2025 N. Bradley St., St. Paul, Minn. 55117
Filed Apr. 16, 1976, Ser. No. 677,603
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32



248,344
FOLDABLE CHAIR
Suekichi Uchida, Aichi, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya, Japan
Filed Dec. 16, 1976, Ser. No. 754,901
Claims priority, application Japan, Jun. 16, 1976, 51-22783
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38

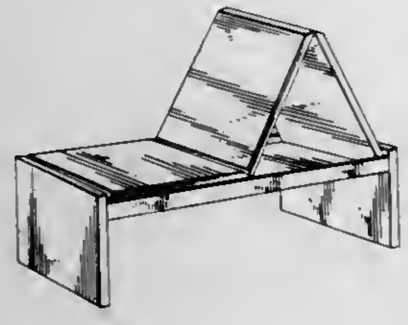


248,345

CONVERTIBLE BENCH

Cynthia Stoddard, 217 W. 14th St., New York, N.Y. 10011
Filed Sep. 24, 1976, Ser. No. 726,252
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—58

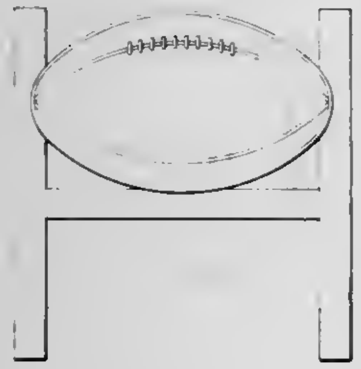


248,346

BED HEADBOARD

Gary M. Robichaud, Coventry, R.I., assignor to Leonard Michaelson, Providence, R.I., a part interest
Filed Apr. 12, 1976, Ser. No. 676,202
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—79

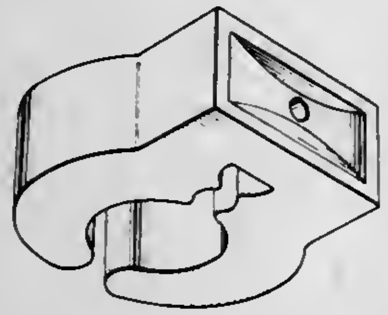


248,347

BRACKET FOR HOLDING FISHING RODS OR THE LIKE

Robert H. McCollum, 2833 Merlin Ave., Fullerton, Calif. 92635
Filed May 27, 1976, Ser. No. 690,532
Term of patent 14 years
Int. Cl. D22—*05;* D6—*04;* D8—*08*

U.S. Cl. D6—125

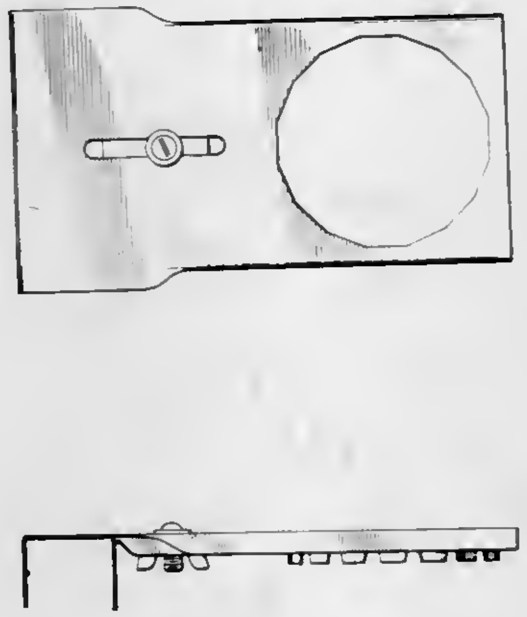


248,348

PLANT POT HOLDER

Ronald D. Lavoie, 137 Folly Mill Rd., Salisbury, Mass. 01950
Filed Jan. 26, 1977, Ser. No. 762,406
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—137

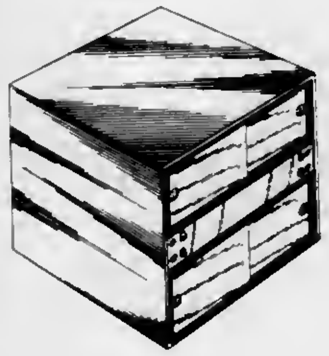


248,349

PISTOL LOCKER

Wells F. Stackhouse, Ashville, N.Y., assignor to American Locker Security Systems, Inc., Jamestown, N.Y.
Filed Nov. 15, 1976, Ser. No. 741,872
Term of patent 14 years
Int. Cl. D6—*04*

U.S. Cl. D6—164

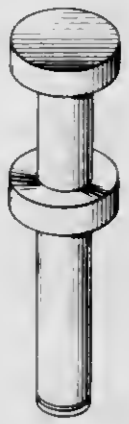


248,350

FURNITURE LEG POST

Leif Biodee, Holland, Mich., assignor to The Gunlocke Company, Inc., Wayland, N.Y.
Division of Ser. No. D. 484,806, Jul. 1, 1974, Pat. No. D. 241,485. This application May 20, 1976, Ser. No. 688,250
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—194

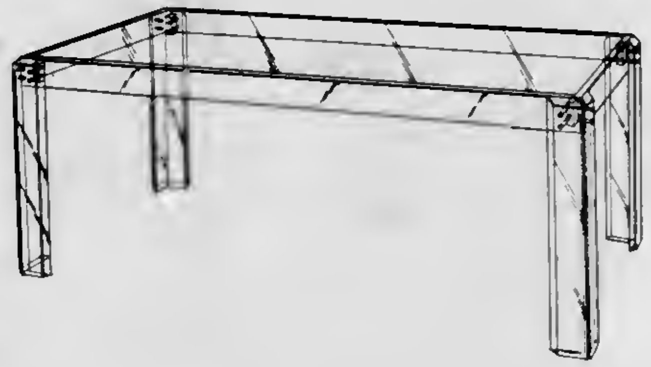


248,351

TABLE

Robert Bartholomew, 1211 Crandon Blvd., Key Biscayne, Fla. 33149
Filed Jun. 29, 1977, Ser. No. 810,981
Term of patent 14 years
Int. Cl. D6—*03*

U.S. Cl. D6—175

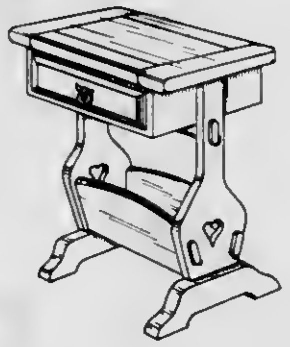


248,352

TABLE

Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Amsterdam, N.Y.
Filed Oct. 8, 1976, Ser. No. 730,897
Term of patent 14 years
Int. Cl. D6—*03*

U.S. Cl. D6—179

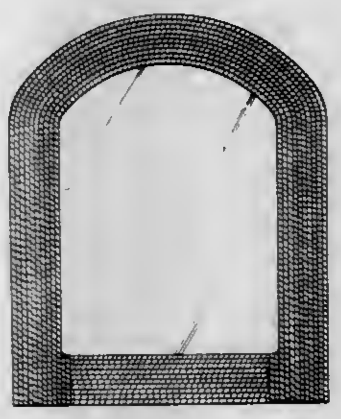


248,353

MIRROR FRAME

David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.
Filed Feb. 8, 1977, Ser. No. 766,805
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—232

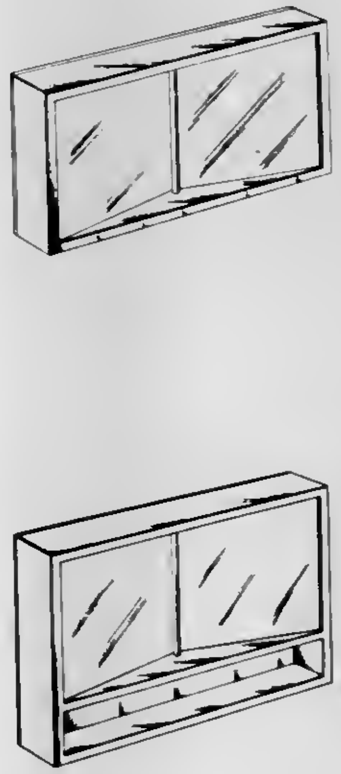


248,354

SHADOW BOX MIRROR

Lynn Hazzard, 2417 Voorhees Ave., Redondo Beach, Calif. 90278
Filed Feb. 28, 1977, Ser. No. 772,507
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—233

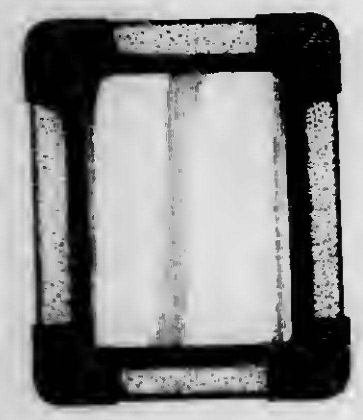


248,355
MIRROR FRAME

David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.

Filed Mar. 31, 1977, Ser. No. 783,387
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—241

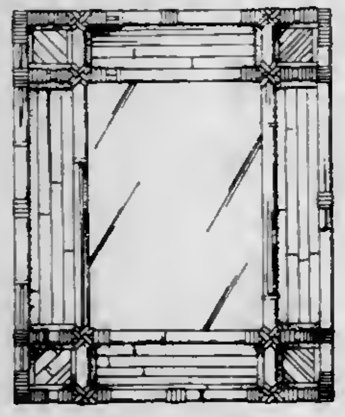


248,356
FRAME

David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.

Filed Feb. 8, 1977, Ser. No. 766,807
Term of patent 14 years
Int. Cl. D6—*07*

U.S. Cl. D6—242

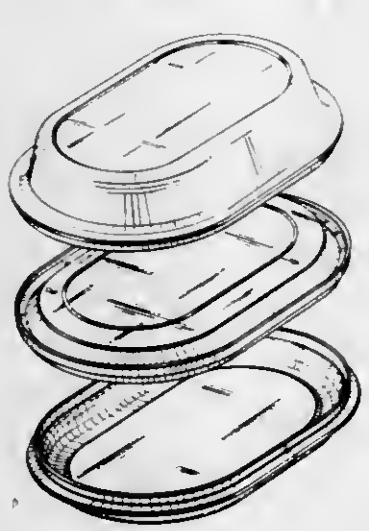


248,357
SERVING PLATE SET

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Oct. 15, 1976, Ser. No. 732,684
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—3

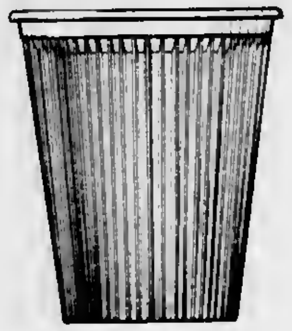


248,358
CUP

Tommy Thomas, Willowdale, Canada, assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 9, 1976, Ser. No. 749,140
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—14

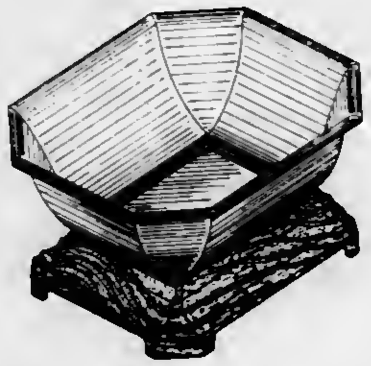


248,359
BOWL

Gene Meyer, 12 Quay Ct., Centerport, N.Y. 11721

Filed Dec. 10, 1976, Ser. No. 749,277
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—22

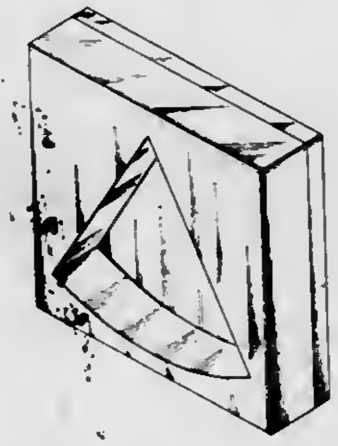


248,360
CHOPPING BOARD WITH A WEDGE-SHAPED RECESSED AREA

Ruth M. Graves, 400 Berthoud St., Sacramento, Calif. 95838

Filed Nov. 10, 1975, Ser. No. 630,544
Term of patent 14 years
Int. Cl. D7—*04*

U.S. Cl. D7—46

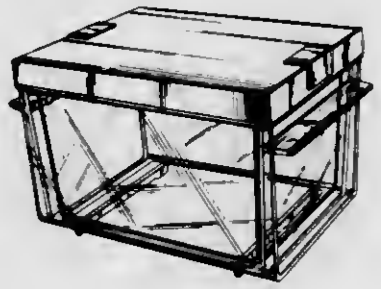


248,361
ICE CONTAINER

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Jul. 8, 1976, Ser. No. 703,500
Term of patent 14 years
Int. Cl. D7—*01*

U.S. Cl. D7—78

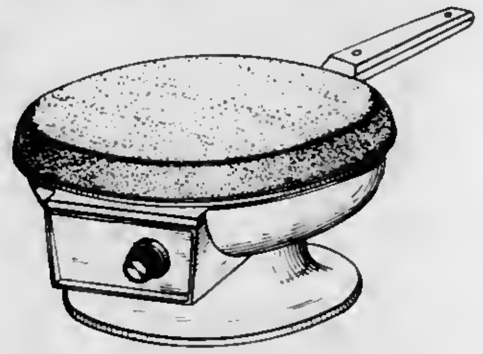


248,362
CREPE MAKER

Bernard B. Bluestein, Des Plaines, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 13, 1976, Ser. No. 704,971
Term of patent 14 years
Int. Cl. D7—*02*

U.S. Cl. D7—87

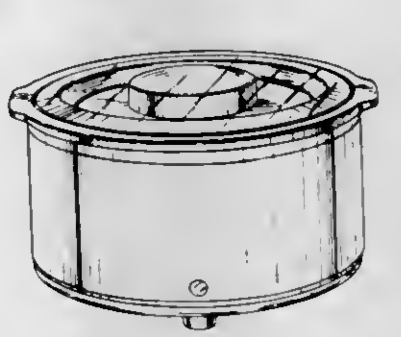


248,363
ELECTRIC SLOW COOKER

Joseph A. Rinaldi, Oradell, N.J., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Apr. 1, 1977, Ser. No. 783,953
Term of patent 14 years
Int. Cl. D7—*02*

U.S. Cl. D7—94

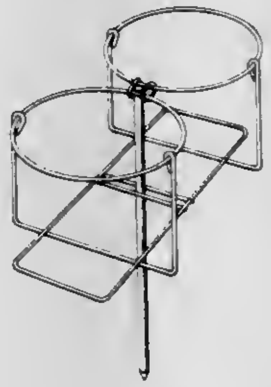


248,364
PEDESTAL TYPE GARBAGE CAN HOLDER

Johnny G. Allen, 603 Cedar Ave., Albany, Ga. 31701

Filed Jan. 13, 1977, Ser. No. 759,293
Term of patent 14 years
Int. Cl. D7—*07*

U.S. Cl. D7—189

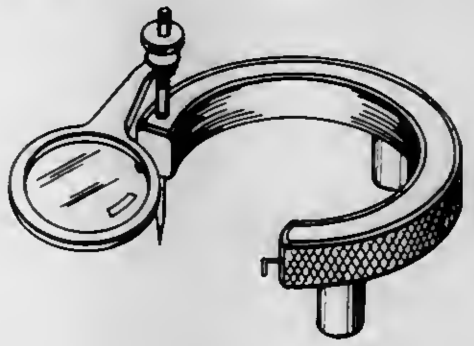


248,365
C-SHAPED ENGRAVER

Walter H. Mueller, New Carrollton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 6, 1977, Ser. No. 757,162
Term of patent 14 years
Int. Cl. D8—*05*

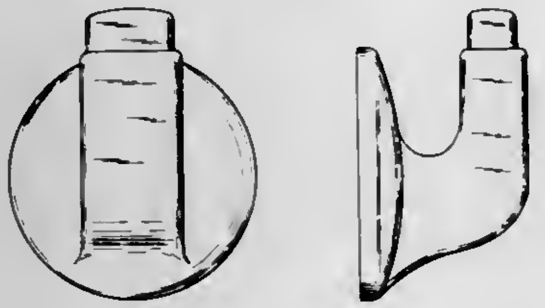
U.S. Cl. D8—98



248,366
COMBINED DOOR OPENER AND KNOB

John M. Arends, 14027 N St., Omaha, Nebr. 68137
Filed Feb. 4, 1976, Ser. No. 655,144
Term of patent 14 years
Int. Cl. D8—*06*

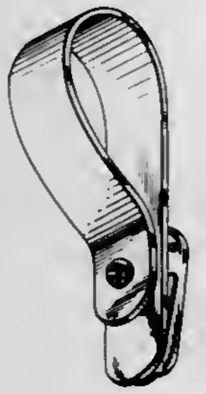
U.S. Cl. D8—302



248,367
HANGER FOR BOAT FENDER AND THE LIKE

Nathan A. Haft, 820 Tenth Ave., New York, N.Y. 10019
Filed Nov. 22, 1976, Ser. No. 744,017
Term of patent 14 years
Int. Cl. D8—*08*

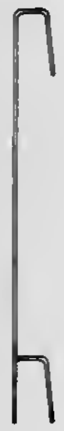
U.S. Cl. D8—356



248,368
HANGER BRACKET FOR SUPPORTING SIGN BOARDS OR THE LIKE

Jack M. Powell, 110 Broadview Dr., Eufaula, Ala. 36027
Filed Feb. 14, 1977, Ser. No. 768,385
Term of patent 14 years
Int. Cl. D8—*08*

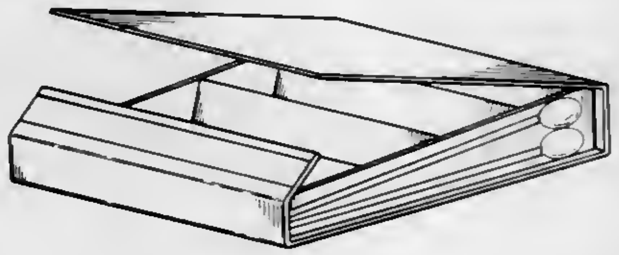
U.S. Cl. D8—373



248,369
BOX

Stanley Robertson; Daniel Pino, both of 1364 York Ave., New York, N.Y. 10021, and Max Murphy, 229 E. 88th St., New York, N.Y. 10028
Filed May 18, 1976, Ser. No. 687,593
Term of patent 14 years
Int. Cl. D9—*03*

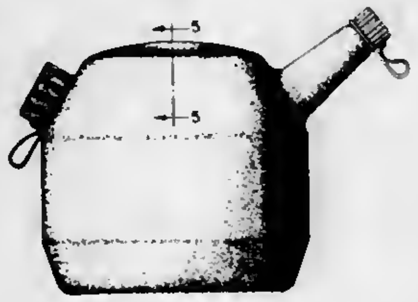
U.S. Cl. D9—184



248,370
CONTAINER FOR LIQUIDS

Gerald Beekenkamp, Etobicoke, Canada, assignor to Reliance Products Ltd., Winnipeg, Canada
Filed Feb. 9, 1976, Ser. No. 656,134
Term of patent 14 years
Int. Cl. D9—*03*

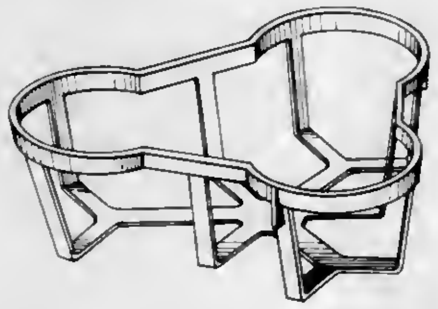
U.S. Cl. D9—175



248,371
BEVERAGE CARRIER

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Filed Sep. 1, 1976, Ser. No. 719,443
Term of patent 14 years
Int. Cl. D9—*03*

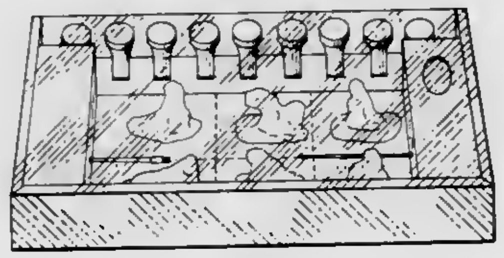
U.S. Cl. D9—179



248,372
COMBINED DISPLAY AND MERCHANDISING PACKAGE FOR PLASTERCRAFT SUPPLIES

Vineta L. Kauth, R.R. 5, Box 492G, Little Rock, Ark. 72204
Filed Apr. 30, 1976, Ser. No. 681,772
Term of patent 14 years
Int. Cl. D9—*03*

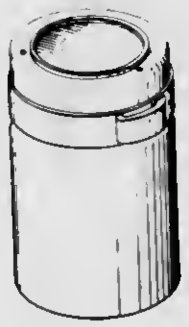
U.S. Cl. D9—193



248,373
TEAR OPEN BOTTLE CAPSULE

David O. Allen, Wilmington, Ohio, assignor to Buckeye Molding Company
Filed Jun. 18, 1976, Ser. No. 697,524
Term of patent 14 years
Int. Cl. D9—*03*

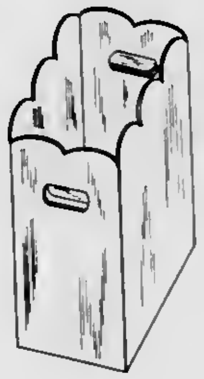
U.S. Cl. D9—216



248,374
COMBINED CARRYING CONTAINER AND WASTE RECEPTACLE OR THE LIKE

Donald R. Thompson, P.O. Box 2030, Pebble Beach, Calif. 93953
Filed Apr. 8, 1976, Ser. No. 675,195
Term of patent 14 years
Int. Cl. D9—*03*

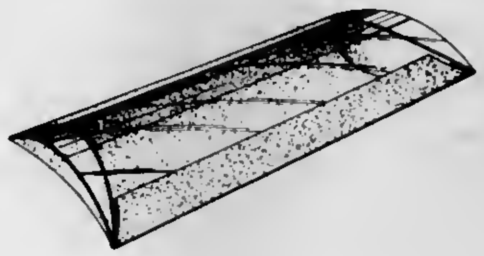
U.S. Cl. D9—224



248,375
DISPLAY CARTON

Robert M. Bergstein, Cincinnati, Ohio, assignor to Bergstein Packaging Trust
Filed Apr. 28, 1976, Ser. No. 681,157
Term of patent 14 years
Int. Cl. D9—*03*

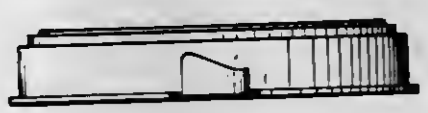
U.S. Cl. D9—237



248,376
MOLDED PLASTIC CLOSURE

David O. Allen, and Harry A. E. Wombold, both of Wilmington, Ohio, assignors to Buckeye Molding Company
Filed Aug. 23, 1976, Ser. No. 716,976
Term of patent 14 years
Int. Cl. D9—*07*

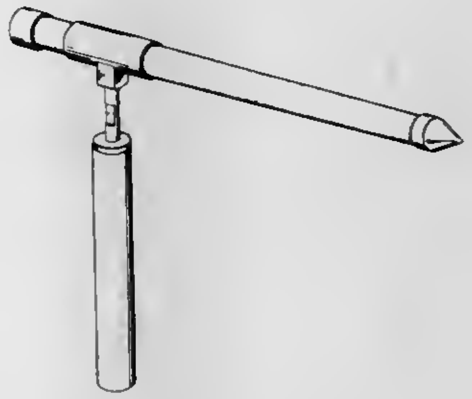
U.S. Cl. D9—255



248,377
DOWSING ROD

Samuel E. Wolfe, 13451 Ector, La Puente, Calif. 91746
Filed Jul. 26, 1976, Ser. No. 708,579
Term of patent 14 years
Int. Cl. D10—*99*

U.S. Cl. D10—46



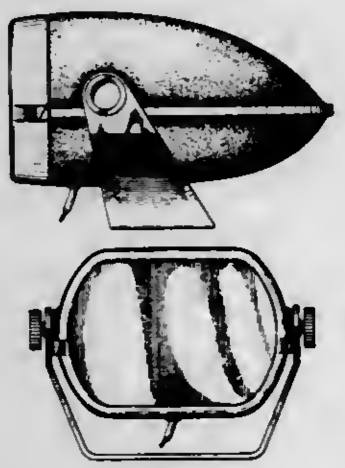
248,378

ELECTRONIC SIGNAL DETECTOR

Calvin Benjamin Coffin, and George G. Vidmar, both of Wichita, Kans., assignors to Interstate Electronics Supply, Inc., Wichita, Kans.

Filed Mar. 21, 1977, Ser. No. 779,605
Term of patent 14 years
Int. Cl. D10—*06*

U.S. Cl. D10—106



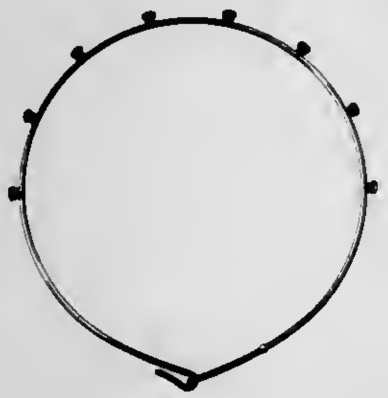
248,379

DIAMOND TORQUE

Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier Inc., New York, N.Y.

Continuation-in-part of Ser. No. 557,123, Mar. 10, 1975, abandoned. This application Sep. 15, 1976, Ser. No. 723,634
Term of patent 14 years
Int. Cl. D11—*01*

U.S. Cl. D11—3

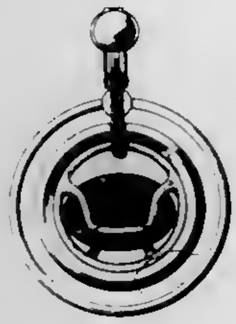


248,380

EARRING

Donna M. Burchett, 1000 Spruce Ave., Sidney, Ohio 45365
Filed Sep. 10, 1976, Ser. No. 722,160
Term of patent 14 years
Int. Cl. D11—*01*

U.S. Cl. D11—43



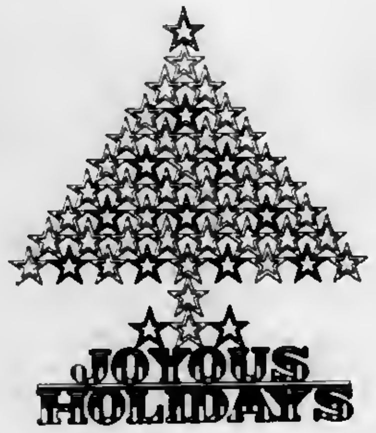
248,381

ARTIFICIAL TREE

Demetrios G. Lambrenos, 23 Winton St., Roslindale, Mass. 02131

Filed May 20, 1976, Ser. No. 688,351
Term of patent 14 years
Int. Cl. D11—*05*

U.S. Cl. D11—118



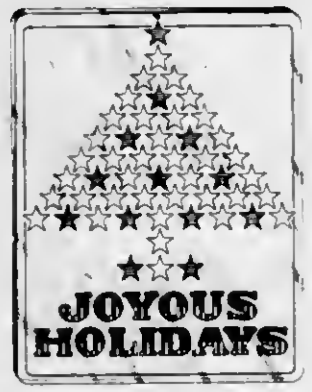
248,382

HOLIDAY DECORATION

Demetrios G. Lambrenos, 23 Winton St., Roslindale, Mass. 02131

Filed May 20, 1976, Ser. No. 688,352
Term of patent 14 years
Int. Cl. D11—*05*

U.S. Cl. D11—125

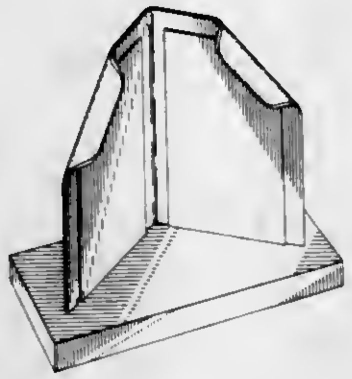


248,383

PLAQUE OR THE LIKE

Carla Ann Dawson, 318 Sterling Ct., Akron, Ohio 44304
Filed Jul. 6, 1976, Ser. No. 702,517
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—140

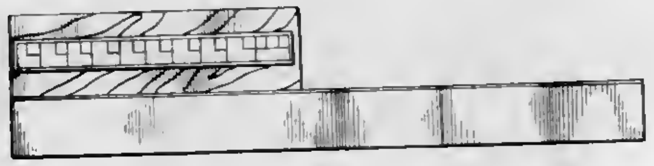


248,384

TROPHY BASE

Roger J. Quigley, 3221 Hackett Ave., Long Beach, Calif. 90808
Filed Aug. 9, 1976, Ser. No. 712,648
Term of patent 14 years
Int. Cl. D11—*02*

U.S. Cl. D11—157



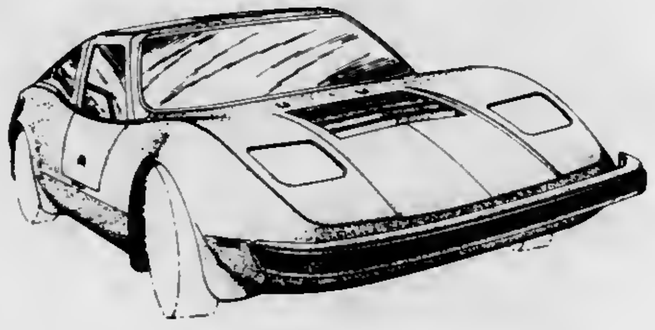
248,385

AUTOMOTIVE VEHICLE BODY

David B. Fuller, Minnetonka, Minn., assignor to Thor Corporation, Edina, Minn.

Filed May 4, 1977, Ser. No. 793,769
Term of patent 14 years
Int. Cl. D12—*08*

U.S. Cl. D12—91

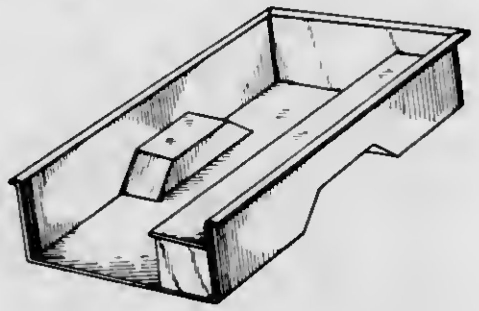


248,386

PICKUP TRUCK LINER

Irvin V. Hefner, 1429 Huron Ave., Metairie, La. 70121
Filed May 27, 1976, Ser. No. 690,643
The portion of the term of this patent subsequent to Aug. 12, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—98



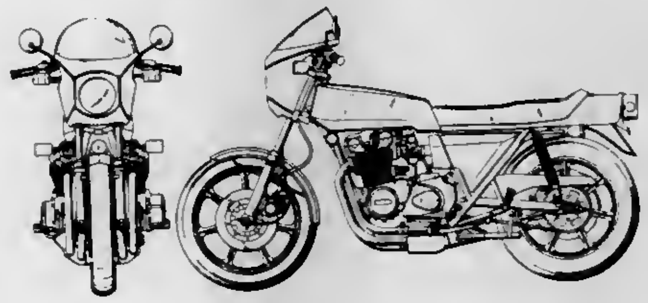
248,387

MOTORCYCLE

Tadahiro Kurishima, Akashi, and Tohru Yamaochi, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 24, 1977, Ser. No. 800,097
Claims priority, application Japan, Nov. 30, 1976, 51-46811
Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—110

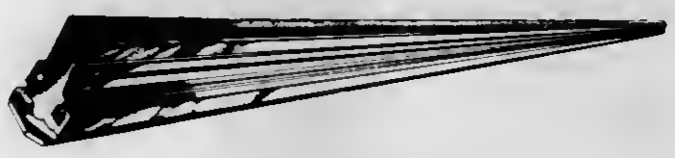


248,388

WIPER BLADE FOR A WINDSHIELD WIPER

David Joe Hughes, 26B Shadowood, Granbury, Tex. 76048
Filed Jun. 16, 1977, Ser. No. 807,033
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—155



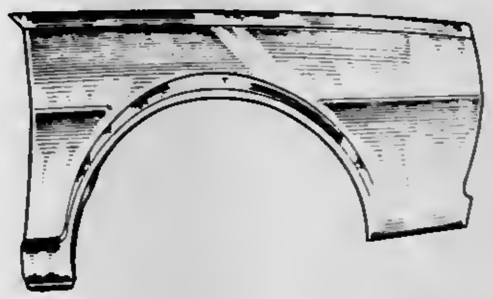
248,389

FRONT FENDER

Jean-Louis Charton, Gennevilliers, France, assignor to AB Volvo, Gothenburg, Sweden

Filed Oct. 8, 1976, Ser. No. 730,993
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—184



248,390

MOTORCYCLE WHEEL

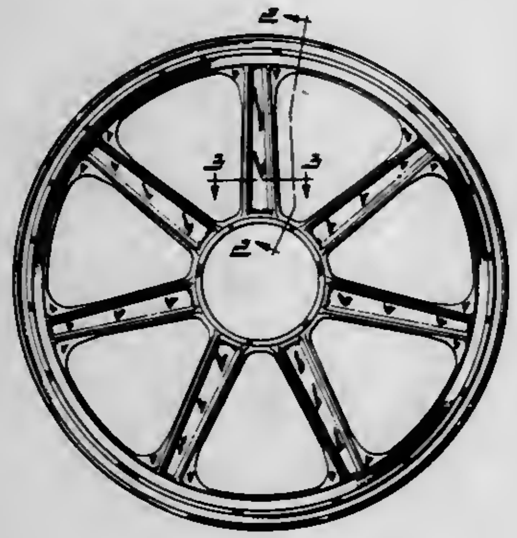
Thomas J. Lester, Aurora, Ohio, assignor to The Lester Tire Company

Continuation-in-part of Ser. No. 617,827, Sep. 29, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,413

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—205



248,391

DEMAND CONTROLLER COMPONENT

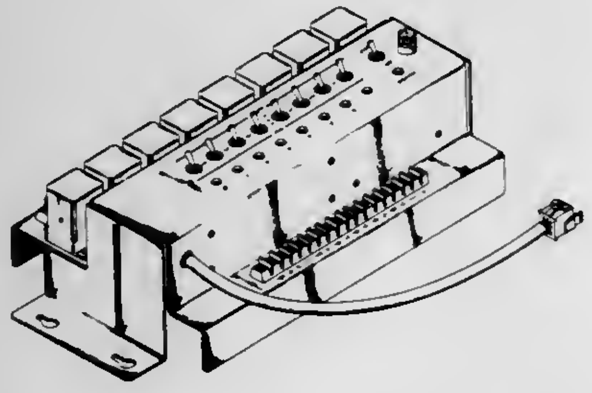
Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems Inc., Eldridge, Iowa

Filed Mar. 23, 1976, Ser. No. 669,513

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—12



248,392

TAPE RECORDER

Takemi Ebata, Kyoto, and Kunishige Miki, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

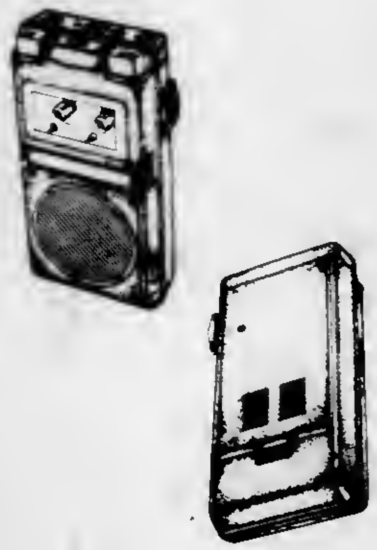
Filed Dec. 23, 1976, Ser. No. 753,912

Claims priority, application Japan, Jul. 9, 1976, 51-26598

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—6



248,393

MAGNETIC TAPE REPRODUCER

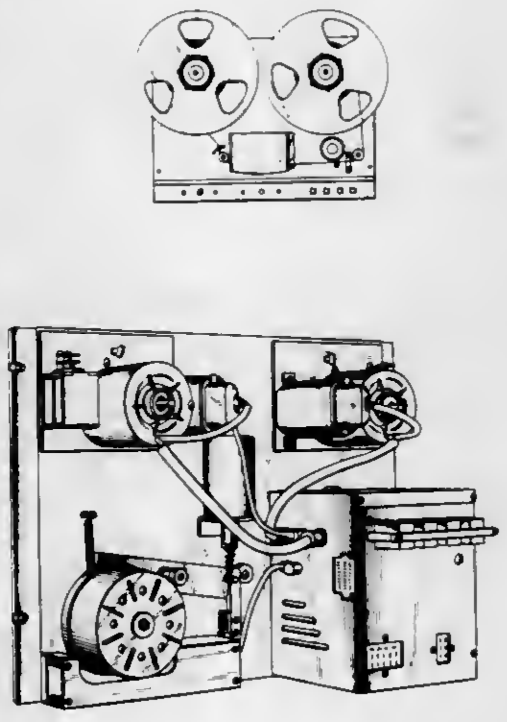
John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Apr. 12, 1976, Ser. No. 675,987

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—8



248,394

LOUD SPEAKER CABINET OR THE LIKE

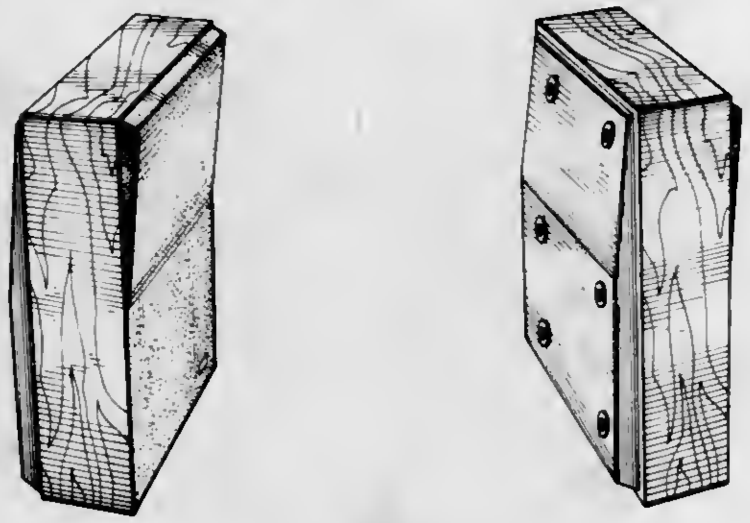
Jakob Jensen, Jutland, Denmark, assignor to Bang & Olufsen of America, Inc.

Filed Feb. 19, 1976, Ser. No. 659,545

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—33



248,395

SPEAKER GRILL OR THE LIKE

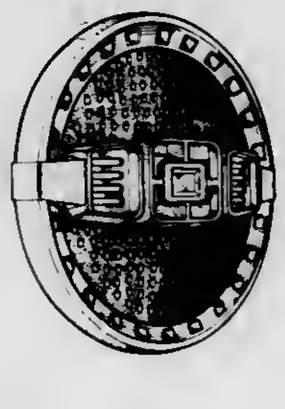
Charles Barbera, 303 E. Elk St., Glendale, Calif. 91205

Filed Apr. 18, 1977, Ser. No. 788,552

Term of patent 14 years

Int. Cl. D14—*01, 99*

U.S. Cl. D14—39



248,396

PUMP FOR CHANGING OIL OR THE LIKE

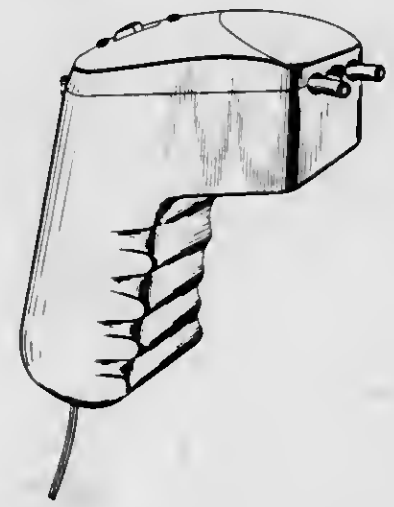
Ronald M. Sendak, 5201 Redwing Dr., Alexandria, Va. 22312

Filed Aug. 31, 1976, Ser. No. 719,263

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—7



248,397

RIDING MOWER

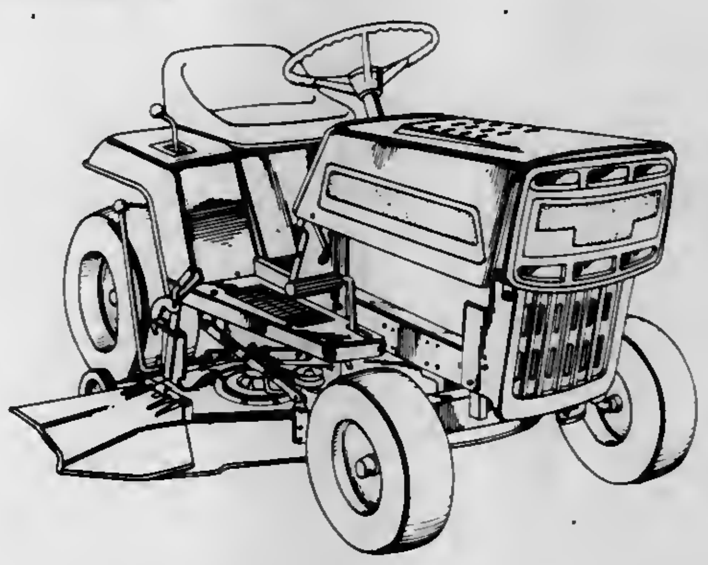
Larry Monroe Cognata, and Keith E. Brightbill, both of Nashville, Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.

Continuation of Ser. No. 580,751, May 27, 1975, abandoned. This application Jul. 21, 1977, Ser. No. 818,271

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—15



248,398

WORK SUPPORT

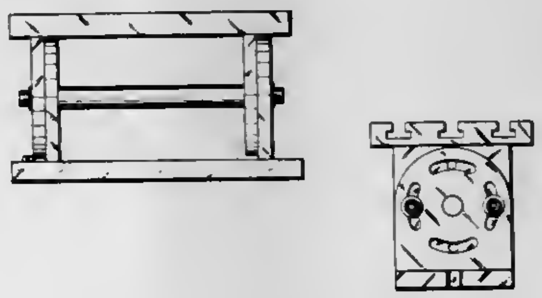
Eugene J. Wehner, 4819 Verguene Ave., St. Louis, Mo. 63119

Filed Oct. 13, 1976, Ser. No. 732,011

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—140



248,399

BAGMAKER/SEALER

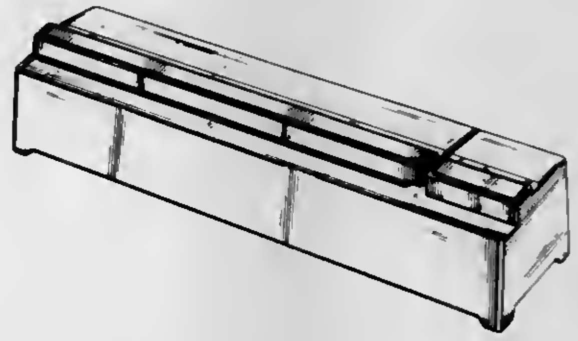
Bill Dobson, West Bend, Wis., and Dave Painter, Glenview, Ill., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 27, 1976, Ser. No. 754,158

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D15—146



248,400

COLLATOR FOR USE WITH AN ELECTROPHOTOGRAPHIC APPARATUS OR THE LIKE

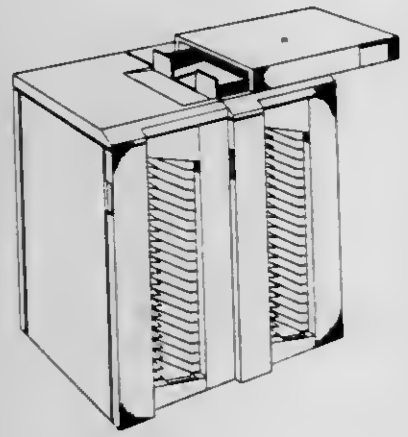
John Charles Alderson; Robert Milton Hofland, and Richard Allen Lamos, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,642

Term of patent 14 years

Int. Cl. D15—*05;* D14—*02*

U.S. Cl. D16—32



248,401

MAGNIFYING LENS HOLDER ASSEMBLY

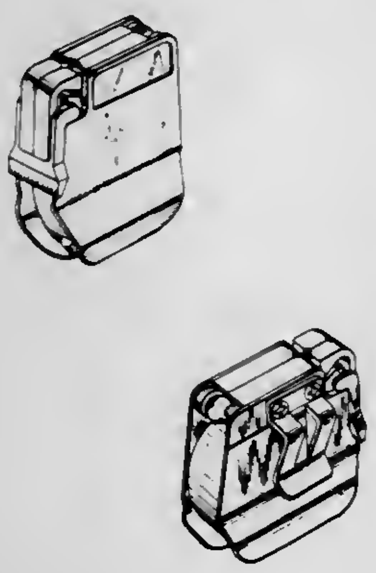
Andrew Del Pesco, Sr., East Killingly, Conn., assignor to Del Pesco Systems, Inc.

Filed Apr. 5, 1976, Ser. No. 673,977

Term of patent 14 years

Int. Cl. 16—*06*

U.S. Cl. D16—54



248,402

FREESTANDING MEMO CLIP OR SIMILAR ARTICLE

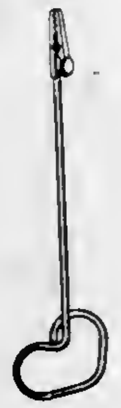
David H. Kittell, 42 Ardsley Rd., Stamford, Conn. 06906

Filed Oct. 16, 1975, Ser. No. 623,022

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—90



248,403

VENTILATED RIB GUN SIGHT

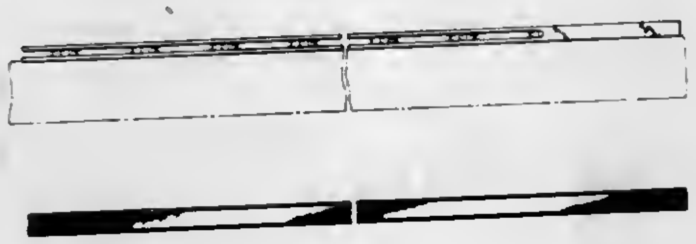
Richard F. Grant, South Windsor, Conn., assignor to The Poly-Choke Company, Inc., East Hartford, Conn.

Filed Mar. 26, 1976, Ser. No. 670,737

Term of patent 14 years

Int. Cl. D22—*01*

U.S. Cl. D22—8



248,404

FLUSH VALVE

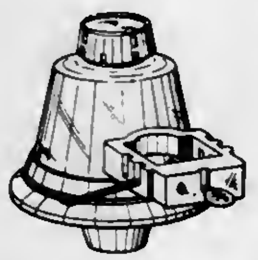
George C. Henry, 26701 Via Alcala, Mission Viejo, Calif. 92675

Filed Aug. 27, 1976, Ser. No. 718,351

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—19



248,405

HOUSING FOR AN ANESTHESIA MACHINE

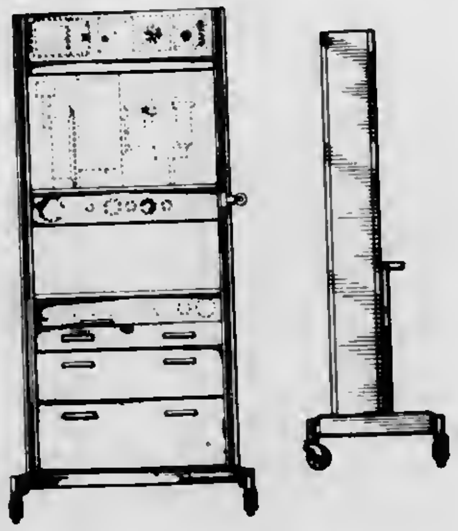
Henry Leong, Kendall Park, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 29, 1976, Ser. No. 700,958

Term of patent 14 years

Int. Cl. D24—*02;* D12—*02*

U.S. Cl. D24—1.1



248,406

CHIROPRACTIC TABLE

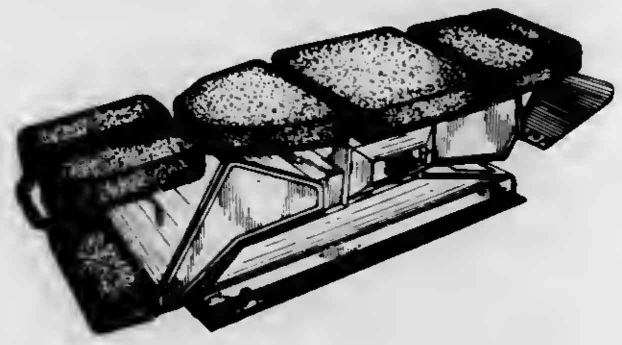
John E. Hodge, Box 91, Moline, Ill. 61265

Filed Jul. 21, 1976, Ser. No. 707,421

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D24—3



248,407

TUBE HOLDER FOR MEDICAL SPECIMEN MIXING DEVICE OR SIMILAR ARTICLE

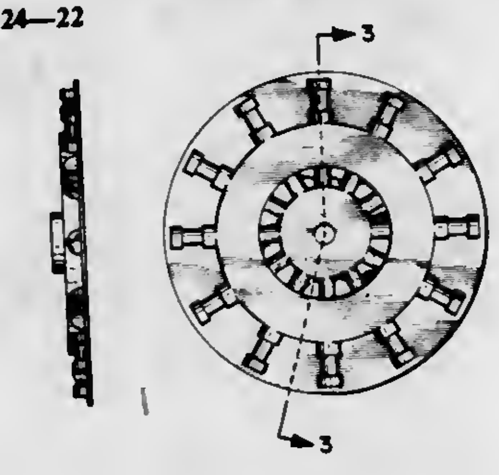
William W. Bassett, Wayzata, and Eugene D. Johnson, Spring Lake Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 15, 1976, Ser. No. 667,230

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—22



248,408

DISPOSABLE SUPPORT FOR A DISPOSABLE BEDPAN

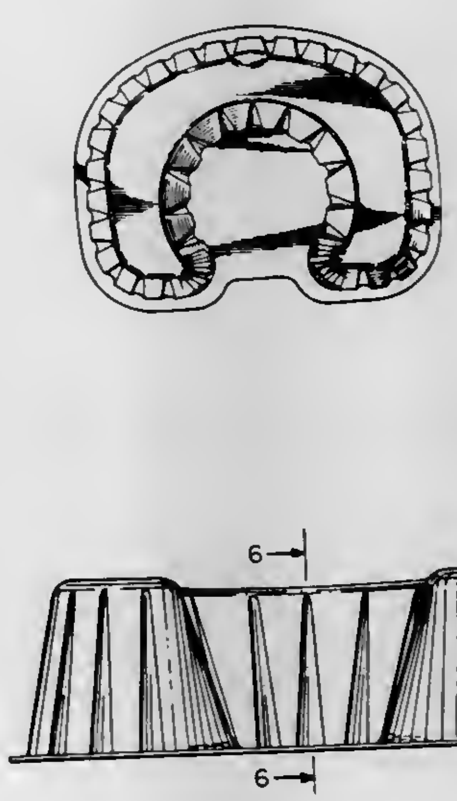
Kenneth Wilson Mills, Bolton, England, assignor to Vernon & Co. (Pulp Products) Limited

Filed Apr. 1, 1976, Ser. No. 672,684

Term of patent 14 years

Int. Cl. D24—*04;* D28—*01*

U.S. Cl. D24—57



248,409

CIGARETTE LIGHTER

Pierre Spreter, Geneva, Switzerland, assignor to Christian Dior, S.A.R.L., Paris, France

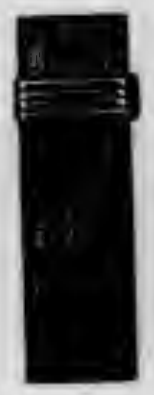
Filed Nov. 29, 1976, Ser. No. 745,853

Claims priority, application United Kingdom, Jun. 17, 1976, 976157

Term of patent 14 years

Int. Cl. D27—*05*

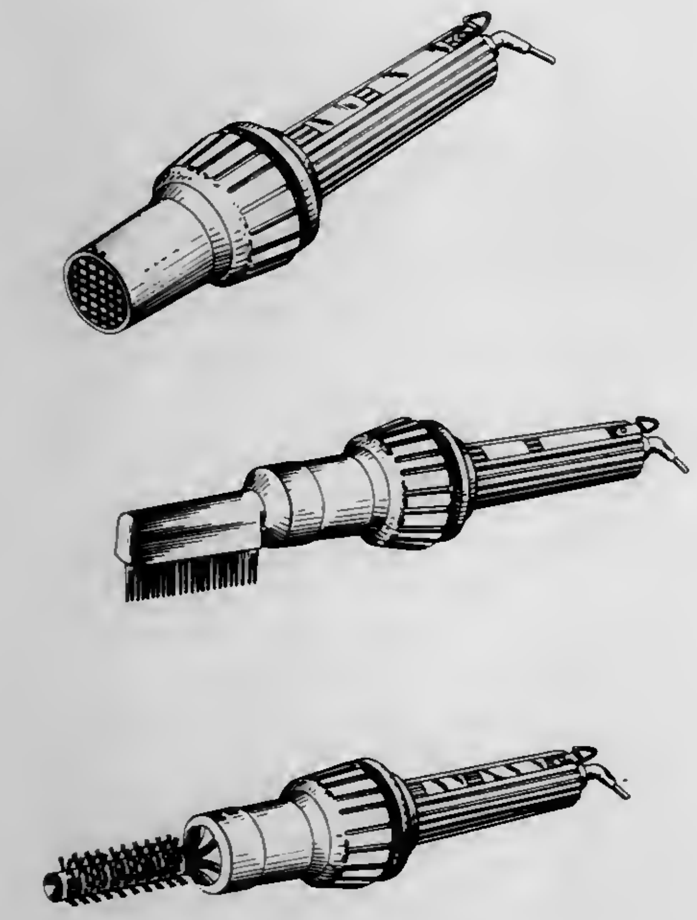
U.S. Cl. D27—36



248,410
HAIR STYLER

Patrick M. Tomaro, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Oct. 21, 1976, Ser. No. 734,504
Term of patent 14 years
Int. Cl. D28—*03*

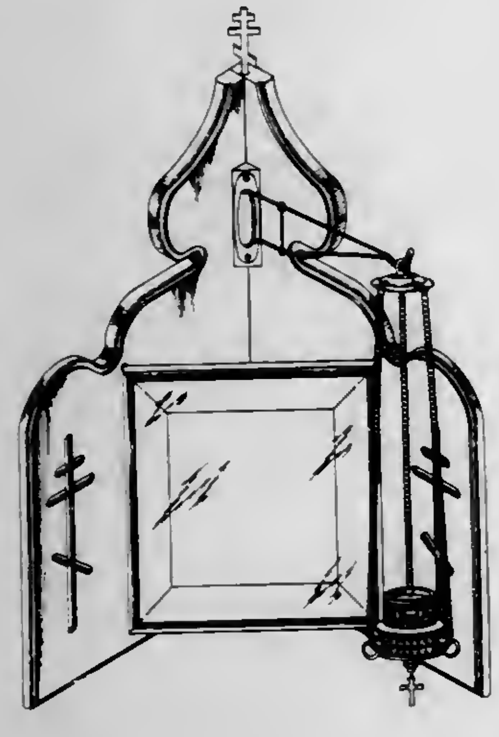
U.S. Cl. D28—13



248,411
COMBINED SUPPORT AND FRAME FOR RELIGIOUS OBJECTS

Dennis Somple, 41 Pamela Dr., R.D. #4, Box 256, Binghamton, N.Y. 13901
Filed Jan. 19, 1976, Ser. No. 650,278
Term of patent 14 years
Int. Cl. D11—*02*

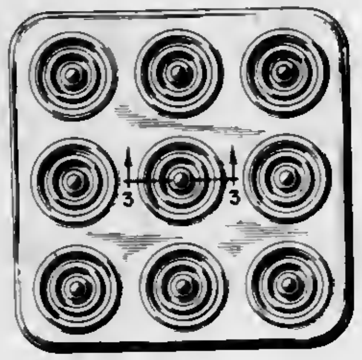
U.S. Cl. D31—21.1



248,412
ONE PIECE GAME BOARD

Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205
Filed May 15, 1974, Ser. No. 470,016
The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*01*

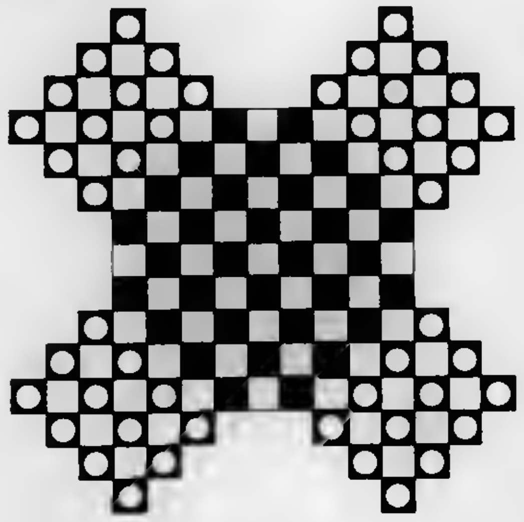
U.S. Cl. D34—5 SS



248,413
TEAM CHECKER BOARD

Theodore Perfetti, 28 Fox La., Levittown, N.Y. 11756; Benedetto Greco, 279 N. Broome Ave., Lindenhurst, N.Y. 11757, and Burton Heiko, 15 Steuben Dr., Jericho, N.Y. 11753
Filed Dec. 10, 1976, Ser. No. 749,278
Term of patent 14 years
Int. Cl. D21—*01*

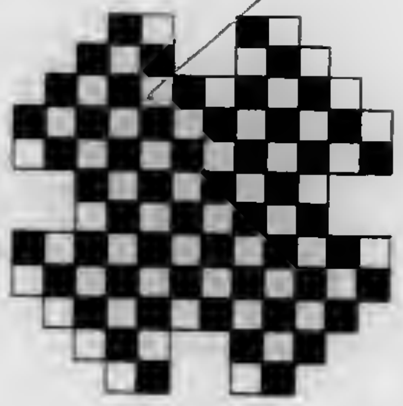
U.S. Cl. D34—5 SS



248,414
TEAM CHECKER BOARD

Theodore Perfetti, 28 Fox Lane, Levittown, N.Y. 11756; Benedetto Greco, 279 N. Broome Ave., Lindenhurst, N.Y. 11757, and Burton Heiko, 15 Steuben Dr., Jericho, N.Y. 11753
Filed Dec. 10, 1976, Ser. No. 749,452
Term of patent 14 years
Int. Cl. D21—*01*

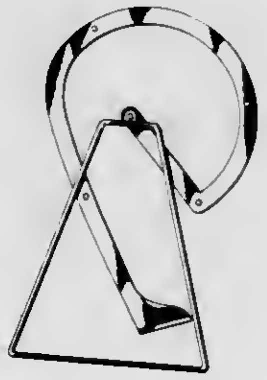
U.S. Cl. D34—5 SS



248,415
SWING STRUCTURE

Herman F. Turgetto, 1595 Metropolitan Ave., Bronx, N.Y. 10462
Filed Jan. 5, 1977, Ser. No. 756,958
Term of patent 7 years
Int. Cl. D21—*03*

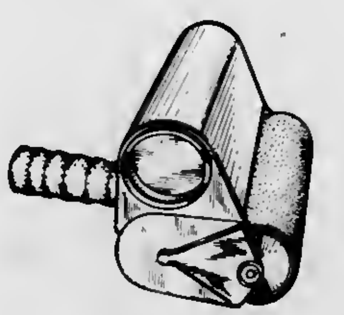
U.S. Cl. D34—5 G



248,416
PAINT APPLICATION DEVICE

Wilhelm F. Lnpkes, Kaap Hoorn 13, Veendam, Netherlands
Filed Jun. 28, 1976, Ser. No. 700,682
Term of patent 14 years
Int. Cl. D8—*05*

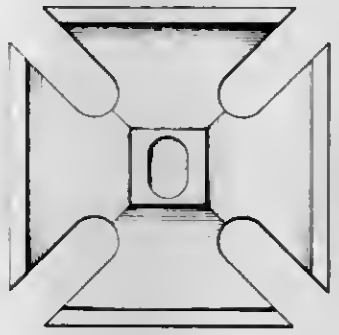
U.S. Cl. D64—18



248,417
RUBBER STAMP HAMMERHEAD

Chester R. Pennington, Conyers, Ga., assignor to Timber Products Inspection & Testing Service, Lithonia, Ga.
Filed Sep. 30, 1976, Ser. No. 728,448
Term of patent 14 years
Int. Cl. D19—*02*

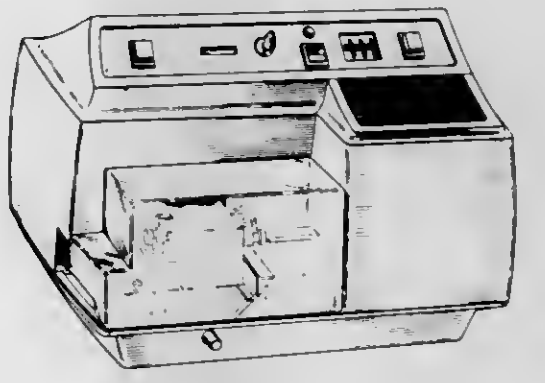
U.S. Cl. D64—10



248,418
COMBINED HOUSING AND PRINT HEAD

Gregory Francis Fossella, Marshfield, Mass., and Steve A. Unger, Raymond, N.H., assignors to Dennison Manufacturing Company, Framingham, Mass.
Filed Jan. 10, 1977, Ser. No. 758,382
Term of patent 14 years
Int. Cl. D18—*02*

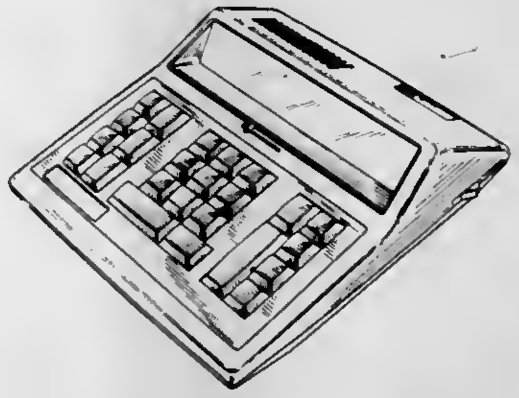
U.S. Cl. D64—11 R



248,419
CALCULATING MACHINE

Myron Beitler, West Orange, and Stuart D. Leer, Chatham, both of N.J., assignors to Litton Business Systems, Inc.
Filed Mar. 21, 1977, Ser. No. 779,727
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B



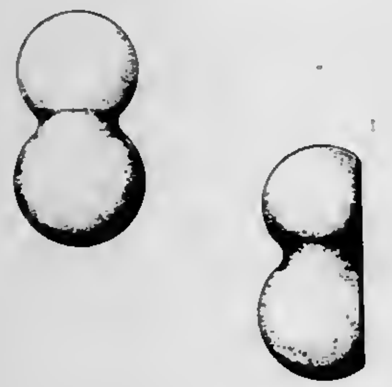
248,420

BAR OF SOAP

Bernard H. Berman, 685 N. Wade Ave. Extention, Washington, Pa. 15301

Filed May 5, 1976, Ser. No. 683,502
Term of patent 14 years
Int. Cl. D28—*02*

U.S. Cl. D73—1 A



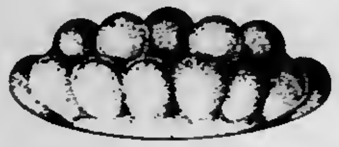
248,421

BAR OF SOAP

Bernard H. Berman, 685 N. Wade Ave. Extension, Washington, Pa. 15301

Filed May 5, 1976, Ser. No. 683,503
Term of patent 14 years
Int. Cl. D28—*02*

U.S. Cl. D73—1 A



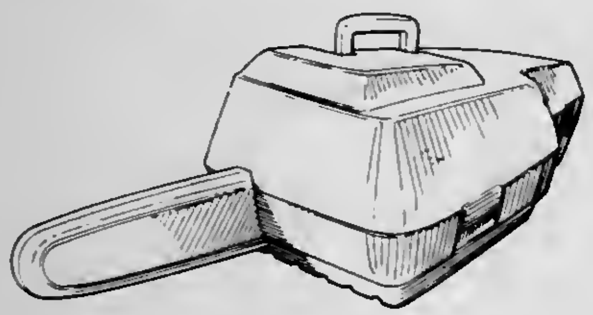
248,422

COMBINED CARRYING AND STORAGE CASE FOR A CHAINSAW

Donald A. Malcolm, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Sep. 7, 1976, Ser. No. 720,937
Term of patent 14 years
Int. Cl. D3—*02*

U.S. Cl. D67—1 R



248,423

FABRIC

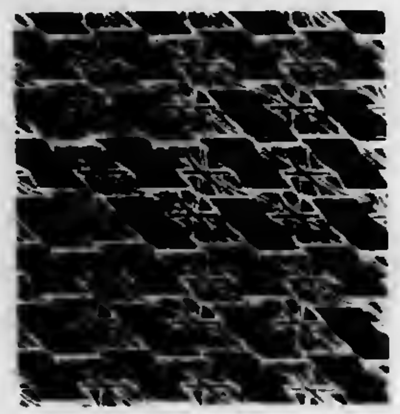
Leo Comensoli, Dural, and Gloria Dawn Smythe, Potts Point, both of Australia, assignors to Speedo Knitting Mills Pty. Limited

Filed Nov. 4, 1976, Ser. No. 738,881

Claims priority, application Australia, May 17, 1976, 69203/76; May 17, 1976, 69201/76

Term of patent 14 years
Int. Cl. D5—*05*

U.S. Cl. D92-1 Z



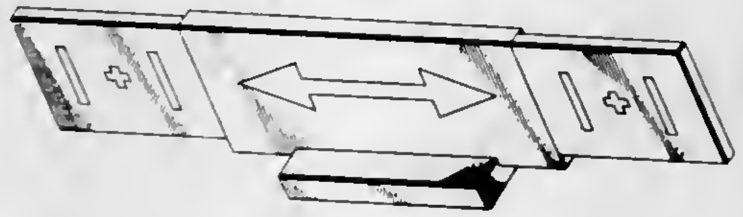
248,424

DEVICE FOR INDICATING BASKETBALL FOUL SHOT SITUATIONS OR SIMILAR ARTICLE

Evangelo James Priovolos, 11401 Georgetowne Dr., Potomac, Md. 20854

Filed Nov. 5, 1976, Ser. No. 739,086
Term of patent 14 years
Int. Cl. D20—*03*

U.S. Cl. D96—12 R



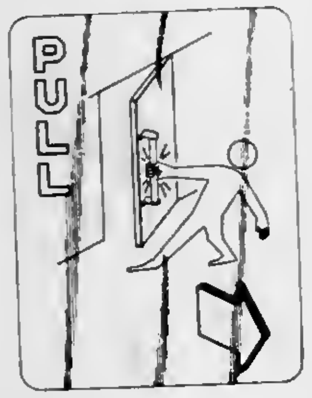
248,425

PULL SYMBOL FOR GLASS DOOR OR THE LIKE

Jack Darrell, 1646 Old Spanish Tr., Houston, Tex. 77054

Filed Aug. 3, 1977, Ser. No. 821,439
Term of patent 14 years
Int. Cl. D20—*03*; D8—*99*

U.S. Cl. D96—12 C



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF JULY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

A.C.S. Industries, Inc.: *See—*
  Botvin, George, 4,098,405, Cl. 206-527.000.
"A"-Company, Inc.: *See—*
  Andrews, Lawrence F., 4,097,993, Cl. 32-14.00A.
A-T-O Inc.: *See—*
  Logan, Zack H., 4,098,493, Cl. 256-24.000.
AB Volvo Penta: *See—*
  Pichl, Heinz, 4,098,218, Cl. 115-17.000.
Abbondanti, Alberto, to Westinghouse Electric Corp. Digital apparatus for synthesizing pulse width modulated waveforms and digital pulse width modulated control system. 4,099,109, Cl. 318-227.000.
Abe, Kichio, to Motorola, Inc. Sense line balance circuit for static random access memory. 4,099,265, Cl. 365-190.000.
Abell, Roy F., Jr., to Eaton Corporation. Valve gear and lash adjustment means for same. 4,098,240, Cl. 123-90.550.
Abex Corporation: *See—*
  Frank, Earl E., 4,098,374, Cl. 188-62.000.
Abiera, Primitivo A. Pickup truck loading ramp. 4,098,414, Cl. 214-85.000.
Abrahamson, Ernest P., II: *See—*
  Rizzitano, Fortunato J.; and Abrahamson, Ernest P., II, 4,098.607, Cl. 75-243.000.
Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, to Daimler-Benz Aktiengesellschaft. Method and apparatus for carrying out the method to control a multi-cylinder internal combustion engine. 4,098,252, Cl. 123-198.00F.
ACF Industries, Incorporated: *See—*
  Morrison, Bertram L., 4,098,490, Cl. 251-329.000.
Adamski, Maximilian, Jr.; Smith, Robert E.; and Desai, Dhimat R., to Union Special Corporation. Method and apparatus for hemming. 4,098,201, Cl. 112-2.000.
Adkins, Richard Cyril; and Yost, James Oswald, to Rolls-Royce Limited. Fluid flow diffuser. 4,098,073, Cl. 60-39.16R.
Adriano Gardella S.p.A.: *See—*
  Kennedy, Claude A.; Gardella, Adriano A.; Brogi, Ruggero E.; and Lavagetto, Lorenzo, 4,098,064, Cl. 57-34.500.
Aeroquip Corporation: *See—*
  Evans, Bryce B., 4,098,292, Cl. 137-614.040.
Agency of Industrial Science & Technology: *See—*
  Ishii, Eiichi; Ishikawa, Hiroshi; Uehara, Itsuki; Nakane, Masanori; and Miyake, Yoshizo, 4,098,875, Cl. 423-658.000.
AGFA-Gevaert AG: *See—*
  Escales, Eberhard; and Hell, August, 4,098,158, Cl. 83-27.000.
  Leuchter, Jurgen; Plursch, Gerald; and Bierinckx, Johannes, 4,099,193, Cl. 354-321.000.
Ailor, James C.: *See—*
  Klein, H. Joseph; Hord, William C.; Ailor, James C.; and Iyer, Sankar P., 4,098,499, Cl. 269-22.000.
Ainsworth, Thomas Somner, to Thorn Electrical Industries Limited. Electric lamps and their production. 4,099,081, Cl. 313-174.000.
Air Products and Chemicals, Inc.: *See—*
  Stone, Francis Gordon Albert; Green, Michael; and Spencer, John Lionel, 4,098,807, Cl. 260-429.0CY.
Airprint Systems, Inc.: *See—*
  Warning, Walter B., Sr.; and Warning, Walter B., Jr., 4,098,915, Cl. 427-8.000.
Aisin Seiki Kabushiki Kaisha: *See—*
  Tamura, Tooru, 4,098,850, Cl. 261-65.000.
Aisu, Nobuo: *See—*
  Haruta, Yasuo; Nagasoe, Kazumasa; Shiga, Norio; Morino, Ikuo; and Aisu, Nobuo, 4,098,785, Cl. 264-220.000.
Aizawa, Hiroshi; Uchidoi, Masanori; Miyakawa, Hideaki; Yamamichi, Masayoshi; Iura, Yukio; and Fukui, Masahisa, to Canon Kabushiki Kaisha. Photographic camera with an electromagnetic control system. 4,099,192, Cl. 354-234.000.
Akatsuka, Hisashi: *See—*
  Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatsuka, Hisashi, 4,098,689, Cl. 210-15.000.
Akerlow, Earl V.; and Buchholz, Kenneth M., to Akerlow Industries, Inc. Apparatus and method for separating lead battery materials. 4,098,685, Cl. 209-10.000.
Akerlow Industries, Inc.: *See—*
  Akerlow, Earl V.; and Buchholz, Kenneth M., 4,098,685, Cl. 209-10.000.
Aki, Osami: *See—*
  Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,098,888, Cl. 424-246.000.
Akiyama, Kakunosuke. Music studying device. 4,098,165, Cl. 84-470.000.
Aksu, Akin. Probe head for testing printed circuit boards. 4,099,120, Cl. 324-158.00P.
Akzo N.V.: *See—*
  Helle, Kees; Groot, Robert Cornelis; and Kamp, Andries, 4,098,654, Cl. 204-16.000.
  Noomen, Arie; and Kik, Leendert Anton, 4,098,928, Cl. 427-203.000.
Akzona Incorporated: *See—*
  van der Vies, Johannes, 4,098,802, Cl. 260-397.400.
Alberti, Robert Stanley; and Goldman, Jon Charles, to Motorola, Inc. Pyrolytic deposition of silicon dioxide on semiconductors using a shrouded boat. 4,098,923, Cl. 427-85.000.
Alcenius, Thomas F., to Technical Research Corporation. Impact driver for electric drill. 4,098,354, Cl. 173-93.500.
Alder, Hanspeter, to Swiss Aluminium Ltd. Continuous measurement of electrolyte parameters in a cell for the electrolysis of a molten charge. 4,098,651, Cl. 204-1.00T.
Alessio, Lorenzo Ercole, to Black and Decker Manufacturing Company, The. Hammer tool. 4,098,351, Cl. 173-13.000.
Allen Industries, Inc.: *See—*
  Goldstone, Edward G., 4,098,629, Cl. 156-87.000.
Allen, Joseph C., to Texaco Inc. Oil recovery process utilizing air and superheated steam. 4,098,336, Cl. 166-261.000.
Allen, Roy A.; and Scott, LeRoy W., to Shell Oil Company. Curable water-borne epoxy resin coating compositions. 4,098,744, Cl. 260-29.300.
Alley, Lewis F.; and White, James E., to Marlen Research Corporation. Machine for continuous pumping of plastic materials. 4,097,962, Cl. 17-39.000.
Alliance Machine Company, The: *See—*
  Kinkopf, Edward J., 4,098,320, Cl. 164-407.000.
Allied Chemical Corporation: *See—*
  Degginger, Edward R.; Dellavecchia, Michael P.; and Steinberg, Albert H., 4,098,943, Cl. 428-283.000.
  Miller, William Albert; Opsasnick, John Paul; and Miller, William Anthony, 4,098,756, Cl. 260-42.270.
Alm, Benjamin C., Jr.; Hopwood, Francis W.; Jelen, Robert A.; Muhlbaier, John P.; and Wright, Joseph F., Jr., to Westinghouse Electric Corp. High speed phase lock control for frequency switching. 4,099,137, Cl. 331-16.000.
Alpers, Heinz-Jurgen; and Rosenbaum, Heinz Jorg, to Bayer Aktiengesellschaft. Process for the preparation of formaldehyde. 4,098,826, Cl. 260-603.00C.
Alsup, James M.; and Whitehouse, Harper J., to United States of America, Navy. Transversal filter prime sequence frequency synthesizer. 4,099,148, Cl. 333-70.00T.
Altman, Robert E., to Tucker, Arnold G. Trip-release anchor. 4,098,217, Cl. 114-299.000.
Altnau, Ronald L., to McGraw-Edison Company. Out-of-balance and safety switch arrangement for washing machine. 4,098,098, Cl. 68-23.00R.
Alto Automotive, Inc.: *See—*
  Vallejos, Tony E., 4,098,238, Cl. 123-81.00B.
Altschuler, Samuel; and Hitz, Jerre A., to TRW Inc. Underwater sound generator. 4,098,369, Cl. 181-118.000.
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  Franz, Edmund C., 4,098,619, Cl. 148-2.000.
  Vernam, William D.; and Evancho, Joseph W., 4,098,957, Cl. 428-654.000.
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  Miyata, Kaneyasu; Amano, Izumi; Iwai, Takehiko; and Asahi, Tetsuya, 4,098,571, Cl. 8-94.110.
Amax Inc.: *See—*
  Fekete, Simon O.; Wicker, Gordon R.; Duyvesteyn, Willem P. C.; and Shieh, Dien F., 4,098,870, Cl. 423-124.000.
  Moore, Fred W.; and Tsigdinos, George A., 4,098,748, Cl. 260-30.60R.
  Tsigdinos, George A.; Moore, Fred W.; Kuck, Valerie J.; and Scalco, Emanuele, 4,098,753, Cl. 260-31.80R.
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  Venezia, J. William, 4,099,021, Cl. 174-75.00R.
American Baler Company, The: *See—*
  Tea, Frank C.; and Hartman, Philip S., 4,098,180, Cl. 100-98.00A.
American Cyanamid Company: *See—*
  Ball, William L.; and Wiese, Eugene E., 4,098,877, Cl. 424-45.000.
  Barua, Girish Chandra; and Nagy, Daniel Elmer, 4,098,987, Cl. 526-304.000.
  Lutz, Albert William; and Diehl, Robert Eugene, 4,098,812, Cl. 260-465.00E.
  Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, 4,098,995, Cl. 536-54.000.

- American Home Products Corporation: *See—*
  - Sarantakis, Dimitrios, 4,098,781, Cl. 260-112.50R.
  - Sarantakis, Dimitrios, 4,098,782, Cl. 260-112.50S.
- American Hospital Supply Corporation: *See—*
  - Bloom, William George; Newman, Howard Fred; and Schmidt, Gerald Warren, 4,098,276, Cl. 128-215.000.
- American Optical Corporation: *See—*
  - Prunier, Louis, 4,098,028, Cl. 51-216.0LP.
- American Sterilizer Company: *See—*
  - Gunther, Donald A., 4,098,573, Cl. 21-93.000.
- Ammann, David W.; Bates, David A.; and Granzow, Daniel B., to Baxter Travenol Laboratories, Inc. Rotary seal distributor member for a centrifuge. 4,098,455, Cl. 233-1.00A.
- Ampex Corporation: *See—*
  - Dolby, Dale P., 4,099,212, Cl. 360-109.000.
  - Hathaway, Richard Allen, 4,099,211, Cl. 360-109.000.
- AMSTED Industries Incorporated: *See—*
  - Stanley, John M., 4,098,528, Cl. 285-235.000.
- Anders, Ronald James; and Mohan, Ramesh, to Rockwell International Corporation. Segmented hub for retaining the spacer ring of a two piece gate valve. 4,098,489, Cl. 251-327.000.
- Andersen, Allen K.; and Archipov, Vsevolod, to Continental Copper & Steel Industries, Inc. Electrolyte metal extraction. 4,098,668, Cl. 204-237.000.
- Anderson, Bruce C.: *See—*
  - Zeskind, Dale A.; and Anderson, Bruce C., 4,099,173, Cl. 340-347.0AD.
- Anderson, George H., to Barber-Colman Company. Automatic control system with gain switching. 4,098,242, Cl. 123-102.000.
- Anderson, Terry G.: *See—*
  - Logue, Daniel R.; and Anderson, Terry G., 4,098,609, Cl. 96-1.800.
- Ando, Takeki: *See—*
  - Inaba, Hiromi; Shima, Seiya; Tashiro, Korefumi; and Ando, Takeki, 4,099,111, Cl. 318-338.000.
- Andrews, Donald Richard; Neel, Alan Fobes, II; and Zegafuse, Donald Ward, to International Business Machines Corporation. Method and apparatus for electronic collation. 4,099,254, Cl. 364-900.000.
- Andrews, Lawrence F., to "A"-Company, Inc. Orthodontic arch wire. 4,097,993, Cl. 32-14.00A.
- Anglo-American Clays Corporation: *See—*
  - Nott, Alan J., 4,098,688, Cl. 209-166.000.
- Antone, Howard J. One-hand bat. 4,098,503, Cl. 273-26.00C.
- Aoki, Kazumi: *See—*
  - Sakurai, Toshio; Nishihara, Akio; Handa, Takuro; Katoh, Hidekatsu; Tomoda, Yoshiro; Aoki, Kazumi; and Yoto, Makoto, 4,098,705, Cl. 252-33.600.
- Aoyagi, Yoshiaki: *See—*
  - Murai, Hiromu; Ohata, Katsuya; Sempuku, Kenji; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,098,892, Cl. 424-249.000.
- Applied Biochemists, Inc.: *See—*
  - Seymour, Donald E.; Schmidt, James C.; and Bezella, Donald A., 4,098,602, Cl. 71-67.000.
- ARBED — Acieries Reunies de Burbach-Eich-Dudelange S.A.: *See—*
  - Baumert, Jean, 4,098,128, Cl. 73-591.000.
- Arcamone, Federico; Di Marco, Aurelio; and Penco, Sergio, to Societa' Farmaceutici Italia S.p.A. Adriamycins, process for their preparation and uses thereof. 4,098,798, Cl. 260-340.90R.
- Arcamone, Federico; Bernardi, Luigi; and Patelli, Bianca, to Societa' Farmaceutici Italia S.p.A. Doxorubicin thioesters. 4,098,884, Cl. 424-180.000.
- Archibald Kenrick and Sons Limited: *See—*
  - Hamblin, Richard David, 4,098,482, Cl. 248-246.000.
- Archipov, Vsevolod: *See—*
  - Andersen, Allen K.; and Archipov, Vsevolod, 4,098,668, Cl. 204-237.000.
- Ardizio, Pierre. Safety belt for motor vehicle. 4,098,524, Cl. 280-744.000.
- Argabright, Perry A.; Rhudy, John S.; and Phillips, Brian L., to Marathon Oil Company. Method of improving injectivity profiles and/or vertical conformance in heterogeneous formations. 4,098,337, Cl. 166-270.000.
- Arizona Chemical Company: *See—*
  - Wojcik, Ronald Thomas, 4,098,982, Cl. 526-233.000.
- Armstrong Cork Company: *See—*
  - Rosenau, Clifford M., 4,098,856, Cl. 264-80.000.
- Armstrong, Errol: *See—*
  - Ford, Freeman A.; Armstrong, Errol; and Rhodes, Richard O., 4,098,331, Cl. 165-170.000.
- Arndt, Henry Clifford; Biddlecom, William Gerard; and Woessner, Warren Dexter, to Miles Laboratories, Inc. Monospiroalkyl derivatives of prostaglandins. 4,098,823, Cl. 260-586.00G.
- Arneklev, Duane R., to Stauffer Chemical Company. Antidote compositions and method of use with herbicides. 4,098,599, Cl. 71-100.000.
- Arneson, Edwin L., to Federal Paper Board Co., Inc. Packaging container with latching arrangement. 4,098,453, Cl. 229-45.000.
- Arnold, Fred E.; and Hedberg, Frederick L., to United States of America, Air Force. Acetylene-substituted aromatic benzils and acetylene-terminated quinoxaline compositions. 4,098,825, Cl. 260-590.00D.
- Arnold, Richard Fairbanks; Dishon, Yitzhak; Ouchi, Norman Ken; and Schor, Marshall I., to International Business Machines Corporation. Markov processor for context encoding from given characters and for character decoding from given contexts. 4,099,257, Cl. 364-900.000.
- Arters, James C., to Scott Paper Company. Heat deformable laminates and process of making same. 4,098,938, Cl. 428-160.000.
- Asahi Denka Kogyo K.K.: *See—*
  - Sakurai, Toshio; Nishihara, Akio; Handa, Takuro; Katoh, Hidekatsu; Tomoda, Yoshiro; Aoki, Kazumi; and Yoto, Makoto, 4,098,705, Cl. 252-33.600.
- Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
  - Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,099,188, Cl. 354-24.000.
  - Urano, Fumio; and Sawada, Yoshio, 4,099,195, Cl. 354-50.000.
- Asahi, Tetsuya: *See—*
  - Miyata, Kaneyasu; Amano, Izumi; Iwai, Takehiko; and Asahi, Tetsuya, 4,098,571, Cl. 8-94.110.
- Asao, Yasuzi; Ogata, Yasuhiro; and Hosoi, Noriyuki, to Fuji Photo Film Co., Ltd. Recording sheet. 4,098,114, Cl. 73-141.00R.
- ASEA AB: *See—*
  - Stenkvist, Sven-Einar, 4,097,978, Cl. 29-25.140.
- Ashland Oil, Inc.: *See—*
  - Egan, Richard R.; Hughes, Graham K.; and Sigan, Jack W., 4,098,822, Cl. 260-585.00B.
- Askevold, Robert J., to Union Oil Company of California. Automatic shut-off liquid dispensing nozzle. 4,098,306, Cl. 141-218.000.
- Astbury, James Harry: *See—*
  - Skelly, James Kenneth; and Astbury, James Harry, 4,098,948, Cl. 428-411.000.
- Astor, Edward A. Wall forming construction unit. 4,098,045, Cl. 52-639.000.
- Astra Lakemedel Aktiebolag: *See—*
  - Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,098,901, Cl. 424-311.000.
- Atari, Inc.: *See—*
  - Bristow, Stephen D., 4,099,092, Cl. 315-10.000.
- Aubard, Gilbert Gustave: *See—*
  - Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, 4,098,803, Cl. 260-397.450.
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- Aubry, Jean Yves: *See—*
  - Scillieri, Antoine; and Aubry, Jean Yves, 4,099,181, Cl. 343-16.00M.
- Auchinleck, Richard J., to Peripheral Dynamics, Inc. Adjustable width document reader. 4,098,458, Cl. 235-475.000.
- Aureille, Gisele: *See—*
  - Perrin, Robert Marc; Aureille, Gisele; Vincent-Falquet, Marie-Francoise; and Collange, Edmond, 4,098,828, Cl. 568-126.000.
- Auto Crane Company: *See—*
  - Wilkinson, Alvin H., 4,098,492, Cl. 254-189.000.
- Automation Systems, Inc.: *See—*
  - Gugliotta, George, 4,099,051, Cl. 250-236.000.
- Avco Corporation: *See—*
  - Waddington, Clive, 4,098,147, Cl. 74-750.00B.
- B. F. Goodrich Company, The: *See—*
  - Mikofalvy, Bela Kalman; and Turner, James Wilson, 4,098,978, Cl. 526-81.000.
  - Rajput, Yudh Vir; and Fickle, Kirby, 4,098,542, Cl. 303-92.000.
- B.S.A. Sintered Components Limited: *See—*
  - Matty, Michael Thomas; and Ridout, Philip James, 4,098,608, Cl. 75-251.000.
- Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, to Hoechst Aktiengesellschaft. Novel analogues of prostanoic acids not occurring in nature. 4,098,815, Cl. 260-514.00D.
- Baboian, Robert, to Texas Instruments Incorporated. Anti-corrosion anode connector system. 4,098,663, Cl. 204-196.000.
- Bach, Nicholas J., to Eli Lilly and Company. Ergoline chlorination process. 4,098,790, Cl. 260-285.500.
- Bacsksai, Robert, to Chevron Research Company. Quaternary ammonium catalyst system for the polymerization of 2-pyrrolidone. 4,098,774, Cl. 260-78.00P.
- Badone, Louis; and March, Alexander, to Chrysler Corporation. Method for improved parting from hot surfaces. 4,098,929, Cl. 427-236.000.
- Baertsch, Richard D.: *See—*
  - Goldberg, Howard S.; Engeler, William E.; and Baertsch, Richard D., 4,099,075, Cl. 307-352.000.
- Baggaley, Keith Howard: *See—*
  - Thorne, David Edward; Baggaley, Keith Howard; and Morgan, Brian, 4,098,816, Cl. 260-520.00E.
- Bagwell, Bryan G.; and Gemmell, Frank S., to Motorola, Inc. Passive optical proximity fuze. 4,098,191, Cl. 102-213.000.
- Bailey, Brian Edward; and Bunker, Anthony John, to Interox Chemicals Limited. Polyurethane adhesives having high peel strength at 70° C. 4,098,747, Cl. 260-30.40N.
- Bailie, John: *See—*
  - Kedjierski, Fred Dennis; and Bailie, John, 4,099,168, Cl. 340-517.000.
- Baines, Eric; Platt, Peter; and Tomlinson, Kenneth, to Colgate-Palmolive Company. Toothpaste containing milled alpha-alumina trihydrate. 4,098,878, Cl. 424-52.000.
- Baker, Alan Stuart; and Hancock, Roger Ian, to Imperial Chemical Industries Limited. Demulsification. 4,098,692, Cl. 210-43.000.
- Baker International Corp.: *See—*
  - Crowe, Talmadge L., 4,098,334, Cl. 166-208.000.
  - Goad, Bobby F., 4,098,335, Cl. 166-120.000.
- Baldi, Luciano; Ferrari, Corrado; and Francese, Renato, to Rumianca S.p.A. Process for the production of chloro-amino-s-triazines. 4,099,006, Cl. 544-204.000.
- Balkin, Larry M.: *See—*
  - Bethune, Billy R.; and Balkin, Larry M., 4,098,399, Cl. 206-288.000.

- Ball, William L.; and Wiese, Eugene E., to American Cyanamid Company. Antimicrobial composition (enhanced activity from combination of phenol and a quaternary compound). 4,098,877, Cl. 424-45.000.
- Banco De Mexico, S.A.: *See—*
  - Mercado-Flores, Ignacio; Carvallo-Garnica, Sergio; and Lara-Sanchez, Luis Eduardo, 4,098,912, Cl. 426-617.000.
- Banucci, Eugene G.; and Byrne, Martin A., to General Electric Company. Process for preparing polyetheramide-acids. 4,098,800, Cl. 260-346.300.
- Bar, Alfredo, to NECCHI Societa per Azioni. Starting relay casing for motorcompressors. 4,099,154, Cl. 338-220.000.
- Barbagelata, Giuseppe; Conterna, Bruno; Giraudi, Mauro; and Stringa, Luigi, to Elettronica San Giorgio-ELSAG S.p.A. Electronic data-processing system with data transfer between independently operating miniprocessors. 4,099,233, Cl. 364-200.000.
- Barber-Colman Company: *See—*
  - Anderson, George H., 4,098,242, Cl. 123-102.000.
- Barber, Everett M., Jr.; and Hopper, Thomas P., to Sunworks, Inc. Solar energy collection system. 4,098,259, Cl. 126-270.000.
- Barkan, Philip, to General Electric Company. Means for effectively controlling the forces imposed on the movable contact of a vacuum-type circuit interrupter. 4,099,039, Cl. 200-144.00B.
- Barone, Bruno J., to Petro-Tex Chemical Corporation. Oxidation of cycloaliphatic compounds. 4,098,817, Cl. 260-533.00C.
- Barrett, Jack P. Electrical assembly for lifting biased down dock levelers. 4,097,949, Cl. 14-71.300.
- Barron, William E., to Bethlehem Steel Corporation. Bin gate operating apparatus. 4,098,413, Cl. 214-17.00R.
- Barry, Adelbert: *See—*
  - Robinson, Leon H.; Speers, Jerry M.; Barry, Adelbert; and Campbell, Daniel J., 4,098,342, Cl. 166-315.000.
- Bartelme, Jack H., to Raymond Lee Organization, Inc., The, a part interest. Insect trap attachable to a tree. 4,098,018, Cl. 43-108.000.
- Barth, Edward G., to Burroughs Corporation. Display panel with integral rigid leads. 4,099,083, Cl. 313-217.000.
- Bartmann, Wilhelm: *See—*
  - Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,098,815, Cl. 260-514.00D.
- Barua, Girish Chandra; and Nagy, Daniel Elmer, to American Cyanamid Company. Non-ionic surfactants from water soluble copolymers of acrylamide with hydrophobic monomers. 4,098,987, Cl. 526-304.000.
- BASF Aktiengesellschaft: *See—*
  - Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, 4,098,640, Cl. 162-146.000.
  - Schoettle, Klaus; Wittkamp, Heinrich; and Gliniorz, Lothar, 4,098,446, Cl. 226-196.000.
  - Thym, Sabine; Pommer, Ernst-Heinrich; Zeeh, Bernd; and Linhart, Friedrich, 4,098,810, Cl. 260-453.0RW.
- BASF Wyandotte Corporation: *See—*
  - Illers, Karl Heinz; and Stutz, Herbert, 4,098,773, Cl. 528-65.000.
  - Login, Robert B., 4,098,842, Cl. 260-857.0PG.
  - Login, Robert Bernard, 4,098,741, Cl. 260-29.20E.
- Bassani, Giovanni, to Dow Corning Corporation. Wire coating using a liquid polymer. 4,098,861, Cl. 264-174.000.
- Bates, David A.: *See—*
  - Ammann, David W.; Bates, David A.; and Granzow, Daniel B., 4,098,455, Cl. 233-1.00A.
- Bates, Dillard T.: *See—*
  - Jackson, William G.; Seibert, Lance; Bates, Dillard T.; and Smith, James M., 4,098,049, Cl. 53-22.00B.
- Battelle Development Corporation: *See—*
  - Swain, James C., 4,098,087, Cl. 61-45.00B.
- Bauer, Friedrich, to Hoerbiger Ventilwerke Aktiengesellschaft. Device for controlling oil injection to a screw compressor. 4,098,487, Cl. 251-61.400.
- Baugher, William Lewis, to Procter & Gamble Company, The. Gelatinized fat particles. 4,098,913, Cl. 426-104.000.
- Baumbach, William J. Drain control device. 4,098,287, Cl. 137-362.000.
- Baumert, Jean, to ARBED — Acieries Reunies de Burbach-Eich-Dudelange S.A. Method of and apparatus for monitoring slag thickness in refining crucible. 4,098,128, Cl. 73-591.000.
- Baumoel, Joseph. Open channel flow transducer for sewerage system. 4,098,117, Cl. 73-194.00A.
- Baxamusa, Yusuf A.; and Robota, Stephen, to Hooker Chemicals & Plastics Corp. Fluorination process catalysed by molybdenum pentachloride. 4,098,832, Cl. 260-651.00F.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Ammann, David W.; Bates, David A.; and Granzow, Daniel B., 4,098,455, Cl. 233-1.00A.
  - Bayham, Edward L., 4,098,456, Cl. 233-14.00R.
  - Ebling, Wendell victor; Witsoe, David Allan; and Soderstrom, Jan, 4,098,274, Cl. 128-214.00E.
  - Granzow, Daniel B., Jr., 4,098,123, Cl. 73-343.00R.
- Bay, William P. Helmet shield apparatus. 4,097,930, Cl. 2-10.000.
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  - Alpers, Heinz-Jurgen; and Rosenbaum, Heinz Jorg, 4,098,826, Cl. 260-603.00C.
  - Buchel, Karl Heinz; Gold, Heinrich; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,098,894, Cl. 424-269.000.
  - Bueb, Michael; and Muschelknautz, Edgar, 4,098,115, Cl. 73-144.000.
  - Burkhardt, Tilo; Wagner, Kuno; and Findeisen, Kurt, 4,098,933, Cl. 427-379.000.
  - Moller, Eike; Meng, Karl-August, deceased; Webinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,099,011, Cl. 548-376.000.
  - Neuray, Dieter; Vernaleken, Hugo; Wulff, Claus; and Lange, Ralf, 4,098,754, Cl. 260-37.0PC.
  - Schulte, Franz-Josef; Bruch, Werner; and Diers, Erwin, 4,098,851, Cl. 261-76.000.
  - von Bonin, Wulf; Kleimann, Helmut; and Ivanyi, Jozsef, 4,098,731, Cl. 521-51.000.
  - Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 4,098,808, Cl. 260-448.80R.
- Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Centrifuge system having collapsible centrifuge bags. 4,098,456, Cl. 233-14.00R.
- BBDM, Inc.: *See—*
  - Dolby, John T., 4,098,270, Cl. 128-141.00R.
- Beck, Gerhard: *See—*
  - Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,098,815, Cl. 260-514.00D.
- Becker, Knut Henning; Rauterkus, Karl Josef; and Seip, Detlev, to Hoechst Aktiengesellschaft. Aqueous vinyl ester copolymer dispersions capable of being cross-linked. 4,098,746, Cl. 260-29.4UA.
- Beckman Instruments, Inc.: *See—*
  - Gropper, Lee; and Ishimaru, Kenzo, 4,098,457, Cl. 233-23.00R.
- Beecham Group Limited: *See—*
  - Howarth, Thomas Trefor, 4,098,897, Cl. 424-272.000.
  - Thorne, David Edward; Baggaley, Keith Howard; and Morgan, Brian, 4,098,816, Cl. 260-520.00E.
- Beggs, William C. Pulse generating system with high energy electrical pulse transformer and method of generating pulses. 4,099,066, Cl. 307-88.0MP.
- Beher, Peter: *See—*
  - Schwanz, Wilfried; Seiffert, Ulrich; Beher, Peter; and Paitula, Hannu, 4,098,525, Cl. 280-750.000.
- Belfor, Alexandr Gershevich: *See—*
  - Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
- Bell, Guido, to Siemens Aktiengesellschaft. Process for the production of a planar conductor path system for integrated semiconductor circuits. 4,098,637, Cl. 156-644.000.
- Bell & Howell Company: *See—*
  - Logue, Daniel R.; and Anderson, Terry G., 4,098,609, Cl. 96-1.800.
- Bell, Malcolm R.; and Oesterlin, Rudolf, to Sterling Drug Inc. Cyclopenta[c]pyrrole derivatives. 4,098,797, Cl. 260-326.620.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Draper, Don Ray, 4,099,256, Cl. 364-900.000.
  - Hartman, Robert Louis; and Johnston, Wilbur Dexter, Jr., 4,098,031, Cl. 51-323.000.
  - Lynes, Dennis Joseph; Panousis, Peter Theodore; and Pritchett, Robert Leonard, 4,099,260, Cl. 365-105.000.
  - Maliszewski, Stephen Raymond; and Ngo, Peter Dinh-Tuan, 4,099,170, Cl. 340-324.00M.
  - Starnes, William Herbert, Jr., 4,098,763, Cl. 260-45.70S.
- Belles, Benjamin P., to Standard Oil Company a corporation of Indiana. Method for continuous soluble polypropylene recovery from hydrocarbon polymerization media. 4,098,992, Cl. 528-500.000.
- Belyaeva, Agnia Alexandrovna: *See—*
  - Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
- Benckiser-Knapsack GmbH: *See—*
  - Sommer, Klaus; and Raab, Guenter, 4,098,814, Cl. 260-502.500.
- Bendix Corporation, The: *See—*
  - Sharpe, Claude A.; and Frazier, Richard V., Jr., 4,099,124, Cl. 325-326.000.
- Benjamin, Benjamin C., to Schmelzer Corporation. Vacuum break device. 4,098,459, Cl. 236-87.000.
- Bennett, Robert A. Child proof plug fitment. 4,098,417, Cl. 215-204.000.
- Bennett, Robert McKay, Jr.; and Osborn, James Leslie, to Motorola, Inc. Frequency error correction circuit. 4,099,125, Cl. 325-419.000.
- Benson, Gustav E.: *See—*
  - Carvalho, Robert L.; and Benson, Gustav E., 4,098,316, Cl. 152-362.00R.
- Berbner, Heinz: *See—*
  - Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, 4,098,640, Cl. 162-146.000.
- Berchem, Antoine; Sudan, Krishan Kumar; and Gres, Edward Michael, to Reichhold Chemicals Limited. Spray-dried phenolic adhesives. 4,098,770, Cl. 528-130.000.
- Berg, Paul F.: *See—*
  - Grasso, Albert P.; and Berg, Paul F., 4,098,296, Cl. 137-855.000.
- Berger, Gunvald Magnus Svante. Load carrier having supporting legs. 4,098,535, Cl. 296-35.00A.
- Berglund, Carl Neil: *See—*
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  - Galanis, Tom L.; Hoffner, Joel L.; and Clymer, John C., 4,099,244, Cl. 364-571.000.
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  - Tonkyn, Richard G.; and Vorchheimer, Norman, 4,098,693, Cl. 210-52.000.
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  - Wortmann, Joachim; Dany, Franz-Josef; Kandler, Joachim; and Beu, Hans Peter, 4,098,968, Cl. 526-1.000.
- Beyl, Jean Joseph Alfred. Safety ski binding. 4,098,522, Cl. 280-618.000.
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  - Owan, Thomas A., 4,098,215, Cl. 114-275.000.
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  - Cheong, Alex Shu-Ki, 4,098,328, Cl. 165-107.000.
  - Fogelberg, Mark John; and Holdeman, John William, 4,098,379, Cl. 192-38.000.
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  - Pollock, Richard, 4,098,944, Cl. 428-284.000.
  - Wayman, Robert William, 4,098,148, Cl. 74-863.000.
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  - Boyd, Darrell B., 4,098,233, Cl. 123-32.00R.
- Boynton, Robert James; and Livermore, Frederick Caldwell, to Northern Telecom Limited. Thermal printing device. 4,099,046, Cl. 219-216.000.
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- Bratthall, Lars; and Lindstrom, Bernt, to Stal-Laval Apparat AB. Finned tube heat exchanger construction. 4,098,332, Cl. 165-172.000.
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- Bright, Gene M., to Pfizer Inc. Sulfamide derivatives of 4 -deoxy-oleandomycin. 4,098,994, Cl. 536-9.000.
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- Brite, Alan D. Flush tank vaporizer. 4,097,936, Cl. 4-228.000.
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  - Westermann, Peter Henry, 4,098,739, Cl. 260-28.50D.
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- Brown, Frank C., to Emerson Electric Co. Returnable packaging system. 4,098,400, Cl. 206-319.000.
- Brown, Jimmie L.; Hinton, Gordon L.; and Magazzu, John T., to Weyerhaeuser Company. Furniture container. 4,098,401, Cl. 206-326.000.
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- Callaghan, William I., to Towmotor Corporation. Synchronized creep and brake control. 4,098,377, Cl. 192-13.00R.
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  - Filby, John, 4,098,691, Cl. 210-29.000.
- Canon Kabushiki Kaisha: *See—*
  - Aizawa, Hiroshi; Uchidoi, Masanori; Miyakawa, Hideaki; Yamamichi, Masayoshi; Iura, Yukio; and Fukui, Masahisa, 4,099,192, Cl. 354-234.000.
  - Komori, Shigehiro; Hayakawa, Kimiaki; Nitanda, Hiroshi; and Inuzuka, Tsuneki, 4,098,551, Cl. 355-3.00R.
  - Matsumura, Isao, 4,098,549, Cl. 351-7.000.
  - Mikada, Hiroyuki; Houryu, Sakae; and Kishimoto, Jyuji, 4,099,247, Cl. 364-710.000.
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  - Finlay, Edward W.; and Cappon, John, 4,099,123, Cl. 325-308.000.
- Captain, Khushroo M., to Foster-Miller Associates, Inc. Humidity indicator. 4,098,121, Cl. 73-337.000.
- Carl Still Recklinghausen, Firma: *See—*
  - Tippmer, Kurt, 4,098,583, Cl. 44-1.00B.
- Carlson, David H. J., to UOP Inc. Oxidation of mercaptans in a petroleum distillate with a supported metal phthalocyanine catalyst. 4,098,681, Cl. 208-206.000.
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- Carman, Vincent E. Hydraulic energy storage multi-speed transmission. 4,098,083, Cl. 60-414.000.
- Carnahan, Thomas G.; and Lei, Kenneth P. V., to United States of America, Interior. Recovery of uranium from refractory ores. 4,098,866, Cl. 423-7.000.
- Carpman, Leif. Method for the feed of cylindrical objects to a working machine. 4,098,383, Cl. 193-2.00R.
- Carrigan, David B.; and Freas, Roy W., to David Carrigan and Associates, Inc. Apparatus for dispensing, filling and capping a plurality of cups. 4,098,058, Cl. 53-315.000.
- Carrillo, Alfred A., to Raymond Lee Organization, Inc., The. Portable ceiling reflector for photography. 4,099,221, Cl. 362-18.000.
- Carroll, John L. Automatically and manually controlled fire extinguisher. 4,098,343, Cl. 169-74.000.
- Carvalho, Robert L.; and Benson, Gustav E., to Owens-Corning Fiberglas Corporation. Bead structure for pneumatic tires. 4,098,316, Cl. 152-362.00R.
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  - Mercado-Flores, Ignacio; Carvallo-Garnica, Sergio; and Lara-Sanchez, Luis Eduardo, 4,098,912, Cl. 426-617.000.
- Casasent, David Paul, to United States of America, Navy. Doppler processing method and apparatus. 4,099,249, Cl. 364-822.000.
- Casey, Joseph M.; and Dahlin, Erik B., to Measurex Corporation. Method for the on-line control of the opacity of a paper sheet. 4,098,641, Cl. 162-198.000.
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  - Prince, Douglas F., 4,098,563, Cl. 425-204.000.
- Caterpillar Tractor Co.: *See—*
  - Eftefield, Larry G., 4,098,350, Cl. 172-776.000.
  - Miller, Calvin L., 4,098,138, Cl. 74-405.000.
  - Strohschein, Donald K., 4,098,140, Cl. 74-447.000.
  - Sturges, James R., 4,098,543, Cl. 305-54.000.
  - Svoboda, James, 4,098,101, Cl. 70-134.000.
  - Szentes, John Francis; Reeser, Ward Welton; and Zuck, Charles Leslie, Jr., 4,099,067, Cl. 307-153.000.
- Caunt, Anthony David, to Imperial Chemical Industries Limited. Process for the production of olefin polymers using an organo-phosphorus catalyst compound. 4,098,976, Cl. 526-77.000.
- CAV Limited: *See—*
  - Mowbray, Dorian Farrar, 4,098,249, Cl. 123-139.0ST.
- Cavanaugh, Leo Francis, to Robot Research, Inc. Multiplexed communication of voice signals and slow scan television signals over a common communication channel. 4,099,202, Cl. 358-85.000.
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  - Zeewy, Abraham; and Geringer, Donald, 4,099,110, Cl. 318-266.000.
- Ceeco Machinery Manufacturing Limited: *See—*
  - Varga, Joseph A., 4,098,063, Cl. 57-13.000.
- Celette S.A., Vienne: *See—*
  - Negrin, Gilbert, 4,098,003, Cl. 33-288.000.
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  - Deblaere, Marie-Claude; Lambert, Alain; and Flambard, Christian, 4,098,129, Cl. 73-599.000.
- Cerioni, Renzo Giuseppe, to EL CU S.p.A. Device for forwarding sacks or like containers. 4,098,054, Cl. 53-139.000.
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  - Hushebeck, Henry R., 4,098,719, Cl. 252-364.000.
- Champion Products Inc.: *See—*
  - Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,098,222, Cl. 118-7.000.
- Chanaud, Robert Charles: *See—*
  - McGregor, Howard Norman; and Chanaud, Robert Charles, 4,098,370, Cl. 181-150.000.
- Chandavoine, Marie-Madeleine: *See—*
  - Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,098,706, Cl. 252-40.500.
- Chang, Wen-Hsuan: *See—*
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- Chapard, Alain: *See—*
  - Henry, Raymond; and Chapard, Alain, 4,097,986, Cl. 29-583.000.
- Chappell, George D.: *See—*
  - Stanford, James R.; Martin, John H.; and Chappell, George D., 4,098,716, Cl. 252-188.000.
- Chard, Steven D.; Loker, W. A.; and Meredith, John T., to United States of America, Navy. High strength, non-metallic coupling. 4,098,096, Cl. 64-14.000.
- Chas. S. Tanner Co.: *See—*
  - Lindemann, Martin K., 4,098,986, Cl. 526-278.000.
- Charles Stark Draper Laboratory, Inc., The: *See—*
  - Watson, Paul C., 4,098,001, Cl. 33-169.00C.
- Chase, Jack S.: *See—*
  - Klimavicz, Frank; and Chase, Jack S., 4,097,998, Cl. 33-1.00G.
- Chattillion, Howard G., to Monsanto Company. Apparatus for sealing containers. 4,098,059, Cl. 53-319.000.
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  - Kober, Frederick P., 4,098,258, Cl. 126-263.000.
- Chemed Corporation: *See—*
  - Hwa, Chih M., 4,098,720, Cl. 252-389.00R.
- Chemetron Corporation: *See—*
  - Brown, Allen C.; Hattes, Neil R.; and Eyrick, Theodore B., 4,098,853, Cl. 261-122.000.
- Chemical Additives Company: *See—*
  - Hartfiel, Arlynn H., 4,098,700, Cl. 252-8.50A.
- Chemie-Anlagenbau Bischofsheim GmbH: *See—*
  - Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,098,730, Cl. 521-107.000.
- Cheong, Alex Shu-Ki, to Borg-Warner Corporation. Cross-flow radiator deaeration system. 4,098,328, Cl. 165-107.000.
- Chernousov, Lev Nikolaevich: *See—*
  - Lidorenko, Nikolai Stepanovich; Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Zhemchuzhina, Elena Alexandrovna; Chernousov, Lev Nikolaevich; Shmidt, Igor Aronovich; Nikolashina, Ljudmila Alexeevna; Gelfgat, David Mendeleevich; and Sgibnev, Igor Vladimirovich, 4,098,617, Cl. 148-1.500.
- Chevron Research Company: *See—*
  - Bacsksai, Robert, 4,098,774, Cl. 260-78.00P.
  - Edwards, Laroy H., 4,098,896, Cl. 424-269.000.
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- Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Electrochemical method and device for producing oxygen. 4,098,667, Cl. 204-234.000.

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  - Pogorelov, Valery Viktorovich; Trusov, Sergei Mikhailovich; Kolbin, Nikolai Petrovich; and Chistyakov, Lev Nikolaevich, 4,098,080, Cl. 60-361.000.
- Chloride, Incorporated: *See—*
  - Malinowski, William J., 4,099,065, Cl. 250-574.000.
- Cho, Hideyuki. Apparatus for unfolding, spreading and guiding travelling fabric. 4,097,973, Cl. 26-78.000.
- Chodil, Gerald J.; and Sobel, Alan, to Zenith Radio Corporation. Stacked lattice spacer support for luminescent display panels. 4,099,082, Cl. 313-217.000.
- Christ, Gunter: *See—*
  - Liebscher, Gunther; and Christ, Gunter, 4,098,424, Cl. 220-4.00F.
- Christen, Gilbert; Favre, Bernard; Marze, Xavier; and Salmon, Michel, to Rhone-Poulenc, S.A. Process for carring out a gas/liquid heat-exchange. 4,098,852, Cl. 261-104.000.
- Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. Process for preparing di-7-azido cephalosporin compounds. 4,099,000, Cl. 544-17.000.
- Christensen, Carl O., to Roll-Rite Corp. Flutter-resistant caster. 4,097,954, Cl. 16-21.000.
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  - Rohde, Heino J.; and Juergens, Rainer, 4,098,363, Cl. 175-329.000.
- Chrysa: *See—*
  - Perrin, Robert Marc; Aureille, Gisele; Vincent-Falquet, Marie-Francoise; and Collange, Edmond, 4,098,828, Cl. 568-126.000.
- Chrysler Corporation: *See—*
  - Badone, Louis; and March, Alexander, 4,098,929, Cl. 427-236.000.
  - Scott, Ian J. C., 4,098,251, Cl. 123-195.00A.
- Chu, Chin-Chiun, to Mobil Oil Corporation. Disproportionation of toluene. 4,098,837, Cl. 260-672.00T.
- Chubu-Nippon Broadcasting Co., Ltd.: *See—*
  - Hattori, Hajime; Usui, Eiji; Oya, Takashi; Sugawa, Kaneyoshi; Kezuka, Eiji; Okada, Tadashi; and Watanabe, Toshiro, 4,099,205, Cl. 358-149.000.
- Chupp, John P., to Monsanto Company. Isocyanoacylamides. 4,098,600, Cl. 71-105.000.
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  - Wright, Peter John; Dodwell, Geoffrey Michael; and Jennings, David Francis, 4,098,953, Cl. 428-483.000.
- Ciba-Geigy Corporation: *See—*
  - Boger, Manfred; and Drabek, Jozef, 4,098,902, Cl. 424-322.000.
  - Dittrich, Volker; Topfl, Werner; and Kristiansen, Odd, 4,098,900, Cl. 424-304.000.
  - Falk, Robert A., 4,098,811, Cl. 260-459.00A.
  - Foery, Werner; and Fischer, Hans Peter, 4,098,601, Cl. 71-124.000.
  - Gschwend, Heinz Werner, 4,099,012, Cl. 548-378.000.
  - Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,098,895, Cl. 424-269.000.
  - Lacroix, Roger; and Haberli, Roland, 4,098,569, Cl. 8-41.00R.
  - Mueller, Karl Friedrich, 4,098,742, Cl. 260-29.20M.
  - Skelly, James Kenneth; and Evans, David George, 4,098,570, Cl. 8-41.00B.
  - Skelly, James Kenneth; and Astbury, James Harry, 4,098,948, Cl. 428-411.000.
- Cieciuch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., to Polaroid Corporation. Dye substituted cyclic 1,3-sulfur-nitrogen compounds as dye image-forming materials in photography. 4,098,783, Cl. 260-147.000.
- Cine Magnetics Inc.: *See—*
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- Citizen Watch Co., Ltd.: *See—*
  - Nikaido, Akira, 4,099,106, Cl. 318-115.000.
- Clamon, Robert Dale: *See—*
  - Penny, Samuel Lee; and Clamon, Robert Dale, 4,098,150, Cl. 76-108.00A.
- Clark, Dexter C. Movie reel system. 4,098,470, Cl. 242-55.180.
- Clark, Thomas W.; and Hale, William E., to Manoscope, Inc. Pressure relief valve. 4,098,291, Cl. 137-871.000.
- Clark, William Thomas; and Partington, Edward Colin, to Products Engineering Research Association of Great Britain, The. Machining method. 4,098,153, Cl. 82-1.00C.
- Clarke, Theodore M.; and Walter, Gordon H., to International Harvester Company. Earth-working implement. 4,098,622, Cl. 148-36.000.
- Claunch, C. Kenneth; and Way, Robert Bailey, to Finish Engineering Company. Acid pump. 4,098,557, Cl. 415-111.000.
- Clements, James M. Soil sample core extraction tool. 4,098,360, Cl. 175-313.000.
- Clinical Data, Inc.: *See—*
  - Stein, Israel M.; and Peterson, Ronald T., 4,098,267, Cl. 128-2.06G.
- Clymer, John C.: *See—*
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- Coach and Car Equipment Corporation: *See—*
  - Harder, Arthur J., Jr., 4,098,357, Cl. 248-399.000.
- Coats Company, Inc., The: *See—*
  - Cunningham, Charles L., 4,098,317, Cl. 157-1.240.
- Coats, William H. Sight-glass adapter. 4,098,119, Cl. 73-323.000.
- Cockerell, Christopher, to Wavepower Limited. Apparatus for extracting energy from wave movement of the sea. 4,098,084, Cl. 60-500.000.
- Coen, Manus; and Bonfield, Joseph, to Eastern Bindery, Inc. Sample book with integral handle. 4,098,443, Cl. 224-45.00P.
- Coffey, William N.; Jernakoff, George; and Zurbrick, John R., to General Electric Company. Energy reflection flaw detection system. 4,098,130, Cl. 73-614.000.
- Cohen, Norman Robert: *See—*
  - Crossfield, Roger John; and Cohen, Norman Robert, 4,098,702, Cl. 252-8.600.
  - Crossfield, Roger John; and Cohen, Norman Robert, 4,098,703, Cl. 252-8.600.
- Cohn, Marvin, to Westinghouse Electric Corp. Harmonic mixing with an anti-parallel diode pair. 4,099,228, Cl. 363-159.000.
- Coin Acceptors, Inc.: *See—*
  - Martin, Bart G., 4,098,386, Cl. 194-102.000.
  - Martin, Bart G., 4,098,387, Cl. 194-102.000.
- Cola, Rudolph A., to Burroughs Corporation. Display panel. 4,099,098, Cl. 315-169.0TV.
- Cole, Darrell D.: *See—*
  - Proctor, D. Frederic; and Cole, Darrell D., 4,099,031, Cl. 179-17.00A.
- Cole, Paul Morrison, to Du Pont de Nemours, E. I., and Company. Hydrojet for propelling yarn. 4,098,444, Cl. 226-97.000.
- Cole, Terrell A. Wound roll of fibrous material and a method for forming the same. 4,097,983, Cl. 29-521.000.
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  - Baines, Eric; Platt, Peter; and Tomlinson, Kenneth, 4,098,878, Cl. 424-52.000.
  - Gaffar, Abdul, 4,098,880, Cl. 424-54.000.
  - Weyn, Hendrik Frans, 4,098,435, Cl. 222-94.000.
- Collange, Edmond: *See—*
  - Perrin, Robert Marc; Aureille, Gisele; Vincent-Falquet, Marie-Francoise; and Collange, Edmond, 4,098,828, Cl. 568-126.000.
- Colledge, Malcolm: *See—*
  - Pentreath, David William; and Colledge, Malcolm, 4,097,982, Cl. 29-451.000.
- Collin, Gerd: *See—*
  - Grigoleit, Georg; Kohler, Helmut; Collin, Gerd; and Matern, Kurt, 4,098,838, Cl. 260-674.00N.
- Collin, Per Harald, to Stora Kopparberg Bergslags Aktiebolag. Method for reduction in a fluid bed of fine grained material containing iron oxide. 4,098,604, Cl. 75-26.000.
- Commeyras, Auguste; Blancou, Hubert; and Moreau, Patrice, to Produits Chimiques Ugine Kuhlmann. Process for functionalizing perfluorohalogenoalkanes. 4,098,806, Cl. 260-405.500.
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  - Phillip, Arpad T.; Bocksteiner, Gunter; Pettis, Russel W.; and Glew, Geoffrey W., 4,098,971, Cl. 526-16.000.
- Communications Satellite Corporation: *See—*
  - Fang, Russell Ju Fu, 4,099,121, Cl. 325-4.000.
- Compagnie Francaise des Petroles: *See—*
  - Wells, Donald R.; and Walker, Raymond W., 4,098,333, Cl. 166-0.500.
- Compagnie Industrielle des Lasers: *See—*
  - Leblanc, Michele; Ripart, Guy; and Brule, Albert, 4,099,141, Cl. 331-94.50C.
- Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See—*
  - Boujet, Jean-Pierre, 4,099,145, Cl. 333-21.00R.
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- Conner, John P.: *See—*
  - Grunert, Kurt A.; Conner, John P.; and Dobrosielski, Stephen S., 4,099,151, Cl. 335-189.000.
- Conner, William Nicholas, Jr. Snap lock structure. 4,097,967, Cl. 24-30.50R.
- Connin, John Lyman, to Eastman Kodak Company. Apparatus for producing duplex collated copies. 4,099,150, Cl. 355-3.00R.
- Connor, David T.; Ringel, Samuel M.; and Von Strandtmann, Maximillian, to Warner-Lambert Company. Aldehyde, oxime and phenylhydrazone derivatives of acid S, an antibiotic produced by *Polyangium cellulosum* var. *fulvum*. 4,098,998, Cl. 542-447.000.
- Consalvo, Dante Vincent. Dual flow cannula set. 4,098,275, Cl. 128-214.00R.
- Container Corporation of America: *See—*
  - Bethune, Billy R.; and Balkin, Larry M., 4,098,399, Cl. 206-288.000.
- Contardi, John G. Tiled enclosure, and method to make same. 4,098,038, Cl. 52-35.000.
- Conterna, Bruno: *See—*
  - Barbagelata, Giuseppe; Conterna, Bruno; Giraudi, Mauro; and Stringa, Luigi, 4,099,233, Cl. 364-200.000.
- Continental Camera Corp.: *See—*
  - Danan, Joseph, 4,099,191, Cl. 354-226.000.
- Continental Copper & Steel Industries, Inc.: *See—*
  - Andersen, Allen K.; and Archipov, Vsevolod, 4,098,668, Cl. 204-237.000.
- Continental Oil Company: *See—*
  - Eisenstein, Andrew J.; Frohreich, Richard A.; and Scamehorn, John F., 4,098,593, Cl. 55-71.000.
  - Mason, Charles E., 4,098,415, Cl. 214-152.000.
  - Rogers, Charles H., 4,098,711, Cl. 252-63.200.
- Conway, John E., to UOP Inc. Process for hydrodesulfurizing or hydrogenating a hydrocarbon distillate. 4,098,683, Cl. 208-216.000.
- Cook, Edward J. Method and apparatus for horticultural grafting. 4,098,020, Cl. 47-6.000.
- Cook, Howard: *See—*
  - Parsons, Robert; and Cook, Howard, 4,099,259, Cl. 364-900.000.
- Cordes, Werner; and Schneider, Roland. Method and apparatus for packing a plurality of separate articles, in a cover of shrinkable foil. 4,098,051, Cl. 53-30.00S.
- Cornelius Company, The: *See—*
  - Kovar, Henry Charles, 4,098,384, Cl. 194-37.000.

Cornell, James R.; and Kirk, Tommy R. Bicycle safety light. 4,099,222, Cl. 362-72.000.

Cornell, Robert J., to Uniroyal, Inc. Substituted haloacetamide antioxidants for elastomers and plastic polymers. 4,098,760, Cl. 260-45.9NC.

Corning Glass Works: *See—*

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Wexell, Dale R., 4,098,610, Cl. 106-47.00R.

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Corth, Richard; and Sausville, Joseph W., to Westinghouse Electric Corp. Fluorescent lamp having a longitudinal stripe of phosphor on outer envelope surface with reflector layer thereover. 4,099,090, Cl. 313-487.000.

Cosden Technology, Inc.: *See—*

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Cote, Camille. Apparatus for evacuating manure. 4,098,541, Cl. 302-53.000.

Cousse, Henri; Mouzin, Gilbert; Vezin, Jean-Claude; Dussourd d'Hinterland, Lucien; and Dubois, Jacques, to Pierre Fabre S.A. N-Alkyl-3-pyridinium-methanol fluorides and derivatives thereof. 4,098,879, Cl. 424-52.000.

Couteau, Willy; and Ramioulle, Jean, to UCB, Societe Anonyme. Process for the production of formamides. 4,098,820, Cl. 260-561.00R.

Cox, Edward G., to FMC Corporation. Mobile scaffold. 4,098,371, Cl. 182-2.000.

CPC International Inc.: *See—*

Johnson, George Erick, 4,098,183, Cl. 101-40.000.

Craig, Philip V. C.: *See—*

Lowe, Virgil L.; and Craig, Philip V. C., 4,099,204, Cl. 358-149.000.

Crance, James M. Sliding-door and sliding-screen sill. 4,098,027, Cl. 49-504.000.

Crase, Gary Monroe: *See—*

Tschirky, John E.; and Crase, Gary Monroe, 4,098,561, Cl. 418-48.000.

Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, to Bristol-Myers Company. Process for preparing quinazolines. 4,098,788, Cl. 544-293.000.

Creusot-Loire: *See—*

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Cricchi, James R.; and Brewer, Joe E., to Westinghouse Electric Corp. Circuit producing a common clear signal for erasing selected arrays in a MNOS memory system. 4,099,069, Cl. 307-238.000.

Crossfield, Roger John; and Cohen, Norman Robert, to George A. Goulston Company, Inc. Yarn finish formulation. 4,098,702, Cl. 252-8.600.

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Crowder, Billy Lee; Hunter, William Ralph; and Ormond, Douglas William, Jr., to International Business Machines Corporation. Method of manufacturing semiconductor devices in which oxide regions are formed by an oxidation mask disposed directly on a substrate damaged by ion implantation. 4,098,618, Cl. 148-1.500.

Crowe, Talmadge L., to Baker International Corp. Dual string tubing hanger. 4,098,334, Cl. 166-208.000.

Culver, Donald W., to United States of America, Energy. Modular heat exchanger. 4,098,329, Cl. 165-140.000.

Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., to Krause Milling Company. Method of manufacturing a resin-like material by crosslinking a saccharide-containing substance with glyoxal and controlling the reaction by the use of an alkali halide. 4,098,615, Cl. 106-162.000.

Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., to Krause Milling Company. Method of manufacturing a bonded particulate article by reacting a polyol and a polyaldehyde. 4,098,859, Cl. 264-122.000.

Cunningham, Charles L., to Coats Company, Inc., The. Tire changing apparatus. 4,098,317, Cl. 157-1.240.

Curtis, Paul J.: *See—*

Roge, Ralph R.; and Curtis, Paul J., 4,099,032, Cl. 179-18.0FA.

Curtis, Ralston, to Zoecon Corporation. Equine anthelmintic. 4,098,885, Cl. 424-212.000.

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Webster, Harold F.; and Cusano, Dominic A., 4,098,452, Cl. 228-123.000.

Custer, Harry S.; and Oliver, Brian H., to Goodyear Tire & Rubber Company, The. Sealing member for an electrolytic cell. 4,098,670, Cl. 204-252.000.

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Czyl, Joseph L., to Vapor Corporation. Unitary cab air cooling system for large off road vehicles. 4,098,093, Cl. 62-243.000.

Dacor Corporation: *See—*

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Dahlin, Erik B.: *See—*

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Dai Nippon Toryo Co., Ltd.: *See—*

Hoshino, Minoru; Shinohara, Toshio; Kawahara, Yukio; Takase, Katsuji; Tsuji, Toshimoto; and Fukuda, Jun-ichi, 4,098,749, Cl. 260-30.60R.

Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 4,098,844, Cl. 260-859.00R.

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Daikin Kogyo Kabushiki Kaisha: *See—*

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Daimler-Benz Aktiengesellschaft: *See—*

Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,098,252, Cl. 123-198.00F.

Helmer, Josef, 4,098,378, Cl. 192-17.00A.

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Renner, Hermann; and Klie, Wolfgang, 4,098,531, Cl. 293-63.000.

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Torii, Eitoku, 4,098,420, Cl. 215-253.000.

Dale, James A.: *See—*

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Danan, Joseph, to Continental Camera Corp. Telescopic convertible camera. 4,099,191, Cl. 354-226.000.

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Biggers, Clifford, 4,099,266, Cl. 365-208.000.

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Carrigan, David B.; and Freas, Roy W., 4,098,058, Cl. 53-315.000.

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Turner, Nathan L., 4,098,989, Cl. 528-486.000.

Dennison, Edward S., to Yardney Electric Corporation. Metal-hydrogen secondary battery system. 4,098,962, Cl. 429-72.000.

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Desai, Ardeshir R.; and Simpson, Dayton M., to Brown & Root, Inc. Riser guide member. 4,098,091, Cl. 61-110.000.

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Adamski, Maximilian, Jr.; Smith, Robert E.; and Desai, Dhimat R., 4,098,201, Cl. 112-2.000.

Desbois, Jean; and Tournois, Pierre, to Thomson-CSF. Piezoelectric device responsive to optical image for generating an electrical signal. 4,099,206, Cl. 358-213.000.

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Deuber, John Martin, to Oxy Metal Industries Corporation. Bright palladium electroplating baths. 4,098,656, Cl. 204-47.000.

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de Vos, Hendrik A. J.; Gustafson, Walter A.; and Labouliere, Elzear R., to GTE Sylvania Incorporated. Lighting fixture arrangement. 4,099,223, Cl. 362-226.000.

DeVries, Adrian J., to Zenith Radio Corporation. Acoustic wave storage convolver. 4,099,146, Cl. 333-30.00R.

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Kotok, Alan; Sullivan, Patrick; Guglielmi, Paul M.; and Gross, David A., 4,099,231, Cl. 364-200.000.

Dijksterhuis, Jan J., to Industrie-en Handelsonderneming Elton B.V. Anchor bolt. 4,098,167, Cl. 85-79.000.

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Distler, Walter, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images. 4,099,059, Cl. 250-445.00T.

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Dittrich, Volker; Topfl, Werner; and Kristiansen, Odd, to Ciba-Geigy Corporation. N,N'-Diphenyl-guanidine derivatives. 4,098,900, Cl. 424-304.000.

Dobrosielski, Stephen S.: *See—*

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Kramer, Volker; Rispeter, Siegfried; and Marlow, Rolf-Peter, 4,098,293, Cl. 137-614.030.

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Wright, Peter John; Dodwell, Geoffrey Michael; and Jennings, David Francis, 4,098,953, Cl. 428-483.000.

Dolby, Dale P. Rotating transducing head assembly. 4,099,210, Cl. 360-108.000.

Dolby, Dale P., to Ampex Corporation. Rotating transducing head assembly. 4,099,212, Cl. 360-109.000.

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Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Certain 2-substituted cephalosporins. 4,098,999, Cl. 544-15.000.

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Wolter, Heinz, 4,098,104, Cl. 70-406.000.

Donnelly, Robert J. Alarm device for detaining user. 4,099,169, Cl. 340-304.000.

Dooley, Philip G., Jr., to Dynage, Incorporated. Random access memory with bit or byte addressing capability. 4,099,253, Cl. 364-900.000.

Dorius, John; and Moriarty, Daniel, to Elsters, Inc. Recirculating dishwasher hood. 4,098,616, Cl. 134-25.00A.

Dotti, Giuseppe, to Snamprogetti S.p.A. Rigid, demountable buoy support. 4,098,090, Cl. 61-102.000.

Douglas, Peter; and Stewart, Thomas Ian, to Plessey Handel und Investments A.G. Electrically conductive composite materials. 4,098,724, Cl. 252-514.000.

Dow Chemical Company, The: *See—*

Brady, Thomas P.; Boardway, Nancy L.; and Whalen, Joseph W., 4,098,821, Cl. 260-567.500.

Dunbar, Joseph E., 4,098,889, Cl. 424-248.520.

Grinstead, Robert R.; and Nasutavicus, Wilmonte A., 4,098,867, Cl. 423-24.000.

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Olstowski, Franciszek; and Parrish, Donald B., 4,098,733, Cl. 521-123.000.

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Dow Corning Limited: *See—*

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Smith, Charles, 4,098,572, Cl. 8-128.00A.

Doyle, Donald E. Method for suture removal. 4,098,157, Cl. 83-13.000.

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    Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
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Dunbar, Joseph E., to Dow Chemical Company, The. Antithrombotic 2-(aminoalkylthio)-N,N'-p-phenylenebissulfonamides. 4,098,889, Cl. 424-248.520.
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    Edwards, Donald William; Gorondy, Emery John; and Van Roggen, Arend, 4,099,186, Cl. 346-74.100.
    Johnson, Robert William, 4,098,843, Cl. 260-857.00F.
    Marsh, Frank Denois, 4,098,831, Cl. 260-646.000.
    McKinney, Charles R., 4,099,052, Cl. 250-283.000.
    Partridge, Walter E., 4,098,955, Cl. 428-537.000.
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    Van Dell, Clarence Arthur, 4,097,958, Cl. 16-128.100.
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    Gawlick, Heinz; and Stahlmann, Rudolf, 4,098,190, Cl. 102-41.000.
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    Dolfini, Joseph E., 4,098,999, Cl. 544-15.000.
    Krapcho, John; and Turk, Chester F., 4,098,789, Cl. 544-299.000.
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    Stryjewski, Walter Anthony, 4,098,631, Cl. 156-221.000.
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Edmaier, Franz; Grunert, Einhart; and Herms, Ulrich, to Motoren-und Turbinen-Union Friedrichshafen GmbH. Mobile power unit housing. 4,098,077, Cl. 60-272.000.
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Edwards, Donald William; Gorondy, Emery John; and Van Roggen, Arend, to Du Pont de Nemours, E. I., and Company. Magnetic printing process and apparatus. 4,099,186, Cl. 346-74.100.
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Egan, Richard R.; Hughes, Graham K.; and Sigan, Jack W., to Ashland Oil, Inc. Mixtures of aliphatic amines and quaternary ammonium compounds thereof. 4,098,822, Cl. 260-585.00B.
Egger, Richard L., to Boeing Company, The. Crack opening displacement gage. 4,098,000, Cl. 33-148.00D.
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Eibl, Volker; and Reis, August, to Sachs Systemtechnik GmbH. Method of purifying water. 4,098,660, Cl. 204-151.000.
Eichenlaub, Dennis P., to Westinghouse Electric Corp. Count logic circuit. 4,099,048, Cl. 235-92.0DM.
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    Molloy, Bryan B., 4,098,890, Cl. 424-248.400.
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Elliott, Robert L.; and Gardiner, Brooke, Jr., to Exxon Research & Engineering Co. Oil-soluble addition products of an ethylene-propylene copolymer and anionically polymerizable monomer having utility as multifunctional V.I. improver for lubricating oils. 4,098,710, Cl. 252-51.50A.
Elsters, Inc.: *See*—
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- Hanauer, Richard H.; and Willette, Gordon L., to Rohm and Haas Company. Polymeric antioxidant viscosity index improvers. 4,098,709, Cl. 252-51.50A.
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- Hardmark, Ragnar Malcus; Hanberger, Bror Anders Soren; and Forsberg, Sven Edvin, to Saab-Scania Aktiebolag. Roadway friction measuring method and apparatus. 4,098,111, Cl. 73-9.000.
- Harman, John N., to Drewry Photocolor Corporation. Reprint film carrier. 4,098,634, Cl. 156-302.000.
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- Hart, John Peter: *See—*
  - Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,098,222, Cl. 118-7.000.
- Hartdegen, Frank Joseph; and Swann, Wayne Elliott, to W. R. Grace & Co. Immobilization of proteins with polyurethane polymers. 4,098,645, Cl. 195-68.000.
- Hartfiel, Arlynn H., to Chemical Additives Company. Clay-free, thixotropic wellbore fluid. 4,098,700, Cl. 252-8.50A.
- Hartman, George D.: *See—*
  - Tull, Roger J.; Hartman, George D.; and Weinstock, Leonard M., 4,098,787, Cl. 544-277.000.
- Hartman, Philip S.: *See—*
  - Tea, Frank C.; and Hartman, Philip S., 4,098,180, Cl. 100-98.00A.
- Hartman, Robert Louis; and Johnston, Wilbur Dexter, Jr., to Bell Telephone Laboratories, Incorporated. Method for lapping semiconductor material. 4,098,031, Cl. 51-323.000.
- Hartmann, Frederick: *See—*
  - Ress, Thomas I.; and Hartmann, Frederick, 4,099,053, Cl. 250-293.000.
- Hartstone, John Lewis; and Zwezerynen, Johannes Cornelis Wilhelmus, to Harstone, John, Lewis. Bracket. 4,098,479, Cl. 248-214.000.
- Hartzler, Earnest D.; and Levesque, Paul D., to National Semiconductor Corporation. Key board switch assembly having canti-levered leaf spring contact assembly on common conductive frame. 4,099,037, Cl. 200-5.00A.
- Haruta, Yasuo; Nagasoe, Kazumasa; Shiga, Norio; Morino, Ikuo; and Aisu, Nobuo, to Nippon Paint Co., Ltd. Thermoplastic duplication plate making method. 4,098,785, Cl. 264-220.000.
- Hasegawa, Takashi: *See—*
  - Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Hasegawa, Takashi; and Shiozaki, Makoto, 4,098,244, Cl. 123-117.00R.
- Hashimoto, Shintaro; and Sato, Yuuichi, to Sharp Kabushiki Kaisha. Four-level voltage supply for liquid crystal display. 4,099,073, Cl. 307-296.00R.
- Hatada, Kenzo: *See—*
  - Kawakami, Hakuhei; Hatada, Kenzo; and Ishihara, Takeshi, 4,098,071, Cl. 58-39.000.
- Hathaway, Richard Allen, to Ampex Corporation. Positionable transducing mounting structure and driving system therefor. 4,099,211, Cl. 360-109.000.
- Hattes, Neil R.: *See—*
  - Brown, Allen C.; Hattes, Neil R.; and Eyrick, Theodore B., 4,098,853, Cl. 261-122.000.
- Hattori, Hajime; Usui, Eiji; Oya, Takashi; Sugawa, Kaneyoshi; Kezuka, Eiji; Okada, Tadashi; and Watanabe, Toshiro, to Chubu-Nippon Broadcasting Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Phase control system. 4,099,205, Cl. 358-149.000.
- Haug, Ernst: *See—*
  - Reinhard, Theodor; Haug, Ernst; and Schulz, Manfred, 4,098,366, Cl. 180-68.500.
- Hauschild, Frank-Dieter, to Blaupunkt-Werke GmbH. Method of manufacturing thick-film resistors to precise electrical values. 4,097,988, Cl. 29-620.000.
- Hauser, Oscar G.: *See—*
  - Ruckdeschel, Frederick R.; Hauser, Oscar G.; Whited, Charles A.; and Gary, Robert E., 4,098,228, Cl. 118-658.000.
- Hawley Manufacturing Corporation: *See—*
  - Scheel, John R., deceased, 4,098,325, Cl. 165-76.000.
- Hay, Robert A., II; and Dettmer, Edward V., to Dow Chemical Company, The. Apparatus for insulation of structures. 4,098,635, Cl. 156-445.000.
- Hayakawa, Kimiaki: *See—*
  - Komori, Shigehiro; Hayakawa, Kimiaki; Nitanda, Hiroshi; and Inuzuka, Tsuneki, 4,098,551, Cl. 355-3.00R.
- Hayashi, Shigeki, to Nusco Kabushiki Kaisha. Numerical control servo system. 4,099,113, Cl. 318-632.000.
- Hayashida, Hiroshi: *See—*
  - Okawa, Tadashi; Matsuda, Yasuo; Hayashida, Hiroshi; and Maeda, Takeo, 4,099,108, Cl. 318-227.000.
- Hayes, John C., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,098,679, Cl. 208-139.000.
- Haynes, Dennis C.; and Sins, Richard G. Self-contained, portable animal commode. 4,098,229, Cl. 119-1.000.
- Haytayan, Harry M., to Pneutek, Inc. Pneumatic piston apparatus. 4,098,171, Cl. 91-461.000.
- Haytayan, Harry M., to Pneutek, Inc. Control valves. 4,098,295, Cl. 137-625.270.
- Hazar, Mitchell M., to Warner-Lambert Company. Method for producing artificial dentures. 4,097,992, Cl. 32-2.000.
- Hazeo Research, Inc.: *See—*
  - Kindig, James K.; and Turner, Ronald L., 4,098,584, Cl. 44-1.00R.
- Heberlein Maschinenfabrik AG: *See—*
  - Moeller, Norbert, 4,097,975, Cl. 28-254.000.
- Hedberg, Frederick L.: *See—*
  - Arnold, Fred E.; and Hedberg, Frederick L., 4,098,825, Cl. 260-590.00D.
- Hedegaard, Kristen, to Pfaff Industriemaschinen GmbH. Sewing ma-

chine having a device for initiating the movement of the thread catcher of a thread cutting device. 4,098,208, Cl. 112-291.000.

Heidelberger Druckmaschinen AG: *See—*
  Wirz, Arno, 4,098,187, Cl. 101-410.000.

Heider, Hermann: *See—*
  Eogmann, Gunther; Jorg, Karl; and Heider, Hermann, 4,098,467, Cl. 242-25.00A.

Heil, Johann: *See—*
  Wiegard, Klaus; and Heil, Johann, 4,098,323, Cl. 165-9.000.

Heimann GmbH: *See—*
  Hoene, Ernst Ludwig, 4,099,084, Cl. 313-217.000.

Heinrich, Helmut G., to Bruggemann & Brand KG. Parachute with selectively adjustable brake flaps for controlling angle of descent. 4,098,475, Cl. 244-152.000.

Heinsohn, Howard H., Jr.: *See—*
  Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,098,910. Cl. 426-535.000.

Heiss, Lorenz: *See—*
  Hammer, Klaus-Dieter; Gerigk, Gunter; Heiss, Lorenz; and Fischer, Klaus, 4,097,963, Cl. 17-49.000.

Hell, August: *See—*
  Escales, Eberhard; and Hell, August, 4,098,158, Cl. 83-27.000.

Helle, Kees; Groot, Robert Cornelis; and Kamp, Andries, to Akzo N.V. Codeposition of a metal and fluorocarbon resin particles. 4,098,654, Cl. 204-16.000.

Helmer, Josef, to Daimler-Benz Aktiengesellschaft. Brake drum for rotating gear change-speed transmission. 4,098,378, Cl. 192-17.00A.

Hemphill, Charles Wayne. Digging tooth with replaceable cutting edge. 4,098,013, Cl. 37-142.00R.

Henderson, Iris N.: *See—*
  Mizuno, William G.; and Henderson, Iris N., 4,098,937, Cl. 428-68.000.

Henry, Raymond; and Chapard, Alain, to Thomson-CSF. Manufacturing process for the collective production of semiconductive junction devices. 4,097,986, Cl. 29-583.000.

Heppinstall, Roy, to English Electric Valve Company Limited. Klystron amplifiers. 4,099,133, Cl. 330-45.000.

Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See—*
  Filby, John, 4,098,691, Cl. 210-29.000.

Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., to Murdock Machine & Engineering Company. Tension bearing connector. 4,098,527, Cl. 285-167.000.

Hercules Incorporated: *See—*
  Kosiorek, Raymond Stanley, 4,098,949, Cl. 428-434.000.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Bispiperazido phosphorus polyamides. 4,098,768, Cl. 528-337.000.

Herms, Ulrich: *See—*
  Edmaier, Franz; Grunert, Einhart; and Herms. Ulrich, 4,098,077, Cl. 60-272.000.

Hernandez, Jesus M. Article attitude handling apparatus. 4,098,391, Cl. 198-417.000.

Hero Conserven Lenzburg: *See—*
  Furter, Walter, 4,098,226, Cl. 118-622.000.

Herr Manufacturing Company, Inc.: *See—*
  McLean, James N., 4,098,067, Cl. 57-120.000.

Hershkowitz, Joseph; and Lanzerotti, Mary Y. DeWolf, to United States of America, Army. Condensed explosive gas dynamic laser. 4,099,142, Cl. 331-94.50G.

Herubel, Jean Frederic, to N. Schlumberger & Cie. Machine for drawing textile fibres. 4,097,964, Cl. 19-236.000.

Hesch, Harold E., to Pullman Incorporated. Plug sliding door. 4,098,022, Cl. 49-209.000.

Hewlett-Packard Company: *See—*
  Osborne, Thomas E.; and Stockwell, Richard Kent, 4,099,246, Cl. 364-709.000.
  Rode, France; Lindes, Peter; Eschenbach, Ralph F.; and Fazarinc. Zvonko A., 4,099,240, Cl. 364-571.000.

Hidaka Engineering Company, Limited: *See—*
  Kozima, Toyoo, 4,098,108, Cl. 72-358.000.

Hill, David T., to SmithKline Corporation. Pharmaceutical compositions and methods of producing antiarthritic activity with bis(-pyridine)gold(I +) salts. 4,098,887, Cl. 424-245.000.

Hill-Rom Company, Inc.: *See—*
  Peck, William H.; and Tekulve, Daniel R., 4,097,939, Cl. 5-63.000.
  Tekulve, Daniel R.; and Peck, William H., 4,097,940, Cl. 5-66.000.

Hillekamp, Klaus: *See—*
  Niedner, Peter; Hillekamp, Klaus; and Kindler, Hubert, 4,098,464, Cl. 241-24.000.

Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, to Metallgesellschaft Aktiengesellschaft; Chemie-Anlagenbau Bischofsheim GmbH; and Reuter Technologie GmbH, part interest to each. Non-flammable organo-red mud polymers, some of which are electrically conductive, and process for their manufacture. 4,098,730, Cl. 521-107.000.

Hilti Aktiengesellschaft: *See—*
  Lang, Gusztav, 4,098,166, Cl. 85-63.000.

Hilton, Allan Richard, to Mining Developments Limited. Earth working machine having independent tools and roof engaging bridge. 4,098,538, Cl. 299-33.000.

Hinton, Gordon L.: *See—*
  Brown, Jimmie L.; Hinton, Gordon L.; and Magazzu, John T., 4,098,401, Cl. 206-326.000.

Hirama, Hideo, to Kabushiki Kaisha Daini Seikosha. Nuclear fuel element. 4,098,644, Cl. 176-68.000.

Hirata, Yoshimutsu. Speech signal processor using comb filter. 4,099,030, Cl. 179-15.55T.

Hirose, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Finger protection usable for archery. 4,097,931, Cl. 2-21.000.

Hisaki, Shigeru; Okada, Ken; and Murakami, Sanpei, to Kanebo, Ltd. Non-fried dry instant cooking noodles and a method for producing said noodles. 4,098,906, Cl. 426-94.000.

Hitachi, Ltd.: *See—*
  Ibaraki, Yoshiro; Yamamoto, Akihiko; and Sasaki, Toshimi, 4,098,623, Cl. 148-133.000.
  Inaba, Hiromi; Shima, Seiya; Tashiro, Korefumi; and Ando, Takeki, 4,099,111, Cl. 318-338.000.
  Okawa, Tadashi; Matsuda, Yasuo; Hayashida, Hiroshi; and Maeda, Takeo, 4,099,108, Cl. 318-227.000.
  Okumura, Masahide; and Saito, Yasushi, 4,099,054, Cl. 250-306.000.
  Shiga, Motohiro; Fujisawa, Fumio; Sato, Kazuo; Shiohata, Kouki; Takasumi, Masakazu; and Koga, Tsuguaki, 4,098,127, Cl. 73-462.000.
  Todokoro, Hideo, 4,099,055, Cl. 250-311.000.

Hitz, Jerre A.: *See—*
  Altschuler, Samuel; and Hitz, Jerre A., 4,098,369, Cl. 181-118.000.

Hobo, Nobuhito: *See—*
  Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Hasegawa, Takashi; and Shiozaki, Makoto, 4,098,244, Cl. 123-117.00R.

Hochstetler, Samuel A. Method of fabricating C-clamp. 4,097,981, Cl. 29-441.00R.

Hodge, Allan M. Trash container lid system. 4,098,429, Cl. 220-331.000.

Hoechst Aktiengesellschaft: *See—*
  Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,098,815, Cl. 260-514.00D.
  Becker, Knut Henning; Rauterkus. Karl Josef; and Seip, Detlev, 4,098,746, Cl. 260-29.4UA.
  Gordon, Wolfgang, 4,098,757, Cl. 260-42.550.
  Groh, Rudolf; and Meinel, Gustav, 4,098,940, Cl. 428-218.000.
  Hammer, Klaus-Dieter; Gerigk, Gunter; Heiss, Lorenz; and Fischer, Klaus, 4,097,963, Cl. 17-49.000.
  Huemer, Heinrich; and Burg, Karlheinz, 4,098,771, Cl. 526-209.000.
  Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Teetz, Volker, 4,098,779, Cl. 260-112.50R.
  Kraft, Kurt; and Reese, Johannes, 4,099,007, Cl. 548-307.000.
  Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, 4,098,759, Cl. 260-45.80R.
  Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,098,872, Cl. 423-265.000.
  Stroszynski, Joachim, 4,098,188, Cl. 101-458.000.
  Wortmann, Joachim; Dany, Franz-Josef; Kandler, Joachim; and Beu, Hans Peter, 4,098,968, Cl. 526-1.000.
  Zimmermann, Wolfgang; and Schindler, Hermann, 4,098,969, Cl. 526-9.000.

Hoene, Ernst Ludwig, to Heimann GmbH. Impulse discharge lamp with disc shaped electrodes. 4,099,084, Cl. 313-217.000.

Hoerbiger Ventilwerke Aktiengesellschaft: *See—*
  Bauer, Friedrich, 4,098,487, Cl. 251-61.400.

Hoffmann-La Roche Inc.: *See—*
  Bocion, Pierre; de Silva, Wijitha; and Winternitz, Pavol, 4,098,598, Cl. 71-76.000.
  Li, Choh Hao, 4,098,778, Cl. 260-112.50R.
  Micheli, Robert Angelo, 4,098,801, Cl. 260-397.200.
  Rosenberger, Michael, 4,098,827, Cl. 568-824.000.
  Williams, Joseph James, 4,099,239, Cl. 364-552.000.

Hoffmeister, Roman: *See—*
  Langanke, Helmut; Hoffmeister, Roman; and Fritz, Herbert, 4,098,097, Cl. 66-202.000.

Hoffner, Joel L.: *See—*
  Galanis, Tom L.; Hoffner, Joel L.; and Clymer, John C., 4,099,244, Cl. 364-571.000.

Hofmann, Hermann L. Apparatus for clearing drains. 4,097,937, Cl. 4-255.000.

Hofstein, Steven R., to Princeton Electronic Products, Inc. Method and system of electronic image storage and display. 4,099,179, Cl. 343-5.0SC.

Holcomb, Gregory W., to Interbake Foods Inc. Ice cream sandwich wrapping machine. 4,098,057, Cl. 53-230.000.

Holdeman, John William: *See—*
  Fogelberg, Mark John; and Holdeman, John William, 4,098,379, Cl. 192-38.000.

Holiman, William E.: *See—*
  Steele, Barney Raymond; and Holiman, William E., 4,098,340, Cl. 166-311.000.

Holland, Henry A. Nelson: *See—*
  Gendron, George J.; and Holland, Henry A. Nelson, 4,098,355, Cl. 173-127.000.

Hollingsworth, Clinton Allen, to Borden, Inc. Counter-current process for passing a solid particulate reactant to a liquid reactant. 4,098,873, Cl. 423-490.000.

Holm, Harry. Method and apparatus for preparing an explosive charge. 4,098,189, Cl. 102-24.00R.

Holset Engineering Company Limited: *See—*
  McDowell, Peter Vincent, 4,098,085, Cl. 60-600.000.

Holz, George E.; and Ogle, James A., to Burroughs Corporation. Information display and method of operating with storage. 4,099,096, Cl. 315-169.0TV.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
  Okada, Eiichi; Ebisawa, Hiroo; Honma, Masashi; and Murakami, Tadashi, 4,098,184, Cl. 101-41.000.

Honeywell Inc.: *See—*
  Goetz, Heinz E., 4,099,119, Cl. 324-73.0PC.

Honeywell Information Systems Inc.: *See—*
  Palumbo, Benedict A., 4,099,243, Cl. 364-200.000.
  Stanley, Philip E.; and Woods, William E., 4,099,255, Cl. 364-900.000.
  Woods, John M.; Porter, Marion G.; Mills, Donald V.; Weller, Edward F., III; Patterson, Garvin Wesley; and Monahan, Earnest M., 4,099,234, Cl. 364-200.000.

Honma, Masashi: *See—*
  Okada, Eiichi; Ebisawa, Hiroo; Honma, Masashi; and Murakami, Tadashi, 4,098,184, Cl. 101-41.000.

Honnold, Darrel Lee, to Deere & Company. Rear folding implement. 4,098,347, Cl. 172-311.000.

Hood, Walter; Subrick, Joseph; and Talman, Woods G., to United States Steel Corporation. Rotatable mine drilling apparatus. 4,098,353, Cl. 173-20.000.

Hooker Chemicals & Plastics Corp.: *See—*
  Baxamusa, Yusuf A.; and Robota, Stephen, 4,098,832, Cl. 260-651.00F.
  Maul, James J.; and Carlson, Richard D., 4,098,761, Cl. 260-45.75B.

Hooper, Edward H., to Westinghouse Electric Corp. Line type modulator for providing stepwise variable pulse width. 4,099,128, Cl. 328-65.000.

Hoopes, Howard Sherman; and Walsh, Thomas Joseph, to Leeds & Northrup Company. Servo stop system. 4,099,114, Cl. 318-676.000.

Hoover Ball and Bearing Company: *See—*
  Mizelle, Ned W., 4,098,485, Cl. 248-425.000.

Hopper, Thomas P.: *See—*
  Barber, Everett M., Jr.; and Hopper, Thomas P., 4,098,259, Cl. 126-270.000.

Hopwood, Francis W.: *See—*
  Alm, Benjamin C., Jr.; Hopwood, Francis W.; Jelen, Robert A.; Muhlbaier, John P.; and Wright, Joseph F., Jr., 4,099,137, Cl. 331-16.000.

Hord, William C.: *See—*
  Klein, H. Joseph; Hord, William C.; Ailor, James C.; and Iyer, Sankar P., 4,098,499, Cl. 269-22.000.

Horibe, Koichi; Watanabe, Minoru; and Machida, Tokuji, to Joetsu Denro Kogyo Co., Ltd. Electric furnace waste heat recovery method and apparatus. 4,099,019, Cl. 13-9.00R.

Hornsby, Isaac W. Bathroom caddy. 4,098,486, Cl. 248-452.000.

Horstmann, Harald: *See—*
  Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,099,011, Cl. 548-376.000.

Hoschler, Hans; Raimar, Wolfgang; and Brandmaier, Klaus, to Siemens Aktiengesellschaft. Method of operating a data processing system. 4,099,235, Cl. 364-200.000.

Hoshino, Minoru; Shinohara, Toshio; Kawahara, Yukio; Takase, Katsuji; Tsuji, Toshimoto; and Fukuda, Jun-ichi, to Dai Nippon Toryo Co., Ltd. Anticorrosion primer coating composition. 4,098,749, Cl. 260-30.60R.

Hosoi, Noriyuki: *See—*
  Asao, Yasuzi; Ogata, Yasuhiro; and Hosoi, Noriyuki, 4,098,114, Cl. 73-141.00R.

Houdaille Industries, Inc.: *See—*
  Troyer, William J., 4,098,373, Cl. 188-1.00B.

Houryu, Sakae: *See—*
  Mikada, Hiroyuki; Houryu, Sakae; and Kishimoto, Jyuji, 4,099,247, Cl. 364-710.000.

Houston, George B.; and Simonsen, Roger H. One-pass general associative search processor. 4,099,242, Cl. 364-200.000.

Howard, David Campbell, to British Gas Corporation. Non-destructive testing of pipeline. 4,098,126, Cl. 73-432.00R.

Howarth, Thomas Trefor, to Beecham Group Limited. Anti bacterial agents. 4,098,897, Cl. 424-272.000.

Howell, Wallace E. Building sway control. 4,098,034, Cl. 52-1.000.

Howlett, Philip C., to National Engineering Company. Method and apparatus for making battery paste. 4,098,494, Cl. 366-144.000.

Howorth, Jonathan Ross; and Pool, Peter James, to English Electric Valve Company Limited. Photocathodes. 4,099,198, Cl. 357-30.000.

Hoyle, Gettys D., Jr.: *See—*
  Ferguson, Richard; and Hoyle, Gettys D., Jr., 4,097,976, Cl. 28-297.000.

Hubbert, Gordon F., to Gladd Industries, Inc. Recirculating processing oven heater. 4,098,567, Cl. 432-72.000.

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Triazolylacetanilide compounds and microbicidal compositions. 4,098,895, Cl. 424-269.000.

Huber, Bernhard Werner; Tamm, Rolf Gunter; and Braun, Klaus Joachim, to Perkin-Elmer Corporation, The. Device for atomizing a sample for flameless atomic absorption measurements. 4,098,554, Cl. 356-85.000.

Hubert, Gustav: *See—*
  Ranney, Richard D.; and Hubert, Gustav, 4,099,178, Cl. 340-515.000.

Hucker, David J., to Sundstrand Corporation. Damped rotor for a multi-channel generating system. 4,099,076, Cl. 310-183.000.

Hudon, Jean-Paul. Portable miniature golf game. 4,098,507, Cl. 273-87.00C.

Hudson Pulp & Paper Corp.: *See—*
  Zucker, Jerry, 4,098,673, Cl. 204-302.000.

Huemer, Heinrich; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Process for the preparation of polymers of vinylene carbonate. 4,098,771, Cl. 526-209.000.

Hughes Aircraft Company: *See—*
  Bilow, Norman, 4,098,767, Cl. 526-262.000.
  Finnila, Ronald M.; and Maeding, Dale G., 4,099,250, Cl. 364-826.000.
  Lee, J. Spencer; and Stoddard, Leon E., 4,099,072, Cl. 307-265.000.
  Towson, Jacob T., IV, 4,099,028, Cl. 179-15.0BA.

Hughes, Graham K.: *See—*
  Egan, Richard R.; Hughes, Graham K.; and Sigan, Jack W., 4,098,822, Cl. 260-585.00B.

Humphrey, Geoffrey John; and Saunders, James Edwin, to Westland Aircraft Limited. Centrifugal oil purifying means. 4,098,696, Cl. 210-168.000.

Humphrey Instruments Incorporated: *See—*
  Campbell, Charles E.; and Humphrey, William E., 4,098,002, Cl. 33-200.000.

Humphrey, William E.: *See—*
  Campbell, Charles E.; and Humphrey, William E., 4,098,002, Cl. 33-200.000.

Hunter, William Ralph: *See—*
  Crowder, Billy Lee; Hunter, William Ralph; and Ormond, Douglas William, Jr., 4,098,618, Cl. 148-1.500.

Hurtt, Jesse J. Spreader having integrally molded deformable handle and bendable blade. 4,097,951, Cl. 15-104.00S.

Huschens, Rolf: *See—*
  Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,098,786, Cl. 260-239.0BD.

Hushebeck, Henry R., to Certain-Teed Corporation. Polyvinyl chloride solvent weld primer composition. 4,098,719, Cl. 252-364.000.

Hussmann Refrigeration, Inc.: *See—*
  Slopa, Robert E., 4,098,023, Cl. 49-139.000.

Huttebraucker, Dag-Harald: *See—*
  Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,098,252, Cl. 123-198.00F.

Hwa, Chih M., to Chemed Corporation. Corrosion inhibition. 4,098,720, Cl. 252-389.00R.

Hydril Company: *See—*
  Lewis, George E., 4,098,341, Cl. 166-314.000.
  Murman, Fernando, 4,098,516, Cl. 277-235.00R.

Hylton, Thomas A.; and Pillai, Muniraj D., to Upjohn Company, The. Process for preparing 3-(cyanimino)-3-amino-propionitriles. 4,098,791, Cl. 260-293.870.

Ibaraki, Yoshiro; Yamamoto, Akihiko; and Sasaki, Toshimi, to Hitachi, Ltd. Method for heat treatment of titanium alloy. 4,098,623, Cl. 148-133.000.

Ibrahim, Abd-El-Fattah Ali; and Berglund, Carl Neil, to Northern Telecom Limited. Complementary input structure for charge coupled device. 4,099,197, Cl. 357-24.000.

Ichiba, Shigeru: *See—*
  Shimizu, Tetsuo; Ichiba, Shigeru; Koizumi, Shun; and Okuno, Chuzo, 4,098,975, Cl. 526-73.000.

Ichikawa, Kiyoshi: *See—*
  Okamoto, Eisaku; and Ichikawa, Kiyoshi, 4,098,162, Cl. 84-1.010.

ICI Americas Inc.: *See—*
  Rutledge, Thomas F., 4,098,766, Cl. 528-217.000.
  Rutledge, Thomas F., 4,098,830, Cl. 568-730.000.

Idemitsu Kosan Company, Ltd.: *See—*
  Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatsuka, Hisashi, 4,098,689, Cl. 210-15.000.
  Ohkawa, Hideo; Nagai, Yoshinori; Kozakura, Shiro; Mugino, Yutaka; Fujimoto, Noriki; and Tomikawa, Masami, 4,098,752, Cl. 260-31.40R.

Iida Sankyo Co., Ltd.: *See—*
  Kobayashi, Toshiji, 4,098,069, Cl. 58-21.110.

Ikeda, Mutsuo: *See—*
  Okamoto, Hiroshi; and Ikeda, Mutsuo, 4,099,144, Cl. 331-107.00R.

Ikeda, Sadaharu: *See—*
  Ikeda, Tomoaki; Washizawa, Yasuo; Sigyo, Masamiti; Ikeda, Sadaharu; and Yoshida, Satoshi, 4,098,712, Cl. 252-79.500.

Ikeda, Tomoaki; Washizawa, Yasuo; Sigyo, Masamiti; Ikeda, Sadaharu; and Yoshida, Satoshi, to Fuji Photo Film Co., Ltd. Processing solution for metal image-forming material. 4,098,712, Cl. 252-79.500.

Illers, Karl Heinz; and Stutz, Herbert, to BASF Wyandotte Corporation. Process for preparing heat-resistant polyurethane elastomers having no secondary softening range. 4,098,773, Cl. 528-65.000.

Illinois Tool Works Inc.: *See—*
  Bernin, Victor M.; Knoll, Carl G.; and Madland, Robert C., 4,099,176, Cl. 340-365.00L.
  Sidor, Edward F.; Camillo, Charles C.; and Bowen, Glenn W., 4,099,164, Cl. 340-197.000.

Imperial Chemical Industries Limited: *See—*
  Baker, Alan Stuart; and Hancock, Roger Ian, 4,098,692, Cl. 210-43.000.
  Caunt, Anthony David, 4,098,976, Cl. 526-77.000.
  Gray, George Derek; Harper, Alastair Cox; and Tunnicliffe, Brian William Richard, 4,098,927, Cl. 427-195.000.
  Kay, Ian Trevor; and Williams, Alfred Glyn, 4,098,657, Cl. 204-59.00R.
  Kelly, Roger Sidney Arthur; and Wilson, John Robert, 4,098,952, Cl. 428-483.000.
  Riley, David Stephen, 4,098,672, Cl. 204-296.000.

Imperial Oil Limited: *See—*
  Filby, John, 4,098,691, Cl. 210-29.000.

Inaba, Hiromi; Shima, Seiya; Tashiro, Korefumi; and Ando, Takeki, to Hitachi, Ltd. Control apparatus for DC motor. 4,099,111, Cl. 318-338.000.

Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Quinazolinone derivatives and a process for production thereof. 4,099,002, Cl. 544-119.000.

Inada, Mikio: *See—*
Okuda, Takio; and Inada, Mikio, 4,099,045, Cl. 219-109.000.

Indian Head Inc.: *See—*
Frische, Dale George, 4,098,932, Cl. 427-374.00R.

Industrial Filter & Pump Mfg. Co.: *See—*
Novotny, Charles J., 4,098,695, Cl. 210-85.000.

Industrie-en Handelsonderneming Elton B.V.: *See—*
Dijksterhuis, Jan J., 4,098,167, Cl. 85-79.000.

Ing. C. Olivette & C., S.p.A.: *See—*
Montanari, Lucio; and Fiorentino, Guido, 4,099,172, Cl. 340-336.000.

Ingersoll-Rand Company: *See—*
Luthi, Oscar, 4,098,642, Cl. 162-259.000.
Luthi, Oscar, 4,099,268, Cl. 366-338.000.

Ingerson, Philip E. Traction device for vehicular wheels. 4,098,313, Cl. 152-213.00R.

Innes, Robert A., to Gulf Research & Development Company. Purification of liquid n-paraffins containing carbonyl sulfide and other sulfur compounds. 4,098,684, Cl. 208-245.000.

Insolio, Thomas A., to Fletcher-Terry Company, The. Self-compensating scoring head. 4,098,155, Cl. 83-8.000.

Insolio, Thomas A., to Fletcher-Terry Company, The. Glass cutter with long axle and retainer holder. 4,098,156, Cl. 83-12.000.

Institut Tehnickih Nauka Sanu: *See—*
Despic, Aleksandar R.; Drazic, Dragutin M.; and Milovan, Purenovic M., 4,098,606, Cl. 75-138.000.

Institute Po Zavaryavane: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,098,445, Cl. 226-186.000.

Institute za Metallorejeshti Machini: *See—*
Petrov, Georgi Nikolov, 4,097,984, Cl. 29-563.000.

Instytut Nawozow Sztucznych Zjednoczenie "Petrochemia": *See—*
Starzycki, Janusz; Starzycka, Jadwiga; Sobczak, Janusz; Golembiowski, Stanislaw; Pieczora, Ernest; Kolanek, Stanislaw; Simonides, Jerzy; and Jendrzej, Jozef, 4,098,579, Cl. 23-283.000.

Intel Corporation: *See—*
Goodman, William R.; Sample, Stephen P.; and Goodman, Allan L., 4,099,236, Cl. 364-200.000.
Simko, Richard T., 4,099,196, Cl. 357-23.000.

Interbake Foods Inc.: *See—*
Holcomb, Gregory W., 4,098,057, Cl. 53-230.000.

Interdonato, Stephen R. Guide tool for mounting vehicle wheels. 4,097,979, Cl. 29-273.000.

International Business Machines Corporation: *See—*
Andrews, Donald Richard; Neel, Alan Fobes, II; and Zegafuse, Donald Ward, 4,099,254, Cl. 364-900.000.
Arnold, Richard Fairbanks; Dishon, Yitzhak; Ouchi, Norman Ken; and Schor, Marshall I., 4,099,257, Cl. 364-900.000.
Crowder, Billy Lee; Hunter, William Ralph; and Ormond, Douglas William, Jr., 4,098,618, Cl. 148-1.500.
Flagg, Howard Lang, 4,099,160, Cl. 340-146.1AL.
Kitcher, James Robert, 4,099,062, Cl. 250-492.00A.
Nepela, Daniel Andrew; Rice, Donald Winston; and Suits, James Carr, 4,098,605, Cl. 75-122.000.
Olbert, Manfred, 4,098,032, Cl. 51-326.000.
Rubin, Barry Jay, 4,099,175, Cl. 340-347.0DA.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,098,910, Cl. 426-535.000.

International Harvester Company: *See—*
Clarke, Theodore M.; and Walter, Gordon H., 4,098,622, Cl. 148-36.000.

Interox Chemicals Limited: *See—*
Bailey, Brian Edward; and Bunker, Anthony John, 4,098,747, Cl. 260-30.40N.

Interpolymer Corporation: *See—*
Wolff, Norwin W., 4,098,951, Cl. 428-463.000.

Inuzuka, Tsuneki: *See—*
Komori, Shigehiro; Hayakawa, Kimiaki; Nitanda, Hiroshi; and Inuzuka, Tsuneki, 4,098,551, Cl. 355-3.00R.

Inverso, Anthony J., to United States of America, Air Force. Electrochemical milling process to prevent localized heating. 4,098,659, Cl. 204-129.650.

Irish, Donald Bertram: *See—*
Berkman, Samuel; and Irish, Donald Bertram, 4,099,041, Cl. 219-10.49R.

Irvinware Division of Beatrice Foods Company: *See—*
Bozzo, George J., 4,097,980, Cl. 29-434.000.

Ishihara, Takeshi: *See—*
Kawakami, Hakuhei; Hatada, Kenzo; and Ishihara, Takeshi, 4,098,071, Cl. 58-39.000.

Ishii, Eiichi; Ishikawa, Hiroshi; Uehara, Itsuki; Nakane, Masanori; and Miyake, Yoshizo, to Agency of Industrial Science & Technology. Method for thermochemical production of hydrogen from water. 4,098,875, Cl. 423-658.000.

Ishikawa, Hiroshi: *See—*
Ishii, Eiichi; Ishikawa, Hiroshi; Uehara, Itsuki; Nakane, Masanori; and Miyake, Yoshizo, 4,098,875, Cl. 423-658.000.

Ishimaru, Kenzo: *See—*
Gropper, Lee; and Ishimaru, Kenzo, 4,098,457, Cl. 233-23.00R.

Ishizumi, Kikuo: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 4,099,002, Cl. 544-119.000.

Ishler, James M.: *See—*
Ward, Anthony T.; Teney, Donald J.; Ishler, James M.; and Damjanovic, Aleksandar, 4,098,655, Cl. 204-38.00A.

Ito, Akihiko: *See—*
Yoshida, Masaru; Kaetsu, Isao; Okubo, Hiroshi; and Ito, Akihiko, 4,098,840, Cl. 260-827.000.

Ito, Osamu: *See—*
Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Hasegawa, Takashi; and Shiozaki, Makoto, 4,098,244, Cl. 123-117.00R.

Itoh, Yasuo: *See—*
Maruta, Rikio; Itoh, Yasuo; and Tomozawa, Atsushi, 4,099,029, Cl. 179-15.0BA.

ITT Industries, Incorporated: *See—*
Peltz, Guenter; and Kornberger, Wolfgang, 4,099,226, Cl. 363-124.000.

Iura, Yukio: *See—*
Aizawa, Hiroshi; Uchidoi, Masanori; Miyakawa, Hideaki; Yamamichi, Masayoshi; Iura, Yukio; and Fukui, Masahisa, 4,099,192, Cl. 354-234.000.

Ivanyi, Jozsef: *See—*
von Bonin, Wulf; Kleimann, Helmut; and Ivanyi, Jozsef, 4,098,731, Cl. 521-51.000.

Iwai, Takehiko: *See—*
Miyata, Kaneyasu; Amano, Izumi; Iwai, Takehiko; and Asahi, Tetsuya, 4,098,571, Cl. 8-94.110.

Iwata, Minoru: *See—*
Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatsuka, Hisashi, 4,098,689, Cl. 210-15.000.

Iyer, Sankar P.: *See—*
Klein, H. Joseph; Hord, William C.; Ailor, James C.; and Iyer, Sankar P., 4,098,499, Cl. 269-22.000.

Izaki, Hiroshi, to Kubota, Ltd. Applicator nozzle for use in centrifugal casting. 4,098,462, Cl. 239-557.000.

J.C. Bamford Excavators Limited: *See—*
Prime, Derek Arthur, 4,098,286, Cl. 137-270.000.

J. L. Clark Manufacturing Co.: *See—*
Foster, John A., 4,098,421, Cl. 215-321.000.

Jackson, Arthur A. Aquarium. 4,098,230, Cl. 119-5.000.

Jackson, William G.; Seibert, Lance; Bates, Dillard T.; and Smith, James M., to Norfolk & Western Railway Company. Apparatus and methods for impregnating oil into a lubricating pad. 4,098,049, Cl. 53-22.00B.

Jackson, William Wayne: *See—*
Stanfill, Ralph Everette; Steinbach, James Gerald; Rehn, Gary Allen; Oelschlaeger, George Frederick; and Jackson, William Wayne, 4,098,346, Cl. 172-283.000.

Jacobs Corporation, The: *See—*
Jacobs, David L., 4,098,537, Cl. 297-195.000.

Jacobs, David L., to Jacobs Corporation, The. Bicycle saddle. 4,098,537, Cl. 297-195.000.

Jacobson, Peter E.: *See—*
Swartz, Harold L.; Jacobson, Peter E.; and Pirman, Robert L., 4,098,546, Cl. 339-5.00R.

Jacques, Donald F.: *See—*
Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., 4,098,662, Cl. 204-195.00C.

Jacquet, Bernard: *See—*
Lang, Gerard; and Jacquet, Bernard, 4,098,882, Cl. 424-59.000.

James, Norman W., Jr.: *See—*
Gaiser, Eugene F.; and James, Norman W., Jr., 4,098,545, Cl. 312-214.000.

James, Stanley L.: *See—*
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,098,011, Cl. 36-129.000.

Jamestown Container Corporation: *See—*
Schauman, James L., 4,098,173, Cl. 93-58.20R.

Janiske, Donald J.: *See—*
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Japan Atomic Energy Research Institute: *See—*
Yoshida, Masaru; Kaetsu, Isao; Okubo, Hiroshi; and Ito, Akihiko, 4,098,840, Cl. 260-827.000.

Jarcho, Michael, to Sterling Drug Inc. Hydroxylapatite ceramic. 4,097,935, Cl. 3-1.900.

Jarcho, Michael: *See—*
Fessler, Dyral C.; Micalizzi, Edwin R.; and Jarcho, Michael, 4,099,010, Cl. 548-344.000.

Jarry, Philippe, to Le Moteur Moderne. Valve control device particularly in an overhead camshaft engine. 4,098,239, Cl. 123-90.440.

Jastrow, Horst: *See—*
Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, 4,098,759, Cl. 260-45.80R.

Jean, Olivier A.; and Roussy, Georges. Applicator for applying microwaves. 4,099,042, Cl. 219-10.55A.

Jeffers, William Q.; Kelley, John Daniel; and Wiswall, Charles E., to McDonnell Douglas Corporation. Chemically fueled laser. 4,099,138, Cl. 331-94.50P.

Jelen, Robert A.: *See—*
Alm, Benjamin C., Jr.; Hopwood, Francis W.; Jelen, Robert A.; Muhlbaier, John P.; and Wright, Joseph F., Jr., 4,099,137, Cl. 331-16.000.

Jendrzej, Jozef: *See—*
Starzycki, Janusz; Starzycka, Jadwiga; Sobczak, Janusz; Golembiowski, Stanislaw; Pieczora, Ernest; Kolanek, Stanislaw; Simonides, Jerzy; and Jendrzej, Jozef, 4,098,579, Cl. 23-283.000.

Jennings, David Francis: *See—*
Wright, Peter John; Dodwell, Geoffrey Michael; and Jennings, David Francis, 4,098,953, Cl. 428-483.000.

Jernakoff, George: *See—*
Coffey, William N.; Jernakoff, George; and Zurbrick, John R., 4,098,130, Cl. 73-614.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Pike, Charles T., 4,099,131, Cl. 330-4.300.

Jilani, Atiq A., to Borg-Warner Corporation. High-speed agricultural disc. 4,098,349, Cl. 172-555.000.

Job, Pierre, to Waron Belgium S.A. Advancing of a textile cloth on an embroidery machine. 4,098,203, Cl. 112-90.000.

Joetsu Denro Kogyo Co., Ltd.: *See—*
Horibe, Koichi; Watanabe, Minoru; and Machida, Tokuji, 4,099,019, Cl. 13-9.00R.

John Zink Company: *See—*
Zink, John S.; and Reed, Robert D., 4,098,566, Cl. 431-202.000.

Johnson, David Emil, to Mobil Oil Corporation. Polystyrene foam extrusion. 4,098,941, Cl. 428-218.000.

Johnson, George Erick, to CPC International Inc. In-line printing device. 4,098,183, Cl. 101-40.000.

Johnson & Johnson: *See—*
O'Connell, Thomas Christopher, 4,097,943, Cl. 5-335.000.

Johnson, Keith I.: *See—*
Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., 4,098,447, Cl. 228-4.500.

Johnson, Larry K., to Lawrence Brothers, Inc. Load supporting hinge structure. 4,097,959, Cl. 16-136.000.

Johnson, Robert William, to Du Pont de Nemours, E. I., and Company. Stabilized polyoxymethylene molding compositions. 4,098,843, Cl. 260-857.00F.

Johnson, Roy B.: *See—*
Ristvedt, Victor G.; and Johnson, Roy B., 4,098,280, Cl. 133-3.00A.

Johnson, Thomas O.; and Slayman, Charles J., to General Electric Company. Track assembly. 4,098,481, Cl. 248-243.000.

Johnson, Victor Ray. Earthworking implement. 4,098,344, Cl. 172-40.000.

Johnston, Wilbur Dexter, Jr.: *See—*
Hartman, Robert Louis; and Johnston, Wilbur Dexter, Jr., 4,098,031, Cl. 51-323.000.

Jones, Alan P., to Brandt-Pra, Inc. Electronically controlled braking means for a document handling machine. 4,099,214, Cl. 361-31.000.

Jones, Kenneth L., to Procter & Gamble Company, The. Detergent compositions. 4,098,713, Cl. 252-89.000.

Jones Norman R.: *See—*
Davis, Oliver Thurston; Jones Norman R.; and Eddy, Elmer Carl, 4,098,231, Cl. 123-25.00B.

Jones, Ronald H.; Finn, Mary A.; Thomas, John J.; and Folger, Edward C., to Florida Institute of Technology. Method of in vitro cultivation of pathogenic organisms of *treponema pallidum* and medium therefor. 4,098,646, Cl. 195-96.000.

Jonsson, Ake Lennart. Chuck key. 4,098,152, Cl. 81-90.00A.

Jorg, Karl: *See—*
Engmann, Gunther; Jorg, Karl; and Heider, Hermann, 4,098,467, Cl. 242-25.00A.

Jorgensen, Ib Offer, to Nord-Plan Stalreoler A/S. Composite shelving system. 4,098,197, Cl. 108-109.000.

Joseph, Joseph Peter: *See—*
Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, 4,098,995, Cl. 536-54.000.

Jouveinal S.A.: *See—*
Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, 4,098,803, Cl. 260-397.450.
Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, 4,098,804, Cl. 260-397.450.

Judet, Robert. Articulated fixation device to hold unaligned bony parts in a fixed relative position. 4,098,269, Cl. 128-92.00A.

Judge, James R., to National Steel Corporation. Method for analyzing the latent gas content of metal samples. 4,098,576, Cl. 23-230.0PC.

Juergens, Rainer: *See—*
Rohde, Heino J.; and Juergens, Rainer, 4,098,363, Cl. 175-329.000.

Juniper, Derek Stanley, to Elliott Brothers (London) Limited. Audio frequency automatic muting arrangement. 4,099,127, Cl. 325-478.000.

Jutte, Herbert F.; and Starkus, Charles J., to United States of America, Army. Mechanical support. 4,098,476, Cl. 248-1.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Hirama, Hideo, 4,098,644, Cl. 176-68.000.

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Shibata, Shin; and Oguchi, Kikuo, 4,099,078, Cl. 310-361.000.
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Kaetsu, Isao: *See—*
Yoshida, Masaru; Kaetsu, Isao; Okubo, Hiroshi; and Ito, Akihiko, 4,098,840, Cl. 260-827.000.

Kahn, Leonard R. Methods and means for avoiding false indications of activity in a multimicrophone system. 4,099,025, Cl. 179-1.0CN.

Kajan Specialty Company, Inc.: *See—*
Perkins, Lee E., 4,098,338, Cl. 166-301.000.

Kakami, Susumu: *See—*
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Kaken Chemical Co., Ltd.: *See—*
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Kali-Chemie AG: *See—*
Derleth, Helmut; Hansen, Maria; Lange, Ingeborg; and Kurs, Artur, 4,098,714, Cl. 252-181.000.

Kali-Chemie Aktiengesellschaft: *See—*
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,098,786, Cl. 260-239.0BD.

Kalina, Edward O. Auto safe lock. 4,098,102, Cl. 70-237.000.

Kamasuka, Teruo: *See—*
Kikumoto, Syoichi; Yamamoto, Osamu; Komatsu, Nobuhiko; Kobayashi, Haruhiko; and Kamasuka, Teruo, 4,098,661, Cl. 204-160.100.

Kameyama, Toshiaki: *See—*
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Kaminsky, Bernice R., administratrix: *See—*
Klutchko, Sylvester; Kaminsky, Daniel, deceased; and von Strandtmann, Maximilian, 4,098,799, Cl. 260-345.200.

Kaminsky, Daniel, deceased: *See—*
Klutchko, Sylvester; Kaminsky, Daniel, deceased; and von Strandtmann, Maximilian, 4,098,799, Cl. 260-345.200.

Kamp, Andries: *See—*
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Kanazawa Tsusho Sangyo Kabushiki Kaisha: *See—*
Ogura, Shoni, 4,098,214, Cl. 114-267.000.

Kancler, H. Clifford, to United States of America, Navy. Variable architecture digital computer. 4,099,229, Cl. 364-200.000.

Kandler, Joachim: *See—*
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,098,872, Cl. 423-265.000.
Wortmann, Joachim; Dany, Franz-Josef; Kandler, Joachim; and Beu, Hans Peter, 4,098,968, Cl. 526-1.000.

Kanebo, Ltd.: *See—*
Hisaki, Shigeru; Okada, Ken; and Murakami, Sanpei, 4,098,906, Cl. 426-94.000.

Kang, Jung Wong, to Firestone Tire & Rubber Company, The. Removal of catalytic residues from hydrogenated thermoplastic or elastomeric polymers. 4,098,991, Cl. 528-492.000.

Kano, Masafumi: *See—*
Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 4,098,844, Cl. 260-859.00R.

Kantorowicz, Gerard, to Thomson-CSF. Negative differential mobility amplifier for a progressive wave. 4,099,132, Cl. 330-5.000.

Karing, Paul, to Bronzavia. Device for regulating the differential pressure between two different pressure points of a fluid circuit. 4,098,285, Cl. 137-117 000.

Kasley, Samuel J.: *See—*
Zweigle, Maurice L.; and Kasley, Samuel J., 4,098,977, Cl. 526-77.000.

Kaspers, Helmut: *See—*
Buchel, Karl Heinz; Gold, Heinrich; Frohberger, Paul-Ernst; and Kaspers, Helmut, 4,098,894, Cl. 424-269.000.

Kataoka, Mitsuru: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 4,098,893, Cl. 424-263.000.

Kathawala, Faizulla G., to Sandoz, Inc. Phenoxyphenyl pyridyl ketones and derivatives and their use as hypolepidemic agents. 4,098,908, Cl. 424-263.000.

Kato, Atsumi: *See—*
Tokunaga, Shoichi; Kato, Atsumi; Takahashi, Yoshikazu; and Yamane, Kiyoshi, 4,098,907, Cl. 526-116.000.

Kato, Kazuma, to Nikko Seiki Company Limited. String winding device for string instruments. 4,098,163, Cl. 84-306.000.

Kato, Takashi: *See—*
Noguchi, Masaaki; Sanda, Shougo; Nakamura, Norihiko; and Kato, Takashi, 4,098,246, Cl. 123-119.00A.

Katoh, Hidekatsu: *See—*
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Kaufman, Melvin S.: *See—*
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Kawahara, Yukio: *See—*
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Kawakami, Hakuhei; Hatada, Kenzo; and Ishihara, Takeshi, to Matsushita Electric Industrial Co., Ltd. Time signal clock. 4,098,071, Cl. 58-39.000.

Kawakita, Kenji: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,098,888, Cl. 424-246.000.

Kawarada, Hiroshi: *See—*
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Kawasaki, Masahiro: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,099,188, Cl. 354-24.000.

Kawashima, Yoshirou. Apparatus for stretching sewed portions of cloth in sewing operation. 4,098,205, Cl. 112-217.000.
Kay, Ian Trevor; and Williams, Alfred Glyn, to Imperial Chemical Industries Limited. Electrolyte dehydrohalogenation of α-haloalcohols. 4,098,657, Cl. 204-59.00R.
Kays, Stanley J.; and Odell, George V. Pecan nut by-products and processes. 4,098,765, Cl. 528-1.000.
Keck, Max H., to Goodyear Tire & Rubber Company, The. Method for accelerating the crystallization rate of crystallizable polyester resin. 4,098,845, Cl. 260-860.000.
Kedjierski, Fred Dennis; and Bailie, John, to Magnum Products, Inc. Intrusion alarm and emergency illumination apparatus and method. 4,099,168, Cl. 340-517.000.
Keezer, Richard C.: *See—*
  Griffiths, Clifford H.; and Keezer, Richard C., 4,098,795, Cl. 260-314.500.
Kehl, Horst: *See—*
  Fountain, Kenneth R.; Kehl, Horst; and Early, Terry, 4,098,903, Cl. 424-324.000.
Keim, Cameron D.: *See—*
  Dietz, Max R.; Keim, Cameron D.; and Nelson, Lloyd A., 4,098,050, Cl. 53-26.000.
Keiper K.G.: *See—*
  Werner, Paul, 4,098,135, Cl. 74-157.000.
Keith, Ernest Voshell: *See—*
  Ferguson, Andrew Marvin; and Keith, Ernest Voshell, 4,098,521, Cl. 280-242.0WC.
Keizer, Eugene Orville: *See—*
  Fuhrer, Jack Selig; and Keizer, Eugene Orville, 4,098,030, Cl. 51-281.00R.
Keller, Donald L.; and Resor, David L., to General Electric Company. Superalloy article cleaning and repair method. 4,098,450, Cl. 228-119.000.
Kelley, John Daniel: *See—*
  Jeffers, William Q.; Kelley, John Daniel; and Wiswall, Charles E., 4,099,138, Cl. 331-94.50P.
Kelly, John, joint personal representative: *See—*
  Kelly, William, deceased; Kelly, John, joint personal representative; and Halpern, Alfred, 4,098,813, Cl. 260-501.150.
Kelly, Monica, joint personal representative: *See—*
  Kelly, William, deceased; Kelly, John, joint personal representative; and Halpern, Alfred, 4,098,813, Cl. 260-501.150.
Kelly, Roger Sidney Arthur; and Wilson, John Robert, to Imperial Chemical Industries Limited. Coated polyester film assembly with a primer layer. 4,098,952, Cl. 428-483.000.
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Kemlite Corporation: *See—*
  Morse, Donald B., 4,098,630, Cl. 156-219.000.
Kemper, Wilhelmus; Kruisman, Gerard; and Rutten, Hendrikus S., to Shell Oil Company. Tanker loading terminal. 4,098,212, Cl. 114-230.000.
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  Kita, John F., 4,098,352, Cl. 173-17.000.
Kennedy, Claude A.; Gardella, Adriano A.; Brogi, Ruggero E.; and Lavagetto, Lorenzo, to Raybestos-Manhattan, Inc.; and Adriano Gardella S.p.A. Strand shearing and deflecting device. 4,098,064, Cl. 57-34.500.
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  Monte, Salvatore J.; and Bruins, Paul F., 4,098,758, Cl. 260-42.140.
Kernforschungsanlage Julich GmbH: *See—*
  Seeger, Arnold; and Schalt, Wilfried, 4,099,103, Cl. 318-85.000.
Kersten, Gerard M., to United States of America, Navy. Method of making radiation seal. 4,098,633, Cl. 156-245.000.
Kesten, Stephen J.: *See—*
  Sircar, Jagadish C.; Kesten, Stephen J.; and Zinnes, Harold, 4,098,794, Cl. 260-306.80R.
Kezuka, Eiji: *See—*
  Hattori, Hajime; Usui, Eiji; Oya, Takashi; Sugawa, Kaneyoshi; Kezuka, Eiji; Okada, Tadashi; and Watanabe, Toshiro, 4,099,205, Cl. 358-149.000.
Kiefer, James E., to SoniForm Incorporated. Inflatable wearable flotation device. 4,097,947, Cl. 9-338.000.
Kik, Leendert Anton: *See—*
  Noomen, Arie; and Kik, Leendert Anton, 4,098,928, Cl. 427-203.000.
Kikumoto, Syoichi; Yamamoto, Osamu; Komatsu, Nobuhiko; Kobayashi, Haruhiko; and Kamasuka, Teruo, to Taito Co., Ltd.; and Kaken Chemical Co., Ltd. Method of producing neoschizophyllan having novel pharmacological activity. 4,098,661, Cl. 204-160.100.
Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Removal of impurities from coal. 4,098,584, Cl. 44-1.00R.
Kindler, Hubert: *See—*
  Niedner, Peter; Hillekamp, Klaus; and Kindler, Hubert, 4,098,464, Cl. 241-24.000.
King Industries, Inc.: *See—*
  Gallacher, Lawrence V., 4,098,950, Cl. 428-458.000.
King, James E.: *See—*
  Francel, Josef; King, James E.; and Woulbroun, John M., 4,098,611, Cl. 106-53.000.
King, Woodrow. Apparatus for mixing granular fertilizer and/or lawn treatment liquid in water. 4,099,267, Cl. 366-142.000.
Kinkopf, Edward J., to Alliance Machine Company, The. Ingot stripper structure. 4,098,320, Cl. 164-407.000.
Kinsman, Gordon F., to Polaroid Corporation. Flat batteries and method of making the same. 4,098,965, Cl. 429-153.000.
Kirk, Tommy R.: *See—*
  Coroell, James R.; and Kirk, Tommy R., 4,099,222, Cl. 362-72.000.
Kirkland, James R., Jr. Commode ventilation system. 4,099,047, Cl. 219-370.000.
Kirkpatrick, Conilee G.; and Possin, George E., to General Electric Company. Method for writing on archival memory target by ion damage. 4,099,261, Cl. 365-105.000.
Kisa Tra AB: *See—*
  Larsson, Carl, 4,098,311, Cl. 144-309.0AC.
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  Mikada, Hiroyuki; Houryu, Sakae; and Kishimoto, Jyuji, 4,099,247, Cl. 364-710.000.
Kissich, Arnulf: *See—*
  Zitz, Alfred; Schetina, Otto; Kogler, Peter; and Kissich, Arnulf, 4,098,539, Cl. 299-75.000.
Kita, John F., to Kennametal Inc. Percussion bit with bypass channel therein. 4,098,352, Cl. 173-17.000.
Kita, Toru; and Fujishiro, Takeshi, to Nissan Motor Company, Limited. Oxygen sensor having protective hood and method of using same. 4,098,653, Cl. 204-1.00T.
Kitano, Noritoshi: *See—*
  Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 4,098,893, Cl. 424-263.000.
Kitcher, James Robert, to International Business Machines Corporation. Electron beam lithography process. 4,099,062, Cl. 250-492.00A.
Kitutaka, Hiromu, to Ryobi, Ltd. Hydraulic door operator with overtravel restraint. 4,097,956, Cl. 16-52.000.
Kitutaka, Hiromu, to Ryobi, Ltd. Automatic door closing device. 4,097,957, Cl. 16-58.000.
Klaassen, Dirk, to Stamicarbon, B.V. Polyalkenes of wide molecular weight distribution. 4,098,974, Cl. 526-65.000.
Klapproth, Ludwig; Metzler, Gerhart; and Rother, Peter, to Geratewerke Lahr GmbH. Suspension devices for the chassis of a recording and/or reproducing apparatus. 4,098,513, Cl. 274-39.00A.
Kleimann, Helmut: *See—*
  von Bonin, Wulf; Kleimann, Helmut; and Ivanyi, Jozsef, 4,098,731, Cl. 521-51.000.
Klein, Gerhart P.; and Wingood, Ivan L., Jr., to P.R. Mallory & Co. Inc. Method of making porous polymer containing separators for electrolytic electrical devices. 4,099,218, Cl. 361-433.000.
Klein, H. Joseph; Hord, William C.; Ailor, James C.; and Iyer, Sankar P., to Cabot Corporation Vacuum casting heads and clamps. 4,098,499, Cl. 269-22.000.
Klein, Howard P.: *See—*
  Zimmerman, Robert L.; McEntire, Edward E.; and Klein, Howard P., 4,099,004, Cl. 544-171.000.
Klie, Wolfgang: *See—*
  Renner, Hermann; and Klie, Wolfgang, 4,098,531, Cl. 293-63.000.
Klima, Frank J. Drill bit with hard-faced bearing surfaces. 4,098,358, Cl. 175-65.000.
Klimavicz, Frank; and Chase, Jack S. Line of sight plotter. 4,097,998, Cl. 33-1.00G.
Klinger, Lance T., to Xerox Corporation. Method and means for seeking magnetic tracks. 4,099,112, Cl. 318-561.000.
Klose, Werner: *See—*
  Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,098,872, Cl. 423-265.000.
Kluender, Harold Clinton, to Miles Laboratories, Inc. Depentyl analogues of PGE$_2$ 4,099,016, Cl. 560-121.000.
Kluender, Harold Clinton, to Miles Laboratories, Inc. Depentyl analogues of PGF$_1$ 4,099,017, Cl. 560-121.000.
Klutchko, Sylvester; Kaminsky, Daniel, deceased (by Kaminsky, Bernice R., administratrix); and von Strandtmann, Maximilian, to Warner-Lambert Company. 3-Formylchromones. 4,098,799, Cl. 260-345.200.
Knapp, Alan George, to U.S. Philips Corporation. Secondary-emissive layers. 4,099,079, Cl. 313-103.0CM.
Knechtel, Herbert B. Peanut brittle manufacture. 4,098,914, Cl. 426-632.000.
Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process. 4,098,647, Cl. 195-51.00S.
Knirsch, Hermann; and Gerz, Hans-Bernd, to GEA Luftkuhlergesellschaft Happel GmbH & Co. KG. Combined wet and dry liquid cooling system and method. 4,098,854, Cl. 261-161.000.
Knoll, Carl G.: *See—*
  Bernin, Victor M.; Knoll, Carl G.; and Madland, Robert C., 4,099,176, Cl. 340-365.00L.
Knudsen, James K., to Minnesota Mining and Manufacturing Company. Magnetic identification label tape and method. 4,098,935, Cl. 428-40.000.
Kobayashi, Akio: *See—*
  Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, 4,098,979, Cl. 526-100.000.
Kobayashi, Haruhiko: *See—*
  Kikumoto, Syoichi; Yamamoto, Osamu; Komatsu, Nobuhiko; Kobayashi, Haruhiko; and Kamasuka, Teruo, 4,098,661, Cl. 204-160.100.
Kobayashi, Makoto: *See—*
  Yamamoto, Hirotaka; Ninomiya, Hideaki; and Kobayashi, Makoto, 4,098,725, Cl. 252-519.000.
Kobayashi, Tadahiro; and Tomura, Teluo, to Fujitsu Limited. Power supply interruption detecting circuit. 4,099,068, Cl. 307-200.00A.
Kobayashi, Toshiji, to Iida Sankyo Co., Ltd. Digital clock with timer. 4,098,069, Cl. 58-21.110.

Kobayashi, Yasushi; Iwata, Minoru; Yoshida, Sadao; and Akatsuka, Hisashi, to Idemitsu Kosan Company, Ltd. Method of treating waste water with activated sludge. 4,098,689, Cl. 210-15.000.
Kober, Frederick P., to Chem-E-Watt Corp. Complex electrochemical heating element. 4,098,258, Cl. 126-263.000.
Koch, Curtis J.: *See—*
  Miller, Gary M.; and Koch, Curtis J., 4,098,194, Cl. 102-105.000.
Koenig, Myron, to M. Argueso & Co., Inc. Method of electroforming. 4,098,652, Cl. 204-4.000.
Koga, Tsuguaki: *See—*
  Shiga, Motohiro; Fujisawa, Fumio; Sato, Kazuo; Shiohata, Kouki; Takasumi, Masakazu; and Koga, Tsuguaki, 4,098,127, Cl. 73-462.000.
Kogler, Peter: *See—*
  Zitz, Alfred; Schetina, Otto; Kogler, Peter; and Kissich, Arnulf, 4,098,539, Cl. 299-75.000.
Kohaut, John E., to Raceway Components, Inc. Apparatus for sealing passages through a concrete floor and about a conductor. 4,099,020, Cl. 174-48.000.
Kohlbeck, Anthony J. Holder to convert spray can into spray gun. 4,098,436, Cl. 222-182.000.
Kohler, Helmut: *See—*
  Grigoleit, Georg; Kohler, Helmut; Collin, Gerd; and Matern, Kurt, 4,098,838, Cl. 260-674.00N.
Kohnstamm, William Samuel: *See—*
  Burrill, Peter Martin; and Kohnstamm, William Samuel, 4,098,701, Cl. 252-8.600.
Koizumi, Shun: *See—*
  Shimizu, Tetsuo; Ichiba, Shigeru; Koizumi, Shun; and Okuno, Chuzo, 4,098,975, Cl. 526-73.000.
Kojima, Minoru: *See—*
  Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,098,732, Cl. 521-125.000.
Kojima, Toshihiko, to Yamato Mishin Seizo Kabushiki Kaisha. Apparatus for stretch-sewing a hem in tubular fabric. 4,098,204, Cl. 112-121.120.
Kokusai Denshin Denwa Co., Ltd.: *See—*
  Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, 4,099,208, Cl. 358-296.000.
Kolanek, Stanislaw: *See—*
  Starzycki, Janusz; Starzycka, Jadwiga; Sobczak, Janusz; Golembiowski, Stanislaw; Pieczora, Ernest; Kolanek, Stanislaw; Simonides, Jerzy; and Jendrzej, Jozef, 4,098,579, Cl. 23-283.000.
Kolbin, Nikolai Petrovich: *See—*
  Pogorelov, Valery Viktorovich; Trusov, Sergei Mikhailovich; Kolbin, Nikolai Petrovich; and Chistyakov, Lev Nikolaevich, 4,098,080, Cl. 60-361.000.
Kollmeier, Hans-Joachim; and Rossmy, Gerd, to Th. Goldschmidt AG. Process of producing cross-linked urethane-group comprising foams of open-cell structure. 4,098,729, Cl. 521-128.000.
Kolomoets, Nikolai Vasilievich: *See—*
  Lidorenko, Nikolai Stepanovich; Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Zhemchuzhina, Elena Alexandrovna; Chernousov, Lev Nikolaevich; Shmidt, Igor Aronovich; Nikolashina, Ljudmila Alexeevna; Gelfgat, David Mendeleevich; and Sgibnev, Igor Vladimirovich, 4,098,617, Cl. 148-1.500.
Komatsu, Nobuhiko: *See—*
  Kikumoto, Syoichi; Yamamoto, Osamu; Komatsu, Nobuhiko; Kobayashi, Haruhiko; and Kamasuka, Teruo, 4,098,661, Cl. 204-160.100.
Komori, Shigehiro; Hayakawa, Kimiaki; Nitanda, Hiroshi; and Inuzuka, Tsuneki, to Canon Kabushiki Kaisha. Both side copying machine. 4,098,551, Cl. 355-3.00R.
Kondo, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for moving curved plate bent in a substantially arcuate-shape. 4,098,134, Cl. 74-45.000.
Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Teetz, Volker, to Hoechst Aktiengesellschaft. Process for the purification and manufacture of secretin. 4,098,779, Cl. 260-112.50R.
Konishi, Kiyokazu; and Yoshida, Hiroshi, to Nippondenso Co., Ltd. Minute pressure control system. 4,098,247, Cl. 123-119.00R.
Konishi, Kiyokazu: *See—*
  Yoshida, Hiroshi; and Konishi, Kiyokazu, 4,098,243, Cl. 123-117.00D.
Koppelomaki, Leo: *See—*
  Persson, Per; and Koppelomaki, Leo, 4,099,026, Cl. 179-1.0VE.
Kopperschmidt, Gerd: *See—*
  Lohmann, Heinz-Juergen; and Kopperschmidt, Gerd, 4,099,129, Cl. 328-75.000.
Kornberger, Wolfgang: *See—*
  Peltz, Guenter; and Kornberger, Wolfgang, 4,099,226, Cl. 363-124.000.
Kornreich, Philipp G.; and Kowel, Stephen T., to Research Corporation. Direct electronic fourier transforms of optical images. 4,099,207, Cl. 358-213.000.
Kornylak, Andrew T. Silicone putty retarder. 4,098,375, Cl. 188-290.000.
Koshiba, Masao: *See—*
  Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; Koshiba, Masao; and Yamamoto, Hisao, 4,099,002, Cl. 544-119.000.
Kosiorek, Raymond Stanley, to Hercules Incorporated. Metallizing compositions and the preparation of electrically conductive articles. 4,098,949, Cl. 428-434.000.
Kotok, Alan; Sullivan, Patrick; Guglielmi, Paul M.; and Gross, David A., to Digital Equipment Corporation. Memory control system for transferring selected words in a multiple memory word exchange during one memory cycle. 4,099,231, Cl. 364-200.000.
Koutalides, Andrew, to Raytheon Company. Package for semiconductor beam lead devices. 4,099,200, Cl. 357-69.000.
Kovacs, Jenoe: *See—*
  Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, 4,098,640, Cl. 162-146.000.
Kovar, Henry Charles, to Cornelius Company, The. Token actuatable vend mechanism. 4,098,384, Cl. 194-37.000.
Kovatch, George N.; Rosey, Richard; and Simon, Ned H., to Westinghouse Electric Corp. Electrical switchboard apparatus including welded bus connector. 4,099,220, Cl. 361-341.000.
Kovitch, Frank J.: *See—*
  Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,098,527, Cl. 285-167.000.
Kowel, Stephen T.: *See—*
  Kornreich, Philipp G.; and Kowel, Stephen T., 4,099,207, Cl. 358-213.000.
Kozakura, Shiro: *See—*
  Ohkawa, Hideo; Nagai, Yoshinori; Kozakura, Shiro; Mugino, Yutaka; Fujimoto, Noriki; and Tomikawa, Masami, 4,098,752, Cl. 260-31.40R.
Kozima, Toyoo, to Hidaka Engineering Company, Limited. Punch and die assembly for use in the production of heat exchanger fins. 4,098,108, Cl. 72-358.000.
Koziol, Dale Lee; and Reed, Thomas Freeman, to General Tire & Rubber Company, The. Tennis ball. 4,098,504, Cl. 273-61.00R.
Kozo, Nakao: *See—*
  Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, 4,099,208, Cl. 358-296.000.
Kraemer, Philipp; and Meresz, Otto. Rotary separating and extracting devices. 4,098,648, Cl. 196-14.520.
Kraft, Harold D.: *See—*
  Kraft, Jack A.; and Kraft, Harold D., 4,098,581, Cl. 23-292.000.
Kraft, Jack A.; and Kraft, Harold D. Gas release device for use with laboratory glassware. 4,098,581, Cl. 23-292.000.
Kraft, Kurt; and Reese, Johannes, to Hoechst Aktiengesellschaft. N,N-Substituted 2,4,5-triketoimidazolidines and a process for their preparation. 4,099,007, Cl. 548-307.000.
Kramer, Leslie D., to Westinghouse Electric Corp. Steam turbine expansion joint with probe for monitoring molten caustics. 4,098,112, Cl. 73-28.000.
Kramer, Volker; Rispeter, Siegfried; and Marlow, Rolf-Peter, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Fluid pressure coupling arrangement. 4,098,293, Cl. 137-614.030.
Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. Omega-(n-aminoalkoxybenzyl-amino)-(n-hydrocarbonoyl-amino)-alkanoic acid esters. 4,098,789, Cl. 544-299.000.
Krar, George R.; Olesen, Ole L.; Sederquist, Richard A.; and Szydlowski, Donald F., to United Technologies Corporation. Compact multitube catalytic reaction apparatus. 4,098,587, Cl. 48-94.000.
Krause Milling Company: *See—*
  Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,098,615, Cl. 106-162.000.
  Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,098,859, Cl. 264-122.000.
Krauss-Maffei Aktiengesellschaft: *See—*
  Niedner, Peter; Hillekamp, Klaus; and Kindler, Hubert, 4,098,464, Cl. 241-24.000.
Krautkramer-Branson, Incorporated: *See—*
  Renzel, Peter, 4,098,131, Cl. 73-627.000.
Kreeb, Reiner: *See—*
  Abthoff, Jorg; Schuster, Hans-Dieter; Huttebrsucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,098,252, Cl. 123-198.00F.
Kreidl Chemico Physical K.G.: *See—*
  Ress, Thomas I.; and Hartmann, Frederick, 4,099,053, Cl. 250-293.000.
Kreuzburg, Gerhard: *See—*
  Lenz, Arnold; Kreuzburg, Gerhard; and Haase, Rainer, 4,098,595, Cl. 65-17.000.
Kristiansen, Odd: *See—*
  Dittrich, Volker; Topfl, Werner; and Kristiansen, Odd, 4,098,900, Cl. 424-304.000.
Kronman, Albert F.: *See—*
  Peters, Melville F., 4,098,262, Cl. 126-270.000.
Krueger, Robert K.: *See—*
  Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,098,615, Cl. 106-162.000.
  Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,098,859, Cl. 264-122.000.
Kruisman, Gerard: *See—*
  Kemper, Wilhelmus; Kruisman, Gerard; and Rutten, Hendrikus S., 4,098,212, Cl. 114-230.000.
Krummel, H. Karl; and Wise, Rodney Mahlon, to Procter & Gamble Company, The. Process for making carboxyalkylated alkyl polyether surfactants with narrow polyethoxy chain distribution. 4,098,818, Cl. 260-535.00R.
Krutzsch, William C.: *See—*
  Bush, Austin R.; and Krutzsch, William C., 4,098,558, Cl. 415-199.100.
Kub, Francis J.; and Bluzer, Nathan, to Westinghouse Electric Corp. Methods for making a sloped insulator for solid state devices. 4,098,638, Cl. 156-657.000.
Kubo, Seitoku; Kuramochi, Kojiro; and Shindo, Yoshio, to Toyota

Jidosha Kogyo Kabushiki Kaisha. Breathing system for an automatic transmission. 4,098,143, Cl. 74-606.00R.

Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Data-record background-defining apparatus for data-recording photographic camera. 4,099,189, Cl. 354-106.000.

Kubota, Ltd.: *See—*

Izaki, Hiroshi, 4,098,462, Cl. 239-557.000.

Kuck, Valerie J.: *See—*

Tsigdinos, George A.; Moore, Fred W.; Kuck, Valerie J.; and Scalco, Emanuele, 4,098,753, Cl. 260-31.80R.

Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernhardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H.; and Saarbergwerke A.G. Water-cooled, high-temperature gasifier and method for its operation. 4,098,324, Cl. 165-1.000.

Kummerl, Klaus, to Durst AG. Fabrik Fototechnischer Apparate. Device for the wet processing of photosensitive materials. 4,099,194, Cl. 354-321.000.

Kunde, Joachim: *See—*

Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, 4,098,640, Cl. 162-146.000.

Kunz, Walter: *See—*

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,098,895, Cl. 424-269.000.

Kupersmith, Murray; and Symansky, Curtis W., to General Signal Corporation. Geographic gain time control. 4,099,180, Cl. 343-6.50R.

Kuramochi, Kojiro: *See—*

Kubo, Seitoku; Kuramochi, Kojiro; and Shindo, Yoshio, 4,098,143, Cl. 74-606.00R.

Kurimoto, Kazuhiko: *See—*

Ogawa, Kinya; Kurimoto, Kazuhiko; Eguchi, Yoshitugu; and Kuwata, Satoshi, 4,098,972, Cl. 526-62.000.

Kuroda, Masataka: *See—*

Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,098,762, Cl. 260-45.70R.

Kuroda, Toshiro; and Kakami, Susumu, to Narumi China Corporation. Substrate assembly for a luminescent display panel having fired liquid gold layers for segmented display electrodes. 4,098,939, Cl. 428-201.000.

Kurs, Artur: *See—*

Derleth, Helmut; Hansen, Maria; Lange, Ingeborg; and Kurs, Artur, 4,098,714, Cl. 252-181.000.

Kurt Manufacturing Company, Inc.: *See—*

Lenz, John O., 4,098,500, Cl. 269-136.000.

Kuwata, Satoshi: *See—*

Ogawa, Kinya; Kurimoto, Kazuhiko; Eguchi, Yoshitugu; and Kuwata, Satoshi, 4,098,972, Cl. 526-62.000.

Kwan, Okun, to Bunker Ramo Corporation. Three position platen control mechanism. 4,098,389, Cl. 400-649.000.

Kyowa Chemical Industry Co., Ltd.: *See—*

Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,098,762, Cl. 260-45.70R.

Laboratoire L. Lafon: *See—*

Lafon, Louis, 4,098,824, Cl. 260-564.00G.

Labouliere, Elzear R.: *See—*

de Vos, Hendrik A. J.; Gustafson, Walter A.; and Labouliere, Elzear R., 4,099,223, Cl. 362-226.000.

Lacey, Richard J. Athletic knee protection device. 4,097,932, Cl. 2-24.000.

Lacroix, Roger; and Haberli, Roland, to Ciba-Geigy Corporation. Stable concentrated liquid preparation of paper dyes of the disazo class. 4,098,569, Cl. 8-41.00R.

Lafon, Louis, to Laboratoire L. Lafon. Benzhydrylsulphinyl derivatives. 4,098,824, Cl. 260-564.00G.

Laing, Jean Wilcox, to Xerox Corporation. Coronode tensioning and support arrangement. 4,099,219, Cl. 361-230.000.

Laird, W. James, Jr., to Upton Industries, Inc. Process for increasing the versatility of isothermal transformation. 4,098,624, Cl. 148-153.000.

Lalancette, Lionel. Wall toaster. 4,098,178, Cl. 99-329.0RT.

Lambert, Alain: *See—*

Deblaere, Marie-Claude; Lambert, Alain; and Flambard, Christian, 4,098,129, Cl. 73-599.000.

Lamothe, Andre, to Foraco Forage Rational Construction. Drilling head connection for use in a reverse circulation system. 4,098,361, Cl. 175-325.000.

Lamothe, Andre, to Foraco Forage Rationnel Construction. Automatic recovery system for plugs and excavation materials. 4,098,698, Cl. 210-309.000.

Lanciault, Joseph A. Solar water heater for trailers and buildings. 4,098,263, Cl. 126-271.000.

Landman, Brice Charles; Sykes, Granville; and Yang, Thien Siung, to Broken Hill Propietary Company Limited, The. Temperature probes. 4,098,122, Cl. 73-341.000.

Landy, Jerome J. Total exhaust laminar flow biological fume hood safety cabinet and method. 4,098,174, Cl. 98-115.0LH.

Lang, Gerard; and Jacquet, Bernard, to L'Oreal. Anti-solar composition. 4,098,882, Cl. 424-59.000.

Lang, Gusztav, to Hilti Aktiengesellschaft. Anchoring member secured by an adhesive material. 4,098,166, Cl. 85-63.000.

Langanke, Helmut; Hoffmeister, Roman; and Fritz, Herbert, to Metallgesellschaft Aktiengesellschaft. Fabrics made from as spun untwisted yarn. 4,098,097, Cl. 66-202.000.

Lange, Georg, to Thyssen Purofer GmbH. Apparatus for direct reduction of iron ore. 4,098,496, Cl. 266-156.000.

Lange, Ingeborg: *See—*

Derleth, Helmut; Hansen, Maria; Lange, Ingeborg; and Kurs, Artur, 4,098,714, Cl. 252-181.000.

Lange, Ralf: *See—*

Neuray, Dieter; Vernaleken, Hugo; Wulff, Claus; and Lange, Ralf, 4,098,754, Cl. 260-37.0PC.

Lanzerotti, Mary Y. DeWolf: *See—*

Hershkowitz, Joseph; and Lanzerotti, Mary Y. DeWolf, 4,099,142, Cl. 331-94.50G.

Lara-Sanchez, Luis Eduardo: *See—*

Mercado-Flores, Ignacio; Carvallo-Garnica, Sergio; and Lara-Sanchez, Luis Eduardo, 4,098,912, Cl. 426-617.000.

Lark Luggage Corporation: *See—*

Pelavin, Joseph Y., 4,098,376, Cl. 190-43.000.

Larralde, Edward, to Vetco Offshore Industries, Inc. Methods and apparatus for the control of a suspended weight from a floating vessel. 4,098,491, Cl. 254-172.000.

Larsson, Carl, to Kisa Tra AB. Forestry machines. 4,098,311, Cl. 144-309.0AC.

Last, Anthony Edward Walter, to BSP International Foundations Limited. Pile drivers. 4,098,356, Cl. 173-131.000.

Laszlo, Marijan: *See—*

Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,098,252, Cl. 123-198.00F.

Lauer, Robert E.; and Symcox, Leonard T. Combination badge and folder. 4,098,014, Cl. 40-1.500.

Laupman, Robert Ronald, to Novanex Automation N.V. Electronic echo device. 4,099,135, Cl. 330-109.000.

Laurent, Pierre Alfred. Process and apparatus for afterburning of combustible pollutants from an internal combustion engine. 4,098,078, Cl. 60-274.000.

Lavagetto, Lorenzo: *See—*

Kennedy, Claude A.; Gardella, Adriano A.; Brogi, Ruggero E.; and Lavagetto, Lorenzo, 4,098,064, Cl. 57-34.500.

Law, Richard S.: *See—*

Buerkley, Donald D.; and Law, Richard S., 4,098,738, Cl. 260-28.5AV.

Lawrence Brothers, Inc.: *See—*

Johnson, Larry K., 4,097,959, Cl. 16-136.000.

Le Moteur Moderne: *See—*

Jarry, Philippe, 4,098,239, Cl. 123-90.440.

Lebedev, Alexei Pavlovich: *See—*

Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.

Leblanc, Michele; Ripart, Guy; and Brule, Albert, to Compagnie Industrielle des Lasers. Laser generator. 4,099,141, Cl. 331-94.50C.

Lee, J. Spencer; and Stoddard, Leon E., to Hughes Aircraft Company. Variable pulse width circuit. 4,099,072, Cl. 307-265.000.

Lee, Thomas E. Adjustable volume pipetting device. 4,098,125, Cl. 73-425.600.

Lee, Timothy Charles Philip; and Millns, William, to Gould Inc. Treatment of vulcanized rubber. 4,098,737, Cl. 260-23.70A.

Lee, Yoon C., to Monsanto Company. Polymeric alloy composition. 4,098,734, Cl. 260-17.00R.

Leedom, Marvin Allan, to RCA Corporation. Video disc handling system for a video disc player. 4,098,511, Cl. 274-9.00B.

Leeds & Northrup Company: *See—*

Hoopes, Howard Sherman; and Walsh, Thomas Joseph, 4,099,114, Cl. 318-676.000.

Lefnaer, Otto, to Wurttembergische Allplastik GmbH. Binding clip for bundling and/or attaching cables and similar objects. 4,097,966, Cl. 24-16.0PB.

Legeai, Jacky Marcel: *See—*

Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, 4,098,803, Cl. 260-397.450.

Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, 4,098,804, Cl. 260-397.450.

Lehnert, Fritz, to Blaupunkt-Werke GmbH. Tape drive for a cassette in a sound reproducer and/or recorder. 4,098,474, Cl. 242-200.000.

Lei, Kenneth P. V.: *See—*

Carnahan, Thomas G.; and Lei, Kenneth P. V., 4,098,866, Cl. 423-7.000.

Lenz, Arnold; Kreuzburg, Gerhard; and Haase, Rainer, to Dynamit Nobel Aktiengesellschaft. Process for the production of granular quartz glass. 4,098,595, Cl. 65-17.000.

Lenz, John O., to Kurt Manufacturing Company, Inc. Adjustable member for reducing clamp load losses in a locking jaw vise. 4,098,500, Cl. 269-136.000.

Lerch, Ulrich: *See—*

Babej, Milos; Bartmann, Wilhelm; Beck, Gerhard; and Lerch, Ulrich, 4,098,815, Cl. 260-514.00D.

Lermer GmbH: *See—*

Liebscher, Gunther; and Christ, Gunter, 4,098,424, Cl. 220-4.00F.

Leuchter, Jurgen; Plursch, Gerald; and Bierinckx, Johannes, to AGFA-Gevaert AG. Continuously operating developing machine with filmstrip tension control. 4,099,193, Cl. 354-321.000.

Levesque, Paul D.: *See—*

Hartzler, Earnest D.; and Levesque, Paul D., 4,099,037, Cl. 200-5.00A.

Levin, Albert R., to Energy Conservation Techniques Inc. Reinforced concrete block making machine. 4,098,562, Cl. 425-121.000.

Lewis, George E., to Hydril Company. Rotating blowout preventer apparatus. 4,098,341, Cl. 166-314.000.

Lhenry, Bernard; Toitot, Michel; and Blondeau, Regis, to Creusot-Loire. Method of and apparatus for quenching sheet metal. 4,098,495, Cl. 266-115.000.

Li, Choh Hao, to Hoffmann-La Roche Inc. β-Endorphin analog. 4,098,778, Cl. 260-112.50R.

Li, Norman N.; and Shrier, Adam L., to Exxon Research & Engineering Co. Liquid membrane encapsulated reactive products. 4,098,736, Cl. 260-18.0PN.

Liberda, Heinz; Spes, Hellmuth; and Trommet, Alfred, to Wacker-Chemie GmbH. Process for the production of phosphoric acid-dimethylamide-dichloride or phosphoric acid-bis-(dimethylamide)-chloride. 4,098,819, Cl. 260-543.00P.

Liberty Glass Company: *See—*

Brockway, M. Clifford; and Sharpe, Robert E., 4,098,934, Cl. 428-35.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*

Roder, Dieter; and Tust, Heinz, 4,099,086, Cl. 313-407.000.

Schroder, Ernst, 4,099,134, Cl. 330-51.000.

Lichtenvort, Uwe: *See—*

Spoler, Johannes-Gerhard; and Lichtenvort, Uwe, 4,098,036, Cl. 52-16.000.

Lidogoster, Michael: *See—*

Fleishaker, Michail; and Lidogoster, Michael, 4,098,179, Cl. 99-450.600.

Lidorenko, Nikolai Stepanovich; Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Zhemchuzhina, Elena Alexandrovna; Chernousov, Lev Nikolaevich; Shmidt, Igor Aronovich; Nikolashina, Ljudmila Alexeevna; Gelfgat, David Mendeleevich; and Sgibnev, Igor Vladimirovich. Method of manufacturing film thermopile. 4,098,617, Cl. 148-1.500.

Liebscher, Gunther; and Christ, Gunter, to Lermer GmbH. Transport container. 4,098,424, Cl. 220-4.00F.

Liepmann, Hans-Gunther: *See—*

Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,098,786, Cl. 260-239.0BD.

Lincoln, Russell L.: *See—*

Blickensderfer, Robert; Deardorff, Donald K.; and Lincoln, Russell L., 4,098,956, Cl. 428-627.000.

Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, to Astra Lakemedel Aktiebolag. Trifluoromethyl substituted compounds having antidepressive activity. 4,098,901, Cl. 424-311.000.

Lindemann, Martin K., to Chas. S. Tanner Co. Copolymerizable monoethylenically unsaturated phosphonates and fire retardant copolymers containing the same. 4,098,986, Cl. 526-278.000.

Lindes, Peter: *See—*

Rode, France; Lindes, Peter; Eschenbach, Ralph F.; and Fazarinc, Zvonko A., 4,099,240, Cl. 364-571.000.

Lindquist, Roy P.: *See—*

Prescott, Robert C.; and Lindquist, Roy P., 4,098,592, Cl. 55-67.000.

Lindroos, Paul Goran Sigvard. Method of treating liquids containing blood substances. 4,098,780, Cl. 260-112.50R.

Lindstrom, Bernt: *See—*

Bratthall, Lars; and Lindstrom, Bernt, 4,098,332, Cl. 165-172.000.

Lindstrom, Robert J. Mops of cellulose sponge cloth material. 4,097,952, Cl. 15-244.00R.

Linhart, Friedrich: *See—*

Thym, Sabine; Pommer, Ernst-Heinrich; Zeeh, Bernd; and Linhart, Friedrich, 4,098,810, Cl. 260-453.0RW.

Linstromberg, William John, to Whirlpool Corporation. Stop mechanism for movable ice receptacle. 4,098,094, Cl. 62-344.000.

Liptak, Julius M., to Square D Company. Sensor circuit. 4,099,227, Cl. 363-126.000.

Litts, Thomas W.: *See—*

Perez, Juan, 4,098,477, Cl. 248-23.000.

Livermore, Frederick Caldwell: *See—*

Boynton, Robert James; and Livermore, Frederick Caldwell, 4,099,046, Cl. 219-216.000.

Lockheed Electronics Co., Inc.: *See—*

Maysonett, Anthony, 4,099,245, Cl. 364-603.000.

Lodi, Robert J., to Sperry Rand Corporation. Non-destructive interrogation control circuit for a variable threshold FET memory. 4,099,264, Cl. 365-189.000.

Logan, Zack H., to A-T-O Inc. Woven wire partition. 4,098,493, Cl. 256-24.000.

Login, Robert B., to BASF Wyandotte Corporation. Providing polymer with antistatic properties. 4,098,842, Cl. 260-857.0PG.

Login, Robert Bernard, to BASF Wyandotte Corporation. Phosphorus-containing polyester and size compositions. 4,098,741, Cl. 260-29.20E.

Logue, Daniel R.; and Anderson, Terry G., to Bell & Howell Company. Method of making improved photoconductive particles. 4,098,609, Cl. 96-1.800.

Lohmann, Heinz-Juergen; and Kopperschmidt, Gerd, to Siemens Aktiengesellschaft. Control pulse generator for the cyclical fault-free generation of an accurate sequence of control pulses. 4,099,129, Cl. 328-75.000.

Lohmann, Robert P.: *See—*

Greenberg, Paul B.; Lohmann, Robert P.; and Wing, Philip M., 4,098,074, Cl. 60-39.360.

Greenberg, Paul B.; Lohmann, Robert P.; and Wing, Philip M., 4,098,075, Cl. 60-39.360.

Loker, W. A.: *See—*

Chard, Steven D.; Loker, W. A.; and Meredith, John T., 4,098,096, Cl. 64-14.000.

L'Oreal: *See—*

Lang, Gerard; and Jacquet, Bernard, 4,098,882, Cl. 424-59.000.

Lowe, Brian Arthur; and Odell, Raymond, to RACAL-Amplivox Communications Ltd. Protective visor means for a helmet. 4,097,929, Cl. 2-10.000.

Lowe, Lynnwood, to Pitney-Bowes, Inc. Ascending register lockout system for a postage meter. 4,099,049, Cl. 235-101.000.

Lowe, Virgil L.; and Craig, Philip V. C., to Edutron Incorporated. Delay circuit. 4,099,204, Cl. 358-149.000.

Lowry, George W., to Metals & Plastics, Inc. Temperature-controlled comminuting method and apparatus. 4,098,463, Cl. 241-17.000.

Lozier Store Fixtures: *See—*

Neumann, Leonard H., 4,098,480, Cl. 248-243.000.

Lubrizol Corporation, The: *See—*

Stuebe, Carl Walter, 4,098,708, Cl. 252-51.50A.

Lucas Electrical Company Limited, The: *See—*

Williams, Malcolm; and Melady, Adrian Walter, 4,098,234, Cl. 123-32.0EA.

Luckenbach, Edward C., to Exxon Research & Engineering Co. Method of regenerating a cracking catalyst. 4,098,680, Cl. 208-164.000.

Luckey, Wilhelm. Collapsible ladder. 4,098,372, Cl. 182-196.000.

Luhowy, Roberta R.: *See—*

Ciecíuch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., 4,098,783, Cl. 260-147.000.

Luke, George Michael: *See—*

Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, 4,098,788, Cl. 544-293.000.

Lumber Systems, Inc.: *See—*

Moore, Jack, 4,098,407, Cl. 209-74.00R.

Luthi, Oscar, to Ingersoll-Rand Company. Pressure pulp washer with inlet pivot. 4,098,642, Cl. 162-259.000.

Luthi, Oscar, to Ingersoll-Rand Company. Mixing device. 4,099,268, Cl. 366-338.000.

Lutz, Albert William; and Diehl, Robert Eugene, to American Cyanamid Company. 4-Cyano-2,6-dinitroanilines. 4,098,812, Cl. 260-465.00E.

Lutze, Siegfried; Feichtinger, Hans; and Birnkraut, Hans-Walter, to Ruhrchemie Aktiengesellschaft. Process for the purification of low pressure polymerized polyolefin powder using recycled, anion-exchange treated water. 4,098,990, Cl. 528-490.000.

Lynes, Dennis Joseph; Panousis, Peter Theodore, and Pritchett, Robert Leonard, to Bell Telephone Laboratories, Incorporated. Bipolar read-only-memory unit having self-isolating bit-lines. 4,099.260, Cl. 365-105.000.

Lyons, James E.: *See—*

Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,098,835, Cl. 260-666.0PY.

Lythall, David John: *See—*

Smith, Christopher John; and Lythall, David John, 4,098,451, Cl. 228-119.000.

M. Argueso & Co., Inc.: *See—*

Koenig, Myron, 4,098,652, Cl. 204-4.000.

MacElvain, Ford M.: *See—*

MacElvain, Robert C.; and MacElvain, Ford M., 4,098,466, Cl. 241-57.000.

MacElvain, Robert C.; and MacElvain, Ford M. Impact mill for reducing solids. 4,098,466, Cl. 241-57.000.

Machida, Tokuji: *See—*

Horibe, Koichi; Watanabe, Minoru; and Machida, Tokuji, 4,099,019, Cl. 13-9.00R.

MacMillan, Alan L.: *See—*

DeAngelis, Peter; Morris, Alfred R.; and MacMillan, Alan L., 4,098,697, Cl. 210-202.000.

Madaus, Rolf; Gorler, Klaus; and Stumpf, Werner, to Dr. Madaus & Co. Aluminum compound and pharmaceutical compositions containing same. 4,098,883, Cl. 424-157.000.

Maddock, Robert W., to McDonnell Douglas Corporation. Oxygen supply system and flow indicator. 4,098,271, Cl. 128-142.300.

Madland, Robert C.: *See—*

Bernin, Victor M.; Knoll, Carl G.; and Madland, Robert C., 4,099,176, Cl. 340-365.00L.

Maeda, Hidetoshi; and Ohba, Toshihiro, to Sharp Kabushiki Kaisha. Touch sensitive electronic switching circuitry for electronic wristwatches. 4,099,074, Cl. 307-308.000.

Maeda, Takeo: *See—*

Okawa, Tadashi; Matsuda, Yasuo; Hayashida, Hiroshi; and Maeda, Takeo, 4,099,108, Cl. 318-227.000.

Maeding, Dale G.: *See—*

Finnila, Ronald M.; and Maeding, Dale G., 4,099,250, Cl. 364-826.000.

Maekawa, Koji; and Hamasaki, Iwao, to Sharp Kabushiki Kaisha. Keyboard entry circuitry of the key strobing type. 4,099,177, Cl. 340-365.00E.

Maekawa, Nobuteru, to Matsushita Electric Works, Ltd. Rotor for coreless motor. 4,099,077, Cl. 310-237.000.

Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, to Sumitomo Chemical Company, Limited. Method for preparing easily processable polyolefin granule. 4,098,979, Cl. 526-100.000.

Maffet, Vere, to UOP Inc. Organic waste dewatering and drying process. 4,098,006, Cl. 34-12.000.

Magazzu, John T.: *See—*
  Brown, Jimmie L.; Hinton, Gordon L.; and Magazzu, John T., 4,098,401, Cl. 206-326.000.
Magna International Inc.: *See—*
  Harding, Dukecal Jenner, 4,098,699, Cl. 210-520.000.
Magnavox Company, The: *See—*
  Worley, David W.; and Filliman, Paul D., 4,099,163, Cl. 340-168.00B.
Magnum Products, Inc.: *See—*
  Kedjierski, Fred Dennis; and Bailie, John, 4,099,168, Cl. 340-517.000.
Mailey, Everett A.: *See—*
  Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, 4,099,003, Cl. 544-137.000.
Majeti, Satyanarayana, to Procter & Gamble Company, The. Compositions to control the chronic effects of exposure to sunlight comprising conjugated dienes. 4,098,881, Cl. 424-59.000.
Malinowski, William J., to Chloride, Incorporated. Smoke detector with chamber for producing eddy currents. 4,099,065, Cl. 250-574.000.
Maliszewski, Stephen Raymond; and Ngo, Peter Dinh-Tuan, to Bell Telephone Laboratories, Incorporated. Light pen detection for plasma panels using specially timed and shaped scan pulses. 4,099,170, Cl. 340-324.00M.
Mange, Franklin E.: *See—*
  Buriks, Rudolf S.; Fauke, Allen R.; and Mange, Franklin E., 4,098,717, Cl. 252-331.000.
Mann, Douglass M. Sand blasting apparatus. 4,098,033, Cl. 51-426.000.
Mann, Willa L.: *See—*
  Mann, William, Jr.; and Mann, Willa L., 4,098,397, Cl. 206-217.000.
Mann, William, Jr.; and Mann, Willa L. Multi chambered thermal container. 4,098,397, Cl. 206-217.000.
Manning Environmental Corporation: *See—*
  Gates, Wendall C., 4,098,305, Cl. 141-92.000.
Manoscope, Inc.: *See—*
  Clark, Thomas W.; and Hale, William E., 4,098,291, Cl. 137-871.000.
Manske, Wendell J., to Minnesota Mining and Manufacturing Company. Humidity indicating method and device. 4,098,120, Cl. 73-335.000.
Marathon Oil Company: *See—*
  Argabright, Perry A.; Rhudy, John S.; and Phillips, Brian L., 4,098,337, Cl. 166-270.000.
Maravilla, Sam; and Tresouthick, Stewart W., to United States Steel Corporation. Basic oil well cement. 4,098,613, Cl. 106-89.000.
March, Alexander: *See—*
  Badone, Louis; and March, Alexander, 4,098,929, Cl. 427-236.000.
Marforio, Nerino; and Bonalumi, Pietro, to Rockwell-Rimoldi S.p.A. Workpiece guide for sewing machines. 4,098,202, Cl. 112-20.000.
Marion Power Shovel Company, Inc.: *See—*
  Sankey, Edwin W., 4,098,139, Cl. 74-410.000.
Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Organic oxalate plasticized polycarbonate composition. 4,098,750, Cl. 260-30.80R.
Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Organic carbonate plasticized polycarbonate composition. 4,098,751, Cl. 260-30.80R.
Markert, Herman Rupert, to Sonoco Products Company. Vacuum package with flexible end. 4,098,404, Cl. 206-525.000.
Markhorst, Robert Lambertus. Process for the manufacture of polygonal cardboard tube segments. 4,098,862, Cl. 264-257.000.
Markle, Richard A.; and Sinclair, Richard G., to Goodyear Tire & Rubber Company, The. Non-aqueous dispersion polymerization of conjugated diolefins. 4,098,980, Cl. 526-201.000.
Marlen Research Corporation: *See—*
  Alley, Lewis F.; and White, James E., 4,097,962, Cl. 17-39.000.
Marlow, Rolf-Peter: *See—*
  Kramer, Volker; Rispeter, Siegfried; and Marlow, Rolf-Peter. 4,098,293, Cl. 137-614.030.
Marrero, Louis. Self-aligning outlet box assembly. 4,098,423, Cl. 220-3.600.
Marrs, Oren L.: *See—*
  Tieszen, Dale O.; and Marrs, Oren L., 4,098,776, Cl. 528-481.000.
Marsh, Frank Dennis, to Du Pont de Nemours, E. I., and Company. Nitrobenzotrichloride or bromide process. 4,098,831, Cl. 260-646.000.
Martin, Bart G., to Coin Acceptors, Inc. Adjustable oversize coin detector assembly. 4,098,386, Cl. 194-102.000.
Martin, Bart G., to Coin Acceptors, Inc. Adjustable counterweight for one-armed coin cradle. 4,098,387, Cl. 194-102.000.
Martin Engineering Company: *See—*
  Stahura, Richard, 4,098,394, Cl. 198-499.000.
Martin, John H.: *See—*
  Stanford, James R.; Martin, John H.; and Chappell, George D., 4,098,716, Cl. 252-188.000.
Martin Marietta Corporation: *See—*
  Ray, James A., 4,098,614, Cl. 106-90.000.
Maruta, Rikio; Itoh, Yasuo; and Tomozawa, Atsushi, to Nippon Electric Co., Ltd. Asynchronous PCM common decoding apparatus. 4,099,029, Cl. 179-15.0BA.
Marze, Xavier: *See—*
  Christen, Gilbert; Favre, Bernard; Marze, Xavier; and Salmon, Michel, 4,098,852, Cl. 261-104.000.
Maschinenfabrik-Augsburg-Nurnberg Aktiengesellschaft: *See—*
  Besel, Gunter; and Regar, Karl Nikolaus, 4,098,144, Cl. 74-687.000.
  Moll, Hans, 4,099,102, Cl. 318-85.000.
Maschinenfabrik Niehoff, KG: *See—*
  Engmann, Gunther; Jorg, Karl; and Heider, Hermann, 4,098,467, Cl. 242-25.00A.
Mash, Dmitry Matveevich: *See—*
  Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
Mason, Burton Hoster. Work arm system for submergible chamber. 4,098,088, Cl. 61-69.00R.
Mason, Charles E., to Continental Oil Company. Method for rotating hose. 4,098,415, Cl. 214-152.000.
Massey, Cleo E., to Moore Iron Works. Foldable shipping rack. 4,098,409, Cl. 211-195.000.
Massey-Ferguson Services N.V.: *See—*
  Quick, Donald J., 4,098,060, Cl. 56-13.900.
Masterton, Walter David, to RCA Corporation. Shadow mask color picture tube having a mosaic color screen with improved tolerances. 4,099,187, Cl. 354-1.000.
Masuko, Tatsuo; Yanagida, Osami; and Yamamoto, Shunji, to Mitsubishi Chemical Industries Ltd. Process for blending liquid rubber and carbon black. 4,098,715, Cl. 252-182.000.
Masuyama, Isao. Cuckoo clock. 4,098,068, Cl. 58-12.000.
Matern, Kurt: *See—*
  Grigoleit, Georg; Kohler, Helmut; Collin, Gerd; and Matern, Kurt, 4,098,838, Cl. 260-674.00N.
Matrix Corporation: *See—*
  Spitzke, Arthur, 4,098,478, Cl. 248-156.000.
Matsuda, Mitsuhiro: *See—*
  Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, 4,098,844, Cl. 260-859.00R.
Matsuda, Yasuo: *See—*
  Okawa, Tadashi; Matsuda, Yasuo; Hayashida, Hiroshi; and Maeda, Takeo, 4,099,108, Cl. 318-227.000.
Matsumoto, Shizuo: *See—*
  Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.
Matsumura, Isao, to Canon Kabushiki Kaisha. Eye bottom camera. 4,098,549, Cl. 351-7.000.
Matsunami, Koichi: *See—*
  Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.
Matsuoka, Mikio: *See—*
  Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
  Hattori, Hajime; Usui, Eiji; Oya, Takashi; Sugawa, Kaneyoshi; Kezuka, Eiji; Okada, Tadashi; and Watanabe, Toshiro, 4,099,205, Cl. 358-149.000.
  Kawakami, Hakuhei; Hatada, Kenzo; and Ishihara, Takeshi, 4,098,071, Cl. 58-39.000.
  Minami, Shunji, 4,099,251, Cl. 364-829.000.
  Yamazoe, Hiroshi; Kawarada, Hiroshi; Sato, Hisanao; and Ohshima, Nobumasa, 4,099,091, Cl. 313-509.000.
Matsushita Electric Works, Ltd.: *See—*
  Maekawa, Nobuteru, 4,099,077, Cl. 310-237.000.
Matsushita, Setsuro, to Zaidan-hoijin Sugiyama Sangyo Kagaku Kenkyusho. Peroxide value determining test for oils and fats. 4,098,575, Cl. 23-230.00R.
Matsushita, Yoshihiro: *See—*
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Mattheis, Harley H.; and Potter, Edward J., to Ethyl Development Corporation. Plastic container. 4,098,430, Cl. 220-339.000.
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Maul, James J.; and Carlson, Richard D., to Hooker Chemicals & Plastics Corp. Halogen containing fire retardant additive with improved heat stability. 4,098,761, Cl. 260-45.75B.
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McAvoy, Bruce R., to Westinghouse Electric Corp. Bulk acoustic delay device. 4,099,147, Cl. 333-30.00R.
McCain, Elizabeth G. Purse for organizing personal articles. 4,098,312, Cl. 150-35.000.
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McChesney, Leroy S., to Towner Manufacturing Company. Disc harrow with support wheels having interconnected separate mounting mechanisms. 4,098,348, Cl. 172-406.000.
McCollough, John K., to Milliken Research Corporation. Dyeing method. 4,097,946, Cl. 8-150.000.
McCready, Samuel D., to Harry S. Peterson Company. Joint seal. 4,098,043, Cl. 52-403.000.
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  Maddock, Robert W., 4,098,271, Cl. 128-142.300.
  Waters, E. Dale, 4,098,326, Cl. 165-76.000.
McDowell, Peter Vincent, to Holset Engineering Company Limited. Flow control valves. 4,098,085, Cl. 60-600.000.
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McGregor, Howard Norman; and Chanaud, Robert Charles. Vibration masking noise system. 4,098,370, Cl. 181-150.000.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted pyridine carboxylic acids and derivatives. 4,098,792, Cl. 260-294.80F.
McKinney, Charles R., to Du Pont de Nemours, E. I., and Company. Mass spectrometer beam monitor. 4,099,052, Cl. 250-283.000.
McKinney, David B.; and Eschenbach, Paul W., to Milliken Research Corporation. Device for scrubbing surfaces. 4,097,953, Cl. 15-320.000.
McLarty, Daniel R., to Textron Inc. Traction-drive transmission. 4,098,146, Cl. 74-690.000.
McLean, James N., to Herr Manufacturing Company, Inc. Wick-lubricated spinning and twisting ring. 4,098,067, Cl. 57-120.000.
McLouski, Raymond M.; and Reid, Philip R., to Westinghouse Electric Corp. Gate fabrication method for MNOS memory devices. 4,098,924, Cl. 427-93.000.
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  Yang, David C., 4,098,687, Cl. 209-166.000.
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Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, to Kali-Chemie Aktiengesellschaft. Benzodiazepin derivatives. 4,098,786, Cl. 260-239.0BD.
Miller, Calvin L., to Caterpillar Tractor Co. Drive disconnect device. 4,098,138, Cl. 74-405.000.
Miller, Gary M.; and Koch, Curtis J., to United States of America, Army. Hypervelocity projectile with aluminum components of high resistance to thermodynamic ablation. 4,098,194, Cl. 102-105.000.
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Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, to Kyowa Chemical Industry Co., Ltd. Magnesium hydroxides having oovel structure, process for production thereof, and resin compositions containing them. 4,098,762, Cl. 260-45.70R.
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Morrison, Bertram L., to ACF Industries, Incorporated. Valve body-bonnet joint. 4,098,490, Cl. 251-329.000.
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Mourier, Georges, to Thomson-CSF. Electronic tube for generating millimetric wave pulses. 4,099,093, Cl. 315-39.300.
Mourier, Georges, to Thomson-CSF. Electronic tube of magnetron type operating as a oscillator or an amplifier. 4,099,094, Cl. 315-39.300.
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Muchisky, Thomas Peter; and Nemer, Russel A., to Muchisky, Thomas P. Massage apparatus. 4,098,266, Cl. 128-36.000.
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Alm, Benjamin C., Jr.; Hopwood, Francis W.; Jelen, Robert A.; Muhlbaier, John P.; and Wright, Joseph F., Jr., 4,099,137, Cl. 331-16.000.
Muller, Rolf, to Papst-Motoren KG. Brushless d-c motor system. 4,099,104, Cl. 318-138.000.
Mundipharma AG: *See—*
Kelly, William, deceased; Kelly, John, joint personal representative; and Halpern, Alfred, 4,098,813, Cl. 260-501.150.
Murai, Hiromu; Ohata, Katsuya; Sempuku, Kenji; Aoyagi, Yoshiaki; and Ueda, Fusao, to Nippon Shinyaku Co., Ltd. Nicotinamido-s-triazines. 4,098,892, Cl. 424-249.000.
Murakami, Sanpei: *See—*
Hisaki, Shigeru; Okada, Ken; and Murakami, Sanpei, 4,098,906, Cl. 426-94.000.
Murakami, Tadashi: *See—*
Okada, Eiichi; Ebisawa, Hiroo; Honma, Masashi; and Murakami, Tadashi, 4,098,184, Cl. 101-41.000.
Murakami, Tetsushi: *See—*
Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.
Murdock Machine & Engineering Company: *See—*
Herbert, John T.; Kovitch, Frank J.; and Sullivan, Paul E., 4,098,527, Cl. 285-167.000.
Murman, Fernando, to Hydril Company. Blowout preventer packing unit with slanted reinforcing inserts. 4,098,516, Cl. 277-235.00R.
Murray, Leonard Quintin. Telephone security device. 4,099,033, Cl. 179-90.00D.
Muschelknautz, Edgar: *See—*
Bueb, Michael; and Muschelknautz, Edgar, 4,098,115, Cl. 73-144.000.
Mussler, James M.: *See—*
Zitelli, William E.; Mussler, James M.; and Szabo, Andras I., 4,099,237, Cl. 364-494.000.
Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Vinyl nortricyclane. 4,098,835, Cl. 260-666.0PY.
N. Schlumberger & Cie.: *See—*
Herubel, Jean Frederic, 4,097,964, Cl. 19-236.000.
Nagai, Yoshinori: *See—*
Ohkawa, Hideo; Nagai, Yoshinori; Kozakura, Shiro; Mugino, Yutaka; Fujimoto, Noriki; and Tomikawa, Masami, 4,098,752, Cl. 260-31.40R.
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Haruta, Yasuo; Nagasoe, Kazumasa; Shiga, Norio; Morino, Ikuo; and Aisu, Nobuo, 4,098,785, Cl. 264-220.000.
Nagata, Nobuyoshi; and Taniguchi, Shu, to Nippon Paint Co., Ltd. Thermoplastic copolymers and preparation thereof. 4,098,841, Cl. 260-837.00R.
Nagy, Daniel Elmer: *See—*
Barua, Girish Chandra; and Nagy, Daniel Elmer, 4,098,987, Cl. 526-304.000.
Nair, Vijay Gopalan; Joseph, Joseph Peter; and Bernstein, Seymour, to American Cyanamid Company. Polygalactosido-sucrose Poly(H-)sulfate salts. 4,098,995, Cl. 536-54.000.
Naka, Hiromitsu. Access door. 4,098,024, Cl. 49-246.000.
Nakamura, Norihiko: *See—*
Noguchi, Masaaki; Sanda, Shougo; Nakamura, Norihiko; and Kato, Takashi, 4,098,246, Cl. 123-119.00A.
Nakane, Masanori: *See—*
Ishii, Eiichi; Ishikawa, Hiroshi; Uehara, Itsuki; Nakane, Masanori; and Miyake, Yoshizo, 4,098,875, Cl. 423-658.000.
Nakano, Kazuo: *See—*
Tateno, Hidenori; and Nakano, Kazuo, 4,098,241, Cl. 123-97.00B.
Nakaya, Ikuo: *See—*
Nakayama, Shiro; Nakayama, Kuniyuki; and Nakaya, Ikuo, 4,098,930, Cl. 427-246.000.
Nakayama, Kuniyuki: *See—*
Nakayama, Shiro; Nakayama, Kuniyuki; and Nakaya, Ikuo, 4,098,930, Cl. 427-246.000.
Nakayama, Shiro; Nakayama, Kuniyuki; and Nakaya, Ikuo, to Fujikawa Cable Works, Ltd., The. Method for producing microporous separator for electrochemical cell, 4,098,930, Cl. 427-246.000.
Nalco Chemical Company: *See—*
Stanford, James R.; Martin, John H.; and Chappell, George D., 4,098,716, Cl. 252-188.000.
Naohiko, Hattori: *See—*
Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, 4,099,208, Cl. 358-296.000.
Narumi China Corporation: *See—*
Kuroda, Toshiro; and Kakami, Susumu, 4,098,939, Cl. 428-201.000.
Nasutavicus, Wilmonte A.: *See—*
Grinstead, Robert R.; and Nasutavicus, Wilmonte A., 4,098,867, Cl. 423-24.000.
National Engineering Company: *See—*
Howlett, Philip C., 4,098,494, Cl. 366-144.000.
National Manufacturing Co.: *See—*
Edeus, James A., 4,098,530, Cl. 292-113.000.
National Patent Search Associates, Inc.: *See—*
Ferguson, Andrew Marvin; and Keith, Ernest Voshell, 4,098,521, Cl. 280-242.0WC.
National Semiconductor Corporation: *See—*
Hartzler, Earnest D.; and Levesque, Paul D., 4,099,037, Cl. 200-5.00A.
Meyer, John Evert, 4,099,171, Cl. 340-335.000.
National-Standard Company: *See—*
Rawls, Vaughn, 4,098,936, Cl. 428-40.000.
National Starch and Chemical Corporation: *See—*
Tessler, Martin M., 4,098,997, Cl. 536-106.000.
National Steel Corporation: *See—*
Judge, James R., 4,098,576, Cl. 23-230.0PC.
Nebelung, Hermann, to Emhart Industries, Inc. Rotary snubber for linear actuator. 4,098,597, Cl. 65-181.000.
NECCHI Societa per Azioni: *See—*
Bar, Alfredo, 4,099,154, Cl. 338-220.000.
Neel, Alan Fobes, II: *See—*
Andrews, Donald Richard; Neel, Alan Fobes, II; and Zegafuse, Donald Ward, 4,099,254, Cl. 364-900.000.
Negrin, Gilbert, to Celette S.A., Vienne. Distortion detection device, notably for motor vehicle frames. 4,098,003, Cl. 33-288.000.
Nelson, Charles Jay: *See—*
Morris, William E.; and Nelson, Charles Jay, 4,098,864, Cl. 264-290.00T.
Nelson, Gerald V.: *See—*
Ganster, Charles A.; Callaghan, Mary E.; Gilmer, Lee K.; Nelson, Gerald V.; and Miller, Kenneth D., 4,098,721, Cl. 252-439.000.
Nelson, Lloyd A.: *See—*
Dietz, Max R.; Keim, Cameron D.; and Nelson, Lloyd A., 4,098,050, Cl. 53-26.000.
Nelson, Norman A., to Upjohn Company, The. 4,5,6-Trinor-3,7-inter-m-phenylene prostaglandin E_1 analogs. 4,099,013, Cl. 560-53.000.
Nemechek, Alfred Emmerich: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,098,445, Cl. 226-186.000.
Nemer, Russel A.: *See—*
Muchisky, Thomas Peter; and Nemer, Russel A., 4,098,266, Cl. 128-36.000.
Nepela, Daniel Andrew; Rice, Donald Winston; and Suits, James Carr, to International Business Machines Corporation. Ferromagnetic palladium alloys. 4,098,605, Cl. 75-122.000.
Nestrock, Frederick L., to Union Manufacturing Company. Liquid-dispensing vacuum bottle or the like. 4,098,304, Cl. 141-84.000.
Neumann, John W., to Oxy Metal Industries Corporation. Rotary conveying apparatus. 4,098,568, Cl. 432-230.000.
Neumann, Leonard H., to Lozier Store Fixtures. Universal shelf system. 4,098,480, Cl. 248-243.000.
Neuray, Dieter; Vernaleken, Hugo; Wulff, Claus; and Lange, Ralf, to Bayer Aktiengesellschaft. Process for the preparation of high molecular thermoplastic polycarbonates of low flammability. 4,098,754, Cl. 260-37.0PC.
Newman, Howard Fred: *See—*
Bloom, William George; Newman, Howard Fred; and Schmidt, Gerald Warren, 4,098,276, Cl. 128-215.000.
Ngo, Peter Dinh-Tuan: *See—*
Maliszewski, Stephen Raymond; and Ngo, Peter Dinh-Tuan, 4,099,170, Cl. 340-324.00M.

Nichols, Robert A., to Fuel Sentry Corp. Heater attachment device for a wall-mounted thermostat. 4,099,152, Cl. 337-102.000.

Nicklin, Thomas; and Farrington, Frederick, to British Gas Corporation. Gas purification liquors. 4,098,886, Cl. 423-226.000.

Nidola, Antonia: *See—*
De Nora, Vittorio; Spaziante, Placido M.; and Nidola, Antonia, 4,098,669, Cl. 204-252.000.

Niedner, Peter; Hillekamp, Klaus; and Kindler, Hubert, to Krauss-Maffei Aktiengesellschaft. Method of treating refuse for reclamation of valuable components thereof. 4,098,464, Cl. 241-24.000.

Nigh, Billy John. Construction element clamp. 4,098,282, Cl. 135-5.00R.

Nikaido, Akira, to Citizen Watch Co., Ltd. Composite pulse motor for a timepiece. 4,099,106, Cl. 318-115.000.

Nikko Seiki Company Limited: *See—*
Kato, Kazuma, 4,098,163, Cl. 84-306.000.

Nikku Industry Co., Ltd.: *See—*
Taniguchi, Toru, 4,098,428, Cl. 220-319.000.

Nikolashina, Ljudmila Alexeevna: *See—*
Lidorenko, Nikolai Stepanovich; Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Zhemchuzhina, Elena Alexandrovna; Chernousov, Lev Nikolaevich; Shmidt, Igor Aronovich; Nikolashina, Ljudmila Alexeevna; Gelfgat, David Mendeleevich; and Sgibnev, Igor Vladimirovich, 4,098,617, Cl. 148-1.500.

Ninomiya, Hideaki: *See—*
Yamamoto, Hirotaka; Ninomiya, Hideaki; and Kobayashi, Makoto, 4,098,725, Cl. 252-519.000.

Nippon Electric Co., Ltd.: *See—*
Maruta, Rikio; Itoh, Yasuo; and Tomozawa, Atsushi, 4,099,029, Cl. 179-15.0BA.
Morimoto, Koichi; and Tokumaru, Tatsuo, 4,097,985, Cl. 29-570.000.
Yoshida, Yasuharu, 4,099,130, Cl. 329-104.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hirose, Akira, 4,097,931, Cl. 2-21.000.
Oguri, Kenro, 4,099,139, Cl. 330-298.000.
Okamoto, Eisaku; and Ichikawa, Kiyoshi, 4,098,162, Cl. 84-1.010.

Nippon Kogaku K.K.: *See—*
Takahata, Koichi, 4,099,100, Cl. 315-241.00P.
Tsuruoka, Tomio, 4,099,190, Cl. 354-225.000.
Watanabe, Sakuji, 4,099,115, Cl. 323-19.000.

Nippon Paint Co., Ltd.: *See—*
Haruta, Yasuo; Nagasoe, Kazumasa; Shiga, Norio; Morino, Ikuo; and Aisu, Nobuo, 4,098,785, Cl. 264-220.000.
Nagata, Nobuyoshi; and Taniguchi, Shu, 4,098,841, Cl. 260-837.00R.

Nippon Seiko Kabushiki Kaisha: *See—*
Yamaguchi, Mikio, 4,098,141, Cl. 74-492.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Yoshida, Motoaki; and Sakata, Nobuhiro, 4,098,931, Cl. 427-324.000.

Nippon Shinyaku Co., Ltd.: *See—*
Murai, Hiromu; Ohata, Katsuya; Sempuku, Kenji; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,098,892, Cl. 424-249.000.

Nippon Telegraph & Telephone Public Corp.: *See—*
Okamoto, Hiroshi; and Ikeda, Mutsuo, 4,099,144, Cl. 331-107.00R.

Nippondenso Co., Ltd.: *See—*
Konishi, Kiyokazu; and Yoshida, Hiroshi, 4,098,247, Cl. 123-119.00R.
Sumiyoshi, Masaharu; Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Hasegawa, Takashi; and Shiozaki, Makoto, 4,098,244, Cl. 123-117.00R.
Yoshida, Hiroshi; and Konishi, Kiyokazu, 4,098,243, Cl. 123-117.00D.

Nishihara, Akio: *See—*
Sakurai, Toshio; Nishihara, Akio; Handa, Takuro; Katoh, Hidekatsu; Tomoda, Yoshiro; Aoki, Kazumi; and Yoto, Makoto, 4,098,705, Cl. 252-33.600.

Nishina, Shingo: *See—*
Yamazawa, Tokumi; and Nishina, Shingo, 4,097,996, Cl. 33-1.00M.

Nissan Motor Company, Limited: *See—*
Kita, Toru; and Fujishiro, Takeshi, 4,098,653, Cl. 204-1.00T.

Nitanda, Hiroshi: *See—*
Komori, Shigehiro; Hayakawa, Kimiaki; Nitanda, Hiroshi; and Inuzuka, Tsuneki, 4,098,551, Cl. 355-3.00R.

Nixon, Brian George; and Stimpson, Ian William, to Weighload Limited. Safe load indicator for jib cranes. 4,098,410, Cl. 212-39.0MS.

Noakes, Michael Lesney: *See—*
Cairns, James Anthony; and Noakes, Michael Lesney, 4,098,722, Cl. 252-466.00J.

Noboru, Sasamoto: *See—*
Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, 4,099,208, Cl. 358-296.000.

Nobuhiro, Azuma: *See—*
Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, 4,099,208, Cl. 358-296.000.

Noesen, Stanley J., to General Electric Company. Terminal connection for aluminum conductor and method of making. 4,098,449, Cl. 228-115.000.

Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, to Hoechst Aktiengesellschaft. Bromine-containing cyclic phosphonic acid esters. 4,098,759, Cl. 260-45.80R.

Noguchi, Masaaki; Sanda, Shougo; Nakamura, Norihiko; and Kato, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal-combustion engine with an auxiliary combustion chamber. 4,098,246, Cl. 123-119.00A.

Noomen, Arie; and Kik, Leendert Anton, to Akzo N.V. Method of coating underwater metal surfaces. 4,098,928, Cl. 427-203.000.

Nord-Plan Stalreoler A/S: *See—*
Jorgensen, Ib Offer, 4,098,197, Cl. 108-109.000.

Noren, Robert C.; and Spritzer, Michael H., to General Atomic Company. Gas coating apparatus. 4,098,224, Cl. 118-49.000.

Noreus, Sture Erik Olof; and Uhlin, Lars Tage, to Mo och Domsjo Aktiebolag. Process for reducing the requirement of fresh chemicals without increasing emissions in the pulping of cellulosic material. 4,098,639, Cl. 162-30.00K.

Norfolk & Western Railway Company: *See—*
Jackson, William G.; Seibert, Lance; Bates, Dillard T.; and Smith, James M., 4,098,049, Cl. 53-22.00B.

Norman, Maurice. Environmental, small-part continuous washing apparatus. 4,098,225, Cl. 118-64.000.

North Shore Precision Research Corporation: *See—*
Davidson, William Ward, Jr., 4,098,185, Cl. 101-137.000.

Northern Telecom Limited: *See—*
Boynton, Robert James; and Livermore, Frederick Caldwell, 4,099,046, Cl. 219-216.000.
Ibrahim, Abd-El-Fattah Ali; and Berglund, Carl Neil, 4,099,197, Cl. 357-24.000.
Yee, Henry Kai-Hen, 4,099,149, Cl. 333-72.000.

Norton, Henry James: *See—*
Gotchel, Joel Peter; and Norton, Henry James, 4,097,965, Cl. 19-306.000.

Nothe, Bjorn, to Siemens Aktiengesellschaft. Method of producing optical cables. 4,098,926, Cl. 427-163.000.

Nott, Alan J., to Anglo-American Clays Corporation. Brightening of clay by froth flotation. 4,098,688, Cl. 209-166.000.

Novanex Automation N.V.: *See—*
Laupman, Robert Ronald, 4,099,135, Cl. 330-109.000.

Novotny, Charles J., to Industrial Filter & Pump Mfg. Co. Distributor-collector assembly. 4,098,695, Cl. 210-85.000.

Novvo Industri A/S: *See—*
Guddal, Erling, 4,098,796, Cl. 260-326.00E.

Nowak, Leonard G.; and Shefsiek, Paul K., to Thermo Electron Corporation. Dual fuel radiant tube burner. 4,098,255, Cl. 126-91.00A.

Nowlin, William E. Angle gauge. 4,097,999, Cl. 33-75.00R.

Nusco Kabushiki Kaisha: *See—*
Hayashi, Shigeki, 4,099,113, Cl. 318-632.000.

Nye, Martin N.: *See—*
Schuette, Henry W.; and Nye, Martin N., 4,098,008, Cl. 34-191.000.

Nygaard, Nils Hansson, to Danfoss A/S. Protective circuit for an inverter. 4,099,225, Cl. 363-56.000.

Nysten, Bernhard, to William Prym-Werke KG. Button having a stitchless fastener. 4,097,969, Cl. 24-90.00R.

Obermeier, Rainer: *See—*
Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Teetz, Volker, 4,098,779, Cl. 260-112.50R.

Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Thiazolylacetamido cephalosporin type compounds. 4,098,888, Cl. 424-246.000.

O'Connell, Thomas Christopher, to Johnson & Johnson. Absorbent pad. 4,097,943, Cl. 5-335.000.

Odell, George V.: *See—*
Kays, Stanley J.; and Odell, George V., 4,098,765, Cl. 528-1.000.

Odell, Raymond: *See—*
Lowe, Brian Arthur; and Odell, Raymond, 4,097,929, Cl. 2-10.000.

Odermann, Charles Robert: *See—*
Suchsland, Alfred Rolf; Tyburcy, Raymond Steven; and Odermann, Charles Robert, 4,098,206, Cl. 112-220.000.

Oehmke, Richard W., to Minnesota Mining and Manufacturing Company. Soft conductive materials. 4,098,945, Cl. 428-327.000.

Oelschlaeger, George Frederick: *See—*
Stanfill, Ralph Everette; Steinbach, James Gerald; Rehn, Gary Allen; Oelschlaeger, George Frederick; and Jackson, William Wayne, 4,098,346, Cl. 172-283.000.

Oesterlin, Rudolf: *See—*
Bell, Malcolm R.; and Oesterlin, Rudolf, 4,098,797, Cl. 260-326.620.

Office National D'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Frechin, Lucette, 4,098,665, Cl. 204-213.000.

Ogata, Yasuhiro: *See—*
Asao, Yasuzi; Ogata, Yasuhiro; and Hosoi, Noriyuki, 4,098,114, Cl. 73-141.00R.

Ogawa, Kinya; Kurimoto, Kazuhiko; Eguchi, Yoshitugu; and Kuwata, Satoshi, to Shin-Etsu Chemical Co., Ltd. Method for bulk polymerization of vinyl chloride. 4,098,972, Cl. 526-62.000.

Ogle, James A.: *See—*
Holz, George E.; and Ogle, James A., 4,099,096, Cl. 315-169.0TV.

Ogren, Sven Ove: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,098,901, Cl. 424-311.000.

Oguchi, Kikuo: *See—*
Shibata, Shin; and Oguchi, Kikuo, 4,099,078, Cl. 310-361.000.

Ogura, Shoni, to Kanazawa Tsusho Sangyo Kabushiki Kaisha. Float made of an automobile-tire. 4,098,214, Cl. 114-267.000.

Oguri, Kenro, to Nippon Gakki Seizo Kabushiki Kaisha. Power amplifier circuit. 4,099,139, Cl. 330-298.000.

O'Hara, Mark J., to UOP Inc. Hydrodesulfurization catalyst and method of preparation. 4,098,682, Cl. 208-216.000.

Ohashi, Takashi: *See—*
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,098,732, Cl. 521-125.000.

Ohata, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for controlling the ignition timing of an internal combustion engine. 4,098,245, Cl. 123-117.00A.

Ohata, Katsuya: *See—*
Murai, Hiromu; Ohata, Katsuya; Sempuku, Kenji; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,098,892, Cl. 424-249.000.

Ohba, Toshihiro: *See—*
Maeda, Hidetoshi; and Ohba, Toshihiro, 4,099,074, Cl. 307-308.000.

Ohkawa, Hideo; Nagai, Yoshinori; Kozakura, Shiro; Mugino, Yutaka; Fujimoto, Noriki; and Tomikawa, Masami, to Idemitsu Kosan Company, Ltd. Thermoplastic resin composition suitable for extrusion molding. 4,098,752, Cl. 260-31.40R.

Ohshima, Nobumasa: *See—*
Yamazoe, Hiroshi; Kawarada, Hiroshi; Sato, Hisanao; and Ohshima, Nobumasa, 4,099,091, Cl. 313-509.000.

Ohta, Toshihiko: *See—*
Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.

Okada, Akira: *See—*
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,098,762, Cl. 260-45.70R.

Okada, Eiichi; Ebisawa, Hiroo; Honma, Masashi; and Murakami, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Pressure operated flexible transfer member for screen printer. 4,098,184, Cl. 101-41.000.

Okada, Ken: *See—*
Hisaki, Shigeru; Okada, Ken; and Murakami, Sanpei, 4,098,906, Cl. 426-94.000.

Okada, Tadashi: *See—*
Hattori, Hajime; Usui, Eiji; Oya, Takashi; Sugawa, Kaneyoshi; Kezuka, Eiji; Okada, Tadashi; and Watanabe, Toshiro, 4,099,205, Cl. 358-149.000.

Okada, Taiiti: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,098,888, Cl. 424-246.000.

Okamoto, Eisaku; and Ichikawa, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Synthesizer type electronic musical instrument. 4,098,162, Cl. 84-1.010.

Okamoto, Hiroshi; and Ikeda, Mutsuo, to Nippon Telegraph & Telephone Public Corp. Injection-locked ultra-high frequency solid-state oscillator. 4,099,144, Cl. 331-107.00R.

Okawa, Susumu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for supplying fuel to an internal combustion engine. 4,098,236, Cl. 123-41.020.

Okawa, Tadashi; Matsuda, Yasuo; Hayashida, Hiroshi; and Maeda, Takeo, to Hitachi, Ltd. Variable speed control apparatus for induction motor. 4,099,108, Cl. 318-227.000.

Okazaki, Tosihumi: *See—*
Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,098,762, Cl. 260-45.70R.

Okubo, Hiroshi: *See—*
Yoshida, Masaru; Kaetsu, Isao; Okubo, Hiroshi; and Ito, Akihiko, 4,098,840, Cl. 260-827.000.

Okuda, Takio; and Inada, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Ultrasonic testing method and apparatus for resistance welding. 4,099,045, Cl. 219-109.000.

Okukawa, Yasutoshi, to Rank Xerox, Ltd. Copying machine. 4,098,552, Cl. 355-8.000.

Okumura, Masahide; and Saito, Yasushi, to Hitachi, Ltd. SEM having D-C bias of video signal controlled by maximum and/or minimum of CRT beam current. 4,099,054, Cl. 250-306.000.

Okuno, Chuzo: *See—*
Shimizu, Tetsuo; Ichiba, Shigeru; Koizumi, Shun; and Okuno, Chuzo, 4,098,975, Cl. 526-73.000.

Olander, Walter K., to General Electric Company. Polyphenylene oxide polystyrene product-by-process. 4,098,846, Cl. 260-874.000.

Olbert, Manfred, to International Business Machines Corporation. Method of forming air bearing rails of head assemblies. 4,098,032, Cl. 51-326.000.

Olesen, Ole L.: *See—*
Krar, George R.; Olesen, Ole L.; Sederquist, Richard A.; and Szydlowski, Donald F., 4,098,587, Cl. 48-94.000.

Oligschlaeger, Frederick Frank, to Dickey-john Corporation. Hydraulic system for broadcast spreader. 4,098,433, Cl. 222-63.000.

Olin Corporation: *See—*
Fullington, Michael C.; and Moller, Kurt H., 4,099,005, Cl. 544-190.000.
Ralston, Richard W., 4,098,666, Cl. 204-228.000.

Oliver, Brian H.: *See—*
Custer, Harry S.; and Oliver, Brian H., 4,098,670, Cl. 204-252.000.

Olivier-Martin, Jean, to Societe Technique pour l'Utilisation de la Precontrainte. Concrete unit prestressed using tendons stressed before concreting, more particularly a railway sleeper. 4,098,460, Cl. 238-91.000.

Olney, Wallace E.; and Wright, Robert G., to Brown Company. Filter paper cup for a percolator and process for making the same. 4,098,177, Cl. 99-310.000.

Olson, Mark W.: *See—*
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Ormond, Douglas William, Jr.: *See—*
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Owan, Thomas A., to Boeing Company, The. Steering control system for hydrofoils. 4,098,215, Cl. 114-275.000.

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Owens-Corning Fiberglas Corporation: *See—*
Carvalho, Robert L.; and Benson, Gustav E., 4,098,316, Cl. 152-362.00R.

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Francel, Josef; King, James E.; and Woulbroun, John M., 4,098,611, Cl. 106-53.000.
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Schermerhorn, Jerry D.; and Slottow, Hiram G., 4,099,097, Cl. 315-169.0TV.
Uhlig, Albert R., 4,098,434, Cl. 222-94.000.
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Pomerantz, Daniel I.; and Sandler, Louis M., 4,099,167, Cl. 340-620.000.

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Palmer, Jack; and Weisser, Sidney, to Cine Magnetics Inc. Chemical replenishing system. 4,098,431, Cl. 222-39.000.

Palumbo, Benedict A., to Honeywell Information Systems Inc. Memory block protection apparatus. 4,099,243, Cl. 364-200.000.

Panousis, Peter Theodore: *See—*
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Paolinelli, Antonio; Pellizzon, Tullio; and Piccolo, Luigi, to Euteco S.p.A. Process for the hydrolysis of titanyl sulphate solutions. 4,098,869, Cl. 423-85.000.
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Partyka, Richard Anthony: *See—*
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Patch, Theodore Neel. Table with two braced legs. 4,098,198, Cl. 108-161.000.
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Pauling, Horst: *See—*
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Peck, William H.; and Tekulve, Daniel R., to Hill-Rom Company, Inc. Hospital bed. 4,097,939, Cl. 5-63.000.
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Pelavin, Joseph Y., to Lark Luggage Corporation. Garment bag. 4,098,376, Cl. 190-43.000.
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  Sanchez, Jose, 4,098,981, Cl. 526-204.000.
  Sandler, Stanley Robert, 4,098,704, Cl. 252-8.600.
Penny, Samuel Lee; and Clamon, Robert Dale, to Dresser Industries, Inc. Cone locking system for a rotary rock bit. 4,098,150, Cl. 76-108.00A.
Pentney, Harry, to Gillette Company, The. Plastic double edge razor. 4,097,990, Cl. 30-57.000.
Pentreath, David William; and Colledge, Malcolm, to Porto & Valente Industries Pty. Limited. Method and apparatus for joining pipes. 4,097,982, Cl. 29-451.000.
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Perez, Thomas. Coffee brewing device. 4,098,176, Cl. 99-303.000.
Peripheral Dynamics, Inc.: *See—*
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Perkin-Elmer Corporation, The: *See—*
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Perkins, Lee E., to Kajan Specialty Company, Inc. Jarring method and apparatus for well bore drilling. 4,098,338, Cl. 166-301.000.
Perlaky, Charles, to United States Steel Corporation. Methods and compositions for dispersing oil films. 4,098,694, Cl. 210-59.000.
Perrin, Robert Marc; Aureille, Gisele; Vincent-Falquet, Marie-Francoise; and Collange, Edmond, to Chrysa. Bactericidic and fungicidic chloromethylisopropylphenols. 4,098,828, Cl. 568-126.000.
Persson, Per; and Koppelomaki, Leo. Loudspeaker for vehicles. 4,099,026, Cl. 179-1.0VE.
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  Pesola, Jeannette E.; and Pesola, Oiva J., 4,098,483, Cl. 248-311.10R.
Peters, Kenneth Donald, to RCA Corporation. Guided beam flat display device with focusing guide assembly mounting means. 4,099,087, Cl. 313-422.000.
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  Peters, Melville F., 4,098,262, Cl. 126-270.000.
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Peterson, David C., to Upjohn Company, The. 3,7-Inter-m-phenylene-4,5,6-trinor-12,13(e)-didehydro-13,14-dehydro-PGD_1 compounds. 4,099,014, Cl. 560-53.000.
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Peterson, Sven Tage, to Telefonaktiebolaget L M Ericsson. Fastening arrangement in a telephone instrument of the one-piece type. 4,099,034, Cl. 179-100.00R.
Peterson, Wesley Robinson, to Singer Company, The. Electromechanical needle bar engaging device. 4,098,207, Cl. 112-221.000.
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  Bright, Gene M., 4,098,993, Cl. 536-9.000.
  Bright, Gene M., 4,098,994, Cl. 536-9.000.
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  Pope, Max D., 4,098,675, Cl. 208-108.000.
  Stapp, Paul R., 4,099,018, Cl. 560-246.000.
  Tieszen, Dale O.; and Marrs, Oren L., 4,098,776, Cl. 528-481.000.
Phillips, William H. Quick engage and release sling for tubular members. 4,098,532, Cl. 294-75.000.
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  O'Neill, Cormac G., 4,098,560, Cl. 417-214.000.
Piasio, Roger N.; Ryan, James W.; and Woiszwillo, James E., to Corning Glass Works. Reverse sandwich immunoassay. 4,098,876, Cl. 424-1.000.
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Pierre Fabre S.A.: *See—*
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Pietzsch, Ludwig; and Overlach, Knut, to Pietzsch, Ludwig. Device for the measurement of wheel or axle loads of road vehicles. 4,098,365, Cl. 177-211.000.
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Pike, Charles T., to Jersey Nuclear-Avco Isotopes, Inc. Free jet laser amplifier. 4,099,131, Cl. 330-4.300.
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Pillai, Muniraj D.: *See—*
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  Haytayan, Harry M., 4,098,295, Cl. 137-625.270.
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Pogorelov, Valery Viktorovich; Trusov, Sergei Mikhailovich; Kolbin, Nikolai Petrovich; and Chistyakov, Lev Nikolaevich. Hydraulic torque converter. 4,098,080, Cl. 60-361.000.
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Pollner, Rudolf, to Robert Bosch GmbH. Method to attach the center electrode into a ceramic insulator body of spark plugs. 4,097,977, Cl. 29-25.120.
Pollock, Richard, to Borg-Warner Corporation. Surface spray coating of latex foams. 4,098,944, Cl. 428-284.000.
Pomerantz, Daniel I.; and Sandler, Louis M., to P.R. Mallory & Co. Inc. Capacitive means for measuring the level of a liquid. 4,099,167, Cl. 340-620.000.
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Pope, Max D., to Phillips Petroleum Company. Preventing ammonium chloride deposition. 4,098,675, Cl. 208-108.000.
Popoff, Ivan Christoff; Mailey, Everett A.; and Haines, Paul Gordon, to Pennwalt Corporation. Non-blooming accelerator and process for vulcanization of EPDM elastomers. 4,099,003, Cl. 544-137.000.
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  DeMajistre, Robert, 4,098,918, Cl. 427-36.000.
  Scriven, Roger L.; and Chang, Wen-Hsuan, 4,098,743, Cl. 260-29.2TN.
  Wallace, David R., 4,098,740, Cl. 260-29.6NR.
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Price, Jerry Lee, to United Technologies Corporation. Paired blade assembly. 4,098,559, Cl. 416-230.000.
Prime, Derek Arthur, to J.C. Bamford Excavators Limited. Hydraulic control valve assembly. 4,098,286, Cl. 137-270.000.
Prince, Douglas F., to Castone Development Corporation. Concrete product manufacturing system. 4,098,563, Cl. 425-204.000.
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Pringle, William L., to United States Steel Corporation. Sofa bed assembly. 4,097,938, Cl. 5-18.00R.
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  Jones, Kenneth L., 4,098,713, Cl. 252-89.000.
  Krummel, H. Karl; and Wise, Rodney Mahlon, 4,098,818, Cl. 260-535.00R.
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  Shulman, Joel Ira, 4,098,911, Cl. 426-547.000.
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Proulx, Raymond E. Rotary cutting head for mowers equipped with flexible cutting blades. 4,097,991, Cl. 30-276.000.
Prunier, Louis, to American Optical Corporation. Adaptor for lens surfacing tool. 4,098,028, Cl. 51-216.0LP.
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Punchev, Simeon Georgiev: *See—*
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Purdum, Charles R., to Standard Oil Company, The. Vapor recovering fuel dispensing nozzle. 4,098,308, Cl. 141-285.000.
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Quick, Donald J., to Massey-Ferguson Services N.V. Sugar cane harvesters. 4,098,060, Cl. 56-13.900.
Raab, Guenter: *See—*
  Sommer, Klaus; and Raab, Guenter, 4,098,814, Cl. 260-502.500.
Rabatin, Jacob G., to General Electric Company. Fluorescent lamp utilizing terbium-activated rare earth oxyhalide phosphor material. 4,099,089, Cl. 313-487.000.
RACAL-Amplivox Communications Ltd.: *See—*
  Lowe, Brian Arthur; and Odell, Raymond, 4,097,929, Cl. 2-10.000.
Raceway Components, Inc.: *See—*
  Kohaut, John E., 4,099,020, Cl. 174-48.000.
Raimar, Wolfgang: *See—*
  Hoschler, Hans; Raimar, Wolfgang; and Brandmaier, Klaus, 4,099,235, Cl. 364-200.000.
Rajchman, Jan Aleksander: *See—*
  Endriz, John Guiry; Rajchman, Jan Aleksander; and van Raalte, John A., 4,099,085, Cl. 313-400.000.
Rajput, Yudh Vir; and Fickle, Kirby, to B. F. Goodrich Company, The. Indicator energizing monitor circuit for anti-skid brake control systems and the like. 4,098,542, Cl. 303-92.000.
Ralston, Richard W., to Olin Corporation. Apparatus for regulating anode-cathode spacing in an electrolytic cell. 4,098,666, Cl. 204-228.000.
Ramioulle, Jean: *See—*
  Couteau, Willy; and Ramioulle, Jean, 4,098,820, Cl. 260-561.00R.
Rammler, Roland; Schmalfeld, Paul; and Weiss, Hans-Jurgen, to Metallgesellschaft Aktiengesellschaft. Recovery of hydrocarbonaceous material from tar sands. 4,098,674, Cl. 208-11.00R.
Randolph, John W. Omni-directional moving picture taking and exhibiting apparatus. 4,098,550, Cl. 352-69.000.
Rank Xerox, Ltd.: *See—*
  Okukawa, Yasutoshi, 4,098,552, Cl. 355-8.000.
Ranney, Richard D.; and Hubert, Gustav, to Emdeko International,

Inc. Test means for light responsive smoke detector. 4,099,178, Cl. 340-515.000.

Rapshys, William, to Motorola, Inc. Directive antenna with reflectors and directors. 4,099,184, Cl. 343-875.000.

Raskevicius, Leo, to Walter Kidde & Company, Inc. Cylinder lock. 4,098,103, Cl. 70-364.00A.

Rasmus, Boyd R., to Pillsbury Company, The. Press for removing liquids from amorphous material. 4,098,182, Cl. 100-121.000.

Rasmussen, Oystein E. Method for protecting ships against fouling. 4,098,925, Cl. 427-154.000.

Raspanti, Giuseppe, to Sandoz Ltd. Method for eliminating or preventing the brightening effects of anionic optical brighteners. 4,098,954, Cl. 428-537.000.

Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,099,000, Cl. 544-17.000.

Rath, Gero: *See—*
Roth, Haye; and Rath, Gero, 4,098,603, Cl. 75-11.000.

Rauterkus, Karl Josef: *See—*
Becker, Knut Henning; Rauterkus, Karl Josef; and Seip, Detlev, 4,098,746, Cl. 260-29.4UA.

Rawls, Vaughn, to National-Standard Company. Pre-cured tread for recapping tires and method for the use thereof. 4,098,936, Cl. 428-40.000.

Ray, James A., to Martin Marietta Corporation. Hydraulic cement mixes and process for improving hydraulic cement mixes. 4,098,614, Cl. 106-90.000.

Raybestos-Manhattan, Inc.: *See—*
Kennedy, Claude A.; Gardella, Adriano A.; Brogi, Ruggero E.; and Lavagetto, Lorenzo, 4,098,064, Cl. 57-34.500.

Raymond Engineering Inc.: *See—*
Wolski, Raymond A., 4,099,161, Cl. 340-147.00R.

Raymond International Inc.: *See—*
Gendron, George J.; and Holland, Henry A. Nelson, 4,098,355, Cl. 173-127.000.

Raymond Lee Organization, Inc., The: *See—*
Bartelme, Jack H., 4,098,018, Cl. 43-108.000.
Carrillo, Alfred A., 4,099,221, Cl. 362-18.000.
Tritle, Robert C., Jr., 4,098,283, Cl. 135-77.000.

Raytheon Company: *See—*
Hart, Harold M., 4,099,088, Cl. 313-450.000.
Koutalides, Andrew, 4,099,200, Cl. 357-69.000.
Ward, Harold R., 4,099,182, Cl. 343-17.2PC.

RCA Corporation: *See—*
Berkman, Samuel; and Irish, Donald Bertram, 4,099,041, Cl. 219-10.49R.
Bloom, Allen; and Sorkin, Howard, 4,098,301, Cl. 141-7.000.
Endriz, John Guiry; Rajchman, Jan Aleksander; and van Raalte, John A., 4,099,085, Cl. 313-400.000.
Fuhrer, Jack Selig; and Keizer, Eugene Orville, 4,098,030, Cl. 51-281.00R.
Leedom, Marvin Allan, 4,098,511, Cl. 274-9.00B.
Masterton, Walter David, 4,099,187, Cl. 354-1.000.
Peters, Kenneth Donald, 4,099,087, Cl. 313-422.000.

Reato, Vincenzo. Radiator with dual heat exchange for heating installations. 4,098,327, Cl. 165-76.000.

Reaville, Eric T.; and Streicher, Gudrun M., to Monsanto Company. Dental restorative composition containing oligomeric BIS-GMA resin and Michler's ketone. 4,097,994, Cl. 32-15.000.

Reber, Harald, to Robert Bosch GmbH. Storage battery with recombination catalyst. 4,098,964, Cl. 429-86.000.

Redker, Donald S., to Redker-Young Processes, Inc. Conversion of organic waste material. 4,098,649, Cl. 201-2.500.

Redker-Young Processes, Inc.: *See—*
Redker, Donald S., 4,098,649, Cl. 201-2.500.

Redmore, Derek; and Thompson, Neil E. S., to Petrolite Corporation. Alpha-amino phosphonic acids. 4,098,849, Cl. 260-944.000.

Reed, Robert D.: *See—*
Zink, John S.; and Reed, Robert D., 4,098,566, Cl. 431-202.000.

Reed, Thomas Freeman: *See—*
Koziol, Dale Lee; and Reed, Thomas Freeman, 4,098,504, Cl. 273-61.00R.

Reedy, Lonnie T.; and Smith, Eddie, to Reedy and Smith, Inc. Lubricated bearing for automatic transmissions. 4,098,382, Cl. 192-110.00B.

Reedy and Smith, Inc.: *See—*
Reedy, Lonnie T.; and Smith, Eddie, 4,098,382, Cl. 192-110.00B.

Reese, Johannes: *See—*
Kraft, Kurt; and Reese, Johannes, 4,099,007, Cl. 548-307.000.

Reeser, Ward Welton: *See—*
Szentes, John Francis; Reeser, Ward Welton; and Zuck, Charles Leslie, Jr., 4,099,067, Cl. 307-153.000.

Regal Tool & Rubber Co., Inc.: *See—*
Files, James H.; Montague, John M.; and Thomerson, Clarence T., 4,098,211, Cl. 114-219.000.

Regar, Karl Nikolaus: *See—*
Besel, Gunter; and Regar, Karl Nikolaus, 4,098,144, Cl. 74-687.000.

Rehn, Gary Allen: *See—*
Stanfill, Ralph Everette; Steinbach, James Gerald; Rehn, Gary Allen; Oelschlaeger, George Frederick; and Jackson, William Wayne, 4,098,346, Cl. 172-283.000.

Reichhold Chemicals Limited: *See—*
Berchem, Antoine; Sudan, Krishan Kumar; and Gres, Edward Michael, 4,098,770, Cl. 528-130.000.

Reid, F. Joseph: *See—*
Rhodes, William H.; and Reid, F. Joseph, 4,098,612, Cl. 106-73.200.

Reid, Philip R.: *See—*
McLouski, Raymond M.; and Reid, Philip R., 4,098,924, Cl. 427-93.000.

Reid, Thomas J., Jr. Wheeled sled. 4,098,519, Cl. 280-87.010.

Reinert, John R., to Motorola, Inc. Sense-write circuit for random access memory. 4,099,070, Cl. 307-238.000.

Reinhard, Theodor; Haug, Ernst; and Schulz, Manfred, to Daimler-Benz Aktiengesellschaft. Device for mounting a storage battery. 4,098,366, Cl. 180-68.500.

Reinke, Elmer E. Fuel nozzle support and cap. 4,098,437, Cl. 222-529.000.

Reinmiller, J. Russell: *See—*
Boyd, Darrell B., 4,098,233, Cl. 123-32.00R.

Reis, August: *See—*
Eibl, Volker; and Reis, August, 4,098,660, Cl. 204-151.000.

Reisdorf, Adolf: *See—*
Wicker, Walter; and Reisdorf, Adolf, 4,098,136, Cl. 74-242.15R.

Reithner, Gerhard, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Starter bar to be used in continuous casting plants. 4,098,322, Cl. 164-446.000.

Reitsma, Hantje, to U.S. Philips Corporation. Method of optimizing radiation doses in an X-ray examining device, and a device for performing the method. 4,099,058, Cl. 250-416.0TV.

Reme Enterprises, Inc.: *See—*
Ferguson, Andrew Marvin; and Keith, Ernest Voshell, 4,098,521, Cl. 280-242.0WC.

Renner, Hermann; and Klie, Wolfgang, to Daimler-Benz Aktiengesellschaft. Body for motor vehicles. 4,098,531, Cl. 293-63.000.

Renzel, Peter, to Krautkramer-Branson, Incorporated. Method and apparatus for increasing the speed of ultrasonic pulse-echo testing. 4,098,131, Cl. 73-627.000.

Repasky, John, to Hanover Prest-Paving Co. Methods of making paving block. 4,098,865, Cl. 264-333.000.

Repco Research Proprietary Limited: *See—*
Dickerson, Alan William, 4,098,235, Cl. 123-32.0EG.

Research Corporation: *See—*
Fountain, Kenneth R.; Kehl, Horst; and Early, Terry, 4,098,903, Cl. 424-324.000.
Kornreich, Philipp G.; and Kowel, Stephen T., 4,099,207, Cl. 358-213.000.

Resistance Welder Corporation: *See—*
Blair, Robert H.; and Janiske, Donald J., 4,099,044, Cl. 219-82.000.

Resor, David L.: *See—*
Keller, Donald L.; and Resor, David L., 4,098,450, Cl. 228-119.000.

Ress, Thomas I.; and Hartmann, Frederick, to Kreidl Chemico Physical K.G. Device for the separation of gas mixtures. 4,099,053, Cl. 250-293.000.

Reuter, Franz Gottfried: *See—*
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,098,730, Cl. 521-107.000.

Reuter Technologie GmbH: *See—*
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,098,730, Cl. 521-107.000.

Rhodes, Richard O.: *See—*
Ford, Freeman A.; Armstrong, Errol; and Rhodes, Richard O., 4,098,331, Cl. 165-170.000.

Rhodes, William H.; and Reid, F. Joseph, to GTE Laboratories Incorporated. Transparent yttria ceramics and method for producing same. 4,098,612, Cl. 106-73.200.

Rhone-Poulenc, S.A.: *See—*
Christen, Gilbert; Favre, Bernard; Marze, Xavier; and Salmon, Michel, 4,098,852, Cl. 261-104.000.

Rhudy, John S.: *See—*
Argabright, Perry A.; Rhudy, John S.; and Phillips, Brian L., 4,098,337, Cl. 166-270.000.

Ribaldone, Giuseppe; Grecu, Renato; Paffoni, Camillo; and Sironi, Giuseppe, to Montedison S.p.A. Anthraquinone compounds and process for preparing same. 4,098,793, Cl. 260-303.000.

Rice, Donald Winston: *See—*
Nepela, Daniel Andrew; Rice, Donald Winston; and Suits, James Carr, 4,098,605, Cl. 75-122.000.

Richards, Louis R., to Formax, Inc. Mold cover for food patty molding machine. 4,097,961, Cl. 17-32.000.

Richardson Company, The: *See—*
Mocas, Verlin A., 4,098,963, Cl. 429-88.000.

Ricoh Company, Ltd.: *See—*
Suzuki, Tomoaki, 4,099,238, Cl. 364-481.000.
Tani, Tatsuo; Tanaka, Mitsuo; and Kameyama, Toshiaki, 4,098,501, Cl. 271-117.000.

Riddel, John W., to General Motors Corporation. Road speed control with redundant release. 4,098,368, Cl. 180-108.000.

Ridout, Philip James: *See—*
Matty, Michael Thomas; and Ridout, Philip James, 4,098,608, Cl. 75-251.000.

Riefler, Monte. Concrete block panel. 4,098,040, Cl. 52-125.000.

Riesser, Gregor H., to Shell Oil Company. Catalyst for dehydrogenation. 4,098,723, Cl. 252-474.000.

Riken Piston Ring Kogyo Kabushiki Kaisha: *See—*
Sakata, Tatsuei, 4,098,515, Cl. 277-165.000.

Riley, David Stephen, to Imperial Chemical Industries Limited. Porous diaphragms. 4,098,672, Cl. 204-296.000.

Ringel, Samuel M.: *See—*
Connor, David T.; Ringel, Samuel M.; and Von Strandtmann, Maximillian, 4,098,998, Cl. 542-447.000.

Ripart, Guy: *See—*
Leblanc, Michele; Ripart, Guy; and Brule, Albert, 4,099,141, Cl. 331-94.50C.

Rispeter, Siegfried: *See—*
Kramer, Volker; Rispeter, Siegfried; and Marlow, Rolf-Peter, 4,098,293, Cl. 137-614.030.

Ristvedt, Victor G.; and Johnson, Roy B. Coin handling machine. 4,098,280, Cl. 133-3.00A.

Rizzitano, Fortunato J.; and Abrahamson, Ernest P., II, to United States of America, Army. 18% Ni-Mo-Co maraging steel having improved toughness and its method of manufacture. 4,098,607, Cl. 75-243.000.

RMS Electronics, Inc.: *See—*
Hacker, Morris; and Padilla, Dominick, 4,099,185, Cl. 343-880.000.

Robert Bosch GmbH: *See—*
Fleischer, Helmut, 4,098,367, Cl. 180-105.00E.
Pollner, Rudolf, 4,097,977, Cl. 29-25.120.
Reber, Harald, 4,098,964, Cl. 429-86.000.

Robert Brown Associates: *See—*
Gammell, Donald M., 4,098,303, Cl. 141-52.000.

Robinson, Charles Elbert. Fuel safety switch. 4,099,166, Cl. 340-626.000.

Robinson, Leon H.; Speers, Jerry M.; Barry, Adelbert; and Campbell, Daniel J., to Exxon Production Research Company. Method and apparatus for maintaining electric cable inside drill pipe. 4,098,342, Cl. 166-315.000.

Robot Research, Inc.: *See—*
Cavanaugh, Leo Francis, 4,099,202, Cl. 358-85.000.

Robota, Stephen: *See—*
Baxamusa, Yusuf A.; and Robota, Stephen, 4,098,832, Cl. 260-651.00F.

Robson, Harry E., to Exxon Research & Engineering Co. Synthetic halloysites as hydrocarbon conversion catalysts. 4,098,676, Cl. 208-111.000.

Rockwell International Corporation: *See—*
Anders, Ronald James; and Mohan, Ramesh, 4,098,489, Cl. 251-327.000.
Hallford, Ben R., 4,099,126, Cl. 325-446.000.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino; and Bonalumi, Pietro, 4,098,202, Cl. 112-20.000.

Rode, France; Lindes, Peter; Eschenbach, Ralph F.; and Fazarinc, Zvonko A., to Hewlett-Packard Company. Method and apparatus for programmable and remote numeric control and calibration of electronic instrumentation. 4,099,240, Cl. 364-571.000.

Roder, Dieter; and Tust, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Aperture mask unit for color television picture tube. 4,099,086, Cl. 313-407.000.

Roge, Ralph R.; and Curtis, Paul J., to Wescom, Inc. Loop current detector. 4,099,032, Cl. 179-18.0FA.

Rogers, Charles H., to Continental Oil Company. Sensor wire thermoplastic compounds. 4,098,711, Cl. 252-63.200.

Rogers, Howard G.: *See—*
Cieciuch, Ronald F. W.; Luhowy, Roberta R.; Meneghini, Frank A.; and Rogers, Howard G., 4,098,783, Cl. 260-147.000.

Rogg, Roger W. Modular type cartridge storage. 4,098,402, Cl. 206-387.000.

Rohde, Heino J.; and Juergens, Rainer, to Christensen, Inc. Diamond drilling bit for soft and medium hard formations. 4,098,363, Cl. 175-329.000.

Rohm and Haas Company: *See—*
Hanauer, Richard H.; and Willette, Gordon L., 4,098,709, Cl. 252-51.50A.

Roll-Rite Corp.: *See—*
Christensen, Carl O., 4,097,954, Cl. 16-21.000.

Rolls-Royce Limited: *See—*
Adkins, Richard Cyril; and Yost, James Oswald, 4,098,073, Cl. 60-39.16R.

Ropte, Eckhard: *See—*
Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, 4,098,640, Cl. 162-146.000.

Rosenau, Clifford M., to Armstrong Cork Company. Method of making a composite mold for making polyurethane foam decorative parts. 4,098,856, Cl. 264-80.000.

Rosenbaum, Heinz Jorg: *See—*
Alpers, Heinz-Jurgen; and Rosenbaum, Heinz Jorg, 4,098,826, Cl. 260-603.00C.

Rosenberg, George J., to Fashion Services, Inc. Collar point former. 4,098,440, Cl. 223-39.000.

Rosenberger, Michael, to Hoffmann-La Roche Inc. 1-(2,6,6-Trimethyl-3-hydroxy-1-cyclohexen-1-yl)-3-methyl-penta-1,4-diene[or 1-yn-4-EN]-3-ols. 4,098,827, Cl. 568-824.000.

Rosenblatt, Solomon. Medical surgical sponge and method of making same. 4,098,728, Cl. 521-141.000.

Rosenkranz, Hans Jurgen: *See—*
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 4,098,808, Cl. 260-448.80R.

Rosey, Richard: *See—*
Kovatch, George N.; Rosey, Richard; and Simon, Ned H., 4,099,220, Cl. 361-341.000.

Ross, Svante Bertil: *See—*
Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,098,901, Cl. 424-311.000.

Rossler, Heinz. Coupling for model vehicles. 4,098,411, Cl. 213-75.0TC.

Rossmy, Gerd: *See—*
Kollmeier, Hans-Joachim; and Rossmy, Gerd, 4,098,729, Cl. 521-128.000.

Roth, Eldon N. Refrigeration apparatus for viscous paste substance. 4,098,095, Cl. 62-346.000.

Roth, Haye; and Rath, Gero, to Demag A.G. Method for melting steel. 4,098,603, Cl. 75-11.000.

Rother, Peter: *See—*
Klapproth, Ludwig; Metzler, Gerhart; and Rother, Peter, 4,098,513, Cl. 274-39.00A.

Rothfuss, William John. Shrink film perforating unit. 4,098,159, Cl. 83-171.000.

Rothmayer, Karl-Heinz. Ski-boot. 4,098,010, Cl. 36-117.000.

Rousselet, Joseph. Apparatus for the dehydration (drying) of textile materials. 4,098,004, Cl. 34-57.00E.

Roussy, Georges: *See—*
Jean, Olivier A.; and Roussy, Georges, 4,099,042, Cl. 219-10.55A.

Roy, Colin: *See—*
Wykes, Robert D.; and Roy, Colin, 4,098,393, Cl. 198-458.000.

Rozmus, John J. Progressive die welding of electrical contacts. 4,099,043, Cl. 219-78.160.

RTE Corporation: *See—*
Flatt, Richard P., 4,099,155, Cl. 337-249.000.

Rubin, Barry Jay, to International Business Machines Corporation. Charge-coupled device digital-to-analog converter. 4,099,175, Cl. 340-347.0DA.

Rubischko, Richard J.: *See—*
Biddick, Royce E.; and Rubischko, Richard J., 4,098,967, Cl. 429-210.000.

Ruchardt, Hugo: *See—*
Ertl, Wilhelm; Guckel, Helmut; Ruchardt, Hugo; and Schneckenaichner, Fritz, 4,098,223, Cl. 118-48.000.

Ruckdeschel, Frederick R.; Hauser, Oscar G.; Whited, Charles A.; and Gary, Robert E., to Xerox Corporation. High speed magnetic brush development system. 4,098,228, Cl. 118-658.000.

Rudinger, George: *See—*
Shorr, Morton; and Rudinger, George, 4,098,594, Cl. 55-403.000.

Rudolph, Hans: *See—*
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans Jurgen, 4,098,808, Cl. 260-448.80R.

Ruegsegger, Ted W. Curtain edge retainer. 4,098,318, Cl. 160-327.000.

Ruhrchemie Aktiengesellschaft: *See—*
Lutze, Siegfried; Feichtinger, Hans; and Birnkraut, Hans-Walter, 4,098,990, Cl. 528-490.000.

Rumianca S.p.A.: *See—*
Baldi, Luciano; Ferrari, Corrado; and Francese, Renato, 4,099,006, Cl. 544-204.000.

Russell, John A. Engraving machine having minimum setup time. 4,098,170, Cl. 90-13.100.

Rutgerswerke Aktiengesellschaft: *See—*
Grigoleit, Georg; Kohler, Helmut; Collin, Gerd; and Matern, Kurt, 4,098,838, Cl. 260-674.00N.

Ruthart, Leonard Crawford; and Williams, Virgil Lynn. Process of dispensing, measuring, coating and cutting sheet material. 4,098,916, Cl. 427-8.000.

Rutledge, Thomas F., to ICI Americas Inc. Method of oxidatively coupling alkyl phenols utilizing a tetravalent manganese-carbon catalyst. 4,098,766, Cl. 528-217.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of dicarboxylic acid compounds. 4,098,830, Cl. 568-730.000.

Rutten, Hendrikus S.: *See—*
Kemper, Wilhelmus; Kruisman, Gerard; and Rutten, Hendrikus S., 4,098,212, Cl. 114-230.000.

Ryan, Daniel John; and Wielicki, Edward Andrew, to FMC Corporation. Regenerated cellulose film recovery process. 4,098,996, Cl. 536-57.000.

Ryan, James W.: *See—*
Piasio, Roger N.; Ryan, James W.; and Woiszwillo, James E., 4,098,876, Cl. 424-1.000.

Ryobi, Ltd.: *See—*
Kitutaka, Hiromu, 4,097,956, Cl. 16-52.000.
Kitutaka, Hiromu, 4,097,957, Cl. 16-58.000.
Sazaki, Kounin, 4,098,472, Cl. 242-84.20G.
Sazaki, Kounin, 4,098,473, Cl. 242-84.20G.

Saab-Scania Aktiebolag: *See—*
Hardmark, Ragnar Malcus; Hanberger, Bror Anders Soren; and Forsberg, Sven Edvin, 4,098,111, Cl. 73-9.000.

Saarbergwerke A.G.: *See—*
Kummel, Joachim; Dressen, Heinz; Danguillier, Wilhelm; Gernbardt, Paul; Grams, Wolfgang; and Pohl, Siegfried, 4,098,324, Cl. 165-1.000.

Sabatino, Anthony, to Gould Inc. Water activatable, lead-acid storage battery and method for manufacturing same. 4,098,961, Cl. 429-48.000.

Sachs, Melvin H.; and Shubow, Calvin. Block-form for use in reinforced concrete structures. 4,098,042, Cl. 52-383.000.

Sachs Systemtechnik GmbH: *See—*
Eibl, Volker; and Reis, August, 4,098,660, Cl. 204-151.000.

Saito, Masumi: *See—*
Yukuta, Toshio; Ohashi, Takashi; Kojima, Minoru; and Saito, Masumi, 4,098,732, Cl. 521-125.000.

Saito, Yasushi: *See—*
Okumura, Masahide; and Saito, Yasushi, 4,099,054, Cl. 250-306.000.

Sakata, Nobuhiro: *See—*
Yoshida, Motoaki; and Sakata, Nobuhiro, 4,098,931, Cl. 427-324.000.

Sakata, Tatsuei, to Riken Piston Ring Kogyo Kabushiki Kaisha. Abrasion resisting material and use of the same. 4,098,515, Cl. 277-165.000.

Sakural, Toshio; Nishihara, Akio; Handa, Takuro; Katoh, Hidekatsu; Tomoda, Yoshiro; Aoki, Kazumi; and Yoto, Makoto, to Asahi Denka Kogyo K.K. Sulfur containing molybdenum dihydrocarbyldithiocarbamate compound. 4,098,705, Cl. 252-33.600.

Salmon, Michel: *See—*
  Christen, Gilbert; Favre, Bernard; Marze, Xavier; and Salmon, Michel, 4,098,852, Cl. 261-104.000.

Salzer, Erwin, to Gould Inc. Electric fuse capable of interrupting small currents. 4,099,156, Cl. 337-290.000.

Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, to Institute Po Zavaryavane. Controllable-force wire advance arrangement for electric-arc welding applications. 4,098,445, Cl. 226-186.000.

Sample, Stephen P.: *See—*
  Goodman, William R.; Sample, Stephen P.; and Goodman, Allan L., 4,099,236, Cl. 364-200.000.

Sanchez, Jose, to Pennwalt Corporation. Polymerization of vinyl monomers employing liquid acyl sulfonyl peroxide formulations derived from solid acyl alkylsulfonyl peroxides. 4,098,981, Cl. 526-204.000.

Sanda, Shougo: *See—*
  Noguchi, Masaaki; Sanda, Shougo; Nakamura, Norihiko; and Kato, Takashi, 4,098,246, Cl. 123-119.00A.

Sander, Bruno; Berbner, Heinz; Steinberger, Rolf; Ropte, Eckhard; Kovacs, Jenoe; and Kunde, Joachim, to BASF Aktiengesellschaft. Manufacture of paper-like and textile-like sheets. 4,098,640, Cl. 162-146.000.

Sander, Willy M.; and Whitney, James C., to Dictaphone Corporation. Electronic control system for multiple cassette record and/or playback apparatus. 4,099,209, Cl. 360-92.000.

Sanderson, William A.: *See—*
  Swidler, Ronald; and Sanderson, William A., 4,098,784, Cl. 260-199.000.

Sandler, Louis M.: *See—*
  Pomerantz, Daniel I.; and Sandler, Louis M., 4,099,167, Cl. 340-620.000.

Sandler, Stanley Roben, to Pennwalt Corporation. Polyoxyalkylene tetrahalophthalate ester as textile finishing agent. 4,098,704, Cl. 252-8.600.

Sandoz, Inc.: *See—*
  Kathawala, Faizulla G., 4,098,908, Cl. 424-263.000.

Sandoz Ltd.: *See—*
  Raspanti, Giuseppe, 4,098,954, Cl. 428-537.000.

Sanford, Arthur Carol; and Waechter, Fritz, to Sanford, Arthur Carol. Apparatus for beveling truss components. 4,098,310, Cl. 144-3.00R.

Sankey, Edwin W., to Marion Power Shovel Company, Inc. Gear train and method of aligning component gears thereof. 4,098,139, Cl. 74-410.000.

Sankyo Company Limited: *See—*
  Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Matsuzawa, Toshiaki, 4,098,893, Cl. 424-263.000.

Sano, Takezo: *See—*
  Maemoto, Kenichi; Sano, Takezo; and Kobayashi, Akio, 4,098,979, Cl. 526-100.000.

Sapchim-Fournier-Cimag: *See—*
  Boussely, Jean; Chandavoine, Marie-Madeleine; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,098,706, Cl. 252-40.500.

Sarantakis, Dimitrios, to American Home Products Corporation. Polypeptides with morphine-like activity. 4,098,781, Cl. 260-112.50R.

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Sasaki, Toshimi: *See—*
  Ibaraki, Yoshiro; Yamamoto, Akihiko; and Sasaki, Toshimi, 4,098,623, Cl. 148-133.000.

Sato, Hisanao: *See—*
  Yamazoe, Hiroshi; Kawarada, Hiroshi; Sato, Hisanao; and Ohshima, Nobumasa, 4,099,091, Cl. 313-509.000.

Sato, Kazuo: *See—*
  Shiga, Motohiro; Fujisawa, Fumio; Sato, Kazuo; Shiohata, Kouki; Takasumi, Masakazu; and Koga, Tsuguaki, 4,098,127, Cl. 73-462.000.

Sato, Tatsuo, to Diamond Shamrock Corporation. Composite coating of enhanced resistance to attack. 4,098,620, Cl. 148-6.200.

Sato, Yuuichi: *See—*
  Hashimoto, Shintaro; and Sato, Yuuichi, 4,099,073, Cl. 307-296.00R.

Satterfield, Larry S., to Milliken Research Corporation. Device for scrubbing surfaces. 4,097,950, Cl. 15-49.00R.

Sauermann, Gerhard O., to United States of America, Air Force. Codable optical transponder. 4,099,050, Cl. 250-199.000.

Sauli, Michel, to Philagro. Process for the preparation of 3-(3,5-dichlorophenyl)-hydantoin. 4,099,008, Cl. 548-314.000.

Saunders, James Edwin: *See—*
  Humphrey, Geoffrey John; and Saunders, James Edwin, 4,098,696, Cl. 210-168.000.

Sausville, Joseph W.: *See—*
  Corth, Richard; and Sausville, Joseph W., 4,099,090, Cl. 313-487.000.

Sawa, Kenneth Bruno; and Mehaffy, Gordon E. Tennis ball pump. 4,098,048, Cl. 53-7.000.

Sawada, Yoshio: *See—*
  Urano, Fumio; and Sawada, Yoshio, 4,099,195, Cl. 354-50.000.

Sayles, Donald A., to Thermo-Lab Instruments, Inc. Method and analyzer for determining moisture in a mixture of gases containing oxygen. 4,098,650, Cl. 204-1.00T.

Sazaki, Kounin, to Ryobi, Ltd. Spin fishing reel with adjustable bail arm return spring. 4,098,472, Cl. 242-84.20G.

Sazaki, Kounin, to Ryobi, Ltd. Bail latching and releasing mechanism for spin fishing reel. 4,098,473, Cl. 242-84.20G.

Scalco, Emanuele: *See—*
  Tsigdinos, George A.; Moore, Fred W.; Kuck, Valerie J.; and Scalco, Emanuele, 4,098,753, Cl. 260-31.80R.

Scamehorn, John F.: *See—*
  Eisenstein, Andrew J.; Frohreich, Richard A.; and Scamehorn, Joho F., 4,098,593, Cl. 55-71.000.

Schalt, Wilfried: *See—*
  Seeger, Arnold; and Schalt, Wilfried, 4,099,103, Cl. 318-85.000.

Schatteman, Etienne Arthur Marie, to Staar, S. A. Tape cassette loading system. 4,099,213, Cl. 360-137.000.

Schauman, James L., to Jamestown Container Corporation. Automatic compensating register. 4,098,173, Cl. 93-58.20R.

Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, to Vsesojuzny Nauchno-Issledovatelsky Institut Stroitelnogo I Dorozhnogo Mashinostroenia. Weight measuring apparatus. 4,098,364, Cl. 177-210.0EM.

Scheel, John R., deceased (by Scheel, Marie M., executrix), to Hawley Manufacturing Corporation. Fluid heat exchanger. 4,098,325, Cl. 165-76.000.

Scheel, Marie M., executrix: *See—*
  Scheel, John R., deceased, 4,098,325, Cl. 165-76.000.

Schell, Charles E.; Deegan, Dennis C.; and Jacques, Donald F., to Betz Laboratories, Inc. Corrosion probe for use in measuring corrosion rate under specified heat transfer conditions. 4,098,662, Cl. 204-195.00C.

Schermerhorn, Jerry D.; and Slottow, Hiram G., to Owens-Illinois, Inc. Driving and addressing circuitry for gas discharge display/memory panels. 4,099,097, Cl. 315-169.0TV.

Schetina, Otto: *See—*
  Zitz, Alfred; Schetina, Otto; Kogler, Peter; and Kissich, Arnulf, 4,098,539, Cl. 299-75.000.

Schilperoort, Cornelis: *See—*
  van Diepenbroek, Alfred Erich Wibrandt; Wormgoor, Jan Hendrik; and Schilperoort, Cornelis, 4,098,591, Cl. 55-2.000.

Schindler, Hermann: *See—*
  Zimmermann, Wolfgang; and Schindler, Hermann, 4,098,969, Cl. 526-9.000.

Schloemann-Siemag Aktiengesellschaft: *See—*
  Fullers, Detlef, 4,098,105, Cl. 72-21.000.

Schluter, Hermann; and Blase, Manfred, tu Didier Engineering GmbH. Changeover device for controlling the movement of dosing frames. 4,098,289, Cl. 137-601.000.

Schmalfeld, Paul: *See—*
  Rammler, Roland; Schmalfeld, Paul; and Weiss, Hans-Jurgen, 4,098,674, Cl. 208-11.00R.

Schmelzer Corporation: *See—*
  Benjamin, Benjamin C., 4,098,459, Cl. 236-87.000.

Schmidt, Gerald Warren: *See—*
  Bloom, William George; Newman, Howard Fred; and Schmidt, Gerald Warren, 4,098,276, Cl. 128-215.000.

Schmidt, James C.: *See—*
  Seymour, Donald E.; Schmidt, James C.; and Bezella, Donald A., 4,098,602, Cl. 71-67.000.

Schmidt, Joachim; and Unruh, Martin. Copy paper. 4,098,947, Cl. 428-407.000.

Schmitz, Eduard: *See—*
  Fullers, Detlef, 4,098,105, Cl. 72-21.000.

Schmoock, Roy F., to Fischer & Porter Co. Unitary electromagnetic flowmeter. 4,098,118, Cl. 73-194.0EM.

Schneckenaichner, Fritz: *See—*
  Ertl, Wilhelm; Guckel, Helmut; Ruchardt, Hugo; and Schneckenaichner, Fritz, 4,098,223, Cl. 118-48.000.

Schneider, Abraham: *See—*
  Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,098,835, Cl. 260-666.0PY.

Schneider, Roland: *See—*
  Cordes, Werner; and Schneider, Roland, 4,098,051, Cl. 53-30.00S.

Schoettle, Klaus; Wittkamp, Heinrich; and Gliniorz, Lothar, to BASF Aktiengesellschaft. Process for the manufacture of tape guides of large area for tape transport apparatus, and tape guides obtained by the said process. 4,098,446, Cl. 226-196.000.

Schopf, Dieter, to Union Special G.m.b.H. Thread cutter for chainstitch sewing machine. 4,098,209, Cl. 112-298.000.

Schoppe, Fritz. Process for the production of powdered, surface-active, agglomeratable calcined material. 4,098,871, Cl. 423-177.000.

Schor, Marshall I.: *See—*
  Arnold, Richard Fairbanks; Dishon, Yitzhak; Ouchi, Norman Ken; and Schor, Marshall I., 4,099,257, Cl. 364-900.000.

Schramm, Franz, to Siemens Aktiengesellschaft. X-ray diagnostics generator for X-ray photographs. 4,099,057, Cl. 250-416.00R.

Schroder, Ernst, to Licentia Patent-Verwaltungs-G.m.b.H. Amplifier with controllable transmission factor and switchable control characteristic. 4,099,134, Cl. 330-51.000.

Schroeder, Michael A., to United States of America, Army. Wear and corrosion reducing additive for gun propellants. 4,098,193, Cl. 102-92.000.

Schuette, Henry W.; and Nye, Martin N., to Wellons, Inc. Dry kiln having bidirectional air flow with unidirectional fan rotation. 4,098,008, Cl. 34-191.000.

Schulte, Franz-Josef; Bruch, Werner; and Diers, Erwin, to Erdolchemie Gesellschaft mit beschrankter Haftung; and Bayer Aktiengesellschaft. Device for mixing gases and liquids. 4,098,851, Cl. 261-76.000.

Schultz, Eduard August. Disposal installation for domestic waste. 4,098,181, Cl. 100-102.000.

Schulz, Manfred: *See—*
  Reinhard, Theodor; Haug, Ernst; and Schulz, Manfred, 4,098,366, Cl. 180-68.500.

Schuster, Hans-Dieter: *See—*
  Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,098,252, Cl. 123-198.00F.

Schwan, Thomas J.; and White, Ralph L., Jr., to Morton-Norwick Products, Inc. 1-(4-Chlorophenyl)-3-(1-ureido)-2-imidazolidinone. 4,099,009, Cl. 548-319.000.

Schwanz, Wilfried; Seiffert, Ulrich; Beher, Peter; and Paitula, Hannu, to Volkswagenwerk Aktiengesellschaft. Vehicle steering wheel safety device. 4,098,525, Cl. 280-750.000.

Schwartz, Boris. Dermatome apparatus and method. 4,098,278, Cl. 128-305.500.

Schwartz, George R. Method of reducing psychogenic impotence. 4,098,899, Cl. 424-300.000.

Schwarzenbek, Eugene F. Cracking catalyst activity maintenance for catalytic cracking process. 4,098,678, Cl. 208-120.000.

Sciaky, Albert M.; and Mello, William R., to Sciaky Bros., Inc. Method and apparatus for manufacturing rotary drill bits. 4,098,448, Cl. 228-102.000.

Sciaky Bros., Inc.: *See—*
  Sciaky, Albert M.; and Mello, William R., 4,098,448, Cl. 228-102.000.

Scillieri, Antoine; and Aubry, Jean Yves, to Electronique Marcel Dassault. Flat radar antenna. 4,099,181, Cl. 343-16.00M.

Scolding Locks Corporation: *See—*
  Morris, William E., 4,097,971, Cl. 24-253.000.

Scott, Bill B., to Pfizer Inc. Folding garden tool. 4,097,945, Cl. 7-116.000.

Scott, Dalbert Byron. Water impervious cover for an arm cast or leg cast. 4,098,268, Cl. 128-82.000.

Scott, Ian J. C., to Chrysler Corporation. Arrangement for mounting a fuel metering control pump on an engine. 4,098,251, Cl. 123-195.00A.

Scott, LeRoy W.: *See—*
  Allen, Roy A.; and Scott, LeRoy W., 4,098,744, Cl. 260-29.300.

Scott, Michael H.: *See—*
  Edson, Donald A.; Johnson, Keith I.; and Scott, Michael H., 4,098,447, Cl. 228-4.500.

Scott Paper Company: *See—*
  Arters, James C., 4,098,938, Cl. 428-160.000.
  Gotchel, Joel Peter; and Norton, Henry James, 4,097,965, Cl. 19-306.000.

Scott, Paul Howard, to Motorola Inc. Buffering for an I^{2}L memory cell. 4,099,263, Cl. 365-155.000.

Scriven, Roger L.; and Chang, Wen-Hsuan, to PPG Industries, Inc. Polylactone-polyurethanes and aqueous dispersions thereof. 4,098,743, Cl. 260-29.2TN.

Sease, John D.: *See—*
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Seddon, Marshall E.: *See—*
  Flower, Robert J.; and Seddon, Marshall E., 4,098,330, Cl. 165-166.000.

Sederquist, Richard A.: *See—*
  Buswell, Richard F.; Sederquist, Richard A.; and Snopkowski, Daniel J., 4,098,588, Cl. 48-94.000.
  Buswell, Richard F.; Sederquist, Richard A.; and Snopkowski, Daniel J., 4,098,589, Cl. 48-94.000.
  Krar, George R.; Olesen, Ole L.; Sederquist, Richard A.; and Szydlowski, Donald F., 4,098,587, Cl. 48-94.000.

Seeger, Arnold; and Schalt, Wilfried, to Kernforschungsanlage Julich GmbH. Apparatus for controlling the rotors of synchronous motors. 4,099,103, Cl. 318-85.000.

Seeger, Hans Joachim; and Sorgatz, Ulrich, to Vereinigte Flugtechnische Werke-Fokker G.m.b.H. Mechanical structure. 4,098,168, Cl. 89-1.815.

Seibert, Lance: *See—*
  Jackson, William G.; Seibert, Lance; Bates, Dillard T.; and Smith, James M., 4,098,049, Cl. 53-22.00B.

Seiffert, Ulrich: *See—*
  Schwanz, Wilfried; Seiffert, Ulrich; Beher, Peter; and Paitula, Hannu, 4,098,525, Cl. 280-750.000.

Seip, Detlev: *See—*
  Becker, Knut Henning; Rauterkus, Karl Josef; and Seip, Detlev, 4,098,746, Cl. 260-29.4UA.

Semmens, Michael J., to University of Illinois Foundation, The. Water purification process. 4,098,690, Cl. 210-18.000.

Sempuku, Kenji: *See—*
  Murai, Hiromu; Ohata, Katsuya; Sempuku, Kenji; Aoyagi, Yoshiaki; and Ueda, Fusao, 4,098,892, Cl. 424-249.000.

Seuter, Friedel: *See—*
  Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, 4,099,011, Cl. 548-376.000.

Seymour, Donald E.; Schmidt, James C.; and Bezella, Donald A., to Applied Biochemists, Inc. Algaecidal composition. 4,098,602, Cl. 71-67.000.

Sgibnev, Igor Vladimirovich: *See—*
  Lidorenko, Nikolai Stepanovich; Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Zhemchuzhina, Elena Alexandrovna; Chernousov, Lev Nikolaevich; Shmidt, Igor Aronovich; Nikolashina, Ljudmila Alexeevna; Gelfgat, David Mendeleevich; and Sgibnev, Igor Vladimirovich, 4,098,617, Cl. 148-1.500.

Shaikh, Mohammed Sabir: *See—*
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Shakshober, Mac Lean C., to Sun Shipbuilding & Dry Dock Company. Pneumatic offloading system for tanker. 4,098,412, Cl. 214-15.00D.

Shank, Harvey T., to Stauffer Chemical Company. Automatic container capping apparatus. 4,098,053, Cl. 53-72.000.

Sharp Kabushiki Kaisha: *See—*
  Hashimoto, Shintaro; and Sato, Yuuichi, 4,099,073, Cl. 307-296.00R.
  Maeda, Hidetoshi; and Ohba, Toshihiro, 4,099,074, Cl. 307-308.000.
  Maekawa, Koji; and Hamasaki, Iwao, 4,099,177, Cl. 340-365.00E.

Sharpe, Claude A.; and Frazier, Richard V., Jr., to Bendix Corporation, The. Combined keyed AGC and pulse amplitude comparator circuit. 4,099,124, Cl. 325-326.000.

Sharpe, Robert E.: *See—*
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Shefsiek, Paul K.: *See—*
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Shell Oil Company: *See—*
  Allen, Roy A.; and Scott, LeRoy W., 4,098,744, Cl. 260-29.300.
  Kemper, Wilhelmus; Kruisman, Gerard; and Rutten, Hendrikus S., 4,098,212, Cl. 114-230.000.
  Riesser, Gregor H., 4,098,723, Cl. 252-474.000.
  Tocco, Dominick J., 4,098,891, Cl. 424-248.560.

Shen, Tsung-Ying: *See—*
  Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, 4,098,726, Cl. 528-403.000.

Shepard, Inella Gatlin: *See—*
  Graham, William Hardin; and Shepard, Inella Gatlin, 4,098,626, Cl. 149-19.400.

Sherwood, Edward F.: *See—*
  Stock, Mark E.; and Sherwood, Edward F., 4,098,025, Cl. 49-388.000.

Shibata, Shin; and Oguchi, Kikuo, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal tuning fork with three electrodes on each major tine face. 4,099,078, Cl. 310-361.000.

Shichman, Daniel: *See—*
  Ferrell, Wesley; Shichman, Daniel; and Olson, Mark W., 4,098,315, Cl. 152-361.00R.

Shieh, Dien F.: *See—*
  Fekete, Simon O.; Wicker, Gordon R.; Duyvesteyn, Willem P. C.; and Shieh, Dien F., 4,098,870, Cl. 423-124.000.

Shiets, Leo C. Axle grinder. 4,098,029, Cl. 51-241.00S.

Shiga, Motohiro; Fujisawa, Fumio; Sato, Kazuo; Shiohata, Kouki; Takasumi, Masakazu; and Koga, Tsuguaki, to Hitachi, Ltd. Balancing method for use in multiple-span rotor shaft system and balancing system using same. 4,098,127, Cl. 73-462.000.

Shiga, Norio: *See—*
  Haruta, Yasuo; Nagasoe, Kazumasa; Shiga, Norio; Morino, Ikuo; and Aisu, Nobuo, 4,098,785, Cl. 264-220.000.

Shima, Seiya: *See—*
  Inaba, Hiromi; Shima, Seiya; Tashiro, Korefumi; and Ando, Takeki, 4,099,111, Cl. 318-338.000.

Shimizu, Shigeru; and Yamauchi, Hiroki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Canister for catalyst converter and manufacturing process therefor. 4,098,580, Cl. 23-288.00F.

Shimizu, Tetsuo; Ichiba, Shigeru; Koizumi, Shun; and Okuno, Chuzo, to Daikin Kogyo Kabushiki Kaisha. Process for preparing polytetrafluoroethylene fine powders. 4,098,975, Cl. 526-73.000.

Shimoi, Akio, to Kabushiki Kaisha Suwa Seikosha. Digital display electronic wristwatch. 4,098,070, Cl. 58-23.00R.

Shin-Etsu Chemical Co., Ltd.: *See—*
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Shindo, Yoshio: *See—*
  Kubo, Seitoku; Kuramochi, Kojiro; and Shindo, Yoshio, 4,098,143, Cl. 74-606.00R.

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Shintaro, Oshima: *See—*
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  - Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,099,188, Cl. 354-24.000.
- Shorr, Morton; and Rudinger, George, to Textron Inc. Inertial particle separator. 4,098,594, Cl. 55-403.000.
- Shrier, Adam L.: *See—*
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- Shrubek, Elena Ivanovna: *See—*
  - Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
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- Shulman, Joel Ira, to Procter & Gamble Company, The. Food antioxidants. 4,098,911, Cl. 426-547.000.
- Sidor, Edward F.; Camillo, Charles C.; and Bowen, Glenn W., to Illinois Tool Works Inc. Sensors for sensing a plurality of parameters. 4,099,164, Cl. 340-197.000.
- Sidorova, Nadezhda Mikhailovna: *See—*
  - Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Iván Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
- Sieck, Charles A. Heating system. 4,098,256, Cl. 126-116.00R.
- Siemens Aktiengesellschaft: *See—*
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  - Distler, Walter, 4,099,059, Cl. 250-445.00T.
  - Ertl, Wilhelm; Guckel, Helmut; Ruchardt, Hugo; and Schneckenaichner, Fritz, 4,098,223, Cl. 118-48.000.
  - Franke, Kurt, 4,099,056, Cl. 250-403.000.
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  - Gerges, Andre; and Siglow, Joachim, 4,099,023, Cl. 178-69.100.
  - Hoschler, Hans; Raimar, Wolfgang; and Brandmaier, Klaus, 4,099,235, Cl. 364-200.000.
  - Lohmann, Heinz-Juergen; and Kopperschmidt, Gerd, 4,099,129, Cl. 328-75.000.
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- Sigan, Jack W.: *See—*
  - Egan, Richard R.; Hughes, Graham K.; and Sigan, Jack W., 4,098,822, Cl. 260-585.00B.
- Siglow, Joachim: *See—*
  - Gerges, Andre; and Siglow, Joachim, 4,099,023, Cl. 178-69.100.
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- Simko, Richard T., to Intel Corporation. Triple layer polysilicon cell. 4,099,196, Cl. 357-23.000.
- Simm, Hans Peter; and Voswinckel, Gerhard, to Fa. H. Krantz GmbH & Co. Apparatus for severing a continuous cloth web mounted on a roller. 4,098,471, Cl. 242-56.00R.
- Simon, Ned H.: *See—*
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- Simonides, Jerzy: *See—*
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  - Zaslavsky, Dan; Sinai, Gideon; and Biran, Giora, 4,098,089, Cl. 61-72.600.
- Sinclair, Richard G.: *See—*
  - Markle, Richard A.; and Sinclair, Richard G., 4,098,980, Cl. 526-201.000.
- Singer, Alec. Wrapping apparatus and method. 4,098,052, Cl. 53-33.000.
- Singer Company, The: *See—*
  - Peterson, Wesley Robinson, 4,098,207, Cl. 112-221.000.
  - Suchsland, Alfred Rolf; Tyburcy, Raymond Steven; and Odermann, Charles Robert, 4,098,206, Cl. 112-220.000.
- Singh, Kanwal N. Heating system with water heater recovery. 4,098,092, Cl. 62-238.000.
- Sins, Richard G.: *See—*
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- Slomski, Lawrence J. Plastic bottle stopper. 4,098,422, Cl. 215-355.000.
- Slopa, Robert E., to Hussmann Refrigeration, Inc. Lock and safety release for power operated doors. 4,098,023, Cl. 49-139.000.
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- Smith, Christopher John; and Lythall, David John, to BOC Limited. Welding method. 4,098,451, Cl. 228-119.000.
- Smith, Curtis P., to Upjohn Company, The. Compounds and process. 4,098,973, Cl. 526-21.000.
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  - Reedy, Lonnie T.; and Smith, Eddie, 4,098,382, Cl. 192-110.00B.
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  - Still, Norman H.; and Berry, Robert W., 4,098,544, Cl. 308-4.00A.
  - Tschirky, John E.; and Crase, Gary Monroe, 4,098,561, Cl. 418-48.000.
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- Smith, Marvin D. Reel lock. 4,098,099, Cl. 70-18.000.
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- Sonoco Products Company: *See—*
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  - Frische, Richard H.; and Maxwell, Timothy T., 4,098,133, Cl. 73-702.000.
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- Standard Oil Company a corporation of Indiana: *See—*
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- Stanfill, Ralph Everette; Steinbach, James Gerald; Rehn, Gary Allen; Oelschlaeger, George Frederick; and Jackson, William Wayne, to Deere & Company. Steering for plow with adjustable plow bottoms. 4,098,346, Cl. 172-283.000.
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- Stanley, John M., to AMSTED Industries Incorporated. Pipe coupling. 4,098,528, Cl. 285-235.000.
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- Stewart, Jeffrey L., to Bio-Med Devices Inc. Respirator. 4,098,272, Cl. 128-145.800.
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- Strong, John D. Soil pasteurizing apparatus. 4,098,019, Cl. 47-1.00R.
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- Strzepek, Joseph A. Window assembly. 4,098,026, Cl. 49-390.000.

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- Sutelan, Franklin S. Multi-level building with prefabricated triangular cantilever units. 4,098,039, Cl. 52-73.000.
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- Swain, James C., to Battelle Development Corporation. Anchoring bolt and method. 4,098,087, Cl. 61-45.00B.
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- Takase, Katsuji: *See—*
  - Hoshino, Minoru; Shinohara, Toshio; Kawahara, Yukio; Takase, Katsuji; Tsuji, Toshimoto; and Fukuda, Jun-ichi, 4,098,749, Cl. 260-30.60R.
- Takasu, Mitsuo: *See—*
  - Miyata, Shigeo; Kuroda, Masataka; Okada, Akira; Okazaki, Tosihumi; and Takasu, Mitsuo, 4,098,762, Cl. 260-45.70R.
- Takasumi, Masakazu: *See—*
  - Shiga, Motohiro; Fujisawa, Fumio; Sato, Kazuo; Shiohata, Kouki; Takasumi, Masakazu; and Koga, Tsuguaki, 4,098,127, Cl. 73-462.000.
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  - Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,098,888, Cl. 424-246.000.
- Takeda, Masahiro. Method of accelerating contact reactions in fluids and apparatus therefor. 4,098,582, Cl. 23-293.00R.
- Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,098,512, Cl. 274-15.00R.
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  - Hood, Walter; Subrick, Joseph; and Talman, Woods G., 4,098,353, Cl. 173-20.000.
- Tamaki, Kazuo: *See—*
  - Etou, Yoshitaka; Matsuoka, Mikio; Matsumoto, Shizuo; Zoda, Takamichi; Gunji, Katsumi; Ohta, Toshihiko; Tamaki, Kazuo; Matsunami, Koichi; and Murakami, Tetsushi, 4,098,860, Cl. 264-171.000.
- Tamm, Rolf Gunter: *See—*
  - Huber, Bernhard Werner; Tamm, Rolf Gunter; and Braun, Klaus Joachim, 4,098,554, Cl. 356-85.000.
- Tamura, Tooru, to Aisin Seiki Kabushiki Kaisha. Orifice device for air flow restriction. 4,098,850, Cl. 261-65.000.
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  - Tani, Tatsuo; Tanaka, Mitsuo; and Kameyama, Toshiaki, 4,098,501, Cl. 271-117.000.
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- Taniguchi, Shu: *See—*
  - Nagata, Nobuyoshi; and Taniguchi, Shu, 4,098,841, Cl. 260-837.00R.
- Taniguchi, Toru, to Nikku Industry Co., Ltd. Tank for pitch impregnation therein. 4,098,428, Cl. 220-319.000.
- Tarada, Ivan Semenovich: *See—*
  - Schedrovitsky, Savely Solomonovich; Glebov, Vladimir Mikhailovich; Sidorova, Nadezhda Mikhailovna; Dubrovin, Jury Mikhailovich; Shrubek, Elena Ivanovna; Tarada, Ivan Semenovich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexaodr Gershevich, 4,098,364, Cl. 177-210.0EM.
- Tardelius, Klas Torsten Hjalmar. Method for manufacturing thermometers and a thermometer manufactured according to the method. 4,098,124, Cl. 73-371.000.
- Tart, David K.; and Osteen, Mitchell M., to General Electric Company. Gasket material formed of felt containing polyethylene terephthalate fibers. 4,098,942, Cl. 428-280.000.
- Tasaku, Wada; Noboru, Sasamoto; Shintaro, Oshima; Kozo, Nakao; Naohiko, Hattori; and Nobuhiro, Azuma, to Kokusai Denshin Denwa Co., Ltd. Facsimile scanning system. 4,099,208, Cl. 358-296.000.

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  - Inaba, Hiromi; Shima, Seiya; Tashiro, Korefumi; and Ando, Takeki, 4,099,111, Cl. 318-338.000.
- Tateno, Hidenori; and Nakano, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for preventing after-fire in an internal combustion engine. 4,098,241, Cl. 123-97.00B.
- Taylor, Clarence R., to Goodrich, David M. Automatic shut-off liquid dispensing nozzle. 4,098,307, Cl. 141-220.000.
- Taylor, Loyd G. Gasoline spill prevention system and apparatuses. 4,098,438, Cl. 222-529.000.
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  - Zadra, Mario D.; and Tazuma, James J., 4,098,718, Cl. 252-356.000.
- Tea, Frank C.; and Hartman, Philip S., to American Baler Company, The. Apparatus for baling bagasse and the like. 4,098,180, Cl. 100-98.00A.
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  - Alcenius, Thomas F., 4,098,354, Cl. 173-93.500.
- Techninn Research and Development Foundation, Ltd.: *See—*
  - Zaslavsky, Dan; Sinai, Gideon; and Biran, Giora, 4,098,089, Cl. 61-72.600.
- Teetz, Volker: *See—*
  - Konig, Wolfgang; Geiger, Rolf; Obermeier, Rainer; and Teetz, Volker, 4,098,779, Cl. 260-112.50R.
- Teitz, Peter David: *See—*
  - Strauss, Rudolf Siegfried; and Teitz, Peter David, 4,098,621, Cl. 148-23.000.
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  - Peck, William H.; and Tekulve, Daniel R., 4,097,939, Cl. 5-63.000.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Ossfeldt, Bengt Erik, 4,099,241, Cl. 364-200.000.
  - Peterson, Sven Tage, 4,099,034, Cl. 179-100.00R.
  - Svensson, Lars Tommy Edvard, 4,099,174, Cl. 340-347.0DA.
- Ten Broeck, Theodore R., to Goodyear Tire & Rubber Company, The. Dustless free flowing rubber additives. 4,098,858, Cl. 264-117.000.
- Teney, Donald J.: *See—*
  - Ward, Anthony T.; Teney, Donald J.; Ishler, James M.; and Damjanovic, Aleksandar, 4,098,655, Cl. 204-38.00A.
- Terrell Machine Company, The: *See—*
  - Ferguson, Richard; and Hoyle, Gettys D., Jr., 4,097,976, Cl. 28-297.000.
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- Tessler, Martin M., to National Starch and Chemical Corporation. Process for preparing cross-linked starches. 4,098,997, Cl. 536-106.000.
- Teuling, Dirk Johan Adriaan, to U.S. Philips Corporation. Circuit in a television display apparatus for producing a sawtooth deflection current through a line deflection coil. 4,099,101, Cl. 315-408.000.
- Texaco Development Corporation: *See—*
  - Zimmerman, Robert L.; McEntire, Edward E.; and Klein, Howard P., 4,099,004, Cl. 544-171.000.
- Texaco Inc.: *See—*
  - Allen, Joseph C., 4,098,336, Cl. 166-261.000.
  - Ganster, Charles A.; Callaghan, Mary E.; Gilmer, Lee K.; Nelson, Gerald V.; and Miller, Kenneth D., 4,098,721, Cl. 252-439.000.
  - Miller, Gordon H., 4,098,920, Cl. 427-46.000.
  - Vartanian, Paul F.; and Biasotti, Joseph B., 4,098,585, Cl. 44-63.000.
- Texas Instruments Incorporated: *See—*
  - Baboian, Robert, 4,098,663, Cl. 204-196.000.
  - Bullock, David Carl; and Shaikh, Mohammed Sabir, 4,098,917, Cl. 427-36.000.
  - Parsons, Robert, 4,099,258, Cl. 364-900.000.
  - Parsons, Robert; and Cook, Howard, 4,099,259, Cl. 364-900.000.
- Textron Inc.: *See—*
  - Dickinson, Thorn W., 4,098,145, Cl. 74-690.000.
  - McLarty, Daniel R., 4,098,146, Cl. 74-690.000.
  - Shorr, Morton; and Rudinger, George, 4,098,594, Cl. 55-403.000.
- Th. Goldschmidt AG: *See—*
  - Kollmeier, Hans-Joachim; and Rossmy, Gerd, 4,098,729, Cl. 521-128.000.
- Thermo Electron Corporation: *See—*
  - Nowak, Leonard G.; and Shefsiek, Paul K., 4,098,255, Cl. 126-91.00A.
- Thermo-Lab Instruments, Inc.: *See—*
  - Sayles, Donald A., 4,098,650, Cl. 204-1.00T.
- Thiokol Corporation: *See—*
  - Graham, William Hardin; and Shepard, Inella Gatlin, 4,098,626, Cl. 149-19.400.
- Thomas, Dalton A. Gear selector mechanism. 4,098,380, Cl. 192-48.500.
- Thomas, John J.: *See—*
  - Jones, Ronald H.; Finn, Mary A.; Thomas, John J.; and Folger, Edward C., 4,098,646, Cl. 195-96.000.
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  - Files, James H.; Montague, John M.; and Thomerson, Clarence T., 4,098,211, Cl. 114-219.000.
- Thompson, Dale F. Laminated fiber sport racket. 4,098,505, Cl. 273-73.00F.
- Thompson, Neil E. S.: *See—*
  - Redmore, Derek; and Thompson, Neil E. S., 4,098,849, Cl. 260-944.000.
- Thompson, Robert L., to Xerox Corporation. Biased flexible electrode transfer. 4,098,227, Cl. 118-649.000.
- Thomsen, Hans Thomas: *See—*
  - Foge, Helga Helene; and Thomsen, Hans Thomas, 4,097,955, Cl. 16-29.000.
- Thomson-CSF: *See—*
  - Desbois, Jean; and Tournois, Pierre, 4,099,206, Cl. 358-213.000.
  - Henry, Raymond; and Chapard, Alain, 4,097,986, Cl. 29-583.000.
  - Kantorowicz, Gerard, 4,099,132, Cl. 330-5.000.
  - Mourier, Georges, 4,099,093, Cl. 315-39.300.
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- Thorberg, Seth Olov: *See—*
  - Lindberg, Ulf Henrik Anders; Ross, Svante Bertil; Thorberg, Seth Olov; and Ogren, Sven Ove, 4,098,901, Cl. 424-311.000.
- Thorn Electrical Industries Limited: *See—*
  - Ainsworth, Thomas Somner, 4,099,081, Cl. 313-174.000.
- Thornburg, David D., to Xerox Corporation. Monolithic electronic scanning device. 4,099,071, Cl. 307-239.000.
- Thorne, David Edward; Baggaley, Keith Howard; and Morgan, Brian, to Beecham Group Limited. Polycyclic oxy-aromatic acid. 4,098,816, Cl. 260-520.00E.
- Thym, Sabine; Pommer, Ernst-Heinrich; Zeeh, Bernd; and Linhart, Friedrich, to BASF Aktiengesellschaft. N-(fluorodichloromethylthio)-benzanilides. 4,098,810, Cl. 260-453.0RW.
- Thyssen Purofer GmbH: *See—*
  - Lange, Georg, 4,098,496, Cl. 266-156.000.
- Tieszen, Dale O.; and Marrs, Oren L., to Phillips Petroleum Company. Poly(arylene sulfide) fibers. 4,098,776, Cl. 528-481.000.
- Tippmer, Kurt, to Carl Still Recklinghausen, Firma. Method of removing ash components from high-ash coals. 4,098,583, Cl. 44-1.00B.
- Tjaden, Garold S.: *See—*
  - Borgerson, Barry R.; and Tjaden, Garold S., 4,099,248, Cl. 364-787.000.
- Tobias, Michael Allan, to Mobil Oil Corporation. Water reducible epoxy ester using monocarboxylic acid to control molecular weight. 4,098,735, Cl. 260-18.0EP.
- Tocco, Dominick J., to Shell Oil Company. Certain s-triazines as lipogenesis inhibitors. 4,098,891, Cl. 424-248.560.
- Toda, Kohei: *See—*
  - Miyata, Kaneyasu; Amano, Izumi; Iwai, Takehiko; and Asahi, Tetsuya, 4,098,571, Cl. 8-94.110.
- Todd, William L. Fuel regulator for a two-cycle gas engine. 4,098,248, Cl. 123-120.000.
- Todokoro, Hideo, to Hitachi, Ltd. Scanning transmission electron microscope. 4,099,055, Cl. 250-311.000.
- Toitot, Michel: *See—*
  - Lhenry, Bernard; Toitot, Michel; and Blondeau, Regis, 4,098,495, Cl. 266-115.000.
- Tokumaru, Tatsuo: *See—*
  - Morimoto, Koichi; and Tokumaru, Tatsuo, 4,097,985, Cl. 29-570.000.
- Tokunaga, Shoichi; Kato, Atsumi; Takahashi, Yoshikazu; and Yamane, Kiyoshi, to Toyo Stauffer Chemical Co., Ltd. Method of preparing the catalyst component for α-olefin polymerization. 4,098,907, Cl. 526-116.000.
- Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
  - Yamamoto, Hirotaka; Ninomiya, Hideaki; and Kobayashi, Makoto, 4,098,725, Cl. 252-519.000.
- Tolley, William K., to UOP Inc. Production of titanium trichloride from ilmenite. 4,098,868, Cl. 423-83.000.
- Tomasina, Giuseppe. Band clamp. 4,097,972, Cl. 24-278.000.
- Tomikawa, Masami: *See—*
  - Ohkawa, Hideo; Nagai, Yoshinori; Kozakura, Shiro; Mugino, Yutaka; Fujimoto, Noriki; and Tomikawa, Masami, 4,098,752, Cl. 260-31.40R.
- Tomlinson, Kenneth: *See—*
  - Baines, Eric; Platt, Peter; and Tomlinson, Kenneth, 4,098,878, Cl. 424-52.000.
- Tomoda, Yoshiro: *See—*
  - Sakurai, Toshio; Nishihara, Akio; Handa, Takuro; Katoh, Hidekatsu; Tomoda, Yoshiro; Aoki, Kazumi; and Yoto, Makoto, 4,098,705, Cl. 252-33.600.
- Tomozawa, Atsushi: *See—*
  - Maruta, Rikio; Itoh, Yasuo; and Tomozawa, Atsushi, 4,099,029, Cl. 179-15.0BA.
- Tompa, Albert S.; French, David M.; Butler, George B.; and Kaufmao, Melvin S., to United States of America, Navy. Solvolytic degradation of pyrotechnic materials containing crosslinked polymers. 4,098,627, Cl. 149-109.600.
- Tomura, Teluo: *See—*
  - Kobayashi, Tadahiro; and Tomura, Teluo, 4,099,068, Cl. 307-200.00A.
- Tonkyn, Richard G.; and Vorchheimer, Norman, to Betz Laboratories, Inc. Cationic chlorine-resistant polymeric flocculants and their use. 4,098,693, Cl. 210-52.000.
- Topfl, Werner: *See—*
  - Dittrich, Volker; Topfl, Werner; and Kristiansen, Odd, 4,098,900, Cl. 424-304.000.
- Torii, Eitoku, to Daiwa Can Company, Ltd. Cap for a bottle. 4,098,420, Cl. 215-253.000.
- Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, to Jouveinal S.A. Esters of 21-thiol-steroids hydrocortisone and cortisone. 4,098,803, Cl. 260-397.450.
- Torossian, Dieran Robert; Aubard, Gilbert Gustave; and Legeai, Jacky Marcel, to Jouveinal S.A. Esters of 21-thiol prednisone and prednisolone. 4,098,804, Cl. 260-397.450.
- Tournois, Pierre: *See—*
  - Desbois, Jean; and Tournois, Pierre, 4,099,206, Cl. 358-213.000.

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Otten, Norman J.; and Presnell, Eldrige J., 4,098,406, Cl. 206-601.000.
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Towson, Jacob T., IV, to Hughes Aircraft Company. Asynchronous multiplexer-demultiplexer. 4,099,028, Cl. 179-15.0BA.
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Kubo, Seitoku; Kuramochi, Kojiro; and Shindo, Yoshio, 4,098,143, Cl. 74-606.00R.
Noguchi, Masaaki; Sanda, Shougo; Nakamura, Norihiko; and Kato, Takashi, 4,098,246, Cl. 123-119.00A.
Ohata, Akira, 4,098,245, Cl. 123-117.00A.
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Tritle, Robert C., Jr., to Raymond Lee Organization, Inc., The, a part interest. Specialized crutch tips. 4,098,283, Cl. 135-77.000.
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Tschirky, John E.; and Crase, Gary Monroe, to Smith International, Inc. Sealed bearings. 4,098,561, Cl. 418-48.000.
Tsigdinos, George A.; Moore, Fred W.; Kuck, Valerie J.; and Scalco, Emanuele, to Amax Inc. Ester-plasticized polyvinyl chloride resin composition containing molybdenum flame retardant and smoke suppressant agent. 4,098,753, Cl. 260-31.80R.
Tsigdinos, George A.: *See—*
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Tsugukuni, Hideyoshi; Kano, Masafumi; and Matsuda, Mitsuhiro, to Dai Nippon Toryo Co., Ltd. Thermosetting polymer dispersions and process for production thereof. 4,098,844, Cl. 260-859.00R.
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Tucker, Arnold G.: *See—*
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Tull, Roger J.; Hartman, George D.; and Weinstock, Leonard M., to Merck & Co., Inc. Process for preparation of 9-(dihalobenzyl) adenines. 4,098,787, Cl. 544-277.000.
Tunnicliffe, Brian William Richard: *See—*
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Turner, Nathan L., to Denka Chemical Corporation Polychloroprene powders. 4,098,989, Cl. 528-486.000.
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Turner, Sam R., to Xerox Corporation. Electron acceptor polymers. 4,098,984, Cl. 526-245.000.
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Ueda, Tatehito, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air feed control device of an internal combustion engine. 4,098,079, Cl. 60-290.000.
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U.S. Armament Corporation: *See—*
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Buswell, Richard F.; Sederquist, Richard A.; and Snopkowski, Daniel J., 4,098,589, Cl. 48-94.000.
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Onder, Kemal B., 4,098,775, Cl. 528-350.000.
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Van de Weijer, Martinus Henricus Adrianus, to U.S. Philips Corporation. Flashlamp unit. 4,098,565, Cl. 431-93.000.
van Diepenbroek, Alfred Erich Wibrandt; Wormgoor, Jan Hendrik; and Schilperoort, Cornelis, to Bronswerk Heat Transfer B.V. Apparatus and method for removing non-conductive particles from a gas stream. 4,098,591, Cl. 55-2.000.
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- vich; Belyaeva, Agnia Alexandrovna; Mash, Dmitry Matveevich; Lebedev, Alexei Pavlovich; and Belfor, Alexandr Gershevich, 4,098,364, Cl. 177-210.0EM.
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- Waddington, Clive, to Avco Corporation. Waddington drive having a cam actuated by an integral flyweight. 4,098,147, Cl. 74-750.00B.
- Waechter, Fritz: *See—*
  - Sanford, Arthur Carol; and Waechter, Fritz, 4,098,310, Cl. 144-3.00R.
- Waghorne, Robert H., to Exxon Research & Engineering Co. Catalytic cracking process with CO_2-stripped regenerated catalyst. 4,098,677, Cl. 208-113.000.
- Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, to Merck & Co., Inc. Poly[{alkyl-(3-ammoniopropyl)iminio}trimethylene dihalides] and process. 4,098,726, Cl. 528-403.000.
- Wagner, Kuno: *See—*
  - Burkhardt, Tilo; Wagner, Kuno; and Findeisen, Kurt, 4,098,933, Cl. 427-379.000.
- Wah, Man. Laminated padlock. 4,098,100, Cl. 70-38.00A.
- Walbe, Andrew W. Retriever training gun with pistol type handle. 4,098,015, Cl. 42-1.00F.
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  - Wells, Donald R.; and Walker, Raymond W., 4,098,333, Cl. 166-0.500.
- Wallace, David R., to PPG Industries, Inc. Aqueous acrylic-carboxylated polyether compositions. 4,098,740, Cl. 260-29.6NR.
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  - Hoopes, Howard Sherman; and Walsh, Thomas Joseph, 4,099,114, Cl. 318-676.000.
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- Ward, Anthony T.; Teney, Donald J.; Ishler, James M.; and Damjanovic, Aleksandar, to Xerox Corporation. Method for fabricating a photoreceptor. 4,098,655, Cl. 204-38.00A.
- Ward, Harold R., to Raytheon Company. Signal receiver. 4,099,182, Cl. 343-17.2PC.
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  - Hazar, Mitchell M., 4,097,992, Cl. 32-2.000.
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  - Cummisford, Robert G.; Wasielewski, Richard J.; and Krueger, Robert K., 4,098,859, Cl. 264-122.000.
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- Watanabe, Sakuji, to Nippon Kogaku K.K. Constant-voltage regulated power supply. 4,099,115, Cl. 323-19.000.
- Watanabe, Toshiro: *See—*
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- Waters, E. Dale, to McDonnell Douglas Corporation. Heat exchanger gas separator. 4,098,326, Cl. 165-76.000.
- Watson, Paul C., to Charles Stark Draper Laboratory, Inc., The. Remote center compliance system. 4,098,001, Cl. 33-169.00C.
- Watt, Richard Edwin. Flat plate solar collector panel having extruded thermal conductors. 4,098,261, Cl. 126-271.000.
- Watts, George G.: *See—*
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- Weber, Victor, to W. R. Grace & Co. Joint sealing method. 4,098,047, Cl. 52-741.000.
- Weberg, Lloyd E., to Westinghouse Electric Corp. Fuseless intrinsic safety barrier. 4,099,216, Cl. 361-56.000.
- Webster, Harold F.; and Cusano, Dominic A., to General Electric Company. Lead bonding method. 4,098,452, Cl. 228-123.000.
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- Weighload Limited: *See—*
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- Weihbold, Heinz, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Medium-conduit-system to be used in tiltable-metallurgical-vessel-arrangement. 4,098,497, Cl. 266-241.000.
- Weihe, Clyde R., Jr. Portable ski tow hoist. 4,098,196, Cl. 104-173.0ST.
- Weil, Hans Herman. Adjustable cutting device. 4,098,160, Cl. 83-468.000.
- Weinshenker, Ned M.; and Dale, James A., to Dynapol. Polymeric hydroquinone antioxidant. 4,098,829, Cl. 568-744.000.
- Weinstein, Bernard. Uniform cap. 4,097,934, Cl. 2-195.000.
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- Weller, Kurt, to Franz Scheffer oHG. Pipe nipple for the discharge of a solid water jet. 4,098,461, Cl. 239-101.000.
- Wellons, Inc.: *See—*
  - Schuette, Henry W.; and Nye, Martin N., 4,098,008, Cl. 34-191.000.
- Wells, Donald R.; and Walker, Raymond W., to Compagnie Francaise des Petroles. Marine production riser system. 4,098,333, Cl. 166-0.500.
- Welsh, Norman F. Emergency traction apparatus for automobile wheels. 4,098,314, Cl. 152-216.000.
- Werner, Paul, to Keiper K.G. Free wheeling drive arrangement for a turnable member, especially for adjusting the position of backrests or window panes in automotive vehicles. 4,098,135, Cl. 74-157.000.
- Wes Industries, Inc.: *See—*
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  - Roge, Ralph R.; and Curtis, Paul J., 4,099,032, Cl. 179-18.0FA.
- Westerlund, H. Benny, to Gow Enterprises Limited. Cathode for electrolytic process involving hydrogen generation. 4,098,671, Cl. 204-284.000.
- Westermann, Peter Henry, to British Petroleum Company Limited, The. Blends containing modified polyethylene. 4,098,739, Cl. 260-28.50D.
- Western Electric Company, Inc.: *See—*
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  - Cameron, Frank L., 4,099,153, Cl. 337-159.000.
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  - Corth, Richard; and Sausville, Joseph W., 4,099,090, Cl. 313-487.000.
  - Cricchi, James R.; and Brewer, Joe E., 4,099,069, Cl. 307-238.000.
  - Dawson, Chester W.; Parsons, Robert B.; and Mattox, Douglas M., 4,099,080, Cl. 313-116.000.
  - Eichenlaub, Dennis P., 4,099,048, Cl. 235-92.0DM.
  - Grunert, Kurt A.; Conner, John P.; and Dobrosielski, Stephen S., 4,099,151, Cl. 335-189.000.
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  - Kub, Francis J.; and Bluzer, Nathan, 4,098,638, Cl. 156-657.000.
  - McAvoy, Bruce R., 4,099,147, Cl. 333-30.00R.

  - McLouski, Raymond M.; and Reid, Philip R., 4,098,924, Cl. 427-93.000.
  - Stock, Mark E.; and Sherwood, Edward F., 4,098,025, Cl. 49-388.000.
  - Weberg, Lloyd E., 4,099,216, Cl. 361-56.000.
  - Zitelli, William E.; Mussler, James M.; and Szabo, Andras I., 4,099,237, Cl. 364-494.000.
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- Weyler, George M., Jr., to United States of America, National Aeronautics and Space Administration. Rotatable mass for a flywheel. 4,098,142, Cl. 74-572.000.
- Weyn, Hendrik Frans, to Colgate-Palmolive Company. Stabilized dentrifice containing initially physically separated normally reactive components. 4,098,435, Cl. 222-94.000.
- Whalen, Joseph W.: *See—*
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- Wheeler, Edward L.: *See—*
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- Whirlpool Corporation: *See—*
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- White, Ralph L., Jr.: *See—*
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- Whitten, David L., to Owens-Illinois, Inc. Safety end of run feeder. 4,098,154, Cl. 83-5.000.
- Whitten, James R., to General Electric Company. Speech scrambler. 4,099,027, Cl. 179-1.50S.
- Wiarda, Johannes Ymer. Vapor degreaser. 4,098,005, Cl. 34-73.000.
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- Wicker, Walter; and Reisdorf, Adolf, to Staubli Ltd. Tension roller in the drive mechanism between a weaving machine and a dobby. 4,098,136, Cl. 74-242.15R.
- Wiegard, Klaus; and Heil, Johann, to Daimler-Benz Aktiengesellschaft. Seal for a regenerative heat-exchanger. 4,098,323, Cl. 165-9.000.
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- Wilke, Gunther; Bogdanovic, Borislav; and Pauling, Horst, to Studiengesellschaft Kohle mbH. Optically active 3-substituted cyclooctene bicyclo-[6.0.3.]-undecene-3 and exo-2-vinyl norbornane. 4,098,834, Cl. 260-666.00A.
- Wilkinson, Alvin H., to Auto Crane Company. Quick change traveling block. 4,098,492, Cl. 254-189.000.
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- Williams, Malcolm; and Melady, Adrian Walter, to Lucas Electrical Company Limited, The. Engine control system. 4,098,234, Cl. 123-32.0EA.
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- Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans Jurgen, to Bayer Aktiengesellschaft. Silyl ethers and their use as polymerization initiators. 4,098,808, Cl. 260-448.80R.
- Wolff, Hanns H., to United States of America, Navy. Self-destroying location marking means. 4,099,183, Cl. 343-18.00B.
- Wolff, Norwin W., to Interpolymer Corporation. Process for eliminating squeal in disc brakes. 4,098,951, Cl. 428-463.000.
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- Zimmerman, Robert L.; McEntire, Edward E.; and Klein, Howard P., to Texaco Development Corporation. Morpholinomethacrylic acid salt. 4,099,004, Cl. 544-171.000.
- Zimmermann, Wolfgang; and Schindler, Hermann, to Hoechst Aktiengesellschaft. Product and process for preparing polyvinyl alcohol deposits of reduced water sensitivity. 4,098,969, Cl. 526-9.000.
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LIST OF DEFENSIVE PUBLICATIONS

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- Bow, Kenneth Earl: *See—*
  - Flores, David Perez; and Bow, Kenneth Earl, T972,002, Cl. 260-897.00B.
- Coleman, Leslie Stinson, Jr. Sort/merge algorithm. T972,003, 7-4-78, Cl. 364-300.000.
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  - Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, T972,001, Cl. 542-469.000.
- Flores, David Perez; and Bow, Kenneth Earl. High temperature thermoplastic adhesive compositions comprising a propylene polymer and an ethylene/carboxylic acid copolymer. T972,002, 7-4-78, Cl. 260-897.00B.
- Heseltine, Donald Warren: *See—*
  - Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, T972,001, Cl. 542-469.000.
- Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, to Eastman Kodak Company. Novel UV absorbing compounds and photographic elements containing UV absorbing compounds. T972,001, 7-4-78, Cl. 542-469.000.

LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Barnes-Hind Pharmaceuticals, Inc.: *See—*
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- General Motors Corporation: *See—*
  - Kondziola, Joseph D., Re. 29,688, Cl. 242-107.40A.
- Hayes, Lawrence E., to R.J. Reynolds Tobacco Company. Process of preparing glucose isomerase. Re. 29,689, Cl. 195-31.00F.
- Kondziola, Joseph D., to General Motors Corporation. Pendulum support for a seat belt retractor. Re. 29,688, Cl. 242-107.40A.
- Lee, Chin K., to R.J. Reynolds Tobacco Company. Process of preparing glucose isomerase. Re. 29,690, Cl. 195-31.00F.
- Long, Margaret E., to R.J. Reynolds Tobacco Company. Process of preparing glucose isomerase. Re. 29,691, Cl. 195-31.00F.
- Long, Margaret E., to R.J. Reynolds Tobacco Company. Process of preparing glucose isomerase. Re. 29,692, Cl. 195-31.00F.
- Phares, Russell E., Jr., to Barnes-Hind Pharmaceuticals, Inc. Process of soaking and sterilizing hydrophilic soft contact lens with chlorhexidine. Re. 29,693, Cl. 424-326.000.
- R.J. Reynolds Tobacco Company: *See—*
  - Hayes, Lawrence E., Re. 29,689, Cl. 195-31.00F.
  - Lee, Chin K., Re. 29,690, Cl. 195-31.00F.
  - Long, Margaret E., Re. 29,691, Cl. 195-31.00F.
  - Long, Margaret E., Re. 29,692, Cl. 195-31.00F.
- Sertich, Anthony T. Air-vibrator dental scaler. Re. 29,687, Cl. 32-56.000.
- Wallshein, Melvin. Orthodontic elastic band with varying outer periphery. Re. 29,686, Cl. 32-14.00A.

LIST OF PLANT PATENTEES

- Kraus, Fred. Azalea plant-Lucille K. 4,275, 7-4-78, Cl. 55.000.
- Slayman, M. Dwight. Pomegranate tree. 4,274, 7-4-78, Cl. 33.000.

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- AB Volvo: *See—*
  - Charton, Jean-Louis, 248,389, Cl. D12-184.000.
- Adler, Peter: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,353, Cl. D6-232.000.
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,355, Cl. D6-241.000.
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- Air Products and Chemicals, Inc.: *See—*
  - Leong, Henry, 248,405, Cl. D24-1.100.
- Alderson, John Charles; Hofland, Robert Milton; and Lamos, Richard Allen, to International Business Machines Corporation. Collator for use with an electrophotographic apparatus or the like. 248,400, 7-4-78, Cl. D16-32.000.
- Allen, David O., to Buckeye Molding Company. Tear open bottle capsule. 248,373, 7-4-78, Cl. D9-216.000.
- Allen, David O.; and Wombold, Harry A. E., to Buckeye Molding Company. Molded plastic closure. 248,376, 7-4-78, Cl. D9-255.000.
- Allen, Johnny G. Pedestal type garbage can holder. 248,364, 7-4-78, Cl D7-189.000.
- American Locker Security Systems, Inc.: *See—*
  - Stackhouse, Wells F., 248,349, Cl. D6-164.000.
- Arends, John M. Combined door opener and knob. 248,366, 7-4-78, Cl D8-302.000.
- Automation Systems Inc.: *See—*
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- Bang & Olufsen of America, Inc.: *See—*
  - Jensen, Jakob, 248,394, Cl. D14-33.000.
- Barbera, Charles. Speaker grill or the like. 248,395, 7-4-78, Cl. D14-39.000.
- Bartholomew, Robert. Table. 248,351, 7-4-78, Cl. D6-175.000.
- Bartlett, Peter G., to Automation Systems Inc. Demand controller component. 248,391, 7-4-78, Cl. D13-12.000.

- Bassett, William W.; and Johnson, Eugene D., to Honeywell Inc. Tube holder for medical specimen mixing device or similar article. 248,407, 7-4-78, Cl. D24-22.000.
- Beekenkamp, Gerald, to Reliance Products Ltd. Container for liquids. 248,370, 7-4-78, Cl. D9-175.000.
- Beitler, Myron; and Leer, Stuart D., to Litton Business Systems, Inc. Calculating machine. 248,419, 7-4-78, Cl. D64-11.00B.
- Bergstein Packaging Trust: *See—*
  - Bergstein, Robert M., 248,375, Cl. D9-237.000.
- Bergstein, Robert M., to Bergstein Packaging Trust. Display carton. 248,375, 7-4-78, Cl. D9-237.000.
- Berman, Bernard H. Bar of soap. 248,420, 7-4-78, Cl. D73-1.00A.
- Berman, Bernard H. Bar of soap. 248,421, 7-4-78, Cl. D73-1.00A.
- Blodee, Leif, to Gunlocke Company, Inc., The. Furniture leg post. 248,350, 7-4-78, Cl. D6-194.000.
- Bluestein, Bernard B., to Sunbeam Corporation. Crepe maker. 248,362, 7-4-78, Cl. D7-87.000.
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  - Cognata, Larry Monroe; and Brightbill, Keith E., 248,397, Cl. D15-15.000.
- Brown, Dwight C. One piece game board. 248,412, 7-4-78, Cl. D34-5.0SS.
- Buckeye Molding Company: *See—*
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- Cartier Inc.: *See—*
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- Cognata, Larry Monroe; and Brightbill, Keith E., to Murray Ohio Manufacturing Co., The. Riding mower. 248,397, 7-4-78, Cl. D15-15.000.
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- Davis, Paul, to Sweetheart Plastics, Inc. Beverage carrier. 248,371, 7-4-78, Cl. D9-179.000.
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Tomaro, Patrick M., to Conair Corporation. Hair styler. 248,410, 7-4-78, Cl. D28-13.000.
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Young, Daniel L. Game ball holder. 248,342, 7-4-78, Cl. D2-400.000.

CLASSIFICATION OF PATENTS

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39.36	4,098,074
	4,098,075
230	4,098,076
272	4,098,077
274	4,098,078
290	4,098,079
361	4,098,080
398	4,098,081
413	4,098,082
414	4,098,083
500	4,098,084
600	4,098,085
CLASS 61	
5	4,098,086
45 B	4,098,087
69 R	4,098,088
72.6	4,098,089
102	4,098,090
110	4,098,091
CLASS 62	
238	4,098,092
243	4,098,093
344	4,098,094
346	4,098,095
CLASS 64	
14	4,098,096
CLASS 65	
17	4,098,595
30 R	4,098,596
181	4,098,597
CLASS 66	
202	4,098,097
CLASS 68	
23 R	4,098,098
CLASS 70	
18	4,098,099
38 A	4,098,100
134	4,098,101
237	4,098,102
364 A	4,098,103
406	4,098,104
CLASS 71	
67	4,098,602
76	4,098,598
100	4,098,599
105	4,098,600
124	4,098,601
CLASS 72	
21	4,098,105
128	4,098,106
237	4,098,107
358	4,098,108
389	4,098,109
CLASS 73	
9	4,098,111
28	4,098,112
113	4,098,113
141 R	4,098,114
144	4,098,115
194 A	4,098,117
194 EM	4,098,118
194 M	4,098,116
300	4,098,110
323	4,098,119
335	4,098,120
337	4,098,121
341	4,098,122
343 R	4,098,123
371	4,098,124
425.6	4,098,125
432 R	4,098,126
462	4,098,127
591	4,098,128
599	4,098,129
614	4,098,130
627	4,098,131
639	4,098,132
702	4,098,133
CLASS 74	
45	4,098,134
157	4,098,135
230.8	4,098,137
242.15 R	4,098,136
405	4,098,138
410	4,098,139
447	4,098,140
492	4,098,141
572	4,098,142
606 R	4,098,143
687	4,098,144
690	4,098,145
	4,098,146
750 B	4,098,147
863	4,098,148
CLASS 75	
11	4,098,603
26	4,098,604
122	4,098,605
138	4,098,606
243	4,098,607
251	4,098,608
CLASS 76	
40	4,098,149
108 A	4,098,150
CLASS 81	
57.3	4,098,151
90 A	4,098,152
CLASS 82	
1 C	4,098,153
CLASS 83	
5	4,098,154
8	4,098,155
12	4,098,156
13	4,098,157
27	4,098,158
171	4,098,159
468	4,098,160
519	4,098,161
CLASS 84	
1.01	4,098,162
306	4,098,163
399	4,098,164
470	4,098,165
CLASS 88	
63	4,098,166
79	4,098,167
CLASS 89	
1.815	4,098,168
35 R	4,098,169
CLASS 90	
13.1	4,098,170
CLASS 91	
461	4,098,171
CLASS 92	
161	4,098,172
CLASS 93	
58.2 R	4,098,173
CLASS 96	
1.8	4,098,609
CLASS 98	
115 LH	4,098,174
CLASS 99	
283	4,098,175
303	4,098,176
310	4,098,177
329 RT	4,098,178
450.6	4,098,179
CLASS 100	
98 A	4,098,180
102	4,098,181
121	4,098,182
CLASS 101	
40	4,098,183
41	4,098,184
127.1	4,098,186
137	4,098,185
410	4,098,187
458	4,098,188
CLASS 102	
24 R	4,098,189
41	4,098,190
92	4,098,193
105	4,098,194
213	4,098,191
232	4,098,192
CLASS 104	
88	4,098,195
173 ST	4,098,196
CLASS 106	
47 R	4,098,610
53	4,098,611
73.2	4,098,612
89	4,098,613
90	4,098,614
162	4,098,615
CLASS 108	
109	4,098,197
161	4,098,198
CLASS 109	
52	4,098,199
CLASS 110	
204	4,098,200
CLASS 112	
2	4,098,201
20	4,098,202
90	4,098,203
121.12	4,098,204
217	4,098,205
220	4,098,206
221	4,098,207
291	4,098,208
298	4,098,209
439	4,098,210
CLASS 114	
219	4,098,211
230	4,098,212
254	4,098,213
267	4,098,214
275	4,098,215
297	4,098,216
299	4,098,217
CLASS 115	
17	4,098,218
31	4,098,219
CLASS 116	
106	4,098,220
114 G	4,098,221
CLASS 118	
7	4,098,222
48	4,098,223
49	4,098,224
64	4,098,225
622	4,098,226
649	4,098,227
658	4,098,228
CLASS 119	
1	4,098,229
5	4,098,230
CLASS 123	
25 B	4,098,231
32 EA	4,098,234
32 EG	4,098,235
32 R	4,098,233
32 ST	4,098,232
41.02	4,098,236
75 C	4,098,237
81 B	4,098,238
90.44	4,098,239
90.55	4,098,240
97 B	4,098,241
102	4,098,242
117 A	4,098,245
117 D	4,098,243
117 R	4,098,244
119 A	4,098,246
119 R	4,098,247
120	4,098,248
139 ST	4,098,249
141	4,098,250
195 A	4,098,251
198 F	4,098,252
CLASS 125	
11 R	4,098,253
CLASS 126	
79	4,098,254
91 A	4,098,255
116 R	4,098,256
121	4,098,257
263	4,098,258
270	4,098,259
	4,098,260
	4,098,262
271	4,098,261
	4,098,263
	4,098,264
	4,098,265
CLASS 128	
2.06 G	4,098,267
36	4,098,266
82	4,098,268
92 A	4,098,269
141 R	4,098,270
142.3	4,098,271
145.8	4,098,272
206	4,098,273
214 E	4,098,274

214 R	4,098,275
215	4,098,276
303 R	4,098,277
305.5	4,098,278
400	4,098,279

CLASS 133

3 A	4,098,280

CLASS 134

25 A	4,098,616

CLASS 135

4 R	4,098,281
5 R	4,098,282
77	4,098,283

CLASS 137

39	4,098,284
117	4,098,285
270	4,098,286
362	4,098,287
596.1	4,098,288
601	4,098,289
604	4,098,290
614.03	4,098,293
614.04	4,098,292
614.11	4,098,294
625.27	4,098,295
855	4,098,296
871	4,098,291

CLASS 138

30	4,098,297
122	4,098,298

CLASS 139

384 B	4,098,299
437	4,098,300

CLASS 141

7	4,098,301
9	4,098,302
52	4,098,303
84	4,098,304
92	4,098,305
218	4,098,306
220	4,098,307
285	4,098,308
291	4,098,309

CLASS 144

3 R	4,098,310
309 AC	4,098,311

CLASS 148

1.5	4,098,617
	4,098,618
2	4,098,619
6.2	4,098,620
23	4,098,621
36	4,098,622
133	4,098,623
153	4,098,624

CLASS 149

19.3	4,098,625
19.4	4,098,626
109.6	4,098,627

CLASS 150

35	4,098,312

CLASS 152

213 R	4,098,313
216	4,098,314
361 R	4,098,315
362 R	4,098,316

CLASS 156

52	4,098,628
87	4,098,629
219	4,098,630
221	4,098,631
245	4,098,633
295	4,098,632
302	4,098,634
445	4,098,635
498	4,098,636
644	4,098,637
657	4,098,638

CLASS 157

1.24	4,098,317

CLASS 160

327	4,098,318

CLASS 162

30 K	4,098,639
146	4,098,640
198	4,098,641
259	4,098,642

CLASS 164

86	4,098,319
407	4,098,320
434	4,098,321
446	4,098,322

CLASS 165

1	4,098,324
9	4,098,323
76	4,098,325
	4,098,326
	4,098,327
107	4,098,328
140	4,098,329
166	4,098,330
170	4,098,331
172	4,098,332

CLASS 166

0.5	4,098,333
120	4,098,335
208	4,098,334
261	4,098,336
270	4,098,337
301	4,098,338
305 R	4,098,339
311	4,098,340
314	4,098,341
315	4,098,342

CLASS 169

74	4,098,343

CLASS 172

40	4,098,344
59	4,098,345
283	4,098,346
311	4,098,347
406	4,098,348
555	4,098,349
776	4,098,350

CLASS 173

13	4,098,351
17	4,098,352
20	4,098,353
93.5	4,098,354
127	4,098,355
131	4,098,356

CLASS 174

48	4,099,020
73 R	4,099,021

CLASS 175

65	4,098,358
93	4,098,359
313	4,098,360
325	4,098,361
329	4,098,362
	4,098,363

CLASS 176

3	4,098,643
68	4,098,644

CLASS 177

210 EM	4,098,364
211	4,098,365

CLASS 178

63 R	4,099,022
69.1	4,099,023
71 R	4,099,024

CLASS 179

1 CN	4,099,025
1 VE	4,099,026
1.5 S	4,099,027
15 BA	4,099,028
	4,099,029
15.55 T	4,099,030
17 A	4,099,031
18 FA	4,099,032
90 D	4,099,033
100 R	4,099,034
107 FD	4,099,035
170 J	4,099,036

CLASS 180

68.5	4,098,366
105 E	4,098,367
108	4,098,368

CLASS 181

118	4,098,369
150	4,098,370

CLASS 182

2	4,098,371
196	4,098,372

CLASS 188

1 B	4,098,373
62	4,098,374
290	4,098,375

CLASS 190

43	4,098,376

CLASS 192

13 R	4,098,377
17 A	4,098,378
38	4,098,379
48.5	4,098,380
48.91	4,098,381
110 B	4,098,382

CLASS 193

2 R	4,098,383

CLASS 194

37	4,098,384
55	4,098,385
102	4,098,386
	4,098,387

CLASS 195

31 F	Re.29,689
	Re.29,690
	Re.29,691
	Re.29,692
51 S	4,098,647
68	4,098,645
96	4,098,646

CLASS 196

14.52	4,098,648

CLASS 198

396	4,098,390
417	4,098,391
425	4,098,392
458	4,098,393
499	4,098,394
748	4,098,395
861	4,098,396

CLASS 200

5 A	4,099,037
61.08	4,099,038
144 B	4,099,039
220	4,099,040

CLASS 201

2.5	4,098,649

CLASS 204

1 T	4,098,650
	4,098,651
	4,098,653
4	4,098,652
16	4,098,654
38 A	4,098,655
47	4,098,656
59 R	4,098,657
114	4,098,658
129.65	4,098,659
151	4,098,660
160.1	4,098,661
195 C	4,098,662
196	4,098,663
212	4,098,664
213	4,098,665
228	4,098,666
234	4,098,667
237	4,098,668
252	4,098,669
	4,098,670
284	4,098,671
296	4,098,672
302	4,098,673

CLASS 206

217	4,098,397
223	4,098,398
288	4,098,399
319	4,098,400
326	4,098,401
387	4,098,402
519	4,098,403
525	4,098,404
527	4,098,405
601	4,098,406

CLASS 208

11 R	4,098,674
108	4,098,675
111	4,098,676
113	4,098,677
120	4,098,678
139	4,098,679
164	4,098,680
206	4,098,681
216	4,098,682
	4,098,683
245	4,098,684

CLASS 209

10	4,098,685
74 R	4,098,407
82	4,098,408
166	4,098,686
	4,098,687
	4,098,688

CLASS 210

15	4,098,689
18	4,098,690
29	4,098,691
43	4,098,692
52	4,098,693
59	4,098,694
85	4,098,695
168	4,098,696
202	4,098,697
309	4,098,698
520	4,098,699

CLASS 211

195	4,098,409

CLASS 212

39 MS	4,098,410

CLASS 213

75 TC	4,098,411

CLASS 214

15 D	4,098,412
17 R	4,098,413
85	4,098,414
152	4,098,415
380	4,098,416

CLASS 215

204	4,098,417
206	4,098,418
252	4,098,419
253	4,098,420
321	4,098,421
355	4,098,422

CLASS 219

10.49 R	4,099,041
10.55 A	4,099,042
78.16	4,099,043
82	4,099,044
109	4,099,045
216	4,099,046
370	4,099,047

CLASS 220

3.6	4,098,423
4 F	4,098,424
9 LG	4,098,425
259	4,098,427
319	4,098,428
331	4,098,429
339	4,098,430
401	4,098,426

CLASS 222

39	4,098,431
43	4,098,432
63	4,098,433
94	4,098,434
	4,098,435
182	4,098,436
529	4,098,437
	4,098,438
531	4,098,439

CLASS 223

39	4,098,440

CLASS 224

1 A	4,098,441
45 P	4,098,442
	4,098,443

CLASS 226

97	4,098,444
186	4,098,445
196	4,098,446

CLASS 228

4.5	4,098,447
102	4,098,448
115	4,098,449
119	4,098,450
	4,098,451
123	4,098,452

CLASS 229

45	4,098,453

CLASS 232

19	4,098,454

CLASS 233

1 A	4,098,455
14 R	4,098,456
23 R	4,098,457

CLASS 235

92 DM	4,099,048
101	4,099,049
475	4,098,458

CLASS 236

87	4,098,459

CLASS 238

91	4,098,460

CLASS 239

101	4,098,461
557	4,098,462

CLASS 241

17	4,098,463
24	4,098,464
43	4,098,465
57	4,098,466

CLASS 242

25 A	4,098,467
54 R	4,098,468
55.18	4,098,470
55.3	4,098,469
56 R	4,098,471
84.2 G	4,098,472
	4,098,473
107.4 A	Re.29,688
200	4,098,474

CLASS 244

152	4,098,475

CLASS 248

1	4,098,476
23	4,098,477
156	4,098,478
214	4,098,479
243	4,098,480
	4,098,481
246	4,098,482
311.1 R	4,098,483
317	4,098,484
399	4,098,357
425	4,098,485
452	4,098,486

CLASS 250

199	4,099,050
236	4,099,051
283	4,099,052
293	4,099,053
306	4,099,054
311	4,099,055
403	4,099,056
416 R	4,099,057
416 TV	4,099,058
445 T	4,099,059
	4,099,060
	4,099,061
492 A	4,099,062
513	4,099,063
559	4,099,064
574	4,099,065

CLASS 251

61.4	4,098,487
240	4,098,488
327	4,098,489
329	4,098,490

CLASS 252

8.5 A	4,098,700
8.6	4,098,701
	4,098,702
	4,098,703
	4,098,704
33.6	4,098,705
40.5	4,098,706
49.9	4,098,707
51.5 A	4,098,708
	4,098,709
	4,098,710
63.2	4,098,711
79.5	4,098,712
89	4,098,713
181	4,098,714
182	4,098,715
188	4,098,716
331	4,098,717
356	4,098,718
364	4,098,719
389 R	4,098,720
439	4,098,721
466 J	4,098,722
474	4,098,723
514	4,098,724
519	4,098,725

CLASS 254

172	4,098,491
189	4,098,492

CLASS 256

24	4,098,493

CLASS 260

17 R	4,098,734
18 EP	4,098,735
18 PN	4,098,736
23.7 A	4,098,737
28.5 AV	4,098,738
28.5 D	4,098,739
29.2 E	4,098,741
29.2 M	4,098,742
29.2 TN	4,098,743
29.3	4,098,744
	4,098,745
29.4 UA	4,098,746
29.6 NR	4,098,740
30.4 N	4,098,747
30.6 R	4,098,748
	4,098,749
30.8 R	4,098,750
	4,098,751
31.4 R	4,098,752
31.8 R	4,098,753
37 PC	4,098,754
39 R	4,098,755
42.14	4,098,758
42.27	4,098,756
42.55	4,098,757
45.7 R	4,098,762
45.7 S	4,098,763
45.75 B	4,098,761
45.8 R	4,098,759
45.85 S	4,098,764
45.9 NC	4,098,760
78 P	4,098,774
112.5 R	4,098,777
	4,098,778
	4,098,779
	4,098,780
	4,098,781
112.5 S	4,098,782
147	4,098,783
199	4,098,784
239 BD	4,098,786
285.5	4,098,790
293.87	4,098,791
294.8 F	4,098,792
303	4,098,793
306.8 R	4,098,794
314.5	4,098,795
326 E	4,098,796
326.62	4,098,797
340.9 R	4,098,798
345.2	4,098,799
346.3	4,098,800
397.2	4,098,801
397.4	4,098,802
397.45	4,098,803
	4,098,804
404	4,098,805
405.5	4,098,806
429 CY	4,098,807
448.8 R	4,098,808
449 R	4,098,809
453 RW	4,098,810
459 A	4,098,811
465 E	4,098,812
501.15	4,098,813
502.5	4,098,814
514 D	4,098,815
520 E	4,098,816
533 C	4,098,817
535 R	4,098,818
543 P	4,098,819
561 R	4,098,820
564 G	4,098,824
567.5	4,098,821
585 B	4,098,822
586 G	4,098,823
590 D	4,098,825
603 C	4,098,826
646	4,098,831
651 F	4,098,832
666 A	4,098,834
666 P	4,098,833
666 PY	4,098,835
668 A	4,098,836
672 T	4,098,837
674 N	4,098,838
683.15 D	4,098,839
827	4,098,840
837 R	4,098,841
857 F	4,098,843
857 PG	4,098,842
859 R	4,098,844
860	4,098,845
874	4,098,846
880 R	4,098,847
897 A	4,098,848
944	4,098,849

CLASS 261

65	4,098,850
76	4,098,851
104	4,098,852
122	4,098,853
161	4,098,854

CLASS 264

50	4,098,855
80	4,098,856
89	4,098,857
117	4,098,858
122	4,098,859
171	4,098,860
174	4,098,861
220	4,098,785
257	4,098,862
275	4,098,863
290 T	4,098,864
333	4,098,865

CLASS 266

115	4,098,495
156	4,098,496
241	4,098,497

CLASS 267

61 S	4,098,498

CLASS 269

22	4,098,499
136	4,098,500

CLASS 271

117	4,098,501

CLASS 272

144	4,098,502

CLASS 273

26 C	4,098,503
61 R	4,098,504
73 F	4,098,505
75	4,098,506
87 C	4,098,507
96 R	4,098,508
183 B	4,098,509

CLASS 274

9 B	4,098,510
	4,098,511
15 R	4,098,512
39 A	4,098,513

CLASS 277

30	4,098,514
165	4,098,515
235 R	4,098,516

CLASS 280

1.12	4,098,517
47.13 R	4,098,518
87.01	4,098,519
242 WC	4,098,521
618	4,098,522
718	4,098,523
744	4,098,524
750	4,098,525
784	4,098,520

CLASS 285

119	4,098,526
167	4,098,527
235	4,098,528

CLASS 292

1	4,098,529
113	4,098,530

CLASS 293

63	4,098,531

CLASS 294

75	4,098,532
116	4,098,533

CLASS 296

1 S	4,098,534
35 A	4,098,535
78 R	4,098,536

CLASS 297

195	4,098,537

CLASS 299

33	4,098,538
75	4,098,539

CLASS 301

5.7	4,098,540

CLASS 302

53	4,098,541

CLASS 303

92	4,098,542

CLASS 305

54	4,098,543

CLASS 307

88 MP	4,099,066
153	4,099,067
200 A	4,099,068
238	4,099,069
	4,099,070
239	4,099,071
265	4,099,072
296 R	4,099,073
308	4,099,074
352	4,099,075

CLASS 308

4 A	4,098,544

CLASS 310

183	4,099,076
237	4,099,077
361	4,099,078

CLASS 312

214	4,098,545

CLASS 313

103 CM	4,099,079
116	4,099,080
174	4,099,081
217	4,099,082
	4,099,083
	4,099,084
400	4,099,085
407	4,099,086
422	4,099,087
450	4,099,088
487	4,099,089
	4,099,090
509	4,099,091

CLASS 315

10	4,099,092
39.3	4,099,093
	4,099,094
92	4,099,095
169 TV	4,099,096
	4,099,097
	4,099,098
194	4,099,099
241 P	4,099,100
408	4,099,101

CLASS 318

85	4,099,102
	4,099,103
115	4,099,106
138	4,099,104
139	4,099,105
227	4,099,107
	4,099,108
	4,099,109
266	4,099,110
338	4,099,111
561	4,099,112
632	4,099,113
676	4,099,114

CLASS 323

19	4,099,115

CLASS 324

3	4,099,116
54	4,099,117
61 R	4,099,118
73 PC	4,099,119
158 P	4,099,120

CLASS 325

4	4,099,121
38 B	4,099,122
308	4,099,123
326	4,099,124
419	4,099,125
446	4,099,126
478	4,099,127

CLASS 328

65	4,099,128
75	4,099,129

CLASS 329

104	4,099,130

CLASS 330

4.3	4,099,131
5	4,099,132
45	4,099,133
51	4,099,134
109	4,099,135
298	4,099,139
304	4,099,136

CLASS 331

16	4,099,137
94.5 C	4,099,141
	4,099,143
94.5 G	4,099,140
	4,099,142
94.5 P	4,099,138
107 R	4,099,144

CLASS 333

21 R	4,099,145
30 R	4,099,146
	4,099,147
70 T	4,099,148
72	4,099,149

CLASS 335

189	4,099,151

CLASS 337

102	4,099,152
159	4,099,153
249	4,099,155
290	4,099,156

CLASS 338

220	4,099,154

CLASS 339

5 R	4,098,546
91 R	4,098,547

CLASS 340

52 F	4,099,157
63	4,099,158
134	4,099,159
146.1 AL	4,099,160
147 R	4,099,161
166 R	4,099,162
168 B	4,099,163
197	4,099,164
304	4,099,169
324 M	4,099,170
335	4,099,171
336	4,099,172
347 AD	4,099,173
347 DA	4,099,174
	4,099,175
365 E	4,099,177
365 L	4,099,176
515	4,099,178
517	4,099,168
589	4,099,165
620	4,099,167
626	4,099,166

CLASS 343

5 SC	4,099,179
6.5 R	4,099,180
16 M	4,099,181
17.2 PC	4,099,182
18 B	4,099,183
875	4,099,184
880	4,099,185

CLASS 346

74.1	4,099,186

CLASS 350

359	4,098,548

CLASS 351

7	4,098,549

CLASS 352

69	4,098,550

CLASS 354

1	4,099,187
24	4,099,188
50	4,099,195
106	4,099,189
225	4,099,190
226	4,099,191
234	4,099,192
321	4,099,193
	4,099,194

CLASS 355

3 R	4,098,551
	4,099,150
8	4,098,552

CLASS 356

2	4,098,553
85	4,098,554

CLASS 357

23	4,099,196
24	4,099,197
30	4,099,198
	4,099,199
69	4,099,200
72	4,099,201

CLASS 358

85	4,099,202
118	4,099,203
149	4,099,204
	4,099,205
213	4,099,206
	4,099,207
296	4,099,208

CLASS 360

92	4,099,209
108	4,099,210
109	4,099,211
	4,099,212
137	4,099,213

CLASS 361

31	4,099,214
42	4,099,215
56	4,099,216
	4,099,217
230	4,099,219
341	4,099,220
433	4,099,218

CLASS 362

18	4,099,221
72	4,099,222
226	4,099,223
433	4,099,224

CLASS 363

56	4,099,225
124	4,099,226
126	4,099,227
159	4,099,228

CLASS 364

200	4,099,229
	4,099,230
	4,099,231
	4,099,232
	4,099,233
	4,099,234
	4,099,235
	4,099,236
	4,099,241
	4,099,242
	4,099,243
481	4,099,238
494	4,099,237
552	4,099,239
571	4,099,240
	4,099,244
603	4,099,245
709	4,099,246
710	4,099,247
787	4,099,248
822	4,099,249
826	4,099,250
829	4,099,251
900	4,099,252
	4,099,253
	4,099,254
	4,099,255
	4,099,256
	4,099,257
	4,099,258
	4,099,259

CLASS 365

105	4,099,260
	4,099,261
126	4,099,262
155	4,099,263
189	4,099,264
190	4,099,265
208	4,099,266

CLASS 366

142	4,099,267
144	4,098,494
338	4,099,268

CLASS 400

124	4,098,388
649	4,098,389

CLASS 403

20	4,098,555

CLASS 408

3	4,098,556

CLASS 415

111	4,098,557
199.1	4,098,558

CLASS 416

230	4,098,559

CLASS 417

214	4,098,560

CLASS 418

48	4,098,561

CLASS 423

7	4,098,866
24	4,098,867
83	4,098,868
85	4,098,869
124	4,098,870
177	4,098,871
226	4,098,886
265	4,098,872
490	4,098,873
628	4,098,874
658	4,098,875

CLASS 424

1	4,098,876
45	4,098,877
52	4,098,878
	4,098,879
54	4,098,880
59	4,098,881
	4,098,882
157	4,098,883
180	4,098,884
212	4,098,885
245	4,098,887
246	4,098,888
248.4	4,098,890
248.52	4,098,889
248.56	4,098,891
249	4,098,892
263	4,098,893
	4,098,908
269	4,098,894
	4,098,895
	4,098,896
272	4,098,897
273 R	4,098,898
300	4,098,899
304	4,098,900
311	4,098,901
322	4,098,902
324	4,098,903
	4,098,904
326	Re.29,693
343	4,098,905

CLASS 425

121	4,098,562
204	4,098,563
461	4,098,564

CLASS 426

94	4,098,906
104	4,098,913
274	4,098,909
535	4,098,910
547	4,098,911
617	4,098,912
632	4,098,914

CLASS 427

8	4,098,915
	4,098,916
36	4,098,917
	4,098,918
42	4,098,919
46	4,098,920
53	4,098,921
54	4,098,922
85	4,098,923
93	4,098,924
154	4,098,925
163	4,098,926
195	4,098,927
203	4,098,928
236	4,098,929
246	4,098,930
324	4,098,931
374 R	4,098,932
379	4,098,933

CLASS 428

35	4,098,934
40	4,098,935
	4,098,936
68	4,098,937
160	4,098,938
201	4,098,939
218	4,098,940
	4,098,941
280	4,098,942
283	4,098,943
284	4,098,944
327	4,098,945
357	4,098,946
407	4,098,947
411	4,098,948
434	4,098,949
458	4,098,950
463	4,098,951
483	4,098,952
	4,098,953
537	4,098,954
	4,098,955
627	4,098,956
654	4,098,957

CLASS 429

17	4,098,958
25	4,098,959
	4,098,960
48	4,098,961
72	4,098,962
86	4,098,964
88	4,098,963
153	4,098,965
161	4,098,966
210	4,098,967

CLASS 431

93	4,098,565
202	4,098,566

CLASS 432

72	4,098,567
230	4,098,568

CLASS 521

51	4,098,731
53	4,098,727
107	4,098,730
123	4,098,733
125	4,098,732
128	4,098,729
141	4,098,728

CLASS 526

1	4,098,968
9	4,098,969
13	4,098,970
16	4,098,971
21	4,098,973
62	4,098,972
65	4,098,974
73	4,098,975
77	4,098,976
	4,098,977
81	4,098,978
100	4,098,979
116	4,098,907
201	4,098,980
204	4,098,981
209	4,098,771
233	4,098,982
237	4,098,983
245	4,098,984
261	4,098,985
262	4,098,767
278	4,098,986
304	4,098,987
328	4,098,988

CLASS 528

1	4,098,765
49	4,098,772
65	4,098,773
99	4,098,769
130	4,098,770
217	4,098,766
337	4,098,768
350	4,098,775
403	4,098,726
481	4,098,776
486	4,098,989
490	4,098,990
492	4,098,991
500	4,098,992

CLASS 536

8	4,098,993
	4,098,994
54	4,098,995
57	4,098,996
106	4,098,997

CLASS 542

447	4,098,998

CLASS 544

15	4,098,999
17	4,099,000
27	4,099,001
119	4,099,002
137	4,099,003
171	4,099,004
190	4,099,005
204	4,099,006
277	4,098,787
293	4,098,788
299	4,098,789

CLASS 548

307	4,099,007
314	4,099,008
319	4,099,009
344	4,099,010
376	4,099,011
378	4,099,012

CLASS 560

53	4,099,013
	4,099,014
	4,099,015
121	4,099,016
	4,099,017
246	4,099,018

CLASS 568

126	4,098,828
730	4,098,830
744	4,098,829
824	4,098,827

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D2—	400	248,341
		248,342
D6—	32	248,343
	38	248,344
	58	248,345
	79	248,346
	125	248,347
	137	248,348
	164	248,349
	175	248,351
	179	248,352
	194	248,350
	232	248,353
	233	248,354
	241	248,355
	242	248,356
D7—	3	248,357
	14	248,358
	22	248,359
	46	248,360
	78	248,361
	87	248,362
	94	248,363
	189	248,364
D8—	98	248,365
	302	248,366
	356	248,367
	373	248,368
D9—	175	248,370
	179	248,371
	184	248,369
	193	248,372
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	224	248,374
	237	248,375
	255	248,376
D10—	46	248,377
	106	248,378
D11—	3	248,379
	43	248,380
	118	248,381
	125	248,382
	140	248,383
	157	248,384
D12—	91	248,385
	98	248,386
	110	248,387
	155	248,388
	184	248,389
	205	248,390
D13—	12	248,391
D14—	6	248,392
	8	248,393
	33	248,394
	39	248,395
D15—	7	248,396
	15	248,397
	140	248,398
	146	248,399
D16—	32	248,400
	54	248,401
D19—	90	248,402
D22—	8	248,403
D23—	19	248,404
D24—	1.1	248,405
	3	248,406
	22	248,407
	57	248,408
D27—	36	248,409
D28—	13	248,410
D31—	21.1	248,411
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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

36 : T972,001
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

Notice of Expanded Classification Listing Service

Current information regarding the classification of patents, up to now available from the Patent and Trademark Office only in the form of subclass listings can now be obtained in two additional listing formats. The three types of listings are described as follows:

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NEW III. LISTING OF DISCRETE PATENTS IN COMBINED SUBCLASSES: a merged patent number sequence listing of the patents appearing in a group of specified subclasses showing their original and/or cross reference classifications.

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Patent Classification Listings
U.S. Patent and Trademark Office
Room 2C32, Crystal Plaza 3
Washington, D.C. 20231

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ALFRED C. MARMOR,
Administrator for Documentation.

May 30, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 213,431, Re. S.N. 906,364, Filed May 12, 1978, Cl. D8/144, KNOB, Leland George Stone, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 218,877, Re. S.N. 906,362, Filed May 12, 1978, Cl. D8/158, PULL, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 220,934, Re. S.N. 906,361, Filed May 12, 1978, Cl. D8/166, HARDWARE FOR CABINETS OR THE LIKE, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 226,895, Re. S.N. 906,363, Filed May 12, 1978, Cl. D8/166, PULL, Raymond U. H. Tegner, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

D. 236,682, Re. S.N. 906,360, Filed May 12, 1978, Cl. D8/179, ESCUTCHEON, LaVerne E. Clayton, Owner of Record: *Amerock Corp., Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 290

3,956,298, Re. S.N. 904,640, Filed May 10, 1978, Cl. 260/248 NS, N-(3-HYDROXYARYL-PROPYL)-IMIDES, Hanns Lind, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 121

3,958,959, Re. S.N. 906,727, Filed May 17, 1978, Cl. 55/10, METHOD OF REMOVING PARTICLES AND FLUIDS FROM A GAS STREAM BY CHARGED DROPLETS, Ernest Cohen, et al., Owner of Record: *TRW Inc., Redondo Beach, Calif.,* Attorney or Agent: John J. Connors, et al., Ex. Gp.: 177

4,024,297, Re. S.N. 906,377, Filed May 16, 1978, Cl. 427/54, ACTINIC LIGHT POLYMERIZABLE COATING COMPOSITIONS, Gerald W. Gruber, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: George D. Morris, Ex. Gp.: 162

4,027,433, Re. S.N. 905,116, Filed May 11, 1978, Cl. 51/410, SAND BLASTING APPARATUS, Wayne B. Hockett, Owner of Record: *Inventor,* Attorney or Agent: Stefan M. Stein, et al., Ex. Gp.: 323

4,036,187, Re. S.N. 904,753, Filed May 11, 1978, Cl. 123/32 SP, CLEAN SPARK IGNITION INTERNAL COMBUSTION ENGINE, Hui-Tzeng Ting, Owner of Record: *Inventor,* Attorney or Agent: Stuart S. Bowie, Ex. Gp.: 342

4,047,231, Re. S.N. 891,676, Filed Mar. 30, 1978, Cl. 360/36, HIGH STABILITY DIGITAL HEAD SERVO FOR VIDEO RECORDERS, Gary B. Garagnon, Owner of Record: *Ampex Corporation, Redwood City, Calif.,* Attorney or Agent: Robert G. Clay, Ex. Gp.: 235

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Dedication

3,650,460.—*Burke P. Lokey,* Covington, Va. PAPER BAG. Patent dated Mar. 21, 1972. Dedication filed May 8, 1978, by the assignee, *St. Regis Paper Company.*

Hereby dedicates the balance of the term of said patent to the Citizens of the United States of America.

Disclaimers

3,808,765.—*James Ludwig Wahlers,* Littleton, Colo., *Rupert Douglas Terry,* Toledo, Ohio, *William Scott, Jr.,* Littleton, Colo., and *Charles Donald Simmers,* Bowling Green, Ohio. INVERTING AND REVERSING CONVEYOR. Patent dated May 7, 1974. Disclaimer filed May 30, 1978, by the assignee, *Johns-Manville Corporation.*

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

3,829,327.—*Thomas T. Omori,* Glendale, and *Hiroshi Imaoka,* Gardena, Calif. CARBON PAPER. Patent dated Aug. 13, 1974. Disclaimer filed Mar. 27, 1978, by the assignee, *Kreha Corporation of America.*

Hereby enters this disclaimer to claims 1 through 12, inclusive of said patent.

3,851,770.—*Cecil Jenkins* and *Joseph R. Wollslayer,* Tulsa, Okla. PIVOTED WELL DRILLING MAST AND SEPARATE TOWER. Patent dated Dec. 3, 1974. Disclaimer filed Jan. 16, 1978, by the assignee, *Lee C. Moore Corporation.*

Hereby enters this disclaimed to claims 1, 3, 4, 5, 6 and 7 of said patent.

3,941,307.—*Edmund G. Van Malderghem,* Lewiston, N.Y. ENVELOPE ASSEMBLY. Patent dated Mar. 2, 1976. Disclaimer filed May 23, 1978, by the assignee, *Moore Business Forms, Inc.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,851,821. RAIL JOINT. Jose Juncosa Lopez, Paseo de la Habana 80, Madrid 16, Spain. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,064,999. ADJUSTABLE BUILDING PANEL SCAFFOLD. Simon Young, P.O. Box 41, Mamou, La. 70554.

4,065,640. APPARATUS FOR INTERCONNECTING A TELEPHONE LINE AND A PORTABLE CALCULATOR. Jeane Marie Rouiller, Couvet, Switzerland. Correspondence to: Stevens, Davis, Miller & Mosher, P.O. Box 2627, Arlington, Va. 22202.

4,066,650. KETO-ALDEHYDE-AMINE ADDITION PRODUCTS AND METHOD OF MAKING SAME. Laszlo G. Egyud, 21 Redgate Lane, Quissett, Falmouth, Mass. 02543. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The American Dental Association Health Foundation is prepared to grant licenses under the following patents upon reasonable terms:

4,018,600. METHOD FOR ELIMINATING GAMMA$_2$ FROM DENTAL AMALGAM AND IMPROVED DENTAL AMALGAM COMPOSITION.

4,078,921. METHOD FOR ELIMINATING GAMMA$_2$ FROM DENTAL AMALGAM AND IMPROVED DENTAL AMALGAM COMPOSITION.

3,892,579. ADHESIVE REFRACTORY PROTECTIVE COMPOSITION FOR INVESTMENT CASTING.

The RCA Corporation offers to grant non exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,081,896. METHOD OF MAKING A SUBSTRATE CONTACT FOR AN INTEGRATED CIRCUIT.

4,082,425. OPTICAL COUPLER.

4,082,438. ZERO-ORDER DIFFRACTIVE SUBTRACTIVE FILTER PROJECTOR.

4,082,453. FABRICATION OF RECTANGULAR RELIEF PROFILES IN PHOTORESIST.

4,082,865. METHOD FOR CHEMICAL VAPOR DEPOSITION.

4,082,996. VIDEO AMPLIFIER INCLUDING AN A-C COUPLED VOLTAGE FOLLOWER OUTPUT STAGE.

4,083,051. CIRCULARLY-POLARIZED ANTENNA SYSTEM USING TILTED DIPOLES.

4,083,710. METHOD OF FORMING A METAL PATTERN ON AN INSULATING SUBSTRATE.

4,084,070. OVERCURRENT PROTECTION CIRCUIT.

4,084,071. SWITCH MECHANISM FOR A CALCULATOR TYPE KEYBOARD.

4,084,115.	CIRCUIT FOR CORRECTING SETUP ERROR IN A COLOR TELEVISION RECEIVER.
4,084,127.	DIGITAL FREQUENCY DEVIATION DETECTOR USEFUL IN A TELEVISION TUNING SYSTEM.
4,084,156.	VOLTAGE MONITORING CIRCUIT.
4,084,177.	SECAM SUBCARRIER GENERATOR.
4,084,188.	OPTICAL FILTER.
4,084,672.	AUTOMATIC CONTROL OF FREE WHEELING.
4,084,690.	VIDEO DISC PACKAGE HAVING A CENTER POST.
4,084,691.	VIDEO DISC PACKAGE.
4,084,772.	ROLL/YAW BODY STEERING FOR MOMENTUM BIASED SPACECRAFT.
4,084,773.	MAGNETIC CONTROL OF SPACECRAFT ROLL DISTURBANCE TORQUES.
4,084,970.	ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA USING SUCROSE BENZOATE.
4,085,178.	METHOD FOR PRODUCING INJECTION MOLDED AND CENTRALLY APERTURED DISC RECORDS.
4,085,359.	SELF-STARTING AMPLIFIER CIRCUIT.
4,085,367.	METHOD AND DETECTION OF PHASE AND FREQUENCY MODULATION.
4,085,377.	MICROWAVE FREQUENCY DISCRIMINATOR COMPRISING A ONE PORT ACTIVE DEVICE.
4,085,432.	VOLTAGE LIMITER CIRCUIT.
4,086,501.	PLANAR TRANSFERRED ELECTRON LOGIC DEVICE WITH IMPROVED BIASING MEANS.
4,086,513.	PLURAL GUN CATHODE RAY TUBE HAVING PARALLEL PLATES ADJACENT GRID APERTURES.
4,086,579.	VIDEO DIGITAL DISPLAY DEVICE WITH ANALOG INPUT.
4,086,617.	VIDEO DISC PLAYER MECHANISM CONTROL SYSTEM.

The following 12 patents are offered by Dr. Richard A. Wallace, 7304 SW. 53rd Ave., Portland, Oreg. 97219.

3,712,025.	CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE AND APPARATUS.
3,718,559.	ELECTROGEL PROCESS FOR REMOVING ELECTROLYTES AND CONCENTRATING THE SAME FROM AN AQUEOUS SOLUTION.
3,727,375.	APPARATUS FOR THE CONTINUOUS ELECTROMIGRATION PROCESS FOR REMOVAL OF GASEOUS CONTAMINANTS FROM THE ATMOSPHERE.
3,773,043.	CHEMICAL BREATHING APPARATUS WITH ALARM DEVICE.
3,799,810.	FAST ACTIVATION RESERVE BATTERY.
3,846,366.	STRUCTURAL MATERIAL AND METHOD.
3,847,788.	ELECTROGEL APPARATUS FOR REMOVING ELECTROLYTES AND CONCENTRATING THE SAME FROM AN AQUEOUS SOLUTION.
3,902,485.	CHEMICALLY ACTIVATED WARNING SYSTEM.
3,911,413.	THERMALLY ACTIVATED WARNING SYSTEM.
3,911,005.	STRUCTURAL MATERIAL AND METHOD.
4,013,616.	MIXED POLYMERIC STRUCTURAL MATERIAL AND METHOD.
4,008,077.	REJUVENATION OF WASTE SILVER-LADEN SOLUTIONS.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half Street SW., Washington, D.C. 20324

Patent application 850,325. Thinned Withdrawal Weighted Surface Acoustic Wave Interdigital Transducers. Filed Nov. 10, 1977.

Patent application 864,065. Junction-Storage JFET Bucket-Brigade Structure. Filed Dec. 23, 1977.

Patent application 864,067. Nondestructive Testor for Fiberglass-Aluminum Honeycomb Structures. Filed Dec. 23, 1977.

Patent application 865,269. Precision Antenna Alignment Procedure. Filed Dec. 28, 1977.

Patent application 866,125. Simplified Plug-In Filter. Filed Dec. 30, 1977.

Patent application 866,186. Communication System Beamport Sidelobe Canceller. Filed Dec. 30, 1977.

Patent 4,070,655. Virtually Nonvolatile Static Random Access Memory Device. Filed Nov. 5, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,709. Piecewise Linear Predictive Coding System. Filed Oct. 13, 1976, patented Jan. 24, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch General Services
Division, Federal Bldg., Agricultural Research Service,
Hyattsville, Md. 20782.

Patent application 775,228. Control of Nematodes and Other Helminths. Filed Mar. 7, 1977.

Patent application 873,570. Process for Preparing Mixed Bean Salads. Filed Jan. 30, 1978.

Patent application 873,573. Mini-Injector. Filed Jan. 30, 1978.

Patent application 875,049. Attractant for Male Mediterranean Fruit Fly. Filed Feb. 3, 1978.

Patent 4,066,792. Method of Producing Soybean Milk Yoghurt. Filed Sept. 22, 1976. Patented Jan. 3, 1978. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

National Institutes of Health, Chief, Patent Branch,
Westwood Building, Bethesda, Md. 20014.

Patent application 828,926. The Compound, 4-Carboxyphthalato (1,2 Diaminocyclohexane) Platinum (II) and Alkali Metal Salts Thereof and Its Use in Alleviating L1210 Murine Leukemia. Filed Aug. 29, 1977.

Patent application 847,022. Parabolic Focussing Thermal Detector for Low Level Ultrasonic Power Measurements. Filed Oct. 31, 1977.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent application 833,216. Safing a Flueric Cartridge Initiator. Filed Sept. 14, 1977.

Patent application 843,760. Solar Energy Window. Filed Oct. 20, 1977.

Patent Application 852,119. Underwater Self-Gripping Pile Cutting Device. Filed Nov. 16, 1977.

Patent Application 852,126. Photographic Image Enhancement by Photofission. Filed Nov. 16, 1977.

Patent application 853,157. Fiber Optic Delay Line Filter. Filed Nov. 21, 1977.

Patent application 853,777. Thoroidal Polisher. Filed Nov. 21, 1977.

Patent application 859,637. Single Filament Fiber Optic Cable Parting Tool. Filed Dec. 12, 1977.

Patent Application 863,840. Cryogenic Refrigeration System. Filed Dec. 23, 1977.

Patent application 864,417. Growth Techniques for Preparing Graded Gap Semiconductors and Devices. Filed Nov. 24, 1976.

Patent application 867,619. Radioiodine Detector Based on Laser Induced Fluorescence. Filed Jan. 6, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 858,596. Over-under Double-Pass Interferometer. Filed Dec. 8, 1977.

Patent application 858,767. Clutter Free Synthetic Aperture Radar Correlator. Filed Dec. 8, 1977.

Patent application 863,773. Method of Construction of a Multi-Cell Solar Array. Filed Dec. 23, 1977.

Patent application 878,542. Microwave Dichroic Plate. Filed Feb. 16, 1978.

Patent 3,359,568. Helmet Feedport. Filed Mar. 30, 1966. Patented Dec. 26, 1967. Not available NTIS.

Patent 3,487,765. Protective Garment Ventilation System. Filed Oct. 6, 1966. Patented Jan. 6, 1970. Not available NTIS.

Patent 3,488,771. Helmet Latching and Attaching Ring. Filed Mar. 17, 1966, patented Jan. 13, 1970. Not available NTIS.

Patent 3,490,074. Restraining Mechanism. Filed Oct. 6, 1966. Patented Jan. 20, 1970. Not available NTIS.

Patent 3,908,118. Cross Correlation Anomaly Detection System. Filed Feb. 27, 1973, patented Sept. 23, 1975. Not available NTIS.

Patent 3,909,602. Automatic Visual Inspection System for Microelectronics. Filed Sept. 27, 1973, patented Sept. 30, 1975. Not available NTIS.

Patent 4,053,231. Interferometer Mirror Tilt Correcting System. Filed Dec. 18, 1975, patented Oct. 11, 1977. Not available NTIS.

Patent 4,055,041. Integrated Gas Turbine Engine—Nacelle. Filed Nov. 3, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,089. Semiconductor Projectile Impact Detector. Filed Mar. 11, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,147. Automatic Fluid Dispenser. Filed Oct. 8, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,777. Window Comparator. Filed Nov. 2, 1976. Patented Oct. 25, 1977, Not available NTIS.

Patent 4,055,810. Independent Gain and Bandwidth Control of a Travelling Wave Maser. Filed July 26, 1970. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,065,053. Low Cost Solar Energy Collection System. Filed July 24, 1975, patented Dec. 27, 1977. Not available NTIS.

Patent 4,068,763. Wrist Joint Assembly. Filed July 26, 1976, patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,661. Variable Mixer Propulsion Cycle. Filed June 2, 1975, patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,574. Magnifying Image Intensifier. Filed Apr. 28, 1976. Patented Jan. 24, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	0-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents	Numbers 2,055 to 2,066, inclusive

REISSUES

JULY 11, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,694

TOOL SUPPORT FOR USE IN MACHINE TOOLS PARTICULARLY IN TURNING MACHINES

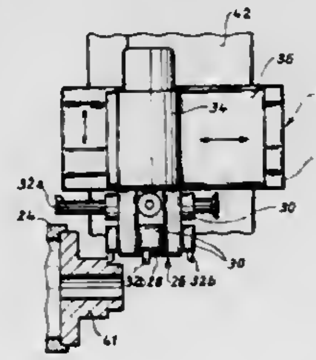
Gerhard Foll, Esslingen, and Heinrich Lahm, Esslingen-Sirnan, both of Germany, assignors to Index-Werke KG Hahn & Tessky, Stuttgart, Germany

Original No. 3,846,880, dated Nov. 12, 1974, Ser. No. 411,381, Oct. 31, 1973. Division of Ser. No. 79,483, Oct. 9, 1970, Pat. No. 3,786,539. Application for reissue Nov. 3, 1976, Ser. No. 738,346

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1969, 1952050

Int. Cl.² B23B *7/04, 3/18*

U.S. Cl. 29—36 **18 Claims**



4. [A combination as defined in claim 3, and] *In a machine tool, a combination comprising a frame; a work spindle for carrying a workpiece to be machined, said work spindle being mounted on said frame rotatable about a first axis; a slide including a first carriage reciprocably mounted on said frame and a second carriage mounted on said first carriage, one of said carriages being reciprocable substantially axially and the other substantially radially of said work spindle; and tool support means mounted on said second carriage and comprising a turret indexible with respect to the second carriage only about a second axis located in a plane including said first axis, said turret being provided with at least two rows of receiving means for tool holders, said receiving means being arranged in at least two groups disposed in two parallel planes spaced in the direction of said second axis from each other, said rows being arranged about said second axis coaxial therewith, said coaxial rows of receiving means being spaced from each other in the direction of movement of one of said carriages said combination also* including a plurality of tool holders respectively mounted on said receiving means and a tool in each of said tool holders, the tools in the tool holders of one of said groups of receiving means extending substantially in the direction of said second axis and being adapted to remove material from the exterior of a workpiece carried by said work spindle and the tools in the tool holders of the other of said groups extending in a direction substantially normal to said second axis and being adapted to remove material from the interior of the workpiece.

9. In a machine tool for use with a plurality of removable tools wherein a selected one of said tools is located at a work position and is capable of being moved into working engagement with a rotating workpiece, a combination comprising: a frame; a work spindle mounted on said frame for carrying the workpiece and means rotating the spindle and the workpiece about a first axis; a slide including a first carriage reciprocably mounted on said frame and a second carriage reciprocably mounted on said first carriage, means reciprocating one carriage substantially axially of said first axis and means reciprocating the other carriage along a transverse axis generally parallel to a radial of said first axis; mounting means on said second carriage; a turret extending from said mounting means and indexible relative thereto about a second axis to a plurality of fixed positions each representing a work position for a tool; said turret having a first annulus portion spaced from said mounting means, concentric with said second axis and defining a plurality of circumferentially spaced receiving means in said first annulus portion for a predetermined number of first removable tools and a second annulus portion between said mounting means and said first annulus portion, concentric with the latter and defining a plurality of circumferentially spaced receiving means in said second annulus portion for a predetermined number of second removable tools; said carriages being respectively movable along said first axis and along said transverse axis and selectively positioning a predetermined receiving means of one annulus portion to where a tool received therein is in working engagement with the workpiece, said turret being movable in the direction defined by the spacing between said annulus portions to selectively position either annulus portion to where a predetermined receiving means thereof is in a tool working engagement position, said first and second annulus portions being spaced apart to permit the mounting of tools in all receiving means, any selected receiving means of either annulus portion when in said tool working engagement position being spaced closer to said first axis than all receiving means of the other annulus portion and the tools thereof.

Re. 29,695

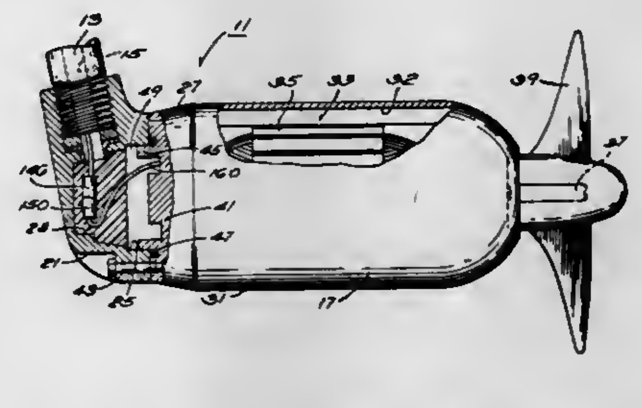
OUTBOARD MOTOR WITH SPEED REGULATOR FOR DC PERMANENT MAGNET MOTOR

Charles H. Blake, Sault Sainte Marie, Canada, assignor to Outboard Marine Corporation, Waukegan, Ill.

Original No. 3,954,081, dated May 4, 1976, Ser. No. 549,951, Feb. 14, 1975. Continuation-in-part of Ser. No. 399,609, Sep. 21, 1973, abandoned. Application for reissue Aug. 11, 1976, Ser. No. 713,391

Int. Cl.² B63H *21/26*

U.S. Cl. 115—18 E **31 Claims**



23. An outboard motor comprising a shaft extending vertically under normal operating conditions and adapted to be connected to a boat hull, said shaft including a hollow interior, a lower housing fixedly connected to said shaft and including a hollow interior communicating with said hollow interior of said shaft, an electric motor mounted in said housing hollow interior and including an output shaft including a first end extending exteriorly of said lower housing and a second end terminating within said hollow interior of said lower housing, a propeller mounted on said first end of said output shaft, a control circuit for said motor including a heat generating electrical component electrically connected to said motor and located in said housing hollow interior in axially spaced relation from said output shaft, and a thermally conductive means fixedly bonding said heat generating electrical component to said housing.

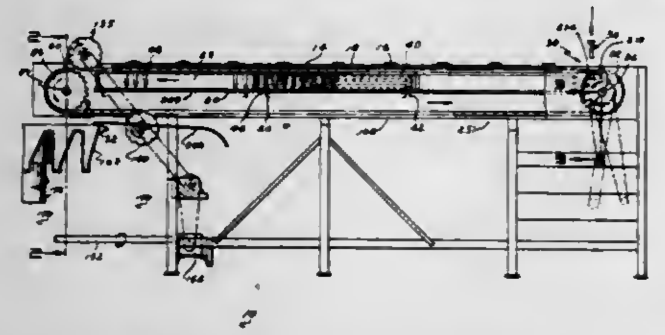
Re. 29,696
APPARATUS IMPROVEMENTS IN TEMPERATURE-CONDITIONING PARTS

Charles L. D. Chin, Avon; Joseph R. Reilly, Naugatuck, both of Conn.; L. John Berggren, deceased, late of Simsbury, Conn., by Edith O. Berggren, executrix, Olathe, Kans., assignors to Monsanto Company, St. Louis, Mo.

Original No. 3,894,835, dated Jul. 15, 1975, Ser. No. 418,075, Nov. 21, 1973. Application for reissue Mar. 25, 1977, Ser. No. 781,262

Int. Cl.^{2} F27B *9/14*

U.S. Cl. 432—124 **36 Claims**



1. Apparatus for temperature-conditioning elongated molded parts which comprises:

- a. wall sections defining a horizontally extending chamber;
- b. heat transfer assemblies *within and extending along at least about two thirds of the length of said chamber to form a heat transfer zone therein, said heat transfer assemblies being* spaced from each other [and extending along said chamber defining] *in the horizontal direction to define* generally parallel paths for said parts, *the height of said heat transfer assemblies in a direction substantially perpendicular to their lengthwise dimensions being adequate to oppose a substantial portion of the length of said elongated parts when positioned in such paths;*
- c. a plurality of bar assemblies *above said heat transfer assemblies* having means to hold said parts in said paths *in suspended position* with their lengthwise dimensions substantially normal to the *lengthwise* direction of extension of said heat transfer assemblies;
- d. means for advancing said bar assemblies through said chamber; and
- e. rotating means operatively interconnected with the advancing means and the bar assemblies for turning the parts about their lengthwise dimensions during travel along said paths.

Re. 29,697
LOW TEMPERATURE SOLVENTLESS SILICONE RESINS

Alan E. Mink, Williamstown, N.J., assignor to Dow Corning Corporation, Midland, Mich.

Original No. 3,948,848, dated Apr. 6, 1976, Ser. No. 601,781, Aug. 4, 1975. Application for reissue Feb. 28, 1977, Ser. No. 772,720

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **10 Claims**

1. A curable composition consisting essentially of a mixture of

- A. a copolymer of (in mole percent) 35 to 42 monophenylsiloxane, 0 to 12 diphenylsiloxane, 35 to 50 dimethylsiloxane and 8 to 15 vinylmethylsiloxane, and
- B. a copolymer of (in mole percent) 8 to 15 diphenylsiloxane, 30 to 55 methylhydrogensiloxane, 28 to 45 dimethylsiloxane and 5 to 12 trimethylsiloxane in amount such that there is a stoichiometric amount of SiH and Si vinyl ±10 percent of either ingredient.

3. A curable composition consisting essentially of, in percent by weight, 35 to 65 of (A) plus (B) of claim 1, 5 to 25 of glass fibers having an average length of from 1/32 to ½ inch and 10 to 50 of crystalline silica having an average particle size of 2 to 8 microns.

Re. 29,698
STABILIZATION OF AHF USING HEPARIN

Lajos F. Fekete, Costa Mesa, and Stephen L. Holst, Santa Ana, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Original No. 3,803,115, dated Apr. 9, 1974, Ser. No. 254,148, May 17, 1972. Application for reissue Apr. 6, 1976, Ser. No. 674,270

Int. Cl.^{2} C07G *7/00*

U.S. Cl. 260—112 B **21 Claims**

1. The method of improving the yield of AHF obtained from blood plasma and plasma fractions comprising admixing from about 0.01 to about ten units of heparin to a concentrate of AHF obtained from said plasma or plasma fraction by cyroprecipitate per ml. of solution of said concentrate of AHF.

Re. 29,699
ADHESION OF POLYESTER TO RUBBER USING AN ADHESIVE CONTAINING ADDED METAL COMPOUNDS

Robert J. Kelly, Columbia, S.C.; Robert Miller, Woodbridge, Conn., and David Adams, Port Huron, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Original No. 3,903,332, dated Sep. 2, 1975, Ser. No. 332,833, Feb. 15, 1973. Application for reissue Sep. 1, 1977, Ser. No. 830,000

Int. Cl.^{2} C09J *7/04*

U.S. Cl. 428—414 **33 Claims**

1. In a shaped polyester article bearing from 2 to about 30% by weight of an adhesive coating composition comprising the reaction products of:

a first component (I) comprising

- I. A. a polyepoxide having an average of at least two epoxy groups in each molecule, a melting point below about 150° C., an average molecular weight below about 3,000 and an epoxide equivalent below about 2,500 and
  - B. an aromatic polyisocyanate from the class consisting of Ar(NCO)$_n$, [Ar(NCO)$_n$]$_m$, and Ar(NHCOX)$_n$; wherein Ar is an organic residue containing at least one aromatic nucleus, X is a radical, selected from the group consisting of aryloxy, arylthio, iminoxy and lactam-N-yl, and m and n are whole numbers of at least 2; the weight ratio of (A)/(B) being within the range of from about 0.01 to about 5.0 and the % by weight being 0.2 to 5.0; in combination, with
- II. [the residue amounting to] *a second component (II), of from about* 1.8 to 25% by weight of a [rubber latex containing the reaction product of a phenol] *mixture of the dried reaction products of a phenolicformaldehyde resin, a rubber latex* and formaldehyde, said rubber latex being selected from the group consisting of natural rubber, SBR and butadiene-vinylpyridine-styrene rubber;

the improvement comprising having added to said [coating composition] *first component I while in admixture with a liquid carrier and* prior to deposit on said polyester article, *a* sufficient amount of a metal-containing compound in the range between 0.00001 and 0.010 moles per 1,000 grams of said [coating composition] *first component I in its liquid carrier* to result in an adhesive bond which has at least a 5% improvement in appearance rating using the hot strip adhesion test, said improvement being compared with a rubber-polyester article control that contains no metal containing compound in said adhesive coating composition, said metal being selected from the group consisting of sodium, potassium rubidium, cesium, strontium, silver, cadmium, barium, cerium, uranium, titanium, vanadium, chromium, tin, antimony, maganese, iron, cobalt, nickel, copper, zinc, lead, bismuth, calcium and zirconium whereby less adhesive is required to achieve the same degree of adhesion as when an adhesive containing no metal-containing compound is used.

Re. 29,700
VOLTAGE-CURRENT CONVERTER

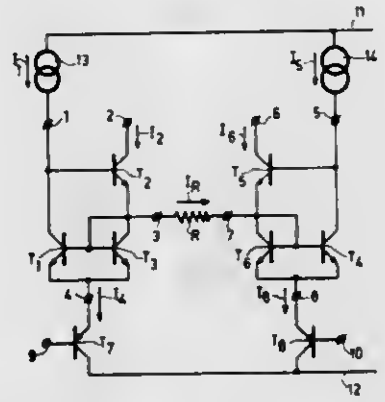
Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 4,004,247, dated Jan. 18, 1977, Ser. No. 586,051, Jun. 11, 1975. Application for reissue Jun. 8, 1977, Ser. No. 804,548

Claims priority, application Netherlands, Jun. 14, 1974, 7407953; Mar. 27, 1975, 7503664

Int. Cl.^{2} H03F *3/45*

U.S. Cl. 330—257 **8 Claims**



1. A voltage-current converter with a balanced-voltage input and a balanced-current output, comprising:

- a first current mirror circuit comprising first and second transistors, each having an emitter, base and collector, and a first semiconductor junction having an anode and cathode, said first and second transistors and said first semiconductor junction all being of a first conductivity type, said cathode of said first semiconductor junction being connected to said emitter of said first transistor, said collector of said first transistor being connected to said base of said second transistor, and said base of said first transistor being connected to said anode of said first semiconductor junction and said emitter of said second transistor;
- a second current mirror circuit comprising the same elements as said first current mirror circuit;
- a first current source circuit connected to said collector of said first transistor of said first current mirror circuit;
- a second current source circuit connected to said collector of said first transistor of said second current mirror circuit;
- a first impedance connected between said emitter of said second transistor of said first current mirror circuit and said emitter of said second transistor of said second current mirror circuit; and
- third and fourth transistors each having an emitter, base and collector, said emitter of said third transistor being connected to said emitter of said first transistor of said first current mirror circuit said emitter of said fourth transistor being connected to said emitter of said first transistor of said second current mirror;

the balanced-voltage input being between said bases of said third and fourth transistors, and the balanced-current output being between said collector of said second transistor of said first current mirror circuit and said collector of said second transistor of said second current mirror circuit.

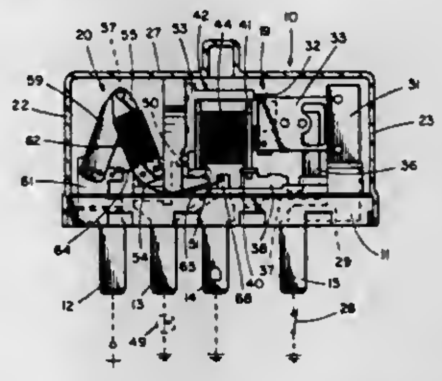
Re. 29,701
TIMED BUZZER

Arthur J. Little, Springfield, and William R. Mayer, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Original No. 4,003,043, dated Jan. 11, 1977, Ser. No. 652,592, Jan. 26, 1976. Application for reissue Apr. 11, 1977, Ser. No. 786,680

Int. Cl.^{2} G01K *1/08;* **G08B** *3/00*

U.S. Cl. 340—403 **11 Claims**



1. A timed buzzer, comprising; housing means, a coil assembly mounted in said housing means, an armature supporting member, a flexible armature connected to said armature supporting member, a contact carried by said armature, a contact member supported in said housing means and being positioned to be engageable with said armature contact, said armature being positioned so that the coil, when energized, will move the armature contact out of engagement with the contact member, first terminal means connected to said armature, said contact member being connected to one end of said coil assembly, second terminal means, said second terminal means being connected to the other end of the coil assembly, said armature having sound producing means thereon, a timer assembly mounted in said housing means, said timer assembly including first and second bimetal elements, third terminal means, [one of said elements] *said first bimetal element* being connected to said third terminal means, one of said bimetal elements having heater means thereon, [another of said elements] *said second bimetal element* being connected to said second terminal means, to provide a circuit to energize said coil assembly when said third terminal means is positive, fourth terminal means for grounding, said heater means being connected to both said third terminal means and said fourth terminal means so that the heater means heats the bimetal elements whenever said third terminal means is positive opening said bimetal elements after a predetermined time delay terminating operation of the sound producing means.

PLANT PATENTS

GRANTED JULY 11, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,276

PIPERACEAE PLANT FAMILY

Barnell L. Cobia, Winter Garden, and Stephen H. Griffith, Apopka, both of Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Jun. 27, 1977, Ser. No. 810,650

Int. Cl.^{2} A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct plant variety of the Piperaceae Family as is described and illustrated and which is primarily distinguished by a growth habit providing specimens with leaf blades that

(1) at the upper epidermal side have a basic field which in color is dominated by yellow green and/or greenish yellow hues, the basic field being discontinuous and interrupted along the veins by color that varies in lateral penetration from the vein and is dominated by reddish orange, reddish brown, brown, brownish orange, yellowish brown and/or orange yellow hues, and the basic field being commonly endowed with elongated streaks of color weaknesses that appear between the primary veins as overtones of light greenish gray, greenish white and/or yellowish grey colors and

(2) at the lower epidermal side have a basic field which in color is dominated by a yellow green hue and which is discontinuous and interrupted along the veins by color that varies in lateral penetration from the vein and is dominated by pink and/or red hues.

4,277

ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Sep. 2, 1977, Ser. No. 830,353

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are medium to deep rose pink in color, (often deeper colored outdoors), the buds and flowers resembling Judy Fischer (miniature — U.S. Plant Pat. No. 3,137) in size and shape; and further characterized by a plant which is vigorous and compact, easy to propagate from cuttings or by budding, with an abundance of disease resistant small semi-glossy or matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,278

MINIATURE ROSE PLANT

Edward P. Woolcock, 1015 Acacia Dr., Placentia, Calif. 92670

Filed Sep. 2, 1977, Ser. No. 830,354

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded much branched habit, substantially as illustrated and described, characterized by buds and flowers which are soft pink in color, with slight coral tone, the depth or shade of color may vary as influenced by the temperature and light intensity, the buds and flowers resembling Judy Fischer (miniature — U.S. Plant Pat. No. 3,137) in size and shape; and further characterized by a plant which is vigorous and compact, easy to propagate from cuttings, with an abundance of small to medium size matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

4,279

DUTCH IRIS PLANT NAMED APOLLO

Gerard Dirk Hommes, Helloo (N.H.), Netherlands, assignor to Marlboro Bulb Farms, Wilmington, N.C.

Filed Sep. 23, 1977, Ser. No. 836,236

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of iris plant substantially as herein shown and described, characterized by the distinctive colored falls having an orange-yellow blotch and light yellow body and by its white standards, by its very large flower, by its tight buds allowing for long distance shipping before the bud opens, by its fast early growing habit, its strong large upright stems, with little or no crinkling of the falls and upright standards, and by its minimum size bulbs and its capability of blooming at any specific time in controlled environment.

PATENTS

GRANTED JUL. 11, 1978

ERRATA

For CLASS	See PATENT NO.
029–579	4,099,305
108–114	4,099,472
400–004	4,099,606
220–403	4,099,665
315–127	4,099,807
029–157.3 D	4,099,928
062–073	4,099,946
062–532	4,099,947
106–039.7	4,100,001
424–078	4,100,027
528–116	4,100,111
521–038	4,100,113
521–175	4,100,114
521–083	4,100,115
521–167	4,100,116
528–010	4,100,134
528–011	4,100,135
528–011	4,100,136
526–021	4,100,137
526–262	4,100,138
528–196	4,100,139
526–068	4,100,142
528–312	4,100,145
528–313	4,100,146
528–362	4,100,147
528–374	4,100,148
544–225	4,100,158
544–277	4,100,159
424–274	4,100,160
424–274	4,100,161
424–325	4,100,170
568–730	4,100,202
568–730	4,100,203
568–730	4,100,204
568–730	4,100,205
568–730	4,100,206
568–804	4,100,207
568–902	4,100,208
568–918	4,100,209
423–345	4,100,233
425–533	4,100,307
427–130	4,100,326
315–297	4,100,476

PATENTS

GRANTED JUL. 11, 1978

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106-039.7	4,100,001
424-078	4,100,027
528-116	4,100,111
521-038	4,100,113
521-175	4,100,114
521-083	4,100,115
521-167	4,100,116
528-010	4,100,134
528-011	4,100,135
528-011	4,100,136
526-021	4,100,137
526-262	4,100,138
528-196	4,100,139
526-068	4,100,142
528-312	4,100,145
528-313	4,100,146
528-362	4,100,147
528-374	4,100,148
544-225	4,100,158
544-277	4,100,159
424-274	4,100,160
424-274	4,100,161
424-325	4,100,170
568-730	4,100,202
568-730	4,100,203
568-730	4,100,204
568-730	4,100,205
568-730	4,100,206
568-804	4,100,207
568-902	4,100,208
568-918	4,100,209
423-345	4,100,233
425-533	4,100,307
427-130	4,100,326
315-297	4,100,476

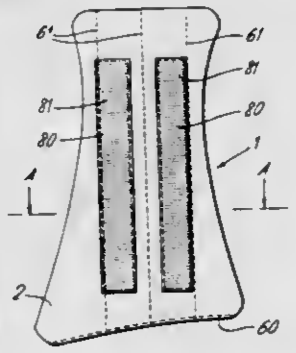
PATENTS

GRANTED JULY 11, 1978

GENERAL AND MECHANICAL

4,099,269
PROTECTIVE DEVICE

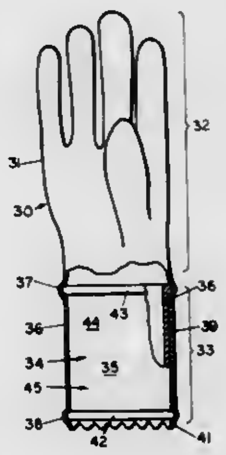
Miroslav Joseph Porner, 24 Bracken Ave., Epsom, Auckland, New Zealand
Filed Jan. 28, 1977, Ser. No. 763,510
Claims priority, application New Zealand, Feb. 4, 1976, 179918
Int. Cl.² A41D *13/08;* **B68C** *5/00*
U.S. Cl. 2—16 **7 Claims**



1. A protective device including a plurality of layers of substantially resilient and shock absorbent material; the layers of substantially resilient and shock absorbent material being provided in juxtaposition one with the other and within an outer covering; the substantially resilient and shock absorbent material being sheet material formed or provided with a plurality of integral, open faced pockets therein; a backing sheet being provided with each layer of substantially resilient and shock absorbent material so as to enclose the pockets and the arrangement being such that the substantially resilient and shock absorbent material within said outer covering, provides a protective cushioning when a blow or force is applied thereto.

4,099,270
SLIP-ON RUBBER GLOVES

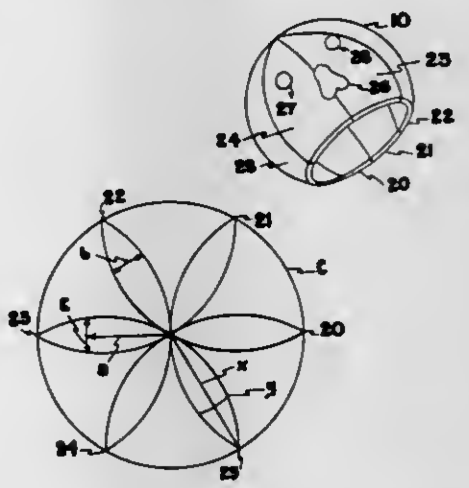
Richard J. Jabour, 102 Butman Rd., Lowell, Mass. 01852
Filed Feb. 16, 1977, Ser. No. 769,119
Int. Cl.² A41D *19/00*
U.S. Cl. 2—168 **5 Claims**



1. In combination
an elongated, flexible, resilient limp rubber glove having a fingered hand portion of predetermined length and an integral cuff portion of about half said length;
a hollow, elongated support of thin, self-supporting, flexible sheet material sleeved within the said cuff portion of said glove and substantially coextensive in length with said cuff portion;
said support having opposite fully open, normally circular ends and normally supporting said cuff portion in full open configuration for the easy reception of the hand of the wearer in donning the glove;
and said support having an integral, outwardly projecting bead of enlarged diameter at each opposite end thereof, each bead extending circumferentially around said support to increase the friction and tension of the cuff portion of said glove sleeved therearound and to avoid sharp peripheral edges on said support.

4,099,271
LIGHTWEIGHT COSTUME HEAD

Terry Mark Allen, 2526 Commonwealth, Salt Lake City, Utah 84109, and William Duane Derfler, 10536 Whitesands, Sandy, Utah 84070
Filed May 8, 1975, Ser. No. 575,496
Int. Cl.² A42C *1/00*
U.S. Cl. 2—192 **2 Claims**



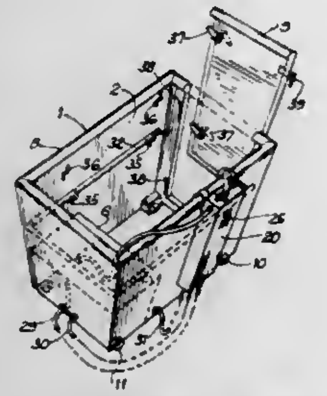
1. A method of forming a substantially spherical hollow shape from a flat elastomeric foam slab comprising:
(a) sculpturing a small scale model of the head shape desired;
(b) completely covering said sculptured model with latex and allowing same to dry;
(c) removing said latex shell from said model;
(d) cutting said latex shell into a number of sections and placing darts in same so that said latex sections become flat patterns;
(e) magnifying and transferring the latex pattern onto thin flat foam material;
(f) cutting the foam material into the desired patterns and joining the pattern sections together to form a costume head of substantially the same shape as the sculptured model.

4,099,272
BATHING APPARATUS FOR INVALIDS

Gene F. Sowder, 1009 Ogden St., Denver, Colo. 80218
Filed Jun. 16, 1977, Ser. No. 806,986
Int. Cl.² A47K *3/22*
U.S. Cl. 4—148 **1 Claim**

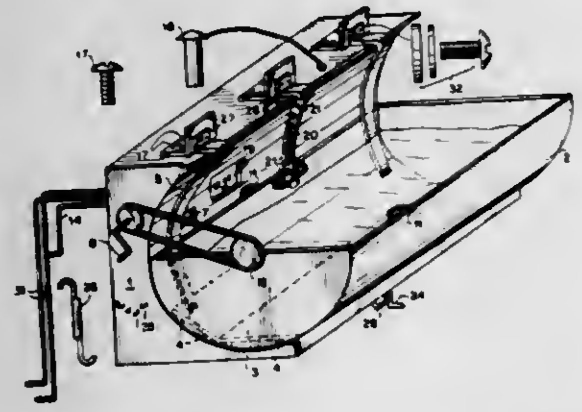
1. A device for bathing invalid and elderly persons which comprises:
- a mobile bathtub mounted on casters having a gate-like opening in one of its walls;
- a door within said opening;
- watertight means for securing the door within said opening;
- at least one liquid supply tank;
- a outlet at the bottom of said tank;

- at least one liquid spraying means;
- a drainage outlet at the bottom of the tub;
- at least one valve for selectively connecting said spray means to one or more of said outlets;
- conduit means between said spray means and said valve and between said valve and said outlets;



- a pump for forcing liquid from said outlets through the conduits toward said valve; and
- a movable console suspendable over the rim of the bathtub housing said pump and means for controlling said valve and pump.

4,099,273
BATHTUB
Wenham J. Colby, 35 Hertzler Rd., Newport News, Va. 23602
Filed Apr. 8, 1976, Ser. No. 674,975
Int. Cl.² A47K *3/06;* **A61H** *33/00*
U.S. Cl. 4—173 R **2 Claims**



1. A bathtub assembly which comprises the combination of:

(a) a rigid, polyhedral support structure having a top, bottom, front, back, and 2 side faces, the support structure having a channel, the configuration of which is substantially a half circular cylinder, the channel partially penetrating into the support structure from the intersection of the top and front faces thereof and extending along the length thereof from one side face to the other side face thereof;

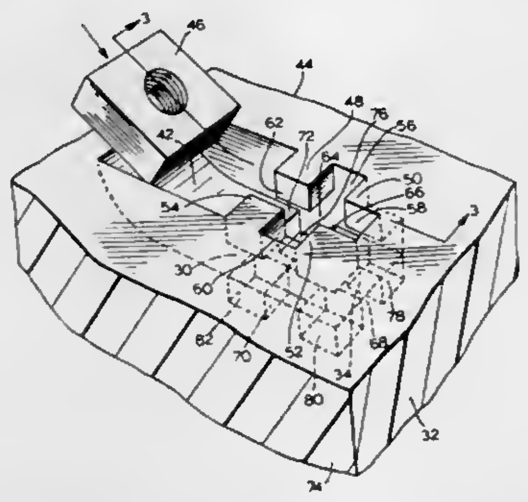
(b) a concave, watertight body substantially having the configuration of a half circular cylinder, the body positioned within the channel so that the cylindrical surface of the body conforms to the cylindrical surface of the channel, the cylindrical surface of the body being mounted on the support structure so that the body may rotate about the longitudinal axis thereof;

(c) releasable locking means for temporarily securing the body in (1) a first position defined by complete congruence of the body and the channel, or (2) a second position defined by parallelism of the plane of the bottom of the support structure with the plane joining the remanent diameters of the half circular cylindrical body;

(d) means for causing the body to rotate from said first position to said second position; and

(e) means for the addition and removal of water from the body while said second position is occupied.

4,099,274
THERMOPLASTIC ARTICLE HAVING ACCESSIBLE WALL CAVITIES THEREIN FOR RECEPTION AND RETENTION OF SECURING MEANS
John Ernest Emberson, 25 Dogwood Cres., Scarborough, Ontario, Canada (M1P 3N5)
Filed May 9, 1977, Ser. No. 794,732
Int. Cl.² E03C *1/26;* **F16B** *39/00*
U.S. Cl. 4—286 **6 Claims**



1. A thermoplastic article adapted to receive in the intermediate thickness of a wall thereof, in predetermined position, an apertured securing means,

the wall of said article having at least one laterally extending securing means receiving cavity in the intermediate thickness thereof;

and including, in the vicinity of the laterally extending cavity:

a bolt receiving aperture extending transversely from a first lateral wall surface into said laterally extending cavity to permit access of a bolt shank to said laterally extending cavity;

first securing means retaining formations disposed around said bolt receiving aperture and extending transversely from said first lateral wall surface to define the first lateral boundary of said laterally extending cavity;

second securing means retaining formations disposed around said bolt receiving aperture and extending transversely from a second lateral wall surface to define the second lateral boundary of said laterally extending cavity;

said second securing means retaining formations being in transverse alignment with separations between said first securing means retaining formations;

at least one end of the laterally extending cavity communicating through the first lateral wall surface, to permit a securing means to be removably inserted into said cavity to lie in transverse alignment with said bolt receiving aperture;

said laterally extending cavity including means to prevent substantial angular movement of a securing means positioned therein.

4,099,275
CHAIR CONVERTIBLE INTO A BED
Erwin Pallan, Dietlindestr. 2, Pochlarn, Austria (3380)
Filed Jan. 6, 1977, Ser. No. 757,221
Claims priority, application Austria, Jan. 12, 1976, 157/76
Int. Cl.² A47C *17/16*
U.S. Cl. 5—18 R **5 Claims**

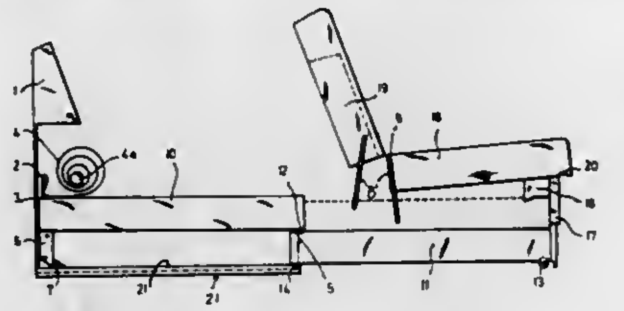
1. A chair convertible into a bed, comprising:

a stationary frame having an upright portion provided with a backrest stop;

a seat member positioned on said frame and displaceable relative thereto to extend in a forward direction;

a support member positioned in said frame below said seat member for the support thereof and displaceable thereby to extend in said forward direction, said seat member being connected to said support member;

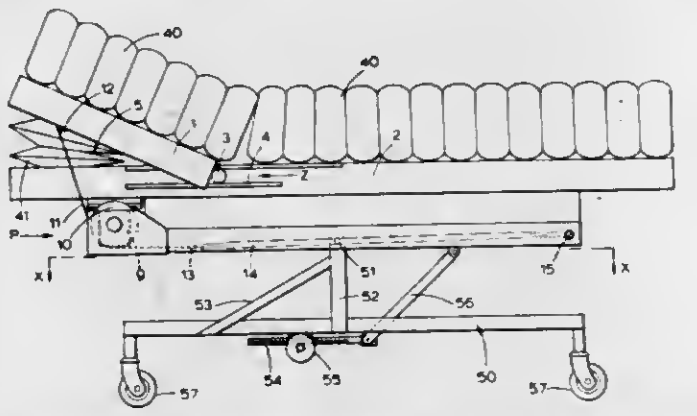
a body defining a bed-forming surface positioned in said frame below said seat member and above said support member when said members do not extend in said forward direction;



a backrest hinged to said seat member and leaning on said stop in an upright position of the backrest, said backrest being displaceable by said seat member to assume a horizontal position between said body and said seat member on a level therewith, said backrest being pivotally connected to said support member in all positions; and

means in said frame for guiding said members for the displacement thereof.

4,099,276
SUPPORT APPLIANCES HAVING ARTICULATED SECTIONS
William Valentine Hunt, Wareham, and Frank Edward Mayhew Dueker, London, both of England, assignors to Watkins & Watson Limited, Wareham, England
Filed Jul. 26, 1976, Ser. No. 708,428
Int. Cl.² A61G *7/06*
U.S. Cl. 5—72 **7 Claims**



6. A support appliance, such as a bed, having a head section which is raisable and lowerable with respect to an adjacent section using an inflatable bellows, said appliance including means for maintaining the head section in a predetermined raised position, which comprises;

a bellows adapted to support said head section,

a pressure source,

a first conduit having a first valve therein and connected between said bellows and said pressure source,

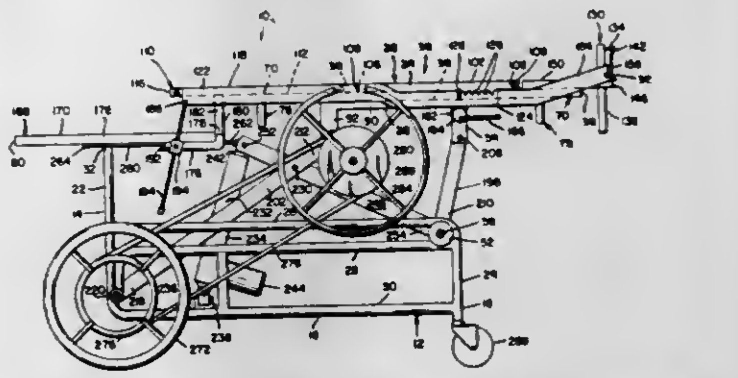
a second conduit having a second valve therein and connected between said bellows and said pressure source,

said first valve including a rotatable conduit rotatable between a valve-open and a valve-closed position,

a pulley frictionally engaging said rotatable conduit whereby rotation of said pulley in one sense rotates said rotatable conduit from said valve-open position to said valve-closed position but no further and rotation of said pulley in the opposite sense rotates said rotatable conduit from said valve-closed position to said valve-open position but no further, and

a line connected to said head section and passed around said pulley in such a manner that if said head section falls from said predetermined position, said line rotates said first valve from a valve-closed to a valve-open position, there admitting pressurized air to said bellows and restoring the head section to its predetermined position.

4,099,277
STANDER APPARATUS PROVIDING VARYING DEGREES OF WEIGHT BEARING FOR PATIENT THERAPY
Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 19154
Filed Sep. 30, 1975, Ser. No. 618,076
Int. Cl.² A61G *13/00*
U.S. Cl. 5—81 R **12 Claims**



1. Apparatus for providing varying degrees of weight bearing therapy to a patient having a body including an upper body portion and a lower body portion, said upper body portion including a head, a pair of arms and shoulders, said apparatus comprising:

a frame assembly having a front end and a rear end, said frame assembly including a pair of spaced, substantially parallel side frames each having upstanding front and rear frame members and upper, intermediate and lower rails each having an end affixed to an associated one of said front and rear frame members, said frame assembly also including upper and lower transverse rails each having an end affixed to an associated one of the upper and lower ends of said upstanding front frame member;

a roller trapped between an upper rail and an intermediate rail on each of said side frames;

a roller axle connecting said rollers together for rolling movement from said rear end of said frame assembly to a position near said front end of said frame assembly;

a stretcher assembly having a front end, a rear end, a first edge, a second edge and an intermediate portion;

a first strut pivotally connecting said rear end of said stretcher assembly to said roller axle adjacent one of said side frames;

a second strut pivotally connecting said rear end of said stretcher assembly to said roller axle adjacent the other of said side frames;

a third strut pivotally connecting said intermediate portion of said stretcher assembly to one of said side frames adjacent the juncture of one of said lower rails and said front frame member;

a fourth strut pivotally connecting said intermediate portion of said stretcher assembly to the other of said side frames adjacent the juncture of the other of said lower rails and said front frame member; and

a lifting device connected to said stretcher assembly adjacent its front end for exerting an upward force on the front end of said stretcher assembly to move it from a horizontal position to a near-vertical position.

4,099,278

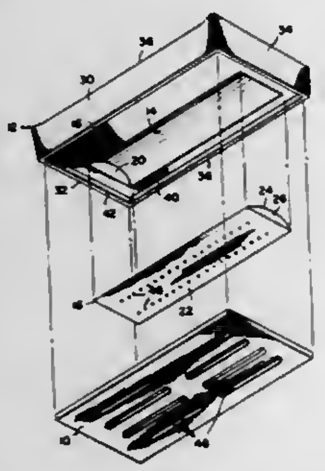
SEAT CONSTRUCTION

Joseph J. Parisi, c/o Parisi, Inc., 10521 Drummond Rd., Philadelphia, Pa. 19154

Filed Jun. 2, 1977, Ser. No. 802,718

Int. Cl.^{2} A47C *27/00*

U.S. Cl. 5—361 B **14 Claims**



1. A seat construction comprising:
a relatively rigid support,
a first cushion supported at its bottom surface on said support and having a recessed portion formed in its bottom,
a second cushion supported at its bottom surface on said support and contained within said recessed portion of said first cushion, said second cushion and said recessed portion being confined to a limited region of said first cushion with a depth substantially less than the depth of said first cushion,
said first cushion made of a resilient material,
said second cushion being made of a resilient material softer than said first cushion, and
a cover enclosing the outer surface of said first cushion and secured to said support.

4,099,279

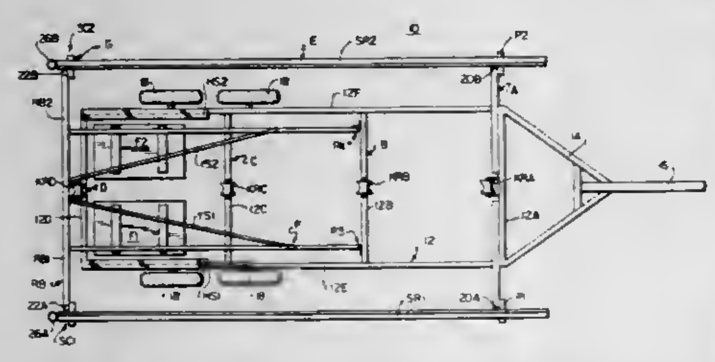
BOAT LAUNCHING AND RECOVERY GUIDE FOR BOAT TRAILERS

W. Sidney Park, 513 Morningside Dr., Louisville, Ky. 40206

Filed Jul. 26, 1977, Ser. No. 819,148

Int. Cl.^{2} B60P *1/52*

U.S. Cl. 9—1.2 **10 Claims**



1. In a boat launching and recovery trailer having a wheeled main frame for engaging the bottom of a body of water and a floating frame section for assuming the attitude of the surface relative to the main frame, the improvement comprising:
a plurality of transverse integral cross-braces spaced from front to rear of said main frame;
front bolster means transversely affixed to a forward cross-brace on the main frame of the trailer and having a contour conforming to the hull of a boat to be launched and recovered by the said trailer;
a floating frame having first and second forward pivot means affixed by the latter to an intermediate one of said cross-braces and extending rearwardly to an integral rear bolster means transversely disposed at the rear end of said frame and having a main hull-shaped contour for recovering and launching a boat therethrough on and from said trailer;
said floating frame including float means adjacent said rear bolster means;
said front and rear bolster means each including upstanding arm portions on opposite sides of said main frame; and
guide rail means interconnecting said front and rear bolster means for guiding a boat during launching and recovery thereof substantially the length of said main frame;
said guide rail means comprising first and second parallel rails connecting corresponding ones of said upstanding arm portions of said front bolster to said rear bolster, first and second pivot means connecting said first and second guide rails at one end thereof to said front bolster and first and second sliding coupling means connecting said other ends of said first and second guide rails to said rear bolster to provide for longitudinal displacement of said rear bolster with respect to said guide rails in response to flotation of said floating frame relative to said main frame.

4,099,280

HULL, MOLD THEREFOR, AND PROCESS FOR PRODUCING SAME

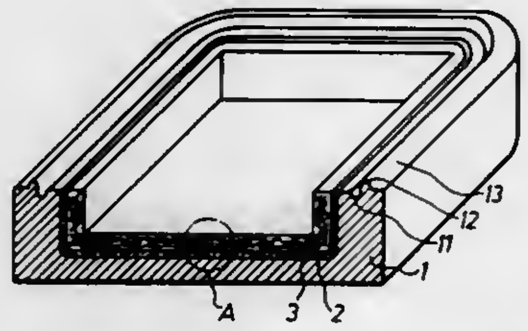
Peter Hoppe, Troisdorf; Helmut Leyer, Opladen, and Johann Müller, Koeln-Flittard, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Division of Ser. No. 219,277, Jan. 20, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,132

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1971, 2104585; May 7, 1971, 2122581

Int. Cl.^{2} B63B *5/24*

U.S. Cl. 9—6 P **8 Claims**



5. A plastic boat body which comprises a molded plastic boat shell, an inner bottom shell in said boat shell and secured around its periphery to the boat shell, said boat shell and inner bottom shell providing a chamber therebetween, an insitu cast hard foam plastic core filling said chamber in full conformity therewith, fiber lamination sheets integrally bonded to and covering the faces of the boat shell and inner bottom defining said chamber, plastic from the boat shell and inner bottom shell being embedded in interstices of said fiber lamination sheets, and fibers of said lamination sheets surrounded by the cast foam plastic core and embedded therein in locked relation therewith to integrally bond the foam plastic core to the boat shell and inner bottom.

4,099,281

NAVIGATIONAL BUOY

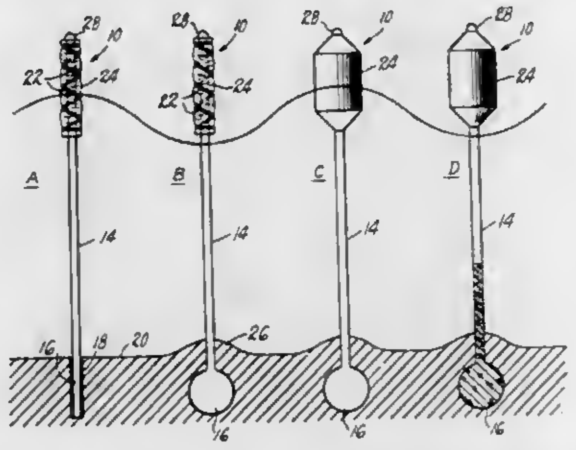
Wallace W. Bowley, Stafford Springs, Conn., assignor to Hydra Corporation, Boston, Mass.

Filed Oct. 7, 1976, Ser. No. 730,670

Int. Cl.^{2} B63B *21/52*

U.S. Cl. 9—8 R **2 Claims**

1. A navigational buoy which comprises an inflatable buoy and an inflatable anchor connected by a stem comprising a hollow member adapted to provide fluid communication with the interior of said anchor and said buoy, said stem having sufficient mechanical strength to support said buoy and means for rendering said stem sufficiently flexible to withstand time-varying loads exerted by wind and water, said means comprising a flexible material for forming said stem.



4,099,282

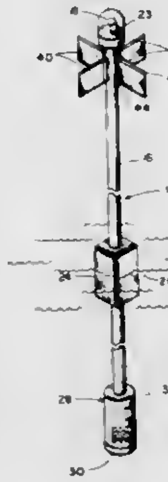
FLOATABLE POLE MARKER BEACON

Richard E. Townsend, 874 San Antonio Pl., San Diego, Calif. 92106

Filed May 9, 1977, Ser. No. 795,049

Int. Cl.^{2} B63B *21/52*

U.S. Cl. 9—8.3 E **5 Claims**



1. A floatable pole marker beacon comprising:
a long hollow pole;
a float fixedly secured to said pole at an intermediate position;
an electric light mounted on an upper end of said pole;
a container sealably mounted at the bottom end of said pole;
a source of electrical power housed within said container;
an electricl circuit connecting said power source and the light source;
said circuit including a magnetically operable switch biased to a closed position, said switch being maintained in an open position by the presence of a predetermined magnetic force;
said switch being mounted within the container, and a holder is provided for storing the container, said holder having a magnet aligned with said switch when the beacon is in a stowed condition in the holder;
whereby deployment of the beacon from the holder will automatically close the switch to energize the light source.

4,099,283

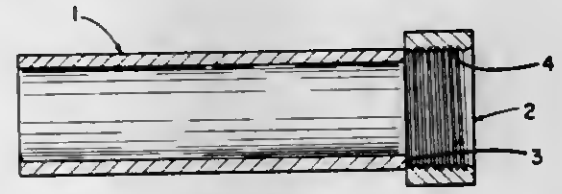
DEVICE FOR CENTERING AND MAINTAINING SHORT SPOOL PIECES

Dale Allen Jueckstock, Sanford, and Thomas Wayne Hindman, Sr., Gladwin, both of Mich., assignors to Robert L. McKellar, Midland, Mich., a part interest

Division of Ser. No. 661,293, Feb. 25, 1976, Pat. No. 4,028,762. This application Mar. 10, 1977, Ser. No. 776,191

Int. Cl.^{2} B23G *1/22;* **B23B** *31/00*

U.S. Cl. 10—107 PH **3 Claims**



1. A device for centering and maintaining short spool pieces in a conventional threading machine while cutting and threading the short spool piece, said device consisting of
a hollow stabilizer and guide bar, which stabilizes the device when the device is clamped in a threading machine, having a length of 9 inches or greater, an outside diameter of from 1⅝ to 6⅝ inches and an inside diameter of from ⅛ to ¼ inches smaller than the outside diameter,
a workholder, which is circular in structure and which has an outside diameter greater than the outside diameter of the hollow stabilizer and guide bar and which has a standard threaded inside diameter of ⅛ to ¼ inch greater than the inside diameter of the hollow stabilizer and guide bar in order to hold short pieces of threaded pipe securely,
said workholder having a length which is dependent on the diameter of the short spool piece being processed, which in turn is dependent upon the length of exposed lining that is desired in the short spool piece,
said workholder being axially aligned and permanently affixed to one end of the stabilizer and guide bar. said one end of said stabilizer and guide bar extending radially inwardly beyond the inside threaded diameter of said workholder to form a planar lip against which a leading edge of one end of said spool piece is seated and said length of exposed lining extends into said guide bar when said spool piece is positioned in the device for cutting and threading an opposite end thereof.

4,099,284

HAND SWEEPER FOR CARPETS

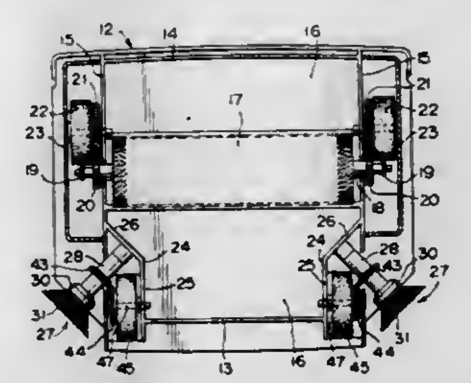
Mamoru Shinozaki, Tokyo; Yuichi Takahama; Hachiro Tubaki, both of Kawagoe; Kazuo Nagasawa, and Yasao Mikami, both of Tokyo, all of Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,768

Claims priority, application Japan, Feb. 20, 1976, 51-19715[U]; Mar. 16, 1976, 51-31880[U]

Int. Cl.^{2} A47L *11/33*

U.S. Cl. 15—42 **3 Claims**



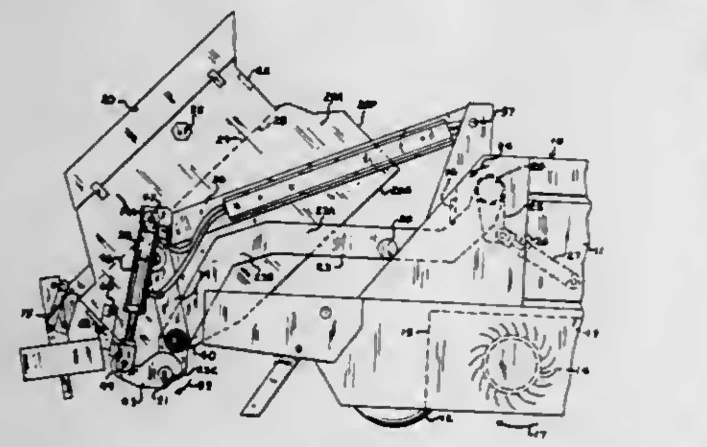
1. A hand sweeper comprising a body having a handle pivot-

ably connected thereto, a base removably connected to said body, said base having a front end and a rear end and forming a dust box, a main rotary brush extending across said dust box, driving wheels on said base adjacent said rear end for rotating said main rotary brush to sweep dust into said dust box, auxiliary rotary brushes rotatably mounted on said base at its forward corners, each of said auxiliary rotary brushes including a horizontal shaft fixedly supported on the base and extending forwardly and outwardly from the base and at an oblique angle with respect to said main rotary brush, a boss rotatably mounted on said shaft, auxiliary driving wheels rotatably supported on said base adjacent said rear end in spaced relationship to said driving wheels for said main rotary brush, and means for transmitting rotation of said auxiliary driving wheels to said auxiliary rotary brushes to rotate them around said horizontal axes, said transmitting means including a bevel gear formed integrally with said boss, and a bevel gear formed on each of said two auxiliary driving wheels and respectively meshing with said bevel gear on said auxiliary rotary brush.

4,099,285
HIGH LIFT SURFACE MAINTENANCE MACHINE

Bryan L. Christensen, Bloomington; William J. Sampson, Osseo; Ronald L. Brogger, Minneapolis, and Jeffrey A. Lee, Crystal, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Mar. 7, 1977, Ser. No. 774,981
Int. Cl.^{2} E01H *1/04*
U.S. Cl. 15—83 **20 Claims**

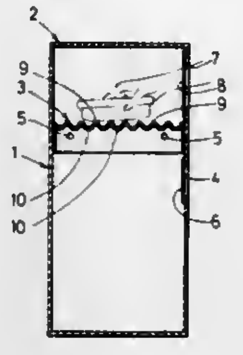


1. A surface maintenance machine comprising a vehicle having a frame, means on the frame defining a downwardly opening sweeping enclosure that has a debris outlet, a debris hopper having a debris inlet and a debris outlet remote from the debris inlet, powered arm means mounted on the frame for supporting the hopper in a street level position so that the debris inlet is adjacent the enclosure outlet and mounting the hopper for pivotal movement relative thereto, means for selectively pivoting the hopper relative the arms means between a dumping position relative the arm means for discharging debris through the hopper discharge outlet, and a non-dumping position, and controlling the pivotal positions of the hopper relative the arm means, a door, means for mounting the door on the hopper for movement under gravity from a position closing the bopper outlet when the hopper is in its non-dumping position to a position permitting debris discharge through the hopper outlet when the hopper is in its dumping position, a lug on the door, operable latch means mounted on the hopper for movement between a latching position latchingly engaging the lug to retain the door closed and a lug release position, and means connected to the control means for operating the latch means to its release position as the control means pivots the hopper to its dumping position, the hopper having a parimetric flange portion defining the hopper outlet, and door holder means for retaining the door in its open position in substantial spaced relationship to said hopper portion after the control means has operated the latch means to its release position and until the control means has operated the hopper back to adjacent its non-dumping position, and thence release the door to allow it to close.

4,099,286
CLEANERS FOR CHALK ERASERS

Soji Ishikawa, 1-22, Chohai-cho, Minami-ku, Nagoya-shi, Aichi-ken, Japan

Filed Feb. 28, 1977, Ser. No. 773,130
Claims priority, application Japan, Feb. 27, 1976, 51-23791
Int. Cl.^{2} A46B *17/06;* B43L *21/00*
U.S. Cl. 15—142 **5 Claims**

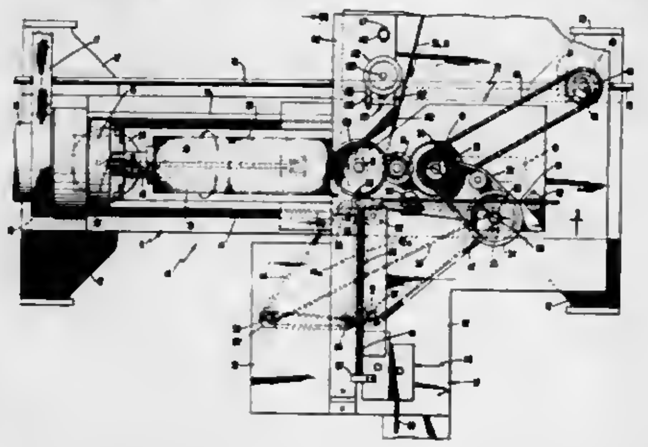


1. A cleaner for a chalk eraser comprising an upper case having an open bottom and formed on one side with an aperture through which a chalk eraser is put into said upper case, a member of elastic material closing said aperture and which can be spread open to insert the chalk eraser through said aperture, a lower case having an open top and removably connected with said upper case and a cleaning plate positioned at the juncture of said upper and lower cases and provided with a plurality of alternately arranged ridges and slots opening into said lower case and wherein said lower case is formed on one side with an opening normally closed by a depending flap through which wastepaper may be thrown into said lower case.

4,099,287
CYLINDRICAL WOUND BRUSH

Harvard W. K. Enchelmaier, 4 E. Greenbrook Rd., N. Caldwell, N.J. 07006

Filed Oct. 28, 1976, Ser. No. 736,483
Int. Cl.^{2} A46B *3/00*
U.S. Cl. 15—182 **9 Claims**

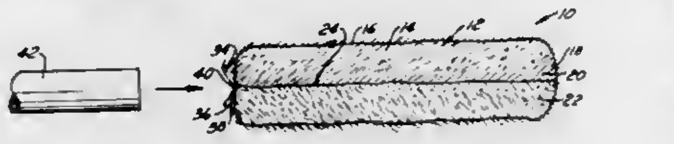


1. A cylindrical cord bound brush having a core with bristles projecting outwardly therefrom, each of the bristles being in the form of a single substantially straight length of strand extending only from its inner root end near the core to its outer end disposed radially outwardly of the core, all of the bristles being arranged in zones of substantial length axially of the brush core, said zones extending circumferentially of the brush, extending at substantially the same substantial angle with respect to radii of the core, the roots of the bristles being held between the turns of at least one bristle-holding cord wound on the core.

4,099,288
DUST MITT WITH OPTIONAL HANDLE

Max Rittenbaum, Atlanta, and Jeffrey A. Rittenbaum, Marietta, both of Ga., assignors to Max Rittenbaum, Inc., Atlanta, Ga.

Filed Apr. 5, 1977, Ser. No. 784,805
Int. Cl.^{2} A47L *13/16, 13/20*
U.S. Cl. 15—228 **4 Claims**

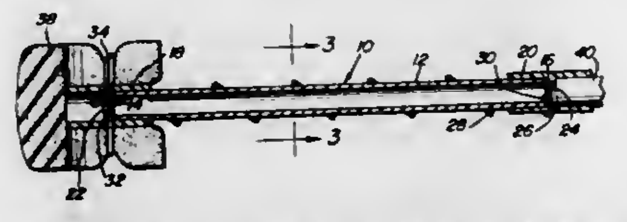


1. In a dust mitt having an optional handle:
a mitt constructed from a nappy fabric in three-dimensional form and having a three-dimensional space in the interior thereof defining a pocket therein, said pocket having a closed front except for a small opening to the interior,
a stuffing inside said pocket in the three-dimensional space therein comprising a sheet of elongated soft, resilient foam material, such as foam plastic, folded substantially in half upon itself to create a smooth marginal edge at one end and an open space aligned with the opening at the other end leading to the interior thereof,
an elongated handle inserted through said opening into and between portions of said frictionally held folded resilient foam material and being removable therefrom,
and a small puckered mouth leading to said opening.

4,099,289
TOOL HAVING REMOVABLE CLEANING ELEMENT

Harry Bretthauer, Carson City, Nev., assignor to James B. Manning, Carson City, Nev., a part interest

Filed Mar. 7, 1977, Ser. No. 775,060
Int. Cl.^{2} A47L *13/46;* B25G *1/12*
U.S. Cl. 15—244 R **10 Claims**



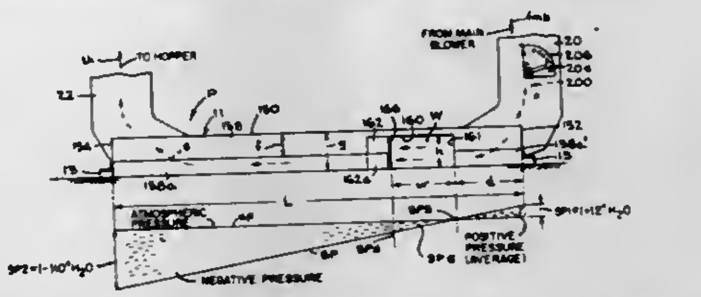
1. A cleaning tool comprising an elongated rod, a pair of end members rotatably mounted on the opposite ends of said rod, said opposite ends including first endwise outwardly facing abutment friction surfaces, said end members including second abutment friction surfaces opposing and frictionally engaged with the corresponding first friction surfaces, and an elongated flexible tension member anchored at its opposite end portions to said end members and spiraled about said rod intermediate said end members, one of said opposite end portions including a looped portion and a cleaning element anchored to one of said end members by said looped portion of said tension member which is tightened thereabout by rotating one of the end members relative to the rod.

4,099,290
SWEEPER WITH RECIRCULATION HOOD HAVING AN UNOBSTRUCTED PICKUP WINDOW

Jan A. Hiszpanski, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 13, 1977, Ser. No. 796,584
Int. Cl.^{2} A47L *5/14*
U.S. Cl. 15—340 **15 Claims**

9. In a mobile street sweeper or the like of the type comprising a vehicle carrying a hopper, a dust filter chamber opening to said hopper and containing filters, means for periodically cleaning the filters, sweeper means comprising an elongate, transversely disposed debris pickup hood of the air recirculation type comprising a closed end duct with front and rear walls having flexible surface engaging flaps, blower means including a main blower for withdrawing air from the hopper and introducing the air under pressure through an air delivery line to a zone adjacent the upstream end of the hood, an auxiliary blower for withdrawing filtered air from said filter chamber and exhausting it to the atmosphere, means for driving said blowers, an air return line adjacent the other end of the hood for returning air from the downstream end of the hood to the hopper thereby causing a stream of air to flow along the hood, a bulky object admitting window formed in the front wall of said duct, said window being substantially shorter than the duct and having upstream and downstream ends and means for windrowing objects into said window; the improvement wherein said blower means, blower drive means, air delivery line, hood and air return line produce an air flow rate that provides a first zone intermediate the length of said duct wherein the static pressure of said air stream substantially equals atmospheric pressure, the static pressure of said air stream downstream of said first zone becoming progressively more negative relative to atmospheric pressure, the upstream edge of said window being disposed substantially at said first or atmospheric pressure zone of said duct, the downstream edge of said window being disposed at a second zone along said duct wherein the static pressure of said air stream is slightly less than atmospheric pressure but is substantially greater than the negative static pressure of said air stream at said air return line, said window being unobstructed during normal operation of the sweeper for freely admitting bulky objects along with a small stream of air.



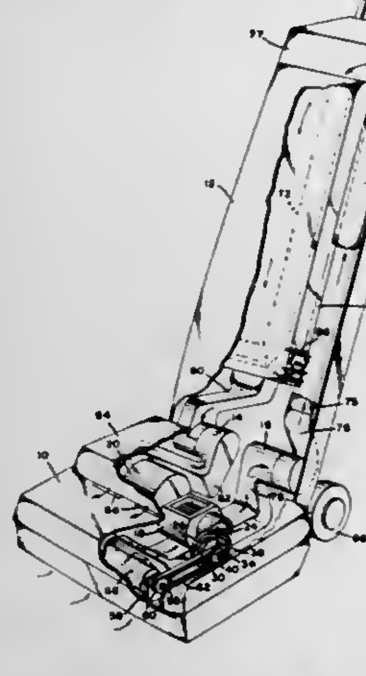
4,099,291
VACUUM CLEANER HAVING MAGNETIC DRIVE FOR AGITATOR BRUSH

Leonard E. Bowerman, 282 Glen Ridge Rd., Fairfield, Conn. 06430

Filed Jan. 1, 1977, Ser. No. 802,413
Int. Cl.^{2} A47L *5/30*
U.S. Cl. 15—390 **10 Claims**

1. In a vacuum cleaner, a suction nozzle, a surface agitator rotatably mounted in said nozzle, an electric motor, a circuit for supplying current to said motor, a magnetic torque-limiting

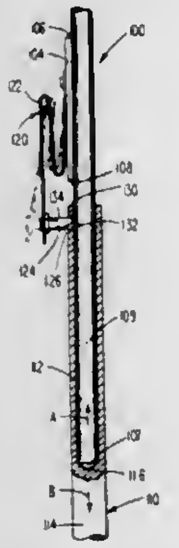
drive having a driving member including a magnet and a driven member including a magnet, means for positively driving said driving member by said motor, and means for positively driving said agitator by said driven member.



4,099,292

TELESCOPING HEAT RESPONSIVE RELEASING MEANS

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901
Continuation-in-part of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and a continuation-in-part of Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304. This application Mar. 18, 1977, Ser. No. 779,044
Int. Cl.² E05F *15/20*
U.S. Cl. 16—48.5 **9 Claims**

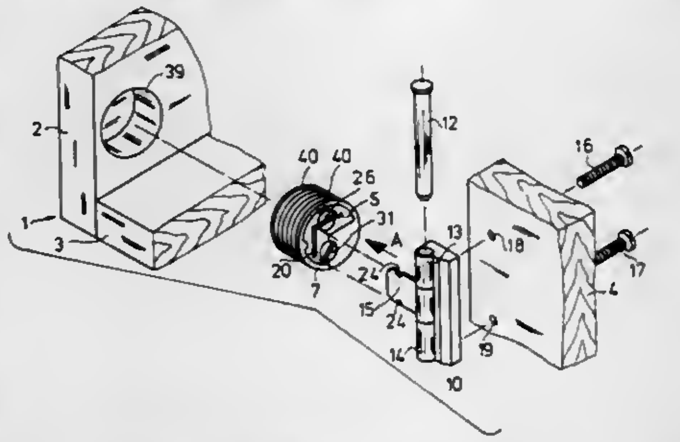


1. A heat responsive releasing device, comprising:
(a) a mounting member;
(b) a pawl member slidably engaging said mounting member, said pawl member tracking relatively along said mounting member between at least restrained and activated positions defined along said mounting member; and
(c) bimetallic means mounted on said mounting member for restraining said pawl member relative to said mounting member in response to a preselected normal ambient temperature and for releasing said pawl member in response to at least a preselected increase in said ambient temperature whereby said pawl member and said mounting member may then slide relative to each other, said bimetallic means further comprising a latching means for at least receiving and engaging at least a portion of said pawl member when said pawl is moved relatively away from said actuated position into said restrained position and in response to at least said normal temperature, said bimetallic means further comprising a bimetal, and said latching means further comprising a pin attached to said bimetal, said pin having at least one beveled surface and said pawl having at least one recess defined therein adapted to receive said pin when said pawl is in the restrained position relative to said mounting member and said ambient temperature is said normal temperature.

4,099,293

CABINET HINGE

Willi Pittasch, Herford, Westf., Fed. Rep. of Germany, assignor to Firma Richard Heinze, Fed. Rep. of Germany
Filed Dec. 2, 1976, Ser. No. 746,938
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554129; Dec. 2, 1975, 2554130; Dec. 2, 1975, 2554133; Jun. 3, 1976, 2624841
Int. Cl.² E05D *7/12*
U.S. Cl. 16—149 **23 Claims**



1. A hinge for articulated connection of two components comprising a first hinge part, a second hinge part and a hinge arm pivotally mounted on said second hinge part, said second hinge part having means operable to fix said second hinge part to one of said components and said first hinge part having an outer anchoring portion and an inner portion, said outer portion being operable to anchor said first hinge part in a bore hole of the other of said component and said inner portion being disposed within a complementary opening in said outer portion and being adjustably displaceable within said outer portion for positioning along an axis perpendicular to the surface of the component within which said first hinge part is mounted, said inner portion having a recess operable to receive said hinge arm and locking means operable to retain said hinge arm in said recess.

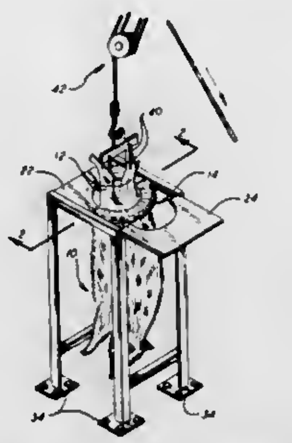
4,099,294

METHOD OF SKINNING SMALL ANIMALS

Gilbert L. Taber, R.D. 2, Lock Pit Rd., Clyde, N.Y. 14433
Filed Jul. 20, 1977, Ser. No. 817,268
Int. Cl.² A22B *5/16*
U.S. Cl. 17—50 **8 Claims**

1. A method of skinning small animals with the aid of first and second rigid plate members each having an opening through which the body of the animal may pass, said method comprising:
(a) manually beginning hide removal by peeling away from the carcass a short section of hide about the animal's hindquarters;
(b) passing the animal's hind legs through the opening in a first of said plate members from a first side thereof leaving said short section of hide on said first side;
(c) placing said short section of hide about said first plate member from said first side thereof, over the outer periphery and upon the second side;

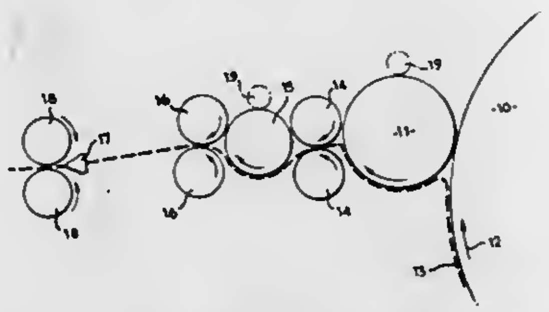
(d) rigidly supporting the second plate member in a fixed position;
(e) passing the animal's hind legs through the opening in said second plate member from a first side thereof;
(f) positioning said first plate member in juxtaposition with said second plate member with the openings in the two substantially aligned and said short section of hide firmly engaged between said first plate member second side and said second plate member first side; and
(g) pulling the carcass in said first direction completely through the aligned openings in said plate members, with said hide section remaining engaged therebetween.



4,099,295

A METHOD OF REMOVING A CARDING WEB FROM A CARDING MACHINE

John Pickles, Halifax, England, assignor to Crosrol Limited, Halifax, England
Continuation of Ser. No. 442,590, Feb. 14, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,016
Claims priority, application United Kingdom, Jul. 18, 1973, 34207/73
Int. Cl.² D01G *15/46*
U.S. Cl. 19—106 R **5 Claims**

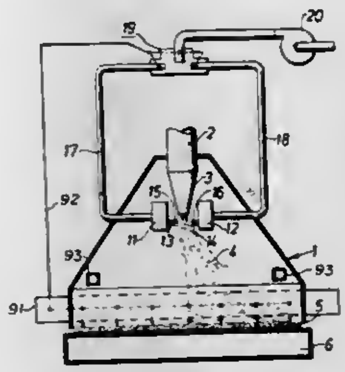


1. A method of removing a carded web of cotton type fibers in full width from a cotton type carding machine comprising stripping said web from a doffer by means of a first card clothing covered stripping roller adjacent said doffer, said web adhering to said first stripping roller, passing said web through a pair of crushing rollers adjacent said first stripping roller, said crushing rollers pulling said web from said first stripping roller, said web sticking to said crushing rollers, then passing said web partially around said second card clothing covered stripping roller, said second stripping roller pulling said web from said crushing rolls, said web sticking to said second stripping roller, feeding said web between a pair of spaced apart control rollers which pull said web from said second card clothing covered stripping roller and direct and control the direction of travel of the web, said control rollers being spaced apart sufficiently to prevent said web from sticking to said spaced apart control rollers.

4,099,296

METHOD AND APPARATUS FOR FORMING A MATERIAL WEB

Lennart Gustavsson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden
Filed Sep. 21, 1976, Ser. No. 725,276
Claims priority, application Sweden, Sep. 26, 1975, 7510795
Int. Cl.² D04H *1/00*
U.S. Cl. 19—304 **33 Claims**

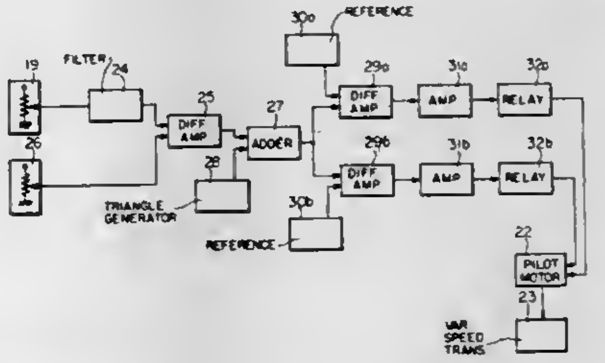


1. A method of forming a material web comprising the steps of causing a composite flow of particulate material in a gaseous transport medium flow into a distribution chamber, precipitating said material from said composite flow on a deposition surface in the distribution chamber, exposing the composite material flow to control flows of gaseous medium directed from opposite sides of the flow against the same, and alternatingly varying the size of the impulse of the control flows with a frequency in the range of 1 to 50 c.p.s., each control flow consisting of a plurality of jets, where the impulse of selected jets being varied separately from one another, the variations in said selected jets being out of phase, whereby the composite material flow is distributed across the width of the deposition surface.

4,099,297

METHOD AND APPARATUS FOR CONTROLLING THE SLIVER-THICKNESS VARIATION IN A CARDING MACHINE

Junzo Hasegawa, Obu; Yasutaka Hayashi; Yasuhiko Suzuki, both of Nagoya; Takashi Katoh, Kariya; Takahiko Tsunekawa, Aichi, and Akira Tanaka, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan
Filed Sep. 3, 1976, Ser. No. 720,351
Claims priority, application Japan, Sep. 6, 1975, 50-108242
Int. Cl.² D01H *5/38*
U.S. Cl. 19—240 **12 Claims**



1. An apparatus for controlling the sliver-thickness variation in a carding machine, comprising:
a first device for detecting the thickness of the sliver delivered from the carding machine and creating a corresponding electric signal;
a first control circuit for producing a difference signal by

comparing said electric signal indicating the thickness of the sliver with a reference level signal indicating a predetermined constant thickness of the sliver;

a second control circuit for creating a control pulse signal in accordance with said difference signal intermittently at time intervals, each of said time intervals being shorter than a time required for a length of carded sliver to be delivered, which length corresponds to a long term variation of sliver thickness, said second control circuit comprising:

- a first circuit for superimposing one alternating current periodic signal which has a far shorter period than the long period of sliver-thickness variation during the delivery of the sliver, on said difference signal;
- a second circuit which processes said difference signal and produces a control pulse signal, a time-related characteristic of which is proportional to a time interval in which the amplitude of said superimposed signal exceeds a predetermined reference level; and

a second device for intermittently adjusting the supply amount of fiber tufts to the carding machine by said control pulse signal at each of said time intervals for reducing said difference signal toward zero,

whereby the supply amount of the fiber tufts to the carding machine is intermittently controlled by aid control signal so as to equalize the thickness.

4,099,298

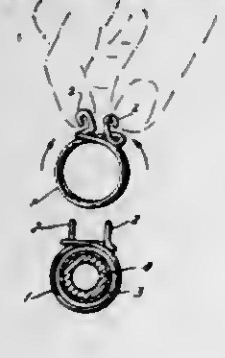
SELF TIGHTENING ELASTIC CLAMP, PARTICULARLY A HOSE CLAMP

Aurelio Helde Gimenez, Rua Araguaia n. 674, Bairro de Caninde Sao Paulo, S.P., Brazil

Filed Mar. 17, 1977, Ser. No. 778,716

Int. Cl.^{2} F16L *33/20*

U.S. Cl. 24—27 11 Claims



1. A self-tightening hose clamp formed of an elastic wire having:

a central portion formed into a continuous helix having at least two full turns of the same hand;

end parts at each of the two ends of said helix and extending generally tangentially oppositely to each other and each having a respective outer end;

two radially outwardly projecting grips each indirectly connected to a respective one of said outer ends, whereby displacement of said grips angularly toward each other elastically deforms said two turns so as to increase the diameter thereof; and

two bent portions each connecting a respective one of said outer ends to a respective one of said grips embracing and thereby restricting axial deformation of said two turns, said bent portions each riding on said two turns during elastic deformation thereof effected through said grips.

4,099,299

ELASTICALLY RESILIENT FASTENING CLIP

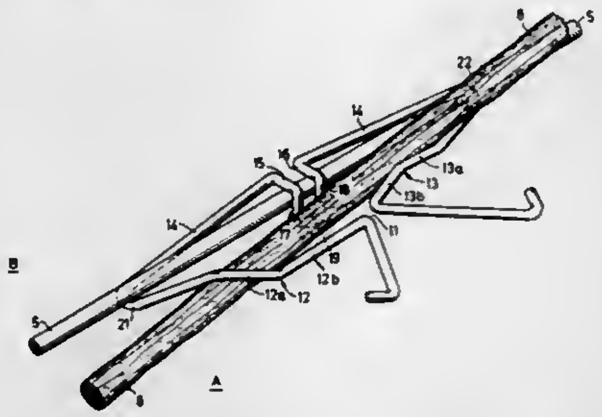
Paul Bruggert, 19, rue Thierenbach, 68500 Jungholtz, and Georges Schuller, 26 rue, Kreuzberger, 68500 Guebwiller, both of France

Filed Nov. 8, 1976, Ser. No. 739,974

Claims priority, application Switzerland, Nov. 10, 1975, 14540/75

Int. Cl.^{2} A44B *21/00;* A01G *17/10*

U.S. Cl. 24—73 PS 7 Claims



1. An elastically resilient fastening clip, in particular for the fastening of a trained plant including fruit trees, vines, or the like to a horizontally extending training wire, said clip comprising a slit loop (10) having a slit (11) which is widenable outwardly for introduction of a sapling, a twig, a shoot or the like part (8) of said plant and, after passing the plant part (8) therethrough, closes again under the clamping effect of said loop (10) of said fastening clip exercised at both sides of said slit (11); and said clip further comprising hook parts (23,24) bent at angles away from said slit (11) in said loop (10); said loop (10) having an elongated compressed or flattened shape in the plane in which the loop extends, and further comprising:

(a) a contact zone (14) extending opposite said slit (11) and approximately parallel to said training wire (5),

(b) two crimped intermediate leg zones (12,13) between the ends of said contact zone (14) and said slit (11), and

(c) a hook-shaped projection (17,18,19) having a nose part (19) bent out of the plane of the loop in the middle of said contact zone (14), said nose part (19) lying opposite said slit (11), being adapted for being hooked on to said training wire (5) by contacting the latter from that side (A) of the wire on which the bent-away leg parts (12,13) are located;

whereby, when said clip is fastened to said training wire (5), said contact zone (14) of said loop (10) comes to lie along one side (B) of said training wire, and said slit (11), said adjacent leg parts (12,13) and nose part (19) are on the other side (A) thereof, and, when said plant part (8) is introduced into said loop (10), it is pressed resiliently against said training wire (5), while, at the same time, the clamping tension caused by the insertion of said plant part (8) pulls said contact zone (14) into frictional contact with said training wire (5) and thereby prevents a lateral displacement of said clip along said training wire (5).

4,099,300

TIE PIN

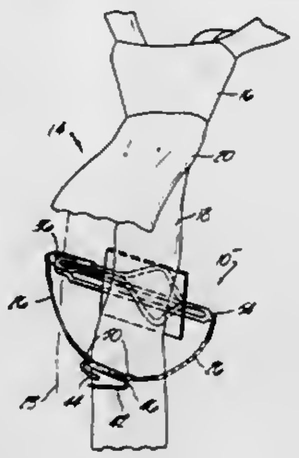
Edward A. Wolak, 7708 Normile, Dearborn, Mich. 48126

Filed May 13, 1977, Ser. Nn. 796,836

Int. Cl.^{2} A41P *25/04*

U.S. Cl. 24—49 CF 5 Claims

1. A tie pin for holding the wide front and the narrow rear portions of a tie relative to a wearer's shirt comprising: a pin element adapted for attachment to selected portions longitudinally and at the rear of the wide front portion of the tie, a clamp member to grip opposed surfaces at the edge of a shirt front and at selected points vertically of the shirt, flexible means extending from opposite ends of said clamp member to said pin element to form a closed loop adapted to receive and confine the short end of said tie to limit lateral displacement thereof relative to said shirt front and said front portion of said tie, said flexible means extending from said clamp member to opposite ends of said pin element.



4,099,301

SLIDE FASTENER COMBINATION

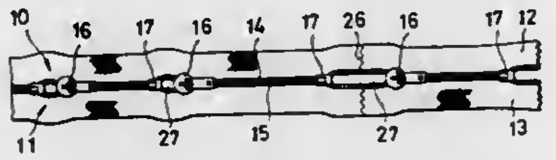
Yoshinori Fujisaki, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Nov. 15, 1976, Ser. No. 741,847

Claims priority, application Japan, Nov. 22, 1975, 50/158718

Int. Cl.^{2} A44B *19/02, 19/36*

U.S. Cl. 24—205 R 3 Claims



1. In combination; a pair of elongated slide fastener stringers each having a stringer tape and a row of fastener elements mounted on and along one edge of said stringer tape, the fastener elements of one row and tape being interlockable with the fastener elements of the other row and other tape; a plurality of pairs of dissimilar coupler-decoupler devices slidably mounted on said rows of fastener elements and moveable therealong to selectively couple into interlocking engagement and decouple from such interlocking engagement the fastener elements within lengthwise portions of said rows thereof, each coupler-decoupler device having a head end at and from which said rows of fastener elements extend in separated, decoupled relation, and a rear end at and from which said rows of fastener elements extend in interlocking, coupled relation, said pairs of coupler-decoupler devices being arranged in spaced succession along said rows of fastener elements with the head end of each coupler-decoupler device in each pair facing the head end of a coupler-decoupler device of the next adjoining pair thereof whereby lengthwise portins of said rows of fastener elements extending between the head ends of coupler-decoupler devices of adjoining pairs thereof, are maintained in separated, decoupled relation, and lengthwise portions of said rows of fastener elements extending between the rear ends of the coupler-decoupler devices of the same pair thereof, are maintained in coupled, interlocking relation.

4,099,302

SLIDE FASTENER

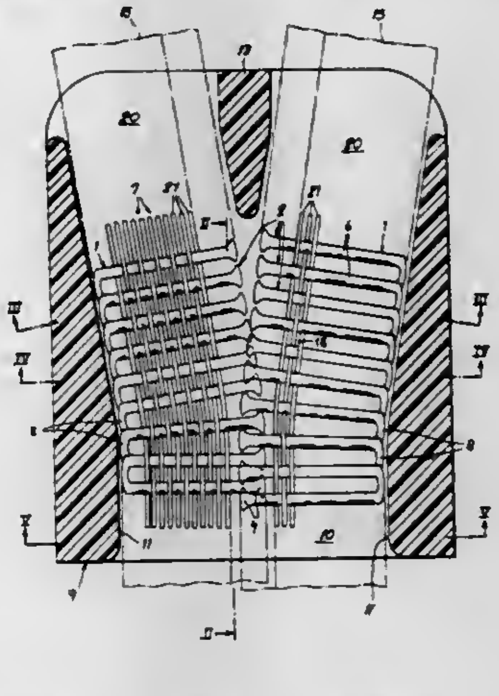
Alfons Fröhlich, and Walter Passmann, both of Essen, Fed. Rep. of Germany, assignors to OPTI Patent- Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,048

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2540201; Jun. 19, 1976, 2627640

Int. Cl.^{2} A44B *19/32*

U.S. Cl. 24—205.15 R 9 Claims



1. A slide fastener comprising, in combination:

a pair of tape-like support units each comprising a continuous monofilament row of coupling elements, each coupling element having a loop-forming eye provided with a coupling head, a pair of eye-forming monofilament segments on opposite side of said head, connecting shanks extending from said segments and bights spaced from said head and connecting shanks of adjacent coupling elements; and longitudinal threads forming pockets receiving said shanks, said heads projecting along one edge of each unit; and

a slider shiftable along said units for interdigitating and separating the coupling heads of said rows, said slider comprising a shield lying along one side of said units, a pair of flanges overhanging the other side thereof and connected to said shield, and a divider, said slider defining in the region of said divider respective channels adapted to receive each of said units and oriented to press the heads of one of said rows between the heads of another of said rows in a direction transverse to the slide fastener plane, said units being so constructed and arranged that the spreadability of said coupling elements is limited to a free spacing of said segments of adjacent coupling elements which corresponds approximately to the width of said head as measured in the longitudinal direction of the slide fastener.

4,099,303

SNAP FASTENER

Pedro Pere Parera, 79-81 Pablo Alcover St., Barcelona-17, Spain

Filed Apr. 11, 1977, Ser. No. 786,089

Claims priority, application Spain, Feb. 15, 1977, 226.417

Int. Cl.^{2} A44B *17/00*

U.S. Cl. 24—217 R 6 Claims

1. An improved snap fastener for permitting first and second laminae to be releasably secured together, said snap fastener comprising a female part which is fixable to the first lamina without having to preform a hole therein and a male part

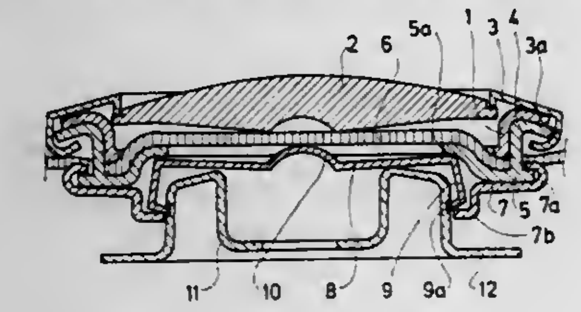
which is fixable to the second lamina, comprising the improvement wherein:

said female part includes a first ring means which is fixedly positioned adjacent one side of said first lamina, said first ring means including a substantially cylindrical part which projects away from the first lamina and defines therein a central opening, the cylindrical part terminating in an annular conical part which flares radially outwardly from the cylindrical part;

said female part including a push button movably positioned within said cylindrical part;

said female part including second ring means disposed adjacent the other side of said first lamina, said second ring means having a plurality of pinlike lugs which penetrate through the first lamina and are slidably guided past the exterior surface of the cylindrical part and are bent outwardly beneath the conical part of said first ring means;

said female part including third ring means which overlies the first ring means and has an outer flange portion which wraps around the radially outer edge of said conical part and the outer ends of said lugs for fixedly connecting said first, second and third ring means together, said third ring means having a central opening which permits a finger to be inserted therethrough so as to contact the push button;



said second ring means having first and second portions which are positioned on said other side of the first lamina, said first and second portions being axially spaced apart so that said first portion is positioned closely adjacent said first lamina whereas said second portion is spaced therefrom, said first and second portions respectively defining first and second openings which communicate with an enlarged receptacle defined therebetween;

said female part further including a locking member positioned within said receptacle and confined between said first and second portions, said locking member including a resilient reversible disc which is resiliently flexibly movable between raised and lowered stable positions, said locking member further including legs connected to said disc and projecting axially therefrom toward said second portion, said legs terminating in locking projections; and

said male part including a portion insertable through said second opening so as to engage said disc, the portion of said male part having a groove formed for engagement with said locking projections.

4,099,304

SCREW TYPE CLAMPING COLLAR

André R. Luc, Ozoir-la-Ferriere, France, assignor to Tridou-Serflex S.A., Bry-sur-Marne, France

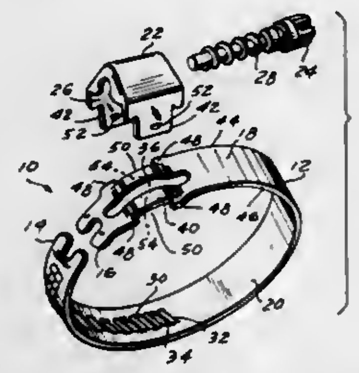
Filed Jun. 3, 1976, Ser. No. 692,334

Claims priority, application France, Jun. 4, 1975, 75 18314

Int. Cl.^{2} F16L *33/08*

U.S. Cl. 24—274 R **8 Claims**

1. A screw-type clamping collar comprising a flexible band having first and second end portions and inner and outer surfaces; said band having a rack of teeth formed thereon adjacent said first end portion and extending along the band for a predetermined distance, said rack teeth including portions protruding from the inner surface of said band, to be adjacent the part to be clamped; a saddle housing rigidly mounted adjacent the second end portion of said band and having a passage therein for receiving the first end portion of the band above the second end portion thereof; a screw rotatably mounted in said housing and fixed against axial movement thereon, said screw being positioned axially of said band whereby its threads will engage the rack teeth on the first end portion of the band in said housing passage to move said first end portion with respect to said second end portion upon rotation of said screw; said second end portion of said band having an elongated slot formed therein extending for a predetermined distance axially of the band and having a width dimension transversely of the band which is substantially equal to the width dimension of said rack teeth whereby said slot receives and cooperates with the protruding portions of the rack teeth on the inner side of said first end portion of the band to guide movement of said first end portion of the band with respect to said second end portion during rotation of said screw; said saddle housing having a pair of mounting lugs bent about the band beneath the inner side of the band adjacent said slot to secure the housing to the band; said second end portion of the band adjacent said slot being bent upwardly away from the remainder of the band to form a projection on the outer side of the second end portion of the band and a recess on the inner side thereof, said recess having a depth substantially equal to the thickness of said housing lugs for receiving the lugs whereby the slot is maintained in close juxtaposition to the protruding portions of the rack to receive and guide the same; said lugs on said housing having free end portions located on the inner side of the band adjacent said slot respectively including a boss received in said slot to resist transverse movement of the lugs with respect to the band.



4,099,305

FABRICATION OF MESA DEVICES BY MBE GROWTH OVER CHANNELED SUBSTRATES

Alfred Yi Cho, and Won-Tien Tsang, both of Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1977, Ser. No. 777,400

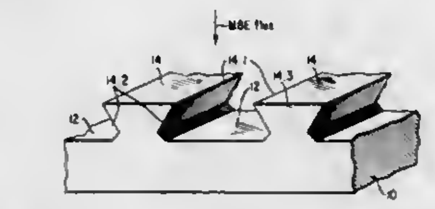
Int. Cl.^{2} B01J *17/00;* H01L *21/203, 29/04*

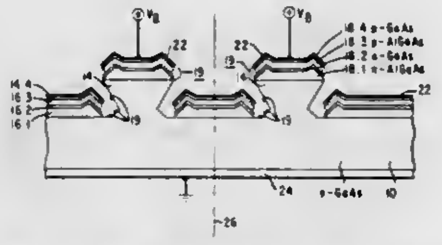
U.S. Cl. 29—579 **11 Claims**

1. A process for fabricating mesa geometry semiconductor devices comprising the steps of:

forming in a semiconductor body a plurality of channels separated by ridges such that each channel is narrower at its top than at its base, and

directing a molecular beam substantially perpendicular to said body so that epitaxial layers grow simultaneously on said ridges and in said channels, the layers on the ridges being physically separate from those in the channels.





4,099,306

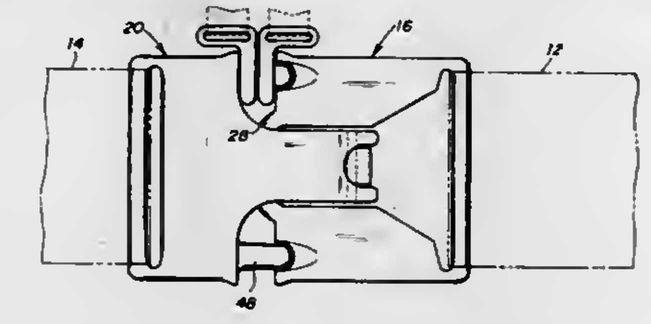
SAFETY BUCKLE

Frank M. Matthews, 1514 Hillcrest Dr., Arlington, Tex. 76010, and Terry O. McClain, Rte. 4, Box 262, Denton, Tex. 76201

Filed Nov. 21, 1975, Ser. No. 633,970

Int. Cl.^{2} A44B *21/00*

U.S. Cl. 24—69 SB **11 Claims**



1. A separable buckle adapted to connect two separable belts which normally are maintained in tension when they are connected, comprising:

(a) a first structural member constituting a floating link of given length, with the link being connected to and pivoting about a point at one end of a first belt, and the distal end of said floating link being generally cylindrical so as to foster rotative contact with an abutting structure;

(b) a second structural member including a base plate and a lever which is permanently secured to the base plate in a manner that provides for pivotable movement about a control axis on the base plate, with the control axis being transverse to the orientation of the two belts being joined, and the base plate being connected to an end of the second belt, said lever having a length which extends from a remote free end to a second end adjacent the control axis and said lever having a cusp-shaped opening between its free end and said control axis, with said cusp-shaped opening lying on a line that extends generally between the lever's free end and the control axis, and said cusp-shaped opening being oriented and sized to selectively receive and hold the distal end of said floating link in abutting contact, and the control axis being located such that the buckle is not only unlatched but also tends to separate when the two belts are in tension and the plane of the floating link is positioned above the control axis, and such that the buckle remains firmly latched together when the two belts are in tension and the plane of the floating link is positioned below the control axis; and

(c) means for manually moving the lever above and below the control axis, with said moving of the lever causing shifting of the floating link when the link's distal end is engaged with the lever, whereby manually displacing the lever through a relatively small angle of as little as 3° can cause the floating link to be shifted to and from a secured state, and the buckle can be thereby changed to and from a latched condition.

4,099,307

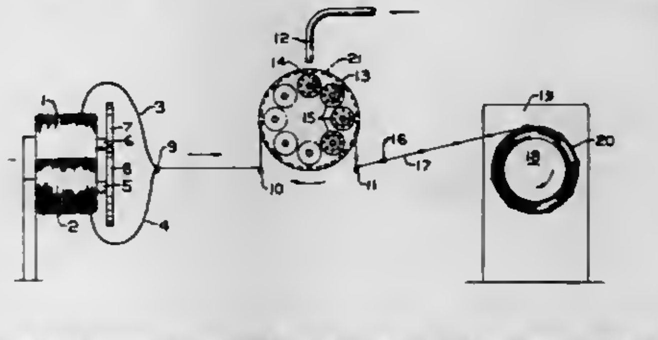
APPARATUS FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, which is a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,989

Int. Cl.^{2} D02G *1/16;* D02J *1/06*

U.S. Cl. 28—252 **4 Claims**



1. An apparatus for producing a slubby strand comprising in combination means to receive a textile strand on a surface, a plurality of fluid passages on said surface, exhaust means for said fluid passages positioned below said surface, means to adjust the volume of exhaust from each of said fluid passage exhaust means, means to rapidly draw said textile strand from said surface and means to introduce high pressure fluid onto said surface while strand is being drawn over said surface.

4,099,308

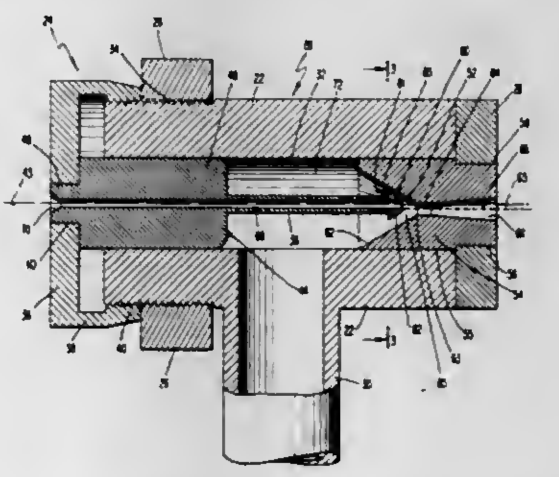
TURBULENCE GENERATING YARN FEED NEEDLE

John Wesley, Wayne, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,027

Int. Cl.^{2} D02G *1/16;* D02J *1/08*

U.S. Cl. 28—273 **13 Claims**



1. In yarn bulking apparatus having a housing with a central axis, an internal cavity, a venturi eccentrically positioned relative to the axis at one end of the housing, a yarn feed opening in a second end of the housing, and means for supplying a pressurized compressible fluid to the internal cavity upstream

of the venturi inlet, an improved device for generating turbulence in the venturi inlet comprising:

first means for generating turbulence in the compressible fluid, positioned in the venturi inlet providing a first stage of turbulence generation;

second means for generating turbulence in the compressible fluid, positioned in the venturi inlet downstream of the first means, providing a second stage of turbulence generation; and

yarn feed needle cantilevered from an upstream end of the internal cavity, extending coaxially through the internal cavity to the venturi inlet, having a yarn feed passage communicating with the yarn feed opening and extending through the yarn feed needle, the second means for generating turbulence being at a distal end of the yarn feed needle and the first means for generating turbulence being upstream of the distal end.

4,099,309
MANUFACTURE OF GRIDS

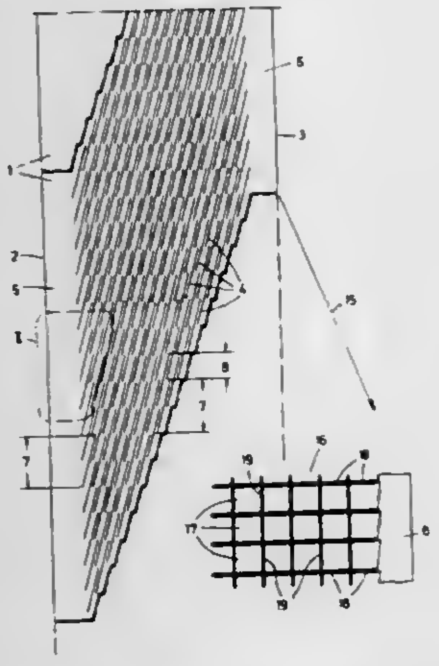
Ulrich Bender, Siegen, Germany, assignor to Firma Emil Bender, Siegen, Germany

Filed Jan. 31, 1977, Ser. No. 764,360

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700603

Int. Cl.² B21D *31/04*

U.S. Cl. 29—2 **3 Claims**



1. Process for the manufacture of a grid, comprising:

(a) providing a metal strip of generally diamond shape having opposite edges which are spaced and parallel,

(b) forming a pattern of equal-length, parallel primary slits that extend entirely through the strip, the pattern being also of generally diamond shape, but smaller than the outline of the strip to leave slit-free elongated areas along the said opposite edges, each primary slit having a first neighboring slit on one side that is co-extensive with one-half of the primary slit and a second neighboring slit on the other side that is co-extensive with the other one-half of the primary slit, so that an area of double width appears beside each primary slit, and

(c) deforming the strip by parallel and transverse movement of the slit-free areas in the plane of the strip, thus forming a grid with single-width bars extending transversely of the said area.

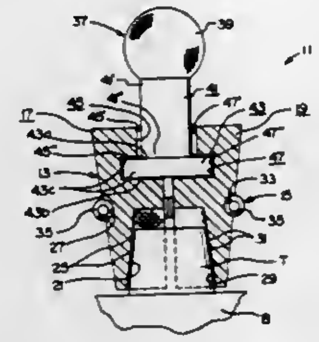
4,099,310
BATTERY TERMINAL CLEANER

Robert Lynn Mitchell, 2300 Fite Rd., Memphis, Tenn. 38127

Filed Aug. 17, 1977, Ser. No. 825,436

Int. Cl.² B23D *71/00;* B08B *1/00;* B23B *3/00*

U.S. Cl. 29—79 **6 Claims**



6. A self-adjusting battery terminal cleaner comprising:

(a) grip means including a substantially spherical grip member and including a leg member having first and second ends, said first end of said leg member being attached to said spherical grip member, said grip means including a substantially plate-like foot member attached to said second end of said leg member, said foot member having four sides positioned at substantially right angles to one another;

(b) body means for selective placement over the battery terminal to be cleaned, said body means including a first body member, said first body member including a face surface having a top edge and a bottom edge, said first body member having a first cavity in said face surface thereof extending upwardly from said bottom edge thereof for receiving a portion of the battery terminal to be cleaned and having a second cavity in said face surface thereof extending downwardly from said top edge thereof for receiving a portion of said leg member and said foot member of said grip means, said first cavity of said first body member having a cross-sectional shape of a portion of a circle that is less than half of a complete circle, said first cavity of said first body member tapering upwardly, said first body member having a plurality of teeth members provided in said first cavity of said first body member, said second cavity of said first body member including a first portion having a cross-sectional shape substantially identical to half the cross-sectional shape of said leg member of said grip means for receiving substantially half of said leg member and including a second portion communicated with said first portion thereof and having a cross-sectional shape substantially identical to half the cross-sectional shape of said foot member of said grip means for nonrotatably receiving substantially half of said foot member; said body means including a second body member, said second body member being substantially a mirror image of said first body member for coacting with said first body member to substantially enclose a portion of said leg member and said foot member of said grip means and the battery terminal to be cleaned; and

(c) spring means positioned circumferentially about said first and second body members for uniformly urging said face surfaces of said first and second body members of said body means towards one another to cause said foot member of said grip means and the battery terminal to be cleaned to be trapped therebetween whereby manual rotation of said grip means will cause said body means to likewise rotate so that said teeth members of said first and second body members will clean the battery terminal enclosed within said first cavities of said first and second body members.

4,099,311
COMPOSITE ROLL WITH ROLL RING OF MATERIAL WHICH IS SENSITIVE TO TENSILE STRESS

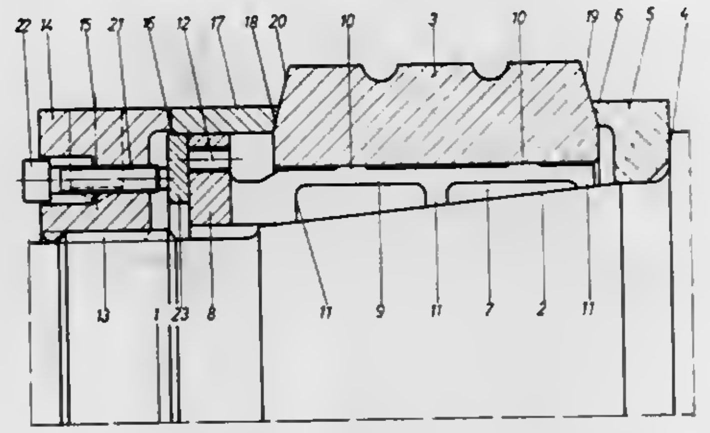
Uwe Kark, Cuxhavener Str. 60a, 2104 Hamburg 92 Hausbruch, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,731

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606908

Int. Cl.² B21B *31/08*

U.S. Cl. 29—126 **6 Claims**



1. A composite roll comprising a coaxial inner roll core and an outer roll ring generally defining an axially tapered annulus therebetween, and intermediate axially tapered means within the axially tapered annulus between and in engagement with the roll core and roll ring for supporting the roll ring on the core, the intermediate axially tapered means being engageable with the inner core and outer roll ring at spaced offset supporting areas respectively and the intermediate axially tapered means forms spring-like means therebetween for resiliently biasing the roll ring radially outwardly at the supporting areas of engagement with the roll ring.

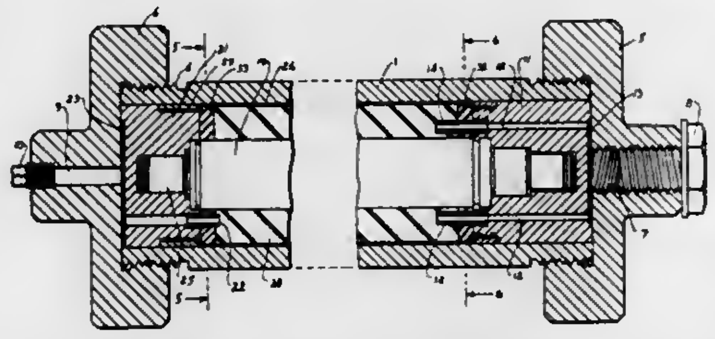
4,099,312
ELASTOMERIC ROLL WITH SEALED ENDS

Robert W. Hill, Sussex; William G. Onnen, Newton, and Lyle C. Ryder, Rockaway, all of N.J., assignors to Ames Rubber Corporation, Hamburg, N.J.

Division of Ser. No. 719,696, Sep. 2, 1976, which is a continuation of Ser. No. 591,720, Jun. 30, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,581

Int. Cl.² B21B *31/08*

U.S. Cl. 29—130 **5 Claims**



1. An elastomeric roll comprising a cylindrical metal core, a cylindrical elastomeric body surrounding said core and bonded thereto, the length of said cylindrical body being less than the length of said cylindrical core, said cylindrical body being positioned with a portion of said cylindrical core protruding beyond each end of said cylindrical body, and a protective cylindrical sleeve of finished constant diameter throughout its length coaxially surrounding said core and body and continuously bonded to said body, said body comprising end rings of environment-resistive elastomeric material within the ends of said sleeve and continuously and fully closing both ends of the space between said core and sleeve, and the remainder of said body comprising environmentally degradable elastomeric material bonded to said rings, said sleeve having an unstressed initial diameter less than said finished diameter and being circumferentially tensed at said finished diameter by uniform hydrostatic precompression of both the elastomeric materials of said body.

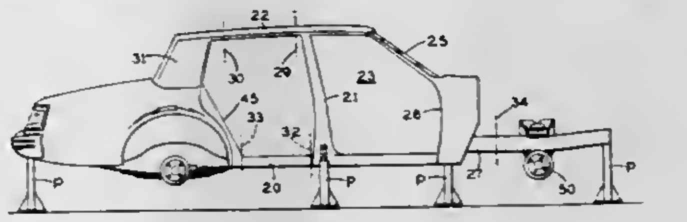
4,099,313
METHOD OF CONVERTING MOTOR CAR

Charles Walter Phillips, Pompano Beach, Fla., assignor to Grandeur Motorcar Corp., Pompano Beach, Fla.

Filed Aug. 9, 1977, Ser. No. 823,170

Int. Cl.² B60P *3/26*

U.S. Cl. 29—416 **11 Claims**



1. A method of converting a passenger car to provide a shortened body and a lengthened engine compartment which comprises the steps of:

removing the doors, the engine, the front fenders and engine compartment hood from the car and removing the drive shaft from the drive shaft tunnel;

removing longitudinal segments of the frame and body of the car, including the drive shaft tunnel, immediately behind the door posts to sever the car body into front and rear sections;

bringing the severed front and rear sections of the car body into aligned, abutting juxtaposition at the roof and joining corresponding parts of said sections, including the drive shaft tunnel, to each other to provide a converted, unitary car body which has been shortened immediately behind the door posts;

putting a correspondingly shorter drive shaft in the shortened drive shaft tunnel;

closing the openings in the opposite sides of the converted body immediately behind the door posts;

severing the frame transversely at the engine compartment and longitudinally separating the severed rear and front sections of the frame thereat;

inserting longitudinal frame segments between the separated sections of the frame at the engine compartment and joining said inserted frame segments at each end to the adjoining sections of the frame;

mounting the engine on the inserted frame segments at the engine compartment;

and attaching to the car body a correspondingly longer engine compartment hood and front fenders.

4,099,314
METHOD OF PRODUCING HOLLOW BODIES IN ALUMINUM-SILICON ALLOYS BY POWDER-EXTRUSION

René Perrot, Voreppe, and Jean-Louis Mazodier, Maisons Laffitte, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Mar. 4, 1977, Ser. No. 774,424

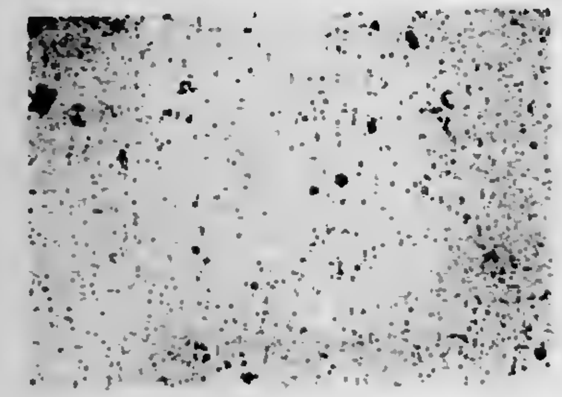
Claims priority, application France, Mar. 10, 1976, 76 07583

Int. Cl.² B22F *1/00*

U.S. Cl. 29—420 **11 Claims**

1. A process for preparation of hollow bodies of aluminum-silicon alloy with improved friction and wear characteristics containing crystals of primary silicon of about 2 micrometers to about 20 micrometers comprising the sequential steps of: providing a cast alloy comprised on the basis of weight of 15 to

20% silicon, from 1 to 5% copper, from 0.5 to 1.5% magnesium, from 0.5 to 1.5% nickel and the remainder aluminum; granulating said alloy to provide granular metal having a particle size between about 5 micrometers and about 2 millimeters; introducing the granular metal into the container of an extrusion press and extruding a hollow tube of suitable diameter; and cutting the tube into lengths corresponding to the length of the hollow bodies to be manufactured, said hollow bodies being characterized by a micrographic structure comprising fine uniformly distributed pores for promoting lubrication by providing zones for retaining lubricant.



4,099,315
PROCESS FOR FIXING THE CENTER OF ROTATION BETWEEN THE LEGS OF TWO-LEGGED DEVICES

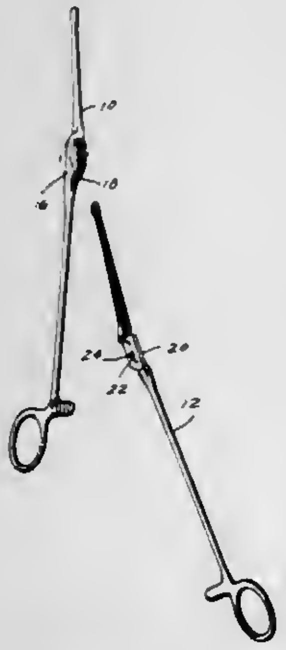
Alfred Pudenz, Wanfried, Fed. Rep. of Germany, assignor to B. Braun Instruments, South San Francisco, Calif.

Filed Feb. 28, 1977, Ser. No. 772,577

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611646

Int. Cl.^{2} B23P *11/00*

U.S. Cl. 29—434 **6 Claims**



1. The method of forming a pivotal connection between the legs of a two-legged device in which one of the legs has a mounting passage formed therein and the other of the legs is inserted in said passage and has a pivot opening formed therein; said method comprising the steps of expanding said mounting passage by heating at least the portion of the leg having said passage therein to a temperature of about 900° to 1000° C; inserting a pivot member having opposed spherical surfaces in the pivot opening of the other of said legs; inserting said other of said legs through said mounting passage until said pivot member is within the confines of said passage; and compressing the portion of said leg having the mounting passage therein adjacent said mounting passage towards said other leg to engage said opposed spherical surfaces of said pivot member against the inner sides of said passage.

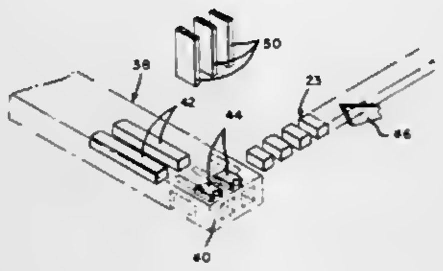
4,099,316
APPARATUS FOR INSERTING DISPLATION TYPE TERMINALS INTO CAVITIES

Joe Pierce Morgan, Camp Hill; Howard Charles Phillips, Harrisburg, and Richard Vernon Spong, New Cumberland, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 23, 1977, Ser. No. 799,838

Int. Cl.^{2} B23P *23/00. 23/04*

U.S. Cl. 29—566.2 **8 Claims**



1. Apparatus for inserting a displation type contact terminal into a cavity in a housing when a wire extends across the open end of said cavity so that said wire moves into the wire receiving slot in said terminal during movement of the terminal into the cavity, said apparatus being of the type having strip feeding means for feeding a strip of said terminals along a first path which extends towards the insertion zone of said apparatus, wire trimming means and terminal insertion means reciprocable along a second path extending towards and away from said zone, shearing means for shearing a terminal from said strip in said zone, and fixture means for holding a workpiece in said zone, said apparatus comprising:

first and second slide assemblies which are reciprocable parallel to said second path from retracted positions towards and away from said insertion zone,

camming means effective between said first slide assembly and said strip feeding means and between said first slide assembly and said shearing means whereby during reciprocation of said first slide assembly, said strip is fed towards said zone and the leading terminal of said strip is severed from said strip,

guide tube means forming part of said second slide assembly, said guide tube means being yieldably coupled to said second slide assembly so that upon arrival of said guide tube means in said insertion zone and against a workpiece on said fixture means said guide tube means comes to rest and said second slide assembly continues to move along said second path, said wire cutter means and said inserter means being movable with said guide tube means, said inserter means and said wire cutter means being yieldably coupled to said second slide assembly independently of said guide tube means whereby during a final portion of said work stroke of said second slide assembly, said inserter means pushes said severed terminal into said workpiece and said wire trimming means trim said wire.

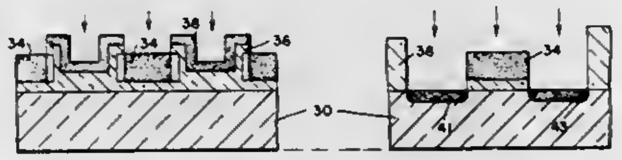
4,099,317
METHOD FOR FABRICATING SELF-ALIGNED CCD DEVICES AND THEIR OUTPUT SELF-ALIGNED MOS TRANSISTORS ON A SINGLE SEMICONDUCTOR SUBSTRATE

Stephen C. Su, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1976, Ser. No. 683,361

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—571 **12 Claims**



1. A method of fabricating a semiconductor charge coupled device structure comprising the steps of:

(a) forming a first layer of electrically insulating material on a portion of a surface of a semiconductor substrate of a first type of conductivity;

(b) disposing a first layer of a semi-insulating semiconductor material on predetermined portions of said first layer of electrically insulating material to form a first set of semiconductor strips with predetermined spaces between adjacent strips exposing portions of said first insulating layer;

(c) forming a second layer of electrically insulating material on said first set of semiconductor strips and on said exposed portions of said first insulating layer;

(d) disposing a second layer of a semiconductor material on selective predetermined portions of said second layer of electrically insulating material to form a second set of semiconductor strips which overlie said spaces between said adjoining strips of said first set of semiconductor strips and partially overlie said strips of said first set;

(e) removing portions of electrically insulating material to expose portions of said first set of strips lying under and between said strips of said second set of strips and to expose predetermined portions of said semiconductor substrate; and

(f) introducing conductivity type determining impurities into both said first set of strips and the exposed substrate to convert the conductivity thereof to a second type of conductivity.

4,099,318
SEMICONDUCTOR DEVICES

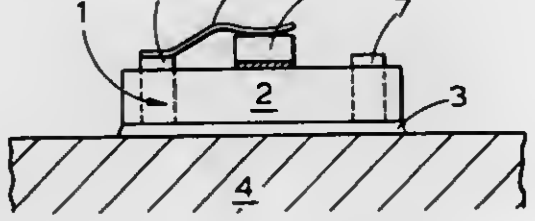
Kenneth Cooper; Ian Stanley Groves; Peter Alexander Leigh; Neil McIntyre; Sydney O'Hara, and John Donald Speight, all of Suffolk, England, assignors to The Post Office, London, England

Filed Nov. 15, 1976, Ser. No. 741,672

Claims priority, application United Kingdom, Nov. 17, 1975, 47339/75

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—578 **5 Claims**



1. In a method of producing a semiconductor device in the form of an IMPATT diode, the steps of:

selecting a slice of semiconductor material having an epitaxial layer on an n^+ substrate material;

diffusing a p^+ layer into the epitaxial layer to form an abrupt p^+-n junction;

removing the uppermost 80 to 120Å of the diffused p^+ layer by RF sputter etching under plasma conditions thereby inhibiting change in surface crystal structure;

thinning the n^+ substrate material to a desired thickness for the device;

producing a photolithographic mask on the surface of the n^+ substrate material;

depositing by sputtering, on both the p^+ and n^+ surfaces a succession of layers of titanium, 800–1200Å, platinum 1,600–2,400Å, and gold, 8000–12,000Å, and electroplating gold layers over these sputtered gold layers;

removing the photolithographic mask to expose the surface of the n^+ substrate material around a series of gold pads;

by high energy proton bombardment, passivating the zones of semiconductor material in depth through the slice to create zones of semi-insulating material to isolate the semiconductor material directly below the gold pads, the energy of protons being increased in stages at intervals of less than 0.11MeV up to an energy in MeV approximately equal to one-tenth of the required passivated layer thickness in μm using a proton dose at each stage of from 10^{14} to 5×10^{15}cm^{-2} and a rate of from 2×10^{12}sec^{-1} to 5×10^{12}sec^{-1} using a proton scan raster pattern ensuring uniformity of dose over the area of the device; and

mounting the processed semiconductor material on to a heat sink and connecting one or more of said gold pads to a connection block.

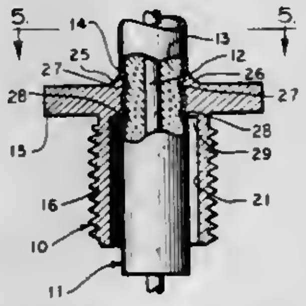
4,099,319
METHOD OF ASSEMBLY OF ELECTRIC HEATING ELEMENT WITH BULKHEAD FITTING

Alan D. Vogel, Laurel, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Division of Ser. No. 564,938, Apr. 3, 1975, Pat. No. 4,035,609. This application May 26, 1977, Ser. No. 800,886

Int. Cl.^{2} H05B *3/00*

U.S. Cl. 29—611 **2 Claims**



1. A method of securing a fitting to a sheathed electrical conductor, the fitting being of the type which sealably passes the conductor through an aperture in a bulkhead, and includes

a flange portion having a diameter greater than the bulkhead aperture,

a sleeve portion integrally adjacent and concentric with said flange portion having an outer diameter smaller than the bulkhead aperture and a length greater than the thickness of the bulkhead, and a threaded portion for receiving a fastener for drawing said flange portion into engagement with the bulkhead,

said flange and sleeve portions including an axially-extending aperture dimensioned to slidably receive in surface contact the sheath of the conductor, and a lip on the face of said flange portion adjacent to said axially-extending aperture,

said method including the steps of:

inserting the sheathed electrical conductor through the axially-extending aperture so as to bring the sheath into surface-contact with the wall of the axially-extending aperture; and

axially compressing the lip into the face of the flange portion so as to force the wall of the axially-extending aperture and the sheath to be radially deformed whereby a mechanically-rigid liquid-sealing engagement is established between the fitting and the sheath.

4,099,320

METHOD OF MAKING A MINIATURE PLUG-IN FUSE

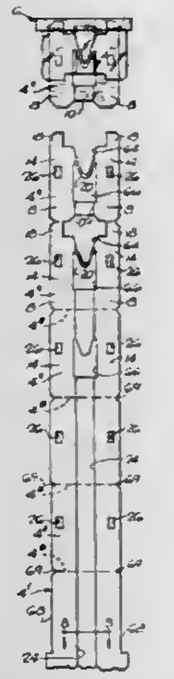
John Schmidt, Jr., Mount Prospect, and Avinash Aryamane, Elk Grove, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 698,079, Jun. 21, 1976, Pat. No. 4,023,264. This application Apr. 25, 1977, Ser. No. 790,657

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.² H01H *69/02*

U.S. Cl. 29—623 13 Claims



1. A method of making plug-in fuse elements having different desired fuse ratings and each comprising a plug-in element including a pair of spaced confronting generally parallel terminal blade portions to be received by pressure clip terminals or the like, a pair of confronting current-carrying extensions projecting longitudinally from the inner ends of the pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, said method comprising the steps of providing substantially identical blank portions of fuse metal for forming fuse elements of different fuse ratings which blank portions are initially provided with portions of substantially identical reduced thickness and substantially identical width for plug-in fuse elements of different fuse ratings, blanking at least said portions of reduced thickness of each blank portion to leave a pair of spaced confronting general parallel terminal blade portions to be received by pressure clip terminals of the like and confronting current-carrying extensions projecting longitudinally from the inner end portions of each pair of terminal blade portions, the fuse elements of different ratings being obtained by blanking said longitudinally extending portions of reduced thickness to provide fuse-forming links of substantially different locations between the confronting portions of said current-carrying extensions where the heat dissipation characteristics thereof are substantially different.

4,099,321

METHOD OF MAKING A MINIATURE PLUG-IN FUSE

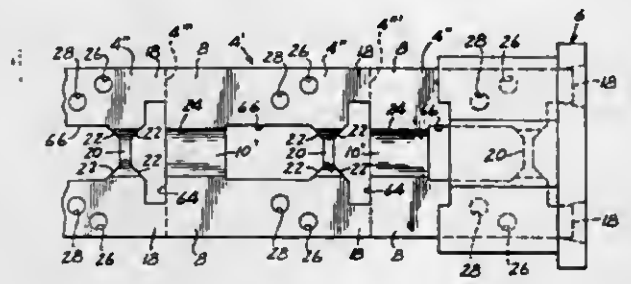
Avinash P. Aryamane, Elk Grove, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 692,040, Jun. 2, 1976, Pat. No. 4,023,265, which is a continuation of Ser. No. 640,253, Dec. 12, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,395

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.² H01H *69/02*

U.S. Cl. 29—623 12 Claims



1. A method of making a plug-in fuse element comprising a plate-like body of the fuse metal having a pair of terminal blade portions to be received by pressure clip terminals in a mounting panel, current-carrying extensions at the inner end portions of the pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, said method comprising the steps of providing a blank of fuse metal which is initially provided between opposite margins thereof with a continuous band of reduced thickness, blanking said blank of fuse metal including at least said portion of reduced thickness to leave a pair of juxtaposed, spaced, terminal forming blade portions outside of said portion of reduced thickness, said fuse link portion formed in said portion of reduced thickness and said current-carrying extension of said terminal blade portions interconnected by said fuse link portion.

4,099,322

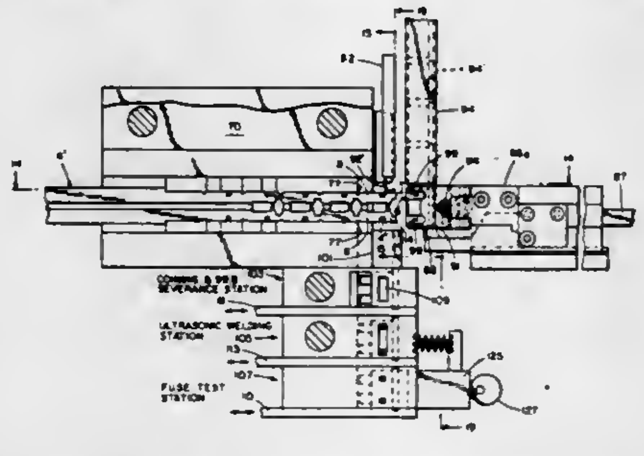
METHOD FOR MAKING PLUG-IN FUSE ASSEMBLIES

Robert J. Tait, Arlington Heights, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Feb. 7, 1977, Ser. No. 766,239

Int. Cl.² H01H *69/02*

U.S. Cl. 29—623 2 Claims



1. A method of mass producing plug-in fuse assemblies each including a plug-in fuse element comprising a plate-like body of fuse metal having a pair of spaced confronting generally parallel terminal blade portions to be received by pressure clip terminals or the like, current-carrying extensions at the inner ends of said pair of terminal blade portions and a fuse link portion interconnecting the current-carrying extensions, and an insulating unit rigidly extending between said current-carrying extensions, said method comprising the steps of providing a strip of fuse metal having longitudinally spaced blank portions from which individual plug-in fuse elements are to be formed, sequentially advancing the strip of fuse metal past punch and die assemblies which form in each blank portion of the strip said pair of terminal blade portions and current-carrying extensions interconnected by said fuse link portion; providing a punch assembly including a punch unit and backing means therefor, said punch and backing means having a width no greater than the length of said terminal blade portions; positioning the terminal blade portions of the end blank portion of the strip between said punch and backing means; moving the punch against the terminal blade portions of the end blank portion of the strip to sever the same from the strip and to bring the severed blank against the backing means where it is clamped securely between the punch and the backing means; and providing an insulating unit with an entry opening at one end adapted to receive the current-carrying extensions and fuse link portion of the severed end blank and pushing said insulating unit over the current-carrying extensions of the end blank clamped between said punch and said backing means.

4,099,323

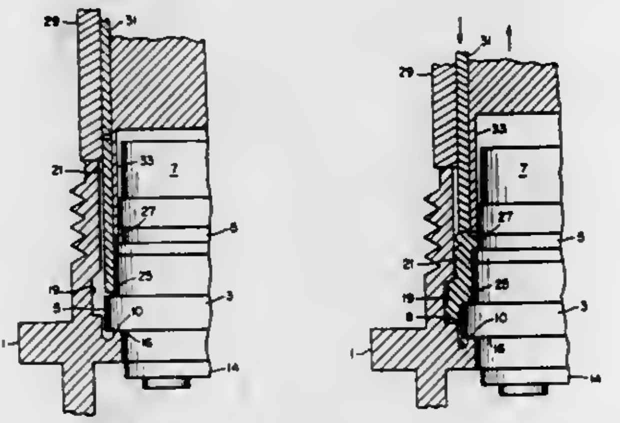
METHOD OF MAKING ELECTRICAL CONNECTOR

Alfred Joseph Bouvier, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 657,124, Feb. 11, 1976, Pat. No. 4,019,799. This application Dec. 17, 1976, Ser. No. 751,931

Int. Cl.² H01R *43/04*

U.S. Cl. 29—629 7 Claims



1. The method of assembling a connector having a shell and an insert member and wafer with appertures therein for receiving electrical terminals, comprising assembling the insert member and wafer member, wrapping a deformable laminate around the members, inserting the assembled members and laminate into the shell with the insert member abutting a shoulder on the inner face of the shell, inserting a first sleeve into the shell in engagement with the laminate, applying force to the first sleeve to deform the laminate in a space between the shell and members, maintaining a second sleeve within the first sleeve in engagement with a shoulder on the wafer member to maintain the members in assembled position with the insert member abutting the shoulder in the shell while applying force to the first sleeve to deform the laminate, and removing the first and second sleeves from the shell including the assembled members.

4,099,324

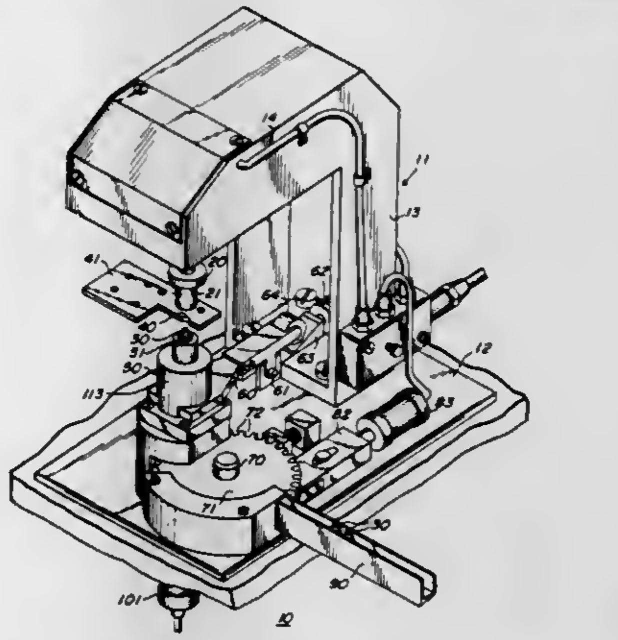
MECHANISM FOR FEEDING AND INSERTING PINS INTO CIRCUIT BOARD

David Leroy Johnson, Des Plaines, and Chester Joseph Matusek, Hillside, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1977, Ser. No. 779,454

Int. Cl.² B23P *19/00*

U.S. Cl. 29—739 8 Claims



1. A sequential magazine feed and holding apparatus for pins comprising:

a collet means having a longitudinal bore extending therethrough from a feed end to a holding end for receiving, transporting and holding a pin;

magazine feed means for sequentially feeding the pin into a position near the receiving end of said collet means bore;

transport means for transporting the pin from the feed end to the holding end of said collet means bore; and

holding means for predeterminedly holding the pin in the holding end of said collet means bore.

4,099,325

MACHINES FOR INSERTING ELECTRIC CIRCUIT COMPONENTS ON PRINTED CIRCUIT BOARDS

Howard Burgess Baker, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 9, 1977, Ser. No. 767,056

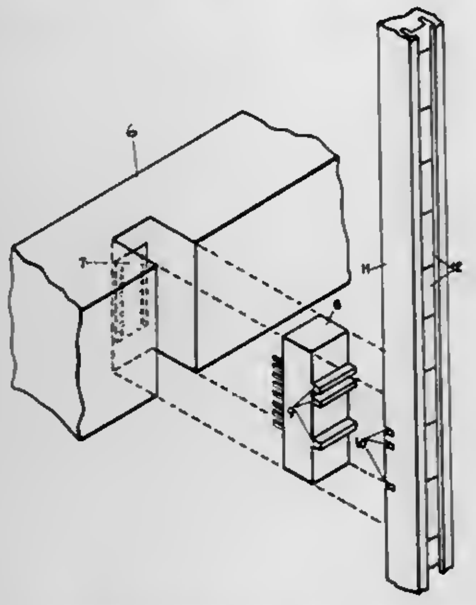
Claims priority, application United Kingdom, Feb. 10, 1976, 5104/76

Int. Cl.² H05K *3/30*

U.S. Cl. 29—741 5 Claims

1. A machine for inserting in a respective position on a printed circuit board any one of a plurality of different electric circuit components taken as required from respective holding locations in the machine comprising control means and, at one of said holding locations first means which is electrically connected to said control means to present to said control means electrical characteristics identifying a respective circuit component and which first means has an external shape at least part of which also identifies said respective circuit component, and

second means which is arranged to hold a plurality of said respective circuit components and at least part of which is shaped to be attachable adjacent only the respective first means.



4,099,326
GARDEN SHEARS

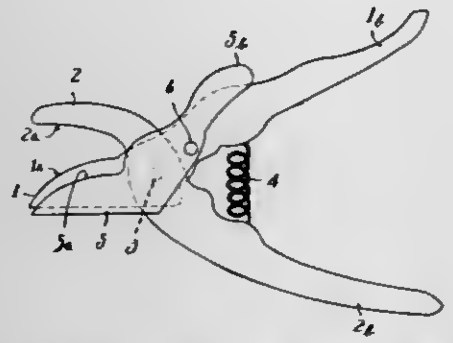
Eizo Mori, and Takao Mori, both of 11 of 473-banchi, Oaza Kuzuha, Hirakata-shi, Osaka-fu, Japan

Continuation-in-part of Ser. No. 645,659, Dec. 31, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,194

Claims priority, application Japan, Jan. 7, 1975, 50-4735; Apr. 30, 1975, 50-53022

Int. Cl.^{2} B26B *13/22*

U.S. Cl. 30—135 **3 Claims**



1. A pair of garden shears comprising a pair of elongated shear elements having complementary cutting portions at the forward end of each and having gripping means for actuating the shear elements at the opposite ends thereof, first pivot means spaced rearwardly of said cutting portions connecting said shear elements to one another in pivotal relationship for opening and closing the cutting portions of the shear elements, spring means spaced rearwardly of said pivot means connecting the shear elements to one another under compression to keep the cutting portions of the shear elements in a normal open state, branch retaining means of a length materially less than the length of each of said shear elements, second pivot means pivotally securing said branch retaining means to one of said shear elements, said second pivot means being positioned rearwardly of and in off-setting relationship to the first pivot means of the shear elements, said branch retaining means having a branch engaging portion at the forward end thereof and lying in superposed relationship with the cutting portion of the shear element to which the branch retaining means is pivoted, said branch portion being in aligned operating relationship with the cutting portion of the shear element, the opposite end of the branch retaining means having an operating portion located forward of the gripping means of each of said shear elements to insure the retention of a branch by the shears after a branch has been cut.

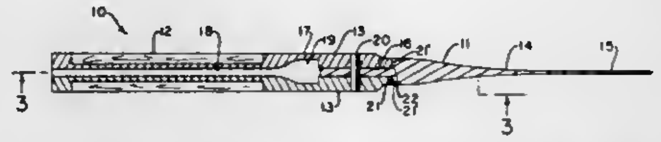
4,099,327
FOLDING KNIFE

William A. Fesa, 578 Oakley Rd., Wooster, Ohio 44691

Filed Aug. 17, 1977, Ser. No. 825,292

Int. Cl.^{2} B26B *1/02*

U.S. Cl. 30—161 **13 Claims**



9. A knife adapted to be folded comprising the combination of a blade sandwiched between a pair of bolsters which are connected to a handle and a pivot pin extending between the bolsters and through an end of the blade, the improvement wherein the forward edge of each said bolster has a surface of an arcuate configuration and the confronting rearward end of the blade has a surface of an arcuate configuration substantially similar to that of the bolsters to permit the blade and bolsters to meet in sliding engagement when the blade is in an opened or closed position thereby transferring any lateral forces acting on the blade to the bolsters and putting a shear stress on the pivot pin instead of forcing the bolsters apart.

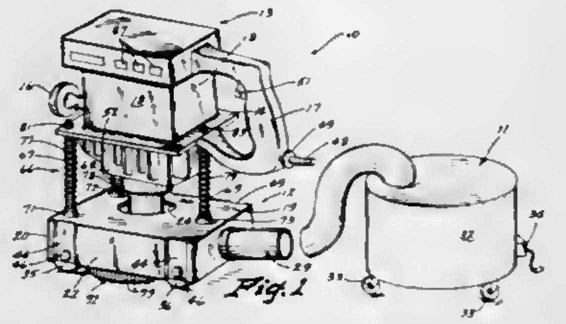
4,099,328
MACHINE FOR REMOVING FLOOR COVERING

John E. Schlemmer, 104 Southview Dr., Grundy Center, Iowa 50638

Filed Jul. 20, 1977, Ser. No. 817,208

Int. Cl.^{2} A47L *11/02;* B24B *55/06*

U.S. Cl. 30—172 **10 Claims**



1. A machine for shredding and removing covering material from a floor surface, comprising:

(a) a portable base structure including an open bottomed shredding chamber having a discharge opening,

(b) an upper frame structure,

(c) means for adjustably supporting the upper frame on the portable base structure, said support means being adjustable to vary both the height and inclination of the upper frame relative to the portable base structure,

(d) wire brush means, rotatable within the shredding chamber having a working surface adjacent the floor surface for engaging and shredding covering material on the floor surface,

(e) means for supporting said wire brush means on the upper frame for rotation about an upright axis inclined relative to the floor surface, and

(f) a motor supported on said upper frame and connected in a drive relation with said wire brush means, whereby material shredded by the rotating brush means is orbited within the shredding chamber toward the discharge opening.

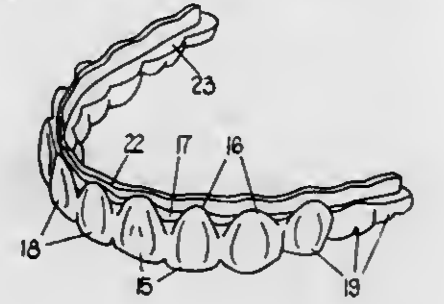
4,099,329
ARCH FORMS AND A METHOD OF MOULDING SAME

Horace Stanley Hawthorne, West Midlands, England, assignor to Lucas Electrical Limited, Birmingham, England

Filed Apr. 21, 1976, Ser. No. 679,071

Int. Cl.^{2} A61C *19/00*

U.S. Cl. 32—2 **9 Claims**



1. An arch form comprising a tooth portion including a plurality of integral teeth of a first plastics material, each tooth having a base portion, an integral fillet between said base portions at each pair of adjacent teeth, at least one integral projection provided on said tooth portion, and a gum portion of a second plastics material, said second plastics material being of a different color than said first plastics material, and said gum portion surrounding said at least one projection and meeting said tooth portion at least at said fillet.

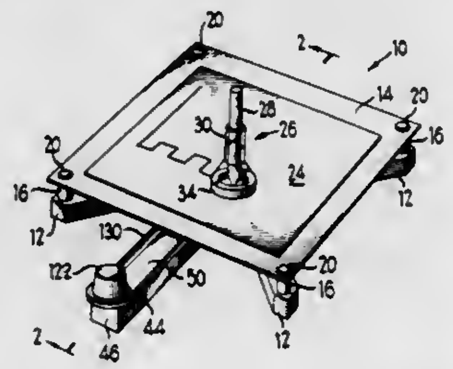
4,099,330
VIBRATORY DRAWING DEVICE

Alan A. Hicks, Chicago; Derek A. Brand, Naperville, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 767,398

Int. Cl.^{2} B43L *13/00*

U.S. Cl. 33—18 R **13 Claims**



1. An apparatus for creating designs on a substrate, comprising, in combination:

a frame structure;

a platen movably mounted on a frame for supporting a substrate;

means for moving said platen relative to the frame structure in a first direction at a predetermined rate and in an opposite direction in a substantially greater relative rate; and

a marking device of predetermined mass positionable on said platen and engageable with said substrate for movement therewith at said predetermined rate and for movement relative thereto in response to movement of the platen at said greater relative rate for creating designs on the substrate by movement of said marking device over the substrate.

4,099,331
PLUMB-RULE

Wallace W. Peterson, 8243 Highway B, Kewaskum, Wis. 53040, and Oscar L. Anderson, 2919 S. 71st St., Milwaukee, Wis. 53219

Filed May 17, 1976, Ser. No. 687,296

Int. Cl.^{2} G01C *9/00*

U.S. Cl. 33—88 **7 Claims**

1. A plumb-rule comprising a pair of inner and outer channel members telescopically related in face to face arrangement with the back of the inner channel member closing the open side of said outer channel member, said members having their adjacent sides interlocked to prevent lateral displacement of said inner member from said outer member, spirit level means within said outer member free of interference with the inner member, a bracket secured to said outer member and carrying said spirit level means, and window means in the face of said outer member registering with said spirit level means for ready observance thereof the outer end of the inner channel member having means aligned with a surface of said outer member for determining the position of the plumb rule in accordance with the indication of said spirit level means.

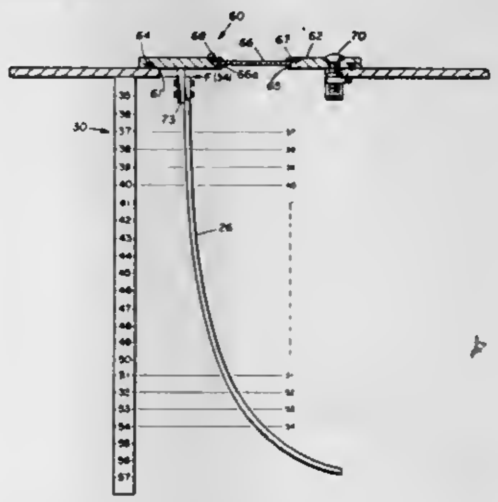
4,099,332
ULLAGE GAGE

John P. Jones, Jr., Greenwich, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,928

Int. Cl.^{2} G01F *23/00*

U.S. Cl. 33—126.7 R **12 Claims**



1. A gage for measuring the ullage of a cargo tank located below the deck of a vessel, said gage comprising:

a sword affixed to the underside of said deck and extending downward into said cargo tank, said sword having a plurality of spaced calibration marks thereon, each of said marks indicative of a discrete vertical distance below the underside of the deck; and

a viewport through said deck adjacent said sword for viewing said plurality of said spaced calibration marks on said sword from said deck, said sword being curved so that the lower portion of said sword will underlie said viewport.

4,099,333

WHEEL ALIGNMENT TESTING APPARATUS

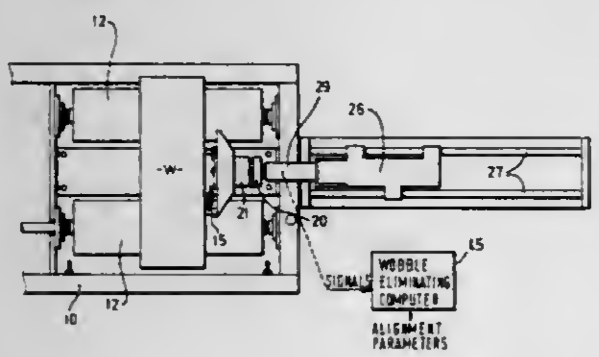
Brian Michael Forster, Harthill, England, assignor to GKN Transmissions Limited, Erdington, England

Filed Jan. 6, 1976, Ser. No. 646,754

Claims priority, application United Kingdom, Jan. 7, 1975, 537/75; Sep. 20, 1975, 38698/75

Int. Cl.² G01B ***5/24***

U.S. Cl. 33—203.12 **7 Claims**



1. Apparatus for testing the alignment of road wheels of a vehicle comprising:

(a) a frame;

(b) two pairs of spaced parallel rollers mounted on said frame for supporting two wheels of a vehicle to be tested;

(c) motor means for rotating said rollers for effecting rotation of said wheels;

(d) reference surface means for securement to each wheel to be tested;

(e) first sensing means for sensing the attitude of said reference means, said first sensing means including a first pair of vertically spaced transducers in operative contact with said reference surface and actuated thereby, each of said transducers continuously producing an electrical signal including a first, DC component representative of at least one wheel alignment parameter and a second, AC component representative of the instantaneous wobble of the reference surface means during rotation of said wheel, and

(f) electric circuit means connected to and receiving the signals from said pair of transducers, said electric circuit means acting on said signals to separate said second components therefrom and to produce an output signal representing the difference between said first components in the signals from said transducers, said output signal being representative of a wheel alignment parameter.

4,099,334

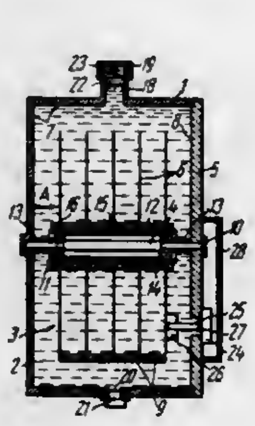
DIP ANGLE DATA TRANSMITTER

Eduard Nikolaevich Kuzin, ulitsa 3 Internatsionala, 74, kv. 199; Mikhail Leibovich Fainzilber, Budapeshtskaya ulitsa, 17, korpus 5, kv. 62; Nadezhda Borisovna Ivanova, ulitsa Dimitrova, 10, korpus 1, kv. 220; Jury Stepanovich Kozlov, ulitsa Dimitrova, 10, korpus 1, kv. 160; Vladimir Fedorovich Korelin, ulitsa Belgradskaya, 20, kv. 123; Nikolai Vasilievich Dmitrievsky, Piskarevsky prospekt, 10, kv. 289, all of Leningrad; Savaty Solomonovich Schedrovitsky, 13 Parkovaya ulitsa, 25, korpus 1, kv. 12, Moscow; Vitaly Iosifovich Berkman, ulitsa Shvernika, 12/2, korpus 2, kv. 57, Moscow, and Anatoly Borisovich Syrkov, Pogonny proezd, 25, kv. 62, Moscow, all of U.S.S.R.

Filed Feb. 17, 1976, Ser. No. 658,715

Int. Cl.² G01C ***9/08, 9/06, 9/12***

U.S. Cl. 33—346 **4 Claims**



3. A dip angle measuring device, comprising:

a casing having an inner surface;

viscous fluid completely filling said casing and serving as a first body of inertia of the device;

a laminated pendulum provided in the form of separate substantially parallel, spaced part sector-shaped plates rotatably mounted on a shaft for rotation about a common axis, said pendulum being arranged in said viscous fluid, and said shaft of said pendulum being disposed in said casing; said pendulum being damped primarily by forces of viscous friction acting on said plates, the spacing of said plates and the viscosity of said fluid being such that said forces are proportional to the speed of the pendulum rotation relative to said first body of inertia;

a converter of the angle of rotation of said pendulum relative to said casing into a physical value useful for providing an indication of the dip angle, said converter being carried by said pendulum and said casing; and

means arranged in said casing for making up for thermal expansion of said viscous fluid within an anticipated working range of temperatures for said transmitter; and

a second body of inertia in the form of discs carred by said shaft of said pendulum between the plates thereof and arranged parallel to said plates.

4,099,335

DRYING AND FINISHING OPERATIONS IN SLURRY OR BULK PHASE POLYMERIZATION PROCESSES

James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1976, Ser. No. 743,095

Int. Cl.² F26B ***3/00***

U.S. Cl. 34—9 **17 Claims**

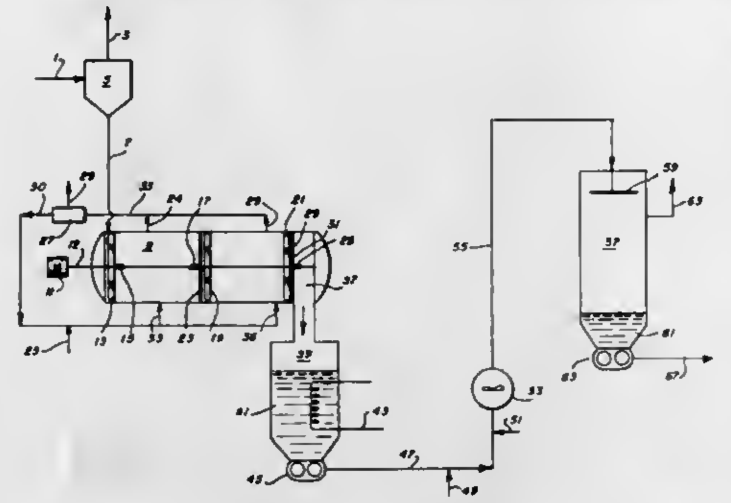
1. A process for drying polymer slurry containing active polymerization catalyst and produced by polymerization in a slurry or bulk phase polymerization which comprises

(a) adding said slurry to a stirred drying zone containing solid particulate polymer, wherein the amount of slurry added is small in comparison with the amount of said solid particulate polymer;

(b) passing a gas stream containing polymerizable monomer into said drying zone;

(c) carrying out a fraction of the overall amount of polymerization in said drying zone, thereby vaporizing easily vaporizable components in the polymer slurry, in essential part, by polymerization heat; and

(d) removing said vaporized components from said drying zone in said gas stream.



4,099,336

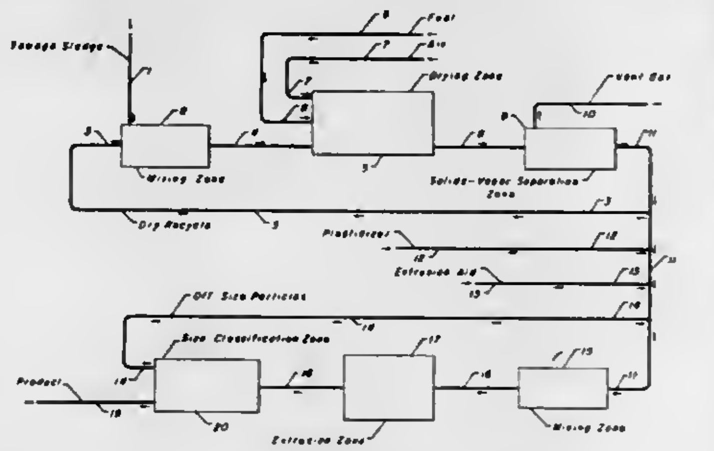
ORGANIC WASTE DRYING PROCESS

Vere Maffet, West Chester, Pa., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 775,673, Mar. 8, 1977. This application Jul. 7, 1977, Ser. No. 813,578

Int. Cl.² F26B ***7/00***

U.S. Cl. 34—12 **11 Claims**



1. A process for drying organic waste which comprises the steps of :

(a) passing a feed stream comprising water and organic waste into a drying zone operated at drying conditions and effecting the evaporation of water contained in the feed stream, and the production of a drying zone effluent stream comprising particulate organic waste and water vapor;

(b) separating the drying zone effluent stream in a solids-vapor separating zone and producing a vapor stream comprising water vapor and a dry solids stream comprising particulate organic waste and containing less than about 15 wt.% water;

(c) admixing a plasticizer into at least a first portion of the dry solids stream, with the amount of plasticizer which is added being less than 5 wt.% of the first portion of the dry solids stream; and,

(d) extruding the first portion of the dry solids stream in an extrusion zone under conditions sufficient to cause at least partial plasticization of the dry solids and the formation of a product stream having a bulk density within the range of about 30–65 lb/ft³.

4,099,337

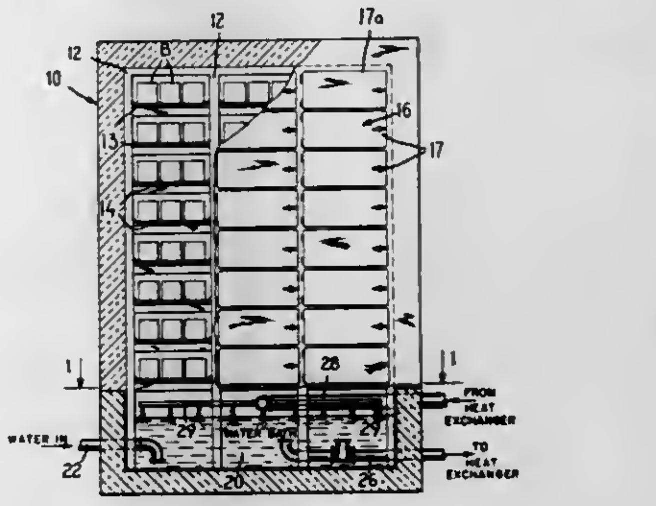
METHOD OF CURING CONCRETE ARTICLES BY WATER VAPORIZATION

Billy Joe Wauhop, Jr., 717 Forth St., Belvidere, N.J. 07823

Filed Dec. 13, 1976, Ser. No. 749,754

Int. Cl.² F26B ***3/00***

U.S. Cl. 34—26 **9 Claims**



1. A method of curing concrete articles in a kiln, comprising the steps of: forming a water bath at the base of the kiln beneath the lowermost level of the concrete articles to be cured; heating and maintaining the water bath at a sufficient temperature, below its boiling point, and spraying the heated water into the water bath at a level beneath the lowermost level of the concrete articles so as to promote and effect vaporization of the water to obtain throughout the kiln a substantially uniform curing atmosphere having sufficient heat and moisture to hydrate and harden the cement to thereby cure the concrete articles; and replenishing the water, as needed, to maintain the water bath throughout the curing.

4,099,338

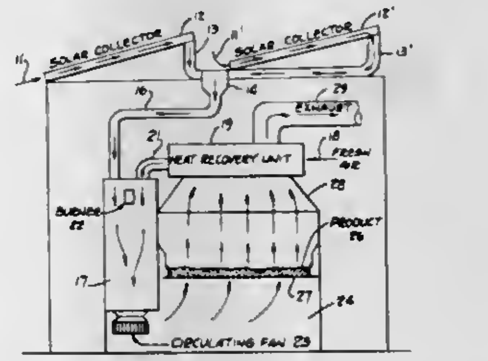
SOLAR ASSISTED DRYER APPARATUS AND METHOD

Joseph V. Mullin, Cherry Hill, N.J., and W. Edwin Saeer, Douglasville, Pa., assignors to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Nov. 10, 1976, Ser. No. 740,619

Int. Cl.² F26B ***3/04***

U.S. Cl. 34—35 **7 Claims**



1. A dryer apparatus unit comprising:

a primary heater for heating gases;

a drying chamber comprising an inlet for a flow of drying gas, and inlet and outlet means for material to be dried;

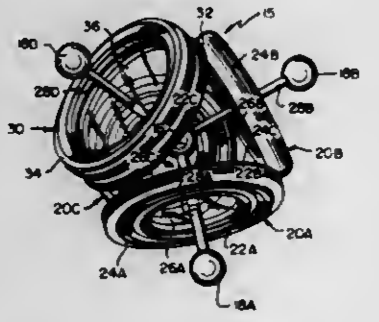
means communicating the primary heater with the drying chamber inlet;

an exhaust line for withdrawing spent gas from said drying chamber;

- solar warming means for a fresh flow of diluent gas, said solar warming means being adapted for large, low velocity gas flow and imparting small temperature rise of the gas flow therethrough;
- a heat exchanger disposed in said exhaust line for warming diluent gas from another source other than the solar warming means by heat exchange with said spent gas;
- ducting means directing said fresh flow of diluent gas and the diluent gas from another source into further heating relationship which said primary heater for forming said flow of drying gas; and
- driving means for passing said flow of drying gas through said drying chamber.

4,099,339
MODEL FOR ATOMIC FORMS

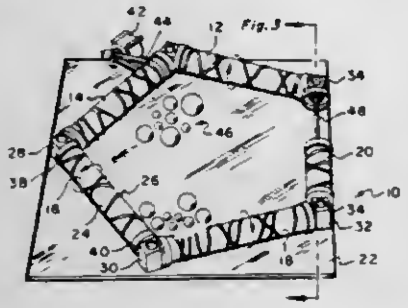
Kenneth Snelson, 140 Sullivan St., New York, N.Y. 10012
Filed Mar. 2, 1977, Ser. No. 773,552
Int. Cl.² G09B *23/26*
U.S. Cl. 35—18 A **8 Claims**



1. A model for atomic comprising:
- (a) a plurality of pairs of ring magnets, each of the ring magnets defining an axis perpendicular to the plane of the ring and passing through its center and having a magnetic field approximately axially symmetric about said axis, each pair of magnets having a first ring magnet and a second ring magnet for representing a pair of electrons, the second ring magnet of each pair being detachably magnetically supportable by the first ring magnet with the axes of said first and second ring magnets in substantial coaxial alignment; and
- (b) means for supporting the first ring magnets at predetermined positions and orientations with their axes passing through a spherical volume having a diameter substantially smaller than the diameters of the first ring magnets.

4,099,340
CHAOTIC MOTION GENERATOR

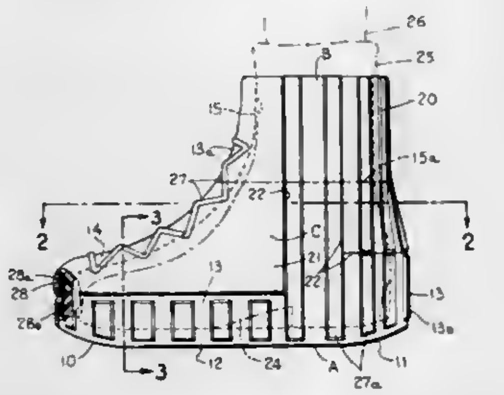
Crispin O. Butler, 106 Kendall Blvd., Oaklyn, N.J. 08107
Filed Jun. 8, 1977, Ser. No. 804,585
Int. Cl.² G09B *23/06*
U.S. Cl. 35—19 R **10 Claims**



1. A chaotic motion generator comprising a substantially horizontal surface, elongated roller means mounted on said surface so as to be spaced therefrom, said roller means lying in a substantially horizontal plane substantially parallel to said surface and defining a substantially closed loop, and means for rotating said roller means.

4,099,341
FOOT WARMER

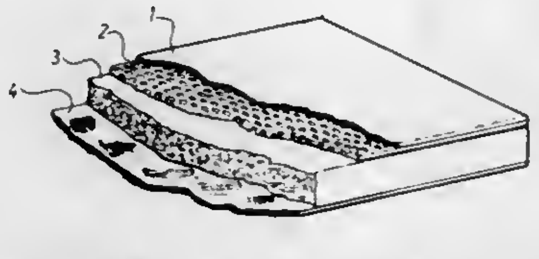
Larry R. Gibson, Rte. 6, Box 652, Easley, S.C. 29640
Continuation-in-part of Ser. No. 648,115, Jan. 12, 1976, abandoned. This application Sep. 23, 1976, Ser. No. 725,691
Int. Cl.² A43B *1/10, 5/04*
U.S. Cl. 36—7.3 **7 Claims**



1. A foot warmer constructed essentially of a stiff waterproof insulating synthetic foam material for receiving a wearer's shoe, boot and the like, comprising:
- a unitary sole having a toe portion tapering inwardly toward the front and a heel portion tapering inwardly toward the rear;
- vertically extending marginal sides integral with said sole;
- an instep and toe cover bridging said sides adjacent a front portion thereof extending across said toe portion;
- said sides and cover defining an opening at a top portion snugly receiving a leg of the wearer therein;
- said sides including longitudinal intermediate members tapering inwardly toward the rear;
- a removable front panel including said instep and toe cover extending transversely of said sole bridging said intermediate members extending entirely thereacross providing an open end tapering inwardly toward the rear, when said panel is removed for admitting said foot by movement thereof between said sides longitudinally of said sole;
- a rear panel bridging said intermediate members and extending upwardly from said heel portion;
- means fastening said removable front panel in position bridging said intermediate members; and
- said fastening means including complimentary end portions on said removable front panel and said intermediate members for engagement is opposed relation.

4,099,342
FOOTWEAR

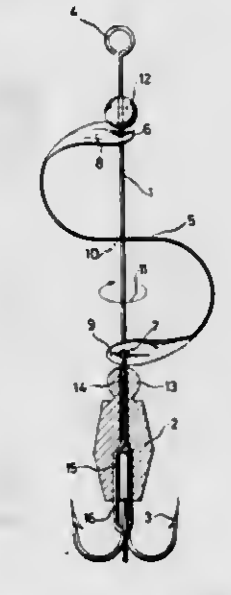
Tej Kuldip Singh, Baildon, England, assignor to Associated Paper Industries Limited, London, England
Filed Jul. 19, 1977, Ser. No. 817,072
Claims priority, application United Kingdom, Jul. 31, 1976, 32010/76
Int. Cl.² A43B *13/38, 23/00;* B32B *5/16*
U.S. Cl. 36—44 **5 Claims**



1. An air-permeable insole comprising a web or matt of fibres loaded with active carbon and held together by a binder disposed predominently at or near the surfaces of the web or matt, and at least one surface of said web or matt having a wear-resistant fabric bonded thereto by means of a discontinuous layer of binder extending from the surface of each of the wear-resistant fabrics into the surface of the web or matt.

4,099,343
SPINNER

Ludwig A. Enz, Kreuzstrasse 17, D-6983 Kreuzwertheim, Fed. Rep. of Germany
Filed Dec. 20, 1976, Ser. No. 751,982
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558439
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.19 **2 Claims**

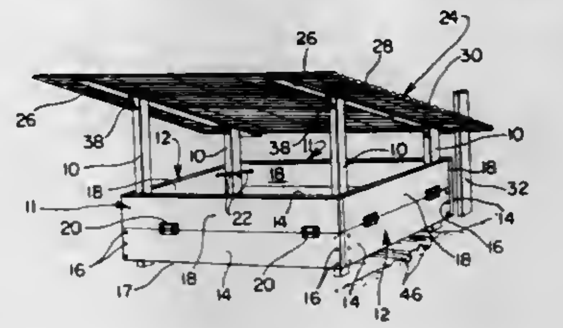


1. A fishing spinner comprising a centrally disposed wire axis including a loop at its upper end, and S-shaped narrow strip curved about its broad side and having boresthrough the middle and opposite end portions thereof, said wire axis passing freely through the bores in said middle and opposite end portions, a bead element between said loop and the S-shaped strip and including a center bore through which said wire axis passes and a curved bearing surface thereon adapted to engage the top end portion of the S-shaped strip, the opposite end portions of said strip terminating immediately adjacent said wire, the opposite end portions for a substantial length of the S-shape inwardly from their intersection with said wire axis being twisted about the longitudinal axis of said strip in the same direction of rotation and at an acute angle with respect of the plane of said strip, said wire axis including a lower end bent back in a U-shaped portion, a weight having a central bore through which said wire axis passes, said weight having a curved bearing contact surface on the top thereof positioned immediately below said S-shaped strip, a fish hook secured on said U-shaped portion, and the central bore at its lower end being enlarged and receiving said U-shaped portion to retain said fish hook thereon.

4,099,344
SHADING UNIT FOR PLANT PROPAGATION

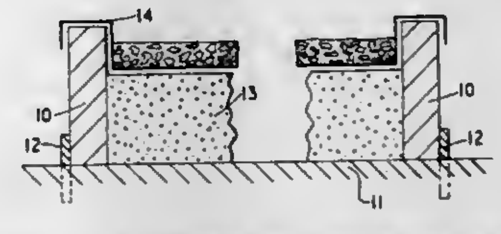
Robert F. Ruemeli, 1411 N. Westshore Blvd. (114), Tampa, Fla. 33607
Filed Oct. 9, 1975, Ser. No. 621,138
Int. Cl.² A01G *13/00*
U.S. Cl. 47—26 **8 Claims**

1. A non-greenhouse type plant propagation unit for shading a garden bed, said unit including means for providing an environment generally cooler than the surrounding ambient conditions to facilitate the growth of plants during hot weather which plants such as lettuce for example, generally require a cooler environment; said means comprising a continuous substantially solid side wall means extending entirely around said bed and substantially to the tops of mature plants growing therein and a perforate, removably mounted top means formed on non-transparent materail extending across and vertically spaced above said side wall means for protecting the plants therein from intense sunlight and beating rain, said unit retaining a body of relatively cool air, with respect to the ambient atmospheric conditions, around the enclosed plants; support means extending below and supporting said side wall means and defining a gap beneath the bottom of said side wall means and the bottom of said support means to permit passage of air therethrough and drainage of water; post means spacing said top means above said side wall means and thereby defining a passage for air between the top of said side wall means and said top means; and securing means releaseably retaining said top means in normal operative position extending across said side wall means for covering the bed, whereby air may circulate freely about plants due to said gap and said passage.



4,099,345
PRODUCTION OF TURF

Frederic Walter Loads, Brookhouse, Near Lancaster, England, assignor to Kapag Manufacturing Co. Limited, Devon, England
Filed Nov. 8, 1976, Ser. No. 739,995
Claims priority, application United Kingdom, Nov. 11, 1975, 46475/75; May 15, 1976, 20175/76
Int. Cl.² A01G *1/00*
U.S. Cl. 47—56 **8 Claims**



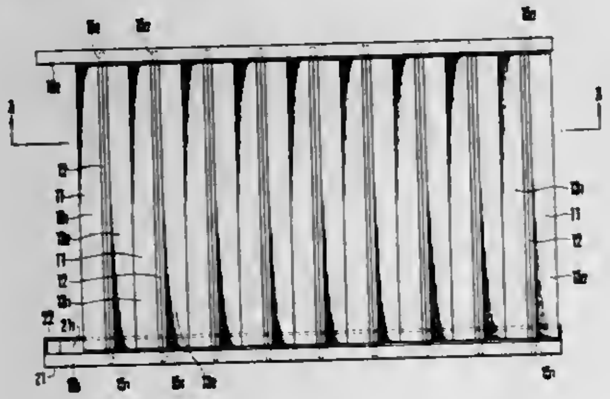
1. A method of producing turf comprising establishing a layer of growing medium including grass seed on a water-impervious bed between parallel kerbs and, when predetermined growth has taken place, removing the layer from between the kerbs, said growing medium comprising lignite together with a particulate filler and a binding agent comprising pulverised paper pulp.

4,099,346
ADJUSTABLY LOUVERED ROOF PLATE ASSEMBLY

Nobujiro Isono, Sando, Japan, assignor to Shin Nippon Kinzoku Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1976, Ser. No. 748,042
Claims priority, application Japan, Jul. 27, 1976, 51-99947[U]
Int. Cl.² E05F *17/00;* E06B *7/096*
U.S. Cl. 49—82 **6 Claims**

1. A louver-type roof assembly, comprising:
- a plurality of elongated roof plates arranged side-by-side and each having shaft means extending from each end thereof;
- a pair of frames, each with a series of openings for receiving the respective shaft means of said roof plates,
- means retaining the shafts in the respective openings for rotation in a sense to open and close the roof;
- a crank secured on each said shaft at a respective one end of each roof plate;

connecting rod means extending along one of said frames;
each crank being pivotally connected to the connecting rod means;
a ratchet gear;
means journalling the ratchet gear for rotation on said one frame;
a drive pawl;
means mounting the drive pawl adjacent the ratchet gear for engagement therewith for actuation to rotate the ratchet gear in a stepwise fashion;
a check pawl;
means mounting the check pawl adjacent the ratchet gear for engagement therewith to prevent undesired counter rotation of the ratchet gear;

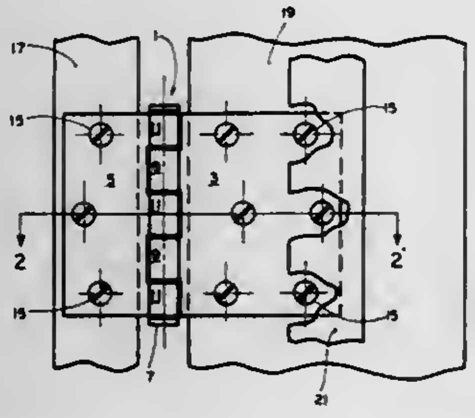


a crank shaft pivotally interconnecting the ratchet gear and the connecting rod means so that each time the drive pawl is actuated to rotate the ratchet gear one step further, the crank shaft moves the connecting rod means a corresponding step longitudinally, thus turning said cranks one step further and correspondingly rotating the roof plates one step further;
one of said frames including upwardly open channel means arranged to catch rainwater draining along the roof plates, as a gutter, and opening means therein to provide a downspout therefor;
said one frame including a C-shaped sub-frame having an open side, an L-shaped sub-frame with a vertical flange and a horizontal flange; the vertical flange closing the open side of the C-shaped sub-frame and extending thereunder and the horizontal flange forming said gutter.

4,099,347

DOOR HINGES

Dennis J. Sharp, 1254 Church St., Reading, Pa. 19601
Filed Dec. 9, 1975, Ser. No. 639,129
Int. Cl.² E05D *3/02*
U.S. Cl. 49—399 **3 Claims**

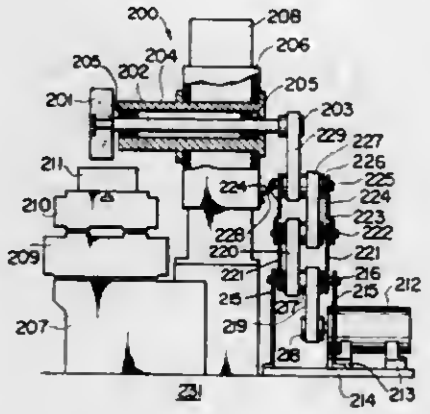


1. A door, including a door frame, a door, a jamb, and a pair of cooperative hinge plates held together for rotation with respect to each other around a central hinge pin with one of the cooperative hinge plates mounted on the door frame and the other of the pair of hinge plates mounted on the door, characterized in that the hinge plate adapted to be mounted on the door frame extends radially a greater distance from the axis of rotation of the hinge pin than does the hinge plate adapted to be mounted on the door, and in that the doorjamb is mounted over at least a portion of the greater distance of the hinge plate mounted on the door frame.

4,099,348

MACHINING ARRANGEMENT WITH MEANS TO ISOLATE VIBRATIONS FROM THE WORKING SPINDLE

Shigeo Kato, Mitaka; Sakae Saito, and Osamu Morita, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan
Filed May 27, 1977, Ser. No. 801,373
Claims priority, application Japan, May 28, 1976, 51-61164
Int. Cl.² B24B *41/02*
U.S. Cl. 51—92 R **32 Claims**

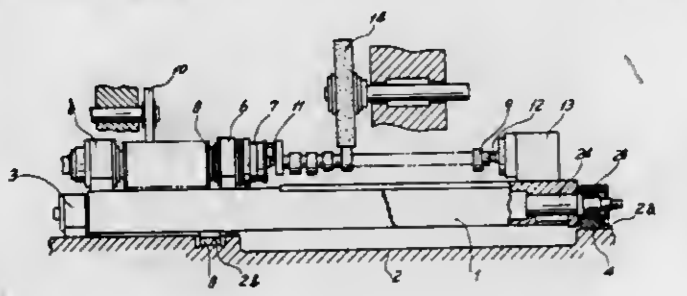


1. A workpiece machining arrangement comprising:
means for machining a workpiece,
a rotatable spindle means mounted at said machining means,
a tool mounted on said rotatable spindle means,
driving means for rotating said rotatable spindle means,
means for transmitting a driving power from said driving means to said rotatable spindle means including a flexible linkage comprising a plurality of interconnected link members, said link members including at least two laterally spaced arms with pulley means arranged at respective end portions of said arms, at least three belt means arranged in series between the pulley means, the driving means and the rotatable spindle means, said belt means being rotatably supported by said pulley means, a first of said at least three belt means being arranged between said driving means and a first of said pulley means, and only a last of said at least three belt means being arranged between one of said pulley means and said rotatable spindle means,
a base plate means for mounting said driving means, said base plate means being independent of and unattached to said machining means,
a fixed frame mounted on said base plate means,
a shaft mounted in said fixed frame,
wherein one end portion of said two arms is rotatably mounted at said shaft, and
wherein said driving means, said transmitting means and said machining means are arranged with respect to each other such that the rotatable spindle means is completely isolated from any vibrations generated by said driving means and said transmitting means.

4,099,349

CAM GRINDING MACHINE WITH SWING TABLE SUPPORT DEVICE

Hiroaki Asano, Chiryu, Japan, assignor to Toyoda Koki Kabushiki-Kaisha, Japan
Filed Oct. 21, 1977, Ser. No. 844,199
Claims priority, application Japan, Nov. 4, 1976, 51-147232[U]
Int. Cl.² B24B *5/42*
U.S. Cl. 51—101 R **4 Claims**

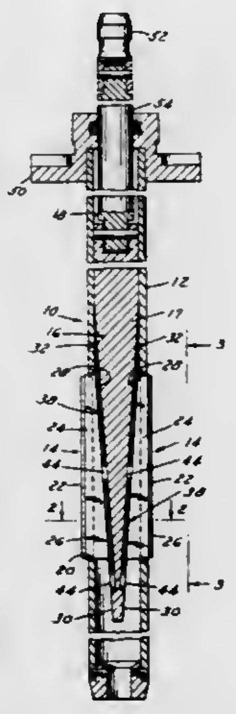


1. A cam grinding machine for grinding a cam shaft comprising:
a traverse table;
a swing table;
first and second end support means mounted on a first surface of said traverse table for swingably supporting said swing table at opposite ends thereof;
third intermediate support means arranged between said first and second end support means and mounted on a second surface of said traverse table, said second surface being lower than said first surface;
a shaft rotatably supported by said third intermediate support means; and
tightening means for fixing the opposite ends of said shaft into bores formed on inside walls of said swing table.

4,099,350

HONING ASSEMBLY

Jerry N. Hasty, Plymouth, Mich., assignor to MWA Company, Owosso, Mich.
Filed May 31, 1977, Ser. No. 802,266
Int. Cl.² B24B *33/08*
U.S. Cl. 51—338 **2 Claims**

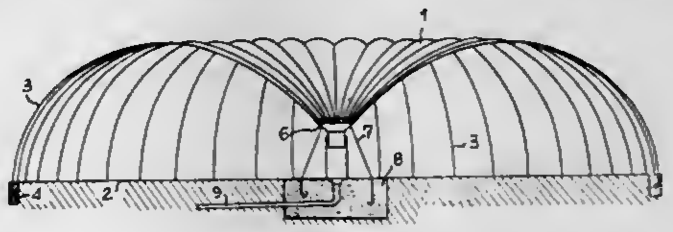


1. A honing assembly comprising an elongated hollow head provided with a plurality of circumferentially spaced slots, honing elements projecting from said slots, an elongated adjusting member for said honing elements longitudinally adjustably supported within said head, said adjusting member having elongated longitudinally tapered surface portions registering with said respective slots, longitudinally extending, continuous undercut grooves in said tapered surface portions of said adjusting member, and a pair of longitudinally spaced studs on each honing element, said studs being shaped to fit slidably in said undercut grooves so that longitudinal movement of said adjusting member relative to said head in one direction will cause radially inward movement of said honing elements, the radially inner surfaces of said honing elements engaging said tapered surface portions of said adjusting member to cause said honing elements to be cammed radially outwardly when said adjusting member is moved longitudinally in the opposite direction, each groove having a pair of openings spaced apart longitudinally the same distance as each pair of studs to permit said studs to enter said grooves and to be withdrawn therefrom, whereby said honing elements can be assembled and disassembled with respect to said adjusting member, said groove openings being located longitudinally in positions such that they will register with said studs only when the honing elements are retracted inwardly beyond a point where honing would normally be carried out.

4,099,351

INFLATABLE STRUCTURES

Pierre Dalo, 12 rue du Dr Kurzeane, Jouy-en-Josas, France (78350), and Jean Dalo, Rue Beaurepaire, Roinville sur Dourdan, France (91410)
Filed Dec. 6, 1976, Ser. No. 747,487
Claims priority, application France, Jan. 19, 1976, 76 01208; Jun. 9, 1976, 76 17322
Int. Cl.² E04B *1/34*
U.S. Cl. 52—2 **8 Claims**

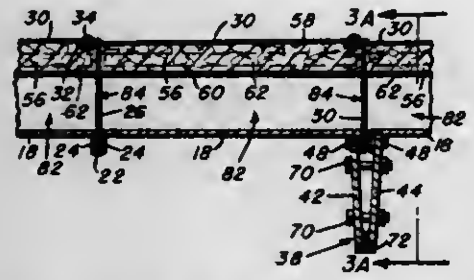


1. An inflatable and deflatable air supported structure which lies in a flat plane and has a rounded geometrical shape in its uninflated condition and which has a substantially spherical shape in its inflated condition, comprising:
a wall including a sheet of rounded geometrical flexible material having an outer peripheral edge with a first perimeter which is greatest in its flat two-dimensional uninflated condition and having an inner central portion, said peripheral edge of the perimeter in the inflated three-dimensional condition of said sheet being substantially geometrically rounded in shape and forming a second outer perimeter which is less than the first perimeter of said sheet in its uninflated condition;
a plurality of cables extending radially from said outer peripheral edge to said inner central portion and connected with said sheet, said cables dividing said sheet into gores which are formed between each pair of adjacent cables, said cables having outer ends extending beyond said outer peripheral edge and inner ends extending to said inner central portion;
first anchoring means connecting said outer ends of said cables to the ground to anchor said sheet and the outer peripheral edge of said sheet to the ground; and,
second anchoring means connected with said inner ends of said cables and said inner central portion to form an inner air-tight chamber with said flexible material in its inflated condition, said second anchoring means anchoring said inner central portion to the ground, and including
a conical connecting element having one end connected with said inner ends of said cables, and tension members connected with the other end of said conical connecting element for connection thereof to the ground.

4,099,352

VAULTED STRUCTURE

William T. Clark, P.O. Box 885, Jackson, Miss. 39205
Filed Sep. 23, 1976, Ser. No. 725,934
Int. Cl.² E04B *1/32*
U.S. Cl. 52—80 **13 Claims**

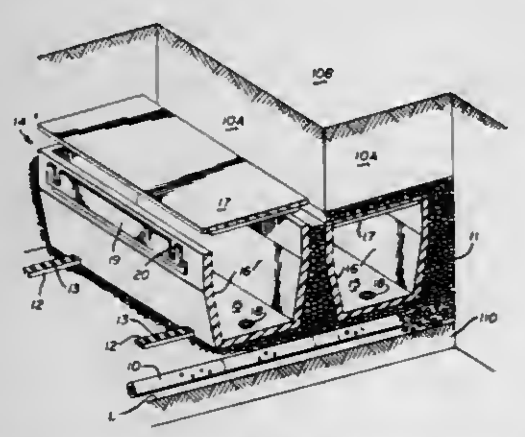


1. A vaulted structure having a base portion and an apex portion comprising a plurality of box-section modules means secured to form the structure, said box-section modules comprising adjacent spaced-apart exterior and interior skin gore members and at least a pair of spaced-apart generally radially extending flange members securing said gore members in spaced-apart relation and defining a ventilation void therebetween, at least some of said exterior gore members having outwardly turned edge portions, joint means for providing for expansion-contraction between at least some of said plurality of box-section modules, said joint means comprising at least a portion of one of said pair of spaced-apart radially extending flange members being interposed between and secured to said outwardly turned portions of two adjacent exterior gore members, and ventilation means for providing at least gravity flow of air through said ventilation void of at least some of said plurality of box-section modules for coaction with said joint means for minimizing thermal distortion of the vaulted structure.

4,099,353

BURIAL CRYPT AND METHOD OF INSTALLATION

Dan R. Blunt, 360 Glenview, Canfield, Ohio 44406
Filed Dec. 23, 1976, Ser. No. 754,018
Int. Cl.² E04H *13/00*
U.S. Cl. 52—139 **6 Claims**

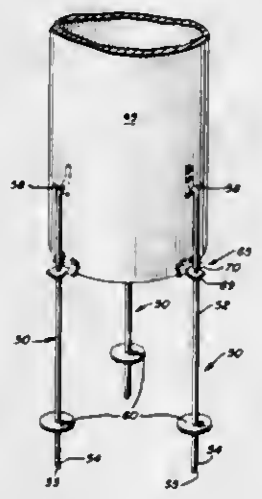


1. A burial crypt and means for positioning a plurality of the same in an excavation in inter-dependent relation to one another, said burial crypt being unitary and comprising a thin walled, lightweight, rectangular box having an open top and integral side, bottom and end walls and a cover registering with said open top, brackets on the upper sides of said burial crypt said brackets each including an elongate member attached to a corresponding side wall for a substantial length of that corresponding side wall at a location spaced from the top of that side wall, said elongate members each having a top edge spaced apart from the corresponding wall top edge, said elongate member having openings defined therein adjacent the top edge thereof, connecting members for engaging said bracket elongate members on adjacent burial crypts and joining the same to one another, said connecting members each including a bar member and an end member attached to each end of said bar, said bar members being received in bracket openings of said adjacent crypts with said end members each abutting a side wall of one of said adjacent crypts so that said side walls are connected by said connecting members in a manner which forms mutual reinforcing support of said joined side walls so as to enable said burial crypts to retain their desired position during a subsequent back-filling operation and support said back fill.

4,099,354

POST FOOTING FORM HOLDER AND STABILIZER SYSTEM

Mario Louis DePirro, 511 S. Highland Ave., Lombard, Ill. 60148
Continuation-in-part of Ser. No. 642,724, Dec. 22, 1975, Pat. No. 4,047,356. This application Oct. 6, 1976, Ser. No. 730,271
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.² E04G *17/14*
U.S. Cl. 52—146 **22 Claims**



1. A post footing form holder and stabilizer system for use in conjunction with a post form of the type having a lower open end, and stabilizer means for positioning and retaining the post form in its use position comprising in combination,

a plurality of legs having upper and lower ends, each of said legs provided with means for mounting said legs to the post form along the lower end thereof,

said means for mounting said legs to said post form comprising an offset portion formed in each of said legs adjacent the upper end thereof and adapted for penetrating said post form and a cross brace mounted on each of said legs in normal relation to said leg and positioned immediately below said offset portion thereby to prevent said offset portion from further penetrating into said post form,

post form carrying means associated with said legs for accommodating and carrying the post form along the lower end thereof,

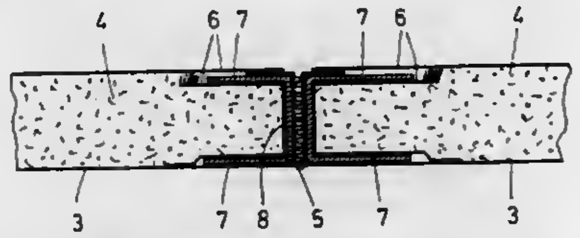
said legs being further provided with stop means mounted thereon and spaced a distance upwardly from said lower end of said legs,

whereby a post form of the type terminating in a lower end which, in use, is positioned within an appropriate post hole to serve as a form for post footing material to be poured therein, may be provided with legs being mountable on the post form and the post form being carried by said post form carrying means such that said post footing form holder system may be positioned within a post hold to accommodate and permit the post footing material to be poured into the post form and exit below said lower end thereof to flow freely about said legs and form a lower post footing having a larger cross section than the cross section of the post form.

4,099,355

PANELING OF FIREPROOF INSULATING ELEMENTS FOR WALLS, FLOORS AND CEILINGS

Ernst-Joachim Strunk, Weitefeld, Fed. Rep. of Germany, assignor to Horst Lampertz, Wallmenroth, Sieg, Fed. Rep. of Germany
Filed Jul. 1, 1977, Ser. No. 812,389
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630479
Int. Cl.² E04B *1/74*
U.S. Cl. 52—404 **3 Claims**

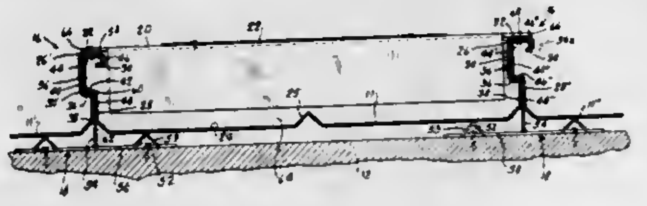


1. Paneling for walls, floors, and ceilings, comprising a plurality of panels in edgewise abutting relation, each panel comprising a metal casing with a filling of endothermally variable insulating material, the panels having, in the zone of their abutting edges, a double metal wall, insulating material within the double metal wall, and external insulating panels in edgewise abutting relationship with each other and overlying the first-mentioned panels, the butt joints between the external panels being offset with respect to the butt joints between the first-mentioned panels.

4,099,356

SEAMED RIB PANEL ASSEMBLY

Hubert P. Graham, Fort Mill, S.C., assignor to Alcan Aluminum Corporation, Cleveland, Ohio
Filed Oct. 7, 1976, Ser. No. 730,158
Int. Cl.² E04D *1/30, 3/362*
U.S. Cl. 52—520 **3 Claims**



1. A panel assembly for buildings and the like comprising, in combination with structure for supporting the assembly,

(a) an array of elongated metal panels disposed in parallel side-by-side relation outwardly of said structure, each of said panels having first and second longitudinal flanges respectively projecting outwardly along opposite sides thereof, the first flange of each panel having an outer portion formed as a longitudinal box channel opening laterally away from the panel, the second flange of each panel having an outer portion formed as a longitudinal box channel fitted within and opening in the same direction as the channel of the first flange of the next adjacent panel in the array, the channel-formed portion of each flange having a flat outer leg with a free longitudinal margin formed with a return curve, and the return curve of the outer leg on each said first flange closely and conformably overlying the return curve of the outer leg of the adjacent-panel second flange fitted therein, the interfitted channel-formed portions of the first and second flanges of adjacent panels comprising a seamed rib for interlocking the panels, such that there is a seamed rib between each pair of adjacent panels in the array; and

(b) a plurality of metal anchor clips spaced along each said seamed rib for securing the array to said structure, each of said clips comprising a base mounted on the structure and an outward projection having an outer portion formed as a box channel conforming to, and interfitted nestingly between, the channel-formed portions of the interfitted first and second flanges constituting the seamed rib along which the clip is disposed;

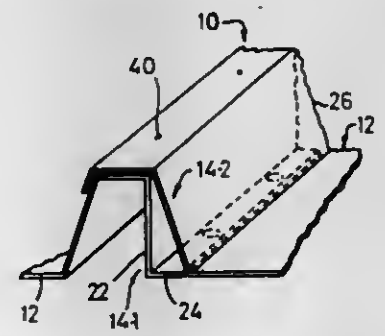
(c) the channel-formed portion of the clip projection having a planar outer leg disposed between, but terminating short of the return curves of, the outer legs of the last-mentioned first and second flanges;

(d) the channel-formed portion of each flange having an inner leg parallel to the outer leg thereof, the channel-formed portion of each clip outward projection having an inner leg parallel to the outer leg thereof, and the channel-formed portions of the flanges and of the clip projection being mutually so dimensioned that the channel-formed portion of the second flange is snugly gripped between the legs of the clip projection and the channel-formed portion of the clip projection is snugly gripped between the legs of the first flange.

4,099,357

BUILDING PANELS, AND A BUILDING AND METHOD UTILIZING BUILDING PANELS

Allan Gerald Lester, 32 Curzon Ct., Klein St., Hillbrow, Johannesburg, Transvaal Province, South Africa
Filed Apr. 19, 1976, Ser. No. 677,984
Claims priority, application South Africa, May 1, 1975, 75/2818
Int. Cl.² E04D *1/00*
U.S. Cl. 52—533 **9 Claims**



1. A panel assembly comprising at least two panels arranged in contiguous relationship, each of said panels having first and second opposed marginal ridges, the first marginal ridge being provided with an attachment zone whereby the panel is attached to a structure by at least one fastening means, and the second marginal ridge being of different cross-section but partly complementary to the first marginal ridge thereof and being adapted to be placed in overlapping relationship over the first marginal ridge of a contiguous panel to cover the attachment zone thereof, said contiguous panels forming a cavity between the respective second marginal ridges and the attachment zones and covering said fastening means, each of said overlapping first and second opposed marginal ridges having a pair of spaced flanks connected together by a substantially planar central strip, the first marginal ridge having innermost and outermost flanks diverging away from one another as they extend from the central strip, the central strips of contiguous panels overlapping each other adjacent one another and are fixed together by fastening means spaced from said structure, said fastening fixedly clamping said central strips together to secure said panels against relative movement.

4,099,358

INTERLOCKING PANEL SECTIONS

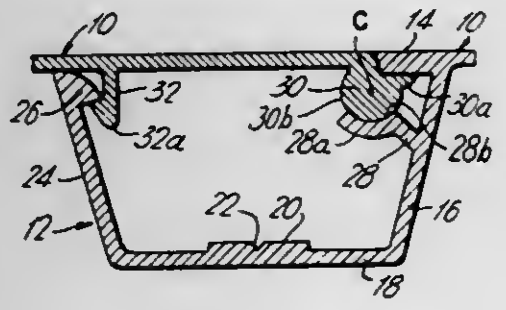
Pieter Compaan, Coaldale, Canada, assignor to Intercontinental Truck Body - Montana, Inc., Conrad, Mont.

Continuation-in-part of Ser. No. 640,096, Dec. 12, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,067

Claims priority, application Canada, Aug. 18, 1975, 233624

Int. Cl.^{2} E04C *1/30, 2/40*

U.S. Cl. 52—588 **4 Claims**



1. An interlocking construction panel adapted for interlocked engagement with other identical panels, said panel comprising:

a planar wall of elongate rectangular configuration,

one longitudinal edge of said wall having an integral open channel projecting downwardly therefrom with a bottom in parallel alignment therewith,

said open channel having an inwardly projecting longitudinal latch member adjacent the open top thereof on one side thereof,

the other side of said channel having first and second inwardly projecting members, said first inwardly projecting member being an extension of said planar wall and having upper and lower planar surfaces joined by a beveled edge at a fulcrum,

said second inwardly projecting member having a resilient inwardly and upwardly projecting finger-like configuration terminating in a trough-like, upwardly concave portion,

the other longitudinal edge of said planar wall remote from said channel having first and second downwardly projecting integral longitudinally extending interlock members, said first interlock member comprising a generally cylindrical bead-like member adapted to be received in said trough-like portion and a projecting lip having a planar top surface adapted to bear against said fulcrum, said planar top surface being connected to said planar wall along a beveled edge contacting said planar top surface at an apex,

said second interlock member having a configuration adapted for latching engagement with said latch member,

said fulcrum and the distal end of said concave portion being spaced apart a distance equal to the distance between said apex and the point of contact between said bead-like member and said distal end when two of said panels are interlocked, and less than the distance between said apex and all other points on said bead-like member contacted by said distal end as two adjacent panels are being brought into interlocking engagement,

whereby said second inwardly projecting member is resiliently deformed during interlocking of two adjacent panels so that said bead-like member is clamped between said first and second inwardly projecting members when two of said panels are in interlocked engagement.

4,099,359

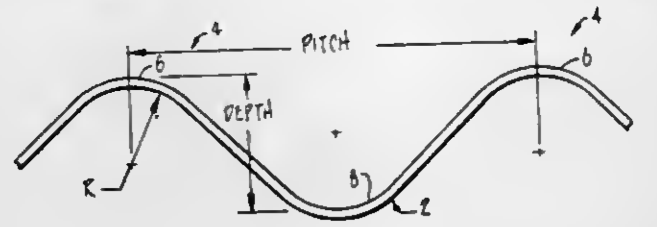
HIGH STRENGTH CORRUGATED METAL PLATE AND METHOD OF FABRICATING SAME

Eugene W. Sivachenko, 6851 Waverly, Redding, Calif. 96001

Filed Jun. 24, 1976, Ser. No. 699,289

Int. Cl.^{2} E04C *2/32;* E04D *1/00;* E02D *5/00;* F16L *9/00*

U.S. Cl. 52—630 **6 Claims**



1. A high-strength structural steel plate comprising a plurality of parallel, longitudinally extending, generally sinusoidally shaped corrugations defined by altering convex and concave peaks and troughs, the spacing between adjacent peaks and troughs in a direction perpendicular to the plate being at least about 4 inches and the spacing between adjacent peaks in a direction parallel to the plate being at least about 12 inches, the plate having a thickness of no more than about one-half inch, the peaks and troughs having a curvature radius of at least about two inches, and a corrosion resisting coating applied to surfaces of the plate, whereby the plate can be rolled to form the corrugations after the application of the coating from flat sheet metal with the peaks and troughs oriented parallel to the rolling direction.

4,099,360

METHOD AND DEVICE FOR JOINING CONCRETE BODIES AND METHOD OF CONSTRUCTING A MULTI-STORY BUILDING

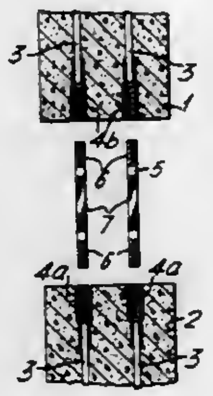
Christopher David Outram, Thames Ditton, England, assignor to CCL Systems, Ltd., Surbiton, England

Filed May 13, 1976, Ser. No. 686,450

Claims priority, application United Kingdom, May 13, 1975, 20185/75

Int. Cl.^{2} E04G *21/00*

U.S. Cl. 52—745 **5 Claims**



1. A method of joining spaced elongate vertical columns of concrete which comprises providing in a face of each column at least one screw threaded metal socket, the socket in one column having a thread opposite in direction to that in the socket of the other column, positioning one column over the other and spaced therefrom with the mouth of a socket in one column aligned with the mouth of the socket in the other column, locating between the two sockets an elongate coupling having an externally threaded portion at each end and an intermediate portion between the end portions and including a grip surface portion, the thread of one end portion being opposite in direction to that on the other end portion, and rotating the coupling by its grip surface while said columns are spaced so as to simultaneously screw the threaded portions into the corresponding sockets a sufficient distance to adjust the spacing between said sockets such that the upper column remains spaced above the lower column but supported thereon by the connection between the sockets and the coupling, with the spacing between the sockets being defined by the length of the intermediate portion of the coupling.--

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4,099,361

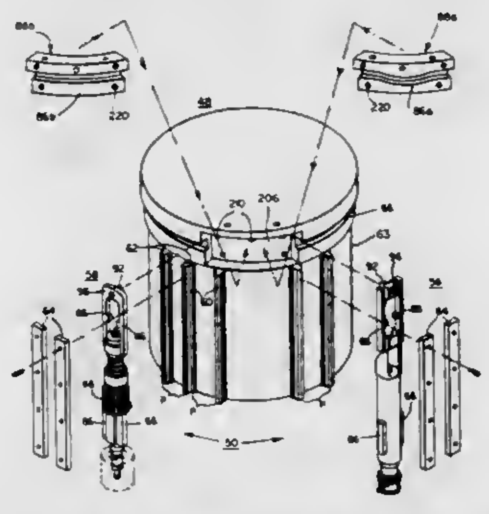
APPARATUS FOR AND METHOD OF CLOSING CONTAINERS

Joseph F. Dix, and Joseph Sampson, both of Baltimore, Md., assignors to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Mar. 20, 1972, Ser. No. 236,385

Int. Cl.^{2} B67B *3/02, 3/12, 3/18;* B65B *7/28*

U.S. Cl. 53—42 **18 Claims**



16. In a capping machine which includes a rotatable turret adapted to receive either roll-on spindles or swage-on spindles with capping heads thereon for applying closures to containers and including an annular cam member with a grooved cam track therein for vertically moving such spindles when they are rotated about the axis of the turret, said spindles having cam followers on them for moving in the grooved cam track in said cam member and said cam member including a substantially horizontal leg for holding a roll-on spindle in a lowermost position in engagement with a closure on a container as the closure skirt is deformed against the container finish, the improvement comprising:

swage-on spindles which are adapted to be mounted in said rotatable turret with the capping head on each such spindle out of contact with a closure on a container when the cam follower on such spindle is in said horizontal leg of the grooved cam track in said annular cam member; and

a replaceable cam section in said horizontal leg of said cam member and a U-shaped cam track in said section for camming a swage-on spindle with a capping head thereon downward to swage a closure on a container, and thereafter substantially immediately upward to strip the capping head from the closed container.

4,099,362

STRUCTURING MECHANISM IN READER-FILLER MACHINE FOR MICROFICHE JACKETS

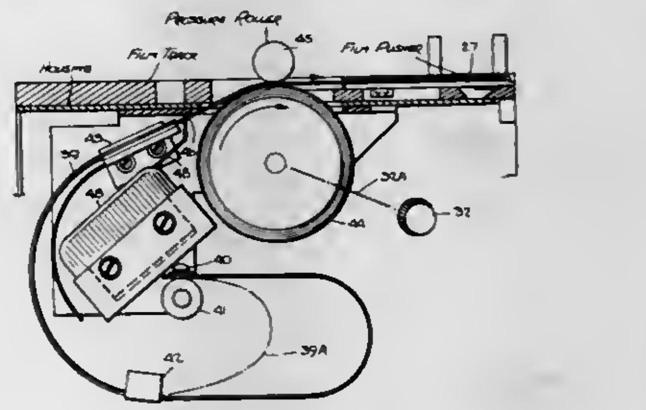
Isidore Dorman, Whitestone, N.Y., assignor to NB Jackets Company, Chicago, Ill.

Filed Sep. 6, 1977, Ser. No. 830,811

Int. Cl.^{2} B65B *5/10*

U.S. Cl. 53—123 **9 Claims**

1. In a reader-filler machine adapted to insert chips of microfilm into the respective channels of a multi-channel microfiche jacket, each channel having an entry slot adjacent the rear end of the jacket, the machine including a stationary film trackway, a drive mechanism to conduct the film to be inserted along the trackway toward the entry slot of the channel then in registration with the trackway and a pusher station provided with a film pusher parallel to the trackway whereby after a section of film loaded in this channel through the entry slot is severed from the film on the trackway to produce a film chip whose tail extends outside of the entry slot, the jacket is indexed to bring the next empty channel into registration with the trackway and the tail of the chip in the loaded channel into alignment with the pusher station to permit the film pusher to engage the tail and push it into the channel to complete the insertion, a structuring mechanism at said pusher station to be used for a chip whose length is shorter than the channel length to advance the chip in the channel to a point where its leading edge coincides with the front end of the jacket, said mechanism comprising:



A. a retractable structuring pusher in the form of a relatively stiff ribbon whose thickness is at least about the same as that of the film;

B. a track in a plane parallel to the plane of the film pusher to conduct the ribbon toward the entry slot in the channel; and

C. means to drive said ribbon along the track to cause the leading edge thereof to engage the trailing edge of the film chip therein and to advance the chip to the desired point, said drive means being reversible to retract said ribbon.

4,099,363

APPARATUS FOR COMPRESSING AND PACKAGING ARTICLES

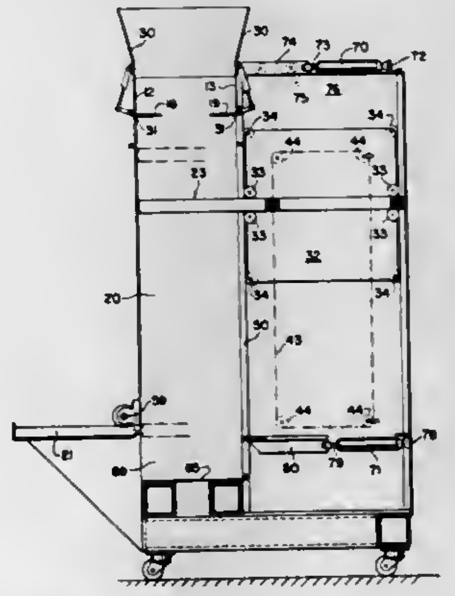
Nikolai K. Wistinghausen, and Edward P. Banninga, both of Sarnia, Canada, assignors to Fiberglas Canada Ltd., Canada

Filed Jul. 11, 1977, Ser. No. 814,627

Claims priority, application Canada, Jun. 23, 1977, 281207

Int. Cl.^{2} B65B *13/20, 63/02*

U.S. Cl. 53—124 D **12 Claims**



8. Apparatus for compressing and packaging batts of insulating material, comprising:

an upwardly open chamber for receiving the batts in succession through the open top thereof;

a compression chamber located beneath said chamber;
means for downwardly compressing the batts from said upwardly open chamber into said compression chamber;
said compression means including a pressure member and means for repeatedly moving said pressure member around an endless path of movement including a first path section extending downwardly through said upwardly open chamber and a second path section extending upwardly at the exterior of said upwardly open chamber, whereby successive batches of the articles are compressed into said compression space by the successive movements of said pressure member down said first path section;
means for retaining the batts under compression in said compression chamber;
said retaining means being movable between a first position located above said compression space and a second position spaced therefrom;
means for displacing said retainer into said first position to maintain the batts in the compression chamber under compression when said pressure member leaves said first path section, whereby two successive batches are compressed together in the compression chamber;
means for applying a convering to the compressed articles; and
means for simultaneously displacing the two compressed batches from said compression chamber to said covering applying means.

4,099,364

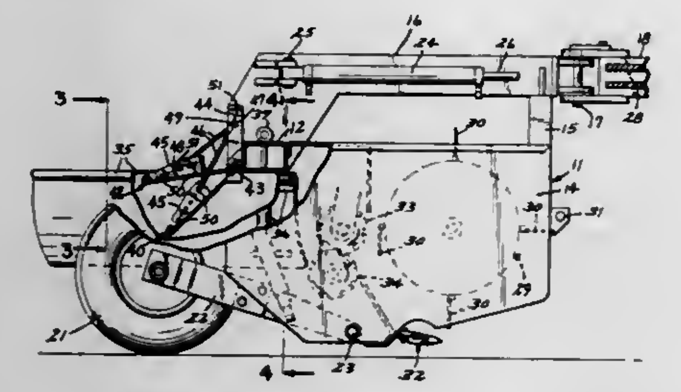
FLUFFER SHIELD SYSTEM FOR CROP HARVESTER

Glenn G. Kanengieter, Blooming Prairie, and Frank C. Krumbolz, Owatonna, both of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Nov. 4, 1976, Ser. No. 738,852

Int. Cl.^{2} A01D *57/26*

U.S. Cl. 56—1 **4 Claims**



1. In a crop harvesting machine including a mobile frame elongated in a direction transversely of the direction of travel of the machine, a mower, and crop conditioner rolls extending longitudinally of said frame, said rolls being operative to deliver cut and conditioned crop rearwardly of the direction of travel of the machine; the improvement comprising, a plurality of cooperating fluffer shields having front and rear edges and disposed in a group extending transversely of the direction of travel of the machine, means pivotally mounting each of said fluffer shields to said frame for swinging movements on a horizontal axis extending transversely of the direction of the machine travel and independently of the others of said fluffer shields, a plurality of support arms at least one for each of said fluffer shields, and a plurality of brackets, one pair for each of said support arms, one bracket of each pair being mounted on said frame and the other on a respective one of said fluffer shields, each of said support arms having one end pivotally secured to one of the brackets of its respective pair and secured at its other end to a selected one of a plurality of spaced points on the other bracker of its respective pair thereof.

4,099,365

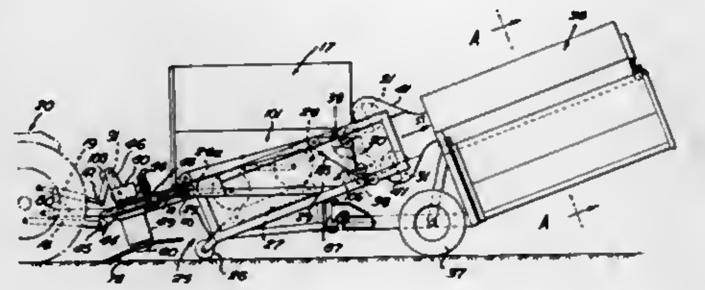
HARVESTING OF SUGAR CANE

John Colin Hudson, St. Thomas, Barbados, assignor to F.W. McConnel Limited, Ludlow, England

Continuation-in-part of Ser. No. 498,921, Aug. 20, 1974, abandoned. This application Oct. 14, 1976, Ser. No. 732,399

Int. Cl.^{2} A01D *45/10*

U.S. Cl. 56—13.5 **29 Claims**



1. A method of cleaning and topping a swath of at least partially cut and flattened leafy green sugar cane, comprising passing over the swath of cane an apparatus, mounted on or towed behind a propelling vehicle which performs the successive steps of gathering the swath, lifting it from the ground on which it lies, pulling individual canes top first from the swath, supporting the stalk of each cane as it is pulled from the swath, accelerating the cane rearwardly of the direction of travel of the vehicle, restraining the top of each cane whilst continuing to move the stalk rearwardly to cause the top to break away from the stalk.

4,099,366

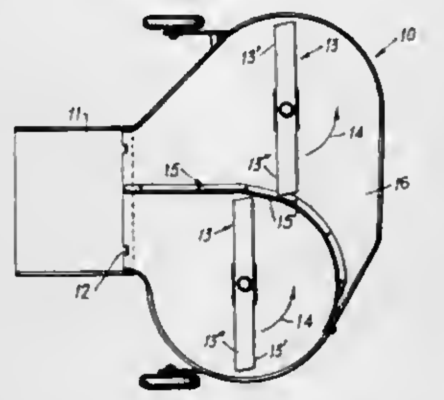
LAWN MOWERS

Clifford D. Peterson, Ankeny, Iowa, assignor to AMF Incorporated, White Plains, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,592

Int. Cl.^{2} A01D *55/18*

U.S. Cl. 56—13.6 **2 Claims**



1. In a lawn mower having a twin-bladed grass cutter with rear discharge, said grass cutter comprising an open bottom housing having a top wall and a depending surrounding side flange, a pair of laterally spaced horizontal rotary grass cutting blades mounted in said housing between the lengthwise center line and opposite sides of said housing, said flange being discontinuous at the rear end of said center line to provide a rear opening on said housing for rear discharge of grass from said housing, and means for eliminating streaking along said center line, said means comprising a baffle mounted to said top wall and depending therefrom into said housing along said center line, wherein said opposite sides of said housing are arcuate and said baffle extends arcuately from one of said sides to between said blades and then along said center line to said rear opening, and said baffle depending into said housing to a maximum depth at each of its ends and then tapering therefrom to a minimum depth at its central portion.

4,099,367

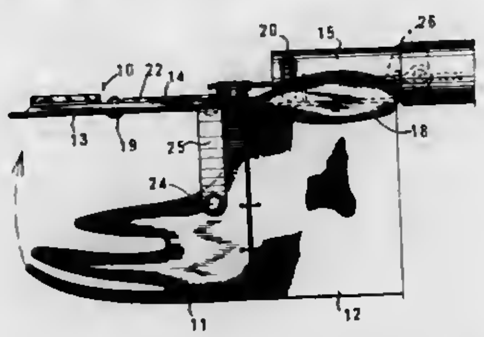
FRUIT PLUCKING DEVICE

Yoshikane Ito, No. 238 Kawai, Koyataira-son, Mima-gun Tokushima-ken, Japan

Filed Jan. 17, 1976, Ser. No. 696,839

Int. Cl.^{2} A01D *46/24*

U.S. Cl. 56—336 **13 Claims**



1. A fruit plucking device for cutting fruit from trees comprising:
scissor means for cutting the stems of said fruit, said scissor means comprised of:
a stationary member having a front portion with cutting edge of one side thereof,
a handle member connected to the rear portion of said stationary member, and
a movable crimping member pivotally connected to said stationary member, said movable member having: a front portion with a cutting edge on one side thereof adjacent the cutting edge of said front portion of said stationary member and contactable therewith, and a lever portion at the rear end of said front portion on the opposite side of the pivot point from said front portion;
holding means pivotally connected to and extending beneath said scissor means and operatively connected to said movable member for pivoting upward when said movable member is pushed and for catching and holding therein the fruit cut by said scissor means, said holding means having front and rear openings larger in diameter than the diameter of said fruit being picked; and
conveying means connected to the rear of said holding means and communicating with said rear opening of said holding means for conveying the cut fruit away from said holding means.

4,099,368

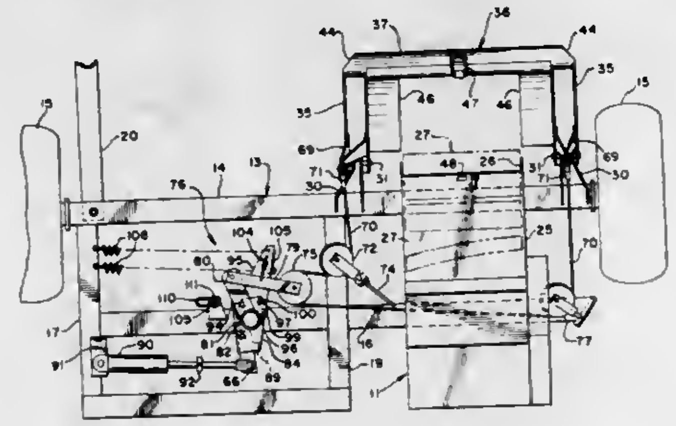
GATHERING UNIT CONTROL APPARATUS

Robert J. Mackert, Downera Grove; Donald P. Storm, Hinsdale, and Manfried L. Hoch, Lockport, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 6, 1976, Ser. No. 712,307

Int. Cl.^{2} A01D *67/00*

U.S. Cl. 56—208 **15 Claims**



1. In a forage harvester having a basic processing unit having a frame and a crop gathering unit operatively associated with said basic unit for vertical articulative movement relative thereto about a transverse pivot axis, control apparatus for said gathering unit comprising:
a main lever pivotally mounted on said frame and having output means operatively connected to said gathering unit for pivoting said gathering unit about said transverse axis, the weight of said gathering unit imposing a first torque through said output means on said main lever;
a floatation spring lever having a first pivotal connection and a second detachable connection with said main lever;
floatation spring means interconnecting said floatation spring lever and said frame, said spring means imposing through said spring lever a balancing torque in opposition to said first torque on said main lever upon said detachable connection therebetween being in the attached state and said spring means imposing no balancing torque on said main lever upon said detachable connection being in the detached state; and
lift means interconnecting said main lever and said frame for selectively exerting a lifting torque in opposition to said first torque on said main lever.

4,099,369

MOWING DEVICE

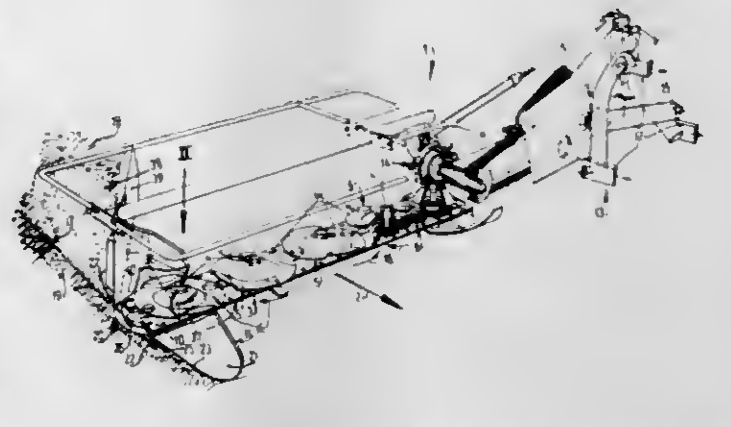
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Oct. 5, 1976, Ser. No. 729,827

Claims priority, application Netherlands, Oct. 10, 1975, 7511970

Int. Cl.^{2} A01D *63/00*

U.S. Cl. 56—314 **26 Claims**



1. A mowing device comprising a housing extending transversely of the direction of travel of the mowing device, a plurality of upright shafts journalled in said housing, driving gear means accommodated in said housing and driving the shafts, a plurality of cutting members, one fixed to the upper end of each shaft, supporting means having a supporting surface bearing on the ground for supporting the mowing device on the field so that the outermost cutting member at one end of the housing is disposed a predetermined distance above the ground to define a cutting level thereat, and at least one screen attached to said one end of the housing and having a front portion extending in front of the outermost cutting member, viewed in the direction of travel and being located just inside the outermost path of said outermost cutting member, but at a higher level than said outermost cutting member, said screen having a lower rim near the outermost cutting member, which extends further outwardly than the front portion and is disposed outside of the outermost cutting member, the lower rim of the screen being located at a higher level than the supporting surface approximately at said predetermined distance above the ground.

4,099,370
TWISTED CORE YARN

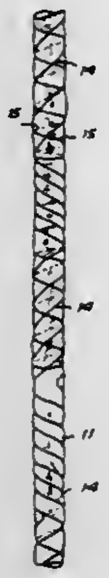
John Umiastowski, 127 Sunnyside Place, Dollard des Ormeaux, Quebec, Canada (H9A 1V9)

Division of Ser. No. 562,113, Mar. 26, 1975, Pat. No. 4,056,924. This application Mar. 11, 1976, Ser. No. 665,767

Claims priority, application Canada, Mar. 29, 1974, 196403

Int. Cl.² D02G *3/36*

U.S. Cl. 57—144 **6 Claims**



1. Yarn comprising an elongated flexible core at least part of which is twisted in a given direction, and a plurality of surface fibers carried by said core at said twisted part thereof and forming a composite yarn structure with said core, said surface fibers being helically wound around said twisted part of said core in a direction opposite to the direction of twist of said part of said core for maintaining said part of said core twisted in said given direction, said surface fibers being twisted to a greater extent than said twisted part of said core with said core having therein a twist resulting from pulling of said fibers around said core.

4,099,371
ELECTRONIC OPTICAL DISPLAY ALARM TIMEPIECE

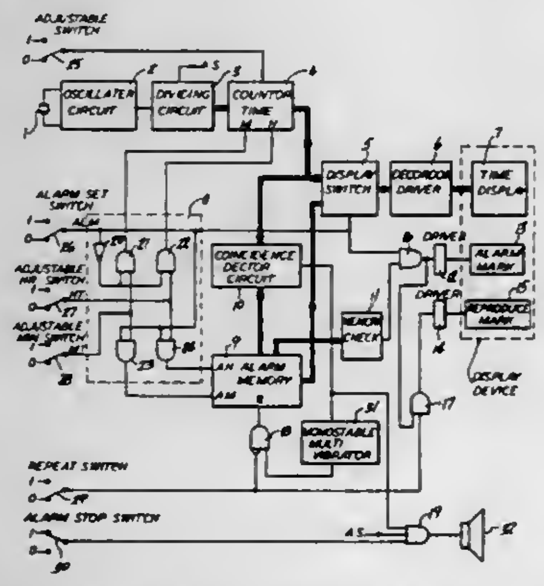
Yoshifumi Mochizuki, Tokorozawa, and Shigeru Morokawa, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,756

Claims priority, application Japan, Oct. 4, 1974, 49-114498; Dec. 18, 1974, 49-145183

Int. Cl.² G04B *23/02;* G04C *21/00*

U.S. Cl. 58—22.7 **1 Claim**



1. An electronic timepiece having an alarm, comprising an electro-optical display for selectively displaying the time and an alarm time setting on the same element of said display and for displaying a first alarm mark indicative of the condition of said alarm whereby the presence or absence of an alarm time setting is indicated by the presence or absence of said alarm mark; means for activating said first alarm mark for each coincidence of said alarm time setting and the time or for the first coincidence of said alarm time setting and the time; means for selecting the each coincidence or first coincidence mode of activation; means for displaying a second alarm mark in response to said selecting means whereby whether said alarm will be activated for each coincidence of said alarm time setting and the time or the first coincidence of said alarm time setting and the time is indicated by the presence or absence of said second alarm mark; and memory means for storing said alarm time setting and including resetting means, said means for selecting, including a logic means having an output connected to said resetting means, a first input connected to said means for activating said alarm, and a second input means connected to a selector switch means.

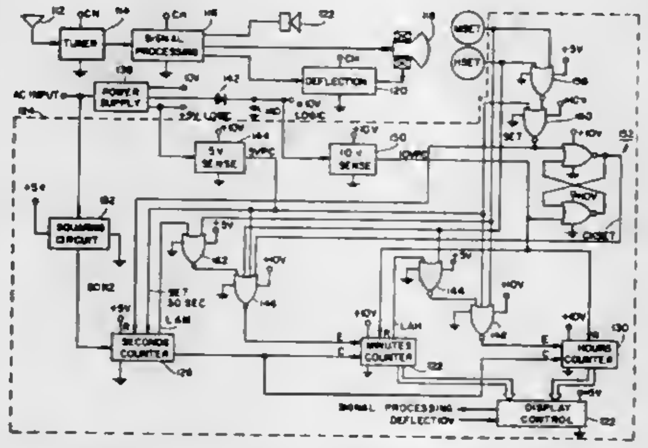
4,099,372
TIMEKEEPING APPARATUS WITH POWER LINE DROPOUT PROVISIONS

Billy Wesley Beyers, Jr., Greenfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,368

Int. Cl.² G04C *17/00;* H02J *9/00*

U.S. Cl. 58—85.5 **13 Claims**



1. A timekeeping apparatus comprising:

a source of reference frequency signal;

first counting means responsive to said reference frequency signal for generating a first group of binary signals representing first units of time;

second counting means responsive to signals of said first group for generating at least a second group of binary signals representing at least second units of time;

a source of input power;

power supply means for developing power for said first and second counting means from said input power;

power maintenance means for maintaining power to said second counting means during a loss of said input power so that information is retained in said second counting means for at least a predetermined time interval;

means for setting said first counting means to a predetermined count corresponding at least approximately to one-half the number of said first units of time in one of said second units after a temporary loss of power having a duration less than said predetermined time interval so that over a number of temporary losses of power the count accumulated in said first counter means will at least approximately correspond to the correct time.

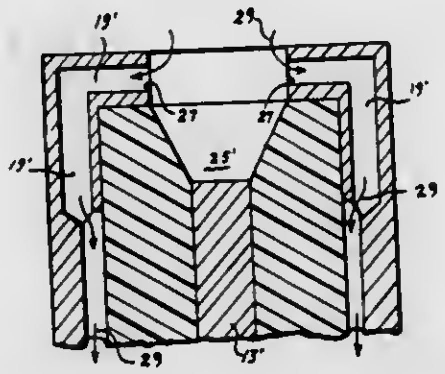
4,099,373
VENTED IGNITER

William W. Griffin, Jr., Lake Park, and Robert M. Pierce, Tequesta, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,821

Int. Cl.² F02C *7/18, 7/26*

U.S. Cl. 60—39.67 **3 Claims**



1. An improved spark igniter for use in a gas turbine engine having a combustion means, said igniter comprising a central electrode, a ceramic insulator surrounding said central electrode and extending beyond the tip thereof, an outer shell positioned around said ceramic insulator and extending over the end surface thereof, said outer shell being spaced from the tip of said central electrode to form an electrode cavity in which a spark gap is formed, at least one vent passage in said outer shell for receiving a fuel-air mixture from within the engine, said vent passage being in communication with an outlet area of lower pressure, and at least one inlet opening in the side wall of the outer shell in the upper portion of the electrode cavity in communication with the vent passage such that the fuel-air mixture entering said opening passes near the tip of the central electrode in the electrode cavity causing the mixture to be ignited when the igniter is activated.

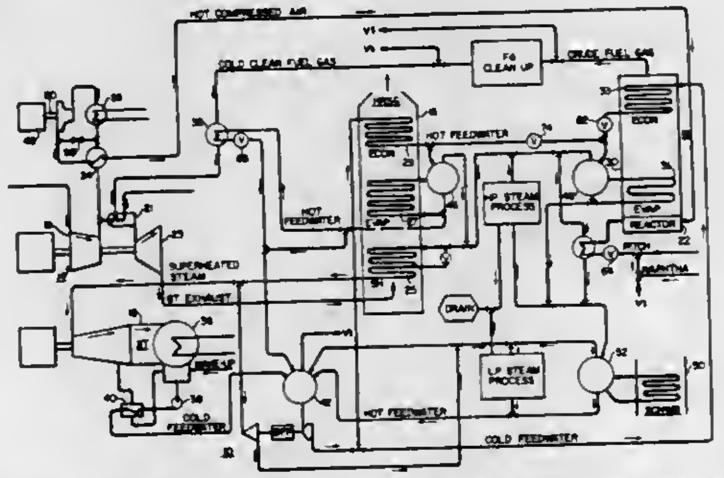
4,099,374
GASIFIER-COMBINED CYCLE PLANT

Richard W. Foster-Pegg, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,194

Int. Cl.² F02B *43/08*

U.S. Cl. 60—39.12 **5 Claims**



1. An electric power plant having a steam turbine and a gasifier system, said plant comprising at least one gas turbine set and at least one heat recovery steam generator which receives hot gas turbine exhaust gas to produce steam for operating the steam turbine, means for supplying a fossil fuel to said gasifier system, means for supplying compressed air from said gas turbine set to said gasifier system, means for controlling the flow of gasifier input fossil fuel as a function of a signal which is dependent on the variation in air flow to the gasifier system as plant load changes occur, means for cooling and cleaning generated fuel gas, and means for reheating the generated fuel gas for use in said gas turbine set.

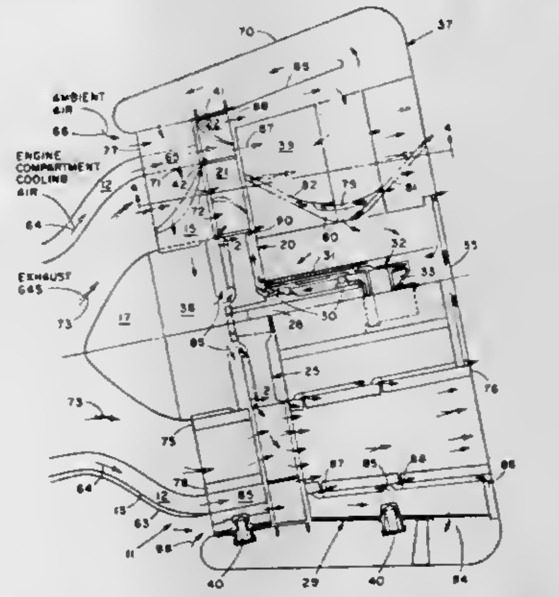
4,099,375
EXHAUST PLUME REDUCTION AND COOLING SYSTEM

Clinton F. Inglee, Media, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1977, Ser. No. 765,500

Int. Cl.² F02C *7/18*

U.S. Cl. 60—39.5 **6 Claims**



1. An exhaust suppressor for a gas turbine or other engine having inner and outer exhaust ducts comprising:

a duct and vane assembly for supporting said suppressor and initially distributing hot exhaust gases;

a plenum and shroud assembly for mixing hot exhaust gases with cooling air;

a turbine and vane assembly for powering the operative components of said suppressor,

said duct and vane assembly coupled to the periphery of said outer exhaust duct and including hollow upstream vanes transverse to and initially intercepting hot engine exhaust gases,

said outer exhaust duct providing for discharge of engine compartment cooling air, and said inner exhaust duct providing for discharge of hot exhaust gases,

said plenum and shroud assembly coupled to and surrounding said duct and vane assembly and including hollow shielding vanes adapted to mix and distribute hot exhaust gases and cooling air, and shroud means retaining and circulating cooling air to and through the vanes of said assembly,

said turbine and vane assembly positioned within and supported by said plenum and shroud assembly and including a centrally disposed exhaust turbine having turbine blades deployed in the path of engine exhaust gases downstream of said vanes in said duct and vane assembly,

said shielding vanes angled relative to the central axis of said suppressor so as to hide all components forward thereof; and

a cover secured to said plenum and shroud assembly at the aft end thereof for hiding said turbine from external view aft of said suppressor.

4,099,376

GAS GENERATOR AND SOLID PROPELLANT WITH A SILICON-OXYGEN COMPOUND AS A BURNING RATE MODIFIER, AND METHOD FOR MAKING THE SAME

Archie B. Japs, Akron, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Jun. 29, 1955, Ser. No. 519,002

Int. Cl.² F02K *9/04;* C06B *45/10*

U.S. Cl. 60—253 **3 Claims**

2. An article of manufacture useful as a gas generator and comprising a container having an outlet and supported and adapted to burn within said container and adhere to the walls of said container a mixed, shaped and cured composition of matter characterized by generating large volumes of gas on combustion and, except for minor amounts of compounding ingredients, consisting essentially of from about 70 to 87% by weight of finely-divided dried ammonium perchlorate, from about 0.5 to 5.0% by weight of at least one high surface area finely-divided essentially anhydrous inorganic silicon and oxygen-containing burning rate modifier selected from the group consisting of silicon monoxide, fume silica, arc silica and silicon oxyimide, and the balance a combustible organic elastomeric polymeric binder selected from the group consisting of a cured polyesterurethane of an organic diisocyanate and a hydroxyl terminated polyester of a dibasic acid and a glycol and a polymer comprising predominantly linear carbon chains cured through at least a portion of its combined curable acid groups selected from the class consisting of COOH, SO_3H, SO_2H and PO_3H_2 radicals.

4,099,377

INTERNAL COMBUSTION ENGINE EQUIPPED WITH CATALYTIC CONVERTER

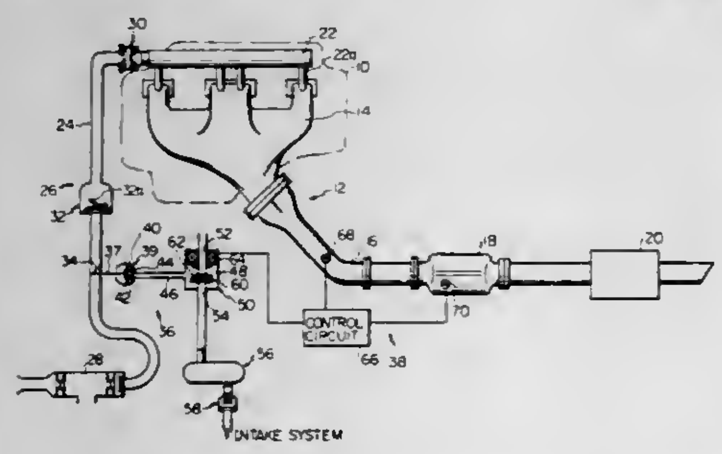
Tooru Yoshimura, Yokosuka, and Hiroshi Kuroda, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 28, 1976, Ser. No. 681,176

Claims priority, application Japan, Apr. 28, 1975, 50-51858

Int. Cl.² F01N *3/10*

U.S. Cl. 60—276 **21 Claims**



1. An internal combustion engine having a combustion chamber therein, comprising:
- a catalytic converter for catalytically purifying the exhaust gases discharged from the combustion chamber;
- an exhaust passage means communicating the combustion chamber with said catalytic converter;
- secondary air supply means for supplying secondary air into said exhaust passage means upstream of said catalytic converter to promote the catalytic purification of the exhaust gases carried out within said catalytic converter;
- an exhaust gas sensor disposed in said exhaust passage means upstream of said catalytic converter adapted to generate a first composition information signal when the oxygen-combustibles ratio of the exhaust gases passing through said exhaust passage means upstream of said catalytic converter is lower than a first predetermined level;
- a temperature sensor disposed in said catalytic converter and adapted to generate a first temperature information signal when the temperature within said catalytic converter is lower than a second predetermined level;
- a control circuit electrically connected to said exhause gas sensor and said temperature sensor and adapted to generate a first command signal upon receiving at least one of the first composition information signal from said exhaust gas sensor and the first temperature information signal from said temperature sensor; and
- secondary air regulating means for allowing said secondary air supply means to supply the secondary air through said exhaust passage means into said catalytic converter upon receiving the first command signal from said control circuit.

4,099,378

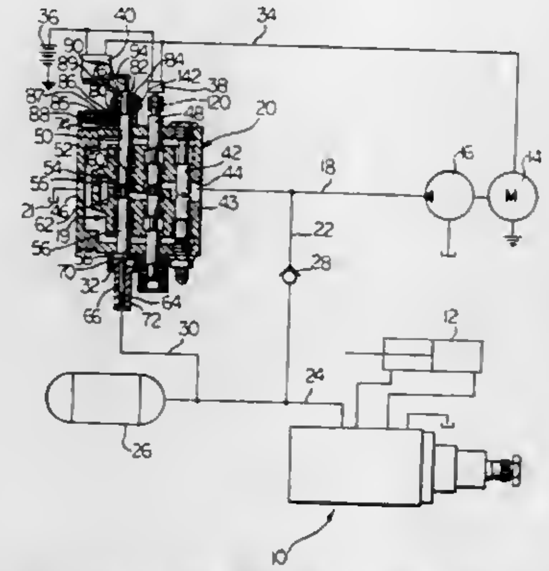
BLOCKING VALVE FOR POWER STEERING FOR LIFT TRUCKS

Walter M. Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 759,951, Jan. 17, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,897

Int. Cl.² F15B *1/02*

U.S. Cl. 60—413 **24 Claims**



1. In a hydraulic system having a prime mover, a pump driven by said prime mover, an accumulator, a supply tank, an implement actuating unit connected to said accumulator, an implement actuating valve between the pump and the tank, a check valve permitting flow from the pump to the accumulator, an accumulator charging means for selectively controlling the flow from the pump to the accumulator, holding means communicating with said accumulator for holding said charging means in the open position, control means slidably carried on said charging means and having retaining means for retaining said control means in one of at least two positions relative to said charging means, means carried by said control means and selectively activated by said charging means for driving said prime mover and pump, a lever operatively connected to said control means for moving said control means in one direction only relative to said charging means until said retaining means seats on an abutment on said charging means, and resilient means urging said control means and said charging means in a direction opposite to the direction of movement by said lever and against the force of the holding means whereby low pressure in the accumulator will permit the resilient means to drive the control means and the charging means to a position to block the flow through the implement valve and to close the means for selectively activating said prime mover and pump whereby the pump will charge the accumulator and upon completing the charge of the accumulator, pressure in the accumulator will cause the holding means to move the charging means to open the flow through the implement valve and to urge the charging means to unseat the retaining means from the abutment to open the selectively activated means and shutoff the prime mover and pump.

4,099,379

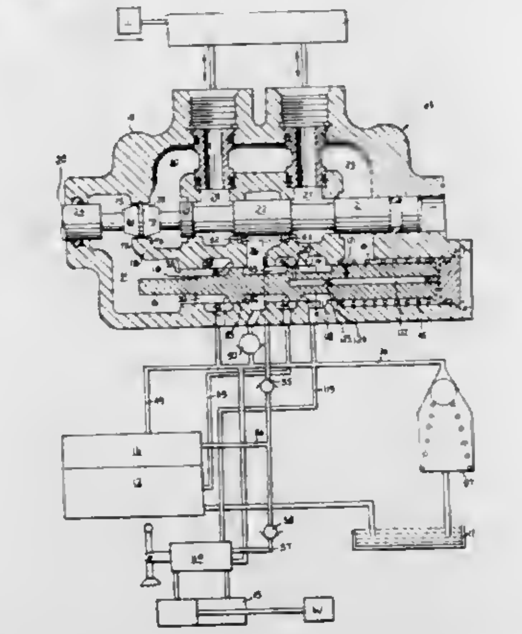
LOAD RESPONSIVE FLUID CONTROL SYSTEM

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,974. This application Feb. 5, 1976, Ser. No. 655,561

Int. Cl.² F15B *13/08*

U.S. Cl. 60—427 **51 Claims**



38. A valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, an outlet chamber, an exhaust chamber, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said fluid outlet chamber and said fluid supply chamber, variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid between said outlet chamber and said exhaust chamber, second valve means having fluid throttling means, fluid isolating means between said inlet chamber and said supply chamber, said second valve means having means responsive to pressure differential at variable pressure level acting across said variable orifice means and operable to maintain said pressure differential relatively constant while pressure at said variable orifice means is permitted to vary, and fluid replenishing means to interconnect for fluid flow said fluid supply chamber and said fluid exhaust means when said fluid isolating means isolates fluid supply chamber from said fluid inlet chamber.

4,099,380

MASTER-CYLINDER FOR HYDRAULIC BOOSTER

Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy

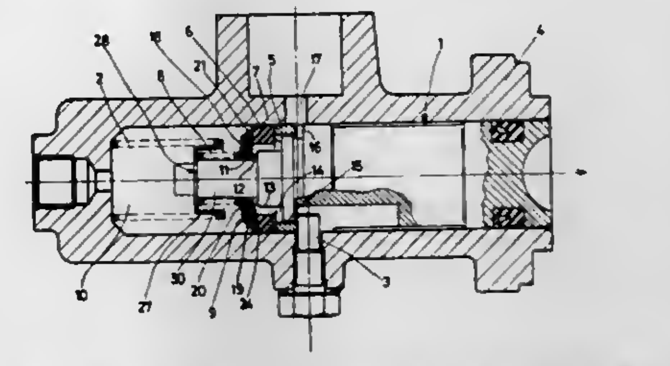
Filed Oct. 22, 1976, Ser. No. 734,915

Claims priority, application Italy, Oct. 23, 1975, 28610 A/75

Int. Cl.² B60T *11/26;* F15B *7/08*

U.S. Cl. 60—588 **8 Claims**

1. In a master cylinder comprising: a housing having a bore for receiving a sliding piston, said piston cooperating with said housing to define a pressure chamber in said bore, said bore being connected to a utilizing circuit, a packing seal being disposed around the head of said sliding piston adjacent to said pressure chamber, said packing seal having a peripheral edge sealingly sliding in said bore and an inner edge defining a radial clearance with the head of said piston, said packing seal being mounted between a shoulder on the head of said piston and a stop means resiliently urged toward an abutment on said piston head, said packing seal by fluid-tight cooperation with said shoulder controlling the fluid communication between said pressure chamber and a low pressure reservoir, and a low preloaded safety valve associated with the head of said piston and the packing seal to control said fluid communication as an in line relationship, said safety valve permitting fluid to flow from said low pressure reservoir into said pressure chamber when said piston returns to its rest position in the event of creation of a negative pressure in said pressure chamber, said packing seal cooperating with a sleeve which engages a stop pin secured to said housing when said piston is in its rest position so as to overcome an intermediate spring and seat off the packing seal and the central part of the safety valve from the shoulder and the abutment respectively, thus creating an axial clearance between said packing seal and said shoulder, said safety valve being a frontal sealing-tight valve axially movable along a protuberance of the piston head projecting towards the pressure chamber, said safety valve having a central substantially rigid part defining said stop means for the packing seal and being adapted to sealingly engage said abutment.



4,099,381

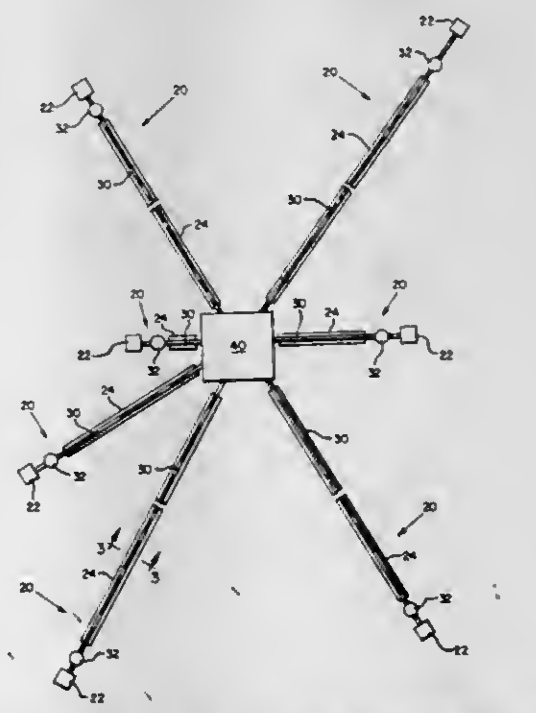
GEOTHERMAL AND SOLAR INTEGRATED ENERGY TRANSPORT AND CONVERSION SYSTEM

Marc D. Rappoport, P.O. Box 10445, Portland, Oreg. 97210

Continuation-in-part of Ser. No. 593,773, Jul. 7, 1977, abandoned. This application Sep. 9, 1977, Ser. No. 831,888

Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **2 Claims**



1. An energy transport and conversion system for conducting geothermal energy from a plurality of geographically dispersed geothermal sources to a common central thermal power station without substantial loss of geothermal energy comprising:

(a) multiple geothermal means spaced from one another, each for transferring geothermal energy at a predetermined geothermal temperature level from a naturally heated material beneath the earth's surface to a fluid medium;

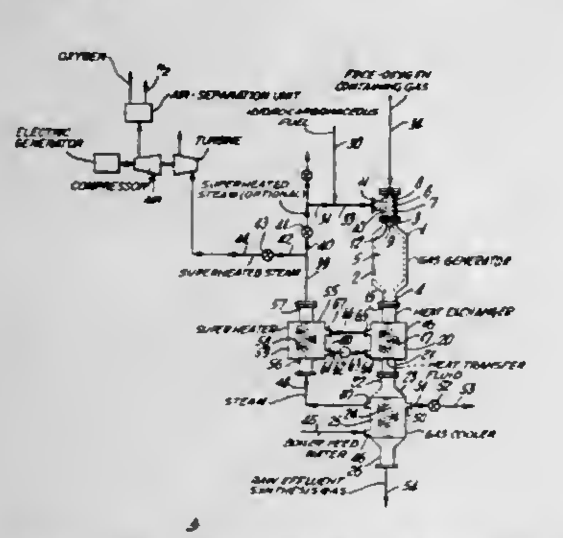
(b) a central thermal power station spaced away from each of said multiple geothermal means including means for receiving thermal energy from said fluid medium;

(c) multiple separate elongate conduits, each respectively coupled between one of said multiple geothermal means and said thermal power station for conducting said fluid medium therethrough toward said central thermal power station; and

(d) multiple concentrating solar collector means each being associated with a respective one of said separate elongate conduits and arranged in longitudinally extending relation thereto, for transferring focused solar energy to said fluid medium in said separate elongate conduits at a temperature level higher than said geothermal temperature level as said fluid medium moves through the conduit toward said central thermal power station.

4,099,382
BY-PRODUCT SUPERHEATED STEAM FROM THE PARTIAL OXIDATION PROCESS

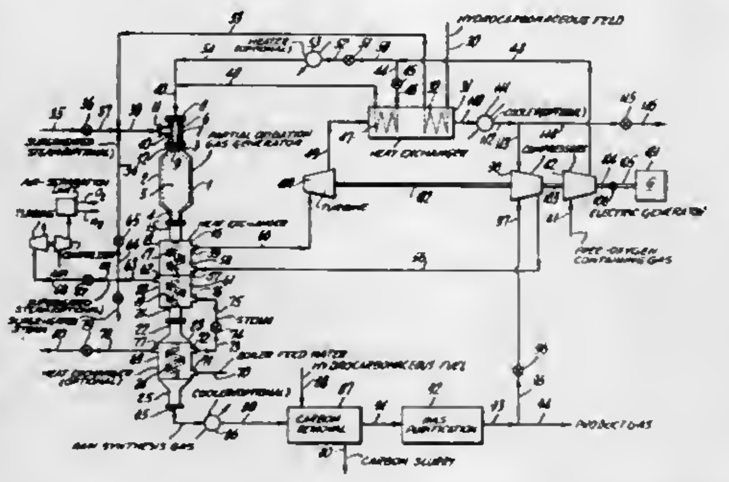
Peter L. Paull, Weston, Conn., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,439
Int. Cl.² F01K *27/00*
U.S. Cl. 60—648 **45 Claims**



1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A and particulate carbon, by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon with a free-oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1500° to 3500° F and a pressure in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone in noncontact heat exchange with a continuous stream of steam produced subsequently in the process in step (3) thereby converting said steam into a continuous stream of superheated steam while simultaneously reducing the temperature of the continuous stream of effluent gas; (2) removing a continuous stream of said superheated steam from (1) as a by-product stream; (3) continuously passing the stream of effluent gas leaving the first heat exchange zone in (1) directly into a second heat exchange zone where it passes in noncontact heat exchange with a stream of water, thereby converting said water into a continuous stream of steam, while simultaneously reducing the temperature of the continuous stream of effluent gas; (4) removing a stream of raw effluent product gas; and (5) introducing at least a portion of the stream of steam from (3) into the first heat exchange zone in (1) as said steam.

4,099,383
PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,438
Int. Cl.² F01K *27/00*
U.S. Cl. 60—648 **37 Claims**

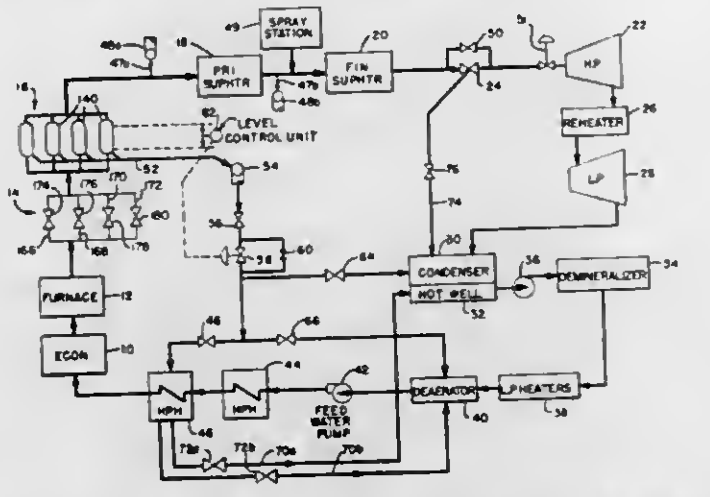


1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A and particulate carbon, by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon, with a free-oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1500° to 3500° F and a pressure in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the raw effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone in noncontact heat exchange with a continuous stream of a gaseous heat transfer fluid selected from the group superheated steam, helium, nitrogen, argon, hydrogen, and gaseous mixtures comprising H_2+CO; (2) introducing the stream of hot gaseous heat transfer fluid leaving (1) into a power developing means as the working fluid and thereby producing power; (3) cooling the gaseous heat transfer fluid leaving (2) by noncontact heat exchange with at least one of the feed materials to said gas generator and optionally with water in a separate heat exchange zone; and (4) compressing the cooled gaseous heat transfer fluid leaving (3) by means of a gas compressor driven by said power developing means and recycling the compressed gaseous heat transfer fluid into the first heat exchange zone in step (1).

4,099,384
INTEGRAL SEPARATOR START-UP SYSTEM FOR A VAPOR GENERATOR WITH CONSTANT PRESSURE FURNACE CIRCUITRY

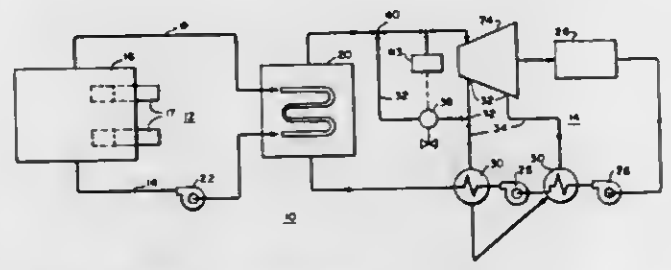
William D. Stevens, North Caldwell, and Walter P. Gorzegno, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.
Continuation-in-part of Ser. No. 538,236, Jan. 2, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,313
Int. Cl.² F01D *19/00*
U.S. Cl. 60—657 **9 Claims**

1. A vapor generating system for use in a power plant having a steam turbine and a condenser connected in a series flow relationship; said system comprising a vapor generating section for receiving a heat exchange fluid and applying heat to said fluid; a superheating section for applying additional heat to said fluid; fluid flow circuitry directly connecting said vapor generating section to said superheating section; a pressure control section connected directly in said fluid flow circuitry in a series flow relation with said vapor generating section and said superheating section for receiving said fluid from said vapor generating section and controlling the pressure of said fluid; and separation means connected directly in said fluid flow circuitry between said pressure control section and said superheating section in a series flow relation therewith for separating said fluid into a liquid and a vapor and passing the vapor to said superheating section; said pressure control section including a plurality of conduits connected in a parallel fluid flow relationship, at least one of said conduits adapted to receive fluid from said furnace section during start-up and full load operation of said vapor generating section, and valve means disposed in at least one of said other conduits for selectively controlling the fluid pressure in said furnace after a predetermined amount of heat has been added to said fluid; said separation means comprising a plurality of separators connected in a parallel relationship and adapted to receive fluid from said conduits during start-up and full load operation of said vapor generating section.



4,099,385
EXTENDED FUEL CYCLE OPERATION FOR PRESSURIZED WATER REACTOR PLANTS

George J. Silvestri, Jr., Morton, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 28, 1976, Ser. No. 653,174
Int. Cl.² F01K *7/34;* G21C *9/00*
U.S. Cl. 60—678 **7 Claims**



1. A power plant comprising:

a source of motive fluid having a predetermined pressure associated therewith,

a turbine element having an inlet and an outlet end, said inlet end being in fluid communication with said motive fluid source,

a heat rejection element for liquefying said motive fluid to condensate, said heat rejection element being in fluid communication with said turbine's outlet end,

a heat recovery element for heating the condensate and passing it therethrough to said motive fluid source;

an extraction conduit connected at a first end to a predetermined point within said turbine between said inlet and said outlet ends and at a second end to the heat recovery element,

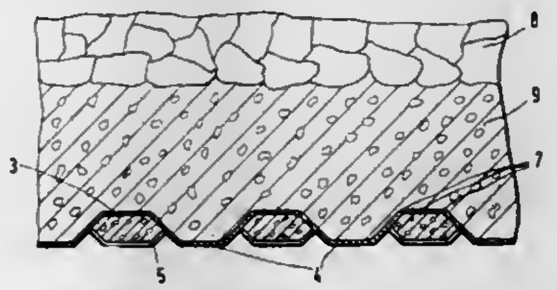
a bypass conduit disposed so as to provide fluid communication between said motive fluid source and said extraction conduit,

a flow control device for regulating fluid flow through said bypass conduit, and,

means for opening said flow control device in response to said motive fluid's pressure dropping a predetermined amount below said motive fluid's predetermined pressure causing motive fluid flow through said bypass conduit whereby a first portion of said bypassed motive fluid can be supplied to the turbine element through the extraction conduit while a second portion of said bypassed motive fluid can be routed to said heat recovery element.

4,099,386
ARRANGEMENTS USED FOR SHORING EXCAVATIONS IN THE GROUND

D. Lucio Arana Sagasta, Coso, 34, Zaragoza, Spain
Filed Aug. 19, 1976, Ser. No. 715,842
Claims priority, application Spain, Oct. 8, 1975, 441.608
Int. Cl.² E01G *5/00*
U.S. Cl. 61—45 R **1 Claim**



1. In a tunnel lining and excavation shoring system of the type having a plurality of substantially parallel spaced-apart trusses spaced from and substantially parallel to the surface to be shored, and metal plating unit attached to and spanning the spaces between said trusses, the space between said plating unit and the surface to be shored being adapted to later filling with concrete, the improvement of a modular plating unit comprising:

(a) said plating unit being fabricated of pressed steel;

(b) said plating unit having parallel trapezoidal longitudinal channels therein;

(c) a row of alternating convex and concave trapezoidal shapes between each pair of parallel trapezoidal longitudinal channels, the apices of said convex and concave trapezoidal shapes being parallel and being located in spaced-apart imaginary planes;

(d) the junction of the walls and apices of said trapezoidal longitudinal channels and said alternating convex and concave trapezoidal shapes being straight and comprising lines for action as flexing points;

(e) windows between adjacent concave and convex trapezoidal shapes; and

(f) said windows reducing the length of one of said concave and convex trapezoidal shapes.

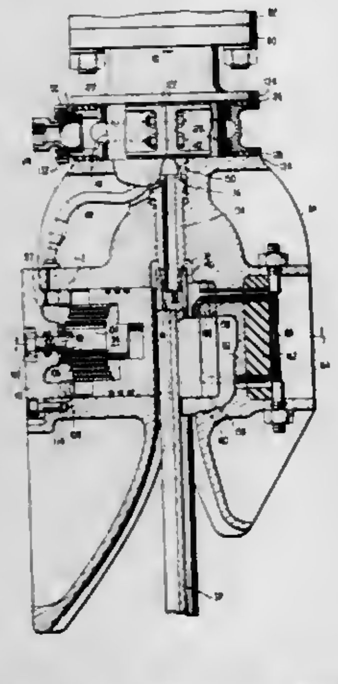
4,099,387
SHEET STEEL PILE CLAMP

Leonard L. Frederick, 15 Crestview Ter., Whippany, N.J. 07981, and Edwin E. Greigg, 509 Notley Rd., Silver Spring, Md. 20904

Division of Ser. No. 672,447, Mar. 31, 1976, abandoned, which is a continuation of Ser. No. 486,624, Jul. 8, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,134

Int. Cl.^{2} E02D *11/00*

U.S. Cl. 61—63 **11 Claims**



1. A universal sheet pile clamp for clamping a vibratory hammer to a sheet pile, comprising:

a body portion having means at one end for fixedly connecting the body portion to a vibratory hammer, a slot formed at the other end for receiving the top portion of a sheet pile, and a main blind bore which intersects the slot; and

jaw-like members mounted within the main blind bore on either side of the slot for engagement with the sheet pile, said jaw-like members including:

hydraulically actuated piston means on one side of the sheet pile with means for gripping the sheet pile; and

laterally adjustable piston means on the other side of the sheet pile with means for gripping the sheet pile.

4,099,388
DRIVE SHIELD FOR TUNNELING APPARATUS AND A METHOD FOR OPERATING SUCH A SHIELD

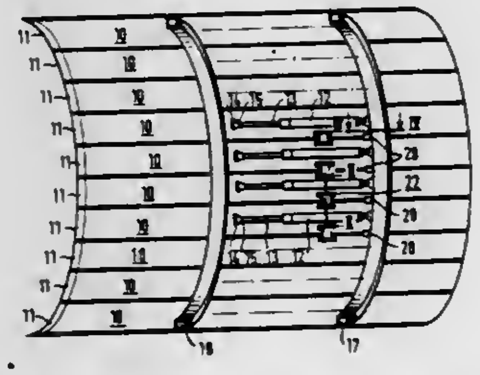
Heinz Hüsemann, and Herbert Heitkamp, both of Werne, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,232

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546755

Int. Cl.^{2} E01G *3/00, 3/02*

U.S. Cl. 61—85 **8 Claims**



1. A drive shield for use in tunnel driving comprising: a plurality of elongate drive members arranged side-by-side in parallel relationship around the tunnel axis; a frame supporting and guiding the members for individual longitudinal displacement; fluid rams coupled between the frame and the drive members and operable to advance the drive members in successive stages and to shift up the frame when the drive members have all been advanced; and automatic means for inhibiting relative movement of the drive members when the frame is being shifted by the rams, the reaction forces produced by the shifting movement being distributed evenly to the drive members.

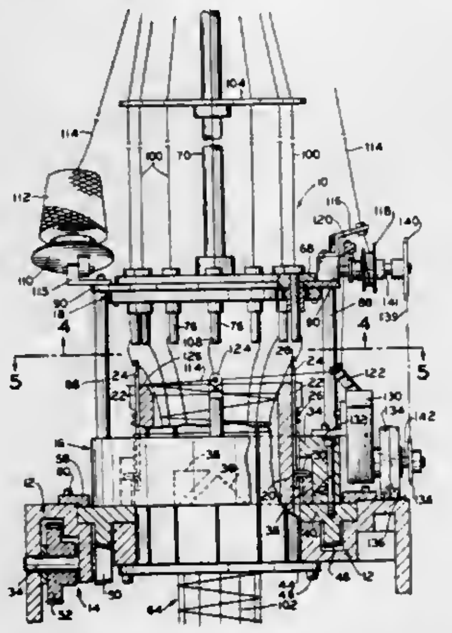
4,099,389
CIRCULAR KNITTING MACHINE

Herbert H. Herbein, Reiffton, Pa., assignor to Ripple Twist Mills, Inc., Reading, Pa.

Filed Jul. 19, 1976, Ser. No. 706,529

Int. Cl.^{2} D04B *9/16, 15/50*

U.S. Cl. 66—9 R **1 Claim**



1. A circular knitting machine for knitting a netting comprised of a plurality of circumferentially spaced warp wales incorporating an elastic weft yarn in a helical manner in the knit chain stitches of the individual warp wales, said machine comprising in combination:

a stationary slotted needle cylinder mounted on a base

circumferentially spaced latch needles disposed in slots of said needle cylinder, each of said latch needles being provided with a latch having an open position and a closed position;

a rotatable annular cam ring defining needle operating cams;

rotary drive means to drive said annular cam ring in order to provide for reciprocating motion of said needles in said slots;

a stationary support plate axially aligned with and disposed above said needle cylinder;

a plurality of hollow rotatable elongated feed tubes supported by said support plate and associated with said needles, said feed tubes being adapted to receive individual warp yarns approximately concentric with the center line thereof;

each of said feed tubes being provided with at least one aperture extending substantially laterally therethrough near one end thereof, said feed tubes being adapted to feed individual warp yarns to said needles through said apertures;

a driving member disposed above said needle cylinder and adjacent said feed tubes, each of said feed tubes being provided with a driven member whereby rotation of said driving member produces rotation of said driven members and said feed tubes;

said driving member being interconnected to said rotatable cam ring such that rotation of said cam ring produces rotation of said driving member;

at least one bobbin of elastic weft yarn mounted on said driving member for feeding weft yarn across the warp yarns;

a plurality of latch wires carried by said annular cam ring and which cooperate with said latch needles in order to prevent premature closure thereof when the latch needles are in a raised position;

weft yarn feed control means for controlling the feed of elastic weft yarn to said needle cylinder, said weft yarn being incorporated, unknit, in the spaced chain stitches of the warp wale;

said weft yarn feed control means comprising a feed take-up wheel mounted on said driving member, means to rotate said take-up wheel defined by a drive mechanism associated with said annular cam ring, said drive mechanism being defined by an idler wheel adapted to rotate with said annular cam ring and power transmission means to transfer rotary motion from said idler wheel to said take-up wheel, said power transmission means comprising a sprocket associated with said idler wheel and a sprocket associated with said take-up wheel and a chain interconnecting said sprockets;

adjustment means provided at said idler wheel in order to vary the circumference of rotation of said idler wheel and the speed of said idler wheel;

the relationship of said rotary drive means to said feed tubes and said annular cam ring of said needle cylinder being such that said warp yarns are fed to said needles during each circular rotation of said feed tubes.

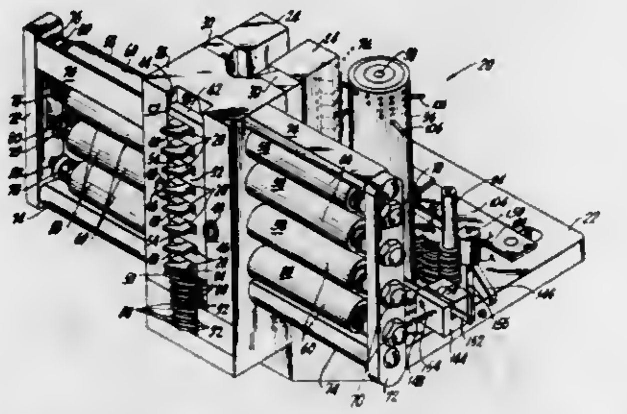
4,099,390
SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE

Juan Vinas, Middle Village, N.Y., assignor to Vinatex Knitting Systems, Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 520,417, Nov. 4, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 711,105

Int. Cl.^{2} D04B *15/78, 15/74*

U.S. Cl. 66—50 R **18 Claims**



1. A selection device for knitting machines having a rotating cylinder with slots around its circumference for accommodating knitting needles and associated needle jacks therein, said device comprising:

(a) a plurality of jack selector means each having a deflectable end portion and cam means spaced from a free end of said deflectable portion and integral therewith;

(b) support means for positioning said jack selector means relative to the cylinder whereby said free end of each said jack selector means operatively coacts with associated needle jacks;

(c) actuator means for deflecting selected ones of said jack selector means in accordance with a predetermined program, said actuator means including cam follower means for engaging said cam means and thereby deflecting said deflectable end portion of said jack selector means in a direction whereby the needle jack associated therewith is engaged and displaced; and

(d) means for changing said direction of deflecting said deflectable end portion including a comb-like member having a plurality of teeth defining comb slots therebetween, said deflectable end portion of each said jack selector means extending through said comb slots and being disposed against either of two opposite surfaces of adjacent teeth.

4,099,391
LATCH KNITTING NEEDLE AND METHOD OF MAKING SAME

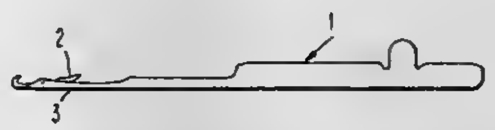
Masao Fukuhara, Nishimuro, Japan, assignor to Fukuhara Needle Co., Ltd., Wakayama, Japan

Filed Nov. 18, 1977, Ser. No. 852,785

Claims priority, application Japan, Jul. 6, 1977, 52-81176

Int. Cl.^{2} D04B *35/04*

U.S. Cl. 66—121 **6 Claims**



1. In a pivotted latch needle having a stem portion, a slot formed in said stem portion, a latch pivotally disposed in said slot for oscillating movement between its opened and closed positions, the said latch having a spoon-shaped end thereof, an improved seat in said needle to receive said spoon-shaped end of said latch therein when the latter is in its said opened position, said seat comprising a concave-shaped recess formed in said stem portion, the shape of the surface of said recess conforming to the shape of the exterior surface of an arcuate section of a right circular cone the axis of which is io a plane extending lengthwise of said slot.

4,099,392
YARN CUTTING AND GRIPPING DEVICE FOR A CIRCULAR KNITTING MACHINE

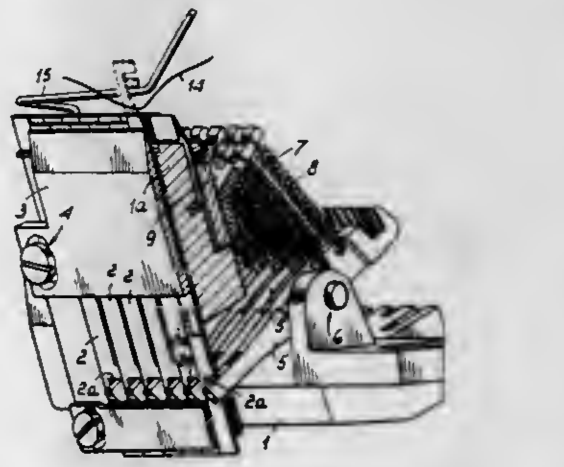
Francesco Lonati, Via Valsorda, 28, Brescia, Italy

Filed May 31, 1977, Ser. No. 802,096

Claims priority, application Italy, Jun. 21, 1976, 24512 A/76; Nov. 18, 1976, 29510 A/76

Int. Cl.^{2} D04B *15/60*

U.S. Cl. 66—140 R **10 Claims**



1. A yarn cutting and gripping device for a circular knitting machine, and particularly for a double-cylinder circular knitting machine, said device comprising a fixed blade, a plurality of adjacent strip-like elements, movable back-and-forth along the length thereof adjacently said fixed blade and each having a hooked end lying on the same plane as said strip-like elements, said hooked end having a cutting edge adapted to coop-

erate with said fixed blade to effect the cutting of the yarn, an elastically biassed body arranged on the opposite side to said fixed blade for pressing said strip-like elements against said fixed blade, said body acting as a gripping means for the yarn cut by the device, wherein each of said strip-like elements has, between said hooked end and remaining portion thereof, a lug spaced apart from said hooked end and extending substantially parallel thereto, the surface of said lug facing said fixed blade being recessed with respect to the plane of cutting by an extent substantially corresponding to the transverse dimension of the yarn to be cut and gripped.

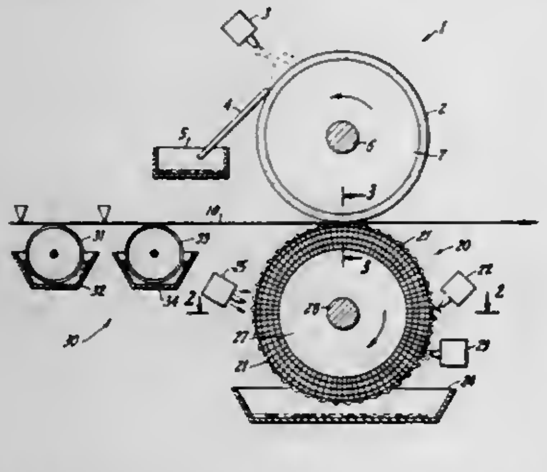
4,099,393
SPACE PRINT HEAD DRAW ROLLS

Alan Hedley Norris; Edwin Dwain Cromer, and Phillip Wayne Chambley, all of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 696,637, Jun. 16, 1976, abandoned. This applicatino Jul. 13, 1977, Ser. No. 815,080

Int. Cl.^{2} D06B *1/14, 15/02*

U.S. Cl. 68—22 R **9 Claims**



1. In a yarn space dyeing apparatus comprising a print mechanism for applying dye in a controlled pattern to yarn passing into contact therewith under tension between a feed roll and the nip of a first and second draw roll, said print mechanism including at least one print roll in communication with dye paste-containing vessel for spreading the dye paste on the yarn in a controlled pattern, said draw rolls including first and second counter-rotating rolls mechanically engaged with each other, said first roll including a core and a link wire sheath covering the exterior surface of said core, the links of said wire sheath being spaced apart to provide a coarse mesh and discrete points of substantially tangential contact between said first and second rolls; said second roll including a core and a resilient covering on the exterior surface of said second roll core; and means for rotating said first and second rolls in opposite directions whereby said draw rolls maintain tension in and advance the dye pasted yarn without displacing the pattern of the dye paste contained on said yarn.

4,099,394
BICYCLE CABLE LOCKING DEVICE

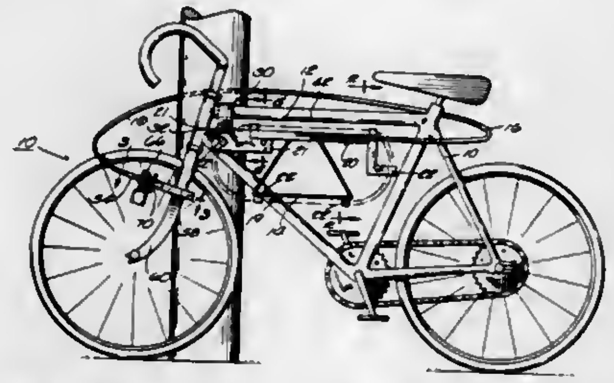
Laszlo Joo, 3002 W. Kilbourn Ave., Milwaukee, Wis. 53208

Filed May 31, 1977, Ser. No. 801,487

Int. Cl.^{2} E05B *71/00;* **B62H** *5/00*

U.S. Cl. 70—233 **4 Claims**

1. A bicycle locking device comprising a storage reel, connecting means for connecting said storage reel to a bike frame with said reel being located between the front wheel and seat, a flexible cable, first means for securing a first end of said cable to said reel, and second means for securing the other end of said cable to said bike frame, said second means comprising a socket adapted to be clamped to the bike frame, and said second means further including a plug on said second cable end receivable in said socket aperture and registrable openings on said plug and said socket to receive the shackle of a lock and wherein said connecting means for said storage reel comprises hinge means, which means affords movement of said reel relative to the bike frame between a swung out access position and a storage position partially within the outline of a bike frame.



4,099,395
TUMBLER PIN-TYPE CYLINDER LOCK

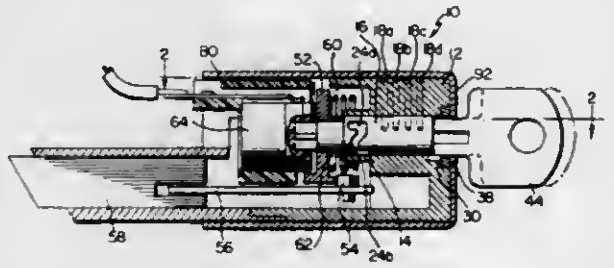
Roque Villareal Garza, Crozco y Berra 201-203, Ma. la Ribera, Mexico

Filed Apr. 13, 1977, Ser. No. 786,994

Claims priority, application Mexico, Apr. 27, 1976, 164449; Dec. 3, 1976, 167256

Int. Cl.^{2} E05B *27/04*

U.S. Cl. 70—360 **6 Claims**



1. A tumbler pin-type cylinder lock comprising a housing having a cylindrical bore therein, a plurality of tumbler pin bores in the housing normal to the cylinder bore and intersecting the same, a lock cylinder mounted in the cylinder bore for controlled axial or axial and radial movement relative to the housing, a key receiving slot in the lock cylinder, cylinder control tumbler pins mounted in the tumbler pin bores, a key having a profile conforming to the tumbler pin combination and a stop member, said stop member engaging a cooperating striker on the lock cylinder for axially moving the cylinder within the cylinder bore in the housing; wherein the stop member on the key comprises a portion of the profile conforming to the tumbler pin combination and the cooperating striker on the lock cylinder comprises one of the tumbler pins.

4,099,396
PICK-RESISTANT AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM

William J. Kerr, Madison, Wis., assignor to Chicago Lock Co., Chicago, Ill.

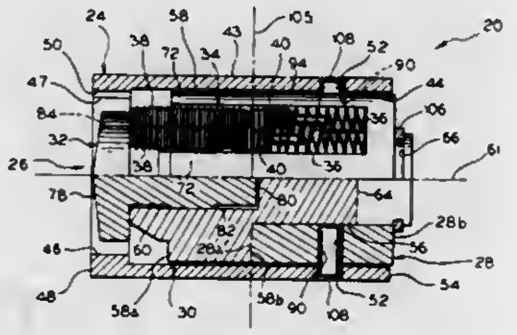
Filed Aug. 15, 1977, Ser. No. 824,442

Int. Cl.^{2} E05B *27/08*

U.S. Cl. 70—363 **16 Claims**

1. In an axial split-pin tumbler-type lock mechanism including a lock cylinder, a barrel assembly secured within said cylinder and having a longitudinal axis extending between front and rear ends thereof, said barrel assembly including a forwardly disposed operating part rotatable about said axis and a rearwardly disposed stationary part adjoining the operating part at a transverse interfacial plane, means forming longitudinal bores in said operating and stationary parts respectively, said bores in respective parts being movable into and out of alignment upon rotation of said operating part, tumblers each having a forwardly disposed driver element carried in one of said operating part bores and a separate rearwardly disposed follower element carried in one of said stationary part bores and the elements adjoining each other when in a pair of aligned bores, said tumblers each being reciprocally movable in the axial direction in a pair of aligned bores between positions wherein the joint between said elements thereof is disposed respectively on opposite sides of said interfacial plane, said operating part being freed for rotation when said joints coincide with said interfacial plane, and spring means yieldingly urging said tumblers in aligned bores forwardly to positions wherein said interfacial plane is bridged by said follower elements to secure the operating and stationary parts against relative rotation, said driver elements having front ends engageable with a key which when moved rearwardly moves said tumblers in aligned bores into positions wherein said joints coincide with said interfacial plane, the improvement which comprises:

- providing at least one combination of two adjacent ones of said pairs of aligned bores in longitudinal communication with each other to permit sidewise engagement of an element of a tumbler in one pair with an element of a tumbler in the remaining pair,
- providing mechanical interlock means on a side surface of an element of a tumbler disposed in each of said adjacent pairs of aligned bores, said interlock means on respective elements being adapted for engagement with each other to interengage the elements,
- whereby when one of said latter tumbler elements bridges said interfacial plane, application of picking torque to said operating part tends to move the elements laterally relative to each other to cause said interengagement thereof and thereby constrain the elements to move together as a unit in the axial direction.



4,099,397
SNAP-IN CYLINDER FOR DISC AND PIN TUMBLER CAM LOCKS

Robert L. Dauenbaugh, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.

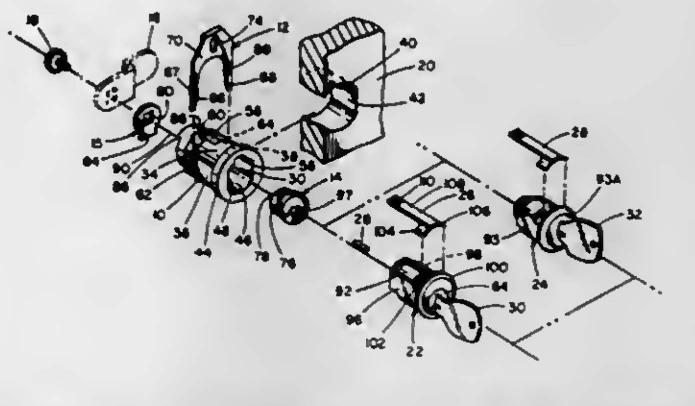
Filed Jan. 29, 1977, Ser. No. 811,307

Int. Cl.^{2} E05B *9/04*

U.S. Cl. 70—371 **14 Claims**

1. An improved lock assembly including a removable cylinder lock comprising, in combination:

- a sleeve including a centerline axis, an inside end, and outside end and a generally cylindrical opening therethrough with a radial slot from the opening through the side of said sleeve;
- a shifter in the opening rotatable about the axis of the sleeve;
- a bolt attached to the shifter at the inside end of the sleeve and projecting to engage a strike;
- a key operated cylinder lock positioned in the sleeve opening from the outside end including a projecting drive member for engaging and driving the shifter about the axis; and
- a removable, lock retainer member having one end engaged to the lock with the opposite end projecting through the radial slot and engaging the sleeve at the inside end.



4,099,398
LOCK KEY, METHOD FOR ITS MANUFACTURE AND LOCK EMPLOYING THIS KEY

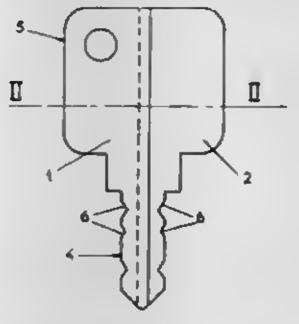
Paul Lipschutz, Croissy-sur-Seine, France, assignor to Societe Neiman SA, Courbevole, France

Continuation-in-part of Ser. No. 561,146, Mar. 24, 1975, abandoned. This application Mar. 24, 1977, Ser. No. 780,934

Claims priority, application France, Apr. 18, 1974, 74 13585

Int. Cl.^{2} E05B *19/04*

U.S. Cl. 70—406 **9 Claims**



1. A key comprising a manipulating head part and an integral lock operating part for insertion into a key receiving slot of a lock, an integral connecting part extending the full length of the key and connecting portions of said head part and said operating part on opposite sides thereof, said portions of said head and operating parts on one side of the connecting part lying in a common plane and the portions of said head and operating part on the other side of said connecting part also lying in a common plane, said integral connecting part including a longitudinally extending section disposed in a plane offset from that plane common to said portions of said head and operating parts on said one side of said connecting part, and wherein an edge of at least one of said portion of said operating part most remote from said connecting part is coded by notching and constitutes means cooperating with tumbler elments of a lock when said operating part is inserted into a key receiving slot of a lock.

4,099,399
METHOD AND APPARATUS FOR PRODUCTION OF HOT-FORMED METALLIC ROD

Milton E. Berry, and Daniel B. Cofer, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

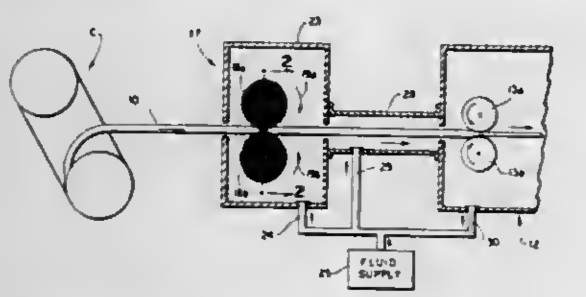
Continuation of Ser. No. 614,126, Sep. 17, 1975, abandoned. This application Jun. 16, 1977, Ser. No. 806,965

Int. Cl.^{2} B21B *9/00, 45/04*

U.S. Cl. 72—38 **10 Claims**

1. The improved method of hot-forming a metallic cast bar of the type wherein a continuous length of bar is conveyed

from a casting machine to a hot-rolling mill along a path which exposes said bar to an oxidizing atmosphere thereby forming metallic oxides on the exposed surface of said bar and wherein said bar is mechanically cleaned prior to entry into said rolling mill, the improvement comprising the steps of:



mechanically removing oxide from the surface of the bar while in a chemically reducing environment for limiting the amount of metal mechanically removed from the surface of the bar, thus minimizing mechanical damage and microporosity of the bar; and then maintaining the de-oxidized bar in a reducing environment at least until the bar is introduced into a rolling mill.

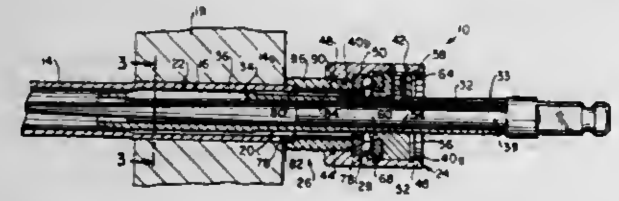
4,099,400
VERSATILE EXPANDING APPARATUS FOR TUBES AND THE LIKE

Donald E. Schott, Chester, Vt., assignor to Thomas C. Wilson, Inc., Long Island City, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,792

Int. Cl.² B21D *39/10*

U.S. Cl. 72—122 **12 Claims**



1. An apparatus for expanding an end portion of a tubular member positioned within an opening defined by an outer member, which comprises a generally elongated first housing having one end portion adapted to be rotatably inserted into the tubular member, means mounted in said housing for expanding the end portion of the tubular member outwardly in engaged relation with peripheral portions of the opening and for developing forces directed axially into the tubular member, a second housing adapted to be securedly positioned along pre-selected locations of said first housing and having at least a first open end portion positioned to face said outer member and the end portion of the tubular member, a reversible collar member having first and second free end portions adapted to be removably positioned within the opening of said second housing in at least one of two positions, the first position wherein the first free end portion is configured to be engaged at least with said outer member in a manner to permit the tubular member to be expanded so as to extend a predetermined distance outwardly of the said outer member and a second position wherein the second free end portion is configured to be engaged at least with said outer member to retain the end of the tubular member substantially continuous with surface portions of said outer member, means positioned within said second housing for engageably rotatably supporting said collar member to provide reaction forces to said collar member in a generally longitudinal direction with respect to said first housing during rotation thereof so as to maintain the preselected relation between said tubular member and said outer member as determined by the configuration of the free end portion of said reversible collar in any given position, and resilient means positioned within said second housing and being adapted to releasably retain either of said end portions of said reversible collar within said second housing for permitting said collar to be releasably installed and removed in response to generally axially directed forces.

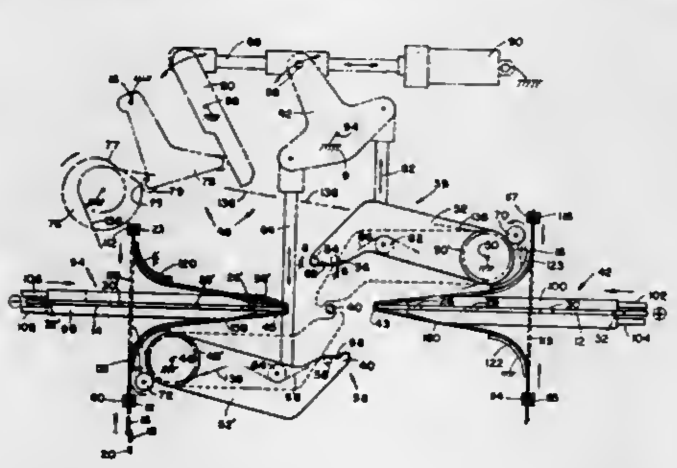
4,099,401
METHOD OF PRODUCING SPIRALLY WOUND ELECTROCHEMICAL CELLS

Leonard F. Hug, Wheatridge; Donald H. McClelland, Littleton, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 810,336, Jun. 27, 1977, which is a division of Ser. No. 733,674, Oct. 18, 1976, Pat. No. 4,064,725. This application Dec. 16, 1977, Ser. No. 861,157

Int. Cl.² B21C *47/12*

U.S. Cl. 72—147 **5 Claims**



1. A method for spirally winding electrode plates and separators into a cylindrical cell pack subassembly for inclusion in an electrochemical cell, comprising:

disposing in juxtaposition first and second retractable winding heads each carrying a driving surface for winding the electrode plates and separators into spiral form;

positioning a mandrel intermediate the winding heads and opposite each of the driving surfaces;

feeding a leading edge of one of the electrode plates, adjacent which is disposed at least one separator layer, in between the mandrel and the driving surface of the first winding head;

feeding a leading edge of the other electrode plate, adjacent which is disposed at least one separator layer, in between the mandrel and the driving surface of the second winding head;

locking the winding heads into winding position by advancing the winding heads toward one another and by sandwiching the plates and separators between each of the driving surfaces and mandrel; and

driving at least one of the driving surfaces while simultaneously retracting the winding heads away from one another whereby the spirally wound cell pack is formed.

4,099,402
STRETCH REDUCING OF HOLLOW STOCK

Horst Biller, Kettwig, Fed. Rep. of Germany, assignor to Mannesmannrohren-Werke, A.G., Dusseldorf, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,976

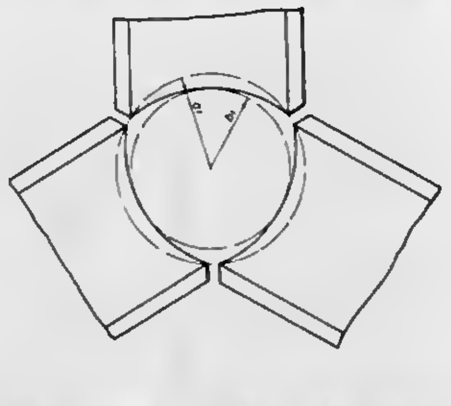
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528883

Int. Cl.² B21B *17/14*

U.S. Cl. 72—234 **2 Claims**

2. Method of stretch reducing pipes in a multiple stand rolling mill, comprising the steps of:

using three grooved rolls per stand with largest radius a and smallest radius b of each groove relative to a roll axis, whereby a ratio a/b from stand to stand for the major reduction passes changes by less than 0.4% and the difference between the largest and smallest values for the contact squeezed length in each pass remains below a particular value.



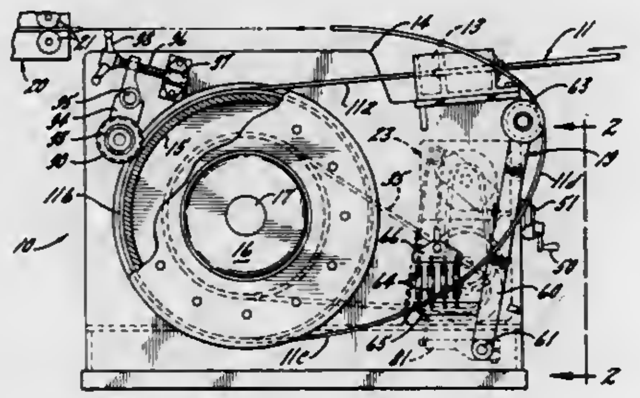
4,099,403
IN-LINE WIRE DRAWING MACHINE

Richard A. Alcock, and Robert M. Guthrie, both of Rockford, Ill., assignors to Rockford Manufacturing Group, Inc., Rockford, Ill.

Filed Feb. 28, 1977, Ser. No. 772,522

Int. Cl.² B21C *1/12*

U.S. Cl. 72—288 **6 Claims**



1. Apparatus for drawing a length of wire through a die and for supplying the wire to a using station, and apparatus comprising a support, a drum rotatably mounted on said support, said drum having an entrance end portion for receiving the wire from the die and having an exit end portion from which the wire is supplied to the using station, there being a coil of wire wrapped around said drum between said entrance and exit end portions with said coil being composed of a number of wraps in a single layer, a variable speed drive mechanism for rotating said drum thereby a draw wire onto said entrance end portion and to supply wire off of said exit end portion, said drive mechanism comprising a motor, an input pulley connected to be rotated by said motor, an output pulley connected to rotate said drum, and an endless belt connected between said pulleys to transmit rotation from said input pulley to said output pulley, each of said pulleys being adjustable in effective diameter and being operable when adjusted to change the speed of said output pulley and said drum, means for enabling the effective diameters of said pulleys to be manually adjusted so as to cause said drum to rotate at a selected speed, a sensing arm pivoted on said support and engaging the wire being supplied from the exit end portion of said drum to said using station in such a manner as to form such wire into a loop, said arm increasing the size of said loop when pivoted in one direction and permitting the size of said loop to decrease when pivoted in the opposite direction, means for biasing said arm in said one direction, and means connected between said arm and at least one of said pulleys and operable to change the effective diameters of said pulleys to decrease the speed of said drum when said arm pivots in said one direction and to increase the speed of said drum when said arm pivots in said opposite direction.

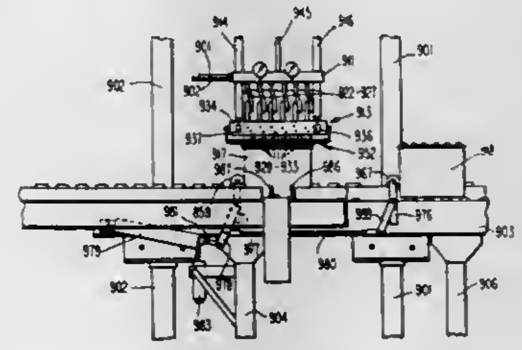
4,099,404
AUTOMATIC AIR LEAK TESTING APPARATUS AND METHOD FOR BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 605,271, Aug. 18, 1975, Pat. No. 4,010,840, which is a continuation-in-part of Ser. No. 475,273, May 31, 1974, Pat. No. 3,938,368. This application Jun. 2, 1976, Ser. No. 692,165

Int. Cl.² G01M *3/26*

U.S. Cl. 73—45.2 **14 Claims**



1. Automatic leak testing apparatus for leak testing battery cells in batteries having different longitudinal dimensions by periodically coupling and decoupling a nozzle assembly with said battery cells and introducing a predetermined amount of gas into said battery cells and monitoring the gas pressure in said cells, said apparatus comprising:

(a) a nozzle assembly movable to mate with at least one cell outlet of a battery,
(b) first conveyor means for longitudinally advancing said batteries, including a position for coupling said nozzle assembly to one of said batteries,
(c) sensing means for determining the longitudinal advancement of one of said batteries along said first conveyor means,
(d) stop means for isolating said one of said batteries and precluding the remainder of said batteries from interfering with the testing process, said stop means acting in response to the determination of said sensing means,
(e) means for sensing the longitudinal dimension of said one of said batteries, and
(f) said stop means thereby moving said one of said batteries to said position for coupling said nozzle assembly to one of said batteries in automatic response to said means for sensing the longitudinal dimension of said one of said batteries.

4,099,405
APPARATUS AND METHOD FOR TESTING PIPES FOR LEAKS, AND SEALS THEREFOR

Thomas D. Hauk, Huntington Beach, and Ernest D. Hauk, Signal Hill, both of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Dec. 12, 1975, Ser. No. 640,190

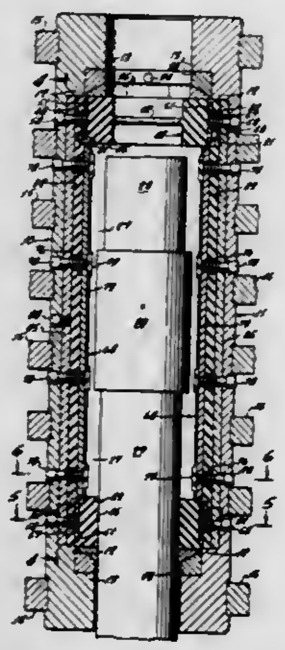
Int. Cl.² G01M *3/28;* F17D *3/04*

U.S. Cl. 73—46 **59 Claims**

1. Apparatus for detecting leaks in joints in pipe sections, which comprises:

(a) casing means adapted to open for lateral reception of a jointed pipe section, and then to close to define a chamber around at least one joint in said pipe section,
(b) means to lock said casing means in closed condition,
(c) means to seal said chamber without the necessity of employing a packer therein,

said seal means including a longitudinal strip seal for sealing a longitudinal joint between opposed regions of said casing means when the latter is in closed condition, said strip seal having a rubber body adapted to be deformed in response to closing of said casing means, and to be further deformed in response to creation of high fluid pressures within said chamber, said rubber body of said longitudinal strip seal having molded therein substantially non-deformable insert means adapted to cooperate with said longitudinal strip seal in sealing very high fluid pressures in said chamber,



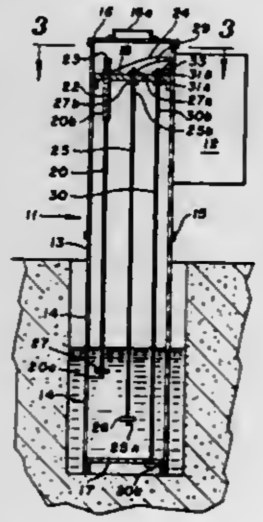
said seal means further, including end seal means provided around said pipe section at the ends of said chamber to prevent escape of high-pressure fluid longitudinally of said pipe section,

(d) means to create a very high fluid pressure in said sealed chamber, and

(e) means to indicate a reduction in the fluid pressure in said chamber, thus indicating the presence of a leak in a joint in said pipe section.

4,099,406
DEVICE FOR AUTOMATICALLY TESTING FLUID ABSORPTION RATES OF SOIL

Melvin A. Fulkerson, Burnsville, Minn., assignor to Hammer Industries Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 630,405, Nov. 10, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,922
Int. Cl.² G01N *5/02*
U.S. Cl. 73—73 **13 Claims**



1. A device for timing fluid absorption into soils to establish a rate of absorption, said device including:

a. a first, electrically conductive, longitudinally extending probe, of a first predetermined length and having a first and a second end;

b. a second, electrically conductive, longitudinally extending probe, of a second predetermined length shorter than that of said first probe and having a first and a second end;

c. a third, electrically conductive, longitudinally extending probe, of a third predetermined length shorter than that of said second probe and having a first and a second end;

d. means for mounting said first ends of said probes in generally planar relation such that said second ends of said probes will be displaced unequally from said mounting means;

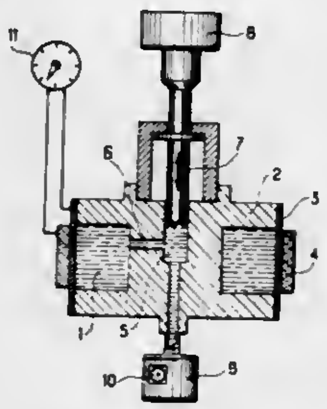
e. means supporting said mounting means with respect to the soil to be tested such that said probes may extending downwardly into a test hole into the soil to be tested;

f. a first timing means connected to said first and third probes and controlled by the conductivity therebetween for actuation of said first timing means in response to conduction between said probes provided by fluid within the test hole; and,

g. a second timing means connected to said first and second probes and controlled by the conductivity therebetween for actuation of said second timing means in response to conduction between said probes provided by fluid within the test hole.

4,099,407
METHOD FOR MEASURING THE PRE-STRESS IN HOOP-BOUND ANULUSES OF RECTANGULAR CROSS-SECTION AND MADE OF PIEZOELECTRIC CERAMIC MATERIAL

Henri Louit, Toulon, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France
Filed May 19, 1977, Ser. No. 798,720
Claims priority, application France, Jun. 9, 1976, 76 17453
Int. Cl.² G01N *3/36;* G01R *29/22;* G01N *33/38*
U.S. Cl. 73—88.5 R **1 Claim**



1. A method for measuring the pre-stress in a hoop-bound annulus having a rectangular cross-section and made of piezoelectric ceramic material, said method comprising the steps of:

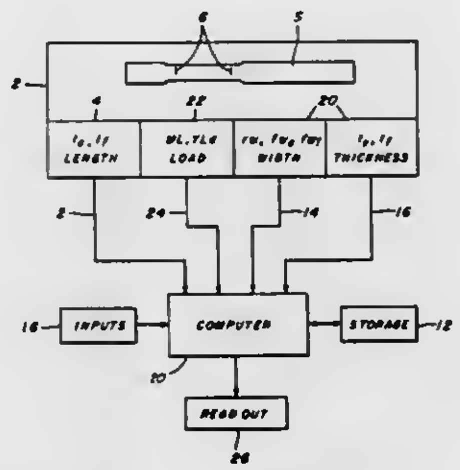
applying a pressure stress on the internal cylindrical surface of said annulus, said pressure stress having a main continuous component and a subsidiary sine-shaped component,

varying the main continuous component while keeping the maximum amplitude of said subsidiary sine-shaped component at a constant value, said main continuous component assuming several values,

and measuring the sinusoidal electric voltage generated across the annulus by the subsidiary component of said pressure stress for each value of the main continuous component, whereby, the main continuous pressure stress component which corresponds to the maximum value of said voltage is a measure equal, in absolute value, of the pre-stress due to binding.

4,099,408
METHOD FOR TESTING SHEET METALS

David C. Ludwigson, Hempfield Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Jul. 5, 1977, Ser. No. 812,974
Int. Cl.² G01N *3/08*
U.S. Cl. 73—95 **16 Claims**



1. A method for tensile testing a sheet metal specimen comprising the steps of

preparing the specimen to have a reduced width portion for a part of the specimen length to be tested, thereby defining a full width section and a reduced width section,

measuring the widths of the reduced width section and the full width section and the thickness of the specimen,

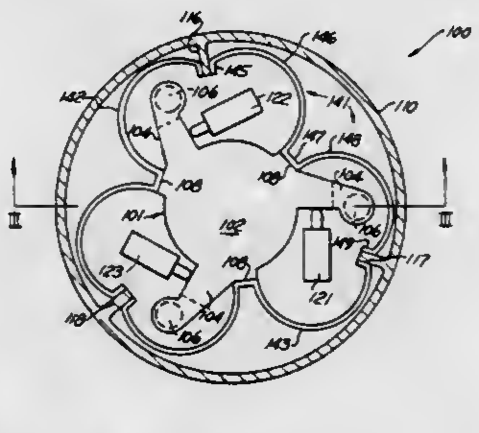
straining the specimen to failure,

measuring the thickness and width of the full width section, and

calculating the strain hardening exponent of the sheet metal from the thickness and width measurements.

4,099,409
MULTI-AXIS LOAD CELL WITH ARCUATE FLEXURES

James Junior Edmond, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed Jul. 5, 1977, Ser. No. 812,966
Int. Cl.² G01L *5/16*
U.S. Cl. 73—133 R **12 Claims**



1. A multi-axis load cell comprising:

a housing;

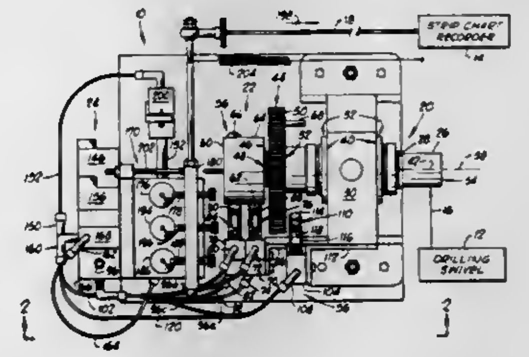
a hub disposed in said housing;

means for connecting said housing and said hub and for receiving and transmitting a load applied to said hub or said housing, said means including a plurality of one-piece flexures, each of the flexures having two ends, each end fixed to one of said housing and said hub, and each flexure has a medial portion coupled to the other of said housing and hub whereby a load applied to the hub or housing causes a displacement thereof by the movement of the connecting means, said displacement being related to the magnitude of the load applied; and

means for measuring the relative displacement between said housing and said hub and generating signals corresponding thereto, said measuring means mounted to one of said housing and said hub and engaging the other of said housing and said hub, whereby the load exerted through said flexures may be determined, said measuring means including a first set of transducers arranged in pin-wheel fashion about an axis of the load cell and a second set of transducers extending parallel to and about said load cell axis, all of said transducers in the first and second sets engaging the other of said hub and housing at points thereon in a substantially common plane.

4,099,410
RATE OF PENETRATION RECORDER

T. Edward Martin, Oklahoma City, Okla., assignor to Arthur J. Connelly, Farmington, N. Mex., a part interest
Filed Sep. 26, 1977, Ser. No. 836,409
Int. Cl.² E21B *45/00*
U.S. Cl. 73—151.5 **10 Claims**

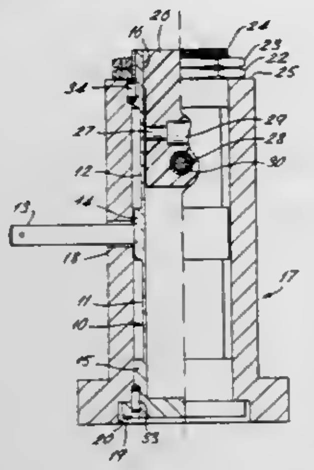


1. In a rate of penetration recorder having a primary shaft portion connected to a drilling swivel, the primary shaft portion rotating once in a first direction about the longitudinal axis thereof in response to the vertically downward movement of the drilling swivel a predetermined penetration distance, the improvement comprising:

sensor means, including a portion connected to the primary shaft portion of the recorder and responsive to the rotation thereof, the sensor means providing a set signal in response to the rotation of the primary shaft portion in the first direction to a predetermined set position, and providing a reset signal in response to the rotation of the primary shaft portion in the first direction to a predetermined reset position, the reset position being displaced from the set position a predetermined number of degrees of rotation of the primary shaft portion in the first direction; and,

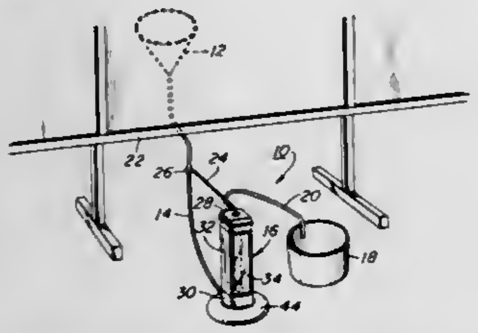
circuit means connected to the sensor means and being selectively positionable in mutually exclusive set and reset states, the circuit means receiving the set and reset signals, being positioned in the set state in response to receiving the set signal while positioned in the reset state, and being positioned in the reset state in response to receiving the reset signal while positioned in the set state, the circuit means providing a step-penetration signal indicative of the vertically downward movement of the drilling swivel the penetration distance in response to being positioned in the set state.

4,099,411
STRAIN MEASUREMENT
George Albert Woolvet, Kingston-opon-Thames, and Bryan Peter Tolley, Humberside, both of England, assignors to National Research Development Corp., London, England
Filed Mar. 23, 1977, Ser. No. 780,337
Claims priority, application United Kingdom, Mar. 24, 1976, 11851/76
Int. Cl.² G01L *1/10*
U.S. Cl. 73—141 R **14 Claims**



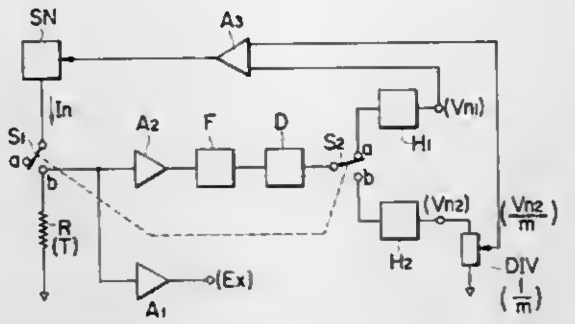
14. Apparatus for strain measurement, comprising:
- a cylinder;
- exciting means for vibrating the wall of said cylinder;
- loading means for longitudinally straining said cylinder wall by applying torsion to the cylinder, the applied torsion being dependent on a strain to be measured;
- means for so constraining said cylinder that its length cannot change freely; and
- means for providing a signal representative of the frequency of vibrations of said cylinder wall,
- the cylinder wall being of a thickness such that an appreciable change in said frequency occurs when longitudinal strains, dependent on strains within a range to be measured, are applied to said cylinder wall by said loading means.

4,099,412
METHOD OF MEASURING THE INSTANTANEOUS FLOW RATE OF URINE DISCHARGE
John Nehrbass, 4793 Lake Valley Dr., Lisle, Ill. 60532
Filed Jun. 17, 1977, Ser. No. 807,594
Int. Cl.² G01F *1/24*
U.S. Cl. 73—209 **5 Claims**



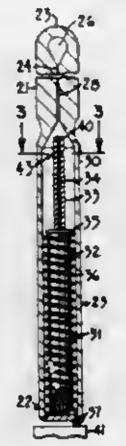
1. A method of measuring the instantaneous flow rate of a urine discharge from a patient, comprising the steps of
- connecting one end of a conduit to the inlet of a rotameter having an inlet at the bottom and an outlet at the top,
- positioning the other end of said conduit at a location above the outlet of said rotameter,
- filling said conduit and said meter with an aqueous solution until the level of said solution in said conduit is at the same height as said outlet, and then causing said discharge to flow freely into said conduit during the voiding of urine by said patient,
- whereby said rotameter indicates the instantaneous flow rate of said discharge.

4,099,413
THERMAL NOISE THERMOMETER
Akira Ohte, and Makoto Imamura, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan
Filed Jun. 13, 1977, Ser. No. 805,729
Claims priority, application Japan, Jun. 25, 1976, 51-75223; Jun. 25, 1976, 51-75225
Int. Cl.² G01K *7/30*
U.S. Cl. 73—359 R **10 Claims**



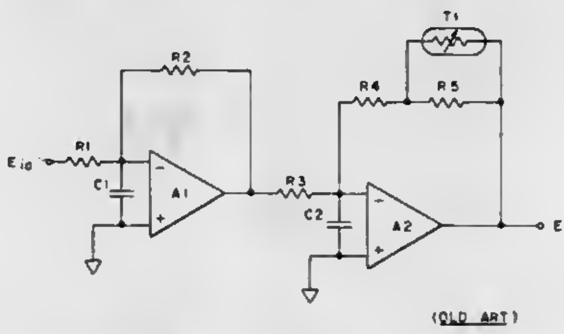
1. A thermal noise thermometer based on the principle that the magnitude of thermal noise signal produced in the resistor is a function of the temperature of the resistor, comprising:
- means to develop a shot noise signal;
- switch means to interruptedly apply said shot noise signal to said resistor;
- voltage-responsive means coupled to said resistor for producing output signals responsive to the voltage thereof in the different conditions of said switch means; and
- means coupled to the output of said voltage-responsive means for producing a measurement signal representing the temperature of said resistor.

4,099,414
AUTOMATIC RELEASE HOSPITAL THERMOMETER
Jon L. Krahmer, 511 E. Second, Fairmont, Minn. 56031
Filed May 19, 1977, Ser. No. 798,430
Int. Cl.² G01K *5/06, 1/14*
U.S. Cl. 73—373 **10 Claims**



1. In a clinical thermometer in which a thermometric liquid expands and contracts to give a meniscus which moves linearly in a stem with respect to fixed temperature graduations thereon:
- an elongated tube of transparent material characterized by a first temperature coefficient of expansion, and having a capillary bore connected at one end to a closed reservoir for liquid;
- temperature correlated graduations disposed in a scale along a first portion of said tube in contiguity to said bore;
- valve means including a member movable with respect to said tube between a normal position, in which limited passage is provided between said reservoir and said bore, and an actuated position in which substantially free passage is enabled between said reservoir and said bore;
- and a liquid in said reservoir having a greater coefficient of thermal expansion than said transparent material, the quantity of said liquid being such that as the ambient temperature rises within a predetermined range said liquid expands out of said reservoir into said bore in contiguity with said graduations, and said limited passage being so small as to prevent unaided movement of said liquid back into said reservoir, although permitting expansive movement of said liquid from said reservoir to said bore, so that as the ambient temperature falls, within said range, the body of liquid separates at the restricted passage said valve means being located in said reservoir and being magnetically actuable from without said reservoir.

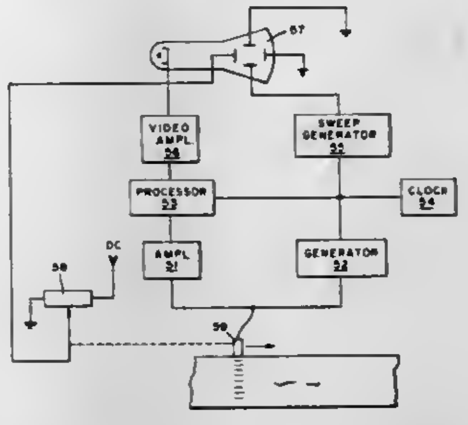
4,099,415
TEMPERATURE COMPENSATION CIRCUIT FOR A FLUID DAMPED SERVO SYSTEM
Robert Engene Hartzeil, Jr., Pittsburg, Calif., assignor to Systron-Donner Corporation, Concord, Calif.
Filed Sep. 1, 1977, Ser. No. 829,774
Int. Cl.² G01P *15/08;* G01D *11/12*
U.S. Cl. 73—497 **3 Claims**



1. A temperature compensation circuit for a fluid damped servo system operating within a predetermined temperature range, comprising
- a single operational amplifier having first and second input terminals and an output terminal,
- an input resistor connected to said first input terminal,
- a feedback path extending between said output terminal and said first input terminal,
- said feedback path including a thermistor and a temperature gain change resistor connected in parallel combination and a feedback resistor connected in series therewith,
- and a room temperature gain resistor connected between a circuit node between said feedback resistor and said parallel combination and said second input terminal,
- so that servo gain increases as fluid viscosity increases, whereby servo system operating parameters are maintained substantially the same over the predetermined temperature range.

4,099,416
RESOLUTION REAL-TIME ULTRASONIC IMAGING APPARATUS
Ludwig Niklas, Lovenich, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.
Filed Apr. 25, 1977, Ser. No. 790,407
Int. Cl.² G01N *29/04*
U.S. Cl. 73—602 **14 Claims**

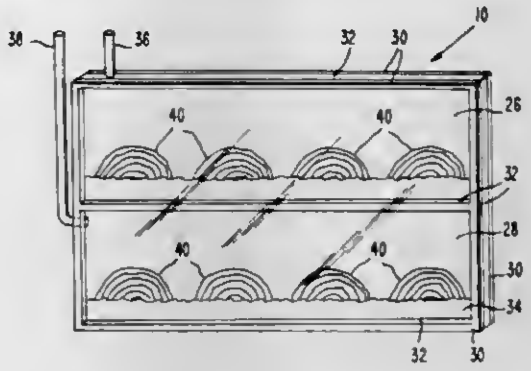
1. An apparatus for improving the resolution of a real-time ultrasonic imaging system comprising:
- electroacoustic probe means adapted to be acoustically coupled to a workpiece;
- energizing means coupled to said probe means for causing said probe means to periodically transmit an ultrasonic energy search signal in the workpiece and to receive echo signals therefrom and to convert said echo signals into electrical signals;
- receiver means coupled to said probe means for receiving said electrical signals and providing respective discrete echo amplitude signals (f_k) responsive to said electrical signals, wherein k is an integer and each signal f_k is commensurate with a depth increment in the workpiece;



- processor means including storage means for storing a sequence of acoustic beam profile values (d_v) commensurate with the characteristics of said probe means coupled to said receiver means for sequentially receiving said amplitude signals (f_k), associating respective stored beam profile values (d_v) with amplitude signals (f_k) and providing a sequence of output signals b_i commensurate with the equation:

$$b_i = \sum_k d_v \cdot f_k.$$

4,099,417
METHOD AND APPARATUS FOR DETECTING ULTRASONIC ENERGY
Stanley Shwartzman, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.
Filed May 25, 1977, Ser. No. 800,277
Int. Cl.² G01H *3/10*
U.S. Cl. 73—606 **10 Claims**



7. A method of detecting the energy level of a beam of ultrasonic energy being propagated through a fluid comprising:
- filling a chamber partially with a liquid, said chamber having two sides separated by a spacing no greater than about 25 millimeters and having a transparent section allowing for visual observation of the height of said liquid therein, the liquid having a viscosity lower than water and being disposed within said chamber so that the free surface of the liquid intersects said two sides, the sides having a width and height significantly greater than said spacing, and

positioning said chamber in said fluid so that said beam of energy strikes said liquid at the surface thereof from a direction substantially parallel to the plane of said free surface, whereby said beam generates a visible arc-shaped spray having an amplitude proportional to the energy level of said beam.

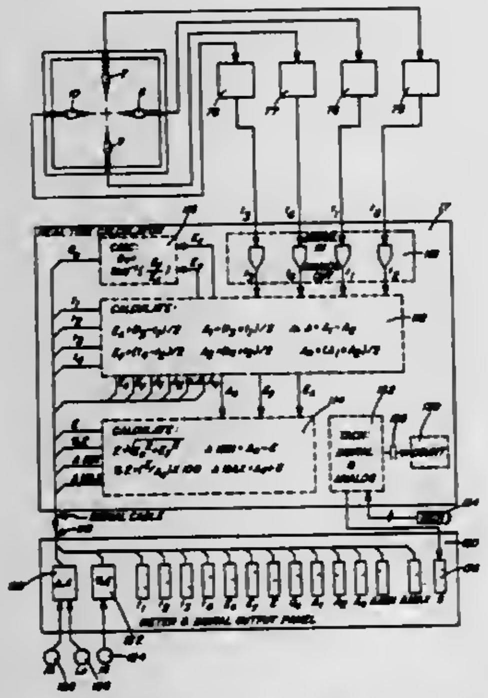
4,099,418
SYSTEM FOR DETERMINING TUBE ECCENTRICITY

Robert F. Bennett; Nicholaas L. Brouwer, both of Allegheny Township, Westmoreland County, and David M. Stricker, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 564,056, Apr. 1, 1975, Pat. No. 4,027,527. This application Feb. 28, 1977, Ser. No. 772,529

Int. Cl.^{2} G01N *29/04*

U.S. Cl. 73—622 **2 Claims**



1. Apparatus for continuously determining eccentricity of the wall of a tube when the average wall thickness of the tube is known, the apparatus comprising
a frame,
two sensors mounted on said frame for sensing the thickness of the wall of said tube, said sensors being supported by the frame adjacent the tube wall at two spaced locations with respect to each other, with the axes of the two sensors extending radially of and intersecting within the tube at a predetermined angle, the sensors being capable of producing output signals that are related to the thickness of the tube wall at the locations of the sensors and,
processing means for receiving the thickness related signals from the two sensors and translating these signals into vector components of eccentricity of the tube wall, and for summing said vector components to provide a signal related to the angular location of the eccentricity of the wall of said tube.

4,099,419
ULTRASONIC TOMOGRAPHY APPARATUS

Masao Kuroda, Tokyo; Toshio Kondo, Kunitachi; Toshio Ogawa, Kokubunji, and Sekijyuro Ono, Hachioji, all of Japan, assignors to Hitachi Medical Corporation, Japan

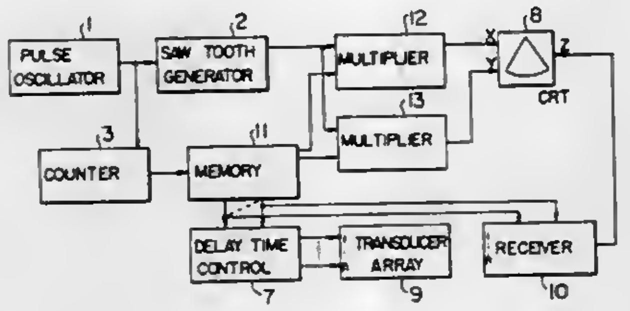
Filed Mar. 1, 1977, Ser. No. 773,171

Claims priority, application Japan, Mar. 5, 1976, 51-23276

Int. Cl.^{2} G01N *29/00*

U.S. Cl. 73—626 **7 Claims**

1. In an ultrasonic tomography apparatus of an electronic scanning type in which an array of ultrasonic transducer elements are excited with desired time delays allotted for the individual transducer elements thereby to transmit and receive ultrasonic beams at a deflection angle corresponding to said time delays, the received echo signal of said ultrasonic beams being displayed on a display means in a form of a tomograph of a sample to which said ultrasonic beams are directed,
the improvement comprising a memory means for previously storing therein first signals representing the time delays selectively allotted for said individual transducer elements in dependence on given deflection angles and second signals commanding display position on said display means, and a data accessing means for reading out said first and second signals corresponding to a desired deflection angle from said memory means, said signals read out through said data accessing means being utilized to provide said time delays for said transducer elements upon excitation thereof and to display said received echo signal on said display means.



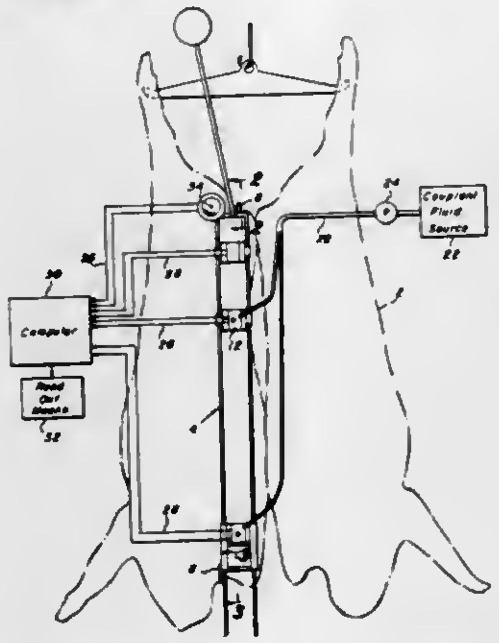
4,099,420
TRANSDUCER POSITIONING APPARATUS

James R. Stouffer, Ithaca, N.Y., and Rudy G. Westervelt, Florissant, Mo., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,260

Int. Cl.^{2} G01N *29/00*

U.S. Cl. 73—629 **7 Claims**



1. In an ultrasonic carcass inspection apparatus including at least one sonic transducer for inspecting an animal carcass that is supported by its hind legs,
the improvement which comprises
vertical frame means for mounting the sonic transducer adjacent the skin side of the carcass, said frame means including
(a) a pair of telescopically connected sections that are relatively vertically slidably displaceable between expanded and retracted positions, respectively;
(b) spring means biasing said frame sections toward their retracted positions, respectively;
(c) means for mounting the sonic transducer on one of said sections;
(d) first hook means for connecting one of said frame sections with the tail portion of the carcass; and
(e) second hook means for connecting the other of said frame sections with the jowl-shoulder junction of the carcass.

4,099,421
PUSHBUTTON TUNER

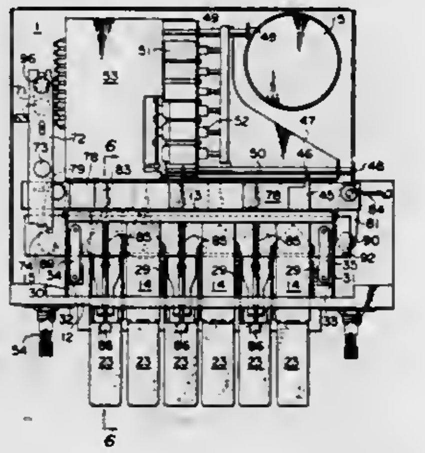
Tamaki Ohashi; Shigemasa Shosakai; Shohei Yamagishi, and Kunihiro Taniguchi, all of Tokyo, Japan, assignors to Nihon Technical Kabushiki Kaisha, Japan

Filed Apr. 2, 1976, Ser. No. 673,119

Claims priority, application Japan, Apr. 5, 1975, 50/40811

Int. Cl.^{2} F10H *35/18*

U.S. Cl. 74—10.33 **10 Claims**



1. In a pushbutton tuner having a support; a tuning element mounted on the support to establish a tuning frequency and including a movable part which is movable to a position corresponding to a desired tuning frequency; a manually rotatable actuator assembly for selectively adjusting the tuning element to a position corresponding to the desired tuning frequency; a clutch assembly for normally operatively connecting the manually rotatable actuator assembly with the tuning element; a plurality of presettable pushbutton actuator assemblies each operable to selectively adjust the tuning element to a position corresponding to a particular tuning frequency that is different from the tuning frequency established by any of the remaining pushbuttons; and clutch trip means for releasing the connection between the manually rotatable actuator assembly and the tuning element in response to operation of any one of the pushbutton actuator assemblies: the improvement wherein each of the pushbutton actuator assemblies comprises a slide mounted on the support so as to be slidably movable between a forward inoperative position and a rearward operative position and normally biased into the inoperative position, a control member pivotally mounted on the slide and being adjustably positionable relative thereto and having an upstanding pin mounted thereon, a preset member for releasably locking the control member to the slide, and a pushbutton carried by the preset member and having a forward end of the slide slidably received therein; the pushbutton actuator assemblies being disposed in a direction transverse to the movable part of the tuning element, the movable part being formed by a flat plate having formed therein a plurality of V-shaped notched cam edges each of which is associated with the respective pushbutton actuator assemblies and in each of which is located the upstanding pin of the control member so that movement of a particular pushbutton actuator assembly to its operative position causes the movable plate to be adjusted to a position corresponding to a particular frequency which is determined by the positioned control member; the pushbutton actuator assemblies being disposed in two sets, each set being disposed in a complementary manner on the opposite side of the movable plate from the other set such that each of the notched cam edges defines a recess formed in the movable plate and opening to the same side as the corresponding pushbutton actuator assembly, and each of the pushbutton actuator assemblies being arranged so that the upstanding pin on the control member carried thereby is located within the associated cam edge in the movable plate; said clutch trip means including a shift member which extends substantially parallel to the movable plate and mounted on the support so as to be movable in the lengthwise direction thereof, a plurality of cams on said shift member each associated with one of the pushbutton actuator assemblies, and a plurality of drive members each associated with one of the pushbutton actuator assemblies and each extending in the same direction as the slide of the corresponding pushbutton actuator assembly and slidably mounted on the support so that normally its one end is in bearing relationship with the rear surface of the pushbutton and its other end located to be engageable with the cam so that movement of a particular pushbutton actuator assembly causes the drive member to move axially thereof as the pushbutton is moved thereby driving the shift member to trip the clutch assembly.

4,099,422
OIL RESISTANT TOOTHED BELT

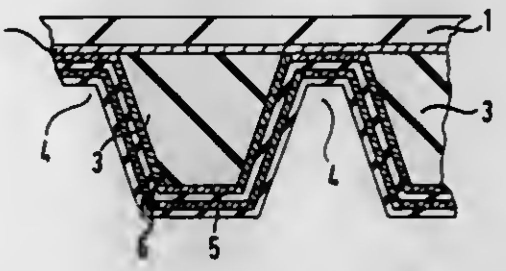
Mario Cicognani, Milan, and Bruno Mirabelli, Varese, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Nov. 15, 1976, Ser. No. 742,073

Claims priority, application Italy, Dec. 5, 1975, 30002 A/75

Int. Cl.^{2} F16G *1/00*

U.S. Cl. 74—231 C **4 Claims**



4. A toothed belt comprising an elastomeric continuous band, a reinforcing structure embedded in said band, a toothing on at least one face of the band and a covering for the toothing constituted by at least two layers of fabric doubled together with a layer of elastomeric material interposed therebetween, said covering being an extremely rigid layer which is substantially non-deformable by flexion stresses in comparison with the elastomeric or plastic material forming the toothing, said band, toothing and covering being an elastomeric composition which is resistant to hot oil.

4,099,423
COMPATIBLE SPROCKET AND CHAIN SYSTEM

Max Mullins, c/o Nel Mullins, 13700 N.E. Miami Court, Miami, Fla. 33161

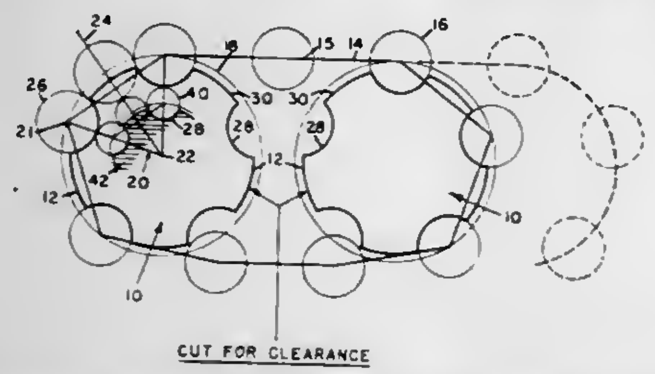
Filed Jun. 21, 1977, Ser. No. 808,470

Int. Cl.^{2} F16H *55/30;* F16G *13/02*

U.S. Cl. 74—243 R **3 Claims**

1. A compatible sprocket and chain system wherein each sprocket (18) has an odd number of teeth (30), there being a minimum of five teeth, and the chain (14) has an odd number of links (15) and rollers (16), there being a minimum of nine links (15) and rollers (16), wherein the shape of the sprocket of the sprocket is set up with twice the number of circles, as the desired number of sprocket teeth (12), the circles (26) being arranged circumferentially and contacting each other on a sprocket blank (18), then cutting into the blank the recesses (28) provided by alternate circles (26) and discarding the intermediate circles, the chain (114) having link rollers (16) of the

same radius as the cut-in recesses (28) of the sprocket blank (18), the sprocket edge being cut away a reasonable distance,



between the recesses, to permit clearance of the link rollers (16).

4,099,424

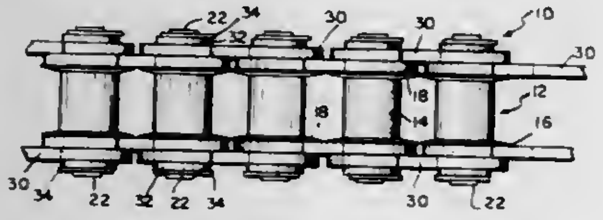
CHAIN DRIVE

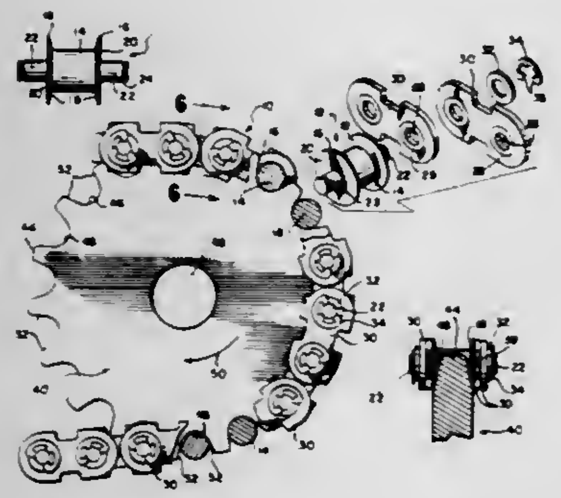
Robert E. Pemberton, R.R. #2, Box 123, Edinburg, Ind. 46124

Filed Jun. 24, 1976, Ser. No. 699,463

Int. Cl.² F16G *13/06, 15/12*

U.S. Cl. 74—251 R **19 Claims**





1. A drive chain comprising a plurality of one-piece roller links each having a cylindrical central roller with a generally circular cross section and a pair of journals extending outwardly from the opposed ends thereof and axially aligned with said central roller; a plurality of side plates each having a pair of journal-receiving holes provided therein, said side plates being mounted in an overlapping, staggered fashion on the journals of adjacent roller links to form the drive chain; and means for retaining said side plates on said journals.

8. A drive chain as set forth in claim 1 wherein each of the journal-receiving holes in each of said side plates has a self-lubricating bushing carried therein, said self-lubricating bushing having an opening formed therein for receiving one of said journals.

4,099,425

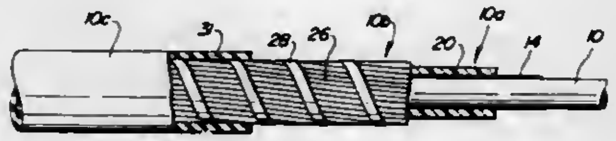
METHOD OF MAKING PUSH-PULL CABLE CONDUIT AND PRODUCT

Bruce H. Moore, Kent, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Jun. 1, 1976, Ser. No. 691,499

Int. Cl.² F16C *1/10*

U.S. Cl. 74—501 P **20 Claims**



1. The method of making a push-pull cable conduit comprising continuously moving a tubular mandrel core of flexible material through a cross head extruding die, forming a thin tape of micro-porous fluorocarbonated resin continuously into a cylindrical covering over the mandrel as it enters the extruding die, extruding an outer layer of polymeric material over the cylindrical covering in the presence of heat to bond said material to said covering by penetration of said material into the pores of the covering, and subsequently removing the mandrel core.

4,099,426

HYDRODYNAMIC TRANSMISSION FOR VEHICLES

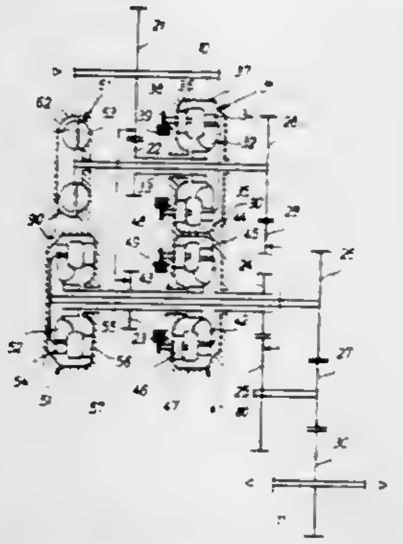
Rolf Keller, and Erich Polzer, both of Heidenheim, Brenz, Fed. Rep. of Germany, assignors to Voith Getriebe KG, Heidenheim, Brenz, Fed. Rep. of Germany

Filed Aug. 19, 1976, Ser. No. 715,981

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537431

Int. Cl.² F16H *47/00;* **F16D** *33/00, 67/04;* **B60K** *41/26*

U.S. Cl. 74—730 **11 Claims**



1. In a transmission, particularly in a transmission for vehicles, a combination comprising rotary input means; reversible rotary outpnt means; forward and reverse drive trains each including an adjustable starting fluid flow converter, a first

mechanical power train common to and connecting said converters with said input means and a second mechanical power train connecting said converters with said output means, said converters being closely adjacent to each other and each thereof comprising a rotary primary element and a rotary secondary element, said first power train comprising a first gear train connecting said primary elements to each other and said second power train comprising a second gear train connecting said secondary elements to each other, said forward drive train further including a cruising fluid flow converter coaxial with the starting converter of said forward drive train and having a discrete secondary element which is coaxial with the secondary element of the starting converter of said forward drive train, each of said converters comprising a working circuit which is rendered operative in response to admission of working fluid and ineffective in response to evacuation of working fluid; a third power train connecting the secondary element of said cruising converter with said output means; a hydrodynamic brake having an annulus of blades in such orientation that said brake is effective only when said output means is rotated in the forward direction, said brake being coaxial with the starting converter of said reverse drive train and further comprising a rotor which rotates with the secondary element of said last mentioned starting converter; means for actuating said brake when the RPM of said output means exceeds a predetermined value; and means for evacuating working fluid from said cruising converter, said actuating means comprising means for operating said evacuating means simultaneously with actuation of said brake when said output means is rotated by said cruising converter.

4,099,427

PLANETARY GEARING

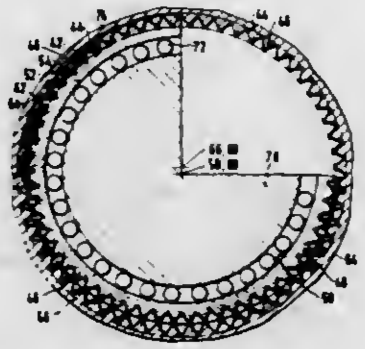
Kurt Gerhard Fickelscher, Frankenthal, Germany, assignor to Balcke-Durr AG, Ratingen, Germany

Filed Oct. 12, 1976, Ser. No. 731,532

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545681; Nov. 14, 1975, 2551083; Apr. 24, 1976, 2617951

Int. Cl.² F16H *1/28*

U.S. Cl. 74—804 **44 Claims**



1. Planetary gearing comprising a toothed planet gear, a pair of toothed central gears meshing with said toothed planet gear said central gears being of similar construction except that they have a respectively different number of teeth forming virtual tooth rows one with the other, and a cam disc rotatable about an axis and operatively connected with said toothed planet gear for guiding and driving the same, all of said gears having teeth of substantially triangular cross section and flat tooth flanks, each of said virtual tooth rows having tooth gap points disposed on a closed virtual addendum curve having a center of mass located on said axis of rotation of said cam disc, said teeth of said planet gear flatly engaging on both sides thereof the flanks of at least one of said virtual tooth rows, said one virtual tooth row having a pitch equal to that of the tooth row of said planet gear so that, in a limiting case, all of the teeth except for the difference in the numbers of teeth of the central gears are in force-transmitting engagement.

4,099,428

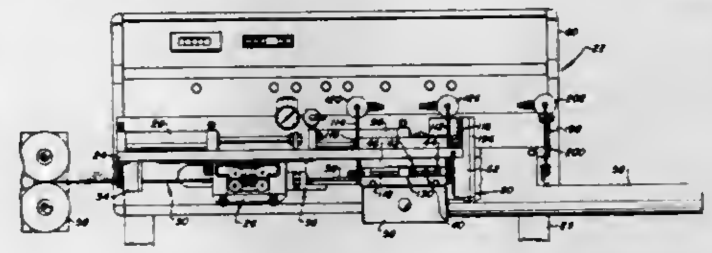
CUTTING AND INSULATION STRIPPING APPARATUS FOR TWISTED WIRE PAIR

Robert B. Senior, Grand Haven, and Frederick Karasinski, Grand Rapids, both of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Division of Ser. No. 656,239, Feb. 9, 1976, Pat. No. 4,043,362. This application May 25, 1977, Ser. No. 800,499

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.51 **11 Claims**



1. An insulation cutting mechanism for cutting the insulation of each wire of a wire pair comprising:
- a pair of opposed insulation cutting blades disposed substantially for reciprocating movement toward and away from each other between open and closed positions;
- actuator means for moving said insulation cutting blades toward and away from each other;
- a first pair of cams disposed for movement to engage the wires of said wire pair for moving said wires toward a position for cutting the insulation by said insulation cutting blades; and
- a second pair of cams movable with respect to said first pair of cams for engaging said wires sequentially after said wires have been engaged by said first pair of cams to move said wires further toward said position.

4,099,429

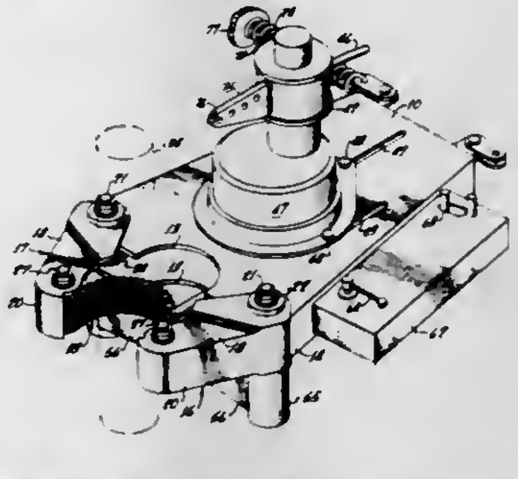
PIPE-SPINNING APPARATUS AND METHOD

Ernest D. Hauk, Signal Hill, Calif., assignor to Service Equipment Design Co., Inc., Signal Hill, Calif.

Continuation of Ser. No. 238,069, Mar. 27, 1972, abandoned. This application Sep. 22, 1975, Ser. No. 615,597

Int. Cl.² B25B *13/52*

U.S. Cl. 81—57.17 **23 Claims**



1. Apparatus for spinning pipe, which comprises:
(a) first and second sprocket wheels,
(b) a chain,
    said chain being a closed loop having an external portion and also having an inverse internal portion disposed within said external portion,
        said external and internal chain portions connecting to each other at return-bent portions which are respectively meshed with said first and second sprocket wheels and bend therearound,
    said chain having a large number of leaf-links the end portions of which are pivotally connected to the end portions of adjacent links,

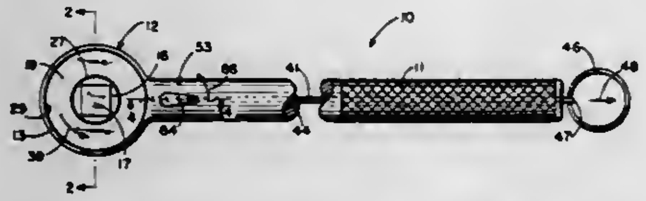
each of said leaf-links having teeth on one side thereof adapted to mesh with said sprocket wheels,
each of said leaf-links having an elongated bearing edge on the other side thereof adapted to engage the exterior surface of a pipe to be spun,

(c) means to effect relative movement between the axes of said sprocket wheels to thereby cause said wheels to be either relatively remote from each other or relatively adjacent each other,
said last-named means being such that when said wheels are relatively remote from each other said pipe may be passed laterally between said wheels and into surface engagement with said bearing edges of said leaf-links in said internal portion of said chain,
said last-named means also being such that when said wheels are relatively adjacent each other said bearing edges of the leaf-links in said internal portion of said chain are in surface engagement with a major portion of the circumferences of said pipe, and

(d) means to drive said chain to thereby spin said pipe,
said drive means comprising a drive sprocket wheel meshed with said chain, and means to lock the axis of said drive sprocket wheel in a fixed position when a pipe of predetermined diameter is being spun by said apparatus.

4,099,430
REWIND RATCHET WRENCH

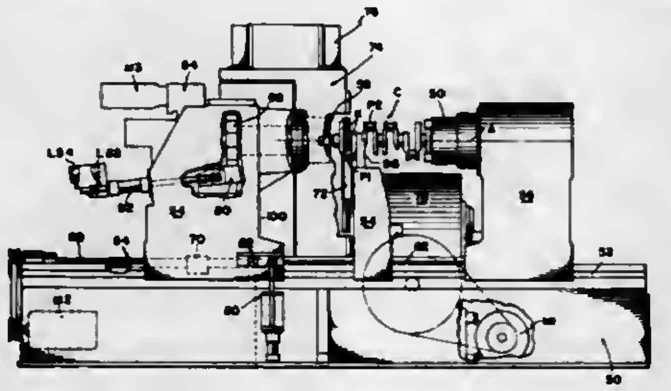
Roger D. Stodola, Rte. 1, Becker, Minn. 55308
Filed Dec. 23, 1976, Ser. No. 754,077
Int. Cl.² B25B *13/00*
U.S. Cl. 81—58.1 **4 Claims**



1. In a wrench for rotating a socket or the like having an elongated handle with an annular head at one end and a longitudinal passage through the handle, said head having a cavity receiving a rotatable drive member having a drive projection, a sleeve in said cavity surrounding said rotatable member, one-way clutch means operable between said member and sleeve, a cable wound around the sleeve and extending outwardly through said handle passage for turning the sleeve and clutched drive member in one direction when pulled outwardly through said passage, and spring means coupled between said head and said sleeve biasing the sleeve to turn declutched in the other direction to rewind the cable around the sleeve,
the improvement therein comprising:
said drive member having axially spaced radially outwardly extending annular flanges defining therebetween a circumferential groove,
said one-way clutch means including an annular series of inclined ramps on said drive member between said flanges, a plurality of inclined ramps on said sleeve in concentric relation to said drive member, and a plurality of rollers disposed between said ramps and lying within and retained by said drive member groove,
said head includes an annular inwardly extending flange at one end of said cavity,
said sleeve includes an inwardly extending annular flange at one axial end thereof substantially engaging said head flange so as to restrict axial movement of said sleeve theretoward,
one of said drive member flanges includes a portion thereof substantially engaging said sleeve flange so as to restrict axial movement of said drive member theretoward, and,
means at the other end of said cavity and said sleeve to preclude axial movement of said sleeve and said drive member, respectively, therepast, thereby to maintain said wrench in assembled relation.

4,099,431
INTERNAL MILLING MACHINE FOR MILLING CRANK PINS

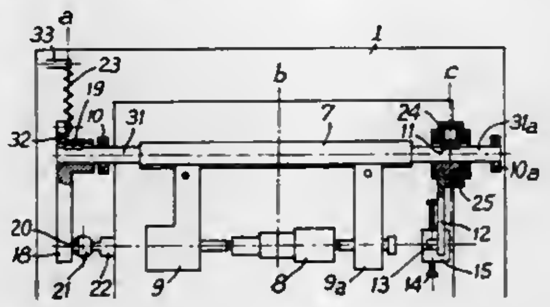
David L. Kreucher, Frankenmuth, Mich., assignor to The Wickes Corporation, Saginaw, Mich.
Filed Jan. 31, 1977, Ser. No. 764,067
Int. Cl.² B23B *5/18;* B23C *3/06*
U.S. Cl. 82—9 **23 Claims**



20. The method of milling crank pins on a crankshaft comprising the steps of axially and rotatively indexing the crankshaft to successively locate each of the crank pins at a single fixed milling position, and passing an internal milling cutter in orbital movement about each crank pin in milling contact with the crank pin while the crank pin is located at said milling position.

4,099,432
APPARATUS FOR CONTROLLING THE POSITION OF A TEMPLATE FOR A COPYING MACHINE

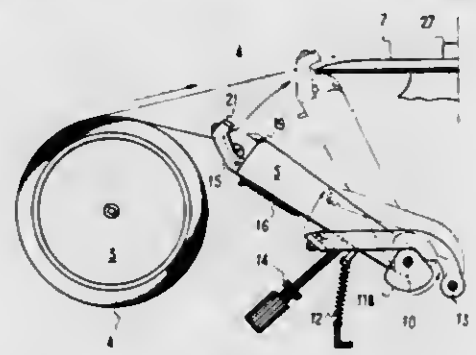
Marcel Champeau, and Andre Pelletier, both of Niort, France, assignors to Societa RAMO S.A., Niort, France
Filed Apr. 13, 1977, Ser. No. 787,159
Claims priority, application France, May 6, 1976, 76 13631
Int. Cl.² B23B *3/28*
U.S. Cl. 82—14 A **4 Claims**



1. In apparatus for controlling the position of a template for a copying machine, permitting the effecting of at least one roughing pass on an adjustable stop and a finishing pass, using a template co-operating with a feeler of a copying apparatus for the control of the tool holder carriage, the template being rockingly mounted on the ends of arms fixed at their other ends to a rod rockably mounted on the frame of the machine, the improvement comprising the rod in rotation said drive means including a drive member capable of selectively bringing in contact a first lever, means for temporarily fixing said first lever to the rod, a series of ronghing stops mounted on a hub for defining the roughing passes, a second lever fixed to the rod, a micrometric precision stop for the finishing pass, and drive means effective to bring selectively said first lever into contact with one of said roughing stops or the second lever into contact with said micrometric precision stop.

4,099,433
APPARATUS FOR PROVIDING ADHESIVE STRIPS OF PREDETERMINED LENGTH

Teruhide Muto, Tokyo, Japan, assignor to Shinko Industries Co., Ltd., Tokyo and Toyonaka Kosakusho Co., Ltd., both of, Japan
Filed Jul. 13, 1977, Ser. No. 815,275
Claims priority, application Japan, Jul. 14, 1976, 51-83801
Int. Cl.² B65H *45/14*
U.S. Cl. 83—155 **10 Claims**

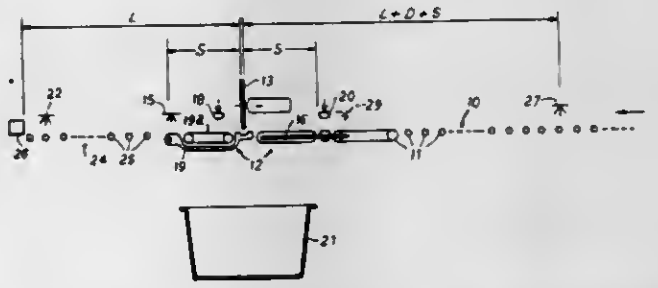


1. Apparatus for providing adhesive strips of predetermined length comprising in combination:
a rotatably mounted support member for a roll of adhesive tape;
means for supporting a plurality of adhesive strips which have been cut to a predetermined length;
a feed member pivotably supported for pivotal movement between a first position adjacent said adhesive tape support member and a second position adjacent said adhesive strip support means, said feed member being provided with a cutter plate and a cutter bar movable longitudinally thereof and cooperable with said cutter plate to cut the adhesive tape into strips of predetermined length;
means carried by said feed member for retaining the free end of the adhesive tape of said roll;
a lever rod carried by said feed member movable longitudinally thereof and operably connected to said tape retaining means;
and a plurality of cam means drivable to sequentially move said feed member, tape retaining means, cutter bar and adhesive strip support means; whereby predetermined lengths of adhesive tape are serially withdrawn from said tape support member by pivotal movement of said feed member from said first position to said second position and positioned on said adhesive strip support means, and cut into strips of predetermined length of said cutter bar in cooperation with said cutter plate upon return of said feed member to said first position.

4,099,434
SAWING APPARATUS

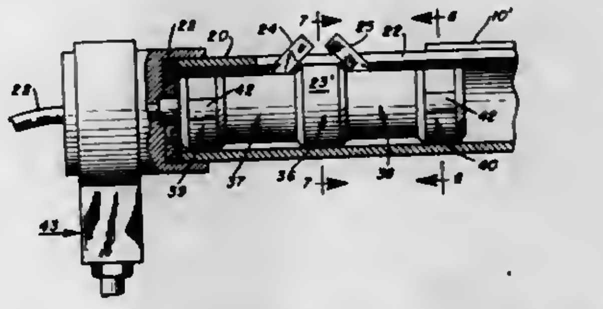
Jean Pierre Hardouin, Luisant, France, assignor to Alcan Research and Development Limited, Montreal, Canada
Filed Feb. 15, 1977, Ser. No. 768,832
Claims priority, application United Kingdom, Feb. 26, 1976, 7729/76
Int. Cl.² B23Q *3/06*
U.S. Cl. 83—157 **5 Claims**

1. Sawing apparatus comprising a saw, a saw table across which the saw can be traversed, and which includes first and second parts extending respectively on opposite sides of the line of movement of the saw, means for inclining each of said two parts independently of the other to tip material off that part, and a releasable clamp at the same side of said line of movement of the saw as said first saw table part for clamping the lengths of material against movement lengthwise of themselves, the said second saw table part having a nose portion which projects a short distance on said same side of the line of movement of the saw at the general level of the table.



4,099,435
CUTTING KNIFE FOR WINDING MACHINES

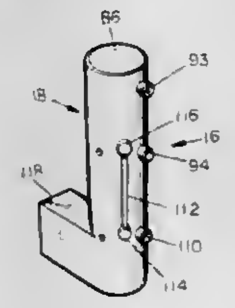
Roger W. Young, Upper Montclair, N.J., assignor to John Dusenbery Company, Inc., Clifton, N.J.
Filed Feb. 28, 1977, Ser. No. 773,080
Int. Cl.² B26D *5/12*
U.S. Cl. 83—614 **9 Claims**



1. A cutting knife arrangement for use in severing relatively thin webs of material, said arrangement comprising:
a. a supporting tube having a longitudinally extending slot formed in the wall thereof,
b. a shuttle slidably positioned within the tube and normally disposed at one end thereof,
c. cutter means carried by the shuttle and extending through the said slot, said
d. means for reducing the air pressure within the tube between the shuttle and the other end of the tube, thereby to move the shuttle to the other end of the tube.

4,099,436
APPARATUS FOR PIERCING SHEET MATERIAL

Donald Joseph Beneteau, 1333 Front Rd. South, Amherstburg, Ontario, Canada
Filed Apr. 11, 1977, Ser. No. 786,299
Int. Cl.² B26D *5/12*
U.S. Cl. 83—617 **11 Claims**



1. Apparatus for piercing sheet material comprising means forming a first chamber, a first piston in said first chamber, a first piston rod connected to said first piston and extending out of said chamber, a punch affixed to an end of said piston rod, means forming a second chamber, a second piston in said

second chamber, a second piston rod connected to said second piston and extendable into said first chamber, first passage means for directing liquid to said first chamber on the side of said first piston opposite said first piston rod, second passage means for directing gas to said second chamber on the side of said second piston opposite said second piston rod, third passage means for directing fluid to both of said chambers on the sides of said first and said second pistons having said first and said second piston rods, means for sensing the pressure of gas in said second chamber on the side of said second piston opposite said second piston rod, and means responsive to said sensing means for supplying fluid through said third passage means to said chambers and for exhausting gas from said second chamber on the side of said second piston opposite said second piston rod upon a sudden drop in the pressure of the gas sensed by said pressure-sensing means.

4,099,437

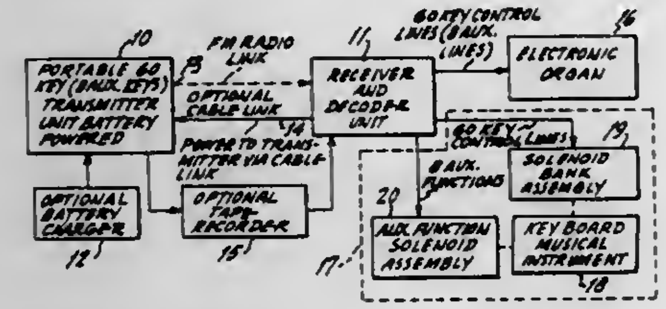
REMOTE CONTROL WIRELESS KEYBOARD MUSICAL INSTRUMENT

Paul Constantine Stavrou, Allentown, Pa., and William Frederick Slack, Byram Township, Sussex County, N.J., assignors to Jerry L. Noury, Jr., New York, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,595

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **31 Claims**


10
PORTABLE 60 KEY (8 AUX. KEYS) TRANSMITTER UNIT BATTERY POWERED
FM RADIO LINK
13
OPTIONAL CABLE LINK
14
POWER TO TRANSMITTER VIA CABLE LINK
11
RECEIVER AND DECODER UNIT
60 KEY CONTROL LINES (8 AUX. LINES)
16
ELECTRONIC ORGAN
60 KEY CONTROL LINES
19
SOLENOID BANK ASSEMBLY
8 AUX. FUNCTIONS
20
AUX. FUNCTION SOLENOID ASSEMBLY
KEY BOARD MUSICAL INSTRUMENT
18
17
OPTIONAL BATTERY CHARGER
12
OPTIONAL TAPE RECORDER
15

1. A remote control wireless keyboard musical instrument, comprising:

a musical device having a plurality of musical sound actuating elements, each element when actuated generating a corresponding musical sound;

a portable transmitter having a plurality of keys, each key corresponding to said actuating elements having an electrical switch coupled thereto and actuatable thereby;

electronic switching means for scanning said switches at a first relatively high rate of speed to ascertain which of said switches are actuated;

scan inhibiting means for temporarily interrupting the operation of said scanning means when an actuated switch is detected by said scanning means;

transmitting means coupled to said electronic switching means and responsive to said scan inhibiting means for causing the wireless transmission of a serial digital code identifying the key corresponding to said actuated switch, said code being transmitted at a second relatively low rate of speed;

means associated with said transmitting means for generating an end of transmission signal when the transmission of said code has been completed;

means responsive to said end of transmission signal for resetting said scan inhibiting means to enable said scanning means to resume operation;

a receiver for the wireless signals generated by said transmitter, said receiver reconstructing the serial code transmitted by said transmitter;

decoding means associated with said receiver for providing a plurality of separate output signals corresponding to respective ones of said portable transmitter keys and musical device sound actuating elements;

said receiver including impulse noise resistant error detecting means for providing an error signal indicative of the presence of an error in said reconstructed code;

signal gating means coupled to said decoding means and responsive to said error signal for inhibiting the generation of any of said output signals by said decoding means in response to a reconstructed code having an error therein; and

means for coupling each output signal of said decoding means to a corresponding actuating element of said musical device, so that actuation of a given key of said portable transmitter results in actuation of the corresponding element of said musical device.

4,099,438

ELECTRONIC MUSICAL INSTRUMENT HAVING A TOUCH VIBRATO EFFECT

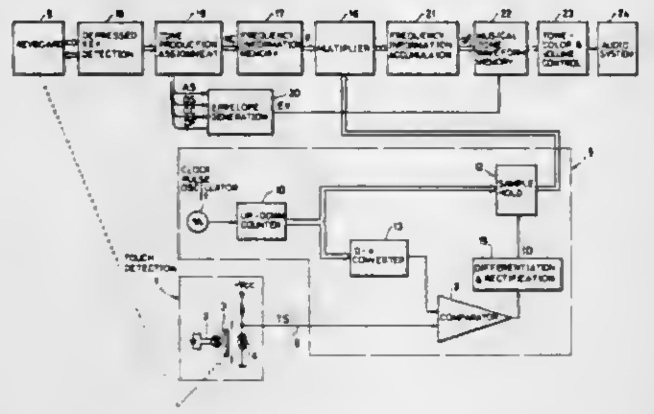
Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Sigeki Isii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 16, 1976, Ser. No. 723,757

Claims priority, application Japan, Sep. 17, 1975, 50-113036

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.25 **6 Claims**


KEYBOARD
DEPRESSED KEY DETECTION
TONE PRODUCTION ASSIGNMENT
FREQUENCY INFORMATION MEMORY
MULTIPLIER
FREQUENCY INFORMATION ACCUMULATOR
MUSICAL TONE WAVEFORM MEMORY
TONE COLOR & VOLUME CONTROL
AUDIO SYSTEM
ENVELOPE GENERATOR
COUNTER
CONVERTER
SAMPLE HOLD
DIFFERENTIATION & RECTIFICATION
COMPARATOR
TOUCH DETECTION

1. A system for producing touch vibrato in a digital electronic musical instrument of the type having a tone generator for generating a tone having a frequency proportional to a digital frequency number F, and note selection means for providing a selected frequency number F to said time generator, said instrument having a touch responsive member and means for producing an analog touch signal having a value proportional to displacement of that member, said system comprising:

signal providing means for providing a reference periodic signal having excursions greater than the maximum range of said touch signal,

comparison means for comparing the value of the analog touch signal to the value of said reference periodic signal, and for providing a digital output each time said touch signal crosses said periodic signal, said digital output having a digital value corresponding to the value of said periodic signal at the point of crossing, and

modulating means for modulating the frequency number F provided by said note selection means by the value of said digital output.

4,099,439

ELECTRONIC MUSICAL INSTRUMENT WITH DYNAMICALLY RESPONSIVE KEYBOARD

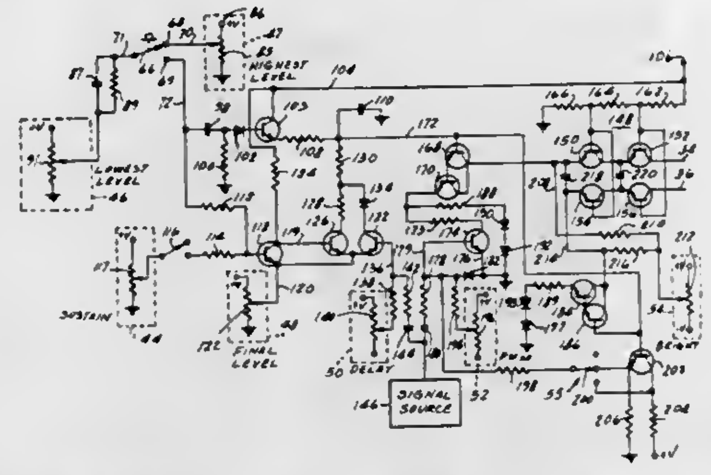
David A. Luce, Clarence Center, N.Y., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Continuation-in-part of Ser. No. 479,485, Jun. 14, 1974. This application Jun. 19, 1975, Ser. No. 588,508

Int. Cl.² G10H *1/02*

U.S. Cl. 84—1.26 **18 Claims**

1. An electronic musical instrument having a keyboard with a plurality of keys, said instrument producing musical sounds at pitches corresponding to said keys, and including a weight mounted in each of said keys, sensing means for sensing the momentum with which each of said keys is operated, envelope producing means responsive to said sensing means for producing an envelope signal in response to the momentum with which one of said keys is operated and in response to the time interval since previous operation of said key, said key having a pivotally mounted operating lever and contact means operated by said lever as said key is operated, said contact means being adapted to open a normally closed circuit and subsequently to close a normally open circuit, said contact means comprising a spring having one end connected to a fixed location and the other end connected to said lever, a first conductor normally in contact with said spring for completing said normally closed circuit, and a second conductor spaced from said spring for completing said normally open circuit, a capacitor connected with said spring, means connecting said first conductor to a source of potential for normally charging said capacitor to said potential, a resistor connected in parallel with said capacitor for discharging said capacitor beginning with the opening of said normally closed circuit, a second capacitor connected with said second conductor for sensing the voltage level of said capacitor on the closing of said normally open circuit, means including said normally open circuit for charging said second capacitor for a short time interval to a level determined in part by the voltage level of said first capacitor at the time said normally open circuit is closed, and in part by the difference in potential between the voltage across said second capacitor at the time of closing of said normally open circuit and a source of supply potential, means for discharging said second capacitor at a controlled rate less than the rate at which said second capacitor is charged when said normally open circuit is closed, whereby said second capacitor is charged to successively higher levels in response to successive operations of said key, signal generating means for producing an AC signal at a frequency corresponding to the operated key, and means for discharging said second capacitor at a rate proportional to said frequency.



4,099,440

PLECTRUM PIANO ACTION

Ellis Barron, 7228 Eads Ave., La Jolla, Calif. 92037

Filed Dec. 6, 1976, Ser. No. 747,798

Int. Cl.² G10C *1/06*

U.S. Cl. 84—258 **2 Claims**

1. In a musical instrument of the harpsichord or plectrum piano type, a plucking means for each string thereof consisting of a key-lever and a plectrum, wherein the improvement comprises:

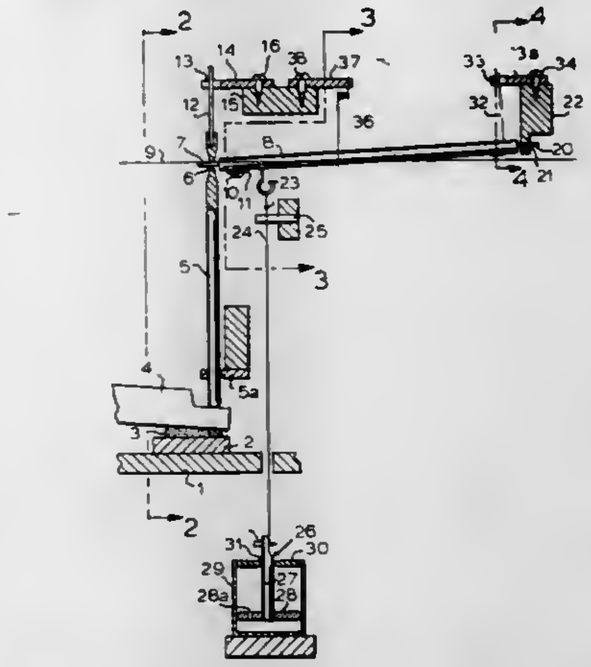
(a) a cylinder means, hollow, closed at one end, and fixed in the instrument,

(b) a piston means having a vent hole and being coaxially slideable within said cylinder means, the combination causing the piston to present a velocity dependent resistance force to motion thereof,

(c) a rotatable pick-rod carrying the plectrum and having a depending crank arm, said pick-rod supported so as to allow limited vertical and horizontal pivoting motion thereof,

(d) jack means connecting the pick-rod to the key-lever,

(e) means connecting the piston to said crank arm such that a portion of key-lever motion is coupled to said piston, the resistance force thereof tending to draw the pick-rod toward the string and to rotate the plectrum into said string,



(f) a first spring means engaging the pick-rod and opposing said piston resistance force so as to cause the plectrum to avoid the string upon release of the key-lever; and

(g) a second spring means fixed to said pick-rod and opposing rotation thereof for the purpose of controlling plectrum angle.

4,099,441

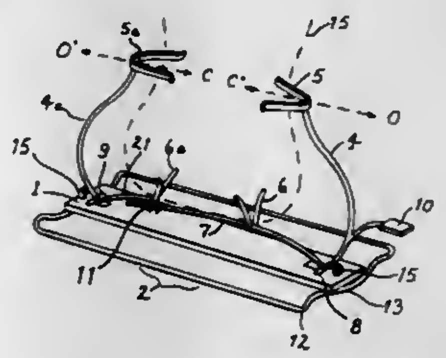
HOLDER FOR GUITARS AND THE LIKE

James M. Landon, 13847 Chandler Blvd., Van Nuys, Calif. 91401

Filed Jun. 28, 1976, Ser. No. 700,345

Int. Cl.² G10D *3/00*

U.S. Cl. 84—327 **1 Claim**



1. In a weighted and rockable stand for holding guitars and similar musical instruments, an arrangement for retaining a musical instrument comprising in combination:

a. two spring loaded, individually pivoted clamping arms, each of said arms having instrument retainer means at its free end for holding said musical instrument in an upright position and, each one of said arms having an inward extension from its respective pivot, one extension bening

slidably coupled to the other by a guide means, each of said extensions also having instrument retaining means;
- b. a foot pedal affixed to one of the clamping arms;
- c. spring biased hinges serving as pivots for said arms and their extensions;

whereby pressure on said pedal opens both arms simultaneously and release of pressure produces simultaneous closure.

4,099,442
CORRECTIVE DEVICE FOR CLARINETS

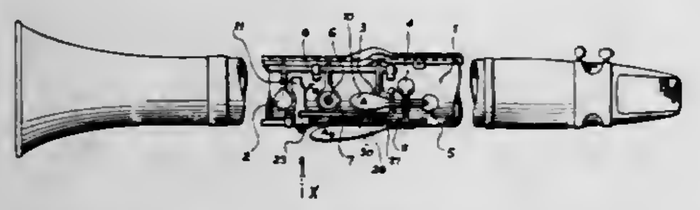
Clive Lyof Amadio, 171 Soldiers Point Road, Salamander Bey, New South Wales 2301, Australia

Filed Mar. 24, 1977, Ser. No. 780,605

Claims priority, application Australia, Mar. 29, 1976, 5406/76

Int. Cl.² G10D *7/06*

U.S. Cl. 84—382 **5 Claims**



1. A clarinet having a barrel, an A-key having a convex surface, an F-sharp key and an A-flat key on said barrel, said keys being adjacent one another, and a post projecting from said barrel adjacent said A-key whereby said post limits the extent that the finger of a clarinetist can move axially of the clarinet barrel over the convex surface of the A-key in a direction away from the F sharp key.

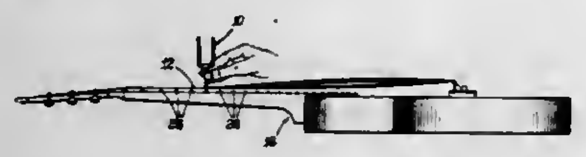
4,099,443
TUNING FORK IMPROVEMENT

Jeffrey L. Yates, 3304 Owl Dr., Rolling Meadows, Ill. 60008

Filed Mar. 10, 1977, Ser. No. 776,136

Int. Cl.² G10G *7/02*

U.S. Cl. 84—457 **7 Claims**



1. A tuning fork having a pair of tines, a body portion interconnecting the tines and a stem depending from the body portion including

means defining a notch in the free end of the stem for riding on the string of a string instrument during a string tuning process, said notch means being effective to restrain the tuning fork from sliding off the string.

4,099,444
RADIALLY ASSEMBLED FRICTION-GRIP SELF-LOCKING RINGS

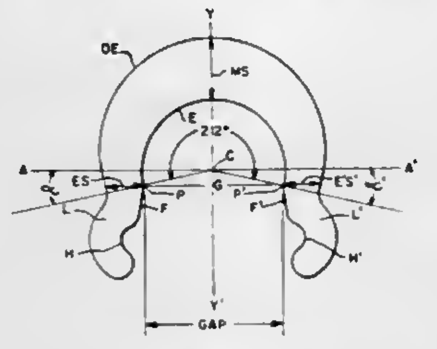
Melvin Millheiser, North Bellmore, and Wallace H. Berliner, Floral Park, both of N.Y., assignors to Waldes Kohinoor, Inc., Long Island, N.Y.

Continuation-in-part of Ser. No. 702,074, Jul. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 577,985, May 16, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,946

Int. Cl.² F16B *21/00*

U.S. Cl. 85—8.8 **4 Claims**

1. A retaining ring adapted for either radial or axial assembly on a cylindrical groveless carrier member and which upon assembly possesses the capability of securing itself solely by the friction grip which its inner edge exerts oo the surface of said carrier member, said ring comprising an open-ended ring body of spring material having the form of a curved tapered bending beam whose inner edge extends aloog the arc of a circle of diameter less by a predetermined small amount than that of the cylindrical carrier-member surface and whose outer edge is eccentric to said inner edge in direction such that the ring-body section heights decrease progressively from its middle section having maximum section height to its end sections having minimum section height, said end sections being at points of the ring inner-edge which are disposed symmetrically to the sides of the vertical center line of the ring body and are spaced from one another thereby to define a gap having width less than that of the diameter of said cylindrical surface by a predetermined small amount, said tapered ring body being characterized by the ratio of the inside diameter of the bending beam to the seating diameter of the ring being less than 1; by the ratio of the inner-edge diameter of said bending beam to its said maximum section height being variable from 1.5 to 2.5; by the ratio of ring-body minimum to maximum section height varying between 0.6 to 0.8; by the degree of permissible spreading of the circle of the ring's inner-edge varying from 6 to 8.5%; by the gap angles lying between two lines, of which the first thereof is a line thru the center of the ring inside diameter perpendicular to a line bisecting the ring gap and the second thereof being a line from the same center extending to end-most real points on the ring inside diameter, varying from 9° to 16°; and means extending from the ring-body ends having gradually decreasing widths and defining a passageway leading to the gap and thence to the ring-body opening, the width of said gap being no less than 96% of the inside ring diameter, wherein 0.96 is the cosine of 16°.



4,099,445
PRESSURE DIFFERENTIAL PISTON-COMBUSTION CHAMBER SYSTEM

Dietrich Singelmann, Ottobrunn; Heinrich Strobl, Munich, and German Munding, Bad Friedrichshall, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

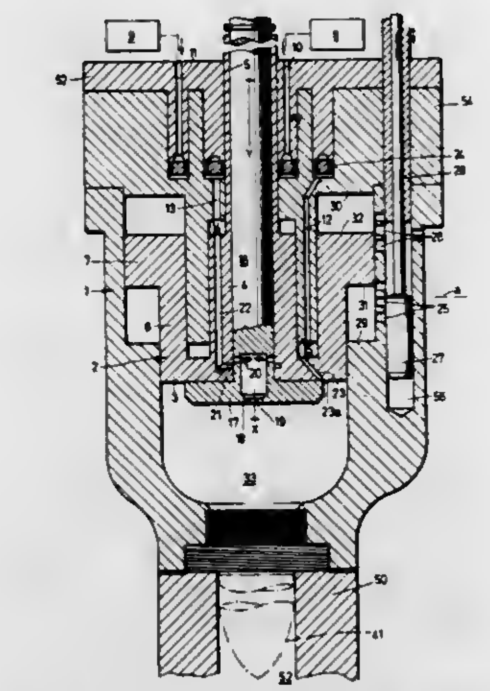
Filed Sep. 22, 1969, Ser. No. 862,637

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1968, 1728077

Int. Cl.² F41F *1/04*

U.S. Cl. 89—7 **10 Claims**

7. A driving force generating system for propelling a device such as a projectile particularly in a fire arm, comprising wall means defining a combustion chamber, a piston movable in said combustion chamber, propellant component passage means defined in said wall means for delivering propellant components into said combustion chamber, valve means associated with said passage means permitting flow of said propellant components through said passage means into said combustion chamber, said propellant components being reactable in said combustion chamber to move said piston in a working stroke, and additional force means acting on said piston at the beginning of its movement in its working stroke to aid in such movement, said additional force means comprising an annular spring surrounding said piston, said piston having an annular portion projecting outwardly from the sides thereof and engageable with said spring at the end of the path of movement thereof in a return direction.



4,099,446
PANTOGRAPH COPYING ATTACHMENT

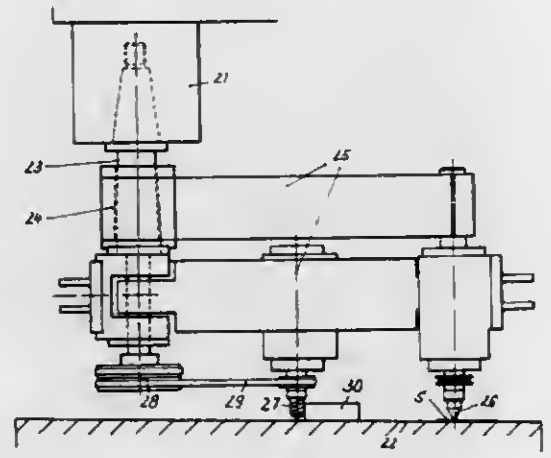
Herbert Härlin, Pforzheim-Eutingen, Fed. Rep. of Germany, assignor to Karl Harlin & Co., Pforzheim-Eutingen, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,807

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2556965

Int. Cl.² B23C *1/16, 7/00*

U.S. Cl. 90—13.1 **5 Claims**



1. A pantograph copying attachment for a machine tool having a rotary spindle adapted for receiving and driving a tool about an axis which attachment comprises

- a main shaft having connecting means adapted to be coonected to said spindle for rotation therewith,
- a bearing rotatably carried by said main shaft,
- a pantograph mounted on said bearing for an angular movement relative to said shaft about the axis thereof said pantograph including means to carry tool means at a distance from said axis,
- a tracer carried by said pantograph at a distance from said axis, and
- an angled tool drive mechanism connected to said main shaft and said tool means whereby said tool means is driven from said spindle through said drive means during said angular movement of said pantograph about said axis.

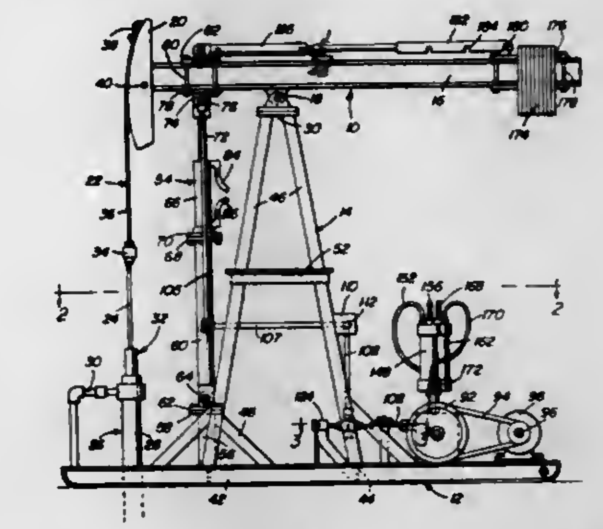
4,099,447
HYDRAULICALLY OPERATED OIL WELL PUMP JACK

Ethridge F. Ogles, Ada, Okla., assignor to Ada Pumps, Inc., Ada, Okla.

Filed Sep. 20, 1976, Ser. No. 724,529

Int. Cl.² F01L *15/00*

U.S. Cl. 91—218 **12 Claims**



1. In combination, a pump jack for well pumps comprising a support, a beam mounted on said support for pivotal movement about a generally horizontal transverse axis, a horsehead at one end of said beam for connection with a polish rod of a well pump, a hydraulic fluid pressure operated piston and cylinder assembly connected to said beam for powering the beam about its pivot axis, a counterbalance weight on said beam on the opposite side of the transverse axis from the horsehead, said piston and cylinder assembly being powered from a hydraulic pump having a separate conduit connected to each end of the cylinder, a reversing valve communicating the pump with the conduits, and means interconnecting the reversing valve and the beam for controlling the position of the reversing valve in response to extension and retraction of the piston and cylinder assembly, said means controlling the reversing valve including a mechanical linkage, said linkage including adjustment means enabling variation in the stroke of the piston and cylinder assembly, each of said conduits including means cushioning high pressure hydraulic fluid moving from the reversing valve to the piston and cylinder assembly for cushioning movement of said beam, each of said cushioning means including a cylinder communicated at one end with said conduit, a piston movable in said cylinder in peripherally sealed relation thereto whereby said piston will move longitudinally in the cylinder in response to pressure changes in the conduits for cushioning movement of the hydraulic fluid in the conduits.

4,099,448
OSCILLATING ENGINE

Gerald H. Young, 2082 Gulfshore Blvd. N., Naples, Fla. 33940

Filed Jan. 19, 1976, Ser. No. 650,068

Int. Cl.² F02B *53/00, 55/00*

U.S. Cl. 91—339 **10 Claims**

1. A fluid device of the type that includes a housing having a pair of adjacent arcuate chambers extending in substantially opposite directions with respect to one another, each of said pair of chambers having an exhaust opening; a vaned rotor mounted for oscillation within each of said chambers; means for synchronizing the rotors to oscillate in opposite angular directions with respect to one another; means for controlling the flow of a fluid into and out of each of said chambers in timed relation with the oscillation of said rotors, said flow controlling means including a rotary valve member having an exhaust passage therethrough and being disposed adjacent said exhaust opening and means operated in timed relation with the oscillation of said rotors for rotating said valve member from

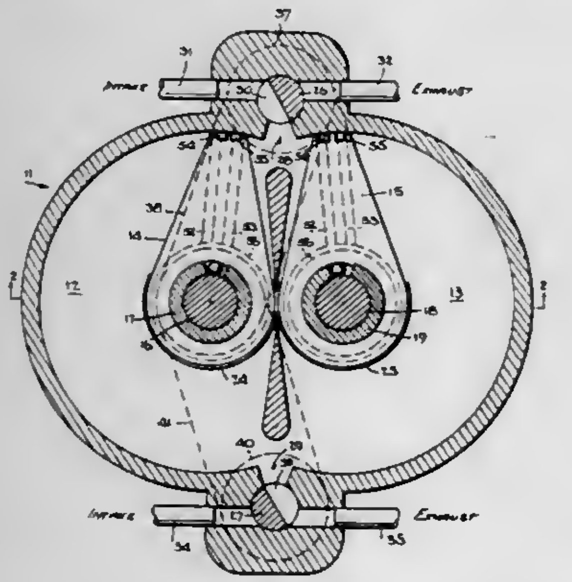
one position where said valve member closes said exhaust opening to another position where said valve exhaust passage partially overlies said exhaust opening, wherein the improvement comprises:

said exhaust opening for each of said chambers being located adjacent to one extreme position of oscillation of the respective rotor for exhausting fluid from the chamber on one side of the rotor and an intake opening for each of said chambers being located adjacent to said exhaust opening;

said means for controlling the flow of fluid into and out of said chambers comprising a rotary valve member having an intake passage therethrough and being disposed adjacent said intake opening and means operated in timed relation with the oscillation of said rotors for rotating said valve member from a position where said valve member closes said intake opening to another position where said valve intake passage partially overlies said intake opening, said rotary valve member disposed adjacent said exhaust opening being the same as the rotary valve member disposed adjacent said intake opening; and

a first one of said rotary valve members being located adjacent to the extreme clockwise position of one of said pair of vaned rotors for controlling the flow of fluid into and out of the chamber of said one rotor and

a second one of said rotary valve members being located adjacent to the extreme counterclockwise position of the other said pair of vaned rotors for controlling the flow of fluid into and out of the chamber of said other rotor.



4,099,449
ELECTROMAGNETIC BUCKET POSITIONER FOR LOADER VEHICLES

Koji Orimoto; Masataka Uno, both of Komatsu; Yoshio Oomachi, Hiratsuka, and Yoshitaka Nishimura, Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 746,812
Claims priority, application Japan, Dec. 4, 1975, 50/162156
Int. Cl.^{2} F15B *13/16, 11/16, 13/06*
U.S. Cl. 91—358 A **5 Claims**

1. An electromagnetic bucket positioner for loader vehicles including lift cylinders for the bucket and bucket cylinders for tilting the bucket, comprising

a control lever adapted to move fore and aft as well as from side to side,

first linkage means connected to said control lever and adapted to be moved in response to the fore and aft movment of said control lever,

first valve means connected to said first linkage means for actuating the lift cylinders for the bucket,

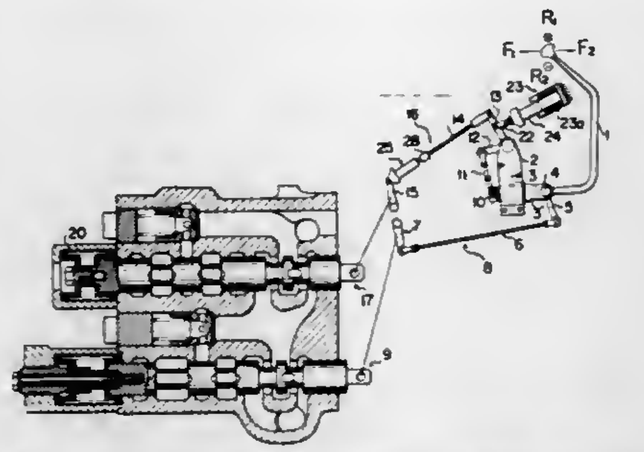
second linkage means connected to said control lever and adapted to be moved in response to the side-to-side movment of said control lever,

second valve means connected to said second linkage means for actuating the bucket cylinders,

electromagnet means disposed adjacent to said second linkage means in such a manner that said second linkage means is not held under restraint by the action of said electromagnet means during normal tilting back operation of said control lever and is held under restraint only when said control lever occupies a rack-back position,

loose spring means disposed in said second linkage means for loosely connecting said second linkage means with said second valve means, and

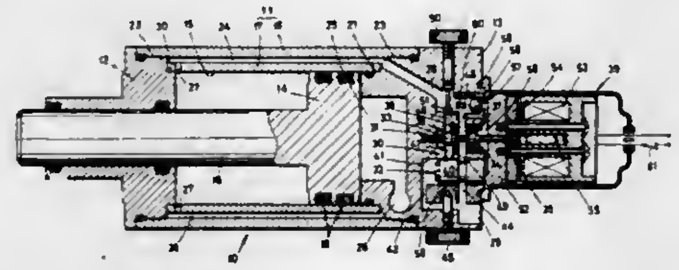
switching means provided on one of said bucket cylinders for interrupting electric current flow through said electromagnet in response to a predetermined movement of a piston rod of one of said bucket cylinders.



4,099,450
FEED MECHANISM

Yoji Mase, Toyokawa, Japan, assignor to Kondo Manufacturing Co., Ltd., Japan

Filed Mar. 11, 1976, Ser. No. 666,089
Claims priority, application Japan, Jun. 27, 1975, 50/80402
Int. Cl.^{2} F15B *13/043*
U.S. Cl. 91—403 **17 Claims**



1. A feed mechanism for advancing a load partially at a full rate, then at a reduced rate, and then retracting the load at full rate, said mechanism comprising:

(a) a fluid-pressure actuator having a cylinder carrying a piston from which a rod projects at one end, said cylinder and rod being adapted to act between a reference and the load, said cylinder having a first port at the other end and a second port communicating with said one end;

(b) a 4-way valve for selecting direction of movement and having a first actuator outlet connected to said first port, a second actuator outlet, and other ports for receiving pressurized fluid and for returning fluid, said 4-way valve being disposed remotely from said cylinder;

(c) flow-path control-valve means interconnecting said second port and said second actuator outlet, and having at least three selectable modes of operation respectively providing a first unrestricted flow path therethrough, a second restricted flow path therethrough, and simultaneous blockage of both said flow paths, and said control valve means including a selector valve having an inlet communicating with said second port and an outlet leading to said second restricted flow path;

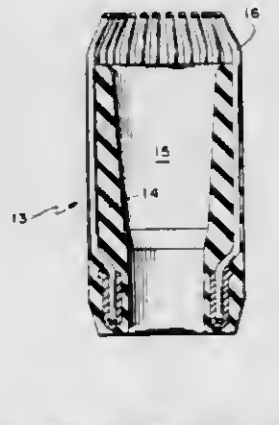
(d) electrical means responsive to a predetermined advance of the load for actuating said control-valve means from said first flow path mode to said second flow path mode; and

(e) said control-valve means being resettable in response to a reversal of flow by said 4-way valve to reinstate said first flow path mode.

4,099,451
OILWELL SWAB CUP

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 756,304
Int. Cl.^{2} F16J *1/04, 15/32*
U.S. Cl. 92—241 **1 Claim**



1. An improved swab cup assembly comprising:

a unitary base member of U-shaped cross section press formed from a single annular, malleable plate to include an annular bottom portion having inner and outer peripheral edges and first and second wall portions, said first wall portion extending from the inner peripheral edge of said bottom portion and said second wall portion extending from the outer peripheral edge of said bottom portion, said wall portions extending in spaced, generally concentric parallel relationship forming an annular slot therebetween;

a plurality of elongated wire members having straight lower end portions, S-shaped intermediate portions, and inwardly bent upper portions, said lower portions being disposed in said slot in circumferentially spaced relationship and in tight, frictional engagement with said wall portions whereby the lower end portions of said wire members are retained immobile with respect said base member and each other; and,

elastomeric means encapsulating said base member and lower and intermediate portions of each of said wire members for forming said base member and wire members into an annular swab cup assembly.

4,099,452
SMOKESTACK-MOUNTED AIRFOIL

Robert C. Costen, 211 Greenwell Dr., Hampton, Va. 23666

Filed Nov. 10, 1975, Ser. No. 630,582
Int. Cl.^{2} E04F *17/02;* **F23L** *17/02*
U.S. Cl. 98—58 **21 Claims**

1. A smokestack effluent dispersal system comprising;

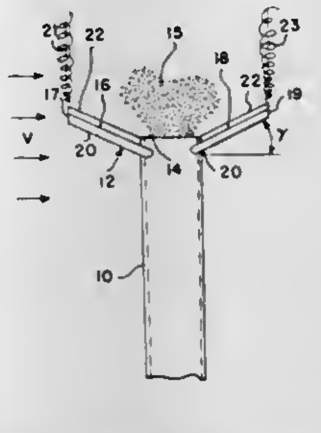
a smokestack;

means located adjacent to the stack gas exit of said smokestack for producing lift component in a downwardly direction and converting the kinetic energy of relative smokestack wind into a plurality of well defined, counterrotating vortical flows of air and entraining smokestack effluents therein for the duration of said well defined vortical flows.

19. A method of improving the effluent dispersal of a smokestack subject to relative winds comprising the steps of:

providing a smokestack,

providing a vortex generating device for producing lift component in a downwardly direction for converting the kinetic energy of said relative winds into a plurality of well-defined vortical flows of air,



placing said vortex generating device in the flow path of said relative winds and adjacent to the stack gas exit of said smokestack;

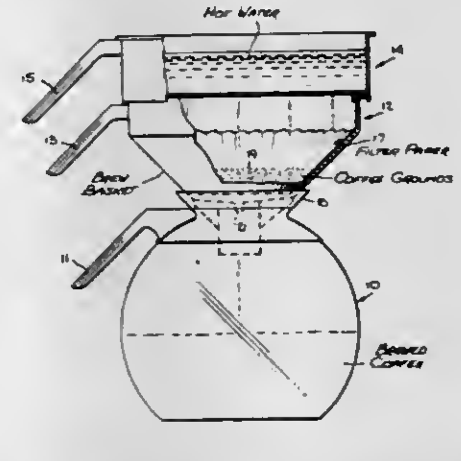
entraining said stack effluents in said well-defined vortical flows of air, and

varying the orientation of said vortex generating device to said relative winds in order to vary the flow direction of said well-defined vortical flows of air.

4,099,453
COFFEE-MAKER ASSEMBLY

Steven Kaplan, 71 Driftwood Dr., Port Washington, N.Y. 11050

Filed Apr. 20, 1977, Ser. No. 789,103
Int. Cl.^{2} A47J *31/02, 31/10*
U.S. Cl. 99—306 **9 Claims**



1. A coffee maker assembly having a large maximum capacity rating for brewing coffee, the same assembly being effective in brewing coffee in an amount much below the maximum rating, comprising:

A. a decanter for containing the brewed coffee and for maintaining it at a desired temperature;

B. a disposable paper filter having a frusto-conical form and a flat base on which is formed a bed of ground coffee to be sprayed by boiling water to cause infusion resulting in brewed coffee; and

C. a basket seated on the decanter and having a corresponding frusto-conical form to nest said filter, the base of said filter resting on the bottom of said basket, the bottom of said basket having a central opening through which the brewed coffee passing through the base of said filter is discharged into said decanter, said bottom having a central depressed region surrounding said opening to define a well underlying a restricted central region of said base and an inactive annular zone concentric therewith in contact with a corresponding annular region of said base, whereby said filter is active only in the restricted central region overlying said well and is effective to control the rate of percolation necessary to brew coffee of good quality regardless of the volume of ground coffee forming said bed.

4,099,454
ELECTRICAL RESISTANCE COOKING APPLIANCE FOR USE WITH AN ELECTRODE TYPE COOKING PACKAGE

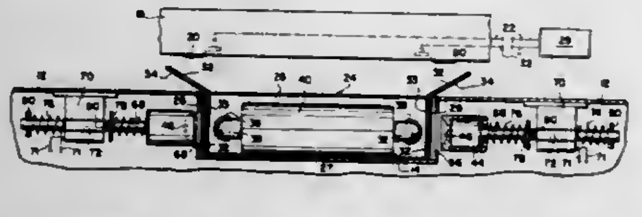
Ernst Theodore Theimer, Rumson, and Robert Stuart Bissett, Tinton Falls, both of N.J., assignors to Lectrofood, Corp., East Brunswick, N.J.

Filed Dec. 3, 1976, Ser. No. 747,309

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.² A47J *36/30*

U.S. Cl. 99—358 **3 Claims**



1. An appliance for use in the electrical resistance cooking of an electrically high conducting food substance within an electrode type cooking package which comprises:
(a) A housing defining a packaged food cooking compartment; and
(b) Retractable plunging means including biasing means located inside said housing at opposite ends of said cooking compartment which urge intimate electrical contact between an electrically high conducting food substance held within a subject food package which is set within the food compartment and at least two electrical contacts located at the inside surfaces of diametrically opposite ends of said food containing package thus forming contacted ends; and
(c) Means for imparting a regulated electrical current for finite time periods to said electrical contacts, forcing current through a subject electrically high conducting food substance, cooking same by conversion of electrical energy into heat without undesirable arcing or food burning; and
(d) A protective cover which may exist in an open or closed position; said cover closes the cooking compartment and simultaneously closes the electrical circuit for added safety during operation,

wherein the electrode type cooking package comprises:
(a) An electrically and preferably thermally insulating container which defines a food cavity having a substantially uniform longitudinal area, and an aperture in each of its two most diametrically opposite ends; and
(b) Electrical contacts located at said diametrically opposite ends attached to the inside surface of said container ends, while draping the apertures and extending out of the container by way of flaps to a source of electrical energy; and
(c) A composition in intimate contact with the inner surfaces of said electrical contacts and the subject foodstuff consisting essentially of:
(i) An aqueous gel selected from the group consisting of agar, xanthan, gum, tragacanth, guar gum, gum arabic and algin gum, in water; and
(ii) A substantially ionized species selected from the group consisting of sodium chloride, potassium chloride, ammonium chloride, magnesium chloride, sodium glutamate, potassium glutamate, sodium alginate, potassium alginate, ammonium alginate, magnesium alginate, calcium alginate, sodium bicarbonate, potassium bicarbonate, magnesium bicarbonate, calcium bicarbonate

wherein:
(i) The weight percent of water is initially 86 up to 99.3
(ii) The weight percent of gel is initially 0.5 to 4.0; and
(iii) The weight percent of edible ionized species is initially from 0.2 up to 10.0

whereby continuous intimate contact during the entire cooking process takes place between the metal electrode and the meat in order to prevent burning, said plunging means causing said contacted end to follow the change in shape of the meat during cooking, and said biasing means causing said plunging means to follow said change in shape of said meat during cooking.

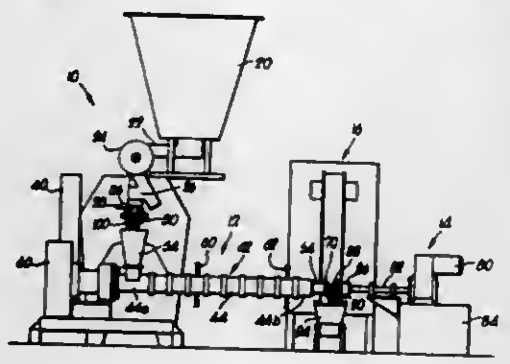
4,099,455
DOUBLE-EXTRUSION APPARATUS FOR PRODUCING DENSE, UNIFORMLY LAYERED VEGETABLE PROTEIN MEAT ANALOGUE

La Von Gene Wenger, Sabetha, and Elmer John Osterhaus, Seneca, both of Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Division of Ser. No. 581,111, May 27, 1975, Pat. No. 3,970,761. This application Jun. 1, 1976, Ser. No. 691,635

Int. Cl.² A23J *3/00;* **A23P** *1/00;* **B29C** *9/00;* **B29F** *3/08*

U.S. Cl. 99—450.1 **6 Claims**



1. Apparatus for producing a dense, layered meat analogue from an admixture including vegetable protein and water, said apparatus comprising:
means for heating and agitating said admixture for rendering the same hot, flowable and substantially unoriented including an elongated, generally tubular first barrel having a receiving end and a delivery end, with an elongated, axially rotatable screw positioned within the first barrel and operable to move said admixture therethrough;
an elongated, generally tubular second barrel having a receiving end and a delivery end,
means adjacent said receiving end of said second barrel for receiving said admixture from the delivery end of said first barrel and delivering the same to the interior of said second barrel,
said receiving and delivery means including structure defining an opening in communication with the interior of said second barrel, said opening-defining structure being in spaced relationship from the delivery end of said first barrel for passage of the admixture through the atmosphere between the first and second barrels for allowing undesirable flavor precursors and the like to leave the admixture;
an elongated, axially rotatable screw situated within said second barrel for moving said admixture through the latter in a direction toward the delivery end thereof while simultaneously subjecting the admixture to displacement forces which are generally transverse of the longitudinal axis of the second barrel;
a hollow, tubular section presenting an elongated processing area mounted on the delivery end of said second barrel in substantial longitudinal alignment therewith and in communication with the interior of the latter;

a die plate positioned over the end of said section remote from said second barrel and being provided with a plurality of circumferentially arranged die openings positioned about the periphery thereof; and
flow directional means positioned within said section for directing the flow of said admixture toward the die openings of said die plate.

4,099,456
TREATMENT OF VEGETABLES

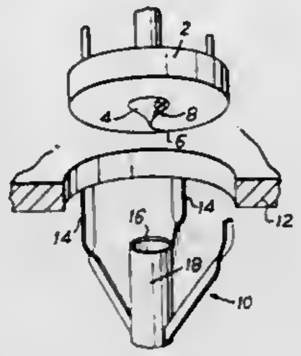
David John Cornish, Dereham, England, assignor to Dreibholz & Floering Limited, Dereham, England

Filed Jul. 19, 1976, Ser. No. 706,200

Claims priority, application United Kingdom, Jul. 23, 1975, 30724/75

Int. Cl.² A23N *15/01*

U.S. Cl. 99—638 **6 Claims**



1. Apparatus for the treatment of agricultural produce having a central stalk or core bearing leaves, florets or the like, comprising:
a cutting member comprising an annular cutting edge surrounding an opening defined by said annular edge for receiving said central stalk or core;
a divider member having a surface having a projection extending therefrom and rigidly mounted thereon for movement therewith;
means for positioning said divider member so as to confront said opening in said cutting member;
said projection being substantially circular in plan and comprising a central raised point portion extending towards said opening and concave side portions sloping concavely outwardly and rearwardly from said point portion to said surface from which said projection extends;
means for moving said cutting member and divider member relatively towards one another along a path lying parallel to the longitudinal axis of said annular cutting edge of the cutting member, an extension of said axis passing through said raised portion of said divider member, whereby, in use, an item of produce having a cut stalk or core end positioned between said divider member and cutting member with the cut end adjacent said opening of said cutting member is moved relative to said cutting member with said divider member to cause the cutting member to progress through said produce item from the cut end thereof to remove the leaves, florets, or the like, while the raised point and concave sloping side portions of said projection extending from said surface of said divider member divide and deflect the leaves, florets, or the like, at a region opposed to said cut end to cause the deflected leaves, florets, or the like, to lie substantially radially of said axis for cutting by said cutting member.

4,099,457
METHOD FOR DISCHARGING REFUSE

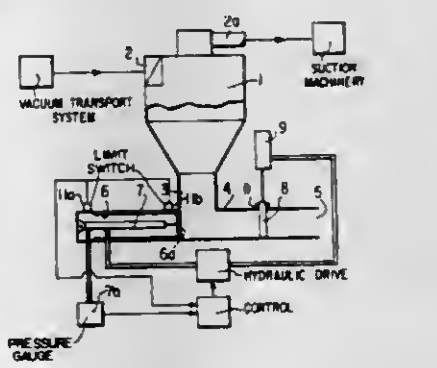
Hans Olof Hyden, Stockholm, Sweden, assignor to AB Centralsug, Solna, Sweden

Continuation-in-part of Ser. No. 573,331, Apr. 30, 1975, abandoned, which is a continuation of Ser. No. 332,099, Feb. 13, 1973, abandoned. This application Nov. 1, 1976, Ser. No. 737,569

Claims priority, application Sweden, Feb. 25, 1972, 2384/72

Int. Cl.² B30B *7/04*

U.S. Cl. 100—42 **3 Claims**



1. A method of discharging refuse through a discharge pipe being in communication with a hopper having an outlet through which refuse is successively introduced into the discharge pipe from a vacuum transport system, comprising the following steps:
a. advancing a compactor gate into the discharge pipe in a direction perpendicular to the length dimension of the discharge pipe at a location between the hopper outlet and a discharge outlet of the discharge pipe for blocking the internal longitudinal passage thereof to substantially prevent air from being drawn into the vacuum transport system through the discharge outlet and the hopper;
b. subsequent to the completion of step (a) repeatedly reciprocating a compactor pusher in the discharge pipe from a withdrawn limit position in which communication between the hopper outlet and the discharge pipe is open, towards the lowered compactor gate to accumulate and compress successively introduced refuse between the compactor pusher and the compactor gate;
c. during performance of step (b), withdrawing the compactor gate to clear the discharge pipe passage when the refuse compressed between the compactor pusher and the compactor gate has reached a sufficient density to form a substantially vacuum tight plug;
d. during continued performance of step (b) and in timed coordination with the reciprocation of the compactor pusher, clamping a refuse portion firmly against the discharge pipe with an edge of the compactor gate while the reciprocating compactor pusher is being withdrawn into said withdrawn limit position and again withdrawing the compactor gate while the reciprocating compactor pusher is moving from the withdrawn limit position into the discharge pipe to forward the refuse continuously accumulated and compressed in step (b) towards and through the discharge outlet of the discharge pipe.

4,099,458
CONE PRESS

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

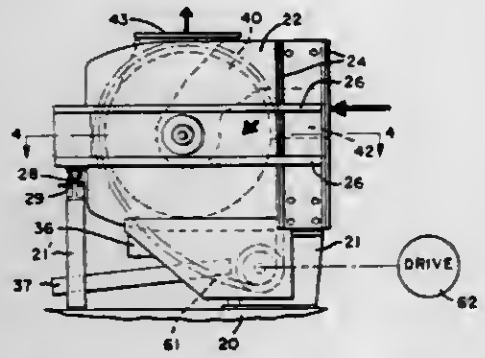
Continuation-in-part of Ser. No. 563,124, Mar. 28, 1975, Pat. No. 3,948,165. This application Apr. 5, 1976, Ser. No. 673,445

Int. Cl.² B30B *9/06, 3/04*

U.S. Cl. 100—116 **8 Claims**

1. A cone press comprising:
(a) a frame,
(b) a pair of rigid side structures supported on said frame for relative pivotal movement,
(c) a pair of rotor assemblies having their axes arranged at an

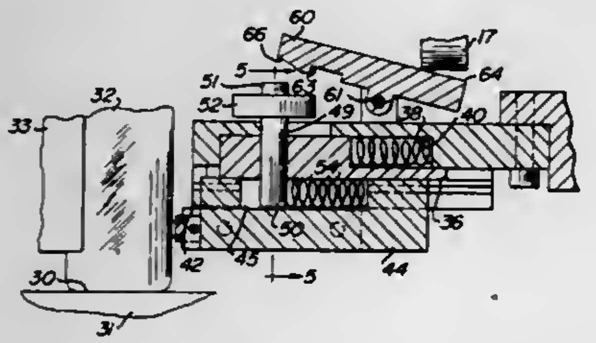
angle to each other and including confronting faces defining a pressing zone,
(d) means mounting each of said rotor assemblies for rotation in a respective said side structure,
(e) each said rotor assembly including a conically shaped screen forming said confronting face thereof and an annular plate forming the axially outer face thereof,
(f) drive means for rotating said rotor assemblies to bring portions of said screens into proximity in a pinch zone while separating other portions of said screens to form a feed receiving zone,
(g) thrust bearing means interposed between said annular plates and said side structures and including an annular thrust pad on each said annular plate for transmitting to the associated said side structures the thrust generated by said confronting faces in said pressing zone,
(h) hydrostatic bearing means for hydraulically compensating for said thrust between said thrust pads and said side structures to minimize the energy requirements for operation of said press,
(i) said hydrostatic bearing means comprising means defining at least one open pocket in each said side structure, and means for supplying pressurized fluid to each said pocket to form a fluid cushion between said pocket and said annular plate means, and
(j) means responsive to the load on said drive means for increasing and decreasing said fluid supply in relation to said drive means load.



4,099,459
INERTIA PRINTING MEMBER

Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J. 08034

Filed Nov. 5, 1976, Ser. No. 739,067
Int. Cl.² B41F *17/00*
U.S. Cl. 101—35 **8 Claims**

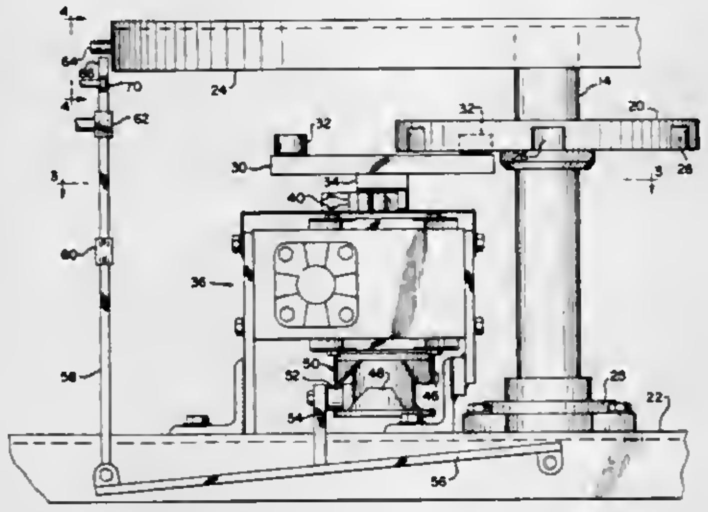


1. A printing mechanism for printing an article at a printing station and comprising a support, a carrier mounted on said support for shifting movement into and out of an extended position toward a printing station, an abutment located for abutting engagement with said carrier to limit its shifting movement to said extended position, primary resilient means urging said carrier toward said extended position, latch means on said support and carrier releasably holding the latter in a retracted position away from the printing station against the force of said primary resilient means, an inertia member carried by said carrier for movement therewith and mounted on said carrier for shifting movement relative thereto toward and away from the printing station, type means on said inertia member for movement therewith into and out of printing engagement with an article at the printing station, secondary resilient means urging said inertia member to a retracted position relative to said carrier away from the printing station, positive retraction means movable relative to said support, connection means between said retraction means and carrier for retracting the latter to its retracted position, and latch release means for disengaging the latch means, whereby disengagement of the latching means releases said carrier for movement to its extended position together with said inertia member which continues inertially relative to said carrier against the force of said second resilient means into type printing engagement with an article and instantaneously retracts by the force of said second resilient means, said support being movable past the printing station, and said retraction means being operative upon support movement beyond the printing station to retract the carrier after printing.

4,099,460
TURRET INDEXING AND REGISTRATION MEANS FOR MULTI-COLOR PRINTER

Henry J. Bubley, Deerfield; Claude H. Oltra, Chicago, and John R. Krutsch, Glenview, all of Ill., assignors to American Screen Printing, Chicago, Ill.

Filed Nov. 29, 1976, Ser. No. 745,530
Int. Cl.² B41F *1/12, 15/10, 15/26, 17/38*
U.S. Cl. 101—44 **2 Claims**



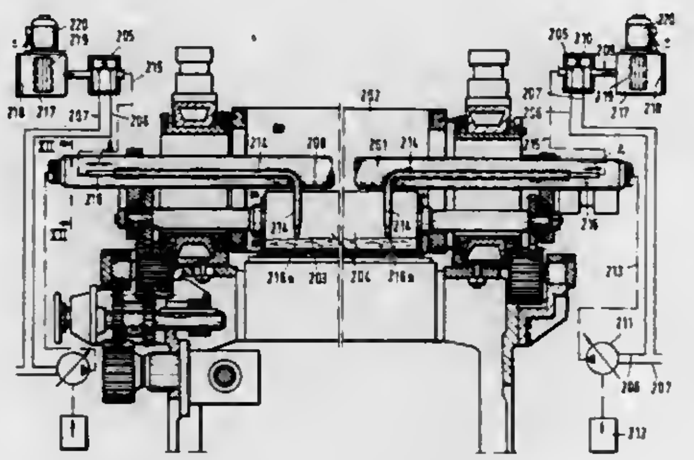
1. In a printing assembly having a turntable, a frame, said turntable being supported on a support means, said support means mounted at one end thereof in said frame to provide for rotation of said turntable, a plurality of printing stations spaced about the periphery of said turntable, a corresponding number of printing machines being operatively positioned at each of said spaced printing stations, and a plurality of platens at least equal to the number of printing stations, each platen supported on said turntable, the improvement comprising indexing means and locking means for successively indexing, registering and locking said platens at said stations prior to a printing cycle and having a drive shaft mounted on said turntable frame, said drive shaft rotatable about a central axis thereof, an actuating means disposed about said drive shaft and responsive to the rotation of said drive shaft, a drive arm mounted on said drive shaft for rotation therewith, said drive arm having a first roller means and a second roller means mounted on opposite ends thereof, a drive wheel concentrically mounted about said turntable support means, each of said first and second roller means being operatively engageable with said drive wheel to rotate said turntable in a continuous series of increments, such that in each increment of rotation, said turntable is moved until said actuating means stops rotation of said drive shaft after a

preselected angular distance and said locking means operates in conjunction with said indexing means to register and lock said turntable prior to initiation of said printing cycle to assure that each platen is positively locked into a desired position and is accurately registered at each station during each said printing cycle, said locking means having a locking pin fixedly mounted on the periphery of said turntable at each station, a locking bar, a rod, said rod pivotally mounted at a first end thereof to said frame, an arm, said arm extending from said rod and captivated in a cam, said cam mounted concentrically on said drive shaft for rotation therewith, said rod being connected to said locking bar at a secoond end thereof, said cam rotating to drive said locking bar vertically to engage said locking pin and guide means fixedly positioned at at least one of said stations to direct the vertical movement of said locking bar in the engagement of said locking pin to assure accurate and positive registration of said turntable.

4,099,461
CONTROL DEVICE FOR CONTROLLING THE LEVEL OF A LIQUID IN A CONTAINER

Mathias Mitter, Senne, Fed. Rep. of Germany, assignor to Mitter & Co., Schloss Holte, Fed. Rep. of Germany

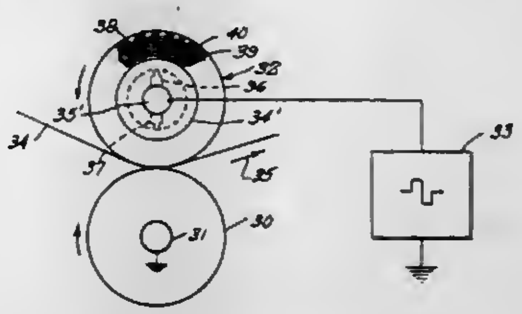
Continuation-in-part of Ser. No. 413,992, Nov. 8, 1973, Pat. No. 3,981,619. This application Feb. 2, 1976, Ser. No. 654,172
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1972, 7241055[U]
Int. Cl.² B41L *13/00, 13/04*
U.S. Cl. 101—119 **17 Claims**



1. In a screen printing device, a combination comprising an endless printing screen bounding an elongated space adapted to receive a printing medium; means for advancing said printing screen in an endless path with reference to a web onto which said screen is to print; means for admitting flowable printing medium into said space; elongated transmitting means extending into said space through one axial end thereof for transmitting a control medium therethrough said transmitting means having a free end located in said space upwardly adjacent the printing medium therein; means encompassing said transmitting means in at least two spaced regions and mounting said transmitting means for longitudinal movement in a path having a horizontal and a vertical component to steplessly adjust the position of said free end in vertical direction relative to said printing screen so that the position of said free end may be adjusted in accordance with the desired level of printing medium in said space; and control means operatively connected with said admitting means and actuated by the control medium passing through said transmitting means, when the level of printing medium rises to and contacts said free end of said transmitting means, said control means being operative for controlling the operation of said admitting means when actuated by said control medium.

4,099,462
ALTERNATING CURRENT ENERGIZED PRINTING SYSTEM UTILIZING A DIELECTRIC COVERED RESILIENT IMPRESSION ROLLER

Daniel A. Coberley, and Joel F. Hutchison, both of Danville, Ill., assignors to Hurletron Altair, Inc., Danville, Ill.
Continuation of Ser. No. 373,367, Jun. 25, 1973, abandoned, and a continuation-in-part of Ser. No. 188,606, Oct. 12, 1971, abandoned, which is a division of Ser. No. 852,783, Aug. 25, 1969, abandoned. This application Oct. 9, 1974, Ser. No. 513,498
Int. Cl.² B41F *9/06;* G03G *13/14, 15/14*
U.S. Cl. 101—153 **6 Claims**



1. In a system for assisting the transfer of ink, carried on a metal printing cylinder connected to ground potential, to a web of substantially non-conductive material as the web passes along a web path through a nip between the grounded printing cylinder and the outer perimeter of a resiliently covered metal impression cylinder, including the combination of:
an electrically conductive inner layer of resilient material on said impression cylinder,
means mounting said impression cylinder for rotation on its central axis and insulating said electrically conductive layer of resilient material on said impression cylinder from ground potential,
an outer sleeve of dielectric material of homogeneous continuous annular cross section having a width substantially equal to the width of the outer perimeter of the impression cylinder, and having a resistivity substantially greater than that of said conductive layer, and
means comprising an electric circuit connected with said electrically conductive layer for applying an electric potential between said electrically conductive layer and said grounded printing cylinder,
the entire operative width of the outer perimeter of the impresion cylinder being formed entirely by said dielectric material of said outer sleeve, said dielectric material having a thickness less than ⅛ of an inch and having a dielectric constant between 20 and 100, and said electric circuit comprising an alternating potential source for applying an alternating current electric potential between said electrically conductive inner layer of resilient material and said grounded printing cylinder to produce an alternating reactive current from said electrically conductive inner layer through said dielectric material of said outer sleeve over the entire operative width of said impression cylinder.

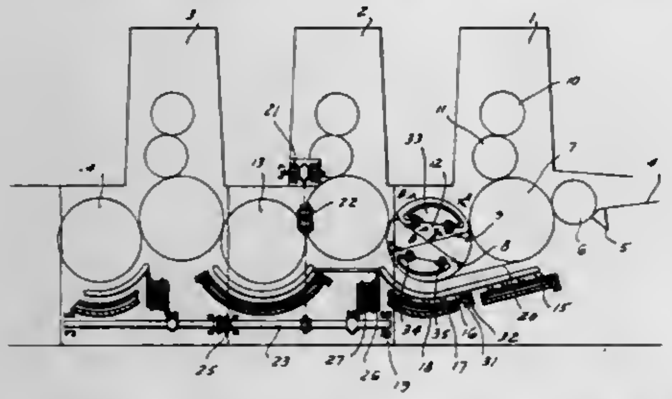
4,099,463
SUPPORT ARRANGEMENT FOR GUIDING SHEETS THROUGH A PRINTING MACHINE

Hans Zimmermann, Coswig; Otfried Rudolph, Dresden; Gunter Peter, Zittau, and Günter Wiesbach, Radebeul, all of German Democratic Rep., assignors to VEB Polygraph Leipzig Kombinat Fuer Polygraphische Maschinen und Ausruestungen, Leipzig, German Democratic Rep.

Filed Apr. 13, 1977, Ser. No. 787,236
Int. Cl.² B41F *5/02*
U.S. Cl. 101—230 **9 Claims**

1. In a printing machine, a combination comprising a plurality of printing stations for printing images on major surfaces of sheets passing therethrough; means for advancing the sheets in

a predetermined path through and between said printing stations including at least one transfer drum intermediate said printing stations and operative for transferring the respective sheet from one to another of said printing stations, and means for so reversing the respective sheet intermediate two of said printing stations that a respective major surface of the respective sheet having a freshly printed image thereon faces downwardly, including a reversing drum, at least one of said drums including a drum cap located within and extending at both sides short of the periphery of said one drum; and means for



supporting each respective sheet from below during the advancement thereof in at least one portion of said path which is located at and downstream of said reversing means, including a blow casing extending over the entire width of the machine and along said path portion underneath the same and having a plurality of upwardly oriented apertures through which a pressurized gaseous medium issues from the interior of said blow casing toward said path portion at least during the advancement of the respective sheet in the latter, and at least one sheet-guiding bracket arranged intermediate said blow casing and at least a zone of said path portion.

4,099,464

SHAPED EXPLOSIVE CHARGE CASING

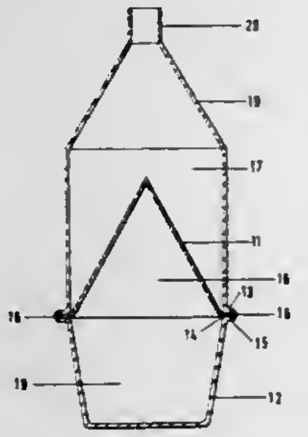
Graham Westwood Cross, Saltcoats, and Thomas James Reid, Ardrossan, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 14, 1977, Ser. No. 759,556

Claims priority, application United Kingdom, Mar. 1, 1976, 8065/76

Int. Cl.² F42B *3/08*

U.S. Cl. 102—24 HC **13 Claims**



1. A casing for a sea-water-destructible shaped explosive charge comprising an explosives container element, a metal cavity liner element, adapted with the explosives container element to define a chamber for a shaped explosive charge, and a stand-off element adapted to define a stand-off volume for the shaped explosive charge, all three elements being bound together by a joint formed at the peripheral margin of each element, which joint comprises material which is destroyed by exposure to sea water whereby, on prolonged exposure of the casing to sea water, said material is destroyed and said elements are separated so as to permit the explosive contents of the shaped explosive to be dispersed in the sea water and rendered harmless.

4,099,465

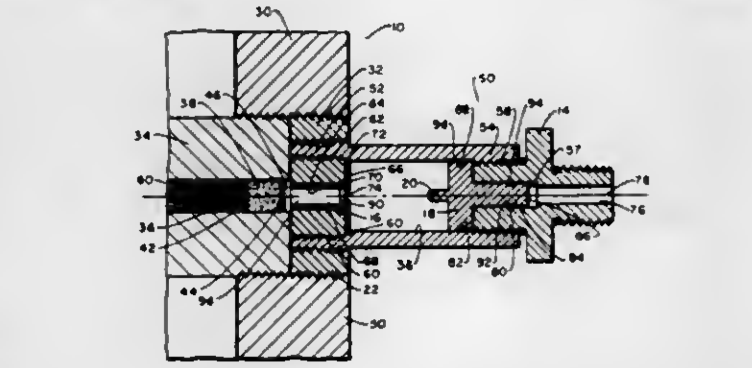
IGNITION DEVICE FOR MISSILE MOTORS

Frederick L. Haake, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1976, Ser. No. 751,638

Int. Cl.² F42C *19/08*

U.S. Cl. 102—204 **5 Claims**



1. A pneumatic igniter firing adapter comprising:

a. a housing containing a percussion-operated priming device;

b. a hollow body having a first end cooperative with said housing such that said housing is connectable to said hollow body, said body having an axial bore therethrough;

c. striker means fluid tightly slidable along said bore for impacting said percussion-operated priming device, including:

1. a midsection suitably dimensioned to fluid-tightly slide along said axial bore within said hollow body wherein said midsection includes a circumferential groove for retaining an O-ring seal between said axial bore and said midsection, thereby effecting said fluid-tight seal;
2. a first axial projection suitably dimensioned to impact said percussion-operated priming device, said first projection being attached to said midsection;
3. a second axial projection attached to said midsection;

d. a striker retaining housing for retaining said striker means in an inoperable position by an O-ring mechanically keyed between said second axial projection of said striker means and said striker retaining housing, said striker retaining means having an axial bore therethrough; and

e. means connected to said hollow body for supplying a fluid to the backside of said striker means, said fluid dislodging said striker means from its inoperative position and forcing said striker means to impact said priming device.

4,099,466

TRAJECTORY ADAPTIVE SAFETY-ARMING DEVICE

Stephen L. Redmond, Ridgecrest; James E. Means, China Lake, and Michael R. Osburn, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 793,998

Int. Cl.² F42C *15/40*

U.S. Cl. 102—215 **10 Claims**

1. A safety-arming device having a variable arming point for use in a maneuvering, explosive missile, comprising:

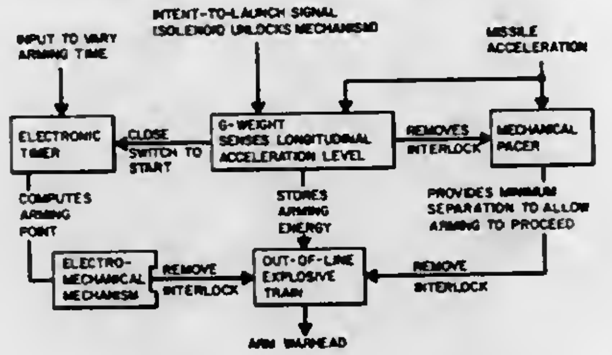
an explosive path having an element which is movable between unarmed and armed positions;

acceleration responsive means operable to detect missile acceleration in the longitudinal direction and in at least one lateral direction, and operable to generate an output signal in response to said missile acceleration;

integrating means coupled to said acceleration responsive means and operable to compute missile displacement in response to said output signal;

logic means coupled to said integrating means, said logic means being operable to compare said computed missile displacement with a predetermined minimum missile displacement, and to send an arming signal if said predetermined minimum displacement is exceeded by said computed displacement; and

means responsive to said arming signal for moving said explosive path element from said unarmed position to said armed position.


INPUT TO VARY ARMING TIME
INTENT-TO-LAUNCH SIGNAL (SOLENOID UNLOCKS MECHANISM)
MISSILE ACCELERATION
ELECTRONIC TIMER
CLOSE SWITCH TO START
G-WEIGHT SENSES LONGITUDINAL ACCELERATION LEVEL
REMOVES INTERLOCK
MECHANICAL PACER
COMPUTES ARMING POINT
STORES ARMING ENERGY
PROVIDES MINIMUM SEPARATION TO ALLOW ARMING TO PROCEED
ELECTRO-MECHANICAL MECHANISM
REMOVE INTERLOCK
OUT-OF-LINE EXPLOSIVE TRAIN
REMOVE INTERLOCK
ARM WARHEAD

4,099,467

SEQUENTIAL INITIATION OF EXPLOSIONS

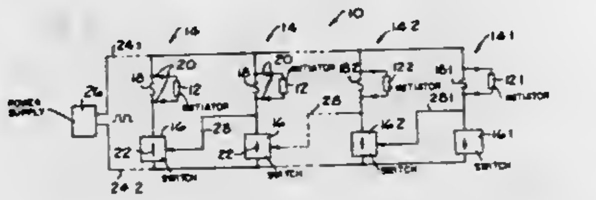
Jeremy Margreave MacKellar, Benoni; Christopher Michael Dryden, and Peter Alan Brazendale, both of Cape Town, all of South Africa, assignors to Plessey S.A. Limited, Cape Town, South Africa

Filed Dec. 8, 1976, Ser. No. 748,438

Claims priority, application South Africa, Dec. 23, 1975, 75/7981

Int. Cl.² F42C *15/40*

U.S. Cl. 102—217 **23 Claims**



1. An activating means for sequentially activating a plurality of electrically actuable initiators, including

a series of activating modules arranged in first and second sets,

first connecting means for connecting each of the activating modules to a different one of the initiators,

each activating module having a controllable, electrically operable switch means and disabling means for disabling the switch means of the immediately succeeding activating module, each disabling means being such that it disables the switch means of the succeeding activating module until the initiator associated with its own activating module has been activated,

second connecting means for connecting the disabling means of each activating module to the switch means of the succeeding activating module, and

third connecting means for connecting the activating modules to a power supply means and including separate power supply cables for supplying power independently to either the first or the second set of activating modules thereby to energize either the first or the second set of activating modules.

4,099,468

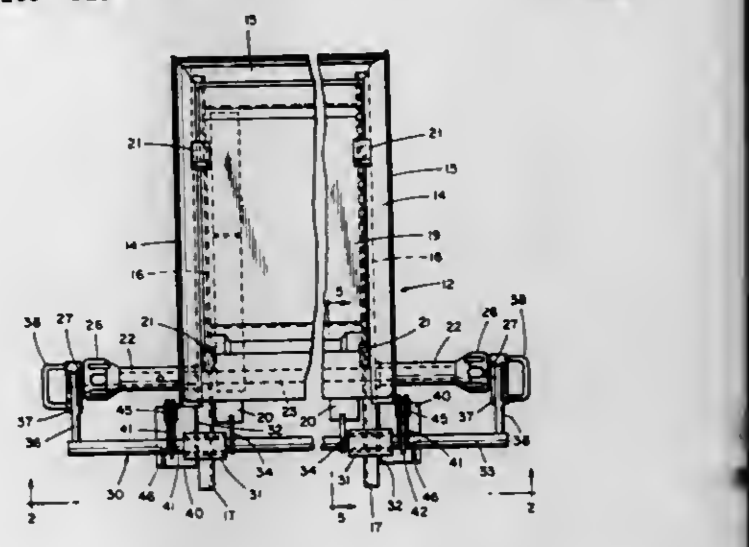
LOCK FOR A HOPPER CAR OUTLET GATE

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Jul. 15, 1976, Ser. No. 705,743

Int. Cl.² B61D *7/02*

U.S. Cl. 105—310 **7 Claims**



1. A discharge gate for a hopper having a discharge opening, said gate including a frame attached to said hopper at said opening,

a horizontally movable closure gate slidingly supported on said frame for movement from a closed position beneath said opening to an open position to one side of said opening,

an actuating shaft rotatably mounted on said frame,

actuating means on said gate operated by said actuating shaft for slidingly moving the gate between said positions,

said actuating shaft having at opposite ends thereof operating heads adapted to receive external operating means for rotating said shaft, the improvement comprising;

a lock assembly for locking said sliding gate in a closed position including,

a locking shaft,

means rotatably supporting said locking shaft in laterally spaced relation on said frame,

locking plate means supported on said locking shaft in a locking position engaging and blocking opening movement of said gate, and

means on said locking shaft in the locking position blocking operating means access to said operating head,

said blocking means being movable with said locking shaft and said locking plate means to an unlock position whereupon operating access to said operating head is achieved,

said locking shaft extending substantially parallel and coextensive with said actuating shaft,

said blocking means including arms projecting in U-shaped configuration from said locking shaft and being rotatable with said locking plate means to an unlock position,

said arms including handle means adapted to be grasped by an operator on either side of said gate for moving said locking shaft between lock and open positions,

said handle means being connected to said blocking means and projecting outwardly with respect thereto.

4,099,469

DRAFTING TABLE

Fritz Sahli, Thun, Switzerland, assignor to Albert Fritschi, Berne, Switzerland

Filed Apr. 22, 1977, Ser. No. 790,126

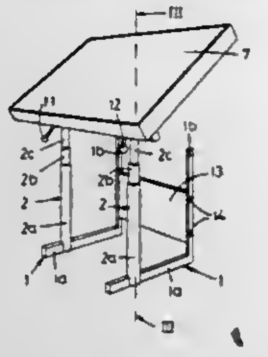
Claims priority, application Switzerland, Apr. 29, 1976, 5419/76

Int. Cl.² A47F *5/12;* **A47B** *27/00*

U.S. Cl. 108—1 **6 Claims**

1. An adjustable drafting table adapted to be stored in a

collapsed, essentially planar configuration, comprising: first and second, generally U-shaped table supports, each support including a generally horizontally disposed base member and a pair of spaced apart, upwardly protruding first and second support posts; transverse means rigidly interconnecting upper ends of the first posts in relative, spaced apart positions; means securing a table plate to the supports for pivotal movement of the plate relative to the supports about a horizontal axis between a first, substantially vertical position and a second position that is inclined from the vertical; and adjustment means disposed within the first posts, connecting the upper ends of the first posts with corresponding lower ends of the first posts, and permitting relative vertical and relative pivotal movements about vertical axes between the upper ends and the lower ends of the first posts so that the U-shaped supports can be positioned in opposing and spaced apart relation to each other for supporting a portion of the table plate on the second posts while the U-shaped supports can be pivoted to substantially align the second posts with the first posts and the table plate can be pivoted into the vertical position for storage of the drafting table in a space saving configuration.



4,099,470

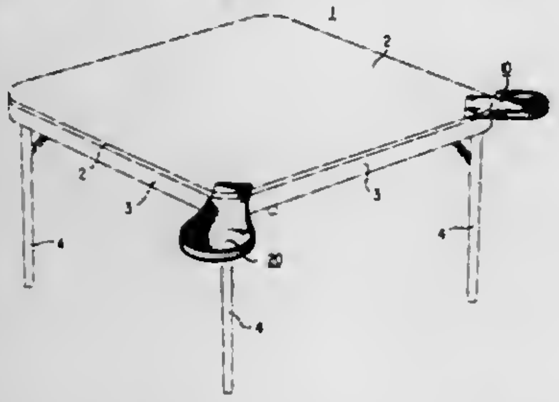
CARD TABLE ATTACHMENT

Thomas C. Cannon, Jr., 5244 Lake Springs Dr., Dunwoody, Ga. 30338

Filed Sep. 17, 1976, Ser. No. 724,598

Int. Cl.^{2} A47B *97/00*

U.S. Cl. 108—26 **14 Claims**



1. An attachment for use with any conventional foldable table which is characterized by a compliant cover mounted on a rigid supporting frame member, said attachment comprising in combination:

a tongue comprising a member not exceeding about 3/32 inch in thickness and having a flexural modulus of at least about 2.5×10^5 pounds per square inch, said member having substantially flat parallel major surfaces,
a tray connected to at least one edge of said tongue,
said tongue being insertable between the compliant cover and the frame of the table thereby deflecting the compliant cover to permit entry of said tongue,
the cover, the frame, and said tongue thereby combining to provide support for said tray in outwardly extended cantilevered fashion in a substantially horizontal plane adjacent an edge of the table, thereby to furnish the sole support for said attachment.

4,099,471

APPARATUS FOR CLEANING THE AIR NOZZLES AND REGULATING AIR FLOW THERETO IN CHEMICAL RECOVERY BOILERS

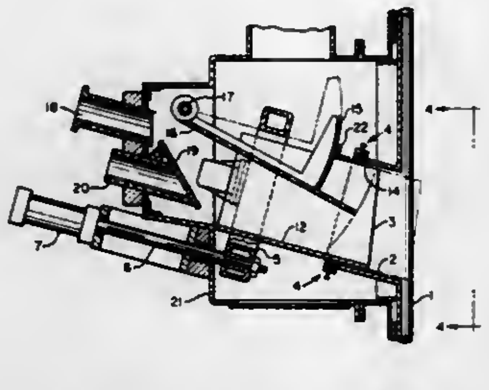
Georg Sander; Sven Eric Jacobson, and Åke Magnus Ivar Ericson, all of Jarfalla, Sweden, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 19, 1976, Ser. No. 743,442

Claims priority, application Sweden, Nov. 24, 1975, 7513171

Int. Cl.^{2} F23L *5/00*

U.S. Cl. 110—182.5 **2 Claims**



1. In combination, walls forming a furnace, air passage means connected to the furnace through a nozzle, a scraping sleeve mounted within the passage means, said scraping sleeve being slightly smaller in cross section than the nozzle, means for moving the sleeve toward and away from the furnace, said nozzle having a sleeve support extending around the entire inner periphery of the nozzle, so as to have line contact with the scraping sleeve around its entire periphery, and damper means for regulating the air flow to the nozzle.

4,099,472

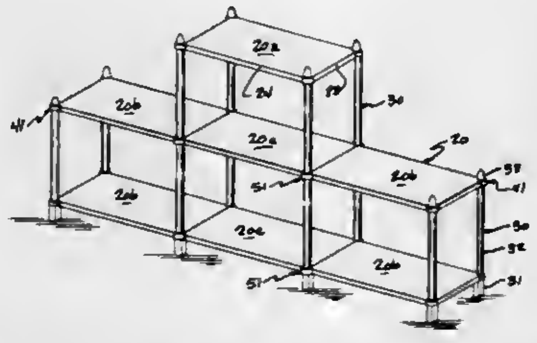
FREE STANDING SHELVING SYSTEM

Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107

Filed May 31, 1977, Ser. No. 801,556

Int. Cl.^{2} A47B *3/00*

U.S. Cl. 108—114 **15 Claims**



1. In a free standing shelving system including a plurality of shelves each having upper and lower faces and side and end edges at the sides and ends thereof, and a plurality of spindle assemblies for supporting the shelves, some of the shelves being arranged in endwise adjacent relation whereby the shelving system has some abutting shelf ends and some free shelf ends, the improvement comprising: each shelf having its corner portions removed to provide like corner openings which extend vertically through the shelf at all four corners thereof, which corner openings intersect the adjacent side and end edges of the shelf generally symmetrically of the virtual shelf corner, the abutting shelf ends having their corner openings contiguous and their virtual corners substantially coincident, one of said spindle assemblies being located at each corner opening at the free shelf ends and one of said spindle assemblies being located at the contiguous corner openings on the abutting shelf ends, each spindle assembly including upper and lower spindle members having end faces at the adjacent ends thereof overlapping portions of the shelf adjacent the respective corner opening, each spindle assembly including an adapter member extending between the adjacent end faces on associated ones of the upper and lower spindle members externally of the shelf, and threaded connector means extending axially of the spindle assembly and in substantial alignment with the virtual corners of the shelves for clamping associated ones of the upper and lower spindle members to the respective adapter member and to the shelf.

4,099,473

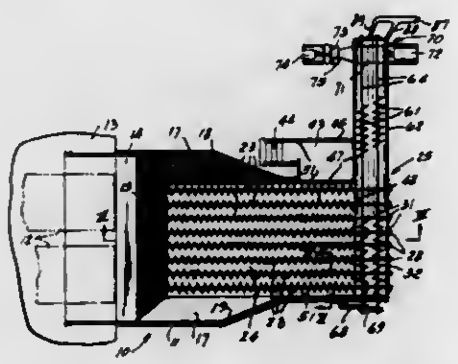
FUEL HANDLING, METERING AND PREPARATION APPARATUS AND METHOD

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Continuation-in-part of Ser. No. 619,056, Oct. 2, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 721,163

Int. Cl.^{2} F23G *5/02;* F23K *3/00*

U.S. Cl. 110—219 **39 Claims**



1. A shredded fuel handling, metering and preparation apparatus, comprising:

a bin for receiving bulk coarse primary shredded fuel material;
means defining a metering gate at a discharge end of said bin;
metering conveyor means for moving shredded fuel material from the bin through said gate;
delivery conveyor means for receiving the primary shredded fuel material metered through said gate and operative to form the received primary shredded material into a stream of substantial width and substantially uniform depth;
a hammer mill reshredder having a plurality of hammers which receive material to be shredded through a horizontally elongated inlet port into which the stream of primary shredded materal is delivered from the conveyor means to the hammers for efficient uniform reshredding into a preferred ultimate fuel particle size;
said delivery conveyor means comprising a transverse delivery conveyor of substantial width subjacent to said gate;
said conveyor acting on said shredded fuel material received on the conveyor to spread the material substantially uniformly across the conveyor and advancing the material along the conveyor toward the reshredder; and
said delivery conveyor having a delivery end of substantially the same width as the length of said inlet port and registering with said inlet port so that the uniformly spread stream of primary shredded material is deposited into the reshredder from said delivery conveyor substantially uniformly throughout substantially the inlet port length and so that all of the hammers of the reshredder receive substantially the same metered quantity of the primary shredded material delivered through said inlet port whereby overloading of any of the hammers is avoided.

14. A method of handling, metering and preparation of shredded fuel, comprising:

receiving bulk coarse primary shredded fuel material in a bin;
moving the primary shredded fuel material from the bin through a metering gate at a discharge end of said bin;
receiving on delivery conveyor means subjacent to said gate the primary shredded fuel material metered through said gate and on said delivery conveyor means spreading the received primary shredded material into a stream of substantial width and substantially uniform depth and moving the material to a delivery end of the conveyor means;
delivering said stream of primary shredded material from said delivery end of the conveyor means into a horizontally elongated inlet port of a length substantially equal to the width of said stream in the top of a hammermill reshredder having a plurality of hammers which receive the material to be reshredded through said inlet port; and
depositing said stream into the reshredder substantially uniformly throughout substantially the inlet port length and thereby to all of the hammers in the reshredder in substantially the same metered quantity and thereby effecting efficient uniform reshredding of the delivered primary shredded material into a preferred ultimate fuel particle size and avoiding overloading of any of the hammers.

4,099,474

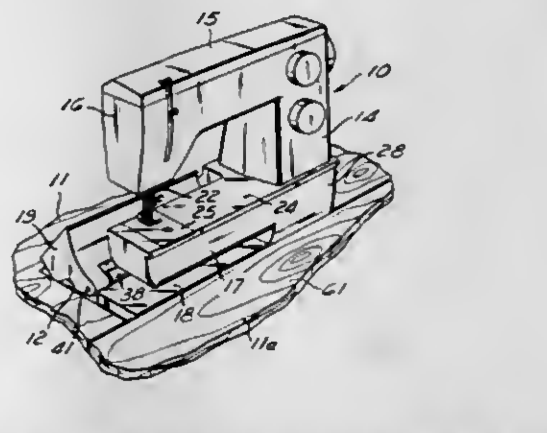
CONVERTIBLE OPEN-ARM SEWING MACHINE

Sidney J. Hamlett, Parma, and Charles M. Bell, Olmsted Falls, both of Ohio, assignors to White Sewing Machine Company, Cleveland, Ohio

Filed Dec. 6, 1976, Ser. No. 747,968

Int. Cl.^{2} D05B *73/06*

U.S. Cl. 112—258 **7 Claims**



1. An assembly comprising a cabinet and a sewing machine, said cabinet including a cabinet panel having an upper horizontal surface and a cut-out for reception of said machine, said sewing machine including as components a frame and a pivot base, said frame having a vertical standard, a horizontal upper arm extending from the standard, a sewing head at the free end of the upper arm, a lower cantilevered arm freely extending from a supported end thereof adjacent the standard and generally parallel to the upper arm, means for pivoting the pivot base on the cabinet about a first horizontal axis parallel to said lower arm, said pivot base including a means for pivotally supporting the machine frame about a second axis spaced from and parallel to said first axis, said pivot base and said cabinet panel being arranged to support said machine frame at two vertically spaced operational positions corresponding to a free arm or first position wherein said lower arm is elevated with respect to said horizontal cabinet surface and a flat bed or second position wherein an upper face of said lower arm is generally coplanar with said horizontal cabinet surface, said pivot base extending generally along a longitudinal side of said frame, a generally planar surface carried by said pivot base, said planar surface being disposed relative to said pivot base and said frame such that it is generally coplanar with the upper surface of said lower arm when said frame is in said second

position whereby said planar surface forms an auxiliary work supporting surface, said planar surface being responsive to relative movement between said pivot base and said frame whereby said planar surface is displaced from said lower arm when said frame is in said first position.

4,099,475

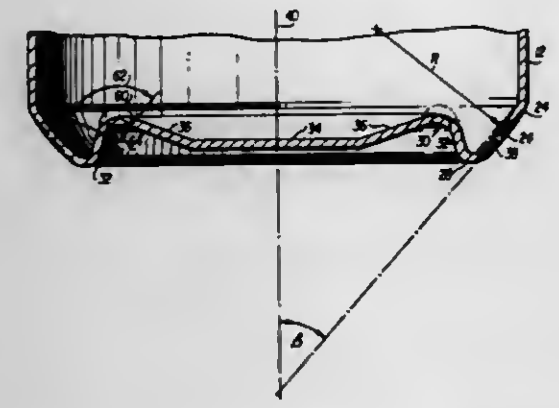
METHOD OF TROUBLE-SHOOTING CAN PRESSES

Harry W. Lee, Jr., Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 29, 1976, Ser. No. 709,904

Int. Cl.² B21D *51/26*

U.S. Cl. 113—116 QA **2 Claims**



1. A method of trouble-shooting a can press including the steps of:

- producing cans from said press wherein said cans have a predetermined normal failure mode;
- correlating given non-normal types of failure modes of said cans with given malfunctions of said can press;
- subsequently selecting cans from said can press when said can press is believed to be operating normally and subjecting said subsequently selected cans to destructive testing to determine whether the resulting failure modes are normal or non-normal; and,
- in the event said resulting failure mode is non-normal, determining the press malfunction corresponding to the non-normal failure mode determined during the previous step.

4,099,476

REMOTE CONTROL APPARATUS FOR MARINE ENGINES

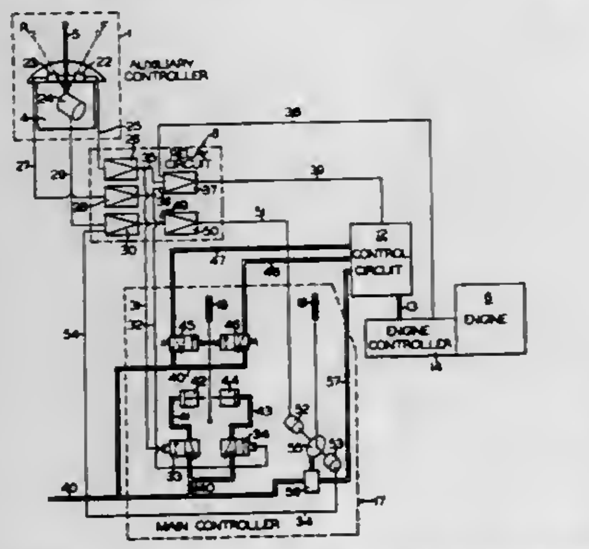
Hiroo Inoue, Amagasaki, and Isao Kishimoto, Kobe, both of Japan, assignors to The Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Apr. 18, 1977, Ser. No. 788,397

Claims priority, application Japan, May 12, 1976, 51-54751

Int. Cl.² B63H *25/24*

U.S. Cl. 114—144 R **7 Claims**



1. In remote control apparatus for controlling direction and speed of a marine engine, synchronizing means for synchronizing operation of at least two operator controllers located remotely from each other, said synchronizing means comprising:

(a) an operator auxiliary controller selectively operable to a direction position for setting the direction of engine rotation, and to one of a plurality of speed positions for setting the rate of engine rotation by emitting respective electrical direction and speed control signals, said auxiliary controller including respective forward and reverse switch devices, one of which is actuated for producing said direction control signal according to the direction position to which the auxiliary controller is operated, and including a detector device for producing said speed control signal according to the speed position to which the auxiliary controller is operated;

(b) an operator main controller selectively operable, independently of said auxiliary operator controller, to a direction position for setting the direction of engine rotation, and to one of a plurality of speed positions for setting the rate of engine rotation by emitting respective direction and speed control signals;

(c) relay circuit means including respective forward and reverse amplifiers, one or the other of which receives the direction control signal from one or the other of the respective switch devices, depending upon the direction position of said auxiliary controller, and transmits such direction control signal to said main controller, and including a speed comparator for comparing the speed control signal produced by said detector device with the speed control signal emitted by said main controller,

(d) said main controller including positioning means responsive to said direction and speed control signals for effecting operation of said main controller to direction and speed positions corresponding to those of the auxiliary controller;

(e) engine controller means operable responsively to direction and speed control signals for effecting operation of the engine according to said control signals; and

(f) control circuit means operably interposed between said main controller and said engine controller for transmitting said control signals from said main controller to said engine controller.

4,099,477

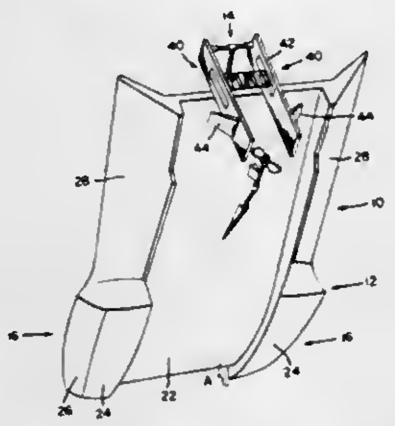
ENGINE POWERED WATER CRAFT

David W. Caldwell, Plant City, Fla. 33566

Filed Jul. 14, 1976, Ser. No. 705,090

Int. Cl.² B63B *1/26*

U.S. Cl. 114—281 **13 Claims**



1. An engine powered water craft comprising a hull including a pair of spaced apart hull elements configured to support said craft on the water in combination with a twin rudder system for directional control, said hull further comprising an upper and lower foil extending between said hull elements, said upper and lower foil intersecting rearward of the forward portion of said hull elements to cooperatively form a thin bow, said twin rudder system comprising a pair of rudders each including a substantially vertical rudder element having a super cavitating foil element attached to the outer side thereof, each said super cavitating foil comprising a knife-like member extending in an angle from said substantially vertical rudder elements, said super cavitating foil elements configured to engage the surface of the water to support the rear portion of said water craft on the water at the intersection of said super cavitating foil elements and said substantially vertical rudder elements.

12. A super cavitating twin rudder system comprising a pair of rudders, each said rudder comprising a substantially vertical rudder element having a super cavitating foil element attached to the outerside, said rudders being vertically offset relative to each other to counteract engine torque, each said super cavitating foil element comprising a knife-like member extending upwardly at an angle from said substantially vertical rudder elements.

4,099,478

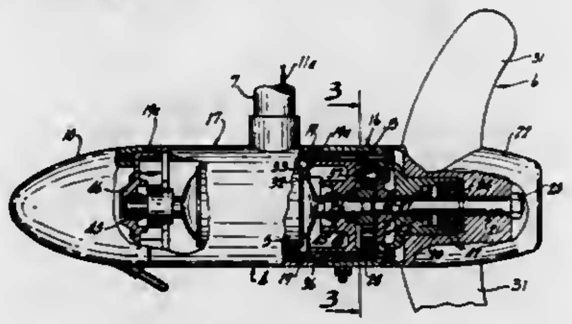
HIGH THRUST TROLLING MOTOR

Charles F. Alexander, Jr., Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 4, 1975, Ser. No. 610,304

Int. Cl.² B63H *21/28*

U.S. Cl. 115—18 E **7 Claims**



1. In an electric trolling motor having a lower unit secured to a tubular depending support, said lower unit including a cylindrical motor housing with an electric motor located therein and closed at the forward end, a generally cup-shaped housing means having an outer cylindrical portion corresponding to the cylindrical motor housing of said motor and having an inner planar base portion adjacent to the outer cylindrical portion, a motor shaft hub member having a cylindrical portion closely fitting within the outer cylindrical portion of the cup-shaped housing and having an inner end, an internally toothed annulus gear located between said base portion and said inner end of the cylindrical portion of the motor hub member, bolt means extending through said base portion and said annulus gear and threaded through said cylindrical portion of said hub member for firmly interconnecting said members, said base portion of said housing means and said hub member having opposed recesses to the opposite side of said annulus gear to define a gear chamber, a reduction gear means located in said chamber and including a planetary gear cage located within the recessed portion of the cup-shaped housing means and having a plurality of planetary gears meshing with the internally toothed annulus gear, a sun gear meshing with planetary gears, a propeller shaft rotatably journaled within said cup-shaped housing means and having the inner end fixed to said cage coaxially of the sun gear, said sun gear having a keying opening with a motor shaft having a keying end projecting therein, and a thrust bearing means between said cage and said sun gear to rotatably support said sun gear.

4,099,479

OUTBOARD MARINE PROPULSION UNIT

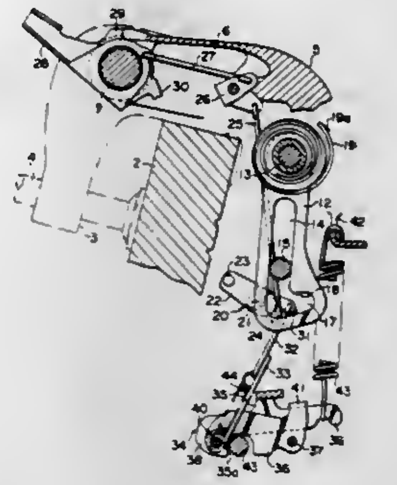
Tetsuya Arimitsu, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha and Yamaha Hatsudoki Kabushiki Kaisha, both of, Japan

Filed Feb. 25, 1977, Ser. No. 772,252

Claims priority, application Japan, Feb. 25, 1976, 51-19683

Int. Cl.² B63H *21/26*

U.S. Cl. 115—41 R **10 Claims**



1. Outboard marine propulsion unit comprising clamp bracket means adapted to be secured to a boat hull, swivel bracket means pivotably mounted about an axis on said clamp means, and carrying a propulsion unit, tilt lock means for holding said swivel bracket means in a position raised with respect to a normal operating position, said tilt lock means including locking member means pivotably mounted on one of the clamp bracket means and the swivel bracket means and having elongated slot means, said slot means being formed at one end with locking recess means offset to one side of the slot means, locking pin means provided on the other of said clamp bracket means and said swivel bracket means and slidably engaging said slot means, biasing means for engaging said locking member means at a point for applying thereto a biasing force in such a direction that the locking recess means is forced into engagement with the locking pin means when the swivel bracket means is moved to the raised position and the locking pin means is slidably moved along the slot means to the end where the locking recess means is formed, restricting means adapted to engage said locking member means for applying thereto a biasing force which is larger than but opposite to the biasing force of the biasing means for restricting said locking member means against the movement under the biasing means, and control means for moving said restricting means into and from a position where the restricting means is engageable with said locking member means, said biasing means being independent from said restricting means and said control means so that said biasing means can always apply a biasing force to said locking member.

4,099,480

ROTATION INDICATORS FOR CASSETTE REELS

Louie E. Loustannau, Los Angeles, Calif., assignor to Raymond Lee Organization, Inc., a part interest

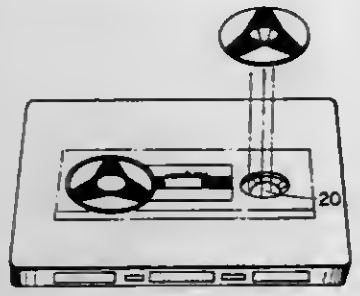
Filed Sep. 30, 1976, Ser. No. 728,306

Int. Cl.² G01P *13/00*; G25B *27/00*

U.S. Cl. 116—135 **2 Claims**

1. Apparatus for use with a reel in a tape cassette comprising: an indicator to be removably inserted in the center of a reel to enable the reel rotation to be observed, said indicator including a flat circular disc with a central hole, and a plurality of equidistantly spaced like flexible legs extending downwardly from the bottom of the disc from points located around the periphery of the hole, each leg having a projection means at its free end whereby each leg can be detachably secured to a corresponding spoke in the cas-

sette reel to maintain said indicator disc spaced from the reel, each leg being biased radially outwardly, each claw having two opposed fingers having curved inner surfaces



and biased toward each other whereby each claw can hold said corresponding spoke between the fingers, each finger having a tip with a radially outwardly projecting section.

4,099,481

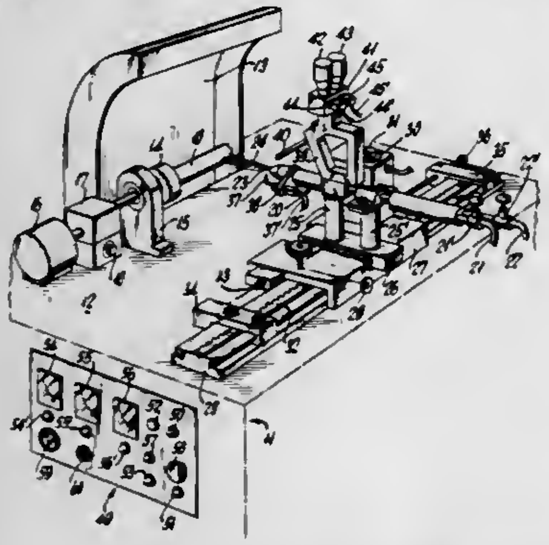
APPARATUS FOR APPLYING METAL COATINGS TO A METAL SUBSTRATE

John E. Lyons, Levittown, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sep. 30, 1976, Ser. No. 728,202

Int. Cl.² B05B *13/04*

U.S. Cl. 118—8 **24 Claims**



1. An automatic machine for applying metal coating to a generally cylindrical metal substrate, comprising a frame including work-holding means supported for rotation about an axis that is fixed with respect to said frame, drive means for rotating said work-holding means, a gas torch for operating upon work supported by said work-holding means, a carriage mounting said torch in position for discharge upon a local region of the supported work, guide means coacting between said carriage and frame for longitudinally guided traverse of said torch with respect to the work, recycling reciprocating drive means for imparting a predetermined repetitive traverse of the work by said torch; said torch comprising a discharge nozzle and means including a gas-flow valve for on-off supply of a gas flow to said nozzle, ignition means positioned adjacent said nozzle for igniting a gas-supplied nozzle discharge, spray-powder supply means, and means including a powder-flow valve for on-off control of a flow of spray powder for admixture with torch flow; and control means operative upon said reciprocating drive means and upon said respective valves and determining (a) a period of torch-reciprocation cycles while said powder-supply valve is in "off" condition, followed (b) by a period of torch-reciprocation cycles while said powder-supply valve is in "on" condition, said control means further determining an "on" condition of said gas-flow valve for at least the combined total of said periods.

4,099,482

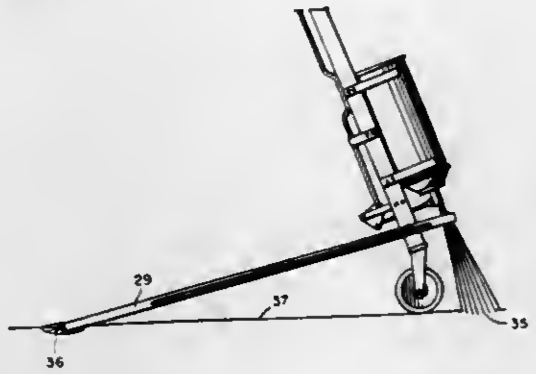
MARKING APPARATUS WITH MEASURING DEVICE

Thomas J. Smrt, 31W 300 W. Bartlett Rd., Bartlett, Ill. 60103

Filed May 11, 1977, Ser. No. 795,712

Int. Cl.² B05C *17/00*

U.S. Cl. 118—9 **1 Claim**



1. In combination with a marking apparatus for making marks, a measuring device for measuring the distance between adjacent marks,

the marking apparatus including an elongated can holder having an upper end and a lower end, means on the can holder for supporting a valve-equipped aerosol can containing marking material, the axis of the can being parallel with the longitudinal dimension of the can holder, valve-opening means on the can holder for opening the valve of the aerosol can and spraying the marking material in a direction parallel with the longitudinal dimension of the can holder, a wheel-mounting bracket attached to the lower end of the can holder and extending angularly therefrom away from the aerosol can to form an included angle of less than 180° with the can holder, and a wheel rotatably mounted on the wheel-mounting bracket for permitting the marking apparatus to be rolled over the surface to be marked, whereby when the wheel-mounting bracket extends substantially perpendicular to said surface the marking material will be sprayed at an acute angle to said surface,

the measuring device comprising an elongated rod having first and second ends and a longitudinally extending slot extending from adjacent the first end of the rod toward the second end, the rod being pivotally and slidably connected to the can holder by a pin adjacent the lower end of the can holder and extending through the slot in the rod, a nut threadedly engaged with the pin whereby the rod and the can holder can be clamped together as the nut is tightened on the pin, the rod being pivotable when the nut is loosened on the pin between a storage position in which the rod extends alongside the can holder and a measuring position in which the second end of the rod extends away from the can holder and is engageable with the surface to be marked, the rod being releasably clamped in the measuring position by said nut whereby a series of equally spaced marks can be sprayed and the angle at which the marking material will be sprayed for each mark can be maintained constant by contacting said second end of the rod with a mark before the next mark is sprayed.

4,099,483

TISSUE PROCESSING APPARATUS

Kenneth James Henderson, Crowthorne, England, assignor to Shandon Southern Products Limited, Runcorn, England

Filed Apr. 7, 1976, Ser. No. 691,585

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49.1 **8 Claims**

1. Tissue processing apparatus comprising

(a) a vessel defining a vapor space;

(b) means for sealing the vapor space to enable the atmospheric pressure within the vapor space to be adjusted;

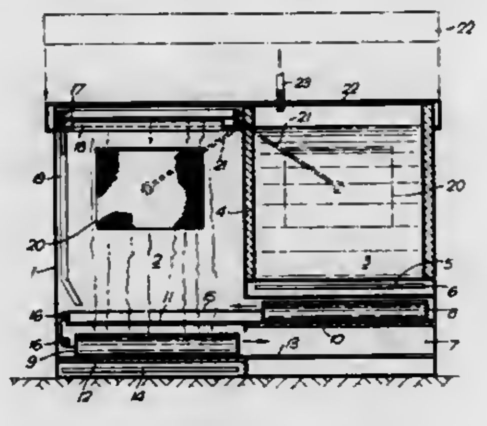
(c) a receptacle for a volatile processing liquid;

(d) heating means for vaporizing the processing liquid in the receptacle,

(1) the vapor space being arranged to receive the processing liquid vapor from the receptacle;

(e) means near an upper end of the vapor space for effecting condensation of the vapor in the upper vapor space end;

(f) means for returning the condensate to the receptacle;



(g) an openwork basket adapted to hold tissue specimens to be processed;

(h) a wax bath; and

(i) suspension means adapted to hold the basket in the vapor space whereby tissue specimens held in the basket are exposed to the processing liquid vapor and to transport the basket from the vapor space into the wax bath for transferring the specimens from the vapor space to the wax bath.

4,099,484

PRESSURE FIXING APPARATUS FOR ELECTROPHOTOGRAPHY

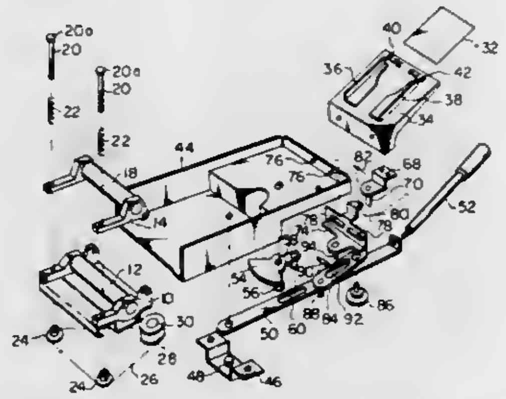
Yukihiro Ohno, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1976, Ser. No. 693,442

Claims priority, application Japan, Jun. 10, 1975, 50-69179

Int. Cl.² B05C *11/02*

U.S. Cl. 118—117 **15 Claims**



1. A pressure fixing apparatus for electrophotography comprising first and second pressure fixing rollers, biasing means pressing the rollers together, adjustor means operatively associated with the biasing means to adjust the latter and thereby the biasing force pressing the rollers together, entry means providing entry for sheets to the apparatus and being adjustable to sheets of different widths, and mechanism means operatively connected between the entry means and the adjustor means such that adjustment of the entry means to accommodate sheets of different width causes the mechanism means to adjust the adjustor means to vary the biasing force pressing the rollers together, whereby the biasing force pressing the rollers is a predetermined function of the width of the sheet in the entry means.

4,099,485

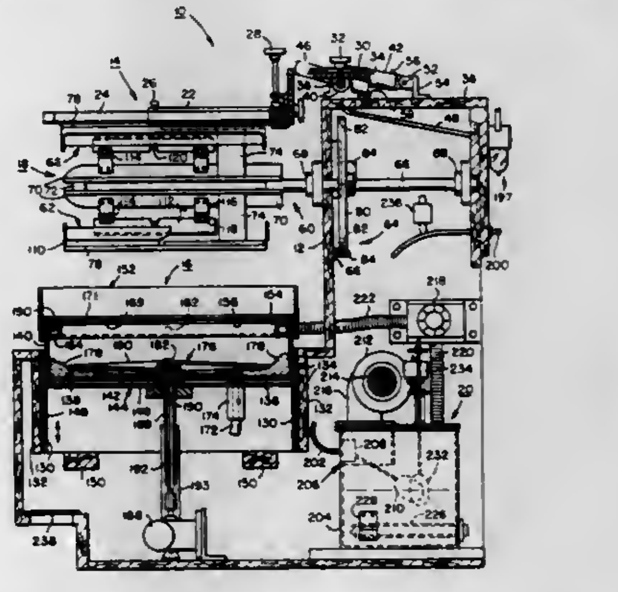
APPARATUS FOR APPLYING FLOCK TO A SUBSTRATE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,608

Int. Cl.² B05B *15/04*

U.S. Cl. 118—301 **23 Claims**



1. Apparatus for applying flock to a substrate comprising:

(a) a cabinet,

(b) means connected to said cabinet including a platen for supporting a substrate to be flocked,

(c) a flock tray positioned below said platen and including a bottom wall and side walls and means for moving said flock tray up and down in said cabinet and up into contact with said platen,

(d) sealing means located in said cabinet between said tray and said cabinet for preventing any flock from getting into said cabinet, and

(e) a flock tray cover having a bottom wall and located on top of said flock tray and having an opening in said bottom wall, and a removable mask having an opening therein and being located on top of said bottom wall of said flock tray cover.

4,099,486

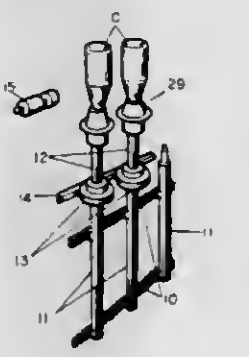
ELECTROSTATICALLY COATING HOLLOW GLASS ARTICLES

Edward J. Bialorucki, Shippenville, Pa.; Ronald W. Bradley, Toledo, and David G. Carl, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 28, 1977, Ser. No. 781,603

Int. Cl.² B05B *5/02*

U.S. Cl. 118—635 **10 Claims**



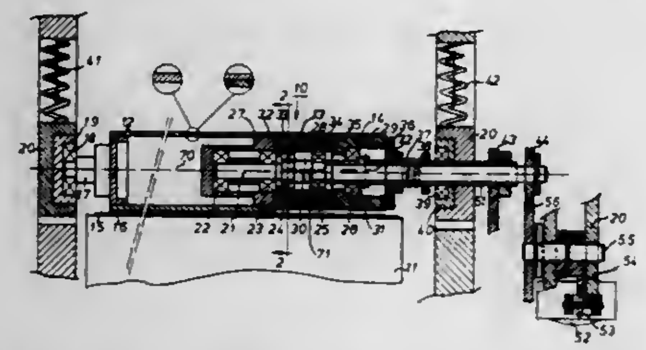
1. Apparatus for electrostatically coating hollow glass articles having an opening leading into the interior, wherein the articles are supported adjacent the opening and electrostatically charged particles are directed toward the articles from at

least one side thereof, the improvement in the article support comprising:

a series of electrically, grounded vertical spindles;
means to rotate said spindles about their vertical axes and to simultaneously transport said spindles in series through the field of charged particles;
a spindle ground plug telescopically received in the upper end of each spindle;
a non-conductive chuck mounted to the upper end of the spindle and extending thereabove, said chuck further being formed with a lower skirt that surrounds that portion of the spindle that contains the ground plug; and
a ground pin in contact with said plug and having a portion extending upward through a central opening in said chuck.

4,099,487
ROLLER WITH ADJUSTABLE LENGTH

Albert Paul Wouters, Deurne, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium
Filed Jan. 7, 1976, Ser. No. 693,550
Claims priority, application United Kingdom, Jan. 10, 1975, 24879/75
Int. Cl.^{2} G03G *13/16*
U.S. Cl. 118—651 **13 Claims**

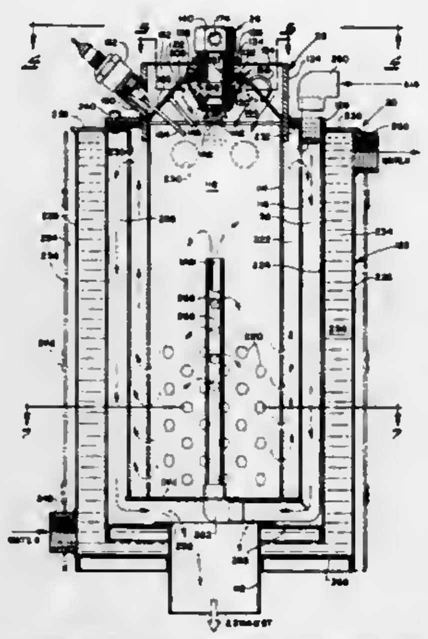


1. An adjustable rotatable pressure roller comprising a support shaft, a main roller section and at least one axially juxtaposed auxiliary roller section supported on said shaft, said auxiliary roller section having a diameter less than that of said main roller section, and adjustable means for bodily displacing said auxiliary roller section radially upon said shaft to adjust the position of its axis of rotation in parallel relation to the position of the axis of rotation of said main roller section.

4,099,488
DIESEL FUELED ENGINE COOLANT HEATER

Ralph S. Damon, Cleveland, Ohio, assignor to Hunter Investment Company, Cleveland, Ohio
Filed Jun. 9, 1975, Ser. No. 584,948
Int. Cl.^{2} F22B *7/00;* F23N *1/08*
U.S. Cl. 122—156 **23 Claims**

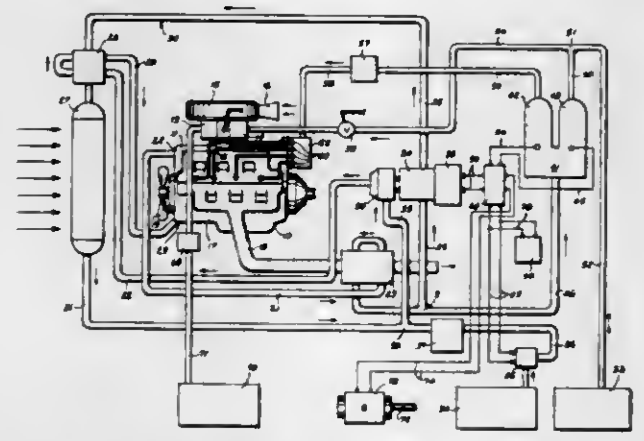
1. A coolant fluid heater comprising in combination:
a combustion chamber;
a fuel-primary air injection nozzle supported by a burner head;
an air spread cup;
first supply means to admit fuel and primary air, under pressure, to said nozzle;
means providing for the atomization of fuel at said nozzle for the introduction of a fuel-primary air mixture into said combustion chamber through said air spread cup;
said fuel-primary air mixture being admitted into said combustion chamber in substantially a conical pattern having an axis substantially coincident with the axis of said nozzle;
second supply means providing for the introduction of secondary air into said combustion chamber, said second supply means providing for the passage of secondary air in a rotating pattern about said nozzle and into said combustion chamber substantially outside of said conical pattern;
third supply means providing for the introduction of tertiary air into said combustion chamber, said tertiary air being admitted into said combustion chamber at a location spaced apart and downstream from said nozzle and on approximately the center line thereof so as to be introduced within said conical pattern at a location approximately midway between the discharge end of said nozzle and the bottom of said combustion chamber;



said secondary air and said tertiary air contributing to complete combustion of said fuel both inside and outside of said conical pattern;
ignition means in said combustion chamber to ignite fuel and air in said combustion chamber to provide for combustion therein;
means to pass coolant fluid in heat exchange relationship to the products of combustion generated in said combustion chamber.

4,099,489
FUEL REGENERATED NON-POLLUTING INTERNAL COMBUSTION ENGINE

Curtis E. Bradley, 4517 Calle Ventura, Phoenix, Ariz. 85018
Continuation-in-part of Ser. No. 620,021, Oct. 6, 1975, Pat. No. 4,003,204, Ser. No. 620,022, Oct. 6, 1975, Pat. No. 4,003,344, and Ser. No. 620,023, Oct. 6, 1975, Pat. No. 4,003,345, each is a division of Ser. No. 456,974, Aug. 1, 1974, Pat. No. 3,939,806.
This application Nov. 22, 1976, Ser. No. 744,193
Int. Cl.^{2} F02B *43/08;* F01K *23/10*
U.S. Cl. 123—3 **11 Claims**

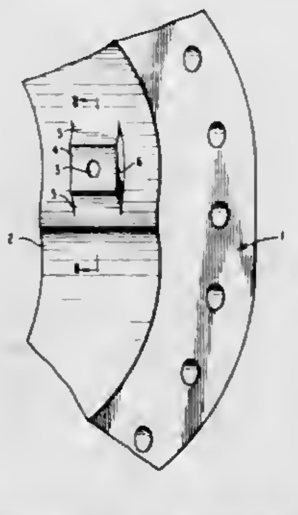


1. In an internal combustion engine;
(a) an engine block providing at least one combustion chamber;
(b) an exhaust pipe extending from said block;

(c) a partially closed system for a working fluid in the form of water and gas emanating therefrom by heating of the water and including a pump for circulating the working fluid through the system, a turbine which is operated by the working fluid in a gaseous state, and a condenser for returning the working fluid from a gaseous state to water;
(d) a heat exchanger disposed about said exhaust pipe and through which said working fluid system passes to derive heat from said exhaust pipe and heat the working fluid;
(e) a generator driven by said turbine to produce an electric current;
(f) an electrolysis cell containing water and connected to said generator whereby current from said generator decomposes the water into oxygen and hydrogen;
(g) a water tank connected to said working fluid system by a conduit including a water purifier, and a piper for taking purified water from said system and delivering it to said electrolysis cell;
(h) a hydrogen carburetor on said engine block for delivering hydrogen to a combustion chamber in said block;
(i) a conduit extending from said electrolysis cell to said hydrogen carburetor and which conveys hydrogen from said cell and delivers it to said hydrogen carburetor under pressure by the heat of said cell and the pump which circulates the working fluid;
(j) a fuel tank for a hydrocarbon fuel;
(k) a hydrocarbon fuel carburetor on said engine block and connected to said hydrocarbon fuel tank; and
(l) means for conveying oxygen from said electrolysis cell and delivering it under pressure to said combustion chamber by pressure generated by said cell and the pump which circulates the working fluid.

4,099,490
METHOD FOR PRODUCING A HOUSING CASING FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

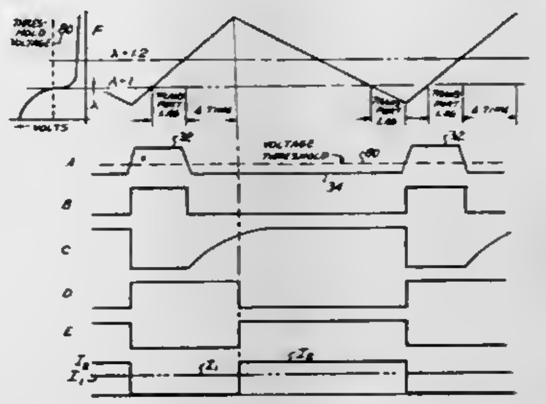
Helmut Dobler, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Division of Ser. No. 328,534, Feb. 1, 1973, Pat. No. 3,892,082.
This application Nov. 12, 1974, Ser. No. 523,046
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1972, 2204560
Int. Cl.^{2} F02B *53/00*
U.S. Cl. 123—210 **9 Claims**



1. A housing casing for a rotary piston internal combustion engine which consists essentially of light metal and which includes a coating of hard material for a piston running surface with a spark-plug-firing channel means terminating in a discharge opening in said running surface, characterized in that the area about the discharge opening of the spark-plug-firing channel means is constituted by a material island of said light metal whose height corresponds to a thickness of the coating provided at an inner contour of the housing casing in a machined condition so that the coating of harder metal commences only at a distance from the spark-plug firing channel means.

4,099,491
SYSTEM CONTROLLING ANY AIR/FUEL RATIO WITH STOICHIOMETRIC SENSOR AND ASYMMETRICAL INTEGRATION

Junuthula Nirdosh Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Continuation of Ser. No. 553,050, Feb. 25, 1975, abandoned.
This application Apr. 26, 1977, Ser. No. 791,092
Int. Cl.^{2} F02B *3/00, 75/10;* F02D *5/02*
U.S. Cl. 123—32 EE **28 Claims**



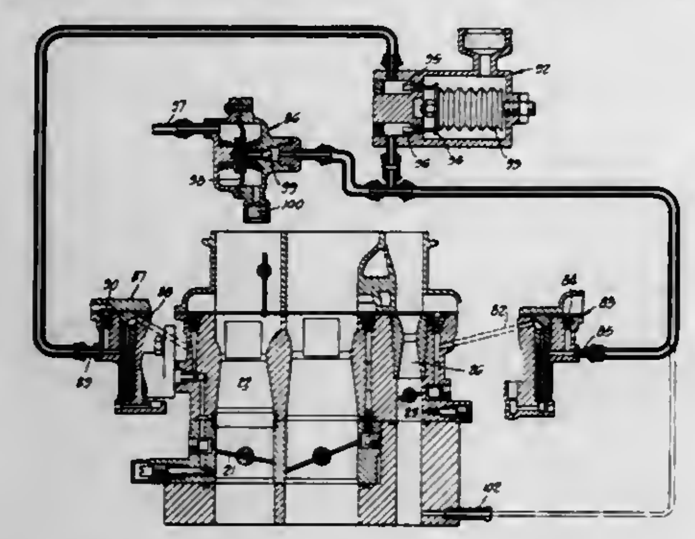
1. In a fuel management system supplying fuel to an internal combustion engine at an average air/fuel ratio comprising:
fuel control means for varying the quantity of fuel supplied to the internal combustion engine to effect the average air/fuel ratio,
an exhaust gas sensor positioned in the exhaust system of the internal combustion engine said sensor adapted to generate an electrical signal switching from a first voltage level to a second voltage level when the instantaneous air/fuel ratio of the exhaust gas mixture exceeds a predefined air/fuel ratio,
means for maintaining a difference between said predefined air/fuel ratio and the average air/fuel ratio, said means including an integrator means responsive to said electrical signal generated by said sensor for generating an output signal to said fuel control means having alternate positive and negative-going slopes the absolute value of the positive-going slope being different than the absolute value of the negative-going slope;
whereby said difference in said slopes causes said system to operate at the average air/fuel ratio while responsive to said sensor switching at said predefined air/fuel ratio.

4,099,492
MIXTURE CORRECTION SYSTEM DURING RAPID ACCELERATION IN INTERNAL COMBUSTION ENGINE WITH AUXILIARY COMBUSTION CHAMBER

Urataro Asaka, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 31, 1977, Ser. No. 763,851
Claims priority, application Japan, Feb. 4, 1976, 51-10266
Int. Cl.^{2} F02B *3/00, 19/10, 19/16*
U.S. Cl. 123—32 ST **17 Claims**

1. In an internal combustion engine in which each piston is provided with a main combustion chamber having an auxiliary combustion chamber associated therewith and connected thereto by means of a torch opening, and a spark plug associated with each auxiliary combustion chamber, the improvement comprising, in combination: means including a main throttle valve for supplying a relatively lean mixture to each of said main combustion chambers, means including an auxiliary throttle valve for supplying a relatively rich mixture to each of

said auxiliary combustion chambers, and correction means responsive to sudden acceleration of the engine for reducing the richness of the mixture in each auxiliary combustion chamber at the time of ignition.



4,099,493

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

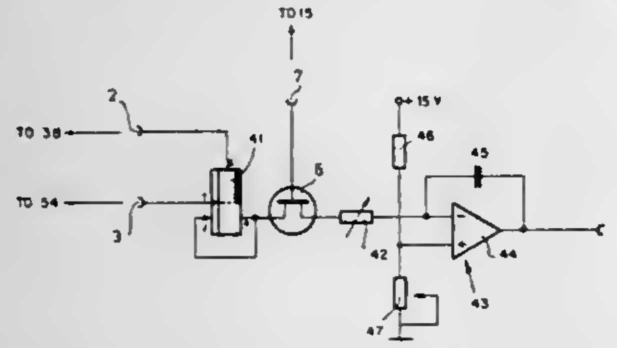
Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 597,404, Jul. 18, 1975, abandoned. This application Mar. 5, 1976, Ser. No. 664,396

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1975, 2509505

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **3 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

(A) determining the scattering of the cyclic fluctuations of the average combustion chamber pressure during time intervals which are synchronous with the engine r.p.m. and generating a first signal representative thereof;

(B) generating a second signal representative of engine r.p.m. but not including dependence on said fluctuations;

(C) performing a phase comparison of said first and second signals and generating a comparison signal representative of this phase comparison;

(D) feeding said comparison signal to a final control element for adjusting the fuel-air ratio of the fuel-air mixture admitted to the internal combustion engine; and

(E) interrupting the feeding of said comparison signal to said final control element whenever said phase comparison indicates changes in engine acceleration toward increasing values of acceleration, but maintaining the feeding of said comparison signal to said final control element whenever said phase comparison indicates changes in engine acceleration toward decreasing values of acceleration; whereby the fuel-air mixture remains unchanged during positive changes in engine acceleration.

4,099,494

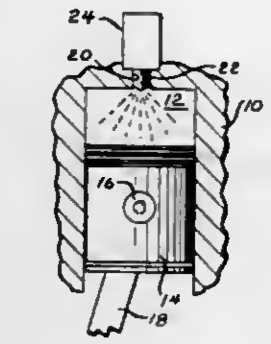
FUEL SPRAY

Alexander Goloff, East Peoria, and Frank E. Keske, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 19, 1976, Ser. No. 733,974

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 JV **13 Claims**



1. In an internal combustion engine having a working chamber, a piston movable within said chamber, a fuel injection nozzle within the chamber, and a means for providing fuel under pressure to said nozzle, the improvement wherein said nozzle includes an element having a hollow interior in fluid communication with said fuel providing means, and at least one slit in said element, the sides of said slit being in abutment with each other for fuel pressures in said interior less than a predetermined value, said sides being spaced from each other to permit fuel to flow from said interior in response to fuel pressures within said interior greater than said predetermined value.

4,099,495

METHOD AND APPARATUS TO DETERMINE THE TIMING OF A PERIODICALLY REPETITIVE EVENT WITH RESPECT TO THE POSITION OF A ROTATING BODY, AND MORE PARTICULARLY IGNITION TIMING, FUEL INJECTION TIMING, AND THE LIKE, IN AUTOMOTIVE INTERNAL COMBUSTION ENGINES

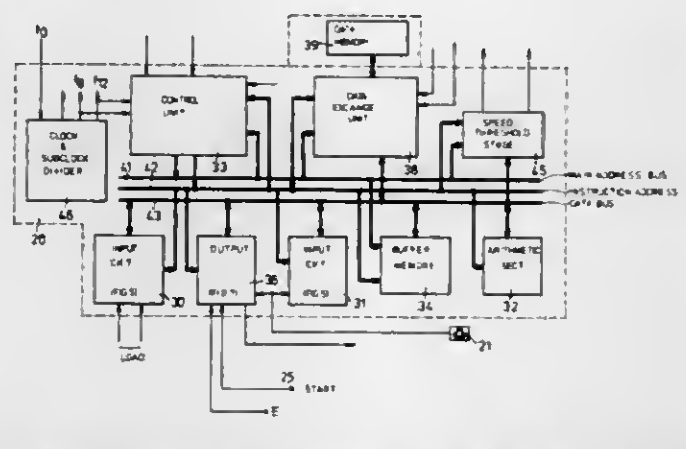
Uwe Kiencke, Ludwigsburg; Ulrich Flaig, Markgroningen; Martin Zechnall, Schwieberdingen, and Günter Hönig, Markgroningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 719,068

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539113

Int. Cl.² F02B *3/00;* F02P *5/04;* G06F *15/20*

U.S. Cl. 123—32 EB **16 Claims**



1. System to determine the timing of a periodically repetitive event with respect to a predetermined angular reference position of a rotating body of an apparatus, in which said timing is determined as a function of an operating parameter of the apparatus, the timing of the periodically repetitive event, with respect to said predetermined reference position of the body being controlled by a square wave electrical signal having a leading flank, the time occurrence of which, with respect to said predetermined reference position, is obtained by a first computation,

and a trailing flank, the time occurrence of which with respect to the leading flank thereof is obtained by a second computation based on the timing of the leading flank with respect to said predetermined reference position,

said system comprising

means providing clock control signals

a transducer means (21) generating a first marker signal related to the predetermined reference position of the body in the apparatus, and further generating a second marker signal relating to rotation of said body over a predetermined angular interval beyond said predetermined reference position;

and a digital data processing system carrying out said first computation and calculating, during time intervals related to angular intervals of rotation of said body beyond said predetermined reference position, digital electrical control signals having calculated values which are representative, in digital form, of operating parameters related to and characterizing the operation of the apparatus;

counter and count decode logic means (80, 81) carrying out said second computation and establishing, by timed sequential counting of said clock control signals, in intervals subsequent to said first marker signal, the temporal relationship between the angular position of the rotating body and said event under control of said calculated digital electrical control signals, wherein the digital processing system carrying out said first computation, and the counter and decode logic means (80, 81) counting and thereby carrying out said second computation, are operating simultaneously, independently from each other, and during time overlap;

and wherein said data processing system and said counter and decode logic means (80, 81) includes

separate units comprising a main control unit (33);

an arithmetic unit (32) to carry out all calculations including calculation of the occurrence, in time, of said leading flank and the trailing flank of said square wave electrical signal;

a data exchange control unit (38);

an external data memory unit (39) storing the relationship or function between change in operating parameters of the apparatus and the timing of the event;

a buffer memory unit (38);

at least one input circuit unit (30, 31);

at least one output circuit unit (36), the output circuit unit (36) providing a voltage pulse in the form of said square wave electrical signal as a function of the angle of rotation of said body from said predetermined reference and as a function of at least one of said operating parameters of the apparatus;

and a bus system (41, 42, 43) interconnecting said units (33, 32, 38, 39, 34, 30, 31, 36), said main control unit also controlling selective connection of said external data memory (39) to said bus system to supply data to said bus system, said data exchange unit (38) and said arithmetic unit (32).

4. System according to claim 1, wherein said apparatus comprises an automotive internal combustion engine, and the data stored in the data memory (39) store the function or relationship between engine operating parameters and the timing of a voltage pulse controlling at least one of the operations of the engine: ignition; fuel injection.

4,099,496

CARBURETOR HEAT SHIELD

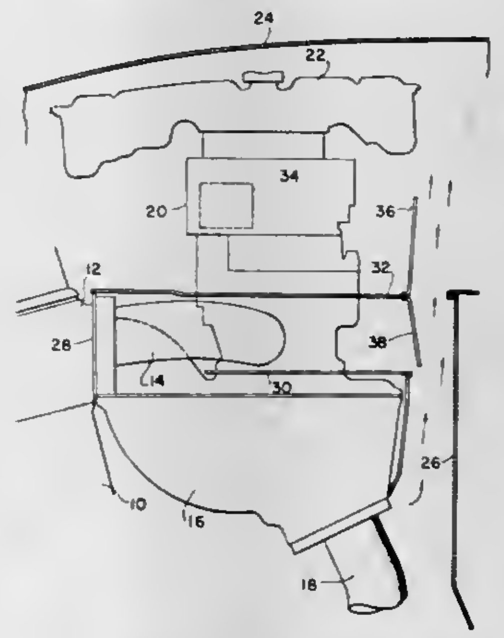
Hidenobu Nagase, Wako; Eiji Kishida, Tokyo, and Mitsuji Yoshihara, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 735,952

Claims priority, application Japan, Oct. 27, 1975, 50-145281[U]

Int. Cl.² F02M *31/00;* F02B *19/10*

U.S. Cl. 123—41.31 **2 Claims**



1. An intake system for an automobile engine, including a carburetor having a float chamber and an intake manifold, said carburetor being mounted on top of said intake manifold, said intake manifold being of a type employed directly above an exhaust manifold, the improvement comprising: a first heat insulating plate positioned between the carburetor and the intake manifold in a substantially horizontal orientation, said first plate being capable of covering at least substantially all of the area above an exhaust manifold with which the intake maifold is to be associated, a second plate extending substantially vertically from an edge of said first plate most distant from said engine, to at least about the height of said float chamber and a third plate extends downwardly from said edge of said first plate most distant from said engine.

4,099,497

INTERNAL COMBUSTION ENGINE HAVING EXHAUST EMISSION CONTROL SYSTEM

Haruo Mori, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,159

Claims priority, application Japan, Dec. 26, 1974, 50/2336

Int. Cl.² F02P *5/04;* F02M *25/06*

U.S. Cl. 123—117 A **10 Claims**

1. An internal combustion engine, comprising

an intake passageway having a throttle valve,

an exhaust pipe operatively communicating with said intake passageway downstream of the latter via the engine,

a distributor,

a vacuum actuator including a first diaphragm means defining an advance chamber and a retard chamber,

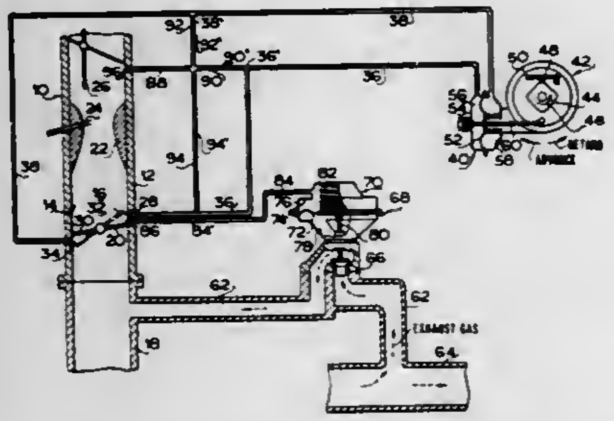
said first diaphragm means being operatively connected to said distributor for controlling spark timing,

an exhaust gas recirculation system further operatively communicating said exhaust pipe to said intake passageway at a point of the latter downstream of said throttle valve,

said exhaust gas recirculation system comprising, a recirculation control valve means for opening and closing, respectively, communication of said exhaust pipe with said intake passageway via said exhaust gas recirculation system, a second diaphragm means operatively connected to said recirculation control valve means for controlling the latter, said second diaphragm means defining a vacuum chamber, and a spring means for biasing said second diaphragm means so as to close said recirculation control valve means,

a first conduit communicating said advance chamber with said intake passageway adjacent said throttle valve at an upstream side of said throttle valve when said throttle valve is closed in idle position and at a downstream side of said throttle valve when the throttle valve is partly opened, respectively,

a second conduit communicating said retard chamber with said intake passageway adjacent said throttle valve at the downstream side of said throttle valve when said throttle valve is closed in idle position and at the upstream side of said throttle valve when the throttle valve is partly opened, respectively,



a third conduit communicating said vacuum chamber of said exhaust gas recirculation system with said intake passageway adjacent said throttle valve at the upstream side of said throttle valve when said throttle valve is closed,

a first branch conduit communicating said first conduit with atmosphere,

a second branch conduit communicating said second conduit with atmosphere,

a third branch conduit communicating said third conduit with atmosphere, and

a flow restricting means provided in each of said branch conduits for restricting flow therethrough, respectively, all said flow restricting means being constructed as a single unit and replaceably mounted with respect to said branch conduits, respectively.

4,099,498

CONTACTLESS IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

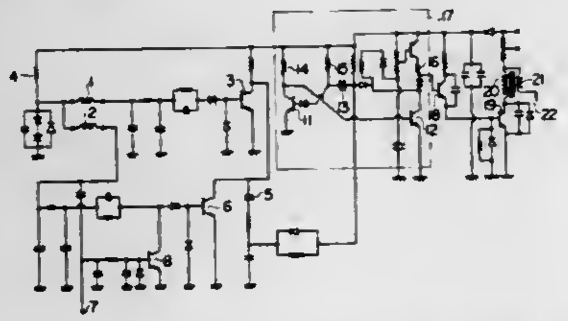
Toshiyuki Sasaki, Nakamachi, Japan, assignor to Hitachi, Ltd., Japan

Continuation of Ser. No. 474,028, May 28, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,123

Claims priority, application Japan, May 30, 1973, 48-59786

Int. Cl.² F02P ***5/04***

U.S. Cl. 123—117 R **7 Claims**



1. A contactless ignition apparatus for an internal combustion engine having an ignition circuit, said apparatus comprising:

first and second pickup coils for detecting different ignition timing points, said first and second pickup coils being so arranged that each of said first and second pickup coils produces an output necessary for actuating said ignition circuit, said first pickup coil being so arranged as to detect the lag angle ignition timing point, said second pickup coil being so arranged as to detect the lead angle ignition timing point, and

first means for introducing selectively one of the respective outputs of said first and second pickup coils to said ignition circuit thereby to control ignition timing, said first means including second means for rendering ineffective the output of said second pickup coil, in response to an external signal representing the running condition of the engine to which said apparatus is coupled, when said external signal indicates that the running condition of the engine requires ignition at the lag angle position timing point, said second means including a first switching transistor, the collector-emitter circuit of said first switching transistor being connected in parallel to the output of said second pickup coil, the base current of said first switching transistor being controlled in response to the external signal representing the running condition of the engine to which said apparatus is coupled thereby to control the on-off operation of said first switching transistor.

4,099,499

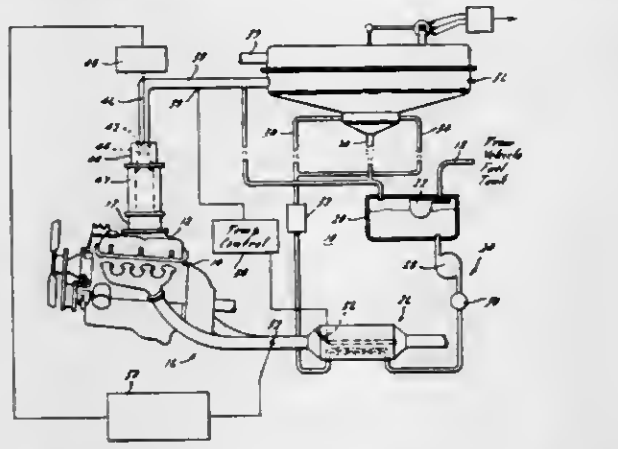
VAPOR TEMPERATURE CONTROLLED EXHAUST GAS HEAT EXCHANGER

Dante S. Giardini, Dearborn Heights, and Douglas R. Hamburg, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 21, 1976, Ser. No. 699,004

Int. Cl.² F02M ***31/00***

U.S. Cl. 123—122 E **2 Claims**



1. The method of providing a vaporized liquid fuel to an internal combustion engine, comprising the steps of:

providing a closed flow of fluid fuel from a liquid fuel reservoir means to a fuel vapor storage means;

generating a flow of heated gaseous medium;

causing said gaseous medium to flow in heat exchange relation to the flow of fluid fuel at a location intermediate the storage means and the reservoir means and at a temperature sufficient, considering minimum fluid fuel dwell time, to heat and completely vaporize the liquid fuel;

sensing a fuel temperature downstream, in the fuel flow direction, from the fuel heating location;

modulating the heat exchange transfer rate between the gaseous medium flow and the fluid fuel in response to sensed temperature whereby the temperature of the generated fuel vapor may be maintained within a desired range;

sensing the quantity of fuel vapor resident in the vapor storage means; and

modulating the heat exchange transfer rate between the fluid fuel flow and the gaseous medium flow in response to sensed vapor quantity whereby the quantity of fuel vapor within the vapor storage means may be maintained within a desired range.

4,099,500

EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINE

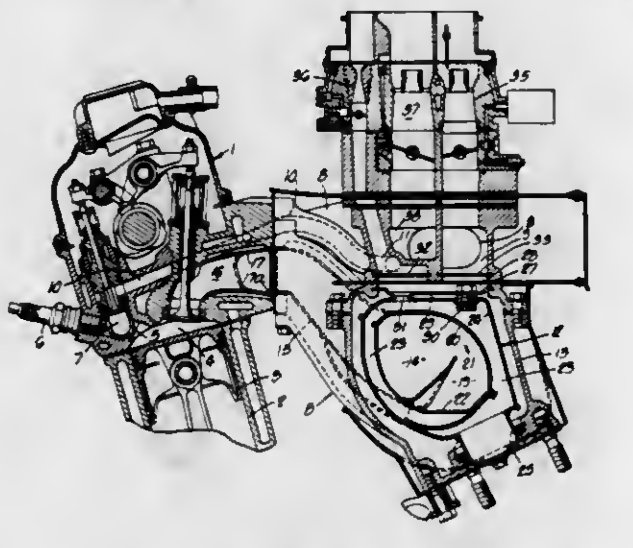
Soichi Nakano, Kawagoe; Yasumichi Ohama, Mitaka, and Masao Watanabe, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1975, Ser. No. 596,411

Claims priority, application Japan, Jul. 22, 1974, 49-83287

Int. Cl.² F02B ***19/10***

U.S. Cl. 123—122 AB **5 Claims**



1. In a multi-cylinder internal combustion engine, the combination of: means including exhaust ports in the engine leading from combustion chambers, at least two of said exhaust ports being positioned as an adjacent pair, and exhaust manifold provided with at least one exhaust collection pipe, said adjacent pair of exhaust ports having a single thin-wall metallic liner positioned within both exhaust ports, said liner being formed of heat resistant metal of low thermal capacity, said liner having one exit opening communicating with said exhaust collection pipe.

4,099,501

POLLUTION REDUCING AND FUEL SAVING DEVICE

Robert D. Fairbanks, and Roger D. Fairbanks, both of P.O. Box 298, Haines, Ak. 99827

Filed Feb. 10, 1977, Ser. No. 767,551

Int. Cl.² F02M ***31/00***

U.S. Cl. 123—122 E **10 Claims**

1. A pollution reducing and fuel saving device adapted for use in conjunction with liquid-cooled internal combustion engines including a carburetor or fuel injector and a fuel supply tube for conducting fuel to the carburetor or fuel injector, a radiator, and flow lines extending from the radiator to the liquid circulating jacket of the engine, said device comprising:

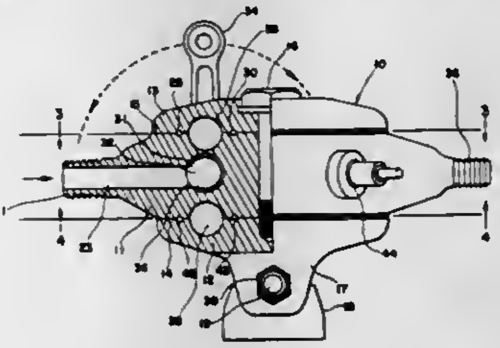
(A) a housing of heat conductive metal, said housing including:
  (1) a central body portion,
  (2) a base portion, and
  (3) a cap portion, each having abutting face-to-face planar surfaces,
  (4) fastening means for securing said body portions together, and
  (5) sealing means between the abutting face-to-face planar surfaces of adjacent body portions,

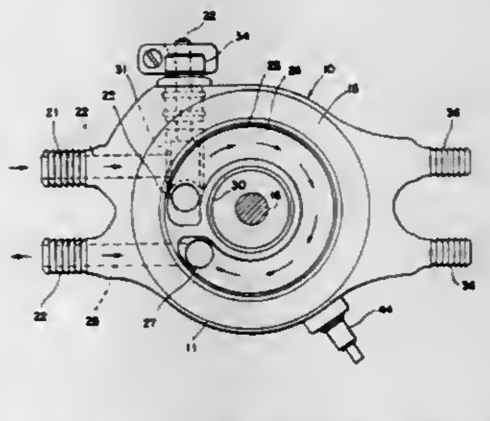
(B) a radiator liquid inlet fitting and a radiator liquid outlet fitting on one side of said central body portion to connect into the radiator liquid flow of a radiator,

(C) a first curvilinear radiator liquid flow channel formed in the interface between said central body portion and one of said other body portions,

(D) a pair of further radiator liquid flow channels in said central body portion connecting said radiator liquid fittings with the ends of said first curvilinear flow channel.

(E) a fuel inlet fitting and a fuel outlet fitting on the opposite side of said central body portion to connect to a fuel supply line between a fuel pump and carburetor or fuel injector,





(F) a second separate curvilinear fuel flow channel formed in the interface between said central body portion and the other of said other body portions adjacent to but spaced from said first curvilinear flow channel,

(G) a pair of further fuel flow channels in said central body portion connecting said fuel fittings with the ends of said second curvilinear flow channel, and

(H) means for mounting said housing.

4,099,502

MANIFOLD ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

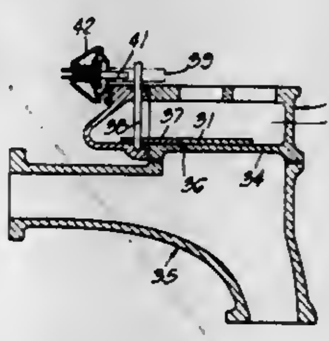
Takao Okura, Ooimachi; Eiichi Hashimoto, Niiza, and Yasumichi Ohama, Mitaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,394

Claims priority, application Japan, Aug. 4, 1975, 50-94187; Aug. 4, 1975, 50-107120

Int. Cl.² F02M ***31/00***

U.S. Cl. 123—122 AC **9 Claims**



1. In a manifold assembly for an internal combustion engine having an intake manifold for delivering an air-fuel mixture for combustion in the engine and an exhaust manifold for receiving hot exhaust gases from the engine, the combination of: heat

exchange means including a stationary heat transfer wall operatively positioned between said manifolds whereby the air-fuel mixture may be heated by the hot exhaust gases, a movable element mounted in said intake manifold in contact with said heat transfer wall, and means pivoting said movable element at right angles to said heat transfer wall so as to uncover and cover said heat transfer wall in order to increase and decrease the amount of heat transferred to the air-fuel mixture.

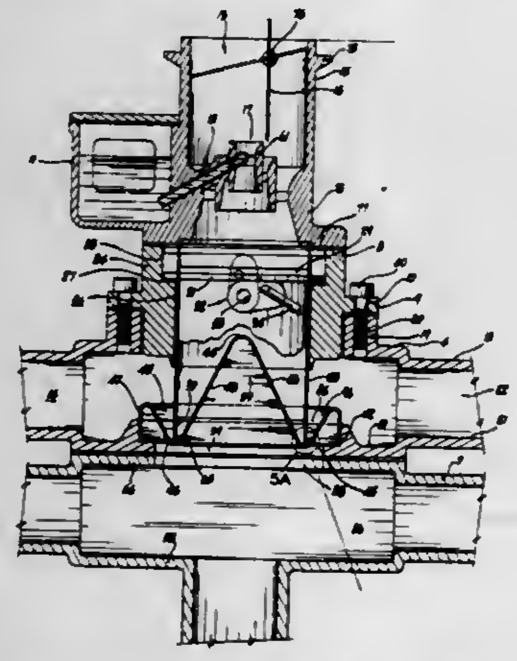
4,099,503
MEANS FOR IMPARTING SUPERSONIC FLOW CHARACTERISTICS IN THE INTAKE MANIFOLD OF AN INTERNAL COMBUSTION ENGINE

Edward H. Casey, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,719

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 AB **11 Claims**



1. A fuel supply system for an internal combustion engine, comprising:
  an intake manifold for distributing fluid to the engine, said manifold having an enclosure, said enclosure defining at least one fluid passage in said manifold;
  a carburetor for supplying a fuel/air mixture to said intake manifold, said carburetor having an air passage in it operatively connected to the fluid passage of said intake manifold, fuel supply means operatively connected to said air passage, and means for combining the fuel and air in said air passage upstream of said intake manifold; and
  throttle valve means for controlling fluid flow through said intake manifold, said throttle valve means having an outlet positioned in said intake manifold, said throttle valve means comprising tubular means movable between a first position and a second position for controlling the area of the outlet opening, and means in said manifold for coacting with said tubular means to define a valve opening in said manifold, said manifold means and said tubular means together defining a converging section, a restriction, and a diverging section for fluid flow, said converging, restriction and diverging sections creating supersonic fluid flow conditions in said manifold in at least one operating position of said tubular means.

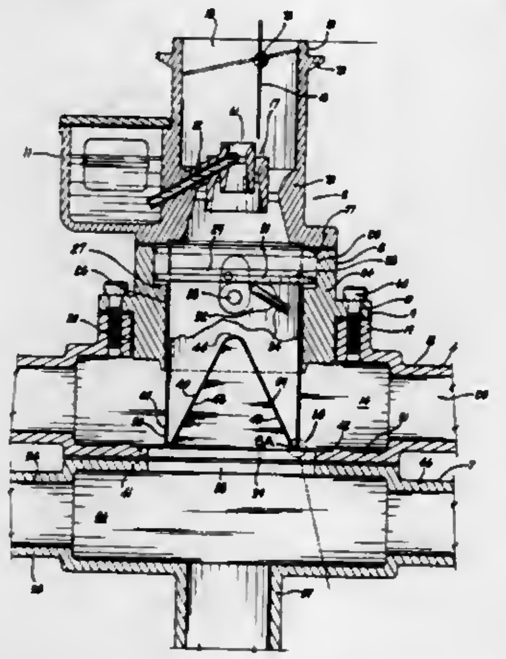
4,099,504
THROTTLE STRUCTURE FOR AN INTERNAL COMBUSTION ENGINE

James T. Bickhaus, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,713

Int. Cl.^{2} F02M *31/00*

U.S. Cl. 123—122 AB **19 Claims**



1. A fluid supply system for an internal combustion engine, comprising:
  an intake manifold, said intake manifold including an enclosure, said enclosure defining a plurality of fuel ports and a distribution passage, said intake manifold having at least one opening in it for communicating with a carburetor, said inlet manifold including a bottom wall;
  a carburetor, said carburetor having a main air passage communicating with the opening in said intake manifold and said distribution passage, means for injecting fuel into said main air passage, and a throttle structure operable from a fully closed to an open position for controlling fluid flow through said intake manifold in response to demands made on said engine, said throttle structure being mounted to said carburetor so as to extend into said intake manifold, said throttle structure having an outlet side in said intake manifold.

4,099,505
FUEL INJECTION SYSTEM

Gerhard Stumpp, Stuttgart; Wolf Wessel, Oberriexingen, and Volkard Stein, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

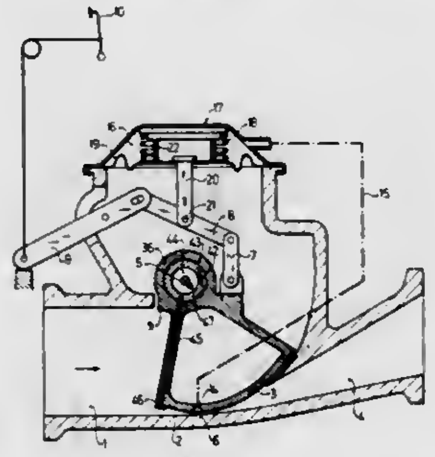
Filed Jun. 11, 1976, Ser. No. 694,984

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1975, 2529701

Int. Cl.^{2} F02M *69/00*

U.S. Cl. 123—139 AW **16 Claims**

1. In a fuel supply system for an internal combustion engine, said engine including an air induction tube, means for fuel injection into said induction tube, fuel metering means, a throttling element located in said induction tube and coupled to said fuel metering means to control fuel injection as a function of air flow through said induction tube, and an accelerator pedal, the improvement comprising:
  a shaft mounted in said induction tube and having an axis transverse to the direction of air flow in said induction tube, said throttle element is a body disposed to pivot about said shaft, a surface of said body remote from said pivotal axis is substantially cylindrical and is adapted to cooperate with the interior wall of said induction tube to form therewith an air flow aperture of varying cross section, and said throttle element can be rotated by linkage attached to the accelerator pedal of the engine;
  pressure means, responsive to the static air pressure prevailing in the vicinity of said air flow aperture, coupled to said throttle element, for independent displacement thereof;
  said fuel metering means is constituted by said pivotal shaft and by portions of said throttle element cooperating therewith such that the magnitude of injected fuel depends on the relative position of said pivotal shaft and said throttle element which together define a fuel metering slot of variable size; and
  said means for fuel injection is a nozzle in said body located adjacent to said substantially cylindrical surface remote from said pivotal shaft, said nozzle being in fluid communication with said fuel metering slot; whereby fuel is injected into said induction tube at a location where the air flow velocity is a relative maximum.



4,099,506
IDLING ABUTMENT FOR THE GOVERNOR OF AN INJECTION PUMP OF AN AIR-COMPRESSING INTERNAL COMBUSTION ENGINE

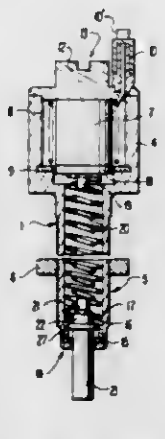
Ulrich Kolb, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1976, Ser. No. 744,866

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553560

Int. Cl.^{2} F02D *1/02;* F02M *39/02*

U.S. Cl. 123—140 J **21 Claims**



14. In an arrangement for the control of the quantity of fuel supplied by an injection pump of an air-compressing internal combustion engine of the type wherein a heat-expansible means acts upon a displaceable abutment member which is operable upon a quantity adjustment member of the injection pump for altering the quantity of fuel supplied by said pump, the improvement comprising:
  electrical heating means for causing an expansion of said heat expansible means; and
  storage means for enabling said heat expansible means to expand in length without causing said abutment member to be displaced until a predetermined temperature is reached, and for enabling displacement of said abutment member by said heat expansible means after said predetermined temperature is reached.

4,099,507
METHOD AND SYSTEM TO CONTROL THE DUTY CYCLE OF A PULSE VOLTAGE CHANGING IN FREQUENCY

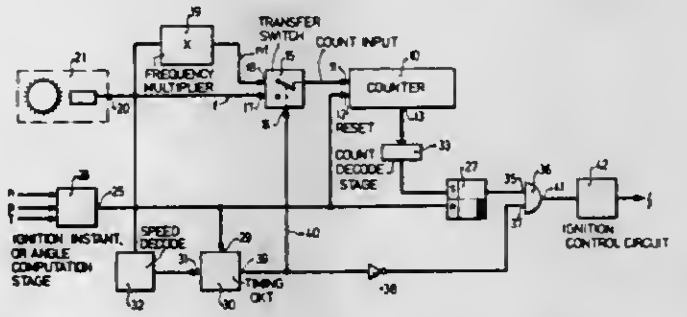
Ernst-Olav Pagel, Freiberg, and Wolfgang Borst, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1976, Ser. No. 669,814

Claims priority, application Fed. Rep. of Germany, May 27, 1975, 2523388

Int. Cl.^{2} F02P *5/04*

U.S. Cl. 123—148 E **18 Claims**



1. Method to control the relationship between ON and OFF-time of ignition current flow in the ignition system of an internal combustion engine by providing a sequence of pulses which vary in frequency comprising
  generating first and second pulse sequences as a function of engine speed in which the first and second pulse sequences have different repetition rates or frequencies;
  accumulating in a counter (10) the pulses of the first pulse sequence (*nf*) and then of the second pulse sequence (*f*);
  generating a timing interval and controlling the accumulation of the first pulse sequence as a function of time;
  computing a theoretically optimum ignition instant and providing a control signal representative of said optimum ignition instant;
  setting the counter (10) to a number determined by said control signal and representative of said optimum ignition instant to thereby
  determine the count state of the counter at a predetermined time $(t_o + t_r)$ after the counter has started to accumulate the pulses of said first and second frequencies;
  and providing an output pulse having a pulse duration (t_s) and a pulse cycling time $(t_o + t_r + t_s)$ controlled by the count state of the counter at said predetermined time with respect to a reference number.

4,099,508
IGNITION SYSTEM

Yoshikazu Noguchi; Katsuyuki Senda, and Mamoru Kobashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 20, 1976, Ser. No. 688,465

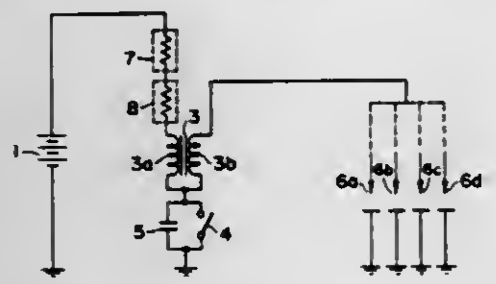
Claims priority, application Japan, Nov. 21, 1975, 50-158128[U]; Nov. 21, 1975, 50-158129[U]

Int. Cl.^{2} F02P *3/04*

U.S. Cl. 123—148 DC **5 Claims**

1. An ignition system for an internal combustion engine comprising:
  a source of direct current power;
  an ignition coil having primary and secondary windings;
  a first impedance element whose impedance is temperature dependent, said first impedance element being coupled between said source of direct current power and said

primary winding of said ignition coil and comprising a negative temperature coefficient thermistor having a two value temperature coefficient characteristic such that below some predetermined temperature it is a high resistance and above some predetermined temperature it is a low resistance whereby the primary current flowing through said primary winding of said ignition coil is not decreased as the direct current resistance of the ignition coil increases with temperature; and



a second impedance element whose impedance is temperature dependent, said second impedance element comprising a positive temperature coefficient thermistor having a two value characteristic such that below a second predetermined temperature it is a low resistance and above said second predetermined temperature it is a high resistance, and wherein the combination of said first impedance element and said second impedance element produces a three value temperature coefficient characteristic.

4,099,509
IGNITION SYSTEMS OF CURRENT INTERRUPTION TYPE FOR INTERNAL COMBUSTION ENGINES

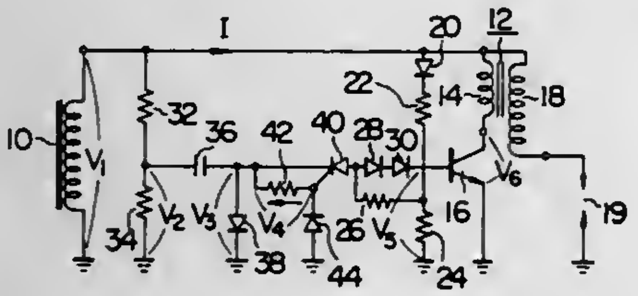
Hideyuki Hashimoto, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jun. 23, 1976, Ser. No. 699,183

Claims priority, application Japan, Jul. 4, 1975, 50-81803

Int. Cl.² F02P *1/08*

U.S. Cl. 123—148 AC **11 Claims**



1. An ignition system of a current interrupting type for an internal combustion engine, comprising:

an a.c. power source,

an ignition coil including a primary winding connected to said a.c. power source,

a controlled switch element for interrupting the current flowing through said primary winding, and

a control means for operating said controlled switch element thereby to interrupt the current fed to said primary coil in synchronism with a required ignition cycle of said engine in dependence on the output of said a.c. power source, said control means including means for synchronizing said current interrupting operation of said awitch element with occurrence of peak value of the output current from said a.c. power source, said synchronizing means including a capacitor, a charging circuit for coupling said capacitor across the output of said a.c. power source to charge said capacitor with said output current and a discharging circuit coupled to said capacitor for discharging the same, said discharging circuit being adapted to be actuated in response to the occurrence of the peak of said output current from said a.c. power source thereby to initiate the discharge of said capacitor, and wherein said control means includes a semiconductor switching element connected between said capacitor and said switch element for the current interruption, said semiconductor switching element being so arranged as to respond to the operation of said discharging circuit thereby actuating said current interrupting switch element to effect the current interruption.

4,099,510
IGNITION COIL FOR INTERNAL COMBUSTION ENGINE

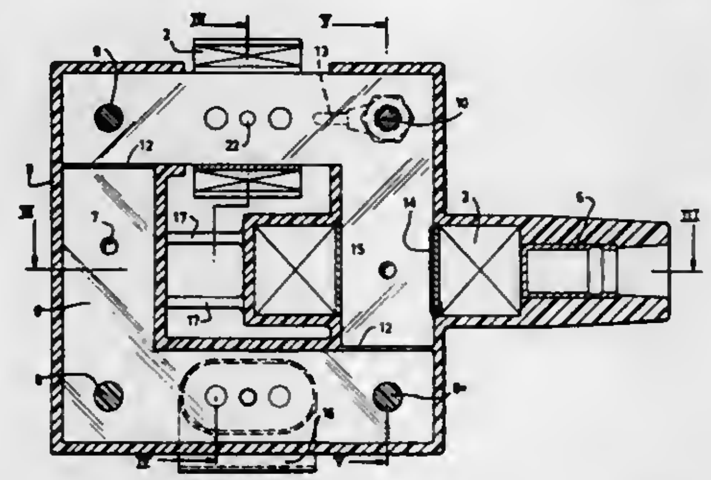
Pierre Perrier, Ramonville-Saint Agne, and Maurice L. Razet, Issy-les-Moulineaux, both of France, assignors to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal, Issy-les-Moulineaux, France

Filed Aug. 9, 1976, Ser. No. 712,964

Claims priority, application France, Aug. 14, 1975, 75 25324

Int. Cl.² F02P *3/02;* H01F *27/30*

U.S. Cl. 123—148 D **11 Claims**



1. An internal combustion engine ignition coil comprising

a rectangular magnetic core having a median line in a single plane and consisting essentially of a stack of sheets of magnetic material, each layer of which is formed from two substantially identical L-shaped members each having two arms of the same width, so that there are two stacks of L-shaped members in which the corners of the L-shaped members are superimposed;

said rectangular core being devoid of magnetic shunt elements, said core having only one primary inductive winding and only one secondary high voltage winding thereon;

said primary inductive winding on one arm of one stack of L-shaped members, and said secondary high voltage winding on the other arm of said one stack;

said primary winding having a length L parallel to said one arm, and a thickness perpendicular to said one arm which is in the range between L/50 and L/8;

said secondary winding having a length l parallel to said other arm, and a thickness perpendicular to said other arm which is in the range of between l and 6l;

a plane through one end of one of said windings perpendicular to its arm intersecting both ends of the other winding.

7. Coil as claimed in claim 1 in which one of the stacks of L-shaped members is electrically connected to one of the terminals of a battery of a vehicle on which the coil is mounted and constitutes a common point to which one of the ends of the primary winding and one of the ends of the secondary winding are connected, the other end of the primary winding being connected through a switch to the terminal of the battery which is not connected to said common point.

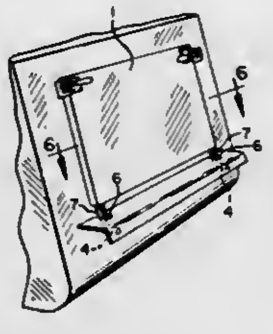
4,099,511
REMOVABLE FUEL DOOR ON A WOOD BURNING STOVE

Kendrick H. McIntire, Rte. 2 Box 1000, and John E. McIntire, Rte. 2 Box 151-A, both of Aurora, Oreg. 97002

Continuation of Ser. No. 642,985, Dec. 22, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,299

Int. Cl.² F23M *7/00*

U.S. Cl. 126—190 **5 Claims**



1. In a wood burning heating stove,

fire chamber means having a doorway surrounded by a jamb,

a door,

a hearth-like bracket secured to the fire chamber means in a position below the doorway and extending generally horizontally out from the doorway and having a pair of hinging slots,

a pair of hook-like hinge members fixed to the lower edge of the door and insertable into the removable from the slots to hinge the lower edge of the door to the bracket,

gasket means carried by the door,

and means for latching the door in a closed position in which the gasket means seals the door to the jamb,

the hook-like hinge members having end portions adapted to engage the fire chamber means when the door is in a substantially horizontal open position to hold the door in said open position.

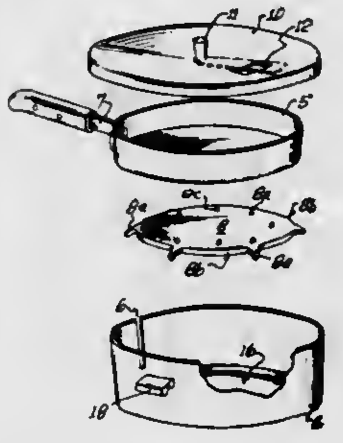
4,099,512
HEAT-CONSERVING COOKING UTENSIL

Joseph Noonan, 100 Santa Inez, San Clemente, Calif. 92672

Filed Dec. 27, 1976, Ser. No. 754,356

Int. Cl.² A47G *23/04;* F24C *15/18*

U.S. Cl. 126—246 **6 Claims**



1. A cooking utensil adapted to be placed over a stove burner or the like, comprising:

a generally cylindrical pot-like housing having an open top, a substantial opening in the bottom having a bottom rim portion, and a generally vertically-extending slit in its side;

a cooking pan adapted to be placed inside said housing and having a generally radially-extending handle having an inner portion extendable through said slit to the outside;

a heat-distributing spider having a generally plate-like central portion smaller than said opening and a plurality of generally radially-extending legs having tip portions supportable in said bottom rim portion, and having spaces between said legs adapted to permit the passage of heated air from said burner up into the interior of said housing; and

a removable cover for said top,

said pan being removable from said housing by removing said cover and lifting upward on said handle externally of said housing, an inner portion of said handle passing through said slit.

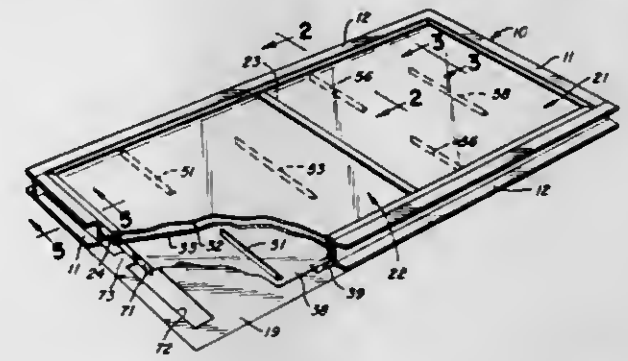
4,099,513
SOLAR HEATING COLLECTOR

Robert K. Skrivseth, Whitewater, Wis., assignor to SolaRay, Inc., Whitewater, Wis.

Filed Mar. 3, 1977, Ser. No. 773,801

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **9 Claims**



1. An air solar heating collector assembly, comprising

a rectangular framework having oppositely spaced end portions and oppositely spaced side portions,

a support plate fastened to and covering the back of said framework,

transparent cover means removably supported on and covering the front of said framework,

a solar energy absorber plate supported within said framework in parallel spaced relation between said support plate and said cover means, thereby defining a first air passage between said cover means and one surface of said absorber plate and a second parallel air passage between said support plate and the opposite surface of said absorber plate,

air inlet means adjacent one end portion of said framework for admitting cool air through said support plate to flow simultaneously across the opposite surfaces of said absorber plate through said first and second air passages,

air outlet means adjacent the opposite end portion of said framework for discharging heatred air simultaneously from said passages through said support plate, and

baffle means comprising a plurality of baffle members secured in spaced parallel relation to the opposite surfaces of said absorber plate in said first and second air passages, sand baffle members being arranged so that the air flow through each of said passages is alternatively split and recombined during its travel from said inlet means to said outlet means.

4,099,514
METHOD AND APPARATUS FOR HEATING A FLUID MEDIUM BY MEANS OF SOLAR ENERGY

Mario Posnansky, Pappelweg 4, 3072 Ostermundigen (Canton of Berne), Switzerland

Continuation-in-part of Ser. No. 537,677, Dec. 30, 1974, abandoned. This application May 7, 1976, Ser. No. 684,189

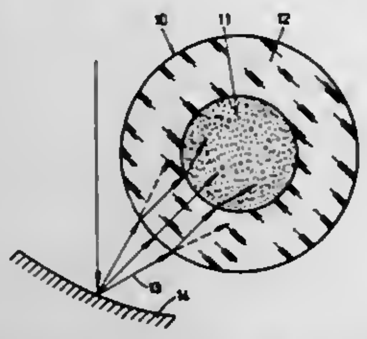
Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **9 Claims**

1. A method for collection of solar energy comprising:

a. focusing solar radiation on a transparent hollow receiver, said receiver containing an energy absorbent colored gas;

b. heating said fluid by said focused solar energy, to a temperature of at least 350° C;

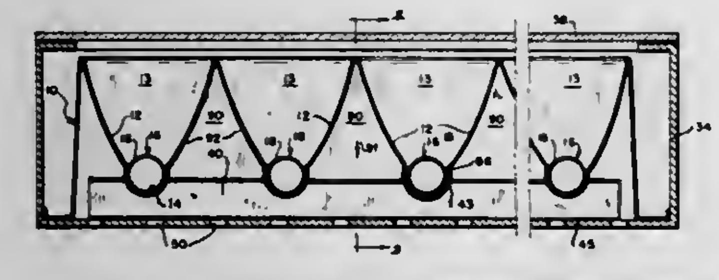


c. recirculating said colored gas to remove its collected energy and provide for solar energy reabsorption.

4,099,515
FABRICATION OF TROUGH-SHAPED SOLAR COLLECTORS

William W. Schertz, Batavia, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,347
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **16 Claims**



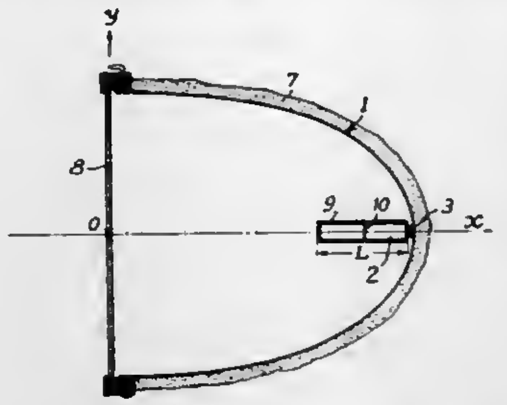
1. A cylindrical radiant energy concentration and collection device comprising: a plurality of rigid energy absorbers, a one-piece thin-walled plastic substrate having a plurality of pairs of opposing wall portions forming troughs, each wall portion being of predetermined contour and having thereon a material making said wall portion reflective for directing radiant energy incident thereupon, said substrate including a seating surface between each pair of opposing wall portions, each seating surface being adapted to receive one of said absorbers such that radiant energy is directed by said wall portions to said absorber, each of said seating surfaces being of such shape that said seating surface grasps said absorber and fits around said absorber received by said seating surface, said rigid absorbers thereby giving structural strength to said substrate.

4,099,516
SOLAR ENERGY PICK-UP

Daniel Pierre Caulier, Route d'Aix, 13122 Ventabren (Bouches-du-Rhône), France

Filed Apr. 28, 1976, Ser. No. 681,190
Claims priority, application France, Apr. 30, 1975, 75 14247
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **12 Claims**

1. A solar energy pick-up producing an energy concentrating effect, comprising an elongated fixed mirror having a semi-elliptical transverse cross-section, said mirror having a light reflective surface on the concave side of its semi-elliptical cross-section, an open side, and a bottom portion opposite said open side adjacent the intersection of the major semi-axis of its semi-elliptical cross-section with the mirror, and a longitudinally extending heating collector positioned within the semi-elliptical cross-section of the mirror near said bottom portion thereof and along the major semi-axis of said mirror; said collector having a width L extending from adjacent the bottom portion of the mirror toward said open side thereof along said major semi-axis and said major semi-axis of the semi-elliptical mirror having a length *a*, said width L and length *a* being

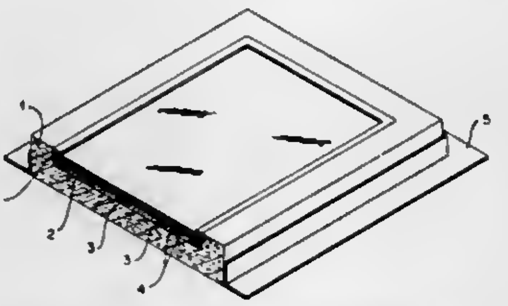


selected such that the width L is smaller than the length *a* and the ratio L/*a* is between ⅛ and ⅓.

4,099,517
SOLAR ENERGY COLLECTOR

Duncan Ross McRae, 1409 Wigmore Ct., Raleigh, N.C. 27609

Filed Jun. 21, 1977, Ser. No. 808,466
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**

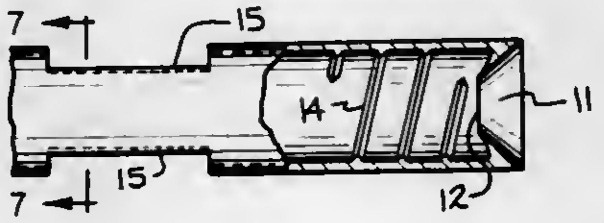


1. Solar energy collector apparatus, comprising:
an insulated, open-topped tray;
a moldable black coagulum of wetted carbon material being contained in said tray;
at least one sheet of light transmissive material covering said open top of said tray and said coagulum of carbon material therein; and
at least one heat transfer fluid conduit embedded in said coagulum of wetted carbon material, said tube entering and exiting through the walls of said tray.

4,099,518
BIOPSY APPARATUS

Shelby M. Baylis, 1761 Schoenith, Bloomfield Hills, Mich. 48013, and Jorge S. Szauer, 142 S. Johnson, Pontiac, Mich. 48053

Filed May 10, 1976, Ser. No. 684,480
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 B **5 Claims**



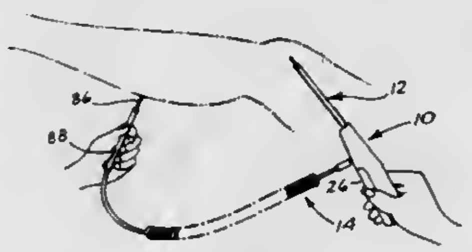
5. An apparatus for extracting biopsy samples and the like, comprising, in combination:
an elongated hollow outer cannula having open distal and proximal ends, said distal end defining a cutting edge;

solid inner means corresponding generally in length and shape to said outer cannula and being adapted to be tightly received within said hollow outer cannula for initial penetration of the body tissue;
a hollow inner cannula adapted to be received within said hollow outer cannula after said solid initial puncture means has been removed therefrom;
said inner cannula having an integral cylindrical elongated distal cutting end section which projects beyond the distal cutting edge of said outer cannula when said inner cannula is introduced thereinto in operative position;
said distal cutting end section of said inner cannula having disposed therein cutting means for cutting the body tissue as the inner cannula is withdrawn from the body and thus causing the tissue sample to be collected interiorly of the hollow inner cannula;
said cutting means disposed within said distal cutting end section of said inner cannula including a truncated conical cutting section having its base adjacent the distal edge of said inner cannula; and
at least one sharp thread disposed on the inner periphery of said cutting end section to effect a tissue-cutting action when said inner cannula is rotated.

4,099,519
DIAGNOSTIC DEVICE

Fred E. Warren, 9205 SW. 91st Ave., #3J, Portland, Oreg. 97223

Filed Jan. 14, 1977, Ser. No. 759,353
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2.1 R **5 Claims**



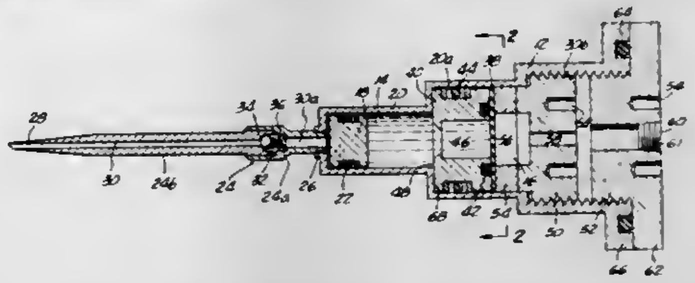
1. A diagnostic and therapeutic tool comprising a portable body assembly adapted for hand manipulation, a first electrode probe assembly mounted on said body assembly terminating in an electrically conductive probe tip disposed outside the body assembly, a second electrode probe assembly mounted on said body assembly terminating in an electrically conductive probe tip disposed outside the body assembly, a piezoelectric element mounted in said body assembly and means electrically connecting the probe tips of the first and second electrode probe assemblies to opposite poles of said piezoelectric element, and trigger actuated means for mechanically stressing the piezoelectric element to generate a voltage in the piezoelectric element which appears directly across said tips.

4,099,520
BLOOD SAMPLING APPARATUS

Donald H. Decker, 1106 W. Bellbrook, Covina, Calif. 91722; William R. Davis, 6532 44th Northeast, Seattle, Wash. 98115, and Duane W. Falleti, 2231 Enterprise Dr., Richland, Wash. 99352

Filed Apr. 7, 1977, Ser. No. 785,509
Int. Cl.² A61B *5/14*
U.S. Cl. 128—2 F **13 Claims**

1. A pressure sensitive device for withdrawing fluids from or injecting fluids into mammals comprising:
a. a hollow body including first and second chambers, said first chamber having a fluid medium therein at a first pressure and said second chamber having a fluid medium therein at a second pressure whereby a predetermined pressure differential exists between said first and second chambers;
b. a piston carried within said first chamber for reciprocal movement therein;
c. an elongated probe connected at one end to said body and having at the opposite end a reduced diameter portion adapted to be inserted into the mammal, said probe being

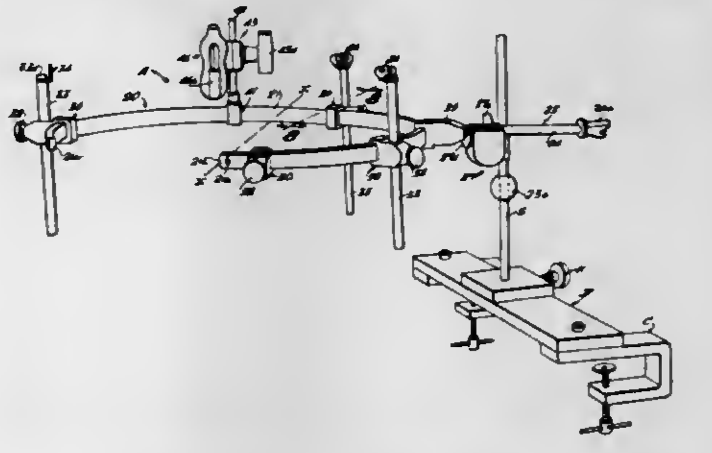


provided with an axial bore extending therethrough in communication with said first chamber; and
d. frangible means disposed within said body intermediate said first and second chambers, said means normally blocking fluid flow between said chambers, but being rupturable by a predetermined increase in pressure differential between said first and second chambers.

4,099,521
SURGICAL RETRACTOR ADJUSTABLE MOUNTING APPARATUS

Jack Nestor, and David H. Slepyan, both of Miami Beach, Fla., assignors to Nestor Engineering Associates, Inc., Miami, Fla.

Filed Jun. 16, 1975, Ser. No. 587,316
Int. Cl.² A61B *17/02*
U.S. Cl. 128—020 **11 Claims**



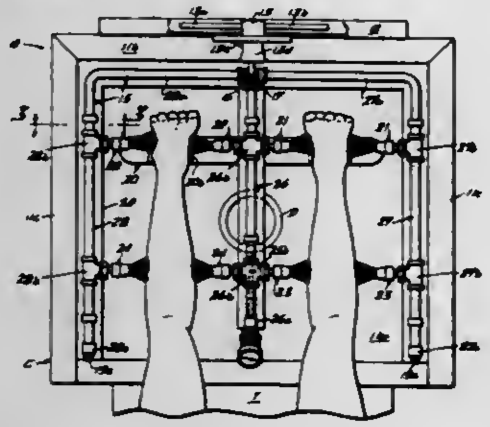
1. A surgical apparatus comprising a ring sized to substantially surround a work area at a spaced distance therefrom, a first means adjustably supporting the ring in a position adjacent the work area in concentric relation thereto, a plurality of connectors, each slidably mounted on the ring and having a post slidably mounted for axial movement therethrough in angular relation to the plane of said ring, a quick releasable anchoring means secured to each post, a plurality of retractors, one for engaging each part of the body to be withdrawn, a length of chain means connected to each retractor and adapted for engaging said anchoring means whereby the length of chain means between each retractor and its anchor means is selectively lengthened and shortened, each connector having a quick release means for simultaneously manually releasing and securing each connector in a selected position on the ring and its post in a selected position in the connector to adjust the position of said anchoring means and the direction of force exerted by the chain means on the retractor.

4,099,522

HYDROTHERAPY APPARATUS AND METHOD FOR EXERCISING THE VEINS OF THE LEG AND FOOT

Santiago S. Alenares, 3038 SW. 8th St., Apt. B202, Miami, Fla. 33135

Filed Apr. 25, 1977, Ser. No. 790,850
Int. Cl.^{2} A61H *9/00*
U.S. Cl. 128—66 **11 Claims**



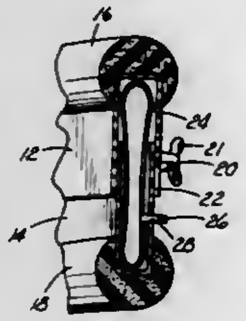
1. A method for exercising the smooth muscles of the veins of the legs and feet comprising the steps of reclining the patient in a supine position wth legs outstretched in horizontal alignment with the body and supported solely above the knees and at the heels, and directing sprays of water against opposite sides of each foot and calf according to a predetermined cycle of times and temperatures including a relatively low temperature for contracting the smooth muscles and a relatively high temperature for relaxing the smooth muscles.

4,099,523

THERAPEUTIC DEVICE

Thomas Patrick Lowrey, Kirkland, Ohio, assignor to Harry C. Walker and David E. Sukalac, part interest to each

Filed Sep. 20, 1976, Ser. No. 724,953
Int. Cl.^{2} A61F *5/01*
U.S. Cl. 128—75 **6 Claims**



1. A therapeutic device for applying traction to a portion of the anatomy comprising,

a pair of hollow substantially annular members, at least one of said members being hollow and U-shaped in cross section,

said members being disposed in sliding telescoping relationship,

said members having surfaces formed to at least partially encircle a selected portion of the anatomy,

said members being formed of a relatively rigid, non-elastomeric material resistant to substantial deformation under pressure,

fluid impervious bladder means disposed within the interior of the telescoped members,

each of said members having internal bladder engaging surfaces,

and means to allow fluid under pressure to be supplied to said bladder means,

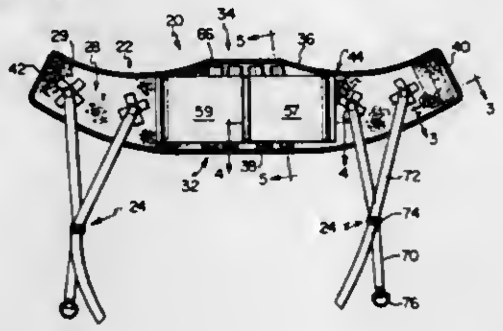
whereby fluid pressure in said bladder will generate a force against said bladder engaging surfaces urging sliding telescoping displacement without appreciable distortion of the members responsive to the fluid pressure in the bladder.

4,099,524

SACRO-LUMBAR SUPPORT BELT

Glenn F. Cueman, and Robert J. Becker, both of Warsaw, Ind., assignors to Zimmer, U.S.A. Inc., Warsaw, Ind.

Continuation of Ser. No. 629,475, Nov. 5, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 840,700
Int. Cl.^{2} A61F *5/02*
U.S. Cl. 128—78 **5 Claims**



1. A sacro-lumbar support belt comprising:

a waist encircling member,

said member having top, bottom and two side edges, and inner and outer faces;

said outer face of said member being formed entirely of brushed nylon pile;

said inner face of said member being formed of urethane foam and having hook means located adjacent one end of said member, for releasably engaging said brushed nylon pile on said outer face to secure said member about the waist of a person with said inner face positioned against the person;

non-stretchable fabric secured along said top and bottom edges by stitching for rendering said member substantially non-stretchable in the longitudinal direction;

non-stretchable fabric secured along said two side edges and interconnecting said non-stretchable fabric on said top and bottom edges;

a plurality of pockets secured to said outer face, said pockets extending transversely of said waist encircling member between said top and bottom edges;

a plurality of stays receivable in said pockets;

means for tightening said member once it is secured about the person's waist,

said means including

two rectangularly-shaped elastic panels, each having a first end and a second end and being substantially as wide as said waist encircling member,

means for rigidly coupling said elastic panels at their first ends to said member outer face, and

hooks means, located at each of said second ends, for releasably engaging said brushed nylon pile on said outer face so said elastic panel second ends are securable to said outer face at any desired location therealong.

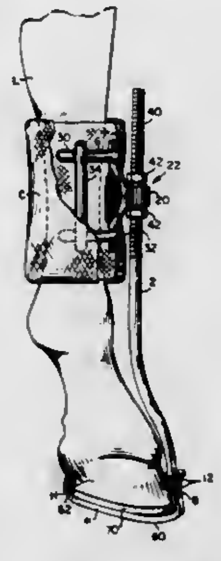
4,099,525

ANIMAL LEG BRACE

Robert O. McCarthy, 25 James Ave., Medfield, Mass. 02052

Filed Mar. 7, 1977, Ser. No. 775,329
Int. Cl.^{2} A61F *5/04*
U.S. Cl. 128—87 R **8 Claims**

1. An equine animal leg brace comprising a rigid elongated support member, a shoe attached to a first end of said member and adapted to be fixed to a bottom surface of a hoof of an animal, a rigid cast frame attached to said member and adapted to be fixed to a leg of said animal by a cast encompassing said leg and said frame, said cast frame being movably disposed on said support member, and lock means for fixing said cast frame on said support member, whereby to facilitate selective positioning of said cast frame on said support member.

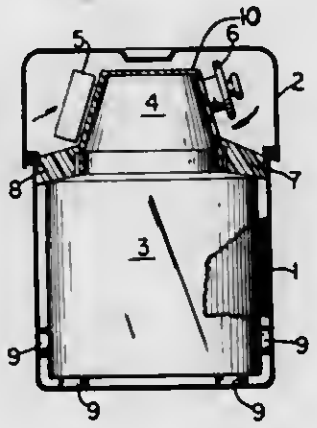


4,099,526

FILTER-TYPE GAS MASK AND BREATHING DEVICE ARRANGED IN A CARRYING CASE

Werner Mascher, Bismarckstr. 6, 1000 Berlin 41, Fed. Rep. of Germany

Filed Nov. 30, 1976, Ser. No. 746,070
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554601
Int. Cl.^{2} A62B *7/10*
U.S. Cl. 128—146.6 **14 Claims**



1. A filter type gas mask arranged in a carrying case and a cover for said carrying case mounted thereon, said mask comprising;

a filter;

a filter head mounted on said filter;

said carrying case including a lower surface and sidewalls with an upper edge, said sidewalls extending perpendicularly upwards from said lower surface and terminating at said upper edge;

said cover including an upper surface and sidewalls with a lower edge, said sidewalls of said cover extending perpendicularly downwards from said upper surface and terminating at said lower edge,

means for connecting said upper edge of said carrying case to said lower edge of said cover wherein said carrying case and said cover form an enclosed chamber;

said filter and said filter head being located within said enclosed chamber such that said filter head is in proximity to said cover and said filter is in proximity to said carrying case; and

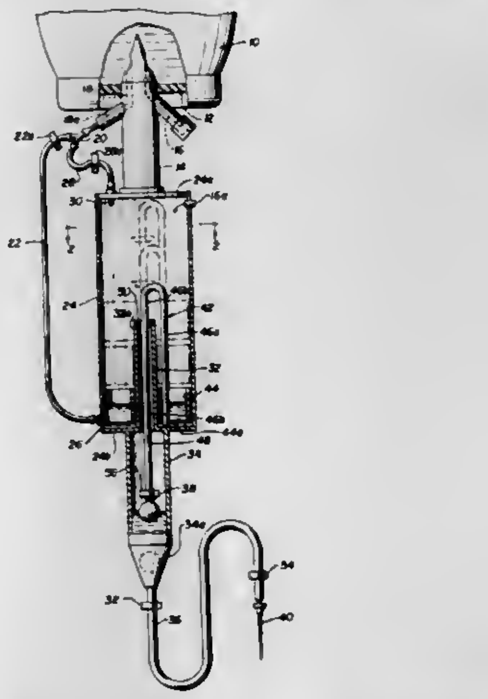
shock absorbing means connected to said filter head and extending outwardly therefrom in a direction towards said sidewalls of said cover and said sidewalls of said carrying case in the area where said sidewalls of said cover are connected to said sidewalls of said carrying case for holding said filter and said filter head firmly within said enclosed chamber formed by said carrying case and cover and for preventing contact between said filter and said filter head with any part of said carrying case and said cover by absorbing shocks and impact from all directions.

4,099,527

PARENTERAL FLUID ADMINISTRATION SETS

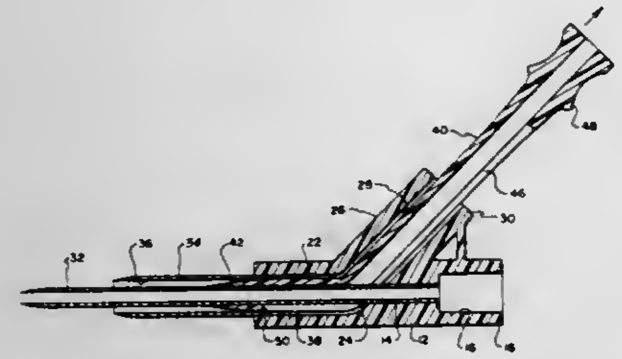
William L. Howell, 3615 Macomb St. NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 675,242, Apr. 8, 1976, abandoned. This application Mar. 16, 1977, Ser. No. 778,118
Int. Cl.^{2} A61M *5/16*
U.S. Cl. 128—214 C **10 Claims**



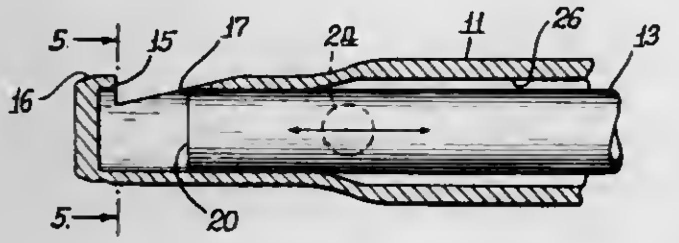
1. A parenteral fluid administration set comprising a source of supply of the fluid to be administered, a flow regulator to which fluid flows through a flow line from said source by gravity, said flow regulator comprising an upright plastic-walled cylinder having top-and-bottom-end walls providing a regulator chamber, a normally open-ended overflow tube affixed to the bottom end-wall of the regulator chamber and extending uprightly therein, the upper end of said overflow tube determining the maxium level of fluid permitted to collect in the regulator chamber, a floating siphon including an annular float and a siphon U-tube disposed in and being movable vertically within said regulator chamber in accordance with fluid level therein, means for supplying fluid from said source to the regulator chamber thereby to provide therein a body of fluid on which the float is adapted to float, said siphon U-tube being affixed to the float so as to be movable in unison therewith, the shorter leg of the siphon extending downwardly through the float and having its end open to the fluid body below the float, the longer leg of the siphon extending downwardly through the bore of said upright over-flow tube and having affixed thereto at a predetermined position along its length which normally is well above the open-top of the overflow tube a disc-form valve element which is adapted to lower against and seat on said open top of the overflow tube thereby to close said overflow tube to downward-outward air flow therethrough responsive to manually induced build-up of air pressure within said regulator chamber, said presure build-up also functioning to prime the siphon.

4,099,528
DOUBLE LUMEN CANNULA
James L. Sorenson; Karl A. Pannier, Jr., both of Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah
Filed Feb. 17, 1977, Ser. No. 769,591
Int. Cl.^{2} A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **8 Claims**



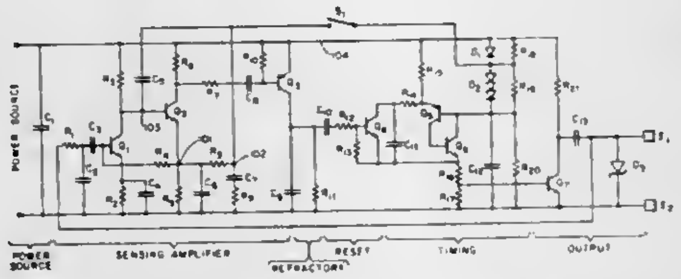
1. A double lumen intravenous cannula assembly comprising in combination:
an interior cannula;
an exterior cannula surmounting the interior cannula and being spaced from at least a portion of the interior cannula to form a passageway therebetween;
a hub mounted to said interior and exterior cannulae; and
a removable sleeve-type bushing normally coaxially interposed in the passageway between the interior and exterior cannulae, said bushing extending through said hub and comprising an exteriorly accessible member displaceable to remove the bushing from the passageway.

4,099,529
WIDE-ANGLE CUTTER VITROPHAGE
Gholam A. Peyman, 1044 N. Oak Park Ave., Oak Park, Ill. 60302
Filed Sep. 20, 1976, Ser. No. 724,709
Int. Cl.^{2} A61B *17/32*
U.S. Cl. 128—305 **1 Claim**



1. A surgical instrument for performing intraocular surgery involving the removal of fibrous tissue from within the eye of a patient and having a control handle carrying a small diameter probe for insertion into the eye comprising:
an external tube as part of the probe having an external wall and a longitudinal axis and formed with a closed end tip and a generally triangular shaped aperture in its external wall;
said triangular aperture being oriented with a base edge tranverse to said longitudinal axis in close proximity to and adjacent said tip and defining a tissue engaging ledge and with an apex of said aperture being remote from said tip said base edge lying in a plane perpendicular to said longitudinal axis;
an internal cutting tube coaxial with and telescoped within said external tube having a driven end and a free end with a sharp cutting edge formed on said free end;
drive means connected to said driven end for causing controlled longitudinal oscillation of said internal tube within said external tube and operable in its oscillation to carry said cutting edge past said base edge of said aperture; and
means defining a sharp shearing edge formed on an inner edge of said aperture base and effective in shearing coaction with said cutting edge of said internal tube to cleanly sever tissue engaged by said ledge.

4,099,530
CARDIAC PACER CIRCUITRY TO FACILITATE TESTING OF PATIENT HEART ACTIVITY AND PACER PULSES
Chieh Y. Chen, Billerica, and Wesley R. Grace, Andover, both of Mass., assignors to American Pacemaker Corporation, Woburn, Mass.
Filed Apr. 27, 1977, Ser. No. 791,552
Int. Cl.^{2} A61N *1/36*
U.S. Cl. 128—419 PT **13 Claims**

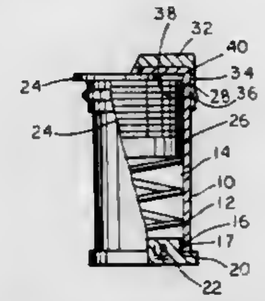


1. An improved implantable electronic heart pacer having a self-contained power source, said pacer including terminal means for connection to the heart of a patient, pulse generator means connected to said terminal means for supplying stimulating pulses thereto, timing means for controlling the rate of delivery of said stimulating pulses, and heart beat detecting means for preventing delivery of said stimulating pulses when the patient has normal heart activity, said timing means having a test mode rate and a demand mode rate which is different from said test mode rate, at least one of said test mode rate and said demand mode rate being dependent upon remaining useful life of said power source, said improvement comprising:
means responsive to an externally applied magnetic field, for inducing said timing means to operate at said test mode rate;
delay means responsive to removal of said magnetic field for inducing said timing means to operate at said demand mode rate for a first predetermined period of time;
means for inactivating said heart beat detecting means only after application of said magnetic field for a second predetermined period of time, said inactivating means being operative during application of said magnetic field and during said first predetermined period of said delay means;
means responsive to an externally applied magnetic pulse having a duration which is short compared with the normal demand mode pulse-to-pulse interval to inhibit said pulse generator means when said pulse generator means is pacing in said demand mode.

4,099,531
FLAVORING INGREDIENT
Edouard P. Demole, Coppet, and Paul F. Enggist, Geneva, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland
Filed Mar. 25, 1976, Ser. No. 670,245
Claims priority, application Switzerland, Apr. 11, 1975, 4630/75
Int. Cl.^{2} A24B *3/12*
U.S. Cl. 131—17 R **2 Claims**

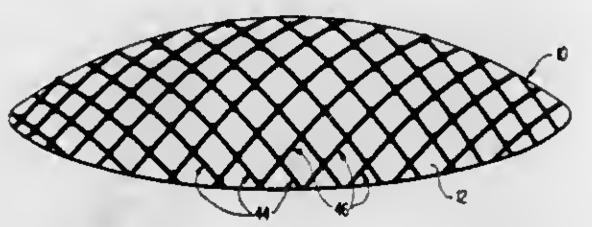
1. A smoking tobacco product selected from the group consisting essentially of tobacco and tobacco substitutes which has added thereto a small but flavour-modifying amount of a flavouring compound consisting essentially of 2-phenyl-3-(fur-2-yl)-prop-2-en-1-al.

4,099,532
COIN HOLDER HAVING RIB RETAINED CLOSURE
Enio Mascherin, 90 Glenhaven St., Toronto, Ontario, Canada (M6M 3M5)
Filed Jan. 28, 1977, Ser. No. 763,407
Int. Cl.^{2} G07D *1/08*
U.S. Cl. 133—5 A **6 Claims**



1. A hollow container comprising a tubular walled body having an inner and outer surface and at least one open end, said body having a predetermined internal diameter, a cap portion removably engaging one end of said body, means for engaging said cap portion, a coiled spring disposed in said body, an annular rib disposed on the outer surface of said body, a partial wall covering at least a portion of the opposite end of said body, a cover member having a top portion and annular neck engaging said opposite end of said body, said neck including an annular recess communicating with said rib, said cover rotatable around said rib, said top portion being smaller than the diameter of said cover portion whereby when said top portion is axially aligned with said partial wall said body is at least partially opened and when said cover portion is rotated such that said top portion is not axially aligned with said partial wall said body is substantially closed.

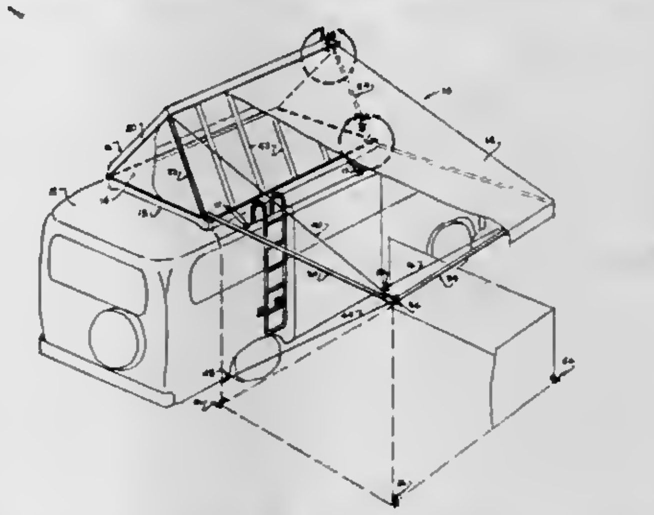
4,099,533
CONCAVE-CONVEX STRUCTURE WITH SPACED FITTINGS FOR INTERSECTING FLEXIBLE RODS
Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003
Continuation-in-part of Ser. No. 614,445, Sep. 18, 1975, Pat. No. 3,986,519. This application Sep. 30, 1976, Ser. No. 728,182
The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.
Int. Cl.^{2} A45F *1/16*
U.S. Cl. 135—3 E **13 Claims**



12. A dome structure comprising
a plurality of continuous stressed rods, each rod being of arcuate shape, said rods crossing each other at a plurality of intersections,
a flexible membrane beneath said rods,
means at substantially all of said intersections attached to said membrane holding said rods in intersecting relationship and for allowing slideable movement of said rods relative to each other and said membrane, and
second means supporting said membrane at fixed points on said membrane from each of said first means.

4,099,534
VAN TOP TENT
John R. Corbin, 404 Garwood Dr., Cherry Hill, N.J. 08034
Filed Feb. 16, 1977, Ser. No. 769,391
Int. Cl.^{2} A45F *1/16;* **B60P** *3/34*
U.S. Cl. 135—4 A **7 Claims**

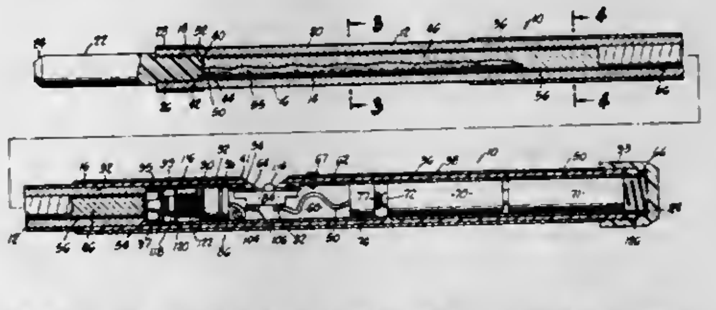
1. A van top tent comprising:
a substantially hollow container having a top and a base, means pivotally connecting said top and said base together so that said top can be pivoted relative to said base between a closed and an opened position;
a pair of poles each of which has a first end pivotally connected to said top and a second normally free end, said poles being pivotally movable between a first position within said container to a second position wherein said second ends cooperate with said base to maintain said top in said opened position;
first and second support poles, each of said support poles having a first end pivotally connected to said base and a second end, said support poles being adapted to be pivoted in a substantially horizontal plane between a first position within said container to a second position wherein said support poles extend away from and substantially perpendicular to said container;



a connecting pole having a first end pivotally connected to the second end of said first support pole and connecting means adapted to releasably connect the second end of said connecting pole and the second end of said second support pole;
cable means connected between said top and said supporting poles for maintaining said support and connecting poles in a substantially horizontal plane;
tent fabric connected to said container and adapted to substantially cover and be suspended from said poles, and
all of said poles, cable means and tent fabric being adapted to fit within said container when said container is closed.

4,099,535
LIGHT EMITTING WALKING CANE
Louis H. Hubachek, 870 S. Gramercy Pl., No. 2, Los Angeles, Calif. 90005
Filed Feb. 22, 1977, Ser. No. 770,572
Int. Cl.^{2} A45B *3/04*
U.S. Cl. 135—66 **16 Claims**

1. A walking cane comprising:
an elongate staff of generally tubular construction having a ground engaging tip portion at one end and a handle portion at the other end;



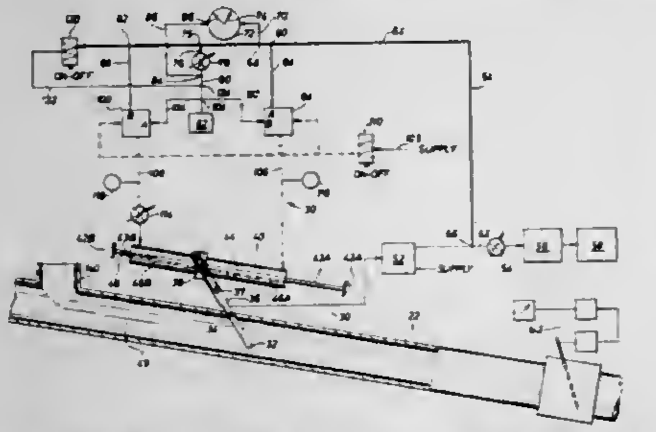
means on the outer surface of said staff providing surrounding light transmitting areas in end-to-end relation on said staff of different colors respectively adjacent said tip portion and said handle portion;
light generating means in the handle portion including a switch controlled electric lamp;

light conducting elongate cylindrical means within said staff extending along said light transmitting areas and having one end positioned to axially receive light from said lamp, and an opposite end portion adjacent said tip portion; and said opposite end portion of said cylindrical means having a roughened surface for producing diffused light in the light transmitting area adjacent said tip portion.

4,099,536
METHOD AND APPARATUS FOR CONTROLLING A SURGING FLOW IN A CLOSED CONDUIT

Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Co., Houston, Tex.

Filed Jul. 21, 1976, Ser. No. 707,230
Int. Cl.² G05D *7/00, 16/00*
U.S. Cl. 137—2 **19 Claims**



1. A pneumatic monitoring device for continuously observing the flow rate of a liquid within a closed conduit comprising:

a flapper disposed within said conduit, said flapper being responsive to flow rate of a liquid therethrough;

a pneumatic signal generator in communication with said flapper, said pneumatic generator adapted for producing a first pneumatic signal functionally related to the instantaneous flow rate of a liquid through said conduit;

a damping assembly in communication with said first pneumatic signal and producing a second pneumatic signal functionally related to said first pneumatic signal and representative of a damped liquid flow rate through said conduit;

a relay assembly in communication with said damping assembly and adapted for receiving said first and second pneumatic signals and producing a poeumatic control signal in response thereto; and,

a pneumatic positioner adapted for receiving said pneumatic control signal and for positioning said flapper in response thereto.

4,099,537
METHOD FOR TRANSPORTATION OF VISCOUS HYDROCARBONS BY PIPELINE

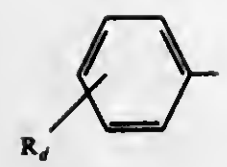
George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,711
Int. Cl.² F17D *1/17;* **B01F** *17/00*
U.S. Cl. 137—13 **2 Claims**

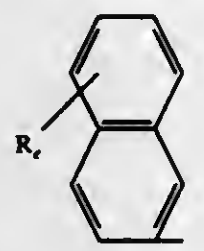
1. In the transportation of viscous hydrocarbons by pipeline, the improvement which comprises forming an oil-in-water emulsion by inroducing into the pipeline with said hydrocarbons an aqueous solution of an oxyalkylated anionic surfactant wherein the amount of the aqueous solution of the surfactant introduced into the pipeline with the said hydrocarbon ranges from about 8 to about 60 percent by volume based on the volume of the hydrocarbon introduced into the pipeline, wherein the concentration of the said surfactant in the aqueous solution is from about 0.01 to about 2.5 weight percent and wherein the oxyalkylated surfactant is a compound of the formula:

$$R_cO(C_3H_4O)_r—(C_3H_6O)_s—(C_2H_4O)_tCH_2CH_2SO_3M,$$

wherein R_c is selected from the group consisting of alkyl of from 10 to 25 carbon atoms;



wherein R_d is alkyl of from 8 to 25 carbon atoms, and

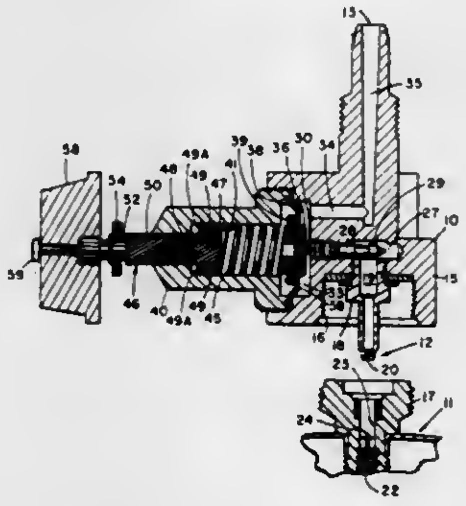


wherein R_e is alkyl of from 8 to 25 carbon atoms; *r* is an integer of from 2 to about 10; *s* is an integer of from 1 to about 8; *t* is an integer of from 2 to about 10, and the sum of $r + s + t$ is not more than 20, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M is selected from the group consisting of sodium, potassium, lithium and the ammonium ion.

4,099,538
TEMPERATURE-RESPONSIVE SHUT-OFF FOR GAS FUEL REGULATOR VALVE

Richard Douglas Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Mar. 3, 1977, Ser. No. 773,858
Int. Cl.² F16K *17/38*
U.S. Cl. 137—73 **3 Claims**



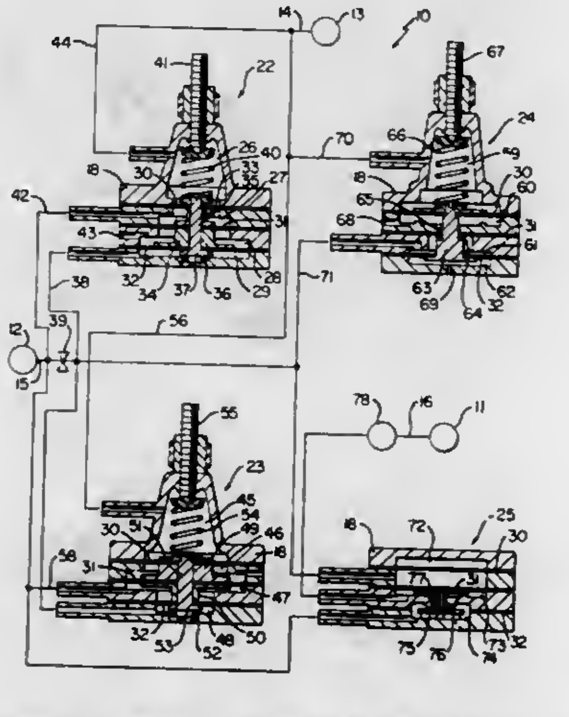
1. In a regulator valve for an applicance using gaseous fuel and having housing means defining inlet and outlet ports, an actuatable valve in said housing means between said ports, a flexible diaphragm assembly adapted to actuate said valve and a spring having one end engaging said diaphragm assembly for urging said diaphragm assembly into operative relation with said valve, an improved shut-off comprising: an adjusting valve stem threadedly received in said housing for longitudinal adjustment; a sleeve mounted about said stem within said housing and displaceable relative to said stem, said sleeve including flange means engaging the other end of said spring for adjusting the compression of said spring as said stem is adjusted; and fusible material meltable at a predetermined temperature securing said sleeve to said stem within said housing; whereby if said temperature is reached, said fusible material will melt and said spring will displace said sleeve relative to said stem thereby permitting closing a said valve.

3. The apparatus of claim 1 wherein said fusible material is an alloy which melts at a temperature of approximately 227° F.

4,099,539
CONTROL SYSTEM AND CONTROL DEVICE THEREFOR

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 25, 1977, Ser. No. 800,211
Int. Cl.² G05D *16/00*
U.S. Cl. 137—84 **20 Claims**

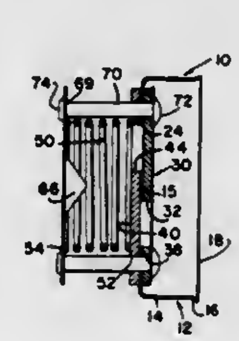


1. A control system comprising a first source having a changeable fluid pressure value, a second source having a changeable vacuum value, a pressure operated control device that changes its operating condition in relation to the value of a pressure signal directed thereto, and pneumatically operated control means operatively interconnected to said sources and said control device for increasing said pressure signal from said first source to said device as the pressure value from said first source increases from a first value thereof to a second value thereof and for thereafter decreasing said pressure signal from said first source to said device as the pressure value from said first source further increases from said second value thereof to a third value thereof, said control means producing said signal in substantially the same manner but at different values for different levels of vacuum at said second source thereof.

4,099,540
TWO-WAY BYPASS VALVE

Louis S. Papp, Chagrin Falls, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Sep. 7, 1976, Ser. No. 721,326
Int. Cl.² F16K *17/18*
U.S. Cl. 137—493.8 **12 Claims**

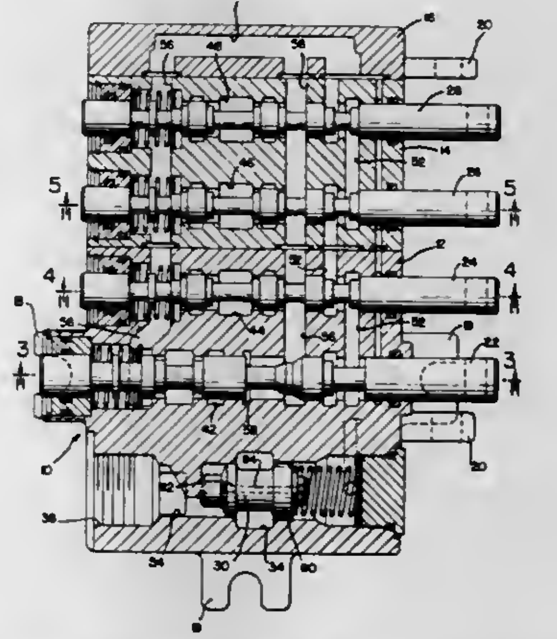


1. Two-way valve apparatus having a base, a seat connected to the base, the seat having first and second faces and first and second passageway means within the seat for communicating openings in the first face with openings in the second face, first and second valve plates mounted respectively on the first and second faces of the seat, the first valve plate having first plate passageway means communicating with the first seat passageway means for flowing fluid through the first plate passageway means and through the first seat passageway means, the second valve plate having second plate passageway means communicating with the second seat passageway means for flowing fluid through the second plate passageway means and second seat passageway means and resilient means urging the first and second valve plates into contact with the first and second faces whereby a portion of the first plate overlies the second seat passageway in sealing relationship therewith and whereby a portion of the second plate overlies opening of the first seat passageway in sealing relationship therewith, whereby fluid pressure in the first plate passageway and the first seat passageway tends to move the second plate away from the first seat passageway against sealing pressure of the resilient means, and whereby fluid pressure in the second plate passageway and second seat passageway tends to move the first plate away from the opening of the second seat passageway against sealing pressure of the resilient means, alignment means connected to the base and to the plates for aligning the plates with the seat whereby openings of passageways in the plates are aligned with openings of respective passageways in the seat, wherein the alignment means comprise pin-receiving openings in the plates and seat and pins extending through the pin-receiving openings.

4,099,541
POWER TRANSMISSION

Carl R. Binkley, Marshall, Mich.; John B. Keir, Marietta, Ga., and John H. Semchena, Royal Oak, Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Nov. 12, 1976, Ser. No. 741,202
Int. Cl.² F15B *13/08, 13/04*
U.S. Cl. 137—596.13 **5 Claims**



1. In a multiple unit directional valve assembly having a body, an inlet port in said body, an outlet port in said body and a plurality of motor ports in said body, said valve having a plurality of valve bores each communicating with one of said motor ports, a plurality of inlet passages in said body, each inlet passage communicating with one of said valve bores, said inlet passages being in parallel connection to the valve inlet port, said valve having a valve spool in each valve bore shiftable to effect communication between one of said inlet passage and one of said motor ports and having a balanced relief valve in the body to divert flow from the inlet port to the outlet port directly, said relief valve having a control chamber fed from the valve inlet through a restriction, that improvement comprising:

separate restrictors in at least two of said inlet passages;

separate passage means extending from said control chamber to points downstream from said separate restrictors; and

a check valve in each of said separate passage means, said check valves being so oriented as to permit flow out of said control chamber, whereby whenever two or more spools are in the motor-supply position, the relief valve will be controlled to maintain a supply pressure only sufficient to overcome the smallest load pressure in any of the motor ports which are at the time connected to the inlet port.

4,099,542

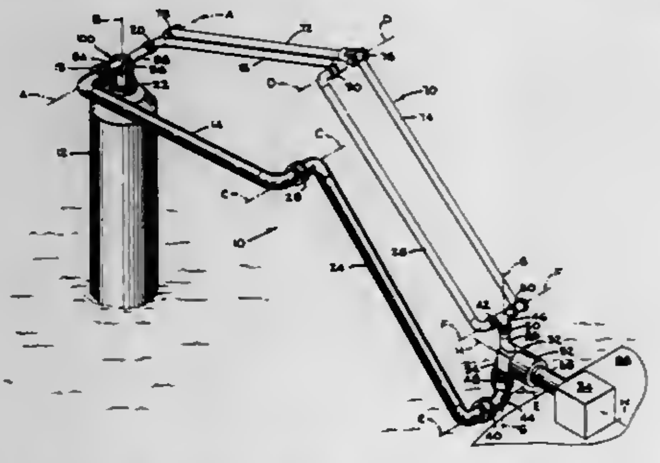
MARINE LOADING ARM JUMPER ASSEMBLY

Harold M. Gibbons, Long Beach, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jun. 9, 1976, Ser. No. 694,256

Int. Cl.² B67D *5/00*

U.S. Cl. 137—615 **5 Claims**



1. A marine loading arm assembly for simultaneously transferring a plurality of fluid products in separate flow passages between an offshore facility and a floating marine vessel, comprising

- a. an upstanding fluid conducting riser assembly including a first coaxial pipe swivel joint means having a plurality of flow passages therethrough,
- b. a pluraity of articulated rigid conduits defirming loading arms,
- c. means for pivotally connecting the respective inner ends of said loading arms to said first coaxial swivel joint means, whereby said loading arms and said first coaxial swivel joint means form a plurality of individual fluid flow passages,
- d. second coaxial pipe swivel joint means having a plurality of flow passages therethrough,
- e. means for pivotally interconnecting and detachably securing the respective outer ends of said loading arms with said second coaxial swivel joint means, said interconnecting means continuing said individual fluid flow passages from said loading arms to said second coaxial swivel joint means, said second swivel joint means providing primary support for said loading arms outwardly of said first swivel joint, and
- f. means for maintaining said loading arms and said second coaxial swivel joint means in a predetermined alignment relationship when said loading arms are disconnected from said second coaxial swivel joint means, said maintaining means comprising a guide arm assembly having a plurality of non fluid-conducting arm sections, means pivotally interconnecting said arm sections, and means pivotally connecting said assembly to said first and second coaxial swivel joint means, said pivotally interconnected guide arm sections being free of attachment to either of said loading arms between said first and second swivel joint means,

whereby said loading arms and said second coaxial swivel joint means can be maneuvered without interference and as an assembly between at least two positions to provide a plurality of individual flow conduits for separate and simultaneous transfer of individual fluid products and wherein connection misalignment of said loading arms in a lateral plane as a result of relative movement between said joints in any direction when the loading arms are disconnected therefrom is prevented by said guide arm assembly supported between said joints.

4,099,543

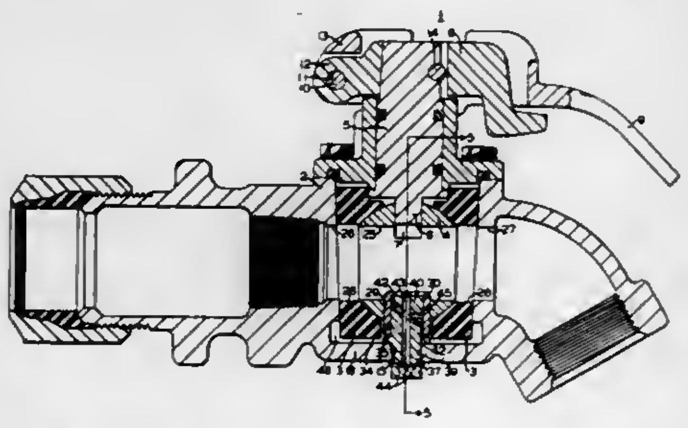
VENTED BALL TYPE ANGLE COCK

William K. Mong, North Huntingdon, and Michael T. Zoric, North Versailles, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 31, 1977, Ser. No. 801,683

Int. Cl.² F16K *11/06*

U.S. Cl. 137—625.22 **10 Claims**



1. A ball-type angle cock comprising:

- a. a hollow housing having a pair of passageways opening thereinto to which may be connected respectively an inlet conduit and an outlet conduit,
- b. a pair of ball seat seals disposed in said hollow housing in opposite spaced-apart relationship and each having a through bore that at one end is in alignment with one end of one of said pair of passageways in said housing, the opposite end being provided with a spherical seat, wherein the improvement comprises:
- c. a ball valve element having a passageway therethrogh and so positioned between said ball seat seals in sealing relationship with said spherical seat on each respective ball seat seal as to, in an open position of said element, establish a communication between said inlet conduit and said outlet conduit, said ball valve element also having a pair of intersecting bores therein, one of said bores so intersecting said passageway that the axis thereof forms a right angle with the axis of said passageway,
- d. a valve stem rotatably mounted in said housing and separably connected to said ball valve element for effecting rotation of said element between said open position and a closed position in which said communication is closed,
- e. a bushing having a bore therein, said bushing being so disposed in said one bore in said ball valve element that one end of said bore in said bushing is in alignment with one end of the other of said pair of intersecting bores in said ball valve element, and
- f. a trunnion carried in said housing bore rotatably supporting thereon said bushing and having a passageway so extending therethrough that one end thereof is constantly open to atmosphere and the other end is in alignment with the other end of said bore in said bushing in only said closed position of said hall valve element whereby a venting communication is established between said outlet conduit and atmosphere.

4,099,544

VENT VALVE OF AN AIR PUMP

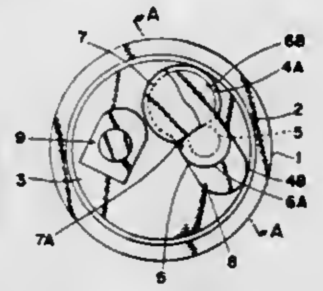
Tsuyoshi Itakura, Itakura Soki Kabushiki Kaisha, 17-20, Unoki 3-Chome, Ohta-ku, Tokyo, Japan, and Allan H. Willinger, Willinger Bros., Inc., 351 E. 84th St., Apt. 22A, New York, N.Y. 10028

Filed Feb. 4, 1977, Ser. No. 765,792

Claims priority, application Japan, Oct. 26, 1976, 51-143046[U]

Int. Cl.² F16K *15/14*

U.S. Cl. 137—856 **3 Claims**



1. A vent valve of an air pump comprising:

- a separator wall dividing a main body of the air pump into an inner air chamber and an outer air chamber, said separator wall having an insertion vent hole for air flow communication between said inner and outer air chambers;
- a valve body consisting of silicone rubber, said valve body including a disc-shaped tongue section and an annular disc-shaped fixed section to define a guitar-like shaped member, said tongue section having a semi-circular portion connected to a base portion, said base portion of said tongue section being connected to said fixed section to provide a one-piece valve body member, said tongue section having a diameter larger than said insertion vent hole for closing said insertion vent hole, said fixed section having a diameter larger than said tongue section diameter;
- said tongue and fixed sections being disposed in contact against a surface of said separator wall with said tongue section closing said insertion vent hole;
- a support member consisting of a rubber material, said support member being retained by a retaining section of said separator wall in an abutting position against said fixed section of said valve body so that said fixed section is sandwiched between said separator wall and said support member; and
- an edge of said support member extending to said tongue section to a position across said insertion vent hole so that an edge portion of said support member closes a portion of said insertion vent hole.

4,099,545

LARGE PORT PRESSURE ACCUMULATOR

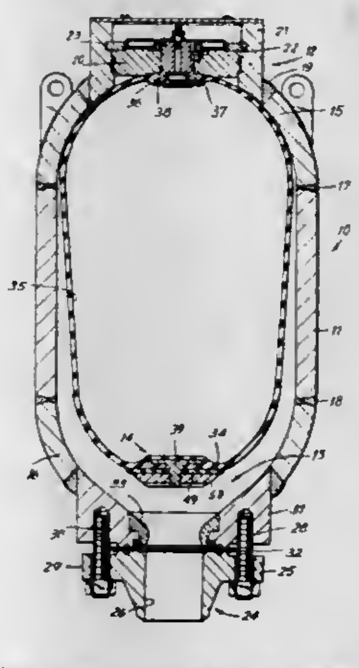
Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 19, 1976, Ser. No. 688,102

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **2 Claims**

1. A large port pressure accumulator-pulsation dampener device especially adapted for use in the pumping of liquids having entrained abrasive solids, comprising a rigid casing, a gas port at one end of said casing, a fluid port at the other end of said casing, said fluid port being surrounded by a beveled valve seat which is circular in section, a bladder assembly disposed within said casing and dividing the same into a gas and a liquid chamber, said bladder assembly including a stretchable elastomeric bladder having a relatively small opening at one end and a closed end, a gas inlet fitting molded in the small opening in said bladder and extending through said gas port, retainer means for securing said fitting in fixed position in said gas port, a valve assembly carried by the closed end of said bladder and shiftable between sealing and unsealing positions of said liquid port, said valve assembly including a plug member, said plug member having a flanged inner end molded entirely within said closed end of said bladder without communication with the interior of the bladder, a span of bladder material completely overlying the inner end of said plug, said plug member having a shank portion extending axially outward therefrom and from tbe closed end of the bladder, a rigid valve member releasably mounted on said axially extending shank portion in opposed relation to said valve seat, said valve member being circular in transverse section and complementally beveled with respect to said seat, said valve member including an upper surface portion directed toward said bladder, and a circular sealing disc clamped between said closed end of said bladder and said upper surface of said valve member, said disc being of greater diameter than said upper surface of said valve member and being formed of resilient elastomeric material of higher durometer than the material of said bladder, said disc in the seated position of said valve assembly being deformed into engagement with beveled portions of said valve seat by said bladder.



4,099,546

DEVICE FOR VARYING THE BEATING-UP POSITION OF THE REED OF A TEXTILE LOOM FOR TURKISH TOWELLING

Nicola Santucci, Schio (Vicenza), Italy, assignor to Nuovo Pignone S.p.A., Italy

Filed Nov. 22, 1976, Ser. No. 744,107

Claims priority, application Italy, Dec. 11, 1975, 30194 A/75

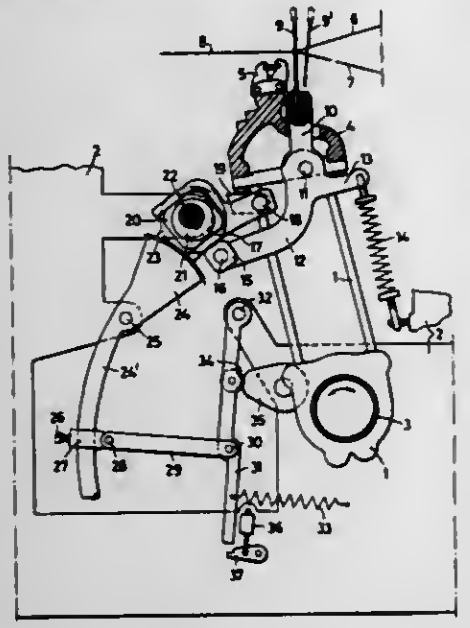
Int. Cl.² D03D *39/22*

U.S. Cl. 139—27 **4 Claims**

1. A device for varying the beating-up position of the reed in textile looms used for the manufacture of Turkish towelling, in which the reed is mounted hingedly on the loom sley, comprising:

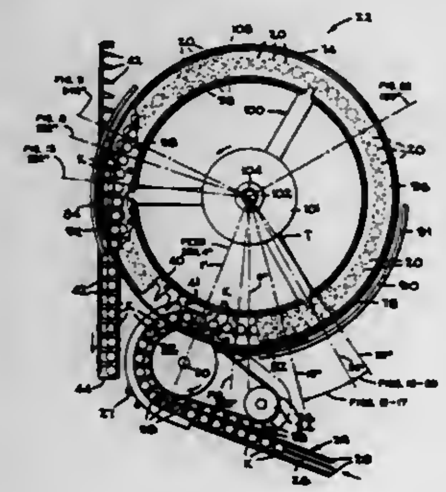
- a set of feeler members mounted integrally with the hinged reed,
- a set of forked profiles which are hinged to the fixed loom frame,

resilient means urging the feeler members into continuous contact with the forked profiles, and,



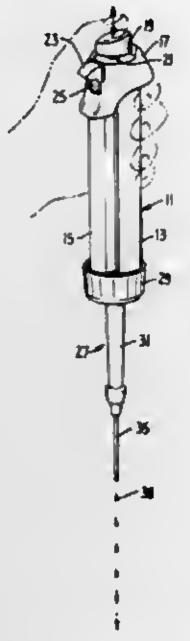
control means for adjusting the position of the forked profiles to vary the beating-up position of the reed.

4,099,547
CONTAINER FILLING EMPLOYING ANTI-VACUUM FOOT VALVE
Sherman H. Creed, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Jan. 26, 1977, Ser. No. 762,705
Int. Cl.² B65B *3/04*
U.S. Cl. 141—5 **27 Claims**



26. The method of filling open top containers with a liquid containing dissolved gas under pressure, said method being of the type which comprises the steps of trapping a measured charge of the liquid under pressure in a measuring chamber defined by a cylinder having a filling port that is closed by a foot valve and a piston slidable in the cylinder and having a charging port that is closed by a plug valve, moving the foot valve toward its open position during a decompression stage while the valve still closes the filling port to enlarge the measuring chamber sufficiently to decompress the gas in the measured charge of trapped liquid down to atmospheric pressure and thereafter opening the foot valve for discharging liquid from the measuring chamber into a container; the improvement comprising the step of moving a pressure equalizing element into the measuring chamber sufficiently to maintain the volume of the measuring chamber substantially constant while the piston is stationary and as the foot valve is moved still further toward its open position after termination of the decompression stage but while the foot valve still closes the filling port and before the discharge of the measured charge of liquid from the measuring chamber begins, for preventing reduction of the pressure in the measuring chamber to subambient pressure during said further opening motion of the foot valve.

4,099,548
HAND-HELD PIPETTE FOR REPETITIVELY DISPENSING PRECISE VOLUMES OF LIQUID
Ronald Leo Sturm, San Carlos, and James Curtis Smith, Hayward, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.
Filed Aug. 25, 1976, Ser. No. 717,744
Int. Cl.² B65B *3/12*
U.S. Cl. 141—27 **17 Claims**



1. A pipette having an interrelated mechanism for drawing liquid thereinto, repetitively dispensing a plurality of small quantities of liquid therefrom between fillings, and disengaging part thereof, comprising:

an elongated housing having first and second ends,

an elongated slide held for reciprocation along a path within said housing in a direction of its length,

a fluid chamber positioned at said first housing end and having an opening for dispensing and drawing fluid therethrough in response to the fluid volume of said chamber being altered,

means for altering the fluid volume of said chamber,

means within said housing for operably connecting said volume altering means to said elongated slide,

means within said housing and responsive to a first external knob at the second housing end for incrementally advancing said slide from a beginning adjacent said second housing end in a direction toward said first housing end to a maximum first knob advanced position within said housing, said slide being advanced a small fraction of its total travel each time said external knob is depressed, thereby to incrementally reduce the volume of said fluid chamber each time said first knob is depressed and thus to displace a desired volume of fluid through said chamber opening,

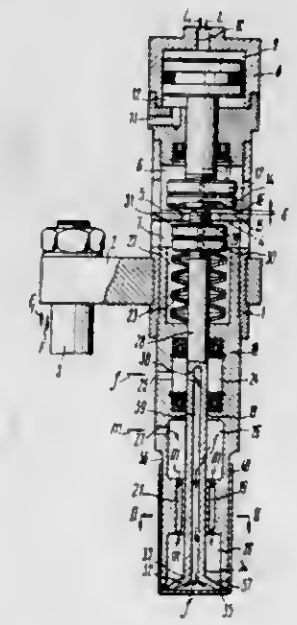
means within said housing non-integral with said slide and responsive to a movement of a second external knob in one direction with respect to said housing for returning said slide to its said beginning position adjacent said second housing end, thereby to increase the fluid volume of said chamber when said second knob is moved in said one direction and thus to draw fluid thereinto through said chamber opening,

means within said housing non-integral with said slide and responsive to movement of the second knob in another direction with respect to the housing for moving said slide beyond its said maximum first knob advanced position in a direction toward said first housing end, thereby to reduce the fluid volume of said fluid chamber to a minimum not possible with said first knob,

connecting means at said first housing end for disengaging said fluid chamber therefrom, and

means as part of said connecting means between the slide and volume altering means that is responsive to the simultaneous disengagement of said chamber by said connecting means and to further movement of said second knob in said another direction beyond its minimum fluid chamber volume position for disengaging said fluid volume altering means from operable connection with said slide, whereby said fluid chamber and volume altering means can be removed from the pipette housing for cleaning or replacement.

4,099,549
DEVICE FOR APPLICATION OF PASTE TO INTERNAL SURFACE OF CYLINDRICAL ELECTRODE OF PRIMARY CELL
Leonid Lavrentievich Belyshev, ulitsa Akademika Komarova, 19a, kv. 52, Moscow; Veniamin Ivanovich Gorokhov, poselok Pravdinsky, 2 Novoproletarskaya ulitsa, 1, kv. 4, Moskovskaya oblast, and Albert Vladimirovich Chuvpilo, ulitsa Novo-Alexeevskaya, 48, korpus 37, kv. 281, Moscow, all of U.S.S.R.
Filed Jun. 23, 1977, Ser. No. 808,978
Int. Cl.² B65B *3/04*
U.S. Cl. 141—32 **1 Claim**



1. A device for application of paste to an internal surface of a cylindrical electrode of a primary cell comprising:

a cylindrical body with means for reciprocating motion;

a partition dividing said body into upper and lower parts and being provided with a hole;

a hydraulic cylinder installed in said upper part of said body and having a rod;

a limiting nut installed at the end of said rod and having a diameter which is larger than the diameter of said hole in said partition;

a cylindrical arbor having an external surface secured by an upper part in said lower part of said body and having a central channel accommodating consecutively arranged first, second, third and fourth spaces,

said first space of said arbor being located in said lower part of said arbor for holding a supply of paste,

said second space of said arbor being located in the upper part of said arbor,

said third space of said arbor being located in the middle part of said arbor,

said fourth space of said arbor being located in the middle part of said arbor between said third and said first speaces of said arbor;

a mandrel installed in said central channel of said arbor with means for reciprocating motion and having an upper cylindrical part and a lower part in the form of a truncated cone whose larger base serves as the face of said mandrel,

said mandrel including a channel for compressed air,

a side hole in said mandrel located in the zone of said third space of said arbor and placing said channel of said mandrel in communication with said third space of said arbor;

an adjusting nut installed at the end of said upper part of said mandrel below said partition and having a diameter which is smaller than the diameter of said second space of said arbor;

a spring installed on said mandrel and located in said second space of said arbor;

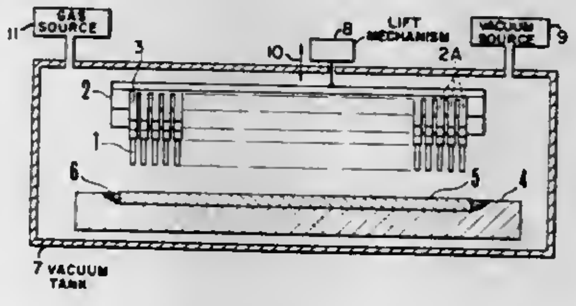
said lower part of said mandrel being made in the form of a truncated cone having its generatrix inclined to said larger base at an angle varying from 10° to 60°, the ratio of the diameter of said larger base to the diameter of said external surface of said arbor ranging from 0.77 to 0.98;

a first side hold of said arbor made in the zone of the third space of said arbor and being used to supply compressed air into said third space of said arbor;

a second side hole of said arbor located in the zone of said fourth space of said arbor and being used to supply paste under pressure into said fourth space of said arbor; and

at least one channel for paste made inside of said arbor for placing said first and said fourth spaces of said arbor in communication with each other.

4,099,550
APPARATUS FOR FILLING LIQUID CRYSTAL INTO THE CELLS OF LIQUID CRYSTAL DISPLAY DEVICES
Hideo Matsuzaki, and Keiji Yajima, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 10, 1976, Ser. No. 722,011
Claims priority, application Japan, Nov. 12, 1975, 50-135055
Int. Cl.² B65B *31/02*
U.S. Cl. 141—51 **6 Claims**



1. Apparatus for filling a liquid crystal into a cell of a liquid crystal display device, said cell being provided with a liquid crystal filling port, said apparatus comprising a cell holder for supporting a plurality of cells in spaced parallel relationship, a support provided with at least one longitudinal groove in the surface thereof for accommodating said liquid crystal, liquid crystal holding means contained in said groove and including capillary passages for the liquid crystal which, due to the surface tension of said liquid crystal, are operatively and locally communicated with the liquid crystal filling port of respective cells by a thin film of liquid crystal about said filling port thus creating a minimized contact area between the liquid crystal and the cell, a vacuum tank containing said bolder mounted with the cells and said support with said liquid crystal holding means, means for producing a vacuum in said tank, means for introducing inert gas into the vacuum tank, and means for contacting the filling port of the respective cells against said liquid crystal holding means, said contacting means supporting said cell holder in said vacuum tank in spaced relationship to the surface of the liquid crystal holding means when said vacuum tank is being evacuated and said cell filling port brought into contact with said liquid crystal hold-

ing means when the inert gas is being introduced, thereby filling said liquid crystal into the cells through said filling ports.

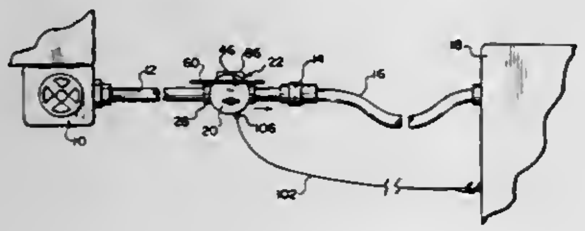
4,099,551
THERMAL-MANUAL CONTROL VALVE

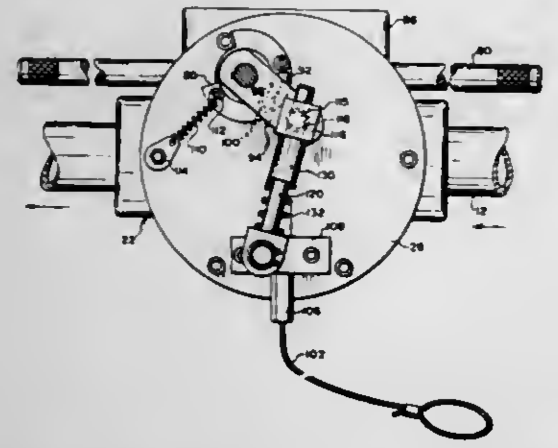
Evans R. Billington, Glenview, and William Nicholas, Chicago, both of Ill., assignors to Golconda Corporation, Chicago, Ill.

Filed Jul. 23, 1976, Ser. No. 708,128

Int. Cl.² F16K *17/38, 31/46, 31/56*

U.S. Cl. 141—388 **10 Claims**





8. A bulk storage tank for LP Gas having a manually controlled liquid eduction valve means connected to a transport truck tank by a flexible hose and a manually disengageable conduit coupling between the flexible hose and the valve seat of the valve means;

a valve in said valve means closing said seat in the direction of outflow from the bulk storage tank through the valve seat;

toggle joint means for holding the valve alternatively open and closed;

means for actuating said toggle joint means to release the valve for it to close including a frangible lanyard connected to said transport truck tank.

4,099,552
ATTACHMENT FOR A POWER TOOL

Reginald Gordon Dyball, 34 Fitzroy St., St. Kilda, Victoria, Australia (3182)

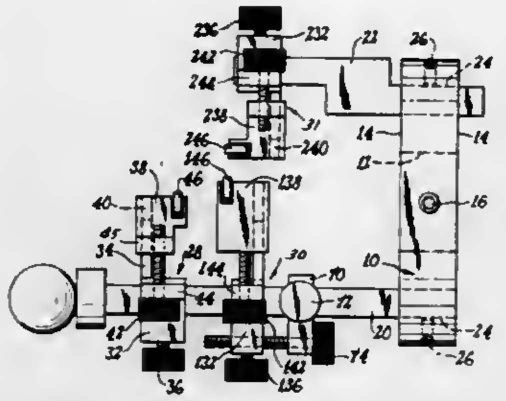
Filed Oct. 19, 1976, Ser. No. 733,888

Claims priority, application Australia, Oct. 24, 1975, 3711/75

Int. Cl.² B27C *5/10*

U.S. Cl. 144—134 D **10 Claims**

1. An attachment for a power tool adapted to perform materials working operations along an edge defined by mutually inclined adjacent surfaces on a workpiece by means of a rotatable shaping element thereof; said attachment having a base member and first and second arms mounted on said base member and projecting therefrom in mutually spaced relationship; a respective guide member mounted on each of said arms; said base member being adapted to be secured to the housing of the tool, adjacent the shaping element such that the shaping element is located intermediate said first and second arms; and each of said guide members being movable relative to the base member to provide a variable guide adapted, in use of the attachment on a power tool, to engage a respective one of said mutually inclined adjacent surfaces of the workpiece and to guide the shaping element of the in relation to the workpiece, each guide member including a body portion by which it is mounted on its respective arm and at least one support means on which is mounted a roller for engaging the respective surface of the material to be worked; the support means being adjustable relative to the body portion laterally of the arm.



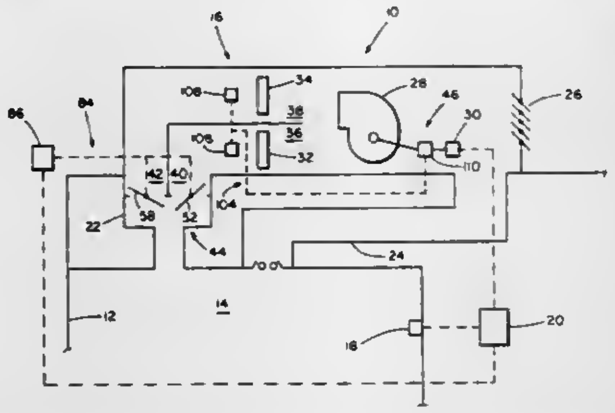
4,099,553
VARIABLE AIR VOLUME SYSTEM

Roger R. Burnham; Merlin K. Chapin; David A. Cook; Theodore C. Gilles, all of Marshalltown, and Billy L. Williams, Montour, all of Iowa, assignors to Lennox Industries, Inc., Marshalltown, Iowa

Filed Feb. 11, 1977, Ser. No. 767,955

Int. Cl.² F24F *3/00*

U.S. Cl. 165—22 **12 Claims**



1. In an air processing system for conditioning air enclosure of the type including an air mover, thermostatic means for sensing the temperature of said enclosure, a first deck, a second deck and duct means for interconnecting said enclosure and said air mover, said duct means having a first passage and a second passage communicating with said first deck and said second deck, respectively, an improvement comprising, in combination:

a shaft rotatably mounted to said duct means, said shaft extending substantially through said first passage and said second passage and beyond said duct means to define a shaft control portion, said shaft including a shaft actuating arm secured to said shaft control portion;

a first damper element secured to said shaft within said first passage;

a tube rotatably mounted on said shaft, said tube extending substantially through said second passage and beyond said duct means to define a tube control portion, said tube including a tube actuating arm secured to said tube control portion;

a second damper element secured to said tube within said second passage;

stop means for detachably securing said shaft and said tube in a first shaft position and a first tube position, respectively;

drive means for driving said first damper element and said second damper element in response to said thermostatic means, said drive means including a shaft drive arm and a tube drive arm adapted to engage said shaft actuating arm and said tube actuating arm, respectively, said shaft, said tube and said drive means cooperatively defining attachment means for detachably securing said shaft actuating arm and said tube actuating arm to said shaft drive arm and said tube drive arm, respectively; and

volume control means for variably operating said air mover in response to said first damper element and said second damper element;

said shaft and said tube being operable in a first mode wherein said shaft actuating arm is detachably secured to said shaft drive arm and said tube is detachably secured in said first tube position by said stop means, a second mode wherein said shaft actuating arm and said tube actuating arm are detachably secured to said shaft drive arm and said tube drive arm, respectively, and a third mode wherein said shaft is detachably secured in said first shaft position by said stop means and said tube actuating arm is detachably secured to said tube drive arm.

4,099,554
CONTROL SYSTEM TO REGULATE THE WALL TEMPERATURE OF A PRESSURE VESSEL

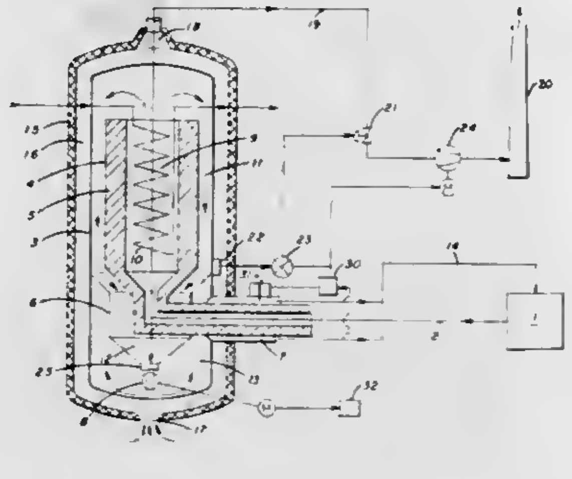
Egon Haese, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 752,295

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557085

Int. Cl.² G05D *23/00*

U.S. Cl. 165—32 **5 Claims**



1. In a pressure vessel adapted to receive a flow of hot rare gas such a helium from a nuclear reactor, said pressure vessel including an outer layer of insulation, an outer pressure jacket spaced inwardly from said layer of insulation to form an airgap therebetween, a chimney coupled by a conduit line to an aperture in the top of said outer layer of insulation which further includes a bottom aperture, an inner jacket having an open top and a conical bottom end disposed within said outer pressure jacket to form an annular chamber therebetween, a layer of insulation supported by said inner jacket, a conical apron including a bottom opening surrounding the conical bottom end of said inner jacket, said conical apron separating said annular chamber between said inner jacket and said outer pressure jacket to define a bottom chamber in said outer pressure jacket, said bottom chamber communicating with an outlet conduit which surrounds an inlet conduit for feeding hot rare gas into the conical bottom end of said inner jacket, the arrangement of parts being such that hot rare gas from a nuclear reactor passes from said inlet conduit to flow upwardly within said inner jacket and then downwardly along said annular chamber to enter said bottom chamber and pass into said outlet conduit, the combination therewith of a control system including the combination of:

a thermocouple supported for response to the temperature of the outer wall of said outer pressure vessel within said airgap to produce a temperature signal corresponding thereto,

a controller receiving said temperature signal to produce a control signal corresponding to the development of a predetermined excessive outer wall temperature of said outer pressure vessel, and

control means responsive to said control signal to both maintain continuous airflow and adjustably control the flow of air delivered by the conduit line into said chimney from said airgap through the top aperture in said outer layer of insulation.

4,099,555
CONVECTOR HAVING A FLATTENED PLASTIC TUBE SPIRAL

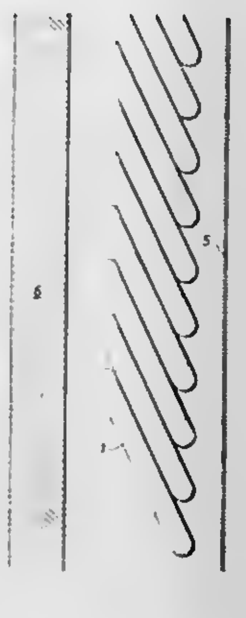
Peter Heinrich Erwin Margen; Jan Anders Bosaeus, both of Nykoping, and Bengt Olof Roland Skårud, Vasteras, all of Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

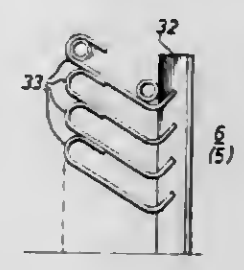
Filed Dec. 8, 1975, Ser. No. 638,546

Claims priority, application Sweden, Dec. 18, 1974, 7415956

Int. Cl.² F24H *9/08*

U.S. Cl. 165—55 **5 Claims**





1. A wall mountable tube convector for heating air wherein air is heated by contact with hot tubes and rises by convection, said convector comprising a hot liquid conducting plastic tube of high thermal stability formed into a plurality of tube windings extending in the form of a vertically oriented flattened helix having a central, axially extending vertical plane parallel to the flattened sides of the helix, all the helix windings being arranged in parallel planes intersecting said central vertical plane along substantially horizontal lines and extending obliquely to the horizontal, tube spreaders between the windings arranged to maintain said windings in a predetermined shape and at predetermined mutual intervals, the first mounting means cooperating with the tube windings for mounting said tube on a wall spaced a distance from said wall, a screen enclosing said tube coils, and second mounting means for mounting said screen on said tube coils spaced a distance from said coils, said screen, in cooperation with the wall, forming an open-ended chimney around said tube coils, whereby said first and second mounting means produce a double flue effect to permit every part of the spiral to be exposed to a substantially unobstructed, uniform airflow in and about said coils to increase heat transfer.

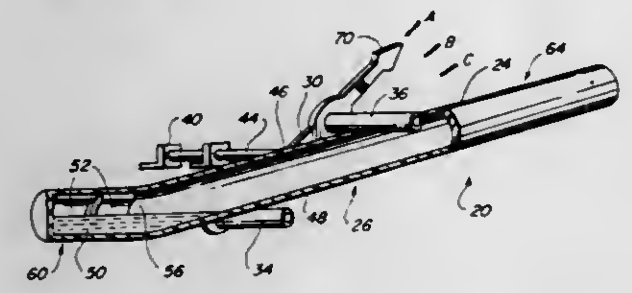
4,099,556

VARIABLE THERMAL CONDUCTANCE REFLUX HEAT PIPE

Charles C. Roberts, Jr., 27 W. 776 Greenview, Warrenville, Ill. 60555

Filed May 23, 1977, Ser. No. 799,454
Int. Cl.^{2} F28D *15/00*

U.S. Cl. 165—96 **4 Claims**



1. Thermal transfer apparatus comprising reflux heat pipe means,
- said heat pipe means including:
- an evaporator section,
- slab wicks of various depths disposed in said evaporator section for contacting a liquid puddle in said evaporator section of said pipe means,
- an adiabatic center section and an upper condenser section,
- said adiabatic center section having a deformable zone,
- closure means sealing said pipe means at each end,
- a vaporizable liquid in said apparatus, said liquid being in equilibrium with a vapor phase thereof, and
- mechanical means for deforming said deformable adiabatic section to provide an inflection in said central section of said pipe means.

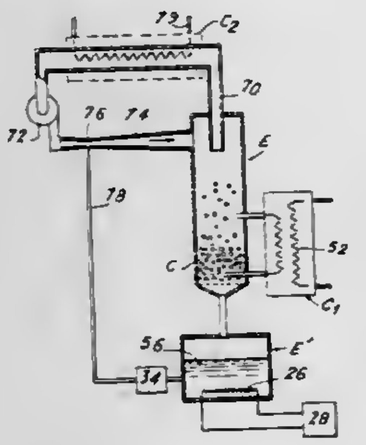
4,099,557

METHOD OF HEAT ACCUMULATION AND A THERMAL ACCUMULATOR FOR THE APPLICATION OF SAID METHOD

Alain Bricard, Grenoble; Maurice de Cachard, La Tronche, both of France; Pierre Goffinet, Brussels, Belgium; Gerard Kurka, Meylan, and Robert Moracchioli, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomiqne, Paris, France

Division of Ser. No. 551,828, Feb. 21, 1975. This applicatioo Dec. 6, 1976, Ser. No. 748,006
Int. Cl.^{2} F28D *21/00*

U.S. Cl. 165—104 S **2 Claims**



1. A thermal accumulator wherein a heat transporting fluid F is passed in direct contact over a material C having a high latent heat of fusion comprising:
- a vessel E containing a portion of the material C in the form of a bed of solid granules and the fluid F, said vessel E having an upper end and a lower end;
- a vessel E' which communicates with the lower end of the vessel E, the vessel E' containing a portion of the material C in a molten liquid state, said vessel E' having an upper end and a lower end;
- a first pumping circuit including a first pipe having one end extending into the vessel E, a first pump connected to the other end of said first pipe;
- a convergent-divergent venturi tube having its divergent end opening in the vicinity of the upper end of the vessel E, the convergent end of the venturi tube being in the vicinity of the first pump, part of the first pipe constituting a primary circuit of a heat exchanger C_2, the fluid F circulating in the primary circuit, heat energy being extracted by an associated secondary circuit of the heat exchanger C_2;
- a second circuit constituted by a second pipe fitted with a filter, said second circuit connecting the lower end of the vessel E' to the throat of the venturi tube, the molten liquid material C store in the vessel E' being supplied to the throat of the venturi tube via the second circuit; and
- a third circuit for pumping fluid F to circulate the fluid F through the granules of material C in the vessel E constituted by a third pipe and a second pump, an end of said third pipe being connected to an opening formed in the vessel E above the maximum level of the bed of solid granules of material C, the other end of the third pipe being connected to an inlet located in the vicinity of the lower end of the vessel E, a mid-portion of the third pipe constituting the secondary circuit of a heat exchanger C_1, an associated primary of the heat exchanger C_1 including a hot liquid supply heat to the fluid F.

4,099,558

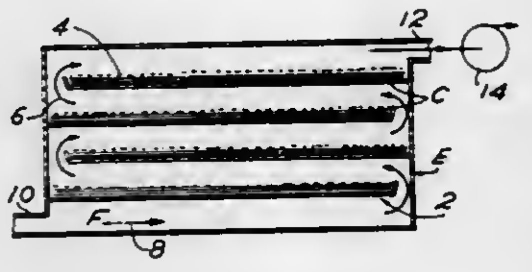
METHOD OF HEAT ACCUMULATION AND A THERMAL ACCUMULATOR FOR THE APPLICATION OF SAID METHOD

Alain Bricard, Grenoble; Maurice de Cachard, La Tronche, both of France; Pierre Goffinet, Brussels, Belgium; Gérard Kurka, Meylan, and Robert Moracchioli, Seyssinet, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 551,828, Feb. 21, 1975. This applicatioo Dec. 6, 1976, Ser. No. 748,007

Claims priority, application France, Mar. 1, 1974, 74 07079; May 31, 1974, 74 19072
Int. Cl.^{2} F28D *21/00*

U.S. Cl. 165—104 S **3 Claims**



1. A thermal accumulator having a high latent heat of fusion, wherein the accumulator comprises:
- means for storing a material C having a high latent heat of fusion; and
- means for circulating a heat-transporting fluid F so that the fluid F and the material C are in direct contact and exchange heat, the heat exchange being carried out essentially at a temperature close to the melting point of the material C, the means for storing including a leak-tight vessel containing a series of trays arranged in tiered stages, the trays containing the material C, the fluid F flowing about said trays in contact with a free surfaces of the material C, each of the trays including a horizontal capillary attached to its associated tray and located at the associated free surface of the material C, the material C and the heat trnasporting fluid F having substantially different densities and surface tensions at the melting point of the material C.

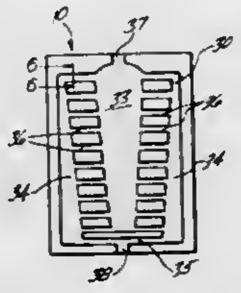
4,099,559

SOLAR ABSORBER PLATE DESIGN

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed May 10, 1976, Ser. No. 685,061
Int. Cl.^{2} F28F *3/14, 9/22;* F24J *3/02*

U.S. Cl. 165—170 **18 Claims**



1. A heat exchange panel possessing a system of internal tubular passageways, said tubular passageways defining at least three generally tapered longitudinally extended headers, at least two of said longitudinally extended headers extending substantially the length of said panel, a connecting header located at one end of said panel transverse to and interconnecting longitudinally extended headers, and generally transversely extended connecting portions of said passageways, said connecting portions extending between longitudinally extended headers, and at least two fluid entry and exit portions longitudinally extending from at least two of said headers, wherein said longitudinally extended headers include a centrally located header offset by a pair of laterally displaced headers.

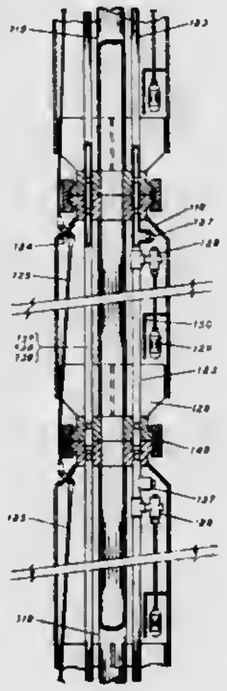
4,099,560

OPEN BOTTOM FLOAT TENSION RISER

William Fischer, Fullerton, Calif., and Virgil D. Rogge, Sumatra, Indonesia, assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 511,158, Oct. 2, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,233
Int. Cl.^{2} E21B *7/12*

U.S. Cl. 166—0.5 **37 Claims**



1. A buoyantly tensioned riser pipe in a body of water comprising:
- an elongated riser pipe having a substantially central opening therethrough;
- means for securing the upper end of said riser pipe to a drilling platform located in said water;
- means for securing the lower end of said riser pipe to a water bottom connector;
- float can means having a closed upper end and an open bottom end;
- means for connecting the upper end of said float can means to said riser pipe concentrically, wherein said means for connecting is able to withstand a pressure exerted against said means for connecting;
- a source of gas under pressure;
- conduit means connecting said source of gas to the upper end of said float can means for injecting gas into said float can means whereby said gas is trapped in the closed upper end of said float can means to buoyantly tension said pipe;
- a plurality of expansion guiding means connected to said riser pipe at the open end of said float can means for guiding said float can means along said guiding means during expansion and contraction of said float can means;
- a normally closed fluid dump valve connected to the upper closed end of said float can means;
- actuating means for operating said valve to open said dump valve in each of said float can means when said riser pipe parts;
- slip joint means operatively connected to said drilling platform and said riser for allowing said riser to slide up and down;
- supplementary tensioning means for providing additional tension when a water current is encountered;
- means for connecting said supplementary tensioning means to said riser; and
- a plurality of lines for killing, choking and controlling a well under said body of water extending longitudinally through said float can means.

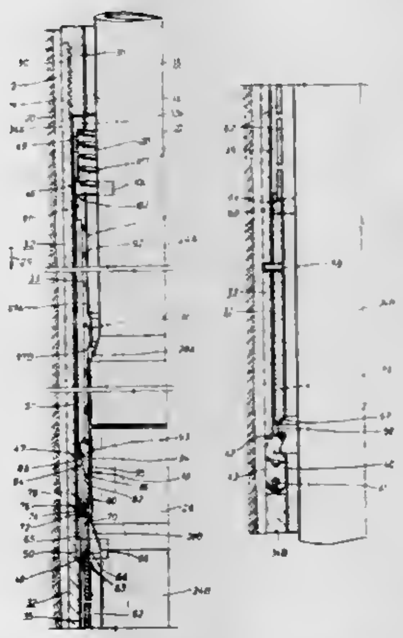
4,099,561

OVERSHOT CUTTER WITH FLEXIBLE RELEASE CAGE

Paul M. Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed May 11, 1977, Ser. No. 795,949
Int. Cl.^{2} E21B *33/03*

U.S. Cl. 166—55.1 **7 Claims**



1. Apparatus for severing a drill string from the exterior thereof, comprising:
- a flexible inner member having a first abutment surface thereon;
- an outer member concentrically disposed about said inner member, said outer member having a second abutment

surface thereon sized to receive said first abutment surface;

means for gripping a distended portion of a drill string disposed radially inwardly of said inner member, said gripping means being mounted on said flexible inner member for radial movement from a first, inner, position in which said gripping means is engageable by the distended portion of the drill string to obstruct axial movement of said overshot cutter with respect thereto to a second, radially outer, position in which said gripping means is axially movable with respect to the drill string;

said first and said second abutment surfaces being engagable to maintain said gripping means in said first, inner, position,

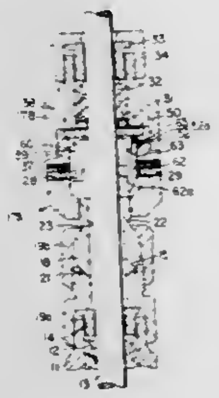
said outer member being axially movable relative to said flexible inner member to disengage and axially space apart said abutment surfaces and to define a radial clearance therebetween sufficient to permit said inner member to flex radially outwardly and to move said gripping means from said first, inner, to said second, radially outer, position.

4,099,562

DEVICE FOR LIMITING LEAKAGE FROM WELL HEAD STUFFING BOX ASSEMBLY

Roland W. Mattoon, P.O. Box 1302, Drayton Valley, Alberta, Canada

Filed Mar. 28, 1977, Ser. No. 782,281
Claims priority, application Canada, Feb. 7, 1977, 271174
Int. Cl.² E21B *33/03*
U.S. Cl. 166—84 **6 Claims**



1. A device for limiting leakage from a well head stuffing box assembly of the type including a vertically reciprocating polished rod, said device including means defining a chamber concentrically surrounding the rod, the upper end of the chamber being defined by a downwardly facing annular valve seat, said device including a flap valve member mounted within said chamber on a pivot carried by a ring member adjacent to said valve seat, said flap valve member being biased by spring means towards a closed position in which it seals against the valve seat, and being arranged normally to be held open by said rod.

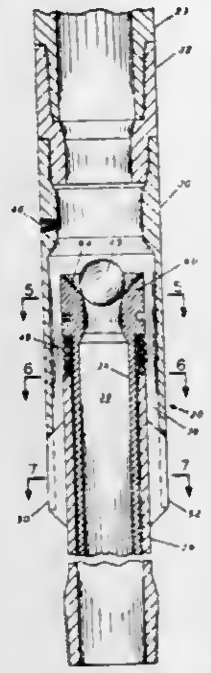
4,099,563

STEAM INJECTION SYSTEM FOR USE IN A WELL

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1977, Ser. No. 783,131
Int. Cl.² E21B *33/122, 43/12*
U.S. Cl. 166—191 **2 Claims**

1. A steam injection system comprising a tubing string, a steam deflector connected into said tubing string operable for initially directing steam flow down the interior of said tubing string into a well and later out of the steam deflector into the well liner-tubing string annulus in a direction concentric with and substantially parallel to the longitudinal axis of the tubing string, means for operating said steam deflector to direct steam flow out of said steam deflector into the well liner-tubing string annulus in a direction concentric with and substantially parallel to the longitudinal axis of the tubing string, downward looking packer cup means packing off the well liner-tubing string annulus above said steam deflector, upward looking packer cup means packing off said well liner-tubing string annulus below said steam deflector and steam generating means connected to said tubing string for flowing steam into said tubing string.

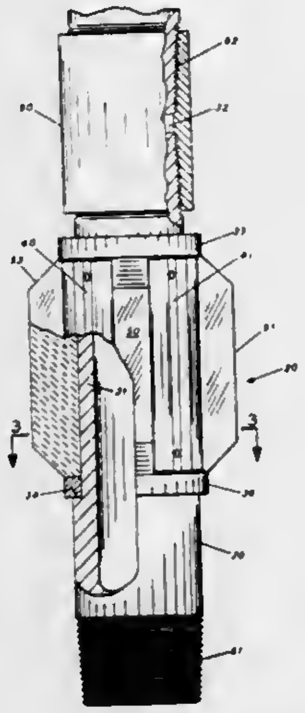


4,099,564

LOW HEAT CONDUCTIVE FRANGIBLE CENTRALIZERS

Stanley O. Hutchison, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 19, 1976, Ser. No. 706,862
Int. Cl.² E21B *17/10*
U.S. Cl. 166—241 **8 Claims**



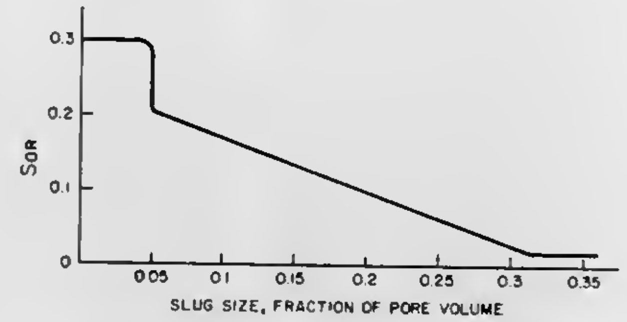
1. A centralizer for use in a tubing string comprising a central tubular section connectable into a tubing string, a plurality of radially extending polymerized frangible furfuryl alcohol impregnated prefired cordierite lugs in spaced apart position on the periphery of said tubular section for positively centralizing said tubular section, and means disconnectably connecting said lugs on said tubular section in said spaced apart position.

4,099,565

SINGLE WELL TRACER METHOD TO EVALUATE ENHANCED RECOVERY

Clyde Q. Sheely, Jr., and David E. Baldwin, Jr., both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 18, 1977, Ser. No. 778,920
Int. Cl.² E21B *43/22*
U.S. Cl. 166—252 **14 Claims**



1. A process for obtaining data useful to evaluate the effectiveness of or to design an enhanced recovery process, the recovery process involving mobilizing and moving hydrocarbons through a hydrocarbon-bearing subterranean formation from an injection well to a production well by injecting a mobilizing fluid into the injection well, comprising sequentially:

(a) determining hydrocarbon saturation in the formation in a volume in the formation near a well bore penetrating the formation,
(b) injecting sufficient of the mobilizing fluid to mobilize and move hydrocarbons from a volume in the formation near the well bore penetrating the formation, and
(c) determining hydrocarbon saturation in a volume including at least a part of the volume of (b) by a single well tracer method.

4,099,566

VICOUS OIL RECOVERY METHOD

David A. Redford, Fort Saskatchewan, Canada, assignor to Texaco Exploration Canada Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 483,172, Jun. 26, 1974, Pat. No. 4,026,357. This application Mar. 4, 1977, Ser. No. 774,292
Int. Cl.² E21B *43/24*
U.S. Cl. 166—260 **11 Claims**

7. A method of generating steam in a subterranean, porous, permeable earth formation, said formation also containing solid hydrocarbon fuel, said formation being penetrated by at least one injection well and by at least one production well, both wells being in fluid communication with the formation, comprising:

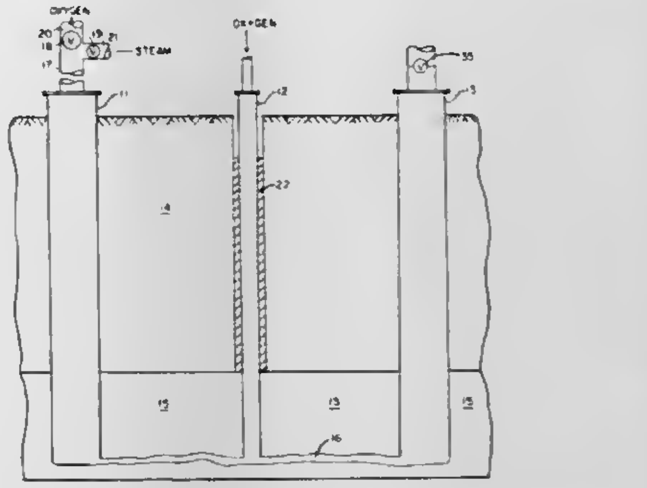
(a) injecting from 1 to 20 gallons of liquid hydrocarbon fuel per foot of formation thickness into the formation via the injection well;
(b) injecting a free oxygen-containing gas into the formation via the injection well;
(c) heating the formation adjacent the injection well for a period of time sufficient to ignite the injected liquid hydrocarbon and solid hydrocarbon fuel present in the formation immediately adjacent the injection well;
(d) continuing injection of an oxygen containing gas into the formation for a period of time sufficient to propagate a high temperature forward combustion reaction zone at least halfway between the injection well and production well;
(e) thereafter discontinuing injection of air;
(f) injecting water containing suspended particulate matter and dissolved minerals into the injection well, said water contacting heated formation matrix materials and as a consequence thereof, being converted into steam; and
(g) recovering steam from the production well.

4,099,567

GENERATING MEDIUM BTU GAS FROM COAL IN SITU

Ruel Carlton Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed May 27, 1977, Ser. No. 801,223
Int. Cl.² E21B *43/24, 43/26;* E21C *43/00*
U.S. Cl. 166—261 **9 Claims**



1. A method of producing coal in situ comprising the steps of

sinking a first bore hole from the surface of the earth into an underground coal deposit,

sinking a second bore hole from the surface of the earth into the said underground coal deposit, the said second bore hole being spaced apart from the said first bore hole,

establishing hermetic seals within the said first and second bore holes,

establishing a communication passage through the said underground coal, the said communication passage being in fluid communication with the said first bore hole and the said second bore hole, the said communication passage through the said underground coal being accomplished by

lowering a perforating gun into the said first bore hole, the said perforating gun being positioned within the said underground coal and the said perforating gun being aligned toward the said second bore hole, then

firing a first projectile from the said perforating gun;

removing the said perforating gun from the said first bore hole,

lowering the said perforating gun into the said second bore hole, the said perforating gun being positioned within the said underground coal and the said perforating gun being aligned toward the trajectory of the said first projectile fired from the said first bore hole, then

firing a second projectile from the said perforating gun, and

removing the said perforating gun from the said second bore hole, and

further including the enlargement of the said communication passage through the said underground coal, comprising the steps of

injecting oxygen in the said first well bore,

igniting the said coal in the said second well bore,

continuing injections of the said oxygen until the underground fire burns through to the said first well bore.

4,099,568

METHOD FOR RECOVERING VISCOUS PETROLEUM

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 442,944, Feb. 15, 1974, abandoned. This application Dec. 22, 1976, Ser. No. 753,659
Int. Cl.² E21B *43/24*
U.S. Cl. 166—269 **15 Claims**

1. A method of recovering viscous petroleum including bitumen from a subterranean, viscous petroleum-containing formation including a tar sand deposit, said formation being

penetrated by at least one injection well and by at least one production well, said injection well containing at least two separate flow paths, the first being in fluid communication with the upper portion of the petroleum formation and the secood being in fluid communication with the lower portion of the formation, comprising:

(a) injecting steam into the upper portion of the formation via the first flow path; and

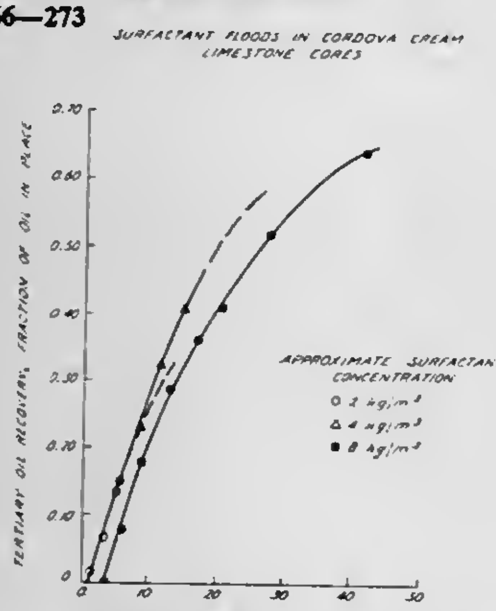
(b) injecting a gas which is non-condensable and non-oxidizing at formation conditions into the lower portion of the petroleum containing formation via the second flow path, said non-condensable gas being selected from the group consisting of nitrogen, methane, ethane, propane, butane, natural gas, liquefied petroleum gas, ethylene, propylene, butylene, hydrogen, and mixtures thereof, said non-condensable gas being injected essentially simultaneously with steam injection so the steam and non-condensable gas mix in the formation and the non-condensable gas contacts substantially all of the viscous petroleum contacted by the steam, thereby preventing loss of steam transmissibility in the formation due to steam condensation or creation of an immobile viscous oil bank in the formation, said steam and gas displacing petroleum toward the production well; and

(c) recovering petroleum from the formation via the production well.

4,099,569
OIL RECOVERY PROCESS USING A TAPERED SURFACTANT CONCENTRATION SLUG

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,679
Int. Cl.² E21B *43/22*
U.S. Cl. 166—273 **9 Claims**



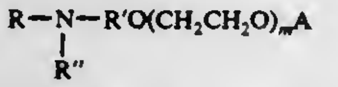
1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

(a) injecting into the formation via the injection well a slug of a surfactant solution;

(b) injecting water into the formation via the injection well; and

(c) recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation, wherein the water injected in step (b) contains dissolved therein a small amount of a solubilizing agent selected from the group consisting of:

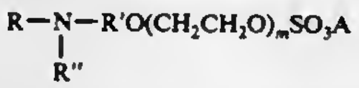
(a) a compound of the formula:



$$\underset{\displaystyle R''}{R-\underset{|}{N}}-R'O(CH_2CH_2O)_mA$$

wherein R is alkyl of from 1 to about 16 carbon atoms; wherein R' is alkylene of from 2 to 4 inclusive carbon atoms; *m* is an integer of from 8 to about 60; A is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion and wherein R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_mA$;

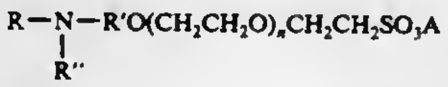
(b) a sulfated compound of the formula:



$$\underset{\displaystyle R''}{R-\underset{|}{N}}-R'O(CH_2CH_2O)_mSO_3A$$

wherein R, R', *m* and A have the same meaning as in (a) above, and R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_mSO_3A$, and

(c) a sulfonated compound of the formula:



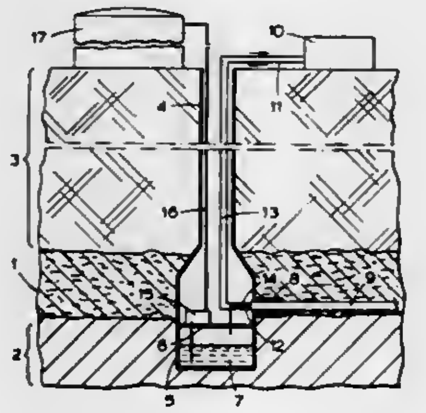
$$\underset{\displaystyle R''}{R-\underset{|}{N}}-R'O(CH_2CH_2O)_nCH_2CH_2SO_3A$$

wherein R, R' and A have the same meaning as in (a) above; wherein *n* is an integer of from about 8 to about 60 and R'' is selected from the group consisting of hydrogen, alkyl of from 1 to about 16 carbon atoms and $R'O(CH_2CH_2O)_nCH_2CH_2SO_3A$.

4,099,570
OIL PRODUCTION PROCESSES AND APPARATUS

Donald Bruce Vandergrift, 264 Silverbrook Way N.W., Calgary Alberta, Canada

Filed Jan. 28, 1977, Ser. No. 763,331
Claims priority, application United Kingdom, Apr. 9, 1976, 14571/76
Int. Cl.² E21B *43/24*
U.S. Cl. 166—303 **9 Claims**



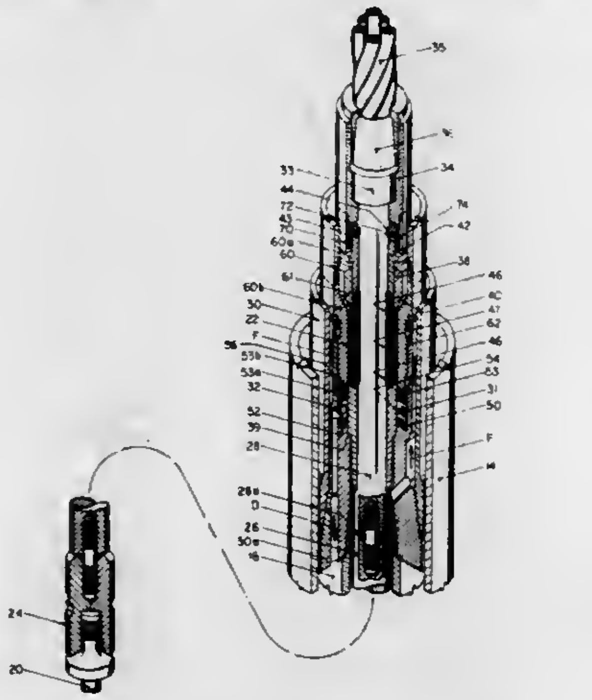
1. An oil recovery string for use in recovering oil from a natural oil-bearing formation with the aid of thermal energy supplied by a fluid-heating medium, said string comprising a tubular heat-conducting casing having oil entry apertures disposed at intervals therealong, an oil-receiving pipe located within said casing and having peripheral openings in sealed communication with said oil-receiving apertures in the casing, and wherein between said casing and said oil-receiving pipe there is a passageway along which heated fluid medium can be circulated in heat-exchange relationship with the casing.

4. A process for recovery of oil from a natural oil-bearing formation utilising thermal energy supplied by a fluid heating meadium to cause or accelerate flow of oil from the formation into an oil recovery duct, with the improvement that in a direction along the formation there is installed at least one composite heating and oil recovery string having a heat conducting casing within which there is at least one passageway for conducting fluid heating medium along the string in heat exchange relationship with such casing, and within which casing there is also at least one duct for conducting oil along the string, the said casing having peripheral oil entry apertures at intervals therealong (via) which apertures are in sealed communication with (the) said oil-receiving duct located within said casing, (is in communication with the formation,) and fluid heating medium is (circulated) forced along said heating passageway to heat a volume of the oil-bearing formation by heat transfer from the string so that oil is caused to gravitate from the formation into said oil-receiving duct via said oil entry apertures.

4,099,571
DOWN HOLD PACKING GLAND AND METHOD FOR LONG STROKE PUMPER

Alfred L. Hollenbeck, Sultan; Allison V. De Tuerk, and John T. Cooper, both of Everett, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Mar. 14, 1977, Ser. No. 776,950
Int. Cl.² E21B *33/03, 23/00*
U.S. Cl. 166—315 **10 Claims**



1. Apparatus for releasably sealing a well hole at a location below ground surface comprising

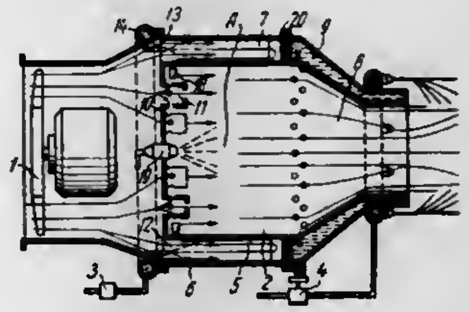
- cylindrical production tube means extending into the well hole,
- a stuffing gland located in the production tube means several feet below the ground surface, said stuffing gland including an internal packing and an outer surface,
- a polish rod reciprocably mounted in engagement with the internal packing within the stuffing gland,
- an inner casing between the stuffing gland and the production tube means,
- resilient sealing and locking means separate from said internal packing and between the inner casing and said outer surface of the stuffing gland, and
- means extending above ground for radially expanding the sealing and locking means for sealing against production fluids passing between the inner casing and the outer surface of the stuffing gland and holding the stuffing gland in position below the ground surface.

7. The method of sealing and locking and removing a packing gland, having an internal packing, around a polish rod below ground in a well hole comprising radially expanding an elastomeric sealing and locking member separate from said internal packing into tight engagement between the packing gland and a stationary tube extending down from the top of the well hole externally of the packing gland; the step of expanding including rotating a second tube from above the ground surface and screwing the second tube downwardly into engagement with the elastomeric sealing and locking member for axially compressing the member to cause it to radially expand, unscrewing the second tube from above the ground surface to relax the elastomeric member and release the packing gland, withdrawing the packing gland, and separately adjusting the internal packing on the polish rod.

4,099,572
VAPOR-GAS MIXTURE GENERATING INSTALLATION FOR EXTINGUISHING UNDERGROUND FIRES

Valentin Vasilievich Vasilenko, ulitsa Levitskogo, 23, kv. 2; Leonid Denisovich Vishnevsky, ulitsa Levitskogo, 27, kv. 8; Viktor Matveevich Zvenyachkin, ulitsa Polotskaya, 20, kv. 55; Anatoly Ivanovich Ivchenko, Komsomolsky prospekt, 27, kv. 33; Mikhail Vasilievich Kolyshenko, ulitsa Artema, 161, kv. 6, all of Donetsk, and Evgeny Petrovich Fedorov, Federativny prospekt, 4, kv. 7, Moscow, all of U.S.S.R.

Filed May 7, 1976, Ser. No. 684,470
Int. Cl.² A62C *13/52*
U.S. Cl. 169—12 **1 Claim**

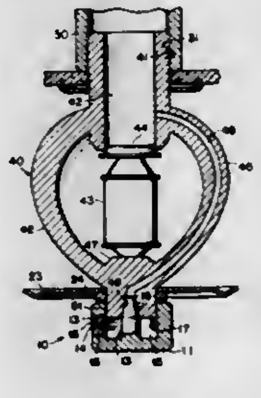


1. A vapor-gas mixture generating installation for extinguishing fires, comprising a blower, a combustion chamber having a restricted section in the direction of gas flow leaving an engine, a fuel system, and a water supply system to cool the restricted section of the combustion chamber and to cool and humidify the combustion products, said combustion chamber before its restricted portion comprising two concentric tubes provided at the outlet with a common vertical wall portion with passages for fuel and air supply into an annular space between the tubes, which is sealed off by a wall at the outlet and divided by longitudinal partitions located at the passage sides into two-way ducts with openings on the inner tube near the vertical wall portion, long partitions extending from the vertical wall portion to the sealing wall, alternating with shorter partitions adjoining the vertical wall portion only, wherein said short partitions are arranged along a helical line normal to the tube surfaces.

4,099,573
SPRINKLER HEAD

Tamotsu Sahara, Tokyo, Japan, assignor to Hitachi Plant Engineering and Construction Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,542
Claims priority, application Japan, May 13, 1976, 51-54973
Int. Cl.² A62C *37/08*
U.S. Cl. 169—37 **11 Claims**

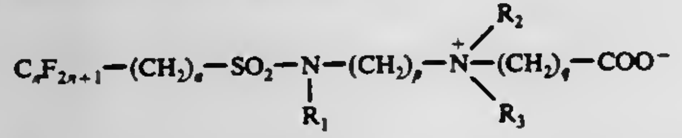


1. A device for confirming water pressure in sprinkler heads

of the type including two forking arms connected to a head pipe near the area of junction with a water delivery pipe at one end and coupled at the other end to a part that supports a heat-sensing component, comprising:
- a branch passageway connected with said head pipe of said sprinkler head which sprinkles water during a fire due to the activation of said heat-sensing component, said branch passageway being drilled through at least one of the two forking arms such that it communicates with said part that supports said heat-sensing component;
- a valve means which opens and closes the branch passageway by contact with, and separation from, said passageway;
- a restraining part which holds said valve in said passageway such that said valve is removed from the branch passageway when said restraint is loosened; and
- a pressure detection port provided in said restraining part and connected with said branch passageway when the branch passageway is opened by said valve, and to which pressure gauge may be connected.

4,099,574
FIRE-FIGHTING COMPOSITIONS
Gerald Edward Cooper, Crowthorne, and Robert Eugene Stratton, Brentford, both of England, assignors to Chubb Fire Security Limited, Sunbury-on-Thames, England
Filed Apr. 4, 1977, Ser. No. 784,398
Claims priority, application United Kingdom, Apr. 6, 1976, 13823/76
Int. Cl.² A62C *1/02;* C09K *3/28*
U.S. Cl. 169—47 **27 Claims**

1. A fire fighting concentrate comprising an aqueous solution of (a) less than 2% by weight of perfluoro surfactant, (b) from 1 to 9 parts by weight, per part by weight perfluoro surfactant, of a fluorine-free surfactant, and (c) glycol or glycol ether solvent for the perfluoro surfactant, and in which the perfluoro surfactant comprises an ampholytic fluorinated sulphonamide having the general formula



$$C_nF_{2n+1}-(CH_2)_a-SO_2-N(R_1)-(CH_2)_p-\overset{+}{N}(R_2)(R_3)-(CH_2)_q-COO^-$$

wherein *n* represents an integer of from 1 to 20, *a* represents an integer of from 2 to 10, *q* represents an integer of from 0 to 10, *p* represents an integer from 0 to 10 and each of R_1, R_2 and R_3, which they be the same or different, are hydrogen, C_{1-6}alkyl or

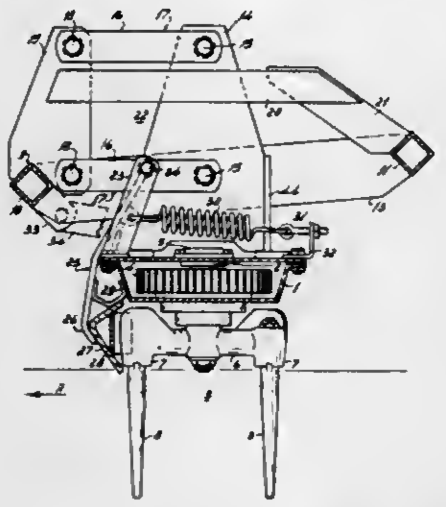
$C_nF_{2n+1}-(CH_2)_a-SO_2$

24. A fire-fighting solution made by mixing one part of a concentrate according to claim 1 with about 16 parts water.

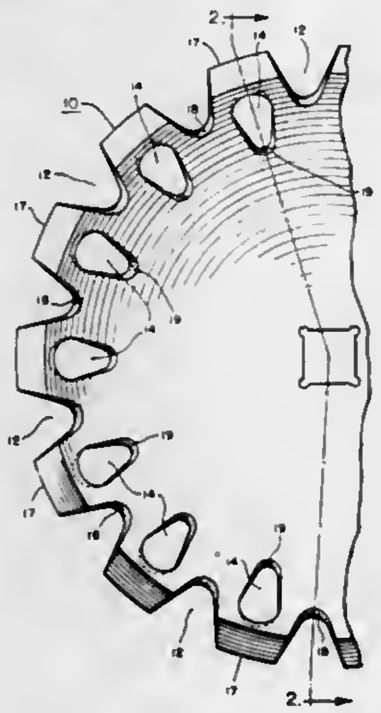
26. A method of fighting a hydrocarbon fire comprising applying to the hydrocarbon a fire-fighting liquid according to claim 24.

4,099,575
SOIL CULTIVATING IMPLEMENTS
Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N.V., Maasland, Netherlands
Filed Dec. 2, 1976, Ser. No. 746,805
Claims priority, application Netherlands, Dec. 2, 1975, 7514005
Int. Cl.² A01B *33/06*
U.S. Cl. 172—59 **13 Claims**

1. A soil cultivating implement comprising a supporting frame structure and a plurality of soil working members rotatably mounted on an elongated frame portion that extends transverse to the direction of travel, said supporting structure including bracket means, linkage assemblies interconnecting said bracket means with at least one upwardly extending support secured to said frame portion, said linkage assemblies comprising vertically spaced apart links with pivots and said frame portion together with the soil working members being displaceable vertically with respect to the supporting structure about said pivots, stops positioned to each side of said support, between said spaced apart links to limit the lateral movements of the frame portion relative to the supporting structure.

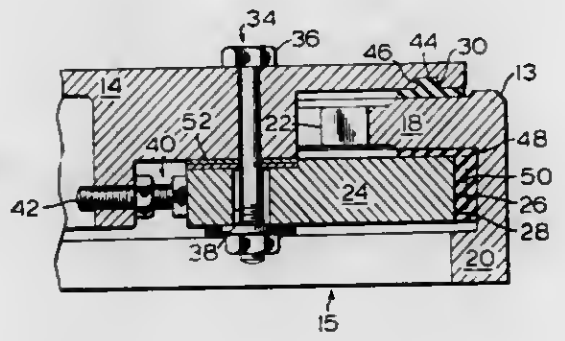


4,099,576
HIGH-SPEED AGRICULTURAL DISC
Atiq A. Jilani, Oak Lawn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jun. 27, 1977, Ser. No. 810,125
Int. Cl.² A01B *15/16*
U.S. Cl. 172—555 **11 Claims**



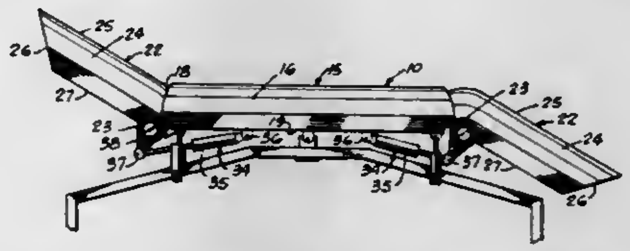
1. A circular, dished earth-cutting agricultural disc having a series of equally-spaced, generally V-shaped notches around its circular periphery, with a radially-extending, generally ovate-shaped opening between each pair of adjacent notches, the wider end of each opening being radially outermost and extending outwardly beyond the bottoms of the notches.

4,099,577
WORK VEHICLE AND RING GEAR BEARING ARRANGEMENT THEREFOR
Joel M. Beckham; Gene B. Easterling; Reginald K. Ringel, all of Decatur, and Egon E. Wolff, Forsythe, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 17, 1977, Ser. No. 778,652
Int. Cl.² E02F *3/76*
U.S. Cl. 172—781 **7 Claims**



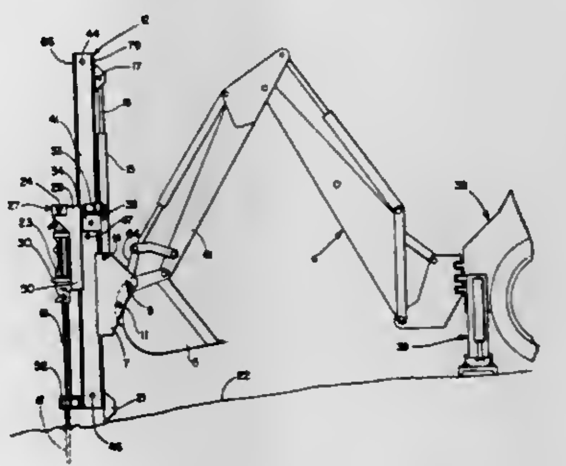
1. A work vehicle, comprising:
- a draw bar frame having a plurality of recesses;
- a work element;
- a ring gear having first and second legs and being of a general "L" cross sectional configuration and fixedly connected to the work element;
- a plurality of shoes each having an end having at least one slot extending generally vertically along the end in the installed position with the shoe movably connected to the frame and the first ring gear leg positioned between the shoe and an overlaying frame portion;
- first means for selectively movably and fixedly connecting the shoe to the frame;
- second means for controllably moving the shoe toward and from the ring gear;
- a plurality of first bearing strips positioned between and in load bearing contact with the first leg of the ring gear and the overlaying frame portion, each of said first bearing strips having at least one portion of a construction sufficient for generally vertically insertion into a respective recess, generally vertical removal from said recess, and for maintaining said first bearing strip against generally horizontal movement relative to said frame in response to preselected forces subjected thereon by the ring gear, said first bearing strips being formed of organic plastic having fiberglass strands and being of a thickness sufficient for maintaining the ring gear spaced from the overlying frame; and
- a plurality of second bearing strips each being of a general "L" cross sectional configuration and positioned over an end portion of a respective shoe and between and in load carrying contact with said shoe and the first and second legs of the ring gear, each of said second bearing strips having at least one lug of a construction sufficient for insertion into a respective generally vertical shoe slot, removal from said slot, and for maintaining said second bearing strip against generally horizontal movement relative to said shoe in response to forces subjected thereon by the ring gear, said second bearing strip being formed of organic plastic having fiber glass strands and being of a size sufficient for maintaining the ring gear spaced from all portions of the shoe.

4,099,578
HINGED BULLDOZER BLADE
John L. Stevens, P.O. Box 374, Eureka, Mont. 59917
Filed Feb. 10, 1977, Ser. No. 767,440
Int. Cl.² E02F *3/76*
U.S. Cl. 172—802 **5 Claims**



3. A selectively adjustable earth moving blade for a bulldozer or like vehicle, comprising:
- a first blade section adapted for mounting to a vehicle, said first blade section having a forwardly facing concave surface along vertical planes across the width thereof;
- a second blade section having a forwardly facing concave surface across the width thereof matching the concave surface of the first blade section;
- upright hinge means joining one end of said first blade section to one end of said second blade section for relative pivotal motion with respect to one another about an upright hinge axis;
- said upright hinge means including interfitting complementary paired concave and convex end surfaces integral with said first and second blade sections;
- each end surface being tangential to the concave surface of the blade section on which it is formed and each pair of concave and convex end surfaces having substantially common radial dimensions relative to the upright hinge axis, whereby a uniform narrow gap is maintained between the blade sections while permitting relative pivotal movement of one blade section relative to the other about the upright hinge axis.

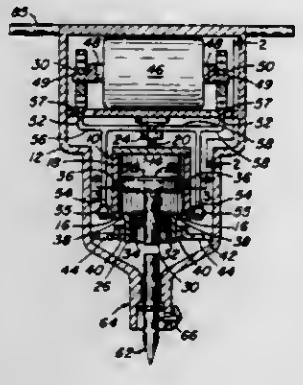
4,099,579
DRILL MOUNTING DEVICE FOR BACKHOE ATTACHMENTS
Harry J. Stormon, 908 Camino Real, Sparks, Nev. 89431
Filed Feb. 9, 1977, Ser. No. 766,937
Int. Cl.² B23Q *5/00*
U.S. Cl. 173—4 **7 Claims**



1. A drill mounting device for backhoe attachments comprising:
- a. attachment means removably affixed to the end of said backhoe and formed with a slide rail;
- b. an elongated mast slidably mounted on said attachment means and formed with a slide rail;

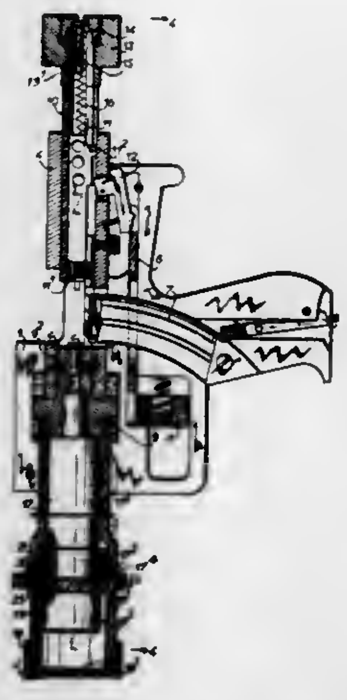
c. power means connected to said attachment means and said mast for controlled lowering and raising of said mast;
d. a tool carrier slidably mounted on said mast slide rail and formed with a handle holding member adapted for removably holding the handle portion of said drill;
e. a chain loop mounted on said mast and connected to said carrier;
f. motor means operably connected to said chain loop for movement thereof;
g. a pair of latch members slidably mounted on said tool carrier and adapted for engaging the handles of said sinker drill; and
h. a pair of shear pins connected to said carrier and to said latches which are dimensioned to shear and release said drill from said carrier when the force exerted on said drill exceeds a preselected force.

4,099,580
IMPACT DEVICE WITH LINEAR AIR SPRING
Frederick W. Ross, 755 Klamath Dr., Del Mar, Calif. 92014
Filed Jan. 24, 1977, Ser. No. 762,003
Int. Cl.² B25D *9/00*
U.S. Cl. 173—118 **15 Claims**



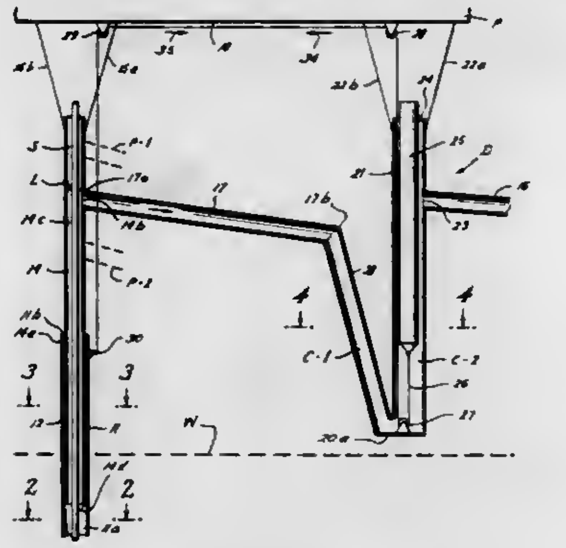
1. An impact device comprising:
a frame,
exciter-reciprocative means operatively mounted on said frame, and having a reciprocating output reciprocating at a working rate of impacting,
a resilient coupler operatively mounted for reciprocation on said frame, said resilient coupler comprising an enclosing wall including a cylinder portion with end elements forming a total enclosed space substantially confining a selected quantity of air therein, and ram means comprising a piston with at least one shaft thereon extending in slidable sealed relation through an associated one of said end elements, said piston fitted for slidable reciprocation axially within said cylinder portion and having piston seal means operative to restrict air leakage past said piston, said piston thereby dividing the total enclosed space within the enclosing wall into separate enclosed spaces of variable volume, each said separate enclosed space confining a substantially constant quantity of air therein,
said resilient coupler operatively interconnecting said reciprocating output and the ram means to transmit reciprocating motion of said reciprocating output to reciprocating motion of said ram means,
impact tool means operatively mounted on said frame for impact by said ram means during each reciprocation thereof,
flow restricting passage means for limiting compensating air flow to an amount not substantially exceeding imminent air leakage past said piston and to substantially maintain the varyingly reduced air pressure of expansion alternatingly occurring during each cycle of operation in each said separate enclosed space, thereby to substantially maintain doubly acting air spring stiffness of said resilient coupler,
said flow restricting passage means comprising one or more openings through said enclosing wall at one or more selected points through which said compensating air is put alternately into and out of each said separate enclosed space by action of said piston reciprocation to compensate for air leakage past the piston seal means to stabilize the piston mid-excursion point during operation, wherein the improvement comprises:
said total enclosed space having total internal open volume Ah, with said piston positioned to divide said total enclosed space into two substantially equal separate enclosed spaces and A is the cross-sectional area of said cylinder portion, and
said one or more openings through said enclosing wall comprising one or more vents grouped about an effective vent flow area center thereof, such center positioned within the medial range of the half of the total equivalent open length, h_r, positioned toward said impact tool means.

4,099,581
EXPLOSIVE-CARTRIDGE POWERED HAMMER OR IMPACT TOOL
Jean Paul Maret, Le Boulevard Karl Marx, Saint-Etienne, France (42100), and Bernard Maret, La Bertrandiere, L'Etrat, France (42580)
Filed Feb. 8, 1977, Ser. No. 766,586
Claims priority, application France, Feb. 9, 1976, 76 04229
Int. Cl.² B25D *9/00*
U.S. Cl. 173—133 **12 Claims**



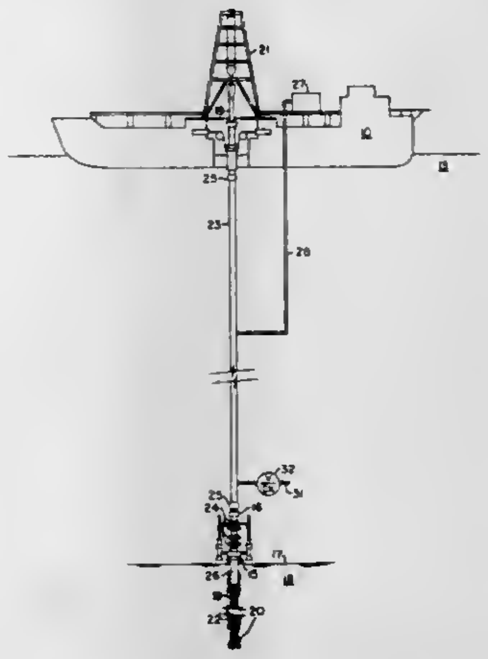
1. An explosive-cartridge powered hammer or impact tool comprising:
a breech member adapted to receive an explosive-cartridge;
means to lock said explosive-cartridge in said breech member and to fire said explosive-cartridge;
grip means;
resilient means connecting said grip means to said breech member, said resilient means comprising means permitting and guiding said breech member to slide smoothly back and forth with respect to said grip means in a direction parallel to the axis of said breech means, a pair of damping rings, each defining one of the limits of travel of said breech member and each returning said breech member away from said limit of travel, when said breech member is forced towards said limit of travel;
whereby said grip means resiliently supports said breech member;
a barrel sleeve fastened to the breech member, so as to receive in its bore the burning gases from the explosive-cartridge when said explosive-cartridge is fired;
piston means slidable in the bore of said barrel sleeve in gas-tight relationship, whereby, when said explosive-cartridge is fired, the piston is driven by the burning gases from a rearward position forward along the bore of said barrel sleeve to a forward position;
an impact head carried by the fore end of said piston for impacting on an impact-receiver;
said impact head protruding beyond said barrel sleeve during impact;
means to retract said piston to its rearward position, said means comprising sealed expandable-compressible chamber means formed between said piston and said bore, said chamber means decreasing in volume as said piston is driven to its forward position, whereby air therein is compressed and tends to drive said piston back to its rearward position; and
detent means to retain said piston in its rearward position until an explosive-cartridge is fired.

4,099,582
DRILLING FLUID COMPENSATION DEVICE
Leo A. Bell, Houston, Tex., assignor to Martin-Decker Company, a division of Gardner-Denver, Santa Ana, Calif.
Continuation-in-part of Ser. No. 720,199, Sep. 3, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,564
Int. Cl.² E21B *7/12*
U.S. Cl. 175—5 **21 Claims**



1. In an offshore oil well drilling system wherein a drilling platform is subjected to wave and tide action causing such platform to heave and wherein the drill string therefor is housed in a marine riser which is connected to the platform through a telescoping connection having a return flowline, the annular area between said marine riser and the drill string serving as a return path for drilling fluid, the flow of such returning drilling fluid through such return flowline being affected by the heave of the drilling platform, a drilling fluid flow compensator, comprising:
a telescoping cylindrical member adapted for mounting in said marine riser and for connection with such platform for slidable, sealed movement in said marine riser in response to heave of such platform from wave action, said telescoping cylindrical member having a return flowline connected therewith for receiving such returning drilling fluid from said marine riser and telescoping cylindrical member; and
volume compensation means connected with said return flowline for substantially neutralizing the effect of wave and tide action on the flow of such return drilling fluid through said return flowline.

4,099,583
GAS LIFT SYSTEM FOR MARINE DRILLING RISER
Leo Donald Maus, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Apr. 11, 1977, Ser. No. 786,529
Int. Cl.² E21B *15/02, 7/18*
U.S. Cl. 175—7 **9 Claims**

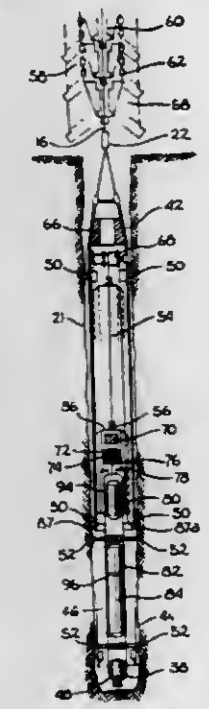


1. In an apparatus for drilling a well through subterranean formations beneath a body of water from the surface of said body of water, said apparatus comprising a riser pipe extends from the surface to a subsea wellhead and a drill string which passes through said riser pipe and into a borehole under the body of water, the improvement comprising:
gas injection means for lifting drilling fluid in said riser pipe to the surface to reduce the pressure of the drilling fluid so that there exists a differential pressure between the drilling fluid and said body of water; and
valve means positioned near the lower end of said riser pipe for providing an influx of seawater into said riser pipe in response to said differential pressure so that the pressures of the drilling fluid and said body of water approximately equalize while the pressure of the drilling fluid in the borehole stabilizes at a level which is below the fracture pressure of the formations.

4,099,584
FLAME JET TOOL FOR DRILLING TO GREAT DEPTHS
Helmut Frankle, and Werner Baum, both of Canoga Park, Calif., assignors to Pei, Inc., Canoga Park, Calif.
Filed Jan. 10, 1976, Ser. No. 694,665
Int. Cl.² E21B *7/14*
U.S. Cl. 175—14 **27 Claims**

1. A flame jet tool for drilling a hole in the ground at great depths comprising:
(a) a flame jet lance having a drill bit and an associated self-contained fuel system disposed in said lance, said fuel system including at least one fuel tank coupled to said drill bit such that fuel is caused to travel from said tank to said drill bit;
(b) a sheath circumferentially disposed about said lance, said

lance being configured in said sheath such that said lance is slidably extendable therefrom; and



(c) positioning means on said lance and said sheath for preventing undesirable movement in said ground.

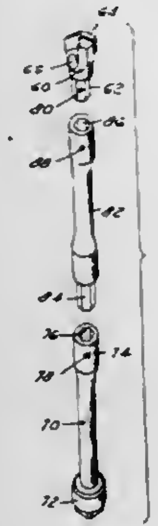
4,099,585
ROOF DRILLING SYSTEM

Kenneth C. Emmerich, Lexington, Ky., assignor to Fansteel Inc., North Chicago, Ill.

Filed Jan. 19, 1977, Ser. No. 760,712

Int. Cl.^{2} E21B *17/00*

U.S. Cl. 175—320 **3 Claims**



1. A mining drill system which comprises:

(a) a bit body having a cutting end and a driving shank at the opposite end to interfit in driving engagement with a driving steel tube, said shank having a central bore terminating in openings in the body leading to the cutting end,

(b) a steel tube driver having an attachment at one end for a mechanical driving mechanism and having a socket at the other end to receive the shank of a bit in driving engagement, said bore of said bit body driving shank being in communication with the interior of said tube,

(c) said bit body shank and said socket having radially registering holes to receive a retainer to hold said body and driver together against tensioning forces,

(d) a plug-like retainer of deformable material in said holes to secure said shank and socket together, and

(e) said plug of deformable material having a flared split end with a diameter larger than said holes prior to being forced into said registering holes.

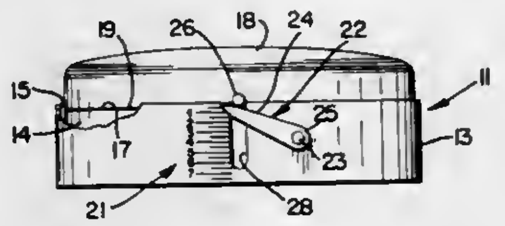
4,099,586
WEIGHT INDICATOR

John H. Bradner, Iron Mountain Rd., Warwick, N.Y. 10990

Filed Nov. 1, 1976, Ser. No. 737,772

Int. Cl.^{2} G01G *3/00, 19/46*

U.S. Cl. 177—159 **5 Claims**



1. An individual portable weight indicating apparatus comprising an open top casing having a continuous side wall arising from a flat bottomed base and containing resilient means in the form of a solid column of elastomeric material fixed on said base and freely surrounded by said side wall, a relatively stiff weight application pad extending fixedly across the top of said column at the open top of the casing, the upper surface of said pad being adapted to support the weight of an individual standing on the apparatus and means for indicating vertical compression of said column in response to weight applied directly downwardly on the pad comprising an indicator member on the casing movable along an external scale on the casing, means on the pad for engaging and displacing said member downwardly along the scale as the column reduces in height in response to said downwardly applied weight, and means for maintaining said indicator member in the position of maximum downward deflection.

4,099,587
ELECTROMAGNETIC COMPENSATION WEIGHING APPARATUS INCLUDING PRELOADING AND LOAD-RESPONSIVE CURRENT COMPONENTS

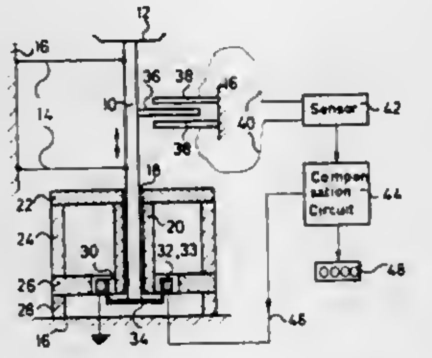
Peter Kaufmann, Greifensee, Switzerland, assignor to Mettler Instrumente, AG, Greifensee, Switzerland

Filed Oct. 14, 1976, Ser. No. 732,480

Claims priority, application Switzerland, Nov. 18, 1975, 14903/75

Int. Cl.^{2} G01G *7/00*

U.S. Cl. 177—210 EM **7 Claims**



1. In a weighing system of the electromagnetic compensation type including a single load support means for supporting a load for movement from a normal first position relative to a stationary frame, sensing means for generating a signal that is a function of the extent of displacement of said load support means by the load from said first position, permanent magnet means connected with said frame to define an air gap relative to said load supporting means, compensation coil means including at least one compensation coil connected with said load support means and arranged within said air gap, compensating current supply means operable by said sensing means for supplying compensating current to said compensation coil means, and indicating means for indicating the magnitude of the load as a function of the compensating current required to restore the load supporting means to the first position, the improvement wherein

(a) said compensating current supply means comprises
  - (1) a source of compensating current;
  - (2) preload modifying means adapted for circuit connection with said compensation coil means to vary the effective impedance thereof; and
  - (3) switch means for selectively connecting said compensation coil means and said preload modifying means with said compensating current source to divide the compensating current into a continuous first current portion which corresponds with up to about 90% of the preloading effect of said load support means, and a second portion that is periodically supplied to said coil means for periods of time that are a function of the magnitude of the load applied to said load support means plus the remainder of said preloading effect; and
  - (4) control means operable by said sensing means for operating said switch as a function of the position of said load support means;

(b) said indicating means being responsive only to said second compensating current portion, whereby said indicating means affords an indication of the load being weighed substantially independently of the no-load preloading effect of said load support means.

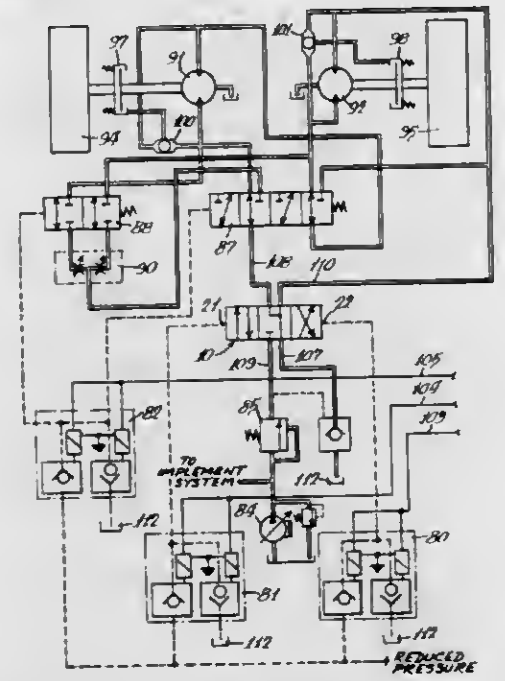
4,099,588
RESPONSIVE PILOT-OPERATED CONTROL VALVE FOR FRONT WHEEL DRIVE

Joseph Edward Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 1, 1976, Ser. No. 719,623

Int. Cl.^{2} F16K *11/06*; B60K *17/02*

U.S. Cl. 180—44 F **12 Claims**



1. A directional control valve comprising:
- a valve body having a longitudinally extending bore and a chamber at opposite ends of said bore communicating therewith, each of said chambers having an inward portion and an outward portion;
- passage means in said valve body adapted to communicate said bore selectively with a source of fluid under pressure with a reservoir and with pressure-actuated devices;
- a valve spool having oppositely disposed ends and being reciprocable within said bore to control communication between said passage means;
- a primary piston reciprocable within each of said chambers and having a bore extending longitudinally between an inward end and an outward end to provide communication between the inward and outward portions of its respective chamber;
- spring means continuously biasing each of said primary pistons inwardly toward said bore of said valve body to normally engage said spool and center said spool within said bore of said valve body;
- a single secondary piston reciprocable within said bore of only one of said primary pistons and sealing against the bore thereof and having an outward end exposed to the outward portion of its respective chamber; and
- pilot ports to communicate the outer portions of each of said chambers with a source of pilot pressure whereby pilot pressure applied through a pilot port to the chamber having the secondary piston acts on the outward end of the secondary piston to urge said spool inwardly away from the pressurized pilot port and whereby pilot pressure applied through a pilot port to the chamber lacking the secondary piston acts on the end of said spool to urge said spool inwardly away from the pressurized pilot port.

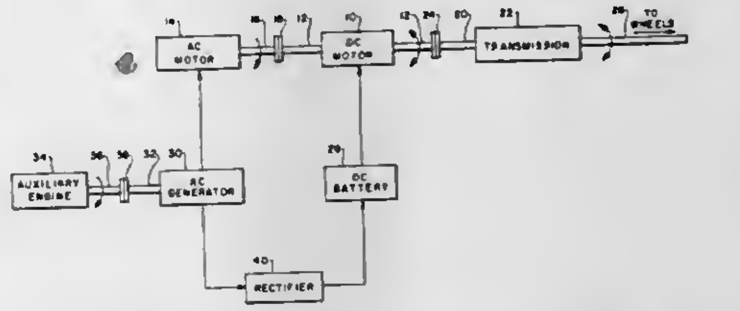
4,099,589
DC ELECTRIC CAR WITH AUXILIARY POWER AND AC DRIVE MOTOR

James R. Williams, Irving, Tex., assignor to Trans Research Development Corporation, Dallas, Tex.

Filed Dec. 20, 1976, Ser. No. 752,539

Int. Cl.^{2} B60K *9/04*

U.S. Cl. 180—65 A **4 Claims**



1. In combination with an electrically powered motor vehicle of the type including a direct current storage battery and a direct current motor having an electrical input circuit connected to receive direct current from the battery and having a rotatable shaft mechanically coupled to drive traction wheels, the improvement which comprises:
- an alternating current motor having an input circuit for receiving alternating current and a rotatable shaft mechanically coupled to drive the traction wheels in response to the flow of alternating current through the input circuit of the alternating current motor;
- an alternating current generator having a rotatable shaft and an electrical output circuit connected to energize the input circuit of the alternating current motor, the generator being operable to produce alternating current in response to mechanical rotation of the generator shaft; and,
- an internal combustion engine mechanically coupled to drive the generator shaft.

4,099,590
SOUND ATTENUATING ENGINE COVER

Robert P. Martin, Sr., 7809 W. 130th St., Parma, Ohio 44130

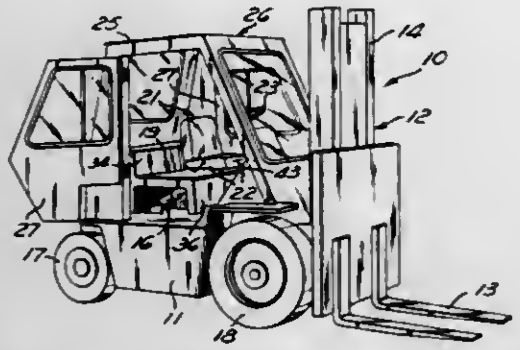
Filed Feb. 17, 1977, Ser. No. 769,318

Int. Cl.^{2} B62D *25/10*

U.S. Cl. 180—69 C **10 Claims**

1. A lift truck including a chassis, an internal combustion engine mounted on the chassis, an operator's station including a seat and a steering wheel, an engine cover disposed between the engine and operator's station, said engine cover extending across a zone sufficiently large to intercept substantially all airborne noise originating at or immediately adjacent the engine and traveling in the direction of the operator's station,

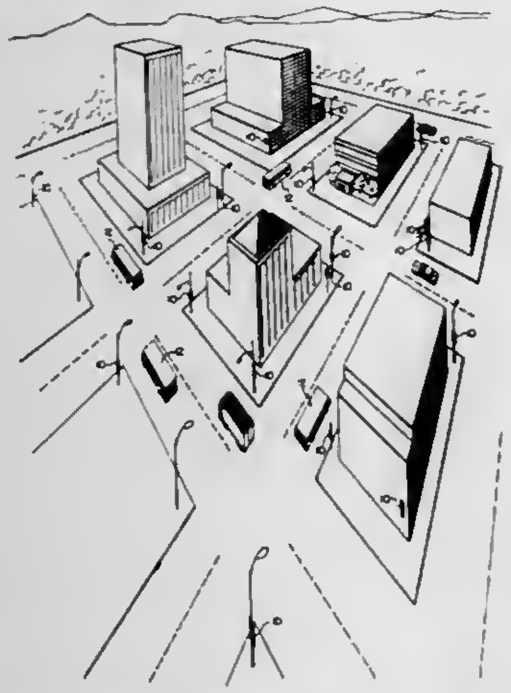
components of said engine cover including an outer shell and in inner liner, said shell and liner each being thin-walled, relatively rigid structures, said liner having a general configuration like that of said shell, said liner being spaced a predetermined distance from said shell, and support means extending generally along the periphery of one of said components to maintain the predetermined distance between said liner and said shell, said liner and shell being substantially free of support between one another inwardly of the periphery of said one component.



4,099,591
VEHICLE CONTROL SCANNING SYSTEM

Frank J. Carr, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 2, 1976, Ser. No. 720,026
Int. Cl.² G08G *1/12*
U.S. Cl. 180—98 9 Claims

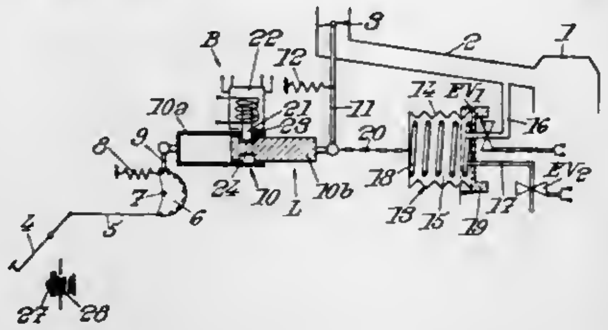


1. A vehicle control scanning system comprising:
(a) a network of reflective target members disposed along the expected path of said vehicle and on both sides of said path;
(b) vehicle carried optical scanning means for generating scanning optical beams for scanning said target members on both sides of said path during travel of said vehicle;
(c) said scanning means including
  (i) a light source for providing a single optical beam;
  (ii) a rotating mirror having a plurality of facets;
  (iii) a mirror system interposed in the path of said optical beam and being constructed and arranged to reflect said beam simultaneously to two different facets of said rotating mirror to provide two simultaneously scanning beams; and
(d) vehicle carried detection means positioned for detecting the reflected optical beams from said both sides.

4,099,592
SPEED LIMITER DEVICES FOR AUTOMOBILES

Boris Gonzales, Issy-les-Moulineaux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Jul. 12, 1976, Ser. No. 704,757
Claims priority, application France, Jul. 23, 1975, 75 23038; Feb. 18, 1976, 76 04452
Int. Cl.² B60K *31/00*
U.S. Cl. 180—108 38 Claims



1. Speed limiter device for an automobile vehicle having a combustion engine comprising an air intake manifold provided with a throttle member, manual control means of the accelerator pedal type to act on the opening of the throttle member and connecting means between these opening control means and the throttle member, this limiter device comprising an assembly of:
means sensitive to a speed parameter of the vehicle, which sensitive means are adapted to produce a speed signal, comparator means provided to compare this signal with a predetermined limit,
and amplifier means for the signal supplied by the comparator means, these amplifiers means being adapted to control the actuation of drive means sensitive to the suction in the intake manifold, these drive means acting on the opening of the throttle member so as to keep the value of the speed parameter of the vehicle at the predetermined limit when the limiter device is engaged, said connecting means between the opening control means and the throttle member being arranged so as to have a substantially constant length when the limiter device is not engaged and to have a variable length when the limiter device is engaged, said limiter device comprising a device forming a resistant point for the stroke end of the manual control means, said resistant point device being adapted to be overcome by the manual control means on exerting a sufficient force on the control means, electrical contact means being also provided to be actuated by the manual control means when said resistant point is overcome, said electrical contact means being adapted to actuate the maximum opening of the throttle member, the assembly being such that when the limiter device is engaged, the driver of the vehicle maintains the manual control at the stroke end in abutment against the resistant point device and, in the course of limitation, the overcoming of this resistant point enables the limitation to be overcome and the maximum opening of the throttle member and thus the maximum engine power, to be obtained.

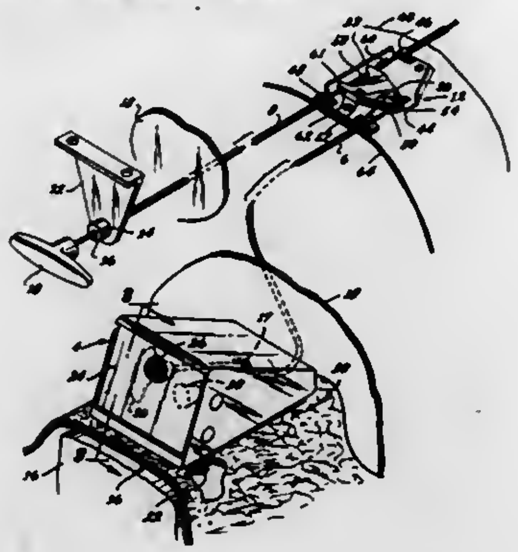
4,099,593
AUTOMOBILE LOCK MECHANISM

Norman W. Schultz, 3834 W. 118th St., Hawthorne, Calif. 90250

Filed Jun. 14, 1976, Ser. No. 695,770
Int. Cl.² B60R *25/00*
U.S. Cl. 180—114 18 Claims

1. A safe compartment for usage with a locking apparatus for a vehicle comprising:
an outer shell of heavy gauge metal;
an inner shell of heavy gauge metal positioned within said outer shell;

said inner shell providing a panel for switch means to be positioned within the safe compartment;
a door for the safe compartment which is movable to a closed position;
means associated with the door to move the switch means to an inactive position toward said panel upon movement of the door to its closed position;

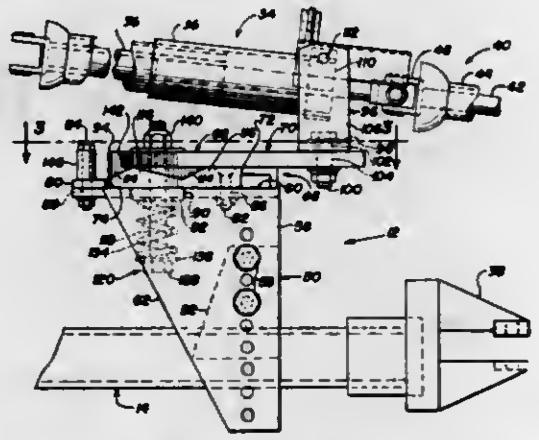


said means associated with the door including a locking cam secured to said door, and
a slot in said inner shell to receive the locking cam with the door in its closed position,
said locking cam having a position and a configuration to move the switch means to an inactive position toward said panel on movement of the door to its closed position.

4,099,594
TONGUE-MOUNTED ASSEMBLY FOR SUPPORTING AN IMPLEMENT DRIVELINE

Kenneth E. Smith, Strasburg, and Floyd L. Myer, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Sep. 8, 1976, Ser. No. 721,270
Int. Cl.² F16D *3/00*
U.S. Cl. 180—14 B 4 Claims

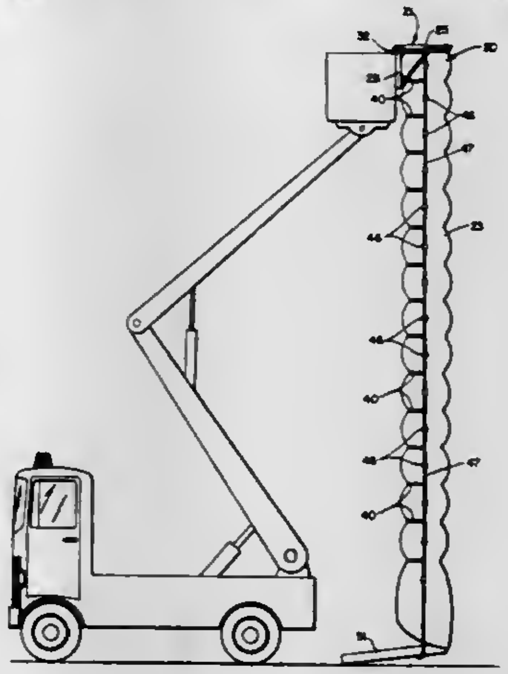


1. An improved assembly mounted on a tongue of a draft implement having an input driveline, said assembly normally supporting said driveline in a predetermined longitudinally extending position for operative drive connection with a power shaft of a tractor or the like which tows the implement through an articulation connection with the implement tongue, said assembly comprising:
support means on the implement tongue;
a lower jaw part fixedly mounted on said support means;
an upper jaw part;
shaft means extending generally vertically through said lower jaw part and journalling said upper jaw part for rotation relative to said lower jaw part about a generally upright axis and for concurrent axial sliding movement toward and away from an intermeshed relationship with said lower jaw part;
each of said jaw parts includes a plurality of teeth extending radially from said upright axis defined by said shaft means and projecting outwardly, the teeth on said upper jaw part extending toward and interengaged with the teeth on said lower jaw part when said jaw parts are disposed in said intermeshed relationship;
a generally horizontal arm rigidly connected to said upper jaw part for movement therewith and being interconnected to and supporting said driveline; and
resilient means for urging said upper jaw part downwardly toward said lower jaw part so as to normally maintain the teeth of said upper jaw part in the intermeshed relationship with the teeth of said lower jaw part such that said arm will support said driveline in said predetermined longitudinal position, said resilient means being yieldable to allow said upper jaw part to concurrently rotate relative to, and axially slide away from said intermeshed relationship upon said lower jaw part between predetermined angularly displaced limits such that said arm will pivotally move laterally and allow lateral movement of said driveline therewith to accommodate sharp turns of the tractor relative to the implement; said predetermined angularly displaced limits between which said upper jaw part may rotate relative to said lower jaw part are defined by a pair of angularly spaced apart elements projecting from said upper jaw part and a stop element stationarily mounted adjacent said lower jaw part spaced between and in the path of movement of said projecting elements with said upper jaw part so as to preclude said teeth on said upper jaw part from indexing into a new intermeshing relationship relative to said teeth on said lower jaw part when said upper jaw part is rotated.

4,099,595
ESCAPE DEVICE

Thomas Ray Tracy, 2175 Fairmeadow Dr., Boise, Id. 83704

Filed Apr. 20, 1976, Ser. No. 678,641
Int. Cl.² A62B *1/20*
U.S. Cl. 182—48 6 Claims



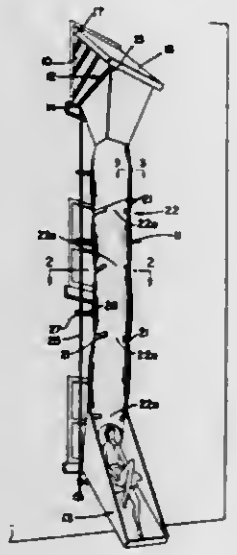
1. An escape chute adapted for rescuing persons from multistoried buildings in event normal egress paths are blocked comprising a generally cylindrical tube of high strength plastic material of multi-story length of a diameter sufficient to freely receive persons entering one end feet first, said peripheral wall at one end of the chute being annularly reinforced at closely longitudinally spaced intervals by nonyielding, tear resisting, reinforcing bands adapted, upon return folding of said one end outwardly around a rigid annulus support member, to dispose

said reinforcing bands into face butting engagement; annularly spaced securing grommets entered through said reinforcing bands and the intervening layers of said plastic material to fixedly secure said chute to said annulus; and respective semicylindrical resilient bands end connected to said tube of plastic material at respective diametrically opposed longitudinally spaced and aligned points, said resilient bands being of a substantially lesser length than the diameter of said fully open tube at said spaced and aligned points whereby the peripherally encircled areas at said spaced and aligned points will be inwardly restricted to yieldingly encompass the opposing portion of a freely descending person within said chute and decelerate or brake the speed of descent, means whereby the end of said escape chute remote from said one end secured to said annulus is fitted with annularly spaced strap hooks disposed in longitudinal alignment with the said restricted peripherally encircled areas; an elongated mattress-like cushion having connector straps extending from one end adapted to be normally secured to said strap hooks thereby connecting said mattress-like cushion in end-to-end spanning relation within said remote chute end of said chute; and means adapted to releasably secure said mattress-like cushion in supporting relation to said remote chute end upon endwise interfolding of said chute toward said one end to form a chute pack for storage when assembled on a rigid annulus support member.

4,099,596

ESCAPE DEVICE

Thomas Ray Tracy, 2175 Fairmeadow Dr., Boise, Id. 83702
Continuation-in-part of Ser. No. 678,641, Apr. 20, 1976. This application Jul. 8, 1976, Ser. No. 703,706
Int. Cl.² A62B *1/20*
U.S. Cl. 182—48 **3 Claims**

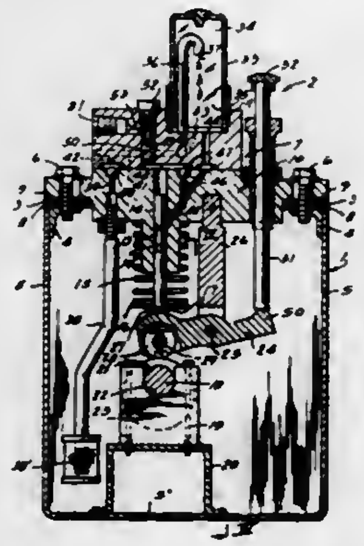


1. An escape device comprising a folded annular pack consisting of a longitudinally folded open ended flexible tubular chute and an attached cushion pad maintained in assembly therewith, a support frame for mounting the pack at a building opening or the like, means connecting the upper open end of the chute to said frame, said pad being connected to the lower end of said chute, means whereby the chute may be released to unfold downwardly so that the lower end of said chute may be lowered toward the ground, longitudinally spaced elastic restriction means spaced at diferent levels along the unfolded chute for periodically successively slowing the descent of a body entering the upper end of said chute, each of said restriction means comprising at least two circumferentially separate elastic bands secured externally on the chute with their opposite ends in spaced relation to thereby define between said opposite ends smooth, uninterrupted areas in said chute which effectively prevent catching or snagging of a user's extremities such as elbows and heels in the area of said restriction means as the user falls through said chute and means whereby said pad is disposed angularly relative to the chute axis across and extending away from the open lower end of said chute in the unfolded position of the pack.

4,099,597

LUBRICATION PUMP

John H. Powell, Twinsburg, and James J. Callahan, Mentor, both of Ohio, assignors to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Aug. 23, 1976, Ser. No. 716,381
Int. Cl.² F16N *7/36, 13/14*
U.S. Cl. 184—27 B **2 Claims**



1. In a lubricator device, the combination of a pump structure provided with a pump cylinder therein, having an open end, a plunger reciprocable therein and having a portion extending from said open end, means biasing said plunger in a direction toward said open end, said pump structure having means for supplying lubricant to the opposite end of said cylinder, and a discharge port communicating with such opposite end of the cylinder, and valve means for controlling lubricant flow to and from said cylinder, a cam shaft disposed in spaced relation to the free end of said plunger portion, with the axis of said shaft disposed normal to and intersecting the axis of said cylinder, a cam carried by said cam shaft, a cam follower arm pivotally supported for movement about an axis laterally spaced from and extending parallel to the axis of said cam shaft, said arm extending between said cam and said free end portion of the plunger and having an arcuate portion engaged with the latter, bearing members supporting said cam shaft at spaced intervals, each bearing member having a shaft-receiving notch therein which opens on the portion of the bearing member adjacent said arm, said notch having a semicylindrical bottom portion which is complemental to the external surface of said shaft, and a roller supported by said arm for rotation about an axis extending parallel to said shaft axis and engageable with said cam for actuation thereby, the axis of said roller and contacts between said cam and roller and between said arcuate surface and said free end portion of the plunger all lying approximately in a common plane containing the plunger axis, throughout rotation of said cam and reciprocation of said plunger.

4,099,598

DRAIN SYSTEM

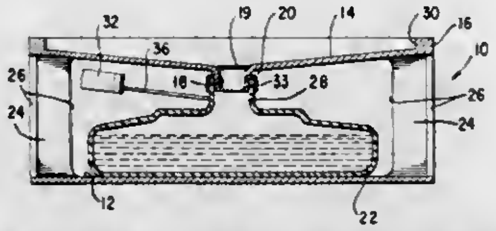
Ralph Clinard, 710 Queens Mill Ct., Houston, Tex. 77879
Filed Jul. 26, 1976, Ser. No. 708,554
Int. Cl.² F16N *31/02*
U.S. Cl. 184—106 **7 Claims**

1. A collection system for collecting spent liquid from a vehicle comprising in combination:

a substantially rigid stand adapted to be moved under a vehicle to receive spent liquid, said stand having an open top wall, an open sidewall, and a flat substantially continuous bottom wall;

said bottom wall adapted to be seated on the ground and to support said stand;

said top wall inwardly sloping to an opening therein so as to receive and channel spent liquid from said vehicle through said opening, a spout integrally connected to said opening and extending downward from said opening for a predetermined distance;

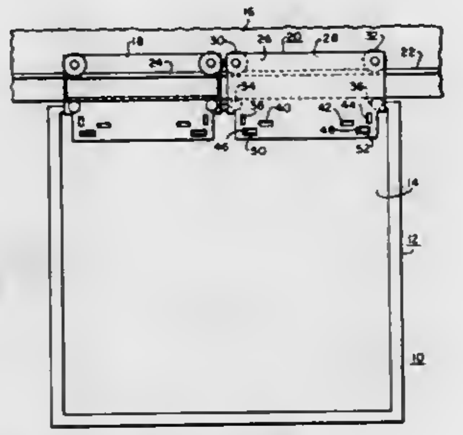


a deformable receptacle operably connected with said spout for receiving said spent liquid, the bottom of said receptacle being fully supported on the bottom wall of said stand when it receives spent liquid under said vehicle as well as when the stand is removed from under said vehicle and a plurality of spaced sidewall members, firmly connecting said bottom wall to said top wall and defining a plurality of open sidewalls to permit easy removal of the deformable receptacle in both its filled and unfilled conditions.

4,099,599

METHOD AND APPARATUS FOR FASTENING A DOOR PANEL TO A DOOR OPERATOR MOUNTED ON AN ELEVATOR CAR

Charles E. Randall, Biglerville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Feb. 1, 1977, Ser. No. 764,670
Int. Cl.² B66B *13/30*
U.S. Cl. 187—52 R **6 Claims**



1. An elevator system comprising:

an elevator car having an entranceway,

a door for said entranceway, said door having top, bottom and side portions, and first and second horizontally spaced hanger brackets on the top portion, said first and second hanger brackets each including an upstanding portion having first and second vertically oriented major opposed surfaces,

door operator means mounted on said elevator car having a depending hanger plate member mounted for rectilinear movement adjacent said entranceway, said hanger plate member including first and second vertically oriented major opposed surfaces, and a width dimension selected to allow the second major surface of both the first and second horizontally spaced hanger brackets to simultaneously contact the first major surface of the hanger plate member,

said hanger plate member and said first and second hanger brackets each having openings therein which extend between the associated major opposed surface,

fastener means, including horizontally oriented bolts for adjustably clamping the second major surfaces of said first and second hanger brackets to the first major surface of said hanger plate member to provide frictional area contact therebetween,

said horizontally oriented bolts of the fastener means extending between said openings in the hanger plate member and the first and second hanger brackets, which openings are aligned to accept said bolts,

said horizontally oriented bolts being carriage bolts with the openings in the first and second hanger brackets and in the hanger plate member having rectangularly shaped elongated configurations dimensioned and oriented to receive a carriage bolt and prevent it from turning, with the directions of elongation of said openings being perpendicular to one another and oriented to permit both horizontal and vertical adjustment of the first and second hanger brackets relative to the hanger plate member,

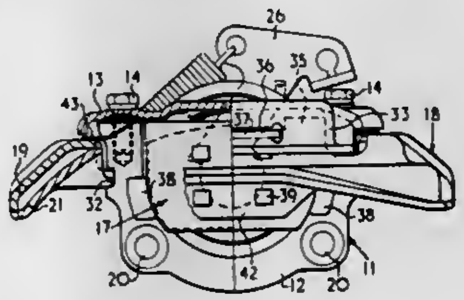
and first and second vertically oriented jacking bolts adjustably linking the first and second hanger plate members and the hanger bracket, respectively, said first and second jacking bolts cooperating with the fastener means and the frictional area contact between said first and second hanger brackets and said hanger member in supporting the weight of the door,

said fastener means being adjustable to provide a first predetermined clamping force which permits slidable orientation of said door and said first and second hanger brackets relative to said hanger plate member and said entranceway by actuation of said first and second jacking bolts, said fastener means being further adjustable to provide a predetermined second clamping force, greater than the first, which maintains the selected orientation of said door while adding structural stiffness across the top portion of said door.

4,099,600

DISC BRAKE ASSEMBLY

Harry Davison Temperley, and David Parsons, both of Leamington Spa, England, assignors to Automotive Products Limited, Leamington Spa, England
Filed Dec. 3, 1976, Ser. No. 747,306
Claims priority, application United Kingdom, Dec. 11, 1975, 50789/75
Int. Cl.² F16D *55/224*
U.S. Cl. 188—73.4 **7 Claims**



1. A disc brake assembly comprising:

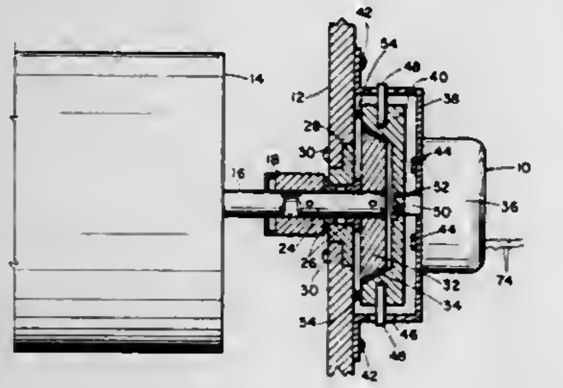
(a) A rotatable disc;

a pair of brake pads, each having a friction surface thereon for frictional contact with the brake disc, disposed one on each side of the disc;

an actuator, on one side of the disc, operatively connected to one of said brake pads to apply said one brake pad to the disc by a direct thrust;

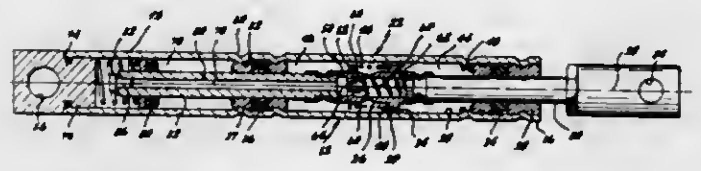
and a yoke, of closed loop form, which encircles the brake pads and a cord of the disc, operatively connected to the actuator to apply the other of said brake pads to the disc, the yoke comprising two sheet metal pressings which are joined to form hollow closed box-sections providing cross-sections through the yoke in the form of two continuous loops of pressing metal where the yoke passes through the planes of the pad friction surfaces.

4,099,601
SOLENOID OPERATED CONE BRAKE
John B. Pittman, Tulsa, Okla., assignor to Telex Computer Products, Inc., Tulsa, Okla.
Continuation of Ser. No. 731,107, Oct. 8, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,975
Int. Cl.² F16D *55/02*
U.S. Cl. 188—163 **2 Claims**



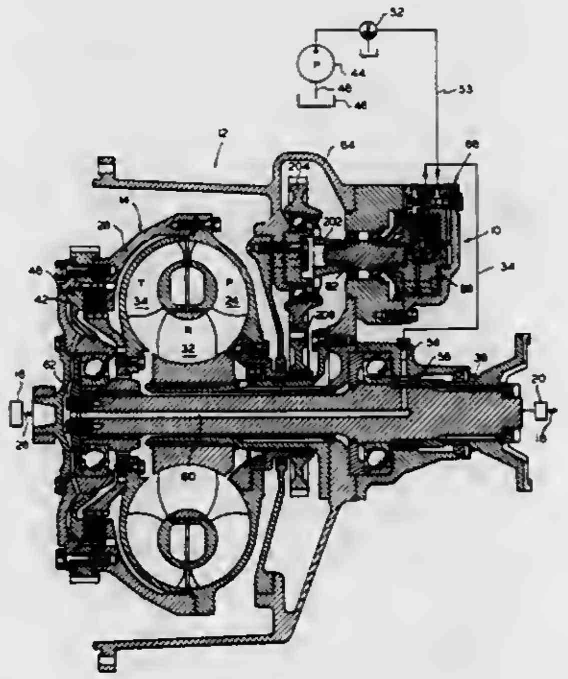
1. An electrically actuated brake for controlling a shaft mounted roll of recording medium, comprising:
- a wall having a bearing therein, the bearing receiving and rotatably supporting said shaft extending from the roll and through the bearing;
- a brake first portion in the form of a disc having a truncated conical braking surface theron, the brake first portion being coaxially received on said shaft on the side of said wall opposite said roll;
- a bracket mounted on said wall on the side opposite said roll, the bracket being parallel said wall and of length greater than the diameter of said brake first portion, and having an opening therein coaxial with said brake first portion, the bracket having integral opposed leg portion extending to said wall and to either side of said brake first portion, each bracket leg portion having a longitudinal slot therein perpendicular to said wall;
- a brake second portion positioned between said bracket and said brake first portion and between said bracket legs and having on the forward surface a recess therein defining a frustro-conical braking surface matching said brake first portion braking surface and having on the rearward surface a shaft exending coaxially of said frustro-conical recess, the shaft being slidably received in said opening in said bracket, the brake second portion having a pair of opposed radially extending pins, each pin being slidably received in a said slot in a said bracket leg portion whereby said brake second portion is displaceable axially towards and away from said brake first portion but is non-rotatable; and
- a solenoid affixed to said bracket on the side thereof opposite said brake first portion, said solenoid receiving said shaft and arranged to axially displace said shaft to thereby move said brake second portion towards said brake first portion whereby the braking surfaces of each such components engage each other to stop the rotation of said roll or to move said brake second portion away from said brake first portion to permit the free rotation of said roll; and
- spring means urging said brake second portion away from said brake first portion.

4,099,602
HYDRAULIC POSITIONER WITH BIDIRECTIONAL DETENTING ACTION
John Kourbetsos, Woodland Hills, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.
Filed Aug. 31, 1977, Ser. No. 829,473
Int. Cl.² F16F *9/20*
U.S. Cl. 188—300 **6 Claims**



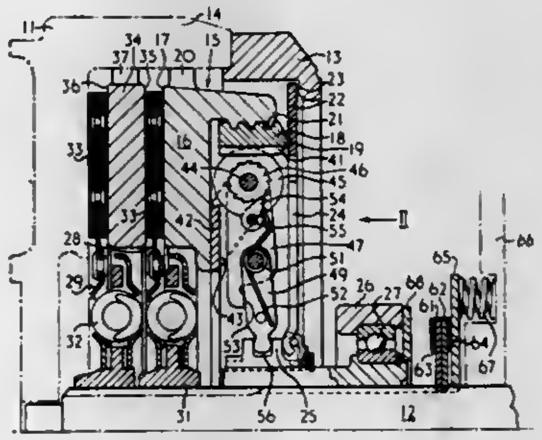
1. An hydraulic positioner of the type in which a piston is movable within a fluid-filled cylinder, for adjustment to a given separation between its attachment points and for thereafter maintaining the given separation, having a bidirectional detenting action whereby the given separation can be altered only by application of a sufficiently large overriding force, said hydraulic positioner comprising:
- a cylinder, hollow and having a central axis, open at its first and second ends, and having an inwardly-facing bore surface;
- piston means, slidable axially within said cylinder, having a first side facing in a first axial direction and having a second side facing in a second axial direction opposite the first axial direction, and having a peripheral portion adjacent the bore surface of said cylinder but spaced from it;
- a first rod attached to the first side of said piston means and extending in said first axial direction;
- a second rod attached to the second side of said piston means and extending in said second axial direction;
- first stationary sealing means positioned in said cylinder near its first end, in slidable sealing engagement with said first rod and forming a first sealed chamber for containing fluid within said cylindrical between said first stationary sealing means and said piston means;
- second stationary sealing means positioned within said cylinder near its second end, in slidable sealing engagement with said second rod and forming a second sealed chamber for containing fluid within said cylinder between said second stationary sealing means and said piston means;
- first check valve means associated with said piston means for movement therewith, preventing fluid from passing through it from said second sealed chamber to said first sealed chamber, and passing fluid from said first sealed chamber to said second sealed chamber when a force in excess of a predetermined force is applied to said piston means in said first direction;
- second check valve means associated with said piston means for movement therewith, preventing fluid from passing through it from said first sealed chamber to said second sealed chamber, and passing fluid from said second sealed chamber to said first sealed chamber when a force in excess of a predetermined force is applied to said piston means in said second direction;
- a reservoir for fluid, including a closed chamber extending in the second direction beyond the second end of said cylinder; and,
- means for pressurizing fluid in said reservoir;
- said second rod extending through said second stationary sealing means and beyond the end of said cylinder into said reservoir, said second rod further comprising an internal passage extending through it between two ports spaced sufficiently far apart in the axial direction to permit communication of pressurized fluid through said second rod from said reservoir to said second sealed chamber so that said second sealed chamber is pressurized at a small positive pressure and so that pressurized fluid is supplied from said reservoir to said second sealed chamber to replace leakage.

4,099,603
LOCK-UP CLUTCH CONTROL VALVES
Jon H. Peppel, Horton, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Mar. 3, 1977, Ser. No. 773,868
Int. Cl.² F16H *45/02*
U.S. Cl. 192—3.31 **13 Claims**



1. In a vehicle drive system including a torque converter for coupling a prime mover with a transmission, a hydraulically actuated lock-up clutch arranged to selectively bypass said torque converter, and mechanically couple said prime mover directly with said transmission, a lock-up clutch control valve assembly for varying the degree of engagement of said lock-up clutch with respect to prime mover rotational speed within a predetermined speed range, said control valve assembly including:
- a source of regulated fluid under pressure;
- a centrifugal valve for selectively communicating said source with said lock-up clutch and with a fluid drain; and
- constriction means fluidically interconnected with and located downstream from said centrifugal valve;
- said centrifugal valve comprising:
  - a. a stationary housing and cover defining a first cavity;
  - b. a rotor rotatably journalled within said first cavity and drivably interconnected with said prime mover, said rotor including a radial bore having a peripheral groove connected with said source via a rotor inlet conduit;
  - c. a rotor spool slidably received within said radial bore and radially outwardly displaceable by centrifugal force that is a function of the rotational speed of said prime mover;
  - d. bias means for inwardly biasing said rotor spool in opposition to said centrifugal force;
  - e. a rotor outlet conduit;
  - f. valve means for regulating the flow of pressurized fluid from said rotor groove into said rotor outlet conduit; and
  - g. said rotor spool further including both a reaction member within said rotor spool, relatively movable to one another, and a spool cavity that is in constant communication with said rotor groove and said reaction member, with the resultant reaction on said rotor spool augmenting the force of said bias means whereby when said prime mover reaches a first predetermined speed said control valve assembly starts a gradual engagement of said lock-up clutch which progressively increases until said prime mover attains a second higher predetermined speed at which point said lock-up clutch is fully engaged.

4,099,604
FRICTION CLUTCH WITH INTEGRAL ADJUSTER
Raymond Higgerson, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England
Filed Mar. 22, 1977, Ser. No. 780,120
Claims priority, application United Kingdom, Mar. 24, 1976, 11764/76
Int. Cl.² F16D *13/75*
U.S. Cl. 192—111 A **8 Claims**



1. A friction clutch comprising:
- a clutch cover for attachment to a flywheel, said flywheel having a friction surface;
- a pressure plate having a friction surface and comprising two relatively adjustable components;
- a driven plate member arranged between the pressure plate and the flywheel and having friction surfaces for co-operation with said friction surfaces of the flywheel and the pressure plate;
- a main spring assembly operatively engaged between said cover and said pressure plate for providing a clamp load to urge the pressure plate towards the flywheel and thereby grip the driven plate by its friction surfaces between the friction surfaces of the flywheel and pressure plate;
- a release mechanism for relieving the clamp load;
- an adjustable inter-engagement mechanism between the two pressure plate components such that a constant inter-engagement subject to incremental adjustments is achieved between the pressure plate components;
- an adjuster mechanism connected between the two components of the pressure plate and operative to adjust the pressure plate to compensate for variations due to wear of the driven plate to achieve a constant clamping condition of the main spring while the clutch remains in a desired state of adjustment;
- and a control member, responsive to movement between the released and engaged conditions of the clutch and operative to effect an incremental adjustment of the inter-engagement mechanism when said movement exceeds a pre-determined distance.

4,099,605
CLUTCH RELEASE DEVICE

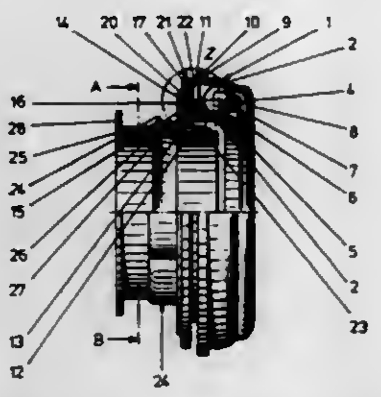
Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schürger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Oct. 4, 1976, Ser. No. 728,941

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1975, 7534422[U]

Int. Cl.^{2} F16D *19/00, 11/00, 13/60*

U.S. Cl. 192—98 **9 Claims**



1. A clutch release device including a self-centering clutch thrust bearing having a fixed bearing ring mounted for radial play with respect to a bearing support, said device comprising a sliding sleeve forming said bearing support, an additional sleeve connected to said sliding sleeve, said fixed bearing ring contacting a radially extending contact surface of said additional sleeve which faces said clutch thrust bearing, said additional sleeve, at an area radially spaced from the area of contact with said contact surface, being axially offset in a direction toward said clutch thrust bearing, said additional sleeve, in said offset, having at least two diametrically opposed recesses for engaging fixed means located on the periphery of said fixed bearing ring for preventing said fixed bearing ring from rotation with respect to said additional sleeve and bearing sleeve.

4,099,606
JUSTIFYING TEXT WRITING REPRODUCING MACHINE

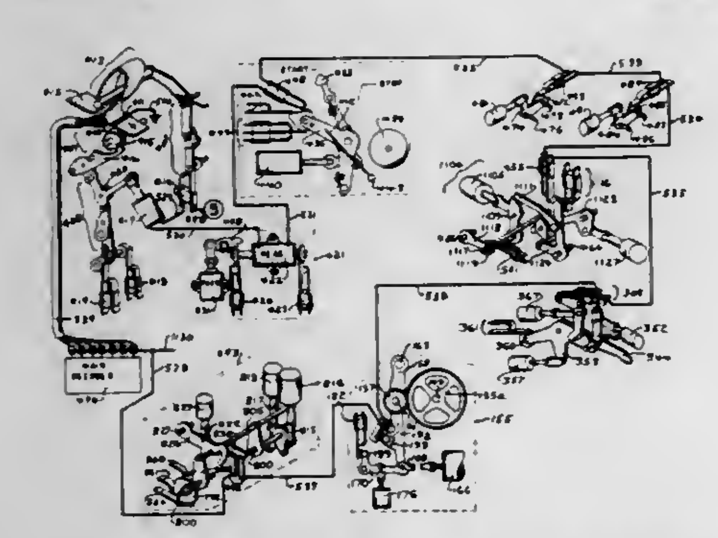
William S. Gubelmann, deceased, late of Palm Beach, Fla. (by Walter S. Gubelmann, executor), and William R. Grier, New Vernon, N.J., assignors to Realty & Industrial Corporation, Morristown, N.J.

Division of Ser. No. 212,895, Dec. 28, 1971, Pat. No. 3,945,480.

This application Dec. 16, 1975, Ser. No. 641,363

Int. Cl.^{2} B41J *5/36*

U.S. Cl. 400—4 **10 Claims**



1. A combined simultaneously operable composing apparatus and reproducing apparatus and a common code storage means, said composing apparatus including storing means for storing blocks of encoded text reproducing information in said common code storage mens and deleting means for selectively deleting said stored text reproducing information, each block containing coded information relates to operational functions including individual items of text to be reproduced in a separate line in said reproducing apparatus, said composing apparatus further including means for altering the character of a porton of said storage means at a sensing station upon completion of storage of one of said blocks in said storge means, said block being stored in said altered portion of said storage means, said reproducing apparatus comprising reader meansfor sensing coded information in said storage means at the same time said composing apparatus is uninterruptedly storing or deleting coded information contained in a succeeding block of text reproducing information contained in a succeeding block in said storage means, and printing means for printing lines of print in response to coded information sensed by said reader means, further comprising scanning means coupled to said reader means for sequentially scanning each block of said storage means for sequentially applying coded information in said storage means to said reader means; inhibiting means for inhibiting the scanning of said storage means by said scanning means while said reader means senses said coded information and said reproducing apparatus completes an operational function comprising at least one instruction corresponding to one of said items in response to said coded information; and cycling means responsive to the completion of each of said operational functions for then disabling said inhibiting means to enable said scanning means to resume scanning said storage means, coded information being applied to said reader means only in response to the completion of the next preceding one of said operational functions corresponding to coded information previously applied to said reader means, said reproducing apparatus being operable at a given time only in response to coded information in a block preceding a block in which said composing apparatus is storing information at said given time, and control means responsive to the altered character of said portion of said storage means at said sensing station for enabling the operation of said reader means, said control means disabling said reader means in response to the absence of an altered character portion of said storage means at said sensing station.

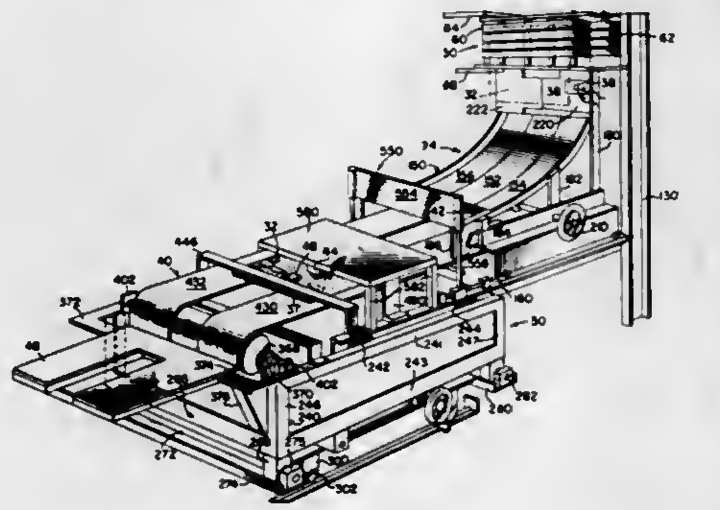
4,099,607
APERTURE MASK CONVEYOR AND INSPECTION SYSTEM

Leon E. Brennan; Joseph P. Lagermasini, both of Towanda, and Larry L. Rarig, Lancaster, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 4, 1977, Ser. No. 765,772

Int. Cl.^{2} B65G *43/08, 21/10, 15/14*

U.S. Cl. 198—341 **12 Claims**



1. An aperture mask conveyor and inspection system for feeding the mask to a densitometer to check the amount of light transmission at the center portion of the mask, said system comprising:

(a) a first conveyor means comprising a pair of parallel belt conveyors which grip the mask therebetween, said means for receiving and transporting a vertically disposed aperture mask having one of its axes extending horizontally, said mask traveling in the direction of said axis,

(b) chute means positioned beneath the first conveyor means and at right angles to the line of travel of the aperture mask,

(c) means for moving one of the pair of belt conveyors away from the other so that the mask normally griped therebetween will fall freely upon the chute means,

(d) means for sensing the travel of the mask whereby when said mask is aligned with the chute the conveyor will release the mask so that the mask will move downwardly onto the chute in the direction of the other axis of said mask,

(e) second conveyor means positioned at the lower extremity of the chute to transport the mask in the same direction as in the chute, and

(f) a densitometer centrally positioned with respect to the width of the second conveyor means whereby the densitometer will scan the middle of the mask along its other axis.

4,099,608
APPARATUS FOR FEEDING ARTICLES

Alan Keith McComble, London, England, assignor to Molins Machine Company Limited, London, England

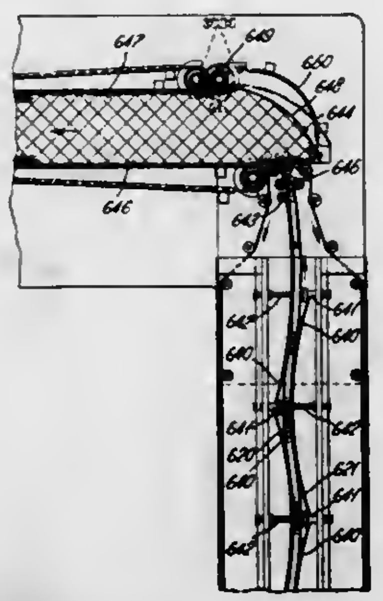
Division of Ser. No. 234,833, Mar. 15, 1972, abandoned, which is a continuation of Ser. No. 875,402, Nov. 10, 1969, abandoned.

This application Jul. 21, 1975, Ser. No. 597,431

Claims priority, application United Kingdom, Nov. 14, 1968, 54034/68; Feb. 14, 1969, 8313/69; Feb. 28, 1969, 10941/69; Jan. 24, 1969, 4195/69; Jan. 24, 1969, 4196/69

Int. Cl.^{2} B65G *43/08*

U.S. Cl. 198—347 **13 Claims**



1. A conveyor system for delivering a row of sideways-moving cigarettes or other rod-like articles upwards into a stack comprising a first substantially horizontal conveyor for carrying a stack of the articles, means defining a junction zone at one end of said first conveyor, and a second sustantially horizontal conveyor having one end adjacent to the junction zone on the side thereof opposite the first conveyor, and an elevator comprising two spaced parallel bands, means for maintaining the bands in tension, means for individually constraining the bands to move upward along a path which is non-linear substantially throughout the upwardly extending portion of said path whereby the bands grip articles between them and drive them upwards to enter said junction zone at a point below the upper surface of the articles in the junction zone in a generally upward direction between the two conveyors, and sensor means responsive to the articles in the junction zone for controlling the movement of one of the said conveyors.

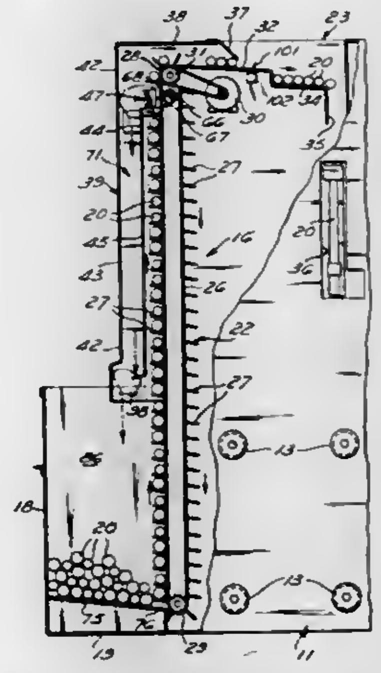
4,099,609
BOBBIN ELEVATING CONVEYOR AND ORIENTOR

John P. Kieronski, Charlotte; Francis N. Williams, Gastonia, and Leo J. Smith, Charlotte, all of N.C., assignors to Whitin Machine Works, Inc., Charlotte, N.C.

Filed Sep. 26, 1975, Ser. No. 617,064

Int. Cl.^{2} B65G *43/08*

U.S. Cl. 198—395 **8 Claims**



1. A mechanism for sorting head and butt ends of a succession of bobbins, comprising means for conveying bobbins along a path in spaced parallel relation to one another and transversely aligned to the conveying direction, mechanical sensor means at one side of the bobbin path, said sensor means being arranged relative to the bobbin conveyor path to be displaced in the axial direction of the bobbins by the adjacent butt ends of the bobbins and arranged to avoid being displaced by the adjacent head ends of the bobbins, means responsive to displacement of said sensor means to reject bobbins of one head or butt orientation from the conveying means.

4,099,610
ENDLESS POWER-DRIVEN CONVEYOR WITH DISCHARGE COMB

Marc M. Aubailly-Delalien, Nice, France, assignor to Societe Anonyme Eau-Gaz-Assainissement, Nice, France

Filed Feb. 9, 1976, Ser. No. 656,261

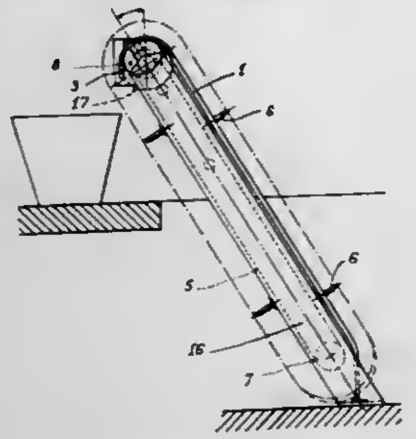
Claims priority, application France, Feb. 7, 1975, 75 04422

Int. Cl.^{2} B65G *19/00*

U.S. Cl. 198—729 **1 Claim**

1. In an upwardly extending power-drive conveyor having a head wheel and an endless conveyor member passing about the head wheel and rake teeth on the endless member, there being a plurality of parallel comb elements extending between the rake teeth; the improvement in which the comb elements rest directly on the head wheel, the periphery of said head wheel having a plurality of spaced parallel annular recesses extending about the periphery thereof, the upper ends of said comb elements being disposed in said recesses, a drive shaft on which said head wheel is fixedly mounted, said endless conveyor comprising a pair of chains one disposed on either side of said head wheel, toothed wheels fixed to said shaft one on either end of said head wheel, said toothed wheels being in driving engagement with said chains, and a plurality of crosspieces extending between and interconnecting said chains, said rake teeth extending outwardly from said crosspieces between said

comb elements, said crosspieces passing beneath said comb elements along the upper run of said conveyor, said head wheel having at least one recess therein extending the length of the head wheel parallel to the axis of the head wheel for reception of said crosspieces, said head wheel being also fixed to said shaft.



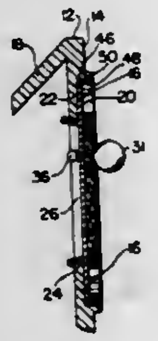
4,099,611
JEWELRY DISPLAY DEVICE

Jeffrey A. Feibelman, Cranston, R.I., assignor to A. & H. Mfg. Co., Cranston, R.I.

Filed Nov. 8, 1976, Ser. No. 742,530

Int. Cl.² B65D *85/56, 85/58*

U.S. Cl. 206—45.14 **11 Claims**



1. A display device for use in the display of jewelry articles and the like comprising, in combination, a display insert adapted to receive an article to be displayed and a support for releasably mounting said display insert, said support including a substantially planar panel, said panel being provided with an opening, said opening delineated in part by a pair of panel webs terminating in relatively straight edges in opposed spaced relationship to each other, said webs forming a seat for receipt of said insert, said insert having a front face including means for receiving said articles and a rear face including a pair of spaced generally parallel longitudinally oriented ribs outwardy rearwardly extending therefrom, said insert adapted for receipt within said opening and having portions transversely extending beyond said ribs for face to face contact with said seat, each of said ribs contacting a respective web edge to releasably secure said insert over said opening, said device further including a recess formed within the front surface of said panel wherein said opening is formed within said recess, said recess having a perimetrical configuration and extent corresponding to but slightly larger than that of said display insert and wherein the outer extent of said insert substantially contacts the periphery of said recess, said webs in opposed parallel relationship and inwardly extending from the periphery of said recess, said insert being releasably secured within said recess, and wherein the terminal portions of said ribs extend rearwardly past said web edges.

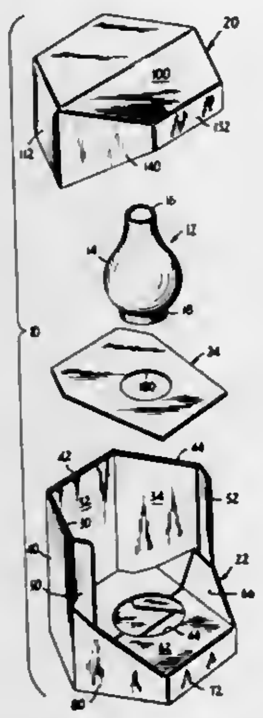
4,099,612
DISPLAY CARTON FOR LAMP FIXTURES

Wallace E. Hanson, Hampden, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 1, 1976, Ser. No. 691,377

Int. Cl.² B65D *5/32*

U.S. Cl. 206—45.19 **9 Claims**



1. A display carton formed from two paperboard blanks comprising:

(a) an upper member including a first base portion and upstanding wall portion defining a first peripheral wall, said first base portion including an upper surface and an inside surface spaced from said upper surface and adapted to bear against one end of the item to be mounted in the display carton; and

(b) a lower member including a second base portion and upstanding wall portion defining a second peripheral wall, said second base portion including a lower surface and a support surface spaced from said lower surface, said second peripheral wall having a configuration corresponding to said first peripheral portion but of different size, said support surface including an aperture for receiving the opposite end of the item to be mounted in the display carton, said upper and lower members slidably intermeshed with the first and second peripheral wall portions being partially coextensive and providing an open window for the visibility of the item contained therein, and with the first and second base portions forming the opposite ends of the display carton.

4,099,613
DISPLAY AND TRANSPORTATION CASE FOR UNIFORM PACKS

Ehrhard T. Holtorf, Dudenhofen, Germany, assignor to Ferrero GmbH, Frankfurt am Main, Germany

Filed Nov. 21, 1975, Ser. No. 634,105

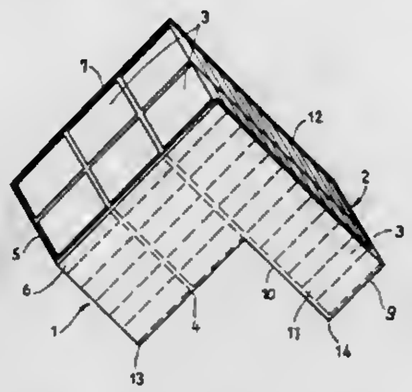
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1974, 7438874[U]

Int. Cl.² B65D *65/16*

U.S. Cl. 206—45.34 **17 Claims**

1. A display and transportation container for a plurality of uniform wafer packs (3) each having a solid rectangular configuration, characterized in that the container is L-shaped and comprises two contiguous sections (1, 2) disposed at right angles to one another and designed to hold the packs in a plurality of adjacent stacks, in that the bottom wall (4) of the first section is disposed at a right angle to the rear wall (10) of the second section, in that the fold (13) between the bottom

wall (4) and the front wall (5) of the first section and the fold (14) between the rear wall (10) and the bottom wall (9) of the second section are parallel to each other and serve as bearing edges in the display position, in that the upper ends of the two sections and the front side of the second section are fully open to implement complete access to the entire areas thereof, in that the interior of the container is fully open to implement the unhindered stacking of the packs, and in that for transportation purposes, two containers can be placed together in a symmetrical, mating manner to form a rectangle, and whereby the packs may be removed from the top of the stacks when in said display position.



4,099,614
PACKAGE FOR A STERILIZED PAIR OF GLOVES AND METHOD OF FORMING THE SAME

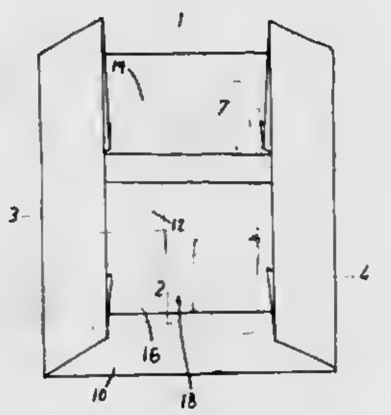
Oswald Heissenberger, Pottschach, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria

Filed Dec. 23, 1976, Ser. No. 754,088

Claims priority, application Switzerland, Jul. 22, 1976, 9435/76

Int. Cl.² B65D *85/18*

U.S. Cl. 206—299 **13 Claims**



1. A package for at least one pair of sterilized gloves used for medical purposes comprising an essentially rectangular sheet of material folded substantially parallel to all four sides and subsequently at a central region, the improvement comprising:

an upper fold and a lower fold having edges spaced from one another, said folds being disposed essentially at right angles to the lengthwise direction of the gloves for completely covering, in contacting relation therewith, the fingers of the gloves and at least part of the cuffs of the gloves;

two lateral, uncut folds to both sides of the pair of gloves essentially parallel to the lengthwise direction of the gloves and overlying said upper and lower folds;

a further fold at the center between the edges of both said upper and lower folds and essentially at right angles to the lengthwise direction of the gloves, such that said gloves are folded at right angles to their lengthwise direction and only said lateral folds and said central region of said sheet of material are folded by said further fold; and

a final fold centrally and essentially parallel to the lengthwise direction of the folded gloves such that only said upper and lower folds and said central region of said sheet of material are folded by said final fold to thereby form a compact glove package requiring a minimum amount of sheet material.

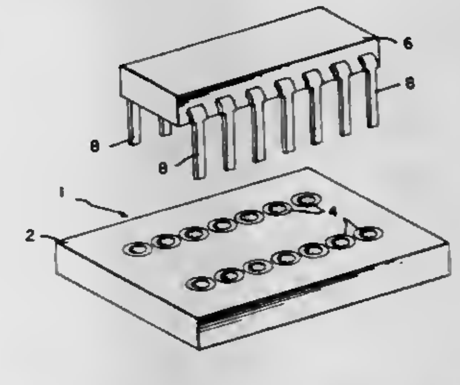
4,099,615
CARRIER STRIP MOUNTED ELECTRICAL COMPONENTS

Timothy Allen Lemke, Dillsburg, and Edmond Franklin Shultz, Jr., Hummelstown, both of Pa., assignors to AMP, Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 499,719, Aug. 22, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,678

Int. Cl.² B65D *73/02*

U.S. Cl. 206—329 **4 Claims**



1. An assembly of electrical components, comprising:

a carrier film provided with a plurality of spaced apertures,

a plurality of electrical components received in said apertures and having solder wettable body portions projecting in depending relationship from said carrier film,

a second film covering said carrier film and covering solder wettable first and second portions of each corresponding component,

said second film and said carrier film cooperating to form envelope means enclosing said solder wettable first and second portions,

said solder wettable body portions of corresponding components projecting externally of said envelope means,

said apertures in said carrier film defining solder admissible clearance spaces adjacent said body portions to permit solder flow along said solder wettable body portions and through said carrier film and into said envelope means and into wettable contact with said first portions of said electrical components, and

said second film contacting and covering said second portions of said electrical components within said envelope means preventing solder contact with said second portions while permitting solder contact with said first portions of said electrical components.

4,099,616
TWO-BOTTLE PACKAGE AND BAG

Julius Mindaugas Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

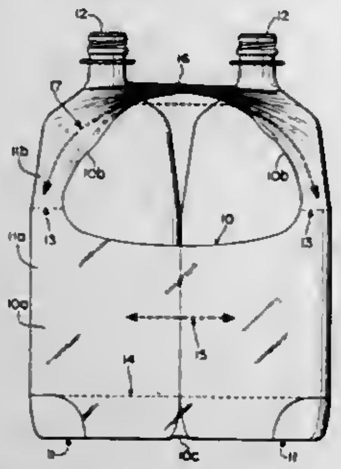
Filed Apr. 14, 1977, Ser. No. 787,420

Int. Cl.² B65D *71/00, 85/62*

U.S. Cl. 206—427 **3 Claims**

1. A package of two bottles comprising, a bag substantially enveloping two bottles in an upstanding side-by-side abutting relationship, said bag formed of a resilient elastic plastic material and comprising a band portion encircling a substantial vertical extent of the body portions of both of said bottles and substantially tensioned horizontally circumferentially about the body portions of both of said bottles, a bottom wall connected to the lower edges of at least two opposed sections of said band portion and extending beneath a substantial portion of the bottom walls of both of said bottles, a pair of upper wall portions, each of said upper wall portions comprising a bifurcated member of two strips integrally joined to a common base section, the common base section of said bifurcated members integrally connected to opposed sections of the upper edge of said band portion, the two strips of each bifurcated member

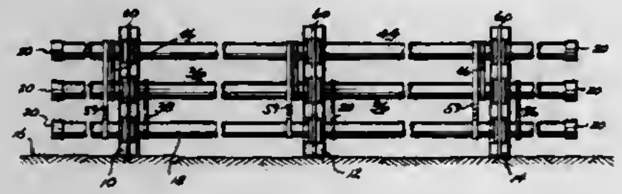
straddling the upper neck portion of one of said bottles beneath the cap portion thereof, and the two strips of both of said bifurcated members being secured together and gathered substantially to a point substantially midway between the upper neck portions of said bottles sufficiently to substantially tension said bifurcated members between said point and said band portion.



4,099,617
SHIPPING BUNDLE FOR NUMEROUS PIPE LENGTHS

Ferdinand J. Nist, Jr., Enumclaw, Wash., assignor to Seattle Box Co., Kent, Wash.

Filed Feb. 17, 1977, Ser. No. 769,542
Int. Cl.² B65D *85/20*
U.S. Cl. 206—443 **7 Claims**



1. A shipping bundle formed of a plurality of lengths of pipe of a common size, comprising:

a base formed of a first plurality of transverse sleepers located in spaced-apart parallel arrangement;
a tier of pipe lengths resting on said base, adjacent pipe lengths of said tier being separated by blocks in transverse series, each block having opposed concavities substantially embracing the curved sides of said adjacent pipe lengths;
each of said series of blocks being located to stand on one of said sleepers and being of a height greater than the thickness of the tier of pipe lengths;
a second plurality of sleepers, each traversing said pipe tier in overlying alignment with a sleeper of said first plurality, the sleepers of said second plurality being supported on the series of separating blocks; and
a bundling strap tightly encircling each sleeper of said first plurality, the separating blocks resting thereon, and the respective overlying sleeper.

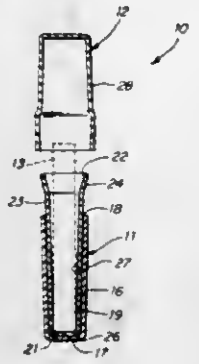
4,099,618
PROTECTIVE CONTAINER FOR FONT DISC SEGMENTS

Peter R. Ebner, S. Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 12, 1976, Ser. No. 675,663
Int. Cl.² B65D *85/48*
U.S. Cl. 206—454 **11 Claims**

1. A protective container for delicate objects, said container comprising:

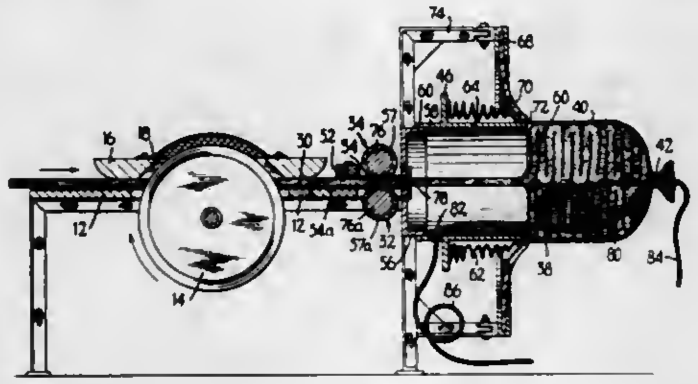
a. a housing portion for receiving an object, said housing portion including:
 1. an outer casing; and,
 2. an inner casing supported within said outer casing, said inner casing having projecting wall means extending through an opening in one end of said outer casing, said projecting wall means defining an opening for insertion of said object into said inner casing; and,
b. a cap portion for closing said housing portion, said cap portion including flange means for surrounding said projecting wall means of said inner casing and for forcing said projecting wall means inwardly into contact with said object for locking said object against movement within said container wherein said outer casing includes side walls which are normally in contact with said side walls of said inner casing, and wherein said flange means of said cap portion cooperates with said projecting wall means of said inner casing for forcing the side walls of said inner casing away from the side walls of said outer casing and against said object.



4,099,619
SORBENT BOOM WITH FLOTATION AND APPARATUS AND METHOD FOR STUFFING SAME

Charles William Hudler, Cloquet; Clare Eugene Swanson, White Bear Lake; George Holger Sundin, Duluth, and Ilmer Issac Niemi, Cloquet, all of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Dec. 1, 1976, Ser. No. 746,237
Int. Cl.² B65D *75/00*
U.S. Cl. 206—524.1 **3 Claims**



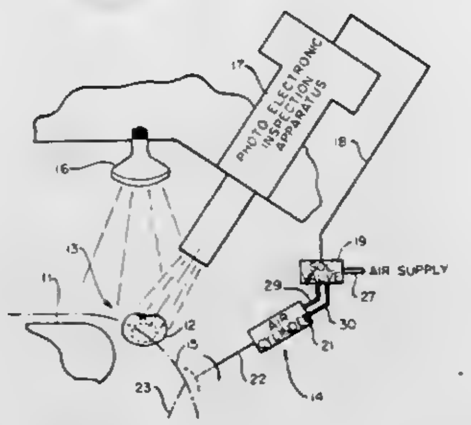
1. A floatable sorbent boom comprising:

(a) a porous flexible, tubular, mesh-like cover having a length at least 10 times its width and having first and second closed ends, said cover having openings large enough to allow substantially free passage of oil and water therethrough;
(b) at least one flexible strip of substantially oleophilic and substantially hydrophobic sorbent material within said cover;
(c) said at least one strip having a length at least 10 times the length of the said cover and a minimum length of at least 10 feet, a width from about ¼ inch to substantially equal to the width of the cover and a thickness of from about 1/64 to about ½ inch; and
(d) said at least one strip being folded in pleated fashion with the pleats being transverse to the longitudinal axis of the cover.

4,099,620
REJECTOR DRIVE SYSTEM FOR SORTING APPARATUS

Robert M. Kendall, Sunnyvale, and William F. Lapson, Cupertino, both of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Filed Mar. 23, 1977, Ser. No. 780,313
Int. Cl.² B65G *47/34*
U.S. Cl. 209—74 R **5 Claims**

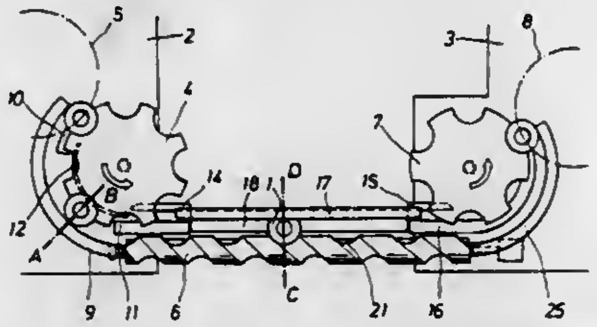


1. A rejector system for sorting apparatus including a rejector for engaging and displacing objects to be rejected including an air cylinder having a piston for driving said rejector between an advanced and retracted position, means for supplying pressurized air to said cylinder for driving said piston to advance the rejector, control means connected between said air supply means and said cylinder for selectively applying air pressure to said cylinder to cause said piston to drive said rejector, and a flow restrictor disposed in said air supply to restrict the flow of air to said cylinder after the piston is initially accelerated to limit the velocity of the piston.

4,099,621
CONVEYING AND REJECT APPARATUS FOR UPRIGHT STANDING BOTTLES

Karl Dullinger, Neutraubling, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth (Danube), Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,532
Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2619950
Int. Cl.² B07B *13/04*
U.S. Cl. 209—98 **8 Claims**

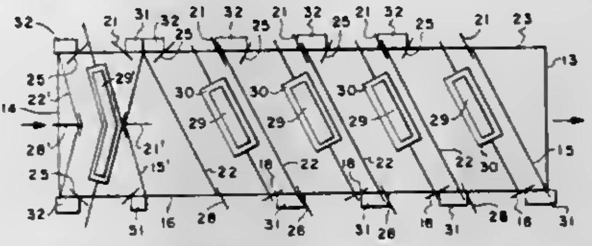


1. In apparatus for conveying upright standing bottles on a path between two synchronously driven bottle treating machines, said apparatus comprising a pocketed star wheel and a worm both driven synchronously with the bottle treating machines, and rails along said path for supporting and guiding said bottles along said path, the improvement for rejecting fractured bottles in which there are two bottle rejecting sections along said path, one of said sections comprising a guide rail along the side of the bottle body and a support rail along the bottom of the bottle and a first gap between said rails through which broken bottles and fragments thereof smaller than said first gap will fall, the other said section comprising a guide rail along the side of the bottle top and a support rail along the bottom of the bottle and a second gap between said rails through which broken bottles and fragments larger than the first gap but smaller than said second gap will fall, both said gaps being longer than the bottle diameter.

4,099,622
INCLINED CONVEYOR BELT SOLIDS SEPARATION SYSTEM

Edward D. Burger, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,587
Int. Cl.² B07C *1/00*
U.S. Cl. 209—114 **47 Claims**



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which have a side that causes the irregularly-shaped solids to tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an upper surface, an upper end and a lower end and adapted to rotate about said upper end and said lower end in a manner such that a point on said conveyor belt-like member cycles upward around said upper end, downward around said lower end, and then upward to the point of origination, said conveyor belt-like member being inclined from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the static slide angle of the irregularly-shaped solids;
b. first removal means adapted to deflect irregularly-shaped solids moving upward on said upper surface in an upward, sideways direction so that said irregularly-shaped solids move off a side of said conveyor belt-like member;
c. second removal means spaced along the longitudinal axis of said conveyor belt-like member from and below said first removal means, said second removal means being adapted to deflect spherically-shaped solids moving downward on said upper surface in a downward, sideways direction so that said spherically-shaped solids move off a side of said conveyor belt-like member;
d. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto a portion of said upper surface between said first removal means and said second removal means;
e. first receiving means adapted to receive irregularly-shaped solids deflected off said inclined conveyor belt-like member by said first removal means; and
f. second receiving means adapted to receive spherically-shaped solids deflected off said inclined conveyor belt-like member by said second removal means.

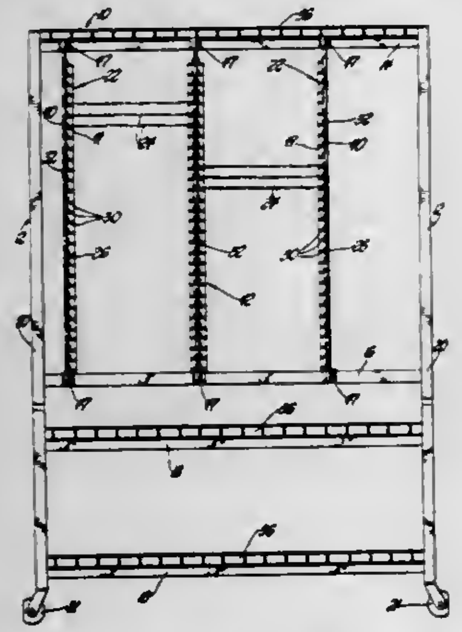
4,099,623
CIRCUIT BOARD STORAGE CART

Peter Van Osdol, Grosse Pointe Farms, Mich., assignor to Panel Controls Corporation, Detroit, Mich.

Filed Sep. 8, 1977, Ser. No. 831,360
Int. Cl.² A47G *19/08;* A47F *5/00;* H02B *1/04*
U.S. Cl. 211—41 **17 Claims**

1. A circuit board storage cart assembly comprising; a frame, circuit board storage means for storing circuit boards and supported by said frame, said circuit board storage means comprising a pair of opposed channel assemblies each having a plurality of channels so that said channels are paired between said assemblies so that each pair of channels may support a circuit board, said channels having two sloping portions with

said portions sloping downwardly from the outward ends thereof to an apex at the inner ends thereof, and each of said channel assemblies including connecting means for vertically interconnecting said plurality of channels, said connecting



means including two outer posts adjacent to and interconnecting said outward ends of said channels of each assembly and a middle post interconnecting said plurality of channels of each assembly at said apexes.

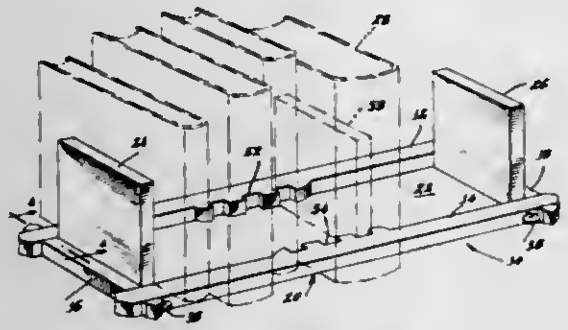
4,099,624
PORTABLE BOOK RACK

John W. McKearin, P.O. Box. 118, Saugatuck Station, Westport, Conn. 06880

Filed May 5, 1977, Ser. No. 793,888

Int. Cl.^{2} A47B *65/00*

U.S. Cl. 211—42 **11 Claims**



1. A portable book rack comprising:

a base, said base including

a pair of elongated side bars each having a surface thereof facing the other, and

a pair of cross bars, each of said cross bars connecting opposed ends of said side bars,

said side bars having an upper surface for supporting a plurality of books or like articles thereon,

a bookend pivotably connected to each of said side bars at opposite ends thereof adjacent said cross bars, at least one of said bookends being removably mounted between the side bars of said base, each of said bookends including

a surface for abutment with its adjacent cross bar when in a substantially upright position and a rounded corner adjacent said cross bar enabling said bookend to pivot to a position between said side bars substantially coplanar therewith, and

means on the facing surfaces of said side bars intermediate the ends of each side bar defining a pair of aligned, substantially upright slots for receiving therebetween a divider or one of said bookends which in conjunction with at least the other of said bookends will support one or more books therebetween.

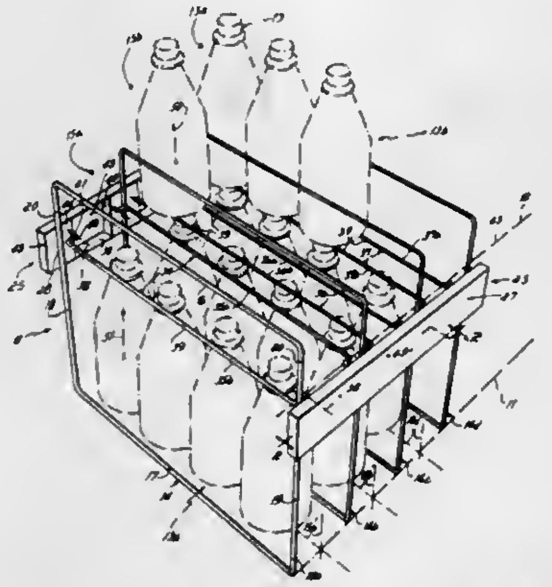
4,099,625
DISPLAY RACK

Rafael T. Bustos, Clarkston, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jul. 13, 1977, Ser. No. 815,224

Int. Cl.^{2} A47F *5/00*

U.S. Cl. 211—49 R **18 Claims**



11. A floor frame for an upper shelf of a display rack having upper and lower shelves said display rack's upper and lower shelves each defining one row, said upper shelf row being disposed in the same vertical longitudinal plane as said lower shelf row, said floor frame comprising:

a right hand support section and a left hand support section, each support section being separably pivotable on a pivot axis disposed parallel to said row's vertical longitudinal plane, said pivot axes being disposed on opposite sides of that longitudinal plane, and said right hand and left hand support sections being movable between an article support position in which said sections are oriented in the shelf plane of said upper shelf row for supporting articles in that upper shelf row, and a storage position in which said support sections are removed from said article support position when no article is in said upper shelf row for allowing articles that may be in said lower shelf row to be lifted vertically out of said display rack, and:

a spring connected with each of said right and left hand sections, said spring permitting the weight of at least one article on both frame sections to maintain said floor frame in the article support position, and the removal of all articles from said floor frame permitting said spring to swing said right and left hand sections into the storage position.

4,099,626
MODULAR RACK

Robert O. Magnussen, Jr., 20442 Lake Canyon Dr., Walnut, Calif. 91789

Filed Feb. 15, 1977, Ser. No. 768,678

Int. Cl.^{2} A47F *7/00*

U.S. Cl. 211—60 R **7 Claims**

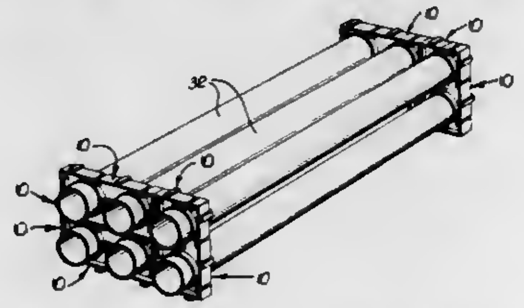
1. A modular component of a rack for storing articles, comprising

a. a longitudinally elongated body having opposite sides, a longitudinally elongated boundary, longitudinally spaced segmented boundaries laterally spaced from said longitudinally elongated bondary, and longitudinally spaced laterally extending boundaries at longitudinally opposite ends of the body,

b. the body having tongue and groove connections at certain of said boundaries, said connections defining guide shoulders extending widthwise between said opposite sides for guided connection with like tongue and groove connections on a like modular component,

c. and said body defining two through openings extending widthwise between said sides, said openings sized to receive said articles which are elongated in said widthwise direction, said through openings being longitudinally spaced between said laterally extending boundaries, and said openings located generally between said segmented boundaries.

d. said tongue and groove connections defining T-shaped tongues projecting outwardly from selected boundaries, and T-shaped grooves sunk in selected boundaries,



e. said tongues and grooves occurring in alternation sequentially along and about said boundaries,

f. four of said connections being spaced along said longitudinally elongated boundary, another four of said connections being spaced along said segmented boundaries with two of the other four connections located at the segmented boundary located between said openings, and wherein one of said connections is located at each of the boundaries at opposite ends of the body, the body longitudinal dimension being about four times as great as the body lateral overall dimension,

g. whereby six of said bodies may be interconnected via tongues and grooves to form six circular through openings, four of the bodies extending longitudinally horizontally, and two of the bodies extending longitudinally vertically.

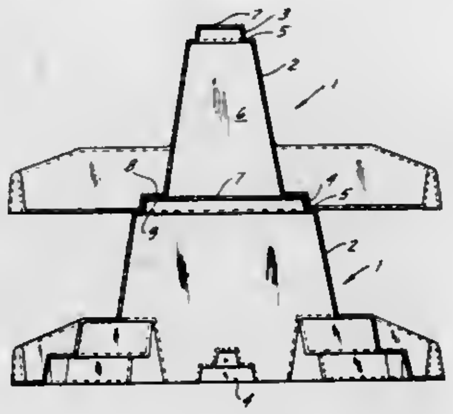
4,099,627
ARRANGEMENT FOR DISPLAYING ARTICLES

Robert Strada, New York, N.Y., assignor to Robert Strada Design Associates, Inc., New York, N.Y.

Filed Sep. 21, 1976, Ser. No. 725,273

Int. Cl.^{2} A47F *3/10*

U.S. Cl. 211—163 **10 Claims**



1. Arrangement for displaying articles, comprising a plurality of stackable elements, each having opposite sides; means for stacking said elements in a row, including a projection having an axis and extending lengthwise of said row beyond one of said sides of each of said elements, each projection having a free end portion which is elongated transversely of said row in a first direction and substantially coaxial with said projection, and a recess formed in the other of said sides of each of said elements substantially coaxial with said free end portion and being elongated transversely of said row in a different second direction, each recess of a respective element being operative for receiving said free end portions of a respective other element upon alignment of said respective free end portion in said second direction, and for maintaining successively stacked elements at a predetermined spacing from each other; and means for nesting said elements, including a cavity formed in said other side of each of said elements substantially coaxial with said recess and being elongated transversely of said row in said first direction, each cavity of a respective element being operative for receiving a respective projection upon insertion of the latter into said respective cavity, and for maintaining successively nested elements at a distance which is relatively smaller than the afore-mentioned predetermined spacing of said stacked elements, so that said elements can be moved by rotation about said axis between a stacked position when the free end portion of one of said elements is received in the recess of the other element, and a nested position when the projection of one of said elements is received in the cavity of the other element.

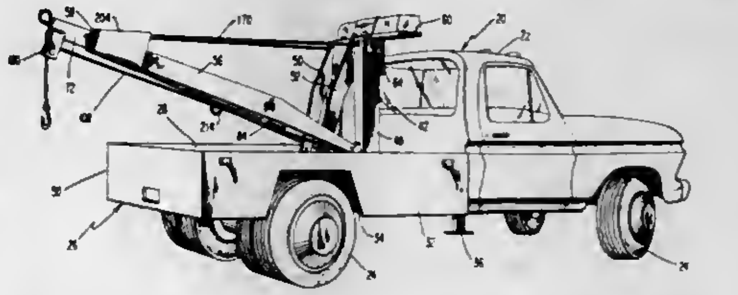
4,099,628
TOWING VEHICLE

Roy A. Richardson, Belfast, Tenn., assignor to Richardson Industries, Inc., Nashville, Tenn.

Filed Aug. 20, 1976, Ser. No. 716,245

Int. Cl.^{2} B66C *23/02*

U.S. Cl. 212—65 **21 Claims**



1. A towing vehicle having a frame, and a drive train for propulsion of the vehicle along a roadway, comprising:

a turntable mounted on said frame for rotation about a vertical axis;

first means for selectively rotating said turntable about said vertical axis in either direction;

a boom assembly attached to said turntable for rotation therewith about said vertical axis, said boom assembly including an inverted, generally U-shaped main support having a horizontal member connecting the upper ends of two vertical legs fixedly attached at their lower ends to said turntable, said boom assembly further including a generally V-shaped support frame having first and second arms joined together at one end to form an apex and each pivotally attached at the other end to said turntable adjacent a respective vertical leg of said U-shaped main support for pivotal movement about a horizontal axis, said V-shaped support frame including a support cable between the upper end of said U-shaped main support and the apex of said V-shaped support frame to maintain said V-shaped support frame in a preselected angular position relative to said U-shaped main frame and said turntable;

a telescoping boom mounted to said V-shaped support frame;

a second means on said V-shaped support frame for selectively extending and retracting said telescoping boom;

a cable winch;

and a cable pulley disposed on the distal end of said telescoping boom, said pulley being rotatable about a horizontal axis parallel to said horizontal axis of rotation of said V-shaped frame, the cable from said winch passing along the underside of said V-shaped frame, and over said pulley;

said first and second means and said winch being operable independently of the vehicle drive train;

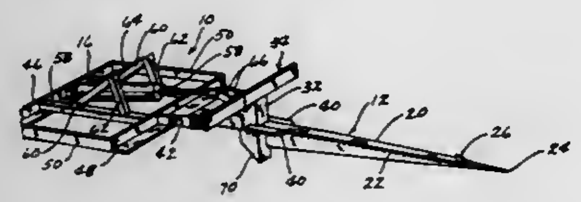
control means coupled to said first and second means and said winch for controlling said rotatable turntable, said telescoping boom and said cable winch from positions remote from said vehicle, and

support cable adjustment means on said V-shaped support frame for adjusting the angular position of said V-shaped support frame with respect to said U-shaped main support, said adjustment means comprising a carriage attached to said V-shaped support frame, a slider disposed on said carriage for movement toward and away from said apex, a pair of pulleys on the distal end of said V-shaped support frame, and means cooperating with said carriage for maintaining said slider in a preselected position, said support cable being attached at one end to said U-shaped main support, passing around one of said pulleys, around said slider, around the other of said pulleys, and back to said U-shaped main support where it is attached at its other end, whereby movement of said slider results in lengthening or shortening of the cable between the distal end of said V-shaped support frame and said U-shaped main support thereby to adjust the angle therebetween.

4,099,629

HAY BALE HANDLING MACHINE

Randal A. Cox, R.R. 1, Van Wert, Iowa 50262
Continuation of Ser. No. 517,434, Oct. 23, 1974, Pat. No. 4,015,739. This application Apr. 4, 1977, Ser. No. 784,396
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² E02F *3/62*
U.S. Cl. 214—1 HH **1 Claim**



1. A pickup truck mounted round bale handling machine for loading round bales and transporting them in a substantially upright position comprising,

a pickup truck having a frame and a cab and a rearwardly disposed box on said frame including opposite sidewalls, a front end wall, a bed, and an open rear end,

a round bale hay handling machine positioned in the rear open end of said box and having a base frame operatively secured to said truck frame,

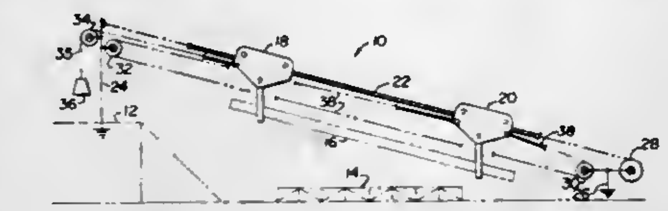
an elongated hay support finger member pivoted at one end to said base frame and being pointed at the other end for penetrating a bale of hay and supporting the bale along the length of said support finger and said support finger having an axis parallel to the longitudinal centerline axis of said truck bed and the support finger at said one end including a bale end support means, and

power means connected to said hay support finger for pivoting it between raised and lowered positions with said finger extending substantially horizontally rearwardly in said lowered position and adapted to penetrate one end of a hay bale on the ground upon said truck moving rearwardly, and extending upwardly above said truck bed in said raised position for transport of a hay bale positioned between the opposite sidewalls of said truck box and with the bale having been turned from its horizontal ground position to its upwardly extending transport position while being maintained on said finger support member by its weight being substantially carried by said bale end support means on said one end of said support finger.

4,099,630

PIPE HANDLING APPARATUS

Don D. Beck, Box 1369, Odessa, Tex. 79760
Continuation of Ser. No. 17,768, Mar. 9, 1970, abandoned. This application Jul. 26, 1971, Ser. No. 165,953
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **27 Claims**



18. A method for transporting a pipe between a derrick floor and a pipe rack which is positioned below the level of and away from the derrick floor comprising:

(a) suspending a main cable in overhanging relation to the derrick floor and the pipe rack such that the portion of the main cable suspended over the derrick floor is higher than the portion of the main cable suspended over the pipe rack;

(b) mounting spaced apart pipe receiving carriages for longitudinal movement on said main cable;

(c) supporting one end of a pipe to be transported in one of said carriages and the other end of said pipe in the other of said carriages;

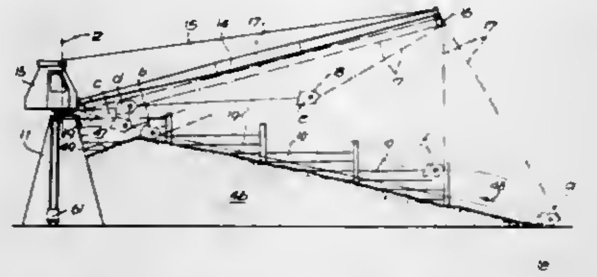
(d) moving at least one of said carriages along said main cable using second and third cables so as to position the carriage to which said second and third cables are attached, said second and third cables being moved by spaced apart drums rotated in such a manner that said second and third cables move the carriage along said main cable while positively controlling the movement of the carriage in both directions under power; and

(e) controlling the tension in said main cable.

4,099,631

SCRAPER

Georg Thierer, Bad Schönborn, and Hans Dolinsek, Stuttgart, both of Germany, assignors to Firma Johannes Fuchs, Ditzingen, Germany
Filed Aug. 18, 1976, Ser. No. 715,431
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621704
Int. Cl.² B65G *65/28*
U.S. Cl. 214—10 **8 Claims**

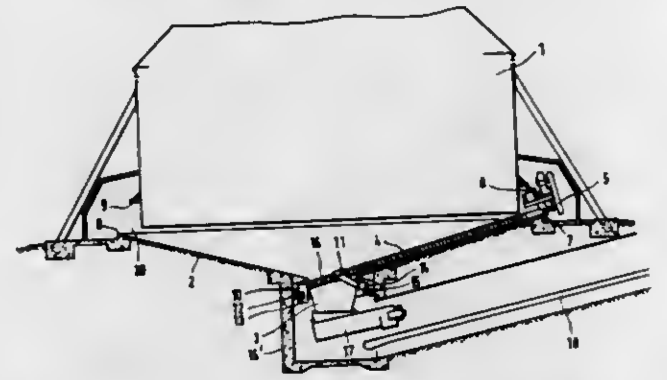


1. Apparatus for scraping piled-up particulate material, against a radial feeder comprising a scraper mounted on a support portion of said feeder, an arm pivotably mounted on said support, a scraper bucket suspended from said arm by a lifting cable line connected to a lifting winch, a digging cable line connected at one end thereof to said bucket and at the other end thereof to a digging winch, motor means for driving said winches, clutch means for connecting said winches with said motor means, brake means for braking said winches, manual control means for directly manually actuating said clutch means and said brake means through linkage means interconnecting said manual control means with said clutch means and said brake means respectively, power-controlled means for automatically actuating said manual control means, whereby manual and automatic operation are optionally selectable, said radial feeder including a plurality of divider walls extending outwardly therefrom defining a plurality of boxes adapted to contain the particulate material, said scraper bucket being movable along a path to convey the particulate material from the periphery thereof inwardly to a storage area adjacent said feeder and then return to the periphery of the pile of material, means for sensing various positions of said bucket along said path and for generating control signals in response thereto, said arm, together with said scraper bucket carried thereby, being laterally movable over said divider walls to a position over a selected box into which said scraper bucket is adapted to be lowered, an automatically controlled drive for laterally moving said arm, and at least one sensor means for initiating the lowering movement said scraper bucket in response to a predetermined phase position of the lateral pendulous movement of said scraper bucket.

4,099,632

ARRANGEMENT FOR WITHDRAWING MATERIAL FROM A SILO

Stig Ove Berg, Huskvarna, and Rolf Tore Persson, Forshaga, both of Sweden, assignors to C J Wennberg AB, Sweden
Filed Jul. 13, 1976, Ser. No. 704,839
Int. Cl.² A01F *25/00*; B65G *65/30*
U.S. Cl. 214—17 DA **5 Claims**



1. An arrangement for withdrawing material from a funnel-shaped bottom portion of a silo comprising a discharge funnel rotatably mounted at the lowest point of the funnel shaped silo bottom and a conveying screw inclined according to the inclination of the funnel-shaped bottom portion of the silo and extending radially outwardly from the discharge funnel through a slot in a wall of the silo, which conveying screw is rotatable about its longitudinal axis by means of a drive arrangement outside the silo wall and a radially outwardly lying end portion of the conveying screw together with the drive being mounted on a first bearing track means extending outside the silo wall in the circumferential direction of the silo and a radially inwardly lying end portion of the conveying screw extending beyond a side of the discharge funnel, being mounted on a second bearing track means extending outside the discharge funnel and below the silo bottom in the circumferential direction of the discharge funnel, and the conveying screw together with the drive being movable in the circumferential direction of the funnel-shaped bottom portion of the silo to produce a sweeping movement over the silo bottom.

4,099,633

DEVICE FOR EVACUATION OF SOLID MATERIALS

Paul Cantenot, 39450 Parcey, Parcey, Jura, France
Filed Feb. 4, 1977, Ser. No. 765,602
Claims priority, application France, Feb. 23, 1976, 76 05688
Int. Cl.² B65G *65/38*
U.S. Cl. 214—17 DA **4 Claims**

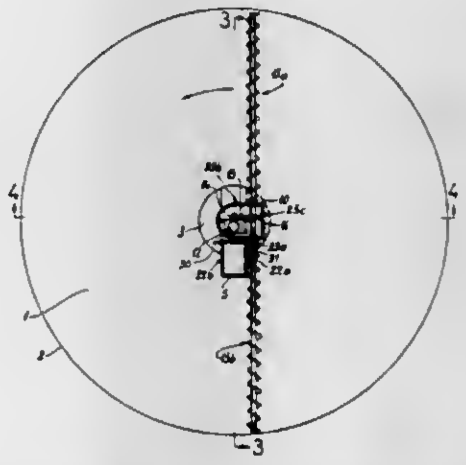
1. A device for evacuating solid materials stored on a covered or uncovered floor or in a bin, through an evacuation orifice in the center of such floor or bin, comprising:

a fixed, non-rotatable frame disposed above the evacuation orifice;

a protective cap disposed above said fixed frame to protect said frame from the stored materials;

an evacuation mechanism supported for rotational movement about a vertical axis through the evacuation orifice by said fixed frame, said evacuation mechanism comprising two horizontally extending worms, each having opposite pitches and together extending substantially to the diameter of the storage area, and first rotation means for providing said worms with a continuous rotational movement about the axes thereof; and

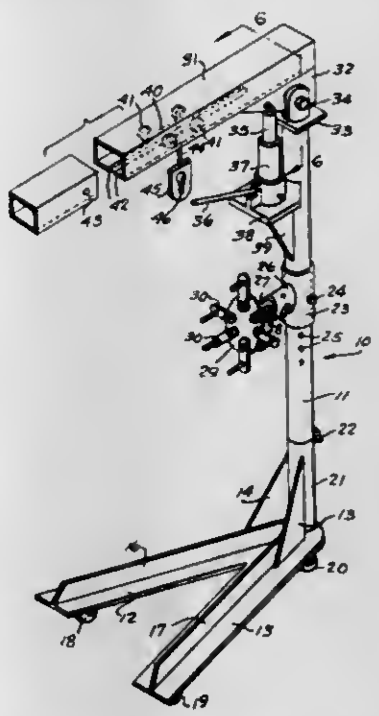
second rotation means, connected to said fixed frame, for causing an automatic discontinuous alternating movement of said worms of substantially 180° around said vertical axis.



4,099,634

COMBINED MOTOR PULLER AND STAND

Robert Lee McIntire, and Timothy Lee McIntire, both of 3325 May St., Sacramento, Calif. 95838
Filed Jan. 3, 1977, Ser. No. 756,379
Int. Cl.² B65G *65/04*
U.S. Cl. 214—86 R **1 Claim**



1. A combined motor puller and stand comprising a pair of forked feet joined together to form a substantially V-shaped carriage, brace members disposed on said feet to strengthen said feet, rollers disposed on the bottom extremities of said feet, an upstanding vertical column emanating from said feet at their joining area, a column mount disposed on said feet underlying said column and connected thereto by braces pinned together

by means of a removable pin, first and second substantially triangular shaped brace members disposed at the joining area of said column and said feet to further fortify the joining area, a hollow substantially rectangular first arm, having a slot horizontally extending on a downward face, pivotally connected to said column at an extremity of said column remote from said feet through a third supporting triangular plate, a shelf supported on said column by a fourth triangular plate below said first arm, a jack member extending between said shelf and said first arm and connected thereto at said third triangular plate which serves to rotate said first arm, a sleeve element slideably disposed on said column between said first and second triangular braces and said fourth triangular plate, a locking pin which extends through said sleeve and column to constrain said sleeve from sliding, a second arm extending horizontally from said column at said sleeve on a side of said column coincident with said first arm, a vertical plate connected to said second arm at an extremity remote from said sleeve, plural arms having bolt means extending outwardly therefrom for bolting an engine element thereto and pivoted to said vertical plate extending outwardly therefrom pivotally adjustable to conform to bolt patterns on an engine element, a wheeled carriage freely riding within said first arm connected to a depending rod which passes through said slot in said first arm, and a chain depending from said rod through a plate connected to said rod so as to support an engine element, a fixed distance below said first arm, whereby when said engine element has been removed from a vehicle with said chain and said jack, the engine element can be fastened to said vertical plate for subsequent work.

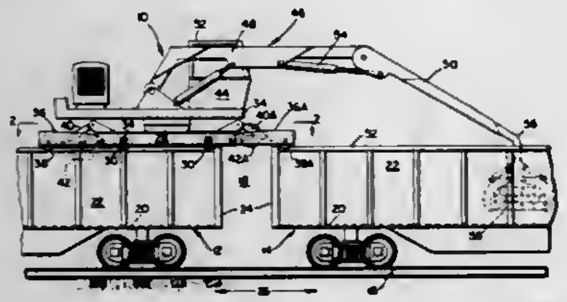
4,099,635
GONDOLA CAR LOADER

Thomas E. Leonard, Evergreen, and Walter E. Buckner, Hartselle, both of Ala., assignors to Lucky Manufacturing Company, Huntsville, Ala.

Filed Nov. 5, 1976, Ser. No. 739,283

Int. Cl.² B65G *67/26*

U.S. Cl. 214—152 **2 Claims**



1. A method for moving a wheeled vehicle along the upper edges of generally parallel lateral walls of adjacent, conventional open-topped gondola cars with gaps therebetween, comprising the steps of:

positioning the vehicle so that wheels of the vehicle are supported on the upper edges of generally parallel lateral walls of a first open-topped car;

spanning a gap between the first car and an adjacent second open-topped car by pivoting a first, forward spanning leg, pivotably mounted to a forward portion of the chassis of the vehicle, in a generally vertical plane so that a leading wheel carried by said leg engages an upper edge of a vertical wall of the second car thereby exerting a downward force so that the vehicle is partially supported on the second car by means of the spanning leg to permit at least one wheel of the vehicle to disengage the first car;

driving the vehicle forward whereby a rear portion of the vehicle approaches the gap between the first and second cars;

pivoting a second, rearward spanning leg, pivotably mounted to a rearward portion of the vehicle, in a generally vertical plane so that the vehicle is partially supported by a trailing wheel carried by the second spanning leg to permit at least another wheel of the vehicle to disengage from the first car;

driving the vehicle forward; and,

pivoting the second spanning leg so that the vehicle is out of contact with the first car and entirely supported on the second car.

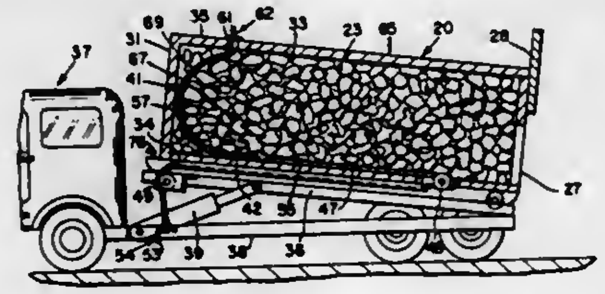
4,099,636
INSTANT LOAD RELEASE METHOD

Lionel G. Frenette, Hudson, N.H., assignor to Victor T. Guertin, Trustee, Nashua, N.H.

Division of Ser. No. 650,256, Jan. 19, 1976, Pat. No. 4,034,880. This application May 16, 1977, Ser. No. 796,899

Int. Cl.² B60P *1/04*

U.S. Cl. 214—152 **5 Claims**



1. The method of releasing the front end of a load of compacted waste frozen to the floor, front walls, side walls or roof of a roll-off container, by strong, heavy elongated cable means tautened by the upward inclination of said container, for rear end discharge of said load, said method comprising the steps of:

extending said cable means rearwardly along said floor, up the front end of said container and anchoring the terminal end thereof to the container roof;

compacting said load from the discharge end of said container to push said load against the front wall thereof while looping said cable means around the top, front and bottom of the front end of said load

and then, during raising of said container for rear end discharge by gravity; tautening said cable means to straighten out the looped cable means, thereby exerting compressive, squeezing forces on the front portion of said load to release the same from any adherence to the inside faces of said container.

4,099,637
RECEPTACLE EMPTYING DEVICE FOR ELONGATED CYLINDRICAL ELEMENTS

Desmond Walter Molins, London, England, assignor to Molins Limited, England

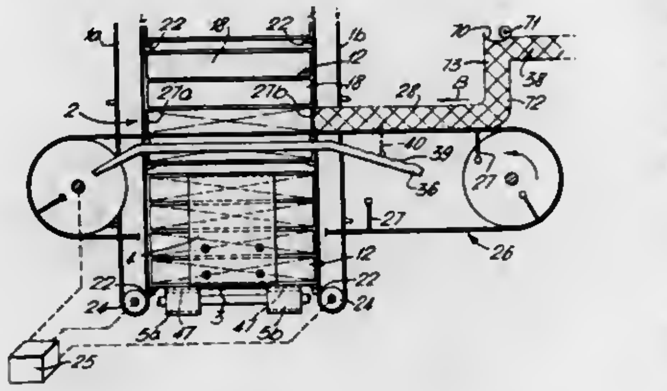
Division of Ser. No. 276,302, Jul. 31, 1972, Pat. No. 3,967,740. This application Apr. 28, 1976, Ser. No. 681,247

Claims priority, application United Kingdom, Aug. 2, 1971, 36319/71

Int. Cl.² B65G *47/52*

U.S. Cl. 214—306 **19 Claims**

1. Apparatus for removing rod-like articles from a container, comprising means for moving a succession of containers through an unloading station, each container carrying at least one batch comprising a stack of said articles; means for successively removing batches from said containers at said unloading station; conveyor means for successively receiving batches removed from said containers; retaining means for confining said batches on said conveyor means and for separating the successive batches which are disposed therebetween; and means for withdrawing said retaining means so that successive batches received on said conveyor means become combined and may be moved away from said unloading station as a continuous stream of articles on said conveyor means.



4,099,638
COATED GLASS BOTTLES

Tetsujiro Tatsumi; Reiji Miyamoto; Shiro Narasaki, all of Ichihara; Seiji Kazama, Kawanishi, and Michio Tanaka, Takatsuki, all of Japan, assignors to Mitsui Polychemicals, Co., Ltd., Tokyo and Takeda Chemical Industries, Ltd., Osaka, both of, Japan

Filed Mar. 7, 1977, Ser. No. 775,642

Claims priority, application Japan, Mar. 9, 1976, 51-25971

Int. Cl.² B65D *11/16;* **B32B** *27/40*

U.S. Cl. 215—12 R **15 Claims**

1. A glass bottle having a single-layer coating on the surface thereof coated with a thermally cured material formed of a powdery composition comprising a mixture of (i) a blocked organic polyisocyanate and (ii) a member selected from the group consisting of a hydrolyxed ethylene-vinyl ester copolymer, a carboxyl-modified version of the hydrolyzed copolymer or mixtures thereof, said ethylene-vinyl copolymer being selected from the group consisting of vinyl acetate, vinyl propionate, vinyl butyrate and vinyl benzoate copolymers.

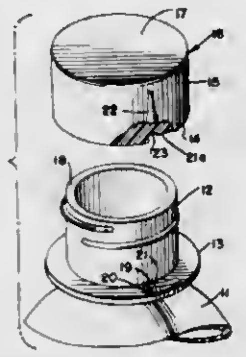
4,099,639
CHILD RESISTANT CLOSURE

Leo M. Boxer, and Robert W. Boxer, both of Fox Point, Wis., assignors to Lewis, Pauls & Associates, Ltd., Miami, Fla.

Filed May 16, 1977, Ser. No. 797,565

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—209 **12 Claims**



1. A child resistant closure for a container having a threaded neck thereon, comprises a cap having an internally threaded cylindrical skirt with an annular end surface and a disc-shaped end wall for sealing engagement on the end of the threaded neck, a yieldable circular collar on the neck of the container in a position to be engaged by the end surface of the cap skirt, said yieldable collar being integral and unitary with the container and being continuous, and complementary projection and recess means on the skirt end surface and collar in a position to be cooperatively interengaged when the cap is threaded fully onto the neck of the container, said collar being yieldable by manual pressure thereon to release the interengaged projection and recess means to enable retrograde movement of the cap from the neck and having a substantially constant diameter and uniform shape, said collar projecting radially beyond the cap skirt a uniform distance for the entire circumference of said collar and beyond the cap skirt only sufficiently far enough to enable manual engagement and downward flexing thereof by an adult.

4,099,640
COLLAPSIBLE CONTAINERS

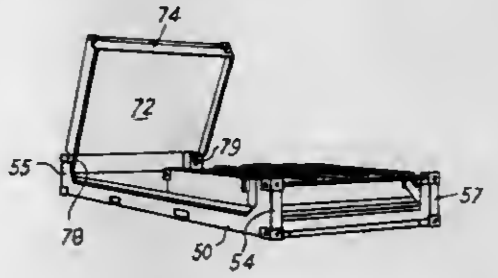
Stanley Nessfield, Tibthorpe; John Elliott Foster, Godalming, and Martin Clive-Smith, London, all of England, assignors to Sea Containers, Ltd., London, England

Filed Apr. 21, 1976, Ser. No. 679,086

Claims priority, application United Kingdom, Apr. 24, 1975, 17126/75

Int. Cl.² B65D *7/24, 87/00*

U.S. Cl. 220—6 **13 Claims**



1. A collapsible container having a base, two pairs of opposed walls hinged to the base for folding inwardly on the base into a collapsed position, a detachable roof member supported on the upper portions of the walls when the latter are erect, a stub corner post fixed vertically at each of four corners of the base, the top of each stub corner post being terminated in a bearing surface for supporting a corner post of a hinged wall of the container when the side wall is erect, each corner post being hinged to its stub corner post about an axis displaced from the stub corner post towards the interior of the container to thereby hinge the said wall to the base, the area of the roof member in plan being less than that of the base whereby the roof member may be separately positioned within the stub corner posts for stowage, the remainder of the container roof being formed by upper portions of at least some walls of the container, said bearing surface at the top of each stub corner post having a longitudinally oriented slot extending around into an inner side wall, the slot being shaped to perform two functions; the first being to act as a top-lift anchorage to permit the handling of the container in the collapsed position by standard container-handling equipment, and the second function being to so accommodate an arm connecting the corner post to its hinge that in the erect position the corner posts standing on the stub corner posts which extend the stub corner posts to the full height of the container are positively positioned over the stub corner posts by said arm being engaged in its corresponding slot.

4,099,641
PRESSURE TANK FOR HOT-WATER HEATERS

Heinz Schiedat, Hoxter, Albaxen, Fed. Rep. of Germany, assignor to Stiebel Eltron GmbH & Co. KG, Holzminden, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,495

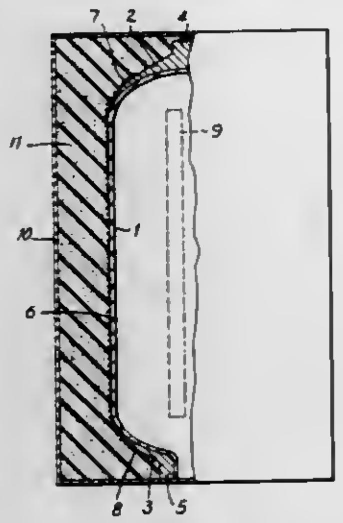
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605103; Dec. 2, 1976, 2654585

Int. Cl.² B65D *25/18*

U.S. Cl. 220—444 **10 Claims**

1. A pressure tank, particularly for hot water heaters, com-

prising: a synthetic liner; a glass fiber wrapping reinforcing said liner; and synthetic material means only at predetermined



locations of said liner for fixing said glass fiber wrapping to said liner only at said predetermined locations.

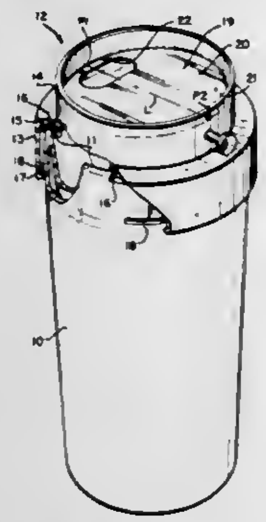
4,099,642
DRINKING RECEPTACLE COVER AND VALVE ASSEMBLY

Orv Nergard, Fridley, Minn., assignor to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 1, 1977, Ser. No. 856,390

Int. Cl.² A47G ***19/22***

U.S. Cl. 220—90.4 **10 Claims**



1. A cover and valve assembly for covering the open top of a drinking receptacle, including:

(a) a plate having top and bottom surfaces;

(b) an annular rim surrounding said plate having a first point on said rim with a second diametrically opposite point, said plate having a beverage outlet opening adjacent to said first point;

(c) a valve head beneath said opening in said plate having resilient support means extending therefrom secured to the bottom surface of said plate biasing the valve head upwardly against the bottom periphery of said opening to normally close said opening; and,

(d) an actuating member passing through a side opening in said rim beneath the undersurface of said plate, said member terminating in a camming surface engaging a portion of said valve head such that when said member is urged inwardly through said side opening in said rim it cams said valve head away from said opening to thereby open the same so that a person can drink a beverage from any receptacle over which said cover has been positioned.

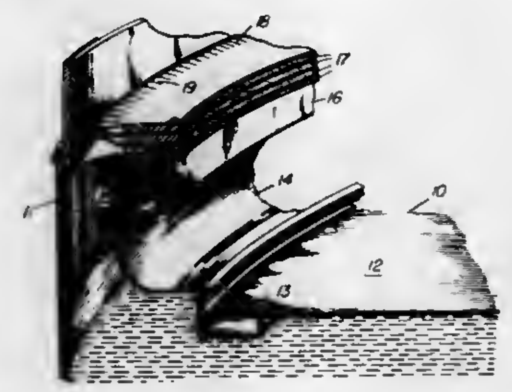
4,099,643
SEAL FOR FLOATING ROOF TANK

John Albert Wardwell; Ray Alan Stewert, both of Torrance, and Ralph Gee Chow, Tarzana, all of Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 799,015

Int. Cl.² B65D ***87/20***

U.S. Cl. 220—222 **1 Claim**



1. In a floating roof tank having a vertical wall of circular shape adapted to contain a stored volatile liquid, a buoyant roof floating on said stored liquid and extending to the interior side of said wall and a dependent sealing element extending downwardly from the periphery of said roof to engagement with said wall, an auxiliary seal mounted on the periphery of the upper surface of said roof and spaced above said dependent sealing element thus defining a vapor space between said dependent sealing element and said auxiliary seal, said auxiliary seal being constituted by a plurality of substantially horizontal layers each constituted by a plurality of segments of which the adjacent ends are overlapped, said layers being vertically spaced one from the other and having the edges thereof remote from said roof in engagement with said wall, and closure means connecting the inner edges of said layers to said roof adapted to inhibit leakage from spaces defined by said layers;

the improvement wherein the said horizontal layers are radially slit from the edges thereof adjacent said wall to a region intermediate said edges and said closure means to form a plurality of radial fingers engaging said wall.

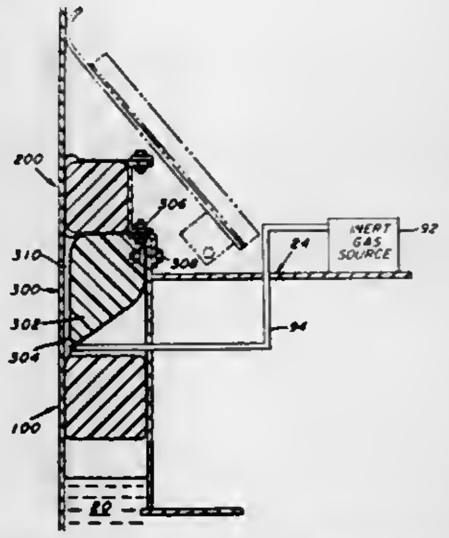
4,099,644
LOW EMISSION MULTIPLE SEALING SYSTEM FOR FLOATING ROOF TANKS

Wayne E. Nuttall, San Gabriel, and William H. Page, Long Beach, both of Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 674,354, Apr. 7, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,255

Int. Cl.² B65D ***87/20***

U.S. Cl. 220—225 **20 Claims**



1. A low emission sealing arrangement adapted for use in a liquid storage tank of the variety having a floating roof of a diameter slightly less than the diameter of such tank, said sealing arrangement sealing the annular space between the floating roof and the inner surface of such storage tank to prevent the loss of at least a portion of such liquid by vaporization, said sealing arrangement comprising:

a plurality of functionally independent, effective vapor sealing and substantially vertically spaced diffusional sealing elements attachable to such floating roof and being in substantially constant slideable engagement with such inner surface of such storage tank for sealing the space between the floating roof and the inner surface of such storage tank, each of said sealing elements providing a seal between such inner surface of said storage tank and such floating roof, said sealing elements being separated for providing at least one stagnant space located therebetween for protecting the integrity of the diffusional path length of the sealing elements located therebelow and confining the effects of wind and wind eddying to the upper sealing elements, said sealing arrangement having a total vertical dimension sufficient to contain a large proportion of the evaporation of any liquid left on the inner surface of such storage tank during normal diurnal and unloading descension of such floating roof within such storage tank;

means for reducing the volume between successive sealing elements for creating a more easily saturated space therebetween; and

means for supporting said plurality of vertically spaced sealing elements upon such floating roof in a sealed relationship thereto.

4,099,645
FUEL TANK, ESPECIALLY FOR MOTORCYCLES

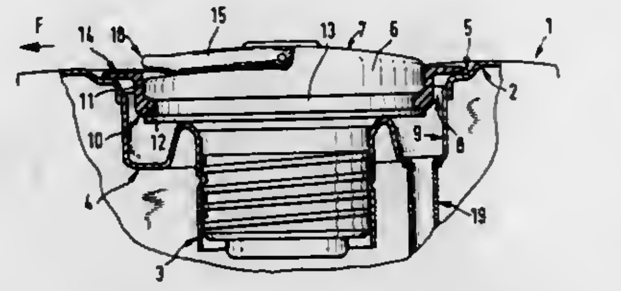
Hans-Albrecht Muth, Hechendorf, Pilsensee; Dirk Reissig, Schweitenkirchen, and Hans-Günther v.d. Marwitz, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,386

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 7616881[U]

Int. Cl.² B65D ***51/16, 53/02***

U.S. Cl. 220—304 **16 Claims**



1. A fuel tank for a single-track vehicle, comprising tank wall means, a filler connection means arranged in a recess in the tank wall means, said filler connection means being connected with the tank wall means by way of an annular channel means having inner and outer wall means, said filler connection means being closed by a cover means arranged in said recess, characterized in that the cover means is constructed flush with the contour of the tank wall means in the closing position and is so constructed that when in the closing position the annular channel means is not completely covered by said cover means such that a gap exists between the outer portion of the cover means and one of the means selected from the group consisting of the outer annular channel wall means and the tank wall means, and wherein said gap is covered off by a ring means of soft elastic material having an outer diameter greater than the diameter of the said cover means.

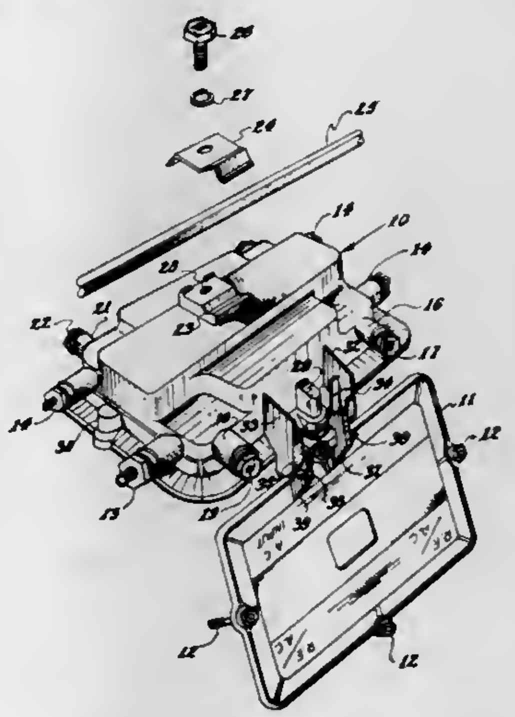
4,099,646
HOUSING AND COVER RETAINING MEANS

Alan E. Devendorf, Phoenix, N.Y., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Jul. 25, 1975, Ser. No. 599,286

Int. Cl.² B65D ***45/16, 53/00***

U.S. Cl. 220—324 **3 Claims**



1. A CATV distribution housing having a cover and a cover retainer, the cover retainer comprising: a pair of slotted members located on an outer surface of the housing; the pair of slotted members having slots that are open at one end thereof, the slots being positioned to face each other; and a pair of projecting tabs facing away from each other and positioned on the cover, the pair of tabs being located to mate within the slots of the pair of slotted members, the pair of slotted members and the pair of projecting tabs cooperating to retain the cover with the housing wherein the pair of slotted members extend beyond a surface of the housing containing the opening, the extensions of the pair of slotted members being provided to accommodate thick gaskets located around the surface of the opening and to allow the cover to swing into position over an opening in the housing.

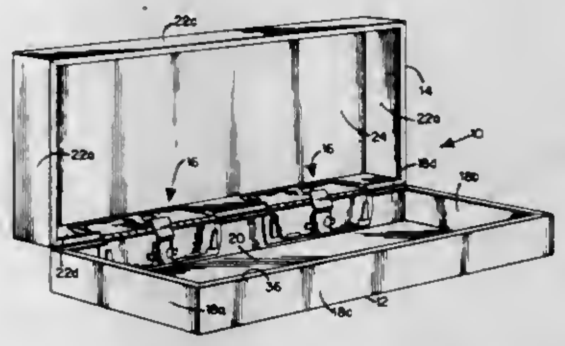
4,099,647
HINGE MOUNTING MEANS

George G. Bergh, and Robert G. Bergh, both of Plainville, Mass., assignors to Bergh Bros. Co., Inc., Attleboro Falls, Mass.

Filed Jun. 6, 1977, Ser. No. 803,764

Int. Cl.² B65D ***43/14, 51/04***

U.S. Cl. 220—334 **17 Claims**

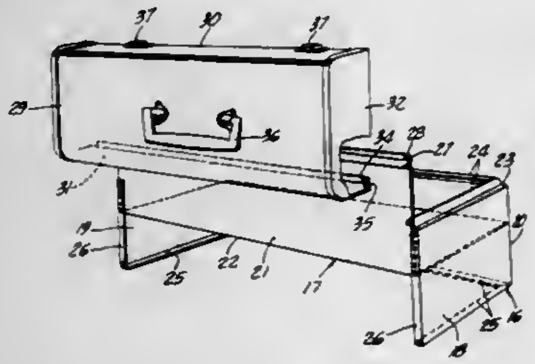


1. Mounting means for fixing a hinge relative to a container wall at a location thereon which is defined in part by a longitudinally extending wall edge, comprising: a hinge receiving element having an inner plate joined to an outer lip by an intermediate web; cooperating means on said hinge receiving element and said container wall for urging said intermediate

web against the wall edge with said container wall being located between and reinforced by said inner plate and said outer lip; and, means for attaching the hinge to said inner plate.

4,099,648
STORAGE BOX

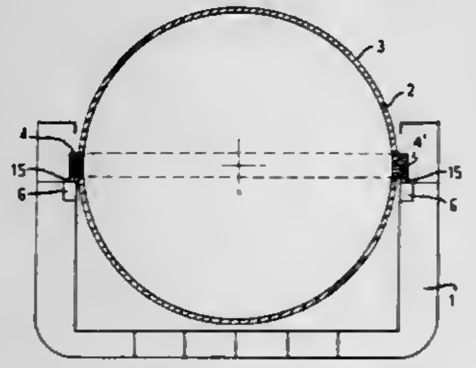
Richard G. Kirkton, 1994 Midwick Dr., Altadena, Calif. 91101
Filed Sep. 19, 1977, Ser. No. 834,597
Int. Cl.² B65D *7/00, 43/16*
U.S. Cl. 220—340 **5 Claims**



1. A storage box having a container and cover, comprising:
- a first elongated metal sheet having two opposite end portions bent generally normally to the central portion forming the container front and two end panels;
- a second metal sheet bent to form an L-shaped member, said member being secured to the first metal sheet defining back and bottom panels for the container;
- the exposed edges of the front, two end and back panels being contoured into generally cylindrical edges; and
- the cover includes an edge which is rolled into cylindrical shape and mated with the container rear panel edge to form a hinge between the cover and the container.

4,099,649
APPARATUS FOR TRANSPORTING FLUIDS AT LOW TEMPERATURE

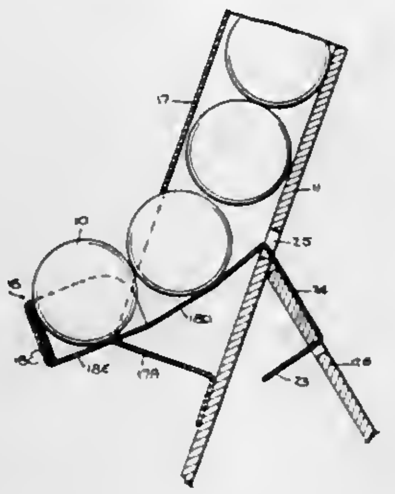
Jacques R. Guilhem, Sainte Adresse, and Pierre Jean, Montivilliers, both of France, assignors to Gaz-Transport, Paris, France
Filed May 21, 1976, Ser. No. 688,839
Claims priority, application France, May 22, 1975, 75 15964
Int. Cl.² B65D *87/24;* **B63B** *25/16*
U.S. Cl. 220—439 **14 Claims**



1. In a device for transporting liquefied gas at low temperature, said device comprising
- a supporting structure,
- at least one fluid-tight, self-supporting tank defining a volume of revolution the meridian of which is a curve free from sharp angles, said tank having an equator,
- a ring fixed to the supporting structure and supporting said tank,
- spacers made of a heat insulating material positioned between said ring and said tank,
- a plurality of circumferentially distributed radial slides positioned between said spacers and connecting said tank to said ring, said spacers having a thickness such that said tank is supported on said spacers rather than said slides, said slides each comprising:
- a female element having a U-shaped opening and a male element extending into the female element and of a size smaller than the U-shaped opening so that there are spaces between the sides of each male and female element, and guides of insulating material in said spaces between each male and female element to minimize heat loss at the slides;
- an insulating layer encircling the wall of the tank,
- a hollow toroidal member encircling said tank at said equator, and having portions thereof on opposite sides of the equator secured to said tank, said toroidal member being filled with an insulating material and supported by said spacers on the ring fixed to the supporting structure, said toroidal member having a transverse section which imparts a transverse rigidity thereto such that, when subjected to torques by those loads and forces to which the tank is subjected during use, the maximum rotation of said transverse section is less than one degree.

4,099,650
CONVERTIBLE BLISTER-CARD PACKAGE

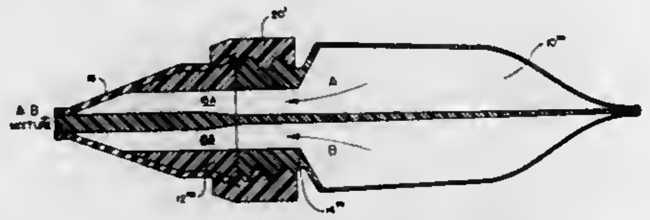
Vincent J. Immordino, Flushing, N.Y., assignor to Display Originals, Inc., West Babylon, N.Y.
Filed Jan. 24, 1977, Ser. No. 762,055
Int. Cl.² B65G *59/06*
U.S. Cl. 221—266 **7 Claims**



1. A convertible blister-card package for housing, displaying and dispensing articles having a roll form, said articles all having the same length and diameter, said package comprising:
- A. a card having a major section covered by a transparent dome to define therewith a rectangular container whose width is substantially equal to the length of the articles for housing a stack of said articles, said dome having an access opening at the lower end thereof whose height is greater than the diameter of one of said articles and less than twice said diameter:
- B. an open box seated in the lower end of said container to receive the lowermost article in said stack, said box having a base, a pair of side walls and a relatively high rear wall which is free of the side walls and normally lies against said card, said rear wall being hinged from said card whereby said box may be pulled out through said access opening to cause said rear wall to swing out from said card to assume an inclined position in which it is substantially co-planar with the base to define a chute for dispensing said articles, at which pulled-out position the lowermost article is removable from said box and the article directly thereabove which lies on said inclined rear wall is trapped within the access opening.

4,099,651
CLOSURE ASSEMBLY FOR COLLAPSIBLE TUBE DISPENSERS, AND THE LIKE

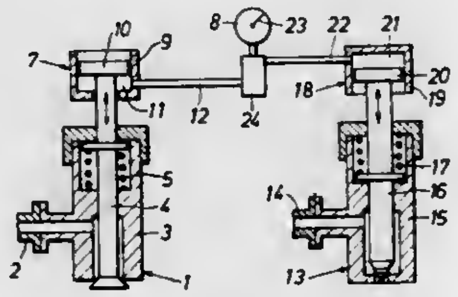
Emil H. von Winckelmann, 7731 Amestoy Ave., Van Nuys, Calif. 91406
Filed May 22, 1975, Ser. No. 579,786
Int. Cl.² B65D *35/50*
U.S. Cl. 222—94 **3 Claims**



2. A closure assembly for a collapsible tube to control the discharge of fluids and soft solids from the tube, said tube having a neck through which the fluids and soft solids are dispensed, said closure assembly comprising: a hollow tubular tip member extending outwardly from the neck of the collapsible tube, at least one side of the tip member having an opening therein extending from said one side thereof into the hollow interior of the tip member; and a flexible sleeve open at both ends drawn over the tip member and over the opening therein in close engagement with the tip member along the length thereof, said sleeve forming a seal around the distal end of the tip member, whereby squeezing pressure applied to the tube causes the fluids and soft solids to pass out the opening in said tip member and between the sleeve and the distal end of the tip to be dispensed therethrough, and which includes a cap member fitted over the tip and secured to the neck of the tube, and in which said cap member has an internal configuration complementing the configuration of the tip and flexible sleeve to fit closely over the tip and flexible sleeve and lock the sleeve in a closed position over the tip.

4,099,652
APPARATUS FOR MIXING FLUID COMPONENTS WHICH REACT QUICKLY WITH ONE ANOTHER TO FORM A BLOWABLE, FOAM-FORMING MIXTURE

Karl Breer, Cologne, Germany, assignor to Bayer Akdtiengesellschaft, Leverkusen, Germany
Continuation of Ser. No. 209,380, Dec. 17, 1971, abandoned, which is a continuation of Ser. No. 885,774, Dec. 17, 1969, abandoned. This application Apr. 22, 1974, Ser. No. 463,021
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1969, 1903243
Int. Cl.² B67D *5/08*
U.S. Cl. 222—135 **3 Claims**



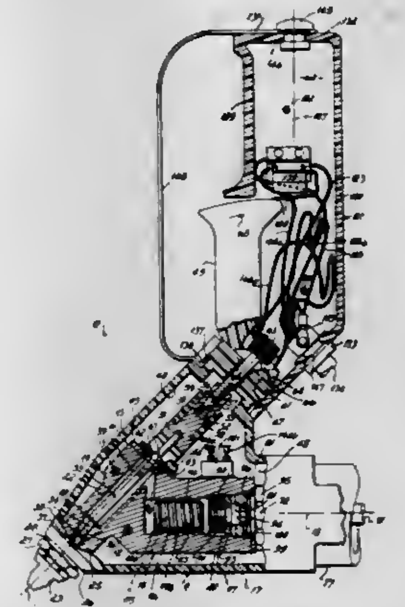
1. In apparatus suitable for mixing two fluid components which react quickly with each other forming foam, comprising:
- (a) a pump for each component, and means for simultaneously operating said pumps,
- (b) a mixing chamber for receiving, mixing, and discharging the components for reaction thereof,
- (c) a conduit between each pump and the mixing chamber for delivery of the components from the pumps to the mixing chamber,
- (d) a valve in each conduit between the pump and the mixing chamber and responsive to pump discharge pressure to open when exposed to a selected pump discharge pressure, for the introduction of the components into the mixing chamber,
- (e) a liquid storage arrangement in at least one of said conduits between the pump and the valve thereof, adjusting means for limiting displacement by said liquid in the liquid storage arrangement for obtaining simultaneous entry of said components into the mixing chamber,

the improvement which comprises:
- (f) a timer for sensing the time interval between opening of the valves,
- (g) means interconnecting the inlet valves and the timer effective to actuate the timer upon opening of the first of the valves to open and inactivate the timer upon opening of the other valve, the interconnecting means comprising pneumatic means for pneumatically transmitting pulses corresponding to operation of the valves, to the time for actuation of the timer and inactivation of the timer,

whereby the timing of the opening of the valves is indicated for adjusting the liquid storage arrangement for said simultaneous entry.

4,099,653
MOLTEN ADHESIVE DISPENSING DEVICE

Charles H. Scholl, Vermilion, and Alan B. Reighard, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio
Division of Ser. No. 565,733, Apr. 7, 1975, Pat. No. 4,006,845. This application Nov. 10, 1976, Ser. No. 740,401
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE **2 Claims**



1. A molten adhesive dispensing device of the hand gun type, said gun including a handle adapted to be gripped by an operator during use, said device comprising
- a heater body located in said gun's housing,
- a first bore and a second bore defined in said heater body, said bores being connected to permit the flow of molten adhesive therebetween,
- a discharge valve mounted in said first bore for controlling the flow of molten adhesive through said bores,
- a heat transfer core fixed in threaded position within said second bore, the molten adhesive being in heat exchange contact with both said core and said heater body as it flows through said second bore, said heater body's second bore surface being provided with spiral threads thereon, and said heat transfer core's outer surface being provided with spiral threads thereon, the threads of said heat transfer core being sized relative to the size of said bore threads

such that said core can be threaded into said bore and such that said threads cooperate to define a spiral path about said core through said bore from one end to another, thereby defining a spiral heat exchange path through said second bore,

heater means disposed in said device for heating molten adhesive as it flows through said heater body, said heater means comprising at least one cartridge type heater disposed within said heater body, and

thermostat means mounted in said device, said thermostat means being interconnected with said heater means to control the temperature of said heater body and said heat transfer core, said thermostat means thereby being operable to control the temperature of said molten adhesive within said hand gun device.

4,099,654

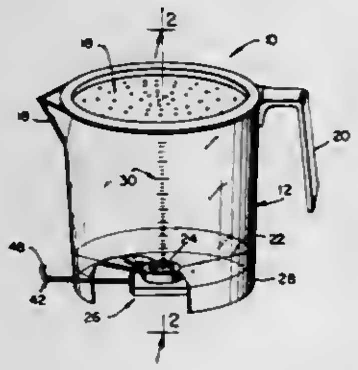
SELECTIVE DISPENSING UTENSIL

Angelo Antolino, Pelham Manor, N.Y., assignor to New Colony Inventions, Inc., Mt. Vernon, N.Y.

Filed May 11, 1976, Ser. No. 685,283

Int. Cl.² B67C *11/04*

U.S. Cl. 222—184 **7 Claims**



1. A dispensing utensil suitable for treating and discharging measured quantities of liquids comprising a substantially cylindrical cup body having an open mouth, the body including a transverse interior wall surface, said wall surface being sloped toward and defining an outlet orifice in said cup body for gravity discharge flow of the liquid contents, the cup body further extending below the outlet orifice to form a skirt wall, said skirt wall providing a pedestal for supporting the cup on a horizontal surface, flow control means operable for regulating discharge flow, said flow control means having an externally mounted sluice valve assembly, said sluice valve assembly being recessed within the skirt wall and including a valve housing and a valve member slidably accommodatable within said housing, coupling means for detachably connecting the valve housing to the cup body, the coupling means including a depending collar formed integrally with the cup and surrounding the outlet orifice, said depending collar being adapted for interfitting, manually separable, fluid tight engagement with the valve housing for removably securing the valve housing to the cup in registration with the outlet orifice, said valve housing further having a discharge port, said slidable valve member having an extension projecting through an opening formed in the skirt wall, said extension providing accessibility to the recessed valve assembly for permitting selective displacement of the valve member with respect to the discharge port to regulate discharge flow from the cup, said valve assembly being detachable as a unit from the cup body with the valve member being positioned to seal the discharge port, the valve member further being withdrawable through the opening in the skirt wall and removable from within the valve housing, whereby the component valve elements can be readily disassembled and separated for cleaning.

4,099,655

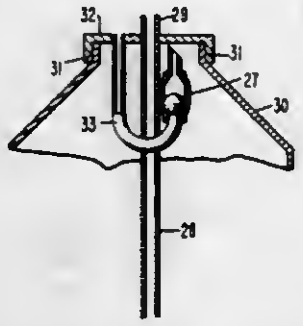
POSITION RESPONSIVE TWO-WAY BALL VALVE

L. Laslo Por, Christiansted P.O. Box 37, St. Croix, V.I.

Filed Nov. 26, 1976, Ser. No. 745,449

Int. Cl.² B05B *11/04*

U.S. Cl. 222—211 **4 Claims**



1. A submersible, automatically functioning, pressure and position responsive air valve for a compressible container, comprising:

a closure member for a compressible container;

a first-U-shaped air inlet tube connected through said closure member to atmosphere, said air inlet tube depending from said closure and adapted to extend into the container;

a tubular housing having an upper ball seat at one end and a lower ball seat at the other end, the lower ball seat being connected through said U-shaped air inlet tube to communicate with the atmosphere, and the upper ball seat being connected through a second air inlet tube to communicate with the interior air content of the container; and

a ball valve located within said tubular housing and freely movable therein, the position and movement of the ball valve within said housing being directed by gravitation and air pressure so that the ball valve engages said lower ball seat to close said air inlet tube to flow due to compression of the container when the container is in an upright position, and so that the ball engages said upper ball seat upon inversion of the container to open said air inlet tube to flow due to compression of the cootainer.

4,099,656

MULTI-PURPOSE CARRYING BAG OR CASE

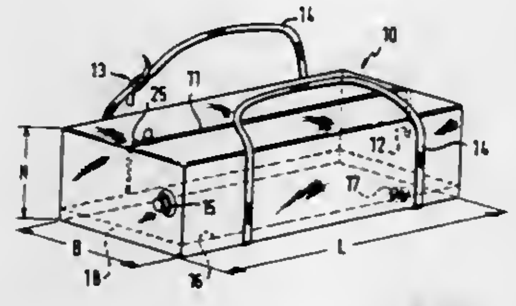
Henning Neumann, Munich; Horst Schalausky, Pocking, and Horst Britschinn, Munich, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk AG, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,632

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 7607449[U]

Int. Cl.² A45F *5/00*

U.S. Cl. 224—5 W **7 Claims**



1. A multi-purpose carrying bag or case having a parallelepiped shape and comprising: a shell of a watertight and airtight, rip-resistant material, said shell defining an interior and having top and bottom portions, first and second longitudinal side portions and first and second end portions, said bottom portion comprising two coextensive layers of said watertight and airtight, rip-resistant material which form a watertight and airtight bottom compartment in said carrying bag or case and a first fill-valve which communicates with the interior of said compartment and is accessible from the interior of said bag; a slot-type opening provided in said upper portion and being closeable by means of a watertight and airtight zipper; a second fill-valve provided in said shell for filling the interior of the carrying bag or case; and a longitudinally adjustable carrying strap movably connected to said shell and six fittings adapted for the arbitrary insertion of the carrying strap, said fittings being affixed to said bottom portion of said shell, four of the fittings being disposed at the corners of an imaginary rectangle on said bottom portion and two additional fittings being disposed in the longitudinal median plane of the bag and without said imaginary rectangle.

4,099,657

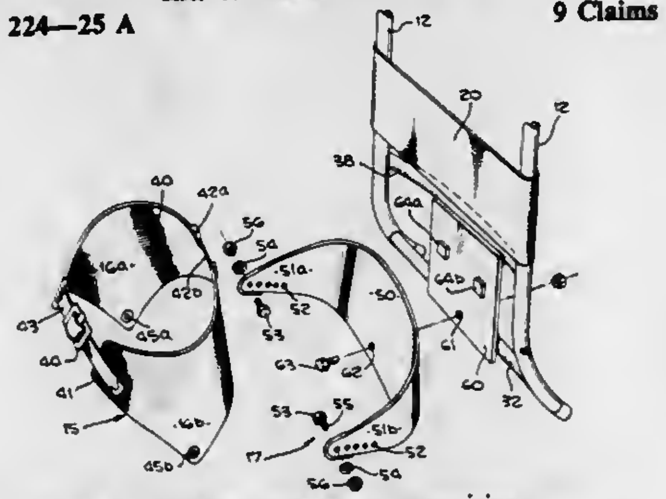
BACKPACK AND FRAME APPARATUS

Anthony C. Zufich, P.O. Box 333, Bodfish, Calif. 93205

Filed May 26, 1976, Ser. No. 690,068

Int. Cl.² A45F *3/10*

U.S. Cl. 224—25 A **9 Claims**



1. A backpack and frame apparatus comprising:

(a) a frame comprising a pair of side bar members and upper and lower lateral cross members connecting said side bar members;

(b) an upper support tube coupled intermediate a pair of upper cross members, said upper support tube with vertically oriented adjustment apertures in spaced relation to each other and aligned parallel to said side members;

(c) a pair of shoulder straps, the upper ends thereof being coupled to vertically aligned adjustment apertures;

(d) a hip belt including an engagement member adapted to encircle the waist of a user, said hip belt including a pair of gussets extending downwardly from diametrically opposed sides of said hip belt, the lower projection of said gussets being substantially below said engagement member and adapted to be adjacent the hips of the user and be diametrically opposed to one another;

(e) means for attaching the lower ends of said shoulder straps to respective ones of said side bar members substantially adjacent said lower lateral cross members;

(f) a supporting frame comprising a substantially planar rear member and side members extending from either edge thereof, said side members being deflected from said planar rear member parallel to respective ones of said gussets, the termini of said side members being in parallel spaced relation to each other and including a plurality of aligned adjustment apertures, a respective pair of adjustment apertures in each of the side members of supporting frame being coupled to the lower projection of the adjacent gussets of said hip belt diametrically opposed to one another;

(g) lower bearing surfaces secured between lateral lower cross members intermediate said pairs of said bar members; and

(h) means for pivotally coupling the planar rear member of said supporting frame to said lower bearing surfaces about an axis substantially perpendicular to said planar rear member whereby said hip belt and supporting frame are free to reciprocally move about said axis independent of said frame.

4,099,658

ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

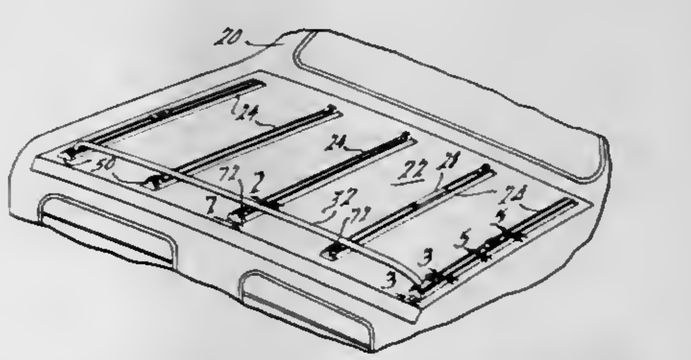
John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,602

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.² B60R *9/00*

U.S. Cl. 224—42.1 F **85 Claims**



1. An article carrier for an automobile including more than two parallel slats fixedly secured on a generally horizontally extending exterior automobile body surface,

said slats extending generally longitudinally of the automobile,

certain of said slats having an upper article supporting surface,

said supporting surfaces being located between said body surface and the lower side of articles on said carrier, each of said slats having major and minor transverse dimensions with said major dimensions being parallel to said body surface and said supporting surface, first fastening means associated with selected of said slats,

a pair of article securing members disposed upon said selected slats and a restraining bar extending laterally between and secured adjacent its opposite ends to said members,

said restraining bar located above said automobile body surface and said slats, and

second fastening means on each of said members and cooperable with said first fastening means for detachably securing and longitudinally adjusting said members and said restraining bar upon said slats.

4,099,659

ADJUSTABLE PNEUMATIC POWER DRIVING APPARATUS

David C. Grimaldi, Jr., 458 George St., Ridgewood, N.J. 07450

Filed Oct. 15, 1976, Ser. No. 732,805

Int. Cl.² B25C *1/04*

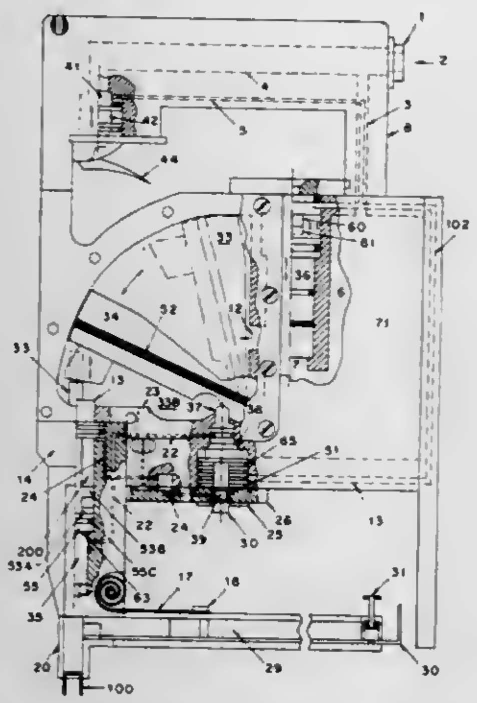
U.S. Cl. 227—130 **11 Claims**

1. Pneumatically powered apparatus for driving fasteners such as staples, nails, rivets, joint fasteners, spring pins and the like, comprising:

a housing having a reservoir for pressurized air and a first chamber;

hammer means for developing power, provided in the first chamber movable between a first position and a second position, and pivotally mounted in the housing;

ram means for transmitting power from the hammer means to a fastener, positioned adjacent the second position of the hammer means, and being movably mounted in the housing to be struck by the hammer means for driving a fastener; and

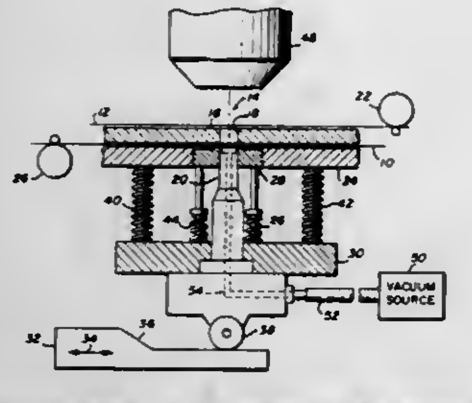


means for admitting pressurized air from the reservoir to the first chamber for moving the hammer means from the first position to the second position.

4,099,660
APPARATUS FOR AND METHOD OF SHAPING INTERCONNECT LEADS

James Edward Schultz, Sunnyvale, and Carmen D. Burns, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 31, 1975, Ser. No. 627,759
Int. Cl.² H01L *21/603*
U.S. Cl. 228—13 **10 Claims**



1. A method of shaping interconnect leads which have been cut from an interconnect lead tape and which are each joined to a respective bump on a semiconductor chip, such that said leads and chip form a unitary article, comprising the steps of:

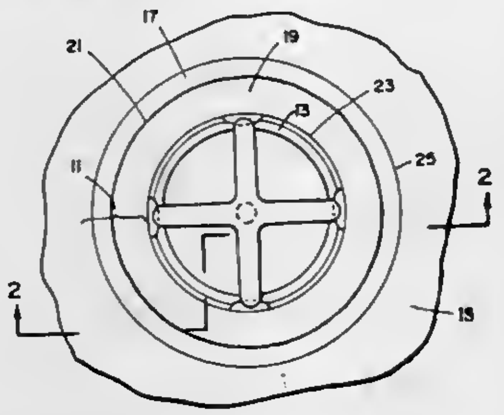
(a) holding the free ends of said leads in one plane, and

(b) applying a differential fluid pressure across said article to bend all of said leads uniformly and the same amount downwardly, whereby the chip is translated downwardly to a position which is spaced below said one plane in which the free ends of said leads are held.

4,099,661
METHOD FOR CONNECTING BIMETALLIC MEMBERS BY EXPLOSIVE BONDING

Charles B. Dick, Port Orchard, Wash.; Curtis L. Knutson, Tulsa, Okla.; Frederick W. Jones, Upper Marlboro, and Richard D. Ireland, Chevy Chase, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,917
Int. Cl.² B23K *21/00, 19/00*
U.S. Cl. 228—107 **5 Claims**



1. The method of bonding a first annular member made of a first material to a second annular member made of a second material comprising the steps of:

(a) concentrically surrounding said first annular member with said second annular member such that an annular acceleration cavity is formed between the outside surface of said first annular member and the inside surface of said second annular member, said acceleration cavity having about uniform dimension throughout the length of said acceleration cavity;

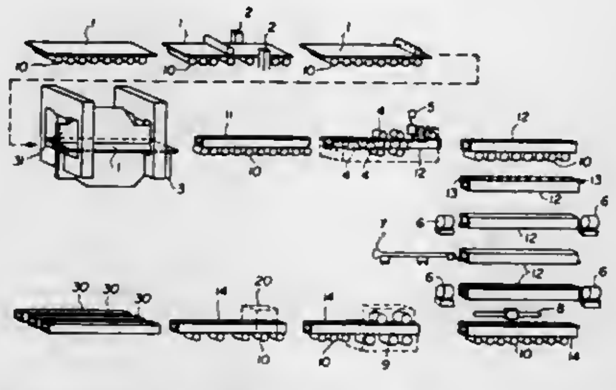
(b) surrounding the outside surface of said second annular member with an explosive powder; and

(c) igniting said explosive powder, said ignition causing said second material to accelerate across said annular acceleration cavity and deposit on and bond to the outside surface of said first annular member.

4,099,662
METHOD AND APPARATUS FOR PRODUCING WELDED STEEL TUBES HAVING LARGE SQUARE CROSS SECTION

Hiromn Nakajima, Itami, Japan, assignor to Kabushiki-Kaisha Nakajima, Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,779
Claims priority, application Japan, Dec. 20, 1975, 50-152105; Feb. 9, 1976, 51-13505; Feb. 9, 1976, 51-13506; Feb. 9, 1976, 51-13507; Feb. 9, 1976, 51-13508
Int. Cl.² B23K *31/02*
U.S. Cl. 228—151 **10 Claims**



1. A method of producing a welded steel tube of relatively large square cross section comprising:

advancing a single steel plate of at least substantially 9mm thickness longitudinally thereof while preparing the opposed longitudinal edges of same for welding;

bending swquentially a first longitudinally extending portion of the steel plate adjacent one free edge thereof and then a second longitudinally extending portion of the plate to be bent into the next adjacent corner portion, then bending a third longitudinally extending portion of the plate adjacent the other free edge thereof and finally a fourth longitudinally extending portion of the plate intermediate said second and fourth portions corresponding to the four corners of the square steel tube to be produced to thereby shape the plate to a form approximate to the desired square steel tube having opposed free edges extending longitudinally of the plate;

subjecting the thus shaped plate to further shaping and to tack welding along said free edges to the form of the square steel tube while continuing to advance the plate longitudinally;

welding the opposed free edges of the thus formed square steel tube from inside and outside the tube by automatic welding means;

and straightening the welded tube while the tube is further advanced.

6. Apparatus for producing a welded steel tube of relatively large square cross section comprising:

conveying means for advancing a flat steel plate having a minimum thickness of substantially 9mm longitudinally thereof;

means for preparing the opposed longitudinal large square cross section comprising:

conveying means for advancing a flat steel plate longitudinally thereof;

means for preparing the opposed longitudinal edges of the plate for welding,

means for bending the steel plate approximately to the shape of the square steel tube to be produced in which opposed free edges of the plate extend longitudinally and in spaced relation;

means for further shaping the bent plate to the square steel tube and for bringing said free edges into abutting relation;

tack welding means for tack welding said tube longitudinally along said free edges;

automatic welding means for welding the opposed free edges of the bent steel plate from inside and from outside the tube;

and means for straightening the square tube after welding;

said conveying means being adapted to advance the steel plate sequentially and continuously from said edge - preparing means to said straightening means.

4,099,663
SEVERING WIRE OR RIBBON MATERIAL ADJACENT AN ATTACHMENT POINT, SUCH AS A SOLDER, BOND OR WELD CONNECTION, PARTICULARLY IN SEMICONDUCTOR AND THIN FILM STRUCTURES

Klaus Brill, Korntal, and Günter Schmid, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 11, 1977, Ser. No. 776,737
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616521
Int. Cl.² B23K *31/02*
U.S. Cl. 228—159 **15 Claims**

1. Method to attach a strand (1) such as by a solder, bond, or weld connection to a substrate and then to sever the strand (1) adjacent the attachment point (2) comprising the steps of

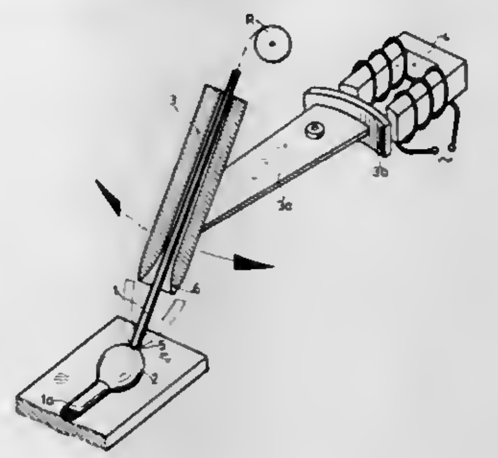
guiding the strand to the attachment point (2);

attaching the strand;

subjecting the stand to repetitive bending stresses and continuing the bending stresses until the materials fails by moving the strand as guided, repetitively in a direction essentially perpendicular to the major axis of the strand.

6. Wire guiding and severing apparatus to sever a strand (1) having a central axis adjacent an attachment point (2) such as a solder, bond or weld connection, comprising

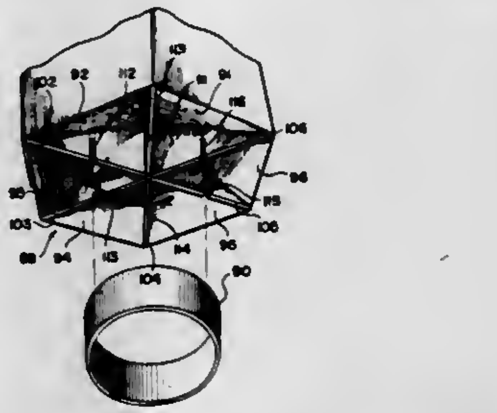
a guide element (3) having a body with an opening formed therein just slightly larger than the strand (1) to guide the strand with slight clearance above its axis;



and a vibrating apparatus (4) coupled to the guide element (3) and vibrating the guide element in a direction essentially perpendicular to the axis of the strand.

4,099,664
BOTTOM SECUREMENT DEVICE FOR POLYGONAL CARTON WITH BOTTOM REINFORCING RIBS

Walter B. Swan, 1400 W. 44th St., Chicago, Ill. 60609
Continuation-in-part of Ser. No. 719,245, Aug. 31, 1976, which is a division of Ser. No. 601,593, Aug. 4, 1975, Pat. No. 3,977,594.
This application Sep. 1, 1976, Ser. No. 719,405
Int. Cl.² B65D *5/12*
U.S. Cl. 229—5.7 **6 Claims**



1. In a polygonal carton having a plurality of side panels and a strong, weight supporting bottom comprising a plurality of generally triangular bottom panels equal in number to the side panels and a plurality of interconnecting webs each extending between a pair of adjacent bottom panels being hingedly connected to one of the side panels and being inclined upwardly from the bottom edge of the side panel to which it is connected so as to form an acute angle therewith, the improvement comprising:

a device for engaging the reinforcing ribs on the bottom of said carton to secure them in place thereby also to secure the bottom panels in place, said device being generally disc shaped with a plate portion and protrusions extending upwardly from one side of said plate portion, said protrusions being configured and dimensioned to be received between adjacent ribs for holding and securing the ribs in place.

4,099,665

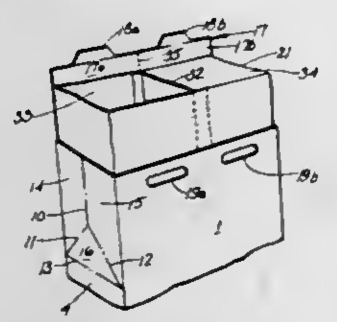
RECLOSABLE CARTON WITH TAPERED TOP CLOSURE

Robert M. Bergstein, Cincinnati, Ohio, assignor to The Bergstein Packaging Trust, Middletown, Ohio

Filed Feb. 22, 1977, Ser. No. 770,640

Int. Cl.^{2} B65D *5/56*

U.S. Cl. 220—403 **3 Claims**



1. A prelined reclosable carton formed from a knocked-down tubular carton structure having opposing side and end walls with bottom closure flaps at their lowermost ends, a tubular liner in said carton having its mouth extending upwardly beyond the uppermost ends of said side and end walls, said liner being adhered to the opposing side walls of said carton as an incident of forming the knocked-down carton structure, said carton end walls being scored to define sets of bellows-like gussets extending downwardly from the uppermost edges of said end walls, each of said sets of gussets being defined by a centrally disposed vertical line of fold extending downwardly from the upper edge of the end wall in which it is formed, said vertical line of fold terminating at its bottom end in a pair of diagonally disposed lines of fold extending downwardly and outwardly to the opposite side edges of the end wall, said lines of fold defining an opposing pair of gussets connected to each other along said vertical line of fold, said sets of gussets, upon erection of said carton body walls relative to each other, being displaceable inwardly between said opposing side walls along said centrally disposed vertical lines of fold and said diagonally disposed lines of fold so as to cause the upper portions of the opposing side walls to flex inwardly relative to each other to form a tapered top closure in which the uppermost edges of said side walls are juxtaposed, said centrally disposed lines of fold, upon inward displacement of said gussets, defining folding edges acting to fold inwardly the portions of the liner mouth contacted thereby to form pleats lying between the opposite sides of the liner mouth, the opposite sides of the liner mouth being concurrently flattened by the upper ends of the side walls as they are flexed inwardly and juxtaposed, with the pleats engaged between the opposite sides of the flattened liner mouth, thereby automatically forming a neatly folded liner mouth as an incident of closing said carton, a closure flap hingedly connected to the upper edge of one of said side walls, said closure flap being infoldable over the uppermost edge of the other of said side walls, whereby as the said closure flap is infolded, the flattened and pleated liner mouth also will be folded over the upper edge of said other side wall, and means for releasably maintaining said closure flap in its folded over position, whereby the mouth of the liner is automatically folded and maintained in its folded condition to form a tight closure for the carton.

4,099,666

COMPOSITE BAG FOR HARD CRUSTED BAKERY PRODUCTS

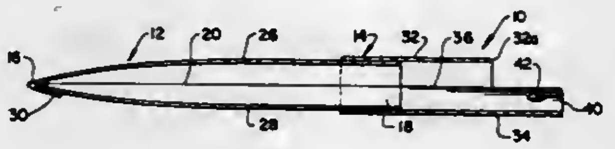
Theodore W. Welles, 20849 Halworth Rd., Shaker Heights, Ohio 44122

Filed Jun. 27, 1977, Ser. No. 810,300

Int. Cl.^{2} B65D *33/16*

U.S. Cl. 229—62 **13 Claims**

1. A pre-formed composite bag for crusted bread products comprising, a first bag portion of paper material having opposite ends and a single longitudinal seam between said ends, portions of the material at one of said ends being secured together to close said one end, and a second bag portion defined by first and second films of plastic material having inner and outer ends and having corresponding opposite side edges longitudinally sealed together providing a pair of parallel longitudinal seams between said inner and outer ends, the other of said opposite ends of said first bag portion being longitudinally received between said inner ends of said films and secured thereto laterally between said pair of seams, and said outer ends of said films providing an opening into said composite bag constrictable to completely enclose an article in said bag.



4,099,667

APPARATUS FOR PREVENTING VIBRATION IN A CENTRIFUGAL SEPARATOR

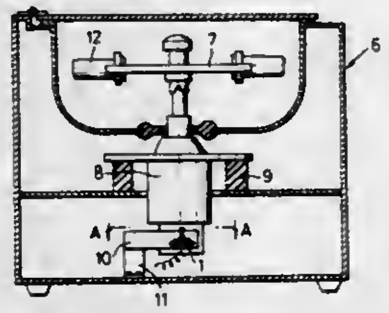
Tadahiro Uchida, Sayama, Japan, assignor to Kabushiki Kaisha Knbota Seisakusho, Tokyo, Japan

Filed Feb. 17, 1977, Ser. No. 769,718

Claims priority, application Japan, Jul. 9, 1976, 51-90450

Int. Cl.^{2} B04B *9/02*

U.S. Cl. 233—24 **9 Claims**



1. In a centrifugal separator having an upright electric motor resiliently supported in a casing and adapted to drive a rotor in rotation, an improvement comprising vibration sensitive means coupled to the motor to control energization thereof, and means supporting said vibration sensitive means in pressure contact with said motor such that if said motor undergoes excessive vibration, said vibration sensitive means deactivates the motor, said means supporting said vibration sensitive means comprising a resilient arm carrying said vibration sensitive means, said motor comprising a casing, said arm being in lateral pressure contact with said casing to respond to radial vibration of the casing of the motor and thereby transmit only such radial vibration to said vibration sensitive means.

4,099,668

MONITORING CIRCUIT

Michal M. Feilchenfeld, Pittsburgh; Kenneth E. Daggett, Monroeville, both of Pa., and Raymond A. Lloyd, Laurel, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 29, 1976, Ser. No. 736,796

Int. Cl.^{2} G06F *11/00;* **G01R** *15/12*

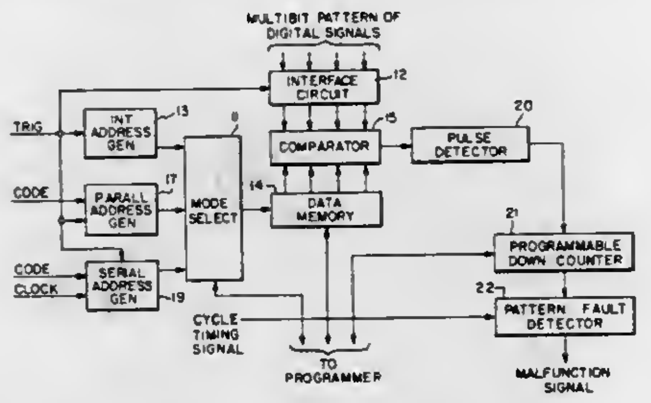
U.S. Cl. 235—304 **5 Claims**

1. A monitoring circuit comprising;

(a) input means for accepting multibit digital signals indicative of the operational status of a device being monitored;

(b) digital storage means having stored therein at predetermined address locations a plurality of multibit digital signals having a predetermined relationship to said multibit digital signals indicative of the operational status of the device being monitored;

(c) means for sequentially reading said stored multibit digital signals and for comparing each of said stored multibit digital signals to each of said signals indicative of the operational status of the device being monitored to generate a pulse each time one of said signals indicative of the operational status of the device being monitored is found to be identical to one of said stored multibit digital signals;



(e) counter means responsive to said pulse to generate a digital number indicative of the number of said pulses which occur within a predetermined time period;

(f) fault detector means responsive to said digital number to generate a malfunction signal if said digital number is less than a preselected value.

4,099,669

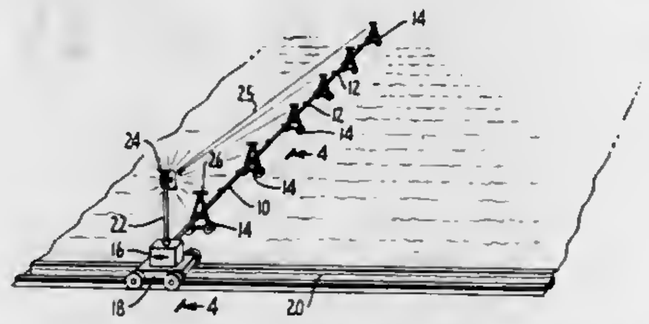
GUIDANCE CONTROL SYSTEM FOR SELF-PROPELLED MOBILE SPRINKLER IRRIGATION SYSTEMS

Dean A. Cortopassi, 11292 N. Alpine Rd., Stockton, Calif. 95205

Filed Dec. 6, 1976, Ser. No. 748,124

Int. Cl.^{2} B05B *3/18*

U.S. Cl. 239—11 **11 Claims**



11. A method for controlling the movement of a self-propelled irrigation system in which a supply pipe carrying a plurality of sprinklers is coupled to a source of irrigation water under pressure and is supported above the ground by a plurality of spaced carriages each having propulsion means, said method comprising the steps of:

generating a generally vertical plane of laser energy directed along said supply pipe;

moving the vertical laser plane forward relative to the carriages;

sensing the position of the laser plane relative to the respective carriages and propelling said carriages in response to the sensed position to maintain the carriages in general alignment with the plane.

4,099,670

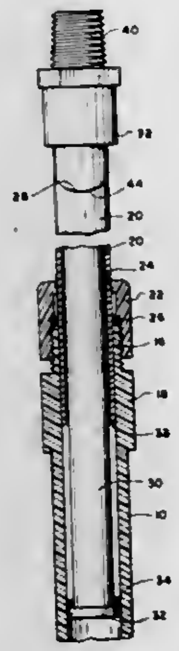
ADJUSTABLE HEIGHT SPRINKLER

Judson C. Cole, 1318 E. 25 St., Tulsa, Okla. 74114, and Eldon W. Morain, 7305 S. 73 E. Ave., Broken Arrow, Okla. 74012

Filed Jan. 24, 1977, Ser. No. 761,798

Int. Cl.^{2} B05B *15/10*

U.S. Cl. 239—205 **3 Claims**



1. An adjustable height sprinkling apparatus comprising:

a tubular base member adapted to be buried vertically in the ground having a threaded upper end adjacent the ground surface and having means at the lower end for connection to a source of water pressure;

a tubular extension member telescopically received in said base member;

a coupling member threadably attached to said base member threaded upper end having an opening slidably receiving said extension member and having gasket means for leak-proof locking said extension member to said base member in selectable telescopic relationship;

a tubular pop-up member slidably and telescopically received in said tubular extension, said pop-up member being longer than said extension member and including a flange affixed to the lower end of said pop-up member below the lower end of said extension member, the flange being of outside diameter less than said base member internal diameter the flange serving to limit the upper travel of said pop-up member by engagement with the lower end of said extension member, and the pop-up member having means at the upper end thereof to receive a spray head, the pop-up member being normally downwardly displaced relative to said extension member by gravity and being upwardly displaced by water pressure.

4,099,671

DEVICE FOR CONTROL OF AN AIRCRAFT

Heinrich Leibach, Grafrath-Wildenroth, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,771

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540537

Int. Cl.^{2} B64C *15/04*

U.S. Cl. 239—265.29 **14 Claims**

1. Control apparatus for an aircraft comprising:

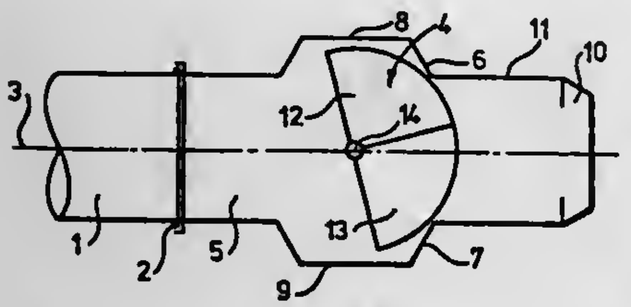
a gas control housing disposed downstream of a means for supplying jet propulsion gases thereto,

propulsion nozzle means disposed on the downstream end of said control housing in alignment with a longitudinal axis through said control housing,

lateral control outlet means extending laterally from said gas control housing at respective opposite lateral sides thereof, and

two control valve members, each swingable about an axis running cross-wise to said longitudinal axis,

(i) one of said control valve members being configured and controllable to selectively block totally the flow of propulsion gases to said propulsion nozzle means, and



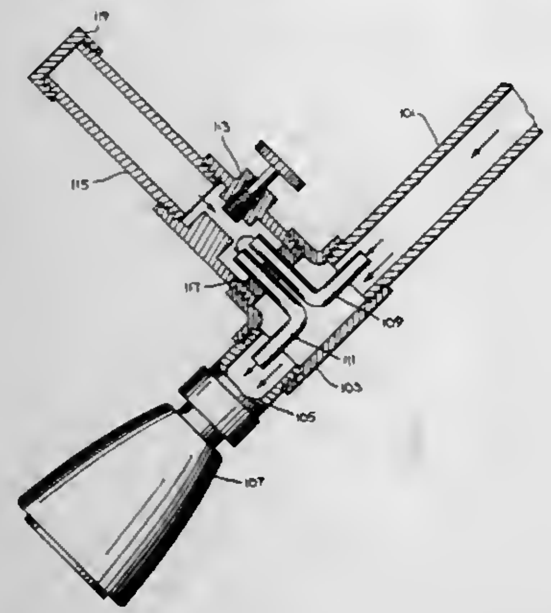
(ii) said control valve members being configured and controllable together to selectively block totally the flow of propulsion gases to said propulsion nozzle means and simultaneously to selectively block at least partially the flow of propulsion gases to at least one of said lateral control outlet means,

whereby steering of said aircraft may be effected by the selective change in flow direction of said propulsion gases.

4,099,672
SHOWER-HEAD FIXTURE

Ray Albert Sheahan, and Dorothy Marie Sheahan, both of 6160 S. 6th St. W26, Milwaukee, Wis.

Filed Feb. 28, 1977, Ser. No. 772,516
Int. Cl.² B05B *7/28*
U.S. Cl. 239—317 **3 Claims**



1. An oil-water mixing device for use in a shower comprising:

a. an oil container for holding an oil supply;

b. first elbow means for directing a portion of supply water into the container from a supply pipe, thereby mixing the oil and the water;

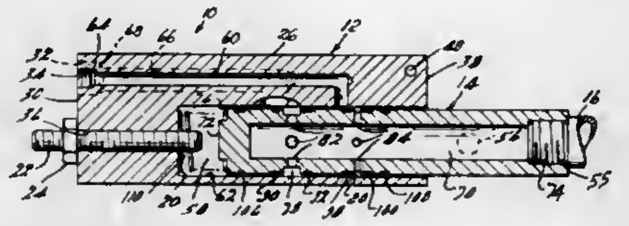
c. second elbow means for returning the mixture from the container to the water stream; and

d. valve means between the first and second elbow means and the container for controlling the amount of oil to be mixed with the water.

4,099,673
SPRAY GUN DEVICE

Allan B. Heath, and Engene E. Wolfe, both of Port Huron, Mich., assignors to Achesoo Industries, Inc., Port Huron, Mich.

Filed Jul. 12, 1976, Ser. No. 702,498
Int. Cl.² B05B *7/04*
U.S. Cl. 239—415 **23 Claims**



1. In a spray gun device for applying lubricants to the working surfaces of forming apparatus the improvement comprising:

a main body housing having an elongated bore provided in one end thereof;

an elongated valve core member movably disposed within said bore and extending outwardly from said one end of said housing and adapted to selectively control the flow of two or more fluids through said spray gun;

actuating means for selectively moving said valve core member relative to said main body housing;

adjustable means adapted to engage a portion of said valve core member so as to limit the movement of said valve core member in one direction;

at least first and second fluid passageways provided in said main body housing, first and second fluid inlet passageways provided on said valve core member, said valve core member being continuously movable between an off position in which said first and second fluid inlet passageways do not communicate with said first and second fluid passageways thereby preventing the flow of fluids through said spray gun to a first position in which only said first fluid passageway communicates with said first fluid inlet passageway and to a second position in which both said first and second fluid passageways communicate with respective of said first and second fluid inlet passageways;

a single longitudinal fluid outlet passageway provided in said valve core member and communicating with each of said first and second fluid inlet passageways; and

said first fluid inlet passageway comprises an annular groove provided on the periphery of said valve core member and a plurality of inwardly extending apertures extending from said groove to said fluid outlet passageway, and said second fluid inlet passageway comprises a second annular groove provided on the periphery of said valve core member and a plurality of inwardly extending apertures extending from said groove to said fluid outlet passageway, said first and second annular grooves being spaced apart a predetermined distance.

4,099,674
NOZZLE MEMBER FOR A CONTAINER WASHING APPARATUS

Wendell Evert Standley, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

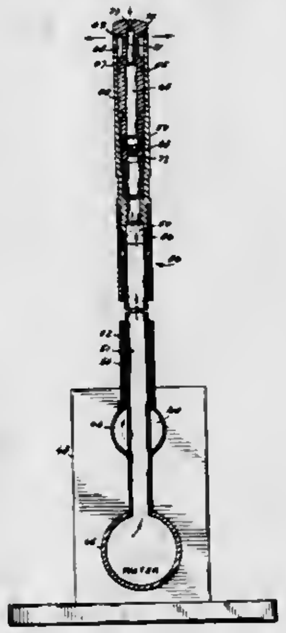
Continuation of Ser. No. 660,587, Feb. 23, 1976, abandoned. This application May 26, 1977, Ser. No. 800,777
Int. Cl.² A47L *15/00;* **B05B** *7/00;* **B67C** *1/00*
U.S. Cl. 239—431 **5 Claims**

1. A nozzle member for use in a washing apparatus to introduce high velocity fluid and a cleaning material into a container for cleaning purposes comprising:

a first conduit means and second conduit means spaced from first conduit means to provide a passage,

a nozzle head member in fluid-tight communication with said first and second conduit means defining a common chamber extending along a longitudinal axis of said nozzle member for mixing said fluid and cleaning material,

at least one first annular aperture communicating with said common chamber to the outside of said nozzle head member, said annular aperture having at least one wall extending substantially transverse to the longitudinal axis of said nozzle member and a second aperture communicating with said common chamber and defined by a wall having an axis substantially parallel with the longitudinal axis of the nozzle member and extending from the nozzle head member and to the outside of said nozzle head member and spaced from said first aperture, said second aperture constructed and arranged to discharge a fluid stream that is essentially parallel to the longitudinal axis of said nozzle member and said first aperture constructed and arranged to discharge a fluid stream that is essentially transverse thereto,



inner and outer pipe members defining said nozzle head member,

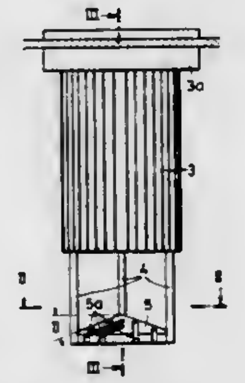
said pipe members being internally threaded to each other, and

adjustment means operatively associated with said inner pipe member to afford internal adjustment and locking of said inner pipe member.

4,099,675
SPRINKLER HEAD FOR WATER SPRAY COOLING INSTALLATIONS

Hans-Jöachim Wohler, Bochum-Dahlhausen, and Walter Ilse, Bochum, both of Germany, assignors to Balcke-Durr AG, Ratingen, Germany

Filed Jul. 26, 1976, Ser. No. 708,630
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533021; Jan. 16, 1976, 2626948
Int. Cl.² B05B *1/26*
U.S. Cl. 239—498 **18 Claims**



1. A sprinkler head particularly suited for water spray cooling installations, where hot water flows through horizontal water distribution conduits or water distribution channels and is to be sprayed onto heat transfer structures thereunder, as it exits through a plurality of sprinkler heads mounted on a bottom wall of said distribution conduit or distribution channel, the sprinkler head comprising in combination:

a downwardly oriented spray pipe attached to the bottom wall of the distribution conduit or distribution channel and communicating with the inside thereof to serve as an outlet, the spray pipe having a mouth portion at its lower extremity;

at least one spray plate arranged centrally underneath the mouth portion of the spray pipe, so as to face upwardly against the latter; and

means for carrying and holding the spray plate in said position against the impact of an impinging stream of liquid exiting from the mouth portion of the spray pipe; and wherein

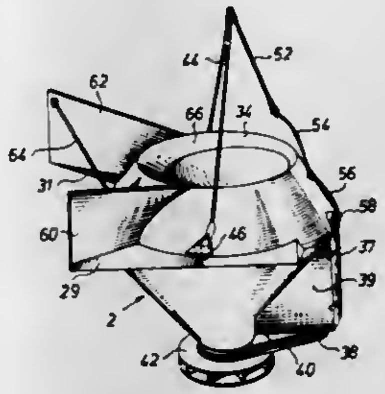
the spray plate has an outwardly and downwardly sloping upper surface of which an impinging stream of liquid is deflected and spread into a generally cone-shaped divergent spray pattern; and

the spray plate further has extending through it a plurality of apertures through which a portion of said liquid stream can pass downwardly so as to cover an area which is located centrally within said spray pattern, said apertures being spray distributor slots extending inwardly from the periphery of the spray plate, forming a slot pattern in which groups of parallel, secantially oriented slots follow each other in a regular angular succession, whereby the slots of angularly adjacent slot groups are oriented substantially transversely to each other and the inner extremities of one group of slots are spaced substantially the same distance from the nearest slot of the adjacent group of slots.

4,099,676
APPARATUS FOR SPREADING FERTILIZER, PLANT KILLER OR SIMILAR AGENTS FROM AN AIRCRAFT

Thore Sterner, and Arne Johansson, both of Borlange, Sweden, assignors to Sterner Aero Aktiebolag, Borlange, Sweden

Filed Jan. 14, 1976, Ser. No. 695,321
Int. Cl.² A01C *17/00*
U.S. Cl. 239—687 **6 Claims**



1. Apparatus for spreading granulated agents from an aircraft comprising a container containing agents and being constructed and arranged to be removably attached to an aircraft, said container defining a first opening, rotating dispersion means connected to said container in communication with said first opening for spreading agent to the surrounding area, stabilizing means secured to said container for keeping the container in a predetermined attitude relative to the aircraft including two fins having surfaces of different sizes attached to the rear portion of the container and forming an acute angle with a vertical plane parallel to the direction of flight of the aircraft for keeping the central axis of the container substantially in a predetermined position parallel with the flight direc-

tion of the aircraft when the dispersion device rotates, substantially independent of the amount of agent in the container and the flying speed of the aircraft.

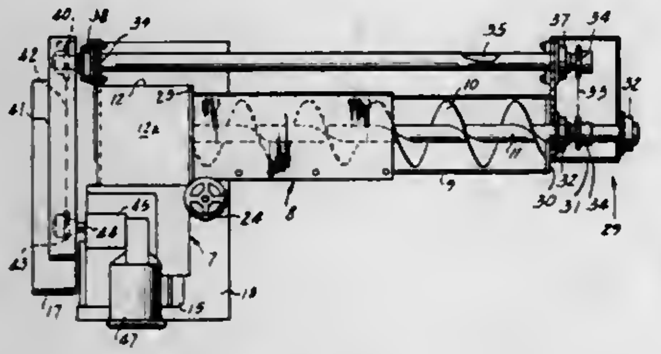
4,099,677
AUGER FEED GRANULATOR

Donald B. DeNoyer, Beloit, Wis., assignor to Sterling, Inc., Milwaukee, Wis.

Filed Dec. 12, 1974, Ser. No. 531,882

Int. Cl.² B02C *13/286*

U.S. Cl. 241—186 A **7 Claims**



1. In an auger feed granulator for conveying and granulating plastic material having a granulator assembly and a conveyor assembly, said conveyor assembly including a trough and an auger, the trough and auger each having inlet and discharge ends, said discharge ends communicating with the granulator assembly, the improvement comprising:

said conveyor assembly being supported from said granulator assembly in a cantilevered manner;

power means being supported from said granulator assembly in a cantilevered manner;

said power means include a jack shaft extending in spaced parallel relation along one side of said trough, and means associated with said granulator assembly comprising a power source coupled in driving relation to said jack shaft;

said power source comprising a motor supported by said granulator assembly;

said power means drivingly connected to said auger through said jack shaft at the inlet end thereof;

said auger at the discharge end thereof terminating substantially adjacent to the entrance of the granulator assembly, to effect free discharge of material from the conveyor assembly into the granulator assembly.

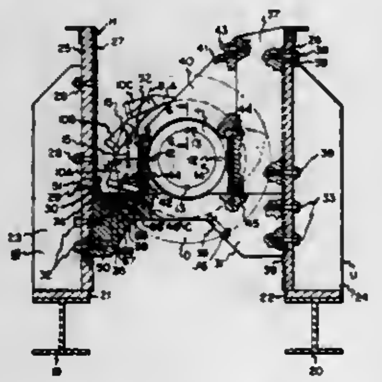
4,099,678
SHREDDER STRUCTURE AND IMPROVEMENTS THEREIN

John C. Brewer, Salt Lake, Utah, assignor to Garbalizer Machinery Corporation, Salt Lake City, Utah

Filed May 31, 1977, Ser. No. 801,654

Int. Cl.² B02C *18/16*

U.S. Cl. 241—243 **4 Claims**



1. A shredder including, in combination, a side plate, a journalled, revolvable shaft disposed parallel to said side plate; a series of mutually-spaced cutter blades mounted on said shaft; a series of stationary cutter bars having upper edges and being fixedly disposed with respect to said side plate; cutter bar segments releasably secured to said cutter bars, respectively, proximate said upper edges and being cooperatively disposed relative to said cutter blades, respectively; a series of webs, transversely positioned relative to said side plate, disposed over portions of respective ones of said cutter bar segments, and having upper declining edges forming with said side plate a constricting travel path for materials progressing toward said cutter bars at uncovered portions of said cutter bar segments, and wherein each of said webs comprises a stationary first web member aligned with a respective one of said cutter bars, and web means apertured to receive said shaft.

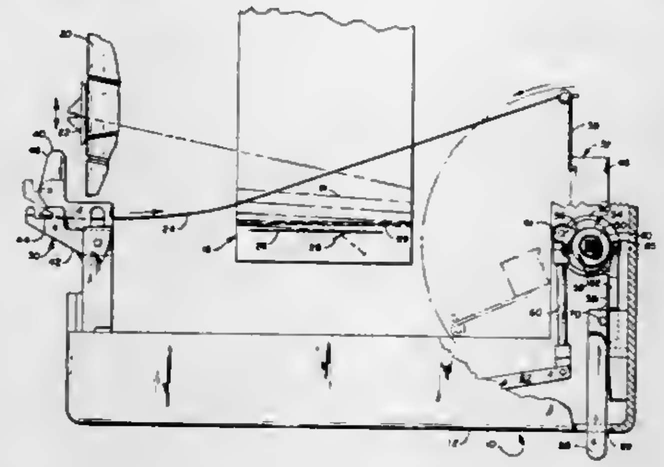
4,099,679
DUAL YARN TIE-UP AND TRANSFER TAIL APPARATUS

Joseph R. De Baker, Kingsport, and Albert E. Spaller, Jr., Johnson City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,274

Int. Cl.² B65H *54/02, 54/34*

U.S. Cl. 242—18 PW **16 Claims**



1. Apparatus for tying-up a yarn to and for forming a yarn transfer tail on a yarn package tube that is supported on a rotating mandrel of a yarn winder, the yarn moving continuously from a source of supply to the yarn package tube for engagement with a portion of the surface thereof and away from the tube, as into an air doffer, the portion of said surface to be engaged rotating in the same direction as the direction of yarn movement, the yarn winder having a self-threading yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the supported yarn package tube comprising:

(a) a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of the cylindrical body and extending at least partly around said cylindrical body in a plane substantially perpendicular to the rotation axis of the tube, and

(b) the cylindrical body also having adjacent the one side wall of the groove closest to said one end of the cylindrical body means defining a corner intersecting said one side wall of the groove and pointing generally in the direction of intended rotation of the tube, which is adapted in rotary winding operations, as a yarn enters the groove in one direction of movement, to snag and deflect a portion of the yarn exiting from the groove around said corner for changing the direction of movement of the exiting yarn portion as said corner rotates with the tube away from where the yarn approaches said surface portion of the tube;

the apparatus comprising:

means for positioning the yarn in engagement with said surface portion of the yarn tube in a partial arch at an initial location along the tube length that is away from and out of contact with the groove and the corner;

said positioning means including a first and second yarn guide means through each of which the yarn is threaded, the first yarn guide means being mounted at a position along the length of one side of the yarn package tube, the position being slighly axially inwardly of alignment with the groove on the yarn package tube and the second yarn guide means being mounted at a position along the length of the other side of the yarn package tube axially inwardly of alignment with said groove;

means for releasing and moving said second yarn guide means along a path of movement relative to said other side of the yarn tube for guiding the yarn sideways along said surface portion of the tube from said initial location toward said groove and corner until the yarn drops into the grooves and the portion of the yarn exiting from the groove becomes snagged and deflected around the corner as the corner rotates with the tube away from where the yarn approaches said surface portion of the tube, and consequently tying-up the yarn to the tube and subsequently snapping and severing the yarn from the yarn moving away from the tube and through the second yarn guide means;

said first yarn guide means, upon said snapping and severing of the yarn, adapted to guide the continuously moving yarn onto the tube into a predetermined number of wraps as the tube rotates to form a waste bunch at a location that is axially inwardly along the tube length from the groove; and

means for releasing and moving said first yarn guide means along a path of movement relative to said one side of the yarn tube axially inwardly from the groove and corner, after formation of the yarn waste bunch, for guiding the continuously moving yarn onto the tube into a predetermined number of spaced helical wraps as the tube rotates, to form a transfer tail at a location that is axially inwardly along the tube length from the waste bunch;

said first yarn guide means adapted as it moves along its path of movement to release the guided yarn for subsequent pick-up by the yarn traverse guide for guiding the yarn as the yarn is thereafter wound on the package portion of the yarn package tube at a location that is axially inwardly from the transfer tail.

4,099,680
WINDER FOR YARN AND THE LIKE

Harry B. Miller, Hopedale, Mass., assignor to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft, Karlsruhe, Fed. Rep. of Germany

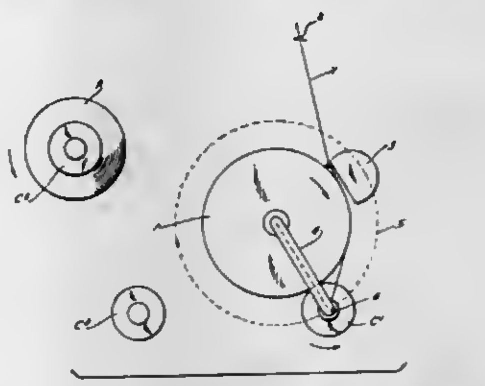
Continuation of Ser. No. 556,556, Mar. 7, 1975, Pat. No. 4,034,923, which is a continuation-in-part of Ser. No. 354,920, Apr. 26, 1973, Pat. No. 3,876,161. This application Feb. 10, 1977, Ser. No. 767,667

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.² B65H *54/02, 67/04*

U.S. Cl. 242—18 A **5 Claims**

1. In a winder for yarn and the like, a combination comprising a drive roll having an axis of rotation; at least two rotatable chucks each adapted to have a yarn package formed thereon, said chucks each having an axial end and being movable into and out of driven engagement with said drive roll; a traversing arrangement for traversing a running yarn which is being wound onto one of said chucks, so as to form a yarn package on the latter; and yarn transfer means for effecting automatic transfer of said running yarn from said one chuck upon forming of the yarn package thereon to the empty other chuck while the same is in driven engagement with said drive roll, including an arm on said drive roll turnable about said axis of rotation thereof and having a free end portion arranged to travel in a path adjacent the axial end of said other chuck and intersecting the axis of rotation of the latter.



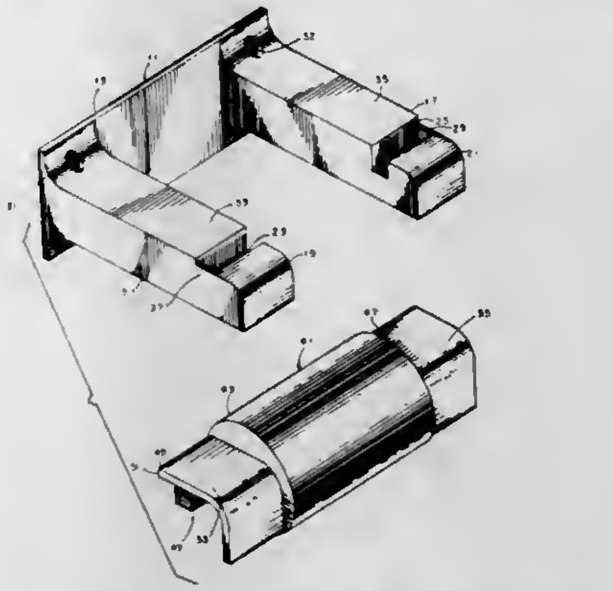
4,099,681
BLADE-TYPE HOLDER FOR PAPER ROLLS

Bennie L. House, P.O. Box 577, Hickory Ridge, Ark. 72347

Filed Mar. 17, 1977, Ser. No. 778,348

Int. Cl.² B65H *19/00*

U.S. Cl. 242—55.2 **10 Claims**



1. A holder for a paper roll comprising

a pair of arms each having a length greater than the radius of a full paper roll and having a width about the same as its depth,

said arms having means for mounting the same extending in parallel orientation from a wall surface,

at least one of said arms having a slot near the end thereof extending into the arm from the top, and

a spindle having at an end a blade conforming in shape at least in part to the interior configuration of said slot.

4,099,682
AUTOMATIC WEB WINDER

Alfred L. Benuska, Naperville, Ill., assignor to V.I.P. Engineered Products Corporation, Elk Grove Village, Ill.

Filed Mar. 14, 1977, Ser. No. 777,125

Int. Cl.² B65H *19/20, 17/02*

U.S. Cl. 242—56 R **9 Claims**

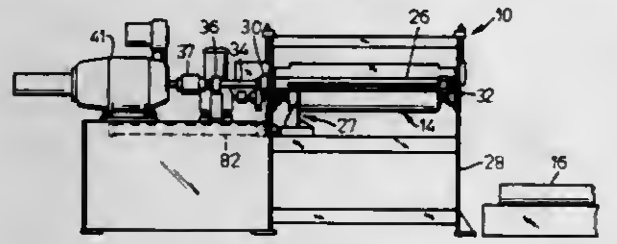
1. In a web winder having a base, a measuring assembly, a feed assembly and a cutting assembly mounted on said base in a series relation, and a control system for synchronizing the operation of the measuring, feed and cutting assemblies, the improvement comprising:

a web roll mandrel assembly mounted on the base in a position to receive the lead end of the web, said assembly including

a slotted mandrel,

means for driving said mandrel to wind the web into a roll of predetermined length, said driving means being rotatable in either direction,

and means connected to said drive motor for providing a signal to the control system indicating the rotary position of the slot in said mandrel whereby said mandrel can be automatically rotated in either direction to orient the slot in the mandrel to receive the lead end of the web in the shortest angular motion.



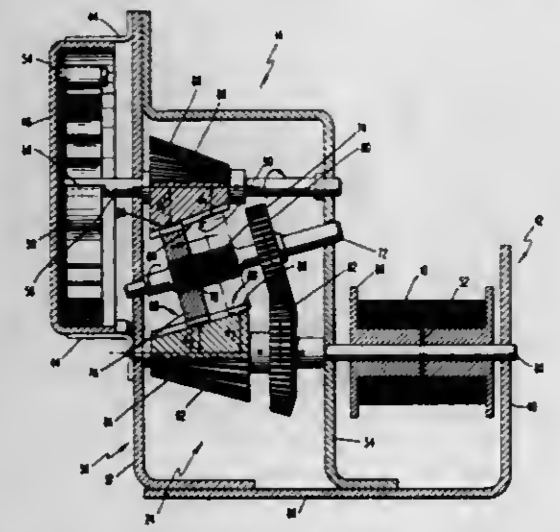
4,099,683
CONSTANT PULL SAFETY BELT RETRACTING MECHANISM

Richard C. Stouffer, Anburn Heights, and John Adams, Grosse Pointe Woods, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County County, N.J.

Filed Feb. 2, 1977, Ser. No. 764,945

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 **12 Claims**



1. In a vehicle safety system including a safety belt adapted to restrain an occupant in position on a seat, a safety belt constant pull retracting mechanism comprising, in combination:

a housing;

storage means for storing said safety belt, said storage means operative for retracting and protracting said belt;

positive force characteristic biasing means for biasing said storage means for retraction of said belt; and

gear train means for coupling together said biasing means and storage means, said gear train means having a negative coefficient of force transfer characteristic compensating for the positive coefficient of force transfer characteristic of said biasing means, a resultant pull applied to said belt thereby being approximately constant as said belt is protracted;

said gear train means including variable gear ratio means for varying a gear coupling ratio during protraction of said belt and comprising:

(a) first and second cone gears oriented with facing inclined sides thereof parallel to each other and mounted respectively on first and second parallel shafts; and

(b) coupling means for coupling together said cone gears at a first, high force transfer gear ratio when said belt is fully retracted, and at a second, lower force transfer gear ratio when said belt is fully protracted, said coupling means comprising a pinion gear mounted on a rod provided between said first and second shafts, said pinion gear meshing with facing sides of said cone gears; a spur gear secured to said rod and a bevel gear secured to said shaft of said second cone gear, said spur and bevel gears being in enmeshment with each other.

4,099,684
SEAT BELT SYSTEM

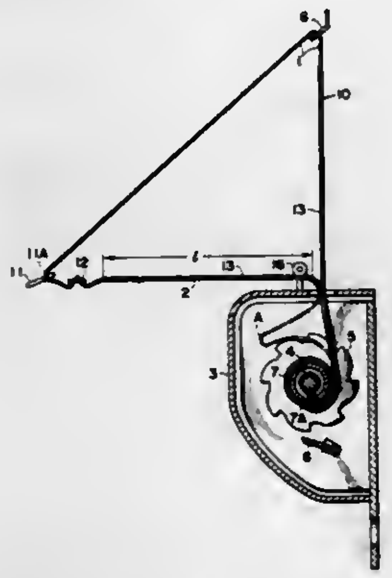
Mamoru Mori, Okazaki; Jun Yasumatsu, Toyota, and Tatsushi Kubota, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and K. K. Tokai Rika Denki Seisakusho, both of, Japan

Filed Jul. 25, 1977, Ser. No. 818,415

Claims priority, application Japan, Aug. 2, 1976, 51-103419[U]

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 **8 Claims**



1. A seat belt retractor system for winding up two seat belts on a single retractor shaft one over the other, comprising:

a base;

a retractor shaft rotatably supported by said base two seat belts coupled said retractor shaft; and

a flexible fastening means provided on both of said seat belts whereby said seat belts are easily fastened together along their length when the seat belts contact each other during retraction and are easily separated when the seat belts are separated during extension.

4,099,685
LOCKING DEVICE IN SAFETY SEAT BELTS FOR VEHICLES

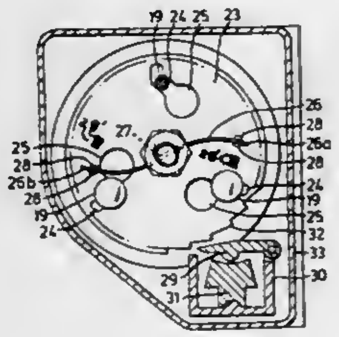
Hannu Olli Paitula, Jarna, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Dec. 7, 1976, Ser. No. 748,393

Claims priority, application Sweden, Sep. 12, 1975, 7513885

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 B **14 Claims**



1. In a locking device for safety seat belts of vehicles in which a strap of a seat belt is automatically retracted and wound onto a wind-up shaft when the seat belt is not in use to prevent rapid extension of the strap, the device including a rotatable body unrotatably attached to one end of said shaft, said body having a guiding surface and arranged to rotate with the shaft, stop means positioned outside the rotatable body and fixedly mounted in relation to the shaft, and at least one elongated locking member movable in relation to the rotatable body and positioned between the rotatable body and the stop means, the locking member being movable on the guiding surface on the rotatable body from a radially inner, free portion, in which it does not prevent rotation of the rotatable body, to a radially outer locking position, in which it engages with both the stop means and the rotatable body and, thus, prevents further turning of the rotatable body, the improvement comprising:

inertia means having a periphery and a relatively large inertia, pivotally mounted on said shaft and positioned adjacent to said rotatable body;

a respective slot provided in said inertia means for each said locking member, said slot having an outer portion extending towards said periphery and, at least at its inner portion, forming an angle with a radius passing through the inner end of the slot, a portion of said locking member extending into and being guided thereby, said inner portion of said slot guiding said locking member in its free position and said outer portion of said slot guiding said locking member in its locking position;

and spring means coupled to said rotatable body and to said inertia means for keeping said body and said inertia means in a determined angular position in relation to one another when said strap is slowly extended and for yielding when said strap is rapidly extended so that said rotatable body and said inertia means change angular position in relation to one another, whereby the locking member is moved in the slot of the inertia means from its free position to its locking position when the strap is rapidly extended.

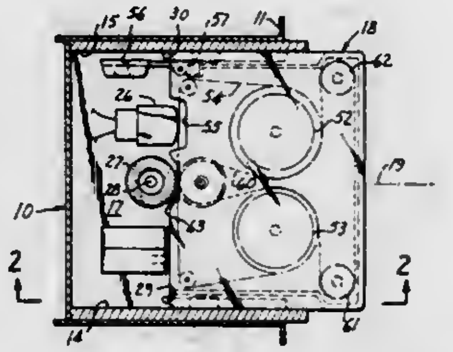
4,099,686
RECEPTACLE FOR TAPE CARTRIDGE

Ephraim F. Moya, Canoga Park, Calif., assignor to Instrumentation Technology Corp., Northridge, Calif.

Filed Feb. 7, 1977, Ser. No. 766,028

Int. Cl.² G03B *1/04;* G11B *15/32, 23/04*

U.S. Cl. 242—198 **12 Claims**



1. A receptacle for receiving a tape cartridge including tape-bearing reels and a pressure wheel for driving the tape, and a first and second axis locating face, said receptacle comprising: a first and a second side wall in part bounding a cavity, said cavity having a first axis extending in the direction of insertion and removal of the cartridge from the receptacle, and a second axis normal to the first axis and also normal to the plane of the cartridge, a second axis locating face carried by each of said side walls, and a first axis locating face carried by the receptacle, whereby the cartridge may be pressed into the cavity and the sets of first and second axis locating faces brought into abutment with one another accurately to align the tape, and bias means exerting forces along both of said axes, whereby to press both the first and second axis locating faces together in sets.

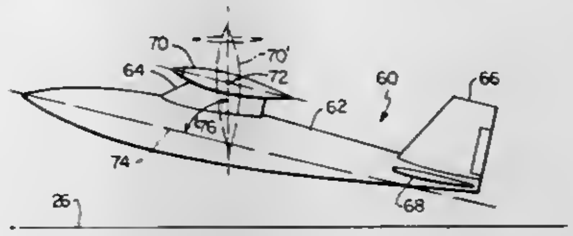
4,099,687
ALL-AXIS CONTROL OF AIRCRAFT IN DEEP STALL

Lawrence T. Roberts, 1634 A Des Moines Rd., Kent, Wash. 98031, and Thomas H. Strom, 605 Tam-O-Shanter Blvd., Williamsburg, Va. 23185

Filed Jul. 22, 1976, Ser. No. 707,789

Int. Cl.² B64C *27/28, 19/00*

U.S. Cl. 244—7 R **5 Claims**



1. A method for controlling the stalled descent of a generally conventional airplane having a fuselage with nose and tail, a fixed wing as the primary lifting surface, a rudder at the tail for yaw control, a power system for generating forward thrust substantially parallel to the longitudinal axis of said fuselage, and a generally planar fully tiltable stabilizer surface at said tail for pitch control, comprising the steps of:

reducing the airspeed of said airplane in substantially level flight and tilting said stabilizer surface, leading edge downward, to produce near stall conditions on said primary lifting surface;

further tilting said stabilizer surface with leading edge downward to induce stalling of said primary lifting surface;

further tilting said stabilizer with leading edge downward at an extreme angle of approximately 65° to 80° with respect to said longitudinal axis of said fuselage to produce deep stall of said primary lifting surface;

increasing said thrust of said power system to orient said axis of said fuselage above the horizontal with said nose higher than said tail; and

varying said engine thrust to control the rate of descent, said rate of descent being arrested when said thrust is increased and said rate of descent being accelerated when said thrust is decreased.

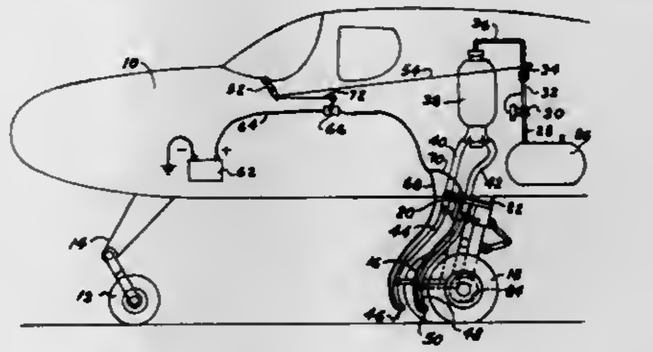
4,099,688
RUNWAY SANDER

Murray Lawrence Jayne, 1906 NE. River Ct., Jensen Beach, Fla. 33457

Filed Oct. 4, 1978, Ser. No. 729,486

Int. Cl.² B64D *47/00;* B60B *39/08*

U.S. Cl. 244—103 R **5 Claims**



2. In combination with an aircraft having an landing wheel, a system carried on the aircraft including a reservoir containing a quantity of gritty aggregate, a source of fluid under pressure, a nozzle portion in communication with the reservoir and positioned to discharge the aggregate in a region to be

engaged between said landing wheel and a surface with which said wheel is in contact, said source of fluid under pressure being separate from said reservoir containing said gritty aggregate, valve means controlling the flow of fluid from said source of fluid under pressure and a conduit connecting said valve means with said reservoir, said reservoir including an inlet having a coupling means for said conduit, and having a frangible diaphragm spaced from said conduit and positioned to seal said inlet against entrance of extraneous matter, and adapted to be ruptured by the pressure of fluid coming from said conduit.

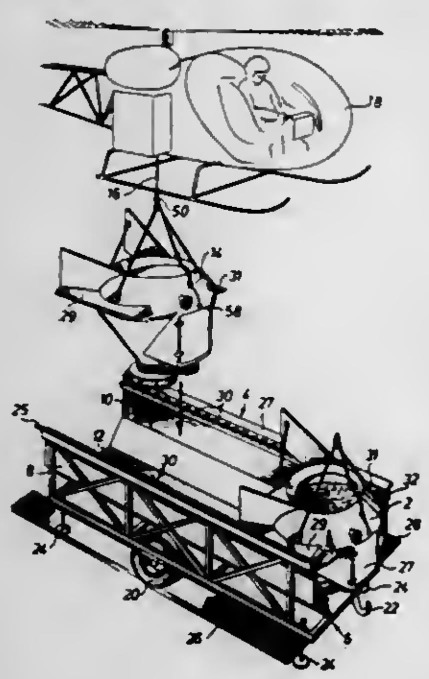
4,099,689
METHOD OF SPREADING FERTILIZER, PLANT KILLER OR SIMILAR AGENTS FROM AN AIRCRAFT

Thore Sterner, and Arne Johansson, both of Borlange, Sweden, assignors to Sterner Aero Aktiebolag, Borlange, Sweden

Division of Ser. No. 695,321, Jun. 14, 1976. This application Aug. 10, 1977, Ser. No. 823,437

Int. Cl.² B64D *1/18*

U.S. Cl. 244—136 **3 Claims**



1. A method of raising, lowering and moving by helicopter while in flight transport containers from and to a mobile station, wherein a first container filled with transport goods, which in the station is carried in a forward position in the direction of helicopter flight, is first connected to the helicopter and lifted by it from the station, whereafter a second container carried in a rear position in the direction of helicopter flight is moved in the station on carrying means attached to the station to the said forward position, whereafter the first container previously emptied of transport goods is set down by the helicopter in the station in the said rear position or in a position behind this, whereafter the helicopter is disconnected from the first container and connected to the filled second container in the forward position.

4,099,690
STABILIZED KITE

Charles Richard Mendelsohn, deceased, late of Wyckoff, N.J., by Phyllis Jane Mendelsohn, executrix, 736 Terrace Heights, Wyckoff, N.J. 07481

Filed Aug. 2, 1976, Ser. No. 710,544

Int. Cl.² B64C *31/06*

U.S. Cl. 244—153 R **13 Claims**

1. A kite comprising:

a wing portion of flexible material disposed symmetrically about a central line;

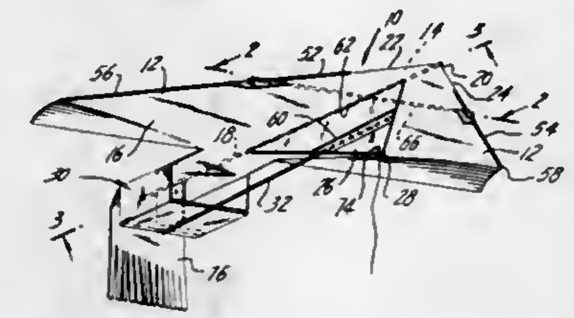
wing spreading means structurally associated with said wing portion for providing equal and opposite extension forces operable at said central line; and

stabilizer means for stabilizing the kite during flight further comprising;

a substantially triangular keel portion depending from and structurally associated with the lower surface of said wing portion being attached thereto along one end of said central line, said wing portion and said keel portion during flight being substantially perpendicular;

at least one apertured elevating cell through which air is drawn while the kite is in flight each said cell having two side walls and upper and lower walls, each said cell depending from and structurally associated with the lower surface of said wing portion along the other end of said central line; and

stabilizer strut means for holding open each said apertured elevating cell during flight being disposed between said keep portion and said lower wall of each said apertured elevating cell.



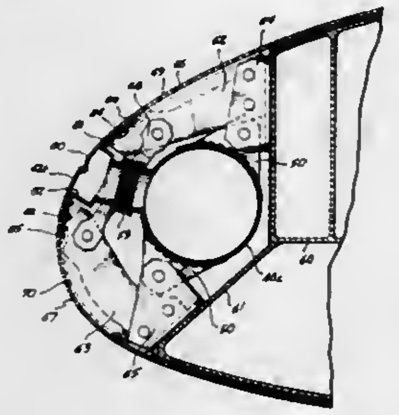
4,099,691
BOUNDARY LAYER CONTROL SYSTEM FOR AIRCRAFT

Everts W. Swanson, Edmonds, and Marvin D. Wehrman, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1976, Ser. No. 749,624

Int. Cl.² B64C *21/04*

U.S. Cl. 244—207 **1 Claim**



1. An improved boundary layer control system for aircraft for injecting controlled air, whose temperature and pressure are substantially greater than ambient temperature and pressure and which is obtained from a controllable air source, into a boundary layer region adjacent to an airfoil surface of the aircraft from a plurality of points located spanwise along at least a portion of a surface of a member of the aircraft forward of the airfoil surface, said system comprising:

(a) means defining a slot in the forward surface, said slot extending spanwise along the forward surface substantially coextensive with said portion of the forward surface from which controlled air is to be injected;

(b) a plurality of longitudinally-extending manifolds for conducting air from the controllable source thereof to points along the forward surface, each said manifold having an open inboard end and an open outboard end;

(c) means mounting said plurality of manifolds in successive spanwise arrangement within the aircraft member, said mounting means including a plurality of first supports, each of said first supports securing, in a fixed position, one of said plurality of said manifolds to the aircraft member in proximity to a respective inboard end of said one manifold, and a plurality of second supports, each of said second supports securing one of said plurality of manifolds to the aircraft member in proximity to a respective outboard end of said one manifold so that each said one manifold can expand longitudinally and thus in a spanwise direction along the aircraft member;

(d) first means interconnecting said inboard end of the most inboard one of said plurality of manifolds with the controllable air source;

(e) a plurality of second means interconnecting the inboard end of each successive outboard one of said plurality of manifolds with the outboard end of an adjacent inboard one of said plurality of manifolds, each said second means being capable of compression upon longitudinal expansion of said manifolds;

(f) a plurality of longitudinally-extending nozzle plenums, at least one said nozzle plenum being associated with a corresponding one of said plurality of manifolds, each said nozzle plenum having a closed inboard end and a closed outboard end, and further having a front wall member configured to fit into said slot and having located therealong a plurality of apertures arranged to inject air into the boundary layer region, each said nozzle plenum also having an upper tongue and a lower tongue both extending longitudinally therealong from said inboard end to said outboard end;

(g) a plurality of third means interconnecting each nozzle plenum with and supporting each nozzle plenum from a corresponding one of said plurality of manifolds so that said plurality of nozzle plenums are located within the aircraft member and in successive spanwise arrangement therealong, each said third means including first and second feeder ducts respectively located in proximity to said inboard and said outboard ends of each said nozzle plenum, said first and said second feeder ducts being capable of permitting relative longitudinal movement between said nozzle plenum and said corresponding one of said plurality of manifolds, each said third means further including a third feeder duct located intermediate said first and said second feeder ducts;

(h) means within the aircraft member defining upper and lower, longitudinal grooves respectively extending above and below and both adjacent to said slot and receiving said upper and lower tongues of said plurality of said nozzle plenums for permitting said nozzle plenums to move longitudinally relative to the aircraft member and for maintaining said front wall member of each said nozzle plenum substantially flush with the forward surface, the outboard end of each said nozzle plenum being adjacent to and separated from the inboard end of an adjacent, outboard one of said nozzle plenums in assembly; and

(i) a plurality of sealing means for substantially blocking airflow through said slot between adjacent nozzle plenums, each said sealing means comprising: an upper plate and a lower plate secured to said front wall member at the outboard end of each said nozzle plenum and respectively above and below said apertures therein, said upper and lower plates extending over the inboard end of the front wall member of the adjacent, outboard one of the nozzle plenums and being configured to permit airflow from the plurality of apertures in said adjacent, outboard one of said nozzle plenums upon relative longitudinal movement of said adjacent nozzle plenums; and, flexible means located within said aircraft member and having a longitudinal dimension sufficient to cover the outboard and inboard ends of adjacent nozzle plenums and the separation therebetween, said flexible means being secured to the aircraft member at points in proximity to said outboard and inboard ends of adjacent nozzle plenums.

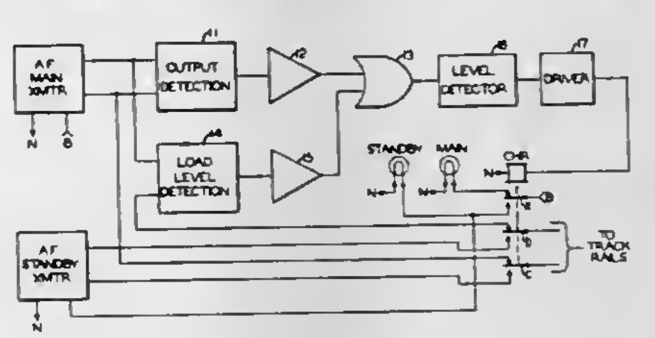
4,099,692
TRANSFER APPARATUS FOR ENERGY SOURCES

Dick J. Kolkman, Gibsonia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Apr. 14, 1977, Ser. No. 787,659

Int. Cl.² H02J *9/06*

U.S. Cl. 246—34 CT **10 Claims**



1. Transfer apparatus for shifting between a main and a standby energy source for supplying a variable load network, comprising in combination,

(a) a first monitoring means coupled to said main source for detecting the unloaded output and responsive thereto for producing a first operational signal when that unloaded output exceeds a predetermined operating level,

(b) a second monitoring means coupled between said main source and said load network for detecting the output of said main source when said network is heavily loaded and responsive to the detection of at least a preselected operating level of said main source for producing a second operational signal,

(c) circuit means coupled to said first and said second monitoring means and responsive to an operational signal from either for producing a source operating indication signal, and

(d) a registry means coupled for registering an operating indication signal received from said circuit means and controlling the source connections to said load network for connecting said main source to said load network when an operating indication signal is registered and transferring said connections to said standby source in the absence of a registered signal.

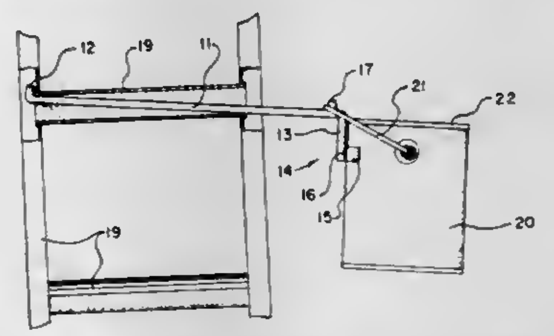
4,099,693
CONTAINER SUPPORT

Ellis L. Blann, 213 Oak Leaf Dr., Wilmington, N.C. 28401

Filed Oct. 22, 1976, Ser. No. 734,825

Int. Cl.² E06C *7/14*

U.S. Cl. 248—210 **6 Claims**

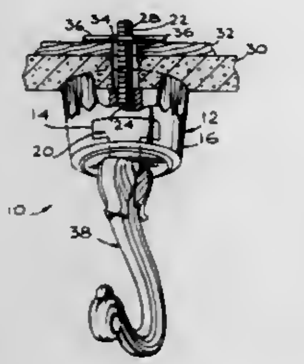


1. A container support comprising: an aluminum type ladder having hollow rungs; an elongated rod-like member of relatively small diameter compared to the interior diameter of said hollow rungs; an upturned hook portion bent at an angle of approximately 90° forming one end of said elongated member and adapted to pass through a hollow rung of said ladder; a downturned bracket portion forming the end of said elongated portion opposite said hook portion whereby a Z-shaped member is provided; a bail engaging member provided on said elongated portion adjacent said bracket portion; and a container side engaging means provided adjacent the end of said

bracket portion opposite said elongated member whereby a container support is provided for use in conjunction with said aluminum type ladder wherein the weight of said container on one end of said support will cause a positive locking effect between the opposite 90° upturned end portion and said ladder.

4,099,694
SWIVEL HOOK ASSEMBLY

Howard James Horwitz, Hidden Hills, Calif., assignor to Spencer G. Horwitz, Tarzana, Calif., a part interest
Filed Oct. 29, 1976, Ser. No. 736,764
Int. Cl.² F16B *45/00*
U.S. Cl. 248—339 **9 Claims**

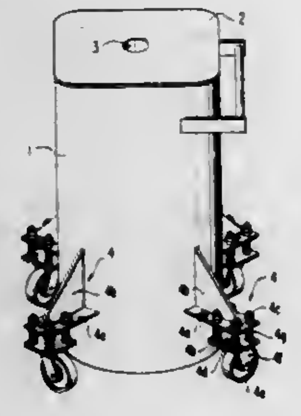


1. An improved swivel hook assembly, said assembly comprising, in combination:

- a. a housing having
  - 1. a configured entry port extending into the interior thereof and adapted to receive a swivel hook hanger, and
  - 2. mounting means for fixedly mounting said housing to an extended support surface;
- b. a swivel hook having an arcuate lower article-supporting hook portion and an upper configured hook hanger adapted to pass through said entry port, said upper hanger being releasably rotatably contained in a fixed location within said housing, said hook being releasably securable against rotation; and,
- c. a closure removably received in said entry port and being movable radially relative to the axis of rotation of said swivel hook into and out of port-closing position.

4,099,695
TRAILER SAFETY STAND

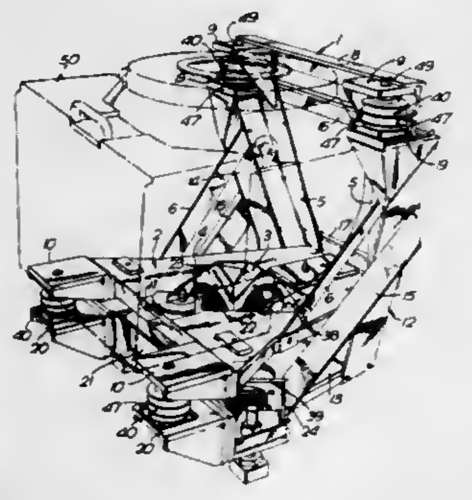
Robert C. Shinn, Jr., Hainesport, N.J., assignor to Hollyford Enterprises, Inc., Hainesport, N.J.
Filed Dec. 11, 1975, Ser. No. 639,595
Int. Cl.² F16M *13/00*
U.S. Cl. 248—351 **3 Claims**



1. A mobile safety stand for temporarily supporting a conventional trailer having a king-pin and landing gear comprising, a pedestal, wheel means mounted on the lower end of said pedestal, a handle connected to said pedestal whereby the pedestal is manually movable to a position under the nose portion of a trailer, a top wall integrally connected to the upper end of the pedestal, an unobstructed recess provided in said top wall for freely receiving and releasing the trailer king-pin in a substantial vertical direction, said recess aligning the trailer king-pin with the top wall of the pedestal, whereby the nose portion of the trailer is supported on the top wall of the pedestal when the trailer landing gear is elevated, and a lubricant contained within said recess whereby the king-pin becomes lubricated while seated therein to thereby facilitate its connection with a tractor fifth wheel when subsequently connected thereto.

4,099,696
SUPPORT APPARATUS

Edward James Toome, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England
Filed Feb. 25, 1977, Ser. No. 771,902
Claims priority, application United Kingdom, Mar. 10, 1976, 9610/76
Int. Cl.² F16F *15/04*
U.S. Cl. 248—358 R **10 Claims**



1. Apparatus for supporting a first structure on a second structure so that relative movement between the two structures is permitted in three mutually perpendicular directions only, comprising:

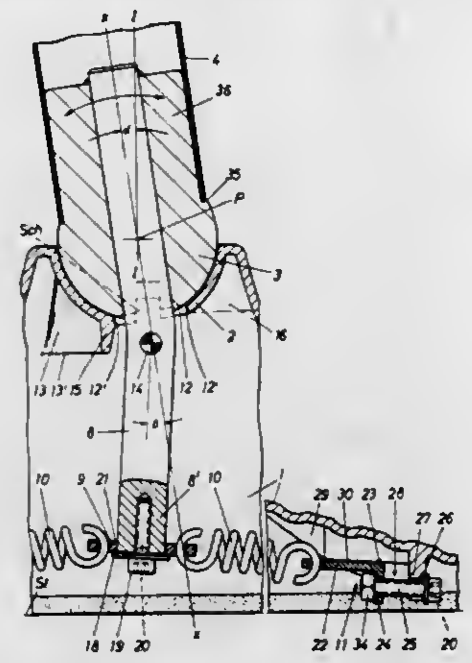
(a) a first structure;
(b) a second structure on which the first structure is supported;
(c) three flexible shafts connected between the first structure and the second structure and mutually inclined so that their axes of torsional restraint intersect at a position at or relatively close to the centre of mass of the first structure and a load carried by the first structure; and
(d) damping means comprising at least three damping units connected between the first and second structures to provide a vibration and shock isolating arrangement and arranged in a common plane which includes the centre of mass of the first structure and a load carried by the first structure.

4,099,697
TILTING POST SUPPORTED SEAT BIASED TO AN UPRIGHT POSITION

Alfred Von Schuckmann, Nordstr. 32a, Haan, Germany (5657)
Filed Oct. 1, 1976, Ser. No. 728,541
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 7531129[]; Sep. 18, 1976, 2642112
Int. Cl.² A47C *3/18*
U.S. Cl. 248—385 **11 Claims**

1. A seat comprising:
a base member;

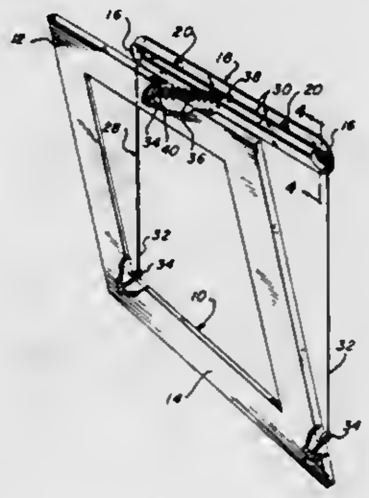
a post member extending generally upwardly from said base member;
a ball joint interconnecting said members for tilting movement of said post member relative to said base member;
a seating surface formed on said post; and
a star-like array of tension springs engaging said post member and anchored to said base member for resisting tilting movements of said post member and biasing same into a normal generally upright position, said base member comprising a hollow support formed with a ball joint socket,



said post member comprising a tubular post having a ball received in said socket and a stem extending below said ball beneath said socket, said socket having a throughgoing bore traversed with clearance by said stem, said springs engaging said stem below said socket, said stem being bent at an obtuse angle below said socket and having a lower end engaged by said springs and disposed substantially vertically below the pivot of said ball joint whereby said springs bias said seating surface into a forwardly tilted normal position.

4,099,698
APPARATUS AND METHOD FOR HANGING AND ORIENTING A WALL HANGING

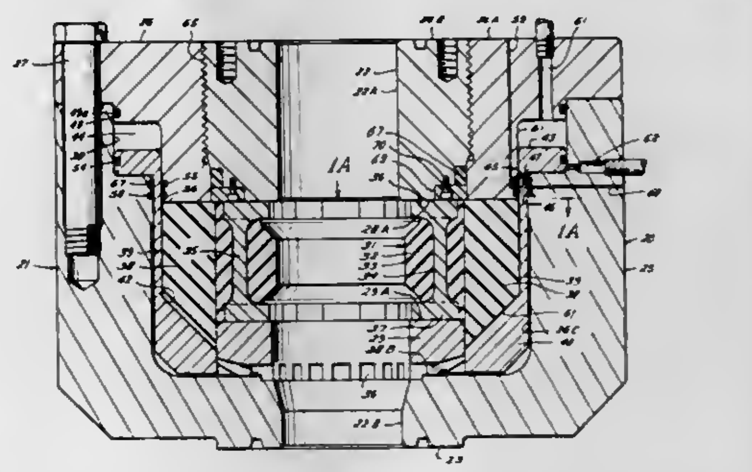
Henry O. Bell, 3758 E. 113th Ave., Thornton, Colo. 80233
Filed Dec. 10, 1976, Ser. No. 749,414
Int. Cl.² A47G *1/16*
U.S. Cl. 248—493 **20 Claims**



1. Apparatus for attaching a wall hanging having a marginal border area to a wall surface, comprising:
a pair of knob members;
means for mounting said knob members at the wall surface generally in an outward protruding and laterally spaced apart relation;
suspension means for suspending the wall hanging at a lower marginal border area from said pair of knob members, said suspension means comprising flexible cable means for encircling said pair of knob members collectively in at least one complete and continuous loop; and
connecting means for operatively connecting the wall hanging at an upper marginal border area to the wall surface.

4,099,699
ANNULAR BLOWOUT PREVENTER

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.
Filed Sep. 10, 1976, Ser. No. 721,968
Int. Cl.² E21B *33/06*
U.S. Cl. 251—1 B **19 Claims**



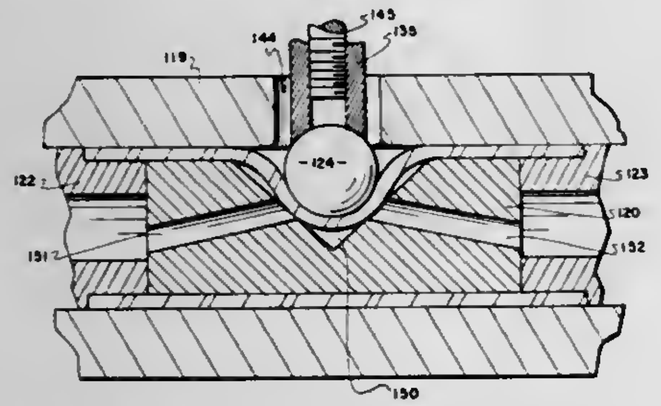
1. An annular blowout preventer, comprising a housing having a bore extending longitudinally therethrough and an annular recess about the bore, a packer comprising an annulus of resilient material mounted in the recess for movement between an expanded position to open the bore and a constricted position to seal about a pipe in the bore or upon itself, another annulus of resilient material surrounding the packer within the recess for moving the packer from expanded to constricted position upon constriction of the inner circumference of the outer annulus, said other annulus having a lower modulus of elasticity than that of the resilient material of the packer annulus, said housing having a cylinder means therein and guideway means connecting the cylinder means with the recess, piston means longitudinally reciprocable within the cylinder means, means for selectively admitting and exhausting operating fluid to and from the cylinder means on opposite sides of the piston means so as to reciprocate the piston means, a ring having a surface engageable with and substantially radially coextensive with one end of the outer annulus, and means extending sealably through the guideway means and connecting the ring to the piston means, whereby upon movement of the piston means in one direction, the ring longitudinally compresses the outer annulus so as to constrict its inner circumference and thereby move said packer from expanded to constricted position, and upon movement of the piston means in the opposite direction, said ring relieves the compression in said outer annulus to permit its inner circumference to expand and thereby permit said packer to move from constricted to expanded position.

4,099,700
FLOW CONTROL DEVICE FOR FLUIDS FLOWING IN A CLOSED CONDUIT

Wen Young, 20228 Valerio, Canoga Park, Calif. 91306
Filed Feb. 16, 1977, Ser. No. 769,181
Int. Cl.² F16L *55/44*
U.S. Cl. 251—7 **6 Claims**

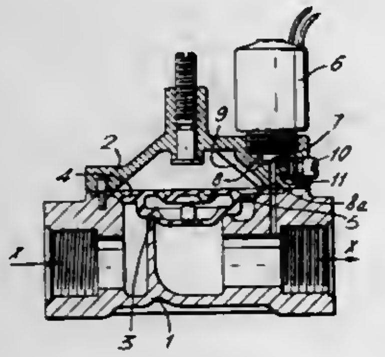
1. A flow control device for fluids flowing in a closed channel, comprising:

a valve body adapted to be interposed in said closed channel and pierced by a cylindrical bore forming a portion of the channel;
a lateral orifice in said valve body, open to one face thereof and terminating in said bore, with the axis of said orifice orthogonal to said bore;
a cylindrical anvil of smaller diameter than said bore, inserted coaxially thereinto;
a seal tube of flexible elastomeric material, intermediate between said anvil and said bore and in sealing contact with both;
retaining means for locating said anvil and said seal tube in said valve body;



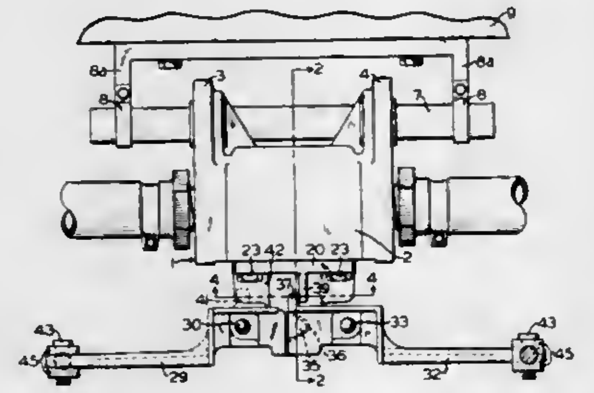
a recess in said anvil, aligned with said lateral orifice;
orifice means in said anvil, including a first orifice interconnecting said recess with one end of said bore, and a second orifice interconnecting said recess with the other end of the bore; and
a ball, reciprocable in said lateral orifice, for entraining said seal tube inwardly against said anvil, whereby said seal tube may be distended into said recess and into sealing relationship with respect to said orifice means issuing into said recess, thereby reversibly increasing the restriction in said flow channel.

4,099,701
SOLENOID-CONTROLLED DIAPHRAGM VALVES
Leopold Benjamin Berger, 151 B. Dereh Hayam, Haifa, Israel
Filed Mar. 12, 1976, Ser. No. 666,398
Claims priority, application Israel, Mar. 18, 1975, 46857
Int. Cl.² F16K *31/40, 31/385*
U.S. Cl. 251—30 **6 Claims**



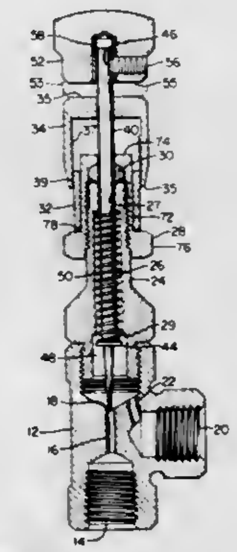
1. In a diaphragm controlled solenoid valve having housing means defined, in part, by a bonnet including an internal conical wall surface, an elastic diaphragm supported along its periphery between the bonnet and the housing in opposition to the conical wall surface in the bonnet, the diaphragm being adapted to follow the movement of the flow pressure whereby a spring is not required to urge the diaphragm onto the conical wall surface and a small pressure inlet orifice in the diaphragm, the improvement comprising an internal groove elongated uprightly inclined in the internal conical wall surface of the bonnet, at least a portion of said groove being in the same vertical plane as and aligned with the orifice, said groove being at least as wide as the diameter of the orifice so that when the valve is open the diaphragm is supported by the conical wall surface in the bonnet with no support along the portion of the diaphragm that contains the orifice and which overlays said groove whereby the portion of the diaphragm that contains the orifice is stretched and the orifice is stretched and the orifice is enlarged to thereby permit contaminants that are lodged in the orifice to be washed away by the fluid flowing through the valve.

4,099,702
DOUBLE HANDLE SELF-LOCKING MECHANISM FOR MANUAL OPERATION OF A COCK KEY
Fred Temple, Swissvale, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Oct. 26, 1976, Ser. No. 735,498
Int. Cl. F16k *35/00*
U.S. Cl. 251—95 **12 Claims**



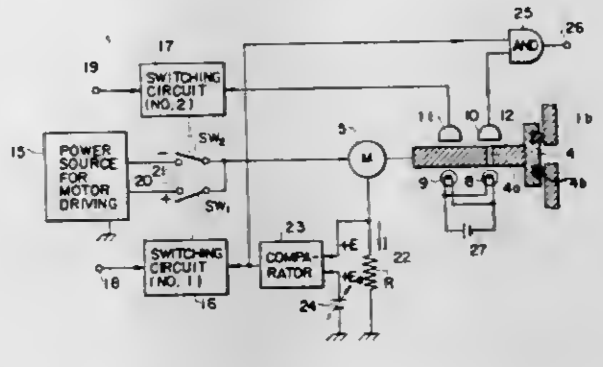
1. For use with a cock having a body disposed in a fluid pressure conduit and a valve rotatably mounted in the body for rotation between an open position in which flow of fluid under pressure through the conduit is established and a closed position in which flow of fluid under pressure through the conduit is prevented, a self-locking operating mechanism for rotating the valve between its open and closed positions, said self-locking operating mechanism comprising;
- a. a member connected to the valve for effecting rotation thereof, said member having a pair of oppositely extending arms, wherein the improvement comprises;
- b. a fulcrum carried by each of said arms,
- c. a pair of links each pivotally mounted on the fulcrum carried by one of said arms and rockable about its respective fulcrum from a first position, in which said self-locking mechanism locks said valve against rotation to a second position, in which said valve may be rotated from one of said open or closed positions to the other,
- d. means so operatively connecting said links that rocking of either effects rocking of the other,
- e. at least one fulcrum member,
- f. at least one lever slidably supported on said at least one fulcrum member and operatively connected to one of said pair of operating links for effecting rocking and rotation thereof,
- g. stop means carried by the cock body, and
- h. means carried by one of said operating links for so cooperating with said stop means as to prevent rotation of said pair of links by said at least one lever prior to the rocking of said pair of links from their first to their second position.

4,099,703
SELF-CLEANING PRECISION METERING VALVE
William Lush, Cheyenne, Wyo., assignor to Ideal-Aerosmith, Inc., Cheyenne, Wyo.
Filed Oct. 12, 1976, Ser. No. 731,523
Int. Cl.² F16K *1/38, 1/52*
U.S. Cl. 251—122 **9 Claims**



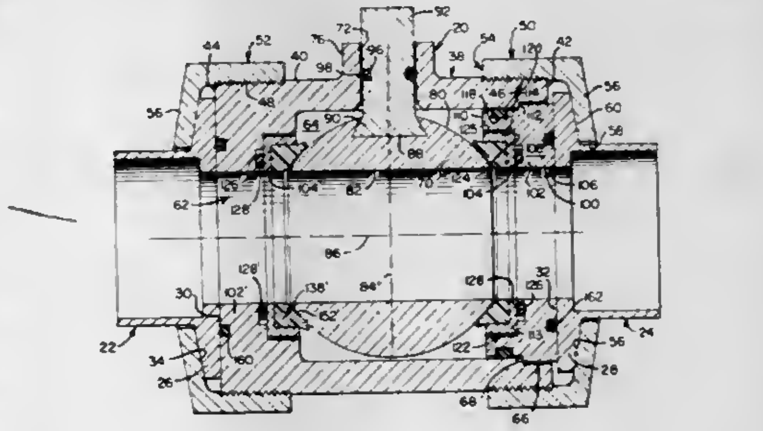
1. A valve apparatus, comprising:
an enclosed chamber, an orifice in said chamber through which fluid enters said chamber, and an unrestricted outlet through which fluid exits said chamber into a flow line;
an elongated longitudinally movable valve stem positioned in said chamber with a tapered end portion longitudinally aligned with said orifice;
a main body member partially enclosing said chamber including said orifice and said outlet port and a bonnet member attached to said main body member and enclosing the remainder of said chamber, said bonnet member having a bore through which said valve stem protrudes into said chamber with a portion of said valve stem extending externally of said bonnet member;
bias means associated with said valve stem for normally urging said valve atem toward said orifice;
retraction means connected to said valve stem positioned externally of and longitudinally beyond said bonnet member for applying force to retract said valve stem from said orifice against the pressure of said bias means, said retraction means being operative to forcibly withdraw said valve stem in the direction of removal from said orifice;
a cylindrical sleeve with graduations on a portion of its external surface, said sleeve being slidably mounted around said bonnet in a manner which limits longitudinal movement while allowing rotational movement of said sleeve in relation to said bonnet such that said graduations can be positioned for optimum viewing; and
adjustment means attached to said sleeve and associated with said retraction means for adjustably limiting the longitudinal distance said bias means is allowed to move said valve stem toward said orifice by limiting the inwardly directed longitudinal movement of said retraction means, said adjustment means registering on said graduations to indicate the setting of said adjustment means in relation to said sleeve.

4,099,704
VACUUM VALVE APPARATUS
Masahide Okumura, Hachioji; Yoshio Sakitani, Ohi; Yasushi Nakaisumi, and Toshiaki Nakata, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 20, 1976, Ser. No. 752,098
Claims priority, application Japan, Dec. 26, 1975, 50-155065
Int. Cl.² E16K *31/04*
U.S. Cl. 251—134 **10 Claims**


25
AND
26
17
19
SWITCHING CIRCUIT (NO. 2)
15
POWER SOURCE FOR MOTOR DRIVING
SW₂
SW₁
20
21
5
M
11
10
12
1b
4
9
8
4a
4b
23
SWITCHING CIRCUIT (NO. 1)
COMPARATOR
+E
+E
22
R
27
18
16
24

1. A vacuum valve apparatus comprising a valve head, a motor for driving said valve head, and means for confirming complete closure of said valve head, said means for confirming comprising first signal generating means for detecting the position of said valve head and generating a first signal when said valve head is situated within a predetermined valve-closed range, second signal generating means for detecting the driving current of said motor and generating a second signal when said driving current has reached a predetermined level, and third signal generating means for generating a third signal only when both of said first and second signals are generated.

4,099,705
END ENTRY BALL VALVE WITH SEAL WEAR COMPENSATION AND FORCE ISOLATED SEAL
Gary L. Runyan, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.
Filed Aug. 19, 1976, Ser. No. 715,795
Int. Cl.² F16K *5/06*
U.S. Cl. 251—171 **8 Claims**



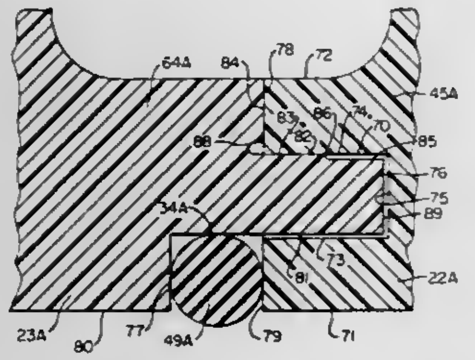
1. An end entry ball valve assembly comprising:
valve body means presenting first and second open ends and operable to be connected in fluid communicating relationship to conduit means;
said valve body means including a valve chamber between said first and second ends and a stem receiving passage communicating with said valve chamber;
valve ball means positioned in said valve chamber and operable to rotate between a flow permitting position and a flow blocking position therein;
stem means extending through said stem receiving passage and engageable with said valve ball means to rotate said

valve ball means between said flow permitting and flow blocking positions;
the opening of at least one end of said valve body means being sufficiently enlarged for insertion of said valve ball means into said valve chamber;
bifurcated seal carrier means received in said at least one end of said valve body means and including an annular seal support member and a back-up member;
said annular seal support member carrying an annular seal engaged with said valve ball member and including an axially facing wall and a radially facing guide wall;
said back-up member being slidably receivable in said opening of said at least one end of said valve body means and presenting a seal support member receiving recess defined by an axially facing wall adjacent said axially facing wall of said seal support member and a radially facing guide wall adjacent said radially facing guide wall of said seal support member;
means defining an annular retaining groove disposed in at least one of said axially facing walls and located radially inwardly from said radially facing guide walls of said seal support member and said back-up member;
annular, resilient biasing and sealing means, disposed in said groove in axially compressed condition, for generally axially biasing said seal support member and the seal carried thereby toward said valve ball means and for sealing against flow between said axially facing walls of said annular seal support member and said back-up member; and
the radial dimension of said radially facing wall of said receiving recess being greater than the outer radial dimension of said seal support member to define limited radial clearance therebetween providing for limited radial centering movement of said seal support member in said receiving recess without direct compressive resistance by said resilient biasing and sealing means.

4,099,706
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Everett T. Steele, Jr., and Marvin P. Weaver, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 9, 1976, Ser. No. 748,860
Int. Cl.² F16K *27/04*
U.S. Cl. 231—367 **24 Claims**

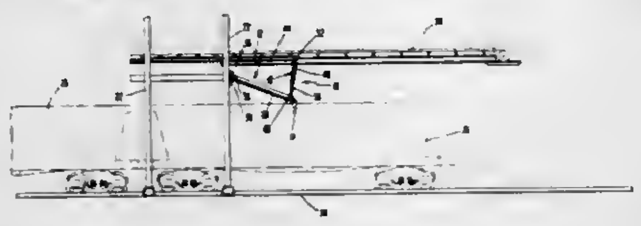


1. In a valve construction having a first housing means provided with an internal chamber therein and inwardly directed shoulder projecting into said chamber at one end thereof and defining a first valve seat on one side thereof, and a second housing means being secured to said first housing means and having a chamber aligned with said chamber of said first housing means, said second housing means having an inwardly directed shoulder projecting into its respective chamber at one end thereof, said first valve seat comprising a resilient annular member disposed against said one side of said shoulder of said first housing means and against an adjacent side of said shoulder of said second housing means while projecting inwardly beyond said shoulders, the improvement wherein one of said housing means has an annular groove in the shoulder thereof inboard of the inner and outer peripheries thereof, the other of said housing means having an annular tongue projecting from the shoulder thereof inboard of the inner and outer peripheries thereof and having an inner annular side and an outer annular side spaced from each other by an end surface of said tongue, said tongue having said inner side thereof engaging the outer periphery of said resilient annular member, said tongue being received in said groove and being ultrasonically welded substantially only on said outer annular side thereof to the housing means having said groove whereby the resulting weld area is isolated from said resilient annular member by said end surface and said inner annular side of said tongue.

4,099,707
VEHICLE MOVING APPARATUS

George Bernard Anderson, Ashland, Ky., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 3, 1977, Ser. No. 765,313
Int. Cl.² B66F *11/00*
U.S. Cl. 254—35 **7 Claims**



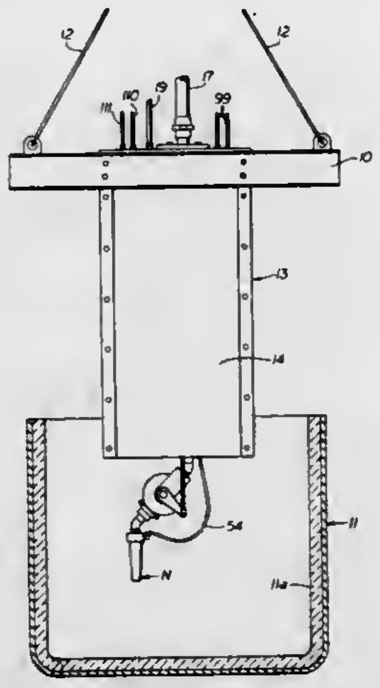
1. Vehicle moving apparatus for moving one or more railroad cars having side walls along a predetermined path, comprising:
support means fixedly dispoed at an elevation which is higher than the upper surface of the car;
first hydraulic cylinder means mounted at one end thereof upon said support means and extensible and retractable in a plane parallel to said railroad tracks for controlling the movement of said cars along said tracks;
second hydraulic cylinder clamping means secured to the other end of said first cylinder means and being extensible and retractable in a plane disposed transverse to said tracks for engaging said railroad car; and
third hydraulic cylinder means secured at one end thereof to said support means and to said first cylinder means at the other end thereof and extensible and retractable within a vertical plane for controlling the elevation of said first and second hydraulic means relative to said railroad car.

4,099,708
APPARATUS FOR APPLYING GRANULAR REFRACTORY MATERIAL TO SURFACES

John C. Morris, Birmingham; James K. Weidman, Gadsden, and Michael D. Prior, Pell City, all of Ala., assignors to Riverside Clay Company, Pell City, Ala.

Filed Aug. 3, 1977, Ser. No. 821,554
Int. Cl.² B05B *3/00*
U.S. Cl. 266—281 **6 Claims**

1. In apparatus for applying granular refractory material to the interior surfaces of an open top ladle, furnace, or the like,
(a) a pair of generally vertically disposed telescopically related conduits,
(b) means to supply granular refractory material to the upper end of the inner one of said conduits,
(c) means to supply water to the upper end of the outer one of said conduits,
(d) means to support said conduits for substantially 360° simultaneous rotation,
(e) said inner conduit having a lower end portion projecting past the lower end of the outer conduit,
(f) a mixing nozzle on the lower end of the inner conduit in position to receive and discharge granular material flowing down the inner conduit,
(g) means to supply water from the lower end of the outer conduit to said nozzle,

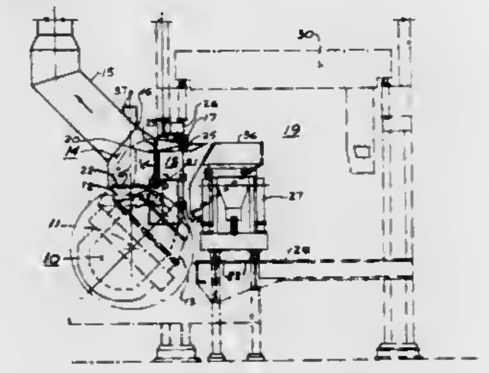


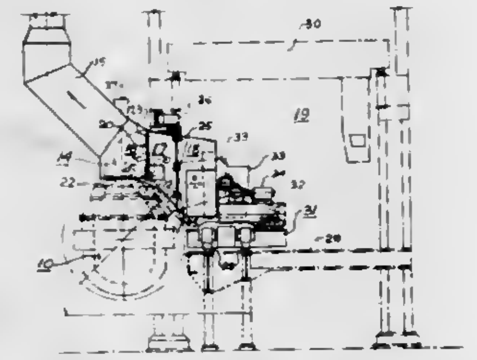
(h) means mounting said nozzle for angular displacement relative to the longitudinal axis of said conduits, and
(i) power means operatively connected to the nozzle for displacing the same relative to the longitudinal axis of said conduits.

4,099,709
METHOD AND APPARATUS FOR CONTROLLING EMISSIONS FROM OXYGEN STEELMAKING FURNACES

Albert Calderon, 1065 Melrose St., Bowling Green, Ohio 43402

Filed Jan. 12, 1977, Ser. No. 758,599
Int. Cl.² C21C *5/38*
U.S. Cl. 266—44 **12 Claims**



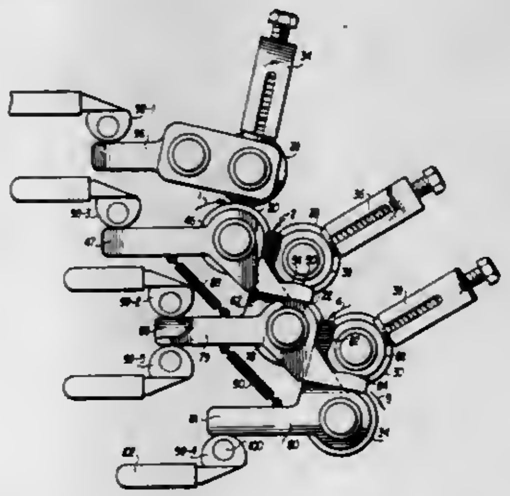


1. In the method of controlling emissions from a basic oxygen steelmaking furnace wherein oxygen is blown onto a charge of metal while the furnace is in a generally upright position with its mouth facing upwardly, and wherein the furnace is rotated to one side of the upright position to bring the mouth to a reclined position on the one side of the upright position for performing certain operations, the improvement comprising the steps of positioning a hood with a first exhaust opening facing the mouth of the furnace while the furnace is in the upright position, providing a second exhaust opening in the hood facing the side of the upright position to which the furnace mouth is rotatable,
connecting a source of suction with the hood, providing gate means selectively positionable either in a first position closing the second exhaust opening and establishing communication of the first exhaust opening with the source of suction or a second position closing the first exhaust opening and establishing communication of the second exhaust opening with the source of suction, and selectively positioning the gate member in either the first position or the second position.

4,099,710
RADIAL ROLL FOLDER

Harold E. Boyer, Anna, and Jerry V. Trisler, Sidney, both of Ohio, assignors to Graphics Equipment International Corporation, Chicago, Ill.

Filed Aug. 10, 1976, Ser. No. 713,323
Int. Cl.² B65H *45/14*
U.S. Cl. 270—68 A **18 Claims**



10. A folding machine in which the spacing between rollers can be set to accommodate paper stock of various thicknesses, said folding machine comprising:
at least two fixed rollers;
at least one adjustable roller, the position of which is adjustable relative to at least one of said fixed rollers along an arc that is substantially concentric about the other roller to obtain an adjusted spacing between said one fixed roller and the adjustable roller;
an adjustable roller setting means for supporting said adjustable roller and causing said adjustable roller to move away from said one fixed roller along said arc in response to paper travelling through nips formed between said one fixed roller and said adjustable roller said adjustable roller setting means having the further function of automatically and simultaneously maintaining said adjusted spacing.

18. A method for setting the roller spacing between an adjustable roller and first and second fixed rollers in a folding machine, said method comprising the steps of:
biasing said adjustable roller toward said first and second fixed rollers so as to form first and second nips between said adjustable roller and said first and second fixed rollers, but allowing said adjustable roller freedom of movement to move away from said first and second fixed rollers on paths that are substantially concentric with the axes of said first and second fixed rollers;
feeding paper stock through said first nip so as to force said

adjustable roller away from said first fixed roller a distance equal to the thickness of said paper stock;

mounting said adjustable roller on a support mechanism which simultaneously and automatically, with the feeding of said paper stock through said first nip, maintains the position of said adjustable roller relative to said first fixed roller to set the space between said adjustable roller and said first fixed roller, but allowing said adjustable roller freedom of movement away from said second fixed roller on said path that is substantially concentric with said first fixed roller;

feeding said paper stock into said second nip so as to force said adjustable roller away from said second roller on said path that is substantially concentric about said first roller by a distance equal to the thickness of said paper stock in said second nip; and,

mounting said adjustable roller on a support mechanism which simultaneously and automatically, with the feeding of said paper stock through said second nip, maintains the position of said adjustable roller relative to said second fixed roller to set the space between said adjustable roller and said fixed roller.

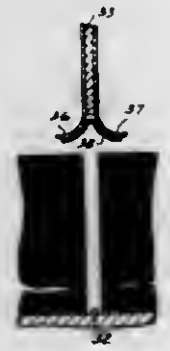
4,099,711
DIVIDER FOR STACKER MECHANISM

Donald R. Grody, Pittsfield, Mass., and Donald C. Fitzpatrick, Chatham, N.Y., assignors to Lenox Machine Company, Lenox, Mass.

Filed Jan. 12, 1977, Ser. No. 758,764

Int. Cl.^{2} B65H *31/20, 31/24*

U.S. Cl. 271—64 **8 Claims**



5. A divider for dividing adjacent stacks of sheets comprising a relatively thin central core, a pair of flexible strips secured to opposite faces of said core and having free end portions extending therebeyond, and flexible hinge means interconnecting said free end portions and urging said free end portions outwardly from said core, said flexible strips and said hinge means being sufficiently thin to be inwardly collapsed below said core and exhibit a combined thickness not greater than said core when so collapsed.

4,099,712
AUTOMATIC SHEET HANDLING APPARATUS

Merrill D. Martin, #2 Mall Ct., Oakland, Calif. 94611

Filed Feb. 25, 1977, Ser. No. 771,845

Int. Cl.^{2} B65H *29/58*

U.S. Cl. 271—184 **9 Claims**

1. In an apparatus for handling sheets,

a right angle side conveyor conveying the sheets at an angle from the direction from which the sheets are delivered thereon,

a stacker conveyor for stacking the sheets delivered from said right angle side conveyor,

a side back-up device for aligning sheets on said side conveyor,

means to support said back-up device above said side conveyor facing toward the direction from which the sheets are delivered to said right angle side conveyor,

adjusting means for moving said back-up device toward to and away from said direction of delivery of sheets according to the length of sheets for stopping and aligning the sheets,

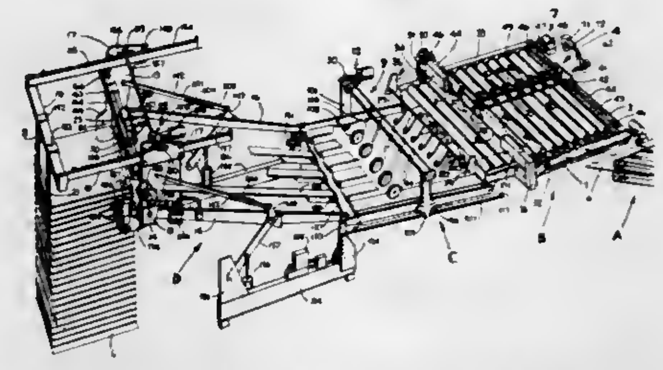
back-stops spaced from the stacker end of the stacker conveyor for stopping and aligning the sheets into a stack,

support means on said stacker conveyor adjustably to support said back stops relatively to said stacker end,

speed and position programmer for controlling the speed of said conveyors and the position of said back-up device and back-stop spacing,

a programmed controller for operating said adjusting means,

pre-setting means to set said speed and position programmer to the respective dimensions of said sheets,



means to translate the pre-setting to said programmed control and to said adjusting means for the adjusting movements of said back-up device and said supports for the back-stops,

means to sense the relative location of said back-up device relatively to said right angle side conveyor,

means to sense the relative location of said back-stops relatively to the stacking end of the stacker conveyor,

and means to translate the location sensed by said sensing means to said programmed controller for comparing the movement of said adjusting means with the pre-set dimensions.

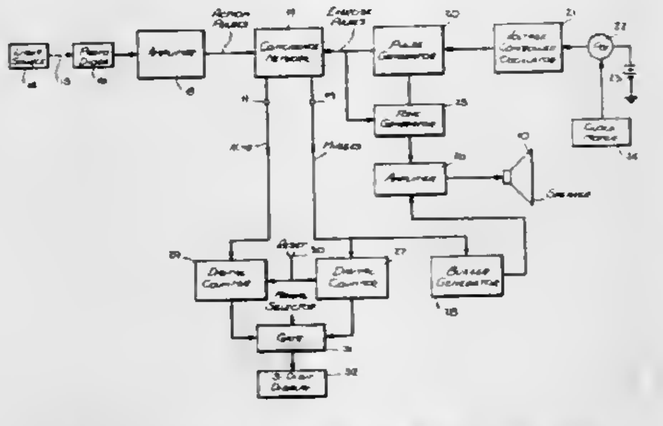
4,099,713
ELECTRONIC PHYSICAL TRAINER SYSTEM

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Jul. 15, 1977, Ser. No. 816,255

Int. Cl.^{2} A63B *21/00;* **G01L** *5/00;* **G08B** *7/00*

U.S. Cl. 272—93 **11 Claims**



1. An electronic physical trainer system comprising:

A. means to generate periodic exercise pulses to establish an exercise rhythm;

B. means responsive to said exercise pulses to produce corresponding tone signals to pace a performer;

C. a position sensor constituted by means projecting a light beam across an exercise area toward a detector to produce action pulses which reflect the movement of the performer as he alternately blocks and clears the beam in seeking to synchronize his movement with that of the tone signals;

D. means to compare the exercise pulses with the action pulses to produce a hit pulse each time an action pulse overlaps an exercise pulse and to produce a miss pulse in the absence of an overlap;

E. means to separately count the hit and miss pulses during a given exercise regimen; and

F. means to display the respective hit and miss counts to score the performance.

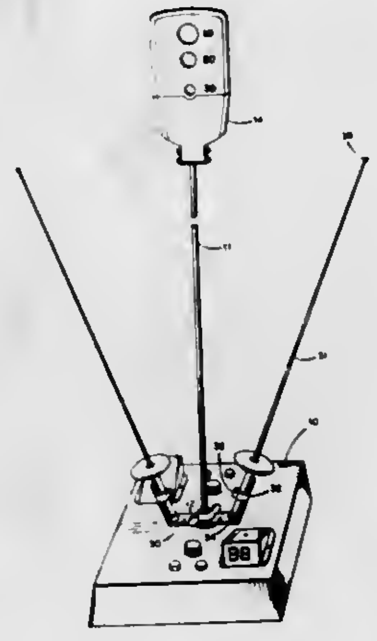
4,099,714
FENCING GAME SET

Charles W. Willis, Rte. 1, Box 273, Rayle, Ga. 30660

Filed Dec. 5, 1977, Ser. No. 857,656

Int. Cl.^{2} A63B *69/02*

U.S. Cl. 273—1 F **7 Claims**



1. A fencing game set for two participants comprising:

a. a target having scoring apertures in graduated sizes;

b. a flexible rod supporting said target at upper torso height;

c. a base anchoring said rod;

d. two score tabulating devices mounted to said base; and,

e. a pair of fencing foils for piercing said scoring apertures and knocking said target out of scoring position.

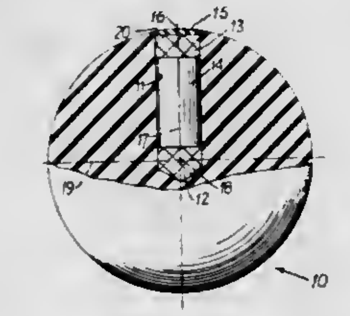
4,099,715
BOWLING BALL

David M. Caplan, Los Alamitos, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 22, 1975, Ser. No. 570,397

Int. Cl.^{2} A63B *37/10, 43/04*

U.S. Cl. 273—63 E **1 Claim**



1. In a bowling ball, an elongated hole formed therein on a diameter of said ball, said hole having a length equal to the radius of said ball plus one half the diameter of said hole, a closure button for the top of said hole, an elongated spacer in said hole, and a weight in said hole positioned at each of the ends of said spacer, said weights being non-metallic and having a specific gravity which is different from the specific gravity of the material of said ball, said spacer and button being non-metallic and having a specific gravity corresponding to the specific gravity of said ball material, and said button, spacer and weights being snug in said hole and filling the same.

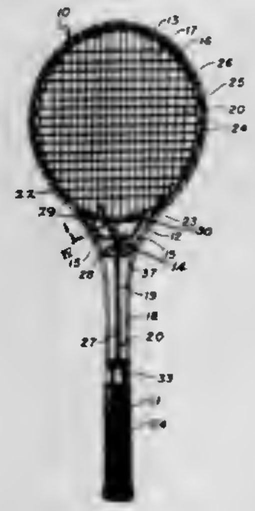
4,099,716
GAME RACKET

Daniel G. Haddad, Worcester, Mass., assignor to Norman S. Blodgett, Worcester, Mass., a part interest

Continuation of Ser. No. 605,167, Aug. 15, 1975, abandoned, which is a continuation of Ser. No. 437,166, Jan. 28, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,703

Int. Cl.^{2} A63B *51/12*

U.S. Cl. 273—73 E **8 Claims**



1. A game racket comprising:

a an elongated handle having a hollow interior,

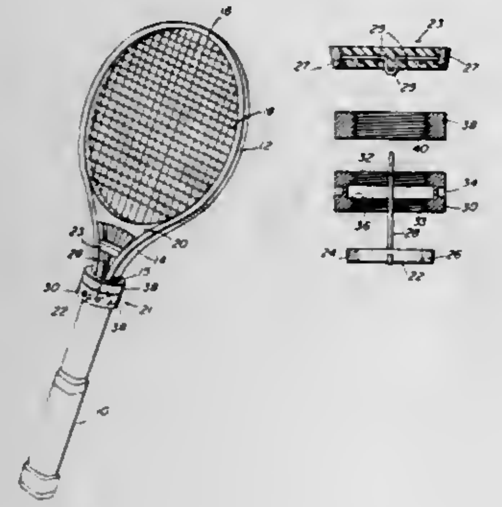
b a frame connected to the handle, the frame defining and being peripheral to a closed geometric figure and being divided into a first and a second portion by two wedge points separating the first portion from the second portion, the frame at least in the neighborhood of the wedge points having inwardly facing grooves, the frame having string points and a dimension perpendicular to the plane of the geometric figure which is larger than the wedge thickness perpendicular to the plane of the geometric figure, the second portion consisting of two generally-parallel legs which pass longitudinally into and through the handle and are fixedly connected to each other by a transverse anchor plate at the end thereof farthest away from the wedge point,

c a wedge having exterior ridges for contacting said grooves in a sliding relationship therewith, said wedge separating the geometric figure into a wide area defined by the wedge and the first portion of the frame, and a narrow area defined by the wedge and the second portion of the frame, the narrow area having a first end and a second end, with the wedge positioned at the first end and the handle position at the second end,

d means including a rod connected at one end to the anchor plate and at the other end by the wedge for causing said ridges to slide within the grooves of said frame and drawing the wedge toward the handle, thereby causing the wedge points to move apart, and

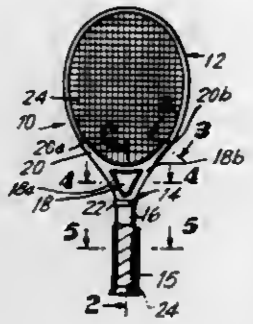
e a string connected between string points on the frame and across the wide area and to the wedge, so that the string becomes more taut as the wedge points move apart and the tension in the string equalizes throughout the racket because of the string points.

4,099,717
ADJUSTABLE TENSION TENNIS RACKET
Bernard R. Sacks, 128 Commonwealth Rd., Cochituate, Mass. 01778
Filed May 11, 1977, Ser. No. 795,995
Int. Cl.² A63B *51/12*
U.S. Cl. 273—73 E **1 Claim**



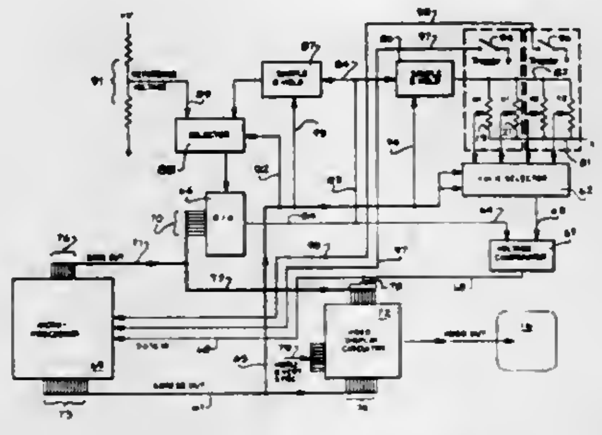
1. A game racket apparatus wherein said racket includes a head portion for carrying main and cross strings, an open throat portion, a fixed yoke in said open throat portion, a handle portion for gripping by the player and having means for adjusting string tension comprising:
 a threaded segment machined in the outer surfaces of said throat portion of the racket;
 a tension ring, threaded on a portion of its inner circumferential surface, encircling and engaging said threaded segment of the outside of said throat portion, and being adjustable along the vertical length of the threaded segment of said throat by rotating said tension ring;
 a recessed track, cut into the unthreaded portion of the inner circumferential surface of said tension ring;
 a tension bar situated in said open throat portion perpendicular to the plane of said racket;
 said tension bar having at its ends graphite pads which engage said recessed track;
 said tension bar being able to slide freely on the recessed track of said tension ring, to maintain its spatial orientation perpendicular to the plane of said racket and simultaneously to move in a vertical direction along the threaded length of said throat, depending on the direction of the rotation of said tension ring;
 an upwardly extending hook integrally formed and coplanar with said tension bar;
 a main string retaining bar situated in said throat which receives the looped ends of said main strings and which is capable of vertical movement within the throat area between said yoke and said tension bar;
 a downwardly extending eye, integrally formed with said main string retaining bar, which engages said upwardly extending hook;
 a threaded locking ring which engages said threaded segment of the throat portion directly above said tension ring and is rotated until it comes into direct contact with said tension ring to lock said tension ring in position;
 a plurality of notches cut into the exterior circumferential surface of said tension ring to permit its rotation by a wrench;
 a rotation of said tension ring resulting in a vertical movement of said tension bar and said main string retaining bar, resulting in a change in tension on said strings.

4,099,718
RACQUET FRAME CONSTRUCTION
Nathan Marks, Englewood Cliffs, N.J., assignor to Marcraft Recreation Inc., Garfield, N.Y.
Filed May 17, 1976, Ser. No. 687,432
Int. Cl.² A63B *49/02*
U.S. Cl. 273—73 C **11 Claims**



1. A racquet frame construction comprising in combination a one-piece handle, throat and shoulder member consisting essentially of a composite material, said shoulder of said one-piece member defining two opposed receiving means, and a curved metal rim, the respective ends of said metal rim being secured in said receiving means to thereby define said racquet frame.

4,099,719
SYSTEM AND METHOD FOR AUTOMATIC ALIGNMENT OF GUN WITH VIDEO DISPLAY
David W. Dean, Campbell, and Stephen D. Bristow, San Jose, both of Calif., assignors to Atari Inc., Sunnyvale, Calif.
Filed Apr. 28, 1977, Ser. No. 791,833
Int. Cl.² F41F *27/00*
U.S. Cl. 273—101.2 **7 Claims**



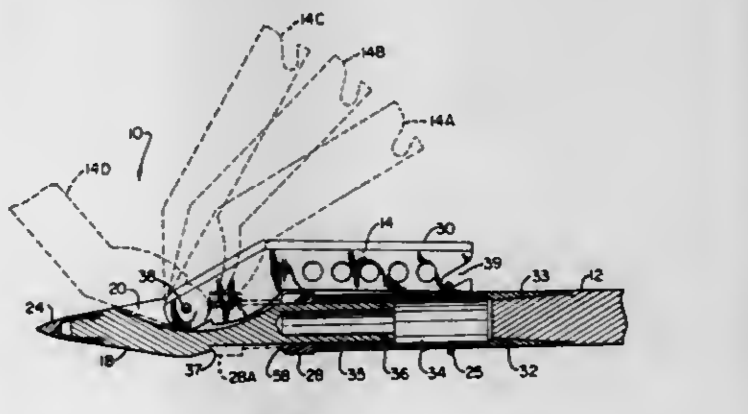
1. In a video game having a video display and a pointing device supported to be pointed at positions on said display, said display having a predetermined number of positions thereon disposed along an axis between first and second predetermined positions thereof and at which an image can be presented, means responsive to movements of the device to provide an image on said display defined by such movements and for aligning the position of the image with the position of the display at which the device is pointed comprising variable means coupled to said pointing device to provide a variable electric output in response to displacing said pointing device between said first and second predetermined positions on said display, means serving to provide in digital form a first value of the output of said variable means with the pointing device directed at one of said predetermined positions to define a first portion of the operative range of said electric output, and means serving to provide in digital form a second value of said output of said variable means with the pointing device directed at the other of said predetermined positions of said display to define a second portion of the operative range of said electric output, means defining the difference between said first and second values, and means for subdividing said difference by said predetermined number of positions lying along said axis to associate a proportionate amount of said difference with the displacement of each of said predetermined number of positions from one of said first and second predetermined positions.

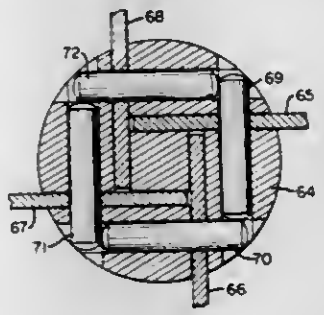
6. The method of aligning the position of an image appearing on a video display with the position of the display at which a pointing device is pointed where the position of the image is defined by the orientation of said pointing device and where the display has a predetermined number of positions thereon disposed along an axis between first and second predetermined positions and at which an image can be presented, the steps comprising pointing the device at said first predetermined position of said display, detecting in digital form a value represented by said first predetermined position, pointing said device at a second predetermined position on said display, detecting in digital form a value represented by the displacement of said second predetermined position from said first predetermined position along a given axis, establishing in digital form the value of said displacement along said axis, subdividing said displacement value by said predetermined number of positions lying along said axis to associate a proportionate amount of said displacement value with the displacement of each of said predetermined number of positions from one of said first or second predetermined positions along said axis.

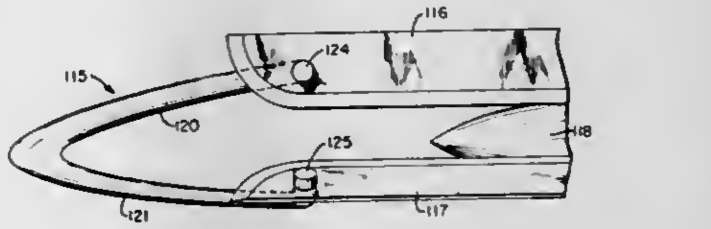
4,099,720
EXPANDING ARROWHEAD
Joseph D. Zeren, 390 Forest Ave., Boulder, Colo. 80302
Filed Feb. 23, 1976, Ser. No. 659,986
Int. Cl.² F41B *5/02*
U.S. Cl. 273—106.5 B **30 Claims**

1. An arrowhead attachable to the end of an arrow shaft comprising:
 an elongated body provided with at least one longitudinally extending slot in its external surface,
 means attaching said body to the end of the shaft for coaxial relative movement between said body and the shaft,
 at least one blade member having a free end portion and an opposite pivotal end portion with said end portions being joined lengthwise in an angularly displaced relation, said pivotal end portion being insertable in said body slot and including means pivotally securing said pivotal end portion to said body so that said blade is pivotal through an angle greater than 90° around an axis perpendicular to but in offset relation from the general plane of said free end portion, said blade being pivotal in a direction away from the axis of said elongated body between a normally retracted position wherein the length of said free end portion is substantially parallel to the length of said elongated body and an extended position in which the length of said free end portion forms an acute angle with respect to the length of said body and in the direction of the shaft, and
 means responsive to said coaxial relative movement for engaging an edge of said blade member pivotal end portion in offset relation to the central axis of said body so as to introduce a rotary force to said blade member outwardly from said body.

16. An arrowhead attachable to an end of an arrow shaft for impacting a target comprising:
 an elongated body having first and second ends with said second end being attachable to the arrow shaft and so that the length of said body is in alignment with the length of the arrow shaft, said body including a plurality of slots extending into said body intermediate of and with the external openings thereof generally perpendicular to said first and second ends,
 a plurality of flat blades each having a pair of spaced elongated edges, said blades being pivotally mounted at one end in repective said slots with each said blade having a cutting edge formed on one of said elongated edges and with the opposite said elongated edge being configured at said pivotal mounted end for conforming to the contour of said slots in the region between said pivotal mounting and said elongated body second end, said blades each being pivotable within the associated said slot between a first position wherein said cutting edge is closest to and generally parallel to the central axis of said body and a second position wherein the other said blade elongated edge is blocked from further rotation by said contour region of the associated said slot in proximity to said body second end for holding said blade in an outwardly extended position relative to the external surface of said body,
 means extending forwardly of said body and the forwardmost point of said blades when said blades are in said first position for initially contacting the target, said initial contacting means including means for applying at least an initial rotational force to each of said blades in the direction of said second position, and
 means yieldably retaining said blades in said first position







and being responsive to said forwardly extending means upon impacting of a target for releasing said blades for rotation within said slots.

21. An arrowhead attachable to an end of an arrow shaft for impacting a target comprising:
 an elongated body having first and second ends with said second end being attached to the arrow shaft and so that the length of said body is in alignment with the length of the arrow shaft, said body including a plurality of arcuate slots extending into said body intermediate of and with the external openings thereof generally perpendicular to said first and second ends,
 a plurality of flat blades each having a pair of spaced elongated edges, said blades being pivotally mounted at one end in respective said slots with each said blade having a cutting edge formed on one of said elongated edges, said blades each being pivotable within the associated said slot between a first position wherein said cutting edge is clos-

est to and generally parallel to the central axis of said body and a second position wherein the other said blade elongated edge is blocked from further rotation at a location in the associated said slot in proximity to said body second end for holding said blade in an outwardly extended position relative to the external surface of said body, said blades each having a notch opening thereinto from said other elongated edge, and

means yieldably retaining said blades in said first position and being responsive to impacting of a target for releasing said blades for rotation within said slots, said yieldable retaining means including a band interconnectably received in said blade notches.

22. In an arrowhead assembly attachable to the end of an arrow shaft, apparatus for pivotally mounting flat arrowhead blades at one end portion thereof comprising:

a solid elongated body having the central axis thereof aligned with the central axis of the arrow shaft when the arrowhead is attached to the arrow shaft, at least one slot opening into the outer surface of said body with the opening of said slot being generally parallel to but in offset relation to said central axis, said slot extending into said body for a distance greater than the perpendicular spacing between said central axis and the outer surface of said body at the location of said opening, and

means cooperative with the one end portion of the flat blade for pivotally mounting the blade for rotation within said slot and about an axis perpendicular to said slot.

4,099,721
LOTTERY TICKET

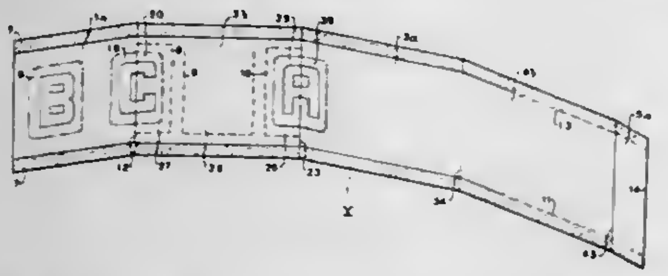
Pehr Ingemar Logander, Rotnäsgatan 6, 654 68 Karlstad, Sweden

Filed Dec. 8, 1976, Ser. No. 748,401

Claims priority, application Sweden, Dec. 9, 1975, 7513835

Int. Cl.^{2} B42D ***15/00***

U.S. Cl. 273—139 **12 Claims**



10. A lottery ticket, consisting of a single continuous strip of paper material, said strip being folded about spaced parallel folds into a pack of at least three superposed ticket sections, said pack comprising a first ticket section, a second ticket section integral with said first ticket section at the first of said folds, and a third ticket section integral with said first ticket section at the second of said folds, said second ticket section being placed between said first and third ticket sections and being of a shorter length than these, a first lottery sign being printed inside and across said first fold upon adjacent merging areas of said first and second ticket sections, a second lottery sign being printed inside and across said second fold upon adjacent merging areas of said first and third ticket sections, said first ticket section having weakening lines delimiting a first rupturable flap retained at and unfoldable about said first fold to expose the whole of said first lottery sign, and said first ticket section having further weakening lines delimiting a second rupturable flap retained at and unfoldable about said second fold to expose the whole of said second lottery sign; and means for sealing the ticket along opposite longitudinal edges thereof.

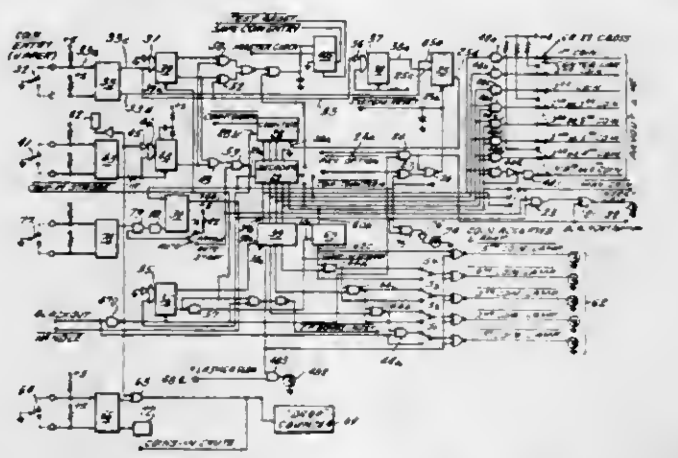
4,099,722
ELECTRONIC SLOT MACHINE

Dale F. Rodesch, and George E. Johnson, both of Las Vegas, Nev., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Jul. 30, 1975, Ser. No. 600,209

Int. Cl.^{2} A63F ***5/04***

U.S. Cl. 273—143 R **24 Claims**



1. Apparatus for stepping a movable display means to one of N possible positions in a random fashion comprising:

multi-stage counter means;

free-running high frequency and low frequency generating means;

selection means for initiating a selection operation signal;

gate means;

bistable circuit means having set and reset states being normally in said set state and responsive to said selection signal to be reset;

first gating means responsive to said bistable circuit means for coupling said high frequency generating means to said counter means only when said bistable circuit means is in the set state to cause said counter means to be repeatedly stepped through its maximum capacity at an extremely high rate, and to disconnect said high frequency generator means from said counter means when said bistable circuit means is reset whereby the count then in said counter determines the final positon of the display means;

means for driving said display means in a stepwise manner;

second gating means for coupling said low frequency generating means to said stepping means when said bistable means is reset;

sensing means responsive to movement of said display means for generating pulses;

third gating means for coupling the output of said sensing means responsive to the stepping of said counter means from the count presently in the counter means to a predetermined count to disable said second gating means to stop said display means at the position related to the count stored in said counter when said first gating means was disabled.

4,099,723
MULTI-TIER GAME BOARD

Pablo T. Robinson, 4002 N. 59th Dr., Phoenix, Ariz. 85033

Filed Feb. 7, 1977, Ser. No. 766,083

Int. Cl.^{2} A63F ***3/02***

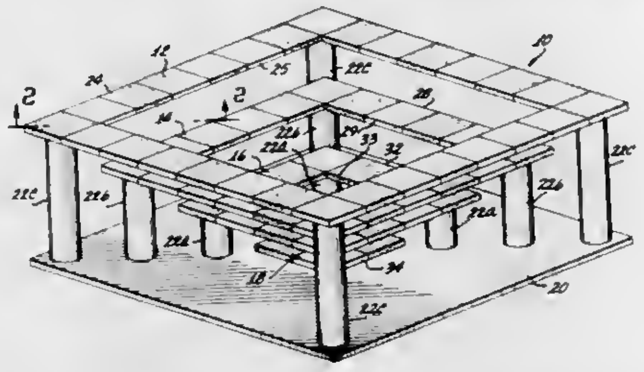
U.S. Cl. 273—241 **8 Claims**

1. A variably configurable multi-tier game board for chess and checker games comprising:

(a) a first tier having a planar surface of square ring configuration upon which 28 playing squares and displayed, said first tier having an endless inner edge;

(b) a second tier vertically displaced from said first tier and having a planar surface of square ring configuration upon which 20 playing squares are displayed, said second tier having an endless outer edge which substantially matches and is in vertical alignment with the inner edge of said first tier, said second tier having an endless inner edge;

(c) a third tier vertically displaced from said second tier and having a planar surface of square ring configuration upon which 12 playing squares are displayed, said third tier having an endless outer edge which substantially matches and is in vertical alignment with the inner edge of said second tier, said third tier having an endless inner edge;



(d) a fourth tier vertically displaced from said third tier and having a planar surface of square configuration upon which four playing squares are displayed, said fourth tier having an endless outer edge which substantially matches and is in vertical alignment with the inner edge of said third tier; and

(e) each of said first, second, third, and fourth tiers being a separate entity to allow vertical rearrangement and spacing alterations therebetween.

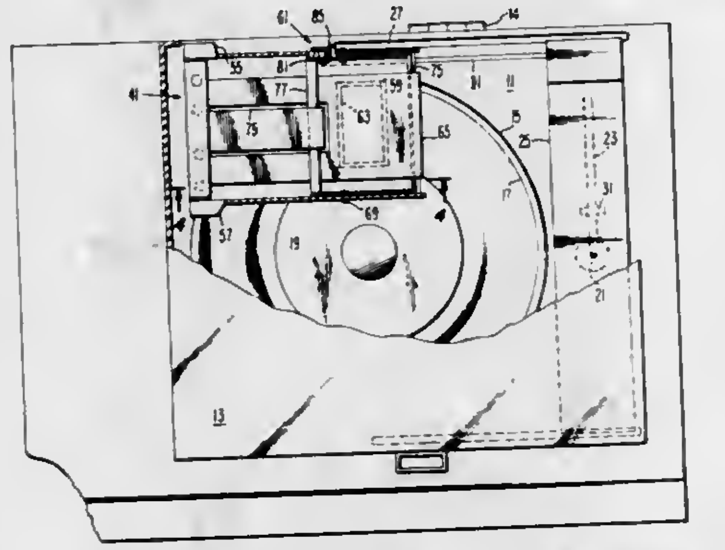
4,099,724
AUTOMATIC DISC WIPING APPARATUS

Larry Dean Huff, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,052

Int. Cl.^{2} G11B ***3/58***

U.S. Cl. 274—47 **10 Claims**



1. In a disc player including a base: a turntable mounted for rotation relative to said base and having a surface adapted to receive a disc record having a groove with information recorded therein; a stylus (21) subject to positioning in said groove for recovering said information; a signal pickup carriage for supporting said stylus, said carriage being mounted on the base for translational motion between an off-record standby position and above-record playback positions; and a lid pivotally mounted on said base for movement between a closed position and an open position; the combination comprising:

a pad for wiping the surface of a disc subject to being received on said turntable;

means for mounting said pad to the underside of said lid; said mounting means being subject, when said lid is in said closed position, to occupancy of a wiping position where said pad is in contact with the surface of the turntable; said mounting means being also subject to movement between said wiping position and a normal position where the pad is out of contact with the surface of the turntable;

defeasable means for effecting movement of said mounting means towards said normal position; and

means, including an engaging element coupled to the pickup carriage and subject to movement therewith, for defeating said movement effecting means in response to the translational travel of said signal pickup carriage during only a portion of the carriage travel between the off-record standby and above-record playback positions.

4,099,725
SEAL OF THE UPPER AREA OF A WET CYLINDER LINER

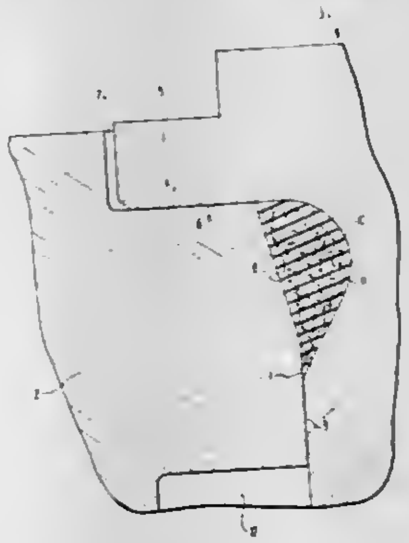
Gerhard Wolters, Gaggenau, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,403

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628674

Int. Cl.^{2} F02F ***1/24;*** **F16J** ***15/14***

U.S. Cl. 277—1 **12 Claims**



1. A seal for the upper area of a wet cylinder liner with respect to a crankcase of a reciprocating piston internal combustion engine, in which a liner collar of the cylinder liner rests with a collar surface on a support surface provided at the crankcase, and which includes an annular space formed by at least one of the two parts consisting of a recess in the cylinder liner underneath the liner collar and a chamfer at the crankcase inside of the support surface, a sealing material being disposed in said annular space, characterized in that a thin layer of deformable sealing material is applied between the collar surface and the support surface.

4,099,726
PACKING FOR CRYOGENIC SEAL JOINT

Roy C. Laible, Jamaica Plain, and Ari Brynjolfsson, Wayland, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

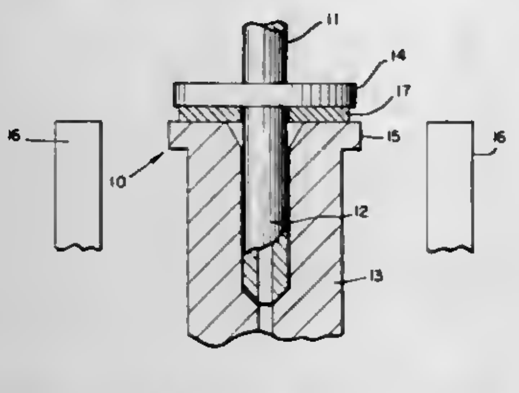
Filed Sep. 8, 1977, Ser. No. 831,452

Int. Cl.^{2} F16J ***15/10;*** **F17C** ***7/02;*** **B32B** ***27/34***

U.S. Cl. 277—1 **8 Claims**

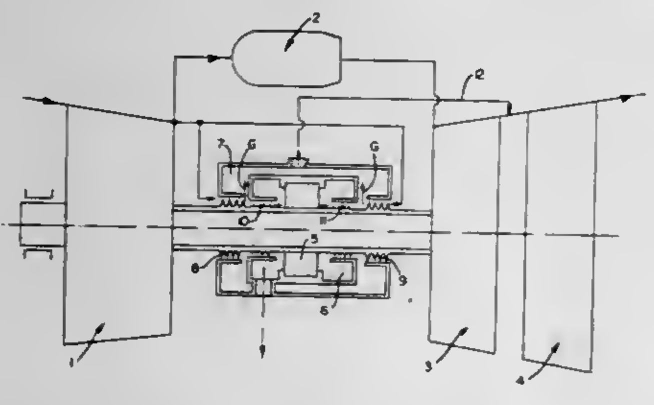
1. A method of preventing the escape of liquid nitrogen and nitrogen gas from an apparatus for treating materials with high energy ionizing radiation while said materials are being maintained at temperatures below about −40° C. with liquid nitro-

gen, which comprises packing each connectible and disconnectible joint of said apparatus through which said liquid nitrogen is conducted with a packing element consisting essentially of filaments of poly (p-phenylene terephthalamide).



4,099,727
SEAL SYSTEM FOR A GAS TURBINE ENGINE OR THE LIKE

Wolfgang Weiler, Dachau, Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Germany
Filed Jun. 3, 1977, Ser. No. 803,383
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1976, 2625551
Int. Cl.² F16J *15/40*
U.S. Cl. 277—3 10 Claims

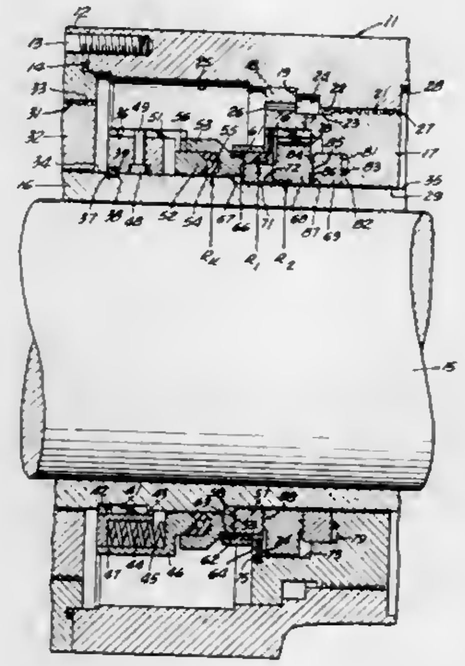


1. Sealing apparatus for a gas turbine engine or the like of the type having compressor means, said compressor means including a turbomachine shaft and bearing means in a bearing chamber for said turbomachine shaft, said sealing apparatus comprising:

- a dual labyrinth system having first and second labyrinth seal means interposed between a supply of high pressure sealing medium and said bearing chamber,
- said labyrinth seal means including contact-free seal portions which permit passage of said sealing medium while reducing the pressure thereof, whereby the pressure of said sealing medium is sequentially reduced as it passes through said first and second labyrinth seal means into said bearing chamber,
- wherein a second chamber is provided which surrounds said bearing chamber, wherein said first labyrinth seal means are disposed between said supply of high pressure sealing medium and said second chamber, and wherein said second labyrinth seal means are disposed between said second chamber and said bearing chamber.

4,099,728
MECHANICAL SEAL ASSEMBLY

Winfred John Wiese, Whittier, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 17, 1977, Ser. No. 842,863
Int. Cl.² F16J *15/34*
U.S. Cl. 277—96 7 Claims

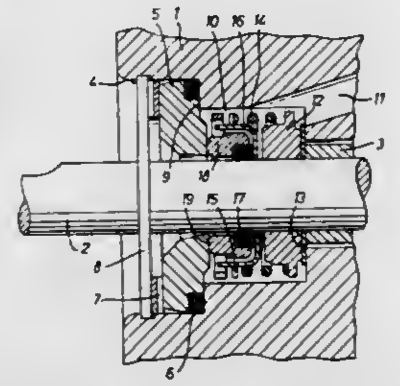


1. A mechanical seal assembly comprising:

- a housing having a shaft opening;
- said housing being exposed at one location to a relatively high fluid pressure and at another location to a fluid pressure less than said relatively high fluid pressure;
- a shaft rotatable in said opening;
- relatively rotatable mechanical seal means for sealing said opening comprising a first annular seal ring connected to said housing and a second annular seal ring connected to said shaft;
- one of said seal rings being longitudinally movable;
- said annular seal rings having transverse engaging annular seal faces; one of which is substantially harder than the other such that the seal face of the softer material will take substantially all of the longitudinal wear as said seal faces rotate relative to one another;
- said softer seal face having an inner radius greater than and an outer radius less than the corresponding radii of said harder face;
- said seal ring having said harder seal face having a balance radius of constant length greater than the inner radius yet less than the outer radius of said softer seal face;
- said softer seal face being provided hy an annular boss on said other seal ring having an outer side sloping outwardly in a direction away from said one seal ring and in inner side sloping inwardly in a direction away from said other seal ring;
- the slopes of the sides of said boss being selected in relation to the balance radius, and the inner and outer radii of the softer seal face such that, as said boss wears away in operation of the seal, the inner radius of said softer seal face decreases and the outer radius of said softer seal face increases to maintain the balance of said seal rings substantially constant.

4,099,729
STUFFING BOX BACKSTOP RING

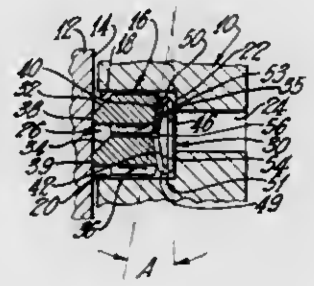
Hans Peter Glud Nylykke, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Continuation-in-part of Ser. No. 697,671, Jun. 18, 1976, abandoned, and Ser. No. 697,672, Jun. 18, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 809,157
Claims priority, application Denmark, Feb. 6, 1976, 483/76; Jun. 18, 1975, 2742/75
Int. Cl.² F16J *15/34*
U.S. Cl. 277—96.1 6 Claims



1. A backstop ring for a stuffing box or the like adapted to cooperate with a carbon sealing ring to provide sealing for dynamic and static operation, comprising, an annularly shaped member having a generally flat sealing surface, said surface having characteristic grinding marks orientated to cause fluid to be pumped in a selected radial outward direction, the flatness of said sealing surface having a deviation of less than six microns and said marks having roughness between 0.2 and 2 microns.

4,099,730
PISTON RING CONSTRUCTION

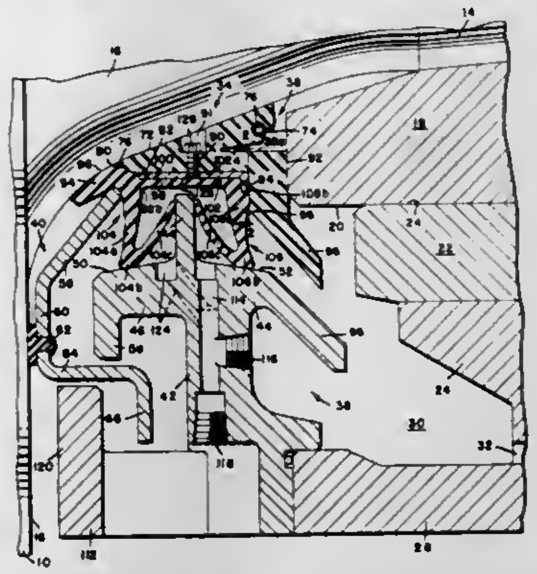
Kenneth J. Nisper, Spring Lake, Mich., assignor to Questor Corporation, Toledo, Ohio
Filed May 31, 1977, Ser. No. 802,179
Int. Cl.² F16F *1/34*; F02F *5/00*
U.S. Cl. 277—139 11 Claims



1. A spacer-expander ring for a piston ring construction comprising a parted ring body having a group of circumferentially-spaced strut sections, connectors arranged in two rows integrally joining the ends of adjacent pairs of strut sections, the connectors of the rows being bent inwardly toward one another whereby the connectors of one row are in staggered relation with respect to connectors of the other row, said rows of connectors forming a second group of sections, portions of the connector sections being radially spaced from portions of the strut sections, one of said groups of sections being arranged for radial engagement with a piston ring.

4,099,731
SEAL

Lowell S. Salter, Jr., Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.
Continuation of Ser. No. 620,438, Oct. 7, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,937
Int. Cl.² F16J *15/34*
U.S. Cl. 277—164 6 Claims

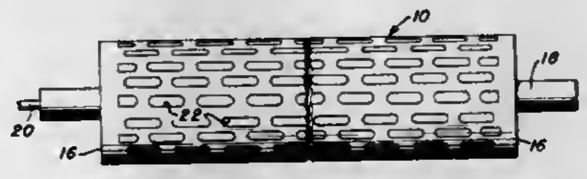


1. In a rolling mill, for use in combination with a work roll having a roll neck rotatably supported by a bearing contained in a bearing chock, with a circular nonrotatable seal end plate surrounding and spaced radially from the roll neck at a location between the bearing chock and the roll end face, a neck seal assembly adapted to be mounted on the roll neck for rotation therewith within the confines of the seal end plate, said neck seal assembly comprising:

- (a) separately manufactured circular flexible inner and outer body segments;
- (b) said inner body segment being arranged radially within said outer body segment, with adjacent portions of said inner and outer body segments being in direct sealing engagement with each other;
- (c) means for connecting said body segments together and for preventing movement of one body segment relative to the other body segment;
- (d) interior surface means on said inner body segment for sealingly engaging the roll neck; and,
- (e) flanges integral with and extending radially from said outer body segment to frictionally engage the seal end plate.

4,099,732
EXPANDABLE SHAFT

James W. Threatt, Rte. 1, Box 159, Darlington, S.C. 29532
Filed Jun. 3, 1977, Ser. No. 803,297
Int. Cl.² B23B *31/40*; B65H *65/18*
U.S. Cl. 279—2 A 6 Claims



1. An expandable shaft for the mounting of cores, mandrels, blade holders, and working tools, said shaft comprising:

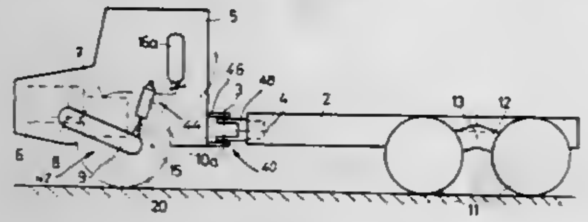
- an expandable elastomeric liner and an expandable metal shell, said shell having multiple openings defined therethrough, said liner being received within and closely conforming to the interior of said shell with portions of the liner extending into and filling the openings defined through the shell, said shell and said liner defining a pressurizable internal chamber and said shell and liner being substantially simultaneously expandable upon pressurizing the internal chamber, and said shell and the liner portions extending through the openings presenting a smooth continuous outer shaft surface after being expanded.

4,099,733

OFF-THE-ROAD VEHICLES

Ahti Ilmari Ahonen, Tampere, Finland, assignor to Valmet Oy, Finland

Filed Apr. 11, 1977, Ser. No. 786,463
Claims priority, application Finland, Apr. 12, 1976, 760992
Int. Cl.² B60S *9/00;* **B60G** *17/00*
U.S. Cl. 280—6.1 **9 Claims**



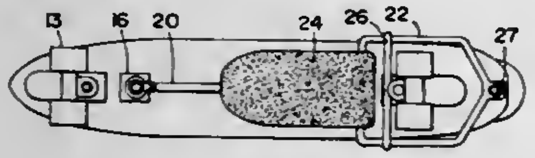
1. In a vehicle, particularly an off-the-road type of vehicle which is adapted to travel on rough terrain, a pair of frame means arranged longitudinally of the vehicle in the direction of travel thereof, and a pair of ground-engaging means respectively operatively connected to said pair of frame means and extending downwardly therefrom into engagement with the ground beneath said pair of frame means to support said pair of frame means for travel along the ground, suspension means operatively connected to one of said ground-engaging means and the frame means associated therewith for forming the operative connection between the latter ground-engaging means and frame means, joint means operatively connected with both of said frame means for interconnecting said pair of frame means for turning movement with respect to each other at least about an axis which extends longitudinally of the vehicle and which is substantially horizontal when the pair of ground-engaging means engage substantially horizontal ground, and a pair of elastically yieldable means one of which forms part of said suspension means for elastically and yieldably interconnecting the ground-engaging means and frame means which are operatively connected to each other by way of said suspension means and the other of which is operatively connected with said joint means for elastically and yieldably opposing relative turning of said pair of frame means with respect to said axis of said joint means.

4,099,734

SKATEBOARD BRAKE

Fred Lowery, P.O. Box 1183, Pebble Beach, Calif. 93953

Filed May 16, 1977, Ser. No. 797,125
Int. Cl.² A63C *17/14*
U.S. Cl. 280—11.2 **3 Claims**



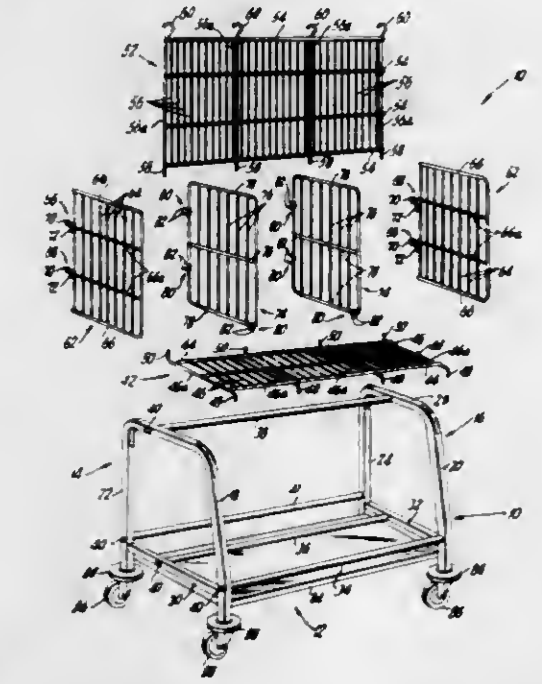
1. A braking device for a skateboard having front and rear wheel assemblies, comprising friction means adapted to frictionally engage the surface on which said skateboard travels, said friction means extending below and along a substantial longitudinal extent of said skateboard, a bracket secured to said friction means subjacently of said skateboard, a ball pivot secured to a forward portion of said skateboard adjacent said front wheel assembly and depending downwardly therefrom, a collar secured to a forward end of said bracket and engaging said ball pivot to permit rotation of said bracket and said friction means in a vertical plane, a portion of said friction means being disposed forwardly of the longitudinal midpoint of said skateboard, a rear portion of said bracket circumscribing said rear wheel assembly and a plunger extending upwardly therefrom; a slot in a rear portion of said skateboard through which said plunger extends freely, a pedal secured to a rear portion of the upper surface of said skateboard, said pedal having a free end impinging on the upper end of said plunger, and resilient means secured to said skateboard and said bracket for biasing said bracket, friction means, plunger, and pedal upwardly.

4,099,735

CONVERTIBLE CART

Frederick R. Becker, III, Dallas, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Sep. 13, 1976, Ser. No. 722,550
Int. Cl.² B62B *3/02*
U.S. Cl. 280—79.3 **25 Claims**



10. A convertible cart comprising:

(a) frame means including a pair of laterally spaced apart end members each having front and rear legs and connecting transverse members proximate upper and lower ends thereof, respectively;

(b) first and second lateral support means extending between said end members, said first support means being coupled to lower ends of said front legs, and said second support means being coupled to lower ones of said connecting transverse members;

(c) third lateral support means extending between and coupled to upper ones of said connecting transverse members;

(d) a bottom mat loosely mounted on said first and said second lateral support means;

(e) a back mat having an upper end loosely coupled to said third lateral support means and having a lower end positioned adjacent said bottom mat;

(f) at least one panel disposed forwardly from said back mat and upwardly from said bottom mat, said one panel including hinge means for releasably engaging a first rod-like member of said back mat, said hinge means including second rod-like members extending rearwardly from and being secured to said one panel, said hinge means being arranged for permitting limited pivotal movement of said one panel with respect to said back mat when said second rod-like members engage said first rod-like member;

(g) shelf means integral with said frame means; and

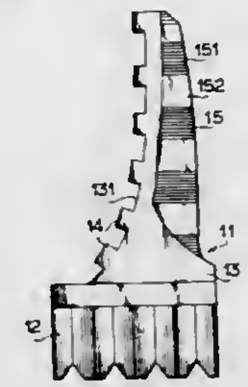
(h) said bottom mat, said back mat, and said at least one panel are each comprised of a plurality of rod-like members secured to each other in a grid-like pattern.

4,099,736

MUDGUARD FOR A VEHICLE

Akira Shiina, 60 Nukari, Kamiyoshima, Yoshima-machi, Iwaki-shi, Fukushima Prefecture, Japan

Filed Dec. 7, 1976, Ser. No. 748,183
Claims priority, application Japan, Jun. 11, 1976, 51-075852
Int. Cl.² B62D *25/16*
U.S. Cl. 280—154.5 R **7 Claims**



1. A mudguard assembly for a vehicle comprising:

(a) an integral mudguard formed of an elastic material and having an attaching plate with a curved side so that the plate narrows gradually towards one end, the thickness of said attaching plate decreasing in stepwise manner in a direction from the curved side to the side opposite the curved side;
a plurality of spaced-apart members protruding from the curved side of said attaching plate; and
a mudguard main plate connected to the end of said attaching plate opposite the narrow end, the thickness of said main plate decreasing in stepwise manner from the end connected to the attaching plate to the end opposite the connected end; and

(b) a plurality of attaching members for attaching said attaching plate to the body of a vehicle, each of said attaching members having:
(1) an attaching body with a generally]-shaped sectional area and having a groove defined by its side walls, one of its side walls having a threaded opening defined therein,
(2) a holding body engageable with the attaching body and having a generally]-shaped sectional area, one side wall of the holding body being positionable inside the groove defined by the side walls of the attaching body, the other side wall of the holding body having an opening defined therein and being positionable outside of the groove, and
(3) a threaded bolt insertable through the openings in the side walls of said attaching body and said holding body for connecting said bodies to each other so that parts of the body of the vehicle and the curved side of said attaching plate are positioned and held between the side walls of said attaching body and said holding body.

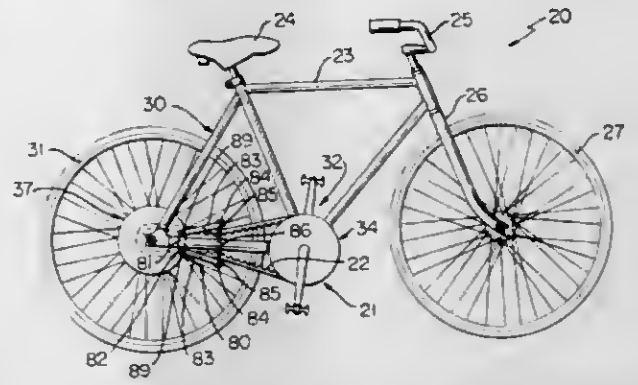
4,099,737

BICYCLE BELT DRIVE SYSTEM

Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Apr. 27, 1977, Ser. No. 791,615
Int. Cl.² B62M *9/00*
U.S. Cl. 280—261 **20 Claims**

1. A bicycle belt drive system comprising, a driving pulley rotatably supported by said bicycle and having a toothed hub portion and a pair of opposite side flanges, a driven pulley carried by a wheel of said bicycle for rotation therewith and having a toothed hub portion and a pair of opposite side flanges, one of said pulleys having at least one of its flanges which is axially movable relative to the other, speed responsive means adapted to engage and move said one flange in response to rotational speed thereof, and a toothed endless power transmission belt having opposed driving surfaces which are adapted to engage said side flanges and having teeth adapted to engage and drive said toothed hub portions of said pulleys, said teeth of said belt engaging said toothed portions immediately upon starting said bicycle to provide a more positive interconnection between said driving and driven pulleys, said speed responsive means serving to move said movable flange axially with an increase in rotational speed of said one pulley causing said belt to ride radially outwardly on said one pulley with said opposed driving surfaces engaging said flanges of said one pulley to thereby change the mechanical advantage between said driving pulley and driven pulley in response to said speed of said bicycle.

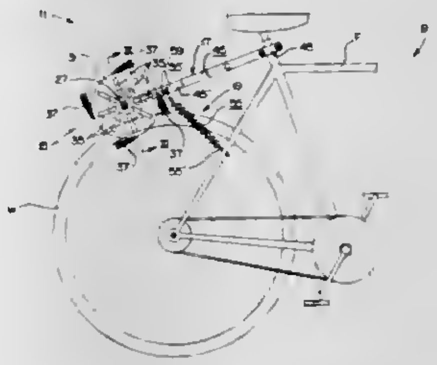


4,099,738

BICYCLE ACCESSORY MEANS

Elbert F. Allen, 2685 Country Green Rd., Memphis, Tenn. 38134

Filed Jan. 3, 1977, Ser. No. 756,471
Int. Cl.² B62J *5/20;* **A63H** *5/00*
U.S. Cl. 280—289 D **5 Claims**



1. Accessory means for attachment to a bicycle or the like of the type including a frame and at least one rotatable wheel mounted on the frame, said accessory means comprising:

(a) roller means for rotation with the wheel of the bicycle, said roller means having first and second ends;

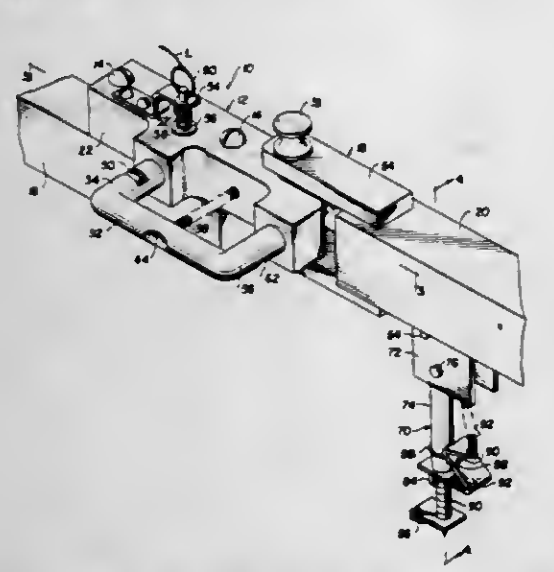
(b) attraction-getting means including first and second attraction-getting platelike members for being fixedly attached to said respective first and second ends of said roller means for rotation therewith, said first and second attraction-getting platelike members each having a predominant face surface directed outwardly of said roller means, said attraction-getting means including a plurality of reflective members attached to said face surfaces of each of said first and second attraction-getting platelike members;

(c) connector means for attaching said roller means to the frame of the bicycle, said connector means including a substantially rigid body member having a first end for attachment to the frame of the bicycle and having a second end for attachment to said roller means; and

(d) spring means for forcing said roller means against the wheel of the bicycle to cause said roller means to frictionally engage the wheel of the bicycle so that said roller means will rotate when the wheel of the bicycle rotates; said first end of said body member of said connector means being substantially U-shaped for receiving a portion of the frame of the bicycle therein, said connector means including means for selectively clamping said first substantially U-shaped end about a portion of the frame of the bicycle to fixedly attach said body member thereto, said second end of said body member of said connector means being substantially U-shaped for receiving said roller means therein, in which said second substantially U-shaped end includes first and second spaced apart leg portions, and said first end of said roller means being rotatably mounted to said first leg portion of said second substantially U-shaped end of said body member and said second end of said roller means being rotatably mounted to said second leg portion of said second substantially U-shaped end of said body member.

4,099,739
HITCHING APPARATUS

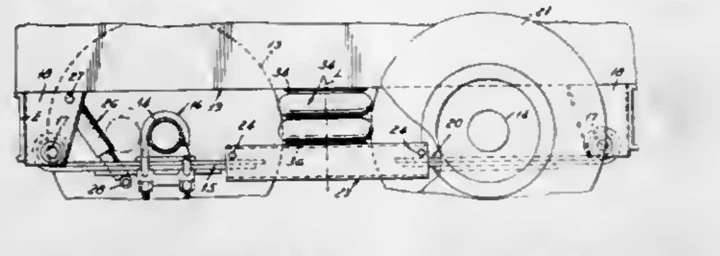
Newman Clarence Foley, Superior, Wis., assignor to N.B.F. Company, Inc., Superior, Wis.
Filed Jan. 17, 1977, Ser. No. 759,776
Int. Cl.² B60D ***1/14***
U.S. Cl. 280—504 **7 Claims**



1. Apparatus for hitching mobile equipment, comprising a locking assembly, said locking assembly comprising:
- a base having a pair of substantially parallel laterally extending bores therethrough and a rearwardly opening slot intersecting one of said bores,
- a substantially U-shaped locking member having a pair of generally laterally extending legs having inner ends slidably mounted in said bores, said locking member being movable between a closed position wherein one of said legs extends across said rearwardly opening slot to close it and an open position wherein said one leg is removed from said slot,
- means for urging said locking member to said closed position, and
- means for releasably retaining said locking member in said open or said closed position, said retaining means comprising a locking pin movably mounted on said base said locking pin having an inner end and an outer end, said inner end being movable into the other of said bores, and the other of said legs having a first notch therein adapted to receive said locking pin therein, whereby said locking pin serves to retain said locking member in said closed position by movement of said locking pin into said other bore and into said notch in said other leg and said locking pin serves to retain said locking member in said open position against the force of said urging means by movement of said locking pin into said other bore wherein it is engaged by the inner end of said other leg.

4,099,740
SPRING-AIR TANDEM SUSPENSION

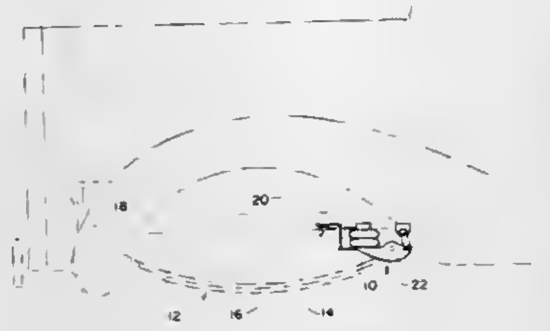
Donald J. McGee, Troy, Mich., assignor to H & H Equipment Co., Detroit, Mich.
Filed Jul. 29, 1976, Ser. No. 709,868
Int. Cl.² B60G ***5/02***
U.S. Cl. 280—678 **6 Claims**



1. An improvement in a heavy duty vehicle characterized by a pair of fore and aft-spaced wheel axles mounted on a vehicle frame and each equipped with a mechanical springing device; said improvement comprising a single mechanical floating beam disposed in front-to-rear alignment with and between said fore and aft springing devices, being operatively connected adjacent its opposite ends to said springing devices, and a single fluid-pressure cushion unit verticallly interposed between said beam and a part of said frame, said cushion unit being located substantially equidistant from said operative end connections of the beam to said fore and aft springing devices respectively and being in a substantially horizontally equally spaced relation to said connections.

4,099,741
SUPPLEMENTAL AIR SPRING ASSEMBLY

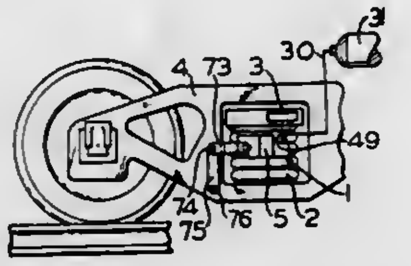
Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Fresno, Calif.
Filed Dec. 6, 1976, Ser. No. 747,880
Int. Cl.² B60G ***11/46***
U.S. Cl. 280—712 **5 Claims**



1. In a front end suspension system for a motorized vehicle characterized by a wheel-supported axle having a transversely oriented leaf spring assembly mounted on the axle and attached at its leading end to a longitudinal frame member for the vehicle, a supplemental air spring assembly comprising:
- a load dissipating arm pivotally connected near its midportion to the trailing end of the leaf spring assembly, an air bag seated on one end portion of the arm and disposed between a pair of parallel planes intersecting the opposite ends of the leaf spring assembly in load supporting relation with said frame member, and coupling means including a rigid link connecting the opposite end portion of the arm to said frame member restraining the arm for oscillatory motion about a horizontal axis disposed in space relation therewith.

4,099,742
CONTROL VALVE DEVICE FOR VEHICLE AIR SPRINGS

Raymond C. Wright, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Jun. 8, 1976, Ser. No. 693,746
Int. Cl.² B60G ***17/10***
U.S. Cl. 280—714 **14 Claims**

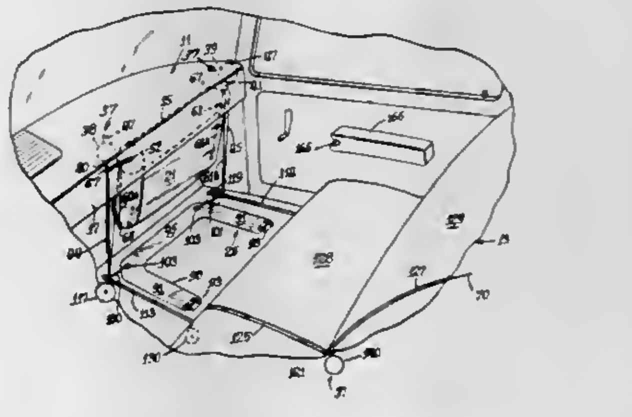


1. A coatrol valve device for so controlling the pressure of a fluid in an air spring between the sprung and unsprung portions of a vehicle as to support the sprung portion at a substantially constant preselected height above the unsprung portion irrespective of the load carried by the sprung portion, said control valve device comprising:
- (a) a casing having a plurality of bores therein, said casing being attached to the sprung portion;
- (b) a supply and a release valve mechanism each having a valve operating stem for effecting the operation thereof, whereby operation of said supply valve mechanism causes the supply of fluid under pressure to the air spring and operation of said release valve mechanism causes the release of fluid under pressure from the air spring to atmosphere;
- (c) a cam rockably mounted with respect to said casing and rockable in one direction or in an opposite direction in response to a deflection of said sprung portion as the vehicle load is increased or decreased;
- (d) actuator means movable in one direction in response to rocking of said cam in said one direction for actuating the valve stem of said supply valve mechanism to cause the supply of fluid under pressure to the vehicle air spring, and movable in an opposite direction in response to rocking of said cam in said opposite direction for actuating the stem of said release valve mechanism to cause the release of fluid under pressure from said air spring;
- (e) means for limiting the rate of movement of said actuator means in said one and said opposite directions, said rate being chosen to reflect the rate of deflection of the vehicle sprung portion resulting from a load change; and
- (f) a pair of resilient means, one being interposed between said cam and said actuator means and the other interposed between said casing and said actuator means whereby said movable means is urged in said one direction or in said opposite direction accordingly as said cam is rocked in said one direction or in said opposite direction, said one of said pair of resilient means further providing for rocking of said cam when the rate of deflection of the vehicle sprung portion is such as to exceed the limiting rate of movement of said actuator means.

4,099,743
PASSIVE RESTRAINT SYSTEM WITH HEAD AND KNEE RESTRAINT

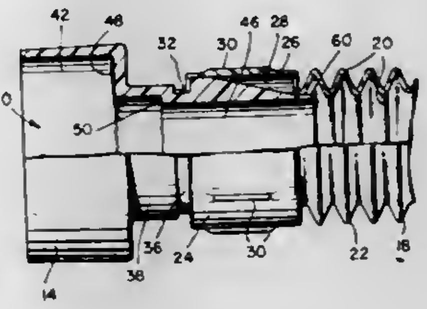
Tse Quong Non, 2315 S. Wentworth Ave., Chicago, Ill. 60616
Filed Feb. 10, 1977, Ser. No. 767,475
Int. Cl.² B60R ***21/02***
U.S. Cl. 280—753 **6 Claims**

1. A safety-belt system for a vehicle comprising a chest restraint element movable from a stowage position located adjacent the vehicle's dashboard to a restraint position about the vehicle's occupant's chest, cable means to shift the chest restraint element from the stowage position to the restraining position with the restraint element extending across the occupant's chest, power means for returning the chest restraint element from the restraining position to the stowage position after use for reuse, an electrically operated control means operable upon a predetermined deceleration of the vehicle to operate the shifting means to shift the chest restraint element automatically from the stowage position to the restraint position, a head restraint means movable from a stowage position located adjacent the vehicle's dashboard to a restraint position for restraining the occupant's head, said head restraint being connected to said chest restraint element and being movable therewith until said chest restraint engages said chest, said cable means having a portion thereof continuing to shift said head restraint element independently of said chest restraint element and upwardly and rearwardly toward the face of the occupant after said chest restraint element has engaged the occupant's chest, said cable means and said power means moving the head restraint means between its stowage position and its restraint position.



4,099,744
SNAP-IN SWIVEL END FITTING

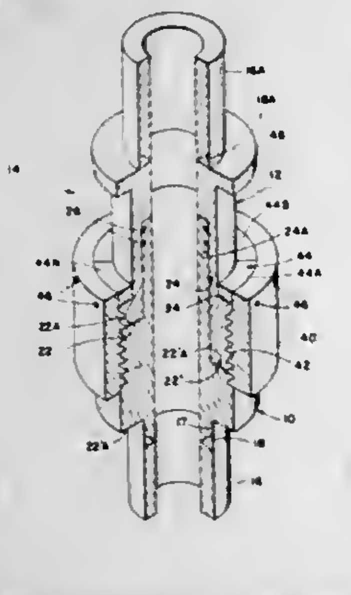
Thomas A. Kutnyak, Greenwood, and George T. Dunn, Abbeville, both of S.C., assignors to Automation Industries, Inc., Los Angeles, Calif.
Continuation of Ser. No. 592,869, Jul. 3, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,857
Int. Cl.² F16L ***33/00***
U.S. Cl. 285—7 **12 Claims**



1. A hose comprising:
- an elongated flexible walled section terminating at one end thereof in a substantially rigid walled tubular cuff, said flexible walled section being integrally molded to said cuff, said cuff having an interior opening, said flexible walled section having an elongated interior chamber, said interior opening being contiguous with said elongated interior chamber, said cuff having a snap lock comprising an inwardly extending radial flange located at the free end of said cuff and an axially located sleeve attached to the free edge of said flange and extending outwardly therefrom;
- an end fitting adapted to be partially inserted within said interior opening of said cuff forming a substantially air-

tight connection therebetween, said end fitting includes a section having a tapered exterior surface and an interior cylindrical wall, said tapered section locatable within said interior opening, the leading edge of said tapered section having an outer diameter less than the inner diamger of said radial flange, the outer diameter of said tapered section increasing from said leading end to a diameter greater than the inner diameter of said radial flange, an inwardly extending annular groove formed within said end fitting at the back end of said tapered section, said annular groove defined by two axially disposed radial faces which normally prevent axial movement of the end fitting in either axial direction, said annular groove having a diameter equal to or somewhat less than the inner diameter of said radial flange, whereby upon insertion of said tapered section within said cuff the said radial flange expands and rides over the outer surface of the said tapered section until the said sleeve rests within said annular groove thereby axially locking said hose in said end fitting while allowing the said end fitting to freely rotate relative to said hose, with said sleeve located in said annular groove the said leading edge of said tapered section includes a hollow cylindrical axial extension which extends slightly past said cuff into the said hose.

4,099,745
DRILL PIPE JOINT
James H. Cobbs, 5144 S. New Haven, Tulsa, Okla. 74135
Filed Apr. 4, 1977, Ser. No. 784,288
Int. Cl.² F16L *35/00*
U.S. Cl. 285—24 **7 Claims**



1. A rotary drill pipe tool joint, comprising;

(a) a pin section and a box section, both sections of said tool joint of larger outer diameter than that of said drill pipe, and adapted to be attached at their first ends individually to first and second ends of a joint of drill pipe, by conventional means, axial openings through said sections corresponding to the axial opening through said pipe;

(b) at their second ends, both said pin and box sections threaded with identical straight threads of any selected form;

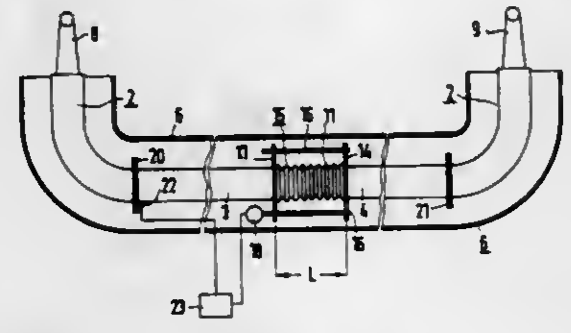
(c) a plurality of longitudinal tongues and grooves cut into the ends of said theaded portions, of selected width and angular spacing such that the tongues on the end of the pin section will fit into the grooves of the box section, and vice versa, and means to polarize said tongues and grooves so that the two parts of a tool joint will fit together in only one angular position;

whereby when said parts are meshed, the threads on the two parts will be collinear with each other;

(d) a cylindrical extension on the second end of said pin section, and an axial socket on the second end of said box section, of corresponding diameters, and means to seal said extension in said socket; and

(e) threaded collar means adapted to screw over the threaded meshed tongues, to couple said pin and box sections together.

4,099,746
EQUALIZING ARRANGEMENT FOR A LOW TEMPERATURE LINE
Otmar Kontsch, Sankt Stefan, Austria, and Fritz Schmidt, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Sep. 8, 1976, Ser. No. 721,486
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1975, 2541219
Int. Cl.² F16L *51/02*
U.S. Cl. 285—119 **10 Claims**

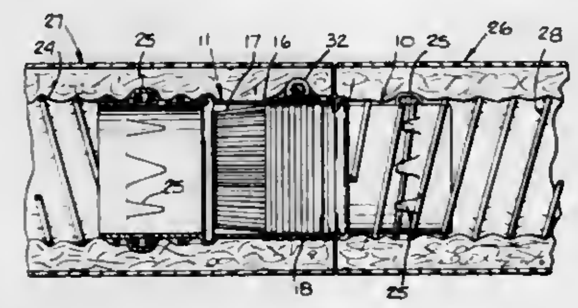


1. An equalizing arrangement for a low temperature line having at least one rigid inner tube enclosed by an outer tube, the inner tube being used for the conduction of a cryogenic medium comprising:

a. a compensating element forming part of the inner tube and connecting two sections thereof; and

b. an expansion device associated with the compensating element, said expansion device rigidly coupling the two tube sections which are connected by said compensating element, the expansion device being such that it establishes a predetermined length for every given temperature between normal ambient temperature and the temperature of the cryogenic medium conducted by said inner tube.

4,099,747
AIR DUCT CONNECTING ASSEMBLY
Robert Henry Meserole, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Filed Nov. 12, 1976, Ser. No. 741,319
Int. Cl.² F16L *59/14*
U.S. Cl. 285—174 **5 Claims**



1. An air duct connecting assembly comprising,

a. a sleeve-like male connector,

b. a sleeve-like female connector, each of said connectors having circumferentially overlapping and overlapped portions,

c. means integral with each of said connectors for retaining each connector in said sleeve-like configuration,

d. said means comprising:

(i) a tongue extending circumferentially from a longitudinal edge of said overlapping portion, said tongue having a longitudinal extent less than said longitudinal edge and having at least one detent in an intermediate portion thereof, said detent having a radially inwardly protruding locking edge,

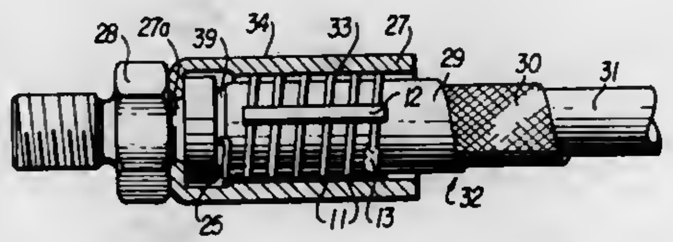
(ii) a slot in said overlapped portion, said slot having at least one edge for cooperating with said locking edge when said detent passes through said slot, and

(iii) a louver-like radially outwardly protruding hood covering said slot, said hood having a longitudinally extending opening for receiving said tongue and having a longitudinally extending wall portion for limiting movement of said tongue in a circumferential direction, and

e. cooperating means on said male connector and said female connector for holding said connectors in a telescoped relationship,

f. means on each of said connectors for mechanically securing each connector to a core of a tubular air duct.

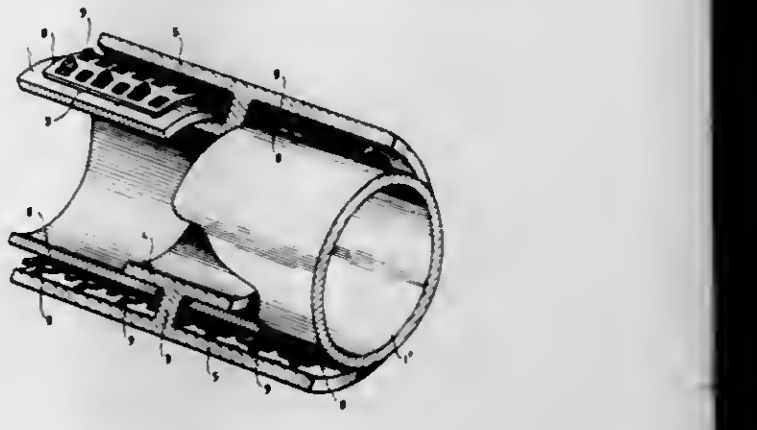
4,099,748
HOSE COUPLING ASSEMBLY
Edward M. Kavick, Chardon, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio
Filed Nov. 12, 1976, Ser. No. 741,372
Int. Cl.² F16L *33/20*
U.S. Cl. 285—256 **12 Claims**



1. A coupling adapted for use on the end of a hose or tube comprising a body member, a pintle member extending from the body member and having a central longitudinal axis therethrough, a compressive member disposed in encompassing relationship about the pintle member and secured at one end thereof to the body member, a coil insert member disposed between the compressive member and the pintle member, said coil insert member comprising a plurality of coils disposed about the pintle member and which completely encircle the pintle member while in a radially uncompressed state prior to attachment of the coil insert member to the hose or tube, said coils having an inner diameter thereof disposed radially outwardly substantially equi-distant from the longitudinal axis of the pintle member for a distance from the outer surface of the pintle member sufficient to permit insertion therebetween of the wall of a hose or tube to which the coupling is to be attached, and said coils having at least a portion thereof secured in a spaced-apart relationship to each other by means of a plurality of circumferentially-spaced longitudinally extending members which extend between at least a portion of the coils to prevent warpage thereof and to more uniformly distribute the radially inwardly compressive force transferred to the coils as a result of compressing the compressive member radially inwardly during the process of attaching the coupling to the hose or tube.

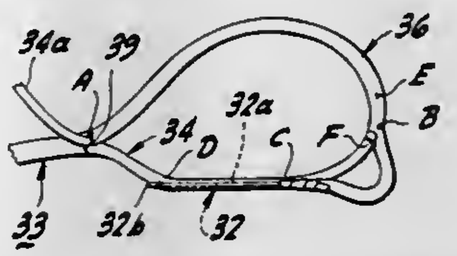
4,099,749
COUPLING SLEEVE
Cors van Vliet, Zwolle, Netherlands, assignor to Air-O-Mulder B.V., Kampen, Netherlands
Filed Mar. 24, 1975, Ser. No. 561,345
Claims priority, application Netherlands, Apr. 8, 1974, 7404779
Int. Cl.² F16L *21/00*
U.S. Cl. 285—398 **1 Claim**

1. For use in interconnecting ventilation duct elements made of sheet material having smooth end portions, a coupling member comprising a coupling sleeve having at least two substantially spaced apart parallel flanges interconnected by a web portion, said flanges differing mutually as to axial length, the shortest flange adjoining one end of the web portion and the longest flange adjoining the other end of said web portion, the surfaces of the flanges which face one another being parallel and wedge locking means between said coupling sleeve and said ventilation duct elements and positioned on each side of said web portion and comprising a loose resilient strip having



a plurality of upwardly and downwardly obliquely protruding teeth formed integrally from said strip, said teeth being disposed in a plurality of rows extending longitudinally and transversely to the major axis of said coupling sleeve, whereby each duct element may be easily inserted in one direction between the strip and one of the flanges and when the duct element is moved in the opposite direction said teeth will engage and lock said duct element to said coupling sleeve.

4,099,750
METHOD OF FORMING EYE SPLICE IN DOUBLE BRAIDED LINE
James D. McGrew, 8120 Rio Linda Blvd., Elverta, Calif. 95626
Filed Sep. 2, 1977, Ser. No. 830,109
Int. Cl.² B65H *69/04*
U.S. Cl. 289—1.5 **4 Claims**



1. A method of forming an eye splice in a double braided line having a core and a sheath using a fid having a flexible handle with a pointed end and a hook extending from the other end of the handle, comprising the steps of:

a. forming an opening in the sheath at a first point thereon;

b. pulling the core out of the sheath through the opening;

c. forming a knot in the end of the core;

d. hooking the hook of the fid around the knot in the end of the core;

e. whipping the end of the core to the fid;

f. inserting the pointed end of the fid into the sheath at a second point on the sheath between the first point and the end of the sheath, working the fid and core through the sheath to the opening and pulling the fid and the end of the core of the sheath through the opening;

g. removing the fid from the end of the core;

h. forming a knot in the end of the sheath;

i. hooking the hook of the fid around the knot in the end of the sheath;

j. whipping the end of the sheath to the fid;

k. pulling the core farther out of the sheath through the opening;
l. inserting the pointed end of the fid into the core at a third point on the core between the first and second points, working the fid and sheath through the core to a fourth point on the core between the third and first points and pulling the fid and the end of the core out of the sheath at the fourth point;
m. removing the fid from the end of the sheath;
n. pulling the ends of the sheath and core to bring the second point on the sheath and the third point on the core together; and,
o. milking the sheath over the core so that the second point on the sheath and the third point on the core enter the sheath through the opening.

4,099,751
PIN LATCH STRUCTURE

Lloyd R. Poe, Long Beach, and Frank L. Sawyer, Orange, both of Calif., assignors to Hartwell Corporation, Placentia, Calif. Continuation-in-part of Ser. No. 718,066, Aug. 26, 1976, abandoned. This application Oct. 27, 1976, Ser. No. 735,967
Int. Cl.² E05C ***1/06***
U.S. Cl. 292—139 **9 Claims**

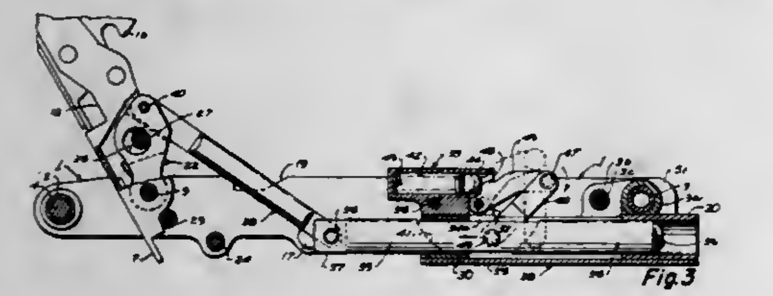


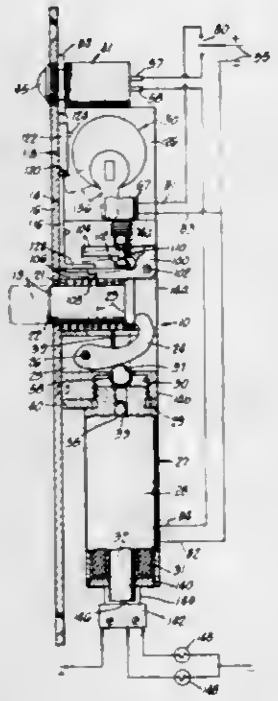
Fig.3

1. A latching structure comprising:
a. a mounting means including a guide sleeve;
b. a latch pin axially reciprocable with respect to the guide sleeve between an extended position, an intermediate position and a retracted position;
c. yieldable means interconnecting the mounting means and latch pin operable between the intermediate and extended positions of the latch pin tourge the latch pin toward its extended position and operable between the intermediate and retracted positions of the latch pin to urge the latch pin toward its retracted position;
d. and a manually operated pivotable handle means and linkage means connected to the latch pin for retracting and extending the latch pin;
e. the handle means and linkage means including a manually engagable trigger assembly having two positions, a first position in which the trigger assembly secures the handle means in a flush condition, and a second position in which the trigger assembly secures the handle means in a manually accessible position while the latch pin remains in its latch position.

7. The combination with a flush latch structure including a handle assembly pivotable between a flush position and an extreme angular position, a fixed guide sleeve underlying the handle assembly, a latch pin slidable in the sleeve and connected by first linkage means to the handle assembly between an extended position, when the handle assembly is in its flush position, and a retracted position when the handle assembly is in its extreme angular position of an overcenter operating means comprising:
a. a support fixed with respect to the guide sleeve;
b. second linkage means extending between the support means and the latch pin;
c. the second linkage means being movable between a first position, when the latch pin is extended through an intermediate position, a second position when the latch pin is retracted;
d. and yieldable means operable, when the second linkage means is between its first position and its intermediate position, to urge the latch pin toward its extended position and operable, when the second linkage means is between its intermediate position and second position, to urge the latch pin toward its retracted position.

4,099,752
ELECTRIC LOCK

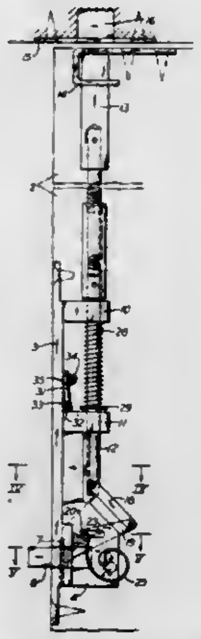
Arthur V. Geringer, 5424 Geyser Ave., Tarzana, Calif. 91356 Continuation-in-part of Ser. No. 593,966, Jul. 8, 1975, Pat. No. 4,021,065. This application Jan. 27, 1977, Ser. No. 763,023
Int. Cl.² E05C ***1/06***
U.S. Cl. 292—144 **10 Claims**



1. In an electric door lock which includes an elongate housing adapted for mounting in a door or frame member, a bolt supported in said housing for movement between a projected locking position and a retracted non-locking position, means normally urging said bolt toward its retracted position and solenoid means for actuating said bolt to a projected locking position; improved deadlocking means automatically operable to releasably lock said bolt in said locking position, said deadlocking means comprising:
an elongate lever member pivoted at one end in said housing for limited vertical swinging movement between deadlocking and non-deadlocking positions with respect to said bolt, said lever member being formed at its other end to provide spaced upper and lower finger portions, said lower finger portion being positioned to engage behind the inner end of said bolt upon movement of said bolt to its projected locking position;
means urging said member to its deadlocking position in response to movement of said bolt to its locking position; and
means for releasing said deadlocking member, comprising a movably mounted actuating member having a lateral projection extending between said upper and lower finger portions, whereby upon movement of said actuating member in an upward direction, the deadlocking member will be swung upwardly on its pivot to disengage said lower finger portion with respect to said bolt to permit movement of said bolt by said urging means to said retracted position.

4,099,753
AUTOMATIC LOCKING MECHANISM FOR ONE OF A PAIR OF HINGED DOORS

Joseph W. Gwozdz, Clark Summit; James E. Biesecker, Gouldsboro, and Charles R. Snyder, Factoryville, all of Pa., assignors to McKinney Manufacturing Company, Scranton, Pa.
Filed Jan. 24, 1977, Ser. No. 761,687
Int. Cl.² E05C ***7/06***
U.S. Cl. 292—177 **5 Claims**

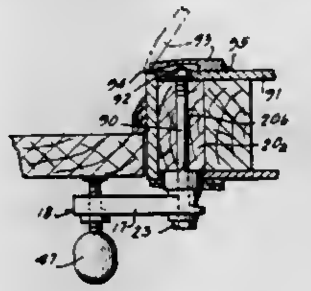


4. Automatic locking mechanism for one of a pair of hinged doors having adjacent free vertical edges when both doors are closed, one of the doors being active and the other being inactive, said mechanism comprising a housing adapted to be mounted on the inactive door and including a face plate provided with an opening therethrough, an axially movable vertical shaft slidably mounted in said housing and extending vertically therefrom, a normally retracted latch bolt rigidly mounted on the end of said shaft remote from the housing, a rocker arm having an inner end and an outer end, an inclined link having one end pivotally connected on a horizontal axis to the opposite end of the shaft and extending therefrom away from said face plate, means pivotally connecting the other end of said link on a horizontal axis to the inner end of said arm, means connecting the central part of said arm on a horizontal axis to said housing for pivotal and translational movement, a cam pivotally connected on a vertical axis to said housing and normally projecting through said face plate opening for engagement by the free vertical edge of the active door when closing for swinging the cam into the housing, the cam engaging the outer end of the rocker arm for swinging the arm vertically to cause the link and shaft to project said latch bolt from a horizontal edge of the inactive door, said central part of said arm being movable by the cam in a direction away from the face plate if the cam is swung into the housing and the shaft cannot move, and spring means constantly urge said pivoted central part of the arm toward the face plate.

4,099,754
DOOR SECURITY GUARD

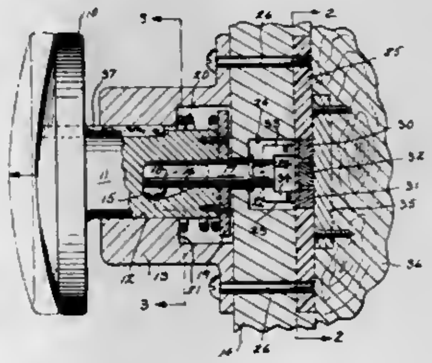
Robert J. Hoebing, RR 3, Quincy, Ill. 62301
Filed Jul. 8, 1977, Ser. Nn. 813,936
Int. Cl.² E05C ***5/04***
U.S. Cl. 292—206 **2 Claims**

1. A door security latch comprising an attachment member for attachment of the latch to a door frame adjacent a door opening having a projecting portion adapted to project beyond the door frame, a link member having a free end and an attachment end, the attachment end pivotably attached to the projecting portion with the link pivotable in a plane substantially normal to the plane of projection of the projecting portion, the free end having a threaded connection to a threaded member, the threaded member having a longitudinal axis of projection substantially normal to the plane of pivotability of the link, the threaded member having one end thereof terminating in a door abutment face and a second end thereof, lying on a side of the link opposite the door abutment face terminating in an actuating handle, rotation of the actuating handle causing the abutment face to withdraw towards the link and to advance away from the link, and the link having a length sufficient to place the abutment face in opposition to an inside surface of a door closing said door opening, the handle means having a light carried thereby and means activating said light only when said abutment face is in engagement with said door surface.



4,099,755
RELEASABLE MAGNET ASSEMBLY

Keith J. Anderson, 5049 Guerin Pass, New Berlin, Wis. 53151
Filed Dec. 10, 1976, Ser. No. 749,355
Int. Cl.² E05C ***17/56***
U.S. Cl. 292—251.5 **12 Claims**



1. A releasable latch comprising:
a strike plate of high magnetic permeability adapted to be mounted on one of a door and the frame of the door;
a magnet mounted for rotation in the other of said door and door frame and having spaced poles;
an intermediate member secured to said other of said door and door frame and disposed between said magnet and said strike plate,
said intermediate member including ferromagnetic means acting as an extension of said poles when said magnet is in one relative angular position with respect to said intermediate member and acting as a shunt when said magnet and said intermediate member have been rotated through an arc relative to each other;
means for rotating one of said intermediate member and said magnet relative to the other through said arc, said rotating means having an axis of rotation normal to said intermediate member and said magnet poles being disposed on opposite sides of said axis of rotation; and
a layer of low friction material disposed between said magnet poles and said ferromagnetic means.

4,099,756

LATCH ASSEMBLY

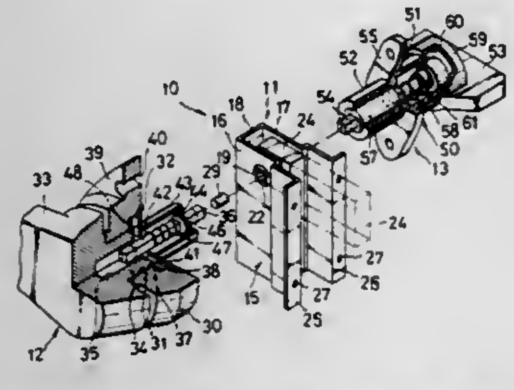
Tetsuro Kagoura, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,324

Claims priority, application Japan, Mar. 26, 1976, 51-33955

Int. Cl.^{2} E05C *3/10*

U.S. Cl. 292—336.3 **16 Claims**



1. A latch assembly for use on a closure frame member, comprising:
(a) a support frame having means for being attached to the closure frame member;
(b) a hollow shaft mounted in said support frame for rotation about a longitudinal axis thereof;
(c) a latch bolt fixed at one end thereof to said hollow shaft and extending radially from said hollow shaft, said latch bolt being angularly movable about said axis between a first position in which said bolt is retracted within said support frame and a second position in which said bolt has the opposite end projecting outwardly from said support frame;
(d) a casing having means for being attached to the closure frame member, said casing having a bore;
(e) a handle having a shaft rotatably disposed in said bore; and
(f) a driver torque bar having one end mounted coaxially in said handle shaft for corotation therewith, said driver torque bar having the opposite end extending into said hollow shaft in driving engagement therewith.

4,099,757

DOOR CATCHES

John P. Palmer; Colin W.F. Clinch, both of Woodley, and David N. Harley, Bournemouth, all of England, assignors to ITW Limited, Windsor, England

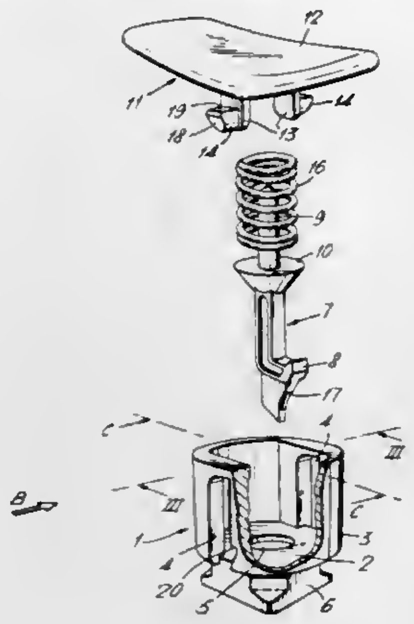
Filed Mar. 28, 1977, Ser. No. 782,254

Claims priority, application United Kingdom, Mar. 30, 1976, 12674/76

Int. Cl.^{2} E05C *3/30*

U.S. Cl. 292—336.3 **8 Claims**

1. A four piece door catch assembly for mounting on the door of a cabinet or the like to cooperate with a ledge or the like on a complementary cabinet including an elongated latching element, a housing having integral means for mounting said housing on a workpiece, and an operating element, the latching element being mounted in the housing on a first axis, said housing presenting a centrally located aperture for cooperation with an operating element, the operating element being operated within said housing both for motion between an operative position when located on said first axis and to an inoperative position when tilted away from the first axis, said operating element having a hook-shaped terminal end located beyond and cooperatively engaging an undersurface radially outwardly of the margin of the aperture presented by said latching element, the operating and latching elements being urged apart by a spring biasing means oriented on said first axis and cooperating engaging means being provided on the operating and latching elements consisting of a spigot and socket arrangement respectively, the engaging means being so arranged that when the operating element is in the operative position rotation of the operating element causes the latching element to rotate.



4,099,758

CLOSURE CONSTRUCTION HAVING ADJUSTABLE CATCH ASSEMBLY

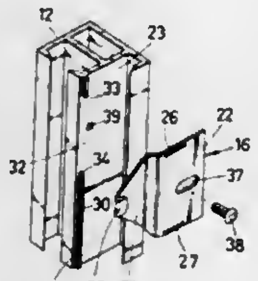
Yukio Yamamoto, and Masami Sakashita, both of Kurobe, Japan, assignors to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,007

Claims priority, application Japan, Feb. 5, 1975, 50/17355[U]; Apr. 23, 1975, 50/55962[U]

Int. Cl.^{2} E05C *13/00*

U.S. Cl. 292—341.18 **10 Claims**



1. A closure construction having an adjustable catch assembly for retaining the closure construction in a closed position, comprising:
(a) a pair of relatively movable closures each having a meeting stile;
(b) a cam assembly having a base secured to one of said meeting stiles and a cam rotatably mounted on said base and including a cam surface;
(c) a cam keeper having a body portion, an extension extending from said body portion and terminating in a keeper detent, said detent being directed toward said one meeting stile and engageable by said cam surface, said body portion having an oblong aperture elongated in the direction of closure movement;
(d) fastening means extending through said oblong aperture and adjustably securing said cam keeper to the other meeting stile; and
(e) interfitting means on said body portion of said cam keeper and on said other meeting stile for positively fixing their relative position in said direction of closure movement and extending transversely to said direction, said interfitting means being a plurality of equally spaced-apart recesses defined in each of the longitudinal edges of said body portion of the cam keeper, and a pair of projections formed integrally with said other stile and received in a selected pair of said cut-away recesses in the longitudinal edges.

4,099,759

ENERGY ABSORBING BUMPER SYSTEM

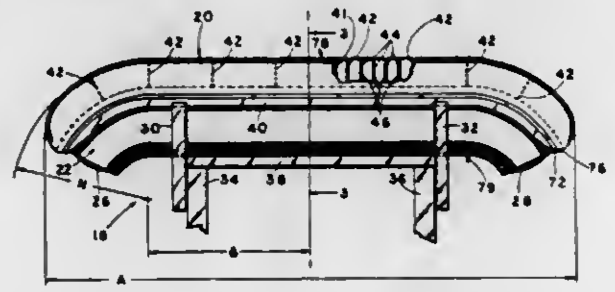
Murray Kornhauser, Wynnewood, Pa., assignor to Safety Consultants, Berwyn, Pa.

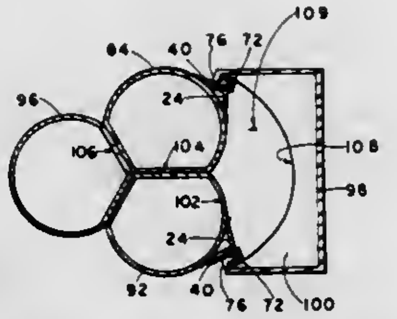
Continuation of Ser. No. 687,513, May 18, 1976, which is a continuation of Ser. No. 430,667, Jan. 4, 1974, Pat. No. 3,971,583, which is a continuation-in-part of Ser. No. 126,155, Mar. 19, 1971, Pat. No. 3,810,668. This application Nov. 26, 1976, Ser. No. 745,419

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.^{2} B60R *19/10*

U.S. Cl. 293—71 P **20 Claims**





1. A bumper apparatus for a vehicle comprising:
(a) a flexible bag structure having a flexible exterior walls forming a cavity for containing a gas compressed under impact to a substantial pressure to absorb the energy of a collision of said vehicle applied over an impact portion of said exterior walls,
(b) means for attaching said bag structure to a vehicle with said impact wall portion in a generally upright orientation; said bag structure including means for forming said exterior walls to have a certain shape in opposition to said gas pressure so as to limit the stroke of said walls under impact, said exterior wall forming means including load bearing means connected along said exterior walls and between a plurality of spaced fixed parts of said bag attaching means, said load bearing means including flexible webs shaped such that substantially all of the web material is in tension when the flexible cavity is pressurized and having an opening for gas flow past said webs under impact;
(c) and means for controlling the gas pressure in said bag structure including means for controlling gas flow out of said bag structure upon the application of pressure thereto under impact.

4,099,760

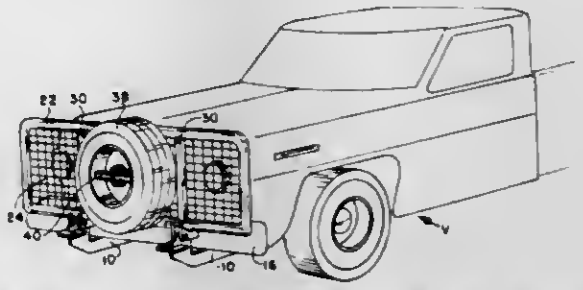
GRILL AND BRUSH GUARD AND UTILITY RACK FOR A VEHICLE

Lawrence L. Mascotte, and Robert L. Rayson, both of 9106 SE. 82nd, Portland, Oreg. 97266

Filed May 5, 1977, Ser. No. 793,979

Int. Cl.^{2} B60R *19/00*

U.S. Cl. 293—73 **4 Claims**



1. A grill and brush guard for use on a front end of a vehicle comprising:
mounting means adapted to be secured to the frame means of the vehicle;
down stop means and up stop means provided on said mounting means;
frame means having grid wire means secured thereto and hinge means provided thereby;
pivot means securing said hinge means to said mounting means so that said hinge means engages said up stop means when said frame means is in an up position and said hinge means engages said down stop means when said frame means is in a down position; and
securing means engaging and directly linking said frame means and said up or down stop means thereby securing said frame means in said up or down position.

4,099,761

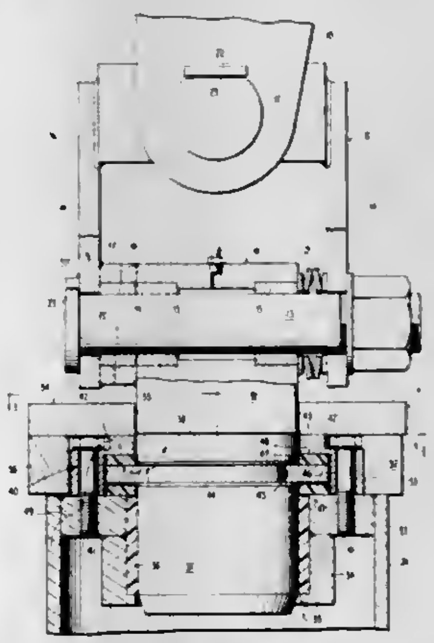
SUSPENDED MATERIAL HANDLING UNIT

Harold L. Cullings, R.D. 1, Box 66, McConnellsburg, Pa. 17233

Continuation-in-part of Ser. No. 632,667, Nov. 17, 1975, Pat. No. 4,005,895. This application Nov. 18, 1976, Ser. No. 742,881

Int. Cl.^{2} B66C *1/00*

U.S. Cl. 294—86 R **8 Claims**



1. A suspended material handling unit comprising a relatively stationary shaft member having a lower end cylindrical portion, means to suspend the relatively stationary shaft member along a vertical axis in free swinging relationship to a movable overhead support, a rotational sleeve member having telescoped engagement with the lower end cylindrical portion of said relatively stationary shaft member, a first thrust bearing element interposed between the telescoped members, a thrust

reaction plate below said first thrust bearing element and being fixedly secured to said relatively stationary shaft member, a second thrust bearing element below said reaction plate and between the reaction plate and an opposing face of said rotational sleeve member, a thrust bearing retainer element above said first thrust bearing element and surrounding said relatively stationary shaft member and being secured to an opposing face of said rotational sleeve member, lateral rotational bearing means coaxial with and interposed between said lower end cylindrical portion and adjacent telescoped portion of said rotational sleeve member and positioned below said second thrust bearing element and spanning a substantial distance axially of the telescoped members, an upper stop member surrounding said relatively stationary shaft member and locked thereto against rotation relative to the shaft member, a cooperative rotational lower stop member fixedly secured to said rotational sleeve member in surrounding relationship to said first and second thrust bearing elements and thrust reaction plate and also constituting said thrust bearing retainer element and adapted to contact said upper stop member for restricting relative rotational movement between said shaft an sleeve members in opposite directions, and material lifting and transporting means on the lower end of said rotational sleeve member.

4,099,762
GRIPPING DEVICE

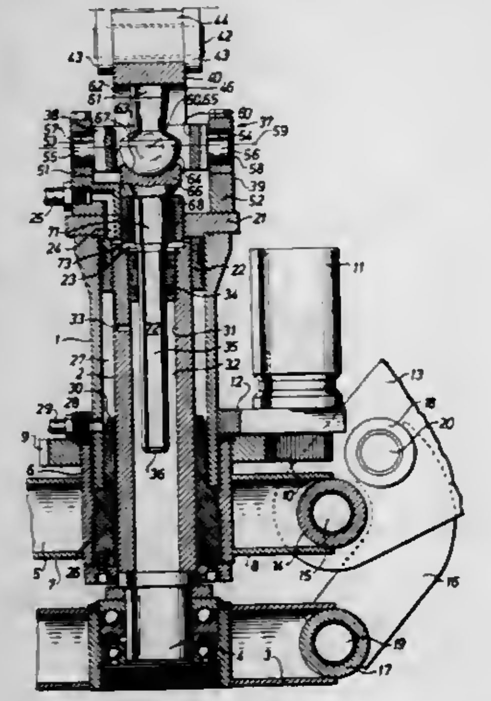
Gustaf Matteus Hultdin, and Ove Anders Hultdin, both of Malå, Sweden, assignors to Hultdins Verkstads AB, Malå, Sweden

Filed Dec. 15, 1976, Ser. No. 750,691

Claims priority, application Sweden, Jan. 22, 1976, 7600642

Int. Cl.² B66C *1/00*

U.S. Cl. 294—88 **25 Claims**



1. Apparatus comprising a gripping device, having claws for holding material, pressure medium actuated means to move said claws including at least one pressure chamber, and a pivotal joint to suspend said device including means for instantaneously stiffening the said pivotal joint temporarily to prevent pivotal movement thereof on actuation of said claws, a pressure rod, means to subject said pressure rod to pressure from said pressure medium from said at least one pressure chamber, a support facing the pressure rod and with which said pressure rod engages to instantaneously stiffen said joint, said pivotal joint comprising a first stand member, a junction member pivotally connected to the first stand member, a second stand member pivotally connected to the junction member, a support member extending from the second stand member, said junction member defining a central opening through which the support member extends, the support member cooperating with the pressure rod.

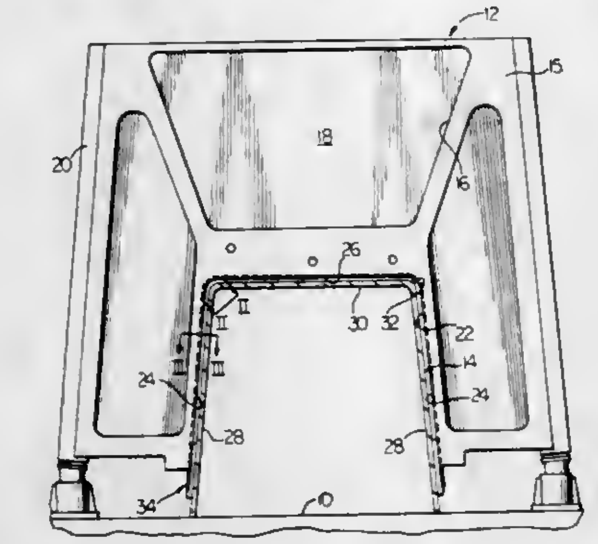
4,099,763
SEAL CONSTRUCTION FOR VEHICLES

Roger F. Maier, Peoria; Jimmy L. Milligan, Pekin; William A. Bahnfleth, East Peoria, and James L. Taylor, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,568

Int. Cl.² B62D *27/00*

U.S. Cl. 296—28 C **10 Claims**



9. A seal comprising:

a. a metallic channel having a base, spaced side walls extending from said base in the same direction, and arms spaced from said base on said side walls and having ends directed toward, but spaced from, each other;

b. a resilient strip having opposed tabs removably captured in said channel and extending therefrom for engagement with an element to be sealed,

c. whereby said channel base may be welded to a metallic element prior to insertion of said resilient strip in said channel to obviate the need for aligned openings for securing means and/or bonding agents of dubious reliability in varying environments.

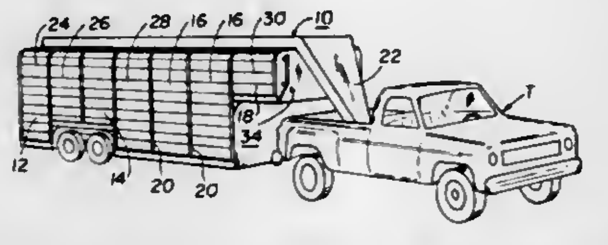
4,099,764
OVERHEAD DOOR LOCKING DEVICE

Roger D. Ratliff, Irving, Tex., assignor to PepslCo Inc., Purchase, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,419

Int. Cl.² B60R *7/08*

U.S. Cl. 296—24 R **9 Claims**



7. In a locking device for locking at least one overhead door in a downwardly closed position, a plurality of articulated operatively interconnected levers; a stationarily positioned mounting element; means for locking said door responsive to predetermined manipulation of said levers; and a tension spring biasing means, operatively interconnecting a pivot between two of said articulated, operatively interconnected levers and said stationarily positioned mounting element, for effecting an over-the-center movement between a first position of the spring, wherein the tension spring urges the levers into first positions to lock said door into a fully closed locked position, and a second position of the spring wherein the tension spring urges the levers into second positions wherein the door is unlocked.

4,099,765
CHANNEL-SHAPED GUIDING, SEALING AND FINISHING STRIPS

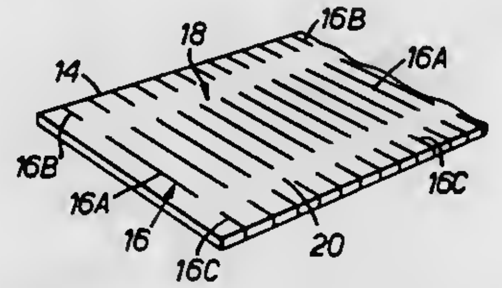
Rnbert G. Bright, Vlersen, Germany, assignor to Draftex Development AG, Switzerland

Filed Sep. 13, 1976, Ser. No. 722,541

Claims priority, application United Kingdom, Sep. 19, 1975, 38643/75

Int. Cl.² E06B *7/18, 7/22*

U.S. Cl. 296—93 **11 Claims**



1. A channel-shaped guiding, sealing or finishing strip structure, comprising

a series of parallel side-by-side generally U-shaped elements each made of resilient flat metal strip,

short resilient metal connecting links integral with and connecting the elements so that the latter define a channel,

those regions of adjacent elements which are connected by each connecting link lying in a common plane and each connecting link being kinked or corrugated so as to curve out of the then back into the said common plane, and each connecting link being of reduced thickness as compared with the thickness of the elements in regions thereof immediately adjacent the said regions that are connected by the connecting links, and

a channel-shaped covering of flexible material on at least the outward surfaces of the elements and links.

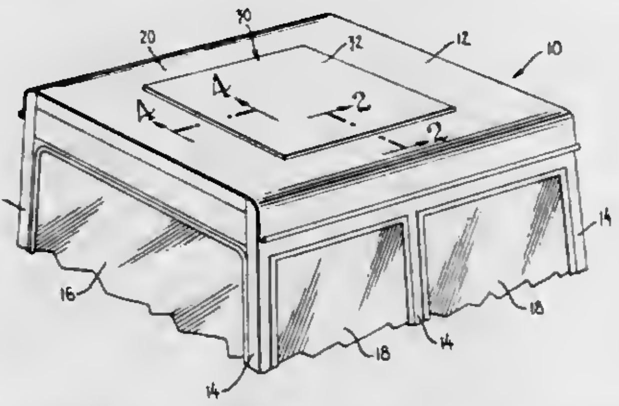
4,099,766
ROOF CONSTRUCTION

Leo J. Lorenz, Farmington, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 21, 1977, Ser. No. 817,873

Int. Cl. B60j *7/18*

U.S. Cl. 296—137 B **10 Claims**



1. A roof construction for a tractor cab or the like characterized by:

a primary roof construction provided with a generally rectangular opening defined by a border, opposed portions of the border being provided with retaining lips which extend downwardly and towards each other; and

a secondary roof construction having a peripheral portion adapted to overlie said border, said secondary roof construction being provided with opposed spaced apart retaining means which normally engage said opposed retaining lips to hold the peripheral portion in sealing engagement with the border, the opposed retaining means being swingable towards and away from each other, each of said opposed retaining means including an arm swingable between a downwardly and outwardly extending normal retaining position and a release position, means mounting one end of the arm on the secondary roof construction to facilitate its movement between retaining and release positions, and manually engageable means carried by the other end of the arm and normally in engagement with an associated retaining lip in an overcenter relationship when the retaining means are in their normal engaging position.

4,099,767
FASTENING OF THE INNER ROOF COVERING OF MOTOR VEHICLES

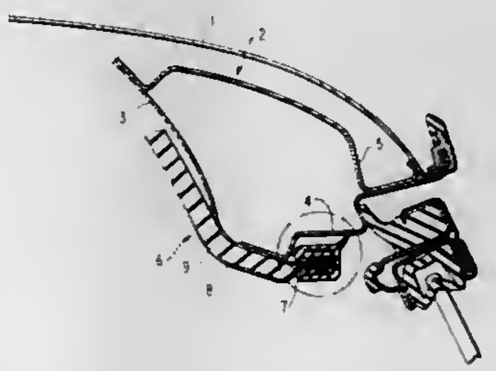
Slegmund Kania, Sindelfingen; Gerhard Zweigart; Karl Luz, both of Aidlingen, and Edgar Lutz, Althengstett, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1974, Ser. No. 475,177

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1973, 2328173

Int. Cl.² B60J *7/00*

U.S. Cl. 296—137 A **18 Claims**



1. A fastening arrangement for an inner roof covering of motor vehicles at a flange means of a roof frame means, characterized in that the flange means points outwardly and terminates in a substantially horizontally extending edge portion disposed at the periphery of a body opening of the vehicle, and that the edge of the roof covering which is constructed approximately U-shaped surrounds the horizontally extending edge portion so as to secure the roof covering at the flange means.

4,099,768
CONVERTIBLE SEAT-BED UNIT

James Amos, Box 2625, Mancie, Ind. 47302

Filed Jul. 30, 1976, Ser. No. 710,277

Int. Cl.² A47C *13/00*

U.S. Cl. 297—63 **3 Claims**

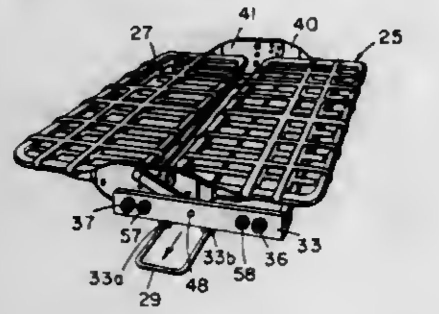
1. A convertible seat-bed unit including a base frame and seat and back sections moveably mounted on said frame for horizontal shifting and for angular shifting of said back section between erect and horizontal positions, wherein the improvement comprises:

side plates mounted at the opposite sides of said sections and disposed with side plates of said seat section closely overlapping the side plates of said back section on each side of said seat unit;

pivot means interconnecting said side plates on each side of said unit;

a link on each side of said unit pivotally connected at one end to said frame, and at the opposite end to one of said overlapped side plates; and

locking means moveably mounted in said base frame, and including members adapted to interengage with said side plates at positions spaced from the axis of pivotal interconnection thereof, and from the axis of pivotal connection of said link means to said one side plate, to secure the angular relationship of said seat and back sections, and secure said sections with respect to said frame, said locking means including a guideway bracket mounted on said frame, and an elongated bolt axially slideably mounted in said bracket.



4,099,769

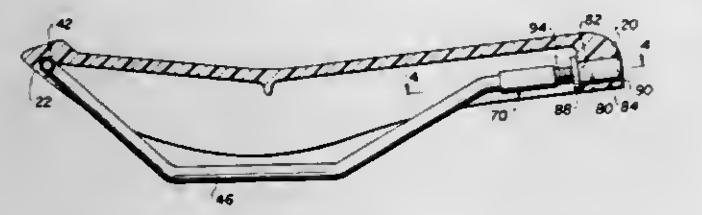
APPARATUS FOR ADJUSTING TENSION IN A BICYCLE SADDLE

David L. Jacobs, Boulder, Colo., assignor to The Jacobs Corporation, Boulder, Colo.

Filed Mar. 7, 1977, Ser. No. 775,231

Int. Cl.² B62J *1/10*

U.S. Cl. 297—204 **6 Claims**



1. An apparatus for adjusting tension in an elongated bicycle saddle wherein said saddle includes a narrow leading end portion with a downwardly contoured tip and a wider trailing end portion with a downwardly extending anchor, said apparatus comprises:

frame means underlying and connected to said bicycle saddle for operably supporting said saddle upon a bicycle saddle post, said frame means including

  a first portion extending in abutting contact with the downwardly extending anchor of said bicycle saddle; and

  a generally U-shaped contoured tubular member including;

    a flaired portion defining said first portion extending in abutting contact with said downwardly extending anchor,

    a pair of generally parallel mounting runs for connection to said bicycle saddle post, and

    generally parallel, spaced, end portions extending toward said downwardly extending tip of said bicycle saddle for engagement with said adjustment bearing means;

an adjustment bearing means connected to a second remote portion of said frame means and extending in proximity to but spaced from the downwardly contoured tip of said bicycle saddle; said adjustment bearing means including

  a generally solid yoke member including,

    a pair of parallel wells on one end thereof to receive in frictional engagement said parallel, spaced end portions of said tubular U-shaped frame means, and

    a bearing well on the other end thereof to receive in abutting contact said adjustment means;

thrust bearing means extending through said downwardly contoured tip portion of said bicycle saddle including

  a tubular member having,

    a threaded interior surface,

    a thrust flange on one end thereof for contacting and bearing against the interior surface of said downwardly contoured tip, and

    a retaining flange on the other end thereof for contacting the exterior surface of said downwardly contoured tip and retaining said thrust bearing means in position extending through said downwardly contoured tip of said bicycle saddle; and

adjustment means connected to and extending through said thrust bearing means and in abutting contact with said adjustment bearing means for imparting longitudinal tension between the downwardly contoured tip and the downwardly extending anchor of said elongated bicycle saddle upon selective regulation of said adjustment means through the downwardly contoured tip of said bicycle saddle.

4,099,770

SAFETY DEVICE FOR AUTOMOBILE OCCUPANTS

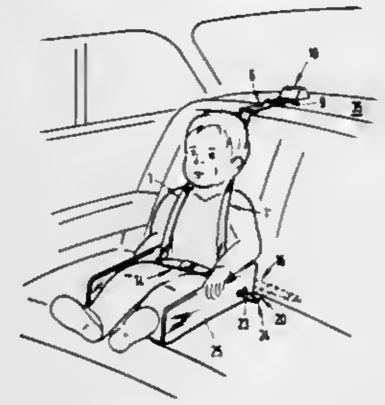
Joachim Elsholz, Berg; Manfred Bortfeld; Josef Maertz, both of Eching, and Erhard Poser, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 741,880

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1975, 2551419

Int. Cl.² A62B *35/00*

U.S. Cl. 297—216 **9 Claims**



1. A device for retaining a child on the rear seat of an automobile comprising a belt system and a seat member having a seat surface contour bounded by side-walls having perforations therethrough, and being retained on said rear seat by said belt system, characterized by securing means secured to the vehicle body behind said rear seat and extending along at least a portion of the width thereof for slidingly receiving two connecting members, said connecting members extending through said perforations provided in said side-walls of said seat member and, at their ends adjacent said seating surface contour being each provided with pass-through fittings, belt bands extending through said pass-through fittings having first and second sections, said first sections being connectable with one another to form a lap belt, and said second sections extending beyond said pass-through fittings and forming shoulder belts cooperating with a single length-adjusting fittings situated behind a child to be retained, said length-adjusting fitting being connected with the belt band of a retractor through the intermediary of an exchangeable energy absorbing member, and said retractor being secured to the vehicle body.

4,099,771

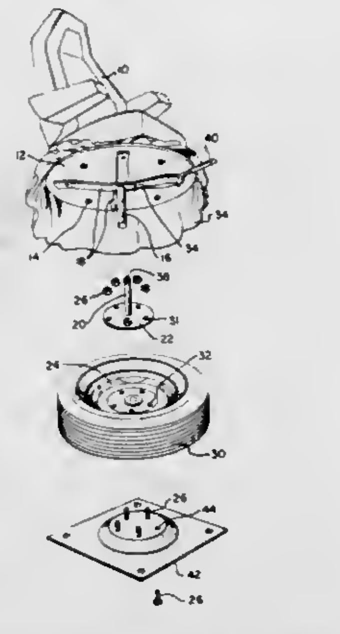
SEAT ADAPTED TO BE MOUNTED ON VEHICLE TIRE

Robert P. Mathews, 5014 Ampere St., Pittsburgh, Pa. 15207

Filed Jun. 9, 1977, Ser. No. 805,186

Int. Cl.² A47C *1/00*

U.S. Cl. 297—217 **4 Claims**



1. A chair adapted to be mounted on a spare vehicle tire comprising:

(a) a vehicle pneumatic tire mounted on a wheel member with a hub area and a rim which together form a well, the hub area having plurality of stud bolt holes;

(b) a seat member;

(c) a seat base plate mounted on the bottom of the seat member and spaced above the tire member just enough to allow rotational movement of the seat base plate with respect to the tire;

(d) a sleeve and rod assembly in which the rod is engaged within the sleeve and both members slide freely with respect to each other, the length of the assembly being approximately the depth of the well, one end of the assembly is attached to the seat base plate, the other end of the assembly having a flange with a plurality of holes which are aligned with the stud bolt boles in the hub; and

(e) a nut and bolt assembly corresponding to each of the holes in the hub and flange securing the flange to hub.

4,099,772

SEAT RACK WITH A REPLACEABLE HEAD REST COVER

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Dec. 13, 1976, Ser. No. 749,727

Int. Cl.² A47C *31/10*

U.S. Cl. 297—220 **6 Claims**

1. A replaceable covering for protecting the headrest of a seat, said headrest having a headrest covering material extending from the front to the top transverse edge and providing a rest for the head of a passenger, said covering material being overlapped at the front and at the top transverse edge by front and back covering members, respectively, comprising:

  a retainer permanently secured to said headrest adjacent the top transverse edge thereof, said retainer comprising an elongated strip of reverse folded material interposed and secured between the overlapping back member and the top transverse edge of the headrest covering material and defining a retainer through passage;

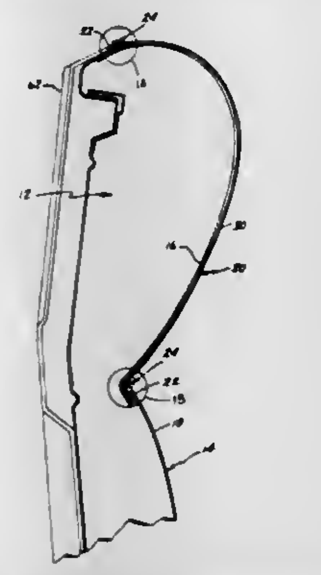
  a sheet material protective cover having a main portion and an upper reverse folded edge defining a cover passage adjacent the upper transverse edge thereof bordering the main portion of said protective cover; and

  clasp means insertable in said retainer passage and said protective cover passage for releasably securing said sheet material cover to said headrest, said clasp means comprising:

  a first elongated arm;

  a second elongated arm joined to and integral with said first arm and extending parallel to and spaced from said first arm, one of said first and second arms being insertable in said retainer passage and the other arm being insertable in said protective cover passage; and

  clip means releasably securing one end of said first arm to one end of said second arm, said clip means being located in one of said passages and substantially concealed therein.



4,099,773

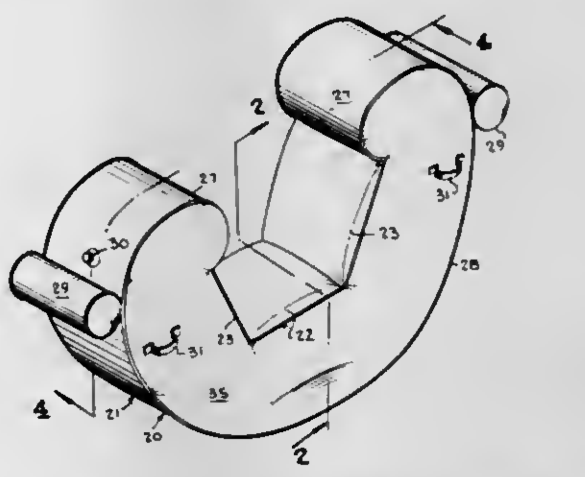
COUPLES CHAIR

James F. Chang, 3821 SW. 88 Pl., Miami, Fla. 33165

Filed May 31, 1977, Ser. No. 802,127

Int. Cl.² A47C *3/02*

U.S. Cl. 297—270 **1 Claim**



1. In an article of furniture, an inflatable rocking chair including a base section, inclined back sections hingedly connected to said base section, said base section and inclined back sections being hollow, support pieces mounted on said inclined sections and said support pieces having cushions contiguous to the outer surfaces thereof, said chair further including curved end sections and a curved bottom section, cylindrical portions formed integrally with the outer upper end portions of the chair and said cylindrical portions providing stop members for limiting rocking movement of the chair, a fitting provided on said chair so that when the chair is being used, air under pressure can be introduced into the hollow interior of the chair through the fitting, and wherein when the chair is not being used, the air can be let out of the interior of the chair through the fitting so that the chair can be folded to occupy a minimum amount of space for storage and shipment, said chair further

including spaced parallel side portions, and straps secured to said spaced parallel side portions.

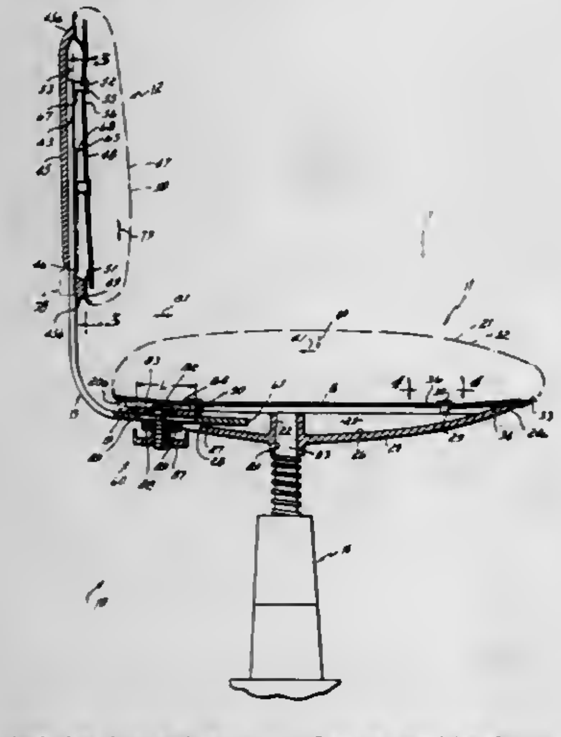
4,099,774
STENOGRAPHER'S CHAIR

Edwin C. Sandham, Thiensville, Wis., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jan. 24, 1977, Ser. No. 761,683

Int. Cl.² A47C *7/02*

U.S. Cl. 297—298 **12 Claims**



1. A chair having at least one of a seat and backrest, said one of said seat and backrest comprising

a rigid shell, said rigid shell having a peripheral edge configuration generally shaped as said one of said seat and backrest, and said rigid shell including a support surface, said support surface being positioned below said rigid shell's peripheral edge relative to the floor of said rigid shell,

a flexible plate-shaped member that serves as the foundation for a cushion, said plate-shaped member being sized to overlie said peripheral edge of said shell, said plate-shaped member being adapted to flex toward said shell when overlying said shell's peripheral edge in response to a centrally disposed force thereon and being adapted to flex away from said shell in response to release of said force thereon, and

connector means connecting said plate-shaped member and said rigid shell, said connector means being partially carried on said plate-shaped member and partially carried on said shell, that portion of said connector means carried on said plate-shaped member being immobile relative thereto and that portion of said connector means carried on said rigid shell being immobile relative thereto, said connector means being structured to permit connection and disconnection by flexing said plate-shaped member toward said rigid shell and thereafter moving said plate-shaped member relative toward said shell's peripheral edge while retaining said plate-shaped member in the flexed attitude, and said connector means being structured to define a gap between said plate-shaped member and said support surface on said rigid shell when said plate-shaped member and said rigid shell are connected for permitting said plate-shaped member to flex toward said rigid shell when disconnection is desired, thereby permitting said plate-shaped member to be connected in and disconnected from final use position with said rigid shell.

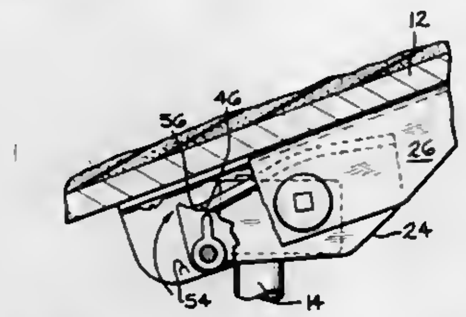
4,099,775
CHAIR CONTROL WITH TILT LOCK

Ned W. Mizelle, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Oct. 7, 1976, Ser. No. 730,161

Int. Cl.² A47C *3/026*

U.S. Cl. 297—303 **1 Claim**



1. A chair control comprising a frame structure supportable by a base, seat support means pivotally mounted on said frame structure for tilting movement relative to said frame structure, bias means operatively associated with said frame structure and said seat support means biasing said support means to a normal position relative to said frame structure in all tilted positions of said support means, said seat support means supported on the front of said frame structure in said normal position, a multiposition member comprising a body having a plurality of angularly arranged blocking surfaces, a shaft member the rear of on said seat support means movably supporting said body thereon for movement between frictionally adjusted positions in one of which said blocking surfaces are disengaged from the rear edge said frame structure and another selectible position in a tilted position of said seat support means in which one of said blocking surfaces is engaged with said rear edge of said frame structure so as to block return movement of said seat support means to said normal position while enabling further tilting of said seat support means away from said normal position, and coacting stop means on said body and said seat support means engageable to define a moved position of said body in which said body is in a clearance relation with the rear of said frame structure to allow return movement of said seat support means to said normal position and free rearward tilting movement of said seat means.

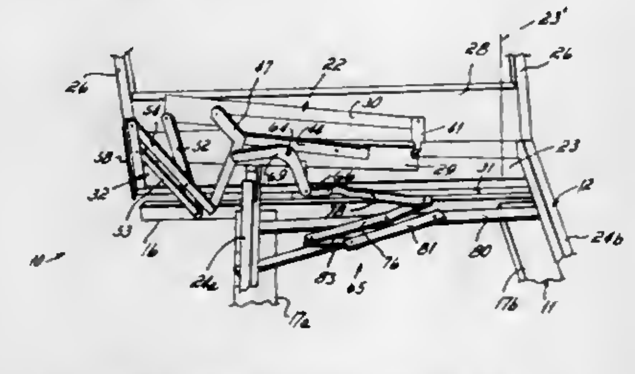
4,099,776
CONTROL ASSEMBLY FOR A RECLINING CHAIR

Donald Crum, Louisville; McKinley Goff, Middletown, and Edward L. Hampton, Louisville, all of Ky., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Mar. 15, 1976, Ser. No. 667,099

Int. Cl.² A47C *1/02*

U.S. Cl. 297—329 **29 Claims**



1. In a reclining chair of the type including

a body support mounted on a body support frame, said body support including a chair seat and a chair backrest,

recliner linkage connecting said chair seat and said body support frame to permit limited tilting movement of said chair seat between an upright position and at least one reclining position, said chair seat being tilted in the reclined position relative to the chair seat attitude in the upright position, and said recliner linkage being partially mounted on said body support frame, and

a stationary chair base on which said body support frame is carried for forward and rearward motion relative to said chair base, the improvement comprising

a control assembly directly connected in a mechanical linkage series between said chair base and said recliner linkage assembly, said control assembly also being connected to said body support frame, said control assembly being operative through direct mechanical connection and coaction with said recliner linkage assembly to control forward and rearward movement of said body support frame relative to said stationary base as said chair seat tilts between the upright and reclining positions and said control assembly being entirely positioned beneath said chair seat in all of the upright and reclining positions of said reclining chair.

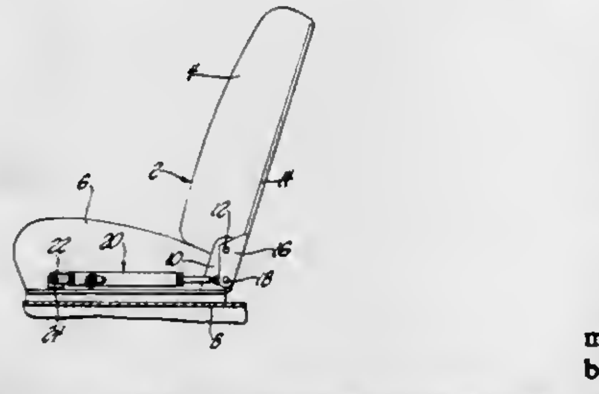
4,099,777
TELESCOPIC SEAT POSITIONING MECHANISM

Russell F. Chekirda, Morristown, Tenn., assignor to Lear Siegler, Inc., Morristown, Tenn.

Filed May 2, 1977, Ser. No. 792,614

Int. Cl.² B60N *1/02*

U.S. Cl. 297—375 **30 Claims**



1. Seat positioning mechanism of the type including an elongated housing having a rod slidably received therein for telescopic movement with respect to said housing between extended and retracted positions with friction lock means received in said housing and having a lock position tilted about a fulcrum in frictional engagement with said rod to frictionally restrain said rod against movement with respect to said housing in any selected position between the retracted and extended positions, and an unlock position disposed substantially transverse to said rod and out of frictional engagement with said rod to permit free movement of said rod with respect to said housing, and rod locking and biasing means interconnecting said housing, rod and friction lock means to urge said friction lock means toward the lock position; wherein the improvement comprises a slot formed in the wall of said housing intermediate the ends thereof, said slot having first and second end portions extending transversely of the longitudinal axis of said housing, said first end portion being located on said wall at the outer cross-sectional boundary of said housing so that the fulcrum is spaced from the longitudinal axis of the rod the maximum distance allowed by the cross section of the housing, said first end portion having a central portion defining the fulcrum for said friction lock means, the outer wall of said housing being deformed to form an inwardly depressed portion projecting inwardly from said outer boundary of said housing, said second end portion being located on said inwardly depressed portion; and wherein said friction lock means comprises at least one lock washer having a rod locking opening receiving said rod and a lever arm projecting from its outer periphery into said slot between said first and second end portions thereof for enaging said fulcrum such that the edge of said rod locking opening frictionally engages said rod in the tilted, lock position of said lock washer, said rod locking opening being larger than said rod to permit said free movement of said rod in the transverse unlock position of said lock washer, said central portion of said first end portion that defines the fulcrum being the only portion of said first end portion that contacts said lever arm to minimize lateral cocking of said lock washers about an axis passing through the center of the lock washer and the lever arm thereof.

4,099,778
RETENTION INSTALLATION FOR CHILDREN IN MOTOR VEHICLES

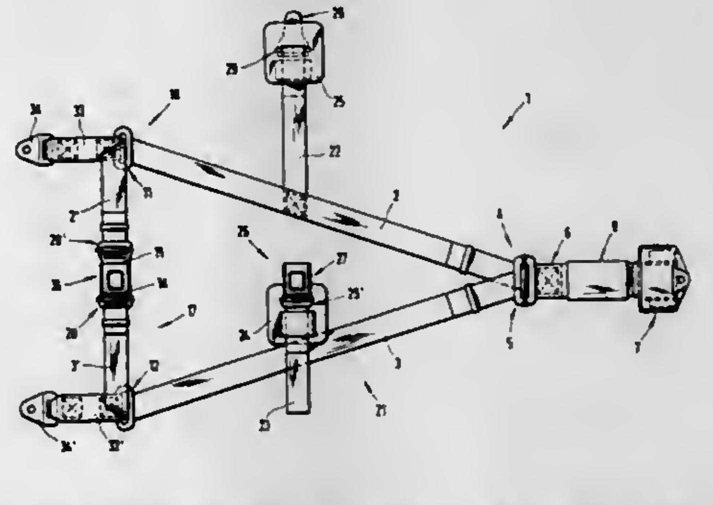
Werner Lehr, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1976, Ser. No. 728,624

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544274

Int. Cl.² A62B *35/00*

U.S. Cl. 297—386 **6 Claims**



1. An installation for the retention of a child on seats in motor vehicles, comprising a chest belt means and a lower body belt means, characterized in that the chest belt means is connected with two belt-bands which extend, behind the vehicle passenger, from anchoring means fixed at a vehicle part located rearwardly of the passenger with which they cooperate by way of energy absorption means, downwardly over the backrest of a seat to pass-through fitting means connected with a fixed part and arranged at the junction of the seat surface and backrest, the end sections of said two belt bands being deflected by said pass-through fittings to extend in front of the lower body portion of the child to form the lower body belt means and said chest belt bands extending between the upper body portion and the arms of the child and adapted to be coupled with one another in the region of the child's chest.

4,099,779
VEHICLE HEAD SUPPORT

Walther Göldner, Ebersbach, Fils, Germany, assignor to Recaro GmbH & Co., Kirchheim, Teck, Germany

Filed Jan. 24, 1977, Ser. No. 809,656

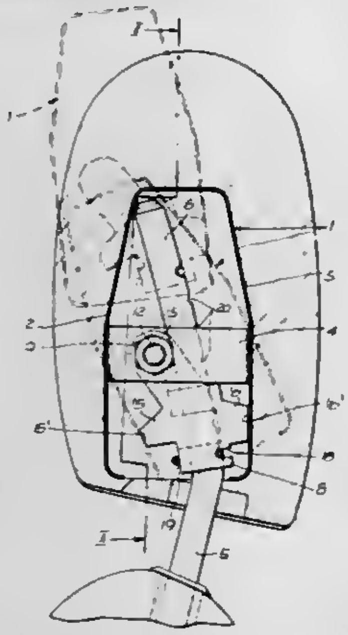
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630281

Int. Cl.² A47C *1/10*

U.S. Cl. 297—408 **7 Claims**

1. In a head support for a vehicle seat, especially for a motor vehicle seat comprising a padded body connected to a vertically non-adjustable fixture secured to the back of the seat, said padded body being vertically and swivelingly adjustable relative to the seat, the improvement comprising said padded body comprising a padded support having a substantially U-shaped cross-sectional profile including front and rear wall portions, spaced bearing walls mounted interiorly of said padded support and extending between the front and rear wall portions thereof, a swivel axle supported between said bearing walls, a

connecting body swivelly mounted on said axle within said padded support, said connecting body having a guide bore therethrough, said fixture including a support bar having an upper terminal portion extending upwardly through the guide bore of the connecting body, means for adjustably securing said connecting body in a selected swivel position about said axle and means cooperating between said support bar and said connecting body for adjustably securing said connecting body in a selected vertical position on said support bar.



4,099,780

AIRLINE PASSENGER SEAT

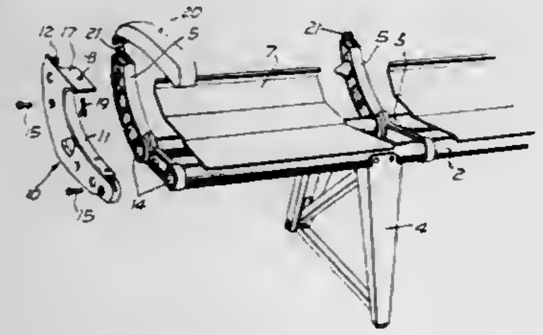
Karl Schmidhuber, Nurtingen-Robdorf, Germany, assignor to Recaro GmbH & Co., Kirchheim, Teck, Germany

Filed Jan. 7, 1976, Ser. No. 693,152

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 7517891[U]

Int. Cl.^{2} A47C *7/54*

U.S. Cl. 297—411 10 Claims



1. In an airline passenger seat having at least one seat divider, the improvement comprising a filler member affixed to said seat divider, said filler member being formed of hard foam plastic for absorbing loads and stresses in an inherently stable manner and transmitting such loads and stresses to the seat divider and a casing supported by said filler member.

4,099,781

APPARATUS FOR AUTOMATICALLY SHIFTING THE CONVEYOR AT THE PIT FACE IN THE COAL MINE

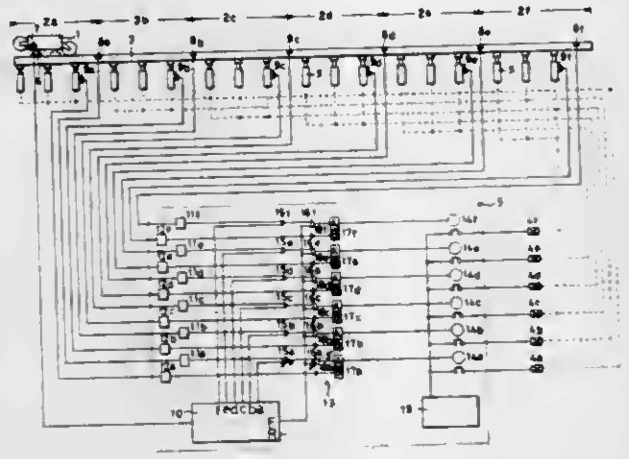
Isao Sawayama, and Hajime Endo, both of Kushiro, Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,750

Claims priority, application Japan, Sep. 22, 1976, 51-114053

Int. Cl.^{2} E21C *35/08*

U.S. Cl. 299—1 3 Claims



1. An apparatus for automatically shifting individual conveyor portions toward a long-walled pit face in a coal mine as a shearer on the conveyor progresses from one portion to another, comprising a position sensor arranged in each portion of the conveyor, a position signal generator attached to said shearer, a set of hydraulic cylinders associated with each individual portion of the conveyor, a stroke sensor attached to each set of said cylinders, and control circuit means including a group of electromagnetic valves which act to render operative the set of hydraulic cylinders belonging to each individual portion of the conveyor to be shifted responding to signals transmitted from the position sensor, the position signal generator and the stroke sensor, whereby only that individual portion of the conveyor corresponding to the portion of the pit face which has been already sheared by the shearer is progressively and automatically shifted toward the pit face by the corresponding set of hydraulic cylinders.

4,099,782

CONTROL SYSTEM FOR A MINERAL MINING INSTALLATION

Walter Weirich, Dortmund, and Heinrich Wildförster, Gelsenkirchen-Buer, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

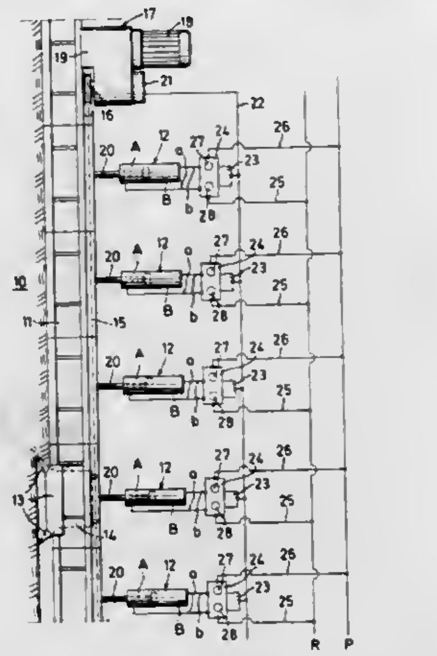
Filed Feb. 16, 1977, Ser. No. 769,367

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606394; May 22, 1976, 2623016

Int. Cl.^{2} E21D *15/48*

U.S. Cl. 299—1 33 Claims

1. In a control system for controlling the thrust applied, by hydraulic rams, to a driven mining winning machine via a guide along which the mining winning machine is movable, the improvement comprising control means which regulates the thrust applied to the guide by the hydraulic rams in dependence upon the loading of the winning machine drive, said control means comprising a transducer for detecting the loading of the winning machine drive and for emitting appropriate control signals, and pressure regulator means associated with the rams for regulating the thrust applied to the guide by said rams in dependence upon said control signals.



4,099,783

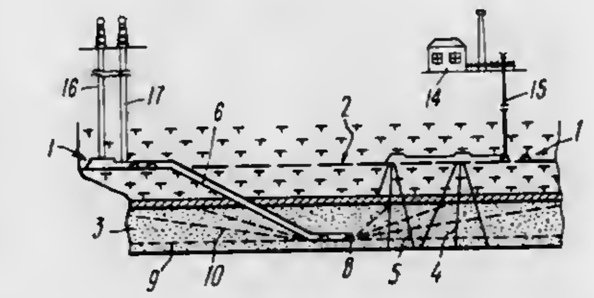
METHOD FOR THERMOSHAFT OIL PRODUCTION

Vladimir Grigorievich Verty, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 4, kv. 29; Pavel Grigorievich Voronin, Ukhta, poselok Yarega, ulitsa Mira, 4, kv. 6; Evgeny Ivanovich Gurov, Ukhta, poselok Yarega, ulitsa Mira, 2, kv. 3; Vitaly Semenovich Zubkov, Ukhta, poselok Yarega, ulitsa Mira, 4-3; Nikolai Ivanovich Melnichuk, Ukhta, poselok Yarega, ulitsa Mira, 7, kv. 5; Grigory Grigorievich Miller, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 4-59; Vladimir Nikiforovich Mishakov, Ukhta, poselok Yarega, ulitsa Pushkinskaya, 1, kv. 4; Vitaly Stepanovich Sukrushev, Ukhta, poselok Yarega, ulitsa Mira, 2-12; Leonid Mikhailovich Ruzin, Ukhta, poselok Yarega, ulitsa Kosmonavtov, 5, kv. 26, all of Komi ASSR, and Vladimir Pavlovich Tabakov, ulitsa Sofii Kovalevskoi, 4a, kv. 125, Moscow, all of U.S.S.R.

Filed Dec. 5, 1975, Ser. No. 638,027

Int. Cl.^{2} E21B *43/24;* E21C *41/10*

U.S. Cl. 299—2 6 Claims



1. A method for thermoshaft oil production of viscous oils or fluid bitumens wherein mining openings are provided above an oil-bearing bed at an overburden level comprising forming said mining openings with an inclination of from about 1° to about 3° to the horizon; drilling injection holes from said mining openings for feeding a heating medium into said oil-bearing bed; constructing a slope and a footway from at least one mine opening leading to the bottom part of said oil-bearing bed to a production gallery which is provided within the bottom part of said bed; drilling a system of horizontal and ascending holes for oil production from said production gallery; positively feeding a heating medium into said injection holes for uniform distribution thereof over the entire volume of said oil-bearing bed and for displacement of oil into said horizontal and ascending production holes towards said production gallery; and recovering the oil from said production gallery.

4,099,784

METHOD AND APPARATUS FOR BREAKING HARD COMPACT MATERIAL SUCH AS ROCK

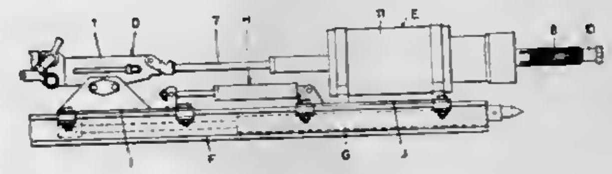
George A. Cooper, Gollion, Switzerland, assignor to Institut Cerac SA., Ecublens, Switzerland

Filed Oct. 12, 1976, Ser. No. 731,316

Claims priority, application Switzerland, Oct. 23, 1976, 13751/76

Int. Cl.^{2} E21C *37/02*

U.S. Cl. 299—10 12 Claims



1. In a method of breaking hard compact material such as rock adjacent a hole drilled thereinto, comprising first firmly gripping a region of the material from the wall of the hole by a wedge effect under the influence of a force applied to a wedging means; the improvement comprising:

then applying an axial force directed outwardly of said hole to said gripped region of sufficient magnitude to cause breaking and pulling out of said region of material;

said outwardly directed axial force being exerted under the influence of a further force which is unidirectional with but separate from said force producing said outwardly directed axial force; and

taking up and neutralizing the thrust reaction force incident to said outwardly directed axial force by said material.

4,099,785

METHOD AND APPARATUS FOR SUPPORTING THE ROOF OF AN UNDERGROUND MINE WORKING

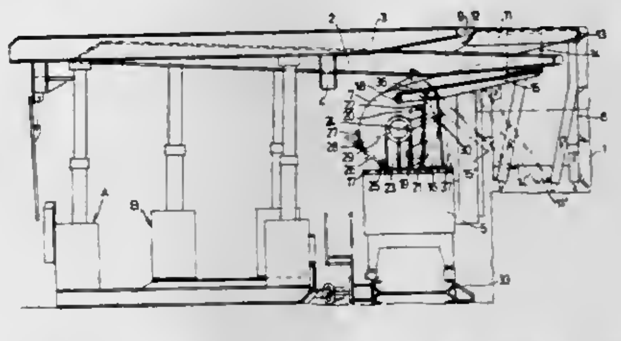
Karl Maria Groetschel, Jakob-Klar-Strasse 5, 80 Munich 40, Fed. Rep. of Germany

Filed Jun. 4, 1976, Ser. No. 693,114

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1975, 2525978; May 3, 1976, 2679509

Int. Cl.^{2} E21D *19/00*

U.S. Cl. 299—11 12 Claims



1. A method of supporting the roof of an underground mine working in a region newly exposed by the passage of a mining machine along an upright face of the working, comprising:

a. storing a supply of flexible mat in a region which is already supported by self-advancing roof supports,
b. moving said supply of flexible mat along the face of the working, with the mining machine,
c. drawing mat from said stored supply in a first direction generally transversely of the direction of passage of the mining machine,
d. redirecting said mat to extend generally parallel to the direction of passage of the mining machine along the newly exposed roof,

e. pressing said extended mat into contact with the roof by advancing and loading the self-advancing roof supports in said direction generally transversely of the direction of passage of the mining machine.

4,099,786

APPARATUS FOR DRAWING THE SHEARERS

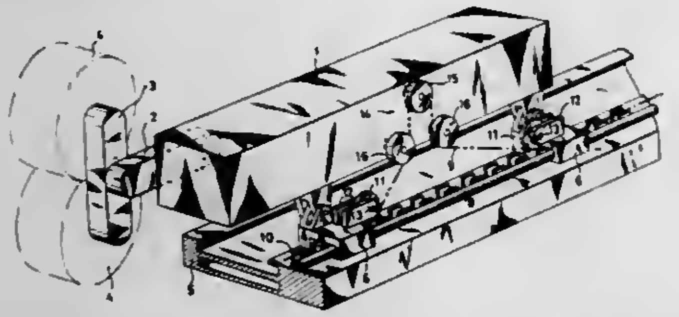
Shigeo Nakajima, Tokyo, and Hajime Endo, Kushiro, both of Japan, assignors to Taiheiyo Engineering Incorporated, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,141

Claims priority, application Japan, Aug. 31, 1976, 51-116857[U]

Int. Cl.² E21C ***27/34***

U.S. Cl. 299—43 **10 Claims**



1. Apparatus for drawing shearers along a long-walled pit face of a coal mine comprising a conveyor arranged along the pit face of the coal mine, a shearer mounted to move along said conveyor, cable fixing means arranged along the conveyor, a cable means disposed along said cable fixing means, said cable means being engageable by said cable fixing means to preclude relative longitudinal movement between the cable means and the cable fixing means, driving means on said shearer engaging said cable means to drive said shearer along said conveyor, and guide wheel means on said shearers and engaging said cable means, said guide wheel means guiding the cable means between said driving means and said cable fixing means such that said cable means has an operational cable portion which extends between the cable fixing means and the driving means, whereby when the shearer drawing force is applied by said driving means to said cable means such drawing force is applied only to said operational cable portion.

4,099,787

MINING MACHINE

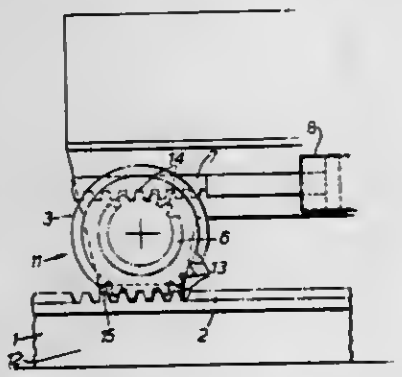
William Askew, Wakefield, England, assignor to Dresser Europe, S.A., Brussels, Belgium

Filed Apr. 19, 1977, Ser. No. 788,896

Claims priority, application United Kingdom, Apr. 23, 1976, 16699/76

Int. Cl.² E21C ***29/22***

U.S. Cl. 299—43 **9 Claims**



1. A conveyor-mounted mining machine including at least two drive units each comprising:

(i) a linearly drivable member,

(ii) double-acting drive means arranged to drive said drivable member selectively in opposite directions,

(iii) a driven wheel with which the linearly drivable member is operatively engaged,

(iv) a driving wheel drivingly engaged with a stationary member of the conveyor, and

(v) a clutch by which the driven wheel is coupled to the driving wheel, whereby linear motion of said linearly drivable member in either said direction imparts rotary drive to the said driving wheel, when the clutch is engaged, so as to propel the machine along the conveyor in a selected direction, the drive units being operable sequentially whereby to propel the machine continuously along the conveyor.

4,099,788

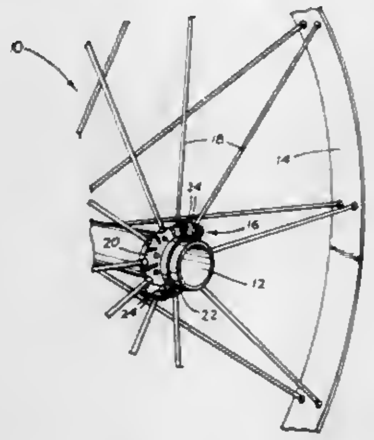
CURVED METAL CLAMP PLATE

Harold K. Trunnell, P.O. Box 2336, Eugene, Oreg. 97402

Filed Jun. 18, 1976, Ser. No. 697,678

Int. Cl.² B60B ***27/06***

U.S. Cl. 301—105 R **7 Claims**



1. A wheel hub plate pressed from flat metal stock, the plate having a curved outline when viewed in side elevation and also possessing a curved outline in transverse cross-section so as to have throughout a significant portion thereof a region of compound curvature,

apertures in said region of compound curvature for the mounting of spokes in the wheel, and

multiple elongate cutouts in the plate in the region thereof of compound curvature, distributed over such region and interspersed with said apertures, said cutouts having their axes disposed at an oblique angle relative to the longitudinal axis of the region of compound curvature, said cutouts accommodating, with distortion of the areas encompassed by said cutouts, the shaping which occurs in the flat metal stock when such is pressed to form the hub plate with the generation of compound curvature in said region of compound curvature.

4,099,789

DEVICE FOR THE ORIENTED COLLECTION OF STOCKINGS, PANTY-HOSE AND LIKE ARTICLES

Sergio Zaglio, Castiglione Delle Stiviere (Mantova), Italy, assignor to Calzificio Golden Lady S.a.s. di Grassi Nerino & C., Castiglione Delle Stiviere (Montava), Italy

Filed Dec. 29, 1976, Ser. No. 755,290

Claims priority, application Italy, Sep. 24, 1976, 27652 A/76

Int. Cl.² B65G ***51/02***

U.S. Cl. 302—2 R **9 Claims**

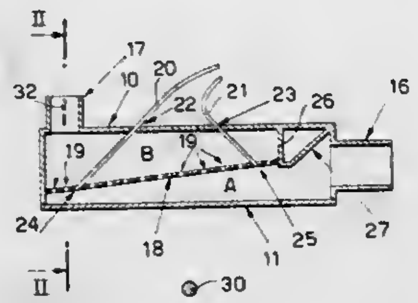
1. Apparatus for the orderly collection of articles such as stockings, panty-hose and the like, in a temporary collection space shorter in length than said article to be collected, and for the subsequent deposit of said articles on a support, comprising

(a) an elongated body inserted in a pneumatic conveyance duct, said body defining a temporary collection space for one article at a time entering said space from an inlet end thereof;

(b) control means for opening the lower portion of said space along the entire length thereof;

(c) a supporting member arranged beneath said lower portion of said space for receiving in substantially centered position the articles falling downwardly from said space upon opening of said lower portion;

(d) means for originating a dragging air stream within said conveyance duct and through said temporary collection spce and means for cutting off said air stream downstream of said body;



(e) said temporary collection space having a length substantially shorter than the length of said article;

(f) a perforated diaphragm defining the top of said space and arranged at an angle in said body so that said space is progressively narrowed from said inlet end towards the end opposite to said inlet end, whereby the perforations in said diaphragm become pregressively clogged as said article fills said space;

(g) said supporting member being spaced from said lower portion substantially beneath the center thereof and transversely relative to the longitudinal axis of said body.

4,099,790

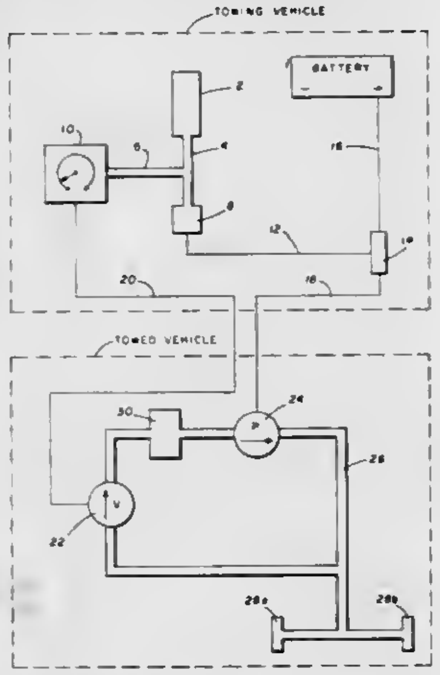
ELECTRO-HYDRAULIC BRAKE ACTUATING SYSTEM

Larry W. Hipps, 506 Colorado St., Sherman, Tex. 75090

Filed Nov. 18, 1976, Ser. No. 742,854

Int. Cl.² B60T ***13/68***

U.S. Cl. 303—7 **9 Claims**



1. A brake actuating system for towed vehicles having hydraulic brakes comprising:

(a) a hydraulic fluid pumping means having an outlet connected hydraulically with hydraulic brakes of said towed vehicle;

(b) reservoir means hydraulically interconnected with the inlet of said pumping means; and

(c) a normally open variable valve means interconnected hydraulically between the inlet of said pumping means and the hydraulic brakes for restricting the flow of fluid from said hydraulic brakes to said reservoir as said valve closes, said variable valve means comprising an electromagnetically controlled valve stem means interconnected to a means for supplying variable electric current to thereby incrementally regulate the flow of fluid through said variable valve means according to the electric current supplied to the electromagnet.

4,099,791

HYDRAULIC BRAKE PRESSURE CONTROL APPARATUS FOR VEHICLES

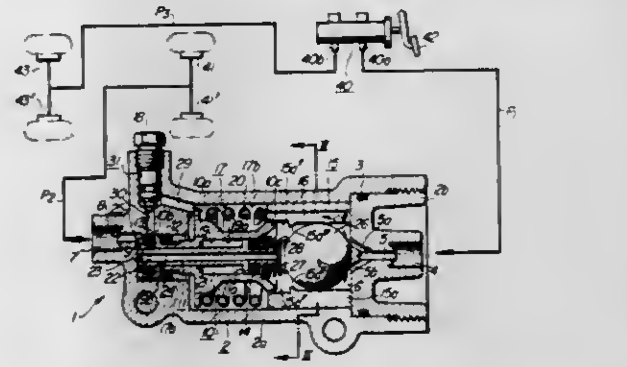
Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1977, Ser. No. 820,246

Claims priority, application Japan, Dec. 2, 1976, 51-145142

Int. Cl.² B60T ***8/093***

U.S. Cl. 303—24 F **9 Claims**



1. An apparatus for controlling hydraulic pressure delivered to hydraulic brake cylinders for rear wheels of a vehicle comprising:

a housing having an inlet port adapted to be hydraulically communicated with a master brake cylinder and an outlet port adapted to be hydraulically communicated with hydraulic brake cylinders for rear wheels;

said housing being composed of a main housing portion having an opening and a plug block fitted into said opening;

a first hydraulic pressure chamber formed in said housing and communicated with said inlet port;

a second hydraulic pressure chamber formed in said housing and communicated with said outlet port;

a communication passage for communicating therethrough said first and said second hydraulic pressure chambers;

a differential piston axially slidably accommodated within said housing and having one end portion located within said first chamber and the other end portion located within said second chamber;

said one end portion of said piston having a smaller effective area which is responsive to the hydraulic pressure than an effective area of said other end portion;

spring means for constantly urging said differential piston toward said second chamber;

an inertia valve element accommodated movably within said housing and adapted to close said communication passage in response to a predetermined deceleration of said vehicle;

means extending through said differential piston for guiding the sliding movement of said piston; and

a sealed air chamber defined between said differential piston and said guiding means;

said sealed air chamber being adapted to be introduced thereinto a hydraulic medium leaked through engaging portions of said differential piston with said guiding means to thereby prevent the hydraulic medium from leaking outwardly from said housing.

4,099,792

BRAKE FORCE CONTROLLER FOR VEHICLES, PARTICULARLY AUTOMOTIVE VEHICLES

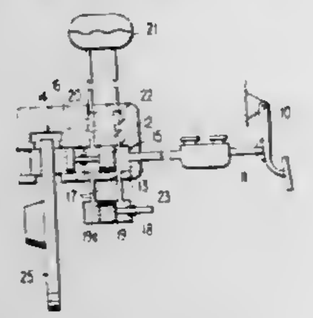
Walter Schmid, Maichingen; Arno Jambor, Vaihingen, both of Fed. Rep. of Germany; Karl Wilfert, deceased, late of Gerlingen-Waldstadt, Fed. Rep. of Germany (by Dorothea Wilfert nee Rischawy, heir), and by Thomas Wilfert, heir, Markgroeningen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,764

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538700

Int. Cl.^{2} B60T *9/10*

U.S. Cl. 303—113 **13 Claims**



1. Wheel brake apparatus comprising:
a pedal-operated master brake cylinder,
brake lining means engageable with a moveable part of a wheel for applying braking forces thereto from said master brake cylinder,
measuring element means for detecting relative movement between said brake lining means and said moveable part,
wheel brake piston means acted upon by a pressure medium supplied by said master brake cylinder and operatively connected with said brake lining means for forcing said brake lining means toward said moveable part in response to a predetermined force on said wheel brake piston means by said pressure medium,
a brake force lock-up preventing controller for automatically changing said predetermined force by said pressure medium in response to the relative movement detected by said measuring element means,
a control piston provided between the master brake cylinder and the wheel brake piston means, the front face of this control piston being exposed to the pressure output of the master brake cylinder, at least portions of the rear face of the control piston being exposed to the pressure acting on the wheel brake piston means,
connection means separate from said control piston for communicating the pressure at said front face directly with said rear face through said lock-up preventing controller, said connection means bypassing the master brake cylinder, and
only a single adjusting piston member means, arranged in said lock-up preventing controller, for controlling flow through said connection means.

4,099,793

ANTI-SKID VEHICLE BRAKE SYSTEM WITH FLUID PRESSURE ACTUATED REGULATING VALVE

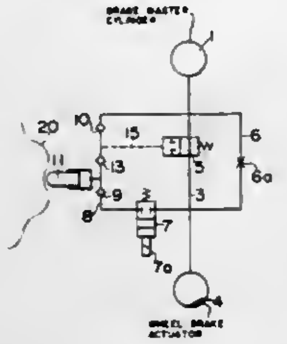
Toshimitsu Iio, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 12, 1976, Ser. No. 713,843

Int. Cl.^{2} B60T *8/02*

U.S. Cl. 303—116 **7 Claims**

1. Anti-skid brake system comprising master cylinder means for providing upon actuation a supply of hydraulic brake pressure, wheel brake actuating means, brake pressure supply passage means between said master cylinder means and said wheel brake actuating means, fluid return passage means between said master cylinder means and said wheel brake actuating means for return of hydraulic fluid, control valve means for opening when actuated said wheel brake actuating means to said fluid return passage means, skid control means for actuating said control valve means upon detection of skidding so that the wheel brake actuating means is opened to the fluid return passage means, fluid return pump means provided in said fluid return passage means for return of said hydraulic fluid through said passage means, first check valve means provided between the return pump means and the wheel brake actuating means to allow fluid flow only toward the pump means, second check valve means provided between the return pump means and the master cylinder means to allow fluid flow only toward the master cylinder means, fluid pressure actuated regulating valve means for introducing upon actuation a restriction to the brake pressure supply passage means, valve actuating fluid passage means provided between the fluid return pump means and the regulating valve means, third check valve means which is disposed between said fluid return pump means and the second check valve means and allows fluid flow only toward the second check valve means, said valve actuating fluid passage means being connected with said fluid return passage means at an area between said second and third check valve means.



4,099,794

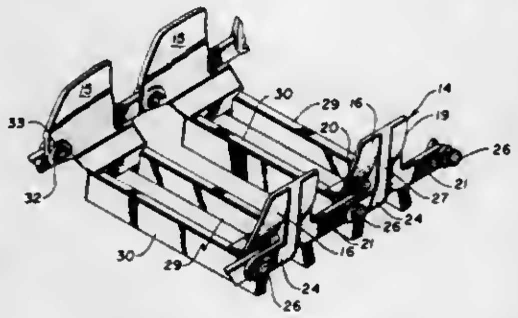
TRACK PAD

Ronald J. Hoffart, Box 124, Casselton, N. Dak. 58012

Filed Mar. 22, 1976, Ser. No. 668,822

Int. Cl.^{2} B62D *55/20*

U.S. Cl. 305—13 **16 Claims**



1. A track pad of rigid construction for use with vehicles having tired wheels comprising:
(a) a pair of transversely spaced upright tire protector plates of generally rectangular shape and having leading and trailing portions;
(b) grouser bar means carried by said plates at their lower end portions and extending therefrom for engaging the ground and for providing traction for such wheels and being of such length as to permit the tire with which it is to be used to extend downwardly between said plates and engage said grouser bar means;
(c) a rigid link carried by one of said leading and trailing portions of each of said plates in essentially fixed relation thereto and extending outwardly from the lower portion thereof for connection to another track pad, said link having an aperture therein adapted to receive a pivot pin therein to accomplish such a connection, and
(d) clevis means carried by the other of said leading and trailing position of each of said plates in essentially fixed relation thereto for pivotally connecting the same to the link of an adjacent track pad and adapted to receive such a rigid link to another track pad and a pivot pin therein for connection to such other track pad.

4,099,795

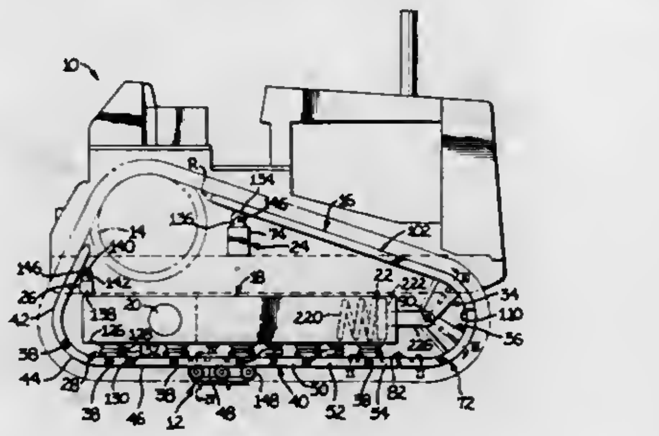
TRACK-TYPE VEHICLE UNDERCARRIAGE

Robert D. Roley, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 8, 1977, Ser. No. 814,234

Int. Cl.^{2} B62D *55/10, 55/30*

U.S. Cl. 305—18 **5 Claims**



1. A track-type vehicle undercarriage, comprising:
a segmented track support rail;
a recoil member operably connected to the rail;
a first portion of the support rail including a plurality of pivotally interconnected segments;
a second portion of the support rail including an arcuate segment slidably interconnected with the first portion and pivotally connected to the recoil member; and
a third portion of the support rail slidably interconnected with the second portion and pivotally connected to the recoil member.

4,099,796

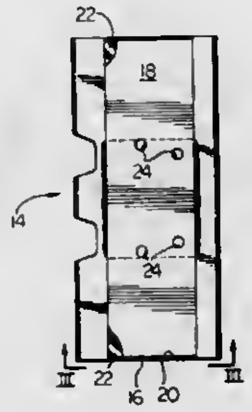
VIBRATION DAMPED SHOE ASSEMBLY

Eugene R. Groff, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1976, Ser. No. 746,567

Int. Cl.^{2} B62D *55/28*

U.S. Cl. 305—46 **10 Claims**



1. In a shoe assembly having a shoe having opposed first and second surfaces, a cover plate generally covering the shoe, and viscoelastic material positioned between the shoe and the cover plate, the improvement comprising:
said shoe and cover plate each having first and second end portions and a middle portion and including:
a seat on the middle portion of one of the cover plate and shoe, said seat contacting the middle portion of the other of said cover plate and shoe with the first and second end portions of the cover plate each spaced a preselected distance from the respective first and second end portions of the shoe and having viscoelastic material between the first and second end portions of the shoe and cover plate in the installed position of the cover plate on the shoe.

4,099,797

ENDLESS TRACK FOR VEHICLE

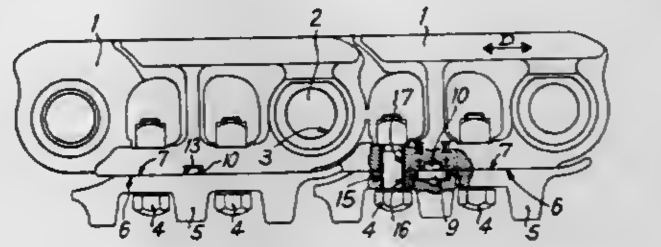
Michel Edouard Grzesik, Crepy-en-Valois, France, assignor to Societe Anonyme POCLAIN, Belleville, France

Filed Oct. 14, 1976, Ser. No. 732,332

Claims priority, application France, Oct. 29, 1975, 75 33098

Int. Cl.^{2} B62D *55/28*

U.S. Cl. 305—54 **3 Claims**



1. An endless track for a public works machine comprising a chain having a plurality of links, separate tiles respectively associated with said links, a plurality of bolts securing said tiles to said links, said tiles and links having recessed housings formed therein opening towards and in axial alignment with each other when the tiles are secured to the links, and at least one anchoring member, separate and independent from the bolts positioned between and extending perpendicularly to the adjacent faces of its associated tile and link and penetrating into said recessed housings in said link and tile, said anchoring member being a solid element formed as a disc having opposite faces being received in the recessed housing of one of said tile and link and a tenon extending from one of its faces out of the disc housing into the housing in the other of said tile and link elements.

4,099,798

STRIPPER DEVICE FOR GUIDE TRACKS ON TOOL MACHINES

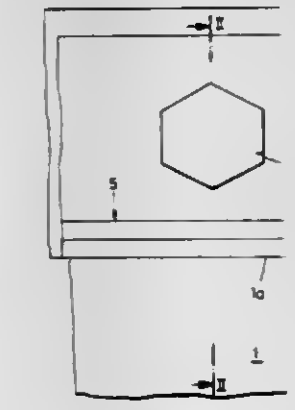
Dietmar Steinmetz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Oct. 27, 1976, Ser. No. 735,976

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550790

Int. Cl.^{2} F16C *21/00*

U.S. Cl. 308—3.5 **8 Claims**



1. A stripper device for guide tracks on a tool machine for fastening to a movable part which moves back and forth on the guide track, comprising
a stripper ledge of a wear resistant elastic material forming

an anchoring stay, the latter having an upper end formed with an anchoring head means thereon, said stripper ledge having a stripper sealing lip compressively resiliently abutting the guide track,

a fastening ledge having an upper end engaging the movable part of the tool machine and a lower end, the latter forming on a front side thereof a groove, said fastening ledge further having a rear side defining an open channel, the latter having an undercut opening at an upper end of said open channel,

said stripper ledge including a rearwardly directed projection which projects into said groove, and

said anchoring head means for engaging in said undercut opening, with said stripper ledge being clamped under said fastening ledge.

4,099,799

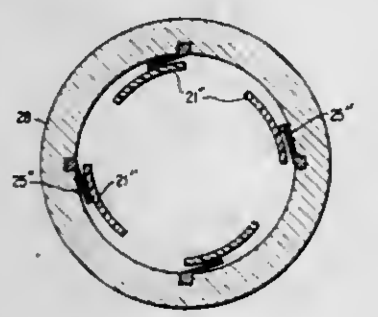
CANTILEVER MOUNTED RESILIENT PAD GAS BEARING

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Izhak Etsion, Haifa, Israel

Filed Apr. 28, 1977, Ser. No. 792,069

Int. Cl.² F16C *17/00*

U.S. Cl. 308—5 R **4 Claims**



1. A gas bearing comprising;

first and second elements movable relative to one another and positioned to form a spacing therebetween; and

resilient bearing means disposed within the spacing for deflecting in response to a pressure distribution established by the relative movement of the first and second elements, the resilient bearing means including

- a resilient cantilever beam extending in the direction of said relative movement being rigidly mounted at one end to the first element; and
- a pad rigidly mounted along a line parallel to its trailing edge to the other end of the cantilever beam and having a substantially smooth surface facing said second element for receiving the load pressure of the bearing, said line being in a plane substantially perpendicular to the direction of said relative movement.

4,099,800

COORDINATE MEASURING MACHINE HAVING AUXILIARY AIR BEARING

Frederick Koonce Bell, Centerville, and John Joseph Tuss, Englewood, both of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1977, Ser. No. 800,668

Int. Cl.² F16C *17/00, 29/02*

U.S. Cl. 308—6 R **14 Claims**

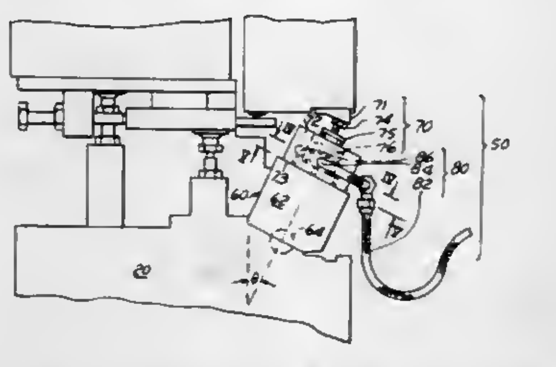
1. In combination with a measuring apparatus having a base, a carriage, means for mounting said carriage to said base for movement of the carriage relative to said base, said means including a plurality of bearings for supporting the carriage during movement, the improvement wherein at least one of said bearings for supporting said carriage is a bearing assembly comprising:

mechanical bearings means for supporting said carriage in a first direction and for allowing said carriage to move in a second direction; and

air bearing means for supporting said carriage in the first direction and for allowing the carriage to move in the second direction said air bearing means including:

a rail mounted to one of said base and carriage and extending in said second direction; and

a housing carried on the other of said carriage and said base, said housing having a plurality of passages connected together and each terminating in an aperture in a surface of said housing in contact with said rail, and means for receiving and directing air under pressure through said passages to direct air out of said apertures and between said surface of said housing and said rail for creating an air cushion and an air force therebetween, whereby the air cushion between said rail and said surface allows the movement of the carriage in said second direction relative to the base with reduced friction on the mechanical bearing means.



4,099,801

HEAVY-DUTY HYDROSTATIC BEARING

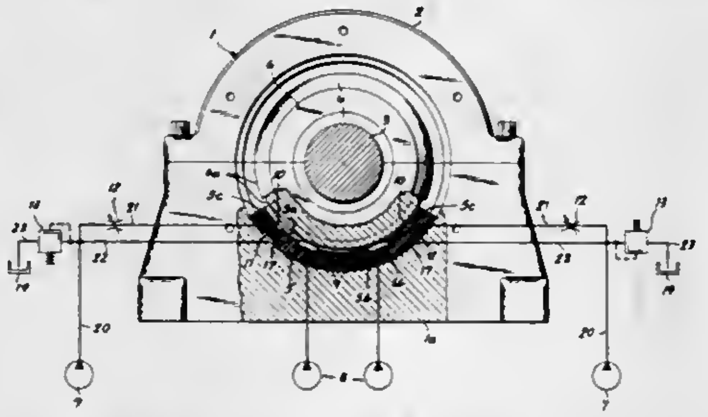
Heinz Korrenn, Obbach, and Horst Voll, Hassfurt, both of Germany, assignors to Kugelfischer Georg Schäfer & Co., Schweinfurt, Germany

Filed Dec. 23, 1976, Ser. No. 753,778

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558678

Int. Cl.² F16C *7/04*

U.S. Cl. 308—9 **10 Claims**



1. A hydrostatic journal bearing comprising:

a ring with a generally horizontal axis engageable with a shaft to be journaled in the bearing;

a ring-segmental shell underneath said ring having a concave surface closely juxtaposed with part of an outer surface of said ring and substantially coaxial therewith, said shell extending about said axis over a portion of a circle and terminating in a pair of transverse edges substantially parallel to said axis;

a base having an upper surface supporting said shell, the latter having a convex surface resting on said upper surface, at least one of said convex and upper surfaces being provided with a lower pocket of limited peripheral extent in the vicinity of each of said transverse edges, said concave surface being provided with a plurality of upper pockets opening onto said outer surface; and

pump means communicating with said pockets for delivering a high-pressure fluid to said upper pockets under a pressure sufficient to prevent direct contact between said concave and outer surfaces and to said lower pockets under a localized pressure resiliently deforming said shell to control the separation of said concave surface from said outer surface at said transverse edges.

4,099,802

HYDROSTATIC BEARING UNIT AND A HYDROSTATIC BEARING ASSEMBLY COMPRISING SEVERAL SUCH BEARING UNITS

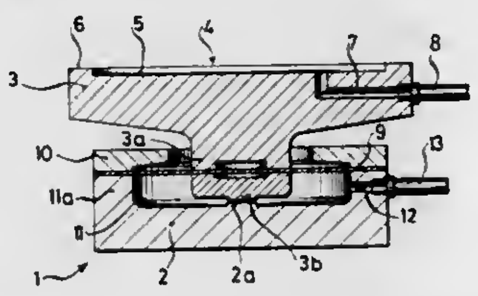
Otto Heinemann, Ennigerloh; Werner Schossler, Ahlen; Helmut Lucke, Neubeckum; Helmut Krumme, Liesborn, and Burkhard Heiringhoff, Celde, all of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Feb. 3, 1977, Ser. No. 765,244

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604889

Int. Cl.² F16C *7/04*

U.S. Cl. 308—9 **19 Claims**



1. In a hydrostatic bearing unit for rotating parts, more especially a radial bearing unit for heavy machine parts, such as drums, comprising a fixed base, a bearing shoe supported above said base for limited gyration with respect to said base and for hydraulic adjustment with respect to the rotating machine part and which comprises a bearing surface at the top surface of said bearing shoe fed with hydraulic carrier medium; the improvement therein comprising said base defining a hydraulic chamber, said bearing shoe including a pin extending into said hydraulic chamber toward engagement with the inner portion of said hydraulic chamber, a supporting membrane extending over said hydraulic chamber and connected to said base and to said pin, conduit means in communication with said hydraulic chamber for pressurizing said chamber and supporting said membrane and said bearing shoe on a body of hydraulic fluid with the pin of said bearing shoe out of engagement with the inner portion of said hydraulic chamber whereby the bearing shoe is free to gyrate with respect to said base.

4,099,803

ROLLER CARRIAGE FOR LARGER BEARINGS

Bernhard Knappe, Gochsheim, Fed. Rep. of Germany, assignor to Roland Kamm, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,827

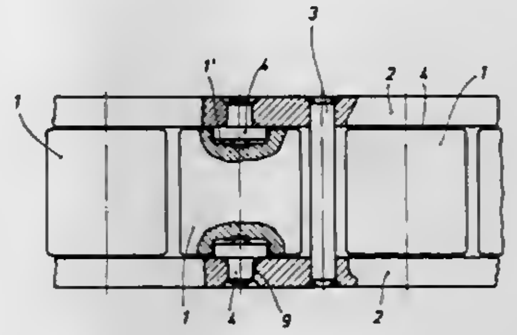
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608308

Int. Cl.² F16C *33/34, 33/52*

U.S. Cl. 308—215 **4 Claims**

1. A roller carriage for larger bearings comprising a number of rollers having end portions and having recesses each with an inner cylindrical surface portion, said recesses being on the end portions of each roller, a cage which comprises two cage-ring sections which are provided with boreholes, spacer bolts connecting said cage-ring sections with one another, and pins inserted into the boreholes of the cage-ring sections, said pins inserted into the boreholes of the cage-ring sections, said pins extending into the recesses of the rollers,

the portion of each one of said pins which extends into one of the recesses of one of the rollers has a frontal portion which faces the roller and a cylindrical surface with a radius and is provided with a convex projection which is concentric to said one pin; said projection has a radius and serves for axial guidance of said roller, while radial guidance of said roller is made between the cylindrical surface of said one pin and the inner cylindrical surface portion of said one recess of said one rollers, each of said recesses of the rollers comprises a cylindrical pocket borehole which is provided with a spherical depression concentric to the roller axis in which said convex projection rests and said radius of said projection is less than the radius of said cylindrical surface.



4,099,804

PLAIN BEARINGS

Dennis Stanley Baker, High Wycombe, and Glyndwr John Davies, London, both of England, assignors to The Glacier Metal Company, Limited, England

Division of Ser. No. 620,754, Oct. 8, 1975, Pat. No. 4,015,949, which is a continuation of Ser. No. 402,334, Oct. 1, 1973, abandoned. This application Oct. 28, 1976, Ser. No. 736,316

Claims priority, application United Kingdom, Jun. 13, 1973, 28054/73

Int. Cl.² B32B *15/08;* **F16C** *9/00*

U.S. Cl. 308—237 R **5 Claims**

1. A bearing comprising a steel backing, having an adherent metal powder intermediate layer bonded thereto, and having a layer of polyphenylene sulfide adherent to said intermediate layer by being melt impregnated therein.

4,099,805

EXTRUDABLE LUBRICANT WICKING MATERIAL

Gordon C. Gainer, Penn Hills, and Russell M. Luck, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1977, Ser. No. 806,970

Int. Cl.² F16C *1/24, 3/14;* **C10M** *5/00, 7/00*

U.S. Cl. 308—240 **10 Claims**

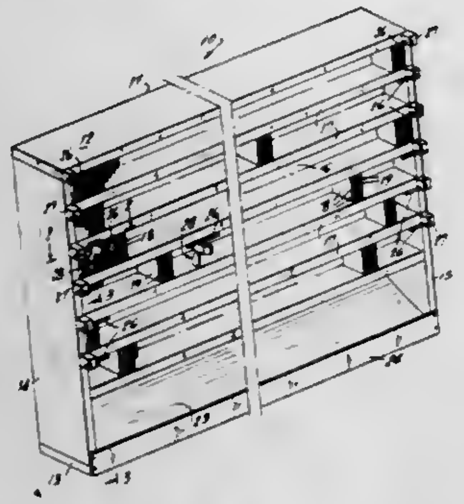
1. An extrudable, oil-permeated wicking material, comprising a lubricating oil, having a viscosity of between about 100 SUS. and 500 SUS. at 100° F, and a mass of steam-pressure-splayed, lignin-containing, celluosic wood fibers, wherein the fibers retain substantially all of the lignin present initially in the wood, the weight ratio of oil:lignin-containing wood fibers is from about 8:1 to about 3:1 and the oil is contained in micro-capillary voids primarily in contact with lignin in the wood fibers so that the lignin in contact with the oil is effective to block oil penetration into the cellulose of the wood.

8. A bearing body having a reservoir therein containing the wicking material of claim 1.

4,099,806

COMBINED OPTHALMIC LENS PATTERN RACK AND DISPENSER

Milton B. Savage, 500 Fifth Ave., New York, N.Y. 10036
Filed Apr. 21, 1977, Ser. No. 789,511
Int. Cl.^{2} A47F *3/02*
U.S. Cl. 312—117 **1 Claim**



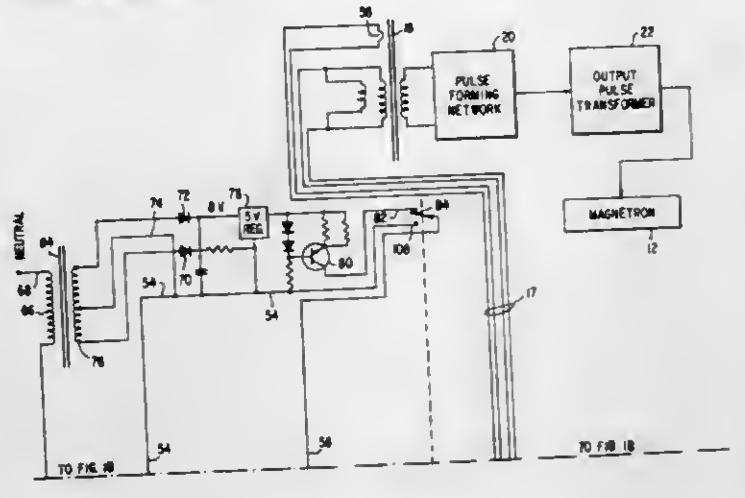
1. A lens pattern rack and dispenser comprising a hollow housing having spaced side walls, a bottom, a top and rear wall, at least one shelf dividing the area within the housing, a plurality of upstanding spaced partitions on the shelf, said shelf and partitions disposed normal to the plane of the rear wall and spaced therefrom, said partitions further dividing the area into a plurality of lens pattern receiving compartments, a chute adjacent the rear wall of the housing in communication with each of the compartments, said chute having an inclined ramp at the bottom thereof and ejecting means comprising a body portion, a depending arm on said body portion and an actuating tab extending from said body portion, said ejecting means further comprising at least one pivotally mounted member swingably carried by the housing laterally slidable upon an elongated rod on the front of the housing and opposite the rear wall to urge lens patterns out of their respective compartments and into the chute, and registerable with at least one of said compartments.

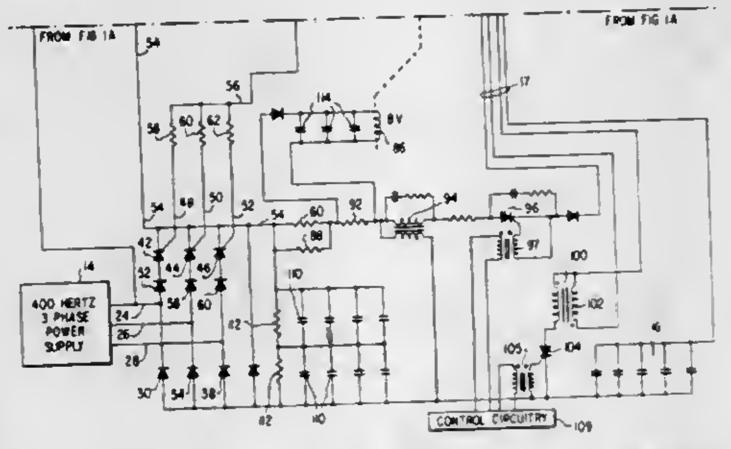
4,099,807

AIRBORNE PULSE MAGNETRON AND POWER SUPPLY SYSTEM

John A. Barnes, Stanton, Calif., assignor to R. Ritter Corporation, Palo Alto, Calif.
Filed Apr. 7, 1977, Ser. No. 785,431
Int. Cl.^{2} H02H *3/08, 7/20*
U.S. Cl. 315—127 **7 Claims**

4. A pulse magnetron system including a power supply comprising:
a magnetron;
pulse output transformer means connected to power said magnetron;
a pulse forming network connected to said output transformer;
a capacitor storage circuit;
a pulse transformer interconnecting said capacitor storage circuit and said pulse forming network;
control circuitry for charging and for selectively discharging said capacitor storage circuit;
a source of AC power;
rectification means coupled to said AC power source for providing DC charging current for said capacitor storage circuit;
semiconductor means including control electrodes for selectively enabling or disabling said rectification means;
means for deriving a low level DC control voltage from said AC power source;
means for normally applying said control voltage to the control electrodes of said semiconductor means to enable rectification; and



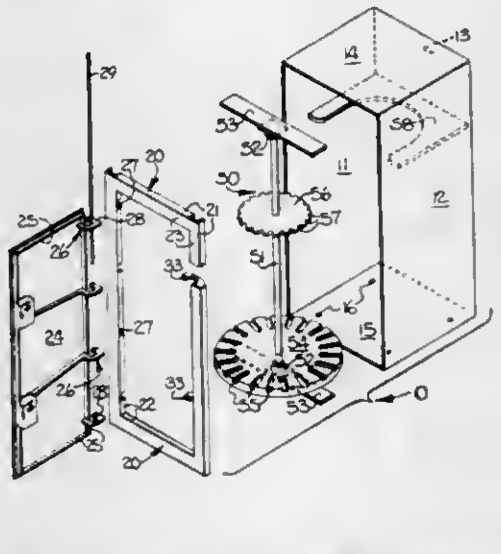


control circuitry responsive to high current fault conditions for charging the control voltage, thereby turning off said semiconductor rectifying means.

4,099,808

UPRIGHT VAULT-LIKE STEEL CABINET FOR GUNS AND VALUABLES

Ervin Carvis Oakley; George Robert Bell, and William Eugene Poole, all of Winston Salem, N.C., assignors to ECO Industries, Inc., Winston Salem, N.C.
Filed Aug. 8, 1977, Ser. No. 822,424
Int. Cl.^{2} A47B *49/00;* E05G *1/00;* A47F *3/10*
U.S. Cl. 312—138 R **15 Claims**

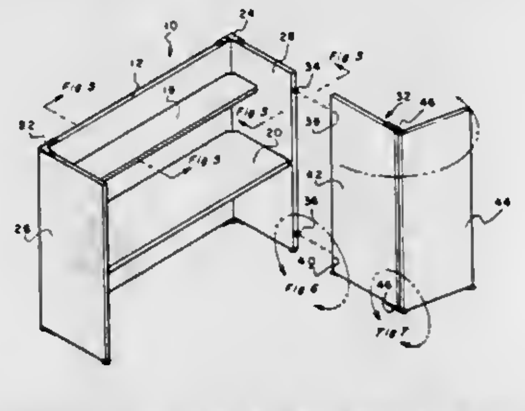


1. A security cabinet of steel construction for storage of valuable articles such as guns and the like and comprising an upright generally rectangular enclosure having an open front and wherein all of the walls thereof are of plate steel construction and welded together at their proximal edges along the corners of the enclosure, a rectangular door frame weldably secured to the walls of the enclosure and comprising weldably connected channel members of U-shaped cross-section having a pair of legs and an interconnecting web portion with one of the legs of all of the channel members being weldably connected to the adjacent plate steel wall of the rectangular enclosure, the other legs of the channel members collectively defining a doorway, and the outer faces of the interconnecting web portions of said channel members collectively defining the outer face of the door frame, a plate steel door positioned in said door frame with the outer face of said door being flush with the outer face of said door frame and with the periphery of the door closely conforming with the doorway defined by the door frame, hinge means located interiorly of the enclosure and carried by one of the side channel members of the door frame, said hinge means comprising a plurality of pivotally mounted arms, and extending inwardly of the enclosure a predetermined distance and then outwardly in an arcuate manner with the outer ends of the pivotally mounted arms being weldably secured to inner portions of said door, and a locking bracket weldably secured to the side channel member of the door frame extending along the opposite side of the door from said hinges, said door having an opening therethrough on the side thereof adjacent said locking bracket and said locking bracket having portions extending inwardly from the channel member and other portions extending forwardly through said door opening, and locking means cooperating with the portion of said locking bracket extending through said door opening for securing the door in locked position.

4,099,809

COLLAPSIBLE WORK STATION

Samuel S. Leotta, 303 Harry St., Conshohocken, Pa. 19428
Filed Aug. 13, 1976, Ser. No. 714,259
Int. Cl.^{2} A47B *43/00*
U.S. Cl. 312—140.2 **2 Claims**

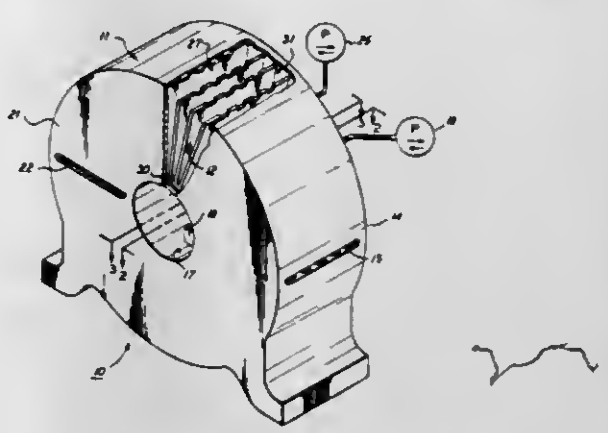


1. A collapsible work station comprising a rear support wall having a front and back surface and a pair of side support walls, means pivotally mounting each of said side support walls to a different side edge of said rear support wall such that said side support walls may be pivoted toward each other and toward said front surface of said rear support wall; a plurality of shelves, the length of each of said shelves being substantially equal to the width of said rear support wall, each of said shelves being pivotally mounted to said front surface of said rear support wall and being movable between a first position wherein said shelves are parallel to said rear wall and a second position wherein said shelves are perpendicular to said rear wall, support means associated with said side support walls for maintaining said shelves in said second position; said means pivotally mounting said side support walls mounting said side walls such that when they are pivoted toward the front surface of said rear support wall and substantially parallel thereto, they are spaced from said front surface of said rear wall a distance at least equal to the thickness of said shelves, whereby said station is collapsed by first pivoting said shelves to their first position wherein they are parallel to the front surface of the rear support wall and thereafter pivoting said side support walls toward said front surface of said rear support wall so that they lie on said shelves.

4,099,810

UPRIGHT DOCUMENT CAROUSEL

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 21, 1976, Ser. No. 688,864
Int. Cl.^{2} B65H *39/10*
U.S. Cl. 312—183 **1 Claim**



1. Apparatus for storing documents, comprising:
(a) a housing having a slot on one side and one or more holes on another side, said slot and said one or more holes being aligned;
(b) a carousel having a number of pockets, said carousel being rotatably supported in the housing, the axis of rotation of the carousel having a horizontally disposed directional component;
(c) drive means for rotating the carousel with respect to the housing whereby said pockets may be aligned with the slot and said one or more holes; and
(d) means for providing a fluid stream traversing the slot, a pocket, and said one or more holes;
(e) wherein said carousel includes a circular member and a plurality of spaced plates supported by the member, said plates extending away from the axis of rotation and each of said pockets being defined by at least two different adjacent plates and the member;
(f) wherein said housing includes at least one arcuate groove in the lower half of the housing and each of the plates includes at least one projection at the ends of the plates opposite from the axis of rotation, each projection being movable through one of the grooves when the carousel is rotated to prevent slippage of documents out of said pockets.

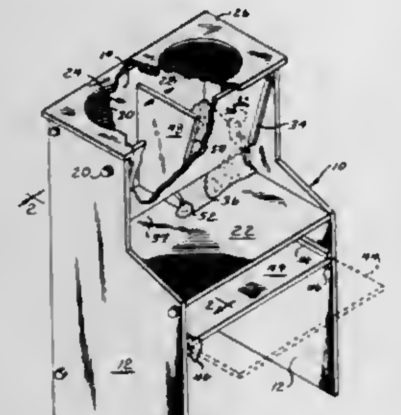
4,099,811

BENCH FOR POTTING OF PLANTS AND THE LIKE

Fentress S. Barry, 2000 Arrow La., Riverwoods, Ill. 60015
Filed May 23, 1977, Ser. No. 799,458
Int. Cl.^{2} A47B *81/00*
U.S. Cl. 312—211 **4 Claims**

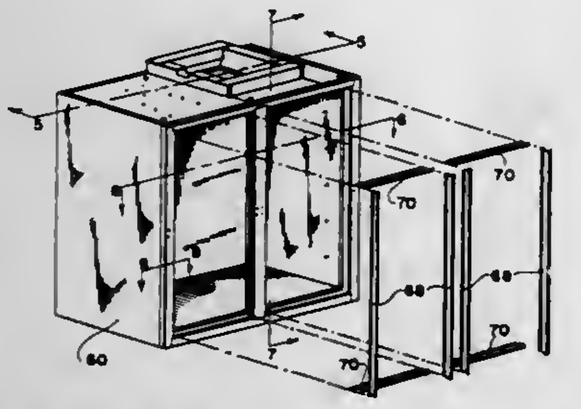
1. A bench for placing particulate matter into receptacles, such as a potting bench, which comprises:
a frame having side walls and a rear wall, which frame defines a horizontal working surface, a storage bin rearwardly positioned above said working surface, having an openable top and a front wall, said front wall being carried by said side walls in vertically slidable relationship to define a variable sized opening between said front wall and the horizontal working surface to provide access to material in said storage bin, and means for retaining said front wall in a predetermined position to maintain said opening at a desired height, said retaining means comprising a separate polygonal structure defining a plurality of sides of differing length, said polygonal structure being positioned between said horizontal working surface and the bottom of said slidable front wall, said side walls being connected together by rod members under tension to bias

said side walls against the horizontal working surface for strengthening of the bench and said front wall being positioned whereby its lower edge is positioned rearwardly of its upper edge.



4,099,812
INSULATED CABINET AND METHOD OF CONSTRUCTION

Paul H. Morphy, Prairie Village, Kans., assignor to Hobart Corporation, Troy, Ohio
Division of Ser. No. 711,442, Aug. 4, 1976, Pat. No. 4,040,166.
This application Feb. 18, 1977, Ser. No. 769,928
Int. Cl.^{2} B65D *25/18;* F25D *11/00*
U.S. Cl. 312—214 **8 Claims**



1. An insulated cabinet comprising:

a substantially rigid, metallic, main structural frame,

said main frame being disposed in a substantially vertical plane and constituting a front face of said cabinet,

a plurality of additional metallic components loosely interconnected with each other and said main frame by mechanical connections which in themselves are insuficient to maintain desired positional relationships between said main frame and said additional components.

said main frame and said additional components collectively defining a metal, outer cabinet shell,

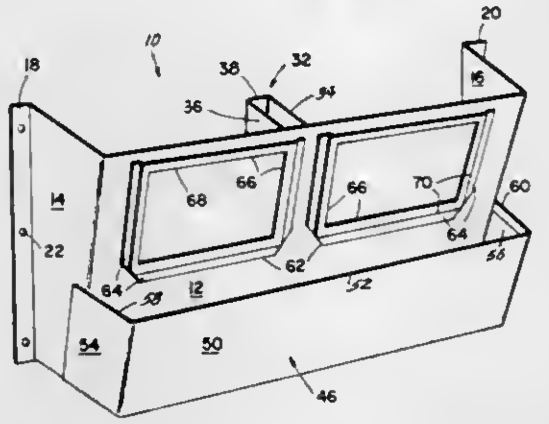
said main frame being manufactured to precise dimensional tolerances relative to the tolerances associated with the positional relationships between said additional components and said main frame, said main frame thereby serving as the basic component of said outer shell,

an inner cabinet shell positioned within said outer cabinet shell in spaced relationship thereto and defining therewith an insulating cavity, and

a hardened in situ insulating material substantially filling said insulating cavity and substantially rigidly interconnecting said main frame, said additional components and inner shell and fixing said main frame and said additional components in said desired positional relationships with respect to each other.

4,099,813
TRUCK CAB CADDY

Andre J. Olivan, 1973 Dora Ave., Walnut Creek, Calif. 94596
Filed Mar. 31, 1976, Ser. No. 672,085
Int. Cl.^{2} A47F *7/00*
U.S. Cl. 312—243 **2 Claims**



1. A cab caddy for holding documents and the like comprising a first sheet of material formed to provide a compartment in cooperation with a surface it is mounted on, including front wall, trapezoidal side walls joined to each end of the front wall by right angle bends in said material rearward of the front wall, flanges provided at rear edges of side walls by bend means in the material, a bottom member joined to the bottom edge of the front wall by bend means and extending rearwardly thereof to a plane defined by said flanges, a lip joined to the rearward edge of the bottom member by bend means and extending upward therefrom coplanar with the flanges, tab members joined to side edges of the bottom member by bend means and extending upward therefrom parallel with and interiorly adjacent the trapezoidal side walls, fastening means securing the tab members to the side walls, a second sheet of material formed to provide a tray extending forward of said compartment and including a front portion in spaced parallel relationship forwardly of and coterminous with a lower portion of the front wall, side portions joined to ends of the front portion by bend means and extending rearwardly thereof in parallel overlapping part way relationship with the side walls, a bottom portion joined to the lower edge of the front portion by bend means and extending rearwardly thereof in parallel overlapping part way relationship with the bottom wall, fastening means securing the side portions to the side walls, and the bottom portion to the bottom wall, a pencil holder secured to the inner surface of the front wall intermediate the side walls and extending rearwardly thereof whereby the compartment will be divided by said pencil holder into respective chambers, said pencil holder comprising a third sheet of material formed to include spaced parallel walls extending rearwardly of the front wall parallel with the side walls, a transverse rear wall joined to the rearward edges of the side walls by bend means, flanges parallel to and abutting the front wall joined to the front edges of the parallel walls by bend means, bottom tab joined to the bottom of one of said parallel walls by bend means and extending normal thereto to said other parallel wall, fastening means securing the flanges to the front wall, at least one document frame, secured to said front wall, said document frame comprising side and bottom flange means secured to said front wall, border means defined by rectangular openings, and stepped portions joining said border means with said flanges.

4,099,814
GLOVE COMPARTMENT SHELF

John Hasselberger, Box 846, East Hampton, N.Y. 11937
Filed Jan. 10, 1977, Ser. No. 757,922
Int. Cl.^{2} A47B *96/02;* B60R *7/06*
U.S. Cl. 312—317 R **3 Claims**

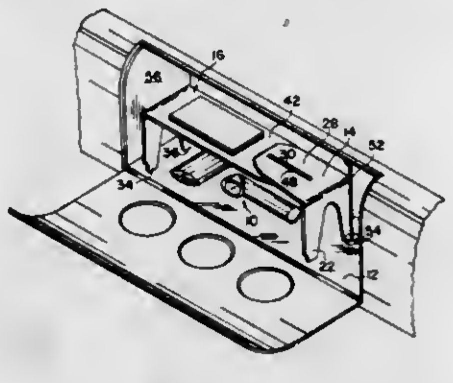
1. A shelf positioned in a glove compartment of an automobile, comprising:

a first and second shelf component,

each of said shelf components including a substantially horizontal and a substantially vertical portion, said vertical portion of each of said shelf components including

a substantially U-shaped end portion pivotally connected to one end of said horizontal ahelf portion,

said U-shaped end portion including a pair of legs for supporting said horizontal shelf portion, and a hinge connecting the bight portion of said support to said horizontal shelf; means for adjustable connecting the horizontal portions of said shelf components including



an elongated slot in the horizontal portion of one of said shelf components adapted to be overlapped with a relatively transverse slot in the horizontal portion of the other of said shelf components;

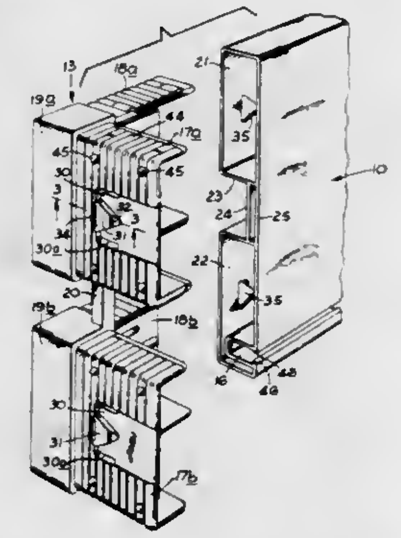
an elongated threaded shank received through said overlapping slots in said horizontal shelf portions, and

a nut threadedly received on the end of said shank,

so that one of said shelf components may be adjusted axially, laterally, and angularly with respect to the other.

4,099,815
STRUCTURAL ELEMENTS

Terence Allan Cox, Polesworth, and David Roger Lewis, Belgrave, both of England, assignora to Swish Products Limited, England
Filed May 20, 1976, Ser. No. 688,184
Claims priority, application United Kingdom, May 30, 1975, 23572/75
Int. Cl.^{2} A47B *47/00*
U.S. Cl. 312—330 R **4 Claims**



1. A set of elements for forming the side walls of a tray-like structure, said elements including a wall member defining a mortice socket opening to one end of said member and a connecting member having a body portion and at least one tenon formation having a free end insertable into the mortice socket to locate the body portion in predetermined alignment with the wall member to form the structure, the tenon formation being provided with a laterally projecting retaining detent for engagement in a mating aperture in a sidewall of the mortice socket to resist withdrawal of the tenon formation therefrom; wherein the improvement comprises:

(a) means providing a central region of the tenon formation with a single, generally U-shaped slot defining a resilient tongue carrying said retaining detent at its free, resilient end, said free end of the tongue being directed away from the free end of the formation and being entirely bordered by the remainder of said tenon formation, said tenon formation free end constituting a one-piece, uninterrupted member;

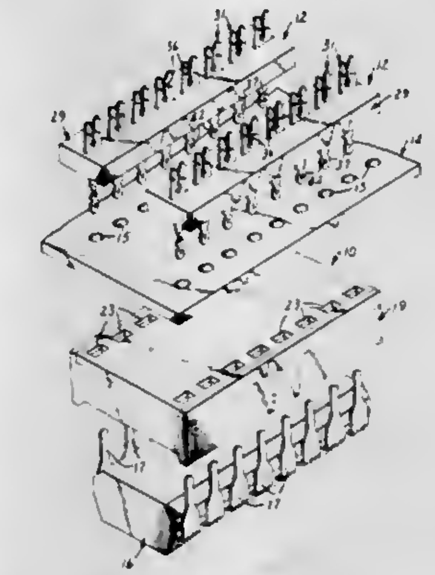
(b) said retaining detent having a leading end facing in the direction of the free end of the tenon formation and away from the free end of the tonque and a pair of edge faces diverging away from said leading end to an abutment part of the detent which is substantially broader than said end,

(c) said mating aperture being a through aperture in said sidewall so that the detent is accessible from the exterior of the completed structure to enable release of the tenon formation from the mortice socket by pressing the abutment part of the detent and thus said tongue free end inward of the aperture to flex the resilient tongue, and

(d) said detent having an acute angle leading tip and an abutment part in the form of a transverse face which merges with the free end of the tongue.

4,099,816
ELECTRICAL CONNECTOR SYSTEM

John E. Bittner, Inver Grove Heights, and Robert S. Dodsworth, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 689,976, May 26, 1976, abandoned.
This application Jun. 3, 1977, Ser. No. 803,206
Int. Cl.^{2} H05K *1/12*
U.S. Cl. 339—17 CF **6 Claims**



1. An electrical connector system for use with a perforated circuit board, comprising:

a connector body comprising:

an insulating housing having a plurality of apertures therethrough, the aperture openings at one face of said housing being spaced to align with perforations in a said circuit board, and

a plurality of spring contact elements retained in said housing, one within each aperture therethrough, each said spring contact element being formed of a metal strip and having two adjacent oppositely directed pairs of resilient jaws for slidably receiving and releasably contacting oppositely extending flat plate conductors, one pair of jaws being aligned with an opening at said one face of said housing and the oppositely directed pair of jaws being aligned with the aperture's opening at the opposite face of said housing; and

a contact strip comprising:

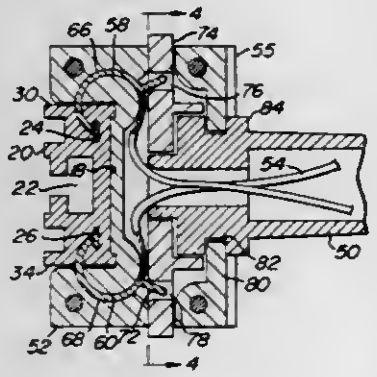
an insulating contact retainer having a plurality of contact apertures therethrough, the aperture openings at one face of said contact strip being spaced to align with perforations in a said circuit board and said openings at said one face of said connector body housing, and

a plurality of spring compression reserve wire contact elements, one in each of said contact apertures, each said spring compression reserve wire contact element having a spring compression reserve wire contact slot accessible at the face of said contact retainer opposite said one face thereof and having a tail extending from said one face of said contact retainer to fit through a perforation in a said circuit board and an aligned aperture in said one face of said connector body housing into the aligned resilient jaws of a spring contact element.

4,099,817
TRACK LIGHTING

Donald J. Booty, 513 Durham Dr., Frankfort, Ill. 60423, assignor to Donald J. Booty and Marvin Felg, both of Chicago, Ill.

Filed Jan. 27, 1977, Ser. No. 763,184
Int. Cl.² H01R *7/06, 13/54*
U.S. Cl. 339—22 B **13 Claims**



1. Apparatus comprising a housing having a generally U-shaped recess on one side for embracing outer faces of a track, a pair of curved movable contacts supported by the housing adjacent said recess, said housing having curved discrete passageways whose curvature corresponds to that of said contacts for slidably accommodating and guiding said contacts on opposite sides of said recess, a pair of electrical conductors extending through said housing, each conductor having one end electrically connected to one of said contacts, a movable actuator means supported by said housing and coupled to said contacts for selectively moving said contacts along a curved path corresponding to said passageways relative to said housing between an inoperative retracted position wherein said contacts are in said passageways and an operative position wherein the contacts extend into said recess, the free end of each contact being adapted to engage a conductor bus on a track only when the contacts are in their operative position.

4,099,818
NON-EXPLOSIVE INITIATOR

Willy L. Meinzer, Canoga Park, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed May 9, 1977, Ser. No. 795,099
Int. Cl.² H01R *13/62*
U.S. Cl. 339—45 R **22 Claims**

1. In combination for providing a movement of a first output member relative to a second output member,

a sleeve,

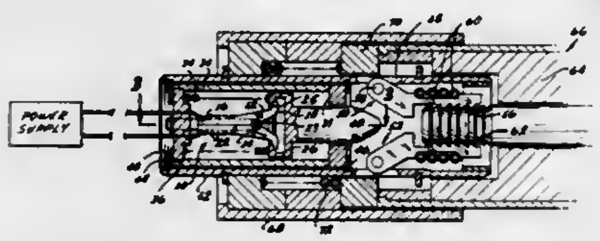
a wire having properties of disintegrating upon the application of an electrical current,

means operatively coupled to the wire for applying an electrical current to the wire to disintegrate the wire,

first means disposed within the sleeve and cooperative with the wire in a first position for restraint by the wire against movement to a second position and biased for movement to the second position upon release by the wire,

second means disposed within the sleeve and biased against movement by the first means in the first position and disposed relative to the first means for movement in a particular direction upon the movement of the first means to the second position,

third means disposed within the sleeve relative to the first means and the second means for providing for the insertion of the first means and the second means and the wire into the sleeve with the wire biasing the first means to the first position and for providing for the withdrawal of the first means and the second means and the wire from the sleeve,



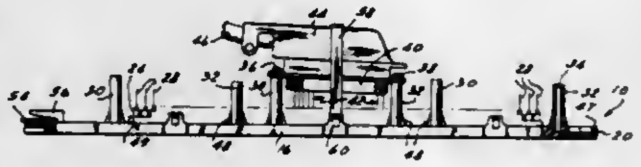
fourth means disposed within the sleeve and restrained against movement during the biasing of the second means against movement in the particular direction and released for movement by the second means in accordance with the movement of the second means in the particular direction, and

fifth means disposed within the sleeve and cooperative with the fourth means and biased for movement in the particular direction, upon the release of the fourth means for movement, and disposed in cooperative relationship with the first output member to obtain a movement of the first output member in the particular direction relative to the second output member.

4,099,819
MODULAR TERMINATION SYSTEM FOR TELECOMMUNICATION DEVICES

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sep. 13, 1976, Ser. No. 722,675
Int. Cl.² H01R *11/20, 13/54*
U.S. Cl. 339—75 M **31 Claims**



1. Modular interconnection apparatus comprising: connector

a plurality of contacts, each of said contacts including an active portion, a terminating portion, and an intermediate portion between said active and termination portions;

a one-piece support mounting said plurality of contacts in rows, said support including

a panel having a front side and a rear side,

a plurality of first projections extending from said rear side, said projections arranged in said rows,

a plurality of contact passageways each extending through a respective first projection and through said panel, each of said passageways receiving and mounting a respective contact with said intermediate portion in said first projection and said termination portion extending rearwardly of said first projection, and

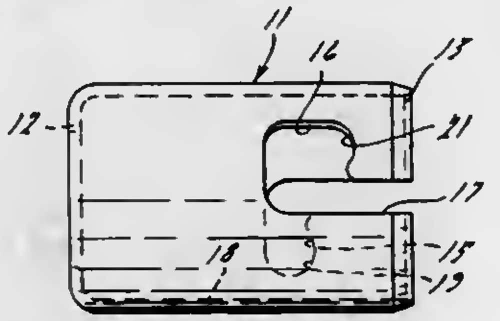
a plurality of second projections extending from said rear side; and

a plurality of mating electrical connector units mounted on said second projections, each of said connector units including a plurality of contacts each having a termination portion and a mating portion, said mating portions adapted for engaging contacts of a complementary mating electrical connector unit, said termination portions of said contacts of a row of contacts electrically connected to respective termination portions of said contacts of a respective mating electrical connctor unit thereby associating each row of contacts with a separate electrical connector unit.

4,099,820
LAMP SOCKET

Don L. DeLano, Mt. Clemens, Mich., assignor to Microdot Inc., Greenwich, Conn.

Filed Jan. 1, 1977, Ser. No. 802,457
Int. Cl.² H01R *33/46*
U.S. Cl. 339—88 R **1 Claim**

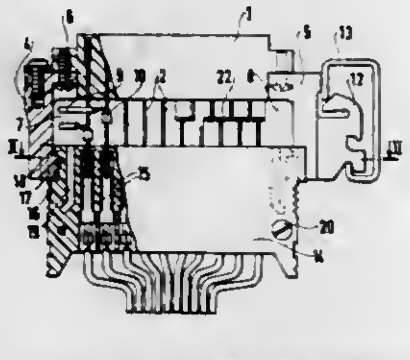


1. A socket capable of accepting conventional single or multicontact light bulbs having radially aligned or axially offset retention pins in the base thereof, respectively, said socket comprising a cylindrical sleeve having a radially inwardly extending flange at one end thereof, first and second diametrically related J-slots in said sleeve defined by axial slots and circumferentially offset open spaces with pin seats at the ends thereof remote from the flange on said sleeve, the pin seat in said first J-slot and closest to said flange being in radial alignment with an enlarged open space defined by the offset portion in said second J-slot, the pin seat in the offset portion of said second J-slot being axially spaced a distance from the pin seat in said first J-slot exactly equal to the spacing of the axially offset pins of a conventional multi-contact light bulb whereby single contact light bulbs having axially aligned retention pins as well as multi-contact light bulbs having axially offset retention pins are acceptable and positively supported by the pin seats in said socket.

4,099,821
ELECTRIC CONNECTION BLOCK WITH MULTIPLE CIRCUITS

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom S.A., Levallois-Perret, France

Filed Feb. 24, 1977, Ser. No. 771,488
Claims priority, application France, Mar. 3, 1976, 76 06009
Int. Cl.² H01R *9/14, 13/54, 13/58*
U.S. Cl. 339—91 R **3 Claims**

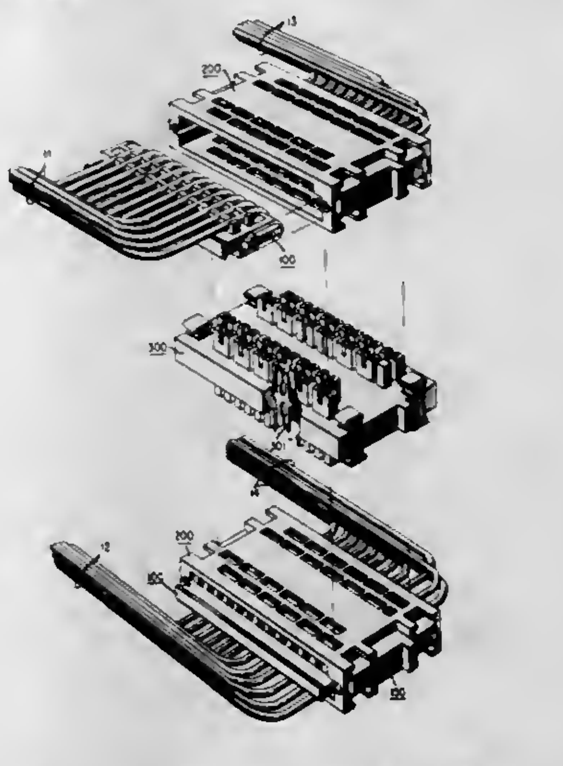


1. An electric connection block having multiple circuits, said block comprising: a base carrying multiple rows of contact pins which are parallel to one another and have free ends projecting outwardly from one side of the base, said base carrying at both ends and to said one side guide bars of insulating material, said guide bars being parallel to the contact pins and perpendicular to the rows and being spaced laterally from the contact pins at respective ends of said rows, a plurality of plugs in side abutting contact and spanning between said guide bars for carrying conductors to be electrically connected to the projecting ends of said contact pins, each plug receiving contact pins of a given row, said guide bars bein slotted in a comb configuration and forming spaced portions faing away from said base, and means for interfitting the ends of said plugs respectively to the ends of respective guide bar portions remote from said base with said base, said guide bars and said plugs defining wiring channels at the ends of the rows of contact pins, to permit conductors to extend through said guide bar slots and wherein said plugs are spaced sufficiently from said base to provide an extended free length to the contact pins to allow conductors connections to respective contacts pins of said rows with said plugs being individually supported by opposed aligned portions of said guide bars as defined by said comb slots.

4,099,822
CONNECTOR FOR MAKING SPLICING, HALF-TAP, BRIDGING AND TERMINATING CONNECTIONS OF MULTIPLE INSULATED CONDUCTORS

Arthur Wallace Carlisle, and Dean Rudisill Frey, both of Dunwoody, Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 24, 1977, Ser. No. 761,978
Int. Cl.² H01R *9/08*
U.S. Cl. 339—98 **12 Claims**



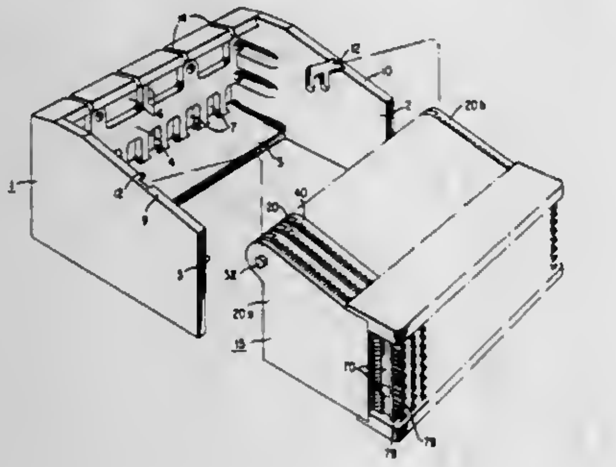
1. A connector for electrically joining at least two wires, comprising in combination:

- a wire mandrel comprising:
  - first and second wire-receiving surfaces; and
  - one or more wire guide channels common to each said surface for positioning a given wire along both of said surfaces, said wire guide channels including wire insulation gripping teeth for holding said wire adjacent to both of said surfaces;
- a unitary mandrel holder comprising:
  - a first and a second face defining therebetween an open-ended interior chamber for receiving said mandrel;
  - each said face having an access hole, with two such holes being aligned on opposite sides of each one of said wire

guide channels when said mandrel is inserted into said chamber; and
a contact module comprising:
- one or more contact-receiving cavities each positioned to align with an access hole pair; and
- a contact element having two like ends and contained in each of said cavities for engaging two different positioned wires carried on oppositely disposed first wire-receiving surfaces of two different wire mandrels to effect the connection therebetween.

4,099,823
HIGH DENSITY MULTIPAIR CABLE CONNECTING BLOCK

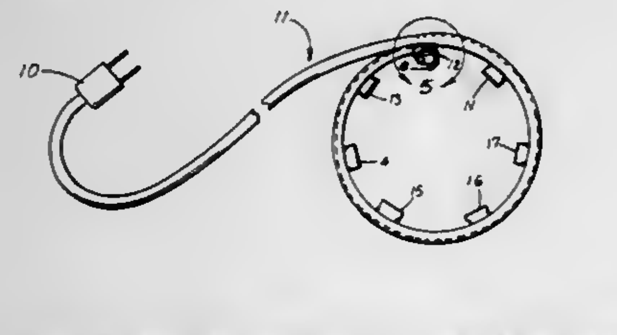
Alfonso Joseph D'Alessio, Rockaway, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 18, 1977, Ser. No. 779,258
Int. Cl.² H01R *3/00*
U.S. Cl. 339—113 B **15 Claims**



1. A wire organizer comprising:
- a two-sided index plate having multiple edges including an indexing edge and two feeder edges;
- a set of spaced concentric grooves in each of said sides, each groove set terminating at said indexing edge, leading therefrom in opposite directions and culminating on respective said feeder edges which are separated by said indexing edge;
- a recess adjacent to each said feeder edge disposed on the side of said index plate opposite that which contains the groove set connecting with each said feeder edge; and
- means for covering all grooves.

4,099,824
MECHANICALLY ADJUSTABLE ELECTRIC OUTLET DEVICE

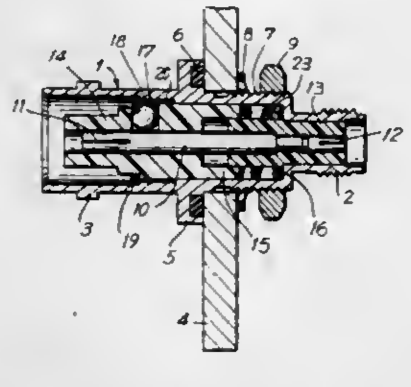
Victor H. Schoppelrey, 1202 N. Harding, St. Orange, Calif. 92667
Filed Jun. 3, 1977, Ser. No. 802,970
Int. Cl.² F21P *1/02*
U.S. Cl. 339—157 C **1 Claim**



1. A multiple electrical outled device which is mechanically adjustable, comprising:
- an elongated housing made of insulating material;
- a pair of electric circuit wires disposed in spaced relation within said housing;
- a plurality of contact pairs spaced along the length of said housing, the contacts in each of said pairs extending into the interior of said housing and being connected to corresponding ones of said circuit wires, said housing having openings through which said contacts are accessible from the exterior of said housing, whereby each of said circuit pairs provides a separate electrical receptacle;
- an elongated metal spring member disposed within said housing and insulated from said circuit wires, said spring member extending substantially the full distance between the two most remote ones of said receptacles;
- means associated with one end of said housing for selectively energizing said circuit wires;
- a first fastener part carried by the other end of said housing;
- at least two of said receptacles adjacent said one end of said housing being of such configuration as to form a second fastener part, said first and second fastener parts being adapted for selective interengagement; and
- said housing and said metal spring member cooperatively providing a resiliently deformable action such that said housing may be bent into a substantially circular configuration with said other end thereof being positioned in the vicinity of said one end thereof, in order to interengage said first and second fastener parts together;
- whereby said device may be selectively formed into a circular configuration of desired diameter, and when usage thereof has been completed, may then be returned to its original essentially straight configuration.

4,099,825
COAXIAL ADAPTER

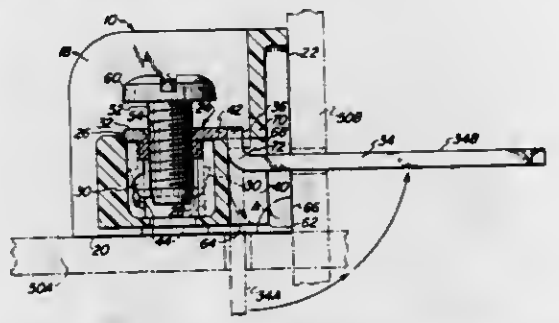
Samuel H. Jackson, Ardsley, N.Y., assignor to Kings Electronics Co., Inc., Tuckahoe, N.Y.
Filed Aug. 24, 1977, Ser. No. 827,217
Int. Cl.² H01R *17/06, 33/30*
U.S. Cl. 339—177 E **4 Claims**



1. In an adapter plug for joining two different coaxial plugs, which comprises a generally cylindrical metal housing and provided with external means at each end for mechanically attaching said coaxial plugs to said adapter, and a center conductor having means at each end for receiving the center conductor of said coaxial plugs, the improvement which comprises a first insulating support for said center conductor, surrounding one end of the same, and rigidly mounted within said housing, a second insulating support slidably mounted within the main portion of said housing and about the other end of said center conductor, the body of said second insulating support being provided with one or more radial openings near one end, extending from the center conductor to the outer face of said insulating support, means forming a metallic shoulder within said housing and positioned adjacent said radial openings, a contact device in each of said openings extending from the center conductor to the outer surface of said second insulating support, spring means normally urging said second insulating support in a direction to press said contacting devices into engagement with said shoulder, an insulating sleeve positioned within said housing adjacent said shoulder and covering a portion of said openings when the contacting devices and the shoulder are in contact-making position, whereby movement of said second insulating support against said spring resulting from the mechanical connection of one of the coaxial plugs shifts said contacting means away from said shoulder and under the internal surface of said insulating sleeve.

4,099,826
FEED-THROUGH TERMINAL BLOCK

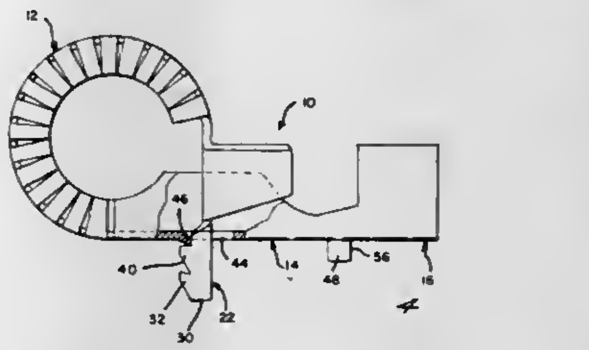
Charles F. Mazzeo, Scotch Plains, and William T. Waddington, Fanwood, both of N.J., assignors to Amerace Corporation, New York, N.Y.
Filed Apr. 7, 1977, Ser. No. 785,531
Int. Cl.² H01R *9/10*
U.S. Cl. 339—198 R **8 Claims**



1. A dual orientation feed-through terminal block for detachably connecting external electrically conductive elements to further circuitry, said terminal block comprising:
- a block of dielectric material having opposite sides, a first base extending between the sides, and a second base extending between the sides and making an angle with the first base;
- at least one recess in the block;
- a slot in the block, said slot having a continuous opening facing both of the first and second bases and communicating with the recess; and
- an electrical terminal member affixed to the block within the recess, the terminal member having a terminal portion for selectively connecting and disconnecting an external conductive element and the terminal member, said terminal portion including a platform having an upper surface, and said terminal member further having an integral electrical contact extending through the slot and projecting beyond one of said bases;
- said contact being movable into one of first and second positions, while the terminal member remains affixed to the block, the contact in the first position thereof projecting beyond the first base and the contact in the second position thereof projecting beyond the second base, whereby the block may be mounted upon either selected one of the first and second bases and provide a feed-through beyond said selected one of the bases;
- the opening of the slot including a first open portion parallel to the first base and a second open portion parallel to the second base, the first and second open portions being in open communication with one another such that the contact is movable laterally from one open portion into the other when moved from one of the first and second positions to the other; and wherein
- the opening of the slot is spaced from the upper surface of the platform in a direction extending downwardly from the upper surface such that the conductive element, when clamped to the upper surface of the platform, will be blocked from entering the slot by the material of the block.

4,099,827
LATCHING DEVICE

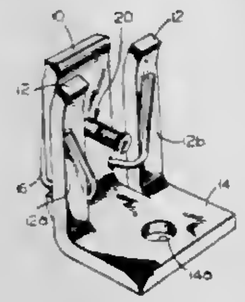
Van Keith Webster, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 15, 1977, Ser. No. 816,042
Int. Cl.² H01R *11/02*
U.S. Cl. 339—228 **14 Claims**



1. A latching device for a battery terminal of the type having a channel with an opening therethrough and a post-engaging hoop at one end, which comprises:
- a. an elongated finger attached to the free end of the hoop and adapted to be inserted into the opening in the channel;
- b. a plurality of teeth on the free end of the finger, said teeth being adapted to be latched against the wall of the opening to retain the finger therein; and
- c. means on the finger for inserting it into the opening.

4,099,828
BLADE-TYPE FUSE CLIP WITH FIELD INSTALLABLE REJECTION MEANS

Louis T. Stegmaier, Plainville, and Howard Reynolds, New Britain, both of Conn., assignors to General Electric Company, New York, N.Y.
Filed Oct. 7, 1977, Ser. No. 840,456
Int. Cl.² H01H *85/24*
U.S. Cl. 339—258 F **8 Claims**



1. A rejector fuse terminal clip for accepting a fuse terminal blade keyed with a special notch and rejecting a fuse terminal blade lacking the special notch, said fuse clip comprising, in combination:
- A. first and second clamping arms upstanding from a common base in parallel, spaced apart relation to define therebetween a fuse terminal blade receiving slot;
- B. means forming a hole in said first clamping arm and an interruption in said second clamping arm in opposed relation across said slot from said hole; and
- C. interference means cantilever mounted by said first clamping arm for extension across said slot and through said interruption in said second clamping arm to reject insertion into said slot of a fuse terminal blade lacking the special notch, said interference means including
  - (1) a rejector pin having an enlarged head and a shank of a diameter conforming to the diameter of said hole,
  - (2) means forming an annular groove in said shank adjacent the free end thereof remote from said head,
  - (3) a helical compression spring carried on said shank intermediate said head and said groove, and

(4) a spring clip lodged in said groove and having a diameter exceeding the diameter of said hole,

(5) said shank extending through said hole to dispose said groove on the opposite side of said first clamping arm from said slot, said spring clip, as lodged in said groove, preventing removal of said rejector pin from said hole, and said compression spring being compressed between said head and said first clamping arm to rigidify the cantilever mounting of said rejector pin to said clamping arm.

4,099,829

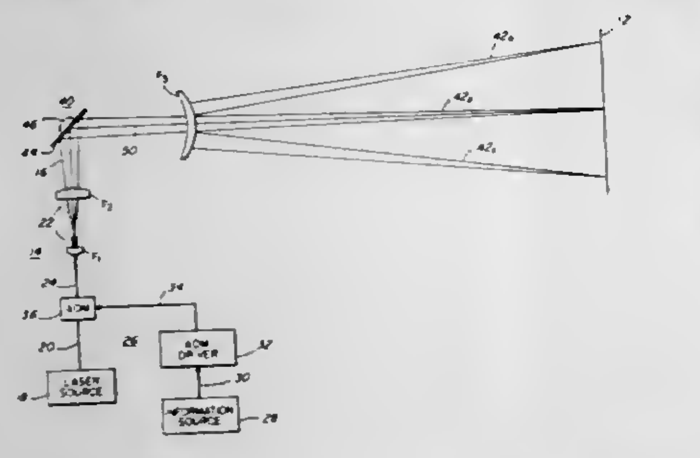
FLAT FIELD OPTICAL SCANNING SYSTEM

Ronald Jack Strasyer, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Feb. 23, 1977, Ser. No. 771,068

Int. Cl.^{2} G02B *27/17*

U.S. Cl. 350—6.1 **13 Claims**



1. An optical system for scanning a light beam on a flat field surface comprising:

a. means supplying a diverging laser light beam,

b. means disposed in the path of the diverging light beam for scanning the light beam on the flat surface,

c. a converging lens disposed between the flat field surface and the scanning means and in the path of the diverging laser light beam for focusing the beam at the flat field surface as the beam is scanned, and

d. the diverging laser light beam and the scanning means being positioned to make the effective laser beam source appear to be moving along a spherical surface having a radius equal to the distance between the beam supplying and the scanning means so that due to the petzval curvature effect of the converging lens the laser light beam is focused equally on all points of the flat field surface.

4,099,830

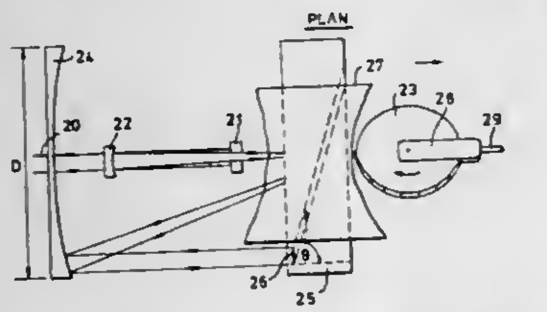
OPTICAL SYSTEMS INCLUDING POLYGONAL MIRRORS ROTATABLE ABOUT TWO AXES

Harry Reed Whittle, Wallingford, and Brooke Armitage Ward, Goring, both of England, assignors to A. J. Bingley Limited, Bristol, England

Filed Dec. 15, 1976, Ser. No. 750,721

Int. Cl.^{2} G02B *27/17;* B23K *9/00*

U.S. Cl. 350—6.8 **6 Claims**



1. An optical system for scanning a beam of radiant energy across a moving workpiece to be acted upon by the radiant energy, said system comprising a cylindrical mirror arranged to bring the beam of radiation to an initial line focus, a polygonal mirror mounted for rotation about an axis, the orientation of which relative to the longitudinal axis of the cylindrical mirror can be varied, and arranged to scan the beam of radiation across a spherical mirror which is positioned to reform the image of the line focus of the beam of radiation on the workpiece, and means for varying the orientation of the axis of the polygonal mirror as a function of the rate of scan of the beam of radiation across the workpiece and the velocity of the workpiece so that the line-focused image is perpendicular to the direction of motion of the workpiece and traverses the workpiece in a straight line in the direction of the line focus.

4,099,831

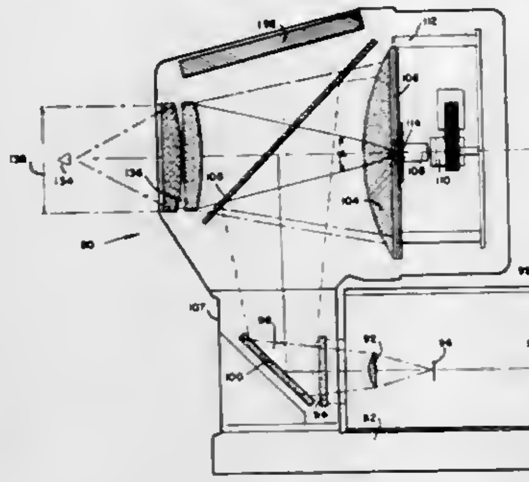
HIGH MAGNIFICATION OPTICAL APPARATUS WITH ROTATABLE REFLECTIVE LENTICULATED SURFACE

Robin John Freeman, Send Woking, England, assignor to Vision Engineering, Ltd., Send Woking, England

Division of Ser. No. 202,743, Nov. 29, 1971, Pat. No. 4,012,109, which is a continuation-in-part of Ser. No. 863,952, Oct. 6, 1969, abandoned. This application Jul. 26, 1976, Ser. No. 708,617

Int. Cl.^{2} G02B *21/38;* G03B *21/60*

U.S. Cl. 350—9 **5 Claims**



1. Apparatus producing an enlarged exit pupil, comprising:

a. means for positioning at said apparatus an object to be viewed;

b. objective lens means spaced from said object;

c. projection lens means spaced from said objective lens means in the optical path proceeding from said objective lens means;

d. first field lens means positioned in said optical path beyond said projection lens means;

e. a rotatable disc carrying a reflective lenticulated surface over which discrete lenticules are distributed positioned in said optical path beyond said first field lens means at focal plane of the image so that each lenticule reflects light incident thereon back through said first field lens means;

f. second field lens means positioned in the continuing optical path reflected from said lenticulated surface;

g. reflecting means on the side of said second field lens means opposite said lenticulated surface and oriented to reflect the light incident thereon to the eye of an observer, and

h. means to rotate said discs to provide uniform motion of said lenticulated surface in a direction to cause the depressions of said lenticules to scan across light pencils incident thereon at a speed such that the persistence of vision and form of said depressions of said lenticules effectively multiplies the angle of light egress from said surface of said light pencils whereby effectively to produce said enlarged exit pupil at the eye of said observer.

4,099,832

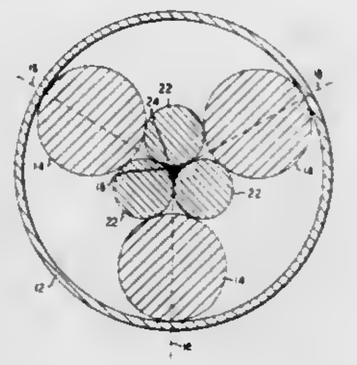
OPTICAL FIBER CONNECTOR UTILIZING NESTED ROD ARRANGEMENT

Arthur Woodward Warner, Jr., Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1976, Ser. No. 754,603

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.21 **12 Claims**



1. An optical fiber connector comprising:

a cylindrical resilient sleeve,

three outer rods affixed to the inner surface of said sleeve, said outer rods being parallel to the cylinder axis of said sleeve and disposed in spaced relation to one another about said axis,

three inner rods extending parallel and in mutual contact with one another, thereby forming a cylindrical aperture therebetween,

an optical fiber disposed within said aperture and secured to said inner rods,

the diameter of said outer rods being larger than the diameter of said inner rods so that, when said inner rods are inserted between said outer rods, each of said outer rods contacts a pair of adjacent inner rods along their length and a net compressive force is supplied to said inner rods.

4,099,833

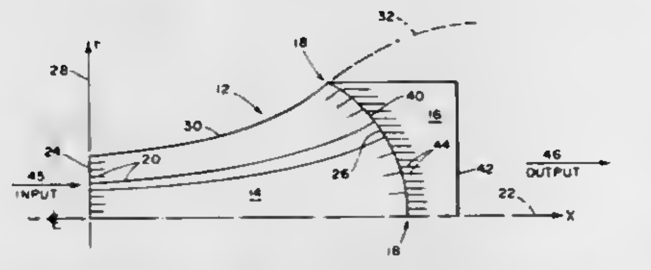
NON-UNIFORM FIBER OPTIC IMAGING SYSTEM

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Continuation of Ser. No. 449,520, Mar. 8, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,457

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.25 **6 Claims**



1. A non-uniformly image-modifying optical device comprising

a first bundle of optical fibers of varying length,

a second bundle of optical fibers of varying length,

a first imaging surface on said first bundle,

a second imaging surface on said second bundle,

each said imaging surface being in fiber-optically transmissive relation with each said bundle and spaced by at least one bundle from an interface between bundles, and said first bundle being joined with said second bundle at a curved interface therebetween,

each said bundle having a tapering portion made up of optical fibers of diameter increasing with increase in bundle diameter in said tapering portion,

said interface intercepting said tapering portion at varying distances along the length of said tapering portion, said distances being chosen so that said interface intercepts optical fibers of said tapering portion at varying cross-sectional areas thereof,

whereby an image introduced onto one said imaging surface is made to appear, non-uniformly modified, on the other said imaging surface.

4,099,834

LOW LOSS GLASS SUITABLE FOR OPTICAL FIBER

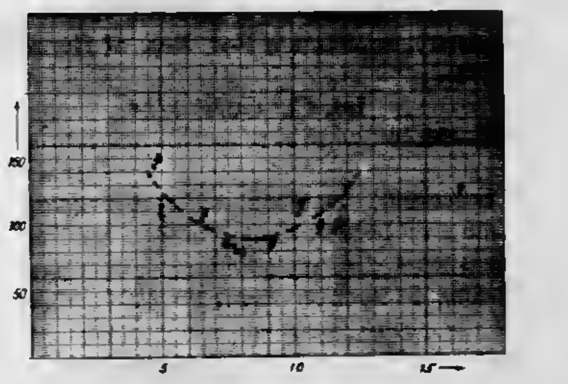
Marga Faulstich, Mainz; Norbert Neuroth, Mainz-Mombach; Franz Reitmayer, Drais, and Georg Krolla, Mainz-Mombach, all of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Nov. 25, 1974, Ser. No. 527,152

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1973, 2359657

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.34 **21 Claims**



1. An optical fiber having an optical loss of not more than 150 dB/km, high transparency, and a high flexural strength, said optical fiber comprising a sheath and core, at least one of said sheath and core being a glass of a composition consisting essentially of:

SiO_2: 65–75 mol-% (38–46% by weight);

R_2O: 4–17 mol-% (4–13% by weight);

PbO: 16–25 mol-% (42–55% by weight);

wherein R_2O is Na_2O, K_2O or Cs_2O or mixtures thereof and with the provision that the molar ratio of SiO_2 : PbO is 2.5–4.0.

4,099,835

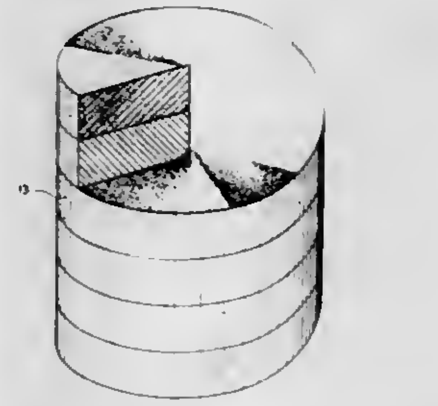
OPTICAL FIBERS WITH HELICAL GRADATIONS IN COMPOSITION

William George French, Plainfield, and John Burnette MacChesney, Lebanon, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 640,577, Dec. 15, 1975, Pat. No. 4,017,288. This application Oct. 8, 1976, Ser. No. 730,803

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.30 **3 Claims**



1. An optical fiber with a transmitting core comprising a first

helical region intertwined about at least one other second helical region, the index of refraction values of the first helical region being different than the index of refraction values of the second helical region along substantially the entire boundary between the two helical regions, the length of the longitudinal gradation in the resulting fiber being between one and ten millimeters.

4,099,836

OPTICAL CONTROL DEVICE FOR INTEGRATED OPTICAL CIRCUIT

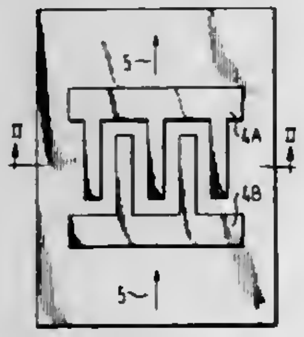
Peter Baues, Krailling, and Rolf Pläettner, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 14, 1976, Ser. No. 723,146

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1975, 2541673

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.14 **14 Claims**



1. An improved optical control device for an integrated optical circuit, said control device incorporating a substrate and a wave guide layer associated with one face thereof, said substrate and said wave guide layer each being comprised of monocrystalline material selected from the group consisting of strontium titanate and barium titanate, and mixed compositions of strontium titanate and barium titanate, provided that, when said substrate comprises monocrystalline strontium titanate, said wave guide layer is comprised of a monocrystal selected from the group consisting of barium titanate and mixed compositions of barium titanate and strontium titanate, and, when said substrate comprises a monocrystal selected from the group consisting of barium titanate and mixed compositions of barium titanate and strontium titanate, said wave guide layer comprises monocrystalline strontium titanate.

4,099,837

COATING OF FIBER LIGHTGUIDES WITH UV CURED POLYMERIZATION PRODUCTS

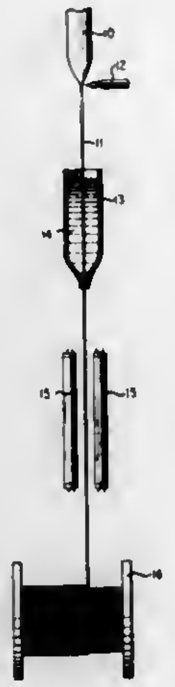
Hargovind Nihchaldas Vazirani, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1976, Ser. No. 690,158

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.29 **4 Claims**

1. An optical fiber waveguide comprising a glass fiber and a polymer coating the fiber, the invention characterized in that the polymer coating comprises the polymerization product of a prepolymer mixture resulting from reacting acrylic acid with a 0.4 to 1.0 weight ratio mixture of aliphatic diglycidyl ether to aromatic diglycidyl ether, and further characterized in that the polymerization product contains a UV sensitizer in order to cure said prepolymer mixture with ultra violet light.



4,099,838

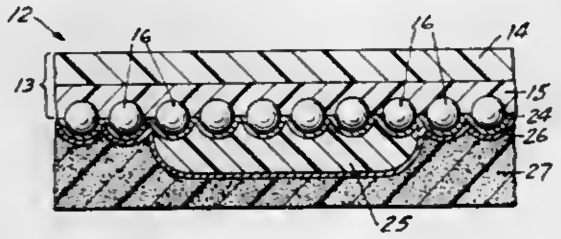
REFLECTIVE SHEET MATERIAL

Jack E. Cook, Saint Paul, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 7, 1976, Ser. No. 693,299

Int. Cl.² G02B *5/28*

U.S. Cl. 350—105 **27 Claims**



1. Sheet material comprising a transparent base substrate, a transparent dielectric mirror coated on said substrate, and an optically thick layer overlying said mirror; said mirror including background and image areas which have different effective optical thicknesses that tune said areas to reflect light from different portions of the visible spectrum of light, whereby there is a color contrast between the reflections from the background and image area; the reflection from at least one of said background and image areas having a spectral purity of at least about 40 percent.

4,099,839

FASTER ADDRESSING OF ELECTROCHROMIC DISPLAYS

Robert Domenico Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

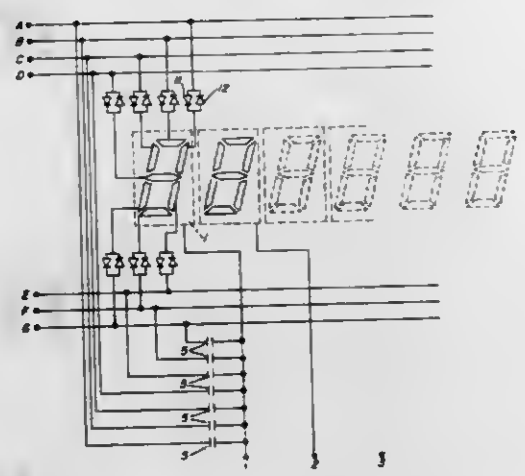
Continuation-in-part of Ser. No. 597,111, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 409,830, Oct. 26, 1973, abandoned. This application Sep. 23, 1976, Ser. No. 726,026

Int. Cl.² G02F *1/36*

U.S. Cl. 350—357 **3 Claims**

1. In an electro-optical display device which contains a plurality of elements, each of said elements comprising a light transmitting substrate with a persistent electrochromic material as a light modulating material, a counter-electrode, and an ion conductive material in contact with said electrochromic material and said counter-electrode, an improved method to sequentially address each element comprising:

1. providing means for a pulse of direct current, and



2. one capacitor per element with said capacitor being in parallel connection with said element and the counter-electrode to transfer said pulse to the element for a fixed limited time interval, wherein the transfer interval is sufficiently long so as to accomplish writing or erasing of said element and the transfer interval occurs independently of the addressing.

4,099,840

MULTILAYER REFLECTOR FOR GAS DISCHARGE LASER

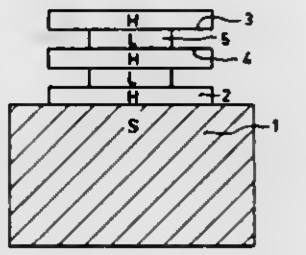
Johannes van der Wal; Wilhelmus Adrianus Jacobus Gielens, and Johannes Maria Marinus Pasmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,175

Claims priority, application Netherlands, Oct. 2, 1975, 7511581

Int. Cl.² G02B *5/28*

U.S. Cl. 350—166 **6 Claims**



1. A reflector comprising a substrate bearing a system of oxide layers alternately having high and low refractive indices, wherein at least the last layer in the system which is most remote from the substrate having a high refractive index consists of a mixture of at least one of the oxides of thorium, titanium, zirconium or hafnium and at least one of the oxides of beryllium, magnesium or calcium.

4,099,841

HEAD UP DISPLAYS USING OPTICAL COMBINER WITH THREE OR MORE PARTIALLY REFLECTIVE FILMS

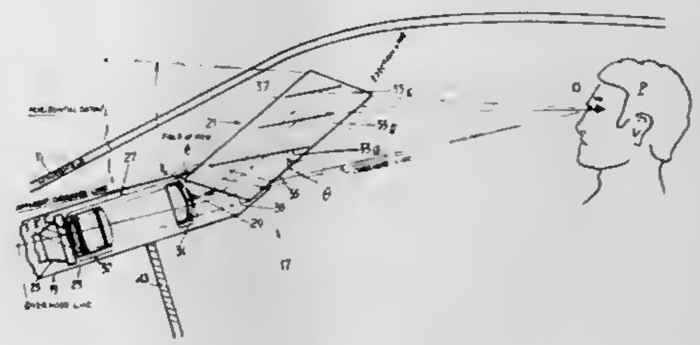
Stafford Malcolm Ellis, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Jun. 20, 1977, Ser. No. 807,920

Claims priority, application United Kingdom, Jun. 30, 1976, 27169/76; Feb. 3, 1977, 4477/77

Int. Cl.² G02B *27/14*

U.S. Cl. 350—173 **12 Claims**



1. A display unit for a head up display system for use in a vehicle comprising:

an optical projector which projects, collimated, from an output aperture, optical data presented by a source; and

an optical combiner comprising partially light transmissive, partially light reflective means so located with respect to said output aperture that, in use, an observer viewing a distant real world scene by transmission of light through said means sees optical data projected through the output aperture, after reflection at said means, as a virtual image superimposed on the distant scene

and including the improvement that the output aperture of the optical projector is of generally rectangular shape and said optical combiner comprises: a body of light-transmissive, refractive material having first and second substantially optically flat parallel external surfaces which face respectively, forwardly, towards the distant real world scene and rearwardly, towards the observer, in use of the unit; within said body, at least three substantially optically flat and parallel films supported and separated by the material of the body and effective to reflect light incident thereon from the optical projector and to transmit light incident thereon from the real world; and a third external surface through which optical data from said projector enters said body for subsequent reflection at said films towards the observer, said third external surface making with said films an angle equal to the angle between the films and said second surface, and said films being relatively positioned so that, observed in the observer's viewing direction to the distant scene, each said film provides a different field of view of the projected optical data.

4,099,842

WIDE FIELD EYEPIECE LENS SYSTEM

Masanobu Kaneko, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,474

Claims priority, application Japan, Dec. 12, 1975, 50-147385

Int. Cl.² G02B *9/30, 9/34*

U.S. Cl. 350—175 E **2 Claims**

1. An eyepiece lens system having an apparent field of view more than 60° and an eye relief greater than 80% of the total focal length of itself, comprising a first lens group, a second lens group disposed rearwardly of said first lens group and a third lens group disposed rearwardly of said second lens group, said first lens group including a positive meniscus lens component with its convex surface facing rearward, said second lens group including a cemented positive doublet lens

component consisting of a biconvex lens element and a negative meniscus lens element, said third lens group including at least a positive meniscus lens component with its convex surface facing forward, said eyepiece lens system satisfying the following conditions:

$$-2.5f \leqq R_1 \leqq -f \tag{1}$$

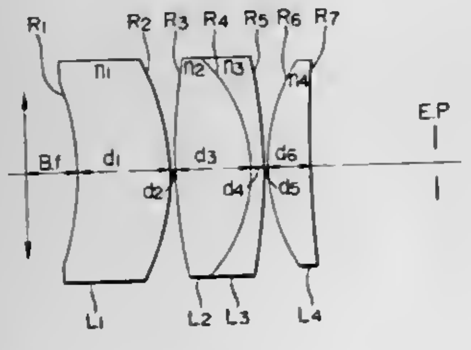
$$0.65 \leqq R_2/R_1 \leqq 1.2 \tag{2}$$

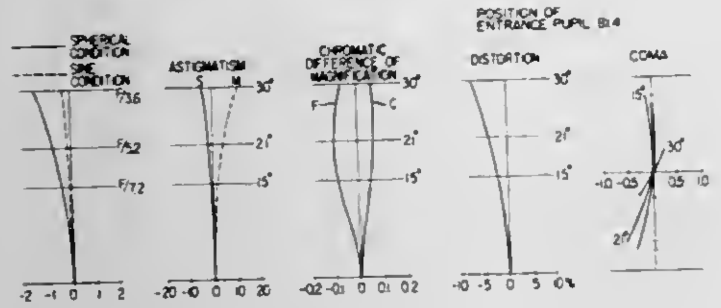
$$0.4f \leqq d_1 \leqq f \tag{3}$$

$$-1.2f \leqq R_4 \leqq -0.8f \tag{4}$$

$$30 < \nu_2 - \nu_3 \tag{5}$$

$$0.1 < n_3 - n_2 \tag{6}$$





$$-3.4f \leqq R_5 \leqq -2.7f \tag{7}$$

$$-1.8 \leqq R_3/R_5 \leqq -1.1 \tag{8}$$

$$f \leqq R_i \leqq 1.5f \tag{9}$$

where *f* represents the total focal length of said eyepiece lens system, R_1, R_2, . . . represent the curvature radii of the successive surfaces in order from front to rear, R_i represents the curvature radius of the front surface of said positive meniscus lens component of said third lens group, d_1 represents the axial thickness of said positive meniscus component of said first lens group, n_2, n_3, ν_2 and ν_3 represent the refractive indices and the Abbe numbers of said biconvex element and said negative meniscus element of said cemented positive doublet component, respectively; and wherein said lens system satisfies the following data:

total focal length 100.0, back focal length 32.4 F-number 3.6, apparent field of view 60°, eye relief 84.5			
$R_1 = -188.9$	$d_1 = 62/5$	$n_1 = 1.62041$	$\nu_1 = 60.3$
$R_2 = -139.2$	$d_2 = 1.7$		
$R_3 = 341.7$	$d_3 = 50.0$	$n_2 = 1.62041$	$\nu_2 = 60.3$
$R_4 = -94.2$	$d_4 = 8.3$	$n_3 = 1.80518$	$\nu_3 = 25.5$
$R_5 = -288.6$	$d_5 = 1.7$		
$R_6 = 120.5$	$d_6 = 29.2$	$n_4 = 1.71300$	$\nu_4 = 53.9$
$R_7 = 1916.7$			

where R_1, R_2, . . . represent the curvature radii of the successive surfaces in order from front to rear, d_1, d_2, . . . represent the axial distances between successive surfaces of the lenses, n_1, n_2, . . . and ν_1, ν_2, . . . represent the refractive indices and Abbe numbers, respectively, of the respective lens components.

4,099,843

COMPACT LARGE-APERTURE PHOTOGRAPHIC LENS SYSTEM WITH LONG BACK FOCAL LENGTH

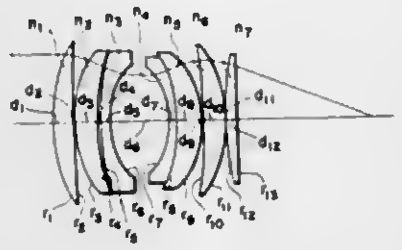
Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,407

Claims priority, application Japan, Mar. 2, 1976, 51-22482

Int. Cl.² G02B *11/32*

U.S. Cl. 350—176 **7 Claims**



1. A compact large-aperture photographic lens system with long back focal length comprising a first, second, third, fourth fifth and sixth lens components, said first lens components being a positive meniscus lens, said second lens component being a positive meniscus lens, said third lens component being a negative meniscus lens, said fourth lens component being a cemented meniscus doublet, said fifth lens component being positive meniscus lens, said sixth lens component being a positive lens, said compact large-aperture photographic lens system with long back focal length satisfying the following conditions:

$$(L/f) < 1 \; (L = \Sigma d) \tag{1}$$

$$0.6f < -r_8 < 1.1f \tag{2}$$

$$0.1 < n_4 - n_5 < 0.2, \; 24 < \nu_5 - \nu_4 < 35 \tag{3}$$

$$-\frac{0.85}{f} < \frac{2}{(n_2 + n_3)f_{23}} + \frac{2}{(n_4 + n_5)f_{45}} < -\frac{0.65}{f} \tag{4}$$

$$1.5 < r5/r4 < 1.87, \; d_4 < 0.05f \tag{5}$$

$$0.16f < d_3 + d_4 + d_5 < 0.19f, \; 0.14f < d_7 + d_8 < 0.17f \tag{6}$$

$$1.7 < n_1, n_2, n_3, n_4 < 1.86 \tag{7}$$

$$1.6 < n_5, n_6, n_7 < 1.82 \tag{8}$$

$$40 < \nu_5, \nu_5, \nu_7 < 60 \tag{9}$$

Wherein reference symbol L represents the overall length of the lens system, reference symbol r_4 represents the radius of curvature of the surface on the image side of the second lens component, reference symbol *r5* represents the radius of curvature of the surface on the object side of the third lens component, reference symbol *r8* represents the radius of curvature of the cemented surface of the fourth lens component, reference symbols *d3* and *d5* respectively represent thicknesses of the second and third lens components, reference symbols *d7* and *d8* respectively represent thicknesses of respective lenses constituting the fourth lens component, reference symbol *d4* represents the airspace between the second and third lens components, reference symbols n1 through *n7* respectively represent refractive indices of respective lenses, reference symbols *ν4* and *ν5* respectively represent Abbe's numbers of respective lenses constituting the fourth lens component, reference symbols *ν6* and *ν7* respectively represent Abbe's numbers of the fifth and sixth lens components, reference symbol *f* represents the focal length of the lens system as a whose, reference symbol *f23* represents the total focal length of the second and third lens components and reference symbol *f45* represents the focal length of the fourth lens component.

4,099,844

VARIABLE FOCAL LENS HAVING A DIVERGENT FRONT ELEMENT

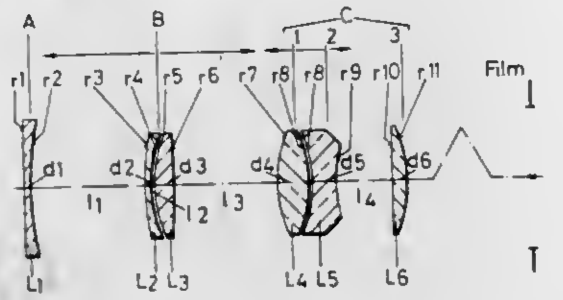
Ludwig Bertele, ch-9658 Wildhaus, Switzerland

Filed Sep. 27, 1976, Ser. No. 727,232

Claims priority, application Switzerland, Sep. 29, 1975, 12625/75

Int. Cl.² G02B *15/14*

U.S. Cl. 350—184 **6 Claims**



1. A lens whose focal length is variable in about the double range, consisting of a front lens element (A) facing the longer beam length and having divergent refractive power, a lens component (B) displaceable over the airspace following thereon and having positive refractive power, and a basic objective (C) having positive refractive power, the lens components being constructed as follows:

- (a) the divergent front lens element contains a concavity facing in the direction of the shorter beam length of the lens;
- (b) the displaceable convergent lens component following thereon comprises at least a divergent meniscus facing the front element and a convergent glass whose more sharply curved surface faces the front element;
- (c) the basic objective consists of a fixed part, and a movable part having negative refractive power and which through the shape of its outer surfaces constitutes a meniscus curved in the direction of the front lens element, and at least a convergent glass and a biconcave glass facing the shorter beam length;
- (d) the displacement of the movable part of the basic objective amounts to only a fraction of that of the convergent lens component (B), and the two movable parts are coupled together in such a manner that this displacement takes place in the same direction;
- (e) the fixed part of the basic objective has a convergent action and its more sharply curved outer surface faces the shorter beam length.

4,099,845

ZOOM LENS WITH ABERRATION VARIATION PREVENTED FOR FOCUSING

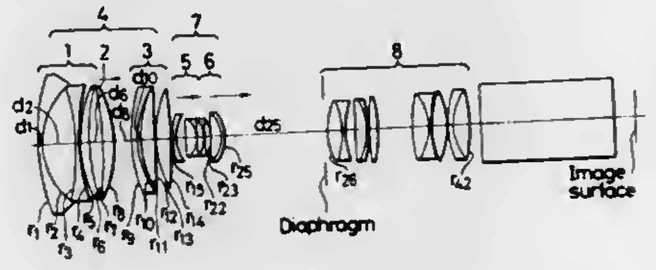
Kunio Takesi, and Kazuo Tanaka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1976, Ser. No. 746,203

Claims priority, application Japan, Dec. 4, 1975, 50-144664

Int. Cl.² G02B *15/14*

U.S. Cl. 350—184 **4 Claims**



1. A zoom lens capable of preventing aberration variation for focusing which comprises:

a front lens part which consists of, from the object side, a first fixed lens group, a movable lens group and a second fixed lens group and which possesses a positive refractive power irrespective of the position of the movable lens group, the first fixed lens group having a negative refractive power while both the movable lens group and the second fixed lens group having positive refractive powers; for re-focusing from a distant object onto a near object, the movable lens group moves in the direction of an image of the object;

a zooming lens part which is provided with at least two movable lens groups, the zooming lens part being disposed on the image side of said front lens part; and

an image forming lens group disposed on the image side of said zooming lens part.

4,099,846

VARIABLE MAGNIFICATION LENS SYSTEM

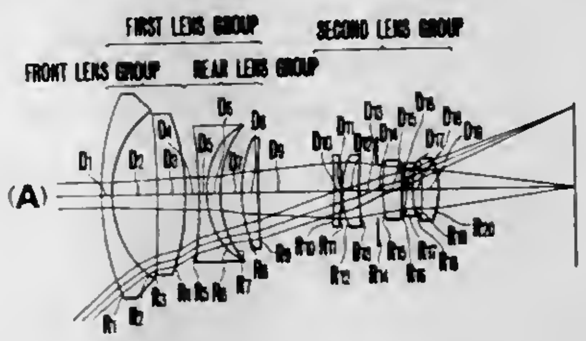
Naoto Kawamura, Inagi; Akira Tajima, Kawasaki, and Katumi Tanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1976, Ser. No. 719,389

Claims priority, application Japan, Sep. 8, 1975, 50/108635

Int. Cl.² G02B *15/14*

U.S. Cl. 350—186 **2 Claims**



1. A variable magnification optical system comprising, from front to rear in the direction in which light enters said system from the object side, a first lens component of negative power and a second lens component of positive power which remains stationary during focusing with an axial air separation between said first and said second components being variable to effect variation of magnification of an object, said first component is divided into a rear lens group of negative power and a front lens group, said front lens group including at least one positive lens and at least one negative lens with the positive lens disposed closest to an image plane in the front lens group, the absolute value of the focal length of said front lens group being larger than that of the focal length of either said rear lens group or said second component, said front and said rear lens groups being movable so that when said first lens component is axially moved toward the front to focus down to shorter object distances, the axial air separation between said front and said rear groups is decreased from that occurring before the focusing operation is performed.

4,099,847

ZOOM LENS SYSTEM CAPABLE OF CLOSE-UP PHOTOGRAPHY

Yukio Ito, Suwa, Japan, assignor to Nitto Kogaku Kabushiki Kaisha, Japan

Filed Sep. 3, 1976, Ser. No. 720,272

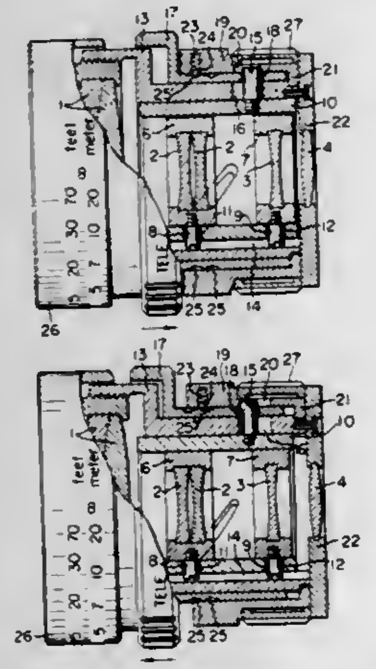
Claims priority, application Japan, Sep. 8, 1975, 50-108674

Int. Cl.² G02B *15/18*

U.S. Cl. 350—187 **I Claim**

1. A zoom lens capable of close-up photography comprising a lens system including positive focusing lenses, negative variable power lenses, a negative correcting lens and a positive fixed lens or including positive focusing lenses, negative variable power lenses, a positive correcting lens, and a negative

fixed lens, characterized by a main lens-barrel having a straight groove parallel to an optical axis thereof, a cam cylinder mounted in said main lens-barrel and having cam grooves formed therein, said variable power lenses and said correcting lens having respective lens-barrels mounted in said cam clyinder in spaced relation, pins extending from said lens-barrels through said cam grooves into said straight groove in said main lens-barrel, means for moving said cam cylinder between a rearward position for ordinary photography and a forward position for close-up photography, means for moving said variable power lenses and said correcting lens together along the optical axis without changing the space between said two lens groups, and means for rotating the cam cylinder to move said variable power lenses and said correcting lens toward and away from each other along the optical axis due to engagement of said pins with said cam and straight grooves, whereby adjustment of the focus for close-up photography can be made in the same way as in a zooming operation when the cam cylinder is in said forward position.



4,099,848
OPTICAL CORRECTION LENS

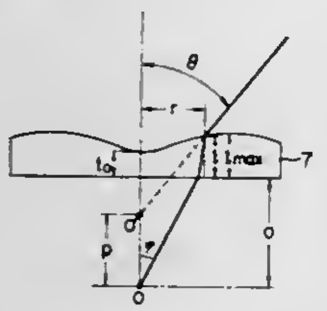
Kuniharu Osakabe, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,779

Claims priority, application Japan, May 30, 1975, 50-64262

Int. Cl.² G02B *3/04;* G03B *41/00*

U.S. Cl. 350—189 **1 Claim**



1. A correction lens of an axially symmetrical configuration provided with a continuous curved surface having a minimum thickness at the center portion thereof and a maximum thickness in the radial intermediate portion between the center and the periphery and so designed that a light source located along the optical axis of said correction lens at one side thereof can be observed from the opposite side through said correction lens in such a manner that said light source is in appearance displaced toward said correction lens by a constant distance on the optical axis independently of observing angles, and in which thickness t of said lens at a radial distance r from the optical axis of said lens is given by following formulae:

$$\frac{dt}{dr} = \frac{\sin\theta - \sin\phi}{\sqrt{N^2 - \sin^2\phi} - \cos\theta}$$

$$\tan\theta = \frac{r}{a - p + t}$$

$$r = a \cdot \tan\phi + \frac{\frac{t \cdot \tan\phi}{N}}{\sqrt{1 + (1 - \frac{1}{N^2})\tan^2\phi}}$$

wherein a is distance between said light source and the surface of said lens facing said light source along the optical axis of said lens, p is a displacement in appearance of said light source toward said lens, N is refraction index of said lens, ϕ is angle at which light ray is emitted from said light source and θ is an angle between said optical axis and the light ray leaving said lens.

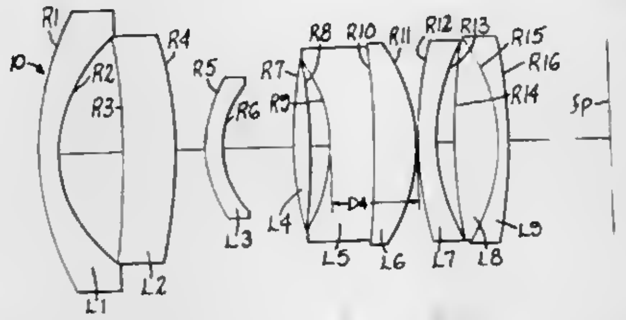
4,099,849
WIDE ANGLE OBJECTIVE

John A. Lawson, Scarborough, and Ellis I. Betensky, Toronto, both of Canada, assignors to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 392,118, Aug. 27, 1973, abandoned. This application Jul. 29, 1974, Ser. No. 492,403

Int. Cl.² G02B *9/64*

U.S. Cl. 350—214 **33 Claims**



1. A lens of the retrofocus type which comprises a plurality of lens elements arranged in six groups along a common optical axis from the object end to the image end as follows: a first group of negative power including positive and negative lens element, a second negative group in the form of a meniscus having a concave image side surface, a third positive group having a convex object side surface, a fourth positive group having a concave object side surface and convex image side surface, a fifth negative group consisting of a meniscus having a convex object side surface, and a sixth positive group consisting of a biconvex doublet.

4,099,850
WIDE ANGLE PHOTOGRAPHIC LENS

Sei Matsui, Chiba, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 4, 1977, Ser. No. 765,605

Claims priority, application Japan, Feb. 5, 1976, 51-11566

Int. Cl.² G02B *9/60*

U.S. Cl. 350—215 **6 Claims**

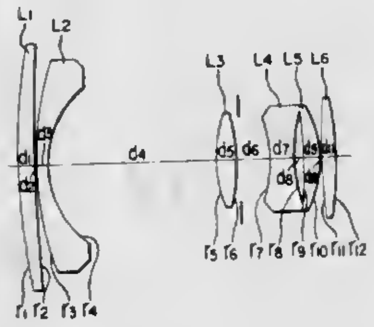
1. A wide angle photographic lens system comprising in the order from the object side, a first lens component which is a positive lens having its more convex surface facing the object side, a second lens component which is a negative meniscus lens having its convex surface facing the object side, a third lens component which is a biconvex lens having its more convex surface facing the object side, a diaphragm, a fourth lens component which is a biconcave lens, a fifth lens component which is a positive meniscus lens having its convex surface facing the image side, and a sixth lens component which is a biconvex lens, said lens system satisfying the following conditions:

$$1.5f < |f_{12}| < 1.75f \quad (1)$$

$$5.0 < f_1/|f_2| < 8.0 \quad (2)$$

$$0.1 < d_1 + d_2 + d_3/d_4 < 0.35 \quad (3)$$

$$0.5f < r_4 < 0.6f \quad (4)$$



where f is the total focal length of the lens system, f_1 and f_2 are the focal lengths of the first and the second lens components, respectively, f_{12} is the combined focal length of the first and second lens components, r_4 is the curvature radius of the surface of the second lens component which faces the image side, d_1 and d_3 are the center thicknesses of the first and the second lens components, respectively, and d_2 and d_4 are the air spaces between the first and second lens components and between the second and third lens components, respectively.

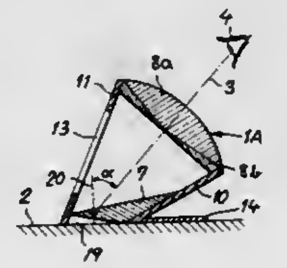
4,099,851
READING AID

Gerard Rethore, 22, rue Garibaldi, 34 Meze, France

Filed May 7, 1976, Ser. No. 684,011

Int. Cl.² G02B *7/02*

U.S. Cl. 350—246 **9 Claims**



1. A reading aid for persons of impaired vision, comprising:

an elongate lens mount with a base positionable on a horizontal surface carrying a text to be read, said base having a bottom slot adapted to register with at least part of a line of said text; and

a plurality of optical components of elongate outline generally paralleling said slot in said lens mount, said components including a positively refracting eyepiece remote from said slot having a longitudinal plane of symmetry inclined at an acute angle to a vertical plane longitudinally bisecting said slot, another of said components lying between said slot and said eyepiece to refract vertical light rays from a centerline of said slot toward said inclined longitudinal plane, said eyepiece having a center transversely offset from the centerline of said slot in the direction of refraction of said vertical light rays by said other of said components.

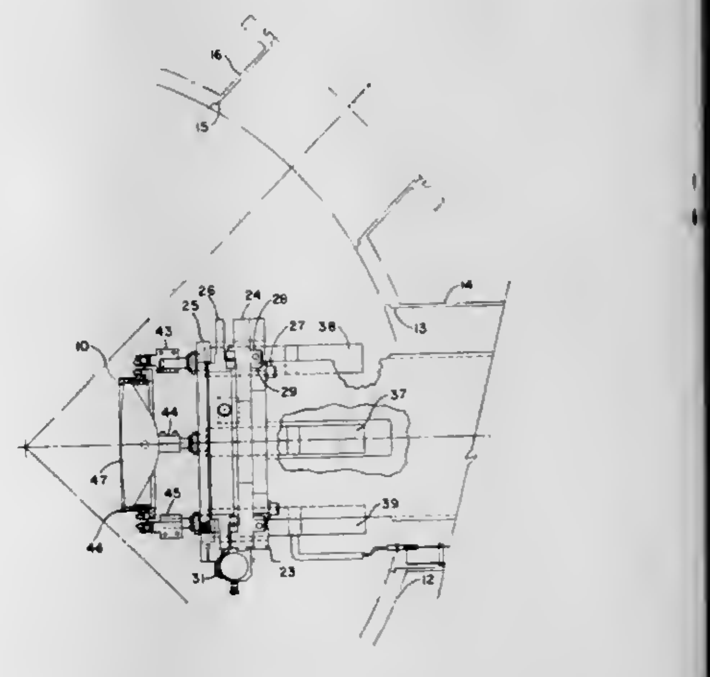
4,099,852
LENS POSITIONER WITH FIVE DEGREES OF FREEDOM

Marian W. Kobierecki, and Frederick Rienecker, Jr., both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 5, 1976, Ser. No. 729,632

Int. Cl.² G02B *7/02, 7/08*

U.S. Cl. 350—247 **1 Claim**



1. A lens positioner for positioning lenses precisely with five degrees of freedom of motion consisting of three translations and two angular rotations in combination with a vacuum chamber and means for supporting same in said vacuum chamber, whereby said lens positioner can be remotely controlled, said lens positioner comprising: a base assembly, an X-stage assembly movably mounted with respect to said base assembly, a Y-stage assembly movably mounted with respect to said X-stage assembly, actuator means for individually moving said X-stage and Y-stage assemblies, three torsion assemblies operatively supported by said Y-stage assembly, actuator means for individually moving said torsion assemblies, and means movably connected to said torsion assemblies for retaining at least one lens, whereby selective activation of said actuator means, produces translations in X, Y, and Z axis motions and angular rotations α and β of the lens retaining means; said supporting means comprising a support and feed-through spool operatively mounted in an opening in said vacuum chamber, said support and feed-through spool having flanged end sections, one of said flanged end sections being secured to said base assembly of said lens positioner, the other of said flanged end sections being adapted to be connected to apparatus for directing a light beam through said lens positioner into said vacuum chamber, said support and feed-through spool being additionally provided with means for sealably securing therein an electrical feed-through assembly, said electrical feed-through assembly being operatively connected to said actuators of said lens positioner and to a remotely located actuator controller.

4,099,853

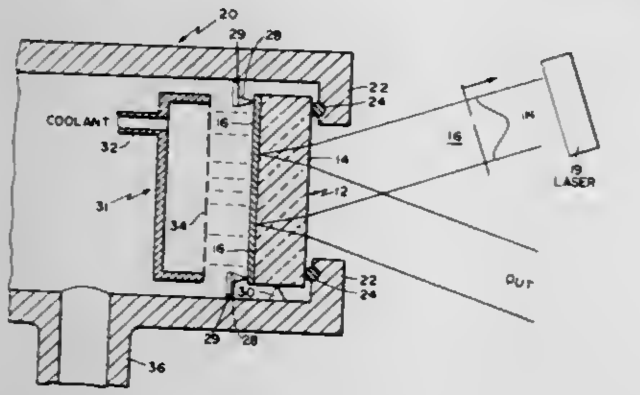
LOW DISTORTION MIRROR FOR HIGH POWER LASER BEAMS INCLUDING A REAR REFLECTIVE SURFACE

Sheldon L. Glickler, Natick, and Paul G. DeBaryshe, Lincoln, both of Mass., assignors to Jersey Nuclear-AVCO Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 583,786, Jun. 4, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,300

Int. Cl.^{2} G02B *5/08, 5/28*

U.S. Cl. 350—310 21 Claims



1. A reflector comprising:
a reflective element having:
a transparent substrate having a low absorption to radiation of at least one predetermined frequency; and
a coating on a first surface of said substrate defining a rear reflective coating and tuned to provide reflection of said at least one predetermined frequency when passing through said substrate from a second surface thereof opposite to said first surface;
means for mounting said reflective element to expose the second surface thereof whereby a radiation may be received thereon for reflection of the radiation from said rear reflective coating;
said mounting means mounting said reflective element substantially free to expand to relieve stress therein; and
cooling means for applying a cooling fluid directly to the first surface of said reflective element having said rear reflective coating thereon.

4,099,854

OPTICAL NOTCH FILTER UTILIZING ELECTRIC DIPOLE RESONANCE ABSORPTION

Donald L. Decker, Ridgecrest, and William M. Tolles, Monterey, both of Calif., assignors to The Unites States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,285

Int. Cl.^{2} G02B *5/24*

U.S. Cl. 350—312 22 Claims

21. An optical notch filter comprising;
a suspending material selected from the group consisting of air, KBr, NaF, CaF_2, BaF_2, LiF, KCl, NaCl, KRS-5 and ZnSe; and
a plurality of absorbing particles within said suspending material to form a colloidal system said particles having a dielectric constant such that a resonant absorption condition exists for a given wavelength of incident radiation, and being small in size relative to said wavelength, wherein said absorbing particles are selected from the group consisting of MgO, BeO, αAl_2O_3, BN, $Ag_{1-x}Cd_x$ alloy system, $Ag_{1-x}Zn_x$ alloy system and Ag.

4,099,855

LIQUID CRYSTAL DISPLAY ARRANGEMENTS

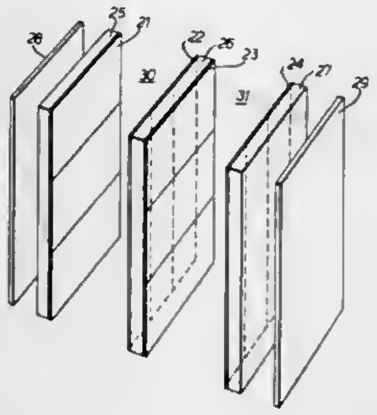
Philip Henry Wisbey, Colchester, and George Elliot, Sandon near Chelmsford, both of England, assignors to The Marconi Company Limited, England

Filed Oct. 1, 1976, Ser. No. 728,845

Claims priority, application United Kingdom, Oct. 4, 1975, 40696/75

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—333 10 Claims



1. A liquid crystal display arrangement including two planar liquid crystal cells placed one behind the other, both cells containing twisted-nematic liquid crystal material and being positioned between a pair of crossed polarizers, and matrix means associated with each cell for addressing selected areas of the display arrangement, each said matrix means comprising discrete conductive stripes defining a row-column matrix, one matrix being adapted to have applied thereto row and column address voltages which are of relatively opposite polarities and the other matrix being adapted to have applied thereto row and column address voltages which are of the same polarities so that the optical rotations effected by the address voltages of the two cells at the cross talk areas thereof have a combined effect which is subsantially removed by the last polarizer.

4,099,856

NEMATIC LIQUID CRYSTALLINE SUBSTANCES

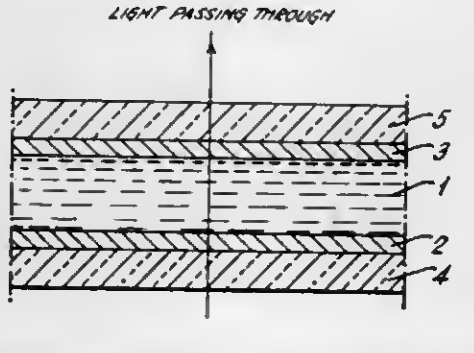
Wolfgang Weissflog, Halle-Neustadt; Hermann Schubert, Nehlitz; Horst Kresse, Halle; Adalbert Wiegeleben, Halle, and Dietrich Demus, Halle, all of German Democratic Rep., assignors to VEB Werk für Fernsehelektronik, Berlin-Oberschoneweide, German Democratic Rep.

Filed Jul. 20, 1973, Ser. No. 381,324

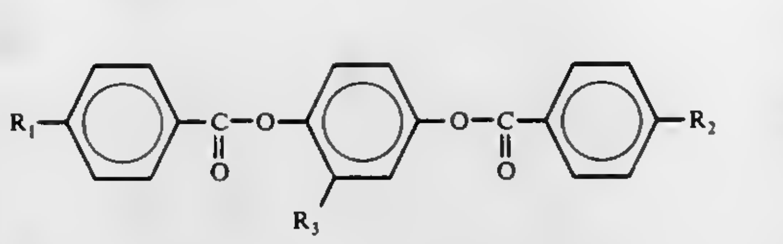
Claims priority, application German Democratic Rep., Oct. 5, 1972, 166044; Nov. 23, 1972, 167034; Nov. 23, 1972, 167033

Int. Cl.^{2} C09K *3/34;* G02F *1/13*

U.S. Cl. 350—350 27 Claims

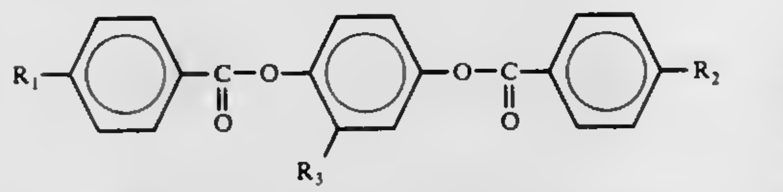


1. In a system comprising means for generating an electric or magnetic field and a composition comprising at least one nematic liquid crystalline compound retained in the field, the improvement in which at least one of the nematic liquid crystalline compounds is



in which R_1 and R_2 each is C_nH_{2n+1}— or $C_nH_{2n+1}COO$—, *n* being an integer of from 1 to 10, and R_3 is Cl—, Br—, CH_3—, C_2H_5—, CH_3CO— or CH_3OOC—.

25. In a system comprising means for generating an electric or magnetic field and a composition comprising at least one nematic liquid crystalline compound retained in the field, the improvement in which at least one of the nematic liquid crystalline compounds is



in which R_1 and R_2 each is $C_nH_{2n+1}O$—, *n* being an integer of from 1 to 10, and R_3 is CH_3CO— or CH_3OOC—.

4,099,857

THERMO-OPTIC LIQUID-CRYSTAL DEVICE FOR REAL-TIME DISPLAY OF ANIMATED IMAGES

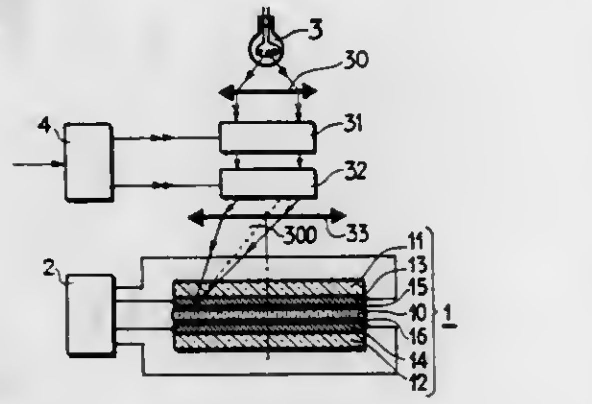
Michel Hareng, and Serge Le Berre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1975, Ser. No. 632,955

Claims priority, application France, Nov. 21, 1974, 74 38281

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—351 2 Claims



1. A method of utilizing a thermo-optical effect for real-time display of successive images in the form of scattering points in a thin transparent layer of a material exhibiting a mesomorphic state with direct transition to an isotropic liquid state comprising the steps of:
maintaining said layer in uniform orientation at a first temperature in said mesomorphic state;
temporarily heating said points to a second temperature in said isotropic liquid state;
subsequently cooling from said isotropic liquid state to said mesomorphic state in uniform orientation so that light scattering cybotactic zones are transitorily formed in said points; and
applying an AC voltage during the transition from said isotropic liquid state to said mesomorphic state to reduce the duration of the cybotactic zones and to maintain said layer transparent in said mesomorphic state.

4,099,858

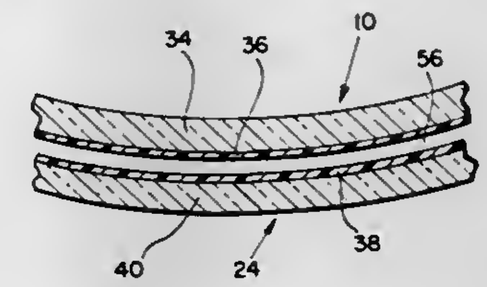
VARIABLE LIGHT TRANSMISSION OPHTHALMIC DEVICE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 1, 1976, Ser. No. 701,873

Int. Cl.^{2} G02C *7/12;* G02B *1/10, 11/04*

U.S. Cl. 351—62 2 Claims



1. In an ophthalmic device comprising a spectacle frame member adapted to engage first and second pairs of light polarizing elements, a first pair of light polarizing elements fixedly held by said frame member, and a second pair of light polarizing elements which is superposed with the first pair of light polarizing elements and rotatable with respect to said first pair of light polarizing elements to provide variable light transmission, the improvement which comprises a hydrophobic coating on each of the immediately adjacent surfaces of said fixed and rotatable light polarizing elements.

4,099,859

CONTACT LENS HAVING A SMOOTH SURFACE LAYER OF A HYDROPHILIC POLYMER

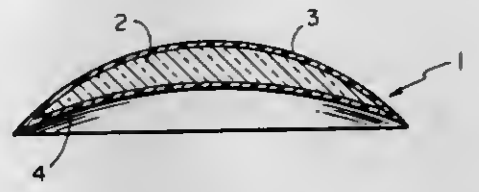
Edward W. Merrill, Cambridge, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation of Ser. No. 528,681, Dec. 2, 1974, abandoned, which is a division of Ser. No. 311,819, Dec. 4, 1972, Pat. No. 3,916,033, which is a continuation-in-part of Ser. No. 299,711, Oct. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 172,538, Aug. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 151,377, Jun. 9, 1971, abandoned. This application Dec. 27, 1976, Ser. No. 754,892

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.^{2} G02C *7/04;* C08F *2/54*

U.S. Cl. 351—160 6 Claims



1. An optically clear, oxygen-permeable contact lens comprising a core formed from a crosslinked silicone polymer or copolymer having groups responsive to ionizing radiation by the formation of graft initiating free radical sites and an optically smooth surface layer formed from a hydrophilic polymer produced by the free-radical polymerization of at least one vinyl monomer, said layer being grafted to the core by the direct addition of said vinyl monomer to free radical sites produced on or from said groups by ionizing radiation without the intervention of oxygen.

4,099,860

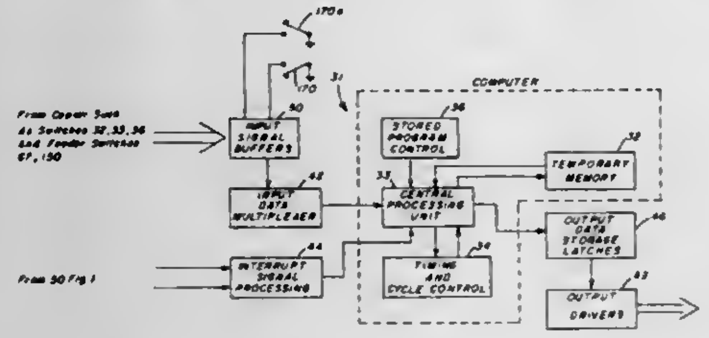
COPIER/DUPLICATOR PRIORITY INTERRUPT APPARATUS

John L. Conolo, Canandaigua, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,895

Int. Cl.² G03G *21/00*

U.S. Cl. 355—14 **3 Claims**



1. In copier/duplicator apparatus for producing production runs having predetermined copies of documents, priority interrupt apparatus for interrupting a first lower priority production run and producing a second higher priority production run and thereafter completing the first production run comprising:

(a) memory means for receiving and storing first and second individual production run signals indicating the number of copies of first and second documents to be made respectively;

(b) switch means effective when actuated for producting a first production run interrupt signal indicating that a second production run has a higher priority than said first production run;

(c) means responsive to said interrupt signal for stopping said first production run and for storing in said memory means production run completion signals which are a function of the remaining number of copies of said first production run which have to be made;

(d) means responsive to said second production run signals for causing said copier/duplicator to complete said second production run; and

(e) means conditioned after said second production run has been completed to be responsive to said completion signals for causing said copier/duplicator to complete the remaining copies of said first production run.

4,099,861

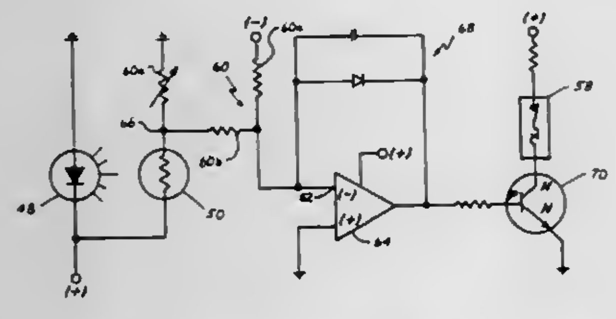
CONTAMINATION SENSOR

Frank Bernard Abel, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,527

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **7 Claims**



6. A method of determining a malfunction condition in a vacuum cleaning apparatus for an electrophotographic copier, and shutting down the electrophotographic copier upon the occurrence of such malfunction condition, said method including the steps of:

determining the concentration of particulate toner material in the air stream of the vacuum cleaning apparatus immediately upstream of point at which said air stream passes into the environment surrounding said electrophotographic copier;

comparing the concentration of particulate toner material in the air stream with a predetermined maximum permissible concentration of particulate toner material in the air stream; and

shutting down the electrophotographic copier when the determined concentration of particulate toner material exceeds the predetermined maximum permissible concentration of particulate material.

4,099,862

METHOD AND APPARATUS FOR EVALUATING DEVELOPED PHOTOGRAPHIC FILMS PREPARATORY TO REPRODUCTION

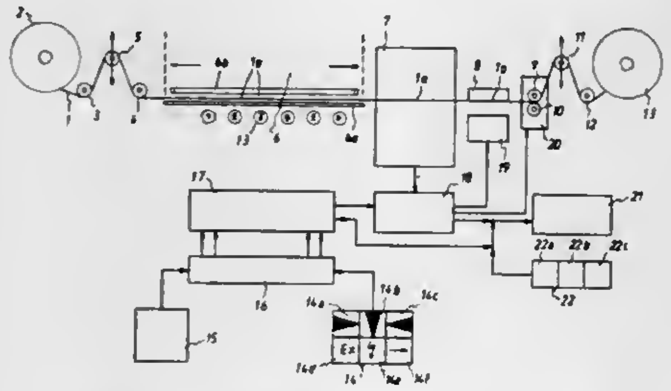
Horst Bickl, Pullach; Günter Findeis, Sauerlach; Helmut Treiber, and Wolfgang Zahn, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,547

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551799

Int. Cl.² G03B *27/76, 27/78*

U.S. Cl. 355—35 **23 Claims**



13. Apparatus for processing discrete portions of information on a web-like carrier, particularly discrete frames of an exposed and developed photographic film, prior to reproduction of such information in a copying machine of the type having adjustable exposure control means, comprising manually actuatable means for producing first signals when a person performing a subjective examination of said portions determines that proper reproduction of selected portions of information necessitates an adjustment of the exposure control means, including means for producing signals which denote the orientation of said portions of information on said carrier; evaluating means for thereupon subjecting successive portions of information to an objective examination, including means for producing second signals for adjustment of exposure control means based on said objective examination; and means for modifying said second signals as a function of the corresponding first signals prior to transmission of said second signals to the exposure control means.

4,099,863

IMPROVED ELECTROGRAPHIC PROCESS FOR PRODUCING A PLURALITY OF COPIES

Toshio Nakatsubo, and Masaji Nishikawa, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

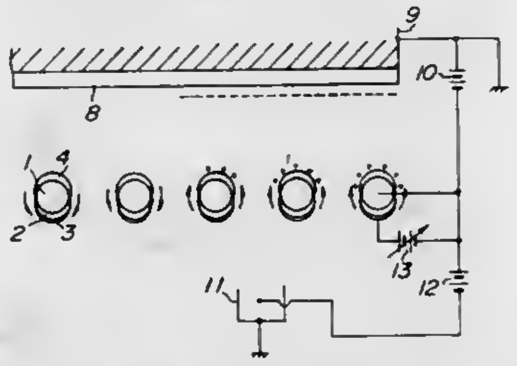
Filed Nov. 23, 1976, Ser. No. 744,268

Claims priority, application Japan, Nov. 27, 1975, 50-141113

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 SC **2 Claims**

1. An electrographic process for producing multiple copies, employing a photosensitive screen composed of four layers consisting of an insulating layer, two electric conductive layers formed on diametrically opposite sides of said insulating layer and a photosensitive layer formed on one of said two electric conductive layers, said process comprising the steps of: uniformly charging the photosensitive layer, illuminating the photosensitive layer with a light image to form an electrostatic latent image thereon, positioning a record sheet having a dielectric material layer in an opposed relation to the photosensitive layer of the photosensitive screen, applying a high electric voltage across a grounded field electrode provided in the rear of the record sheet having the dielectric material layer and the electric conductive layer of the photosensitive screen, applying a bias electric voltage across the two electric conductive layers of the photosensitive screen, directing a flow of ions from a corona discharge device arranged at the side of and spaced apart from the electric conductive layer of the photosensitive screen through the photosensitive screen toward the record sheet, and forming an electrostatic charge image corresponding to the electrostatic latent image on the photosensitive screen on the record sheet having the dielectric material layer, repeating the steps of positioning said record sheet and the steps thereafter to obtain a plurality of copies, and changing the bias electric voltage applied across the two electric conductive layers of the photosensitive screen in a direction to compensate for the increasing attenuation of the electric latent image formed on the photosensitive layer when a plurality of copies is to be obtained.



4,099,864

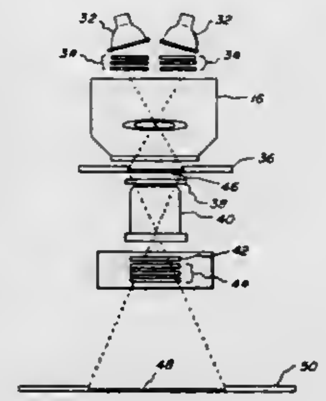
LIGHT SOURCE FOR PHOTOGRAPHIC PRINTER

Patrick J. Gilligan, and Kenneth D. Schrupp, both of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Mar. 11, 1977, Ser. No. 776,875

Int. Cl.² G03B *27/54, 27/76*

U.S. Cl. 355—37 **9 Claims**



1. A light source for a photographic printer comprising:

a plurality of print lamps for providing light;

filter means for selectively modifying colors of the light from the plurality of print lamps;

heatsink means positioned around the plurality of print lamps for dissipating heat generated by the plurality of print lamps, the heatsink means comprising a blackened, baffled assembly positioned to receive and absorb heat radiated from the plurality of print lamps;

blower means for cooling the heat sink means and the plurality of print lamps;

a lamphouse enclosure within which the plurality of print lamps, the filter means, the heatsink means, and the blower means are mounted, the lamphouse enclosure having a window through which light from the plurality of print lamps is directed;

diffuser means for diffusing light from the plurality of print lamps to provide an essentially uniform light distribution, the diffuser means being positioned to receive the light passing through the window and including white porcelain diffuser reflector for diffusing the light and changing the progation direction of the light received through the window from essentially horizontal to essentially vertical and downward.

4,099,865

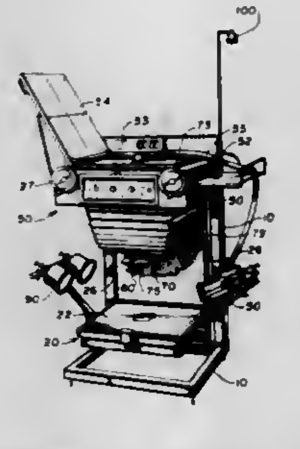
METHOD AND APPARATUS FOR MAKING COLOR SEPARATIONS FROM A COLOR TRANSPARENCY

Gerald V. Knippenberg, 5805 Stuart Ave. South, Edina, Minn. 55436

Filed Mar. 23, 1977, Ser. No. 780,433

Int. Cl.² G03B *27/54, 27/32*

U.S. Cl. 335—37 **12 Claims**



1. A method for making color separations from masked color transparencies comprising: masking a color transparency with a black and white transparency having the same image thereon; directing a light source having a limited spectral band width onto the masked transparency to produce imaged light therefrom; directing the imaged light onto a film which has a predetermined color emulsion thereon responsive to the light having a limited spectral band width to expose the film emulsion to the imaged light; and repeating the steps using a light source having a limited spectral band width which is different from the first named light source and using a film having an emulsion which responds to the light source having the different limited spectral band width to produce separate films exposed to the imaged light having the differing spectral band widths.

4,099,866

FOCAL ADJUSTMENT ON A SINGLE-FOCUS LENS IN A CONTINUOUSLY VARIABLE MAGNIFICATION SYSTEM

Rick Owen Jones, Longmont, and Michael Henry Ulrich, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,810

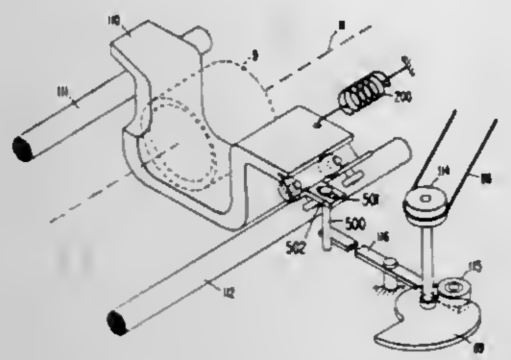
Int. Cl.² G03B *27/36*

U.S. Cl. 355—58 **4 Claims**

3. In a continuously variable reduction optical system wherein both the object and image planes are stationary, wherein a single focus lens is mounted on a lens carriage for movement to an infinite number of reduction positions between boundaries, wherein the lens is allowed a tolerance range relative to total conjugate length, and wherein the total conjugate length and the reduction ratio of the optical system

are set by moving optical path mirrors and the lens according to lens nominal values, a method of minimizing the focus error due to lens tolerance comprising the steps of:

at a first reduction ratio, adjusting the position of the lens and mirrors to achieve substantially zero focus error while maintaining the precise reduction ratio; and



at a second reduction ratio substantially distant from said first reduction ratio, adjusting the position of the lens carriage to achieve substantially zero focus error without affecting the adjustment of lens position at said first reduction ratio when said lens is returned to the first reduction ratio.

4,099,867
FILM PLATENS

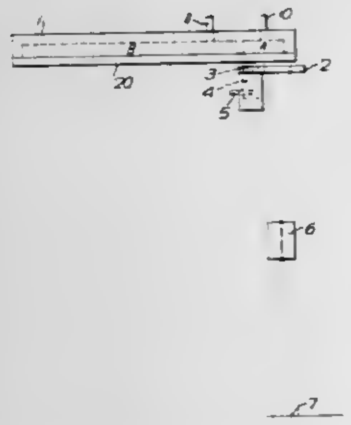
Harry Arthur Hele Spence-Bate, 1 Cheam Pl. Morley, Australia (6062)

Filed Aug. 11, 1976, Ser. No. 713,359

Claims priority, application Australia, Aug. 20, 1975, 2859/75

Int. Cl.^{2} G03B *27/60, 27/32*

U.S. Cl. 355—73 7 Claims



1. A microfiche or microfilm camera incorporating a suction platen which comprises a single flat plate having a film receiving surface, a plurality of interconnected vacuum chambers enabled by means of suitable vacuum inlets to be connected to sources of vacuum, said plate forming one wall of said vacuum chambers, and a group of closely spaced generally parallel slots penetrating said plate and extending throughout substantially the entire length thereof and communicating directly between the chambers and the film receiving surface on the plate, said chambers being internally divided into two vacuum areas, one area corresponding to the title area of a microfiche and the other area corresponding to the area on which the principal information is recorded.

4,099,868
COPYING APPARATUS, IN PARTICULAR PHOTOPRINTING APPARATUS, COMPRISING A DEVELOPING CHAMBER WHICH OPERATES ACCORDING TO THE DRY-DEVELOPMENT PRINCIPLE, AND A DOSING DEVICE FOR LIQUID DEVELOPER MEDIUM

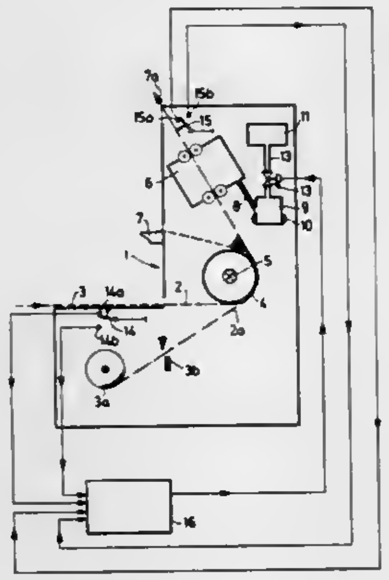
Herbert Schröter, Taunusstein, and Eckehard Stein, Frankfurt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,104

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613331

Int. Cl.^{2} G03B *27/30*

U.S. Cl. 355—106 6 Claims



1. In a copying apparatus, particularly a photoprinting apparatus, comprising an exposure station, a developing chamber, and an evaporator associated with the developing chamber, in which a developer composed of an ammonia/water mixture is virtually completely evaporated and over-heated at a temperature above 100° C, preferably about 105° C, and at a predetermined pressure, preferably atmospheric pressure, the apparatus further including, for dosage of the ammonia/water mixture, a feed pipe connected with the evaporator, a valve connected with the feed pipe, and a control unit connected with the valve, whereby the rate of feed of the ammonia/water mixture may be adapted to different operating conditions,

the improvement comprising first switch means, actuatable by an original, positioned at an entrance for the original upstream of an exposure station in the feed direction of the apparatus,

second switch means, actuatable by a copying material, positioned at a delivery point of said copying material downstream of said developing chamber,

control unit means electrically connected with said first and second switch means, said control unit being so constructed that after said first switch means has been switched to a first position by the original, the valve is first opened for a relatively long period of time, and the valve is then alternately opened and closed, in accordance with pulses, as long as the first or second switch means is maintained in its first switching position by one or more originals or one or more sheets of copying material, respectively,

and said pulse-wise opening and closing of the valve is terminated only when neither the first nor the second switch means is maintained in its first switching position by an original or a sheet of copying material, respectively.

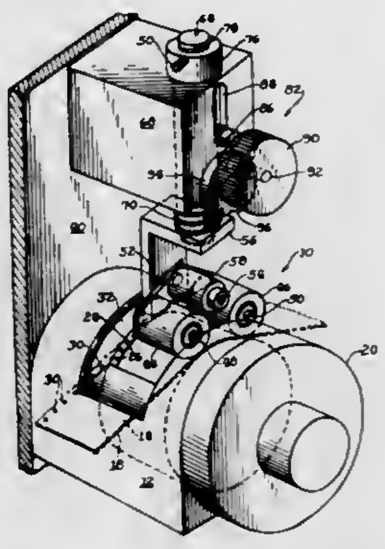
4,099,869
PRINTING HEAD ASSEMBLY

John W. Lang, Jr., Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 750,084

Int. Cl.^{2} G03B *27/10*

U.S. Cl. 355—108 21 Claims



1. A printing head assembly for exposing raw stock film with a preprint film in a contact film printer, comprising:

a printing head including a film printing aperture and a printing sprocket for engaging film sprocket holes;

drive means connected to the printing sprocket for moving the raw stock film and preprint film past the printing aperture at a predetermined rate; and

a pair of film engaging rollers for rollingly engaging the film on each side of the printing aperture for maintaining the raw stock and preprint film in contact with one another and in engagement with said printing sprocket through a predetermined arcuate segment thereof substantially greater than the length of said printing aperture.

4,099,870
OPTICAL PROBE FOR THE MEASUREMENT OF SPEEDS IN A FLUID FLOW

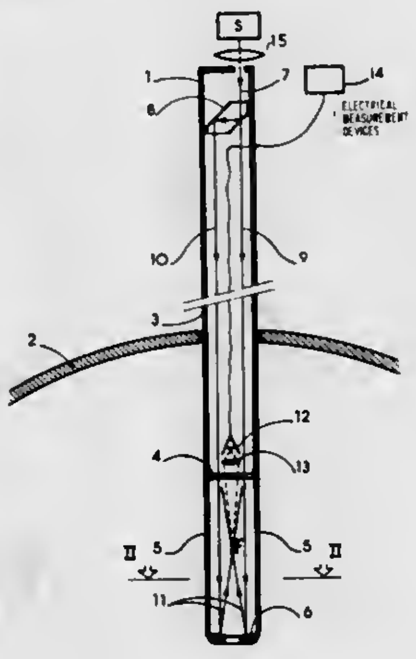
Antoine Luzzi, Echirolles, France, assignor to Societe General de Constructions Electriques et Mecaniques Alsthom s.a., Paris, France

Filed Mar. 8, 1977, Ser. No. 775,679

Claims priority, application France, Mar. 12, 1976, 76 07161

Int. Cl.^{2} G01P *3/36*

U.S. Cl. 356—28 3 Claims



1. A device for optical measurement of local speed and turbulence in a fluid flow by the method based on the Doppler effect or the interference fringe method, said device comprising:

a probe for insertion in the flow, said probe comprising a first sealed tube part having one end immersed in said flow,

a sealed window within said one end,

means for transmitting incident light through said first part and said window,

a second, open support part forming an extension of said first tube part and extending within said flow beyond said window,

a reflector at the end of said second support part for receiving said incident light beams emanating from said window and for reflecting said light beams directly back towards said window and causing them to converge and intersect at a measurement point between said reflector and said window, within said open support part and to pass through said window into said first sealed tube part, and

a light detection device positioned within said first tube part in the path of reflected light beams converging at said measurement point for detecting variations of light at the measurement point and to deduce therefrom the component of speed of said flow at said measurement point.

4,099,871
METHOD AND APPARATUS FOR DETERMINATION OF ACTIVATED SLUDGE VOLUME INDEX

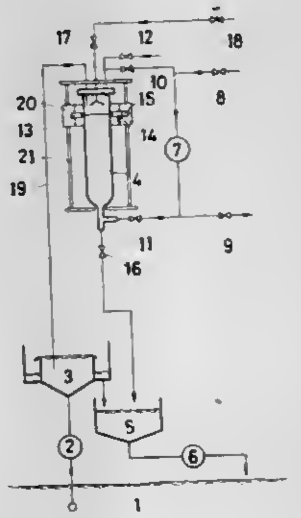
Hiroshi Sunahara, Seto; Yutaka Ishibara, Anjyo; Kazuhiko Tanaka, Nagoya, and Yuko Morimoto, Kyoto, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo and Yanagimoto Manufacturing Co., Ltd., Kyoto, both of, Japan

Filed Jun. 22, 1976, Ser. No. 698,319

Claims priority, application Japan, Jun. 24, 1975, 50-78236

Int. Cl.^{2} G01N *21/24;* B01D *21/02*

U.S. Cl. 356—73 4 Claims

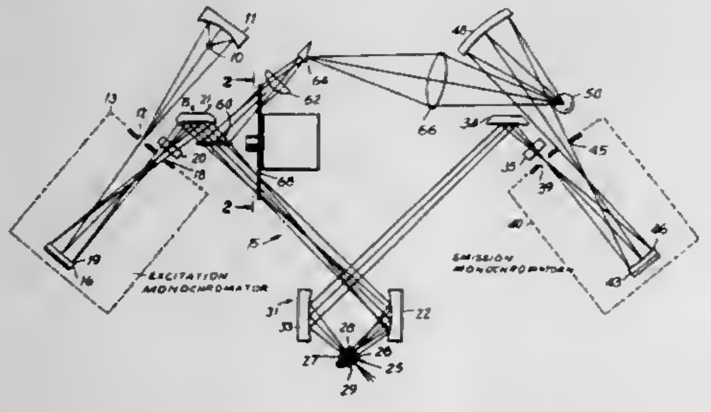


1. An apparatus for the determination of the activated sludge volume index, which comprises, in combination, means for metering and introducing into a test cell a mixed liquor of activated sludge sampled at the outlet of the aerator or in the final settler, means for blowing air into the test cell for thereby agitating the sample uniformly, means for determining the intensity of transmitting light and the intensity of scattering light in the sample, calculating the logarithm of the ratio of said intensity of scattering light to said intensity of transmitting light and thereby determining the concentration of activated sludge, means for optically following the sedimentation interface of activated sludge in the sample and determining the sedimentation rate of activated sludge within a fixed length of time, an arithmetic circuit adapted to calculate the activated sludge volume index on the basis of the concentration of activated sludge and the sedimentation rate of activated sludge, washing means for discharging the used sample from the test

cell and washing the interior of the test cell and automatic process control means for automatically and continuously operating said means for introducing and metering the sample, said means for agitating the sample in the test cell, said means for determining the concentration of activated sludge, said means for determining the sedimentation rate of activated sludge, said arithmetic circuit and said washing means, whereby the activated sludge volume index is automatically determined, displayed, recorded and transmitted.

4,099,872
FLUORESCENCE SPECTROPHOTOMETER

John U. White, Contentment Island Rd., Darien, Conn. 06820
Continuation-in-part of Ser. No. 639,804, Dec. 11, 1975, Pat. No. 4,022,529. This application Oct. 12, 1976, Ser. No. 731,765
Int. Cl.^{2} G01J *3/30, 3/42*
U.S. Cl. 356—85 **19 Claims**



1. Apparatus for measuring radiation from a sample, the apparatus comprising, in combination:

a source of radiation;

excitation monochromator means for isolating an excitation beam of monochromatic radiation from said source, the excitation monochromator means having means for receiving radiation from said source, an excitation exit slit, and means for directing a part of the received radiation through said excitation exit slit;

first means cooperating with the excitation monochromator means for directing the excitation beam to said sample and for forming an image of the excitation exit slit;

emission monochromator means for isolating radiation from said sample, the emission monochromator means having an emission entrance slit for receiving an emission beam of radiation from said sample, an emission exit slit, and means for directing monochromatic radiation from the emission beam through said emission exit slit;

second means cooperating with the emission monochromator means for directing the emission beam to the emission entrance slit and for forming an image of said emission entrance slit;

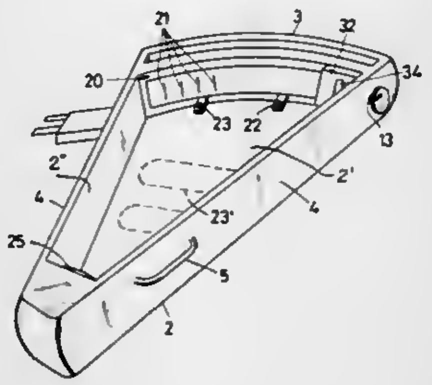
said excitation beam and said emission beam having axial rays which intersect at said sample, and each of said images having a longitudinal axis which lies in the plane defined by said axial rays; and

radiation detecting means for receiving the monochromatic radiation from the exit slit of the emission monochromator means;

said first and second means each comprising a plurality of optical elements including a pair of aspherically concave mirrors angularly related to each other.

4,099,873
ARRANGEMENT FOR THE SPECTRAL ANALYSIS OF SUBSTANCES

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhütte, Fed. Rep. of Germany, assignors to Klockner-Werke AG, Fed. Rep. of Germany
Filed Mar. 10, 1976, Ser. No. 665,770
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513358
Int. Cl.^{2} G01J *3/30, 3/12*
U.S. Cl. 356—86 **7 Claims**



1. An apparatus for spectroscopically analyzing the composition of a workpiece, comprising,

a portable support;

means including an electrode juxtaposable with a surface of said workpiece for sparking between said surface and said electrode;

optical means on said support for transmitting into said support the light of a spark between said electrode and said surface;

a reflective Rowland grating in said support defining therein a Rowland circle;

an arcuate guide in said support having a pair of spaced parallel walls conforming to and extending along said Rowland circle;

a carrier displaceable along said guide between said walls and dimensioned to have some freedom of movement in direction towards and away from said walls;

means including a primary slit on said carrier displaceable therewith along said Rowland circle for casting the light from said optical means on said Rowland grating;

means including at least one guide spring located intermediate and bearing upon said carrier and one of said walls of said guide for urging said carrier against the other of said walls;

a fixed abutment on said support adjacent said circle;

an abutment spring mounted on said fixed abutment and extending generally in one direction along said circle from said fixed abutment;

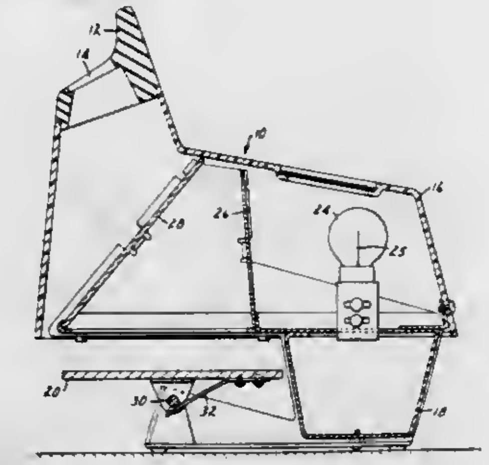
a movable abutment displaceable along said circle in said one direction and in another direction opposite said one direction, said carrier being between said abutments and being engageable in said one direction with said movable abutment and in said other direction with said abutment spring;

means for displacing said movable abutment in said directions along said circle and for arresting said movable abutment at any of a multiplicity of positions therealong, whereby said carrier is limitedly movable along said guide between said movable abutment and said spring when embraced thereby; and

means including a plurality of secondary slits spaced apart and fixed on said support at said Rowland circle for breaking the light reflected by said Rowland grating down into an analyzable spectrum.

4,099,874
DETECTING SYSTEM

Robert J. Oliveira, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Division of Ser. No. 601,384, Aug. 4, 1975, Pat. No. 3,992,096. This application Jul. 12, 1976, Ser. No. 704,172
Int. Cl.^{2} G01N *15/02*
U.S. Cl. 356—102 **2 Claims**



1. A viewer for detecting the presence of lightinteracting domains of a predetermined size in a medium comprising:

a housing having a viewing window in the top portion thereof;

a viewing stage in the lower portion of said housing for supporting the medium positioned to be seen through said viewing window, said viewing stage being capable of generating multipoint illumination when illuminated from below;

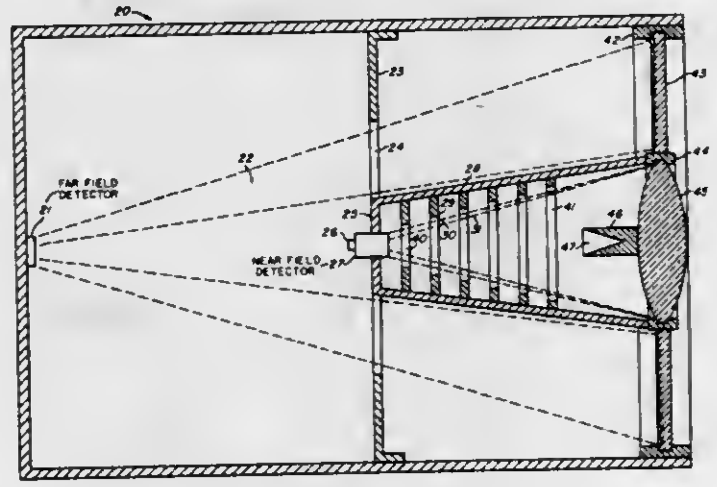
a lamp positioned below said viewing stage to provide a light source; and

means for moving said viewing stage in one or more directions;

whereby scintillation can be observed as light is transmitted through said medium when light interacting domains of a predetermined size are present in the medium.

4,099,875
COAXIAL MULTI-DETECTOR SYSTEM AND METHOD FOR MEASURING THE EXTINCTION COEFFICIENT OF AN ATMOSPHERIC SCATTERING MEDIUM

Donald H. McMabon, Carlisle, and James B. Thaxter, Townsend, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Feb. 7, 1977, Ser. No. 766,473
Int. Cl.^{2} G03B *27/10*
U.S. Cl. 356—103 **16 Claims**



1. In a system for determining the extinction coefficient of an atmospheric scattering medium, apparatus comprising:

transmitter means for irradiating the scattering medium whose extinction coefficient is to be determined with a series of pulses of radiation directed along a predetermined propagation path,

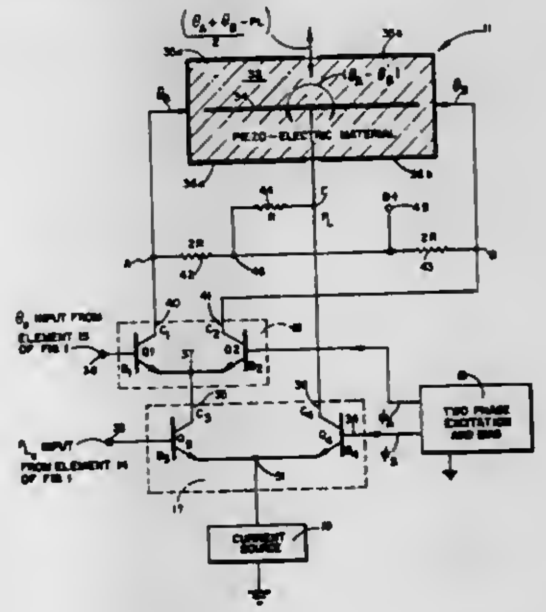
near field receiver means responsive to radiation backscattered from first scattering elements disposed in the near field of view within said predetermined propagation path for producing a first receiver output,

far field receiver means responsive to radiation backscattered from second scattering elements disposed in a far field of view concentric with said predetermined propagation path for producing a second receiver output, and

processor means responsive to said first and second receiver outputs for providing a measure of the extinction coefficient for said atmospheric scattering medium with respect to both said first and said second scattering elements.

4,099,876
PHASE-CODED CONTROL FOR RING LASER GYRO

Adrian K. Dorsman, Bellflower, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 14, 1977, Ser. No. 777,369
Int. Cl.^{2} G01B *9/02;* **G01P** *9/00*
U.S. Cl. 356—106 LR **10 Claims**



4. In a laser gyro, laser optics adjustment means comprising

a mirror within the laser optics of said laser gyro mounted upon a three-terminal duo-mode bimorph device for duo-mode modulation of said optics, and

a two-stage differential amplifier responsively coupled to a source of two mutually phase coded reference signals for separately dithering each mode of the duo-mode bimorph device, each stage being further responsive to a mutually exclusive one of a first and second synchronously detected photodetector laser output of said laser gyro, whereby closed loop control of said laser optics is effected.

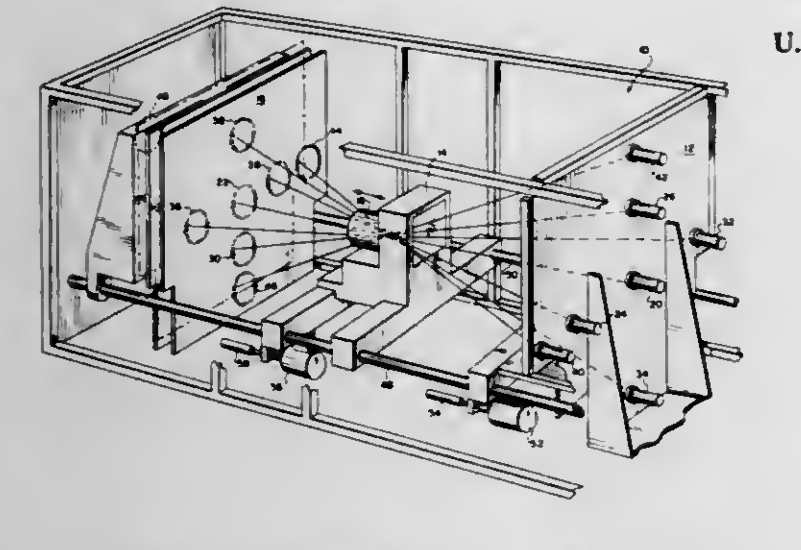
4,099,877
LENS TESTING METHOD AND APPARATUS

Willem Brouwer, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.
Filed Oct. 13, 1976, Ser. No. 732,044
Int. Cl.^{2} G01B *9/00*
U.S. Cl. 356—124 **27 Claims**

1. A method of testing a lens of a type normally having an indefinite number of focal planes within a specified focal range including the steps of:

A. projecting individual light images from a first plurality of apertures in an aperture mounting structure through said lens toward a plurality of targets carried on a target mounting member, each target having a second plurality of apertures whose configurations are all generally geometrically similar to the configurations of said first plurality of apertures and the number of apertures of the second plurality being substantially greater than the number of the first plurality,

B. moving the mounting structure and target mounting member with respect to one another to cause individual light images from said first plurality of apertures to traverse the plurality of apertures of individual targets, respectively,



C. detecting the light passing through the targets and generating electric signals responsive thereto, the number of signals for any target being related to the number of target apertures traversed by the individual light images,

D. locating an acceptable focal plane for said lens on the basis of detection of a predetermined number of signals generated from the passage of a single image through the apertures of a single target; and

E. determining the value of the transfer function of said lens at a multiple number of points in said lens in said focal plane.

4,099,878

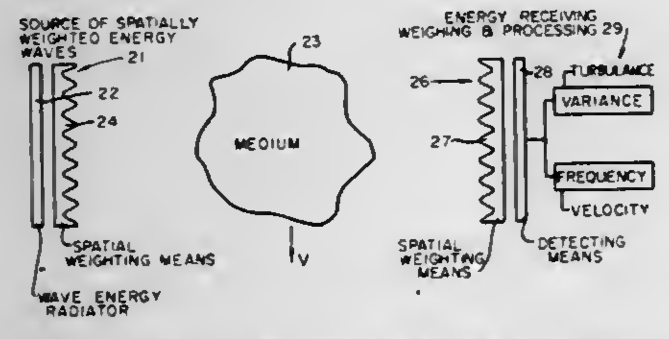
REMOTE PROBING APPARATUS AND METHOD

Robert Wilton Lee, Manton, Calif., assignor to Argosystems, Inc., Palo Alto, Calif.

Continuation of Ser. No. 562,875, Mar. 28, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,351

Int. Cl.^{2} G01N *71/46, 9/24;* G01J *1/00*

U.S. Cl. 356—128 **22 Claims**



1. Apparatus for remote sensing of a refractivity index structure only at a selected region in a fluid transmission medium comprising solely means forming and transmitting spatially weighted divergent propagating waves of energy having a transmit spatial frequency through said fluid medium to interact with said fluid medium and means for receiving and spatially weighting at a receive spatial frequency said waves after transmission through said fluid transmission medium and generating output signals indicative of the refractive index structure, said transmit and receive spatial frequencies determining the selected region between the transmitting means and the receiving means where said refractivity index structure is sensed.

4,099,879

OPTICAL ANTENNA OR LENS

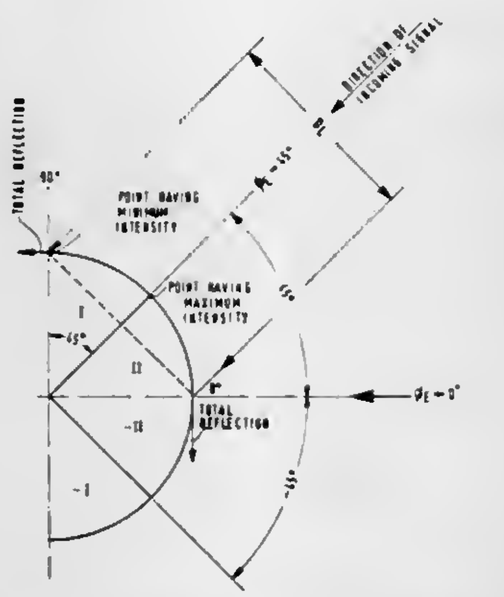
Hans Ernst Britz, Ludwig-Quidde-Str. 23, 6000 Frankfurt am Main 56, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 447,814, Mar. 4, 1974, Pat. No. 3,953,131. This application Jan. 23, 1976, Ser. No. 651,809

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1975, 2360781

Int. Cl.^{2} G01B *11/26;* G02B *27/00*

U.S. Cl. 356—141 **16 Claims**


DIRECTION OF INCOMING SIGNAL
TOTAL REFLECTION
POINT HAVING MINIMUM INTENSITY
POINT HAVING MAXIMUM INTENSITY
TOTAL REFLECTION
90°
45°
I
II
-II
-I
φE = 0°

5. A method for the evaluation of the information received from an opto-electronic antenna system having a plurality of stationary antennas disposed on a prescribed geometrical surface, the optical axis of each antenna having an elevation and azimuth and being disposed at a solid angle with respect to the optical axes of the other antennas and intercepting a single base point comprising the steps of:

obtaining voltage components from a plurality of detectors connected to selected ones of the plurality of antennas;

modifying the phase of the obtained voltage components by the neighboring solid angle components in elevation and azimuth;

forming a resultant quotient from the modified voltage components; and

calculating accurate information of the direction of the solid angle associated with the information received in elevation and azimuth on the basis of the resultant quotient.

4,099,880

METHOD AND AN APPARATUS FOR STEREOSCOPIC MEASUREMENT UTILIZING A THREE-DIMENSIONAL IMAGE

Tsutomu Kano, No. 225 Hanakoganel-cho 4-chome, Kodaira-shi, Tokyo, Japan

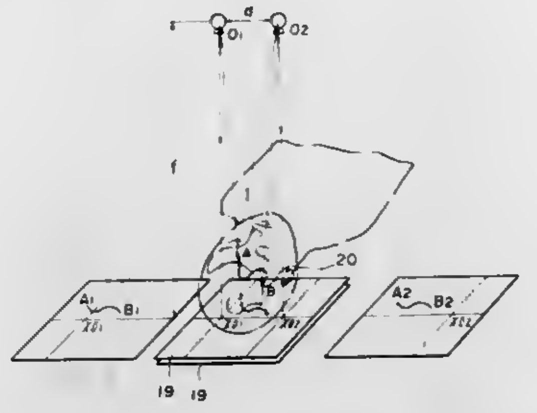
Filed Oct. 19, 1976, Ser. No. 733,967

Claims priority, application Japan, Aug. 11, 1976, 51-107157[U]; Aug. 11, 1976, 51-95802; Aug. 11, 1976, 51-95803

Int. Cl.^{2} G01B *9/00, 11/00, 11/24*

U.S. Cl. 356—164 **4 Claims**

1. A method for measurement of actual distances in three dimensional axes using a three dimensional image in a three dimensional measurement with a three dimensional image obtained from two stereoscopically photographed films of a subject and a distance between centers of an optical axis and a distance between a light source and film, wherein said three dimensional image is prepared with a first film in which a center of a first optical axis is recorded and a second film in which a center of a second optical axis is recorded, a first marker which slides on said first film is moved to align with the center of the first optical axis of the first film, a second marker which slides on said second film is moved to align with the center of the second optical axis of said film, said first and second markers are moved to a first measuring point to align the first and second markers with said first measuring point on the three dimensional image, distances from said first measuring point to said center of the first optical axis and center of the second optical axis in directions of axes *x*, *y* and *z* are measured, calculated and recorded, the first and second markers are moved to a second measuring point to align on the three dimensional image, and distances from said second measuring point to said center of the first optical axis and said center of the second optical axis in directions of axes *x*. *y* and *z* are measured, calculated and recorded to measure linear distances between two points.



4,099,881

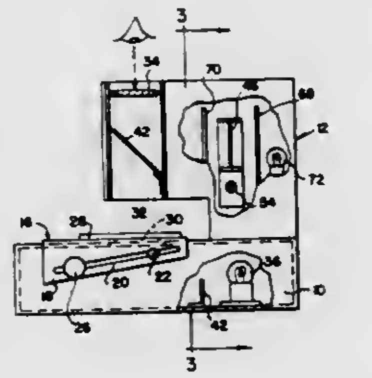
VIEWER FOR BIOLOGICAL DIFFUSION PLATE

Jan A. Vanden Broek, and James A. Carney, both of Ann Arbor, Mich., assignors to Transidyne General Corporation, Ann Arbor, Mich.

Filed Sep. 19, 1975, Ser. No. 614,875

Int. Cl.^{2} G01B *11/02;* G01N *21/16*

U.S. Cl. 356—171 **6 Claims**



1. Apparatus for viewing and measuring an area having a relatively high optical diffusion characteristic occurring on a plate having a relatively low diffusion characteristic, comprising: a support for the plate; a viewing area fixed relative to the support; a source of light operative to illuminate the side of a plate opposite to the side facing said viewing area; baffle means disposed between the viewing area and the illumination source operative to prevent an observer viewing the plate through the viewing area from seeing direct light from the source; measuring indicia, including a fixed line and a movable line, supported parallel to the fixed line and adjustable in a direction normal to both lines, said indicia being supported so that an observer viewing the plate from the viewing area cannot observe the indicia; and an optical element supported between the viewing area and the plate for rendering the indicia visible through the viewing area so as to be superimposed on the image of the plate seen through the viewing area by an observer.

4,099,882

APPARATUS FOR OPTICALLY ANALYZING FLUIDS

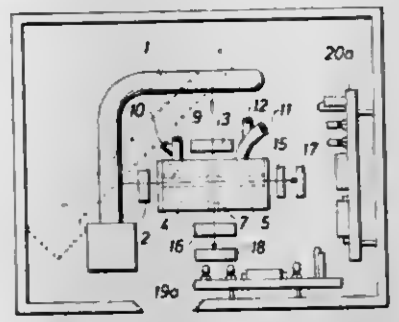
Lars-Göran Hjalmar Andrén; Rune Harald Bjorkman, both of Upsala, Sweden; Richard Lee Easterday, Martinsville, N.J., and Hans Gösta Munktell, Upsala, Sweden, assignors to Pharmacla Fine Chemlcals AB, Upsala, Sweden

Filed Oct. 13, 1976, Ser. No. 731,870

Claims priority, application Sweden, Oct. 29, 1975, 7512125

Int. Cl.^{2} G01J *3/50;* G01N *21/26, 1/10*

U.S. Cl. 356—181 **19 Claims**



1. A fluid analyzer for measuring optical properties comprising first and second elongated flow ducts, one duct being adapted to have a test fluid flowing therethrough and the other duct being adapted to have a reference fluid flowing therethrough, a radiation source for passing radiation through fluid in said ducts, separate detector means for detection of the radiation from said source that has passed through fluid in said ducts, said radiation source being arranged to radiate along at least two optical paths through each flow duct, the first path passing through the corresponding flow duct substantially along the longitudinal direction thereof and the second path passing through the corresponding flow duct transverse to the longitudinal direction thereof, the first optical paths being of equal lengths and the second optical paths being of equal lengths, the length of the first optical paths being substantially greater than the lengths of the second optical paths, and each pair of first and second paths being provided with separate detector means, and evaluation means for determination of the optical properties of the test fluid as compared to the reference fluid along said optical paths in response to the output of said detector means.

4,099,883

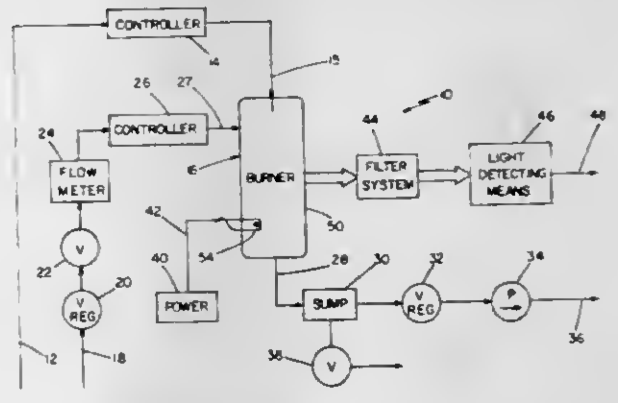
SULFUR DETECTING APPARATUS COMPRISING HOLMIUM, AND ERBIUM FILTERS

Abraham William Berger, 17 Westbourne Rd., Newton, Mass. 02159, and Harry Eugene Stubbs, P.O. Box 686, Boston, Mass. 02102

Filed Feb. 7, 1977, Ser. No. 765,950

Int. Cl.^{2} G01N *3/48;* G02B *5/22, 5/20*

U.S. Cl. 356—187 **4 Claims**



1. In sulfur detecting apparatus wherein a sample is excited to emit light and having light detecting means arranged to receive said light, and an optical filter system positioned to filter said light passing to said light detecting means, the im-

provement wherein said filter system provides a signal path for light passing to said detecting means, said signal path containing holmium and erbium, the quantities of holmium and erbium in said signal path being selected so that the optical transmission in said signal path is preponderantly in a wavelength interval 5 nm wide and including the wavelength 374 nm.

4,099,884

OPTICAL INSPECTION SYSTEMS

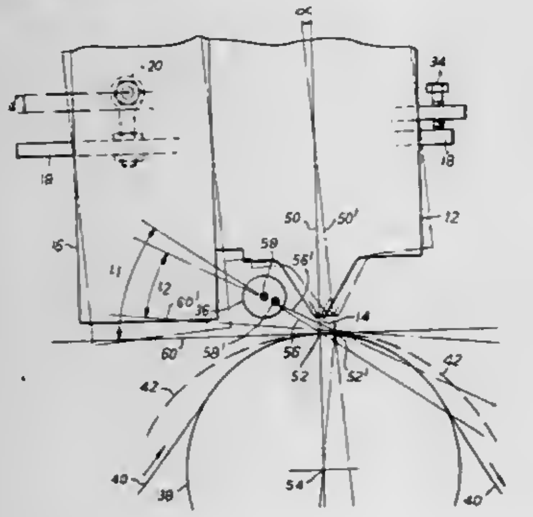
Paul Nash, Kinfauns, Worthing Rd., Horsham, Sussex, England

Filed Jul. 23, 1976, Ser. No. 708,049

Claims priority, application United Kingdom, Jul. 25, 1975, 31221/75

Int. Cl.^{2} G01N *21/32*

U.S. Cl. 356—200 **10 Claims**



1. Apparatus for detecting blemishes in sheet material arranged to flow past an inspection head of the apparatus, comprising light source means arranged to direct light onto the sheet material and photosensitive means in the inspection head arranged to receive light reflected from or transmitted through the sheet material as it passes the inspection head, in which means are provided for adjusting the relative sensitivity of the apparatus to mechanical and optical defects, in which the light source means are arranged on the same side of the path of sheet material as the photosensitive means, the photosensitive means being arranged to receive light reflected from sheet material as it passes the inspection head, and means are provided for varying the mean angle of incidence of light falling onto the area of sheet material from which light is reflected to the photosensitive means, in which there is provided a cylindrical roller over which sheet material is trained as it passes the inspection head, the head includes a collimating system by means of which the photosensitive means receives only light reflected from a narrow strip-like area of the surface of the sheet material extending parallel to the axis of the roller, and the means for adjusting the angle of incidence of the light includes means for adjusting the collimating system so as to displace circumferentially relative to the light source means the area of the surface from which light is received by the photosensitive means.

4,099,885

DIGITAL DISPLAY CIRCUIT FOR CAMERA EXPOSURE METER

Masahiro Kawasaki, Tokyo, and Eiichi Tano, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1976, Ser. No. 741,435

Claims priority, application Japan, Nov. 14, 1976, 51-136926

Int. Cl.^{2} G01J *1/42;* **G01R** *17/06*

U.S. Cl. 356—223 **2 Claims**

1. A digital display circuit for a photographic exposure meter, comprising:

(a) a constant current source,

(b) a capacitor coupled to said constant current source,

(c) a first oscillator for controlling the discharge of said capacitor and the charging thereof from said constant current source,

(d) a second oscillator,

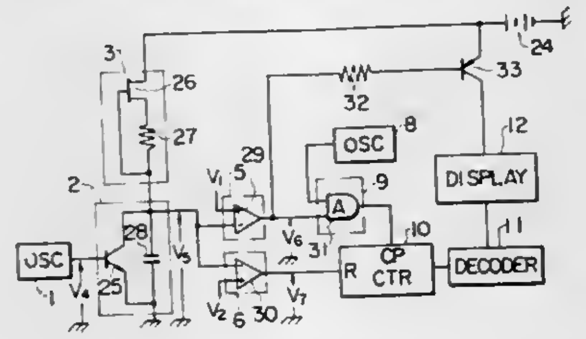
(e) a counter,

(f) a reference voltage source,

(g) a light measuring circuit for producing an output voltage proportional to the logarithm of the brightness of a photographic object,

(h) means for enabling the counter to register pulses generated by said second oscillator when the charge on said capacitor reaches said reference voltage wherein said means for enabling comprises a first comparator responsive to the charge on said capacitor and said reference voltage, means for terminating the counter operation when the charge on said capacitor subsequently reaches the output voltage of said light measuring circuit wherein said means for terminating comprises a second comparator responsive to the charge on said capacitor and the output voltage of said light measuring circuit, and wherein the output of said first comparator is connected to a reset input of said counter, and further comprising an AND gate having its inputs connected to the outputs of said second comparator and said second oscillator and its output connected to a count input of said counter,

(i) means for digitally displaying the number of pulses registered by said counter.



4,099,886

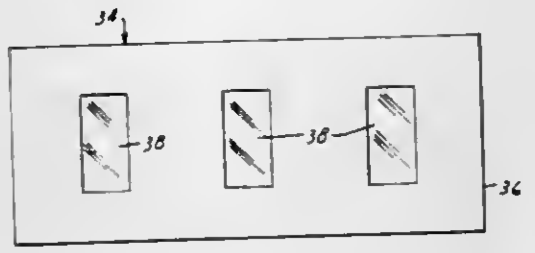
DETECTING SYSTEM

Robert J. Oliveira, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 601,384, Aug. 4, 1975, Pat. No. 3,992,096. This application Jul. 12, 1976, Ser. No. 704,175

Int. Cl.^{2} G01N *21/04*

U.S. Cl. 356—244 **3 Claims**



1. A test card for preforming immunological tests on the surface thereof comprising a flat substrate which generates a multiplicity of discreet light beams of predetermined size when illuminated by a single light source having deposited thereon at least one dried immunological test reagent.

4,099,887

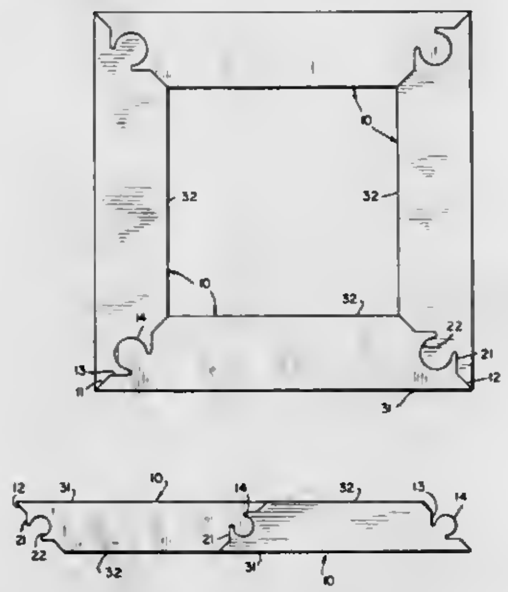
STRUCTURAL JOINTS

Einhard Mackenroth, Lower Salem La., South Salem, N.Y. 10590

Filed Jul. 18, 1977, Ser. No. 816,391

Int. Cl.^{2} F16D *1/00;* **F16L** *25/00*

U.S. Cl. 403—4 **6 Claims**



1. An article of manufacture, comprising:

first and second members, said first member having a portion beveled at an angle of 45°, said second member having a portion beveled at an angle of 45°, said beveled portion of the first member including a recessed portion, said recessed portion including a cylindrical rib which extends outwardly beyond the plane of the beveled portion of the first member, said beveled portion of the second member including a projecting portion, said projecting portion including an open cylindrical groove which extends inwardly beyond the plane of the beveled portion of the second member, said first and second members being joined together at the beveled portions by a joint of said rib being fitted in said groove.

4,099,888

JUNCTION DEVICE FOR TRIDIMENSIONALLY EXTENDING TRUSSED STRUCTURES

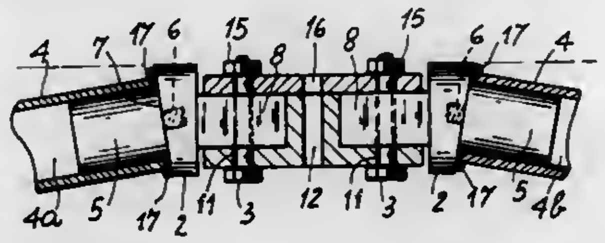
Giovanni Simone, Via Bacchiglione, 14, Milan, Italy

Filed May 17, 1977, Ser. No. 797,695

Claims priority, application Italy, May 17, 1976, 23324 A/76

Int. Cl.^{2} F16B *7/00*

U.S. Cl. 403—172 **10 Claims**



1. A junction device for tridimensionally extending trussed structures, of the type designed to connect structural bars, by which the bays are defined, with one another, the device comprising a central connecting core having an axis, said core having a plurality of radially directed seats formed thereon, said seats having respective axes which are orthogonal with respect to said axis of said core;

a plurality of coupling elements which are to be secured to ends of respective structural bars and can be partially and coaxially inserted into said radially directed seats each said coupling element having an outwardly directed end formed as an enlarged portion which has a surface in a plane inclined with respect to said axis of said core;

locking means fitted to said seats for fastening said coupling elements to said core; and

a plurality of tangs which are to be coupled with ends of respective structural bars, each said tang having an axis perpendicular to said inclined plane of a respective one of said enlarged portions and being of a size determined by the size of a structural bar with which it is to be connected.

4,099,889

REAMER

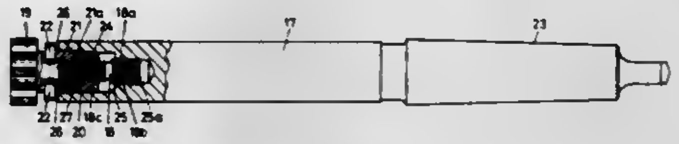
Istvan Vig, Olten, Switzerland, assignor to Merz AG Dulliken, Dulliken, Switzerland

Division of Ser. No. 622,856, Oct. 16, 1975, Pat. No. 4,040,765. This application May 6, 1977, Ser. No. 794,526

Claims priority, application Switzerland, Oct. 18, 1974, 13983/74

Int. Cl.^{2} B23B *31/04*

U.S. Cl. 408—239 R **9 Claims**



1. A reamer comprising a tool shank having at one end means for engagement in the lathe spindle of a machine tool and at the other end a conical socket; a reamer head having an integral conical butt for seating engagement in said socket to achieve precision alignment of said head with said tool shank; and means for releasably securing the conical butt in said socket, said releasable securing means comprising a screw threaded recess at the bottom of said conical socket, a screw-threaded recess in the inner end of said conical butt, and a securing rod having screw threads on its opposite ends for engagement with both said recesses.

4,099,890

IMPELLER TYPE PUMP HAVING SEAL MEANS AND PROTECTIVE MEANS

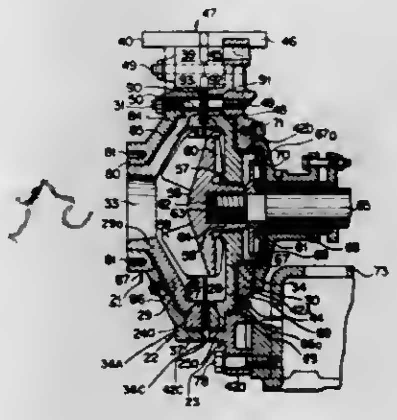
Yoshio Murakami, Tanashi, and Takezo Nakazawa, Higashi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd. and Mitsui Kinzoku Engineering Service Co., Ltd., both of Tokyo, Japan

Filed Dec. 17, 1975, Ser. No. 641,525

Claims priority, application Japan, Aug. 21, 1975, 50-115143[U]; Sep. 30, 1975, 50-133444[U]; Sep. 30, 1975, 50-133445[U]

Int. Cl.^{2} F04D *29/08, 7/02*

U.S. Cl. 415—170 A **4 Claims**



1. a front casing comprising first ceramic main portion defining therein an inlet, one part of a pump chamber and one half

of a discharge port, and a first protection member covering the first ceramic main portion;

a back casing confronting the front casing and comprising a second ceramic main portion defining therein the other part of the pump chamber and the other half of the discharge port, and a second protection member covering the second ceramic main portion;

a plurality of projections each having a flattened end surface, extending toward the second protection member and formed in spaced relation with each other on that marginal surface of the first protection member which confronts the second projection member;

a plurality of projections each having a flattened end surface, extending toward the first protection member and formed in spaced relation with each other on that marginal surface of the second protection member which confronts the first protection member, said projections of the second protection member being so arranged that the flat end surfaces of the projections of the second protection member abut against the respective flat end surfaces of the projections of the first protection member;

a continuous packing disposed between the marginal areas of the first and second ceramic main portions; and

narrowed portions for reducing the circumferential speed of waste water therebetween more than the circumferential speed of waste water in the pump chamber, said narrowed portions being provided at those areas of the confronting marginal portions of the first and second ceramic main portions which are adjacent to the pump chamber inwardly of said packing.

4,099,891

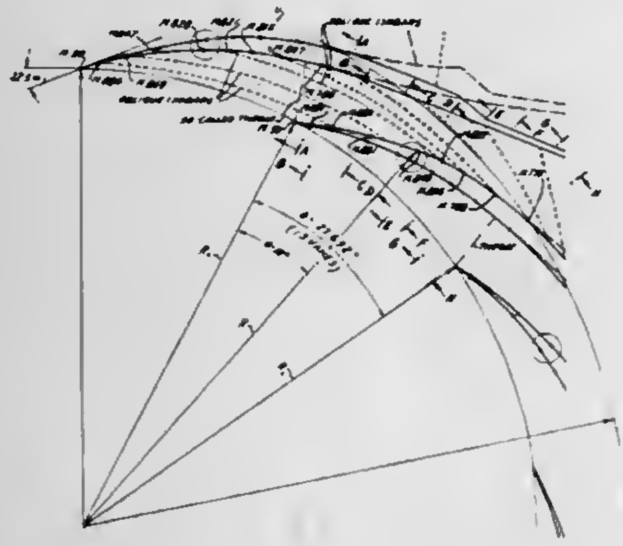
SAWTOOTHED DIFFUSER, VANED, FOR CENTRIFUGAL COMPRESSORS

Kenneth Campbell, Ridgewood, N.J., assignor to Miriam N. Campbell, Oradell, N.J.

Filed Jul. 14, 1977, Ser. No. 815,787

Int. Cl.² F01D *1/02, 9/00*

U.S. Cl. 415—207 **6 Claims**



1. A vaned diffuser for centrifugal compressors, wherein, as applied to the radially inner portion of the whole diffuser, there are defined a plurality of passages each extending from an initial vane tip to a throat, said passages being bounded on their radially inner side by a vaneless open region each pair of adjacent passages being separated by a vane, the side-walls of each individual passage diverging radially outwardly from each other as sectioned on a plane parallel with and intersecting the impeller-diffuser axis, the relative dimensions of the cross sections of at least one pair of adjacent passages being such that the vane width between side-walls, of the separating vane which bounds the radially inner side of the outer of said 2 adjacent passages, is less than the width between side-walls of the other side of the same vane, which side bounds the radially outer side of the inner adjacent passage.

4,099,892

HELICOPTER ROTORS

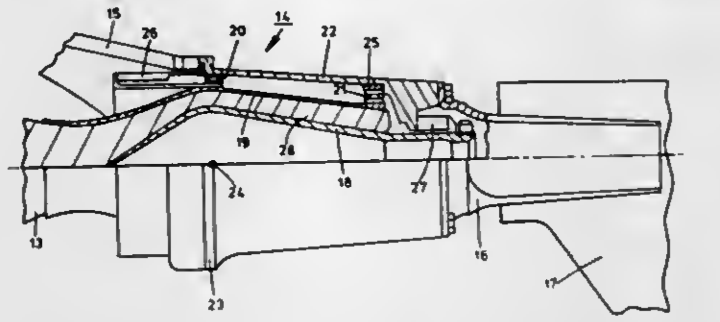
Alfred Charles Martio, Shepton Mallet, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed May 9, 1977, Ser. No. 794,944

Claims priority, application United Kingdom, May 11, 1976, 19446/76

Int. Cl.² B64C *27/38*

U.S. Cl. 416—134 A **7 Claims**



1. A helicopter rotor including a rotor hub and a plurality of rotor blades, the rotor hub comprising, for each rotor blade, a flexure member extending generally radially from the hub and being flexible in a blade flap plane, a feathering hinge located at an outer end of the flexure member and including a generally cylindrical portion rotatably mounted on axially spaced-apart inner and outer bearings on an extension of the flexure member, said inner bearing comprising a part-spherical bearing having a geometrical center, and resilient means associated with said outer bearing and arranged so as to permit, during operation, blade lead and lag movements of said cylindrical portion about the center of the inner bearing.

4,099,893

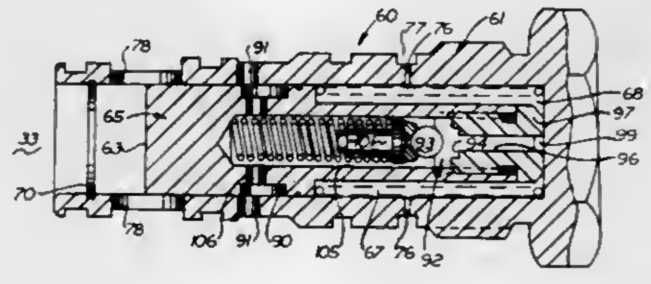
PUMP WITH ELECTRICALLY ACTUATED FLOW CONTROL

Jerry L. Coffman, Colfax, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 29, 1976, Ser. No. 736,732

Int. Cl.² F04B *49/08*

U.S. Cl. 417—300 **4 Claims**



1. A pump unit comprising a housing defining a pumping chamber, a fluid inlet and a fluid outlet in said housing communicating with said pumping chamber, a pair of cooperating gear members in said pumping chamber for pumping fluid from said inlet to said outlet, means supported in said housing defining a variable orifice in said outlet, said means defining said variable orifice including a part of a pintle member and a valve seat, means supporting said pintle member for movement relative to said valve seat to control the size of the variable orifice, an electric motor supported on said housing for moving said pintle member relative to said valve seat to control the size of said orifice, a flow control valve in said housing for bypassing fluid from said outlet to said inlet, said flow control valve including a spool valve member located in a bore in said housing and which is movable therein, said spool valve member being positionable between a first position blocking communication between said inlet and outlet and a full relief second position providing maximum communication between said inlet and outlet to control bypassing of fluid from said outlet to said inlet, a spring biasing said spool valve member into said first position blocking communication between said inlet and outlet, said spring being located in chamber means at one end of said spool valve member, said spool valve member having one face surface acted upon by the pressure on one side of said orifice, said spool being movable by the pressure on one side of the orifice to said full pressure relief second position or a flow control position intermediate said first and second positions, flow passages in said housing communicating the pressure on the other side of said orifice to said chamber means, a pilot valve carried by said spool valve and which opens in response to pressure in said chamber means exceeding a predetermined value, passage means to said inlet communicating the pressure in said chamber means to inlet upon opening of said pilot valve, and means for restricting the rate of pressure build-up in said chamber means during relief of the pressure in said chamber means by opening of said pilot valve to cause said spool valve to move from a flow control position to said full pressure relief second position, said means for restricting pressure build up comprising a restricted portion of said flow passages and said passage means to said inlet having a substantially greater cross-sectional area throughout its extent than said restricted portion of said flow passage.

4,099,894

FUEL INJECTION FOR DIESEL ENGINES HAVING CONTROLLED-RATE PRESSURE RELIEF MEANS

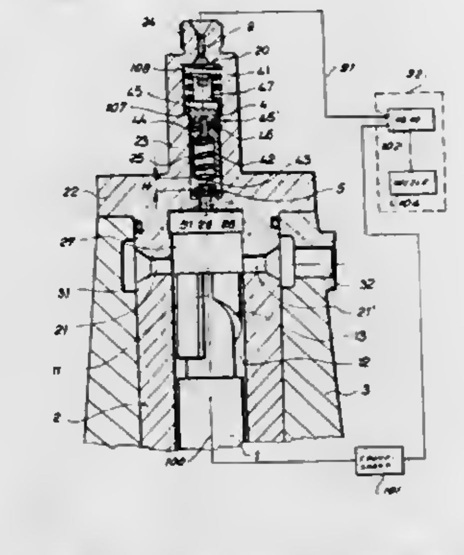
Jaromir Indra, Brno, Czechoslovakia, assignor to Vysoke uceni technicke, Brno, Czechoslovakia

Filed Jan. 15, 1976, Ser. No. 649,358

Claims priority, application Czechoslovakia, Jan. 15, 1975, 262-75

Int. Cl.² F04B *39/10;* **B05B** *1/30*

U.S. Cl. 417—499 **12 Claims**



1. In a piston-type injection pump for supplying fuel downstream over a discharge channel to a nozzle-type diesel injector, the pump comprising, in combination, a cylinder having a fuel supply port in a transverse wall thereof, a piston supported for reciprocation in the cylinder to define pressure and suction strokes of the pump, the piston having a profiled peripheral edge cooperable with the fuel supply port in the cylinder during the piston movement for effecting a flow of fuel through the fuel supply port, the space between the piston and the associated end of the cylinder defining a first chamber, means associated with the cylinder and disposed downstream of the first chamber for defining a second chamber separated from the first chamber, means providing fluid communication between the first and second chambers, the downstream end of the second chamber communicating with the upstream end of the discharge channel, discharge valve means supported for unobstructed movement in the second chamber between variable upstream and downstream positions, the valve means being movable upstream from a downstream position thereof at the end of each pressure stroke of the piston by a variable distance necessary to effect a drop of pressure in the discharge channel from the value then existing therein to a reference value and thereafter being movable downstream from the resulting variable upstream position during the next succeeding pressure stroke of the piston, and means disposed between the fuel supply port in the cylinder and the downstream end of the second chamber and independent of the second chamber defining a restricted passage for providing a fluid return path from the second chamber to the fuel supply port and for limiting the rate of pressure drop in the discharge channel.

4,099,895

STRUCTURE FACILITATING FUEL PUMP ASSEMBLING

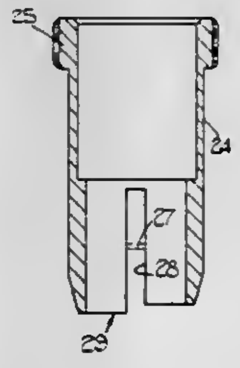
James Martin Anderton Askew, Brockworth, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 1, 1976, Ser. No. 746,440

Claims priority, application United Kingdom, Dec. 10, 1975, 50559/75

Int. Cl.² F04B *7/04, 39/10;* **F01B** *29/08*

U.S. Cl. 417—499 **4 Claims**



1. A fuel pumping apparatus comprising a body, a bore defined in the body, a reciprocable plunger mounted within the bore and having a portion extending from the bore, means for adjusting the angular setting of said plunger in the bore, said means comprising an annular angularly adjustable member surrounding said portion of the plunger and having side walls defining an open ended slot in said member, a lateral dog on the plunger engaging in said slot, the side walls defining said slot engaging with the side walls of the dog to determine the angular setting of the plunger, a head at one end of the plunger, a coiled compression spring, a spring abutment plate engaging the spring and head to urge the plunger in the direction out of the bore, the end face of the member being relieved over an area adjacent one of the side walls of the dog, said area being of a size to facilitate alignment of said plunger and said member whereby during assembly the plunger is moved into the bore until said relieved face of said member is engaged by the end face of the dog whereafter the engaging pressure is relaxed and the angularly adjustable member is moved angularly so as to bring a side wall defining the slot into engagement with a side wall of the dog thus accurately aligning the dog with the slot so as to permit further compression of the spring.

4,099,896

ROTARY COMPRESSOR

Rune Valdemar Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Feb. 22, 1977, Ser. No. 770,354

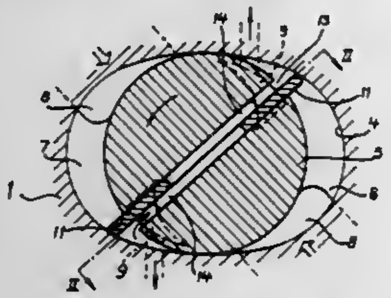
Claims priority, application Sweden, Feb. 26, 1976, 76024777

Int. Cl.² F04C *29/08*

U.S. Cl. 418—184 **3 Claims**

1. A rotary compressor of the vane type which comprises a housing having inlet ports for a gas to be compressed, the housing including end walls having outlet ports, a cylindrical

rotor journalled in the housing for rotation on an axis and provided with slots, an even number of vanes slidable in said slots and adapted to sealingly engage the inside wall surface of the housing to form working chambers between said rotor, said wall surface and said vanes, the rotor having recesses adapted to cooperate with said outlet ports to form outlet passages for compressed gas, and piston means located radially inside each of said recesses in the rotor and connected to a diametrically opposed vane, each piston means being movable into the corresponding recess to fill up the same and thereby force the gas in the recess out through the corresponding outlet port.



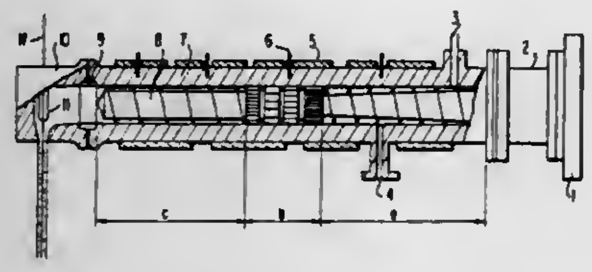
4,099,897
APPARATUS FOR PRODUCING FOAMED PLASTIC INSULATED WIRES

Hideo Takano; Satoshi Saito; Tadashi Sato; Tuyoshi Yamaguchi, and Yoshihiro Narita, all of Ibaragi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,625

Int. Cl.^{2} B29D *27/00*; B29G *7/02*

U.S. Cl. 425—4 C **14 Claims**



1. An apparatus for producing foamed plastic insulated wires including an extruding machine comprising a supply portion, said supply portion having means for receiving under pressure a molten thermoplastic resin and a foaming agent, a blend portion positioned to receive said resin and said foaming agent from said supply portion for blending said resin and foaming agent, and a metering portion positioned to receive blended resin and foaming agent from said blend portion for metering said blended resin and foaming agent to deliver same to a cross head, said supply, blend and metering portions being sections of an extrusion cylinder and an extrusion screw, said portions having respective extrusion coefficients α_1, α_2 and α_3 which are related to one another as follows:

$$\alpha_1 > \alpha_3 > \alpha_2$$

said extrusion coefficients being a function of screw contour and defining the volume extruded per revolution of the screw.

4,099,898
ARRANGEMENT FOR AND METHOD OF INSERTING A NOZZLE UNIT INTO AN OPENING OF A SPINNING DEVICE

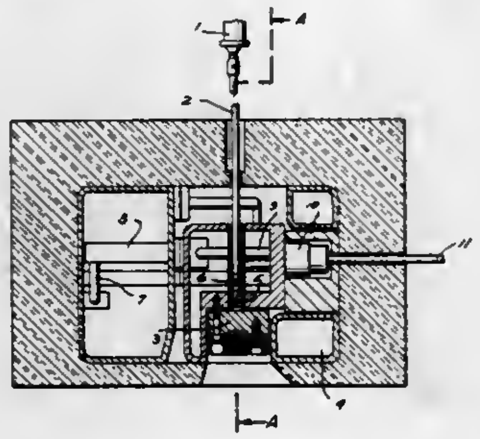
Arnold Beck, Würen, Fed. Rep. of Germany, assignor to Büttner-Schilde-Haas Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,939

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611940

Int. Cl.^{2} B29C *1/16*; D01D *3/00*

U.S. Cl. 425—192 S **15 Claims**



1. An arrangement for inserting a nozzle unit into an opening of a spinning device, comprising at least one shaft extending through the opening of the spinning device and having a first end portion facing towards the nozzle unit to be inserted and a second end portion facing away thereof, said shaft being movable between a first position in which it is located in said opening and said first end portion thereof extends outwardly beyond the opening, and a second position in which said first end portion is retracted into the opening; means for detachably connecting said first end portion of said shaft to the nozzle unit when said shaft is located in said first position and said first portion, as well as the nozzle unit is located outside the opening of the spinning device; and drive means connected to said second end portion of said shaft and operative for displacing said shaft connected with the nozzle unit from said first position into said second position so that the nozzle unit is pulled by said shaft from outside the opening towards the latter and thereupon into said opening.

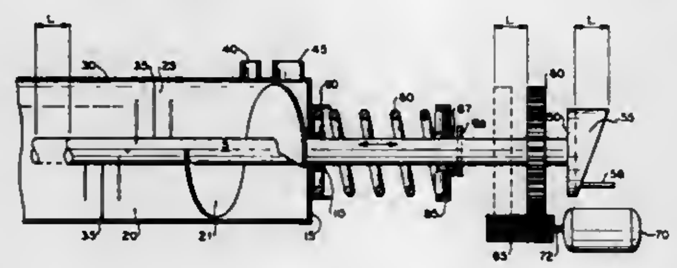
4,099,899
CARBON BLACK PELLETER

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 28, 1976, Ser. No. 700,435

Int. Cl.^{2} B29C *23/00*

U.S. Cl. 425—222 **5 Claims**



1. A carbon pelleter adapted to agglomerate particle carbon black introduced therein with a wetting agent, said pelleter comprising:

(1) an elongated cylindrical chamber;

(2) a rotating shaft extending through said chamber, said shaft having mounted thereon pins projecting radially outward and closely fitting inside the chamber; and

(3) spring-loaded means actuated by a rotating disc for axially moving the rotating shaft back and forth during pelletizing operations so that the pins prevent formation of carbon deposits on the inside of the chamber.

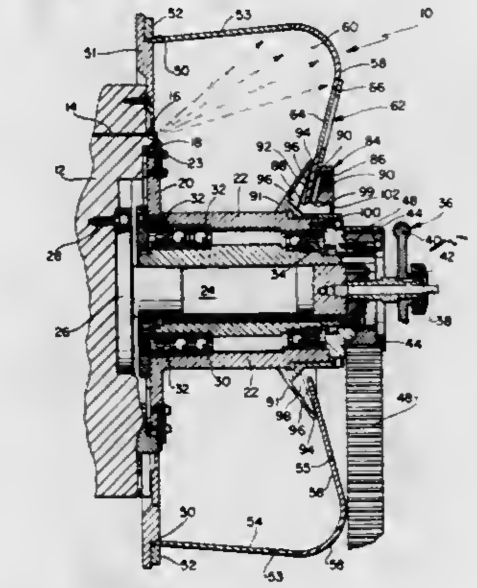
4,099,900
PELLET COOLING SYSTEM

Christopher G. Bradbury, Rumford, R.I.; Walter Buchan, Norton, Mass.; Edward J. Winiarski, Pawtucket, R.I., and Gomer E. Kropa, North Reading, Mass., assignors to Leesona Corporation, Warwick, R.I.

Filed Dec. 6, 1976, Ser. No. 748,235

Int. Cl.^{2} B29C *17/14*

U.S. Cl. 425—313 **11 Claims**



1. A pellet cage for cooling and collecting thermoplastic pellets formed by the cutting of strands of thermoplastic material emerging from the die face of an extruder or the like substantially into an air or other gaseous environment enclosing chamber by means of rotating cutters or the like which project said pellets in a generally radially outward and forward or downstream orientated trajectory, said cage comprising a hood having an arcuate peripheral side internal surface and a forward internal surface interconnected with each other and positioned with respect to said die face so as to in part form said enclosing chamber immediately downstream thereof for confining and receipt of said pellets as they are formed, first means for projecting a first flow of coolant in a substantially single pass peripheral orbit about and in contact with a major portion of said internal side surface and second means for simultaneously projecting a second flow of coolant over and in contact with a major portion of said internal forward surface so as to contact substantially all of said emerging pellets with one or both of said coolant flows to cool them, and means for continuously withdrawing said cooled pellets from said chamber.

4,099,901
TABLE FOR PLASTIC FORMING APPARATUS

Jack N. Shuman, 3330 Foxcroft Rd., Charlotte, N.C. 28211

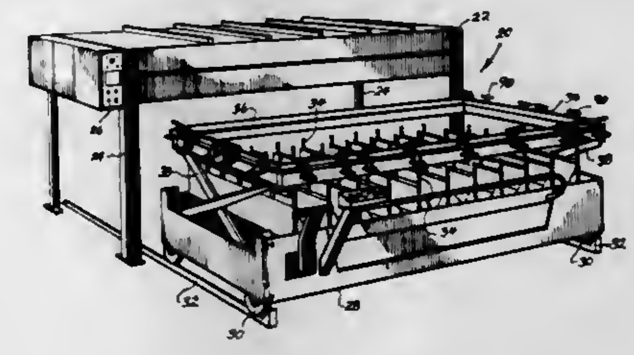
Continuation-in-part of Ser. No. 599,784, Jul. 28, 1975, Pat. No. 4,018,551. This application Jan. 7, 1977, Ser. No. 757,624

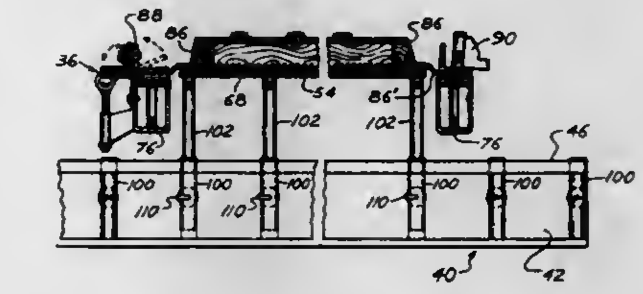
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.^{2} B29C *17/04*

U.S. Cl. 425—388 **9 Claims**

1. Apparatus for use in forming plastic material into predetermined configurations, said apparatus comprising a forming table including a central area having a plurality of upstanding support members arranged therein, means for selectively locating said upstanding support members at a plurality of positions within said central area, a vacuum forming mold having means for selectively mounting said vacuum forming mold at the upstanding ends of said plurality of support members, and a clamping frame having side elements defining an open area and having clamping means for engaging the side edges of a sheet of said plastic material, said side elements being selectively adjustable to vary the size of said open area, and said clamping frame being selectively movable to a position at which all of said plurality of support means lie within said open area defined by said clamping frame side elements and at which said side elements of said plastic sheet are held beneath the lowermost edges of said vacuum forming mold supported by said plurality of support means.





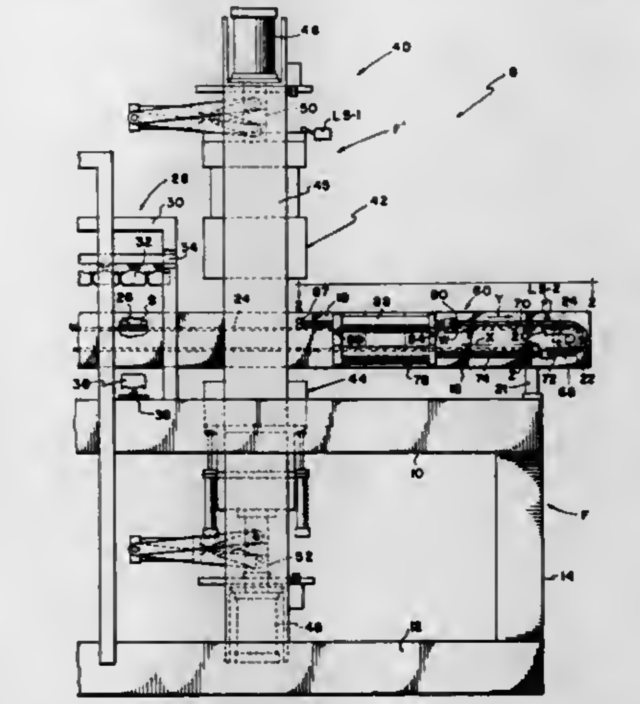
4,099,902
THERMOFORMING MACHINE

William Oberloier, Beaverton, Mich., assignor to Lyle Development, Inc., Beaverton, Mich.

Filed Feb. 28, 1977, Ser. No. 772,590

Int. Cl.^{2} B29C *17/04*

U.S. Cl. 425—388 **16 Claims**



1. A differential pressure forming machine comprising:

endless sheet support means comprising a pair of laterally spaced, longitudinally extending, endless sheet support members movable in endless paths of travel for supporting a thermoplastic sheet;

means for heating said moldable, thermoplastic sheet to a forming temperature;
mold means for applying differential pressure to said heated sheet to form a shape therein;
means for intermittently incrementally indexing said endless support means to incrementally advance said sheet to said mold means and remove said sheet from said mold means after a shape is formed therein, including:
drive train means including power transmitting means movable in forward and reverse paths for driving said endless support members and
clutch means for selectively coupling said power transmitting means and said endless support members to drive said endless support members only when said drive train means moves in one of said forward and reverse paths;
fluid driven advance drive means comprising a fluid receiving advance cylinder; an advance piston mounted in said cylinder; means mounting said advance cylinder and said advance piston for relative, reciprocal movement; means coupling one of said piston and cylinder to one end of said power transmitting means; and
fluid driven return drive means comprising a fluid receiving return cylinder; a return piston received by said return cylinder; means mounting said return cylinder and said return piston for relative reciprocal movement; and means coupling one of said return cylinder and said return piston to the other end of said power transmitting means.

4,099,903

CORE FOR DEEP DRAW MOLDING A CLOSURE CAP FOR BOTTLES AND THE LIKE

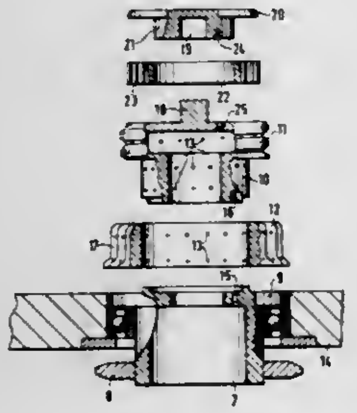
Zafir Petrov, Akazienweg 5-A, D-6710 Frankenthal, Fed. Rep. of Germany

Filed Apr. 12, 1977, Ser. No. 786,891

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 7611954[U]; Jun. 3, 1976, 2624969

Int. Cl.² B29C *17/04;* B29D *1/00*

U.S. Cl. 425—388 **5 Claims**



1. In an apparatus for forming a stepped closure cap, a mold core, comprising:
a rotatably mounted base portion;
an intermediate thread-forming portion secured to said base portion; and
at least one serration-forming portion mounted for rotation relative to said base portion and said thread-forming portion, said mold core being stepped in diameter, with the largest diameter being toward the bottom thereof.

4,099,904

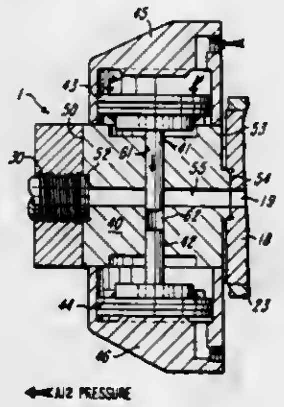
NOZZLE SHUT-OFF VALVE FOR INJECTION MOLDING MACHINE

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 21, 1977, Ser. No. 789,533

Int. Cl.² B29F *1/03*

U.S. Cl. 425—563 **2 Claims**



1. In an injection molding apparatus comprising a chamber having a nozzle attached near one end thereof, means for forcing molten material from said chamber through a passageway formed in said nozzle, a mold having a sprue formed therein, which sprue is in communication with the passageway formed in said nozzle, and a nozzle shut-off device interposed between said nozzle and said chamber the improvement comprising:
(a) a body for said device having a first passageway in communication with both said chamber and the passageway formed in said nozzle and a second passageway intersecting said first passageway, and a third passageway substantially coaxial with said second passageway and having common intersection with said first and second passageway;
(b) a long pin reciprocal in said second passageway and having a length sufficient to extend at least along said second passageway, completely across said first passageway and to enter said third passageway;
(c) a short pin reciprocal in said third passageway but having a length less than said long pin length yet sufficient to extend completely along said third passageway and to protrude not more than partly across said first passageway and being substantially coaxial with said long pin;
(d) first and second pistons respectively engaging that end of said long pin and said short pin most remote from said first passageway;
(e) first and second cylinders encompassing said first and second pistons, respectively, each being mounted on said body and having means for connecting same to a fluid pressure source; and
(f) means in each of said cylinders to establish communication from one side of its said piston to a source of fluid pressure.

4,099,905

INJECTION MOLDING MACHINE BASE

Myrwin William Nash; John Kenneth Barry, and James Gordon Wiatt, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

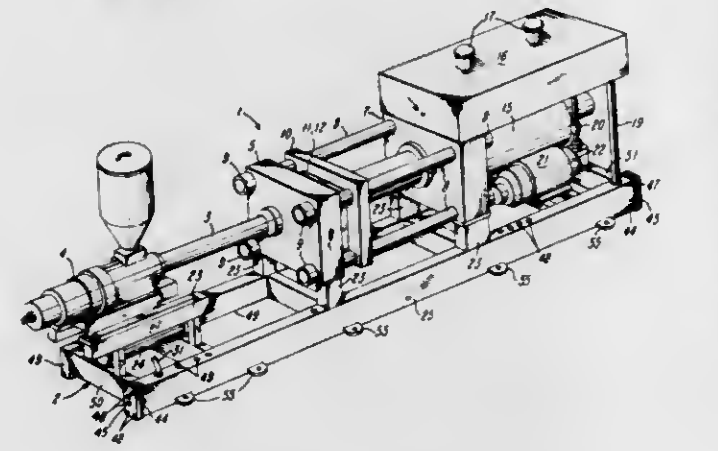
Filed Apr. 29, 1977, Ser. No. 792,191

Int. Cl.² B29F *1/00*

U.S. Cl. 425—589 **2 Claims**

1. A machine base for a hydraulic injection molding machine for molding plastic and resin material in a multiple part mold comprising
a generally rectangular body to be placed on a horizontal support surface, the sides of said rectangular body including a pair of opposed long side members connected together adjacent their ends by opposed short end members;

a plurality of longitudinally spaced apart mounting pads supported from and above said body for supporting machine elements thereon such as means to plasticate and inject plastic into a mold cavity, a fixed mold platen to receive part of a mold, and a fixed rear platen for supporting hydraulic clamping means;
one of the long side members of said rectangular body being a hollow elongated conduit defined by substantially axially straight walls;



a pair of removable closures each one sealably mounted on a respective end of said conduit and being of a size to seal off the entire cross section of said conduit and thus to expose said cross section for cleaning when removed;
an exit port through a conduit wall near one end of said conduit;
at least one inlet port through said conduit wall located between said exit port and at the other end of said conduit;
the passageway defined by said conduit being substantially the same cross section throughout the length thereof.

4,099,906

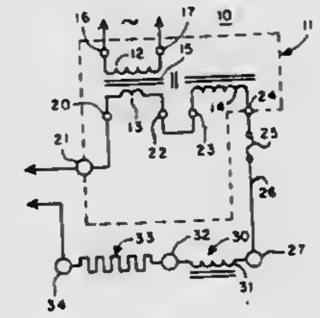
HOT SURFACE FUEL IGNITION SYSTEM

B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1976, Ser. No. 752,381

Int. Cl.² F23H *5/14*

U.S. Cl. 431—66 **10 Claims**



1. A hot surface fuel ignition system, including: hot surface igniter means having a negative temperature coefficient of resistance and a surface that reaches a temperature high enough to ignite a fuel when said igniter means conducts a predetermained electric current; fuel flow control means operated to an open position when carrying said electric current; current interruption means capable of continuous current conduction at said predetermined electric current level, but which open circuits when carrying a current higher than said predetermined electric current; regulating transformer means having a primary circuit adapted to be energized from a source of electric power and secondary circuit means; and said secondary circuit means connected in a series circuit with said igniter means, said fuel flow control means, and said current interruption means with said series circuit adapted to be completed by a control switch; said regulating transformer means supplying said predetermined electric current in said series circuit as long as the resistance of said igniter means is such as to cause said igniter means to be hot enough to ignite said fuel; said regulating transformer means supplying a current higher than said predetermined electric current upon said ignition means reaching a sufficiently low resistance to thereby cause said current interruption means to operate and deenergize said fuel flow control means.

4,099,907

IGNITION MECHANISM FOR A PYROPHORIC LIGHTER

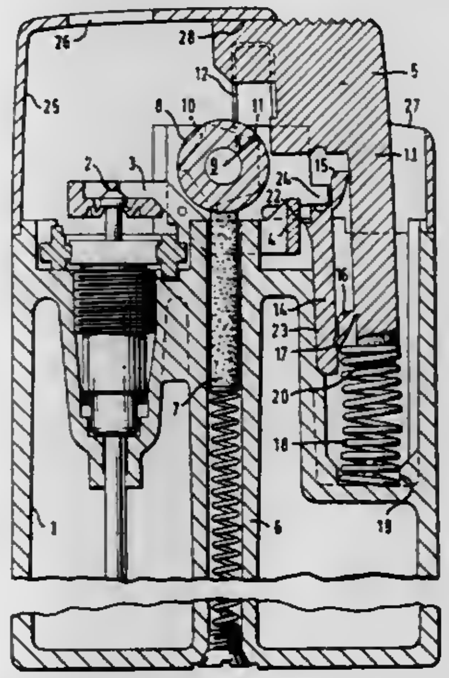
David Lee Fuller, Atlanta, Ga., assignor to Scripto, Inc., Atlanta, Ga.

Filed Oct. 4, 1976, Ser. No. 729,383

Claims priority, application United Kingdom, Oct. 6, 1975, 40816/75

Int. Cl.² F23Q *2/16*

U.S. Cl. 431—254 **9 Claims**



1. In a pyrophoric lighter having a spark wheel with ratchet teeth actuated by a manually operable press button pivotally mounted for arcuate motion around the spark wheel axis the improvement characterized by said press button comprising a unitary molded pivotal linkage having a plurality of bar por-

tions and integral flexible webs pivotally inter-connecting adjacent bar portions.

4,099,908

LOW PRESSURE GAS BURNER

Martin Josef Beckmann, 9719 - 75A St., and Ferris George Swann, 13903 - 47 Ave., both of Edmonton, Alberta, Canada

Filed Aug. 13, 1976, Ser. No. 714,093

Int. Cl.^{2} F23Q *9/00*

U.S. Cl. 431—284 **3 Claims**

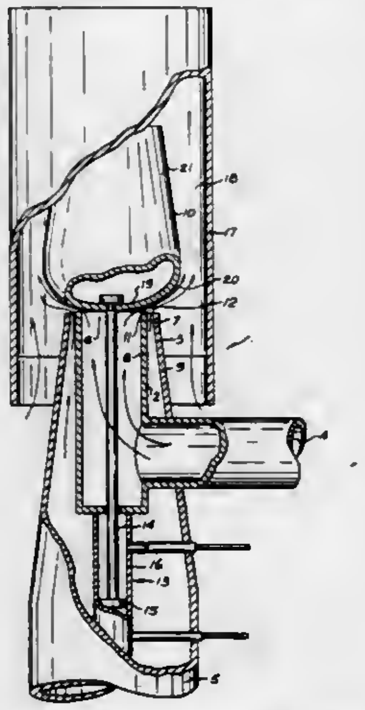
1. A burner for use in association with a relatively high pressure gas supply line and a relatively low pressure gas supply line, which comprises:

a tubular outer conduit for connection to the low pressure gas supply line and a tubular inner conduit for connection to the high pressure gas supply line, each conduit having an outlet end and an outlet;

the outlet end of said inner conduit being positioned within the outlet end of said outer conduit so that their outlets are substantially even in elevation;

said inner conduit forming a valve seat at its outlet;

a Coanda-type valve body having a curved surface, said valve body being positioned at the end of the inner conduit and arranged to seat in the valve seat and being axially displaceable from said seat whereby said valve body and valve seat co-operate to form an annular passage whereby high pressure gas flowing through said passage is deflected by and follows the curved surface of the valve body, thereby creating a low pressure zone adjacent said surface which functions to draw low pressure gas, from the outer conduit, and air into the high pressure gas flow so that they mix and form a combustible mixture.



CHEMICAL

4,099,909

METHOD OF DYEING WITH DISPERSIBLE AZO ANILINO DYESTUFFS

Stefan Koller, Pratteln; Dieter Reinker, and Hans Rudolf Schwander, both of Rieben, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

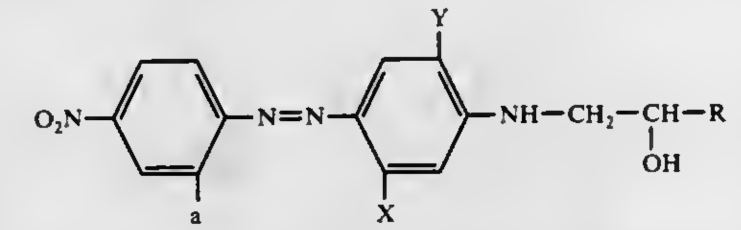
Continuation of Ser. No. 617,842, Sep. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 456,198, Mar. 29, 1974, Pat. No. 3,963,431, which is a continuation-in-part of Ser. No. 106,550, Jan. 14, 1971, abandoned. This application Mar. 7, 1977, Ser. No. 775,645

Claims priority, application Switzerland, Jan. 16, 1970, 628/70

Int. Cl.^{2} C09B *27/00;* **D06P** *1/02*

U.S. Cl. 8—41 C **7 Claims**

1. A method for the dyeing of polyester textile fibers which comprises contacting the said polyester textile fibers with a dyeing composition containing as an essential component a dyestuff of the formula



wherein *a* is cyano, chlorine or bromine, R is ethyl, phenyl or phenoxymethyl, Y is chlorine, bromine and X is hydrogen, lower alkyl or lower alkanoylamino.

4,099,910

SURFACE MODIFICATION OF POLYMERIC SUBSTRATES VIA INTERACTION WITH AZIDO FORMYL OR AZIDO SULFONYL COMPOUNDS

John E. Herweb, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jul. 29, 1977, Ser. No. 820,050

Int. Cl.^{2} D06M *13/38*

U.S. Cl. 8—115.5 **11 Claims**

6. A process for forming an improved textile material comprising

(a) treating the surface of said textile material with a compound of the formula $R(CH_2)_mX$ wherein R is C_2 to C_{12} linear or branched fluoroalkyl, C_2 to C_{12} linear or branched alkoxy substituted C_2 to C_{12} alkyl, or C_2 to C_{12} linear or branched alkyl; $(CH_2)_m$ represents a linking group that is C_2 to C_{12} linear or branched alkylene; and X represents a sulphonazide or azidoformate and m is a whole number greater than 1;

(b) heating said treated textile material to a temperature of 130°-150° C. for a time sufficient to react the second compound with the textile material.

11. A woven or knitted textile material produced by the process of claim 6.

4,099,911

AMMONIA PROCESSING OF FABRICS-EFFECTIVE REMOVAL OF RESIDUAL AMMONIA

Jackson Lawrence, West Sand Lake, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,471

Int. Cl.^{2} D06M *1/02, 1/00*

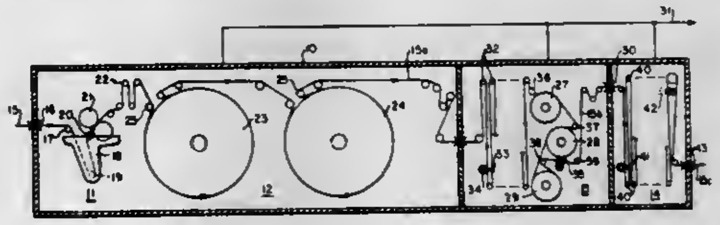
U.S. Cl. 8—125 **8 Claims**

1. In a continuous process for treating fabrics having a content of cellulosic fiber, wherein the fabric is first impregnated with substantially anhydrous liquid ammonia and is then heated to terminate the ammonia reactions and to evaporate and drive off from the fabric a substantial portion of the ammonia, an improved method of reducing the residual ammonia content of the treated fabric, which comprises

(a) bringing at least one surface of the fabric into momentary contact with a very thin film of water and thereby imparting to said fabric surface a limited moisture content insufficient to wet the fabric completely through, and

(b) thereafter heating said fabric sufficiently to cause said moisture to vaporize and penetrate said fabric, whereby to cause said moisture to replace said residual ammonia within said fabric.

5. A continuous process for removing residual ammonia from fabric having a cellulosic content and treated by impregnation with substantially anhydrous liquid ammonia, which comprises



(a) exposing the fabric to dry heat for a time sufficient to drive off at least about 90% of the ammonia,

(b) thereafter moistening at least one surface of the fabric with an amount of water insufficient to wet the fabric completely through,

(c) thereafter heating the fabric to cause said fabric to be thoroughly penetrated by moisture from said water, and

(d) thereafter heating said fabric to substantially eliminate residual ammonia and excess moisture.

4,099,912

DETERGENT COMPOSITIONS AND WASHING METHODS INCLUDING AND UTILIZING SEPARATE TABLETS OF COMPONENTS

Robert L. Ehrlich, Wyckoff, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 470,258, May 15, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,988

Int. Cl.^{2} B08B *3/00*

U.S. Cl. 8—137 **8 Claims**

1. A method of washing laundry which consists essentially of admixing with laundry and wash water at a washing temperature in the tub of a washing machine, the volume of which tub is from 20 to 80 liters, a plurality of separate units of different detergent composition components, in the range of 1 to 10 of each of said units, to produce a liquid washing medium containing 0.05% to 0.5% of an operator formulated synthetic organic detergent composition and agitating the medium for a time sufficient to remove soil from the laundry being washed, said units being of tablet, envelope, packet, capsule or other container form having a weight of 5 to 30 grams each and a volume of 4 to 20 milliliters and being dispensed from a dispensing article located on or near the washing machine, which separately stores and dispenses the units as selected by the operator of the washing machine to produce an efficient washing composition for the type of laundry being washed.

4,099,913

FOAMS FOR TREATING FABRICS

Andrew Tainter Walter; George Macon Bryant, both of Charleston, and Ronald Louis Readshaw, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

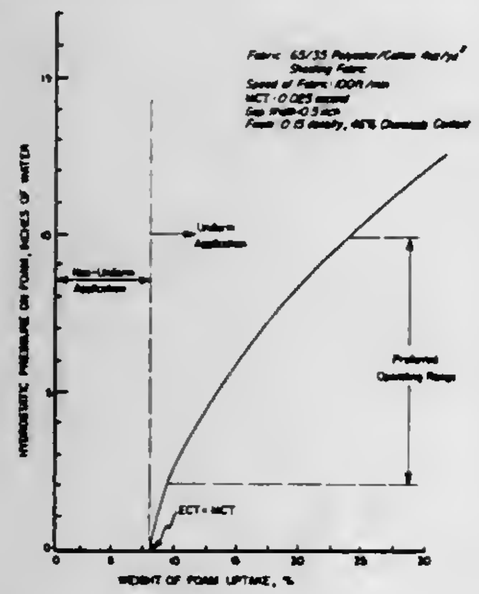
Filed Mar. 25, 1976, Ser. No. 670,380

Int. Cl.^{2} D06B *1/04;* **D06P** *1/16*

U.S. Cl. 8—173 **5 Claims**

1. A froth composition for continuously and directly surface treating a fabric or paper substrate, said composition being a froth having a foam density of from 0.005 to 0.3 gram per cc, an average foam bubble size of from 0.05 to 0.5 millimeters in diameter and a foam half-life of from 1 to 60 minutes, said foam composition comprising from 5 to 75 weight percent of func-

tional textile treating compound, from 0.2 to 5 weight percent of frothing agent, from 0 to 5 weight percent of wetting agent, with the balance of said composition being water, said percentages based on the weight of said foam composition; said foam further characterized in that it immediately breaks on contact with said substrate and is rapidly absorbed thereby to leave the surface thereof essentially dry to the touch.

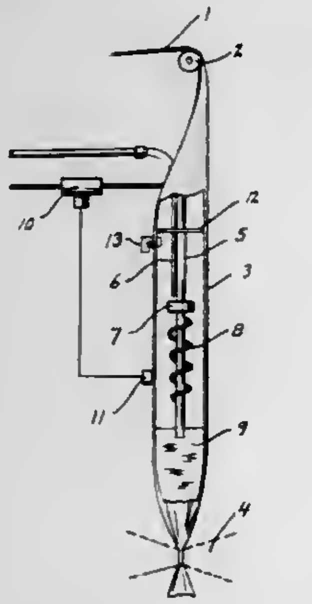


4,099,914

METHOD AND AN ARRANGEMENT FOR THE STERILIZATION OF PACKING MATERIAL

Åke Gustafsson, Chatel-Saint-Denis, Switzerland, and Olof Stark, Rydsgård, Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Nov. 24, 1976, Ser. No. 744,604
Claims priority, application Sweden, Nov. 28, 1975, 7513420
Int. Cl.² A61L *1/00, 13/00;* B65B *31/02, 55/10*
U.S. Cl. 21—57 9 Claims



1. A method for the internal sterilization and filling of a tube of packing material comprising the sequential steps of: supplying a tube of packing material to a packaging machine, supplying a sterile product into the tube of material, supplying a liquid sterilizing agent into the tube of material above the sterile product, vaporizing the liquid sterilizing agent, condensing the vaporized liquid sterilizing agent on the inside walls of the tube of material and repeatedly flat pressing and sealing the tube of material to form packages of sterile product.

4,099,915

METHOD FOR RETARDING THE EVAPORATION OF WATER

Robert E. Savoit, Wappingers Falls, and Clemence J. Henry, Newburgh, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,395
Int. Cl.² B01J *1/18;* C10M *1/28, 3/22;* C09K *3/00*
U.S. Cl. 21—60.5 A 4 Claims

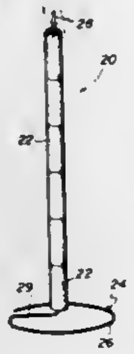
1. A method for suppressing and/or retarding the evaporation of water caused by the movement of partially air-exposed, water-immersed rotary surfaces at a temperature in the range of 50° to 150° F comprising contacting said water with a composition comprising from 99.5 to 99.9 weight percent of a light lubricating oil having a viscosity at 100° F of between 80 and 120 SUS; 0.1 to 0.5 weight percent of an alkaline earth metal sulfonate having two alkyl groups of from 6 to 16 carbon atoms attached to an aromatic group in a symmetrical manner, and 30 to 150 parts per million of an acrylic defoaming agent, whereby said surfaces are preferentially oil wetted; water is stripped therefrom and airwater interfaces are eliminated.

4,099,916

INCENSE PRODUCT

Helen J. Gardner, and Samuel M. Gardner, both of Wheaton, Ill., assignors to Hindu Incense, Chicago, Ill.

Filed Dec. 2, 1976, Ser. No. 746,696
Int. Cl.² A61L *9/00, 9/01*
U.S. Cl. 21—116 9 Claims



1. An incense product comprising a plurality of incense beads, each of said incense beads being a solid body with a hole therethrough, and a stand including a rod and a base integrally formed of a single length of wire, said rod being adapted to pass through a selected number of said beads, the size of the hole of each bead being greater than the cross sectional size of said rod so that beads may be readily slipped onto said rod.

4,099,917

PROCESS FOR PREPARING A CELL SUSPENSION FROM BLOOD FOR DISCRIMINATION OF WHITE BLOOD CELLS AND PLATELETS FROM OTHER BLOOD PARTICLES

Young Ran Kim, Hartsdale, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,595
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B 11 Claims

1. A process for preparing a cell suspension from a diluted blood sample for discrimination of white blood cells and platelets from other blood particles which comprises the steps of:

(a) treating an anticoagulated blood sample with a detergent which preconditions the red blood cells for subsequent lysing without damaging the white cell morphology;
(b) adding a fixative thereto with mixing while maintaining the mixture at a neutral pH; and
(c) incubating at a temperature substantially from 55° C to 62° C for at least 2 minutes.

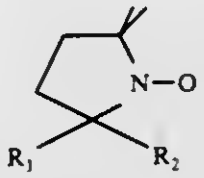
4,099,918

PROXYL NITROXIDES AS SPIN LABELS

John F. W. Keana, Eugene, Oreg., assignor to State Board of Higher Education For and on Behalf of the University of Oregon

Filed Apr. 18, 1977, Ser. No. 788,621
Int. Cl.² G01N *27/78;* C07D *207/46*
U.S. Cl. 23—230 R 2 Claims

1. In the spectrometric analysis of biological molecules, the method comprising labeling the molecule with a 2,2,5,5-tetraalkylpyrrolidine-N-oxyl nitroxide having the formula:



wherein R_1 and R_2 are alkyl, aliphatic, or aromatic groups, saturated or unsaturated, and the carbon atoms in R_1 and R_2, together with the carbon atom in the pyrrolidine-N-oxyl ring to which R_1 and R_2 are attached, form a carbon-to-carbon open chain of from four to fifty carbon atoms, and

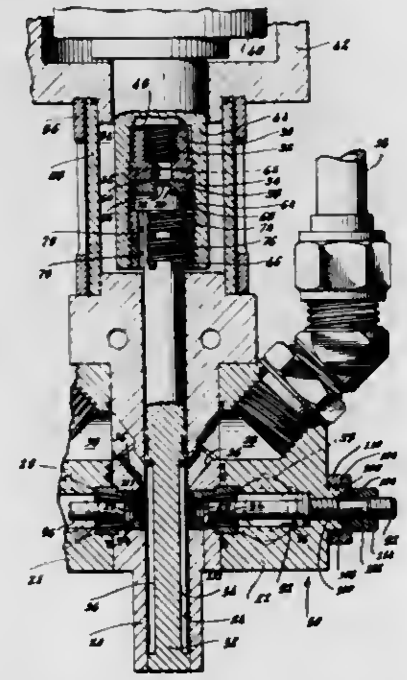
observing the ESR signal of the labeled molecule.

4,099,919

STEM ADJUSTMENT SEAL FOR REACTION INJECTION MOLDING MACHINE

Shirley Margaret Leidal, Akron, Ohio, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 22, 1976, Ser. No. 753,464
Int. Cl.² B01F *15/02;* B01J *1/00*
U.S. Cl. 23—252 R 3 Claims



1. In a mixing head, for a reaction injection molding machine, that includes a body defining a mixing chamber and a plurality of nozzle orifices opening into the mixing chamber for directing reactive polyer components into the mixing chamber, the body being formed with a plurality of at least partially, internally threaded bores terminating at one end in a nozzle orifice and at the other end in an annular rabbet; and adjustable restrictor valve for controlling the amount of component entering the mixing chamber through each one of said nozzle orifices; each restrictor valve comprising:

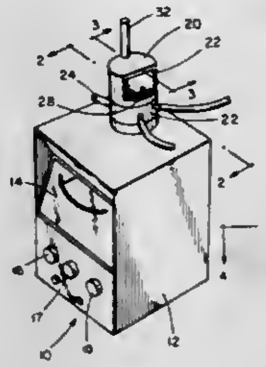
A. a valve seat formed about the upstream end of the associated nozzle orifice in the bore;
B. an elongated, externally threaded valve member, mounted in said bore for reciprocal movement through screw-like adjustment toward and away from said valve seat, formed with an annular recess intermediate its end positioned adjacent the annular rabbet to, together therewith, define a toroidal channel;
C. a packing gland seal positioned in said toroidal channel;
D. gland seal retaining means for holding said packing gland seal in position in said toroidal channel, said retaining means comprising a removable cap having an aperture for receiving said valve member and a flange formed adjacent said aperture to enclose said toroidal channel; and
E. lock means comprising a lock nut threaded on said valve member to abut said cap, react thereagainst, and thereby lock said valve member in position once adjusted relative to said valve seat.

4,099,920

TEMPERATURE CONTROL AND STIRRING APPARATUS FOR LUMINESCENCE MEASURING PHOTOMETER

Louis Robert Heiss, Annapolis, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 17, 1977, Ser. No. 778,663
Int. Cl.² G01N *21/24*
U.S. Cl. 23—253 R 10 Claims



1. In a photometer device which is particularly adapted for sensing the luminescence emitted when a reagent is inserted in a solution containing adenosine triphosphate (ATP) and which includes a reaction chamber mounted on top of a cabinet which has electronic circuitry therein and an indicating meter and control knobs on one side thereof, a photomultiplier tube extending upwardly into the center of the reaction chamber, an opening in the top of the reaction chamber, a rotatable sample tube carrier having a portion thereof received within the reaction chamber and a portion thereof positioned outside of the reaction chamber, the portion outside the reaction chamber having a sample tube receiving opening therein, an arm extending from the carrier for rotating the carrier with a sample tube therein into said reaction chamber to a position beneath the opening in the top thereof for receiving a reagent, and the carrier having a light transmitting passageway in the body thereof between the sample tube and the photomultiplier tube, the improvement comprising means coupled to and rotatable with the carrier for maintaining the liquid contents of the sample tube at a desired temperature and means situated exterior of the sample tube for mechanically mixing and stirring the liquid contents of the sample tube after the tube is rotated to a desired position within the reaction chamber.

4,099,921

CHEMICAL ANALYZER

Robert William Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Mar. 28, 1977, Ser. No. 781,765
Int. Cl.² G01N *33/16, 1/14*
U.S. Cl. 23—253 R 18 Claims

1. A chemical analyzer comprising:

a plurality of movable shuttles which move through a closed path;
a first chamber having first and second opposite ends;

a second chamber parallel to and spaced from said first chamber and having first and second opposite ends;

a first transfer passageway connecting said first ends of said first and second chambers;

a second transfer passageway parallel to and spaced from said first transfer passageway and connecting said second ends of said first and second chambers;

drive means for driving certain of said shuttles in step-by-step motion in said transfer passageways;

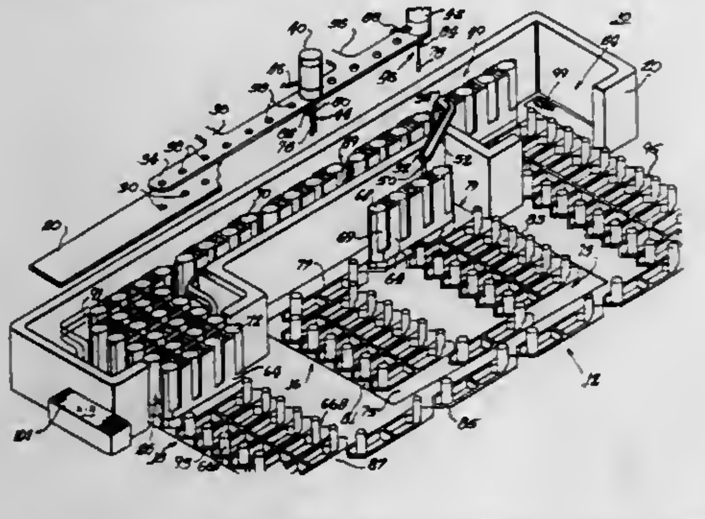
said shuttles having camming means on one end for camming other shuttles in a forward direction in said chambers and connecting means on an opposite end for pulling an adjacent shuttle through a distance in said transfer passageways or from said chambers;

a fluid transfer station;

said shuttles being adapted to support receptacles;

said fluid transfer station including fluid transfer means for transferring fluid from said station into said receptacle; and

at least a portion of said closed path being of sufficient length to permit a chemical reaction to take place between two successive appearances of a given receptacle at the station.



4,099,922

GAS COMPONENT DETECTION APPARATUS

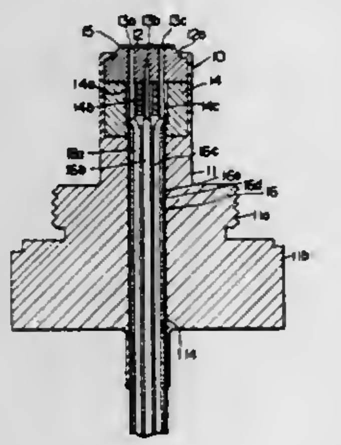
Eturo Yasuda; Susumu Sato; Yoshihiro Segawa; Tadashi Hattori, all of Okazaki, and Keiji Aoki, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 17, 1976, Ser. No. 751,956

Claims priority, application Japan, Dec. 23, 1975, 50-154334

Int. Cl.² G01N *27/16*

U.S. Cl. 23—254 E **9 Claims**



1. A gas component detection apparatus for detecting gaseous components of exhaust gases from an internal combustion engine and determining whether an air-fuel ratio of an air-fuel mixture supplied thereinto is larger or smaller than the stoichiometrical air-fuel ratio comprising:

a gas component detecting element comprising a sintered mass of semiconductive metal oxides, said detecting element having a surface partially exposed to exhaust gases and exhibiting variable electric resistances according to gaseous components and temperatures of the exhaust gases;

a catalyst carried on that surface of said detecting element partially exposed to the exhaust gases for promoting oxidation reactions of the gaseous components of the exhaust gases;

a pair of electrodes inserted into said detecting element in a manner not short-circuited through said catalyst and having outer ends disposed adjacent said catalyst, said electrodes sensing an abrupt change in electric resistances exhibited at that portion of said detecting element near said catalyst resulting from the gaseous components and temperatures of the exhaust gases; and

an additional electrode disposed in said detecting element in a relation spaced from said catalyst, said additional electrode detecting, in association with one of said pair of electrodes, a change in electric resistances resulting mainly from the temperatures of the exhaust gases exhibited at that portion of said detecting element substantially spaced from said catalyst.

4,099,923

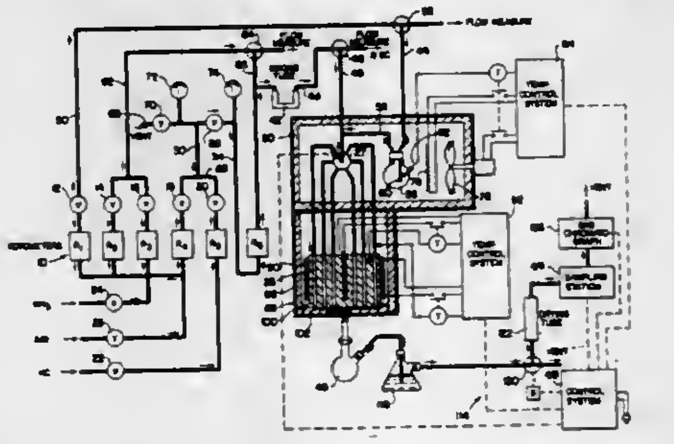
AUTOMATIC CATALYTIC SCREENING UNIT

Ernest C. Milberger, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 17, 1977, Ser. No. 760,198

Int. Cl.² G01N *31/08, 31/10*

U.S. Cl. 23—254 R **20 Claims**



1. A automatic catalyst screening unit for automatically screening a plurality of potential catalysts comprising:

a reactor module comprising means defining a plurality of chambers having essentially equal volumes for receiving respective potential catalysts, each of said chambers having an inlet and an outlet;

first heating means for heating potential catalysts when received in said chambers to the same temperature;

first control means for controlling said first heating means;

feeding means for feeding said at least one gaseous reactant to said plurality of chambers;

selector valve means intermediate said feeding means and said plurality of chambers for selectively placing only one of said chambers in fluid communication with said feeding means at any one time;

analyzing means for analyzing the product passing out of said plurality of chambers;

means defining a common manifold attached to the outlets of said plurality of chambers so that each of said chambers is in constant fluid communication with said manifold; and

second control means for controlling said first control means, said selector valve means and said analyzing means so that (1) said at least one gaseous reactant is sequentially fed to said plurality of chambers in a predetermined sequence at at least one predetermined temperature and (2) gross product passing out of each of said chambers is fed to said analyzing means via said common manifold means and analyzed for useful product.

4,099,924

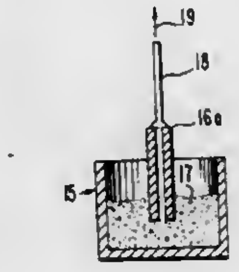
APPARATUS IMPROVEMENTS FOR GROWING SINGLE CRYSTALLINE SILICON SHEETS

Samuel Berkman, Florham Park; Michel Thomas Duffy, Princeton Junction; Kyong-Min Kim, East Windsor, and Glenn Wherry Cullen, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,105

Int. Cl.² C01B *35/00;* B01J *17/18*

U.S. Cl. 23—273 SP **5 Claims**



1. In an apparatus for growing single crystalline silicon in sheet or ribbon form comprising a crucible and die in contact with molten silicon the improvement which comprises a protective layer of silicon oxynitride of the general formula $SiO_{(3/2)(x)}N_{(4/3)-(x)}$, wherein x is equal to or greater than 0.1 but equal or less than 0.8, applied by chemical vapor deposition on the portions of said crucible and die in contact with said molten silicon.

4,099,925

APPARATUS FOR DESULFURIZATION OF FLUE GAS

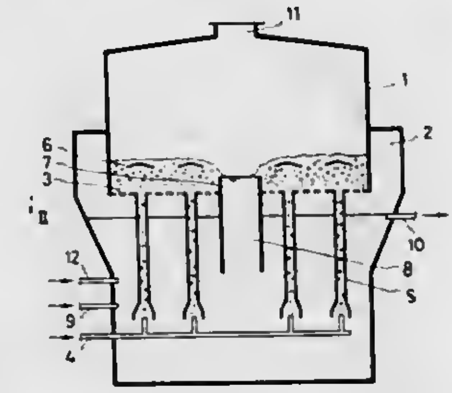
Hiroshi Yanagioka, Yokohama; Shinichi Shimizu, Kawasaki, and Kouichi Tamura, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Sep. 20, 1977, Ser. No. 834,878

Claims priority, application Japan, Sep. 29, 1976, 51-115981

Int. Cl.² B01J *1/22;* C01B *17/00;* B01D *53/14*

U.S. Cl. 23—285 **4 Claims**



1. An apparatus for desulfurization of flue gas, in which a sulfurous acid gas-containing flue gas is contacted with an absorption liquid to have the sulfurous acid gas absorbed by said absorption liquid and simultaneously oxidized by an oxygen-containing gas and fixed by a fixing reactant in the absorption liquid, which comprises: (a) a single vessel divided by a flue gas-dispersing plate and a weir into an upper flue gas-absorption liquid contacting zone and a lower absorption liquid reservoir zone; (b) a liquid-dropping zone formed by a lower portion of the weir extended to the absorption liquid reservoir zone, wherein the absorption liquid overflows from the contacting zone and drops; (c) a flue gas-introducing section provided along the peripheral wall of the absorption liquid reservoir zone and located below the flue gas-dispersing plate; (d) liquid-raising pipes connected between the lower part of the absorption liquid reservoir zone and the flue gas-dispersing plate, oxygen-containing gas introducing pipes with openings below the openings of the lower end of the liquid-raising pipes and in alignment therewith, fixing reactant-introducing means and absorption liquid-discharging means, respectively provided in the absorption liquid reservoir zone; and (e) a treated gas discharging outlet provided above the flue gas-dispersing plate in the flue gas-absorption liquid contacting zone.

4,099,926

MULTISTAGE REACTOR

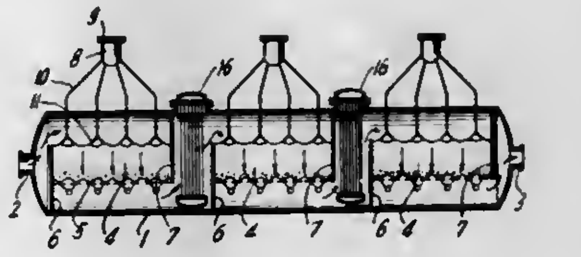
Friedrich Gütlhuber, Metten; Adolf Jäger, Plattling, and Heinrich Ufholz, Deggendorf, all of Germany, assignors to Deggendorfer Werft und Eisenbau G.m.b.H., Deggendorf, Germany

Filed Oct. 20, 1975, Ser. No. 624,289

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1974, 2449789

Int. Cl.² B01J *4/00, 8/04, 8/10, 8/12*

U.S. Cl. 23—286 **12 Claims**



4. Multi-stage hurdle-type reactor for catalytic exothermic and endothermic chemical processes comprising a tubular shaped reactor wall with the axis thereof arranged horizontally and forming a reaction space therein, said reactor wall having a first end and a second end spaced apart in the axial direction thereof from said first end, said first and second ends extending transversely of said reactor wall axis and providing closures for the opposite ends of said reactor wall, an inlet in said first end for admitting a reactive gas into said reaction space, an outlet in said second end for discharging the reactive gas after it flows through said reaction space, a plurality of serially arranged catalyser beds mounted within said reaction space and spaced apart in the axial direction thereof, each of said catalyser beds having an upper surface through which the catalyst is fed and a lower surface below the upper surface on which the catalyst is supported and through which the catalyst exits, a plurality of distributor pipes extending downwardly into said reaction space for each of said plurality of catalyser beds, each said distributor pipe having one end in communication with said upper surface of one of said plurality of catalyser beds and another end located above said reactor wall and in communication with a source of catalyser so that the catalyser is fed to each said catalyser bed, a plurality of draining pipes extending downwardly from said reactor wall for each of said plurality of catalyser beds, each said draining pipe having a first end in communication with said lower surface of one of said plurality of catalyser beds and a second end spaced from said first end for the exit of the catalyser from said draining pipe of the one of said plurality of catalyser beds, each of said catalyser beds having a first end and a second end extending transversely of the axis of said reactor and located at the opposite ends of said bed, each of said plurality of catalyser beds comprising an upright first delimiting wall located at the first end of said bed and extending downwardly from said upper surface past said lower surface and being connected to one portion of said reactor wall, an upright second delimiting wall located at the second end of said bed and extending upwardly from said lower surface past said upper surface and being connected to another portion of said reactor wall, said one

portion and said another portion of said reactor wall being diametrically opposed to one another so that reactive gas entering said reaction space from said inlet is forced to follow a certain path through said catalyser beds in the axial direction of said reactor wall by said first delimiting walls and said second delimiting walls, each of said plurality of catalyser beds being mounted in said reaction space in a horizontal position parallel with said axial direction thereof, said plurality of catalyser beds comprising at least three catalyser beds, a plurality of heat exchangers located in said reaction space, each of said heat exchangers having a nest of tubes, the tubes in each of said plurality of heat exchangers being mounted in a direction transverse to the axial direction of said reactor wall and spaced from one another by one of said plurality of catalyser beds, whereby the reactive gas entering said reaction space passes through a first catalyser bed located closest to said inlet, then through one of said heat exchangers, and then alternately through another catalyser bed and another heat exchanger.

4,099,927

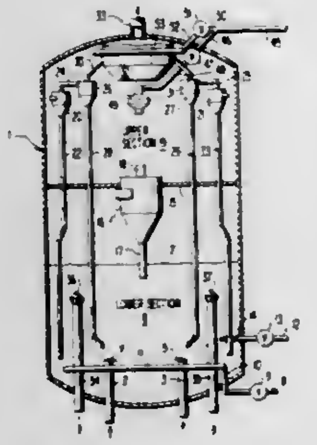
APPARATUS FOR REGENERATION OF CATALYST

Claude O. McKinney, Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 460,518, Apr. 12, 1974, Pat. No. 3,990,992. This application Mar. 22, 1976, Ser. No. 669,046

Int. Cl.^{2} B01J *8/28*

U.S. Cl. 23—288 B 9 Claims



1. A regeneration vessel for the continuous regeneration of a fluidizable cracking catalyst which has been deactivated with coke deposits while employed in a catalytic hydrocarbon cracking process comprising

- a vessel having an upper section and a lower section;
- catalyst particle inlet means in said lower section of the vessel for supplying said catalyst which has been deactivated with coke deposits;
- regenerated catalyst particle outlet means in said lower section of the vessel for withdrawing regenerated catalyst;
- oxygen-containing gas inlet catalyst fluidizing means in a lower portion of said lower section of the vessel for supplying oxygen-containing gas to fluidize catalyst in said lower section of the vessel and to support combustion of coke on the catalyst and produce regeneration gases containing carbon monoxide;
- an essentially solid, horizontal partition extending throughout the cross-section of said vessel at the position of the partition, said partition separating said lower section and said upper section of said vessel, and said partition being located at about 25 to 80 percent of the internal height of the vessel so as to provide sufficient space in said lower section for essentially complete combustion of carbon monoxide in the regeneration gases and for regeneration of said catalyst;
- gas passage means in gas-flow communication with said lower section and said upper section through said partition, said gas passage means including combusted regeneration gas and catalyst first separating means for receiving said regeneration gases and catalyst from said lower section to separate catalyst particles from the regeneration gases rising from said lower section to said upper section, said combusted regeneration gas and catalyst separating means having discharge means for discharging said separated catalyst particles;
- combustion gas and particle cyclone, second separation means in an upper portion of said upper section of the vessel for receiving regeneration gases from said upper section and for separating particles of catalyst from said gases, said combustion gas and particle separation means having discharge means for discharging said separated catalyst particles; and
- combustion gas effluent means in the upper portion of said upper section of the vessel and in gas-flow communication with said combustion gas and particle second separation means in said upper section for exhausting regeneration gases from said upper section of the regeneration vessel.

4,099,928

METHOD OF MANUFACTURING A HEAT EXCHANGER BODY FOR RECUPERATIVE EXCHANGERS

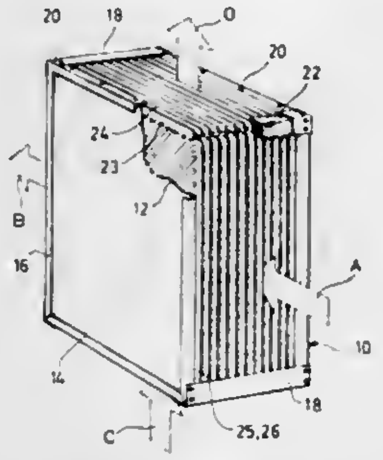
Per S. Norback, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden

Filed Jul. 15, 1976, Ser. No. 705,536

Claims priority, application Sweden, Jul. 18, 1975, 7508256

Int. Cl.^{2} B21D *53/00*

U.S. Cl. 29—157.3 D **11 Claims**



1. Method for manufacturing a heat exchanger body for recuperative heat exchangers for two gaseous media, which body is of the type containing a number of superimposed sheets which are corrugated to form channels for the media to flow through, the sheets being arranged so that the corrugations in neighbouring sheets cross each other to form channels passing through the heat exchanger body in two directions, and the juxtaposed edges of the sheets being displaced and joined to the corresponding edges of the neighbouring sheets so that the edges on the same side of the body alternately are sealed together and form openings to admit the heat exchange medium to the channels, characterized in that the sheets (**12**) are first corrugated all over and cut to the desired dimensions, and that the edges (**23** –**26**) are then compressed flat in such a manner that opposite ends of the sheet are in the same plane and adjacent ends of the sheet are in different but parallel planes, and at the same time or subsequently the juxtaposed edges (**23** and **24**, or **25** and **26**, respectively) are displaced in the same direction, but in the opposite direction to the other pair of juxtaposed edges (**25** and **26**, or **23** and **24**, respectively), whereafter the desired number of sheets are assembled into the heat exchanger body (**10**) and those displaced edges of neighbouring sheets (**12**) which bear on each other are joined and sealed.

4,099,929

METHOD OF REMOVING ASH COMPONENTS FROM HIGH-ASH CONTENT COALS

Kurt Tippmer, Recklinghausen; Hubert Schmitt, Bochum; Heinrich Vinke, Recklinghausen and Georg Abendroth, Dülmen, all of Germany, assignors to Firma Carl Still Recklinghausen, Germany

Filed Mar. 11, 1977, Ser. No. 776,870

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611619

Int. Cl.^{2} C10L *9/00;* **C10J** *3/00*

U.S. Cl. 44—1 F **15 Claims**

12. A method of removing ash components from coals, particularly, high-ash content coals comprising grinding the coal into ground particles, suspending the ground coal in an aqueous carbonate solution to form a coal liquor suspension, maintaining said coal liquor suspension in a reactor from 45 to 120 minutes at a temperature in the range from 250° to 280° C under a pressure of 50 to 80 atm causing CO_2 to be set free by dissociation, directing a stream of inert gas through the reactor to mix with the free CO_2 whereby the CO_2 is discharged from the reactor with said inert gas stream, cooling the coal liquor suspension, separating acqueous liquor of said coal liquor suspension from the coal therein whereby said separated aqueous liquor contains dissolved ash components, directing said separated aqueous liquor with dissolved ash component to a spray tower whereby said separated aqueous liquor is exposed to gases containing CO_2 at elevated temperature and pressures to carbonize said liquor, separating the insoluble ash components from the soluble alkali carbonates of said carbonized liquor, and recycling the carbonized liquor to said reactor to form a coal liquor suspension on said reactor.

4,099,930

CATALYTIC FUEL ADDITIVE FOR GASOLINE AND DIESEL ENGINES

Harry Matthew Webb, Toronto, Canada, assignor to Natural Resources Guardianship International, Inc., Clayville, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,777

Int. Cl.^{2} C10L *1/24*

U.S. Cl. 44—56 **10 Claims**

1. A fuel additive for internal combustion and diesel engines consisting of an active ingredient formulation comprising a mixture of picric acid and ferrous sulfate in a relationship of picric acid:ferrous sulfate of about 17:1 to 70:1 in a mixed solvent of lower alcohol, toluene, and water.

4,099,931

HIGH DENSITY LIQUID RAMJET FUEL

James T. Bryant, and George W. Burdette, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1972, Ser. No. 294,068

Int. Cl.^{2} C10L *1/04*

U.S. Cl. 44—80 **3 Claims**

1. A fuel mixture consisting essentially of 95.2 weight percent decahydronaphthalene and 4.8 weight percent n-hexane.

4,099,932

CONVERSION OF SOLID FUELS TO FLUID FUELS

Edward T. Child, Tarrytown, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

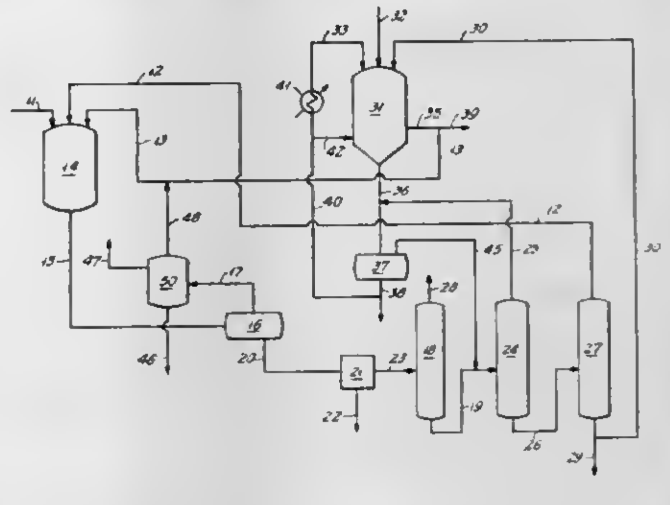
Filed Mar. 28, 1977, Ser. No. 782,154

Int. Cl.^{2} C10J *3/00, 3/16*

U.S. Cl. 48—197 R **10 Claims**

1. A continuous process for the production of synthesis gas which comprises the steps of

a. mixing finely divided solid carbonaceous fuel with a solvent therefor,
b. heating the resulting mixture to a temperature between about 700° and 900° F. in a solvation zone to solubilize said solid fuel,
c. removing the heated mixture of solvent and solubilized fuel from the solvation zone,
d. separating unsolubilized mineral residue from the liquid portion of the solvation zone effluent,
e. adding to said liquid portion a suspension of particulate carbon in a hydrocarbon liquid
f. distilling the mixture formed in step (e) to remove liquids boiling up to about 450° F.
g. separating the still residue from step (f) into a fraction boiling up to about 900° F. and a residual fraction containing particulate carbon boiling above about 900° F.



h. returning the fraction boiling up to about 900° F. to solvation zone as solvent
i. combining the mineral residue of step (d) with the residual fraction of step (g)
j. subjecting the mixture from step (i) to partial combustion to form a gas comprising hydrogen and carbon monoxide and containing particulate carbon
k. transferring the particulate carbon of step (j) to suspension in the liquids boiling up to about 450° F. of step (f) and
l. adding the suspension of step (k) to the liquid portion of the solvation zone effluent as in step (e).

4,099,933

PROCESS FOR THE MULTIPLE ZONE GASIFICATION OF COAL

Clarence A. Johnson, Princeton, N.J., and John Shen, Gaithersburg, Md., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Continuation-in-part of Ser. No. 365,910, Jun. 1, 1973, abandoned. This application Jun. 10, 1975, Ser. No. 585,696

Int. Cl.^{2} C10J *3/54*

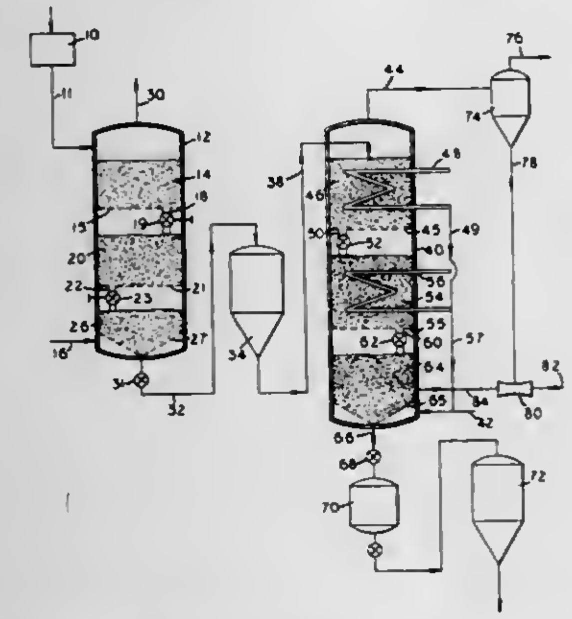
U.S. Cl. 48—202 **10 Claims**

1. A process for gasifying particulate coal in a vertical multibed reactor comprising an upper bed, at least one (1) intermediate bed, and a lower gasifying bed, wherein the temperature profile of the reactor increases from the upper bed to the lower bed, and wherein an inventory of particulate coal is maintained in each bed, the coal being sequentially passed to each successively lower bed, comprising the steps of:

(a) passing particulate coal to the upper bed of the gasifier, the gasifier being maintained at a pressure between about 400 and 1500 psig;
(b) passing a fluidizing gas comprising oxygen and steam upwardly through each bed of the gasifier at sufficient velocity to fluidize and heat each bed;
(c) maintaining a heating rate of the coal in each bed of the gasifier at a rate between about 20° and 100° F per minute, whereby swelling and thermal disintegration of the particulate coal is minimized,
(d) maintaining the coal inventory in the uppermost bed of the gasifier at a temperature between about 600° and 800° F;
(e) transferring the coal from the upper bed to the next lower

intermediate bed of the gasifier intermittently in batches, wherein the coal is heated to a temperature between 1000° and 1400° F thereby partially devolitilzing the coal, liberating tars and oils therefrom;

(f) condensing the tars carried by the upwardly flowing fluidizing gases on the particulate coal inventory maintained in the upper bed of the gasifier, whereby the tars and oils are substantially hydrocracked upon sequential passage to the intermediate bed;



(g) passing the partially devolitized coal to the lowest bed of the gasifier wherein the coal is heated to a temperature between about 1600° and 1800° F, such temperature not exceeding the ash softening point of the coal, whereby the coal reacts with the fluidizing gas thereby converting the coal into char, byproduct ash and a gaseous product;

(h) removing a portion of the char and byproduct ash from the lowest bed of the gasifier;

(i) removing a gaseous product stream from the upper bed of the gasifier.

4,099,934

METHOD FOR MANUFACTURING RESINOID-BONDED GRINDING TOOLS

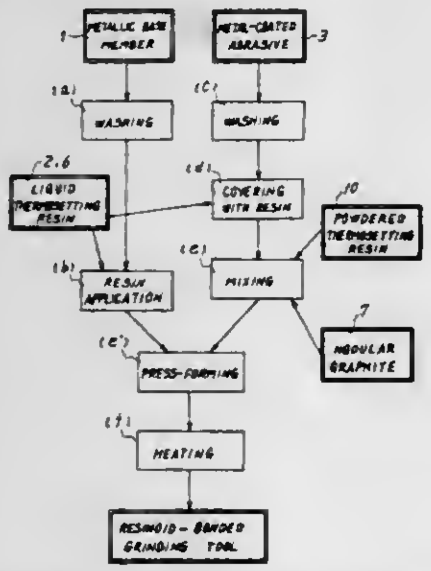
Ikuo Suzuki, Chiryu; Tomoyasu Imai, Kariya; Masato Kitajima, Hekinan, and Kazunori Hota, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1976, Ser. No. 750,439

Claims priority, application Japan, Sep. 1, 1976, 51-104395; Jul. 29, 1976, 51-90611

Int. Cl.² C23G *1/02, 1/14*

U.S. Cl. 51—295 **11 Claims**



1. A method for manufacturing a resinoid-bonded grinding tool in which metal-coated abrasive grains are adhesively attached upon the surface of a metallic base member with a thermosetting resin, comprising the steps of:

(a) washing said surface of said base member so as to expose a pure metallic surface thereon by washing said surface of said metallic base member with a grease removing solvent; washing said washed surface with an alkali solution; and then washing said alkali washed surface with an acid solution;

(b) applying a liquid thermosetting resin to said pure metallic surface of said base member so as to prevent the formation of an oxide film thereon or the adherence of gas thereto during subsequent heating;

(c) washing said abrasive grains;

(d) coating the surface of said abrasive grains with a liquid thermosetting resin;

(e) mixing a powdered thermosetting resin with said abrasive grains covered with said liquid thermosetting resin and press-forming the mixture upon said resin-applied surface of said base member to form a press-formed article of a desired shape; and

(f) heating said press-formed article formed upon said base member so as to thermally set said formed article upon said base member.

4,099,935

CUTTING TEETH FOR ETCHED ABRASIVES

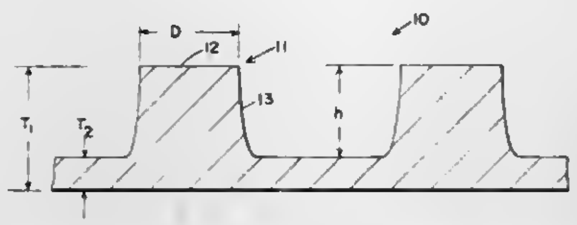
Herbert M. Bond, Stillwater, and Michael E. Rucinski, St. Paul, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

Continuation of Ser. No. 627,751, Oct. 31, 1975, abandoned, and a continuation of Ser. No. 489,247, Jul. 17, 1974, abandoned.

This application Jan. 31, 1977, Ser. No. 764,501

Int. Cl.² B24D *3/06*

U.S. Cl. 51—309 R **1 Claim**



1. A one piece abrading device for smoothly abrading away material, said abrading device comprising a flexible base member having rigid abrading teeth thereon, said base member and said abrading teeth comprised of the same metallic base material, said base member defined by a width, a thickness and a length; said thickness of said abrading member being substantially of less dimension than said width and said length so that said base member lacks rigidity and flexes in response to a force on the surface of said base member, said abrading teeth comprising a plurality of metallic post-shaped cutting teeth spaced widthwise and lengthwise across said base member, said abrading teeth having a rigid top cutting surface, said teeth characterized by being distributed throughout said base member to thereby provide said abrading device with tooth density of approximately 700 to 900 teeth per square inch so as to smoothly shear away material on the surface of an article to be abraded when said abrading device is rubbed over the article to be abraded, said cutting teeth integrally formed with said base member and projecting a distance H from said base member, said plurality of postshaped cutting teeth having a substantially flat top and substantially vertical side walls, said substantially flat top of said plurality of post-shaped cutting teeth having a diameter designated by D, said diameter of said teeth having a minimum dimension of about 0.0015 inches to prevent said teeth from piercing the surface of the article to be abraded with said dimension H of said teeth having a minimum dimension of about 0.0025 inches to thereby produce abrading teeth which are sufficiently rigid to smoothly abrade away material.

4,099,936

PROCESS FOR THE PURIFICATION OF SILANE

Gregorio Tarancon, Woodbridge, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,197

Int. Cl.² B01D *53/02*

U.S. Cl. 55—75 **6 Claims**

1. A process for the purification of a mixture of silane and impurities comprising passing the mixture through a succession of zones connected in series, in a closed system, according to the following steps:

(a) passing the mixture, in gaseous form, through a zone containing porous, granular charcoal as an adsorbent at a temperature in the range of about minus 40° C to about minus 80° C to provide a mixture of silane and remaining impurities in gaseous form;

(b) passing the gaseous mixture from step (a) through a zone containing porous, granular magnesium silicate as an adsorbent at a temperature in the range of about minus 40° C to about 80° C to provide a mixture of silane and remaining impurities in gaseous form;

(c) passing the gaseous mixture from step (b) into a distillation zone in such a manner that the impurities are removed overhead in gaseous form and at least about 95 percent by weight of the silane is converted to liquid bottoms; and

(d) recovering the silane.

4,099,937

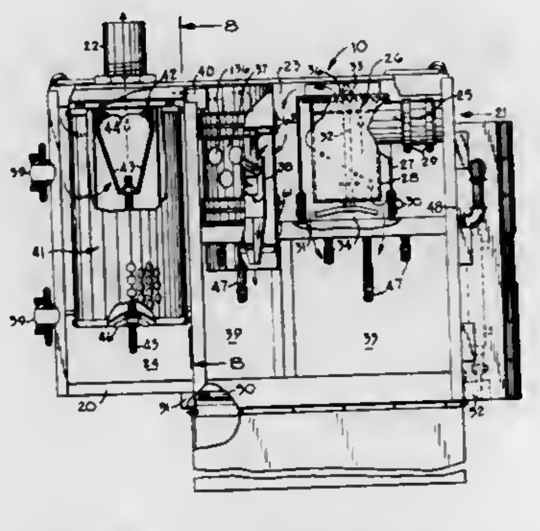
AUTOMATIC DUMPING ROOF DRILL DUST COLLECTOR

Gregory Allen Ufken, and Jon Arthur Ruopsa, both of Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Nov. 19, 1976, Ser. No. 743,226

Int. Cl.² B01D *50/00*

U.S. Cl. 55—212 **12 Claims**



1. A roof dust collector comprising:

(a) a housing having an inlet for dust laden air to enter therein, and an outlet for cleaned air to exit therefrom,

(b) dust separating means, including at least one cyclone dust separator, within the housing between the inlet and the outlet, said housing having walls forming at least one dust collection chamber in said housing below said dust separating means;

(c) means within the housing for washing down the walls of the dust collection chamber;

(d) means including a hinged door in said housing, for emptying the collected dust from said chamber; and

(e) means, including a limit switch removed from the housing, for actuating said washing and emptying means, and for controlling a cyclic sequence of actuation so that the washing means are only actuated as the collection chamber is being emptied.

4,099,938

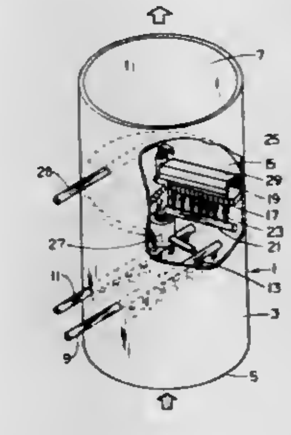
MIST ELIMINATOR CLEANING DEVICE

James H. Onnen, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Feb. 17, 1977, Ser. No. 769,521

Int. Cl.² B01D *47/06*

U.S. Cl. 55—230 **12 Claims**



1. In a gas scrubbing device that includes a vertical housing having a dirty gas inlet disposed in the lower portion thereof and a clean gas outlet disposed in the upper portion thereof in spaced relation from the dirty gas inlet to provide a confined gas flow path for a gaseous stream to be treated, and, means to introduce scrubbing solution within the confined gas flow path and means to remove the scrubbing solution from the housing; the improvement comprising:

a mist eliminator disposed within the confined gas flow path through which substantially all of the upwardly flowing gases pass, the mist eliminator being spaced vertically above the means to introduce scrubbing solution;

two revolvably mounted spray headers in flow communication with a spraying solution source, one of the headers being disposed above the mist eliminator with means to spray a solution onto the downstream side of the mist eliminator, the other of the headers being disposed beneath the mist eliminator with means to spray a solution onto the upstream side of the mist eliminator; and,

drive means for the spray headers whereby said mist eliminator is cleanable during normal operations.

4,099,939

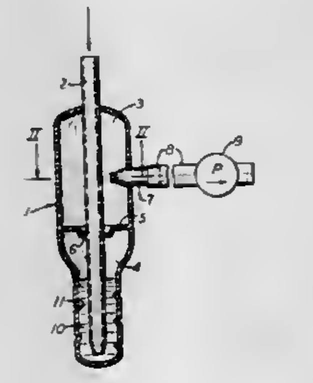
SPILL-PROOF GAS SAMPLER

Frank J. Vancheri; Stanley P. Nebash, both of Pittsburgh, and Paul W. McConnaughey, Wilkinsburg, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jul. 20, 1977, Ser. No. 817,365

Int. Cl.² B01D *47/02*

U.S. Cl. 55—246 **4 Claims**

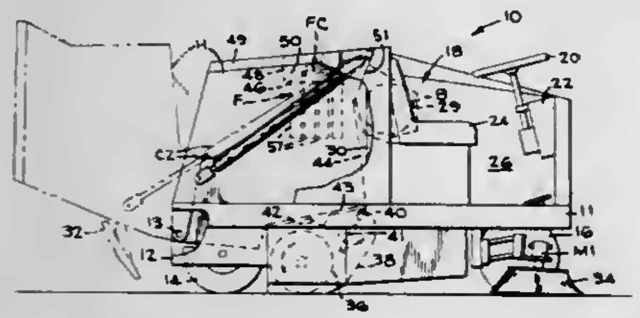


1. A spill-proof gas sampler in the form of a bubbler comprising a normally upright bottle having an upper portion and a lower portion, a central inlet tube extending from near the bottom of the bottle up through the top of the bottle, a collar encircling the inlet tube in the lower part of said upper portion

and sealed to the side of the bottle to divide it into upper and lower chambers, there being clearance between the collar and inlet tube to provide a restricted passage between said chambers, an exhaust tube above said collar extending from near one side of said inlet tube laterally out through the side of the bottle, said tubes being sealed in the bottle, and a predetermined volume of liquid in said lower chamber spaced from said collar, the depth of the liquid in said lower chamber being such that the lower end of said inlet tube is located beneath the surface of the liquid, the capacity of said lower chamber being such that all of the liquid remaining therein when the bottle is on its side is beneath the inlet tube, and the capacity of the upper chamber is such that when the bottle is inverted all of the liquid in that chamber will be below the exhaust tube and when the bottle is turned back on its side from its inverted position the inner end of the exhaust tube will always be above the liquid in said upper chamber.

4,099,940
IMPULSE FILTER CLEANER
Donald G. Mortensen, San Jose, and Dennis P. Strand, Modesto, both of Calif., assignors to FMC Corporation, San Jose, Calif.

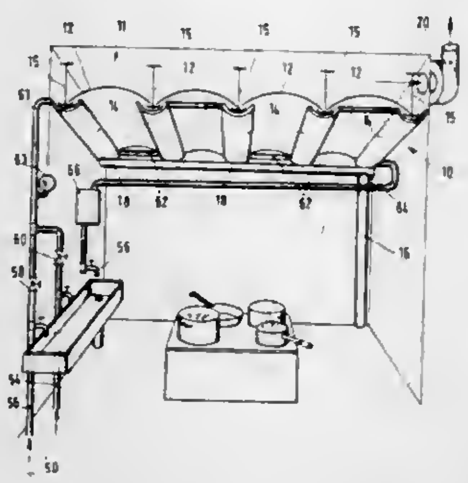
Filed Mar. 17, 1977, Ser. No. 778,633
Int. Cl.² B01D *41/04*
U.S. Cl. 55—300 **10 Claims**



1. In an apparatus for cleaning dust filters comprising frame structure, a filter support, means for resiliently mounting said support on said frame structure, dust filters depending from said support, said cleaning apparatus comprising a rocker arm, means for pivotally supporting said rocker arm on said frame structure, a hammer head mounted on said rocker arm in spaced relation to said pivot means and means for operating said rocker arm to cause said hammer head to strike the filter support; the improvement wherein said operating means comprises resilient crank arm means having one end portion operatively connected to said rocker arm pivot means for oscillating the arm about its pivot, oscillating means having a predetermined stroke and engaging the other end portion of said resilient crank arm means, means for driving said oscillating means, the stroke of said oscillating means in one direction acting on said resilient crank arm means, to cause said hammer head to strike said filter support, the complete stroke of said oscillating means in said one direction exceeding the stroke motion required to cause the hammer head to strike the support so that the striking force imparted by said oscillating means continues right up to the time of strike, said resilient crank arm means deflecting during the terminal portion of said complete stroke thereby accommodating completion of the stroke while motion of said hammer head remains interrupted by said filter support, and said oscillating means further including means for retracting said hammer head from said support during the stroke of said oscillating means in the opposite direction.

4,099,941
CONDENSER CEILING FOR KITCHENS
Paul Gutermutb, Augustastrasse 48, D-6456 Langenselbold; Heinrich Oetjen, August-Bebel-Strasse, 11, D-6451 Bruchkobel, and Paul Gutermutb, Jr., Augustastrasse 48, D-6456 Langenselbold, all of Fed. Rep. of Germany

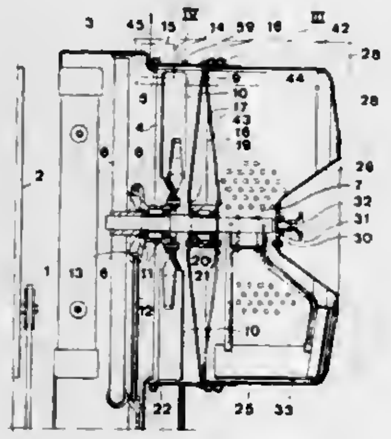
Filed Sep. 16, 1977, Ser. No. 834,022
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641708
Int. Cl.² B01D *51/00*
U.S. Cl. 55—269 **6 Claims**



1. In a subceiling for protecting damp rooms, such as industrial canteens, slaughter houses, laundries and the like, against rising steam vapors and the precipitation of particles contained therein, and including at least one overhead exhaust port, and a plurality of upwardly arched ceiling elements whose lateral edges are disposed approximate the openings of U-shaped collecting channels and spaced from the opposite walls of the collecting channels, the collecting channels being connected with a condensate absorber, the improvements characterized by: the collecting channels (**14, 22, 30, 70**) being configured as groovelike hollow profiles, and means for supplying fluid at desired temperatures into the interior cavities (**28, 35, 37, 77**) of the profiles.

4,099,942
ROTARY AIR FILTER
José A. C. L. Carnewal, Eeklo, and Etienne R. O. C. Hommez, Oostende, both of Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 20, 1977, Ser. No. 789,174
Claims priority, application United Kingdom, Apr. 27, 1976, 16973/76
Int. Cl.² B01D *46/26*
U.S. Cl. 55—396 **4 Claims**



1. A rotary air filter assembly comprising,

(a) a stationary structure having collar means defining a generally circular opening,

(b) support means secured to the stationary structure generally centrally thereof,

(c) fan means with opposed intake and pressure sides, rotatably mounted on the support means and adjacent the generally circular opening with the generally circular opening being located on the pressure side of the fan means, said fan means having a diameter substantially corresponding to the diameter of the generally circular opening,

(d) an annular structure rotatably mounted on the support means and generally surrounding the fan means, said annular structure having opposed ends, one of which is disposed adjacent said collar means defining therewith an annular opening at the pressure side of said fan means,

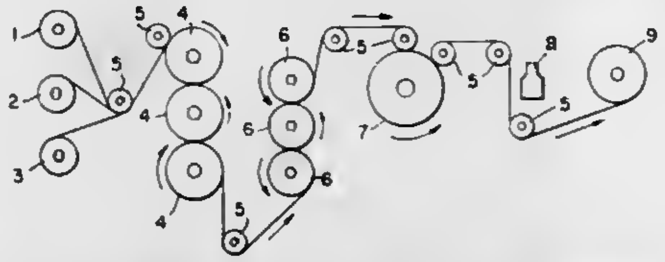
(e) perforated filter means mounted detachably and for rotation in unison with the annular structure at the intake side of said fan means, said filter means having an end portion remote from said fan means and an opposite generally circular edge in registration with the end of said annular structure opposite to the collar means, said filter means and said annular structure having a generally unobstructed inner surface lengthwise thereof in the direction from the end portion of said filter means to said annular opening for enabling unobstructed generally linear movement of material along the inner surface towards and through said annular opening,

(f) first drive means for driving said annular structure and said filter means in unison, and

(g) second drive means for driving said fan means for drawing air through said filter means, for forcing filtered air through said circular opening in said collar means and for producing an overpressure at the annular opening thereby preventing atmospheric air from penetrating said annular opening during operation.

4,099,943
COMPOSITE FLUID FILTERING MEDIUM AND METHOD OF MAKING
Kurt Fischman, New Milford, N.J.; Robert Offer, Racine, Wis.; Bernard Rudner, Ridgewood, N.J., and David Shepard, Racine, Wis., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Oct. 18, 1976, Ser. No. 733,290
Int. Cl.² B01D *39/16*
U.S. Cl. 55—487 **12 Claims**

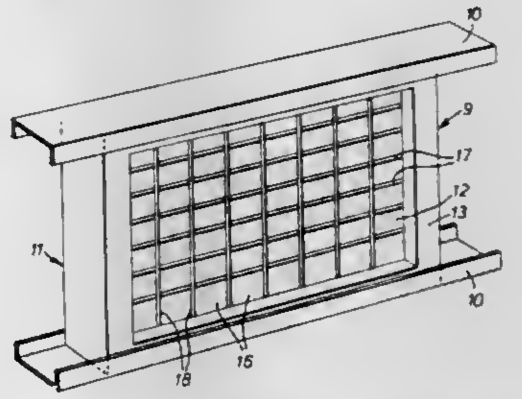


1. A fluid-permeable article of manufacture suitable for use in the removal of solid particles from a fluid by filtration, said article consisting of a layer of open cell polyurethane foam adhered by adhesive means to a layer of non-woven fibrous material of fine porosity relative to the porosity of the foam, said foam being impregnated with an impingement fluid, and said adhesive means being a permeable layer of a thermoplastic hot-melt adhesive.

10. A method for the manufacture of an article suitable for use in the removal of solid particles from a fluid by filtration which comprises subjecting a sandwich consisting of an outer layer of open cell polyurethane foam, an outer layer of nonwoven fibrous material of fine porosity relative to the porosity of the foam and an intermediate permeable layer of thermoplastic hot-melt adhesive to the action of heat and pressure whereby the adhesive is melted, following which the sandwich is cooled to solidify the adhesive, whereby the adhesive adheres the foam to the fibrous material, and following which the foam layer is impregnated with an impingement fluid.

4,099,944
FILTERS
Maurice Davis, Croydon, England, assignor to Davis Industrial (Equipment) Limited, Croydon, England

Continuation-in-part of Ser. No. 272,023, Jul. 14, 1972, abandoned. This application Aug. 7, 1974, Ser. No. 495,413
Claims priority, application United Kingdom, Jul. 14, 1971, 32968; Australia, Jul. 27, 1972, 45052; France, Jul. 17, 1972, 25728; Canada, Nov. 21, 1973, 186424
The portion of the term of this patent subsequent to Apr. 11, 1994, has been disclaimed.
Int. Cl.² B01D *46/10*
U.S. Cl. 55—501 **11 Claims**



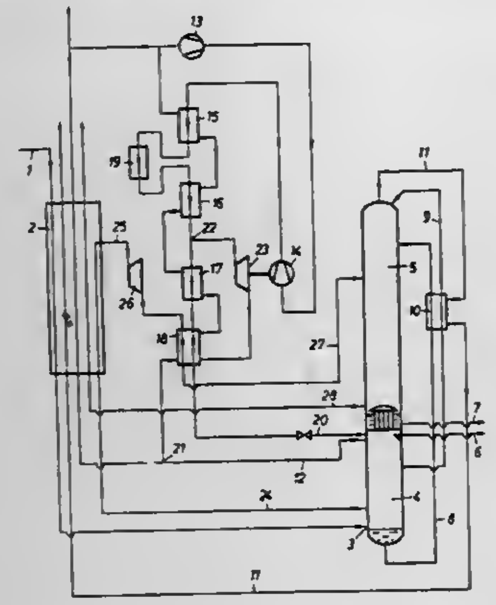
1. A disassemblable filter assembly comprising a filter unit and a sealing member extending around the periphery of the filter unit, the periphery of said filter unit being releasably sealingly received in a channel formed around the entire inner periphery of said sealing member by a pair of spaced apart opposed inwardly directed flanges, said filter unit comprising a resilient foamed synthetic plastic filter element, and a perforate filter support member including a grid portion which extends over a first face of said filter element and is provided at its periphery with a turned marginal portion which projects into and makes releasable locking engagement with one of said flanges of said sealing member so as to secure the filter unit to said sealing member.

4,099,945
EFFICIENT AIR FRACTIONATION
Werner Skolaude, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden Germany

Filed Oct. 27, 1976, Ser. No. 736,212
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1975, 2548222
Int. Cl.² F25J *3/04*
U.S. Cl. 62—30 **10 Claims**

1. In a process for the fractionation of air wherein the air is subjected to rectification in a high pressure column and a low pressure column, wherein in a liquefaction cycle, a first stream of nitrogen is withdrawn in the gaseous phase from the head of the high-pressure column and is heated, compressed and recooled then liquefied by expansion and recycled as liquid to the high-pressure column and wherein a second gaseous stream containing nitrogen is derived from the high pressure column, is preheated and is then expanded through a low-pressure expansion turbine, the improvement which comprises cooling

the second gaseous stream expanded in the low-pressure expansion turbine in an indirect heat exchange step with at least a portion of the first stream being heated in the liquefaction cycle.



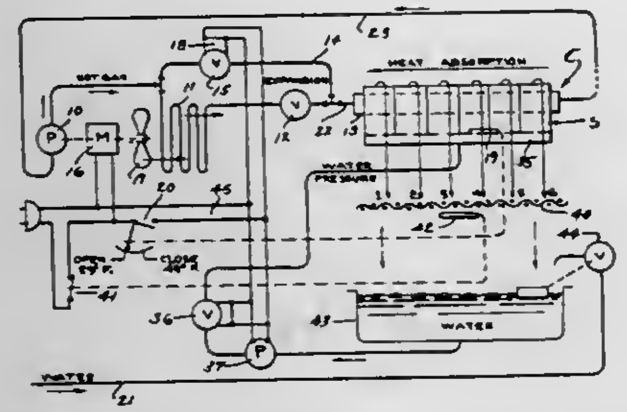
4,099,946
METHOD FOR PRODUCING ICE

Robert W. Alexander, Pasadena, Calif., assignor to Armalite, Inc., Costa Mesa, Calif.

Division of Ser. No. 462,887, Apr. 22, 1974, abandoned. This application Mar. 24, 1975, Ser. No. 561,197

Int. Cl.² F25C *5/10*

U.S. Cl. 62—73 **2 Claims**



1. The method of producing multi-form ice and comprising, holding still water in a series of stalls, the progressive application of heat absorption through said series of stalls of still water until all stalls are solidly iced, followed by the progressive application of heat through said series of stalls of solid ice until the ice-to-stall interfaces are thawed, and completed by the application of pressured water beneath said solid ice to refill said stalls by progressively floating and hydraulically ejecting the ice as a product therefrom, and the product cycling repeated by holding said refill water and applying said progressively applied heat absorption in place of said progressive application of heat.

4,099,947
CONCENTRATION OF COMESTIBLE LIQUIDS

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Houston, Tex.

Division of Ser. No. 320,594, Jan. 2, 1973, abandoned. This application Feb. 23, 1977, Ser. No. 771,128

Int. Cl.² B01D *9/04*

U.S. Cl. 62—532 **3 Claims**

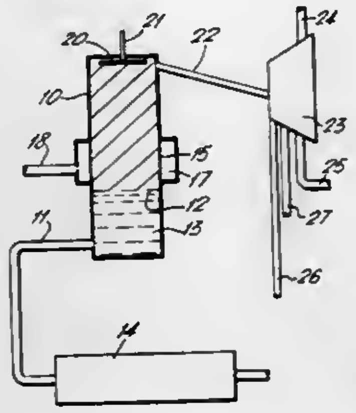
1. Apparatus for concentration of aqueous solutions comprising:

(a) a crystallizer,

(b) a draining tower connected to the crystallizer to receive ice-liquid slurry forced thereto from said crystallizer;

(c) filtering outlet means in said tower for removing filtered liquid from said tower;

(d) a centrifuge, and



(e) means for transferring ice from said tower to said centrifuge,

(f) said connection to said tower of said crystallizer being positioned below said filtering outlet means and said means for transferring being positioned above said filtering outlet means.

4,099,948
BUSHING FOR PROCESSING MOLTEN GLASS

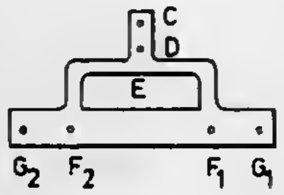
John Stuart Thomas, St. Helena, England, assignor to Fibreglass Limited, St. Helena, England

Continuation of Ser. No. 669,090, Mar. 22, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,257

Claims priority, application United Kingdom, Apr. 2, 1975, 13516/75

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **5 Claims**



1. In a bushing for processing molten glass comprising a bushing body having a bottom and side and end walls extending upwardly from said bottom to form a hollow container; a plurality of rows of orifices in the bottom of said body for delivering streams of molten glass for attenuation into fibers, and terminal means associated with each of said end walls for connection to a source of electrical energy for heating said bushing; the improvement comprising each of said end walls and its associated terminal means being cast as a single, weld-free, integral unit by a lost wax investment casting process in a vacuum furnace from a material selected from the group consisting of platinum and platinum/rhodium alloy.

4,099,949
METHOD OF REDUCING DETERIORATION OF ELECTRIC FURNACE REFRACTORY METAL COMPONENTS

Leonard Elmo Olds, Castle Rock, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 737,805, Nov. 1, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,925

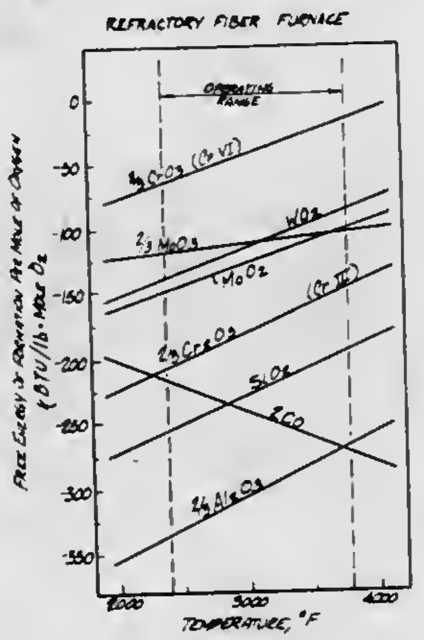
Int. Cl.² C03B *5/02*

U.S. Cl. 65—17 **18 Claims**

1. A process for the reduction or prevention of chromia-induced oxidative deterioration of components made of refrac-

tory metal selected from the group consisting of molybdenum, tungsten, rhenium, tantalum, osmium and iridium and alloys thereof in an electric furnace in which a chromia-containing oxide mixture is melted, which process comprises:

supplying to the furnace in addition to the oxide mixture an additive material which is in less than its maximum valence state and which can be oxidized by chromium dioxide or chromium trioxide to an oxide which has a lower free energy of formation per mole of oxygen than the oxides of the refractory metal and chromia, such that in operation the additive material is oxidized in preference to the oxidation of the refractory metal, acts to reduce the higher chromium oxides to chromia, and forms an oxide which is inert to the refractory metal, the reactive quantity of said additive being present as 25 to 50 percent by weight based on weight of chromia in the mixture.



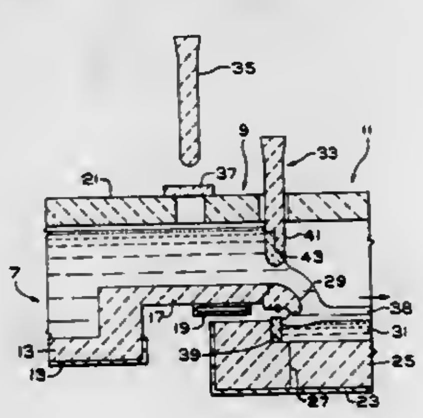
4,099,950
GLASS RIBBON APPARATUS WITH TWEEL EMPLOYING GLASSY SILICA GLASS CONTACT REFRACTORY

George A. Pecoraro, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1977, Ser. No. 821,671

Int. Cl.² C03B *18/02*

U.S. Cl. 65—99 A **5 Claims**



1. In a glassmaking apparatus comprising a glassmaking furnace and a glass forming chamber joined through a molten glass delivery means having a molten glass-supporting member and side members forming a glass flow channel and a tweel extending transversely across the channel for metering the flow of molten glass therethrough, the improvement which comprises a composite tweel having a lower, glass-contacting portion of a substantially glassy silica wherein the lower, glass-contacting portion of the tweel is connected to an upper portion of the tweel of thermal shock-resistant refractory material along an interface which is substantially immediately below a first intended glass surface intersection on an upstream face facing the glassmaking furnace and substantially immediately above a lower second intended glass surface intersection on a downstream face facing the glass forming chamber which second intersection is at a location below the intersection between the interface and the upstream face of the tweel.

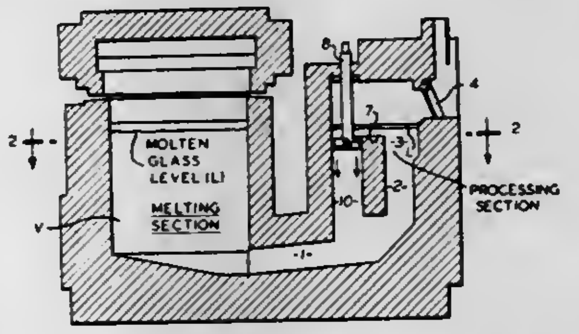
4,099,951
GLASS MELTING FURNACE AND PROCESS WITH RECIRCULATION OF MOLTEN GLASS

Helmut Pieper, Lohr, Germany, assignor to Sorg GmbH & Co. KG, Plochsbach, Germany

Continuation-in-part of Ser. No. 694,863, Jun. 10, 1976, Pat. No. 4,046,547. This application Jun. 7, 1977, Ser. No. 804,404

Int. Cl.² C34B *5/18*

U.S. Cl. 65—135 **8 Claims**



1. Method for operating a glass melting furnace having a melting zone and at least one processing zone disposed adjacent to said melting zone and which is connected by a passage thereto, the method which comprises causing molten glass to flow from said melting zone to said processing zone, withdrawing a portion of the molten glass from the top of said processing zone laterally in a surface flow, recirculating the withdrawn portion of molten glass to said processing zone or to a separate refining zone by flowing the recirculated portion of molten glass into the passage connecting the melting zone and the processing zone and applying a submerged, downwardly directed impulse to the recirculated glass.

4. Glass melting furnace comprising melting means and at least one processing tank means communicating with said melting means through passage means, recirculating passage means connecting the top of the processing tank means and said passage means, and means connected with said passage means for establishing a recirculating flow of molten glass via said recirculating passage means comprising submerged agitator means operating in the direction of flow for applying a submerged downwardly directed impulse to the recirculating glass.

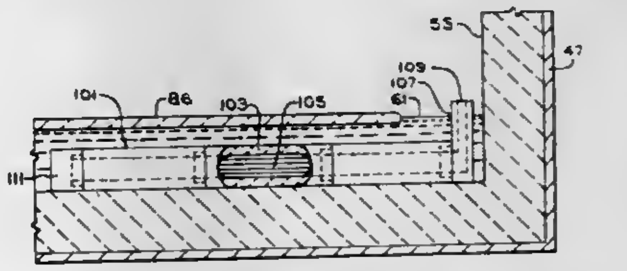
4,099,952
MOVABLE SUBMERSIBLE DAM BARRIER FOR USE IN A GLASS FORMING CHAMBER

Ronald L. Schwenninger, Wiley Ford, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 18, 1977, Ser. No. 816,424

Int. Cl.² C03B *18/02*

U.S. Cl. 65—182 R **10 Claims**



1. In a glass forming chamber comprising an enclosure con-

taining a pool of molten metal for supporting glass during its formation as the glass is advanced along the surface of the pool of molten metal and cooled to form a continuous sheet of glass, wherein submersible dam barriers are provided in the pool of molten metal beneath its surface for selectively controlling the flow of molten metal to establish desired thermal conditions, each submersible dam barrier comprising an inner body of material more dense than the molten metal and an outer covering of material which is substantially free from attack by the molten metal, the improvement which comprises

an inner body comprising a dense metal packed in a particulate material within said outer covering wherein said particulate material provides a sufficient void space for the passage of a gas through it along the interior portion of the dam barrier inside said outer covering and

means connected to an end of said dam barrier for venting the interior portion of said dam barrier including a substantially enclosed conduit in communication with the interior portion of said dam barrier containing said particulate packing material.

4,099,953
INSTALLATION FOR HEATING STARTING MATERIALS FOR GLASS MELTING

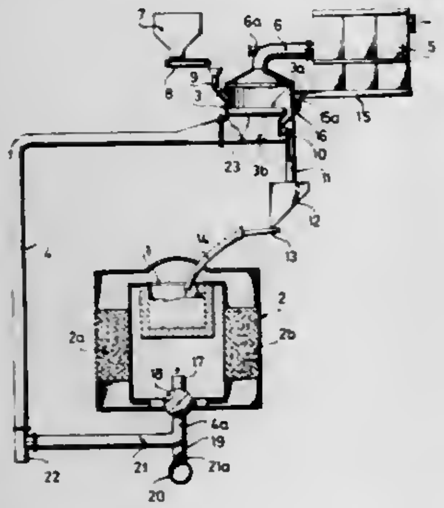
Louis Roodeaux, Velaines; Jules Legrand, Brussels, both of Belgium, and Claude Baelde, Saint-Germain en Laye, France, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Nov. 10, 1977, Ser. No. 850,087

Claims priority, application Belgium, Nov. 12, 1977, 848251

Int. Cl.² C03B *5/16*

U.S. Cl. 65—335 **15 Claims**



1. An installation for heating starting materials intended for the melting of glass comprising a melting furnace and a preheater for the starting materials which is arranged upstream of the melting furnace and a preheater for the starting materials which is arranged upstream of the melting furnace and to which is connected a pipe for introducing the residual gases from the furnace, characterised in that a fluidised-bed preheater (3) provided with a discharge lack (10, 37) is used as the preheater for the starting materials and in that a high-performance dust remover (5), of which the dust discharge pipe (15*a*) is connected to the discharge lock of the fluidised bed, is connected to the residual gas pipe (6) of the fluidised-bed preheater. lock

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4,099,954
AMIDE PHOSPHOROTHIOLATE HERBICIDES

Shunichi Hashimoto, Takarazuka, and Kunio Mukai, Nishinomiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

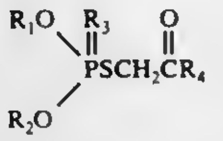
Filed Aug. 11, 1976, Ser. No. 713,595

Claims priority, application Japan, Aug. 28, 1975, 50-104630; Mar. 31, 1976, 51-36541

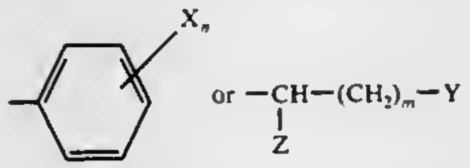
Int. Cl.² A01N *9/36;* C07F *9/65, 9/60, 9/18*

U.S. Cl. 71—87 **5 Claims**

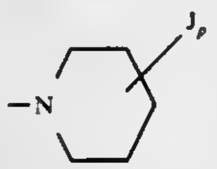
1. A compound of the formula:



wherein R_1 and R_2 are each a group of the formula



in which X is lower alkyl or halogen; Y is halogen; Z is hydrogen or methyl; *m* is an integer of 1 to 2; *n* is an integer of from 0 to 2; R_3 is oxygen or sulfur; R_4 is



in which J is lower alkyl and *p* is an integer of from 0 to 2; pyrrolidino or hexamethyleneimino.

4. A herbicidal composition which comprises as an active ingredient an effective amount of the compound according to claim 1, and an inert carrier.

5. A method for controlling the undesired growth of grasses or weeds which comprises applying an effective amount of the compound according to claim 1 to the area where the control of the grasses or weeds is desired.

4,099,955
PLANT REGULATING COMPOUNDS

Claude Clapot, Oullins; Jean Vial, Tassin, and Louis Dumont, Chaponost, all of France, assignors to Philagro, Lyons, France

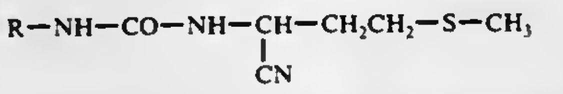
Continuation-in-part of Ser. No. 472,471, May 22, 1974, Pat. No. 3,990,883, which is a division of Ser. No. 725,295, Sep. 21, 1976. This application Oct. 20, 1976, Ser. No. 734,172

Claims priority, application France, May 22, 1973, 73 19579

Int. Cl.² A01N *9/12*

U.S. Cl. 71—98 **12 Claims**

1. A composition for plant growth regulation comprising an inert agricutural carrier and an amount sufficient to regulate plant growth of a compound of the formula



$$R-NH-CO-NH-\underset{\displaystyle CN}{\underset{|}{CH}}-CH_2CH_2-S-CH_3$$

wherein R is H, alkyl of 1-5 carbons naphthyl, phenyl or chlorinated phenyl with the proviso that R is not 3,5-dichlorophenyl.

4,099,956
HERBICIDAL SEMICARBAZONES

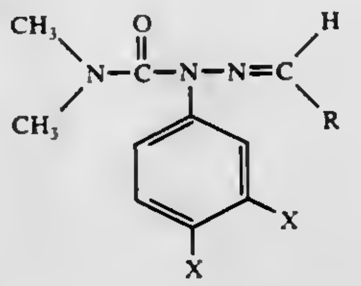
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 466,103, May 20, 1974, which is a continuation of Ser. No. 283,686, Aug. 25, 1972, abandoned. This application Oct. 15, 1976, Ser. No. 732,678

Int. Cl.² A01N *9/20*

U.S. Cl. 71—120 **7 Claims**

1. A compound of the formula



wherein R is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms and one of X is halogen of atomic number 9 to 35 inclusive, or trifluoromethyl and the other is halogen or alkoxy in which the alkyl portion is straight or branched chain and contains from 1 to 4 carbon atoms.

4,099,957
RIPENING OF SUGARCANE BY USE OF ALCOHOLS

Louis G. Nickell, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,341

Int. Cl.² A01N *9/24*

U.S. Cl. 71—122 **15 Claims**

1. A process for increasing the sugar yield of grown sugarcane which comprises applying an effective amount of isobutanol as a sugarcane ripening agent to the cane at a time at least about 2 and up to about 10 weeks prior to harvest.

4,099,958
METHOD OF PRODUCING VANADIUM

Donald R. MacRae, Bethlehem; Richard G. Gold, Coopersburg; William R. Sandall, and Charles D. Thompson, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 9, 1976, Ser. No. 675,672

Int. Cl.² C22F *1/02;* C22B *34/22;* C22C *1/04*

U.S. Cl. 75—0.5 BA **3 Claims**

1. A method of producing vanadium and alloys thereof, comprising:

(a) introducing a blended dispersal of discrete particles of vanadium oxides and a carbonaceous substance into a plasma arc torch,

(b) establishing an arc in said torch to at least partially melt said blended particles together, and

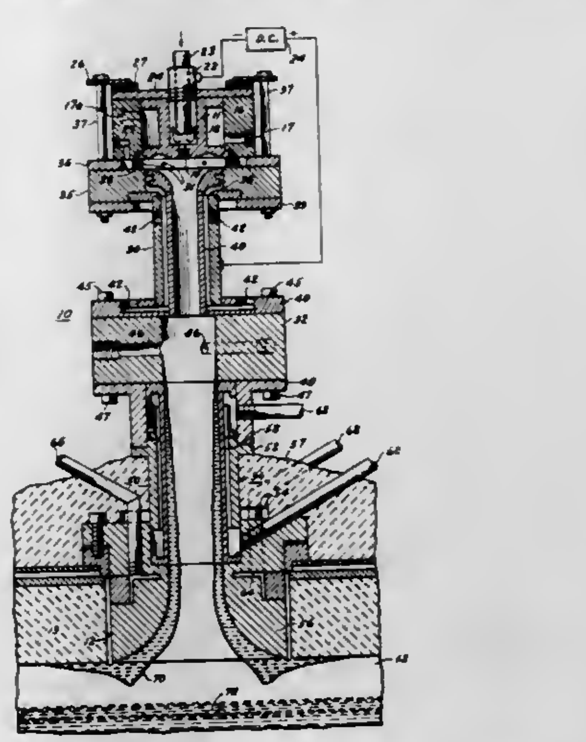
(c) causing said blended, at least partially melted particles to slowly descend along the walls of said torch whereby the carbon in said carbonaceous substance reduces said vanadium oxides substantially completely to vanadium metal.

3. A method of producing vanadium and alloys thereof, comprising:

(a) partially reducing a first mixture of solid particles comprising primarily vanadium pentoxide into a second mixture of solid particles comprising primarily a higher melting point vanadium oxide in which iron powder is added to said second mixture of solid particles to lower the melting point of said second mixture;

(b) supplying a stabilizing gas stream adjacent the cathode of a plasma arc torch comprising a cathode and an anode;

(c) introducing said second mixture of solid particles into said torch between the ends of said anode, establishing an arc between said cathode and said anode, and reacting a reductant with the vanadium oxides in said second mixture of particles; and



(d) recovering vanadium and alloys thereof.

4,099,959
PROCESS FOR THE PRODUCTION OF ALUMINIUM

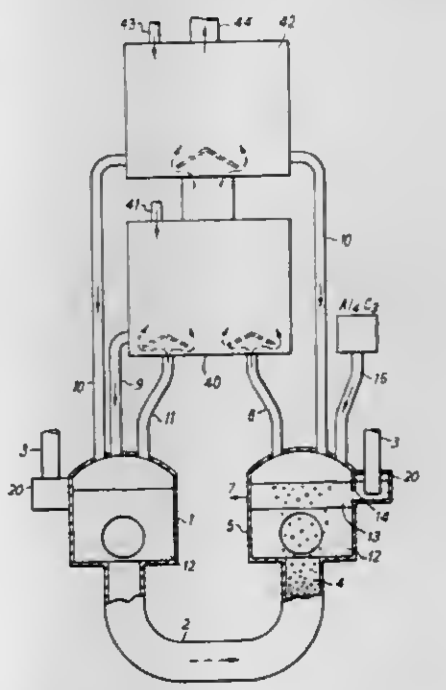
Ernest William Dewing, Arvida; Jean-Paul Robert Huni, Kingston; Raman Radha Sood, Arvida, and Frederick William Southam, Kingston, all of, Calif., assignors to Alcan Research and Development Limited, Montreal, Canada

Filed May 23, 1977, Ser. No. 799,762

Claims priority, application United Kingdom, May 28, 1976, 22474/76

Int. Cl.² C22B *21/02*

U.S. Cl. 75—10 R **19 Claims**



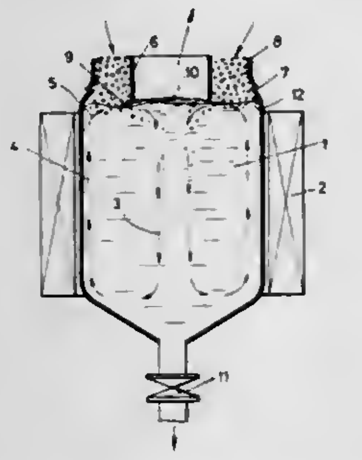
1. A process for the production of aluminium metal which includes the steps of establishing a circulating stream of molten alumina slag containing combined carbon in the form of at least one of aluminum carbide and aluminum oxycarbide, circulating said stream of molten alumina slag through a series of alternately arranged low temperature zones and high temperature zones, each low temperature zone being maintained at

least in part at a temperature at or above that required for reaction of alumina with carbon to form aluminium carbide but the whole of each low temperature zone being at a temperature below that required for reaction of aluminium carbide with alumina to release Al metal, forwarding said stream of molten alumina slag from a low temperature zone to a high temperature zone maintained at least in part at a temperature at or above a temperature required for reaction of aluminium carbide with alumina to release Al metal, collecting and removing Al metal released at said high temperature zone, forwarding said molten alumina slag from said high temperature zone to a succeeding low temperature zone, introducing carbon to the circulating stream of alumina slag in said low temperature zone, introducing alumina into said circulating slag stream at at least one location and removing evolved gases, said series including at least one low temperature zone and at least one high temperature zone.

4,099,960

METHOD OF SMELTING METALLIC MATERIAL, PARTICULARLY IRON SPONGE

Bernd Olschewski, Duisburg, and Werner Wenzel, Aachen, both of Germany, assignors to Demag A.G. Duisburg, Germany
Continuation of Ser. No. 658,041, Feb. 13, 1976, abandoned. This application May 31, 1977, Ser. No. 801,651
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2506926
Int. Cl.^{2} C21C *5/52*
U.S. Cl. 75—11 **1 Claim**



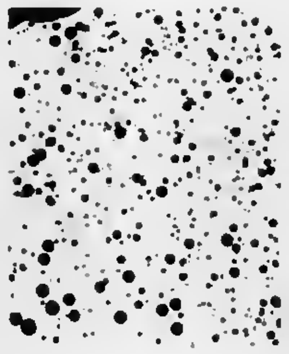
1. A method for smelting a metallic material in an induction crucible furnace, characterized by

(a) introducing charge material adjacent the top surface of an induction crucible furnace;
(b) heating said charge material to form a hot bath and to reduce said charge material;
(c) separating the top surface of said bath into a central portion and an outer annular portion so as not to produce a central dome;
(d) said introducing step being carried out continuously into said annular outer portion;
(e) while carrying out said heating step, applying an induced magnetic current flowing upwardly along the walls of said furnace to cause an upward flow path in said bath along the walls of said bath, and a downward flow path adjacent the axis of said path;
(f) said applying step causing a radial inward flow in said bath adjacent the top surface toward the axis of said bath;
(g) said introducing step causing impact of said introduced charge material with said upward flow path and the movement thereof radially inwardly toward the axis of said bath;
(h) collecting slag from said bath at the segregated central portion of the surface thereof;
(i) removing slag from said segregated central portion; and
(j) withdrawing said reduced material adjacent the bottom of said furnace as product.

4,099,961

CLOSED CELL METAL FOAM METHOD

James W. Patten, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Dec. 21, 1976, Ser. No. 752,935
Int. Cl.^{2} C22F *1/02, 1/04, 1/08, 1/11*
U.S. Cl. 75—20 F **7 Claims**



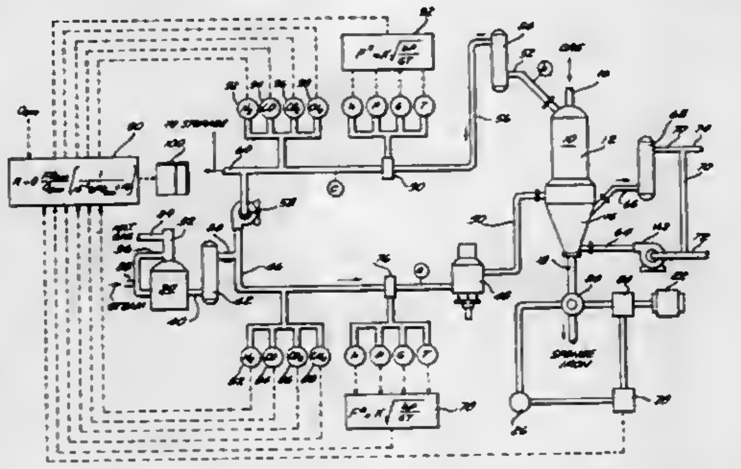
1. Method for preparing a metal or metal alloy foam body having a closed cellular structure comprising:

a. preparing, by sputter deposition, a solid metal or metal alloy body containing entrapped atoms of inert gas evenly distributed throughout the body;
b. heating the body containing the entrapped gas to a temperature slightly above the melting temperature of the metal;
c. maintaining the temperature for a period of time sufficient to permit the entrapped gas to expand within the molten body to form individual cells of expanded entrapped gas; and
d. cooling the body containing the entrapped expanded gas to below the melting temperature of the metal, thereby forming a metal foam body having a closed cellular structure.

4,099,962

METHOD AND APPARATUS FOR MEASURING AND CONTROLLING THE PERCENTAGE REDUCTION OF ORE IN A MOVING BED GASEOUS REDUCTION REACTOR

Patrick W. MacKay; Enrique Martinez Vera, and Ramon de la Pena, all of Monterrey, Mexico, assignors to Grupo Industrial Alfa, S.A., Monterrey, Mexico
Filed Jan. 5, 1976, Ser. No. 646,496
Int. Cl.^{2} C22B *1/10*
U.S. Cl. 75—26 **9 Claims**



1. A process for producing sponge metal by the gaseous reduction of oxidic metal ore in a vertical moving bed reactor,

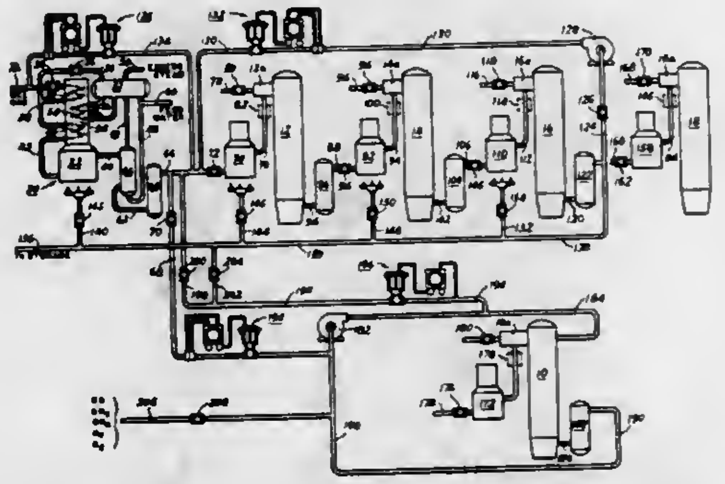
said process comprising the steps of charging ore to the reactor, feeding a reducing gas comprising carbon monoxide, hydrogen, methane and carbon dioxide through the ore in said reactor, cooling the effluent gas from said reactor to remove water therefrom, and determining the extent to which reduction of said ore occurs in said reactor by

(1) measuring the flow and composition of the reducing gas at a first location before said gas enters said reactor,
(2) measuring the flow and composition of the effluent reducing gas from the reactor at a second location after the effluent gas has been cooled,
(3) determining the difference between
  (a) the sum of the change in molar flow of hydrogen and twice the change in molar flow of methane between said two locations and
  (b) the sum of the change in molar flow of carbon monoxide and twice the change in molar flow of carbon dioxide between said two locations as a first value indicative of the rate of removal of oxygen from said ore.
(4) measuring the rate at which sponge metal is processed through said reactor,
(5) effectively determining from said processing rate a second value indicative of the rate at which reducible oxygen enters said reactor with said ore and
(6) comparing said first and second values to obtain a third value indicative of the percentage reduction in said reactor.

4,099,963

METHOD FOR THE BATCHWISE REDUCTION OF METAL ORES

Patrick W. MacKay, Monterrey, Mexico, assignor to Fierro Esponja, S.A., Monterrey, Mexico
Continuation-in-part of Ser. No. 635,655, Nov. 26, 1975, Pat. No. 4,067,728, which is a continuation of Ser. No. 516,095, Oct. 18, 1974, abandoned. This application Jun. 16, 1976, Ser. No. 696,488
Int. Cl.^{2} C21B *13/02*
U.S. Cl. 75—35 **27 Claims**



1. A method for the batchwise gaseous reduction of metal oxides to metals in a multiple unit reactor system of the type in which separate fixed beds of metal-bearing material are simultaneously treated in a plurality of interchangeable reactors including a cooling reactor and at least one reduction reactor, which method comprises preparing a preformed reducing gas composed largely of carbon monoxide and hydrogen outside of the reactor system causing at least a portion of said preformed reducing gas to flow successively through the bed of metal-bearing material in said cooling reactor and then through the bed of metal-bearing material in said reduction reactor or reactors, heating said reducing gas before it is fed to each said reduction reactor or reactors, cooling and de-watering said gas after it leaves each said reduction reactor or reactors, and after said reducing gas has passed through said cooling reactor mixing a small amount of fluid hydrocarbon with the reducing gas fed to at least one reduction reactor of said system prior to the point at which said reducing gas is heated, to increase the productivity of said reduction system.

4,099,964

RECYCLING OF IRON VALUES

Maurice D. Henery, Evanston; Ernest B. Snyder, South Holland, and Walter W. Walker, Matteson, all of Ill., assignors to Marblehead Lime Company, Chicago, Ill.
Continuation of Ser. No. 662,943, Mar. 1, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,933
Int. Cl.^{2} C21C *7/00, 5/36*
U.S. Cl. 75—52 **5 Claims**

1. In the operation of a basic oxygen furnace wherein iron is introduced along with a flux addition to provide a furnace charge for refining the iron, said flux addition including dolomitic lime in amounts between 15 and 60 pounds per ton of furnace charge, a slag layer being formed in the furnace and an equilibrium condition of iron oxide content calculated as FeO being developed between the slag layer and the metal bath, the improvement comprising a method for recycling iron values from compounds comprising iron and iron oxide, said method comprising the steps of preparing a mixture by mixing such compounds in particulate form together with dolomite, the mixture including sufficient iron values such that the reaction products after calcination will contain in excess of 20 percent and up to 50 percent by weight iron values, calculated as Fe_2O_3, providing such calcination by heating the mixture in a kiln to a temperature in excess of 2000° F. whereby the output of the kiln comprises said reaction products, forming said flux addition by substituting said output in the flux addition in an amount from 20 to 100 percent of said dolomitic lime portion of the flux, and introducing the flux addition including said output from the kiln into said furnace along with said iron, said slag layer being enriched in iron oxide by reason of the presence of said output in said flux addition whereby the depletion of iron values from said bath in order to reach said equilibrium condition is substantially minimized.

4,099,965

METHOD OF USING $MgCl_2$-KCl FLUX FOR PURIFICATION OF AN ALUMINUM ALLOY PREPARATION

Jean Claude Béguin, Brussels, Belgium, and Pierre Guérit, Chambery, France, assignors to Servimetal, Chambery, France
Filed Sep. 22, 1976, Ser. No. 725,556
Claims priority, application France, Sep. 26, 1975, 75 30276
Int. Cl.^{2} C22B *21/06*
U.S. Cl. 75—68 R **1 Claim**

1. A process for removing the sodium and calcium metals present in an aluminum-magnesium alloy consisting essentially of melting a flux containing from about 60 to 80% by weight of $MgCl_2$ and from about 40 to 20% by weight of KCl, distributing the flux in the form of grains over the bottom of a preheated casting ladle, whereby the flux is absorbed by the lining of the ladle, casting the aluminum-magnesium alloy in melt form into the ladle, purifying the cast aluminum-magnesium alloy by slow release of the flux in contact with the alloy, and recovering a purified aluminum alloy.

4,099,966

AUSTENITIC STAINLESS STEEL

Joseph A. Chivinsky, Sarver, and Harry E. Deverell, Natrona Heights, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.
Filed Dec. 2, 1976, Ser. No. 746,968
Int. Cl.^{2} C22C *38/16, 38/42, 38/58*
U.S. Cl. 75—125 **15 Claims**

1. A hot workable austenitic stainless steel of superior pitting and crevice corrosion resistance to the chloride ion, consisting essentially of, by weight, from 19 to 23% chromium, 8 to 16% nickel, 3.5 to 4.5% molybdenum, 7.5 to 15% manganese, up to

0.01% sulfur, 0.01 to 0.1% of at least one element from the group consisting of cerium, calcium and magnesium, nitrogen from 0.2% up to its solubility limit, up to 0.1% carbon, up to 1% silicon, up to 3% copper, up to 1% columbium, up to 0.3% vanadium, up to 0.3% titanium, balance essentially iron; said steel being characterized by a weight loss of one part or less in 10,000, in a 72 hour room temperature 10% ferric chloride, 90% distilled water rubber band test.

4,099,967

GALLING RESISTANT AUSTENITIC STAINLESS STEEL

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 14, 1976, Ser. No. 751,022
Int. Cl.^{2} C22C *38/02, 38/58*

U.S. Cl. 75—128 A **2 Claims**

1. Austenitic stainless steel having a galling resistance of at least 40 ksi stress when rotated against itself by the test described herein, a stress corrosion resistance of greater than 90 hours to failure at 50–60 ksi stress in boiling magnesium chloride (42% concentration), a Huey rate of not greater than 0.005 inches per month after reheating at 850° C for a time up to four hours, and good high temperature oxidation resistance, consisting essentially of, by weight percent, about 14 to about 16% chromium, about 14 to about 17% nickel, 0.5 to about 3.0% manganese, about 4.0 to about 5.5% silicon, about 0.03 to about 0.10% carbon, about 0.03% maximum nitrogen, about 0.05% maximum phosphorus, about 0.05% maximum sulfur, and balance iron except for incidential impurities.

4,099,968

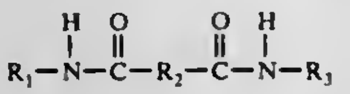
DICARBOXYLIC ACID BIS-AMIDES IN ELECTROSTATIC IMAGING COMPOSITIONS AND PROCESSES

Charles G. Scouten, Webster, N.Y., and Willard C. Hamilton, Morganville, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 3, 1976, Ser. No. 692,255
Int. Cl.^{2} G03G *9/00, 13/08*

U.S. Cl. 96—1 SD **8 Claims**

1. An image developing material comprising particles, said particles including finely divided toner material and an active amount, based on the weight of said toner material, of a separate additive of the formula



$$R_1-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-R_2-\overset{O}{\overset{\|}{C}}-\overset{H}{\overset{|}{N}}-R_3$$

wherein R_1 and R_3 are individually defined as a H, phenyl, lower alkyl-substituted phenyl, or lower alkyl group, where lower alkyl contains from 1 to about 7 carbon atoms in a branched, unbranched, or cyclic configuration; and

R_2 is defined as an alkylene group of 2 to about 22 carbon atoms, phenylene, naphthylene, lower alkyl-substituted phenylene, or lower alkyl-substituted naphthylene group in which lower alkyl substituents contain 1 to about 7 carbon atoms in straight, branched, or cyclic chain configuration.

4,099,969

COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTORS

Lewis B. Leder, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 513,695, Oct. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 477,737, Jun. 10, 1974, abandoned. This application Aug. 15, 1975, Ser. No. 605,135
Int. Cl.^{2} B05D *3/06*

U.S. Cl. 96—1.5 R **16 Claims**

1. A method for obtaining flexible photoreceptors having improved durability and adhesion between a metal- or metal-coated substrate thereof, and a photoconductor layer thereof containing inorganic photoconductive material in charge blocking contact with the substrate, comprising exposing a clean oxide-coated conductive substrate to an ambient atmosphere consisting of one or more inert gases, a vapor cloud containing photoconductive material in a glow discharge, said atmosphere being nonreactive with said photoconductive material so that no new photoconductive materials are formed during said glow discharge.

4,099,970

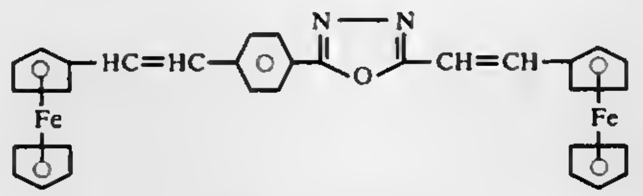
DERIVATIVES OF 1,3,4-OXADIAZOLE AND ELECTROPHOTOGRAPHIC ELEMENTS CONTANING SAME

Mitsuo Okazaki, Tama; Akihiro Yamaguchi, Yokohama, and Masaomi Sasaki, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

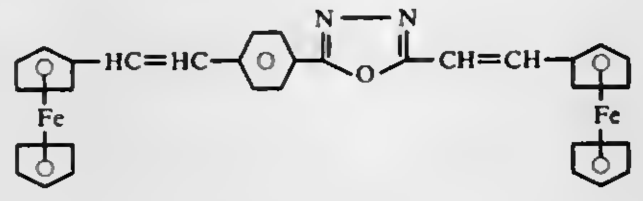
Division of Ser. No. 784,618, Apr. 4, 1977. This application Dec. 22, 1977, Ser. No. 863,128
Claims priority, application Japan, Apr. 12, 1976, 51-40374
Int. Cl.^{2} C07D *271/00;* **G03G** *5/06*

U.S. Cl. 96—1.5 N **7 Claims**

1. A compound having the formula



2. In an electrophotographic plate comprising a conductive support and a photosensitive layer on said support, said photosensitive layer consisting essentially of charge-generating pigment, charge-transport material and binder agent, the improvement which comprises: said charge-transport material is a compound having the formula



4,099,971

METHOD FOR FABRICATING REFLECTION INFRARED HOLOGRAMS

Andrejs Graube, Venice, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 30, 1976, Ser. No. 755,755
Int. Cl.^{2} G03C *5/04, 11/00, 5/32;* **G02B** *3/00*

U.S. Cl. 96—27 H **6 Claims**

1. A method of forming a reflective latent hologram suitable for reconstruction at infrared wavelengths comprising:

(a) first exposing a photographic silver halide emulsion film to the coherent beams emanating from a visible light source to form a latent image in said film comprised of fringe lines having preselected spacings and orientations,

(b) causing said exposed film to be developed and fixed in a manner suitable for conventional photographic processes,

(c) treating said film with swelling agents which cause said film to expand until a preselected volume is obtained and said fringe line spacings have been increased to a preselected distance thereby enabling said film to reflect IR radiation, and

(d) geometrically fixing said expanded film to prevent further expansion or loss in volume.

4,099,972

DYE IMAGE FORMING PROCESS USING SHIFTED AZO DYE DEVELOPER

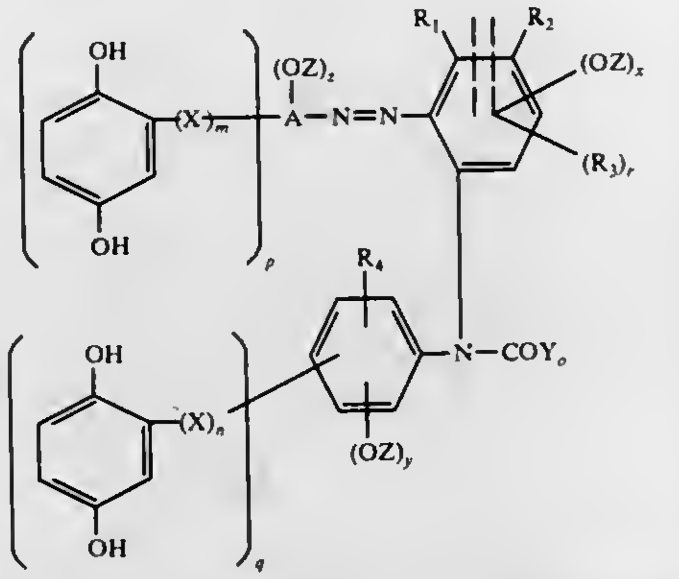
Yuzuru Sato; Ryuichiro Kobayashi, both of Hachioji; Naoshi Kunieda; Kazumasa Watanabe, both of Tokyo; Noboru Mizukura, Hachioji; Kenji Yoshida, Yokohama, and Tadanori Oya, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Konishiroku Photo Industry Co., Ltd., both of Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,548
Claims priority, application Japan, Aug. 2, 1975, 50-94293; Jun. 19, 1976, 51-72402
Int. Cl.^{2} G03C *5/54, 1/40, 1/10*

U.S. Cl. 96—29 D **5 Claims**

1. In a process for forming a dye image on a receiving element by diffusion transfer from a photosensitive element comprising a support and a silver halide photosensitive layer thereon wherein said photosensitive element is imagewise exposed, the improvement comprising:

(a) processing the exposed photosensitive element with an alkaline solution in the presence of a dye developer having one azo radical therein to form an image of a diffusible dye in said photosensitive element, said dye developer being represented by the formula



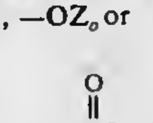
wherein A represents substituted or unsubstituted aromatic hydrocarbon, aromatic heterocyclic ring, or active methylene or active methine-containing compound-residue which can have at least one substituent selected from alkyl, aromatic hydrocarbon, alkoxy, aryloxy, halogen, nitro, cyano, acylamino, alkylamino, amyl, acyloxy, aralkyl, hydroxyl, amino, carbamoyl, sulfamoyl, and arylamino;

R_1, R_2, and R_3 individually represent hydrogen, halogen, nitro, alkyl, halogen-substituted alkyl, alkyloxy, aryloxy, alkylamido, arylamido, carbamoyl or sulfamoyl, and R_1 and R_2 can co-operatively form a naphthalene nucleus and, in that case, R_3 is bonded to any position of the naphthalene nucleus;

R_4 represents hydrogen, alkyl, aromatic hydrocarbon, alkoxy, aryloxy, halogen, nitro, cyano, acylamino, alkylamino, amyl, acyloxy, aralkyl, hydroxyl, amino, carbamoyl, sulfamoyl, and arylamino;

X represents a —CO—, —N(alkyl)—, —NH—, —S—, —O—, —SO_2—, alkylene, allylene, —NHCO alkylene—, —SO_2NH alkylene—, NHCO alkylene S—, divalent alicyclic or divalent heterocyclic group;

Yo represents alkyl of 1 to 5 carbon atoms being substituted with at least one halogen in at least one of α- or β- positions of the alkyl, —OZ_o or



$$-\overset{O}{\overset{\|}{C}}O-X_o$$

in which Z_o is unsubstituted or substituted alkyl of 1 to 5 carbon atoms or unsubstituted or substituted phenyl, and X_o is hydrogen or a substituent as defined in Z_o,

Z represents hydrogen or acyl; m and n are individually a value of 0 or 1; p and q are individually a value of 0 or 1, but the sum of p and q is 1 or more, r is an integer of 1 to 5; and x, y and z are individually a value of 0, 1 or 2, provided that when A is aromatic hydrocarbon, $x+y+z$ is 1 or 2 and, when A is other than aromatic hydrocarbon, $x+y$ is 1 or 2; and

(b) superimposing the receiving element on the photosensitive element at least during said processing step whereby the diffusible dye image is transferred onto the receiving element.

4,099,973

PHOTO-SENSITIVE BIS-AZIDE CONTAINING COMPOSITION

Kiyoshi Miura, and Yoshifumi Tomita, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 497,035, Aug. 13, 1974, abandoned. This application Sep. 14, 1976, Ser. No. 723,063
Claims priority, application Japan, Oct. 24, 1973, 48-119007
Int. Cl.^{2} G03C *1/52, 1/70*

U.S. Cl. 96—115 R **7 Claims**

1. A photosensitive composition consisting essentially of an admixture of crosslinking agent consisting of a bisazide compound, a water-soluble polymer substance which may be photo-crosslinked by said bisazide compound and an effective amount of a water-soluble alcohol having 4 to 6 hydroxyl groups to accelerate a photo-crosslinking reaction between said water-soluble polymer substance and said bisazide compound when said composition is exposed to a small dosage of ultraviolet rays, said water-soluble polymer substance being selected from the group consisting of polyvinyl pyrrolidone, polyacrylamide, polyvinyl alcohol, gelatine, acrylamide-diacetone acrylamide copolymer, acrylamide-vinyl alcohol copolymer, acrylamide-vinylpyrrolidone copolymer and a mixture thereof.

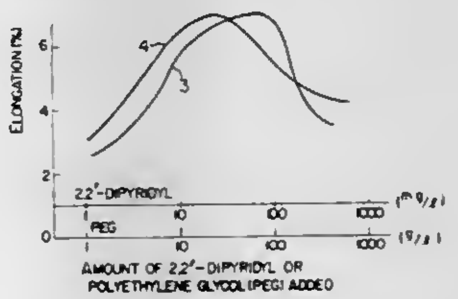
4,099,974

ELECTROLESS COPPER SOLUTION

Hirosada Morishita; Mineo Kawamoto; Motoyo Wajima, and Kanji Murakami, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 10, 1976, Ser. No. 665,708
Claims priority, application Japan, Mar. 14, 1975, 50/30147
Int. Cl.^{2} C23C *3/02*

U.S. Cl. 106—1.23 **8 Claims**



1. In an electroless copper solution containing an aqueous solution consisting of a copper salt, a complexing agent, a reducing agent and pH-adjusting agent, and having a high pH, the improvement wherein said copper solution further contains 5 to 300 mg/l 2,2'-dipyridyl or 1 to 50 mg/l of 2,9-dimethyl-1,10-phenanthroline and at least 1 g/l of polyethylene glycol, has a pH of 12.5 to 13.5, measured at 20° C. and is capable of providing a copper film having an elongation greater than 3%.

4,099,975

INTUMESCENT FIRE RETARDANT COMPOSITIONS CONTAINING PENTAERYTHRITOL CYCLIC DIPHOSPHATES

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

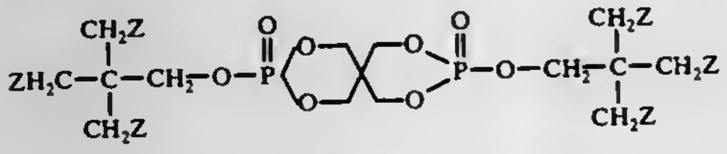
Continuation-in-part of Ser. No. 616,935, Sep. 26, 1975, Pat. No. 3,978,167, which is a continuation-in-part of Ser. No. 429,607, Jan. 2, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,282

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.² C08K *5/53*

U.S. Cl. 106—15 FP **9 Claims**

1. An intumescent composition comprising a coating vehicle and an intumescing amount of an intumescent agent of the formula



wherein each Z is independently selected from the group consisting of hydrogen and halogen.

4,099,976

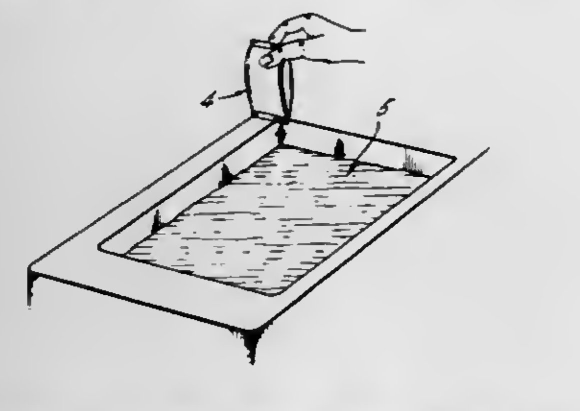
WATER-DISPERSIBLE BIODEGRADABLE COMPOSITIONS AND CONTAINERS AND THE LIKE MADE THEREFROM

Kenneth S. Kraskin, Milltown, and Mohamed W. Hammad, Old Bridge, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Division of Ser. No. 527,737, Nov. 27, 1974, Pat. No. 3,954,104. This application Jan. 21, 1976, Ser. No. 651,081

Int. Cl.² C08L *1/28;* **C09J** *3/04*

U.S. Cl. 106—15 R **14 Claims**



1. A thermoplastic, water-dispersible, biodegradable composition of matter comprising hydroxyalkyl cellulose, starch, and an antimycotically-effective amount of a member selected from the group consisting of sorbic acid and its alkali metal salts, whereby the composition is biodegradable after disposal but resistant to fungal attack prior to dispersal.

4,099,977

SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 637,351, Dec. 3, 1975, Pat. No. 4,038,091, which is a division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, Apr. 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974, Pat. No. 3,967,973, which is a continuation of Ser. No. 246,316, Apr. 21, 1972, abandoned. This application Jan. 27, 1977, Ser. No. 810,231

Int. Cl.² C03C *3/10, 3/04*

U.S. Cl. 106—53 **20 Claims**

1. In a sealing glass paste comprising a PbO-containing sealing glass frit, a binder for said frit and a solvent for said binder, the improvement wherein said sealing glass paste having present with said sealing glass frit an amount of powder sufficient to prevent reduction of the PbO during sealing of said sealing glass frit, said powder being a higher oxide of a cation which is thermally stable at the temperature at which such sealing glass frit seals and which can be chemically reduced to a lower oxide of the cation when exposed to said reducing conditions, said lower oxide of said cation being compatible with the fired sealing glass, said higher oxide of said cation being selected from the group consisting of Pb_3O_4, BaO_2, CrO_3, MnO_2, Mn_2O_3, Fe_2O_3, Fe_3O_4, CuO, Cu_2O, $Zr_2.H_2O$, Tl_2O_3, Sb_2O_3, TeO_2, Ta_2O_5, Nb_2O_5, V_2O_5, CeO_2, and Bi_2O_3.

4,099,978

HIGH REFRACTIVE INDEX HYDRATED GLASSES

Roger F. Bartholomew, Painted Post, and Che-Kuang Wu, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,798

Int. Cl.² C03C *3/10, 3/30*

U.S. Cl. 106—53 **3 Claims**

1. A hydrated glass of optical quality with an essentially colorless, transparent appearance and a refractive index in excess of 1.60 consisting essentially, on the anhydrous basis in mole percent on an oxide basis, of 8–18% Na_2O, 2–6% K_2O, 10–23% $Na_2O + K_2O$, >15 but <21% PbO, 55–67% SiO_2, the mole ratio $PbO:SiO_2$ being >0.225 but <0.3, and an amount of BaO and/or Y_2O_3 and/or ZnO and/or ZrO_2 effective to render the hydrated glass essentially colorless up to the indicated maxima of 5% BaO, 5% Y_2O_3, 8% ZnO, and 5% ZrO_2, the total $BaO + Y_2O_3 + ZnO + ZrO_2$ not exceeding 10%.

4,099,979

Si_3N_4 HOT PRESSED WITH MgO

Frederick F. Lange, Thousand Oaks, Calif., and Clarence A. Andersson, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

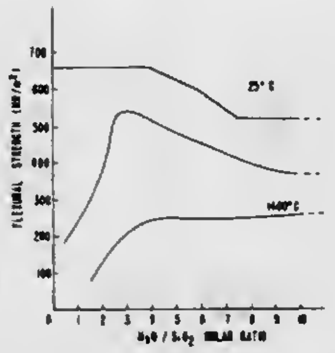
Filed Dec. 29, 1976, Ser. No. 755,384

Int. Cl.² C04B *33/32, 35/58*

U.S. Cl. 106—58 **3 Claims**

1. A structural material suitable for use at elevated temperatures consisting essentially of silicon nitride, silicon dioxide and magnesium oxide, the molar ratio of MgO to SiO_2 being within the range between about 3 and about 5, the MgO content not

exceeding 6% by weight and the CaO content not exceeding 200 ppm, and the silicon nitride phases are between 83 and 93% alpha phase and between 7 and 17% beta phase and silicon is ≦ 1%.



4,099,980

PROCESS FOR PRODUCING GAMMA QUINACRIDONE SOLID SOLUTIONS

Robert Jarl North, Elmwood Park, N.J., assignor to Harmon Colors Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 643,443, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,558, Oct. 29, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,691

Int. Cl.² C09B *48/00*

U.S. Cl. 106—288 Q **7 Claims**

1. A process for producing quinacridone solid solutions exhibiting essentially the X-ray diffraction pattern of unsubstituted gamma quinacridone which comprises heating, at a temperature between 80°–120° C., a mixture comprising 80–99 weight percent of dianilinoterephthalic acid and 1–20 weight percent of di-(orthosubstituted) anilinoterephthalic acid, 4,11-disubstituted quinacridone, or mixtures thereof, in the presence of polyphosphoric acid and thereafter diluting the reaction mixture by adding the mixture to a water miscible alcohol containing from 1 to 3 carbon atoms and recovering the precipitated gamma quinacridone solid solution, and wherein the substituents on the di-(ortho-substituted) anilinoterephthalic acid or 4,11-disubstituted quinacridone are halogens, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogenated alkyl of 1 to 4 carbon atoms or carboalkoxy of 1 to 4 carbon atoms.

4,099,981

SULFUR CONTAINING SILANE COUPLING AGENTS

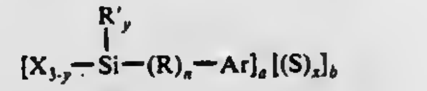
Jeffrey Yick-Pui Mui, Tarrytown, and Arthur Noah Pines, Katonah, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 536,207, Dec. 24, 1974, Pat. No. 4,044,037. This application May 19, 1977, Ser. No. 798,625

Int. Cl.² C09C *1/28*

U.S. Cl. 106—308 Q **8 Claims**

1. An inorganic mineral filler treated with a polysulfide aryl silane coupling agent having the average formula



$$[X_{3-y}-\overset{R'_y}{\overset{|}{Si}}-(R)_n-Ar]_a[(S)_x]_b$$

wherein X is a hydrolyzable group selected from the class consisting of halogen, alkoxy, and acyloxy radicals; R′ is an alkyl radical containing from 1 to 4 carbon atoms; y has a value of 0 to 2 inclusive; R is a divalent bridging group selected from the class consisting of alkylene and alkyleneoxy radicals containing from 1 to 7 carbon atoms; n has a value of 0 or 1; Ar is an aryl radical containing from 6 to 12 carbon atoms; $(S)_x$ is a divalent polysulfide radical each free valence thereof being directly bonded to an aromatic carbon atom of an Ar radical whereby each Ar radical is bonded to another Ar radical through a $(S)_x$ radical, x has a value of from 2 to 6; a has a value of at least 2; b has a value of at least 1; and wherein the ratio of a to b is a value ranging from 0.4 to 2; and hydrolyzates and condensates thereof.

4,099,982

METHOD OF EVAPORATING AND SPRAY DRYING OF A SUCROSE SOLUTION

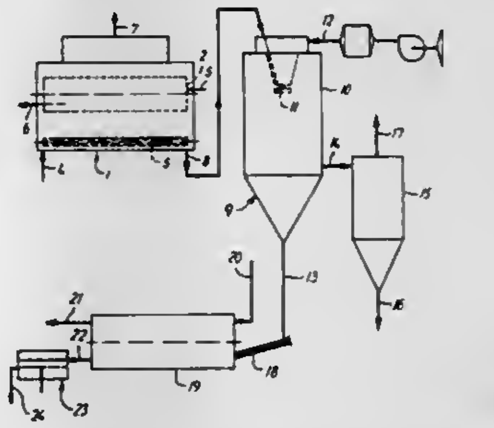
Ove Hansen, Vaerløse, and Stig Rasmussen, Gadstrup, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Oct. 31, 1977, Ser. No. 847,366

Claims priority, application Denmark, Nov. 1, 1976, 4935/76

Int. Cl.² C13F *1/02*

U.S. Cl. 127—61 **2 Claims**



1. A method of evaporating and spray drying a sucrose solution, comprising evaporating the sucrose solution continuously while subjecting it to vigorous mechanical agitation, to produce a suspension of sucrose crystals in sucrose solution, spray drying in a spray drier said suspension without any preceding cooling-crystallization to achieve a material resembling wet snow and having a moisture content of between 0.5 and 5% by weight, wherein there is no recycling of sucrose crystals to the spray drier, and post-crystallizing and post-drying said material.

4,099,983

PROCESS FOR PREPARING HIGH PURITY LACTOSE

Lester H. Wittenberg, 103 Devoe Rd., Chappaqua, N.Y. 10514

Filed May 31, 1977, Ser. No. 801,874

Int. Cl.² C13K *5/00*

U.S. Cl. 127—63 **10 Claims**

1. A process for purifying lactose which comprises washing lactose crystals in an alkaline wash bath having a pH within the range of from about 8.5 to about 12.5 at a temperature sufficient to prevent undesirable dissolution of said lactose crystals and isolating the so-washed lactose crystals from the bath.

4,099,984

PROCESS FOR CLEANING FOULED HEAT EXCHANGERS

Christopher P. Christenson, and Gary M. McNamee, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

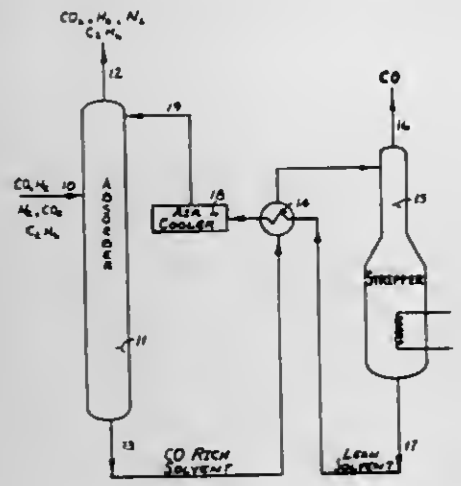
Filed May 3, 1977, Ser. No. 793,328

Int. Cl.² B08B *3/08*

U.S. Cl. 134—2 **3 Claims**

1. In a process for removing fouling from heat exchangers wherein the fouling is generated by passing a sorbent solvent solution containing $CuAlX_4$. solvent complex through said heat exchangers; the improvement which comprises removing said fouling by contacting the portion of said exchanger con-

taining said fouling with a sorbent solvent solution containing from about 1 to about 15% AlX_3 by weight and from about



20% to about 80% by weight of $CuAlX_4$. solvent complex wherein in each instance X is a halogen.

4,099,985
PROCESS FOR CLEANING GREASY SURFACES WITH A HEAT DEPENDENT ALKALI GEL

Donald F. Garvin, Wyandotte, and Otto T. Aepli, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 429,979, Jan. 2, 1974. This application Aug. 15, 1977, Ser. No. 824,914

Int. Cl.² B08B *3/08, 3/10*

U.S. Cl. 134—4 **4 Claims**

1. A process for the removal of greasy soil from a surface comprising applying a liquid composition to said surface while said surface is at a temperature of at least 100° F, sufficient to cause the composition to form a gel; permitting said composition to emulsify with said greasy soil; allowing said surface to cool to a temperature below 100° F, sufficient to cause said gel to revert to a liquid; and thereafter removing said emulsified greasy soil from said surface; wherein said composition consists essentially of water, an alkali metal hydroxide and a surfactant selected from the group consisting of

(a) an ethoxylated alcohol of the formula:

$$Y - O(C_2H_4O)_nH$$

wherein Y is a straight chain alkyl group having an average of 19 carbon atoms, n is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 75 to 95 weight percent of the total weight of the surfactant and the molecular weight of the ethoxylated alcohol is about 1500 and

(b) a polyoxyethylene-polyoxypropylene copolymer of the formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein *a* is an integer such that the hydrophobe base represented by (C_3H_6O) has an average molecular weight of at least 3200 and *b* is an integer such that the hydrophile represented by (C_2H_4O) constitutes from about 70 to 95 weight percent of the copolymer,

wherein the concentration of alkali metal hydroxide in the composition is from about 1 weight percent to about 7 weight percent, the concentration of surfactant in the composition is from 4 weight percent to about 30 weight percent and the balance of the composition is water.

4,099,986
SOLAR CELL COMPRISING SEMICONDUCTIVE WHISKERS

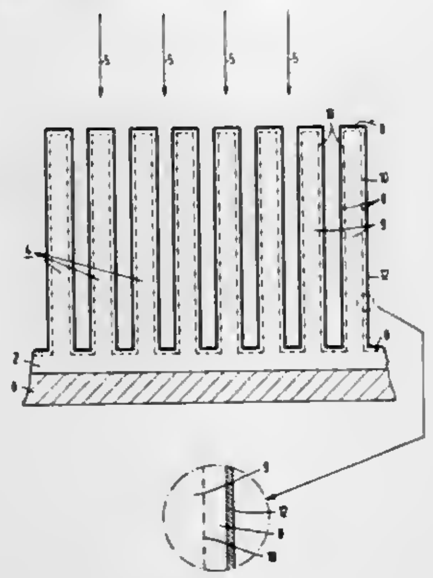
Heinrich Diepers, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,026

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639841

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 TF **6 Claims**



1. In a solar cell having a semiconductor body with zones of opposite doping forming a p-n junction and each zone provided with an electrode, the improvement comprising the semiconductor body consisting of a plurality of single crystal semiconductor whiskers grown on a substrate surface.

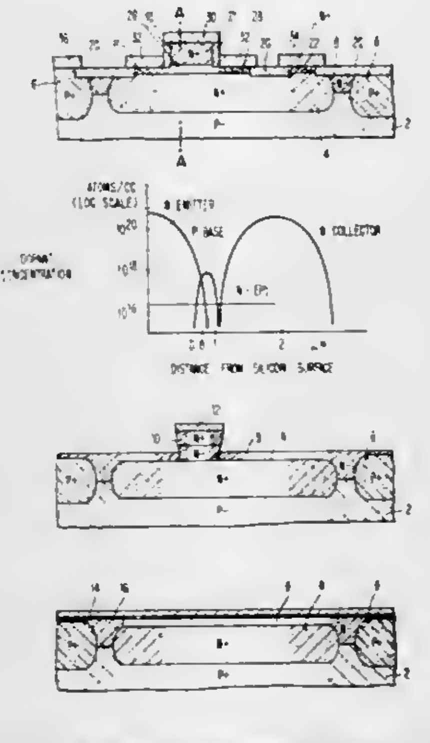
4,099,987
FABRICATING INTEGRATED CIRCUITS INCORPORATING HIGH-PERFORMANCE BIPOLAR TRANSISTORS

Chakrapani Gajanan Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,640

Int. Cl.² H01L *21/265, 7/54*

U.S. Cl. 148—1.5 **26 Claims**



1. A method for fabricating a semiconductor device comprising:

forming a mesa emitter in a silicon body,

passivating the said mesa emitter sidewall with a suitable dielectric;

forming a base region in said body using a blockout mask for a first ion implanation to form an extrinsic base region in said body surrounding said mesa emitter using high dose and low energy and a second ion implantation to form an intrinsic base region in said body below said mesa emitter and contiguous with said extrinsic base region using a low dose and high energy; and

providing contacts to said emitter and said extrinsic base region.

4,099,988
COMPOSITE MATERIAL HAVING WEAR- AND IMPACT-RESISTING SURFACE AND PROCESS FOR PRODUCING SAME

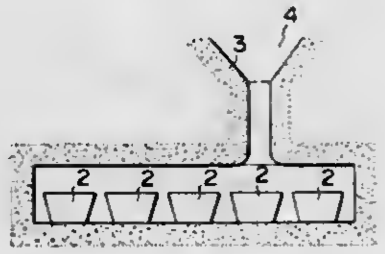
Kaoru Horiuchi, Toride; Akio Matsui, and Yoshio Okamoto, both of Chiba, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1977, Ser. No. 770,029

Claims priority, application Japan, Feb. 26, 1976, 51/20500; Feb. 26, 1976, 51/20501

Int. Cl.² B22D *19/02*

U.S. Cl. 148—3 **13 Claims**



1. A process for producing a composite material having at least one impact and wear resisting surface comprising the steps of:

placing on the bottom of a mold at least one wear resisting cast iron block having a chromium content of between 15 to 27%;

pouring into the mold a molten impact resisting cast steel;

allowing said molten cast steel to solidify, thereby forming a molded material;

removing said molded material from the mold; and

subjecting said molded material to a heat treatment after removal from said mold whereby said molded material is heated to a temperature of between 900° and 1150° C and then rapidly cooled in air.

4,099,989
PROTECTIVE COATING FOR ALUMINUM PRODUCTS

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 610,966, Sep. 8, 1975, Pat. No. 4,004,951, which is a continuation-in-part of Ser. No. 593,092, Jul. 3, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,027

Int. Cl.² C23F *7/00*

U.S. Cl. 148—6.27 **11 Claims**

1. A method of forming a tenacious, hydrophobic coating on an aluminum surface which is resistant to polar organic solvents consisting essentially of:

(a) mechanically disrupting the natural oxide coating on the aluminum surface to generate a fresh aluminum surface, and

(b) maintaining on the aluminum surface during said disruption an alkaline liquid selected from the group consisting of nonaqueous liquids and aqueous liquids having a pH of less than 10, said liquid having dissolved therein an effective amount of an aliphatic carboxylic acid or an equivalent carboxylate compound having from 12–22 carbon atoms so that upon generation of a fresh aluminum surface by said disruption a tenacious hydrophobic coating is formed.

4,099,990
METHOD OF APPLYING A LAYER OF SILICA ON A SUBSTRATE

David Emmerson Brown; John Trevor Kent Clark, both of Weybridge; John James McCarroll, Camberley, and Malcolm Leslie Sims, Walton-on-Thames, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 23, 1976, Ser. No. 669,636

Claims priority, application United Kingdom, Apr. 7, 1975, 14145/75

Int. Cl.² C23C *11/10*

U.S. Cl. 148—6.35 **9 Claims**

1. A process for forming protective films on a nickel, chromium or iron alloy substrate surface susceptible to coke formation, comprising first preoxidizing said surface at an elevated temperature and then depositing on said preoxidized substrate surface a layer of silica by thermally decomposing an alkoxy silane vapor in a carrier gas in contact with the preoxidized substrate surface.

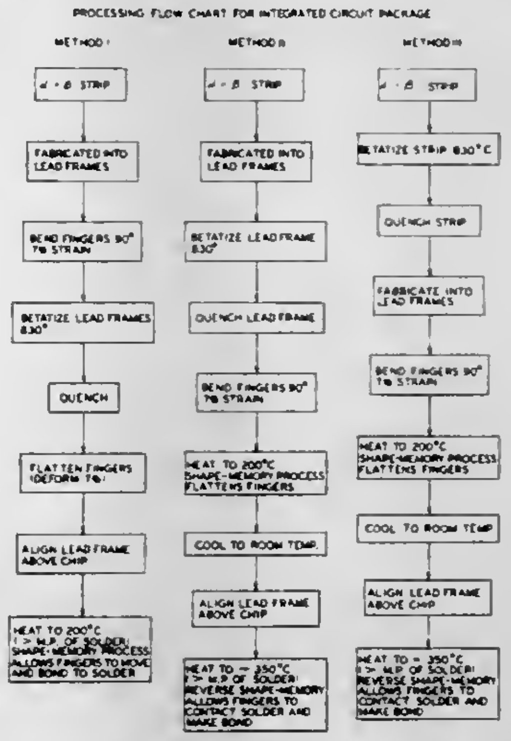
4,099,991
METHOD FOR EFFECTING REVERSE SHAPE MEMORY PHENOMENA IN CU-ZN-SI BRASS ALLOY

Horace Pops, Fort Wayne, Ind., and Barry C. Johnson, Pittsburgh, Pa., assignors to Essex Group, Fort Wayne, Ind.

Continuation of Ser. No. 513,659, Oct. 10, 1974, which is a division of Ser. No. 338,360, Mar. 5, 1973, Pat. No. 3,854,200. This application Oct. 4, 1976, Ser. No. 728,975

Int. Cl.² C22F *1/08*

U.S. Cl. 148—11.5 C **2 Claims**


PROCESSING FLOW CHART FOR INTEGRATED CIRCUIT PACKAGE
METHOD I
METHOD II
METHOD III
α + β STRIP
FABRICATED INTO LEAD FRAMES
BEND FINGERS 90° TO STRAIN
BETATIZE LEAD FRAMES 830°
QUENCH
FLATTEN FINGERS (DEFORM T6)
ALIGN LEAD FRAME ABOVE CHIP
HEAT TO 200°C (> M.P. OF SOLDER) SHAPE-MEMORY PROCESS ALLOWS FINGERS TO MOVE AND BOND TO SOLDER
α + β STRIP
FABRICATED INTO LEAD FRAMES
BETATIZE LEAD FRAME 830°
QUENCH LEAD FRAME
BEND FINGERS 90° TO STRAIN
HEAT TO 200°C SHAPE-MEMORY PROCESS FLATTENS FINGERS
COOL TO ROOM TEMP.
ALIGN LEAD FRAME ABOVE CHIP
HEAT TO ~ 350°C (> M.P. OF SOLDER) REVERSE SHAPE-MEMORY ALLOWS FINGERS TO CONTACT SOLDER AND MAKE BOND
α + β STRIP
BETATIZE STRIP 830°C
QUENCH STRIP
FABRICATE INTO LEAD FRAMES
BEND FINGERS 90° TO STRAIN
HEAT TO 200°C SHAPE-MEMORY PROCESS FLATTENS FINGERS
COOL TO ROOM TEMP
ALIGN LEAD FRAME ABOVE CHIP
HEAT TO ~ 350°C (> M.P. OF SOLDER) REVERSE SHAPE-MEMORY ALLOWS FINGERS TO CONTACT SOLDER AND MAKE BOND

1. A method of heat treating a brass composition of about 62–65% by weight copper, 35–38% by weight zinc and 0.3–0.5% by weight silicon to provide a reverse shape memory effect comprising the steps of:

betatizing said material;

deforming said material up to 10% by bending at a temperature below the martensite transformation temperature of said material or just slightly above said temperature;

heating said deformed material to a temperature of less than 400° C. and above the martensite transformation temperature and maintaining said material isothermally whereby shape memory effect returns said material substantially toward the original undeformed condition; and subsequently heating said material to a temperature in the range of 230° to 550° C. whereby said material reforms to the deformed condition by reverse shape memory effect.

4,099,992

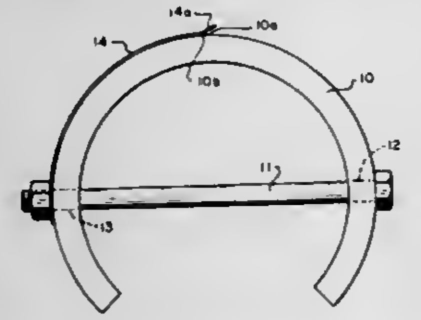
TUBULAR PRODUCTS AND METHODS OF MAKING THE SAME

Leonard A. Pugliese, Murrysville, and James P. Stroup, Ligonier Township, Westmoreland County, both of Pa., assignors to Latrobe Steel Company, Latrobe, Pa.

Filed Apr. 11, 1977, Ser. No. 786,490

Int. Cl.^{2} C21D *9/14*

U.S. Cl. 148—11.5 N **6 Claims**



1. A tubular metal product for use in sour gas wells characterized by resistance to hydrogen sulfide embrittlement at temperatures up to about 600° F. consisting essentially of an alloy having the composition up to about 0.035% maximum carbon, up to about 0.15% maximum silicon, up to about 0.15% maximum manganese, up to about 0.010% maximum sulfur, up to about 0.015% maximum phosphorus, about 19.0 to about 21.0% chromium, about 33.0% up to 37.0% nickel, about 9.0% to about 10.5% molybdenum, up to about 1.0% titanium, up to about 0.015% boron, up to about 2% iron and the balance cobalt, said tubular product having been cold worked at least sufficiently to impart increased strength and up to about 75% and thereafter heat treated in the range 1350° F. to 1500° F.

4,099,993

PROCESS FOR PRODUCING AN EXTREMELY HARD MIXED CARBIDE LAYER ON FERROUS MATERIALS TO INCREASE THEIR RESISTANCE TO WEAR

Hermann Müller, Heinrich Hall Str. 2A, 7501 Marxzell, and Otto Schaaber, Brauteichen 23, 282 Bremen 70, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 437,085, Jan. 28, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 651,368

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1973, 2303756

Int. Cl.^{2} C21D *1/74*

U.S. Cl. 148—14 **7 Claims**

1. A process for producing an extremely hard, non-brittle adherent carbide layer on ferrous materials having a carbon content of less than 0.4% to improve wear and corrosion resistance, said process comprising annealing said ferrous material in the presence of a case-hardening powder containing a vanadium yielder, a chromium yielder and an iron yielder wherein the iron to vanadium content of said case hardening powder is in the ratio of 2:3 to 1:4 and the chromium content of said powder is sufficiently greater than the vanadium content thereof to cause the formation of a continuous, hole free mixed carbide layer and wherein the total amount of vanadium and chromium present is sufficiently low to preclude the formation of a carbon-free mixed crystal layer between the ferrous material and the mixed carbide layer.

4,099,994

HIGH DUTY DUCTILE CASE IRON AND ITS HEAT TREATMENT METHOD

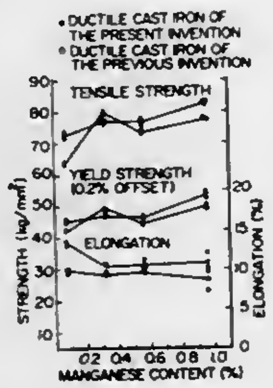
Katsuya Ikawa, and Yuichi Tanaka, both of Muroran, Japan, assignors to Riken Piston Ring Industrial Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 678,480, Apr. 20, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,800

Claims priority, application Japan, Apr. 22, 1975, 50-48767

Int. Cl.^{2} C21D *5/00*

U.S. Cl. 148—35 **3 Claims**



1. A ductile cast iron having a tensile strength of at least 72 kg/mm^2 and an elongation of at least 7%, consisting essentially of 3.0 - 4.0% C, 1.5 - 2.5% Si, less than 1.0% Mn, no more than 0.1% P, no more than 0.02% S and the balance Fe, and further having a microstructure wherein the graphite nodules are deposited in a matrix structure of finely mixed ferrite and pearlite grains of a size less than 10 microns, said microstructure being obtained by cooling the ductile cast iron of said chemical composition from a temperature range between 780° and 810° C in which a ferrite, austenite, and graphite coexisting structure is formed.

4,099,995

COPPER-HARDENED PERMANENT-MAGNET ALLOY

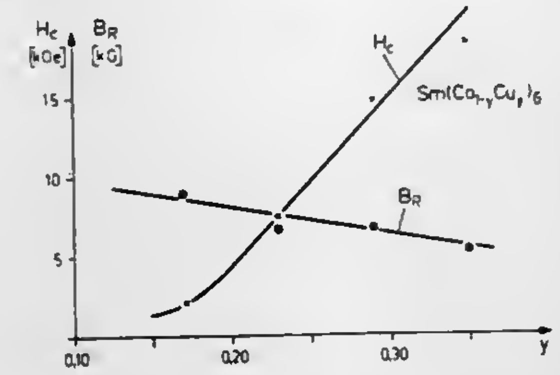
Anton Menth, Nussbaumen; Hartmut Nagel, Baden, and Antony James Perry, Nussbaumen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Continuation of Ser. No. 598,588, Jul. 24, 1975, abandoned. This application Jun. 14, 1977, Ser. No. 806,336

Claims priority, application Switzerland, Jul. 31, 1974, 10559/74

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—101 **9 Claims**



1. A coarse-grained, copper-hardened permanent-magnet alloy having the formula

$$\mathrm{Sm(Co}_{1-y}\mathrm{Cu}_y)_{6+x},$$

wherein

$0 \leqq x \leqq 1$, and

$0.15 < y < 0.35$,

which is prepared by a process which comprises melting together the mixed components cobalt, copper, and samarium in weight proportions according to the final desired formula:

holding the melt at a temperature of about 1400° C for from 3 to 5 minutes: and

subsequently solidifying the melt in situ by applying a cooling rate of less than 50° C/min. within the solidification temperature range of between 1300° C and 1200° C.

4,099,996

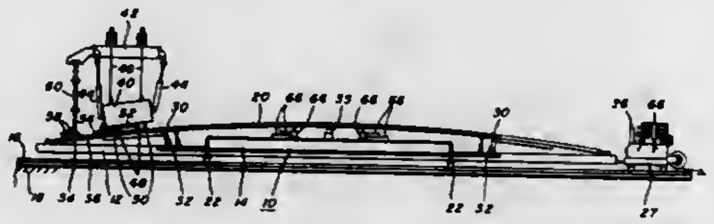
PROCESS FOR HEAT-TREATING THE HEAD OF RAILROAD RAIL

John Toleikis, Jr., Whiting, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 801,489

Int. Cl.^{2} C21D *1/78*

U.S. Cl. 148—131 **3 Claims**



1. In the process for heat-treating a railroad rail having a head, web and flange wherein the rail is bent within the elastic limit in the plane of the web to form an arc having a predetermined height so that the head is convex and the flange concave, and the head of the rail is heat-treated progressively from one end to the other while holding the rail in such an arcuate condition, said heat treatment involving heating the rail head into the austenitic temperature range followed by a mild quench to form pearlite, the improvement comprising holding the rail in such predetermined arcuate condition while about 10% of the rail head length is heated, thereafter decreasing the height of the arc about 14% while said heat-treatment is continued until about 40% of the rail head has been heated, thereafter increasing the height of the arc to approximately its original height while said heat-treatment is continued until about 60% of the rail head has been heated, thereafter again decreasing the height of the arc about 14% while said heat-treatment is continued until about 90% of the rail head has been heated, thereafter again increasing the height of the arc to approximately its original height while said heat-treatment is continued to the end of the rail, each of said lower and raising of the arc height being effected during a period of at least 45 seconds.

4,099,997

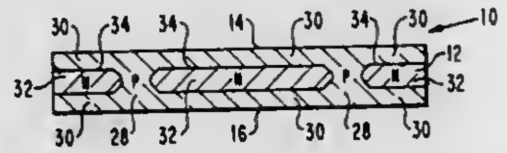
METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Wojciech Rosnowski, Summit, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,480

Int. Cl.^{2} H01L *21/225, 21/223*

U.S. Cl. 148—187 **14 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:

forming a source of first impurities of one conductivity determining type on each of two major opposing surfaces of a semiconductor wafer, said wafer containing opposite type determining impurities;

disposing a layer of masking material over said source of first impurities;

defining said layer and said source of first impurities to expose preselected portions of said surfaces;

exposing said wafer to a source of second impurities of said one conductivity determining type in such a manner that said second impurities diffuse into said wafer through said preselected portions, said first impurities simultaneously penetrating said unexposed portions of said wafer, said second impurities being masked from the unexposed portions of said surfaces by said source of first impurities and said masking layer, said second impurities having a comparatively higher diffusivity in said wafer than said first impurities; and thereafter

removing said masking layer and said source of first impurities; and thereafter

heating said wafer to a temperature at which said first impurities and said second impurities further penetrate said wafer for a time long enough so that said second impurities form first continuous regions between said two opposing surfaces.

4,099,998

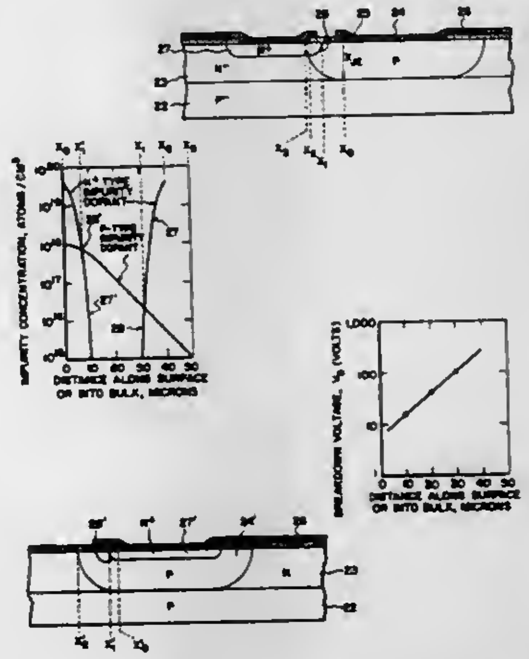
METHOD OF MAKING ZENER DIODES WITH SELECTIVELY VARIABLE BREAKDOWN VOLTAGES

Armand P. Ferro, Schenectady, N.Y., and Bruno F. Kurz, deceased, late of Schnectady, N.Y. by Elizabeth Kurz-Beerli, also known as Elizabeth Kurz Chinoy, executrix, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 628,376, Nov. 3, 1975. This application Aug. 20, 1976, Ser. No. 716,090

Int. Cl.^{2} H01L *21/22, 21/66*

U.S. Cl. 148—187 **4 Claims**


N+ TYPE IMPURITY DOPANT
P-TYPE IMPURITY DOPANT
IMPURITY CONCENTRATION, ATOMS/CM³
DISTANCE ALONG SURFACE OR INTO BULK, MICRONS
BREAKDOWN VOLTAGE, Vb (VOLTS)
1,000
100
10
0
10
20
30
40
50
DISTANCE ALONG SURFACE OR INTO BULK, MICRONS
P
N

1. A method of making a semiconductor device characterized by a selectively variable breakdown voltage ranging from a few volts to several hundred volts, said method comprising:

diffusing into a substrate a first impurity-doped region of a conductivity-type different from that of said substrate, said first region having a surface-adjacent portion of substantially constant impurity concentration and a gradient region of decreasing impurity concentration extending laterally from said surface-adjacent portion;

diffusing into said substrate a second region of the same conductivity type as said substrate but of higher impurity concentration, said second region intersecting a surface-adjacent portion of said gradient region to form a P-N junction at the intersection of the edge of said second region with said gradient region; and

selecting the location of the intersection between the edge of said second region and the surface-adjacent portion of said gradient region to provide a specific breakdown voltage, V_B, which varies with the location of the P-N junction at the surface of the substrate relative to the impurity concentration in the gradient region in accord-with the following equation for linearly graded junctions:

$$V_B \simeq 60(E_g/1.1)^{6/5}(a/3 \times 10^{20})^{-2/5} \text{ volts,}$$

where

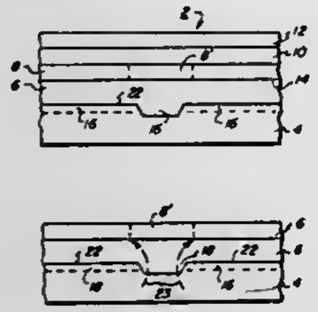
E_g is the energy bandgap in electron volts and
a is the impurity gradient in cm^{-4}.

4,099,999

METHOD OF MAKING ETCHED-STRIPED SUBSTRATE PLANAR LASER

Robert D. Burnham, Los Altos Hills, and Donald R. Scifres, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1977, Ser. No. 805,661
Int. Cl.² H01L *21/20, 21/74;* **H01S** *3/06*
U.S. Cl. 148—187 **2 Claims**



1. A method of making a diode laser comprising the steps of:
forming an initial rectifying junction along the surface of a body of substrate semiconductor material of one conductivity type,
removing a portion of said substrate material, said portion extending from said surface to beyond said rectifying junction whereby a channel is provided that divides said rectifying junction into two separate portions,
filling said channel with semiconductor material of said one conductivity type, and
subsequently providing another rectifying junction between layers of semiconductor material, said channel defining the path of pump current flowing across said another rectifying junction when said another rectifying junction is forward biased.

4,100,000

PRILLED EXPLOSIVE COMPOSITION

Thomas S. Sterling, Ottawa; Jean-Yves Belanger, Ste. Foy, and Kenneth S. Kalman, Dollard des Ormeaux, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 26, 1976, Ser. No. 735,339
Claims priority, application Canada, May 31, 1976, 253728
Int. Cl.² C06B *45/36*
U.S. Cl. 149—4 **14 Claims**

1. A free-flowing, high-density, water-resistant explosive composition, comprising 35–80% by weight trinitrotoluene, 10–30% by weight aluminum and 0–45% by weight cyclonite, in spheroidal prill form.

4,100,001

THERMALLY CRYSTALLIZABLE GLASSES AND GLASS-CERAMICS MADE THEREFROM

Earl W. Franklin, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 15, 1977, Ser. No. 788,066
Int. Cl.² C03C *3/22, 3/04*
U.S. Cl. 106—39.7 **5 Claims**

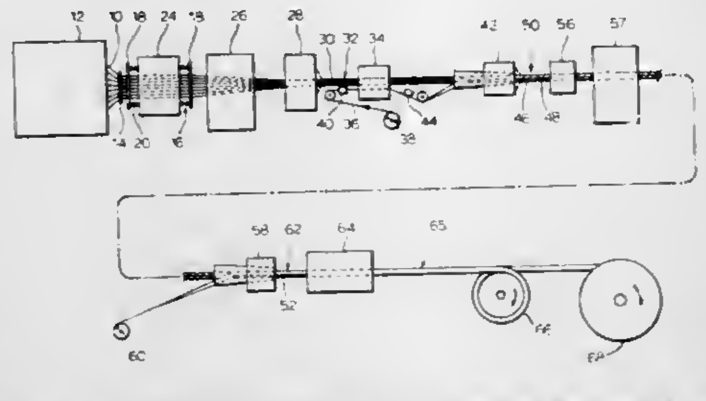
1. A thermally crystallizable glass composition consisting essentially of SiO_2, Al_2O_3, Li_2O and the nucleants TiO_2 and ZrO_2, said compositions (1) containing 18.2–20.3 parts Al_2O_3 per 100 parts by weight of $SiO_2+Al_2O_3+Li_2O$ (2) having Li_2O present in a ratio of from 0.55 to 0.63 moles for each mole of Al_2O_3 present and (3) containing 2.8–5 weight percent (TiO_2+ZrO_2) based on the total composition, including 1–2 weight percent TiO_2 and 1.2–3 weight percent ZrO_2.

4,100,002

METHOD FOR PRODUCING POWDER FILLED CABLE

Leo Victor Woytiuk, Pointe Clair; Ronald Yves Mayer, LaSalle, and George B. Kepes, Montreal, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 1, 1975, Ser. No. 564,070
Int. Cl.² H01B *13/06*
U.S. Cl. 156—48 **8 Claims**



1. In a method of continuously producing an electric cable having a plurality of conductors forming a stranded core enclosed in a sheath or jacket, the voids within the sheath or jacket being at least partially filled with powder, the sequential steps of:
maintaining the conductors in spaced lateral relationship over a predetermined length of travel;
applying a coating of oil to the laterally spaced conductors;
applying powder electrostatically to the separated conductors; and
bringing the powdered conductors together to form said core.

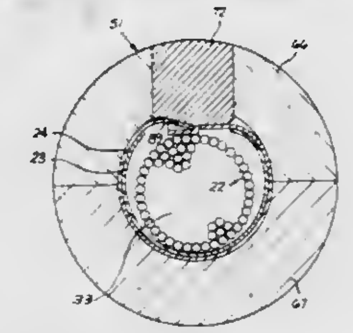
4,100,003

METHOD OF AND APPARATUS FOR PREFORMING METAL OVERLAP EDGE WITH OVERLAP DIE

Kenneth Paul Trusch, Phoenix, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 733,977
Int. Cl.² H01B *13/26*
U.S. Cl. 156—54 **8 Claims**

1. A method of forming a metallic shield about a cable core to provide a preformed overlap of the shield, which includes the steps of,
forming the shield partially about the cable core,
passing the partially formed shield and cable core through an overlap and forming die to form the shield about the cable core and to provide the shield with a substantially circular configuration with the longitudinal edge portions of the shield forming an overlap, while at the same time, guiding the longitudinal edge portions of the shield to cause at least a portion of the overlying longitudinal edge portion of the shield at the overlap to be turned inwardly toward the cable core a distance sufficiently to preclude the edge portion of the shield from protruding into a subsequently extruded jacket over the formed shield.

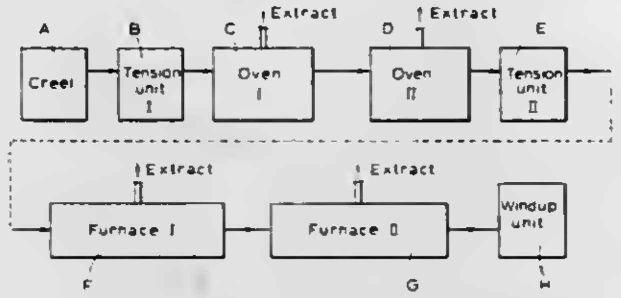


4,100,004

METHOD OF MAKING CARBON FIBERS AND RESIN-IMPREGNATED CARBON FIBERS

Maurice Moss, Mougins, France; Colin Barry Hill, and Michael Roger Rowland, both of Wilmslow, England, assignors to Securicum S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 685,427, May 11, 1976, abandoned, which is a continuation of Ser. No. 471,279, May 20, 1974, abandoned. This application Feb. 24, 1977, Ser. No. 771,740
Int. Cl.² B32B *31/18;* **D01F** *9/22*
U.S. Cl. 156—60 **17 Claims**



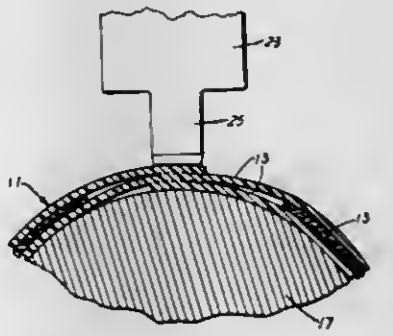
1. A method of making carbon fibre, comprising passing a multifilament commercial heavy tow of fibres formed of an acrylonitrile polymer or copolymer through an initial heating stage at a temperature in the range of from 100° to 160° C whilst holding it under sufficient tension to remove crimp and to stretch the fibres by up to 75%; passing the thus heated and stretched multifilament heavy tow through a pre-heat zone maintained at a temperature at least 100° C below the critical temperature of the fibres; passing the thus pre-heated multifilament heavy tow through an oxygenation zone comprising at least two stages, a first stage in which the multifilament heavy tow is contacted with an oxygenation medium selected from the group consisting of oxygen and oxygen-containing gases, gradually heated up to a first temperature in the range of from 220° to 250° C, at which the fibres are able to take up oxygen without degradation and maintained at that temperature, and a second stage in which the partly oxygenated multifilament heavy tow of fibres is further heated in the presence of an oxygenation medium to a second higher temperature, in the range of from 260° to 300° C, and is maintained at that second temperature, the multifilament heavy tow of fibres passing straight through each stage of the oxygenation zone without a change in direction within either of such stages, the fibres being held under sufficient uniform tension within the oxygenation zone to stretch the fibres by at least 50% during heating and oxygenation; and thereafter passing the multifilament tow of oxygenated fibres through a carbonizing zone comprising at least one stage in which the multifilament heavy tow of fibres is heated to a third elevated temperature in the range of from 1050° to 1600° C under non-oxidizing conditions to yield a fibre with a mean Young's modulus of at least 25 × 10^6 p.s.i. and a mean tensile strength of at least 250,000 p.s.i.

4,100,005

METHOD OF MAKING A DYNAMOELECTRIC MACHINE INSULATOR

Walter P. McNeal, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 333,786, Feb. 20, 1973, Pat. No. 3,880,194. This application Dec. 23, 1974, Ser. No. 536,946
Int. Cl.² B29C *27/08;* **B29D** *23/10;* **B32B** *31/00*
U.S. Cl. 156—73.1 **14 Claims**



1. A method of assembling together at least a portion of one strip of electrically insulating material and at least one other segment of electrically insulating material to form electric motor insulators of the type having at least one first elongate insulation piece for placement in an axially extending slot of a motor core, and having spaced apart insulation pieces for placement between the end turn portions of different phase windings supported on the motor core with the spaced apart insulation pieces interconnected by the at least one first elongate insulation piece, the method comprising the steps of: moving the strip in a longitudinal direction; overlapping a first portion of the strip and the other segment of insulating material; welding together the overlapped segment and first portion of the strip while they are disposed between a support and an energized welding tool; and subsequently severing the strip material along a line transverse to the longitudinal extent thereof so as to form a discrete insulator having at least one elongated insulation piece that can be accommodated in a core slot, and spaced apart insulation pieces connected together by the at least one first elongate insulation piece that can each be disposed between end turn portions of at least two different windings.

4,100,006

CARD-CLOTHING

John Buckley, Oldham, England, assignor to The English Card Clothing Company Limited, Huddersfield, England

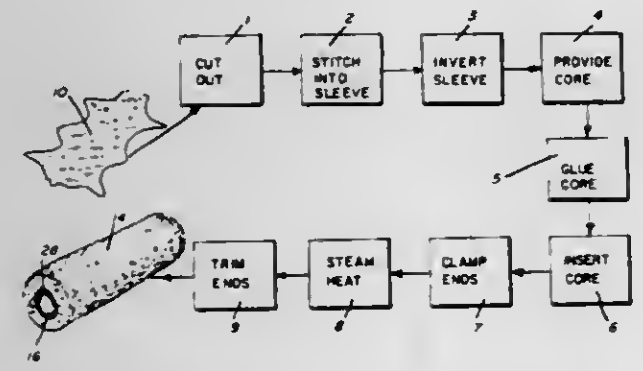
Filed Mar. 24, 1977, Ser. No. 780,902
Claims priority, application United Kingdom, Apr. 6, 1976, 13798/76; Sep. 18, 1976, 38754/76
Int. Cl.² B32B *5/20*
U.S. Cl. 156—78 **7 Claims**

1. A method of manufacturing flexible card-clothing for use in textile carding comprising the steps of:
mechanically introducing air into a polyvinylchloride (p.v.c.) compound, which is in a plastisol form, in a continuous foam mixer to produce a foamed compound having a density of between 0.6 and 1.00 grams per cubic centimeter; applying a sealing coat of a material which is compatible with said foamed compound to a fabric layer; applying a layer of said foamed p.v.c. onto said sealing coat to produce a finished foam layer of between 2 and 5 millimeters thickness on said fabric, said sealing coat being adequate to prevent substantial penetration of said fabric layer by said foamed material; heating said applied foamed layer of p.v.c. to cause said foamed layer to fuse; applying a surface layer of sealing material to the exposed surface of said foamed layer to provide a smooth non-absorbent external surface therein, said fabric, foamed p.v.c. and said surface layer together forming a composite foundation

face; combining said foundation face with a foundation back to form a laminated foundation and then inserting card-clothing wires into said foundation so that parts of said wires project from the smooth external surface of said surface layer.

4,100,007
METHOD OF MAKING PAINT ROLLER COVER

Gerald D. Van Zeeland, New Berlin, Wis., assignor to E Z Paintr, Milwaukee, Wis.
Filed Oct. 15, 1976, Ser. No. 732,713
Int. Cl.² B32B *31/16, 31/26*
U.S. Cl. 156—86 **6 Claims**



1. A method of fabricating a paint roller cover or similar applicator fabricated partially from animal pelt, comprising the steps of:

forming a tubular sleeve of predetermined diameter of said animal pelt;

providing an internal core smaller than said predetermined diameter about which said sleeve is adapted to be embraced;

applying adhesive to the exterior of said core to facilitate adherence between the sleeve and the core, said sleeve being sufficiently larger than the outside diameter of said core so as not to displace or render uneven the layer of adhesive on the outside of the core;

mounting said core within said tubular sleeve and clamping the sleeve to the ends of the internal core to prevent longitudinal shrinking of the sleeve relative to the core; and

heat shrinking said sleeve onto said core by placing said internal core with said sleeve embraced thereabout into a steam heating chamber to shrink the animal pelt to provide a roller having a denser pile and a substantially harder sleeve in adherence with the internal core.

4,100,008
METHOD OF FORMING AN OPTICAL WAVEGUIDE CABLE

Stewart A. Claypoole, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Division of Ser. No. 593,285, Jul. 7, 1975, Pat. No. 4,037,922. This application Mar. 16, 1977, Ser. No. 778,022
Int. Cl.² B32B *17/04, 27/12*
U.S. Cl. 156—180 **17 Claims**

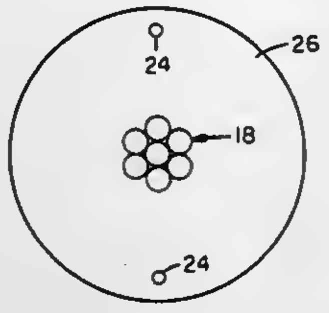
1. A method of forming a substantially circular optical waveguide cable comprising

providing a plurality of optical waveguide fibers,

disposing said fibers in a substantially contiguous relationship to one another to form a single concentrically arranged fiber bundle,

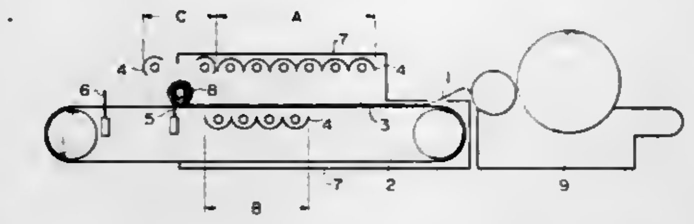
disposing at least two strength members parallel to said single bundle in a plane substantially along a diameter of said single bundle through the longitudinal axis of said bundle, at least one of said strength members being disposed in said plane on each side of said single bundle, the remainder of said strength members being disposed in said plane on either or both sides of said single bundle, each strength member on one side of said single bundle being disposed at a distance from said longitudinal axis of said bundle substantially equal to the distance therefrom of the corresponding strength member on said other side of said single bundle, said strength members on one side of said single bundle being disposed adjacent each other and said strength members disposed on said other side of said single bundle being disposed adjacent each other when a plurality of strength members are disposed on either or both of said sides, and

applying an encapsulating coating of at least one layer surrounding said single bundle of fibers in such manner that said strength members and said single bundle are embedded in said encapsulating coating.



4,100,009
METHOD OF AND APPARATUS FOR PRODUCING HOLLOW-CYLINDRICALLY SHAPED FIBROUS ARTICLES

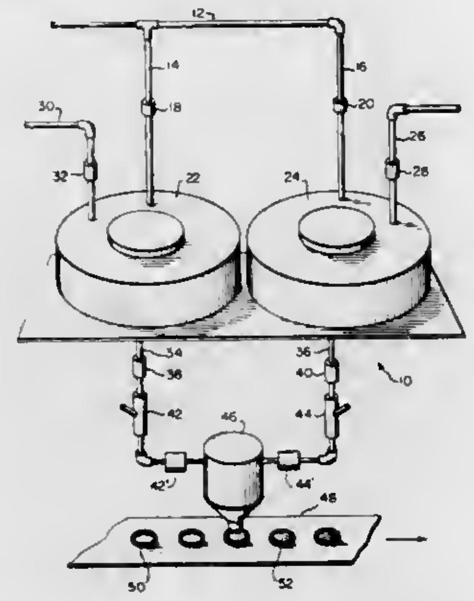
Takayoshi Nakajima, Moriyamashi; Hiroshi Sonoda, Shigaken; Katsutoshi Sasaki, Shigaken, and Teruaki Hane, Shigaken, all of Japan, assignors to Chisso Corportion, Osaka, Japan
Filed May 6, 1977, Ser. No. 794,697
Claims priority, application Japan, May 8, 1976, 51-52323; May 25, 1976, 51-60499; Nov. 2, 1976, 51-132028
Int. Cl.² B65H *81/00*
U.S. Cl. 156—184 **9 Claims**



1. A process for producing a hollow-cylindrically shaped fibrous articles stabilized by hot melt adhesion which comprises passing a web of gathered fiber layer having a fixed width, carried on a conveyer belt through a heating zone, heating said web of gathered fiber layer in such a way that a lower-melting component of composite fiber contained in the lower part of said web contacting the conveyer belt is in the state close to its melting point but not in the molten state and a lower-melting component contained in the upper part of said web is in the molten state, while separating said web from the conveyer belt, winding up said web on a take-up rod in such a way that the upper surface thereof occupies the inner side of the winding, further heating, during the course of winding, the lower part of the web having been contacted with the surface of the conveyer belt which is exposed to the air after the separation, adjusting the vacant space proportion during the course of the above-mentioned steps or after completion of winding, cooling the wound up article after the adjustment of the vacant space proportion of final winding, and drawing out the take-up rod from the shaped product, said web of gathered fiber layer containing at least 10% hot-melt-adhesive composite fiber consisting of a lower-melting component, and a higher-melting component.

4,100,010
METHOD FOR MAKING DECORATIVE EMBLEMS

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio
Continuation-in-part of Ser. No. 478,789, Jan. 12, 1974, abandoned. This application Jul. 2, 1976, Ser. No. 702,194
Int. Cl.² B29C *13/00, 21/00*
U.S. Cl. 156—242 **10 Claims**



1. A method of forming foil-backed inserts in the form of cast decorative emblems, comprising:

a. providing a series of flat decorative foil shapes onto which a clear, hard plastic composition suitable as a substitute for vitreous enamel is to be cast,
said foil shapes each having a top and bottom surface,
said foil shapes also having sharply defined peripheral sides which intersect with said top surface, and
having an adhesive coated on said bottom surface,

b. holding said series of foil shapes flat and horizontal on a supported surface free from surrounding side walls,

c. casting a measured amount of said plastic composition in liquid form, which liquid is poorly wetting with respect to the top surface of said foil shapes, directly onto the top surface of each of said foil shapes so that it flows to said sharply defined peripheral sides and forms a positive meniscus without flowing over said sharply defined peripheral sides,

d. allowing said cast plastic composition to cure while maintaining said foil shapes flat and horizontal, whereby said cured plastic composition gives a lens effect to the top surface of said foil shapes onto which it has been cast, and

e. utilizing said adhesive coated bottom surface of said foil shapes to adhere said inserts onto their intended base.

4,100,011
PRODUCTION OF LAMINATED CARD WITH PRINTED MAGNETICALLY ENCODABLE STRIPE

Francis C. Foote, Huntsburg, Ohio, assignor to Addressograph Multigraph Corp., Cleveland, Ohio
Continuation-in-part of Ser. No. 601,366, Aug. 4, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,668
Int. Cl.² B29C *27/02;* **B32B** *31/26*
U.S. Cl. 156—272 **7 Claims**

1. A method for making a magnetically encodable article comprising the steps of:

advancing a relatively rigid core stock layer in a path through a work station;

feeding a flexible, non-porous surface laminate sheet from a roll supply source into engagement with the core stock layer;

providing a vacuum shoe intermediate the roll supply source and the core stock layer for maintaining a partial vacuum at the interface of the surface laminate sheet and the core stock layer whereby movement of the surface laminate sheet over and in contact with the vacuum shoe causes the surface laminate sheet to adhere to the core stock layer by means of static electricity;

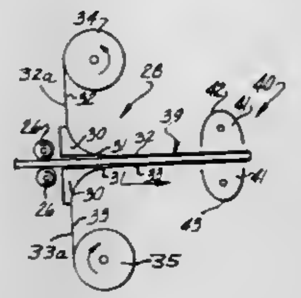
tacking the surface laminate sheet to the core stock layer subsequent to adherence of the surface laminate sheet to the core stock layer while the core stock layer is being advanced in the path;

applying a magnetically encodable medium directly to a predetermined area on the surface laminate sheet subsequent to tacking of the surface laminate sheet to the core stock layer; and

laminating the surface laminate sheet to the core stock layer;

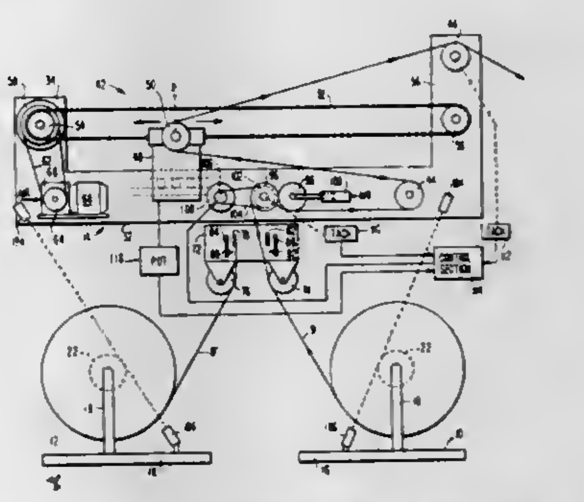
said tacking step comprising advancing the core stock layer and the surface laminate sheet past a radiation source positioned adjacent the path while directing radiant energy along narrow areas on the core stock layer and the surface laminate sheet extending transverse to the core stock layer,

whereby the surface laminate sheet is adhered to the core stock layer at points of contact therewith impinged upon by the radiant energy.



4,100,012
DRIVEN NIP ROLL SPLICER

Edward F. Meihofer, Norfolk; George F. Corcoran, Wellesley, and John W. Clifford, Ashland, all of Mass., assignors to Butler Automatic, Inc., Canton, Mass.
Filed Nov. 8, 1976, Ser. No. 739,794
Int. Cl.² B65H *19/14, 25/00*
U.S. Cl. 156—351 **14 Claims**



1. A splicer of the type including a roll stand, a splicing station and a festoon including adjacent fixed rollers, a dancer and a track permitting the dancer to be movable toward and away from the fixed rollers, said festoon being downstream from the splicing station, the improvement comprising

A. a pair of nip rolls between the splicing station and the festoon,

B. a motor connected to drive the nip rolls to feed the web from the roll stand into the festoon,

C. means for monitoring web speed into the festoon to produce a first signal,

D. means for monitoring web speed out of the festoon to produce a line speed signal,

E. means for monitoring excursions of the festoon dancer from a selected reference position to produce a web velocity trim signal,

F. means for processing said signals to develop a command signal for said motor that causes said motor to controlledly vary the torque applied to the nip rolls so as to maintain substantially constant tension in the web downstream from the rolls, and

G. means for biasing the dancer away from the fixed rollers including

i. a controllable variable slip clutch having an input shaft and an output shaft,

ii. a motor connected to the clutch input shaft, and

iii. means coupled between the clutch output shaft and the dancer for urging the dancer away from the fixed rollers with a force dependent upon the amount of slippage in the clutch.

4,100,013

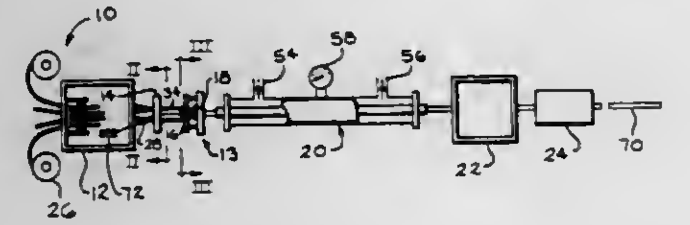
APPARATUS FOR FORMING RESIN EMBEDDED ANTENNA

Albert S. Medler, and Donald L. Myers, both of Jackson, Mich., assignors to Plastigage Corporation, Jackson, Mich.

Filed Aug. 5, 1976, Ser. No. 711,992

Int. Cl.² B29D *3/02*

U.S. Cl. 156—441 **3 Claims**



1. Apparatus for producing a smooth glass fiber reinforced elongated member in a continuous operation comprising, in combination, glass fiber filament dispensing means, means for impregnating said filaments with a hardenable resin, means for forming said filaments into a plurality of bundles, a cylindrical gathering die having a bore and an axis, means for feeding said bundles into said die equidistantly located about said bore and axis of said die, an elongated glass tube curing mold receiving said glass fiber filaments from said die, said mold having a glass smooth bore of a uniform diameter substantially equal to the diameter of said gathering die, means for heating said mold to a resin curing temperature, cooling means receiving said glass fiber elements after curing by said mold, and pulling means pulling said glass fibers through said impregnating means, gathering die, mold and cooling means at a rate to permit curing of said resin while within said mold.

4,100,014

ETCHING AGENT FOR III/V SEMICONDUCTORS

Franz Kuhn-Kuhnenfeld, Burghausen; Dietmar Kirsten, Tann, both of Germany, and Marianne Maier, Ostermiething, Austria, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mgH, Burghausen, Germany

Filed Apr. 6, 1977, Ser. No. 785,138

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638302

Int. Cl.² H01L *21/306*

U.S. Cl. 156—647 **14 Claims**

10. An improved method for producing etch pits to expose dislocations on the surface of Ga As_x P_{1-x} semiconductors, wherein x is in the range between 0 and 1, comprising the step of:

treating the surface of said semiconductors with a polishing dislocation etchant consisting of

(a) 1 to 30 percent by weight of hydrofluoric acid;

(b) 2 to 30 percent by weight of hydrogen peroxide;

(c) 1 to 75 percent by weight of sulfuric acid;

(d) 15 to 95 percent by weight of water; wherein the quantities by weight of the individual components are so chosen that they will add up to 100 percent by weight.

4,100,015

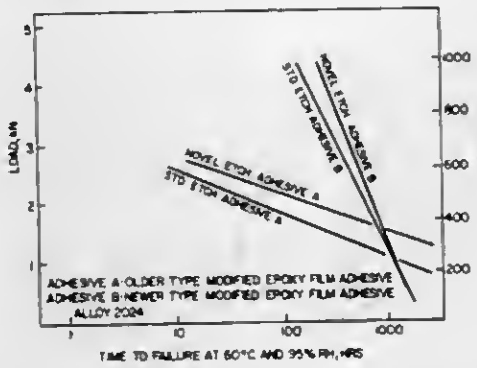
CHROMATE-FREE ETCHING PROCESS AND COMPOSITION FOR PREPARING ALUMINUM FOR ADHESIVE BONDING

William J. Russell, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,504

Int. Cl.² C23F *1/00*

U.S. Cl. 156—665 **6 Claims**



1. The method of adhesive bonding of aluminum parts, wherein the aluminum parts are subjected, prior to adhesive bonding, to an etching process to produce a surface preparatory to adhesive bonding, which comprises contacting the aluminum part with a chromate-free etching composition consisting essentially of:

1 to 25 weight percent nitric acid 0 to 10 weight percent sulfuric acid

5 to 8 weight percent alkali metal sulfate

0.2 weight percent to saturated solution of ferric sulfate

60 to 93 weight percent water

4,100,016

SOLVENT PULPING PROCESS

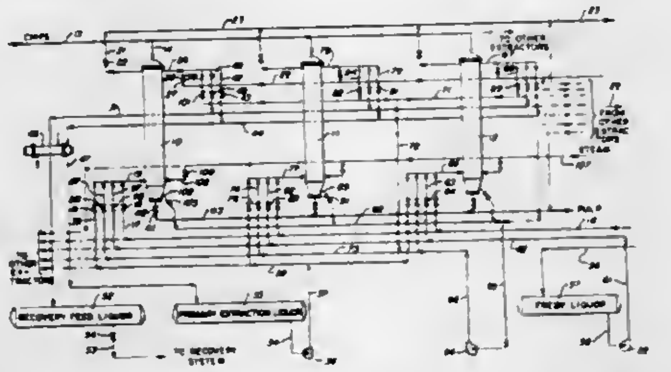
Vincent B. Diebold, Cincinnati, Ohio; Wavell F. Cowan, Montreal, Canada, and John K. Walsh, Cincinnati, Ohio, assignors to C P Associates Limited, Montreal, Canada

Filed Sep. 17, 1976, Ser. No. 724,387

Claims priority, application Canada, Oct. 24, 1975, 238294

Int. Cl.² D21C *3/20*

U.S. Cl. 162—16 **16 Claims**



1. In a solvent extraction pulping process wherein lignin is extracted from subdivided fibrous plant material by contacting said material at an elevated pulping temperature and pressure with a solvent pulping liquor comprising an aqueous solution of a lower aliphatic alcohol, the improvement which comprises providing a plurality of batch extractors and carrying out the following sequential steps in each extractor:

(a) feeding a first charge of said subdivided fibrous plant material to a first extractor;

(b) filling said first extractor with a first used pulping liquor so as to displace air from said first extractor;

(c) introducing a second used pulping liquor of relatively high dissolved solids content at an elevated temperature and pressure into said first extractor so as to displace said first used pulping liquor, and recirculating said second used pulping liquor without separation of lignin at a relatively high velocity through said first extractor and through an external heat exchanger so as to effect rapid heating of said first charge to a predetermined pulping temperature of from about 160° to about 220° C. within not more than about 10 minutes at a predetermined pulping pressure of from about 10 to about 50 atmospheres, said second used pulping liquor being obtained from step (e), as hereinafter described, during pulping of another charge in a second extractor and being supplied from said second extractor to said first extractor without separation of lignin;

(d) continuing said recirculation of said second used pulping liquor without separation of lignin to effect essentially isothermal initial extraction of said first charge at said predetermined pulping temperature and pressure, and thereafter withdrawing said second used pulping liquor from said first extractor;

(e) flowing at least one additional used pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal further extraction of said first charge at said predetermined pulping temperature and pressure, said additional used pulping liquor having a lower dissolved solids content than said second used pulping liquor and being obtained from step (f), as hereinafter described, during pulping of still another charge in a third extractor and being supplied from said third extractor to said first extractor without separation of lignin;

(f) flowing heated fresh pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal final extraction of said first charge; and

(g) discharging crude cellulose pulp from said first extractor.

9. In a solvent extraction pulping process wherein lignin is extracted from subdivided fibrous plant material by contacting said material at an elevated pulping temperature and pressure with a solvent pulping liquor comprising an aqueous solution of a lower aliphatic alcohol, the improvement which comprises providing a plurality of batch extractors and carrying out the following sequential steps in each extractor:

(a) feeding a first charge of said subdivided fibrous plant material to a first extractor;

(b) filling said first extractor with a first used pulping liquor so as to displace air from said first extractor;

(c) introducing a second used pulping liquor of relatively high dissolved solids content at an elevated temperature and pressure into said first extractor so as to displace said first used pulping liquor, and recirculating said second used pulping liquor without separation of lignin at a relatively high velocity through said first extractor and through an external heat exchanger so as to effect rapid heating of said first charge to a predetermined pulping temperature of from about 160° to about 220° C. within not more than about 10 minutes at a predetermined pulping pressure of from about 10 to about 50 atmospheres, said second used pulping liquor being obtained from step (e), as hereinafter described, during pulping of another charge in a second extractor and being supplied from said second extractor to said first extractor without separation of lignin;

(d) continuing said recirculation of said second used pulping liquor without separation of lignin to effect essentially isothermal initial extraction of said first charge at said predetermined pulping temperature and pressure, and thereafter withdrawing said second used pulping liquor from said first extractor;

(e) flowing at least one additional used pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal further extraction of said first charge at said predetermined pulping temperature and pressure, said additional used pulping liquor having a lower dissolved solids content than said second used pulping liquor and being obtained from step (f), as hereinafter described, during pulping of still another charge in a third extractor and being supplied from said third extractor to said first extractor without separation of lignin;

(f) flowing heated fresh pulping liquor through said first charge in said first extractor on a once-through basis to effect essentially isothermal final extraction of said first charge, said fresh pulping liquor being obtained at least in part, from steps (g), (h), (k), and (l), as hereinafter described;

(g) draining liquor from said first extractor, depressurizing said first extractor by releasing the solvent vapors therein to a condenser, and recovering condensed solvent suitable for reuse as said fresh pulping liquor in step (f);

(h) passing steam through said first extractor to strip residual solvent from said first charge, and condensing the stripped solvent vapors to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f);

(i) discharging crude cellulose pulp from said first extractor;

(j) subjecting said second used pulping liquor withdrawn in step (d) at said predetermined pulping temperature and pressure to depressurization, and separating the resultant solvent vapors from residual used pulping liquor;

(k) condensing the solvent vapors from step (j) to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f); and

(l) steam stripping at least a portion of said residual used pulping liquor from step (j) at subatmospheric pressure, removing and condensing the stripped solvent vapors to obtain a condensate suitable for reuse as said fresh pulping liquor in step (f), and separating the resultant residual slurry containing lignin solids and dissolved carbohydrates.

4,100,017

MULTI-PLY TISSUE PRODUCT

Thomas Joseph Flautt, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 574,840, May 5, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,885

Int. Cl.² D21H *5/24*

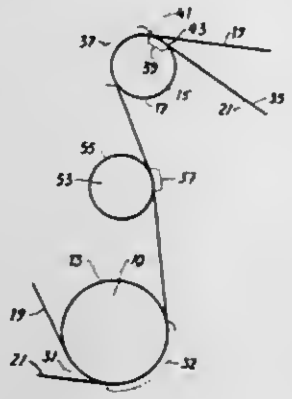
U.S. Cl. 162—111 **13 Claims**

1. A soft, absorbent paper product comprising at least two webs of paper, at least two of which webs are dissimilar, wherein at least one of said dissimilar webs is produced by a conventional papermaking process and has a random crepe pattern and a density of from 0.150 to 0.240 gm/cc and wherein at least one of said dissimilar webs is produced by a high bulk papermaking process and has a regularly repeating crepe pattern and a density of from about 0.070 to about 0.140 gm/cc; said paper product having a bending modulus substantially lower than the average of the bending moduli of a multi-ply paper product made entirely from paper produced by said conventional papermaking process and of a multi-ply paper product made entirely from paper produced by said high bulk papermaking process.

4,100,018
METHOD AND APPARATUS FOR FORMING A FIBROUS WEB

Douglas Wahren; Erik Gunnar Stenberg, and Berndt Erik Ingvar Klerelid, all of Karlstad, Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Jun. 22, 1976, Ser. No. 698,538
Claims priority, application Sweden, Jun. 23, 1975, 7507159
Int. Cl.² D21F *1/00, 9/00*
U.S. Cl. 162—203 **14 Claims**

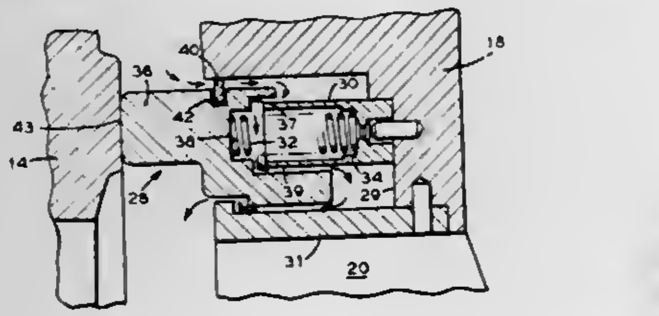


1. A method for continuously forming a running fibrous web from a fibrous suspension by injecting suspension between two running web forming wires that are pervious to the suspension liquid, forming and dewatering the injected suspension by passing the wires with the injected suspension therebetween over an arcuate segment of the impermeable surface of a forming roll while under tension, and thereafter separating the wires so that the web follows one of the wires, wherein the improvement comprises subjecting the web to further nonsuction dewatering to a dry content of about 8 – 13% at a location spaced apart from the forming roll by passing the wires and web after run-off from said forming roll and while under tension over a convexly curved surface that has a smaller radius of curvature than the forming roll and that has adjacent dewatering and wire separation portions, respectively, at least the wire separation portion being impervious, and thereafter separating the outer wire relative to said convexly curved surface from the web solely by running it off the impervious wire separation portion of said convexly curved surface in the direction away therefrom at an angle of less than 10° with respect to the inner wire while running the inner wire off the impervious wire separation portion of said convexly curved surface with the web.

4,100,019
NOZZLE SEAL

Russell Dennis Groff, Canal Fulton, and Richard John Vatovec, Akron, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1975, Ser. No. 591,255
Int. Cl.² G21C *15/00*
U.S. Cl. 176—50 **4 Claims**

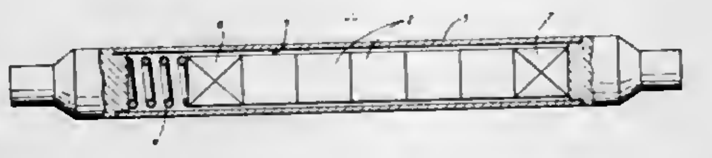


1. A reactor system comprising a pressure vessel having at least one inlet and one outlet nozzle, a distribution hoop located within the vessel, the hoop having an opening facing the outlet nozzle, an impervious means interposed between the vessel and the hoop to define a fluid flow channel extending from the opening to the outlet nozzle, said impervious means including a compression ring circumscribing the opening, the compression ring being formed with an annular recess, a spring seated in the recess, a seal ring slidably mounted on the compression ring, the spring urging the seal ring toward the vessel to maintain sealing contact therebetween, and means including at least one slidable pressure ring for precluding fluid leakage between the seal ring and said hoop.

4,100,020
INTERNAL FUEL PIN OXIDIZER

Mena G. Andrews, Newington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 22, 1976, Ser. No. 734,910
Int. Cl.² G21C *3/02*
U.S. Cl. 176—68 **7 Claims**

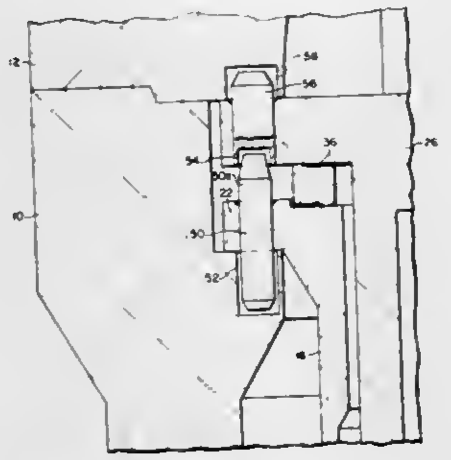


1. A nuclear reactor fuel pin, including,
a tubular cladding which is sealed,
a series of fuel pellets aligned along the internal length of the tube,
and a pellet of oxidizing chemical placed within the series of fuel pellets,
whereby the pellet of oxidizing chemical will decompose during use of the pin and produce an oxidizing material which will disperse over the length of the tubular cladding and oxidize any internal surface of the tubular cladding which may become exposed.

4,100,021
NUCLEAR REACTOR VESSEL AND INTERNALS ALIGNMENT APPARATUS

Bernard L. Silverblatt, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1976, Ser. No. 733,592
Int. Cl.² G21C *13/10*
U.S. Cl. 176—87 **8 Claims**



1. An improved nuclear reactor of the type having a reactor vessel, a reactor vessel head supported atop said vessel, a core barrel including a flange supported within said vessel, and an upper support structure supported between said core barrel flange and said head, wherein the improvement comprises:
apparatus for laterally aligning said vessel, head, flange, and support structure, said apparatus including lower keyed means for aligning said flange, support structure and vessel, and upper keyed means for laterally aligning said support structure and head, said upper keyed means maintaining alignment of said support structure and head upon their simultaneous removal from said core barrel and vessel.

4,100,022
PROCESS FOR PREPARING A CURING AGENT FOR MYELOGENIC LEUKEMIA

Katsuhiro Ogasa, Yokohama; Morio Kuboyama, Tokyo; Minoru Saito, Komae, and Kazuhiro Nagata, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

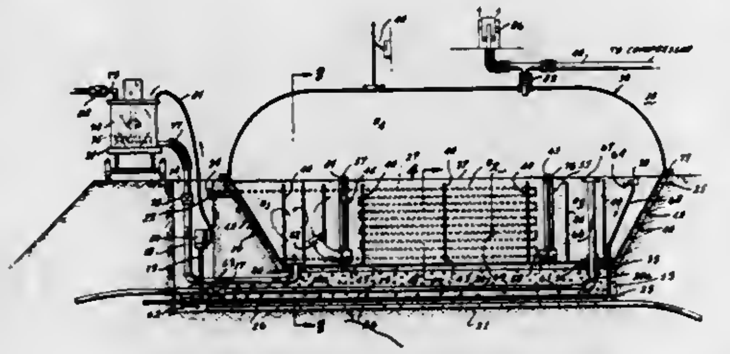
Filed Sep. 29, 1976, Ser. No. 727,653
Claims priority, application Japan, Oct. 17, 1975, 50-124435
Int. Cl.² C12K *9/00*
U.S. Cl. 195—1.8 **2 Claims**

1. A process for preparing a therapeutic agent, comprising the steps of: preculturing human amnion cells isolated from the human amnion by trypsinization or human amnion cells obtained by subculturing isolated amnion cells in a medium containing calf or bovine fetal serum at least 1 time for 1 to 5 days thereby forming a monolayer of cultured cells; separating said cultured cells from the culture medium; culturing said cells in a medium containing 0.5 to 20 mg of human serum albumin per 1ml of medium thereto for 3 to 6 days; dialyzing the culture medium against a diluted buffer or water; and filtering said dialyzed culture liquid through a bacterial filter thereby obtaining a germ-free liquid agent.

4,100,023
DIGESTER AND PROCESS FOR CONVERTING ORGANIC MATTER TO METHANE AND FERTILIZER

Byron A. McDonald, R.D. 2, Baraboo, Wis. 53913

Filed Apr. 8, 1977, Ser. No. 785,777
Int. Cl.² C12D *3/10*
U.S. Cl. 195—27 **11 Claims**



1. A digester for controlling the decomposition of organic matter to produce methane gas and a liquid fertilizer comprising:
first, second and third slurry chambers disposed in tandem;
a flexible chamber located above and covering said slurry chambers;
a first passthrough tube connecting said first chamber to said second chamber and disposed to pass slurry from the central level portion of said first chamber to the lower level portion of said second chamber;
a second passthrough tube connecting said second chamber to said third chamber and disposed to pass slurry from the lower level portion of said second chamber to the lower level portion of said third chamber;
an input line connected for periodically feeding a load of raw slurry into the bottom of said first chamber; and
an output line connected to the bottom of an upright pipe in said third chamber, the upper end of said upright pipe being the outlet port into which the slurry in the third chamber drains for feeding into the output line;
whereby the periodical feeding of a load of raw slurry into said first chamber results in an equal volume of slurry being automatically transferred from each chamber to the next and into the output line; and
wherein the size of the said first chamber is large enough to detain the volume of slurry received there in long enough to produce an acidified material and the size of said second chamber is large enough to detain the volume of slurry received therein from the first chamber long enough to generate methane gas which is collected in said fourth chamber.

10. A process for the producing of a methane gas and a liquid fertilizer from organic matter comprising the steps of:
blending a slurry of organic waste matter containing aerobic and anaerobic bacteria in a mix tank
providing a first, second and third chamber interconnected in tandem by passthrough tubes such that the central level portion of the first chamber is connected to the bottom level portion of the second chamber and the bottom level portion of the second chamber is connected to the bottom level portion of the third chamber, the size of the second chamber being larger than the size of either the first or third chambers;
providing a flexible gas collecting chamber above and covering first, second and third chambers;
initially filling said first, second and third chambers with slurry from said mix tank to the level of an output port provided by the upper end of an upright pipe in the third chamber; and
periodically feeding a predetermined volume of slurry less than the volume of the first chamber from the mix tank into the bottom of the first chamber and automatically creating a movement of a like volume of the slurry from said first chamber to said second chamber, from said second chamber to said third chamber; and from said third chamber into the outlet port;
wherein the size of said first chamber is large enough to detain the volume of slurry received therein from the mix tank long enough to react to aerobic bacteria and anaerobic bacteria to produce an acidified material and the size of said second chamber is large enough to detain the volume of slurry received therein from the first chamber long enough to further react to anaerobic bacteria to generate methane gas;
whereby the digested slurry received in the third chamber from the second chamber and drained down said outlet port corresponds to liquid fertilizer and permitting the slurry in the second chamber to remain long enough to generate methane gas which is collected in said fourth chamber.

4,100,024
HYDROLYSIS OF SOY PROTEIN

Jens Lorenz Adler-Nissen, Copenhagen, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 12, 1977, Ser. No. 758,776
Claims priority, application United Kingdom, Jan. 19, 1976, 2042/76
Int. Cl.² A23L *1/20*
U.S. Cl. 195—29 **7 Claims**

1. Process for the preparation of polypeptides from soy protein soluble in aqueous media at pH's in the range of from 2 to 7 which are suitable for use as an additive for low protein acid food products, which process comprises hydrolyzing soy protein with a microbial, alkaline proteinase in concentration ranging from 4 to 25 Anson units per kg of soy protein at a substrate concentration of between 5 and 20% w/w soy protein, at a pH in the range of from 7.5 to 8.5, until a degree of hydrolysis in the range of from about 8 to 15%, is attained, whereafter the enzyme is inactivated by reduction of pH with a food grade acid, then recovering the supernatant from the precipitate.

4,100,025

METHOD OF TREATING A DEXTROSE SOLUTION

Shigehiro Enokizono, Ageo; Norio Kamata, Funabashi, and Sakado Kanno, Sakada, all of Japan, assignors to CPC International Inc., Englewood Cliffs, N.J.

The portion of the term of this patent subsequent to July 11, 1995 has been disclaimed.

Filed Sep. 30, 1975, Ser. No. 618,090
Claims priority, application Japan, Oct. 4, 1974, 49-113998
Int. Cl.^{2} C13K *1/00, 11/00;* C13D *3/14;* C12C *13/00*
U.S. Cl. 195—31 F **5 Claims**

1. A method for the removal of heavy metal ions from a dextrose containing solution comprising passing said solution through a bed of a selectively adsorbing chelating resin or a selectively adsorbing complex adsorbing exchange resin capable of binding said heavy metal ions.

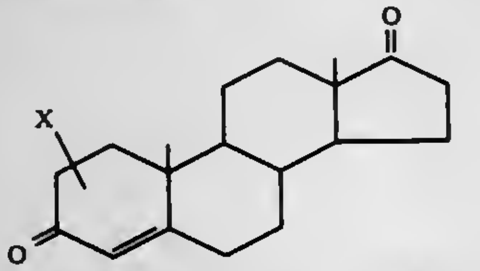
4,100,026

PROCESS FOR THE PREPARATION OF 4-ANDROSTENE-3,17-DIONE DERIVATIVES

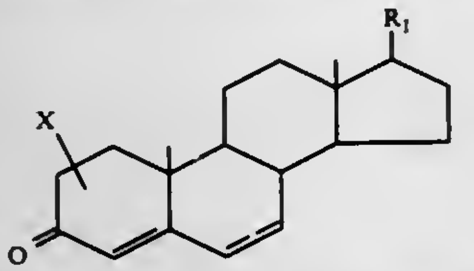
Alfred Weber; Mario Kennecke; Rudolf Mueller; Ulrich Eder, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,677
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2558090
Int. Cl.^{2} C07B *29/00*
U.S. Cl. 195—51 G **10 Claims**

1. A process for the preparation of a 4-androstene-3,17-dione compound of the formula



wherein X is 1,2-methylene or 1- or 2-methyl, comprising fermenting, in the absence of 4-androstene-3,17-dione degradation inhibitors, a sterol of the formula



wherein X is as above, ----- is a single bond, and R_1 is a saturated or unsaturated hydrocarbon side chain of 8-10 carbon atoms, with a microorganism culture capable of degrading sterol side chains.

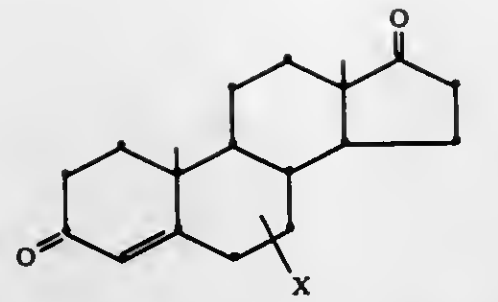
4,100,027

PROCESS FOR THE PREPARATION OF 4-ANDROSTENE-3,17-DIONE DERIVATIVES

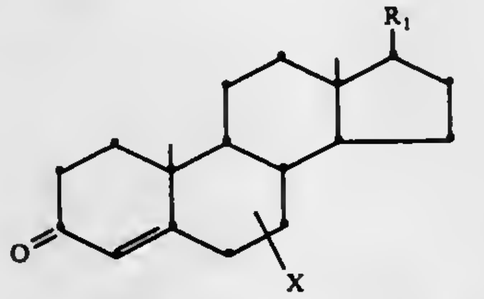
Alfred Weber; Mario Kennecke; Rudolf Mueller; Ulrich Eder, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,687
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2558088
Int. Cl.^{2} C07B *29/00*
U.S. Cl. 195—51 G **10 Claims**

1. A process for the preparation of a 4-androstene-3,17-dione of the formula



wherein X is 6,7-methylene or 6- or 7-fluoro, chloro, or methyl, comprising fermenting, in the absence of inhibitors, a sterol of the formula



wherein X is as above and R_1 is a saturated or unsaturated sterol side chain of 8–10 carbon atoms, with a microorganism culture capable of degrading sterol side chains.

4,100,028

METHOD FOR PURIFICATION OF PROTEOLYTIC ENZYMES

Valentin Mikhailovich Stepanov, ulitsa Chertanovskaya, 33, korpus 1, kv. 247, and Galina Nikolaevna Rudenskaya, ulitsa Tsandera, 7, kv. 281, both of Moscow, U.S.S.R.

Filed Jun. 7, 1977, Ser. No. 804,248
Claims priority, application U.S.S.R., Jun. 9, 1976, 2370306
Int. Cl.^{2} C07G *7/026*
U.S. Cl. 195—66 R **3 Claims**

1. A method for purification of proteolytic enzymes comprising a biospecific sorption of dissolved proteolytic enzymes on a sorbent prepared by a chemical addition of the naturally-occurring polypeptide bacitracin, to agarose activated with cyanogen bromide; elution of the sorbed proteolytic enzymes with salt buffers.

4,100,029

METHOD FOR IMPROVING THE ACTIVITY OF OXIREDUCTASE ENZYMES EMBEDDED IN FILAMENTARY STRUCTURES

Giulio Prosperi, Rome; Walter Marconi, San Donato Milanese (Milan); Silvia Giovenco, Rome, and Franco Morisi, San Giovanni in Persiceto (Bologna), all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Jul. 9, 1976, Ser. No. 703,968
Claims priority, application Italy, Jul. 10, 1975, 25251 A/75
Int. Cl.^{2} C07G *7/02*
U.S. Cl. 195—68 **6 Claims**

1. A method for improving the activity of oxidoreductase enzymes that are formed into a filamentary structure which comprises a fibrous or filamentous structural base of a water-insoluble artifical synthetic polymeric material and an enzyme or enzymes therein englobed and subdivided and partially enclosed in separated alveoli, said method comprising the steps of forming solutions of a structural base of a water-insoluble artifical synthetic polymeric material an oxidoreductase enzyme and a coenzyme of nicotinamide-adenine-dinucleotide and a water soluble, high molecular weight polymer, forming an emulsion of said solutions and thereafter spinning said emulsion into said filamentary structure.

4,100,030

PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATEDEHYDROGENASE

Walther Lamprecht, Isernhagen, Fed. Rep. of Germany, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Division of Ser. No. 723,649, Sep. 15, 1976, which is a division of Ser. No. 612,633, Sep. 12, 1975, Pat. No. 4,003,795. This application Jun. 7, 1977, Ser. No. 804,377
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1974, 2443741
Int. Cl.^{2} G01N *31/14*
U.S. Cl. 195—103.5 R **7 Claims**

1. A method for diagnosing pathological changes in the lower female genital tract by determining specific isoenzymes of the lactatedehydrogenase (LDH) which method comprises applying a test reagent composed of

1.0 to 150 mM of a buffer adapted to provide about a pH of 7 for the reagent prior to use
20 to 350 mM sodium salt of DL-lactic acid
0.01 - 1.0 mM phenazinemethosulfate (PMS)
0.1 - 10 mM nicotinamide-adenine-dinucleotide (NAD^+)
0.01 - 1.5 mM nitro-blue-tetrazoliumchloride (NBT)

onto a carrier adapted for insertion into the vagina, inserting said carrier in the lower female genital tract, the test reagent providing a pH between about 6 and 6.5 when in the vagina, leaving said carrier in said tract for at least 10 minutes then removing said carrier and observing the carrier for the appearance of a blue coloration indicating the presence of said enzymes, particularly of the isoenzymes 4 and 5.

4,100,031

PROCESS FOR PREPARING BLAST FURNACE COKES

Yoshio Kiritani, Osaka, and Michio Tsuyuguchi, Wakayama, both of Japan, assignors to Sumikin Coke Company Limited, Japan

Filed Jan. 4, 1977, Ser. No. 756,967
Claims priority, application Japan, Apr. 30, 1976, 51-50230
Int. Cl.^{2} C10B *47/10, 53/08, 57/04*
U.S. Cl. 201—6 **8 Claims**

1. A process for preparing a blast furnace coke which contains low-grade coal in a carbonizing chamber which comprises the steps of

(a) adding a binder to a coal for making briquettes which contains 40% or more of a low-grade coal;
(b) forming briquettes of different shapes or weights from the binder-coal combination of step (a) to increase the bulk density and decrease segregation in the carbonizing chamber;
(c) blending the briquettes of step (b) with a charging coal such that the briquettes comprise about 35% or more of the obtained blend; and
(d) carbonizing the blend of step (c) in a carbonizing chamber to prepare the blast furnace coke.

4,100,032

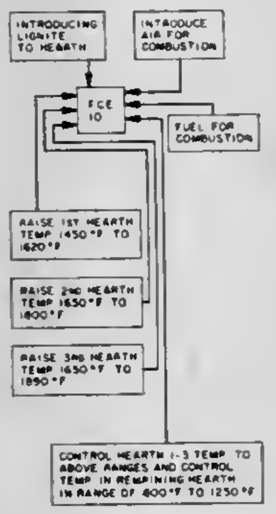
PROCESS FOR CARBONIZING LIGNITE COAL

Anton J. Elberg, Dickinson, N. Dak., assignor to Husky Industries Inc., Dickinson, N. Dak.

Filed Jul. 25, 1977, Ser. No. 818,522
Int. Cl.^{2} C10B *49/00, 53/00, 57/02*
U.S. Cl. 201—27 **10 Claims**

1. In a multi-hearth furnace for converting lignite to produce specification char having a controlled residual volatile content wherein sufficient quantities of combustion air and supplemental fuel are introduced into the furnace to raise the temperature of the furnace and a given quantity of lignite is introduced into the furnace and is successively passed from one hearth to the next adjacent hearth until the completed char is withdrawn from the last hearth, the improvement comprising:

(a) controlling the temperatures in the first hearth in range of between approximately 1450° to 1620° F while admitting sufficient combustion air to the first hearth to assure complete combustion of volatiles driven off within at least the first hearth and in the stack and to drive off a major portion of the moisture contained in the lignite;
(b) controlling the temperature in the second hearth in the range of between approximately 1650° and 1800° F while admitting sufficient combustion air to the second hearth to assure combustion of the volatiles driven off within the second hearth and to drive off the remainder of the moisture contained in the lignite and to drive off a portion of the volatiles contained in the lignite;
(c) controlling the temperature in the third hearth in the range of between approximately 1650° and 1890° F while admitting sufficient combustion air to the third hearth to assure combustion of the volatiles driven off within the third hearth and to drive off a major portion of the volatiles contained in the lignite, the volatiles driven off of the lignite in the second and third hearth being burned off in the furnace in all hearths by mixing with the previously admitted combustion air so that the furnace is self-sustaining after being initially ignited and heated up by the use of the supplemental fuel; and
(d) controlling the temperature in at least one more hearth in the range of approximately 990° to 1250° F to control and drive off a predetermined portion of the volatiles in the lignite to thereby control the volatile content of the final specification char produced in the multi-hearth furnace.


INTRODUCING LIGNITE TO HEARTH
INTRODUCE AIR FOR COMBUSTION
FCE 10
FUEL FOR COMBUSTION
RAISE 1ST HEARTH TEMP 1450°F TO 1620°F
RAISE 2ND HEARTH TEMP 1650°F TO 1800°F
RAISE 3RD HEARTH TEMP 1650°F TO 1890°F
CONTROL HEARTH 1-3 TEMP TO ABOVE RANGES AND CONTROL TEMP IN REMAINING HEARTH IN RANGE OF 400°F TO 1250°F

4,100,033

EXTRACTION OF CHARGE GASES FROM COKE OVENS

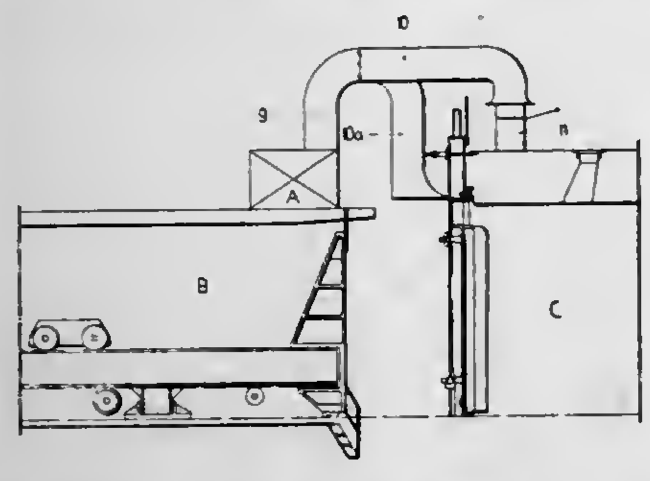
Heinz Hölter, Beisenstrasse 39-41, Gladbeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 602,659, Aug. 7, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,420
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1974, 2440016; Oct. 17, 1974, 2449391; Apr. 23, 1975, 2517968
Int. Cl.^{2} C10B *27/04*
U.S. Cl. 201—27 **14 Claims**

14. In a method for burning, in a combustion chamber, coke-oven gases produced in a battery of successive coke ovens, the improvement which comprises, in combination:

a. mounting the combustion chamber on a movable truck,
b. passing gases from each of the successive coke ovens sequentially into said combustion chamber at a flow velocity which does not exceed 10 meters per second and for a period sufficient to burn the gases completely, and

c. providing the combustion chamber with a refractory lining means to maintain a sufficient heat level between gas charges to ignite charges from successive coke ovens substantially without supplementary heating means.



4,100,034

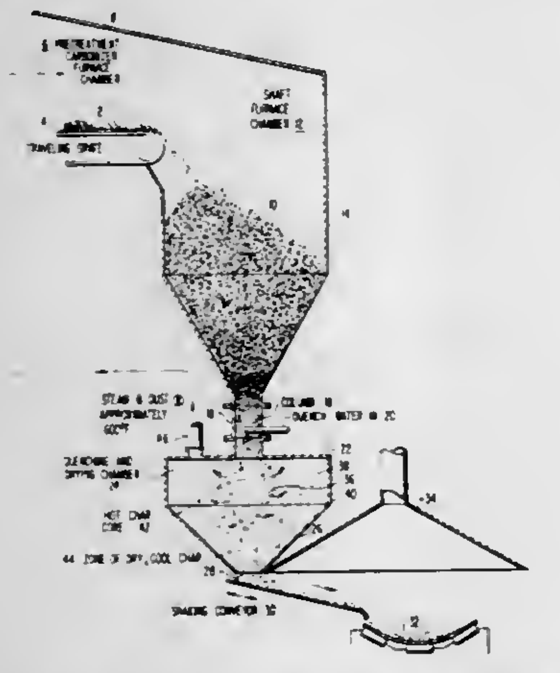
QUENCHING METHOD

Jimmy B. Smith, Columbia, and Jack R. Haley, Nashville, both of Tenn., assignors to Peabody Coal Company, Columbia, Tenn.

Filed Jul. 19, 1976, Ser. No. 706,436

Int. Cl.^{2} C10B *39/04*

U.S. Cl. 201—39 **2 Claims**



1. A process for quenching loose, hot char material which comprises:

gravity feeding a column of downwardly moving hot char material in a substantially vertical pipe, collecting said material in a vessel having an outlet opening in a lower portion thereof by feeding said column of material into a top portion of said vessel, forming a pile of said material in said vessel which pile extends upwardly to and chokes the bottom of the pipe, feeding quench water into said column of material forming a hot steam drenched core portion beneath the column and extending within the vessel adjacent said top portion and exhausting steam from an upper portion of said vessel while discharging said material through said outlet opening at a rate to obtain a desired residence time of said material in said pipe and vessel so as to control the temperature and moisture content of the discharging material, whereby the material in the column and core portion is cooled and quenched by the quench water and moisture is driven off from the material in the pile by the residual heat therein.

4,100,035

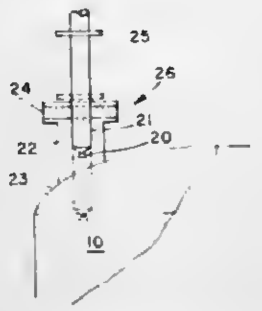
APPARATUS FOR QUENCHING DELAYED COKE

George E. Smith, Stillwater, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 619,279, Oct. 3, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,643

Int. Cl.^{2} C10B *39/06*

U.S. Cl. 202—227 **2 Claims**



1. In a delayed coking drum comprising an elongated vertically oriented coking drum having feedstock inlet means at the bottom thereof, vapor outlet means at the top thereof, steam inlet means at the bottom thereof, and coke outlet means at the bottom thereof, the improvement comprising:

retractable nozzle means extending downwardly from the top of the coking drum for introducing quench water onto the top of a bed of delayed coke therein;

protective housing means for the retractable nozzle means on the top of the coking drum whereby the nozzle means may be stored therein out of the main body of the coking drum when not in use;

means limiting the downward movement of the nozzle means whereby the nozzle means do not extend into a bed of delayed coke in the coking drum; and

steam outlet means at the bottom of the coking drum for removal of steam formed by contact of quench water with hot coke.

4,100,036

METHOD OF REGULATING CATHODE CURRENT DENSITY IN AN ELECTROPLATING PROCESS

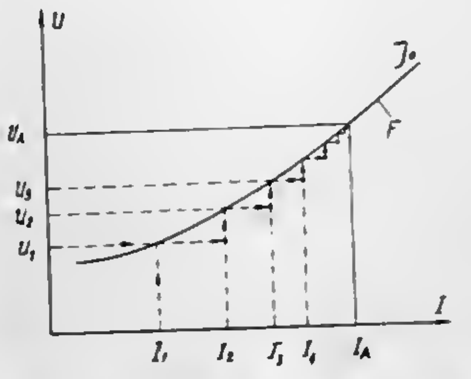
Ernst-Dietrich Rode, and Hans-Georg Winkler, both of Hamburg, Fed. Rep. of Germany, assignors to E.D. Rode KG, Hamburg, Fed. Rep. of Germany

Filed Feb. 9, 1977, Ser. No. 766,930

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605669

Int. Cl.^{2} C25D *21/12*

U.S. Cl. 204—14 R **8 Claims**



1. In a method of regulating cathode current density in electroplating baths having at least one controllable power supply unit by means of which the plating current I and the plating voltage U can be adjusted in accordance with the optimum current density J_O, for the particular electroplating bath involved, and the surface area A of the parts to be electroplated, when area A is unknown and difficult to determine, to the value U_A or I_A required to produce J_O, the method including the steps of:

selecting and introducing into the bath, several electroplatable parts which have various known and predetermined surface areas;

determining from the optimum current density J_O and the surface area of each part, the plating current values required for producing J_O for each part;

adjusting the power supply unit to the current values corresponding to each of the electroplatable parts; and

measuring the associated voltages, which arise in response to the various currents;

the improvement which comprises the steps of:

introducing the electroplatable parts in a particular sequence into the bath;

adjusting the power supply unit to the plating current values, and measuring their associated voltages in the particular sequence that the electroplatable parts were introduced into the bath;

plotting a graph F representing the plating current values in the particular sequence versus the measured values of the associated voltages, the graph F being defined by a function $U = F(I)J_O$, and having as a parameter the optimum current density J_O;

introducing into the bath an electroplatable part, having an unknown surface area A;

freely selecting an initial value of voltage U, which is relatively low as compared with the optimum voltage U_A on graph F;

adjusting the power supply unit to the voltage U_1;

determining from the graph F, the initial current I, associated with U_1;

measuring a current I_2, which is larger than the initial current I, but smaller than the optimum current I_A;

determining from the graph F, the value of the voltage U_2 associated with I_2;

adjusting the power supply unit to voltage U_2; and

continuing to measure in sequence the intermediate currents arising in response to the adjustments of the power supply unit to the intermediate voltages determined from the graph F, with increments of current and voltage becoming relatively smaller and smaller until the values of the plating voltage and current closely approach the values of U_A and I_A required to produce J_O for the electroplatable part.

4,100,037

METHOD OF DEPOSITING A METAL ON A SURFACE

William James Baron, Franklin Township, Somerset County, and John Thomas Keaney, Lawrence Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

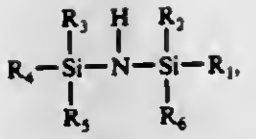
Filed Mar. 8, 1976, Ser. No. 664,610

Int. Cl.^{2} C23C *3/02;* C23B *5/64*

U.S. Cl. 204—15 **45 Claims**

1. A method of depositing a metal on a surface capable of retaining a colloidal species thereon which comprises:

(a) selectively coating a portion of the surface with a colloidophobic material selected from the group of colloidophobic materials consisting of (1) a composition comprising dimethoxy polysiloxane having a viscosity ranging from 20 to 100,000 centipoise, (2) a composition comprising a polyfluoroalkyl ester, (3) a composition comprising a perfluoro epoxy resin, and (4) a composition comprising a colloidal silica having chemically bonded to the surface thereof amounts of from about 0.01 to about 30 percent by weight based on the weight of the silica of a disilizane compound having the general formula



$$R_4-\underset{R_5}{\overset{R_3}{Si}}-\overset{H}{N}-\underset{R_6}{\overset{R_2}{Si}}-R_1,$$

wherein R_1, R_2, R_3, R_4, R_5 and R_6 are like or unlike radicals selected from the group consisting of alkyl having one to five carbon atoms to render said portion collodiophobic and to delineate an exposed surface pattern capable of retaining a colloidal species thereon; and

(b) treating said selectively coated surface with a sol comprising a colloidal species selected from the group consisting of (a^1) a colloidal species capable of reducing an activating metal ion to an activating metal, and (b^1) a colloidal activating metal species capable of participating in an electroless metal deposition to deposit said colloidal species on said exposed surface pattern.

4,100,038

PLATING ON ALUMINUM ALLOYS

Jan C. Jongkind, East Detroit, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Nov. 8, 1977, Ser. No. 849,633

Int. Cl.^{2} C25D *5/44*

U.S. Cl. 204—38 B **7 Claims**

1. The process for plating aluminum and aluminum alloys which comprises contacting said aluminum with an aqueous activating bath substantially free of active copper ions containing a stannate salt selected from the group consisting of sodium stannate and potassium stannate in a concentration of 10 – 70 grams per liter of tin as stannate; at least one member of the group consisting of sodium and potassium hydroxide in a concentration of from 1.2 grams per liter to 12.0 grams per liter; and 0.01 gram per liter to 25 grams per liter of at least one member of the group consisting of methyl cellulose ethers, polyvinyl alcohols, polyethylene oxide, and polyethylene glycols; maintaining said aluminum and said aqueous bath in contact thereby activating the surface of said aluminum, withdrawing from said aqueous bath said aluminum bearing a film of said aqueous bath, immersing said aluminum bearing said film as cathode in an alkaline bronze bath containing an anode thereby depositing a strike plate on said aluminum, and establishing a negative potential on said aluminum bearing said film with respect to said anode prior to the time said aluminum is immersed in said alkaline bronze bath.

4,100,039

METHOD FOR PLATING PALLADIUM-NICKEL ALLOY

Jerome Joseph Caricchio, Jr., Binghamton, and Edward Robert York, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,901

Int. Cl.^{2} C25D *3/56*

U.S. Cl. 204—43 N **5 Claims**

1. A method for depositing a palladium-nickel alloy on a substrate, comprising the steps of:

subjecting an anode to an aqueous bath solution consisting essentially of 3 to 6 grams per liter of palladium ion derived from palladosammine chloride, about 12 grams per liter of nickel ion derived from the group consisting of nickel sulfamate, nickel chloride and nickel sulfate, from 10 to 50 grams per liter of ammonium sulfamate, ammonium sulfate or ammonium chloride, between 1 and 1000 parts per million of a sulfite ion derived from sodium sulfite and sufficient 29% ammonium hydroxide to solubilize the palladium and nickel metal ions into soluble ammonia complexes and to maintain a pH between 8.8 and 9.6;

immersing the substrate to be coated in said solution and in spaced relation to said anode;

applying a plating current density of 0.3 to 3.0 amperes per square decimeter to said solution and substrate;

agitating both said solution and substrate; and

maintaining said solution at ambient temperature and without increasing the above concentrations of ingredients in the bath during the plating process.

4,100,040

ELECTRODEPOSITION OF BRIGHT ZINC UTILIZING ALIPHATIC KETONES

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 735,420, Oct. 26, 1976, Pat. No. 4,059,510, which is a continuation-in-part of Ser. No. 593,310, Sep. 4, 1975, Pat. No. 3,988,219, and Ser. No. 610,251, Jul. 7, 1975, Pat. No. 4,007,098. This application Sep. 14, 1977, Ser. No. 833,034

Int. Cl.^{2} C25D *3/22*

U.S. Cl. 204—55 R **30 Claims**

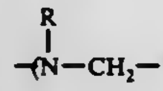
1. A zinc brightener additive, comprising:

from about 1 percent to about 98 percent by weight of a polymeric amine selected from the class consisting of;

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group; said amine groups separated by two through six methylene groups or alkyl substituted methylene groups;

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the class consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C; the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted;

a polyethylenimine having the formula



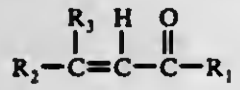
$$\left(\overset{R}{\overset{|}{N}}-CH_2-CH_2\right)_n$$

wherein R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and *y* is about 10 to about 100, and combinations thereof;

including from 1 to 98 percent by weight of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500;

said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide in either order to a residue of any organic compound containing a plurality of active hydrogen atoms; and

including from about 1 to about 20 percent of aliphatic ketones having the general formula



$$R_2-\overset{R_3}{\overset{|}{C}}=\overset{H}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-R_1$$

where R_1 is an alkyl group having from 1 to 4 carbon atoms or an alkenyl group having from 2 to 4 carbon atoms;

where R_2 is hydrogen or an alkyl groups having from 1 to 4 carbon atoms; and

where R_3 is an alkyl group having from 1 to 4 carbon atoms or furyl.

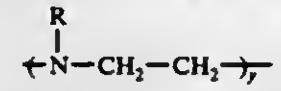
12. An aqueous acid zinc electroplating bath for producing a bright electrodeposition of zinc, containing zinc ions, comprising:

having dissolved therein from about 0.5 to about 10.0 grams/liter of a polymeric amine selected from the class consisting of;

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of ephichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, or one primary and one secondary amine group; said amine groups separated by two through six methylene groups of alkyl substituted methylene groups;

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the class consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted;

a polyethylenimine having the formula

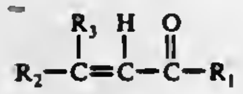


$$\left(\overset{R}{\overset{|}{N}}-CH_2-CH_2\right)_y$$

where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and y is about 10 to about 100, and combinations thereof;

including from 1 to about 10 grams/liter of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms; and

from about 0.05 to about 0.5 grams/liter of an aliphatic ketone having the general formula



$$R_2-\overset{R_3}{\overset{|}{C}}=\overset{H}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-R_1$$

where R_1 is an alkyl group having from 1 to 4 carbon atoms or an alkenyl group having from 2 to 4 carbon atoms;

where R_2 is hydrogen or an alkyl group having from 1 to 4 carbon atoms; and

where R_3 is an alkyl group having from 1 to 4 carbon atoms or furyl.

4,100,041

METHOD OF FORMING A COLORED AND OXIDE FILM ON ALUMINUM AND ALUMINUM ALLOYS

Shozo Kimura, Osaka, and Hidetoshi Yoshida, Oizumi, both of Japan, assignors to Toyo Chuo Kagaku Kenkyusho, Oizumi, Japan

Continuation-in-part of Ser. No. 780,494, Mar. 23, 1977, abandoned. This application Sep. 29, 1977, Ser. No. 837,878

Claims priority, application Japan, Apr. 14, 1976, 51-41247

Int. Cl.^{2} C25D *11/08, 11/10*

U.S. Cl. 204—58 **1 Claim**

1. A method of forming a yellow-black colored and oxide film on aluminum and aluminum alloys comprising subjecting defatted and washed aluminum and aluminum alloys to treatment of electrolytic oxidation by direct current, ac-dc combined current or pulse wave-form in an electrolyte comprising 5 – 500 g/l of sulfofumaric acid and at least one of 0.1 – 30 g/l of sulfuric acid, 0.1 – 50 g/l of oxalic acid and 0.1 – 50 g/l of metal sulfate.

4,100,042

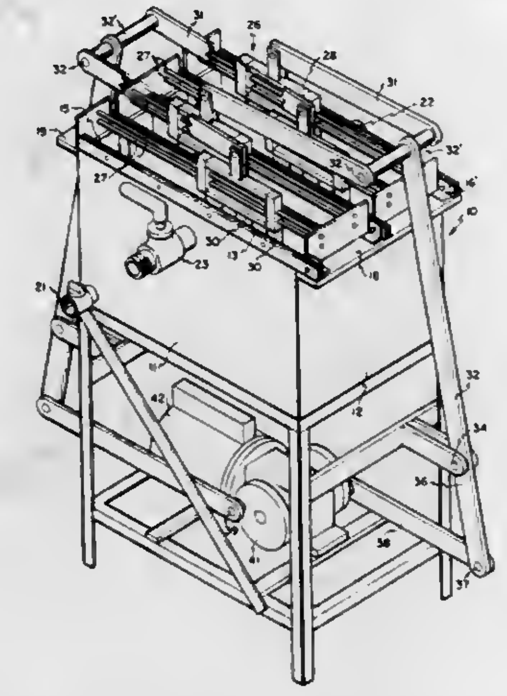
PROCESS FOR ELECTROWINNING METALS FROM A METAL-BEARING SOLIDS SLURRY

Bruce C. Wojcik, Twin Falls, Id.; Wilfred H. Herrett, Box Z, Filer, Id. 83328; Gerald D. Cooper, Rte. #N. Box 106, Pocatello, Id. 83201; Reed Goold, Rte. #4, and Charles W. Wojcik, 1004 Delmar Dr., both of Twin Falls, Id. 83301, assignors to Reed Goold; Charles W. Wojcik, both of Twin Falls; Gerald D. Cooper, Pocatello and Wilfred H. Herrett, Filer, all of, Id.

Division of Ser. No. 567,949, Apr. 14, 1975, Pat. No. 4,022,678. This application Mar. 2, 1977, Ser. No. 773,685

Int. Cl.^{2} C25C *1/00, 1/12*

U.S. Cl. 204—105 R **8 Claims**



1. A process for electrowinning metals from a slurry containing metal bearing solids in an electrolyte containing an oxidizing agent in solution in an electrolyte cell having a plurality of spaced-apart anode and cathode plates, comprising the step of directing more than one-half of the flow of said slurry against said anode plate to minimize polarization at the anode plate, thereby creating maximum efficiency at the anode plate and increasing the valance of the oxidizing agent to its higher state.

4,100,043

ATMOSPHERIC LEACH ION-EXCHANGE PROCESS FOR TREATING IRON-CONTAINING NICKEL-COPPER MATTE

Eddie C. Chou, Arvada; Paul B. Queneau, Golden; John M. Laferty, Wheatridge, and John R. Carlberg, Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Sep. 17, 1976, Ser. No. 724,380

Int. Cl.^{2} C25C *1/12*

U.S. Cl. 204—108 **4 Claims**

4. A process for leaching comminuted nickeliferous sulfide matte containing by weight about 20 to 75% nickel, about 5 to 50% copper, over 0.5 to 20% iron, optionally small amounts of cobalt, and non-stoichiometric sulfur ranging from over 4 to about 24%, the sum of the nickel, copper and sulfur contents being at least about 80% which comprises,

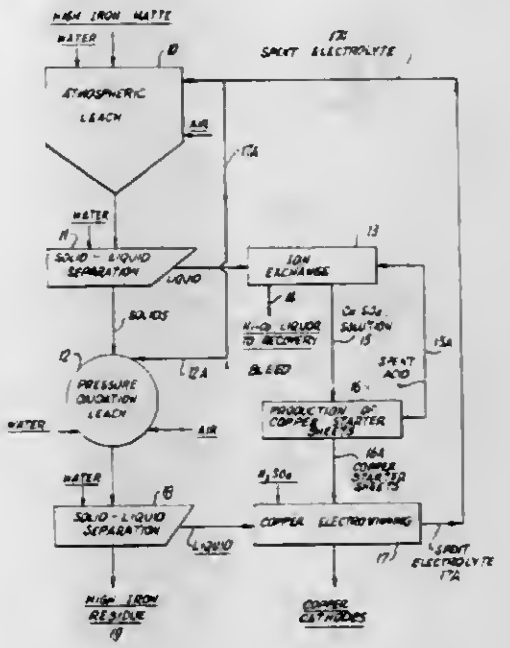
subjecting said comminuted matte to atmospheric leaching in a spent copper electrolyte-sulfuric acid solution of pH below 2 while vigorously aerating said solution to leach selectively nickel from said matte and produce a pregnant nickel solution containing less than about 10 ppm iron and copper ranging from over 5 ppm to about 750 ppm and leaving a copper-nickel-containing sulfide residue,

separating said pregnant nickel solution from said copper-nickel-containing sulfide residue,

passing said pregnant nickel solution through an ion-exchange resin bed selective to the absorption of copper selected from the group consisting of $RN(CH_2COOH)_2$, $RNH(C_2H_4NH)_nH$ and $RC(NH_2)NOH$, where R comprises polymers and copolymers of vinyl aromatic compounds and *n* is an integer of 1 or above, thereby removing said copper from said solution with a purified nickel solution going to nickel recovery,

eluting said copper from said ion-exchange resin bed by passing a sulfuric acid solution therethrough of pH below 2 and thereby produce a copper sulfate-sulfuric acid electrolyte,

producing copper starting sheet electrodes from said electrolyte for use as cathodes in the electrowinning of copper,



subjecting said copper-nickel sulfide residue from said atmospheric leach to high pressure oxidation leach with a sulfuric acid-containing solution at a temperature of about 150° to 250° C and a pressure of about 200 to 900 psig and thereby produce a pregnant copper sulfate-containing electrolyte and a leached residue which is removed,

subjecting said pregnant copper sulfate-containing electrolyte to electrowinning to recover copper therefrom and form a spent copper electrolyte with regenerated sulfuric acid,

and recycling said spent copper electrolyte into said leaching process.

4,100,044

PROCEDURE FOR REMOVING ALUMINUM FROM AN Al-Al$_3$Ni TWO-PHASE MATRIX

Charles L. Hussey, USAF Academy, Colo.; John C. Nardi, Brunswick, Ohio; Armand A. Fannin, Jr., USAF Academy, Colo.; Lowell A. King, Colorado Springs, Colo., and John K. Erbacher, USAF Academy, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 15, 1977, Ser. No. 816,223

Int. Cl.^{2} C25F *3/00, 3/04, 5/00*

U.S. Cl. 204—146 **4 Claims**

1. An electrolytic process for separating aluminum from a solid, two-phase matrix of aluminum and trialuminum nickelide filaments which comprises the steps of passing an electric current between (1) a cathode composed of an inert material and (2) an anode composed of a two phase matrix of aluminum and tri-aluminum nickelide filaments while (3) both anode and cathode are immersed in an anhydrous aluminum halide containing molten salt electrolyte to effectively remove said aluminum from said matrix without adversely affecting said trialuminum nickelide filaments.

4,100,045

RADIATION CURABLE EPOXY COATING COMPOSITION OF DIMER ACID MODIFIED VINYL ESTER RESIN

Gary W. Bogan, and Richard A. Hickner, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,693
Int. Cl.^{2} C08F *8/00;* C08L *63/00*
U.S. Cl. 204—159.16 13 Claims

1. A radiation curable composition said composition consisting essentially of the reaction product of from 0.9 to about 1.05 equivalents of carboxylic acid ingredients for 1.0 equivalents of a polyepoxide wherein said carboxylic acid ingredients consist essentially of from 0.1 to 0.3 equivalent of a dicarboxylic acid having from 20 to about 36 carbon atoms, from 0.5 to 0.9 equivalent of an ethylenically unsaturated monocarboxylic acid, and from 0 to 0.3 equivalent of a saturated monocarboxylic acid.

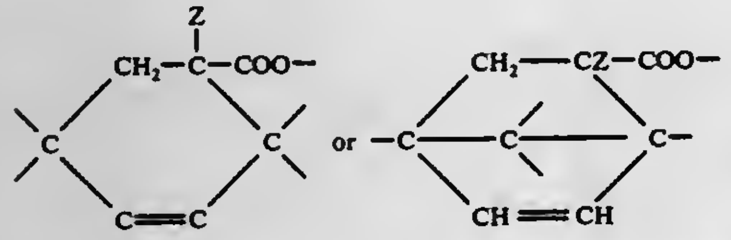
4,100,046

RADIATION POLYMERIZABLE CYCLOALKENYL DERIVATIVES OF ACRYLATED EPOXIDIZED FATTY OILS OR FATTY ACIDS

Leonard Edward Hodakowski, St. Albans, and Claiborn Lee Osborn, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,150
Int. Cl.^{2} C08F *2/46, 4/00*
U.S. Cl. 204—159.23 13 Claims

1. A polymerizable composition containing compounds having in the molecule the cycloalkenylcarbonyloxy group of the structural formula:



wherein Z is hydrogen or methyl and wherein said cycloalkenylcarbonyloxy group is attached to the molecule via the free valence bond of the carbonyloxy group thereof, said composition being the reaction product of (A) an unsubstituted or substituted conjugated diene with (B) an acrylate or methacrylate ester of an epoxidized long chain unsaturated fatty oil, fatty acid or ester thereof, wherein the ratio of said diene charged per equivalent vicinal hydroxyl acryloxy group charged is from 0.1:1 to 1.2:1.

4,100,047

ULTRAVIOLET CURABLE AQUEOUS COATINGS

William H. McCarty, White House Station, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,144
Int. Cl.^{2} C08F *2/50, 4/00*
U.S. Cl. 204—159.23 12 Claims

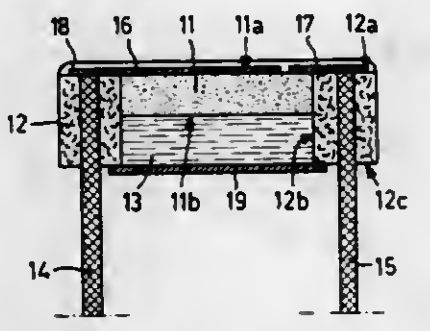
1. An ultraviolet curable aqueous coating solution comprising an hydroxy functional ethylenically unsaturated ultraviolet curable material reacted with a polycarboxylic acid or anhydride and dissolved in water with the aid of an amine photoinitiator, said ultraviolet curable material being monoethylenic or polyethylenic and monohydric or polyhydric and having a molecular weight providing a viscosity ranging from a fluid liquid to a viscous semi-solid, the proportion of said polycarboxylic acid or anhydride providing an acid number of from 20–300, and said amine providing a pH of from 6.0–11.0, said solution further containing a photosensitizer rendering the composition sensitive to ultraviolet light.

4,100,048

POLAROGRAPHIC CELL

Jean Pompei, Noisy-le-Roi, and Francis Pierrot, Rueil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 506,249, Sep. 16, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,490
Claims priority, application France, Sep. 20, 1973, 73 33743
Int. Cl.^{2} G01N *27/46*
U.S. Cl. 204—195 P 5 Claims



1. In a polarographic cell particularly adapted for the measurement of the partial pressure of a gas in a fluid comprising a detection electrode and a reference electrode immersed in an electrolyte and an insulating membrane, permeable to the gas being measured, separating the electrodes and the electrolyte from said fluid, the improvement wherein the electrolyte is at least partly immobililized by absorption in a rigid, insulating, porous material selected from the group consisting of sintered glass and sintered ceramic material and at least the detection electrode is in the form of a coating on the surface of said rigid material, said coating being thinner than said rigid material.

4,100,049

COATED CATHODE FOR ELECTROLYSIS CELLS

James R. Brannan, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jul. 11, 1977, Ser. No. 814,703
Int. Cl.^{2} C25B *9/00, 11/04*
U.S. Cl. 204—242 6 Claims

1. In an electrolytic cell for the production of halogen and alkali metal hydroxides or alkali metal hypohalides and chlorates from alkali metal halide solutions wherein said cell is equipped with an anode and a cathode, the improvement which comprises a composite cathode comprising a metal substrate having thereon a coating comprising a mixture of palladium oxide and zirconium dioxide, said metal substrate selected from a group consisting of iron, nickel, cobalt and alloys thereof.

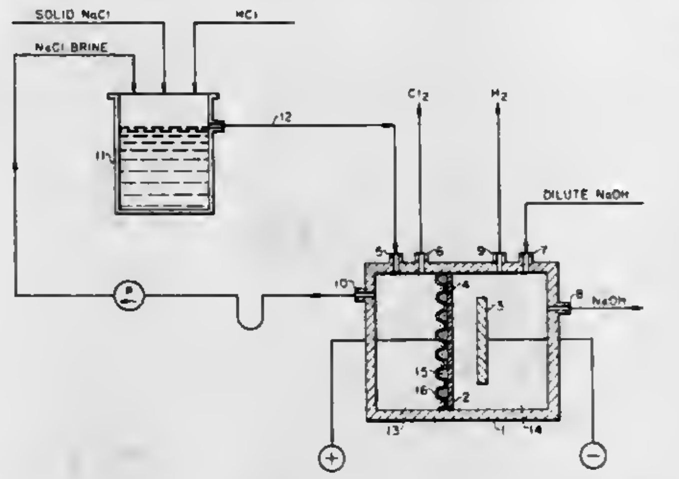
4,100,050

COATING METAL ANODES TO DECREASE CONSUMPTION RATES

Edward H. Cook, Jr., Lewiston, and Gerald R. Marks, Youngstown, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,242
Int. Cl.^{2} C25B *1/16, 1/26, 9/00*
U.S. Cl. 204—252 17 Claims

1. An electrolysis cell comprising a housing, having, in substantially vertical configuration, an anode compartment containing a porous valve metal anode, a cathode compartment containing a cathode and a cation-active permselective membrane which is substantially impervious to liquids and gases separating said anode and said cathode, said membrane being emplaced on the surface of said anode which faces the cathode, spaced apart from said cathode, said anode having a coating of a noble metal, or alloy or oxide thereof on the back face of the anode, the front face thereof not being so coated.

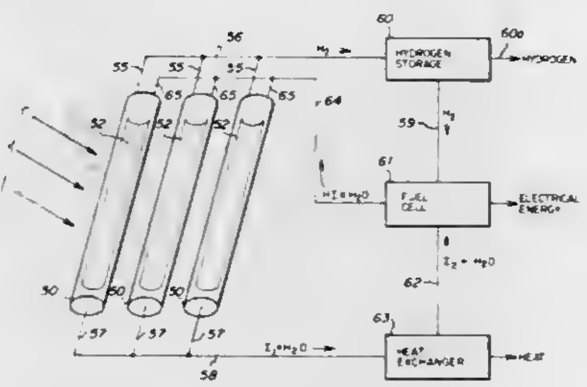


4,100,051

LIGHT ENERGY CONVERSION

Jack S. Kilby, 7723 Midbury, Dallas, Tex. 75230; Jay W. Lathrop, Clemson, S.C., and Wilbur A. Porter, College Station, Tex., assignors to Jack S. Kilby, Dallas, Tex.

Continuation-in-part of Ser. No. 599,473, Jul. 28, 1975, Pat. No. 4,021,323. This application Dec. 2, 1976, Ser. No. 747,022
Int. Cl.^{2} C25B *9/00;* H01M *8/04, 8/18*
U.S. Cl. 204—266 23 Claims



1. An energy converter which comprises:
a. a plurality of photovoltaic generators,
b. an electrolyte in physical contact with said generators,
c. means for exposing said generators to light, causing an electric potential to be developed by said generators which will cause current flow through said electrolyte to produce an electro chemical reaction in said electrolyte,
d. means for separating at least one electro chemical reaction product and transporting at least one such product from said converter, and
e. means for extracting and recombining said at least one electro chemical reaction products to produce electrical energy.

5. An optico-electro chemical energy converter which comprises:
a. a cell adapted to contain an electrolyte and to confine gases above the surface of the electrolyte,
h. a photovoltaic generator mounted in said cell and having at least two surface areas, one adapted to be wetted by the electrolyte and the other insulated to prevent wetting by the electrolyte,
c. means transmissive of optical energy for illuminating said generator,
d. means for completing an electrical circuit from said generator when said cell contains the electrolyte for dissociation of components of the electrolyte in response to light radiation induced voltage from said generator, at least one of said components being gaseous, and
e. means for extracting product gas from said cell.

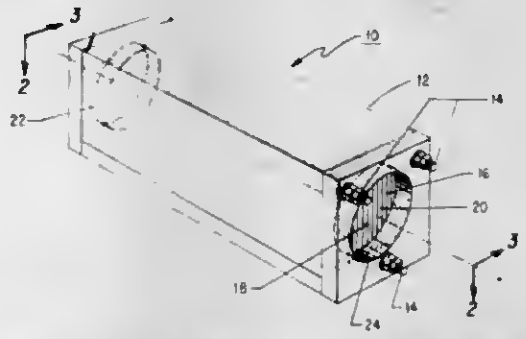
18. The method of solar energy conversion which comprises:
a. exposing a plurality of photovoltaic generators to light to develop electric potentials,
b. contacting at least selected contact areas of said generators with an electrolyte to establish current flow through said electrolyte for producing an electro chemical reaction in said electrolyte,
c. collecting at least one of the reaction products, and
d. recombining said reaction products to produce electrical energy.

4,100,052

ELECTROLYTIC GENERATION OF HALOGEN BIOCIDES

Neil W. Stillman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 11, 1976, Ser. No. 740,870
Int. Cl.^{2} C25B *1/26, 9/00;* C02B *1/82*
U.S. Cl. 204—268 12 Claims



1. An electrolytic cell for the production of halogen for use as a biocidal agent comprising: an enclosure; means for connecting said enclosure to a liquid distribution system of the facility to be biocidally affected so that the liquid must flow therethrough; a plurality of spaced planar electrode plates attached to said enclosure interior in parallel fashion across the entire cross-section area of said means for connecting said enclosure to a liquid distribution system; each of said spaced planar electrode plates having coatings on one side thereof to promote ionic potential travel in one direction through each of said spaced planar electrode plates; said means for connecting said enclosure to said liquid distribution system consisting of openings at opposing ends of said enclosure of a size nearly as large as the height of said spaced planar electrode plates; means for connecting a power source to substantially less than all of said spaced planar electrode plates to promote an electrical field thereacross to evolve halogen which is dissolved in the liquid flowing through said distribution system; and a halogen salt concentration in the liquid greater than 0.5 grams per liter.

4,100,053

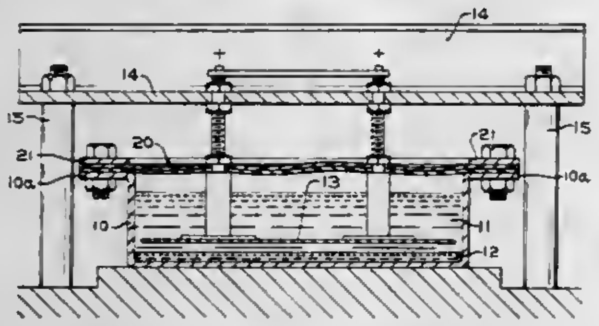
FLEXIBLE COVER FOR A CHLORINE CELL

Ralph F. Anderson, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 7, 1977, Ser. No. 858,234
Int. Cl.^{2} C25B *9/00, 1/40*
U.S. Cl. 204—279 6 Claims

1. A flexible elastomeric cover for an electrolysis cell in which free chlorine is generated, the said cover comprising an integral laminated sheet with the face thereof that is adapted to be exposed to free chlorine formed of a compound the princi-

pal ingredient of which is chlorinated polyethylene and the opposite face formed of a compound the principal ingredient of



which is an ethylene-propylene terpolymer material which is resistant to ozone.

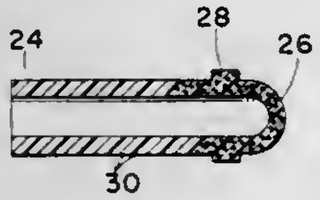
4,100,054
COMBINATION INSULATING SLEEVE AND ELECTRICAL CONTACT MEMBER FOR ELECTRO-PLATING RACK

Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 11, 1977, Ser. No. 777,281

Int. Cl.² C25D *17/06*

U.S. Cl. 204—297 W **3 Claims**



1. In an electroplating apparatus for plating an electrically conductive article, including an electrically conductive rack and supporting means thereon for supporting said article, an electrolyte bath into which said article is immersed, an electrically insulating coating on that portion of said rack and supporting means which is immersed into said electrolyte bath, a portion of said electrically insulating coating on said supporting means being removed to form a contact area at which said article and rack electrically connect one another, the improvement which comprises:

a composite electrical contact interposed between said supporting means and said article at said contact area, said composite electrical contact comprising a unitary body having an insulative portion and a resilient, normally non-conductive pressure sensitive contact portion, the surface of said pressure sensitive contact portion facing said article being ribbed such that the ribs extend above the surface of said insulative portion, whereby the ribs are conductive when compressed by the article being plated.

4,100,055
TARGET PROFILE FOR SPUTTERING APPARATUS

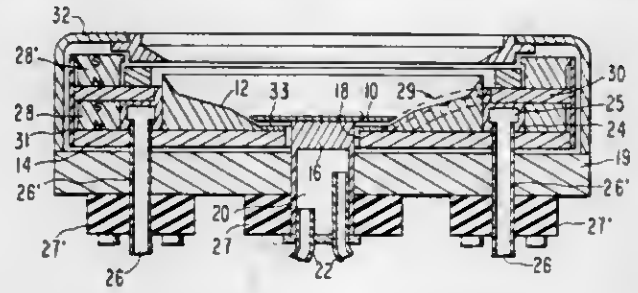
Robert M. Rainey, Ben Lomond, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 10, 1977, Ser. No. 805,485

Int. Cl.² C23C *15/00*

U.S. Cl. 204—298 **6 Claims**

1. A target for sputter coating apparatus comprising an annular body having an inner surface surrounding and generally sloping away from a central axis of said body, said surface comprising an inner portion, a middle portion and an outer portion closest said axis, a tangent to the surface of said middle portion forming a first angle with said axis, a tangent to the surface of said inner portion forming a second angle with said axis, a tangent to the surface of said outer portion forming a third angle with said axis, said first angle being an acute angle, and said first angle being different from said second and third angles, wherein said first angle is acute, said second angle is



more acute than said first angle, and said third angle is more acute than said second angle.

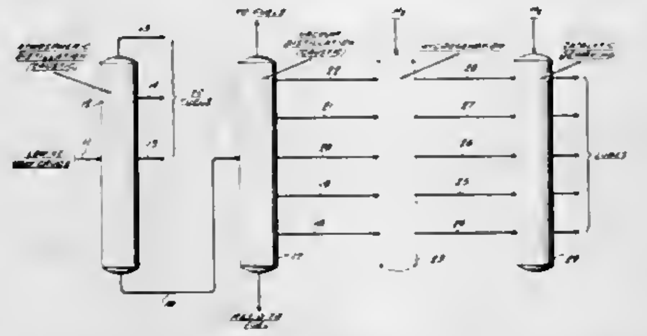
4,100,056
MANUFACTURE OF NAPHTHENIC TYPE LUBRICATING OILS

Ronald W. Reynolds, Wilmington, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Dec. 27, 1976, Ser. No. 754,284

Int. Cl.² C10G *41/00*

U.S. Cl. 208—57 **6 Claims**



1. A process for making naphthenic type lubricating oils from a low VI waxy crude which consists of distilling said low VI waxy crude to 500° to 650° F at atmospheric pressure to separate distillable fractions therefrom, subjecting the residue to a vacuum distillation at about 25 to about 125 mm Hg absolute pressure to obtain one or more distillate fractions having an SUS at 100° F viscosity of from about 60 to about 2000, and catalytically dewaxing all of said distillates in the presence of an H^+ form mordenite catalyst containing a Group VI or Group VIII metal at 550° F, 500 to 1500 psig and 0.25 to 5.0 LHSV to obtain said naphthenic type oils having a pour point of from about −50° to +20° F.

5. A process for making naphthenic type lubricating oils fom a VI waxy crude which consists of atmospherically distilling said crude to remove wet gas, straight run gasoline, naphtha and atmospheric gas oil fractions, subjecting the residue to a vacuum distillation at about 25 to 120 mm mercury pressure absolute to obtain gas oul fractions having an SUS at 100° F viscosity of from about 60 to about 2000 hydrotreating said gas oil fractions in the presence of a Ni/Mo catalyst at about 650° F, a hydrogen pressure of about 800 psig and a LHSV of about 1.0 and catalytically dewaxing said hydrotreated gas oil fractions in the presence of an H+ form mordenite catalyst containing platinum at a temperature of about 550° to about 600° F, a hydrogen pressure of about 850 psig, and a LHSV of from about 0.8 to about 1.0 to obtain napthenic type oils having a pour point of from about −60° to about 20° F.

4,100,057
METHOD OF TREATING A SOUR PETROLEUM DISTILLATE

David H. J. Carlson, Park Ridge, and James R. Deering, Prospect Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 1, 1977, Ser. No. 820,472

Int. Cl.² C10G *27/06*

U.S. Cl. 208—206 **10 Claims**

1. A method of treating a sour petroleum distillate which comprises admixing from about 5 to about 50 wt ppm morpholine with said distillate and treating the distillate and morpholine mixture in an alkaline solution in contact with an oxidizing agent and a metal phthalocyanine catalyst.

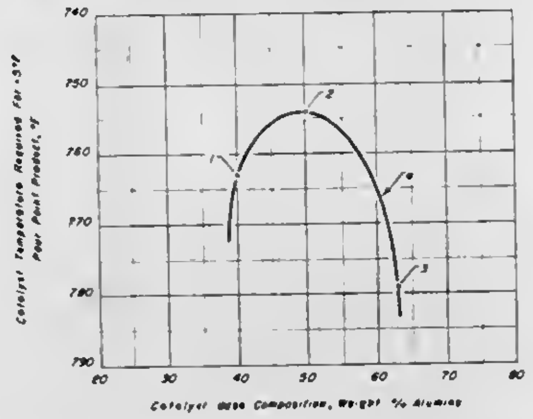
4,100,058
HYDROPROCESSING OF HYDROCARBONS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 716,922, Aug. 23, 1976, Pat. No. 4,061,563, which is a division of Ser. No. 599,561, Jul. 28, 1975, Pat. No. 4,003,956, which is a continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application Sep. 30, 1977, Ser. No. 838,266

Int. Cl.² C10G *23/02;* B01J *27/02, 27/10*

U.S. Cl. 208—264 **5 Claims**



1. A process for improving the jet fuel characteristics of a sulfurous kerosene boiling range fraction, which process comprises reacting said kerosene fraction and hydrogen, at a maximum catalyst temperature below about 750° F., in a catalytic reaction zone containing a catalytic composite comprising a combination of a nickel component, and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten component.

4,100,059
ASPHALT RECYCLE SYSTEM

Michio Jinno, 6-3, Yasudadohri, Showa-ku, Nagoya-shi, Japan

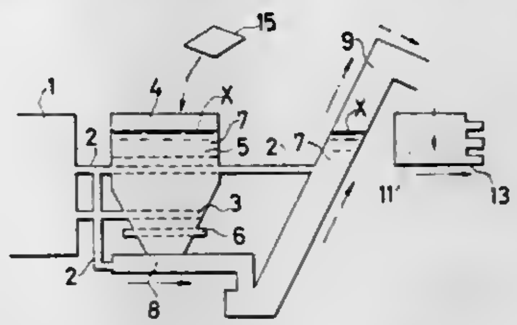
Filed Nov. 23, 1976, Ser. No. 744,308

Claims priority, application Japan, Dec. 11, 1975, 50-148246; May 14, 1976, 51-55945; May 17, 1976, 51-56317; May 17, 1976, 51-56318; May 17, 1976, 51-56319; May 20, 1976, 51-57231

Int. Cl.² B03B *9/02*

U.S. Cl. 209—3 **5 Claims**

1. An asphalt recycling method comprising the steps of:
a. introducing 1) asphalt waste and 2) activated terra alba, activated carbon or a mixture thereof into a tank of water;
b. jetting steam into said water to heat said water to a temperature sufficient to soften the asphalt waste; and
c. mechanically subdividing the asphalt waste while immersed in the heated water into aggregate grains, each aggregate having a surface coated with a thin asphalt film.



2. The method of claim 1 further comprising sorting said aggregate grains into a predetermined number of size groups.

4,100,060
INDEX CARD REGISTER WITH SELECTOR DEVICE

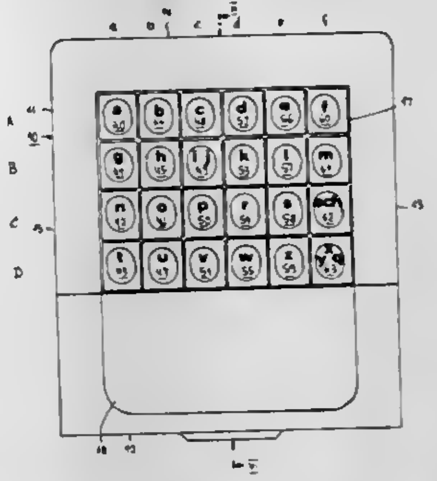
Hans Halm, Herne, Germany, assignor to Firma Niveau AG, Basel, Switzerland

Filed Jan. 18, 1977, Ser. No. 760,260

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647067

Int. Cl.² B07C *5/00*

U.S. Cl. 209—80.5 **11 Claims**



1. An index card register with selector means, including a housing consisting of a cover member and a bottom member, a plurality of counter spring-biased selector keys, a drawer biased hy a compression spring and adapted to be locked by a locking mechanism, a plurality of index cards defining a replaceable stack of index cards accommodated within the drawer, the index cards including marginal cutouts, means for unlocking the drawer and exposing to sight an index card selected by actuation of a corresponding selector key, by unlocking the drawer and moving the same into a position projecting from the housing under the bias of the compression spring, the drawer including entrainment cams of a resilient material adapted to engage entrainment apertures of the index cards, the index cards including selector apertures adapted to be engaged by the counter-spring-biased selector keys, said index card register being characterized by the plurality of selector keys being arranged in an array in several rows and columns on the cover member, each selector key being mounted on one end of an associated one-armed pivot lever, the other end of said pivot lever being rotatably journalled on a mounting rod serving as a pivot axis, the mounting rod being disposed in a forward region of said housing, said pivot lever being held in a substantially horizontal position by resilient means and includes, at its free end, a card retainer pin depending downwardly toward the bottom wall of said housing bottom member, said card retainer pins of said pivot levers being arranged in two rows along the lower surfaces of said pivot

levers whereby the card retainer pins of every other pivot lever define a row; a drawer detent bar resiliently mounted in a rearward region of said bottom wall of said housing bottom member, said drawer detent bar including a drawer locking mechanism adapted to be unlocked to permit outward movement of said drawer when being biased by the card retainer pin of a depressed selector key; selector tongues bearing said selector apertures for said card retainer pins along rearward marginal portions of said index cards disposed in a stack within said drawer, said selector tongues increasing in extension by steplike increments from a lowermost index card having one aperture up to an uppermost index card having a highest number of apertures, from a bottom right hand position to a top left hand position, the number of apertures in said selector tongues increasing from the lowermost index card to the uppermost index card by one for each card, whereby the incremental one aperture in each index card as compared to the apertures in an adjacent underlying index card is exposed with respect to the aperture-containing selector tongue portions of an adjacent underlying index card; and a triangular entrainment cam in a forward region of said drawer, said entrainment cam adapted to cooperate with entrainment apertures in a forward region of said index cards.

4,100,061
SEPARATOR

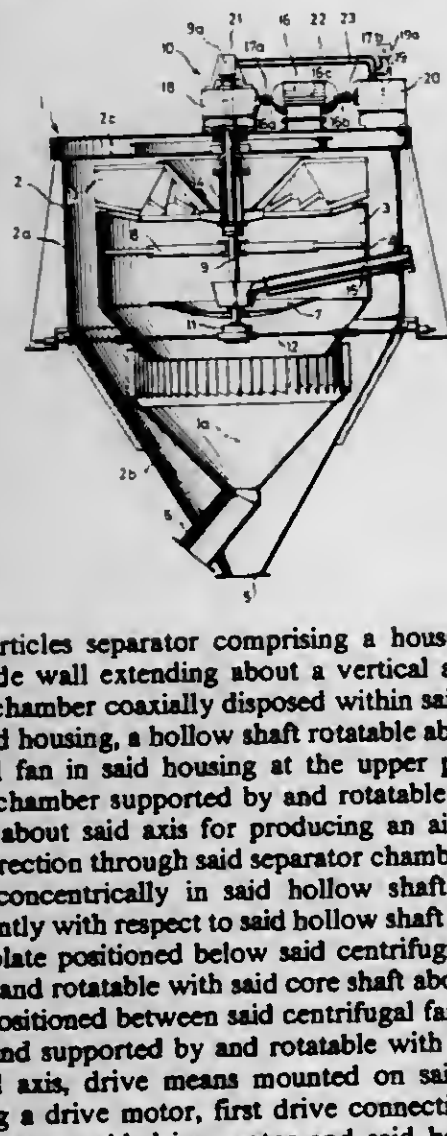
Hubert Eickholt, Neubeckum, and Günter Heinzel, Ahlen, both of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Sep. 20, 1976, Ser. No. 724,272

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547709

Int. Cl.^{2} B07B *7/08*

U.S. Cl. 209—139 A **4 Claims**



1. A particles separator comprising a housing defining a circular side wall extending about a vertical axis, a circular separator chamber coaxially disposed within said circular side wall of said housing, a hollow shaft rotatable about said axis, a centrifugal fan in said housing at the upper portion of said separator chamber supported by and rotatable with said hollow shaft about said axis for producing an air stream in an upward direction through said separator chamber, a core shaft mounted concentrically in said hollow shaft and rotatable independently with respect to said hollow shaft about said axis, a scatter plate positioned below said centrifugal fan and supported by and rotatable with said core shaft about said axis, an impeller positioned between said centrifugal fan and said scatter plate and supported by and rotatable with said core shaft about said axis, drive means mounted on said housing and comprising a drive motor, first drive connection means connected between said drive motor and said hollow shaft for rotating said centrifugal fan, and second drive connection means connected between said drive motor and said core shaft for rotating said scatter plate and said impeller, said second drive connection means comprising a hydraulic pump driven by said drive motor, a hydraulic motor in driving connection with said core shaft and driven by said hydraulic pump, and flow control means for selectively varying the speed of said hydraulic motor with respect to said hydraulic pump whereby the drive motor is operated to rotate the hollow shaft and fan up to a desired speed of rotation and the flow control means is selectively operated to vary the driven speed of the hydraulic motor, core shaft, scatter plate and impeller independently of the rotation of the hollow shaft and fan.

4,100,062
METHOD OF TREATMENT OF AN OXIDIZABLE MATERIAL BY A BIOCHEMICAL PROCESS

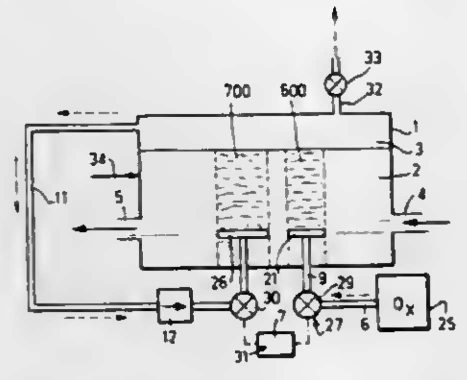
Paul Boulenger, Le Chesnay; Nicole Angelier, and Jean-Pierre Torres, both of Echirolles, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 637,869, Dec. 4, 1975, abandoned, which is a continuation of Ser. No. 480,304, Jun. 17, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,902

Claims priority, application France, Jun. 25, 1973, 73 23074

Int. Cl.^{2} C02B *1/34;* C02C *1/12*

U.S. Cl. 210—14 **9 Claims**



1. A method of biochemical treatment of a liquid mass comprising water with an oxidizable material, in an oxygenation zone comprising a gaseous atmosphere including oxygen surmounting said liquid mass, comprising the following operations:

1. in a first step introducing an oxygenation gas, comprising more than 50% by volume of oxygen supplied from an external source into the heart of the liquid mass in the form of bubbles, the duration (a) of said introduction step being at most equal to the mean duration (d) of travel of said bubbles up to the inter-face between said gaseous atmosphere and said liquid mass;
2. in a second step effecting a circulation of either said liquid mass or said gaseous atmosphere in contact one with the other by the use of mechanical oxygenation, the duration (b) of said circulation step being at least equal to the mean duration (d) of travel of the bubbles of the oxygenation gas in the liquid mass;
3. cyclically repeating steps 1 and 2; and
4. maintaining at least one of the following parameters namely the duration (b) of said circulation step, the total period (a + b) of said sequence, and the mass flow-rate of the oxygenation gas, such that the mean rate of flow of oxygenation gas to said oxygenation zone corresponds substantially to the consumption of oxygen.

4,100,063
METHOD AND APPARATUS FOR THE BIOLOGICAL CLEANSING OF WASTE WATER

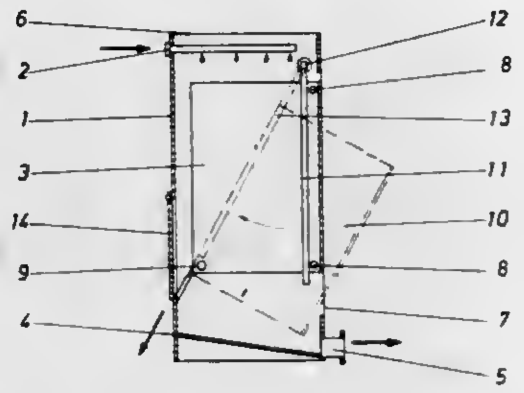
Ludwig Hartmann, Karlsruhe, Fed. Rep. of Germany, assignor to Maschinenfabrik Hellmut Geiger, Karlsruhe-West, Fed. Rep. of Germany

Continuation of Ser. No. 543,423, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 380,545, Jul. 19, 1973, abandoned. This application May 6, 1976, Ser. No. 683,743

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1972, 2235470

Int. Cl.^{2} C02C *1/04*

U.S. Cl. 210—17 **7 Claims**



1. A trickling filter apparatus for cleaning waste water, comprising, in combination:

a housing;

charging means near the upper part of said housing and operable for charging said waste water into said housing up to a predetermined level;

a plurality of growth means uprightly suspended adjacently within said housing for growing a biological mass sprayable by the waste water, said biological mass being free from immersion in the waste water;

removal means disposed between the adjacent growth means and operable for mechanically removing said biological mass from said growth means to form a sludge;

first discharge means disposed in said housing below a substantial portion of said growth means and operable to cooperate with said removal means for discharging said sludge from said housing; and

second discharge means disposed near the lowermost part of said housing and below said first discharge means and operable for continuously discharging the cleaned waste water, the predetermined level being between said first and said second discharge means.

5. A method of cleaning waste water in a trickling filter comprising a housing, charging means near the upper part of said housing and operable for charging said waste water into said housing up to a predetermined level, a plurality of growth means uprightly suspended adjacently within said housing for growing a biological mass free from immersion in the waste water, removal means disposed between the adjacent growth means and operable for mechanically removing said biological mass from said growth means to form a sludge, first discharge means disposed in said housing below a substantial portion of said growth means, above said predetermined level, and operable to cooperate with said removal means for discharging said sludge from said housing, and second discharge means disposed near the lowermost part of said housing and below said first discharge means and operable for continuously discharging the cleaned waste water, comprising the steps of:

charging the waste water into said apparatus, said predetermined level being between said first and said second discharge means; spraying the waste water onto said growth means; continuously discharging the cleaned waste water; and removing the biological mass.

4,100,064
PURIFICATION OF WATER BY REVERSE OSMOSIS USING A SUPPORTED SEMI-PERMEABLE MEMBRANE

George Martin Gale, Shrewsbury, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 467,477, May 6, 1974, abandoned, which is a continuation of Ser. No. 304,783, Nov. 8, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,560

Claims priority, application United Kingdom, Nov. 23, 1971, 54432/71

Int. Cl.^{2} B01D *13/00*

U.S. Cl. 210—23 H **3 Claims**

1. In a method for purifying water by reverse osmosis using a semi-permeable membrane, the improvement wherein the membrane is supported by the outer surface of an extruded tube of water-permeable rigid p.v.c. so that impure water is contacted with said outer surface and purified water is recovered from the bore of the tube, the p.v.c. having an apparent density of from 0.5 to 1.3g/cc, and an average pore diameter of from 5 to 500 microns, at least 50% of the pores being interconnected and 95 to 99.5% of the pores in the tube being accessible from the inner or outer surface thereof, the tube having 1 to 10 holes/mm^2 on the outer surface thereof, having an external diameter of from 1.5 mm to 8 mm and having a wall thickness of at least 0.5 mm.

4,100,065
METHOD FOR REMOVING OF MULTIVALENT HEAVY METALS FROM METAL PLATING WASTE EFFLUENTS

James E. Etzel, Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Dec. 22, 1976, Ser. No. 753,218

Int. Cl.^{2} C02B *1/44*

U.S. Cl. 210—38 B **9 Claims**

1. A method for removing multivalent heavy metal ions from metal plating waste effluents to avoid polluting the water supplies comprising passing a metal plating waste effluent having a multivalent heavy metal ion concentration of 25 mg/l or less through a cation-exchange column packed with exfoliated vermiculite particles, whereby the multivalent heavy metal ions are exchanged for a non-polluting magnesium ion and the heavy metal ions are retained by the vermiculite lattice so as to prevent polluting the water supplies with the discharged metal plating waste effluent.

4,100,066
TREATING PAINT WASTE SOLIDS

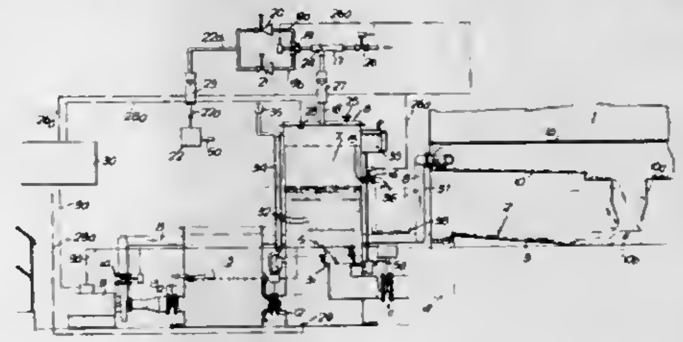
Ivan Bloomer, and Ronald William Young, both of London, England, assignors to Carrier Drysys Limited, London, England

Filed May 5, 1976, Ser. No. 683,424

Claims priority, application United Kingdom, May 7, 1975, 19240/75

Int. Cl.^{2} C02B *1/00*

U.S. Cl. 210—44 **29 Claims**



1. A method of collecting and disposing of waste paint solids contained in an aqueous medium which flows from a paint spray booth into a water container located beneath the booth, the method comprising the steps of:

flowing paint laden aqueous medium from the water container into the lower portion of a vessel which has sides, a top and a bottom and which is located outside the booth;

retaining the aqueous medium in the vessel for a residence time sufficient to permit paint solids to accumulate as a raft on the surface of the aqueous medium in the vessel; and

by applying fluid pressure to the raft causing the accumulated paint solids to flow from an outlet at an upper portion of the vessel into a container.

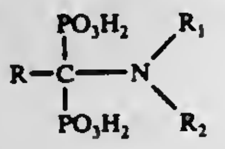
4,100,067
METHOD FOR SEQUESTERING METAL IONS

Klaus Sommer, Heidelberg, and Günter Raab, Laudenbach, Bergstr., both of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH., Ladenburg am Neckar, Fed. Rep. of Germany

Division of Ser. No. 675,479, Apr. 9, 1976, Pat. No. 4,029,696.
This application Jan. 18, 1977, Ser. No. 760,367
Int. Cl.^{2} C02B *5/06*

U.S. Cl. 210—58 **3 Claims**

1. A method of sequestering bivalent and polyvalent metal ions in an aqueous system, comprising the step of adding an effective sequestering amount of a compound of the formula



$$R-\overset{\overset{PO_3H_2}{|}}{\underset{\underset{PO_3H_2}{|}}{C}}-N\begin{matrix}\diagup R_1\\ \diagdown R_2\end{matrix}$$

in which

R is hydrogen, lower alkyl, phenyl, hydroxy lower alkyl, or carboxy lower alkyl;

R_1 is hydrogen, lower alkyl, hydroxy lower alkyl, dihydroxy lower alkyl, or hydroxy carboxy lower alkyl, and

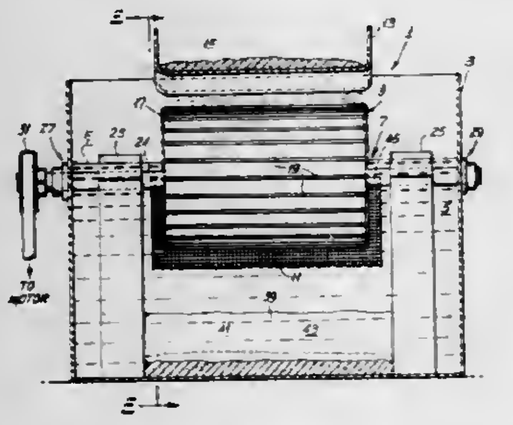
R_2 is hydroxy lower alkyl, or the alkali metal salts thereof, to said aqueous system in order to effect complex formation with said bivalent and polyvalent metal ions.

4,100;068
SYSTEM FOR THE DIELECTROPHORETIC SEPARATION OF PARTICULATE AND GRANULAR MATERIAL

Cy Edward Jordan, and Casimir Paul Weaver, both of Tuscaloosa, Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 13, 1977, Ser. No. 759,202
Int. Cl.^{2} B03C *5/00*

U.S. Cl. 204—300 R **11 Claims**



1. A dielectrophoretic separator for the continuous separation of particulate and granular materials, which separator comprises, in combination:

a vessel containing a liquid dielectric medium;

an electrode configuration disposed within the vessel and including:

a cylindrical-shaped rotatable electrode having a nonuniform conductor surface, and

an arcuate-shaped perforated electrode spaced radially outward from the rotatable electrode to define a contact zone therewith; and

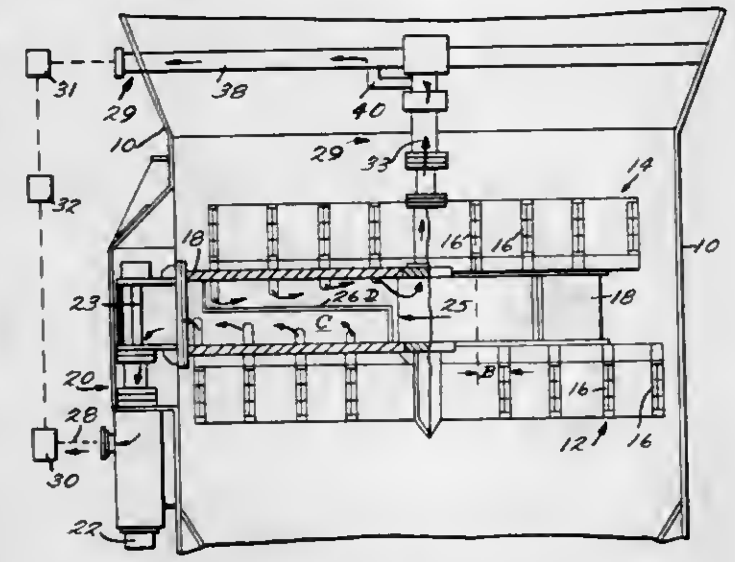
means for applying a source of voltage to the electrode configuration to produce a divergent electric field in the contact zone, wherein the particulate and granular materials are immersed in the divergent electric field.

4,100,069
TWO-STAGE PULP THICKENING

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,928
Int. Cl.^{2} D21C *9/18;* B01D *33/00*

U.S. Cl. 210—109 **2 Claims**



1. Apparatus for screening pulp comprising

two sets of concentric screens mounted in a tower, each set being vertically spaced from the other, the lowermost screen set being a first screen set, and the uppermost screen set being a second screen set, and each screen set comprising a plurality of radially spaced screens;

the screens of said first screen set being radially offset from the screens of said second screen set;

a plurality of hollow mounting arms between said screen sets and each commonly mounted said screen sets and in operative fluid communication with at least said some of screens of said screen sets, each of said hollow mounting arms being in communication with screens of each of said first and second screen sets;

means for dividing each of said hollow mounting arms into first and second chambers to prevent fluid communication between the interior screens of said first and second screen sets;

first and second withdrawing means for withdrawing screened-out liquid from said mounting arms, said first withdrawing means comprising a suction source for withdrawing screened liquid generally radially outwardly from said first screen set; said second withdrawing means comprising a suction source for withdrawing screened liquid axially and then radially outwardly from said second screen set;

said second withdrawing means further comprising a tubular shaft concentric with said screens of said second screen set and extending axially vertically upwardly from said screens of said second screen set; a stationary withdrawal conduit in fluid communication with said tubular shaft; bushing means for providing liquid-tight axially slidable engagement between said tubular shaft and said stationary withdrawal conduit; and a radially extending hollow support arm mounted in the tower vertically above said stationary withdrawal conduit, and supporting said withdrawal conduit, said hollow support arm being in fluid communication with said withdrawal conduit;

means for controlling operation of said first and second suction sources to substantially balance extraction flow rates of liquid through said first and second screen sets; and

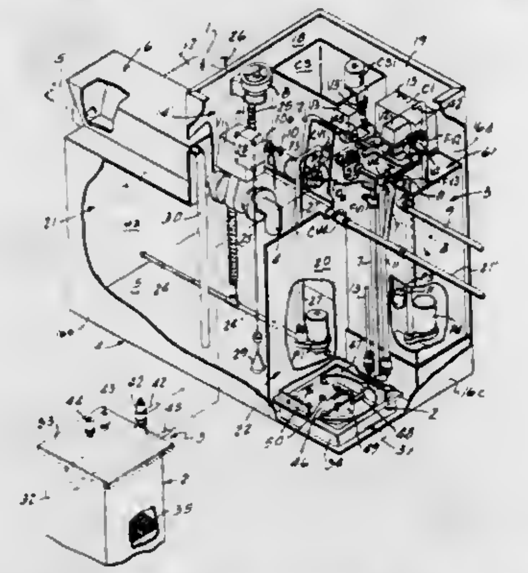
means for axially reciprocating said hollow mounting arms and screen sets connected thereto; whereby liquid-tight axial sliding movement takes place between said tubular shaft and said stationary withdrawal conduit of said second withdrawing means.

4,100,070
APPARATUS FOR USE IN WATER PURIFICATION PARTICULARLY SEWAGE TREATMENTS

Eugene B. White, Oak Park, and Mahindar N. Sharma, Lake Zurich, both of Ill., assignors to Filters International, Inc., Chicago, Ill.

Division of Ser. No. 429,488, Jan. 2, 1974. This application Sep. 10, 1975, Ser. No. 611,853
Int. Cl.^{2} C02C *1/04;* B01D *23/14*

U.S. Cl. 210—136 **68 Claims**



1. In a bio-chemical oxidation/physio-chemical adsorption sewage treatment system, the combination of a sewage receiving tank, means for effecting aeration of the contents therein for primary treatment thereof, and in which tank a secondary settling treatment may be effected, a tertiary filter and adsorption structure comprising a receptable containing an upflow filtration mixed bed graded from coarse to fine particles in the direction of flow and an adsorption bed containing activated carbon disposed thereabove, means for conducting effluent in said receiving tank, resulting from the secondary treatment, to an inlet disposed below the filtration bed of said tertiary structure for upward passage therethrough, the latter having an outlet therein disposed above said adsorption bed, a storage tank, means for conducting output renovated water of said tertiary structure to said storage tank for storing a predetermined volume of such water, and conducting an excess thereover from the system, means for selectively supplying water from said storage tank to the bottom of said tertiary structure, means for selectively supplying an oxidizing gas, under pressure, to the bottom of said tertiary structure, means operatively connecting said receiving tank and the output of the tertiary structure for conducting liquid from the latter to said receiving tank, and valve means disposed in the various supply and conducting means for controlling flow therethrough, whereby respective fluid flows may be selectively established, one for effluent from the receiving tank upwardly through the tertiary structure to the storage tank, another for renovated water from the storage tank upwardly through the tertiary structure to the receiving tank, and a third from the gas-supply means upwardly through the tertiary structure to the receiving tank, with the last two flows providing means for regenerating the beds of the tertiary structure.

4,100,071
APPARATUS FOR THE TREATMENT OF LIQUIDS

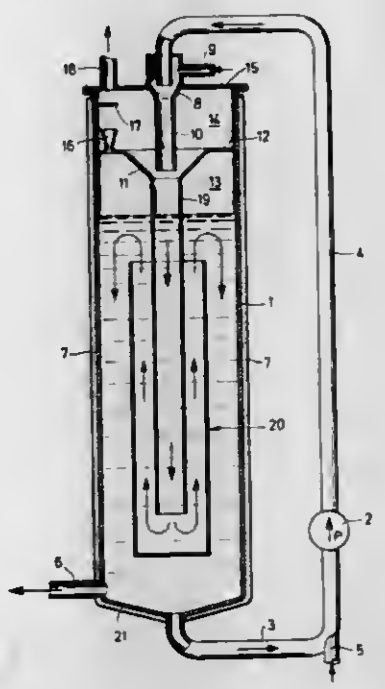
Peter Beurer, Winterthur; Johannes Lüthi, Neftenbach, and Libero Portaleoni, Kollbrunn, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 3, 1976, Ser. No. 747,329

Claims priority, application Switzerland, Dec. 10, 1975, 16027/75

Int. Cl.^{2} C02C *5/04*

U.S. Cl. 210—197 **7 Claims**



1. An apparatus for the treatment of liquids and/or mixtures of liquids and solids, said apparatus comprising

a container defining a mixing chamber;

a hydraulic conveying means for conveying a forced through-flow of a liquid and/or a mixture of liquids and solids through said container;

a system of conduits connected between said container and hydraulic conveying means to define a closed circuit for circulating the flow therebetween, one of said conduits having a cross-section smaller than the cross section of said container;

a gas supply means located in said one conduit for delivering a flow of gas thereto to mix with said through-flow;

a foam collecting chamber in said mixing chamber;

a foam breaking chamber in communication with said foam collecting chamber to receive a flow of foam therefrom;

a partition separating said foam breaking chamber from said foam collecting chamber;

at least one impact plate in said foam breaking chamber for breaking up foam bubles impinging thereon from said mixing chamber;

an ejector communicating said foam breaking chamber with said mixing chamber to return fine bubbled foam to said mixing chamber from said foam breaking chamber;

at least one conduit of said system of conduits being disposed within said container for feeding the mixed flows of liquid and gas into said mixing chamber with said ejector communicating with said one conduit to deliver fine bubbled foam thereto; and

at least one foam accelerating device in said partition in spaced opposition to a respective impact plate.

4,100,072

EFFLUENT OIL COLLECTING VESSEL

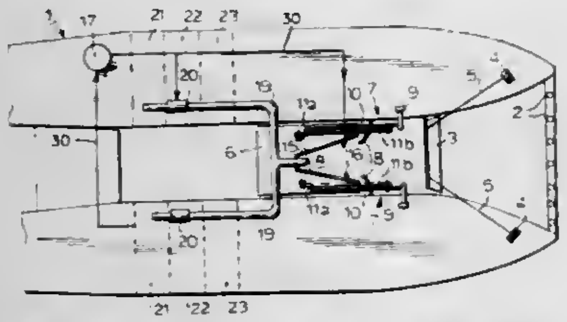
Shoji Uchida, Nagayo; Hiroshi Takeshita, and Shozo Yamazaki, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,453

Claims priority, application Japan, May 10, 1976, 51-58991

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 S **6 Claims**



1. An effluent oil collecting vessel of twin-hull type for collecting effluent oil from a body of water, said vessel comprising:

parallel flotation hulls spaced from each other;

a float between said parallel hulls;

linkage means mounted on both of said parallel hulls and connected to said float for continuously maintaining said float is a horizontal position on the surface of said body of water;

tank means in said parallel flotation hulls for receiving and separating said effluent oil and water and for storing said effluent oil separated from said water;

suction pipe means on said float having one end open at the surface of said body water and the opposite end connected to said tank means for sucking in said effluent oil and water on the surface of said body of water and carrying the same to said tank means;

ejector means in said suction pipe means for creating a suction in said suction pipe means;

oil converging means at the forward end of said float for converging the flow of effluent oil and water between said parallel hulls toward said suction pipe means on said float;

a plurality of flexible guide means attached at only one end to said parallel hulls and extending into the space between said hulls in front of said oil converging means at approximately the surface of said body of water for blocking the spaces between said parallel hulls and said oil converging means and for directing said oil and water between said parallel hulls towards said oil converging means;

high pressure water ejector means directed toward said oil converging means and said suction pipe means for directing high pressure water against said oil converging means and for enhancing the flow of effluent oil and water between said parallel hulls in said oil converging section toward said suction pipe means; and

high water supply means connected to said high pressure water ejector means, said ejector means and said tank means for taking water from said tank means and supplying high pressure water to said high pressure water ejector means and said ejector means.

4,100,073

WASTE-WATER TREATMENT SYSTEM

Francis J. Hopcroft, 56 Prospect St., Norwood, Mass. 02062

Filed Jul. 6, 1976, Ser. No. 702,959

Int. Cl.² C02C *5/10*

U.S. Cl. 210—532 S **2 Claims**

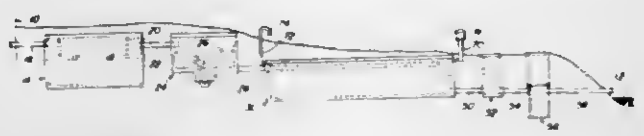
1. A wastewater treatment system including,

(a) an anaerobic septic tank having an inlet adapted to receive raw wastewater including solid and liquid waste components and a first outlet conduit at the upper portion of said septic tank for discharging effluents therefrom, said septic tank providing primary anaerobic treatment of said wastewater,

(b) a dosing chamber connected to said first outlet conduit of said septic tank whereby the effluent discharge of said septic tank is delivered to said dosing chamber for temporary storage therein, said dosing chamber including automatic dosing means for discharging a predetermined volume of liquid collected in said dosing chamber, and a second outlet conduit connected to said dosing means for discharging liquids therefrom,

(c) a gravity filter connected to said second outlet conduit for removing solid particles suspended in the liquid discharged from the dosing chamber and for enhancing aerobic decomposition of said solid particles,

(d) said filter including an enclosure and a filter bed disposed within said enclosure, said enclosure including top, bottom and side walls and connected at the top thereof to said second outlet conduit, a third outlet conduit connected to the bottom of said enclosure, said filter bed including an upper stratum of peastone, a middle stratum of sand, and a bottom stratum of peastone, the top surface of said upper stratum being spaced from said top wall to define a void therebetween coextensive with the top of the filter and said top wall, at least a pair of spaced atmospheric vents connected to the upper portion of said enclosure, communicating with said void, and adapted to automatically and continuously circulate fresh air across the top surface of said filter, and distribution means connected to said second outlet conduit and adapted to distribute the liquid discharged from said dosing chamber over the top of said filter bed, and collection means at the bottom of said filter connected to said third outlet conduit for collecting filtered effluent, and,



(e) disinfection means connected to said third outlet conduit for disinfecting filtered liquid.

4,100,074

ANTIMONY TRIOXIDE COMPOSITION AND PROCESS OF PRODUCING THE SAME

Nobuyoshi Abe, Urawa; Shigenaga Kobo, Tokyo, and Kiyoshi Kanamaru, Toda, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd. and Toho Ganryo Kogyo Co., Ltd., both of Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,895

Claims priority, application Japan, Aug. 7, 1975, 50-95416

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **24 Claims**

1. An antimony trioxide composition of improved chemical and physical properties, including sulfide resistance, transparency and electrical insulation capability, which comprises antimony trioxide particles having on the surfaces thereof hydrous zirconium oxide in an amount of about 0.1 to about 5% by weight (as ZrO_2) of the total weight of said composition and fine amorphous silica in an amount of about 1 to about 20% by weight, said silica being coated on said particles as an outer contiguous, dense coating upon electron microscope observation.

4,100,075

SILANE TREATED ANTIMONY COMPOUNDS

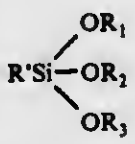
John Slocum Ashman, Euclid, and Anton Mudrak, Broadview Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,226

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **12 Claims**

1. A finely divided particulate inorganic antimony compound aurface modified with up to about 5% by weight of an organosilane having the formula



$$R'Si(OR_1)(OR_2)(OR_3)$$

wherein R_1, R_2 and R_3 are each independently hydrogen, lower alkyl, lower alkenyl, alkoxyalkyl aryl, lower alkylaryl, or lower arylalkyl groups, and R' is an organo functional group.

8. A method for improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface modified antimony compound of claim 1 effective to improve the flame-retardant properties.

4,100,076

TITANATE TREATED ANTIMONY COMPOUNDS

John Slocum Ashman, Euclid; Gerald Dennis Burt, Shaker Heights, and Anton Mudrak, Broadview Heights, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,227

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **13 Claims**

1. A finely divided particulate inorganic antimony compound surface modified with an organic titanate having the general formula

$$Ti(OR)_4 \qquad I)$$

wherein each R is independently an alkyl, aryl, cycloalkyl, or vinyl group containing from one to about 18 carbon atoms, or

$$Ti(OR')_2(OYX)_2 \qquad II)$$

wherein X is oxygen or nitrogen,

Y is a two- or three-carbon atom chain, and

R' is equal to R, H, or the ligand represented by XYOH.

8. A method of improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface-modified antimony compound of claim 1 which is effective to improve the flame-retardant properties.

4,100,077

ZIRCONATE TREATED ANTIMONY COMPOUNDS

Gerald Dennis Burt, Shaker Heights, and Anton Mudrak, Broadview Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,228

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **10 Claims**

1. A finely divided particulate inorganic antimony compound surface-modified with an organic zirconate having the general formula

$$(RO)_4Zr$$

wherein each R is independently an aliphatic radical containing from one to about 18 carbon atoms.

6. A method of improving the flame-retardant properties of organic resins and elastomers comprising incorporating into said resin or elastomer, an amount of the surface-modified antimony compound of claim 1 which is effective to improve the flame-retardant properties.

4,100,078

SECONDARY ETHERAMINE ACETATES AND THEIR USE AS LUBRICATING AGENTS FOR SYNTHETIC FIBERS

Rolf Kleber, Nen-Isenburg, and Willi Steckelberg, Hofheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

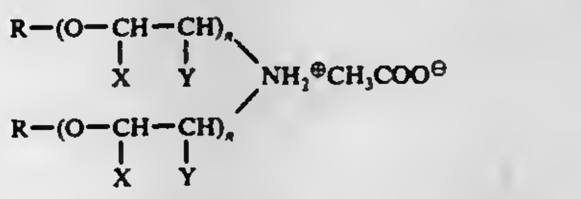
Filed Dec. 9, 1976, Ser. No. 748,968

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555896

Int. Cl. D06m *13/18*

U.S. Cl. 252—8.9 **4 Claims**

1. Secondary etheramine acetates of the formula



I

$$[R-(O-CH(X)-CH(Y))_n]_2NH_2^{\oplus}CH_3COO^{\ominus}$$

in which R is alkyl or alkenyl having from 7 to 24 carbon atoms, cyclohexyl or aryl optionally substituted by alkyl having from 8 to 10 carbon atoms, X and Y represent hydrogen or methyl, but are not both methyl at the same time, and n is an integer in the range of from 2 to 20.

4,100,079

POLYMERS FOR ACID THICKENING

Gloria DiMarco Sinkovitz, Bridgeville, Pa., and Andrew Jackson Sharpe, Jr., Cheshire, Conn., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1977, Ser. No. 772,051

Int. Cl.² E21B *43/27*

U.S. Cl. 252—8.55 C **7 Claims**

1. A method of fracturing a subterranean formation comprising:

a. contacting said formation with an aqueous fracturing fluid which contains an acid which is capable of reacting with subterranean carbonate formations and as a thickening agent therefore at least 0.5 percent by weight of the acid and water of a copolymer having a molecular weight of at least 5,000, said copolymer containing from about 50 to about 98 weight percent dimethyl diallyl ammonium chloride and from about 2 to about 50 weight percent of a monomer capable of postreaction after polymerization to provide branching or partial crosslinking said monomer being selected from the group consisting of N-methylolacrylamide and diacetone acrylamide;

b. applying sufficient pressure to the said fracturing fluid to fracture said formation; and

c. maintaining said pressure while forcing said fracturing fluid into said fracture.

4,100,080

GREASES CONTAINING BORATE DISPERSIONS AS EXTREME-PRESSURE ADDITIVES

John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1977, Ser. No. 777,367
Int. Cl.^{2} C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **5 Claims**

1. In a grease having extreme-pressure properties comprising an oil of lubricating viscosity, thickened to grease consistency with an organic grease thickener, the improvement comprising the addition of a minor portion sufficient to impart extreme-pressure properties of a dispersion of hydrated potassium borate having a mean particle size of less than one micron and a boron to potassium ratio of about 2.5 to 4.5.

2. The grease of claim 1 in which the thickener is a lithium soap.

4,100,081

POLYUREA-BASED EXTREME PRESSURE GREASE

John L. Dreher, El Cerrito, and Richard E. Crocker, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1977, Ser. No. 777,365
Int. Cl.^{2} C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—25 **6 Claims**

1. A grease comprising a major portion of an oil of lubricating viscosity, a minor portion of polyurea, sufficient to thicken said oil to grease consistency, and a minor portion, sufficient to impart extreme-pressure properties to the grease, of a potassium or sodium triborate, said borate being introduced into the grease in aqueous solution, said polyurea comprising a water- and oil-insoluble organic compound having a molecular weight between about 375 and 2500 and having at least one ureido group.

4,100,082

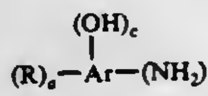
LUBRICANTS CONTAINING AMINO PHENOL-DETERGENT/DISPERSANT COMBINATIONS

Donald Lynn Clason, Mentor; John Francis Pindar, Euclid, and Jerome Martin Cohen, University Heights, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 28, 1976, Ser. No. 653,177
Int. Cl.^{2} C10M *1/40, 1/54, 1/32, 3/34*
U.S. Cl. 252—33.4 **23 Claims**

1. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula



$$(R)_a-\overset{(OH)_c}{\overset{|}{Ar}}-(NH_2)_b$$

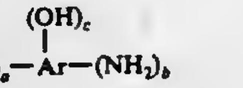
wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a*, *b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a*, *b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 substitutents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(I) at least one neutral or basic metal salt of an organic sulfur acid, phenol or carboxylic acid.

7. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula

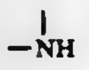


$$(R)_a-\overset{(OH)_c}{\overset{|}{Ar}}-(NH_2)_b$$

wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a*, *b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a*, *b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(III) at least one acylated, nitrogen-containing compound having a substituent of at least 10 aliphatic carbon atoms and made by reacting a carboxylic acylating agent with at least one amino compound containing at least one

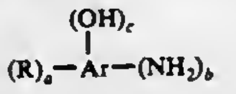


$$-\overset{|}{N}H$$

group, said acylating agent being linked to said amino compound through an imido, amido, amidine or acyloxy ammonium linkage.

17. A lubricant composition for two-cycle engines comprising a major amount by weight of at least one oil of lubricating viscosity and a nitrogen-containing organic composition comprising a combination of:

(A) about 2 to about 30% (based on the oil composition) of at least one amino phenol of the formula



$$(R)_a-\overset{(OH)_c}{\overset{|}{Ar}}-(NH_2)_b$$

wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; *a*, *b* and *c* are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of *a*, *b* and *c* does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety which is substituted by 0–3 substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) about 1 to about 30% (based on the oil composition) of at least one detergent or dispersant, said detergent or dispersant being

(IV) nitrogen-containing condensate of a phenol, aldehyde and amino compound having at least one —NH group.

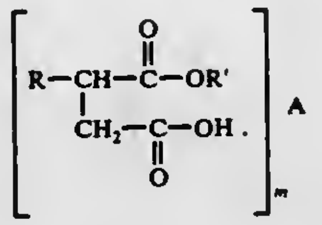
4,100,083

LUBRICANT COMPOSITIONS CONTAINING AN AMINE SALT OF A HALF ESTER OF SUCCINIC ACID

William R. Murphy, West Trenton, N.J., and Carleton N. Rowe, Yardley, PA, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 474,494, May 30, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,922
Int. Cl.^{2} C10M *1/26*
U.S. Cl. 252—34 **10 Claims**

1. A lubricant composition consisting essentially of a major amount of a lubricant selected from the group consisting of lubricating oil and a grease therefrom and an anti-fatigue amount of an amine salt of a half ester of a succinic acid, the salt having the formula:



wherein *m* is 1 or 2, R is an alkyl or alkenyl group containing from 4 to 100 carbon atoms, R' is an alkyl group containing from 1 to 40 carbon atoms and A is (1) a hydrocarbyl monoamine or (2) a polyamine of the formula:

$$NH_2CH_2CH_2(R''NH)_xNH_2$$

wherein R'' is an alkylene group of from 1 to 10 carbon atoms and *x* is zero to 10.

4,100,084

PREPARATION OF OVERBASED METAL NAPHTHENATE LUBRICATING OIL COMPOSITIONS

William J. Powers, III, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 767,000
Int. Cl.^{2} C10M *1/24, 3/18, 5/16, 0/22*
U.S. Cl. 252—39 **4 Claims**

1. A method of preparing a clarified overbased metal naphthenate lubricating oil composition comprising contacting a reaction mixture of a metal naphthenate reactant having a metal ratio of from about above 1 to 10, an alkaline earth metal hydroxide, a hydrocarbon lubricating oil and an alcohol selected from the group consisting of alkanols and alkoxyalkanols having from 1 to 5 carbon atoms with carbon dioxide at a temperature between about 140° and 155° F., allowing the mixture to stand in an air blanketed vessel for 1 to 100 hours; subsequently filtering the resultant naphthenate product and recovering said clarified overbased metal naphthenate composition from the filtrate, said metal naphthenate being derived from naphthenic acid of a molecular weight between about 230 and 600, said contacting employing between about 1 and 10 moles of hydroxide per mole of said metal naphthenate reactant, between about 0.75 and 1.1 moles CO_2 per mole of hydroxide, said hydrocarbon lubricating oil being present in a weight ratio of between about 1:1 and 6:1 diluent oil to metal naphthenate reactant, and said alcohol being present in a weight ratio of between about 1:2 and 1:6 alcohol to naphthenate reactant.

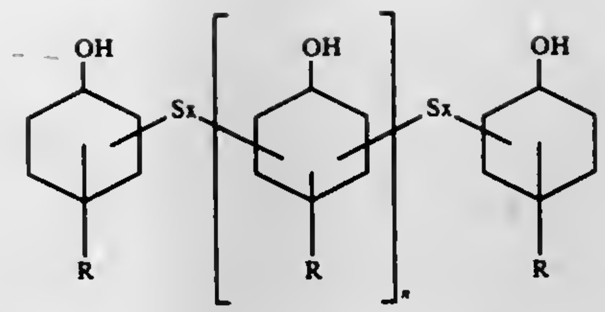
4,100,085

PROCESS FOR THE PREPARATION OF ADDITIVES FOR LUBRICATING OILS

Andrea Peditto, Turin; Franco Fossati, Robassomero (Turin), and Vincenzo Petrillo, Cirie (Turin), all of Italy, assignors to Liquichimica Robassomero S.p.A., Milan, Italy

Filed Dec. 15, 1976, Ser. No. 750,696
Claims priority, application Italy, Dec. 24, 1975, 30779 A/75
Int. Cl.^{2} C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **6 Claims**

1. In a process for preparing a detergent additive for a lubricating oil, of the type in which an alkylphenolsulfide, having the formula:



wherein R is a C_8–C_{20} alkyl group, *x* had a value of between 1 and 2 and *n* is an integer of between 0 and 3, is reacted with calcium oxide or calcium hydroxide and carbonated with carbon dioxide, the improvement comprising carrying out the reaction in the presence of (1) a promoter selected from the group consisting of NH_3 and NH_4OH, and (2) a co-promoter which is a short chain alcohol having not more than 5 carbon atoms.

4,100,086

DISPERSANT AND LUBE OILS CONTAINING SAME

John M. Larkin, Austin, Tex., and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,250
Int. Cl.^{2} C10M *1/32;* C08L *23/36*
U.S. Cl. 252—50 **7 Claims**

1. A composition of matter useful as a lubricating oil additive consisting of the reaction product of halogenated polyalkylenes having a molecular weight ranging from about 300 to 5000 or copolymers thereof and an excess of an unsaturated nitrogen containing heterocycle reacted at a temperature of around 80 to 160° C in the presence of an alkali or alkaline earth metal salt; the amount of heterocycle reacted being in excess of 1.5 to 30 moles per mole of said halogenated polyalkylenes with the amount of said metal salt being in an amount ranging from 0.2 to 3.0 moles per mole of said polyalkylenes.

4,100,087

PRESSURE-FIXING MAGNETIC DEVELOPER CONTAINING HYDROGENATED POLYSTYRENE BINDER FOR ELECTROSTATIC PHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Hiroshi Takayama, Moriguchi, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jan. 11, 1977, Ser. No. 758,423
Claims priority, application Japan, Jan. 22, 1976, 51/5477
Int. Cl.^{2} G03G *9/14*
U.S. Cl. 252—62.1 P **18 Claims**

1. A pressure fixing developer for electrostatic photography comprising a finely divided magnetic material and a binder as effective components and consisting essentially of substantially spherical particles of said finely divided magnetic material dispersed in a solid medium of said binder, said binder medium being composed of a resin composition comprising (a) 25 to 65% by weight based on the total binder of a hydrogenated styrene resin, (b) 5 to 45% by weight based on the total binder of a wax having a melting point of at least 60° C. and (c) 10 to 30% by weight based on the total binder of a copolymer of an olefin with a carbonyl group-containing, ethylenically unsaturated monomer.

4,100,088

IMAGING COMPOSITION

Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1976, Ser. No. 702,362
Int. Cl.^{2} G01N *27/00*
U.S. Cl. 252—62.52 **9 Claims**

1. An imaging composition consisting essentially of a ferro-

fluid and metal flakes, said metal flakes being detached from magnetic particles suspended in said ferrofluid and capable of being aligned in the direction of a magnetic field to which said ferrofluid is subjected.

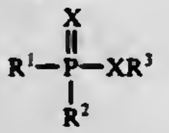
4,100,089
HIGH-VOLTAGE INSULATING MATERIAL COMPRISING ANTI-TRACKING AND EROSION INHIBITING COMPOUNDS WITH INSULATING POLYMERS

Travers Kregg Cammack, II, Union City, and David Dolph Nyberg, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 16, 1976, Ser. No. 649,797
Int. Cl.^{2} H01B *3/00*
U.S. Cl. 252—63 **36 Claims**

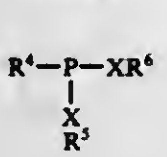
1. A high-voltage electrically insulating material comprising at least one polymer and a composition comprising an additive effective in reducing tracking and a compound selected from the group consisting of nickel phosphate, a compound of Formula I, a compound of Formula II, a compound of Formula III and mixtures thereof;

Formula I



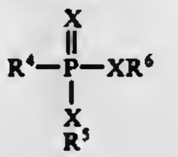
$$R^1-\overset{\overset{\displaystyle X}{\|}}{\underset{\underset{\displaystyle R^2}{|}}{P}}-XR^3$$

Formula II



$$R^4-\underset{\underset{\underset{\displaystyle R^5}{\displaystyle X}}{|}}{P}-XR^6$$

Formula III



$$R^4-\overset{\overset{\displaystyle X}{\|}}{\underset{\underset{\underset{\displaystyle R^5}{\displaystyle X}}{|}}{P}}-XR^6$$

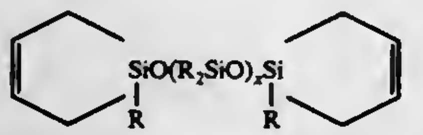
wherein each X is independently selected from oxygen or sulfur and wherein R^1 through R^6 can be the same or different and are independently selected from hydrogen or an organic group bound to P or X by carbon and wherein R^3, R^5 and R^6 can independently be a metallic or ammonium cation.

4,100,090
ELECTRICAL DEVICES CONTAINING SILACYCLOPENTENE DIELECTRIC FLUIDS

William T. Brooks, and Gary E. Legrow, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 5, 1977, Ser. No. 794,272
Int. Cl.^{2} H01B *3/46, 3/24, 3/20*
U.S. Cl. 252—63.7 **13 Claims**

1. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid a siloxane having the general formula



wherein each R is independently selected from the group consisting of methyl, phenyl, chloropropyl, and 3,3,3-trifluoropropyl radicals, and *x* is an integer.

4,100,091
PROCESS AND MEANS FOR ABSORBING AND RELEASING THERMAL ENERGY BY UTILIZING THE ALLOTHOPIC CHANGE OF ENDO-5-NORBORNENE-2, 3-DICARBOXYLIC ACID ANHYDRIDE WITH HEAT

Justin C. Powell, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,962
Int. Cl.^{2} C09K *5/00*
U.S. Cl. 252—70 **5 Claims**

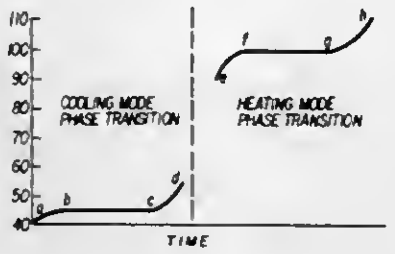
1. A process for absorbing, storing and releasing thermal energy which comprises exposing anisotropic, orthorhombic, endo-5-norbornene-2,3-di-carboxylic acid anhydride crystals to heat at a temperature in the range of 93°-160° C to cause absorption of heat energy accompanied by an allotropic change to another crystalline state at said temperature, storing said crystals at a temperature above 40° C and cooling said crystals at a temperature below 40° C., to release the stored energy.

5. Material for storing, and releasing thermal energy at a temperature above 30° C consisting essentially of endo-5-norbornene-2,3-dicarboxylic acid anhydride in an allotropic crystalline state produced by heating said anhydride to a temperature of about 93° to 160° C.

4,100,092
DUAL TEMPERATURE THERMAL ENERGY STORAGE COMPOSITION FOR HEAT PUMPS

Hans O. Spauschus, Prospect, and Leopold Loeb, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 705,808, Jul. 16, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,087
Int. Cl.^{2} C09K *5/06;* **F25B** *29/00, 13/00*
U.S. Cl. 252—70 **16 Claims**



1. A thermal energy storage material comprising at least two dissimilar, non-reactive paired organic constituents in a mixture, one of said constituents having a phase change transition temperature in the range of between about 35° F. and about 55° F. and the other having a phase change transition temperature in the range of between about 90° F. and about 130° F., each phase change transition temperature for one constituent occurring in mixture with the other constituent, said mixture consisting of paired constituents selected from one member of a group consisting of (a) a low m.p. C_{14}-C_{16} straight chain paraffin oil paired with a high m.p. paraffin or hydrocarbon wax (oil/wax); (b) a C_8 fatty acid paired with an acid selected from one member of the group consisting of a C_{14}-C_{18} fatty acid (acid/acid); (c) an alcohol selected from one member of the group consisting of a C_{10}-C_{12} alcohol paired with an acid selected from one member of the group consisting of a C_{14}-C_{18} fatty acid (alcohol/acid); and (d) an alcohol selected from one member of the group consisting of a C_{10}-C_{12} alcohol paired with a paraffin or hydrocarbon wax (alcohol/wax).

4,100,093
COMPOSITIONS FOR THE TREATMENT OF GLASS SURFACES

Giorgio Rialdi, via Padre Semeria 18, Genova, Italy

Filed Oct. 4, 1976, Ser. No. 729,156
Claims priority, application Italy, Apr. 1, 1976, 21827 A/76
Int. Cl.^{2} C11D *7/24, 7/50*
U.S. Cl. 252—89 R **3 Claims**

1. A glass surface treating composition which comprises, in intimate admixture:

(a) 0.2–0.5% of a polyisopropylene gum;
(b) 18–25% of a monovalent saturated alcohol having from 3 to 4 carbon atoms;
(c) 9–13% of a liquid hydrocarbon having a boiling point of from 31° C to 36.2° C. and being capable of solubilizing said polyisopropylene gum and maintaining said gum in solution;
(d) 4–8% of a fatty compound selected from the group consisting of castor oil, hydrogenated castor oil and polymerized castor oil;
(e) 2–6% of silica gel;
(f) 0.05–0.2% of ammonium hydroxide; and
(g) 40–60% of water,

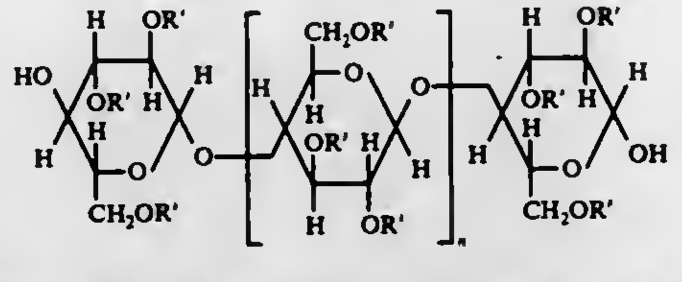
all percentages being expressed in parts percent by weight.

4,100,094
NOVEL CELLULOSE ETHERS AND DETERGENT COMPOSITIONS CONTAINING SAME

Michael E. Burns, West Chester, and Hans J. Pracht, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 654,431, Feb. 2, 1976, Pat. No. 4,048,433. This application Jun. 13, 1977, Ser. No. 805,946
Int. Cl.^{2} C11D *1/02, 1/66, 1/94*
U.S. Cl. 252—89 R **17 Claims**

1. A detergent composition having soil release properties consisting essentially of (a) from 5% to 65% by weight of a water-soluble organic surfactant selected from the group consisting of nonionic, anionic, ampholytic and zwitterionic surfactants and mixtures thereof; (b) from 0.1% to 5% by weight of a methyl cellulose ether having the structure



wherein R′ is hydrogen or methyl provided the average degree of methyl substitution on the anhydroglucose unit is from 1.8 to 2.7, n ranges from 14 to 54 and having a molecolar weight of from 3,000 to 10,000; and (c) the balance detergency adjunct materials.

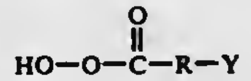
4,100,095
PEROXYACID BLEACH COMPOSITION HAVING IMPROVED EXOTHERM CONTROL

James Peyton Hutchins, Springfield Township, Hamilton County; Donald Victor Julian, Colerain Township, Hamilton County, and Michael Eugene Burns, Union Township, Butler County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 27, 1976, Ser. No. 718,282
Int. Cl.^{2} C11D *7/18*
U.S. Cl. 252—99 **6 Claims**

1. A dry, granular bleach composition consisting essentially of:

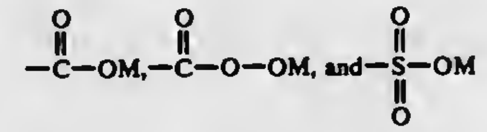
(1) boric acid, and
(2) a peroxyacid compound of the formula



$$HO-O-\overset{\overset{\displaystyle O}{\|}}{C}-R-Y$$

wherein

(a) R is selected from the group consisting of an alkylene group containing from 1 to about 20 carbon atoms and phenylene, and
(b) Y is selected from the group consisting of hydrogen, halogen, alkyl, aryl,



$$-\overset{\overset{\displaystyle O}{\|}}{C}-OM, -\overset{\overset{\displaystyle O}{\|}}{C}-O-OM, \text{ and} -\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle O}{\|}}{S}}-OM$$

wherein M is selected from the group consisting of hydrogen and a water-soluble, salt-forming cation;

wherein boric acid is present in an amount of at least 50% or more of said peroxyacid.

4,100,096
CLEANER FOR HYDROPHILIC METAL SURFACES OF LITHOGRAPHIC DUPLICATORS

Jack C. Rubin, Westchester, Ill., assignor to Addressograph Multigraph Corp., Cleveland, Ohio

Filed Jan. 4, 1976, Ser. No. 692,894
Int. Cl.^{2} C11D *3/14, 7/08;* **C23G** *1/02*
U.S. Cl. 252—145 **5 Claims**

1. The process of cleaning lithographic ink deposits from metal surfaces of a lithographic duplicator which comprises rubbing the surface to be cleaned with a composition consisting essentially of an aqueous dispersion containing about 6 percent to 25 percent by weight of levigated alumina of particle size smaller than 25 microns, about 0.02 percent to 0.25 percent by weight of a water miscible, acid stable, non-cationic surfactant, about 8 percent to 15 percent by weight of aluminum sulfate and an acid present in an amount sufficient to maintain the pH of the dispersion in the range of 0.65 to 0.75, and thereafter removing from the cleaned surface any residue of said composition.

3. A composition for cleaning the hydrophilic metal surfaces of lithographic duplicators consisting essentially of an aqueous dispersion containing about 6 percent to 25 percent by weight of levigated alumina of particle size smaller than 25 microns, about 0.02 percent to 0.25 percent by weight of a water miscible, acid stable, non-cationic surfactant, about 5 percent to 15 percent by weight of aluminum sulfate and an acid present in an amount sufficient to maintain the pH of the dispersion in the range of 0.65 to 0.75.

4,100,097
LOW pH DETERGENT BAR

James R. O'Roark, Dayton, Ohio, assignor to The Hewitt Soap Company, Inc., Dayton, Ohio

Filed Feb. 2, 1977, Ser. No. 764,875
Int. Cl.^{2} C11D *1/28, 3/22, 17/00*
U.S. Cl. 252—145 **11 Claims**

1. A milled synthetic detergent bar providing a pH of from about 4 to about 7 at a use concentration of about 1% by weight in water and consisting essentially of (a) from about 20% to about 40% by weight of a synthetic detergent selected from the group consisting of coconut-oil fatty acid ester of sodium isethionate and sodium lauryl sulfoacetate and mixtures thereof; (b) from about 15% to about 25% by weight of paraffin; (c) from about 7.5% to about 13.5% by weight powdered starch; (d) from about 12.5% to about 25% by weight dextrin; (e) coconut-oil fatty acid in an amount up to about 2.5% by weight to improve plasticity of the paraffin and to improve sudsing performance; (f) from about 9.0% to about 14.5% by weight water; (g) from about 0.5% to about 5% microcrystalline wax; (h) from about 0.5% to about 5% by weight lauric diethanolamide; and (i) lactic acid to adjust the pH.

4,100,098
STABILIZED SOLUTIONS OF SODIUM DITHIONITE

Phillip R. Magan, Lawrenceville, Ga., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 26, 1976, Ser. No. 735,356
Int. Cl.^{2} C09K *3/00*
U.S. Cl. 252—188 **7 Claims**

1. A method of stabilizing aqueous solutions of mixtures of sodium dithionite and sodium sulfite which comprises:

(a) preparing an aqueous solution containing greater than about 13 percent by weight of of sodium dithionite and at least one percent of sodium sulfite by weight of said sodium dithionite,
(b) adding potassium hydroxide to said aqueous solution of

an amount sufficient to provide a residual of potassium hydroxide in the solutions of from about 1 to about 12 grams per liter,

(c) maintaining the aqueous solution at a temperature of from about 0° to about 15° C.

4,100,099
QUATERNARY SALT-POLYAMINE INHIBITOR FOR SOUR GAS CONDITIONING SOLUTIONS

Robert G. Asperger, and Robert C. Clouse, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 782,159
Int. Cl.² C09K *3/00*
U.S. Cl. 252—189 **11 Claims**

1. A sour gas conditioning solution inhibited against CO_2 and H_2S promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part hy weight of a quaternary pyridinium salt and about 0.01-10 parts of a lower alkylenepolyamine, a corresponding polyalkylenepolyamine, or a mixture thereof wherein the alkylene units contain 2-3 carbon atoms.

4,100,100
COBALT-CONTAINING INHIBITOR FOR SOUR GAS CONDITIONING SOLUTIONS

Robert C. Clouse, and Robert G. Asperger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 782,253
Int. Cl.² C23F *11/18;* **B01D** *47/02, 53/34*
U.S. Cl. 252—189 **10 Claims**

1. A sour gas conditioning solution inhibited against CO_2 promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part by weight of a quaternary pyridinium salt and about 0.001–10 parts of a thio compound which is a water-soluble thiocyanate or an organic thioamide, and, in addition to the above, a small but effective amount of cobalt, said cobalt present as a dissolved divalent cobalt compound.

4,100,101
EUROPIUM-ACTIVATED ALKALINE EARTH FLUOROHALIDE X-RAY PHOSPHORS AND METHOD FOR PREPARING THE SAME

Russell F. Messier, Ulster, and Robert W. Wolfe, Wysox, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 614,836, Sep. 19, 1975, abandoned. This application Jun. 21, 1976, Ser. No. 698,058
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.4 H **6 Claims**

1. A europium-activated x-ray phosphor composition of the formula:

$Ba_{1-x}Sr_xFH{:}yEu$

wherein x is from about 0 to about 0.5, y is from about 0.001 to about 0.100 and H is a halogen selected from the chlorine and bromine, characterized in that europium is present in the trivalent state in an amount of at least 1 percent of the amount of europium in the divalent state.

4,100,102
COMPOSITION FOR SCREENING INFRA-RED RADIATION

Roy E. Shaffer, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 35,380, Jun. 10, 1960. This application Apr. 6, 1965, Ser. No. 486,247
Int. Cl.² C09K *3/30*
U.S. Cl. 252—305 **1 Claim**

1. A composition for use in generating a protective aerosol, consisting essentially of a suspension of 30 to 40% by weight of aluminum particles in from 60 to 70% by weight of vaporizable hydrocarbon oil, said aluminum particles having diameters in the range of 2 to 20 microns and thicknesses of less than 3/10 micron.

4,100,103
CAPSULE MANUFACTURE

Peter L. Foris; Robert W. Brown, and Paul S. Phillips, Jr., all of Appleton, Wis., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 30, 1976, Ser. No. 755,830
Int. Cl.² B01J *13/02*
U.S. Cl. 252—316 **17 Claims**

1. A process for manufacturing minute capsules, en masse, in an aqueous manufacturing vehicle, comprising:

establishing an agitating aqueous system comprising

(A) melamine and formaldehyde,

(B) monomeric methylol melamine or a low molecular weight polymer thereof or

(C) monomeric methylated methylol melamine or a low molecular weight polymer thereof as a starting material or mixtures of any of said starting materials, about 0.4 to about 15 percent by weight, based on the weight of aqueous manufacturing vehicle, of a system modifier material selected from the group consisting of poly-(ethylene-co-maleic anhydride), poly(methyl vinyl ether-co-maleic anhydride), poly(acrylic acid), poly(-propylene-co-maleic anhydride), poly(butadiene co-maleic anhydride) and poly(vinyl acetate-co-maleic anhydride), and particles of an intended capsule core material substantially insoluble in the system, in which agitating system the modifier is present prior to the addition of said particles, whereby said starting material polycondenses to form a condensation polymer resulting in

(i) liquid-liquid phase separation of the resulting condensation polymer above a molecular weight to be soluble in the system and

(ii) cootinued polycondensation of the separated polymerization product to give solid capsule wall material individually surrounding particles of the dispersed intended capsule core.

4,100,104
CATALYTIC MATERIALS AS FOR OLEFIN POLYMERIZATION

Stanley J. Katzen, Cincinnati, and Louis J. Rekers, Wyoming, both of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

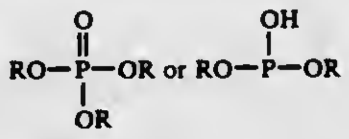
Filed Jan. 13, 1977, Ser. No. 759,213
Int. Cl.² C08F *4/78;* **B01J** *31/14, 27/16, 21/12*
U.S. Cl. 252—428 **10 Claims**

1. A process for the preparation of an olefin polymerization catalyst, which comprises:

(a) coating a solid, inorganic support material having surface hydroxyl groups with an aluminum compound capable of reacting with said surface hydroxyl groups and having the formula $Al(X)_a(OR)_b$, wherein X is R, a is 0–2, b is 1-3, $a+b$ is 3, and R is an alkyl group having from 1 to 8 carbon atoms in an amount sufficient to provide from 0.1 to 10% of aluminum by weight based on the weight of the support;

(b) calcining the support material having the aluminum compound coated thereon at temperatures of at least 200° F.;

(c) depositing on the support a chromium-containing compound capable of reacting with said surface hydroxyl groups and comprising an organophosphoryl chromium reaction product of chromium trioxide and an organophosphorus compound of the formula:



$\mathrm{RO-\underset{\underset{OR}{|}}{\overset{\overset{O}{\|}}{P}}-OR}$ or $\mathrm{RO-\overset{\overset{OH}{|}}{P}-OR}$

wherein R is hydrogen, or alkyl, aralkyl, aryl, or cycloalkyl, but at least one R is other than hydrogen in an amount sufficient to provide from about 0.25 to 2.5% of chromium by weight based on the weight of the support; and

(d) activating the thus treated support in a non-reducing atmosphere at temperatures of from 800° F. and up to the decomposition temperature of the support.

2. The process of claim 1, further comprising the step of:

(e) combining the activated, supported catalyst with a metallic or non-metallic reducing agent, the metallic reducing agent being selected from among the trialkyl aluminums, alkyl aluminum halides, alkyl aluminum alkoxides, dialkyl zinc, dialkyl magnesium, and the alkali metal and magnesium, beryllium and aluminum borohydrides, and the non-metallic reducing agent being selected from among the alkyl boranes and hydrides.

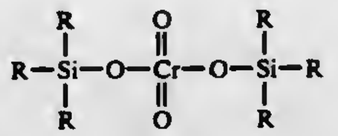
5. The process of claim 1, wherein the calcination is effected in an oxygen-containing atmosphere at temperatures of from 200° to 2000° F., and wherein the activation is carried out in an oxygen-containing atmosphere at temperatures of from 800° to 2000° F.

4,100,105
TITANIUM-MODIFIED SILYL CHROMATE CATALYSTS FOR ETHYLENE POLYMERIZATION

Isaac Jacob Levine, Somerville, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,213
Int. Cl.² B01J *31/12, 27/06;* **C08F** *2/34*
U.S. Cl. 252—429 R **12 Claims**

1. A catalyst for the polymerization of ethylene alone or the copolymerization of ethylene with α-olefins containing 3 to 6 carbon atoms comprising an amount of a silyl chromate having the formula:



$\mathrm{R-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-O-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{Cr}}-O-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-R}$

wherein each R is a hydrocarbyl radical containing from 1 to about 14 carbon atoms sufficient to afford about 0.05 to about 2.0 weight % of chromium calculated as Cr, based on the total weight of catalyst deposited onto a high surface area silica support containing about 0.01 % to about 50% by weight of aluminum, calculated as Al_2O_3, and about 2% to about 20% by weight of titanium, calculated as TiO_2, both based on the weight of silica, said support previously having been heat-treated to a temperature of about 500°–1000° C. prior to depositing the silyl chromate thereon.

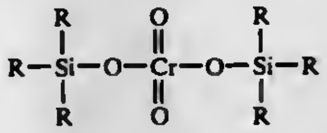
3. Catalyst claimed in claim 1 containing about 0 to about 10% by weight of a fluoridation agent based on the weight of silica.

9. Method of preparing an ethylene polymerization catalyst which comprises the steps of:

(A) Heating a high surface area silica support containing about 0.01% to about 50% by weight of aluminum, calculated as Al_2O_3, and about 2% to about 20% by weight of titanium, calculated as TiO_2 both based on the weight of silica to a temperature of about 500° to about 1000° C.,

(B) Cooling the silica support and

(C) Depositing on the cooled silica support an amount of a silyl chromate having the formula:



$\mathrm{R-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-O-\underset{\underset{O}{\|}}{\overset{\overset{O}{\|}}{Cr}}-O-\underset{\underset{R}{|}}{\overset{\overset{R}{|}}{Si}}-R}$

wherein each R is a hydrocarbyl radical containing from 1 to about 14 carbon atoms sufficient to afford about 0.05 to about 2.0 weight % of chromium calculated as Cr, based on the total weight of catalyst.

4,100,106
PROCESS FOR THE PRODUCTION OF A MIXED-OXIDE OXIDATION CATALYST CONTAINING VANADIUM AND PENTAVALENT PHOSPHORUS

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Basel, Switzerland

Filed Jan. 12, 1976, Ser. No. 648,025
Claims priority, application Switzerland, Jan. 10, 1975, 00266/75
Int. Cl.² B01J *27/14*
U.S. Cl. 252—437 **18 Claims**

1. The process for the production of a mixed-oxide oxidation catalyst, which, based on the vanadium and pentavalent phosphorus, has an atomic ratio of phosphorus to vanadium between 1.05 to 1 and 1.10 to 1, by reacting a salt of the tetravalent vanadium, dissolved in a concentrated non-oxidizing acid aqueous solution with orthophosphoric acid forming a vanadium-phosphorus-oxide-complex, isolating the complex, putting the dried complex into the desired form and subjecting the formed catalyst material to a heat treatment of at least 300° C., the improvement which comprises the step of isolating the vanadium-phosphorus-oxide-complex by precipitating the complex by adding water to the concentrated solution.

4,100,107
DESULFURIZATION OF FUEL GAS AT HIGH TEMPERATURE USING SUPPORTED MOLTEN METAL CARBONATE ABSORBENT

Ronald H. Wolk, San Jose, Calif.; William Rovesti, Columbia, S.C., and Peter Maruhnic, Pennington, N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Division of Ser. No. 567,635, Apr. 14, 1975, Pat. No. 3,996,335. This application Nov. 28, 1975, Ser. No. 636,277
Int. Cl.² B01J *27/20;* **B01D** *47/00;* **C01D** *47/00*
U.S. Cl. 252—443 **4 Claims**

1. A sorbent material for removing sulfur from sulfur containing gases consisting essentially of, low surface area, macroporous, alumina support material having an SiO_2 content of less than 2 weight percent and porosity of at least 0.10 cc/gm, having at least 10 weight percent of an alkali metal carbonate interspersed within the pores of the refractory support material.

4,100,108
ZEOLITIC CATALYSTS AND METHOD OF PRODUCING SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 718,166, Aug. 27, 1976, and a continuation-in-part of Ser. No. 718,167, Sep. 9, 1976, Pat. No. 4,058,484. This application Mar. 30, 1977, Ser. No. 782,971

Int. Cl.^{2} **B01J** *29/06;* **C10G** *11/02*

U.S. Cl. 252—455 Z **11 Claims**

1. A catalytic composition of matter comprising: a mixture of a zeolite of the faujasite type having a sodium content, expressed as Na_2O from about 2.5% to about 5% and a zeolite of the faujasite type having a sodium content of less than about 2.5% and less than said first named zeolite, the weight ratio of the first named zeolite to the second named zeolite being in the range of from about 1. part by weight of the first named zeolite to 4 parts by weight of the second named zeolite to 4 part by weight of first named zeolite to 1. part by weight of the second named zeolite, said mixture being combined with a matrix and the combination having a sodium content expressed as Na_2O of about 0.1 to about 1.5% on a volatile free basis.

4,100,109
CATALYST AND A PROCESS FOR THEIR PREPARATION

Alain Muller, Le Havre, France, assignor to Compagnie Francaise de Raffinage, Paris, France

Filed Dec. 7, 1976, Ser. No. 748,303

Claims priority, application France, Dec. 8, 1975, 75 37507

Int. Cl.^{2} **B01J** *21/04, 23/28, 23/30, 23/74*

U.S. Cl. 252—465 **33 Claims**

1. Catalyst comprising in combination (1) a carrier formed of an intimate mixture of aluminum oxide and nickel oxide, said carrier having been obtained by co-precipitating a gel from a solution of an organic salt of aluminum and an aqueous solution containing nickel, said co-precipitation being followed by drying and by calcination of said gel, and (2) an active phase on said carrier comprising at least one metal selected from groups VIII and VIB of the Periodic Table of the elements.

4,100,110
ISOLONGIFOLENE PRINS REACTION COMPOUNDS IN PERFUMERY

Hifzur Rahman Ansari, Rayleigh; Neville Unwin, Surbiton, and Horst Richard Wagner, Woodford Green, all of England, assignors to Bush Boake Allen Limited, London, England

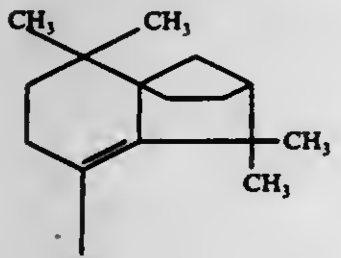
Filed Aug. 11, 1975, Ser. No. 603,908

Claims priority, application United Kingdom, Aug. 9, 1974, 25244/74

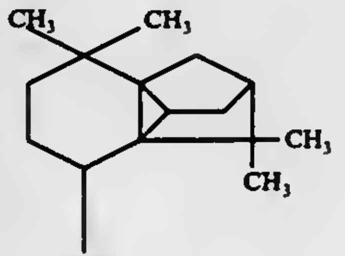
Int. Cl.^{2} **C11B** *9/00*

U.S. Cl. 252—522 **24 Claims**

1. A compound having the formula XY, wherein X is a polycyclic monovalent radical selected from the group consisting of II, III and IV:

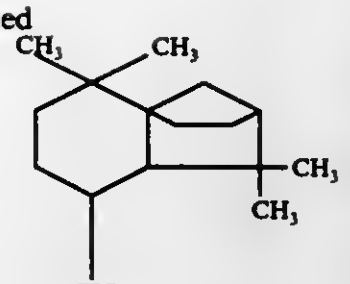


(II)



(III)

-continued



(IV)

Y is $-C(OR'_n)(H)_nR$, *n* is 0 or 1, R is selected from the group consisting of hydrogen and alkyl groups having from 1 to 5 carbon atoms and R' is selected from the group consisting of hydrogen and alkanoic acid residues having from 1 to 6 carbon atoms.

4,100,111
CURABLE MIXTURES

Heinz Peter, Rheinfelden, Switzerland; Dieter Reinehr, Wittlingen, Germany, and Eduard Troxler, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

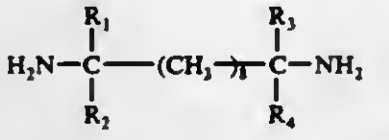
Filed Oct. 29, 1975, Ser. No. 626,896

Claims priority, application Switzerland, Nov. 7, 1974, 14891/74

Int. Cl.^{2} **C08G** *59/50*

U.S. Cl. 528—116 **14 Claims**

1. Curable mixtures which are suitable for the manufacture of mouldings, impregnated materials, coatings, lacquers and sealings, characterised in that they contain (a) a compound having more than one epoxy group and (b), as the curing agent, at least one 1,10-diaminodecane of the formula I



$$H_2N-\underset{R_2}{\overset{R_1}{C}}-\left(CH_2\right)_8-\underset{R_4}{\overset{R_3}{C}}-NH_2 \qquad (I)$$

wherein R_1 and R_3 independently of one another represent an alkyl, cycloalkyl, aralkyl, phenyl or naphthyl group and R_2 and R_4 independently of one another represent hydrogen, alkyl, cycloalkyl, aralkyl, phenyl or naphthyl group or R_1 and R_2 and/or R_3 and R_4, conjointly with the carbon atom to which they are linked, form a 5-membered to 12-membered alkylene or oxaalkylene ring.

4,100,112
PROCESS FOR THE PRODUCTION OF AMINE SILICATE COMPOUNDS AND THEIR RESINOUS CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 652,338, Jan. 26, 1976, which is a continuation-in-part of Ser. No. 559,313, Mar. 17, 1975, Pat. No. 3,979,362, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application May 19, 1977, Ser. No. 798,329

Int. Cl.^{2} **C08G** *77/04*

U.S. Cl. 260—185 **17 Claims**

1. The process for the production of amine silicate compounds by the following steps:

(a) mixing about 20 parts by weight of a fine granular hydrated silica, 20 to 40 parts by weight of an amine compound, selected from the group consisting of ammonium hydroxide, methylamine, ethylamine, propylamine, isopropylamine, butylamine, amylamine, hexylamine, aniline, toluidine amine, xylidine amine, naphthylamine, benzylamine, phenylenediamine, ethylenediamine, tetramethylenediamine, pentamethylenediamine, decamethylenediamine, xylylenediamine, piperazine, diethylenetriamine, triethylenetetramine tetraethylenepentamine, tolylene diamine, aminocaproic acid, caprolactam, aminoacetic acid, aminobenzoic acid, aminosuccinic acid, 2-aminopyridine, 2-amino-1-butanol, 2-aminoethanol, 1-amino-2-propanol, o-aminophenol, p-aminophenol, 6-amino-2-picoline, 2-amino-4-nitrophenol, and mixtures thereof, and 50 to 100 parts by weight of water;

(b) adding an alkali catalyst in the proportion of 1% to 10% by weight, weight based on the weight of hydrated silica and the amine compound;

(c) heating said mixture to 80° to 150° C while agitating until most of the water is evaporated, replacing any evaporated amine, then heating is continued at 80° to 150° C for 30 to 60 minutes, thereby

(d) producing amine silicate compounds.

8. The process of claim 1 wherein additional steps are added following step (d) to produce epoxy silicate resinous products by the following steps:

(e) mixing slowly 10 to 40 parts by weight of an epoxy compound selected from the group consisting of epichlorohydrin, glycidol, methyl epichlorohydrin, 1,2-epoxy-3-phenoxypropane, 3,4-epoxyethyl benzene, 1,2-epoxybutane, 1,2-epoxycyclohexane, epoxyethane, 1,2-epoxypropane, 1-chloro-2,3-epoxypropane, 1:2,3:4-diepoxybutane, 2:3,6:7-diepoxy-2,6-dimethyl-4-octene, epoxyethylbenzene, epichlorohydrin bisphenol A epoxy resin containing 2 or more reactive epoxy groups per molecule, epichlorohydrin diglycidyl ether of bisphenol epoxy resin containing 2 or more reactive epoxy groups per molecule, epichlorohydrin resorcinol epoxy resin containing 2 or more reactive epoxy groups per molecule and mixtures thereof, with about 20 parts by weight of the amine silicate compound as produced by the methods of claim 1;

(f) agitating the said mixture while keeping the temperature between 30° to 70° C at ambient pressure, thereby

(g) producing an epoxy silicate polymer;

(h) heating said epoxy silicate polymer to a temperature between 80° to 100° C, thereby

(i) producing an epoxy silicate resinous product.

4,100,113
ELECTROLYTIC CELL MEMBRANE AND METHOD OF PREPARATION BY PLASMA POLYMERIZATION OF POLYAMIDE OR POLYTETRAFLUOROETHYLENE THIN FILMS ONTO POLYMERIC SUBSTRATES

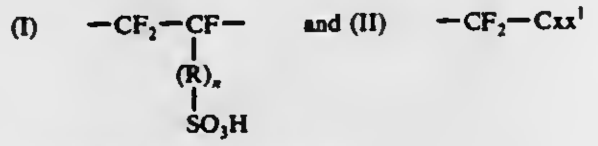
G. Howard McCain, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 1, 1976, Ser. No. 672,781

Int. Cl.^{2} **C25B** *13/00;* **C08F** *2/46, 259/08*

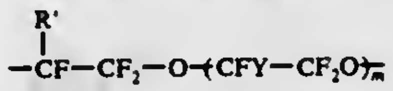
U.S. Cl. 521—38 **5 Claims**

1. An improved hydraulically impermeable cation exchange membrane consisting essentially of: a substrate selected from the group of a film of copolymer having the repeating structural units of the formula



$$\text{(I)}\quad -CF_2-\underset{\substack{|\\(R)_n\\|\\SO_3H}}{CF}- \qquad \text{and (II)}\quad -CF_2-Cxx^1$$

wherein R represents the group



$$-\overset{\overset{R'}{|}}{C}F-CF_2-O-\left(CFY-CF_2O\right)_m$$

in which R' is fluorine, or perfluoroalkyl of 1 to 10 carbon atoms; Y is fluorine or trifluoromethyl; *m* is 1, 2 or 3; *n* is 0 or 1; *x* is fluorine, chlorine or trifluoromethyl; and *x'* is *x* or CF_3 $-CF_2-{}_aO-$; wherein *a* is 0 or an integer from 1 to 5; the units of formula (I) being present in an amount to provide a copolymer having an $-SO_3H$ equivalent weight of about 1000 to 1400;

copolymers of tetrafluoroethylene and hexafluoropropylene having grafted thereon a 50-50 mixture of styrene and alpha methylstyrene which has been sulfonated; or

an insoluble, infusible copolymeric matrix formed from at least 20 percent by weight of a polyvinyl aromatic compound and not more than 80 percent of a monovinyl aromatic compound with a reinforcing material therein and no more than 70 percent by weight of a monovinyl aromatic compound without a reinforcing material therein, sulfonate groups chemically bonded to the aromatic nuclei of the matrix and a solvating liquid in gel relationship with the matrix, the sulfonate groups being present in an amount no more than four equivalents or sulfonate groups for each mole of polyvinyl aromatic compound and not less than one equivalent of sulfonate groups for each 10 moles of poly- and monovinyl aromatic compound the solvating liquid being at least 25 percent by volume of the resin; and

a top coating deposited upon the surface of at least one side of said substrate by plasma polymerization to produce a thin pinhole free coating in the range of 50 to 2000 Angstroms having a chemical makeup selected from the group of polyamide or polytetrafluoroethylene.

4,100,114
POLYURETHANE FOAM COMPOSITION

Reishi Naka; Toshikazu Narahara, and Junji Mukai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 30, 1975, Ser. No. 645,340

Claims priority, application Japan, Jan. 6, 1975, 50-45

Int. Cl.^{2} **C08G** *18/06;* **C08K** *3/34;* **C08L** *75/04*

U.S. Cl. 521—175 **7 Claims**

1. A rigid polyurethane foam-containing composition which also contains 5 to 20% by weight of hollow-spherical amorphous natural vitreous Silas balloons having a particle size of 100 to 300μ, based on the total weight of polyol and isocyanate components of the polyurethane foam, and 0.2 to 2% by weight of an organosilane compound, based on the total weight of the polyol and isocyanate components of the polyurethane foam and said Silas balloons in the rigid polyurethane foam, said foam composition having a density of about 0.05 gram per cubic centimeter or less.

4,100,115
HIGH-TEMPERATURE INSULATION COMPOSITE MOLDED PRODUCT

Steven R. Baer, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 6, 1976, Ser. No. 712,310

Int. Cl.^{2} **C08J** *9/00*

U.S. Cl. 521—83 **48 Claims**

1. A cellular high-temperature insulation composite molded product comprising the molded and cured product obtained by preparing a mixture of

(1) a dry blend of
  (a) expanded perlite,
  (b) a calcium aluminate cement,
  (c) a refractory clay, and
  (d) wollastonite, with
(2) an aqueous liquid composition comprising
  (a) an auxiliary binder, and
  (b) water and molding and curing the mixture or allowing the mixture to cure.

4,100,116

POLYURETHANE FOAMS FROM POLYETHER POLYOLS WHICH CONTAIN AMIDE GROUPS

Jan Mazanek; Johannes Blahak, both of Cologne; Kuno Wagner, Leverkusen, and Heinz Ziemann, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

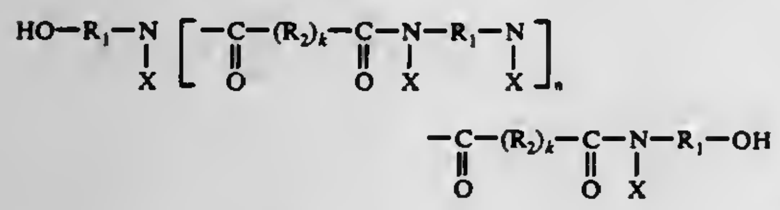
Filed Dec. 14, 1976, Ser. No. 750,492

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559372

Int. Cl.^{2} C08G *18/14, 18/50;* **C07C** *97/02, 102/06*

U.S. Cl. 521—167 **17 Claims**

13. Polyether diols containing amide groups in accordance with the following formula:



$$HO-R_1-\underset{X}{\underset{|}{N}}\left[-\underset{O}{\underset{\|}{C}}-(R_2)_k-\underset{O}{\underset{\|}{C}}-\underset{X}{\underset{|}{N}}-R_1-\underset{X}{\underset{|}{N}}\right]_n-\underset{O}{\underset{\|}{C}}-(R_2)_k-\underset{O}{\underset{\|}{C}}-\underset{X}{\underset{|}{N}}-R_1-OH$$

wherein

R_1 denotes identical or different alkylene groups having a molecular weight of between 148 and 40000 and containing at least two ether groups,

R_2 denotes divalent aliphatic, cycloaliphatic araliphatic or aromatic groups having from 1 to 15 carbon atoms and

X denotes hydrogen or a straight chain or branched chain C_1–C_6 alkyl group and

n represents an integer of between 0 and 100

k represents 0 or 1.

16. In a process for the production of polyurethane resins by reacting polyisocyanates with compounds containing isocyanate reactive hydrogen atoms optionally in the presence of chain lengthening agents having a molecular weight of from 32 to 400, blowing agents, catalysts and other additives, the improvement wherein the isocyanate reactive compounds comprise the product of a process wherein 10 to 95% of the hydroxyl groups of a polyether polyol, having a molecular weight of from about 150 to 40,000, are converted into amino or alkylamino or arylamino groups or mixtures thereof and wherein the resulting partially aminated polyether polyol is amidated by reaction with a compound selected from the group consisting of a polycarboxylic acid, a polycarboxylic acid ester, a polycarboxylic acid anhydride, a polycarboxylic acid halide or mixture thereof said compound having a functionality in the sense of the amidation reaction of from 2 to 4.

4,100,117

SOMATOSTATIN ANALOGS AND INTERMEDIATES THERETO

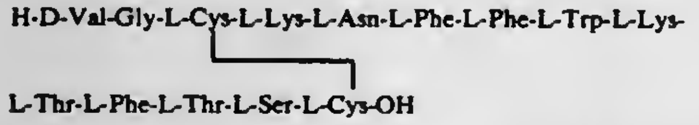
James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 21, 1977, Ser. No. 789,472

Int. Cl.^{2} C08L *37/00;* **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—8 **10 Claims**

1. A compound selected from those of the formula



H-D-Val-Gly-L-Cys-L-Lys-L-Asn-L-Phe-L-Phe-L-Trp-L-Lys-

L-Thr-L-Phe-L-Thr-L-Ser-L-Cys-OH

and its pharmaceutically acceptable non-toxic acid addition salts, and intermediates to said compounds, said intermediates having the formula R-D-Val-Gly-L-Cys(R_1)-L-Lys(R_2)-L-Asn-L-Phe-L-Phe-L-Trp(R_5)-L-Lys(R_2)-L-Thr(R_3)-L-Phe-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

R is hydrogen or an α-amino protecting group;

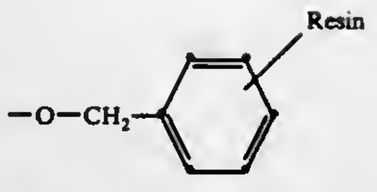
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an ϵ-amino protecting group;

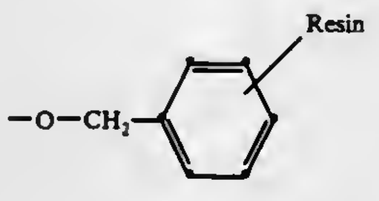
R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, each of R, R_1, R_2, R_3, R_4, and R_5 is hydrogen, and, when X is



each of R, R_1, R_2, R_3, and R_4 is other than hydrogen.

4,100,118

THERMOSETTING RESIN COMPOSITION

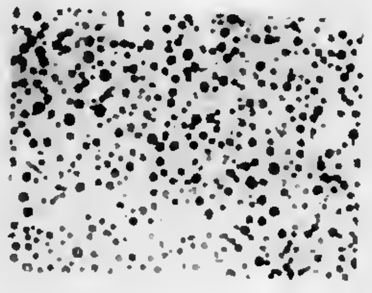
Shun-ichi Numata, Hitachi; Hitoshi Yokono, Katsuta, and Junji Mukai, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,760

Claims priority, application Japan, Oct. 11, 1974, 49-116105

Int. Cl.^{2} C08G *73/06*

U.S. Cl. 260—18 PT **29 Claims**



14. A molded thermoset composition comprising a resin containing isocyanurate and oxazolidone rings produced by curing at a temperature in the range of 50° C to 250° C, a thermosetting resin consisting essentially of (a) one equivalent of a polyfunctional epoxy compound containing 10 to 80% by weight of a polyglycidyl ester obtained from a polymer or Diels-Alder adduct of an unsaturated fatty acid and an epihalohydrin, (b) 1.5 to 5 equivalents of a polyisocyanate compound, and (c) 0.01 to 10% by weight of a curing catalyst based on the total weight of the polyfunctional epoxy compound and the polyisocyanate compound, said curing catalyst being a basic catalyst capable of facilitating isocyanaurate and oxazolidone ring formation and being at least one member selected from the group consisting of a tertiary amine, an imidazole and a quaternary ammonium salt containing an alkyl group of 8 or more carbon atoms; an inorganic filler and a coupling agent, said molded thermoset composition exhibiting thermal resistance and thermal shock resistance and having a rigid resin part consisting mainly of the polyfunctional epoxy compound and the polyisocyanate compound in the form of a matrix and a flexible resin part consisting mainly of the polyglycidyl ester and the polyisocyanate compound uniformly distributed in the form of fine spheres in the matrix.

4,100,119

GREATER WATER RESISTANCE AND SHORTER DRYING TIME IN WATER SOLUBLE ENAMEL PAINTS

Michael A. Lerman, Park Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 625,009

Int. Cl.^{2} B32B *9/02, 15/08;* **C08L** *91/00, 93/00*

U.S. Cl. 260—22 CB **8 Claims**

1. A water soluble polyester resin suitable as an ingredient in water soluble enamel paints comprising the reaction product of a fatty acid, trimethylol propane, isophthalic acid, trimellitic anhydride, and from 1 to 15 weight percent of a rosin-ester resin (based on the amount of polyester resin), said rosin-ester resin comprising the reaction product of rosin, maleic acid, and pentaerythritol.

5. A water soluble enamel point having good water resistance comprising the reaction product of ammonium hydroxide, water, a pH sensitive chelate of about 80 weight percent triethanolamine titanate in isopropanol, and a polyester resin comprising the reaction product of a fatty acid, trimethylol propane, isophthalic acid, trimellitic anhydride, and from 1 to 15 weight percent of a rosin-ester resin (based on the amount of polyester resin), said rosin-ester resin comprising the reaction product of rosin, maleic acid, and pentaerythritol.

4,100,120

RESINOUS COMPOSITION

Iwao Maekawa; Isao Uchigasaki, and Sakato Kumazaki, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,332

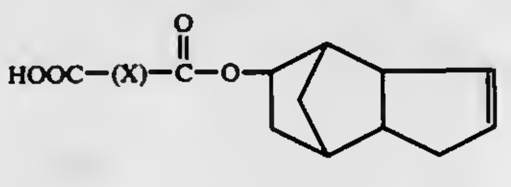
Claims priority, application Japan, Mar. 2, 1976, 51-22874

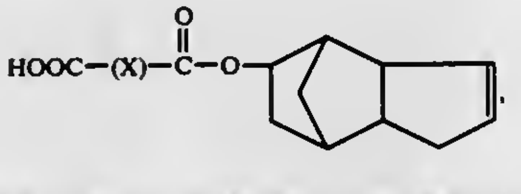
Int. Cl.^{2} C09D *3/68*

U.S. Cl. 260—22 CB **16 Claims**

1. A resinous composition comprising

1. 40 - 90 parts by weight of one or more oligomers obtained by reacting a polyvalent alcohol or its derivative with a fatty acid derived from oils and fats in an amount of 30 - 70% by mole based on the hydroxyl group of the polyvalent alcohol, and a monobasic acid of the formula,





wherein X is an α,β-unsaturated hydrocarbon group having 2 or 3 carbon atoms in an amount of 70 - 30% by mole based on the hydroxyl group of the polyvalent alcohol, and

2. 10 - 60 parts by weight of one or more polymerizable monomers having at least one polymerizable double bond in the molecule.

4,100,121

METAL ACETYL ACETONATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 568,221, Apr. 15, 1975, Pat. No. 3,973,439.

This application Apr. 5, 1976, Ser. No. 674,004

Int. Cl.^{2} C09D *3/58, 5/26;* **G01K** *1/00*

U.S. Cl. 260—23 EP **18 Claims**

1. A thermoparticulating composition comprising at least one metal acetylacetonate and a solution in an organic solvent of a resinous carrier curable at room temperature and stable at 60° C, and unreactive with said metal acetylacetone at the thermoparticulation temperature of said metal acetylacetonate.

4,100,122

TRANS-POLYISOPRENE COMPOSITIONS

Eric George Kent, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 605,835, Aug. 19, 1975, abandoned.

This application Mar. 18, 1977, Ser. No. 778,965

Claims priority, application Canada, Sep. 10, 1974, 209009

Int. Cl.^{2} C08K *3/36, 5/01, 7/14*

U.S. Cl. 260—28.5 B **7 Claims**

1. A thermoplastic remoldable composition of improved dimensional stability and stiffness comprising a mixture of 100 parts by weight of trans-1,4-poly-isoprene, 5 to 50 parts by weight of short, chopped glass fibres and 5 to 40 parts by weight of finely divided reinforcing silica filler, wherein said trans-1,4-polyisoprene is a high molecular weight polymer of isoprene having a trans-1,4 content of at least 85%, a crystallinity as determined by X-ray diffraction of about 15–40%, a Mooney viscosity (ML-4 at 100° C) of about 5 to 50 and a crystalline melting point of from about 20° C to about 80° C.

4,100,123

POLYCHLOROPRENE-CONTAINING BLENDS

Peter Henry Westermann, Dorking, England, assignor to The British Petroleum Company Limited, London, England

Filed Jan. 13, 1977, Ser. No. 759,244

Claims priority, application United Kingdom, Jan. 16, 1976, 1716/76

Int. Cl.^{2} C08L *95/00*

U.S. Cl. 260—28.5 B **18 Claims**

1. A vulcanizable composition comprising (a) a rubber component containing a polychloroprene and a rubbery terpolymer of ethylene, propylene, and a diene or triene monomer said terpolymer containing at least 50% by weight of units derived from ethylene the weight ratio of said polychloroprene to said terpolymer of from 1:005 to 1:1.5, and (b) 3 to 300 parts by weight, per 100 parts by weight of rubbery component of a hardened extract obtained by blowing air at elevated temperature into a solvent extract of a distillate petroleum fraction boiling in the lubricating oil boiling range and containing a major proportion of aromatic hydrocarbons and having a saturated hydrocarbon content of not more than 10% by weight.

4,100,124

SILICONE BINDING COMPOSITIONS USEFUL IN PREPARING GASKETS AND PACKINGS

Kunihiro Ichikawa; Terumi Mie, both of Ichihara, and Isao Ona, Kimitsu, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,139

Claims priority, application Japan, May 6, 1976, 51-50796

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—29.2 M **5 Claims**

1. A composition of matter which is useful in preparing gaskets and packings which consists essentially of

(A) 100 parts by weight an an α,ω-dihydroxydiorganopolysiloxane having a viscosity of at least 100 cs. at 25° C.,

(B) 5–150 parts by weight of a silane of the general formula

$RSi(OR')_3$

wherein R is a substituted or unsubstituted monovalent hydrocarbon radical, R' is an aliphatic hydrocarbon radical containing 1 to 4 carbon atoms,

(C) 0.1–15 parts by weight of an organometallic catalyst,

(D) 1-20 parts by weight of an emulsifying agent and
(E) 50-1000 parts by weight of water,
(F) sufficient solid gasketing material to form a gasket.

4,100,125

SEAMLESS FLOORING AND METHOD AND COMPOSITIONS FOR MAKING SAME

Michael Pezzato, Jr., Burlington, Mass., assignor to Beatrice Foods Company, Wilmington, Mass.

Continuation of Ser. No. 358,029, May 7, 1973, abandoned, which is a continuation of Ser. No. 72,672, Sep. 16, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,783

Int. Cl.^{2} C08L *13/02, 31/02*

U.S. Cl. 260—29.6 TA **6 Claims**

1. A film-forming composition, consisting essentially of an aqueous emulsion of:

an emulsion polymer of a major proportion of monomer selected from the class consisting of methyl methacrylate and butyl methacrylate and a minor proportion of an unsaturated monocarboxylic acid monomer capable of rendering said monomer in major proportion more hydrophilic and stabilizing said aqueous emulsion, the monomers being copolymerized by emulsion polymerization to a molecular weight in the range of from the order of 4 × 10^5 to the order of 2 × 10^6 and exhibiting a glass transition temperture in the range of 35° C to 55° C, and

a plasticizing solvent for the emulsion polymer having a boiling point between about 212° F to 400° F, said polymer when applied as a film at a wet thickness of about 3 mil developing a Sward hardness in the range of 25 to 45 in 18 hours or less.

4,100,126

STABILIZATION OF NITRILE RESINS WITH HALF ACID SALTS OF MALEIC ACID

Gerald Goldberg, and Paul Richard Kaufman, both of Parkersburg, W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 8, 1977, Ser. No. 785,907

Int. Cl.^{2} C08L *33/20, 55/02*

U.S. Cl. 260—29.6 AQ **3 Claims**

1. A nitrile resin composition stable toward thermal discoloration comprising:

A. a polymer selected from the group consisting of polymers of an α,β-unsaturated nitrile with at least one other vinyl monomer copolymerizable therewith; graft polymers of an α,β-unsaturated nitrile, at least one additional vinyl monomer copolymerizable therewith and a diene rubber; and blends thereof, said polymer having been coagulated from a latex emulsion by use of an inorganic salt of a Group IIA metal ion, and

B. as a stabilizer, an effective amount of a half-acid salt of maleic acid selected from the group consisting of sodium acid maleate and magnesium acid maleate.

4,100,127

PROCESS FOR PREPARATION OF GRAFTED UNSATURATED POLYESTER LIQUID RESIN DISPERSION

Hiroshi Fukuzaki; Masao Niki, and Yukinaga Yokota, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,150

Claims priority, application Japan, Mar. 8, 1976, 51-24870

Int. Cl.^{2} C08L *67/06*

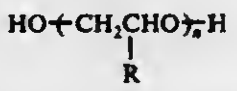
U.S. Cl. 260—29.6 NR **12 Claims**

1. A process for preparing a liquid resin dispersion, which comprises the steps of:

(1) preparing a surface active, unsaturated polyester by reacting and condensing a polyester-forming dicarboxylic acid component containing at least 30 mole % of an unsaturated dicarboxylic acid or anhydride thereof, with a mixture of polyol components consisting essentially of

(A) at least one ester-forming polyol selected from the group consisting of 4,4′-bis(β-hydroxyethoxyphenyl)-2,2-propane, 4,4′-bis(β-hydroxypropoxyphenyl)-2,2-propane, diglycidyl ether of 2,2-bis(4-hydroxyphenyl)propane, di-β-methylglycidyl ether of 2,2-bis(4-hydroxyphenyl)-propane and 2,2-bis(4-hydroxycyclohexyl)propane, and

(B) at least one member having the formula



$$HO\left(CH_2\underset{R}{\underset{|}{C}}HO\right)_nH$$

wherein R is H or CH_3 and *n* is from 3 to 100, wherein the amount of (B) is from 10 to 50% by weight, based on the weight of A,

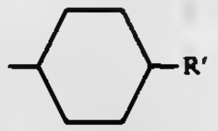
whereby to form a surface active, unsaturated polyester having a number average molecular weight of from 500 to 5000;

(2) dispersing the unsaturated polyester obtained in step (1) in the colloidal state in water to form an oil-in-water colloidal dispersion, said dispersion being free of water-soluble protective colloids and emulsifiers,

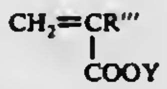
(3) adding to the dispersion obtained in step (2) from 0.1 to 50% by weight, based on the weight of said polyester, of at least one water-insoluble monomer selected from the group consisting of (a) monomers having the formula

$CH_2{=}CHX$

wherein X is —OOCR″ wherein R″ is alkyl having one to 8 carbon atoms,



wherein R′ is H, CH_3 or $CH{=}CH_2$, —Cl, —CN, —$Si(OCH_3)_3$, —$Si(OC_2H_5)_3$, —$Si(OCH_2CH_2OCH_3)_3$ or —$Si(OOCCH_3)_3$, and (b) monomers having the formula



$$CH_2{=}\underset{COOY}{\underset{|}{C}}R'''$$

wherein R‴ is —H or —CH_3, and Y is alkyl having 3 to 8 carbon atoms, —$(CH_2)_2OR''''$ wherein R″″ is alkyl having one to 4 carbon atoms, glycidyl, —$(CH_2)_3Si(OCH_3)_3$ or —$(CH_2)_3Si(OCH_2CH_2OCH_3)_3$,

so that said monomer is solubilized by said polyester, and adding a radical polymerization initiator and grafting said monomer to said polyester whereby to obtain an aqueous dispersion of said polyester having said monomer grafted thereto.

4,100,128

OIL-PLASTICIZED COPOLYMERS OF SO_2 AND OLEFINS

Guido Sartori, Linden, and Robert D. Lundberg, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 634,881, Nov. 24, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,367

Int. Cl.^{2} C08G *75/18;* **C08K** *5/01*

U.S. Cl. 260—33.6 UA **6 Claims**

1. A flexible composition consisting of:

(a) 100 parts by weight of an olefin-SO_2 copolymer, said olefin-SO_2 copolymer having a softening point of at least about 40° C., said olefin-SO_2 copolymer being formed from at least one alpha olefin having at least 20 carbon atoms, said copolymer having about 5 to about 9.5 wt. % of sulfur; and

(b) about 5 to about 24 parts per hundred by weight based on 100 parts of said copolymer of a nonpolar oil having a number average molecular weight of about 200 to about 540, a solubility parameter of about 7.0 to about 8.5, and at least about 10 wt. % of naphthenic hydrocarbons.

4,100,129

CURABLE COMPOSITIONS AND PROCESS

Melvin D. Beers, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

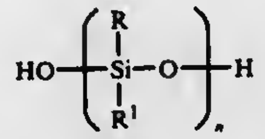
Continuation-in-part of Ser. No. 417,787, Nov. 21, 1973, abandoned. This application May 19, 1975, Ser. No. 579,025

Int. Cl.^{2} C08G *77/04;* **C08L** *43/04*

U.S. Cl. 260—37 SB **38 Claims**

1. A fluid composition stable under substantially anhydrous conditions and curable to a self-bonding elastic solid in the presence of moisture which comprises:

(a) 100 parts by weight of a silanol chain-stopped polydiorganosiloxane of the formula:



$$HO\left(\underset{R^1}{\overset{R}{Si}}-O\right)_nH$$

wherein R and R^1 are each, independently, organic radicals of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl and cyano lower alkyl and *n* is an average number of from about 10 to 15,000;

(b) from 0.01 to 5.0 parts by weight of a cross-linking silane of the formula:

$R_m{}^2\,Si\,(OR^3)_{4-m}$

wherein R^2 and R^3 have the values defined for R and R^1 hereinabove and *m* has a value of 0 to 3 and an average value based on the total amount of silane in the composition of 0 to 1.99; and

(c) from 0.1 to 10 parts by weight of a silanol reactive organometallic ester compound of a metal other than silicon, said compound being a partially chelated ester of a lower aliphatic alcohol with a β-dicarbonyl compound or a partial hydrolyzate of such compounds which retain at least one hydrocarbonoxy radical or substituted by hydrocarbonoxy radical attached to the metal atom through M—O—C linkages wherein M is the metal, the weight ratio of components (c) to (b) always being at least 0.5 to 1.

4,100,130

FLAME-RESISTANT POLYCARBONATES

Dieter Freitag, Krefeld-Taar, and Werner Nouvertné, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 2, 1975, Ser. No. 592,588

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1974, 2435508

Int. Cl.^{2} C08K *3/06*

U.S. Cl. 260—37 PC **17 Claims**

1. Molding compositions consisting essentially of aromatic polycarbonates having molecular weights M_w of about 20,000 to 80,000 and about 0.5 to 7% by weight of sulphur, relative to the total weight of polycarbonate and sulphur.

4,100,131

SPIN DYEING OF ACRYLIC FIBRES

Francis René Daniel Manier, Cinqueux, and Pierre Léon Adolphe Caulett, Taverny, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 27, 1975, Ser. No. 544,539

Claims priority, application France, Feb. 8, 1974, 74 04248

Int. Cl.^{2} C08K *5/00*

U.S. Cl. 260—42.21 **10 Claims**

1. Process for the spin dyeing of acrylic fibre obtained by spinning a collodion containing 15% to 25% of a homopolymer or copolymer of acrylonitrile, wherein the collodion is dyed by means of at least one nitrate of a cationic dyestuff in which the dyestuff cation is a derivative of a triphenylmethane, contains a cycloammonium group or comprises a side chain carrying a quaternary nitrogen atom, the colouring agent being added to the collodion in the form of a stock solution containing 1% to 30% of dyestuff nitrate.

4,100,132

STABILIZED POLYOLEFIN COMPOSITION

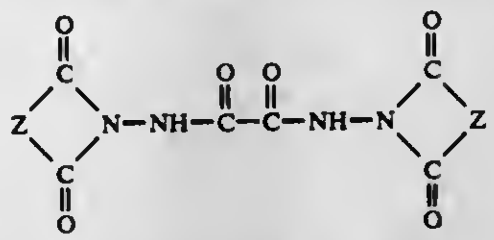
Harry Elwyn Hill, Wallingford, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Mar. 22, 1976, Ser. No. 668,842

Int. Cl.^{2} C08K *5/26*

U.S. Cl. 260—42.46 **21 Claims**

1. A compound having the structural formula:



(I)

wherein Z is a bivalent radical which together with the dicarboximide group forms a monocyclic or polycyclic ring system and is selected from the group consisting of phenylene, cyclohexylene, cyclohexenylene, cyclohexenylene substituted by a methyl group, norbornenylene, ethylene, vinylene and tetradecenylene.

4,100,133

AIR-DRY CURABLE COMPOSITIONS COMPRISING DICYCLOPENTENYL (METH) ACRYLATE COPOLYMERS AND NON-VOLATILE REACTIVE MONOMER, AND CURED COATINGS AND IMPREGNATIONS OBTAINED THEREFROM

William D. Emmons, Huntingdon Valley; Peter R. Sperry, Doylestown, and Kayson Nyi, Sellersville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 699,726, Jun. 24, 1976. This application May 31, 1977, Ser. No. 802,087

Int. Cl.^{2} C08K *5/33;* **C08L** *31/02*

U.S. Cl. 260—45.9 L **12 Claims**

1. An autoxidizable coating or impregnating composition comprising:

(a) a copolymer of about 5% to about 50% by weight of at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate and about 95% to about 50% by weight respectively of at least one other monoethylenically unsaturated monomer,

(b) a non-volatile reactive monomer, at least 50 weight percent of which is at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate,

(c) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the oxidative curing of a) and b), and

(d) a small but effective amount of a volatile oxime stabilizer.

4,100,134

STORAGE-STABLE EPOXY-TERMINATED SILANE PREPOLYMER

Janis Robins, St. Paul, and J. Lamar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1977, Ser. No. 782,079

Int. Cl.^{2} C08G *77/04*

U.S. Cl. 528—10 **22 Claims**

1. A prepolymer composition comprising an epoxy prepolymer of an epoxy-terminated silane, said composition characterized by (1) a viscosity of less than 15,000 cp at 25° C, (2) having less than 40% by weight of low molecular weight epoxy or silane reactive materials of less than 50 A, and 3) being storage stable in solution with methylene chloride in an anhydrous environment for at least 30 days at 25°–30° C at no more than 33% solids content.

4,100,135

NOVEL ELASTOMERS AND IMPROVED WATERLESS LITHOGRAPHIC PRINTING MASTERS

Joseph Y. C. Chu, Fairport, and Richard L. Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 27, 1977, Ser. No. 791,353

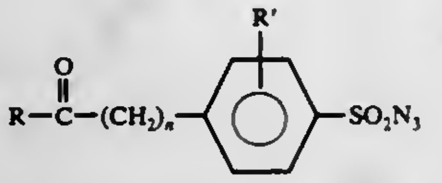
Int. Cl.^{2} C08G *77/04*

U.S. Cl. 528—11 **6 Claims**

1. A process for preparing a silicone polymer comprising

(a) providing a silicone elastomer gum having from 0.1 to 10% pendant hydroxyl or primary or secondary amino groups,

(b) providing an azide stable at ambient temperature in an amount sufficient to react with said pendant groups wherein the azide employed is of the formula



wherein R is chloro or hydroxyl, R' is chloro, cyano, hydrogen or nitro or an alkyl of from 1-8 carbon atoms and n is an integer of from 0-20 and

(c) reacting said azide with said silicone.

4,100,136

FLUOROCARBON SILOXANE COMPOSITIONS

Philip L. Carter; Yung K. Kim, and Michael O. Riley, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

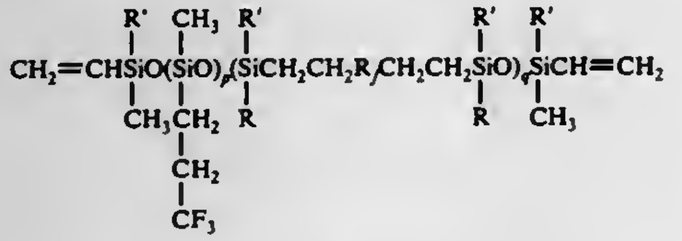
Division of Ser. No. 647,473, Jan. 8, 1976, Pat. No. 4,057,566. This application Jun. 3, 1977, Ser. No. 803,110

Int. Cl.^{2} C08G *77/04*

U.S. Cl. 528—11 **14 Claims**

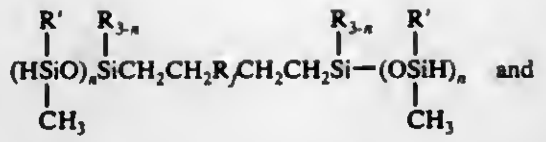
1. A curable composition consisting essentially of a homogeneous mixture of

(A) a siloxane polymer or copolymer of the formula



$$CH_2{=}CH\overset{R'}{\underset{CH_3}{Si}}O(\overset{CH_3}{\underset{CH_2CH_2CF_3}{Si}}O)_p(\overset{R'}{\underset{R}{Si}}CH_2CH_2R_fCH_2CH_2\overset{R'}{\underset{R}{Si}}O)_q\overset{R'}{\underset{CH_3}{Si}}CH{=}CH_2$$

(B) a curing agent of the formula



$$(H\overset{R'}{\underset{CH_3}{Si}}O)_n\overset{R_{3-n}}{Si}CH_2CH_2R_fCH_2CH_2\overset{R_{3-n}}{Si}-(O\overset{R'}{\underset{CH_3}{Si}}H)_n \quad \text{and}$$

(C) an effective amount of a platinum-containing catalyst; where, in (A) and (B), each R and R' is independently methyl, phenyl, or 3,3,3-trifluoropropyl, each R_f is independently a perfluoroalkylene radical of 2 to 10 carbon atoms, a perfluorocycloalkylene radical, or a perfluoroalkylene radical of 2 to 10 carbon atoms or a perfluorocycloalkylene radical containing one or more —C—O—C— linkages; p has a value of 0 to $2q$ inclusive, so that, when $p = 0$, siloxane (A) is a siloxane polymer, but when p has a value of from greater than 0 to q, inclusive, siloxane (A) can be either a random copolymer or an alternating copolymer and when p has a value of from greater than q to $2q$, inclusive, siloxane (A) is only an alternating copolymer having no more than 2 adjacent $CH_3(CF_3CH_2CH_2)SiO$ units, q has an average value of at least 5, each n is independently 1, 2, or 3, there being an average of greater than 2.0 silicon-bonded hydrogen atoms per molecule of (B) and the amount of (B) being such that there is, in said curable composition, from 0.5 to 3.0 silicon-bonded hydrogen atoms for every silicon-bonded vinyl radical.

4,100,137

CROSSLINKING OF HYDROXYL-CONTAINING POLYMERS WITH POLYALDEHYDE COMPOUNDS

Raymond Urgel Lemieux, and Rastko Vukov, both of Edmonton, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 15, 1975, Ser. No. 568,381

Claims priority, application Canada, May 30, 1974, 201213

Int. Cl.^{2} C08G *4/00*

U.S. Cl. 526—21 **18 Claims**

1. A process for crosslinking polymers containing an average of at least 1.8 hydroxy groups per polymer molecule which comprises mixing a polymer having a molecular weight of about 1,000 to about 500,000 with a polyaldehyde compound of general form

$$[(H_2O)_a . OHC . C(X)]_n — R—C(Y)—CHO . (H_2O)_a$$

wherein R is an organic group comprising one or more aromatic rings or an aliphatic group having not less than three carbon atoms one of which is quaternary, X and Y are the same and are selected from oxygen and di(methoxy), n is 1 or 2 and a is 0 or 1, said mixing being at a temperature of from about room temperature to about 200° C, wherein the amount of said polyaldehyde compound is at least about 0.05 molar equivalent but not more than about 2 molar equivalent to the hydroxy group content of the polymer, shaping the mixture at a temperature of about 100° C to about 200° C and cooling the shaped mixture to yield the crosslinked polymer.

4,100,138

ETHNYL TERMINATED POLYIMIDE COMPOSITES

Norman Bilow, Encino, and Boyce G. Kimmel, Palos Verdes, Peninsula, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1975, Ser. No. 576,909

Int. Cl.^{2} C08G *73/12*

U.S. Cl. 526—262 **8 Claims**

1. Laminating materials comprising copolymers or terpolymers consisting of an ethynyl-substituted polyimide oligomer coreacted with di- or polyethynyl-substituted diluent or mixtures of such diluents and a reinforcing fabric, filler or chopped fiber.

4,100,139

POLYCARBONATES INCORPORATING EPIHALOHYDRIN RESIDUES

Joseph McClendon Baggett, Freeport, and Ruben Louis Krause, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 374,858, Jun. 29, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,393

Int. Cl.^{2} C08G *63/62*

U.S. Cl. 528—196 **7 Claims**

1. A linear thermoplastic polycarbonate which comprises a reaction product under polycarbonate forming conditions of

(1) a carbonate precursor,

(2) a dihydric phenol,

(3) about 50 to about 2 mole percent of hydroxyl compounds having the formula $HO—Z—O—CH_2CH(OH)—CH_2—O—Z—_nOH$, and

(4) a catalytic quantity of a catalyst selected from the group consisting of quaternary amines and tertiary amines

wherein Z is the divalent residue from a dihydric phenol and n is a number having an average value from 1–5 wherein the polycarbonate has a weight average molecular weight greater than about 25,000 as determined by gel permeation chromatography.

4,100,140

PROCESS FOR THE MANUFACTURE OF CROSSLINKED POLYMERS WHICH CONTAIN IMIDE GROUPS

Sheik Abdul-Cader Zahir, Oberwill, and Alfred Renner, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 18, 1976, Ser. No. 697,791

Claims priority, application Switzerland, Jan. 19, 1975, 7988/75

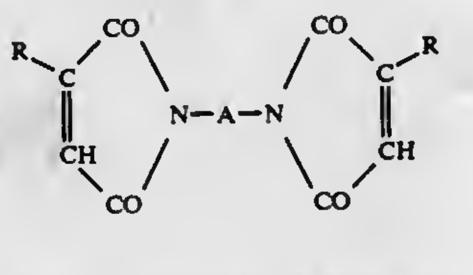
Int. Cl.^{2} C08G *73/12*

U.S. Cl. 526—90 **34 Claims**

1. A process for the manufacture of a crosslinked polymer containing imide groups comprising

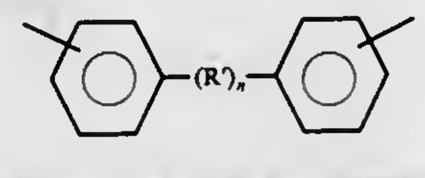
reacting at a temperature of 20° to 250° C

(a) a polyimide of the formula

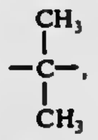


wherein

R is hydrogen or methyl, and A is a divalent radical of the formula



in which R^1 is selected from the group consisting of $—CH_2—$;



$$-\overset{CH_3}{\underset{CH_3}{C}}-,$$

$—SO_2—$, $—SO—$, $—S—$ and $—O—$, and n is 0 or 1; or

a polyimide selected from the group consisting of the N,N'-bis-maleimide of 4,4'-diamino-triphenyl phosphate, the N,N'-bis-maleimide of 4,4'-diamino-triphenyl phosphate, the N,N',N''-tris-maleimide of tris-(4-aminophenyl) phosphate and the N,N',N''-tris-maleimide of tris-(4-aminophenyl) thiophosphate; or a mixture of said polyimides; with

(b) an alkenylphenol selected from the group consisting of o,o'-diallyl-bisphenol A, 4,4'-dihydroxy-3,3'-diallyldiphenyl, bis-(4-hydroxy-3-allylphenyl)methane, 2,2-bis-(4-hydroxy-3,5-diallylphenyl)propane, eugenol, o,o'-dimethallyl-bisphenol A, 4,4'-dihydroxy-3,3'-dimethylallyldiphenyl, bis-(4-hydroxy-3-methallylphenyl)methane, 2,2-bis-(4-hydroxy-3,5-dimethallylphenyl)-propane and 4-methallyl-2-methoxyphenol; or

an alkenylphenol ether selected from the group consisting of 2,2-bis(4-methoxy-3-allylphenyl)propane, 2,2-bis(4-methoxy-3-methallyphenyl)propane, 4,4'-dimethoxy-3,3'-diallyldiphenyl, 4,4'-dimethoxy-3,3'-dimethallyldiphenyl, bis(4-methoxy-3-allylphenyl)methane, bis(4-methoxy-3-methallylphenyl)methane, 2,2-bis(4-methoxy-3,5-diallylphenyl)propane, 2,2-bis-(4-methoxy-3,5-dimethallylphenyl)propane, 4-allylveratrole and 4-methallyl-veratrole; or

a mixture of said alkenylphenols, a mixture of said alkenylphenol ethers or a mixture of said alkenylphenols and said alkenylphenol ethers;

in such molar proportion that for each 1 equivalent of polyimide component (a) there is from 0.1 to 10 moles of alkenylphenol, alkenylphenol ether or mixture thereof as component (b).

4,100,141

STABILIZED ADHESIVE AND CURING COMPOSITIONS

Denis Joseph O'Sullivan, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 2, 1976, Ser. No. 702,309

Int. Cl.^{2} C08F *112/08, 114/06, 120/14*

U.S. Cl. 526—301 **17 Claims**

1. A stabilized, curable composition comprising:

a. a free radical-polymerizable monomer selected from the group consisting of aromatic and alkyl vinyl compounds, halogen-substituted vinyl compounds, alkyl and aromatic acrylates and methacrylates, and urethane-acrylates and -methacrylates;

b. an effective amount for initiation of a peroxy or photosensitive initiator; and

c. an effective amount for stabilization of the composition of an inhibitor system selected from the group consisting of an allyl alkoxyl hydroquinone and the combination of a compound containing the allyl group $CH_2{=}CH—CH_2—$, but no inorganic group of the reducing type, with an alkoxyl hydroquinone, said alkoxyl hydroquinone group containing 1 to about 4 carbon atoms and said inhibitor system being dissolved in the monomer.

4,100,142

POLYESTER PROCESS AND PRODUCT

Peter Schaefer, Charlotte; Peter Alan Mason, Salisbury, and William Harold Yates, Charlotte, all of N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 288,837, Sep. 13, 1972, abandoned. This application Oct. 20, 1976, Ser. No. 734,214

Int. Cl.^{2} C08G *63/70, 63/12*

U.S. Cl. 526—68 **11 Claims**

1. In a process for developing high molecular weight polyester from a direct esterification polyester prepolymer having an intrinsic viscosity of at least about 0.1 wherein said prepolymer is passed through a polymer finisher of the type comprising a generally cylindrical vessel having an inlet for liquid near one end and an outlet for liquid near the opposite end thereof and an intermediate vent for vapor and, mounted inside along an axis substantially parallel to the cylindrical axis, a multiplicity of foraminous surface generating members adapted to rotate and thereby agitate liquid in the vessel, the cross-sectional void space and spacing in between said members generally increas-

ing from the inlet end in the direction of the outlet end, the improvement which comprises positioning said members so that substantially all of said members exert a baffling factor (B) of above about 3500 on liquid flowing therethrough where $B = (PNv)/A$ wherein B is the baffling factor, N is number of surface area generators from the point of calculation in the high polymerizer to the discharge end of the reactor, Pv is polymer viscosity in poises at the point of calculation in the high polymerizer and A is the average cross-sectional void area of the surface generator at the point of calculation beneath the polymer pool level expressed in square feet at standstill.

4,100,143

FILAMENTS WHICH MAY BE CROSS-LINKED COMPRISING AT LEAST 65% ACRYLONITRILE AND 0.5–10% N-METHYLOL DERIVATIVE OF A URETHANE

Gerhard Dieter Wolf; Werner Schnoor, both of Dormagen; Jean-Claude Voegele, Dormagen-Hackenbroich; Ulrich Reinehr, and Günther Nischk, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Filed Jan. 19, 1977, Ser. No. 760,704

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602352

Int. Cl.² B01F *9/08;* **C08F** *28/00, 18/24, 20/70*

U.S. Cl. 526—301 **4 Claims**

1. A filament or fiber of an addition copolymer comprising at least 65% by weight of acrylonitrile; 0.5–10% by weight of at least one N-methylol compound of an unsaturated monourethane, bisurethane, alkyl ether of a monourethane, or ethyl ether of a bisurethane; and 0–30% by weight of at least one comonomer selected from the group consisting of acrylic acid alkyl esters, methacrylic acid alkyl esters, unsaturated sulfonic acids, unsaturated amides, unsaturated urethanes, unsaturated ureas, unsaturated hydrazides, unsaturated semicarbazides, and halogen containing monomers copolymerizable with acrylonitrile, the amount of said halogen containing monomer being 10–30% and the amount of all others of said comonomers being 0–10%.

4,100,144

PROCESS FOR THE PREPARATION OF OLIGOURETHANES

Willi Dünwald, Leverkusen; Jürgen Lewalter, Odenthal; Rudolf Merten, Leverkusen, and Hans-Jürgen Müller, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 6, 1977, Ser. No. 803,718

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1976, 2626175

Int. Cl.² C08G *18/08*

U.S. Cl. 260—860 **10 Claims**

1. A process for the preparation of oligourethanes having isocyanate end groups blocked with alkanol and/or cycloalkanol groups by the reaction of aromatic polyisocyanates with monohydric and polyhydric alcohols having aliphatically and/or cycloaliphatically bound hydroxyl groups, characterized in that aromatic polyisocyanates are reacted with about 0.7 to 1.5 times the equivalent quantity, in terms of the NCO/OH reaction, of monohydric and polyhydric alcohols having aliphatically and/or cycloaliphatically bound hydroxyl groups, the proportion of monohydric to polyhydric alcohols being calculated so that from about 30 to 70% of the total quantity of alcoholic hydroxyl groups present consist of hydroxyl groups of one or more monohydric alcohols and about 70 to 30% of the total quantity of hydroxyl groups present consist of hydroxyl groups of one or more polyhydric alcohols, the reaction being carried out either by introducing the total quantity of alcohol component as a mixture into the reaction vessel and then adding the polyisocyanate to this mixture or by introducing at least about 70 equivalent percent, in terms of the NCO/OH reaction, of the alcohol component into the reaction vessel and reacting it with the total quantity of polyisocyanate and thereupon adding the remaining quantity of alcohol to the prepolymer initially obtained which contains free isocyanate groups, at least about 50 equivalents percent of the total quantity of polyhydric alcohol components being already in the alcohol mixture originally introduced into the reaction vessel if the second reaction method mentioned is employed.

4,100,145

POLYMERIZATION OF 2-PYRROLIDONE WITH CATALYST PREPARED FROM THE REACTION PRODUCT OF CO_2 AND ANHYDROUS POTASSIUM PYRROLIDONATE

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 28, 1975, Ser. No. 636,200

Int. Cl.² C08G *69/24*

U.S. Cl. 528—312 **3 Claims**

1. A process for polymerizing 2-pyrrolidone to produce polypyrrolidone capable of being formed into fibers which comprises contacting 2-pyrrolidone in a reaction vessel with a catalyst prepared by steps comprising reacting CO_2 with a potassium pyrrolidonate to obtain a CO_2-adduct thereof, wherein the potassium pyrrolidonate is prepared outside of the reaction vessel by steps comprising contacting and reacting potassium hydroxide with 2-pyrrolidone in equal molar amounts, in a reaction zone and in the absence of any appreciable excess of 2-pyrrolidone or potassium hydroxide above the equal molar amounts in the reaction zone, to produce an aqueous mixture and drying said mixture to obtain the potassium pyrrolidonate in substantially anhydrous form.

4,100,146

PHOSPHONIUM CATALYST SYSTEM FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 20, 1976, Ser. No. 724,802

Int. Cl.² C08G *69/24;* **B01J** *23/04*

U.S. Cl. 528—313 **10 Claims**

1. A process for making catalyst for the polymerization of 2-pyrrolidone, which comprises contacting an alkali metal pyrrolidonate, a tetraalkyl phosphonium halide and carbon dioxide in mol ratio 1:0.1-2:0.1–0.5, respectively.

7. The process according to claim 1 wherein said alkali metal pyrrolidonate is prepared by contacting an alkali metal hydroxide with 2-pyrrolidine.

4,100,147

POLYMERIZATION OF ALIPHATIC NITRILES

Gordon H. Miller, Littleton, Colo., assignor to Texaco Inc., New York, N.Y.

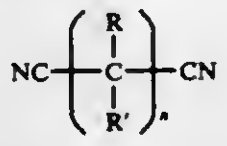
Filed Oct. 14, 1975, Ser. No. 621,702

Int. Cl.² C08G *63/00*

U.S. Cl. 528—362 **16 Claims**

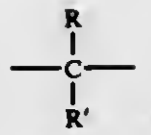
1. A process for preparing a soluble, curable triazine polymer which comprises:

(A) preparing a partially cured, thermoplastic triazine polymer by heating an aliphatic polynitrile of the formula:



$$NC-\left(\begin{array}{c} R \\ | \\ C \\ | \\ R' \end{array}\right)_n-CN$$

wherein n is an integer of from 1 to 8 inclusive and in each



$$-\begin{array}{c} R \\ | \\ C \\ | \\ R' \end{array}- \text{ unit}$$

R and R' are independently selected from the group consisting of hydrogen, alkyl of from 1 to 10 inclusive carbon atoms, amino, nitro, hydroxyl, carboxyl and halogen, at a temperature of about 80° to about 450° C in the presence of a catalyst selected from the group consisting of:

- (a) phosphorous pentoxide, phosphorous trichloride, phosphorous pentachloride, arsenic trichloride, or arsenic pentachloride;
- (b) hydrochloric acid, hydrofluoric acid, fluosulfonic acid, chlorosulfonic acid; or
- (c) halides of metals of Groups, II, III, IV, V or VIII of the Periodic Table as set forth on page 125 of Mellor's Inorganic Chemistry, Revised Edition 1967,

(B) contacting the said partially cured, thermoplastic triazine polymer with a solvent of the formula:

R — O — R',

where R and R' are independently selected alkyl groups from 1 to 5 carbon atoms in order to extract therefrom the unreacted polynitrile;

(C) extracting the soluble, curable triazine polymer as an alcoholic solution by contacting the thus-treated partially cured thermoplastic triazine polymer with a monohydric alcohol, and

(D) recovering the soluble, curable triazine polymer from said alcohol solution and wherein from about 0.1 to about 5.0 weight percent of said catalyst is employed based on the weight of the polynitrile.

4,100,148

STORAGE-STABLE, VERY QUICKLY HARDENABLE, ONE-COMPONENT SEALANT BASED ON MERCAPTO-TERMINATED POLYMERS

Lothar Hockenberger, Ludwigshafen am Rhein; Manfred Soyka, Duisburg, and Gerhard Wilhelm, Viernheim, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 4, 1976, Ser. No. 683,136

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526603

Int. Cl.² C08G *75/00, 75/04;* **C09J** *3/14*

U.S. Cl. 528—374 **9 Claims**

1. A storage-stable sealant composition capable of quickly hardening, said composition comprising at least one liquid monomer, oligomer or polymer having terminal mercapto groups; and at least one oxidation agent for curing said liquid monomer, oligomer or polymer; wherein said oxidation agent is substantially uniformly distributed throughout said composition in the form of encapsulated small particles of a paste made from said oxidation agent and a plasticizer which is compatible with said liquid monomer, oligomer or polymer wrapped in a gelatin encapsulating material, the ratio of paste to gelatin being 12:1.

4,100,149

METHOD OF SEPARATING PROTEINS BY ION EXCHANGE

François Meiller, Palaiseau, and Bernard Mirabel, Fresnes, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,308

Claims priority, application France, Aug. 28, 1975, 75 26530; Jul. 28, 1976, 76 22985

Int. Cl.² A23J *1/20, 1/16, 1/08, 1/06*

U.S. Cl. 260—112 R **10 Claims**

1. A method of separating proteins from solution, comprising putting a solution of proteins into contact with an ion exchange resin, comprising a porous inorganic carrier with a particle size from 4 μm to 5 mm, a specific surface area of approximately 5 to 150 m^2/g, a pore diameter of 500 to 2500 A and a pore volume of 0.4 to 2 ml/g, coated with less than 15 mg/m^2 of a film of cross-linked polymer, containing or carrying either tertiary amines or quaternary ammonium salts, as anion exchanging groups, or acid functions as cationic exchanging groups, wherein at least one protein becoming fixed onto the ion exchange resin, and eluting the fixed protein(s) from the ion exchange resin.

4,100,150

STABILIZATION OF INTERFERON AGAINST MECHANICAL STRESS USING THIOCTIC ACID

Terence Cartwright, Merton, England, assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 628,747, Nov. 4, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,130

Int. Cl.² A61K *45/02*

U.S. Cl. 260—112 R **4 Claims**

1. A method for stabilizing interferon against mechanical stress conprising treating an interferon preparation with an effective stabilizing amount of thioctic acid for selectively retaining interferon sulfhydryl groups in the reduced state without reduction of essential disulfide linkages.

4,100,151

ENZYMATIC MODIFICATION OF CORN GLUTEN

Jens Lorenz Adler-Nissen, Copenhagen, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 6, 1977, Ser. No. 757,330

Claims priority, application United Kingdom, Jan. 12, 1976, 1090/76

Int. Cl.² A23J *1/16, 1/12*

U.S. Cl. 260—112 G **8 Claims**

8. Corn gluten modified by proteolytic treatment in an aqueous suspension contaning above about 6% w/w of protein with from 0.5 - 0.5 Anson units/l of proteinase until the viscosity exceeds about 50 cP.

4,100,152

PEPTIDES

Masahiko Fujino, Takarazuka; Osamu Nishimura, Toyonaka; Yuji Nagawa, Nagaokakyo, and Naohisa Fukuda, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

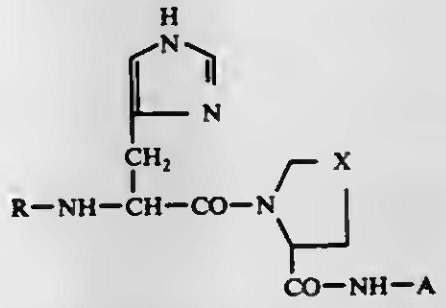
Filed Mar. 16, 1977, Ser. No. 778,321

Claims priority, application Japan, Mar. 23, 1976, 51-32170

Int. Cl.² C07C *103/52;* **A61K** *37/00*

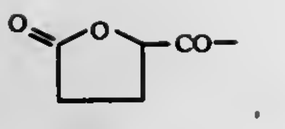
U.S. Cl. 260—112.5 TR **3 Claims**

1. A member selected from the group consisting of a compound of the formula



wherein A represents hydrogen, alkyl of up to 10 carbon atoms, aralkyl of up to 10 carbon atoms, alkoxyalkyl of up to 9 carbon atoms, hydroxyalkyl of up to 9 carbon atoms or alkoxy of up to 9 carbon atoms,

R represents



X represents —S— or —$(CH_2)_n$— wherein n is 1 or 2, and a pharmacologically acceptable acid salt thereof.

4,100,153
(D-TRP⁵)-SOMATOSTATIN AND ANALOGUES THEREOF

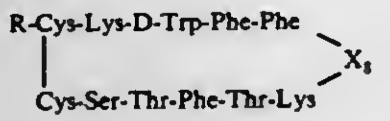
Victor M. Garsky, Radnor, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,687

Int. Cl.² C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 S **4 Claims**

1. A polypeptide of the formula:



R-Cys-Lys-D-Trp-Phe-Phe

X_8

Cys-Ser-Thr-Phe-Thr-Lys

wherein:

R is hydrogen, lower alkanoyl, Ala-Gly-, Gly-Gly-Gly-, Ala-D-Ala- or p-Glu;

and

X_8 is L-Trp or D-Trp;

or the linear reduced form thereof; or a non-toxic acid addition salt thereof.

4,100,154
PROCESS FOR RECOVERY AND SEPARATION OF NUTRITIOUS PROTEIN HYDROLYSATE AND CHROMIUM FROM CHROME LEATHER SCRAP

Donald Francis Holloway, Milwaukee, Wis., assignor to A. L. Gebhardt Company, Milwaukee, Wis.

Filed Apr. 22, 1977, Ser. No. 789,857

Int. Cl.² A23J *1/10;* C07G *7/00*

U.S. Cl. 260—123.7 **8 Claims**

1. A process for making protein hydrolysate from chrome leather scrap which comprises the steps:

(a) heating to a temperature above 200° F a mixture comprised of:

(i) 100 parts by weight of chrome leather scrap,

(ii) at least eight parts by weight of alkaline earth compound selected from the group consisting of calcium oxide and calcium hydroxide, and

(iii) at least 100 parts by weight of water, until substantially all of the original collagen of the leather has been reduced to molecular weights between about 1500 and 10,000, thereby producing a water soluble protein hydrolysate and simultaneously converting substantially all of the chromium in the leather to water insoluble chromium compounds; and

(b) separating the water soluble protein hydrolysate from the insoluble chromium compounds to provide:

(i) a protein hydrolysate that is substantially free of chromium, and

(ii) a residue of chromium compounds that is substantially free from protein.

4,100,155
METHOD OF CONDENSING AND/OR POLYMERIZING SULFONATED LIGNIN CONTAINING MATERIALS

Theodore Heinrich Gustave Ashorn, and Paul Elis Laine, both of Tampere, Finland, assignors to G. A. Serlachius Oy, Mantta, Finland

Filed Jan. 5, 1977, Ser. No. 757,070

Claims priority, application Finland, Jan. 30, 1976, 752488

Int. Cl.² C07G *1/00*

U.S. Cl. 260—124 R **5 Claims**

1. Method for converting sulfonated lignin containing materials to substantially water soluble products comprising

(a) adjusting the pH of the material such that a 3 percent aqueous solution of the material has a pH below 7;

(b) adjusting the moisture content of the pH adjusted material to a value from 1 to 15 percent; and

(c) subjecting the material from step (b) to heating at a temperature range from 80° to 225° C in a manner to maintain the moisture content of the material at a value sufficient to allow the conversion to proceed, but less than 15 percent, and for a time period sufficient to form products having viscosity at least 25 percent higher than the viscosity of the starting material, said viscosities being measured in a 50 percent aqueous solution at room temperature.

4,100,156
CHLORINE-CONTAINING DISAZA PIGMENTS

Paul Müller, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

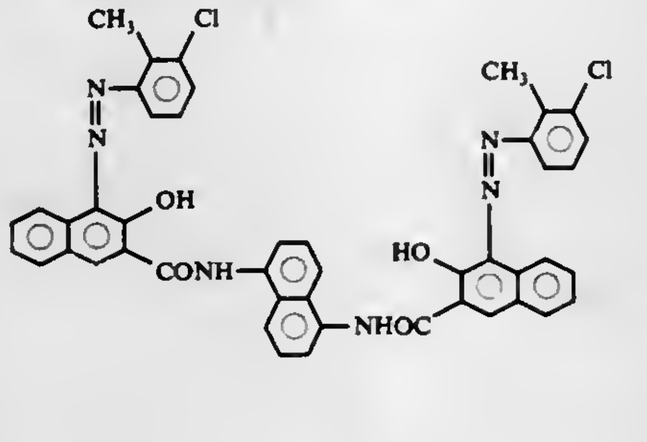
Filed Dec. 9, 1974, Ser. No. 531,028

Claims priority, application Switzerland, Dec. 20, 1973, 17900/73

Int. Cl.² C09B *31/12, 33/04, 35/06, 43/00*

U.S. Cl. 260—174 **1 Claim**

1. The disazo pigment of the formula



4,100,157
β-CRYSTALLINE FORM OF THE PIGMENT OBTAINED BY COUPLING DIAZOTIZED 1-AMINOBENZENE-2-CARBOXYLIC ACID METHYL ESTER WITH 2,3-OXYNAPHTHOIC ACID

Paul Müller, Basel, and Willy Müller, Rhine, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

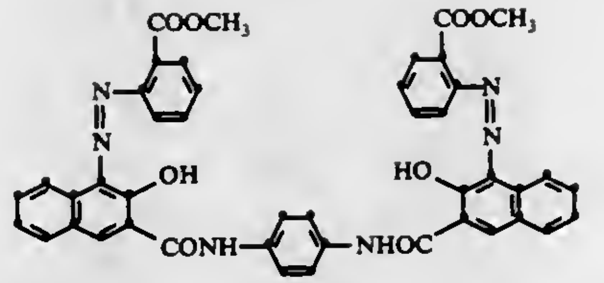
Continuation of Ser. No. 391,102, Aug. 27, 1973, abandoned. This application Jul. 16, 1975, Ser. No. 596,490

Claims priority, application Switzerland, Sep. 5, 1972, 13034/72

Int. Cl.² C09B *43/00, 43/12*

U.S. Cl. 260—174 **5 Claims**

1. A disazo pigment of the formula



in the β-modification thereof, whose X-ray diffraction pattern at an interplanar spacing of 3.33 A° shows a line of very strong intensity, at 5.38 and 8.33 A° lines of strong intensity, at 3.74, 4.24, 4.68, 4.94, 5.18 and 8.70 A° lines of medium intensity, at 4.05, 4.37, 6.33 and 12.6 A° lines of medium to faint intensity, at 3.50, 3.94, 5.65, 6.09, 6.71, 10.6 and 11.5 A° lines of faint intensity.

4,100,158
OSMIUM COMPOUNDS

Paul Cedric Hydes, and Michael James Cleare, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jul. 2, 1976, Ser. No. 702,132

Claims priority, application United Kingdom, Jul. 9, 1975, 28877/75

Int. Cl.² C07F *15/00*

U.S. Cl. 544—225 **1 Claim**

1. A complex consisting of osmium tetroxide and a compound selected from the group consisting of pyridazine, phthalazine, isoquinoline, triethylenediamine, and quinuclidine.

4,100,159
PROCESS FOR PREPARATION OF 9-(2,6-DIHALOBENZYL)ADENINES

Michael C. Vander Zwan, Maple Glen, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 7, 1977, Ser. No. 766,326

Int. Cl.² C07D *473/34*

U.S. Cl. 544—277 **4 Claims**

1. An improved process for alkylating an alkali or alkaline earth metal salt of adenine with 2,6-dihalobenzyl halide and producing a mixture of isomers of (2,6-dihalobenzyl)adenine in which at least about 70% by weight is 9-(2,6-dihalobenzyl)adenine wherein the improvement comprises carrying out the alkylation in a rapidly stirred solid-liquid or liquid-liquid two phase system wherein,

(a) the solid-liquid two phase system comprises a solid phase comprising an alkali or alkaline earth metal salt of adenine and a liquid phase comprising a solution of 2,6-dihalobenzyl halide and an onium salt phase transfer catalyst having the structure:

$(R)_3N^{\oplus}R_1\ Z^{\ominus}$ or

$(R_1)_3P^{\oplus}R\ Z^{\ominus}$

wherein R is alkyl having 4 to 18 carbon atoms, R_1 is alkyl having 1 to 8 carbon atoms and $Z^{\ominus}$ is an anion selected from the group consisting of chlorine, bromine and iodine in an aprotic water miscible or water immiscible organic solvent wherein the water miscible solvent contains from 0 to about 5 moles of water per mole of adenine salt,

(b) the liquid-liquid two phase system comprises one liquid phase comprising an aqueous solution of an alkali or alkaline earth metal salt of adenine and a second liquid phase comprising a solution of 2,6-dihalobenzyl halide and an onium salt phase transfer catalyst having the structure:

$(R)_3N^{\oplus}R_1\ Z^{\ominus}$ or

$(R_1)_3P^{\oplus}R\ Z^{\ominus}$

wherein R, R_1 and $Z^{\ominus}$ are as defined above in an aprotic water immiscible organic solvent; wherein the phase transfer catalyst is used in an amount from about 1 mole % to about 10 mole % relative to adenine and the alkylation is carried out at a temperature range of room temperature to 150° C. from about 1 hour to about 24 hours.

4,100,160
THERAPEUTIC COMPOSITIONS COMPRISING ALPHA-HYDROXY ANALOGS OF ESSENTIAL AMINO ACIDS AND THEIR ADMINISTRATION TO HUMANS FOR PROMOTION OF PROTEIN SYNTHESIS AND SUPPRESSION OF UREA FORMATION

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,259, Apr. 15, 1974, abandoned, and Ser. No. 461,260, Apr. 15, 1974, abandoned, each is a continuation-in-part of Ser. No. 355,326, Apr. 30, 1973, abandoned, and Ser. No. 355,327, Apr. 30, 1973, abandoned, said Ser. No. 355,327, is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,588

Int. Cl.² A61K *31/19, 31/40, 31/195*

U.S. Cl. 424—274 **30 Claims**

1. A composition capable of promoting protein synthesis and conserving nitrogen in a patient in need thereof, said composition being in the form of a mixture adapted for oral or parenteral administration to subjects on a protein-restricted diet, said composition being substantially devoid of non-essential amino acids, and said composition comprising a mixture of effective quantities of hydroxy-acid and/or keto-acid analogs of the essential amino acids valine, phenylalanine, isoleucine, leucine and methionine, at least one of said analogs of essential amino acids being hydroxy-acid analogs, said hydroxy-acid or keto-acid analogs being present in the form of the acid analogs per se or salts of the acid analogs.

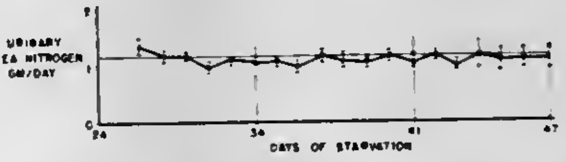
4,100,161
PROMOTION OF PROTEIN SYNTHESIS AND SUPPRESSION OF UREA FORMATION IN THE BODY BY KETO ANALOGS OF ESSENTIAL AMINO ACIDS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,222, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 355,327, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,590

Int. Cl.² A61K *31/40, 31/19, 31/195*

U.S. Cl. 424—274 **18 Claims**



1. A composition capable of promoting protein synthesis and conserving nitrogen in a patient in need thereof, said composition being in the form of a mixture adapted for oral or parenteral administration to subjects on a protein-restricted diet, said composition consisting essentially of effective quantities of the keto-acid analogs of the branched-chain essential amino acids valine, leucine and isoleucine.

4,100,162

PROCESS FOR PREPARING GAMMA QUINACRIDONE FROM POLYPHOSPHORIC ACID AND ALCOHOL

Robert Jarl North, Elmwood Park, N.J., assignor to Harmon Colors, New York, N.Y.

Continuation-in-part of Ser. No. 643,445, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,557, Oct. 29, 1974, abandoned. This application Jan. 17, 1977, Ser. No. 759,692

Int. Cl.² C09B *48/00*

U.S. Cl. 260—279 QA **5 Claims**

1. A process for the direct production of gamma quinacridone pigment which comprises heating, at a temperature between 80° and 120° C. 2,5-dianilinoterephthalic acid in polyphosphoric acid, diluting the reaction mixture by addition thereof to a water-miscible alcohol containing 1 to 3 carbon atoms in an amount sufficient to dissolve the polyphosphoric acid while maintaining the temperature of the alcohol between about 0° and 25° C. during said addition, and thereafter separating gamma quinacridone from the resulting mixture.

4,100,163

SUBSTITUTED 8-SULFONAMIDOQUINOLINES

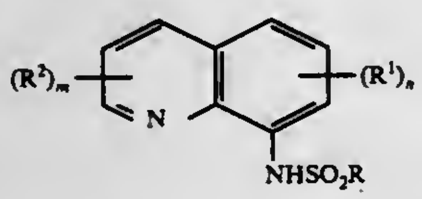
Michael J. Virnig, Fridley, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jan. 26, 1976, Ser. No. 652,005

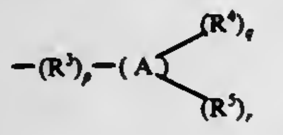
Int. Cl.² C07D *215/40*

U.S. Cl. 260—283 SA **96 Claims**

1. Compounds of the structure:



where R is selected from the group consisting of alkyl and alkenyl of 8 to 20 carbon atoms and



where R^3 is an alkylene of 1 to about 20 carbon atoms, p is 0 or 1, A is a monocyclic hydrocarbon ring or a bicyclic hydrocarbon ring wherein the ring or rings are 5 or 6 membered, q is a whole integer selected from 1, 2 and 3, r is 0 or 1, and $q + r =$ 1 to 3, R^4 is an alkyl or alkenyl of up to about 20 carbon atoms such that the total number of carbon atoms in $(R^4)_q$ is at least 8 with the proviso that when q is 2 at least one R^4 contains 5 or more carbon atoms and when q is 2 or 3 and more than one of the R^4 groups are branched chain the branched chain groups are not on adjacent carbon atoms, R^5 is —Cl, —Br, —NO_2 or —O—R^6 wherein R^6 is a hydrocarbon group radical of from 1 to about 20 carbon atoms, n is 0, 1 or 2 with the proviso that when n is 2 the R^1 substituents are not on adjacent carbon atoms, m is 0 or 1 and R^1 and R^2 are selected from the group consisting of hydrocarbon groups of from 1 to 5 carbon atoms, —Cl, —Br, NO_2 and —O—R^6, said compounds being further characterized as having solubilities of at least 2% by weight in an essentially water-immiscible, liquid hydrocarbon solvent having a flash point of at least 150° F and also further characterized in that the Cu++ complexes thereof have solubilities of at least 2% by weight in the said solvent.

4,100,164

2,6-METHANO-3-BENZAZOCINES

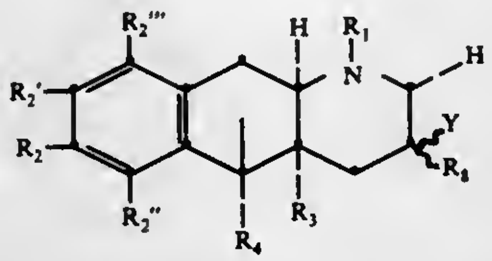
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 695,977, Jan. 14, 1976, abandoned, and Ser. No. 576,313, May 12, 1975, abandoned, said Ser. No. 695,977 is a continuation-in-part of said Ser. No. 576,313, which is a continuation-in-part of Ser. No. 471,571, May 20, 1974, Pat. No. 3,932,422. This application Nov. 12, 1976, Ser. No. 741,227

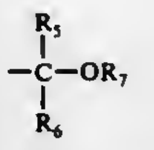
Int. Cl.² C07D *215/04, 215/08, 215/36, 215/48*

U.S. Cl. 260—287 B **39 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, lower-alkanoyl (only when R_4 is hydrogen), lower-alkenyl, lower-alkynyl, halo-lower-alkenyl, cycloalkyl, cycloalkyl-lower-alkyl, phenyl-lower-alkyl, phenyl-lower-alkyl substituted in the phenyl ring by a single trifluoromethyl or by from one to two members of the group consisting of halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, amino, lower-alkanoyl-amino or a single methylenedioxy attached to adjacent carbon atoms, or R_1 is 2- or 3-furylmethyl or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkoxycarbonylamino or phenyl, or two of the adjacent such groups together are methylenedioxy; R_3 is hydrogen or lower-alkyl; R_4 is hydrogen, lower-alkyl, lower-alkoxy-lower-alkyl, hydroxy-lower-alkyl, lower-alkylthio-lower-alkyl, lower-alkylsulfinyl-lower-alkyl, phenylthio-lower-alkyl, phenylsulfinyl-lower-alkyl, lower-alkenyl or halo-lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, —$(CH_2)_n$—, where n is one of the integers 3 or 4; R_8 is hydrogen or lower-alkyl; and Y is carboxy, cyano, carbo-lower-alkoxy, COR_5, COO-lower-alkylene-cycloalkyl, COO-lower-alkylene-phenyl, or a group of the formula:



$$-\overset{\displaystyle R_5}{\underset{\displaystyle R_6}{\overset{|}{\underset{|}{C}}}}-OR_7$$

where R_5 and R_6 are the same or different members selected from the group consisting of hydrogen, lower-alkyl, cycloalkyl-lower-alkyl, phenyl or phenyl-lower-alkyl; and R_7 is hydrogen, lower-alkanoyl, benzoyl, or benzoyl substituted by a single trifluoromethyl or by one to three sterically compatible members of the group consisting of lower-alkyl, lower-alkoxy, hydroxy or halo, and wherein cycloalkyl, all occurrences, is a group having from 3 to 7 carbon atoms or is alkyl-substituted cycloalkyl having a total of from 3 to 8 carbon atoms, 3 to 7 of which are cycloalkyl ring carbon atoms, or an acid-addition salt thereof.

4,100,165

IMIDAZO [2,1-a]ISOQUINOLINES

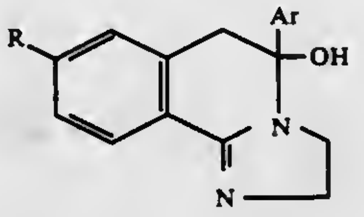
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 587,544, Jun. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 523,141, Nov. 12, 1974, abandoned. This application Jul. 22, 1976, Ser. No. 707,682

Int. Cl.² C07D *471/04;* A61K *31/47*

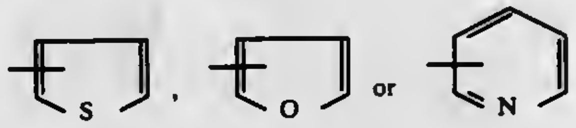
U.S. Cl. 260—288 CF **13 Claims**

1. A compound of the formula



where

Ar represents



R represents H, halo having an atomic weight of 19–36, or methyl,

or a pharmaceutically acceptable acid addition salt thereof.

4,100,166

NOVEL CIS N-CYCLOPROPYLMETHYL DECAHYDROISOQUINOLINE

Dennis M. Zimmerman, Mooresville, and Winston S. Marshall, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

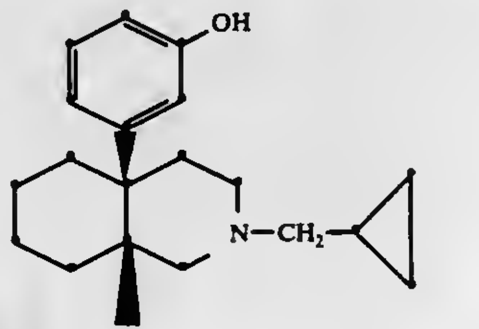
Continuation-in-part of Ser. No. 477,222, Jun. 7, 1974, Pat. No. 4,001,248. This application Oct. 22, 1976, Ser. No. 734,895

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.² C07D *217/04;* A61K *31/47*

U.S. Cl. 260—289 D **2 Claims**

1. A compound of the formula:



and its pharmaceutically-acceptable acid addition salts.

4,100,167

PRODUCTION OF 1-AMINOALKANE-1, 1-DIPHOSPHONIC ACIDS USING PHOSPHOROUS ACID AND NITRILES IN A NON-AQUEOUS SYSTEM

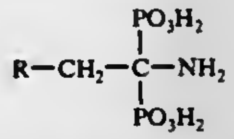
Radhakrishnan Selvarajan, Oak Park, and Edward G. Ballweber, Glenwood, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 9, 1977, Ser. No. 794,887

Int. Cl.² C07D *213/73;* C07F *9/38*

U.S. Cl. 260—296 R **3 Claims**

1. A process for producing 1-amino-alkane-1,1-diphosphonic acids of the formula,



$$R-CH_2-\overset{\displaystyle PO_3H_2}{\underset{\displaystyle PO_3H_2}{\overset{|}{\underset{|}{C}}}}-NH_2$$

which comprises reacting a nitrile of the formula, [R—CH-$_2$—C=N]R—CH_2—C≡N, with at least 2 moles of phosphorous acid in the presence of a high boiling hydrocarbon liquid suspending agent at a temperature ranging between 140°–170° C. for a period of time to sufficiently convert the nitrile and the phosphorous acid into the aminoalkane-1,1-diphosphonic acid and then recovering said aminoalkane-1,1-diphosphonic acid and wherein in the above formula R is selected from the group consisting of hydrogen, alkyl with 1–18 carbon atoms, phenyl, phenylalkyl where alkyl has 1–18 carbon atoms, substituted phenyl wherein the phenyl moiety contains a sulfonic acid group or halo group, and pyridyl.

4,100,168

2,5 OR 2,6-DISUBSTITUTED BENZOXAZOLES

David William Dunwell, Camberly; Delme Evans, Peter, and Terence Alan Hicks, Farnborough, all of England, assignors to Lilly Industries Ltd., London, England

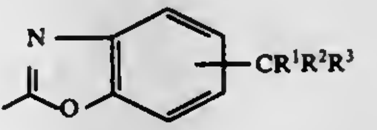
Division of Ser. No. 655,668, Feb. 4, 1976, Pat. No. 4,025,637, which is a continuation-in-part of Ser. No. 515,133, Oct. 16, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,309

Claims priority, application United Kingdom, Sep. 20, 1974, 49260/74

Int. Cl.² C07D *263/54, 263/58*

U.S. Cl. 260—299 **2 Claims**

1. A benzoxazole of formula (III):



(III)

where the —$CR^1R^2R^3$ group is at the 5- or 6-position of the benzoxazole nucleus, R^1 is H, R^2 is H or CH_3, R^3 is -CN, COOH or an alkali or alkaline earth metal, aluminum or ammonia salt thereof, or the group $COOR^5$ wherein R^5 is C_1-C_4 alkyl and Q is —SH or halogen.

4,100,169

THIAZOLYLPHTHALIDE COMPOUNDS

Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

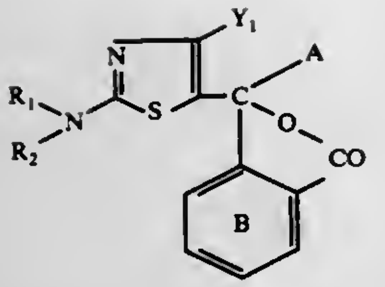
Filed Nov. 5, 1975, Ser. No. 629,156

Claims priority, application Switzerland, Nov. 14, 1974, 15189/74

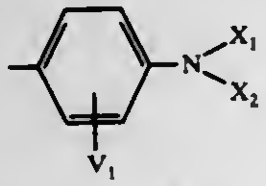
Int. Cl.² C07D *277/38*

U.S. Cl. 260—306.8 R **8 Claims**

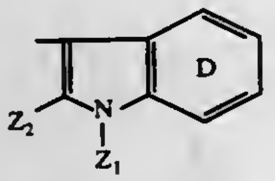
1. A thiazolylphthalide compound of the formula



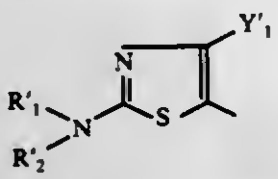
wherein A represents a p-aminophenyl radical of formula



or a 3-indolyl radical of formula



or a 2-thiazolyl radical of formula



each of R_1R_2, X_1, X_2, R_1' and R_2' independently represents hydrogen, alkyl of 1 to 12 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, cycloalkyl of 5 or 6 carbon atoms, or unsubstituted or substituted benzyl or phenyl wherein the substituents are independently selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, acyl of 1 to 4 carbon atoms, nitro, halogen and amino substituted by alkyl of 1 to 4 carbon atoms or benzyl,

each of Y_1 and Y_1' represents hydrogen, alkyl of 1 to 12 carbon atoms, cycloalkyl or 5 or 6 carbon atoms or said unsubstituted or substituted benzyl or phenyl,

V_1 represents hydrogen, alkyl of 1 to 2 carbon atoms, alkoxy of 1 to 12 carbon atoms or acyloxy of 2 to 12 carbon atoms,

Z_1 represents hydrogen, alkyl of 1 to 12 carbon atoms, benzyl or β-cyanoethyl,

Z_2 represents hydrogen, alkyl of 1 to 12 carbon atoms or phenyl, and

wherein the benzene rings B and D independently are unsubstituted or substituted by halogen, nitro or by an amino group which is unsubstituted or substituted by alkyl of 1 to 6 carbon atoms.

4,100,170

ANORECTIC ADAMANTANE DERIVATIVES AND METHOD OF USING THE SAME

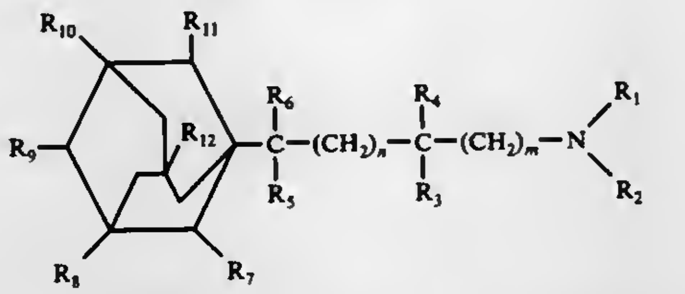
Bola Vithal Shetty, Rochester, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 691,182, Dec. 18, 1967, abandoned. This application Aug. 13, 1971, Ser. No. 171,736

Int. Cl.² A01N ***9/20, 9/24***

U.S. Cl. 424—325 **5 Claims**

1. The method of curbing appetite in an animal which comprises administering to the animal an amount effective to curb
(1) appetite of a compound of the formula:



(1a) or their pharmaceutically acceptable acid addition salts, in which
R_1 = H, lower alkyl, aralkyl, aralkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, NO_2; phenoxy alkyl or phenoxyalkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, or NO_2; acyl including formyl or acetyl;
R_2 = H, lower alkyl, COO-lower alkyl, aralkyl, aralkyl substituted with NH_2, OH, OCH_3, halogen, alkyl, NO_2; phenoxyalkyl or phenoxyalkyl substituted with NH_2, OH,
(1b) OCH_3, halogen, alkyl, or NO_2; acyl including formyl or acetyl,
R_3 = H, lower alkyl or alkynyl;
R_4 = H, lower alkyl, or alkynyl;
R_5 = H, OH, halogen, or lower alkyl;
R_6 = H, OH, halogen, or lower alkyl; or
R_5 and R_6 together represent a carbonyl oxygen;
R_7 = H, lower alkyl, halogen, hydroxy, alkoxy, amino or substituted amino, trifluoromethyl, sulfamyl, nitro,
(1c) phenyl;
R_8, R_9, R_{10}, R_{11}, R_{12} are any of R_7;
n = 0 to 4;
m = 0 to 4;

4,100,171

ANTIBIOTIC X-14547

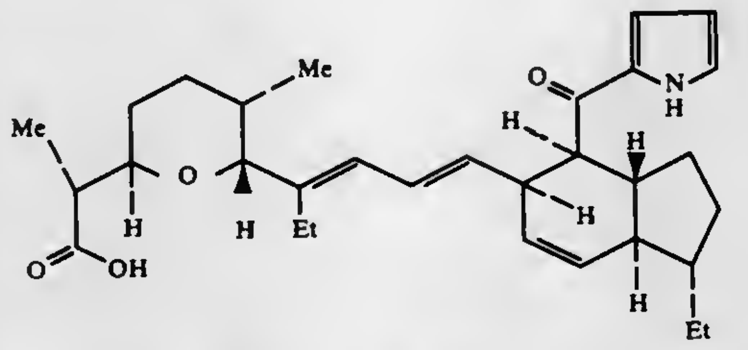
John Westley, Clifton, and Chao-Min Liu, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 6, 1976, Ser. No. 712,286

Int. Cl.² C07D ***207/32***

U.S. Cl. 260—326.33 **2 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof.

4,100,172

SULFUR CONTAINING NORBORNANYL SILICON COMPOUNDS

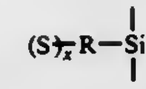
Jeffrey Y. P. Mui, Ossining, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 187,551, Oct. 7, 1971, abandoned. This application Jun. 7, 1976, Ser. No. 694,028

Int. Cl.² C07F ***7/08***

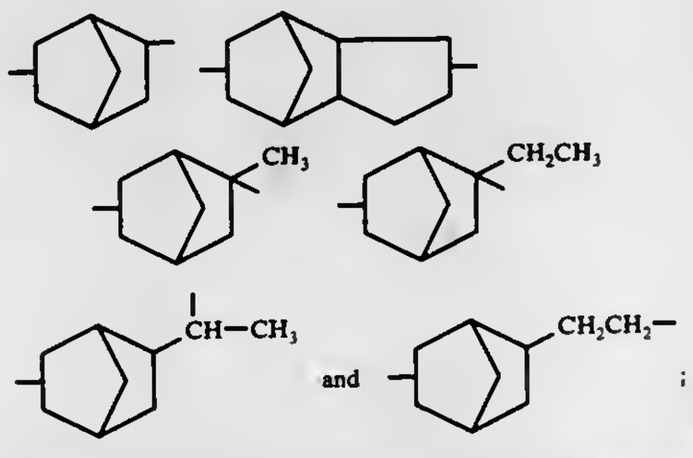
U.S. Cl. 260—327 H **10 Claims**

1. Sulfur substituted norbornyl substituted compounds characterized by having present therein the structure:



$$(S)_x R-\overset{|}{\underset{|}{Si}}-$$

wherein the free valences of the silicon atom are bonded to one or more monovalent hydrocarbon groups and hydrolyzable groups, R is one of the polyvalent cycloaliphatic hydrocarbon radicals characterized as follows:



x has the value of 2 or 3; provided that when x is 2 each sulfur atom is bonded to hydrogen to form a mercaptan, and when x is 2, the two mercaptans are attached to separate carbon atoms and such carbon atoms are adjacent to one another, and when x is 3, the sulfur atoms form a trisulfide wherein each sulfur atom is bonded to another sulfur atom and the terminal valences of the trisulfide are bonded to vicinal carbon atoms of R.

4,100,173

DIBENZ[B,F]OXEPIN DERIVATIVES

Max Gerecke; Emilio Kyburz, both of Reinach, Switzerland, and Jean-Pierre Kaplan, Le Plessis Robinson, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

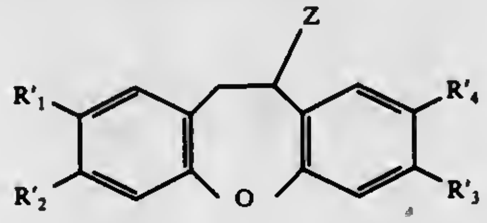
Division of Ser. No. 534,033, Dec. 18, 1974, Pat. No. 4,032,525. This application Mar. 18, 1977, Ser. No. 778,897

Claims priority, application Switzerland, Jan. 4, 1974, 62/74; Nov. 20, 1974, 15369/74

Int. Cl.² C07D ***313/14***

U.S. Cl. 260—333 **2 Claims**

1. A compound of the formula



wherein Z is a leaving atom or group selected from the group consisting of halogen, alkyl-substituted sulfonyloxy and aryl-substituted sulfonyloxy; R'_1 is methyl and R'_2 is hydrogen; R'_3 is hydrogen and R'_4 is fluoro.

4,100,174

PROCESS FOR THE PREPARATION OF 2-(5H-DIBENZO[a,d]CYCLOHEPTEN-5-ON-2-YL)ACETIC, PROPIONIC AND BUTYRIC ACIDS AND INTERMEDIATES

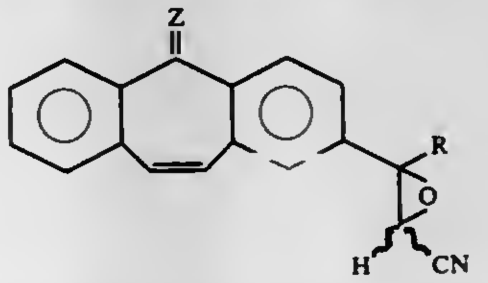
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 611,053, Sep. 8, 1975, Pat. No. 4,011,241. This application Dec. 6, 1976, Ser. No. 748,083

Int. Cl.² C07D ***317/72***

U.S. Cl. 260—340.9 R **2 Claims**

1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z is a conventional ketal protecting group selected from the group consisting of dimethyl-, diethyl-, ethylene-, 1,3-propylene-, 2,2-dimethyl-1,3-propylene-, 1,4-butylene-, 2,3-butylene- and dibenzyl- ketals.

4,100,175

CLAISEN INTERMEDIATES

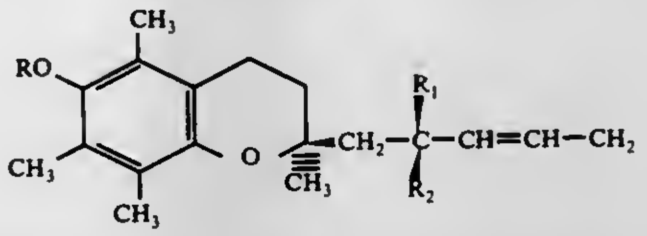
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,382, Dec. 8, 1975, Pat. No. 4,029,678, which is a continuation-in-part of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Mar. 15, 1977, Ser. No. 777,808

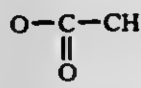
Int. Cl.² C07D ***311/72***

U.S. Cl. 260—345.5 **1 Claim**

1. A compound of the formula



wherein R is trityl, benzyl, benzhydryl or lower alkenyl; one of R_1 and R_2 is hydrogen, and the other is



$$O-\underset{\underset{O}{\|}}{C}-CH_3$$

with the proviso that when R_1 is hydrogen, the 2–3 double bond has a trans configuration and that when R_1 is other than hydrogen the 2–3 double bond has a cis configuration.

4,100,176

4,5-DIDEHYDRO-6-HYDROXY-2β-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACIDS

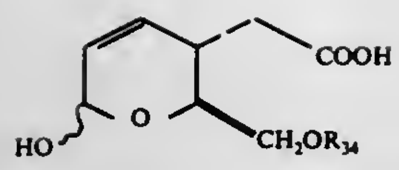
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,476

Int. Cl.² C07D ***309/22***

U.S. Cl. 260—345.7 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
- (a) benzyl,
- (b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (c) benzhydryl,
- (d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (e) trityl, and
- (f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,100,177

4,5-DIDEHYDRO-6-HYDROXY-2-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACID ALKYL ESTERS

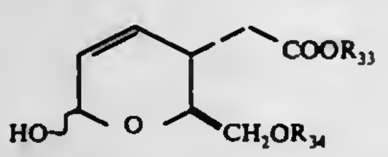
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,175

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.8 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
- (a) benzyl,
- (b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (c) benzhydryl,
- (d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (e) trityl, and
- (f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive; and

wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,100,178

4,5-DIDEHYDRO-6-METHOXY-2-ARYLMETHOXYMETHYL-4α-TETRAHYDROPYRANACETIC ACID ALKYL ESTERS

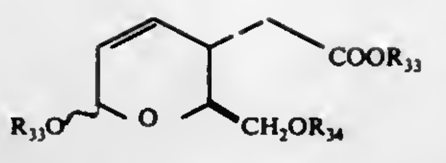
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,178

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.8 P **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
- (a) benzyl,
- (b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (c) benzhydryl,
- (d) benzhydryl substituted hy one to ten alkyl of one to four carbon atoms, inclusive, chloro, hromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (e) trityl, and
- (f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive; and

wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,100,179

PREPARATION OF CITRACONIC ANHYDRIDE

Rudolph G. Berg, Groton, and Donald S. Hetzel, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 482,486, Jan. 24, 1974, abandoned. This application Jan. 7, 1977, Ser. No. 757,626

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **2 Claims**

1. A process for preparing citraconic anhydride essentially free of 2,4-dimethylfuran which comprises contacting a gaseous mixture of about 0.4 to 2% by volume of mesityl oxide and air with a non-supported, fused vanadium oxide containing catalyst at a temperature of from about 390° to 460° C until substantial citraconic anhydride is produced, said catalyst containing 0.1 to 0.9 parts by weight of antimony, 0.05 to 0.35 parts by weight of nickel, 0 to 0.02 parts by weight of chromium, 0 to 0.02 parts hy weight of silver and 0 to 0.02 parts by weight of lithium, said parts by weight being parts by weight of recited element per part by weight of vanadium and said antimony, nickel, chromium, silver and lithium being present in said catalyst as oxides or hydroxides.

4,100,180

PROCESS FOR HYDROGENATING UNSATURATED ALDEHYDES TO UNSATURATED ALCOHOLS

Yataro Ichikawa; Nobuo Suzuki, and Toru Sawaki, all of Iwakuni, Japan, assignors to Teijin, Limited, Osaka, Japan

Filed Dec. 23, 1975, Ser. No. 643,953

Claims priority, application Japan, Dec. 26, 1974, 49-148267; Dec. 26, 1974, 49-148268

Int. Cl.² C07C *29/14;* **C07D** *307/42*

U.S. Cl. 260—347.8 **5 Claims**

1. An improved process for preparing unsaturated alcohols by catalytic hydrogenation of unsaturated aldehydes with hydrogen in the presence of a solid hydrogenating catalyst, said catalyst comprising platinum oxide and deposited on its surface in an atmosphere of hydrogen, an iron compound selected from the group consisting of ferrous sulfate and ferrous acetate and a zinc compound selected from the group consisting of zinc sulfate and zinc acetate, wherein the platinum oxide is reduced by the hydrogen in the presence of the iron and zinc compounds.

4,100,181

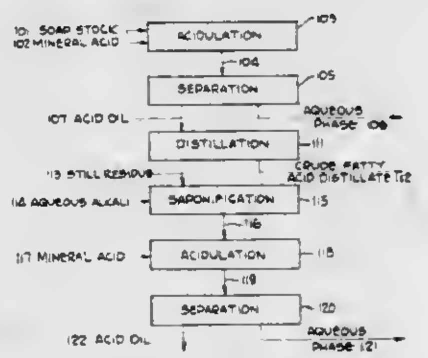
PROCESS FOR OBTAINING FREE FATTY ACIDS FROM SOAP STOCK

C. Frank Phillips, and Dwight E. Leavens, both of Panama City, Fla., assignors to SCM Corporation, Cleveland, Ohio

Filed May 10, 1977, Ser. No. 795,513

Int. Cl.² C11C *1/04*

U.S. Cl. 260—416 **12 Claims**



1. A process for obtaining free fatty acids from soap stock, comprising:
- (a) acidulating said soap stock with sufficient mineral acid to liberate the fatty acids from at least a major proportion of the soap present in said soap stock, thereby forming a first acid oil phase and a first aqueous saline phase;
- (b) separating said first acid oil phase from said first aqueous saline phase;
- (c) vacuum distilling the separated first acid oil phase to produce a first crude fatty acid distillate;
- (d) saponifying the still residue from (c) with a stoichiometric excess of aqueous alkali;
- (e) acidulating the saponified product from (d) with sufficient mineral acid to liberate the fatty acids from at least a major proportion of the soap present therein, thereby forming a second acid oil phase comprising predominantly free fatty acids and a second aqueous saline phase; and
- (f) separating said second acid oil phase from said second aqueous saline phase.

4,100,182

METHOD OF MAKING ADJUVANT FOR ELASTOMERIC COMPOSITION

Frank Stephen Martin, Cranston; Terence Melvin, North Kingstown, and Joseph Kirby Pieroni, Providence, all of R.I., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 441,716, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 284,303, Aug. 28, 1972. This application May 11, 1976, Ser. No. 685,249

Int. Cl.² C07F *3/06*

U.S. Cl. 260—429.9 **8 Claims**

1. A method of making an adjuvant for an elastomer comprising slurrying zinc oxide in a volatile liquid medium selected from the group consisting of water and an alkanol, the concentration of zinc oxide in the slurry being from 31 to 65 percent by weight, thereafter rapidly adding to the slurry, while agitating the slurry, methacrylic acid in an amount such as to provide a zinc oxide-methacrylate acid molar ratio of from 0.8:1 to 2:1 whereby an exothermic reaction between the zinc oxide and the methacrylic acid takes place, the said liquid medium serving to dissipate the heat liberated by the exothermic reaction, subsequently removing the volatile liquid medium from the resulting reaction product to provide a dried product, and grinding the resulting dried product at least to a fineness sufficient to pass a 200 mesh sieve, the resulting product being of white color and having zinc oxide and methacrylic acid combined in the proportions required by basic zinc methacrylate.

4,100,183

PROCESS FOR PREPARING CUPROUS ALUMINUM TETRAHALIDE COMPLEXING AGENTS

Christopher P. Christenson, Lake Jackson, Tex.; John W. Faller, Hamden, Conn., and Gary M. McNamee, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1977, Ser. No. 793,205

Int. Cl.² C07F *1/08*

U.S. Cl. 260—438.1 **7 Claims**

1. In a process for preparing cuprous aluminum tetrahalide complexing agents by reacting a cuprous halide containing contaminating quantities of cupric halide with an aluminum trihalide, the improvement which comprises treating the contaminated cuprous halide, prior to reacting with the aluminum trihalide, with an organo metal compound selected from the group consisting of metal alkyls, metal alkyl halides or metal alkoxides, wherein said metal is selected from Groups IA, IIA, IIB, and IIIA of the Periodic Table, in a quantity sufficient to reduce the cupric ion to the cuprous ion at a temperature of from about 0° C to about 70° C for a period of time sufficient to reduce the cupric ion to the cuprous ion.

4,100,184

PROCESS FOR PRODUCING 3-CYANOMETHYL CYCLOPENTANONE DERIVATIVES

Kiyoshi Kondo, Yamato; Daiei Tunemoto, Sagamihara; Kikuo Sugimoto, Fujino, and Yuriko Takahatake, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

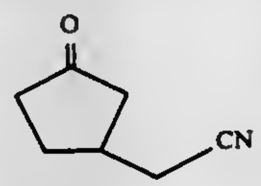
Continuation-in-part of Ser. No. 661,263, Feb. 25, 1976. This application Feb. 15, 1977, Ser. No. 768,908

Claims priority, application Japan, Feb. 27, 1976, 51-20076

Int. Cl.² C07C *120/00, 121/46*

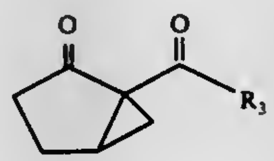
U.S. Cl. 260—464 **6 Claims**

1. A method for producing a fragrant 3-cyanomethylcyclopentanone jasmonoide intermediate having the formula:



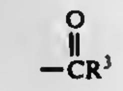
which comprises:

reacting a bicyclo[3,1,0] hexane derivative having the formula:



wherein R^3 represents alkoxy or alkyl, with a cyanating agent selected from the group consisting of hydrogen cyanide, acetone cyanohydrin and metal cyanides under basic conditions in an inert solvent; and

eliminating said



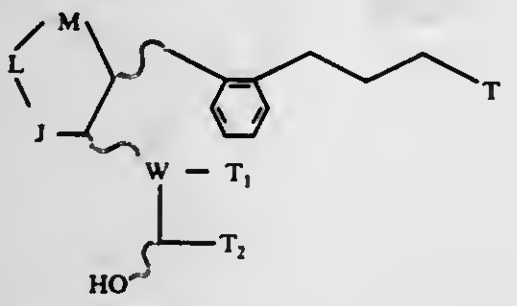
$$-\overset{\overset{\displaystyle O}{\|}}{C}R^3$$

group when said R^3 is alkoxy, by first hydrolyzing said cyanated hexane derivative and then decarboxylating said hydrolyzed hexane derivative or by heating said cyanated hexane derivative in the presence of an alkali metal salt when said R^3 group is alkyl.

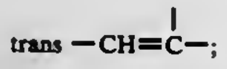
4,100,185
CYCLOHEXANONE 5,6-BENZO ANALOGUES OF PROSTAGLANDIN E

Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,132
Int. Cl.² C07C *177/00*
U.S. Cl. 260—465 F **3 Claims**

1. A compound of the formula,



in which:
T is cyano;
M is carbonyl;
L is methylene;
J is ethylene;
W is



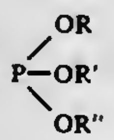
$$\text{trans } -CH=\overset{|}{C}-;$$

T_1 and T_2 are attached to adjacent carbon atoms;
T_1 is hydrogen only if T_2 is loweralkyl; and
T_2 is selected from the group consisting of loweralkyl having 1–5 carbon atoms or a polymethylene radical having 4–6 carbon atoms;
provided, however, that T_2 is the polymethylene radical only when it is joined with W to form a cycloalkylidene radical having 6–8 carbon atoms.

4,100,186
ORGANIC NITRILES

Donald Wright, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Apr. 22, 1977, Ser. No. 790,001
Claims priority, application United Kingdom, May 24, 1976, 21401/76
Int. Cl.² C07C *120/00, 121/20*
U.S. Cl. 260—465.8 D **5 Claims**

1. A process for the conversion of acrylonitrile to a dimer product, at least 85% by weight of which consists of 1,4-dicyanobutenes, which process consists essentially of reacting acrylonitrile at a temperature of 20° to 100° C and a pressure of 0.2 to 20 bars (absolute) with, as sole catalyst, an organic phosphite of the general formula



in which each of R, R' and R" represents an alkyl radical having from 1 to 6 carbon atoms, in a liquid medium which is a solvent for the said catalyst, consists essentially of an alcohol having up to 6 carbon atoms as proton donor or of a mixture of said alcohol with a hydrocarbon solvent, and contains less than 1 mole of water per mole of catalyst, the acrylonitrile forming at least 5% but less than 50% by weight, and the said organic phosphite forming from 0.01% to 5% by weight of the total liquid reaction mixture.

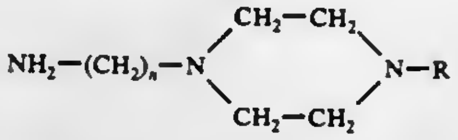
4,100,187
OLEFIN-THIONOPHOSPHINE SULFIDE REACTION PRODUCTS, THEIR DERIVATIVES AND USE THEREOF AS OIL AND FUEL ADDITIVES

Stanley J. Brois, Westfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.
Division of Ser. No. 452,955, Mar. 20, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,073
Int. Cl.² C07F *9/04, 9/38*
U.S. Cl. 260—502.5 **8 Claims**

1. The oil soluble reaction product of:
(A) a polyamine which is an alkylene amino compound containing 2 to 12 nitrogen atoms, wherein pairs of nitrogen atoms are joined by alkylene groups of 2 to 4 carbon atoms, said polyamine being selected from the group consisting of polyamines defined by the fomulae:

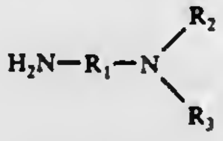
(a) $NH_2(CH_2)_n-[NH(CH_2)_n]_m-NH_2$

wherein: *n* is 2 to 4 and *m* is 0 to 10;



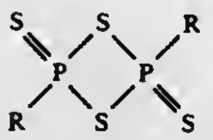
(b)

wherein: *n* is 2 to 3 and R is selected from the group consisting of hydrogen and aminoalkyl radicals of 2 to 3 carbon atoms; and



(c)

wherein R_1 is a C_2 to C_4 alkylene radical, and R_2 and R_3 are C_1 to C_5 alkyl radicals; and
(B) an oil soluble olefin-thionophosphine sulfide adduct of (1) an olefin polymer having at least one double bond, and (2) a dimeric thionophosphine sulfide having the structure:



wherein, R is an organic radical selected from the group consisting of C_1 to C_{18} alkyl, C_6 to C_{18} cycloalkyl, and C_6 to C_{18} aryl radicals; said adduct being formed by heating said olefin polymer and said sulfide together, under anhydrous conditions, at a temperature in the range of about 100 to 250° C., with the evolution of H_2S, said olefin polymer having a molecular weight in the range of about 400 to 100,000 and being selected from the group consisting of:
(a) unsaturated hydrocarbon polymers of C_2 to C_5 mono-olefins; and
(b) copolymers of about 30 to 85 mole % ethylene, about 15 to 70 mole % C_3 to C_5 mono-alpha olefin, and about 2 to 15 mole % of C_4 to C_{14} non-conjugated diene;
wherein said adduct is the reaction product of equimolar proportions of said sulfide with said olefin polymer of group (a) above; and said adduct is the reaction product formed by reacting in the range of about 0.05 to 1.0 molar proportion of said sulfide per molar proportion of said diene, when reacted with the olefin polymer of group (b) above;
and wherein about a molar proportion of said adduct is reacted with said polyamine at about 0° to about 100° C., in a relative proportion of about 0.1 to 0.5 mole of polyamine per atom of phosphorus in said adduct.

4,100,188
CHEMICAL PROCESS

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Apr. 27, 1972, Ser. No. 248,053
Int. Cl.² C07C *59/12*
U.S. Cl. 260—535 P **16 Claims**

1. A process for recovering an alkali metal, ammonium or amine salt of carboxyalkoxy succinic acid from an aqueous solution thereof which comprises combining said solution with lower alkanol having from 1 to about 3 carbon atoms per molecule to form a system consisting essentially of (1) water, (2) alkanol, and (3) said salt, said system containing from about one-half to about 10 parts by weight of alcohol per part of aqueous salt solution, the weight ratio of salt to water being from about 1:10 to about 1:1, said system containing greater than a saturation amount of salt, and recovering a precipitate of salt from said system.

4,100,189
RECOVERY OF ACETIC ACID FROM DILUTE AQUEOUS SOLUTIONS THEREOF

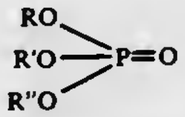
Jules Mercier, Melle-Deux-Sevres, France, assignor to Rhone-Poulenc Industries, Paris, France
Filed Jan. 21, 1976, Ser. No. 651,195
Claims priority, application France, Apr. 25, 1975, 75 12799
Int. Cl.² C07C *51/46, 51/48*
U.S. Cl. 260—541 **18 Claims**

1. A process for the recovery of acetic acid from dilute aqueous solutions thereof containing from about 0.5 to about 3.0% acetic acid, comprising extracting such a dilute aqueous solution with an organic solvent, neutralizing the acidic extract with aqueous ammonia, whereby there are separated an organic phase and an ammonium acetate containing aqueous phase, withdrawing said aqueous phase, thermally decomposing the ammonium acetate present in said aqueous phase at atmospheric pressure and at a temperature within the range of from about 90° C. to about 130° C. in the presence of an agent capable of forming with water a minimum boiling point heteroazeotrope, and thence recovering the acetic acid of decomposition.

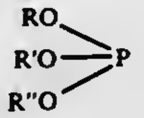
4,100,190
PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Vincent C. Martines, White Plains, N.Y., and Ramsey G. Campbell, Berkeley, Calif., assignors to Stauffer Chemical Company, Westport, Conn.
Filed Dec. 22, 1976, Ser. No. 753,122
Int. Cl.² C07C *149/16, 148/00*
U.S. Cl. 260—543 H **7 Claims**

1. In a method for producing perchloromethyl mercaptan via the catalytic reaction of chlorine and carbon disulfide, the improvement which comprises contacting the reactants with additive selected from the group consisting of phosphates, phosphites, or blends thereof, said phosphates having the following structure:



wherein R, R' and R" independently are hydrogen, hydrocarbyl, or substituted hydrocarbyl, however, R, R' and R" cannot all be hydrogen simultaneously, and said phosphites having the following structure:

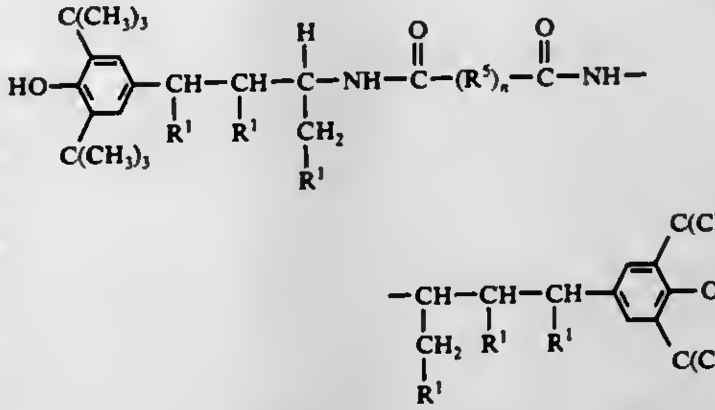


wherein R, R' and R" independently are hydrogen, hydrocarbyl, or substituted hydrocarbyl, however, R, R' and R" cannot all be hydrogen simultaneously, said additive being contacted with said reactants in amounts effective to suppress the formation of carbon tetrachloride and sulfur monochloride.

4,100,191
4-(M,M'-DI-T-BUTYL-P-HYDROXYPHENYL)-BUTYL-2-DIAMIDES

Roman Fischer, Mutterstadt; Werner Fliege, Otterstadt; Wolfgang Koernig, Mannheim, and Peter Horn, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany
Division of Ser. No. 443,822, Feb. 19, 1974, Pat. No. 4,026,952. This application Nov. 18, 1976, Ser. No. 743,085
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1973, 2309375; Feb. 24, 1973, 2309376; Feb. 24, 1973, 2309377
Int. Cl.² C07C *103/147, 103/19, 103/24*
U.S. Cl. 260—557 R **9 Claims**

1. 4-(*m,m'*-di-t-butyl-p-hydroxyphenyl)-butyl-2-bisamides of the formula



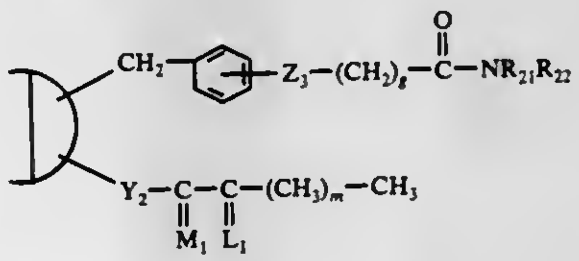
VII

in which each R^1 respectively is hydrogen or an aliphatic radical, R^5 is an aliphatic, cycloaliphatic, araliphatic, or aromatic radical and *n* is 0 or 1.

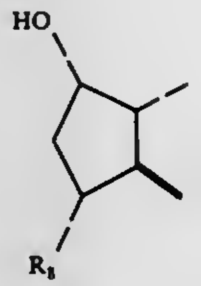
4,100,192
INTER-PHENYLENE-PG AMIDES

Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Apr. 18, 1977, Ser. No. 788,455
Int. Cl.² C07C *103/20*
U.S. Cl. 260—558 R **46 Claims**

1. A prostaglandin analog of the formula



wherein D is



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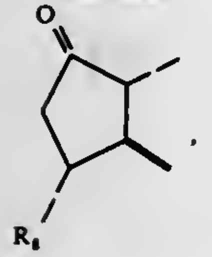
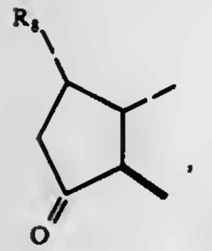
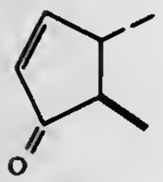
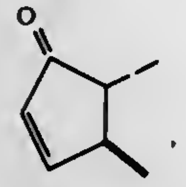


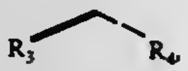


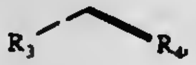


, or

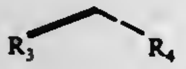


wherein R_8 is hydrogen or hydroxy;
wherein Y_2 is
(1) trans—CH═CH—, or
(2) cis—CH═CH—,
wherein *g* is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein L_1 is

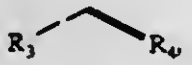




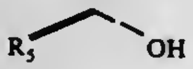
or a mixture of



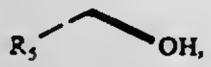
and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



or



wherein R_5 is hydrogen or methyl;
wherein *m* is one to 5, inclusive; and
wherein R_{21} and R_{22} are

(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or nitro;
(vii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(viii) dihydroxyalkyl of one to 4 carbon atoms; or
(ix) trihydroxyalkyl of one to 4 carbon atoms;
with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl.

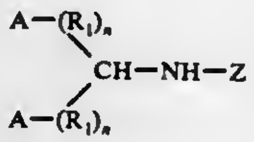
4,100,193

NOVEL DIBICYCLO [2.2.2] OCTYL AND DIBICYCLO [2.2.2] OCTENYL POLYAMINES AND METHODS FOR THEIR PREPARATION

Nathaniel Grier, Englewood; Richard A. Dybas, Somerville, and Robert A. Strelitz, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

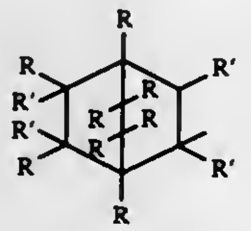
Filed Jun. 10, 1976, Ser. No. 694,639
Int. Cl.² C07C *83/00*
U.S. Cl. 260—563 P **25 Claims**

1. A compound of the formula:

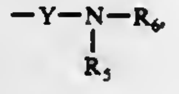


$$\left.\begin{matrix}A-(R_1)_n\\ \\A-(R_1)_n\end{matrix}\right\rangle CH-NH-Z$$

where:
each A is alike or different and is a [2.2.2] bicyclic group of **the formula:**

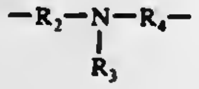


where R is alike or different and is hydrogen or C_1 to C_4 alkyl, R' is alike or different and is hydrogen or C_1 to C_4 alkyl or R' on adjacent carbon atoms taken together comprise an olefinic bond;
each R_1 is alike or different and is C_1 to C_4 alkylene;
each *n* is alike or different and is the integer 0 to 1;
Z is



$$-Y-\underset{\displaystyle R_5}{\underset{|}{N}}-R_6,$$

where
R_5 is hydrogen, aminoethyl or aminopropyl; C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl; and
R_6 is hydrogen, C_1 to C_4 hydroxyalkyl; C_2 to C_4 dihydroxyalkyl;
Y is either



$$-R_2-\underset{\displaystyle R_3}{\underset{|}{N}}-R_4-$$

or -R_2-
where
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
R_3 is hydrogen, C_1 to C_4 alkyl, C_1 to C_4 aminoalkyl or C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl or aminohydroxypropyl, and acid addition salts thereof.

4,100,194

PRODUCTION OF UNSATURATED AMINES EMPLOYING A PALLADIUM COMPOUND CO-CATALYZED WITH A PHOSPHONITE LIGAND

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 697,900, Jun. 21, 1976. This application Dec. 6, 1976, Ser. No. 747,835
Int. Cl.² C07C *85/18, 87/45, 87/54, 87/62*
U.S. Cl. 260—576 **10 Claims**

1. The process of producing N-(alkadienyl)amines by reaction of a conjugated diene and an aromatic amine selected from the group consisting of aniline, methylaniline, phenylenediamines, and N-phenylphenylenediamines in a hydroxylic solvent medium in the presence of a catalyst comprising a palladium compound co-catalyzed with a phosphonite ligand.

4,100,195

PROCESS FOR PREPARING DIPHENYLAMINE IN THE PRESENCE OF A BORON/FLUORINE COMPOUND AND WATER

Hans-Michael Fischler; Dieter Bauer, and Hein Quast, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 679,112, Apr. 22, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,979
Claims priority, application Fed. Rep. of Germany, May 13, 1975, 2521293
Int. Cl.² C07C *85/20*
U.S. Cl. 260—576 **10 Claims**

1. Process for producing diphenylamine which comprises heating aniline under pressure to temperatures of 250° to 400° C in the presence of a boron/fluorine compound devoid of metal cations and water in an amount of 0.1 to 5.0% by weight, based on the weight of aniline used.

4,100,196

PRODUCTION OF N-(ALKADIENYL)AMINES

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 697,900, Jun. 21, 1976. This application Dec. 23, 1976, Ser. No. 753,970
Int. Cl.² C07C *85/18*
U.S. Cl. 260—585 D **13 Claims**

1. The process of producing N-(alkadienyl)amines by reaction of conjugated dienes and ammonia or amines having from one to about 20 carbon atoms in a hydroxylic solvent medium in the presence of a catalyst comprising a palladium compound co-catalyzed with a polymeric phosphonite ligand, said phosphonite ligand comprising a phosphonite polymerized with polyvinyl alcohol.

4,100,197

MANUFACTURE OF ECHINENONE

Hagen Jaedicke, Ludwigshafen; Joachim Paust, Neuhofen, and Joachim Schneider, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Jul. 14, 1976, Ser. No. 705,281
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1975, 2534807
Int. Cl.² C07C *45/02*
U.S. Cl. 260—586 P **6 Claims**

1. A process for the manufacture of echinone by oxidizing β-carotene or retro-dehydro-carotene, wherein the oxidation is carried out with iodic acid or a salt of iodic acid in a proportion of 1 to 20 moles per mole of β-carotene or retro-dehydrocarotene in the presence of the halogens bromine or iodine as a catalyst, and in the presence of an inert diluent or solvent, at from 0° to 50° C.

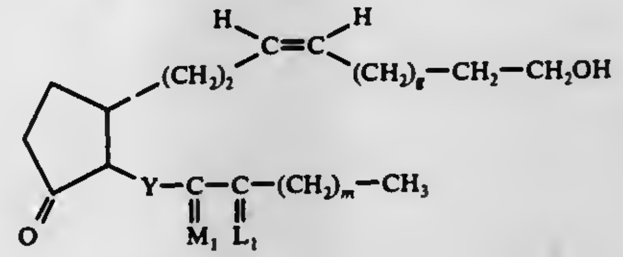
4,100,198

2-DECARBOXY-2-HYDROXYMETHYL-CIS-4,5-DIDEHYDRO-9-DEOXY-PGD$_1$ COMPOUNDS

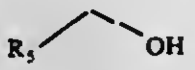
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,363, Jan. 8, 1976, Pat. No. 4,028,419. This application Mar. 17, 1977, Ser. No. 778,763
Int. Cl.² C07C *49/46, 49/80, 49/82*
U.S. Cl. 260—586 R **22 Claims**

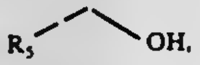
1. A prostaglandin analog of the formula



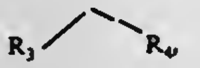
wherein Y is trans—CH=CH—;
wherein M_1 is

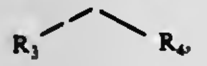


or

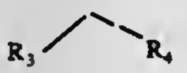


wherein R_5 is hydrogen or methyl;
wherein L_1 is

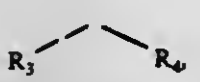




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *m* is one to 5, inclusive.

4,100,199
CARBORANE PURIFICATION

Gary Burr Dunks, Peekskill, and Kathy Palmer Ordonez, Scarsdale, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,212
Int. Cl.^{2} C07F *5/02*
U.S. Cl. 260—606.5 B **17 Claims**

1. A process for the separation and purification of a carborane from a reaction mixture comprised of said carborane and undesirable tarry by-products formed during the reaction of decaborane with an acetylenic compound in the presence of a donor ligand, said process comprising the steps of:

(a) removing from said mixture any solvent in which said carborane was synthesized except when such solvent:
  (i) also serves as said donor ligand,
  (ii) is employed in amount in excess of the stoichiometric amount required for said reaction, and,
  (iii) is selected from the group consisting of acetonitrile and propionitrile,
(b) dissolving said mixture from which any solvent has been removed in accordance with step (a) in a first solvent in which all the components of said mixture are soluble and non-reactive therewith,
(c) extracting said carborane from said mixture with a second solvent, immiscible with the solvent of either steps (a) or (b) and in which said carborane is soluble and said by-products are insoluble, and
(d) thereafter recovering said carboranes from said second solvent.

4,100,200
USE OF NOVEL ETHERS AS OXYDIMETHYLATING AGENTS

Cataldo Aldino Maggiulli; Donald MacArthur Burness, and William Clarence Perkins, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 597,950, Jul. 21, 1975, Pat. No. 4,025,542. This application Feb. 11, 1977, Ser. No. 767,713
Int. Cl.^{2} C07C *149/18;* C07D *295/08*
U.S. Cl. 260—609 R **4 Claims**

1. In the method of oxydimethylating an organic compound with an oxydimethylating agent the improvement comprising reacting said organic compound with an oxydimethylating agent having the formula

$$R-SO_2O-CH_2-O-CH_2-OSO_2-R$$

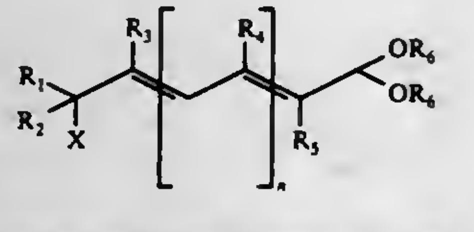
wherein R is alkyl having from 1 to 6 carbon atoms.

4,100,201
PROCESS FOR THE PREPARATION OF HALOGENOACETALS FROM ESTERS

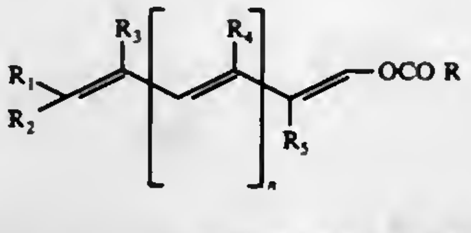
Jean-Pierre Decor, Thurins, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Feb. 23, 1977, Ser. No. 771,312
Claims priority, application France, Feb. 25, 1976, 76 05241; Jan. 13, 1977, 77 00854
Int. Cl.^{2} C07C *41/06*
U.S. Cl. 260—615 A **11 Claims**

1. Process for the preparation of a halogeno-acetal of an ethylenically unsaturated aldehyde of the formula:



in which X represents chlorine, bromine or iodine; R_1, R_2, R_3, R_4 and R_5, which may be identical or different, represent hydrogen straight or branched alkyl of from 1 to 6 carbon atoms, or straight or branched alkenyl of from 3 to 6 carbon atoms in which the double bond is in a position other than the 1–2 position; *n* is 0, 1, 2, 3 or 4, it being understood that if *n* is greater than 1, the various symbols R_4 may be identical or different and the two symbols R_6 each represent straight or branched alkyl of from 1 to 6 carbon atoms, or they together form a straight or branched alkylene radical R'_6 of from 2 to 6 carbon atoms, optionally substituted by hydroxyl or alkoxy of from 1 to 4 carbon atoms, which comprises reacting a halogen cation chosen from Cl^+, Br^+ and I^+, with an ester of the formula:



in which R_1, R_2, R_3, R_4, R_5 and *n* are as defined above and R represents straight or branched alkyl of from 1 to 6 carbon atoms, in the ratio of 1 halogen cation per mole of the said ester at −40° to +80° C and in the presence of an excess of a primary or secondary alcohol of the formula R_6OH, in which R_6 is as defined above, or of a glycol of the formula $HO—R'_6—OH$, in which R'_6 is as defined above.

4,100,202
OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY CUPRIC COMPLEXES

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,015
The portion of the term of this patent subseqoent to Jul. 4, 1995, has been disclaimed.
Int. Cl.^{2} C07C *27/00, 37/00, 41/00, 45/00*
U.S. Cl. 568—730 **18 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 8.5–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric complex of a compound selected from the class consisting of quanidines, amides, salens, dihydrazides, triazenes, dihydroxy substituted aromatics, macrocylic polyamines and alpha, delta-polyketones.

4,100,203
OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF AN OXIME OF A KETO OR ALDEHYDE COMPOUND

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,200
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.^{2} C07C *27/00, 37/00, 41/00, 45/00*
U.S. Cl. 568—730 **18 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 8.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, or cobaltous metal complex of an oxime of a keto or aldeyhyde compound.

4,100,204
OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF A HYDROXY- OR KETO-ACID COMPOUND

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,061
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.^{2} C07C *27/00, 37/00, 41/00, 45/00*
U.S. Cl. 568—730 **18 Claims**

I. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, or cobaltous metal complex of a hydroxy- or keto- acid.

4,100,205
OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF AMINOKETO COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,208
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.^{2} C07C *37/00, 27/00, 41/00, 45/00*
U.S. Cl. 568—730 **18 Claims**

I. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.5–10 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, nickelous, ferric, or chromic metal complex of an aminoketone.

4,100,206
OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF KETO ALCOHOL COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,210
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.^{2} C07C *27/00, 37/00, 41/00, 45/00*
U.S. Cl. 568—730 **17 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.5 during the oxidative coupling reaction and a catalyst system comprising a cupric or manganous metal complex of a keto alcohol.

4,100,207
PREPARATION OF METHYL-SUBSTITUTED PHENOLS

Thomas E. Goodwin, College Station, Tex., and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 24, 1977, Ser. No. 771,509
Int. Cl.^{2} C07C *39/06*
U.S. Cl. 568—804 **6 Claims**

1. A method of preparing di- and tri-methyl-substituted phenols wherein the method comprises heating, at a temperature in the range of about 200° to about 575° C., a di-C_4-C_6-tertiary alkyl cresol and methanol in the presence of a catalytic amount of magnesium oxide, said magnesium oxide being present in an amount in the range of about 0.1 to about 35 expressed as volume of total liquid per hour per volume of catalyst.

4,100,208
PROCESS FOR THE PRODUCTION OF UNSATURATED COMPOUNDS

Federico Maspero, Milan, and Emilio Perrotti, S. Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 147,653, May 27, 1971, abandoned. This application Apr. 11, 1974, Ser. No. 460,222
Claims priority, application Italy, May 29, 1970, 25267 A/70
Int. Cl.^{2} C07C *29/00*
U.S. Cl. 568—902 **6 Claims**

1. Process for the selective production of an ethylenic compound by conversion of the corresponding acetylenic compounds which comprises reacting an acetylenic compound selected from the group consisting of 3-methyl-1-butyn-3-ol, 2-butyn-1,4-diol, 1-butyn-3-ol and 3-phenyl-1-butyn-3-ol with isopropyl alcohol in a homogeneous liquid phase in the presence of a metal complex selected from the group consisting of $IrH_3CO(P\phi_3)_2$ and $IrH_3\,(P\phi_3)_2$.

4,100,209
SEPARATION OF ALKYL ALCOHOLS FROM ALKYLDIMETHYLAMINES

William J. Libbey, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 12, 1976, Ser. No. 741,190
Int. Cl.^{2} C07C *29/24, 85/26*
U.S. Cl. 568—918 D **9 Claims**

1. A process for removing C_6–C_{18} alkanols from a mixture of C_6–C_{18} alkanols and C_6–C_{18} alkyldimethylamines wherein the process comprises (a) contacting said mixture of alkanols and alkyldimethylamines with an effective amount, in the range of about 2:1 parts to about 50:1 parts per volume of said mixture, of an immiscible solvent mixture comprising a polar solvent selected from the group consisting of dimethylformamide, 2-amino-2-methyl-1-propanol, and mixtures thereof, and a nonpolar solvent, said polar solvent and said nonpolar solvent being present in the range of about 4:1 to about 1:4, on a volume basis, and still being immiscible, (b) forming a polar phase containing a substantial amount of said C_6–C_{18} alkanols and a nonpolar phase containing a substantial amount of said C_6–C_{18} alkyldimethylamines, (c) separating said polar phase and said nonpolar phase, and (d) removing the polar solvent and nonpolar solvent from the respective polar and nonpolar phases.

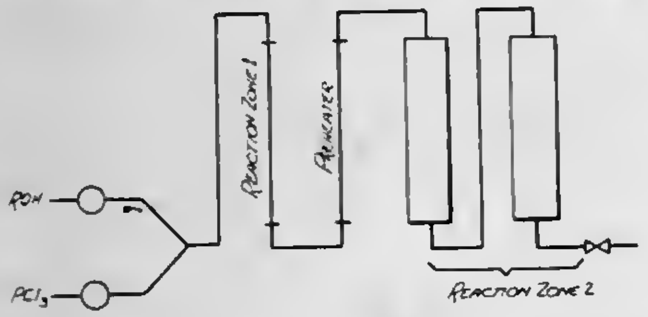
4,100,210
ALKYLCHLORIDE

Jan Bertil Eriksson, Visp, Switzerland, and Zaven Armen Dadekian, Upper Saddle River, N.J., assignors to Lonza A. G., Basel, Switzerland

Filed Aug. 10, 1976, Ser. No. 713,263
Claims priority, application Switzerland, Aug. 12, 1975, 10461/75
Int. Cl.^{2} C07C *19/02*
U.S. Cl. 260—652 R **9 Claims**

1. In a process for the preparation of alkyl chlorides by the reaction of an alkyl alcohol having from 4 to 22 carbon atoms with phosphorus trichloride, the improvement of performing said process in a flow line which is maintained at a pressure of from 25 to 50 atmospheres and divided into a first reaction zone, a preheater, and a second reaction zone, wherein the alcohol and the phosphorus trichloride are fed to the first reaction zone at a temperature of from 85° to 110° C. in a molar ratio of 2.85:1 to 3:1; wherein the reaction mixture from the

first reaction zone is passed to the preheater and heated to a temperature of 140° to 150° C.; and wherein the reaction mix-



ture from said preheater is passed to the second reaction zone maintained at a temperature of 150° to 200° C. to substantially complete the reaction.

4,100,211
PROCESS FOR PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

Angelo Joseph Magistro, Brecksville, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed May 17, 1976, Ser. No. 686,908

Int. Cl.^{2} C07C *21/02*

U.S. Cl. 260—656 R **7 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising (1) contacting ethane, oxygen, and a chlorine source in the presence of a solid solution catalyst of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3 at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and chlorine source are employed at a molar ratio of 1 mole of ethane to 0.1 to 10 moles of the chlorine source to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, (2) adding an iron source to the ongoing process to regenerate the solid solution catalyst in situ, and (3) removing the products produced from the reaction area.

4,100,212
PROCESS FOR CHLORINATING LINEAR PARAFFINS

Lucio Di Fiore; Benedetto Calcagno, both of Milan, and Marcello Ghirga, Bresso, Milan, all of Italy, assignors to Societa'Italiana Resine S.p.A., Milan, Italy

Continuation of Ser. No. 97,900, Dec. 14, 1970, abandoned. This application Oct. 28, 1975, Ser. No. 626,000

Claims priority, application Italy, Dec. 23, 1969, 26200 A/69

Int. Cl.^{2} C07C *17/10*

U.S. Cl. 260—660 **5 Claims**

1. A process for the non-catalytic continuous liquid-phase chlorination using gaseous chlorine of linear paraffins having 9 to 15 carbon atoms per molecule comprising:

contacting said gaseous chlorine and said linear paraffins in a reactor of an elongated tubular shape comprising a plurality of independent interconnecting reaction stages by means of baffles consisting of perforated sheets or plates in said reactor, each of said stages having a height to diameter ratio of 1:1 to 5:1, by supplying said paraffins to the base of said reactor and supplying gaseous chlorine through distributors at the bottom of each reaction stage at a linear inlet velocity of between 50 to 150 meters/sec. at a molar ratio of chlorine to paraffins of 0.1:1 to 5:1 and at a paraffins supply rate of 0.1 to 1.3 volumes of paraffins per reactor volume per hour, said chlorination reaction being carried out at temperatures from 90 to 170° C, the size of the holes in said baffles and said chlorination reaction conditions being carried out such that the gas velocity passing from one reaction stage to another, through the baffles, is between 2 and 60 cm/sec., said chlorination reaction being controlled at said temperatures using heat exchangers situated internally at each reaction stage; and recovering the reaction products at the head of the reactor.

4,100,213
ISOMERIZATION WITH CATALYST OF GRAPHITE CONTAINING INTERCALATED ACID AND FLUORIDE

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 609,334, Sep. 2, 1975, Pat. No. 4,035,434, which is a division of Ser. No. 532,146, Dec. 12, 1974, Pat. No. 3,962,133. This application Feb. 2, 1977, Ser. No. 765,133

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.^{2} C07C *5/28*

U.S. Cl. 260—666 P **7 Claims**

1. A process for isomerization of an isomerizable hydrocarbon charge selected from the group consisting of naphthenes, paraffins and mixtures thereof which comprises contacting the same at a temperature between about 0° and about 200° C, a pressure between about atmospheric and about 30 atmospheres at a liquid hourly space velocity between about 0.2 and about 10 with a catalyst consisting essentially of graphite having intercalated in the lattice thereof between about 5 and about 50 weight percent of a Lewis acid fluoride selected from the group consisting of boron trifluoride and phosphorus pentafluoride and having additionally intercalated therein between about 0.5 and about 75 weight percent of a Bronsted acid selected from the group consisting of hydrofluoric acid, hydrochloric acid, fluorosulfuric acid, trifluoromethane-sulfonic acid and mixtures thereof, the molar ratio of Bronsted acid to Lewis acid fluoride being within the range of 0.1:1 to 50:1.

4,100,214
ISOMERIZATION OF MONOCYCLIC ALKYL AROMATIC HYDROCARBONS

Francis G. Dwyer, West Chester, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1976, Ser. No. 684,512

Int. Cl.^{2} C07C *5/24*

U.S. Cl. 260—668 A **10 Claims**

1. A process for effecting catalytic isomerization of xylenes which comprises contacting said xylenes in the vapor phase with hydrogen at a temperature of from about 450° to about 900° F, a pressure of from about 50 psig to about 500 psig, a hydrogen/hydrocarbon mole ratio of from about 0.1 to about 100 and a weight hourly space velocity of from about 0.1 to about 200 in the presence of from about 3 to about 30 combined weight percent, based upon weight of the xylene feed, of diluent of toluene and $C_9{}^+$ recycle material and a crystalline aluminosilicate zeolite characterized by a silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12 and containing cations which are selected from the group consisting of iron, nickel and cobalt.

4,100,215
SELECTIVE PRODUCTION OF PARA-XYLENE

Nai Y. Chen, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 509,188, Sep. 25, 1974, Pat. No. 4,002,697, which is a continuation-in-part of Ser. No. 421,459, Dec. 3, 1973, abandoned. This application Sep. 27, 1976, Ser. No. 727,084

Int. Cl.^{2} C07C *3/52*

U.S. Cl. 260—671 M **10 Claims**

1. In a process for manufacture of xylene by reacting toluene with a methylating agent in the presence of a crystalline aluminosilicate zeolite catalyst, the improvement resulting in a proportion of para-xylene greater than the thermodynamic equilibrium proportion of total xylenes which comprises conducting the reaction at a temperature between about 400° and about 500° C in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, which has not undergone prior surface

deactivation by treatment with a compound of nitrogen or silicon, characterized by (1) a silica to alumina ratio of at least about 12, (2) a constraint index within the approximate range of 1 to 12 and (3) a crystal size greater than 1 micron.

4,100,216
PREPARATION OF BETA-METHYLTETRAMETHYLENE NORTRICYCLANE

Harry K. Myers, Jr., Aston; James E. Lyons, Wallingford, and Abraham Schneider, Overbrook Hills, all of Pa., assignors to Sun Oil Company of Pennsylvania, Philadephia, Pa.

Filed Jul. 27, 1977, Ser. No. 819,445

Int. Cl.^{2} C07C *13/32*

U.S. Cl. 260—666 PY **10 Claims**

1. Process for the catalytic codimerization of norbornadiene and isoprene comprising:

- (a) contacting norbornadiene and isoprene in the presence of a catalytic amount of a three-component homogeneous catalytic system consisting of cobaltic or cobaltous acetylacetonate, 1,2-bisdiphenylphosphino ethane and one of the following alkyl aluminum chlorides: diethylaluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;
- (b) having the contacting occurring at a temperature within the range from between about 20° C to about 100° C; and
- (c) continuing the contacting until the desired amount of codimer of norbornadiene and isoprene is prepared.

4,100,217
SELECTIVE PRODUCTION OF PARA-SUBSTITUTED BENZENES

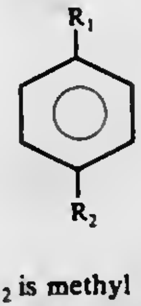
Lewis Brewster Young, Kendall Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 704,194, Jul. 12, 1976, Pat. No. 4,049,738. This application May 3, 1977, Ser. No. 793,469

Int. Cl.^{2} C07C *3/52*

U.S. Cl. 260—671 R **14 Claims**

1. A process for the selective production of para-substituted benzenes characterized by the formula:



where R_1 is ethyl and R_2 is methyl or ethyl which comprises reacting a mono alkyl benzene wherein the alkyl substituent contains 1 or 2 carbon atoms with an ethylating agent at a temperature between about 300° and about 750° C in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.

4,100,218
ETHANE CONVERSION PROCESS

Nai Yaen Chen, Titusville, and Werner O. Haag, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,713

Int. Cl.^{2} C07C *15/02, 11/04;* C10G *37/02*

U.S. Cl. 260—673 **14 Claims**

1. An ethane conversion process which comprises:

- a. thermally cracking ethane at temperatures within the range from about 1500° to 1600° F, pressures within the range from about 20 to 50 psig, and steam:ethane molar ratios within the range from about 0.1–0.7:1 to produce an olefin-rich effluent in a thermal cracker wherein the ethane conversion is greater than about 60 weight percent;
- h. cooling the olefin-rich effluent to a temperature within the range from about 600° to 1200° F;
- c. contacting the cooled, olefin-rich effluent, without prior separation or purification, at a pressure within the range from about 0 to 200 psig and a WHSV of from about 1 to 10 with a crystalline aluminosilicate zeolite characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12 and a constraint index within the range of from 1 to 12; and
- d. recovering a C_5+ product suitable for use as gasoline, an LPG product, and light fuel gases.

4,100,219
SILICA-MODIFIED ZEOLITE CATALYST AND CONVERSION THEREWITH

Paul G. Rodewald, Rocky Hill, NJ, assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 672,194, Mar. 31, 1976, Pat. No. 4,060,568. This application Dec. 23, 1976, Ser. No. 753,748

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.^{2} C07C *1/20, 1/24*

U.S. Cl. 260—682 **10 Claims**

1. A process for converting a charge consisting essentially of one or more lower monohydric alcohols having up to four carbon atoms, the ethers derived therefrom or mixtures of said alcohols and ethers to a hydrocarbon product rich in ethylene and propylene which comprises contacting said charge under conversion conditions with a catalyst composition comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and containing within the interior crystalline structure thereof added amorphous silica in an amount of at least about 0.3 weight percent, said catalyst being characterized by a n-hexane sorption capacity at a temperature of 90° C. and a n-hexane partial pressure of 83 mm. of mercury which is at least 1 percent less than the corresponding sorption capacity under identical conditions for the unmodified zeolite.

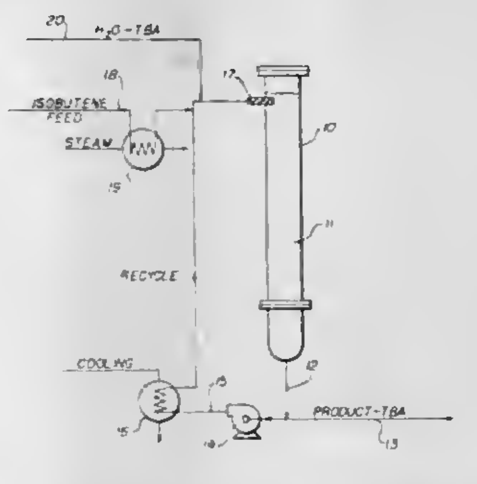
4,100,220
DIMERIZATION OF ISOBUTENE

William G. Bowman, and William P. Stadig, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Jun. 27, 1977, Ser. No. 810,644

Int. Cl.^{2} C07C *3/10*

U.S. Cl. 260—683.15 R **13 Claims**



1. A process for the preparation of isobutene dimer comprising passing isobutene and t-butanol, water or a mixture of t-butanol and water through a fixed bed of acidic cation exchange resin catalyst in liquid phase at a temperature in the range of 55° to 160° C for a sufficient time to react isobutene, the mol ratio of t-butanol to isobutene being in the range of 0.001 to 1.0:1 and the mol ratio of water to isobutene being less than 0.06: provided that the total amount of t-butanol including

the equivalent represented by the reaction of water present with isobutene is within the mol ratio of t-butanol to isobutene range of 0.001 to 1.0:1, producing only a hydrocarbon phase, recovering said hydrocarbon phase, containing isobutene dimer, splitting said hydrocarbon phase, cooling one portion thereof to a temperature in the range of 15° to 110° C and recycling the cooled portion to the reaction.

4,100,221

UNSATURATED POLYESTER RESIN COMPOSITIONS

Beppino Passalenti, Lissone (Milan); Giorgio Brunnat, Verano Brianza (Milan), and Silvio Vargiu, Casatenovo (Como), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Aug. 5, 1977, Ser. No. 822,170

Claims priority, application Italy, Aug. 5, 1976, 26049 A/76

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—835 **8 Claims**

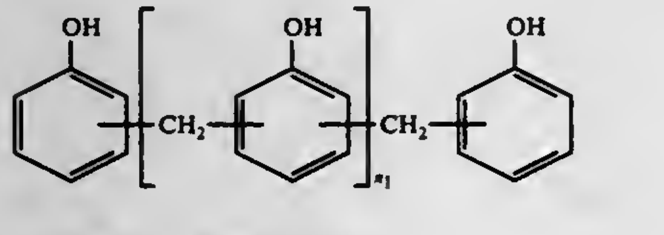
1. An unsaturated polyester resin composition hardenable by means of peroxides, which comprises:

(a) an unsaturated polyester resin,

(b) a vinyl chloride polymer in an amount of from 5 to 15 parts by weight for each 100 parts by weight of unsaturated polyester resin, and

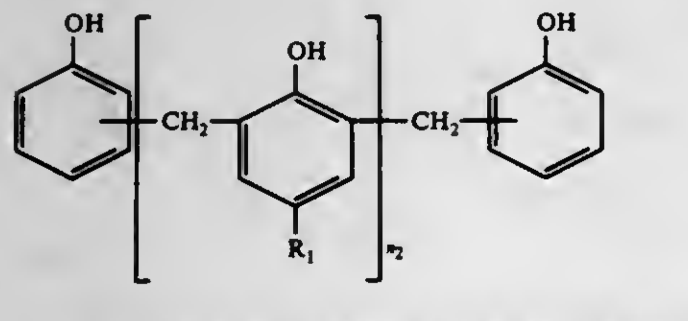
(c) from 10 to 20 parts by weight for each 100 parts by weight of unsaturated polyester resin, of an epoxy Novolak resin having an epoxy function greater than 2, or of a mixture of the latter with a liquid epoxy resin, said liquid epoxy resin being present in the mixture in an amount not exceeding 50% by weight and such that the average epoxy function of the mixture be higher than 2, and said epoxy Novolak resin being the product of the epoxidation with epichlorohydrin of a Novolak phenolic resin chosen from the following classes:

(I)



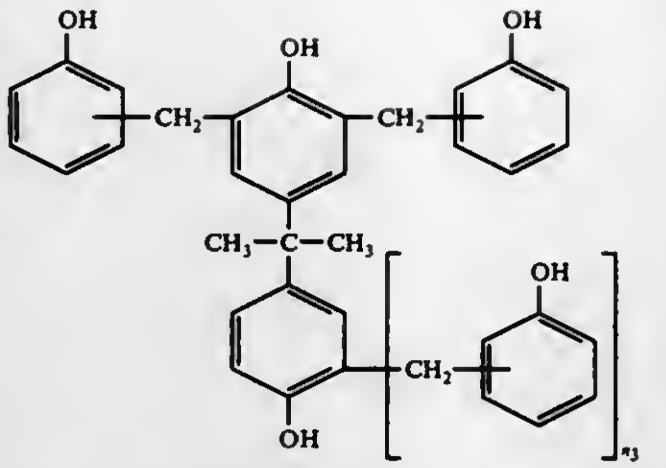
wherein n_1 is from 0.2 to 4

(II)



wherein n_2 is from 1 to 8 and R_1 is an alkyl radical with from 2 to 10 carbon atoms, and

(III)



wherein n_3 is from 0 to 1.

4,100,222

AGENT FOR IMPROVING WEATHERABILITY OF SYNTHETIC RESIN

Kyoichi Iwamoto, and Hiroshi Kakei, both of Shinnan-yoshi, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 560,778, Mar. 21, 1975, Pat. No. 3,984,491. This application Jul. 2, 1976, Ser. No. 702,100

Claims priority, application Japan, Mar. 27, 1974, 49-34833

Int. Cl.^{2} C08L *27/06*

U.S. Cl. 260—837 PV **3 Claims**

1. An improved resin composition which comprises 100 parts by weight of a synthetic resin selected from the group consisting of graft-copolymers prepared by grafting vinyl chloride on copolymer of ethylene and vinyl acetate, copolymers of ethylene and vinyl chloride, chlorinated polyvinyl chloride, and 0.1–5.0 parts by weight of a reaction product which is prepared by reacting an epoxy resin selected from the group consisting of glycidyl epoxy resins, epoxidized vegetable oils and alicyclic epoxy resins, with at least one acid selected from the group consisting of cinnamic acid, α-methylcinnamic acid and o-coumaric acid.

4,100,223

PROCESS FOR THE PRODUCTION OF HIGH-IMPACT THERMOPLASTIC MOULDING COMPOSITIONS

Rolf-Volker Meyer, and Rolf Dhein, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 15, 1977, Ser. No. 777,716

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2612011

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—857 L **14 Claims**

1. A moulding composition consisting essentially of:

(1) from 60 to 93 parts, by weight, of a polyamide;

(2) from 6 to 30 parts, by weight, of a polyethylene; and

(3) from to 20 parts, by weight, of a copolymer of an aromatic vinyl compound, an α,β-unsaturated mono- and/or di-carboxylic acid or an anhydride thereof, free acid groups optionally being neutralised by a mono- and/or poly-amine or with ammonia, and an ester of the said mono- and or di-carboxylic acid;

the total of components (1), (2) and (3) amounting to 100 parts, by weight.

4,100,224

STABLE ORGANIC DISPERSIONS WHICH CAN BE CURED WITH LITTLE SHRINKAGE, BASED ON UNSATURATED POLYESTER RESINS AND THERMOPLASTIC POLYMERS

Bernhard Hess, Moers; Karl Raichle, Krefeld; Ludwig Bottenbruch, Krefeld; Hansjochen Schulz-Walz, Krefeld, and Heinrich Alberts, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 669,285

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1975, 2513255

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—862 **5 Claims**

1. An organic dispersion which consists essentially of:

(A) 20–70% by weight of an α,β-ethylenically unsaturated polyester;

(B) 20–70% by weight of a copolymerizable vinyl or vinylidene compound;

(C) 3–30% by weight of a thermoplastic polymer which is colloidally soluble in component B, incompatible with a composition comprising components A plus B and which consists essentially of polyestyrene, polyacrylic acid ester or polymethacrylic acid ester; and

(D) 0.001–20% by weight of ethylene/vinyl acetate copolymer having a vinyl acetate content of 50–80% by weight and a Mooney viscosity of 8–60 measured according to DIN 53,523 (L-4), said percentages by weight being based on the sum of weights of components A, B and C.

4,100,225

STABLE POLYMER COMPOSITIONS CONTAINING PERFLUOROALKYL GROUPS AND PROCESS FOR MAKING

Karl Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 481,429, Jun. 20, 1974, abandoned, which is a continuation of Ser. No. 355,639, Apr. 30, 1973, abandoned, which is a continuation of Ser. No. 122,131, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 750,464, Aug. 6, 1968, abandoned. This application Mar. 3, 1976, Ser. No. 663,420

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.^{2} C08F *255/06, 279/02, 261/06, 265/06*

U.S. Cl. 260—878 R **12 Claims**

1. A process for preparing a composition comprising a backbone polymer having attached to the graft sites thereof perfluoroalkyl ester units with no more than three units attached to any one graft site, which comprises dissolving a backbone polymer having a reactive double bond or a hydrogen atom which can be abstracted by a free radical, a free-radical generating initiator, and a perfluoroalkyl ester of fumaric acid in an organic solvent and reacting the resulting mixture for a period of time in the range of about 0.5 to about 24 hours.

4,100,226

INDENE-CHLOROBUTYL RUBBER COPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1976, Ser. No. 753,919

Int. Cl.^{2} C08F *279/02*

U.S. Cl. 260—879 **9 Claims**

1. The graft polymer composition resulting from the polymerization of (A) from 60 to 95% by weight of indene in the presence of from 5 to 40% by weight of (B) a chlorinated rubbery copolymer of from 95% to 99% by weight of isobutylene and from 1 to 5% by weight of isoprene.

4,100,227

TRANSPARENT IMPACT-RESISTANT POLYSTYRENE STRUCTURE

Corwin J. Bredeweg; Kent S. Dennis, and Charles E. Lyons, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1977, Ser. No. 784,483

Int. Cl.^{2} C08F *279/02*

U.S. Cl. 260—880 R **7 Claims**

1. A method for the preparation of a generally transparent impact-resistant polymer structure, the steps of the method comprising providing a rubbery reinforcing diene polymer which is a polymer prepared from 1,3-butadiene, isoprene, or mixtures thereof, the diene rubber having an inherent viscosity in the range of 0.9 to 2.5 as determined at 25° C employing 0.3 gram of rubber per deciliter of toluene, the diene rubber being employed in a proportion of from about five to twelve parts by weight, preparing a solution of the diene rubber in styrene and from about 0.01 percent to 0.3 percent by weight based on the combined weight of the rubber and styrene of a bromine-containing compound selected from the group consisting of: allyl bromide, 2-(bromomethyl)-3-bromopropene, 3,3-dibromo-1-propene, 3-bromo-1-pentene; 3,4-dibromo-1-butene, 2-(dibromomethyl)-1-butene, 2-(bromomethyl)-1-butene, 2-(bromomethyl)-1-pentene, 2-(dibromomethyl)-1-pentene, 2-(bromomethyl)-1-hexene, 3-bromo-1-hexene, 2-(dibromomethyl)-1-hexene, 3-bromocyclohexene and 3-bromocyclopentene and mixtures thereof, heating the mixture with agitation to a temperature to initiate free radical polymerization maintaining agitation until at least about 30 weight percent of styrene is converted to polymer and subsequently polymerizing the mixture until about 70 to 90 percent conversion of styrene to polymer to thereby provide an improved styrene polymer structure, the structure comprising a continuous matrix of polystyrene, the structure having a dispersed phase of a reinforcing diene rubber, the diene rubber being present in a proportion of about five to about twelve parts by weight per one-hundred parts by weight of the combined weight of styrene and rubber, the rubber being in the form of a plurality of particles of generally cellular nature and containing occlusions of polystyrene, the particles being of both monocellular and multicellular configuration, the rubber particles having a weight average particle diameter not exceeding two microns and cell walls not greater than about 0.15 microns in thickness, the dimensions and configuration of the rubber particles being determined by means of an electron microscope on a sample of the polymer which has been treated with osmium tetroxide in accordance with the procedure set forth in *Polymer Engineering and Science*, by K. Kato, 7, 38(1967), with the further limitation that when the structure has a thickness of about 10 mils, the light absorbance, being measured using a wave length of 640 millimicrons, is not greater than about 0.10, and the structure has a notched izod impact value when measured in accordance with the American Society for Testing Materials, Specification D 256A of at least 0.65 foot pounds per inch of notch.

4,100,228

TRANSPARENT IMPACT STYRENE POLYMER STRUCTURE

Kent S. Dennis; Charles E. Lyons, and Corwin J. Bredeweg, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1977, Ser. No. 784,482

Int. Cl.^{2} C08F *279/06*

U.S. Cl. 260—880 R **8 Claims**

1. A method for the preparation of a generally transparent impact resistant polymer structure, the steps of the method comprising providing a rubbery reinforcing diene polymer which is a polymer prepared from 1,3-butadiene, isoprene or mixtures thereof, the diene rubber having an inherent viscosity in the range of 0.9–2.5 as determined at 25° C employing 0.3 gram of rubber per deciliter of toluene, the diene rubber being

employed in a proportion of from about 4 to 12 parts by weight, preparing a solution of the diene rubber in a mixture of (a) styrene and methylmethacrylate, the styrene being present in a proportion from about 65 to 95 parts by weight and the methylmethacrylate being present in a proportion from about 5 to 35 parts by weight of methylmethacrylate, (b) from about 0.01 to 0.5 weight percent of a bromine-containing compound selected from the group consisting of: allyl bromide, 2-(bromomethyl)-3-bromopropene, 3,3-dibromo-1-propene, 1-bromo-1-propene, 1-bromo-1-butene, 1-bromo-1-pentene 1-bromo-1-hexene 3-bromo-1-pentene, 3,4-dibromo-1-butene, 2-(dibromomethyl)-1-pentene, 2-(bromomethyl)-1-butene, 2-(bromomethyl)-1-pentene, 2-(dibormomethyl)-1-pentene, 2-(bromomethyl)-1-hexane, 3-bromo-1-hexene, 2-(dibromomethyl)-1-hexene, 3-bromocyclohexene, and 3-bromocyclopentene, and mixtures of such compounds, heating the mixture with agitation to a temperature to initiate free radical polymerization, maintaining agitation until at least about 30 weight percent of the combined weight of the styrene and methylmethacrylate is converted to polymer and subsequently polymerizing the mixture until about 70 to 95 percent conversion of monomer to polymer to thereby provide in an improved synthetic resinous structure or body, the structure comprising a continuous matrix of a polymer of about 65 to 95 parts by weight of styrene and 5 to 35 parts by weight of methylmethacrylate, the structure having a dispersed phase of a diene rubber, the diene rubber being present in a proportion of from 4 to about 12 parts by weight per hundred parts by weight of the combined weight of styrene and methylmethacrylate, the rubber being in the form of a plurality of particles dispersed throughout a styrene-methylmethacrylate polymer continuous phase, the rubber particles being of a generally cellular nature and containing occulusions of the styrene-methylmethacrylate polymer, the particles being of both monocellular and multicellular configurations, the rubber particles having a weight average particle diameter not exceeding 2 microns and the cell walls of the rubber particles having a thickness not exceeding 0.15 microns, the dimensions and configuration of the rubber particles being determined by means of an electron microscope on a sample of the polymer which has been treated with osmium tetraoxide, [K. Kato, *Polymer Engineering and Science*, 7, 38(1967)], with the further limitation that when the structure has a thickness of about 10 mils, the light absorbance, as measured using a wavelength of 640 millimicrons, is not greater than about 0.07, and the structure has a notched Izod impact value, when measured in accordance with The American Society for Testing Materials Specification D256A, of at least 0.65 foot pounds per inch of notch.

4,100,229
LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 665,751, Mar. 11, 1976, Pat. No. 4,038,341. This application May 2, 1977, Ser. No. 793,221

Int. Cl.² C08L *47/00, 67/06;* C08F *218/14;* C08G *81/00*

U.S. Cl. 260—887 **3 Claims**

1. A low profile additive for polyester molding compositions comprising the reaction product of a styrene-maleic anhydride copolymer and a hydroxyl-terminated polydiene.

4,100,230
PROCESS FOR PREPARING MONO- AND DISUBSTITUTED MERCAPTO-PHOSPHOROTHIONOCHLORIDATES

Eugene H. Uhing, Pleasantville, N.Y., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 4, 1976, Ser. No. 711,769

Int. Cl.² C07F *9/20*

U.S. Cl. 260—972 **14 Claims**

1. A process for preparing a compound having the formula:

$$(RS)_x P(S)Cl_{(3-x)}$$

where each R is an independently selected alkyl, cycloalkyl or benzyl, and x is 1 or 2, comprising; reacting a sulfide reactant having the formula R_2S wherein R is as defined above, with P_4S_{10} and $P(S)Cl_3$ at a temperature of from about 150° C to about 300° C, and recovering the $(RS)_xP(S)Cl_{(3-x)}$.

4,100,231
PROCESS FOR MAKING PHOSPHATE ESTERS AND PRODUCTS THEREOF

Wun Ten Tai, Palos Hills; Lawrence A. Mura, Oak Forest; Kenneth G. Phillips, River Forest, and Edward G. Ballweber, Glenwood, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 632,066, Nov. 14, 1975, Pat. No. 4,061,695. This application Mar. 1, 1977, Ser. No. 773,176

Int. Cl.² C07C *9/09*

U.S. Cl. 260—978 **12 Claims**

1. A process for making an organophosphate composition comprising simultaneously

(A) heating for a time not greater than about 2 hours in a reaction zone at a temperature of from about 135 to 165° C at least one phosphoric acid material selected from the group consisting of phosphoric acid and polyphosphoric acid in admixture with a least one polyol which is characterized by
  (1) having from 2 to 7 carbon atoms per molecule,
  (2) having from 2 to 4 hydroxyl groups per molecule distributed so that not more than one oxygen atom is substituted on each carbon atom per molecule, and
  (3) being selected from the group consisting of hydroxyl substituted saturated aliphatic hydrocarbons,

in the presence of at least one inorganic base selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, and ammonia, the mole ratio of said polyol to said phosphoric acid material as charged to said zone ranging from about 0.56 to 0.77 and the mole ratio of said inorganic base to said phosphoric acid material ranging from about 0.25 to 0.75 while maintaining said reaction zone at a subatmospheric pressure ranging from greater than 0 to about 400 mm Hg, and while removing water from said zone at a rate at least about equal to the rate water is generated in said reaction zone,

(B) cooling the resulting reaction product to a temperature in the range from about 60° to 130° C., said reaction product comprising on a 100 weight percent total weight basis
  (a) from 0 to about 15 weight percent inorganic phosphate,
  (b) the balance up to 100 weight percent of any given said reaction product being organophosphate material, and
  (c) said organophosphate material containing on a 100 weight percent total organophosphate weight basis from about 20 to 60 weight percent of phosphate ester polymer material,

(C) admixing the resulting so cooled reaction product with, and dissolving same in sufficient water to form a product solution comprised on a 100 weight percent total weight basis of from about 5 to 70 weight percent water with the balance up to 100 weight percent thereof being said reaction product.

4,100,232
CARBURETORS

Ronald Swynerton Kaye, 112 Kunyung Rd., Mt. Eliza, Victoria, 3930, Australia

Continuation of Ser. No. 645,994, Jan. 2, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,864

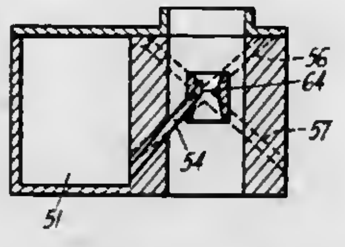
Int. Cl.² F02M *5/12*

U.S. Cl. 261—36 A **15 Claims**

1. A fuel regulating device for a carburetor having a float chamber for receiving fuel and a throat, said float chamber

lying to one side of the throat in an imaginary vertical plane extending through said carburetor, a throat passage connected to said chamber and extending between the chamber and the throat and lying in said imaginary vertical plane, said passage having a nozzle for discharging fuel into the air stream passing through the throat, said chamber having a float for establishing fuel levels in said chamber and passage, said fuel regulating device being operative to prevent a discharge of fuel from said throat nozzle responsive to tilting to the carburettor in said imaginary vertical plane about an axis normal thereto which increases the fuel level in the throat passage, said fuel regulating device comprising:

a duct coupled to said carburettor and lying in a second imaginary vertical plane parallel to said first imaginary plane, said duct having an inlet end, an outlet end, and an intermediate portion; said inlet end communicating with the float chamber; said outlet end forming a fuel discharge means for said duct; said intermediate portion forming a weir which is aligned with the nozzle of the throat passage in a direction normal to the vertical planes, the flow controlling portion of said weir being positioned below the opening of the nozzle for being responsive to increases in the level of fuel in the passage resulting from tilting the carburetor about said normal axis to pass fuel from said inlet end to said outlet end of said duct at an increased level of fuel in the throat passage less than that which causes a discharge of fuel from the throat nozzle.



4,100,233
SILICON CARBIDE FIBERS HAVING A HIGH STRENGTH AND A METHOD FOR PRODUCING SAID FIBERS

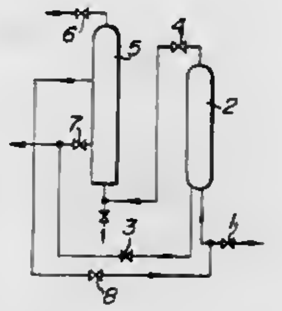
Seishi Yajima; Josaburo Hayashi, and Mamoru Omori, all of Oharai, Japan, assignors to The Research Institute for Iron, Steel and other Metals of the Tohoku University, Sendai, Japan

Filed Apr. 19, 1976, Ser. No. 677,960

Claims priority, application Japan, Apr. 25, 1975, 50-50529; May 2, 1975, 50-52471; May 2, 1975, 50-52472; May 16, 1975, 50-58033; May 16, 1975, 50-58034; Jun. 11, 1975, 50-70302; Jun. 11, 1975, 50-70303; Jun. 23, 1975, 50-77219; Jun. 30, 1975, 50-79972; Sep. 4, 1975, 50-107371

Int. Cl.² C01B *31/36*

U.S. Cl. 423—345 **44 Claims**



32. A method for producing silicon carbide fibers having a high tensile strength which comprises

(1) preparing a spinning solution from at least one organosilicon high molecular weight compound having a softening point of higher than 50° C, in which silicon and carbon are the main skeleton components, and spinning said spinning solution into fibers,

(2) preliminarily heating the spun fibers at a temperature of 350°–800° C under vacuum to volatilize low molecular weight compounds contained therein, and

(3) baking the thus treated fibers at a temperature of 800°–2,000° C under vacuum or at least one nonoxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas, to form said silicon carbide fibers.

39. A method for producing silicon carbide fibers having a high tensile strength which comprises:

(1) subjecting polysilanes having Si-Si bond which have no halogen atoms to polycondensation reaction by at least one process of addition of a polycondensation catalyst, irradiation and heating to produce polycarbosilanes containing no halogen atoms,

(2) reducing a content of low molecular weight compounds contained in said polycarbosilanes by treating the above described polycarbosilanes with at least one treatment of a solvent, aging said polycarbosilanes at a temperature of 50°–700° C and distilling said polycarbosilanes at a temperature of 100°– 500° C, to produce the polycarbosilanes having a softening point of higher than 50° C,

(3) dissolving the thus treated polycarbosilanes in a solvent or melting said polycarbosilanes to prepare spinning solution or spinning melt, and spinning said spinning solution or spinning melt into filaments,

(4) baking the thus treated filaments at a temperature of 800°– 2,000° C, under vacuum or at least one non-oxidizing atmosphere selected from the group consisting of an inert gas, CO gas and hydrogen gas to form silicon carbide fibers.

44. Continuous silicon carbide fibers having tensile strength of 200–800 Kg/mm², Young's modulus of 10–40 ton/mm² and resistant to corrosion and oxidation and showing no decrease in the tensile strength and Young's modulus at a high temperature of higher than 800° C, which are composed of ultra-fine grain silicon carbide having an average grain size of less than 0.1 μ.

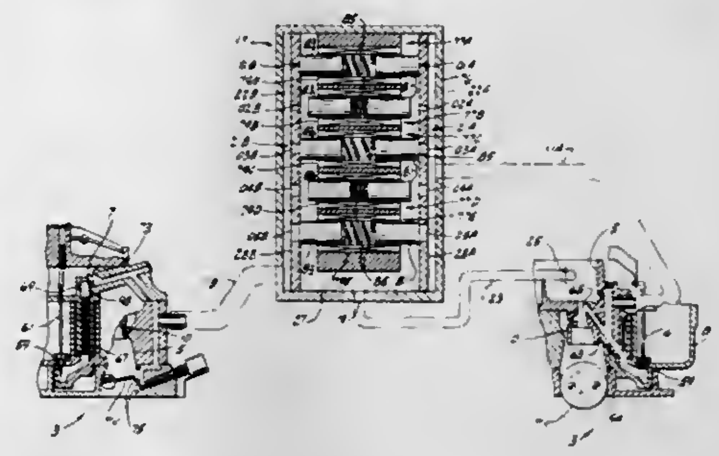
4,100,234
AIR METERING APPARATUS

Allen W. Lindberg, Kirkwood, and Thomas R. Gantzert, Florissant, both of Mo., assignors to ACF Industries, Inc., New York, N.Y.

Filed Feb. 11, 1977, Ser. No. 768,007

Int. Cl.² F02M *7/24*

U.S. Cl. 261—121 B **11 Claims**



1. Apparatus for metering the quantity of air supplied to at least two fuel systems in a carburetor for an internal combustion engine, said carburetor having at least one air passageway therein through which air is drawn into the engine, fuel from a source thereof being supplied to said carburetor through said fuel systems and mixed with air as it passes through the carburetor and the carburetor having a first conduit through which air is introduced into a first of said fuel systems and a second

conduit through which air is supplied to the second of said fuel systems, the apparatus comprising:

a chamber having an air inlet in communication with said air passageway and a first set of air outlets in communication with said first conduit and a second set of air outlets in communication with said second conduit, each set of air outlets comprising a plurality thereof with the same number of air outlets being in each set and with each of the air outlets in said second set being substantially equal in size to a corresponding one of the air outlets in said first set and said chamber comprising a housing having first and second partitions dividing it into an inlet chamber between a first and a second output chamber, said air inlet being in communication with said inlet chamber, said first conduit being in communication with said first outlet chamber and said second conduit being in communication with said second outlet chamber, said first set of air outlets being in said first partition and said second set of air outlets being in said second partition;

electrically operated valve means for selectively opening and closing each air outlet in each set, the valve means of each air outlet of said first set and the valve means of the corresponding air outlet of said second set being conjointly operable for opening an air outlet of said second set simultaneously with the opening of the corresponding air outlet of said first set and said valve means including a single set of windings in said inlet chamber for each of the corresponding air outlets in the two sets and a valve member for each air outlet of said first set and a valve member for each air outlet of said second set, the valve members for corresponding air outlets in the two sets being operated by one of the windings when it is energized;

means biasing each valve member for an air outlet of said first set and each valve member for an air outlet of said second set toward its closed position closing its associated air outlet; and

means for selectively supplying electrical current to each of said windings of said valve means whereby one or more of the corresponding air outlets in said first and second sets are simultaneously opened thereby to supply air from said passageway to said first and second conduits to control the quantity of air flowing to said first and second fuel systems.

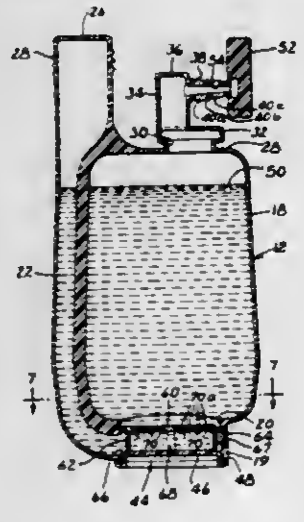
4,100,235
HUMIDIFIER-NEBULIZER APPARATUS

Everett D. Thornwald, Glenview, Ill., assignor to Aerwey Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 569,229, Apr. 18, 1975, Pat. No. 4,061,698. This application Jan. 31, 1977, Ser. No. 763,818

Int. Cl.² B01F *3/04;* A61M *15/00*

U.S. Cl. 261—142 **4 Claims**



1. A liquid reservoir for use in containing a liquid such as sterilized water preparatory to mixing the liquid with a gas in a nebulizer or humidifier system, said reservoir including a primary liquid reservoir adapted to contain a quantity of liquid and having a humidifier discharge passage communicating with the interior of said primary reservoir, said primary reservoir having an opening at its lower end defined by a generally annular wall, sparger means supported by said reservoir and including a liquid impervious bottom wall sealingly secured at its periphery to said annular wall within said reservoir opening so as to close said opening at the lower end thereof, said sparger means further including a sparger plate spaced from said bottom wall and sealingly secured at its periphery to said annular wall so as to extend across said opening adjacent the upper end thereof, said sparger plate having an annular depending wall formed thereon the lower edge of which abuts said bottom wall, said depending wall being spaced inwardly from said annular wall of said reservoir to define an annular passage therebetween, said sparger plate having a plurality of flow orifices therethrough disposed within the area of said sparger plate interiorly of said depending wall, said depending wall having a plurality of openings therein equidistantly circumferentially spaced about said annular depending wall through which gas may pass, a filler tube extending generally longitudinally upwardly along said primary reservoir externally thereof and having a lower end connected to said annular wall such that the interior of said filler tube is in communication with said annular passage such that gas caused to pass downwardly within said filler tube passes through said openings in said depending wall and through said flow orifices in said sparger plate for dispersion through any liquid contained within said primary liquid reservoir.

4,100,236
METHOD OF PREPARING MICRON SIZE PARTICLES OF SOLID POLYMERS

Gerald A. Gordon, Skokie, and Karl Josephy, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Nov. 16, 1976, Ser. No. 742,402

Int. Cl.² B01J *2/06*

U.S. Cl. 264—8 **10 Claims**

1. A method of preparing micron sized polymer particles which comprises preparing a homogeneous solution of the polymer in a normally liquid organic material which is a solvent for the polymer, the concentration of the polymer in the solvent being in the range of about 0.1 to 50 grams/liter of solvent, atomizing the solution, impinging the atomized solution into a moving film of liquid which is a nonsolvent for the polymer, and then recovering a dispersion of precipitated micron sized particles in the mixture of organic solvent and nonsolvent.

4,100,237
CO-EXTRUSION OF ABS/POLYSTYRENE MULTIPLE-LAYERED SHEETING

Donald F. Wiley, Tempe, Ariz., assignor to Cosden Technology, Inc., Big Spring, Tex.

Continuation-in-part of Ser. No. 519,682, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. Nn. 368,834, Jun. 11, 1973, abandoned, which is a continuation of Ser. No. 128,940, Mar. 29, 1971, abandoned. This application Dec. 20, 1976, Ser. No. 752,619

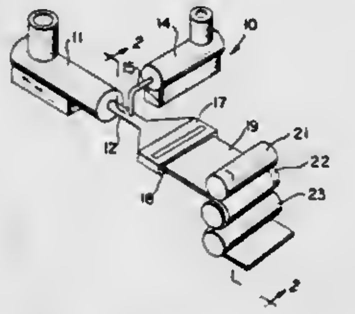
Int. Cl.² B29F *3/10*

U.S. Cl. 264—40.6 **10 Claims**

1. A process for the manufacture of composite sheeting having a major layer corresponding substantially to the final composite sheeting thickness of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal copolymers of styrene containing a minor amount of another copolymerizable monomer, and a minor layer constituting less than 20% of the total final thickness of an ABS polymer firmly united to the exterior surface of said major layer, comprising conveying a heat plasticized stream of said styrene polymer in a conduit, joining to the exterior surface of said styrene polymer stream within the said conduit a second, heat plasticized stream of said ABS polymer, said ABS polymer being characterized by a bonding factor (BF_c) of between about 0.9 and 1.15, wherein said bonding factor is defined as

$$BF_c = [A(15.4) + B(8.6) + S(9.1)]\delta_S$$

wherein *A, B* and *C* are the respective percentages of acrylonitrile, butadiene and styrene in said ABS polymer, δ_S is the Hildebrand solubility parameter for said styrene polymer and *A* is less than about 0.45, said second stream constituting less than about 20% by volume of the combined first and second streams thereby forming a single stratified stream of heat plasticized material conforming to the cross section of said conduit



and being characterized by distinct, contiguous layers of said polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at each end at a point on the inside surface of said conduit, adjusting the temperature of said stream of ABS to a temperature at which the melt viscosity of the ABS polymer stream exhibits a value within the range of about 50% to 150% of the melt viscosity exhibited by said styrene polymer stream under the conditions of the extrusion process, conveying said composite stream undisturbed through said conduit to a sheet-form extrusion die having its die lips generally aligned in parallel with the said interface between the two polymeric materials, and passing said composite stream of molten material through the said die to form a sheet, whereby said second stream spreads laterally across said first stream inside of said extrusion die thereby forming said minor layer of said composite sheeting.

4,100,238
PROCESS FOR PRODUCING PERMEABLE MEMBRANES

Toshihiko Shinomura, Yokohama, Japan, assignor to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,450

Claims priority, application Japan, Mar. 20, 1975, 50-32956

Int. Cl.² B29D *27/00*

U.S. Cl. 264—49 **4 Claims**

1. A process for producing a permeable membrane, which comprises mixing, in a molten state, (A) 90 to 30 parts by weight of at least one thermoplastic linear organic synthetic resin having stretchability with (B) 10 to 70 parts by weight of at least one compound having partial compatibility with the synthetic resin (A) and selected from the group consisting of synthetic polymers or oligomers containing at least 20 carbon atoms, natural organic polymeric compounds containing at least 20 carbon atoms, fatty acids containing at least 16 carbon atoms, and esters or salts of said fatty acids, the total amount of components (A) and (B) being 100 parts by weight; fabricating the resultant molten mixture into a film or sheet in which components (A) and (B) are present in a partly mutually dissolved state; treating said film or sheet with a solvent which is a good solvent for component (B) but a poor solvent for component (A), for a time sufficient to remove 50 to 100% by weight of component (B) from said film or sheet; drying the thus treated film or sheet until the amount of said solvent in or adhering to said film or sheet is not more than 10% by weight based on the total weight of said solvent and said film or sheet; and stretching the dried film or sheet 50 to 1500% monoaxially or biaxially to form a network of continuous pores in the film or sheet.

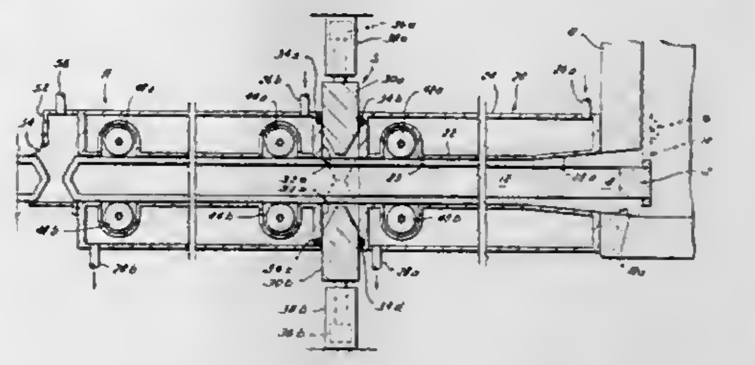
4,100,239
METHOD FOR MAKING HOLLOW PANELS

Lonnie E. Daniels, Jr., 1014 W. 18th St., Houston, Tex. 77008

Filed May 23, 1977, Ser. No. 799,261

Int. Cl.² B29D *23/03, 23/04;* B29G *2/00*

U.S. Cl. 264—102 **4 Claims**



1. A process for continuously molding a hollow insulation product from plastic material having the resulting central cavity at a vacuum pressure condition including the steps of:

processing the plastic material into a flowable form;

placing the flowable plastic material continuously about a core to form an enclosed continuous central cavity in the plastic material while forming the outer predetermined dimensions of the insulation product;

hardening and cooling the plastic material sufficiently to maintain the outer predetermined dimensions;

forming a vacuum about the plastic material to maintain the area adjacent the outer predetermined dimension below atmospheric pressure;

severing the continuous plastic material periodically to form end closures for the severed plastic material;

sealing the central cavity of the severed plastic material with the end flaps to form the hollow insulation product with the sealed central cavity having a pressure therein below atmospheric pressure;

hardening and cooling the sealed hollow insulation product to retain the predetermined shape;

moving the sealed hollow insulation product out of the vacuum.

4,100,240
LIQUID POLYMER EXTRUSION PROCESS AND PRODUCT

Giovanni Bassani, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

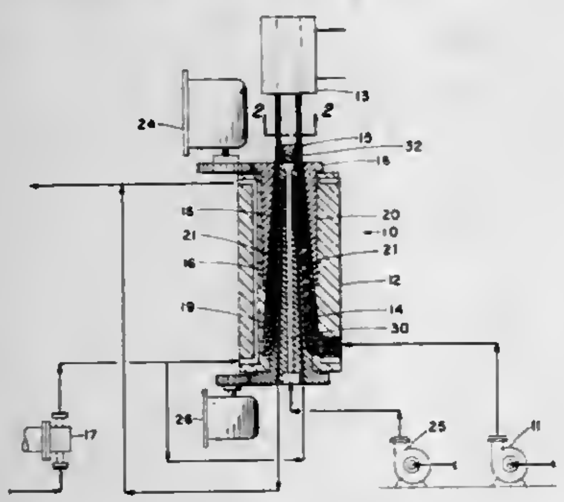
Filed Sep. 30, 1976, Ser. No. 728,328

Int. Cl.² B29D *23/05*

U.S. Cl. 264—108 **2 Claims**

1. A method of forming an oriented-fiber reinforced elastomeric tubular product by continuously extruding a liquid polymer precursor, said method employing a heated non-pumping extruder having rotatable forming surfaces to shape the precursor as it cures into said tubular product, said precursor being characterized by a room temperature Brookfield viscosity in the range of from 20 to 4000 centipoise and a cure time when heated to from about 150° to 250° C. of about 3 to about ½ seconds and wherein said non-pumping extruder the fibers are oriented to both provide increased strength to the tubular product and to facilitate said method by adding strength to the semi-cured extrudate as it emerges from said non-pumping extruder; said method comprising the steps of:

(a) pumping said fiber containing liquid polymer precursor through said non-pumping extruder which is heated to initiate the curing reaction said precursor having a residence time in said extruder such that as the curing precursor emerges from the die it has reached a substantially self-sustaining state; and simultaneously



(b) rotating at least one of the forming surfaces to orient said fibers; and

(c) heating the semi-cured extrudate to drive the curing reaction toward completion.

4,100,241

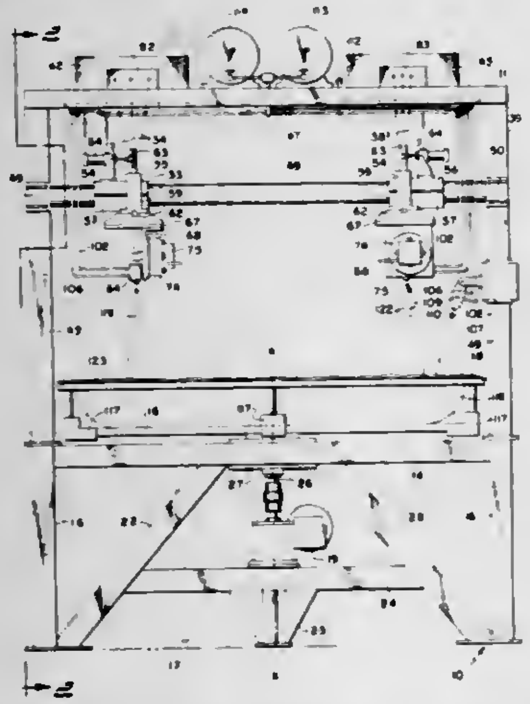
METHOD FOR MANUFACTURING CURVED BODIES OF FIBER REINFORCED PLASTIC

William J. Hampshire, Peninsula, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 611,978, Sep. 10, 1975, Pat. No. 3,988,089. This application Jul. 14, 1976, Ser. No. 705,062

Int. Cl.² D04H *3/16*

U.S. Cl. 264—113 **14 Claims**



1. A method of building a preform for a curved fiber reinforced body of plastic material in which said body is curved about an axis of revolution having a radius of curvature comprising:

(a) depositing a stream of radial fibers on a support rotating about a generally vertical axis at a first position over said support in a direction generally along the radii of curvature of said curved body,

(b) depositing a stream of circumferential fibers on said support rotating about said axis at a second position over said support in a direction generally tangential to an arc of said body,

(c) spraying a liquid plastic material onto said fibers during steps (a) and (b) so that successive layers of said fibers coated with said liquid plastic material are built up during successive revolutions of said support during rotation uotil a preform of desired thickness is laid down on said support, and

(d) removing said preform from said support.

4,100,242

METHOD OF MOLDING AQUEOUS SETTABLE SLURRIES CONTAINING SHREDDED OPEN-CELL POLYSTYRENE PARTICLES

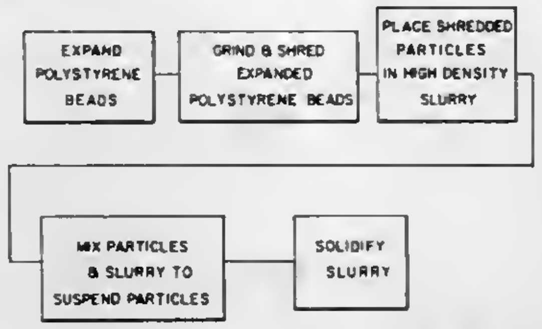
Irby H. Leach, 2094 Emerson, Napa, Calif. 94558

Continuation-in-part of Ser. No. 118,569, Feb. 24, 1971, abandoned, which is a division of Ser. No. 844,895, Jul. 25, 1969, Pat. No. 3,630,820, and Ser. No. 118,483, Feb. 24, 1971, Pat. No. 3,686,068, which is a division of Ser. No. 844,896, Jul. 25, 1969, Pat. No. 3,627,211. This application Aug. 10, 1972, Ser. No. 279,422

The portion of the term of this patent subsequent to Jun. 5, 1990, has been disclaimed.

Int. Cl.² B28B *21/02;* B28C *5/00*

U.S. Cl. 264—115 **6 Claims**


EXPAND POLYSTYRENE BEADS
GRIND & SHRED EXPANDED POLYSTYRENE BEADS
PLACE SHREDDED PARTICLES IN HIGH DENSITY SLURRY
MIX PARTICLES & SLURRY TO SUSPEND PARTICLES
SOLIDIFY SLURRY

1. A method for forming a lightweight granular structure comprising forming a slurried mixture of high viscosity including as the essential slurry constituents, water, relatively low density foam particles having a large surface area compared to volume caused by tears and serrations which provide ragged ridges and intersect a substantial number of foam cells opening the foam cells to the exterior and a material chosen from the group consisting of cement and gypsum, bringing about the penetration of the foam particles by said material and said water and distributing the particles substantially uniformly throughout the slurried mixture, thereafter forming said structure by positioning the slurry so that it has a vertical extent substantially greater than the largest dimension of the foam particles, and solidifying the mixture while maintaining the slurry still with said particles distributed substantially uniformly throughout said mixture.

4,100,243

PROCESS FOR THE SIZING OF COEXTRUDED, MULTIPLE-LAYER EXTRUDED PROFILES FROM THERMOPLASTIC SYNTHETIC RESINS

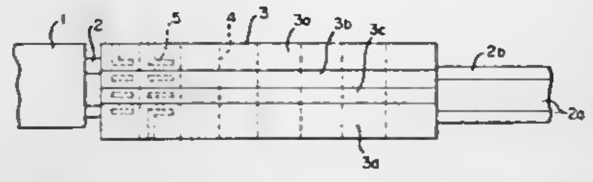
Waldemar Wissinger, Siegburg, and Peter Gauchel, Alzenbach, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,645

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535286

Int. Cl.² B29F *3/08*

U.S. Cl. 264—171 **12 Claims**



1. A process for the sizing of an extruded profile manufactured by coextrusion of a core profile of a thermoplastic synthetic resin and a cover layer provided over a portion of the periphery made of a thermoplastic synthetic resin different from the thermoplastic of the core profile, such that the extruded profile has a peripheral surface that comprises in part the thermoplastic synthetic resin of the core profile and in part the thermoplastic synthetic resin of the cover layer, one of the thermoplastic synthetic resins having a higher Vicat softening temperature than the other, which comprises sizing the extruded, still plastic profile in the external cross-sectional dimensions, and cooling the extruded profile during this sizing step, said cooling being accomplished using differential cooling of different portions of the extruded profile surface, said differential cooling comprising a more gradual cooling of the part of the extruded profile surface comprised of the thermoplastic synthetic resin having the higher Vicat softening temperature than that part of the extruded profile surface comprised of the thermoplastic synthetic resin having the lower Vicat softening temperature.

4,100,244

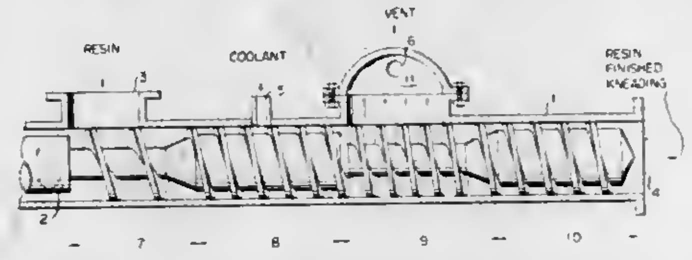
METHOD FOR DIRECTLY COOLING MELTED THERMOPLASTIC RESINS

Hidehiro Nonaka, Hiroshima, Japan, assignor to Japan Steel Works LTD, Japan

Continuation of Ser. No. 336,553, Feb. 28, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,131

Int. Cl.² B29F *3/08*

U.S. Cl. 264—211 **6 Claims**



1. Method of cooling melted thermoplastic resin in a continuous extruder having a primary mixing zone and a final mixing zone, which comprises directly injecting a coolant having a lower boiling point than said thermoplastic resin and being inactive to said resin, into the melted thermoplastic resin while mixing the resin in the primary mixing zone of the extruder at a temperature in the range of about 175° C, injecting said coolant at a temperature sufficiently lower than said melted thermoplastic resin and cooling said melted thermoplastic resin to a temperature in the range of about 130° C to 156° C before entrance into the final mixing zone of the extruder; said coolant being injected through a coolant inlet injection orifice formed in the wall of said extruder downstream of the resin inlet and said coolant being injected at a definite weight ratio of about 6.8 to 13.4 percent relative to the extruded thermoplastic resin, said extruder having a coolant vent orifice arranged downstream of said coolant inlet in the primary mixing zone of said extruder, and said extruder further being provided with an external indirect cooling jacket; uniformly mixing said coolant with said thermoplastic resin in said primary mixing zone; and removing said coolant through said coolant vent orifice before mixing the cooled thermoplastic resin in the final mixing zone of the extruder with indirect cooling through said cooling jacket and recovering the cooled mixed resin from said final mixing zone.

4,100,245

METHOD FOR MANUFACTURING BEARINGS OR OTHER ANTI-FRICTION ELEMENTS FORMED OF LUBRICANT CONTAINED POLYACETAL

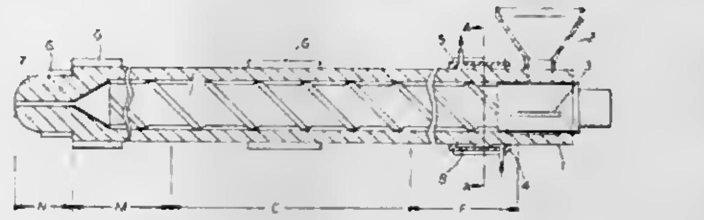
Masayuki Horikawa, Tokyo; Yataro Takata, Yokohama, and Kikuo Sumiyoshi, Tokyo, all of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 584,506, Jun. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 366,425, Jun. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 36,950, May 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 694,495, Dec. 29, 1967, abandoned. This application Jul. 26, 1976, Ser. No. 708,370

Claims priority, application Japan, Sep. 11, 1967, 42-57874

Int. Cl.² D01F *1/02;* C10M *5/00*

U.S. Cl. 264—211 **9 Claims**



1. A method of making bearings or other anti-friction elements characterized by comprising the steps of uniformly mixing at the normal room temperature polyoxymethylene or copolymers of trioxane and ethylene oxide having the bulk factor of 2 – 8 in the starting material, with 2 to 12 wt % of a lubricant which is in a liquid state at normal room temperature or the melting point of the polymer or copolymer to form a molding composition, the lubricant being from the group consisting of a mineral oil and a synthetic lubricant oil which are in a liquid state at the normal room temperature; or from paraffins, a higher fatty acid or a higher fatty acid ester, which are in a solid state at the normal room temperature but in a liquid state at the melting point of the material being processed; and grease which is in a jelly state at the normal room temperature;

and molding the resultant molding composition to form the element by use of a screw type injection or extrusion molding machine, the temperature of the feed section of the cylinder of the machine which has been controlled to that of 40 – 75% of the melting point of the material used, and having the cylinder temperature controlled to about 65° – 120° C in the feed section, about 120° – 190° C in the compression section, and about 170° – 200° C in the metering and the nozzle sections of the cylinder.

4,100,246

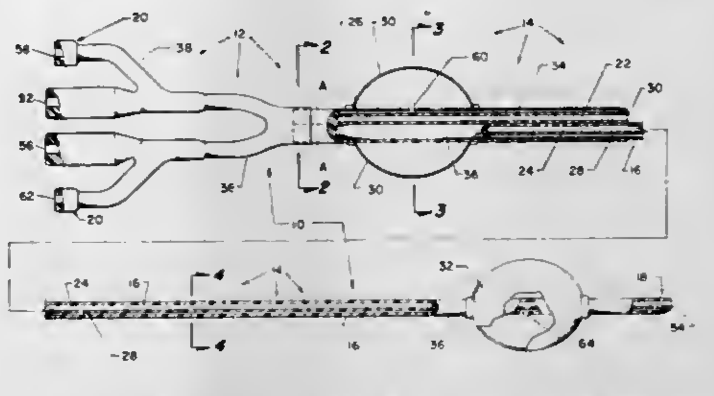
METHOD OF FORMING A GASTROINTESTINAL TUBE

Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 21, 1976, Ser. No. 698,396

Int. Cl.² B29C *13/00*

U.S. Cl. 264—230 **1 Claim**



1. A method of forming an elastomeric four-lumen gastroin-

testinal tube assembly which may be surgically inserted into a patient's stomach and threaded downward into the intestine to provide both intestinal stent plication and gastric and/or intestinal decompression; said assembly having a proximal portion which remains external to the patient's body and a distal portion which is internal to the patient's body when the tube is properly placed, said method comprising the steps of:

(a) extruding an elastomeric three-lumen sleeve portion which when the assembly is formed and placed in the patient's body extends from the proximal portion into the patient's stomach, and wherein the sleeve portion one of the lumens is an insert carrying lumen;

(b) extruding a elastomeric two-lumen insert portion, which when the assembly is formed and placed in the patient's body extends from the proximal portion through the sleeve portion through the patient's stomach and into the intestine; the external shape of the insert portion approximating the shape of the insert carrying lumen and the external dimensions of the insert portion being larger than the internal dimensions of the insert carrying lumen;

(c) immersing the sleeve portion in a solvent to swell the sleeve portion and to increase the internal dimensions of the insert carrying lumen until the internal dimensions are larger than the external dimensions of the insert portion;

(d) inserting the insert portion into the insert carrying lumen, and

(e) removing the solvent and thereby causing the sleeve portion to shrink and the insert carrying lumen to contract around the insert portion thereby forming a "solvent shrink fit" which securely fixes the insert portion in the insert carrying lumen.

4,100,247

METHOD OF MANUFACTURING A DISC WHEEL

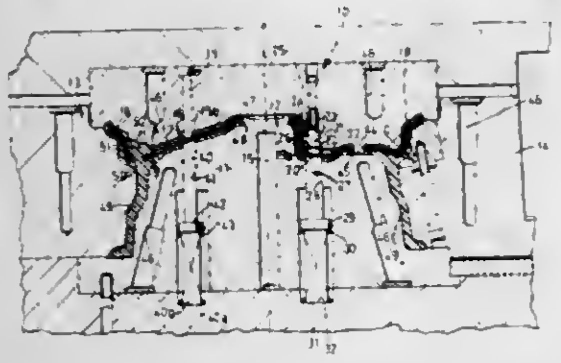
Terence Humphrey Charles Shead, Chorley Wood; Frederick Leslie Hart, Cressage, and Herbert John Sharp, Greenford, all of England, assignors to GKN Sankey Limited, Bilston, England

Filed Mar. 4, 1976, Ser. No. 663,645

Claims priority, application United Kingdom, Mar. 8, 1975, 9753/75

Int. Cl.² B29D *3/02;* **B29F** *1/10*

U.S. Cl. 264—271 **8 Claims**



1. A method of manufacturing a disc wheel which is of generally Y-shape in cross sections radial of the rotary axis of the wheel, the stem of the Y providing the central disc of the wheel and having holes for the normal wheel bolts or studs, and the bifurcations of the Y providing the wheel rim, the wheel comprising an annular metal reinforcement having parts located in the stem and in one of the bifurcations of the Y, and a covering of synthetic resinous material for the reinforcement, the covering having an integral extension which provides the other bifurcation of the Y, the method comprising applying the synthetic resinous covering to the reinforcement by moulding in a mould having first and second portions which are movable towards and away from one another in directions parallel to the rotary axis of the wheel between open and closed positions, the reinforcement having holes therein corresponding to the holes in the finished wheel for said bolts or studs and being located at least at the start of said moulding in a mould cavity defined between said mould portions by first and second series of abutments, each abutment of the first series engaging in one of said holes in the reinforcement and each abutment of the second series engaging the reinforcement at a position radially outwardly of said holes with respect to said rotary axis.

4,100,248

MANUFACTURE OF GRADING AND DEWATERING SCREENS

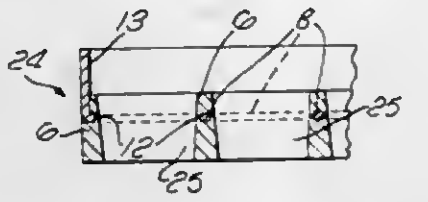
Terence C. Adams, Exeter, England, assignor to Birtley Engineering Limited, Chesterfield, England

Filed Nov. 4, 1976, Ser. No. 738,979

Claims priority, application United Kingdom, Nov. 4, 1975, 45798/75; Jul. 26, 1976, 31105/76

Int. Cl.² B29D *3/02;* **B29H** *7/22*

U.S. Cl. 264—273 **18 Claims**



1. A method of making a reinforced elastomeric apertured screen element for a grading or dewatering screen, comprising the steps of providing a tray-like mould having a substantially horizontal bottom and upright side walls, forming in said mould a sheet of a wear resistant elastomeric material in a liquid state, providing above said mould both a plurality of studs for forming the apertures of the screen element and a substantially rigid open-work reinforcement defining a plurality of openings therein, lowering said reinforcement into contact with said liquid elastomeric material in said mould, lowering said studs whereby said studs penetrate said liquid elastomeric material substantially to said bottom of said mould, said studs extending through said openings of said reinforcement, allowing said liquid elastomeric material to set, and withdrawing said studs from the set sheet of said elastomeric material in said mould leaving said reinforcement and said elastomeric material permanently fixed together.

4,100,249

METHOD OF AND APPARATUS FOR MOLDING A RECEPTACLE

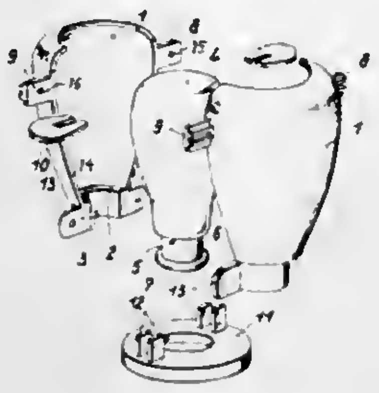
Jacques Pierre Max Giron, Saint Nizier sous Charlieu, France, assignor to Scolarma, Charlieu, France

Filed Nov. 26, 1976, Ser. No. 745,173

Claims priority, application France, Nov. 28, 1975, 75 36456

Int. Cl.² B29C *1/12, 1/16;* **B28B** *7/30;* **B22C** *9/24*

U.S. Cl. 264—313 **10 Claims**



1. A method of molding comprising the steps of:

(a) juxtaposing a pair of mold parts to form a mold cavity having a relatively large maximum cross-sectional size and having an upper opening and a lower opening of relatively

small cross-sectional size forming a neck portion of the mold separated from said cavity by a shoulder;

(b) positioning in said cavity a hollow core having a body of cross-sectional size greater than that of said lower opening and having a shoulder dimensioned to fit snugly against the shoulder adjacent said neck portion of the mold, a neck extending out of said cavity through said lower opening and adapted to fit snugly within said neck portion of the mold and a laterally extending portion provided at the lower end of the neck of the core adapted to abut against the lower end of the neck portion of the mold when the latter receives the core, said hollow core having an outer elastically inwardly deflectable surface of predetermined shape;

(c) introducing a mass of hardenable material into said cavity from said upper opening of the mold around said core substantially without elastic deformation of the latter;

(d) hardening the introduced mass;

(e) temporarily elastically deforming said core and simultaneously withdrawing the same from the hardened mass; and

(f) displacing said mold parts apart to demold the hardened mass and automatically elastically returning said outer surface to said predetermined shape.

4,100,250

SELECTIVE PRECIPITATION OF COPPER CHLORIDES FROM AQUEOUS SOLUTIONS WITH UNSATURATED ALIPHATIC HYDROCARBONS

Godefridus M. Swinkels, Rossland, Canada, assignor to Cominco Ltd., Vancouver and Sherritt Gordon Mines Limited, Toronto, both of, Canada

Filed Aug. 23, 1976, Ser. No. 716,412

Claims priority, application Canada, Aug. 25, 1975, 234318

Int. Cl.² C01G *3/04*

U.S. Cl. 423—34 **11 Claims**

8. In a hydrometallurgical process for the recovery of copper from copper bearing materials by treating such materials with chloride containing lixiviant whereby solution is obtained containing cuprous chloride, cupric chloride and silver chloride as well as one or more chlorides of metals chosen from the group consisting of iron, zinc, calcium, magnesium and cobalt, the improvement of selectively recovering substantially pure cuprous chloride from said solution in the presence of silver chloride which comprises the steps of contacting said solution with a gaseous unsaturated aliphatic hydrocarbon chosen from the group consisting of straight chain aliphatic hydrocarbons having from 2 to 6 carbon atoms and cyclo aliphatic hydrocarbons having from 4 to 6 carbon atoms to precipitate hydrocarbon cuprous chloride addition compound at a temperature in the range of about −35° to +40° C, maintaining the concentration of cuprous copper in the solution above about 20 g/l whereby the silver chloride remains substantially in solution, separating the addition compound from residual solution, decomposing said addition compound for removal of the hydrocarbon at a temperature in the range of about 40° to 80° C, recycling said removed hydrocarbon to the contacting step and recovering substantially pure cuprous chloride, said process steps being carried out substantially in the absence of an oxygen bearing gas.

4,100,251

METHOD OF RECOVERING METALS OUT OF SOOT ORIGINATING FROM THE COMBUSTION OF OIL

Nils Reinhardt; Ulf Vilhelm Knylenstierna, both of V:a Frolunda, and Bengt Agne Alfredsson, Stenungsund, all of Sweden, assignors to Sotex AB, Molndal, Sweden

Filed Apr. 7, 1977, Ser. No. 785,536

Claims priority, application Sweden, Apr. 20, 1976, 7604527

Int. Cl.² C01G *49/00, 53/00, 31/00*

U.S. Cl. 423—63 **6 Claims**

1. A process for recovering at least one metal selected from the group consisting of iron, nickel and vanadium which is contained in the soot which results from the combustion of oil, comprising (a) leaching the soot with an aqueous solution of sulphuric acid at a pH of from about 1 to about 2, to extract some of the total metal content from the soot, (b) combusting the leached soot in a furnace at a temperature of from about 600° to about 1200° C, and (c) further leaching the combustion residue with an aqueous solution of sulphuric acid at a pH of from about 0 to about 2, so as to extract more of the metal from the soot and (d) recovering said metal from the leaching solution.

6. The process of claim 1 wherein the metal is recovered from the leaching solution by means of a liquid-liquid extraction.

4,100,252

METAL EXTRACTION PROCESS

Frank Pitts, Madrid, Spain, assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 28, 1977, Ser. No. 781,753

Claims priority, application United Kingdom, Apr. 26, 1976, 16846/76

Int. Cl.² C01G *31/00*

U.S. Cl. 423—68 **10 Claims**

1. A method for recovering vanadium from a waste vanadiferous residue resulting from the chlorination of a titaniferous ore or ore concentrate in the presence of carbon followed by distillation of titanium tetrachloride, resulting in a fuming residue solid, said fuming solid residue comprising vanadium chloride together with at least one chloride selected from the group consisting of niobium, tantalum, zirconium, titanium and mixtures thereof, at least one chloride selected from the group consisting of aluminum, iron, chromium and manganese, carbon and unreacted ore, said fuming solid residue having been moistened with a small amount of water to form a free-flowing nonfuming powder, which recovery method comprises: forming said moistened solid residue into a slurry with a material selected from the group consisting of water and aqueous sulfuric acid that is between 0.05 and 1 Normal, maintaining said slurry at elevated temperature for a time sufficient to extract substantially all of the vanadium into solution and separating said solution from the remainder which is an insoluble residue comprising carbon, unreacted titaniferous ore and substantially all of the niobium, tantalum, zirconium or titanium.

4,100,253

RECOVERY OF SODIUM AND ANTIMONY VALUES FROM SPENT ETHYLENE GLYCOL RESIDUES

Steve John Dougherty, and Kenneth Joseph Garska, both of Saint Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 25, 1976, Ser. No. 699,977

Int. Cl.² C01B *29/02*

U.S. Cl. 423—87 **5 Claims**

1. A process for recovering antimony and sodium compounds from antimony-containing spent ethylene glycol residues resulting from the manufacture of polyethyleneterephthalate polyester which comprises combusting the spent glycol residues with an oxygen-containing gas so as to produce an ash; contacting said ash with water to effect at least a partial separation of the water-soluble sodium compounds from the relatively insoluble antimony compounds thereby forming an ash-water mixture having a liquid phase and a solid phase, the water-soluble sodium compounds being essentially contained in said liquid phase and the water-insoluble antimony compounds being essentially contained in said solid phase; and separating said liquid phase from said solid phase to recover sodium and antimony compounds from said liquid phase and said solid phase, respectively.

4,100,254
INDUSTRIAL PROCESS OF PREPARING MAGNESIA OF HIGH PURITY

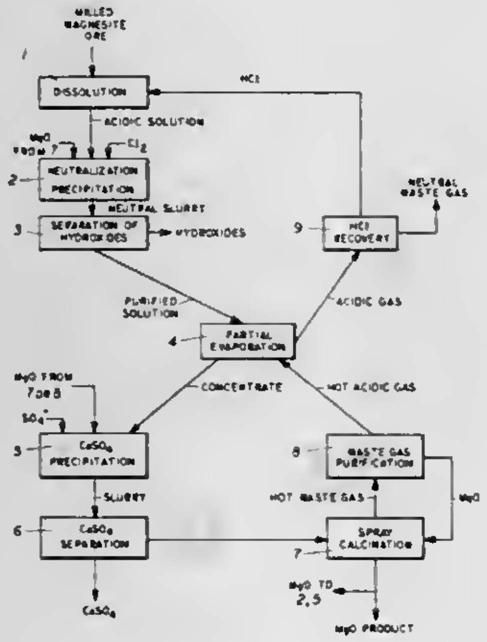
Helmut Grohmann, St. Jakob bei Mixnitz, and Michael Grill, Leoben, both of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Nov. 18, 1976, Ser. No. 743,072

Claims priority, application Austria, Nov. 20, 1975, 8837/75

Int. Cl.² C01F *5/06*

U.S. Cl. 423—163 **10 Claims**



1. In an industrial process of preparing magnesia of high purity from a magnesium-containing starting material containing impurities which comprises

(a) dissolving the starting material in aqueous hydrochloric acid to produce an acidic solution of the starting material, and

(b) subjecting the acidic solution of the starting material to a multi-step treatment wherein the impurities are precipitated from the solution and the precipitate is separated from the residual purified solution, said multi-step treatment comprising

(1) a first step in the purification treatment including precipitating impurities as hydroxides and separating the precipitate from the residual magnesium chloride solution, and

(2) a second treatment step including precipitating calcium present in the magnesium chloride solution by adding sulfate ions containing material and separating the precipitate, said calcium originating from the starting material and/or from material added for promotion of precipitation during the first step of the treatment, and

(c) thermally decomposing the magnesium chloride in the purified solution to obtain magnesia, and recovering the magnesia,

the improvement of first concentrating the magnesium chloride solution in the second treatment step to a content of more than 350 grams $MgCl_2$/liter and then adding thereto the sulfate ions containing material to precipitate the calcium ions from the concentrated solution as calcium sulfate.

4,100,255
COMBUSTION OF REFUSE CONTAINING CHLORINATED HYDROCARBONS

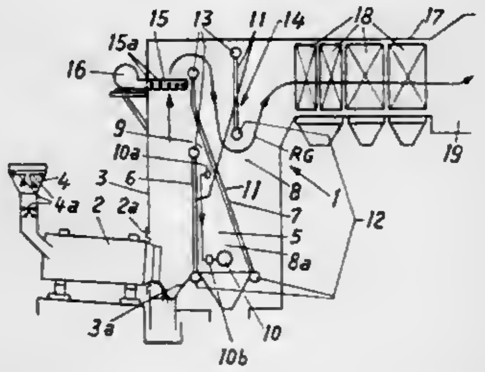
Walter Tschantre, Zurich, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed May 12, 1975, Ser. No. 576,965

Claims priority, application Switzerland, May 16, 1974, 6749/74

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **9 Claims**



1. Method for simultaneous combustion of refuse and chlorinated hydrocarbons in a single furnace having

a refuse combustion chamber (3) and a separate incineration cell (5) located within at least a portion of the chamber (3) comprising the steps of

introducing the chlorinated hydrocarbons into the cell (5) separately and apart from refuse; introducing refuse into the chamber (3);

incinerating said separate chlorinated hydrocarbons in said incineration cell (5) and whereby chlorinated hydrocarbon combustion gases will be generated;

combusting the refuse in the chamber (3) at a combustion temperature below that of the chlorinated hydrocarbon incinerating temperature and generating refuse combustion gases at a temperature below that of the chlorinated hydrocarbon combustion gases;

retaining the chlorinated hydrocarbon combustion gases while flowing in said cell (5) for a dwell time period of at least one second, separate from the refuse combustion gases;

then mixing the chlorinated hydrocarbon combustion gases and the cooler refuse combustion gases to cool the chlorinated hydrocarbon combustion gases in the mixture;

and then purifying the cooled mixture of refuse combustion gases and chlorinated hydrocarbon combustion gases.

4,100,256
HYDROLYSIS OF CARBON OXYSULFIDE

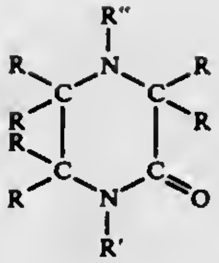
John W. Bozzelli, Midland; Donald N. Bremer, Freeland, and George D. Shier, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1977, Ser. No. 778,903

Int. Cl.² B01D *53/34*

U.S. Cl. 423—220 **9 Claims**

1. A process for hydrolyzing COS to H_2S and CO_2 which comprises contacting a COS-containing gas with an aqueous piperazinone compound solution, said piperazinone compound having the formula



wherein R', R'', and each R is independently a hydrogen atom or an alkyl group of 1-5 carbon atoms.

4,100,257
PROCESS AND AMINE-SOLVENT ABSORBENT FOR REMOVING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 14, 1977, Ser. No. 768,420

Int. Cl.² B01D *53/34*

U.S. Cl. 423—226 **20 Claims**

1. A process for the removal of acidic gases from a normally gaseous mixture, which comprises contacting said normally gaseous mixture with an amine-solvent liquid absorbent being comprised of:

(i) an amine mixture comprised of at least 50 mol % of a sterically hindered amine and at least about 10 mol % of a tertiary amino alcohol, wherein said sterically hindered amine contains at least one secondary amino group which is part of a ring and is attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom, and

(ii) a solvent for said amine mixture which is a physical absorbent for said acidic gases.

4,100,258
SODIUM ALUMINATE TO REDUCE FLUE GAS CORROSION

Peter H. Vossos, Lisle; Morris Mindick, Downers Grove, and Larry P. Koskan, Orland Park, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 19, 1976, Ser. No. 677,924

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **8 Claims**

1.

The method of treating flue gas, delivered to a stack, to remove an entrained sulfur-containing compound selected from the group consisting of oxides of sulfur and sulfuric acid derived from burning the fuel, comprising the step of spraying the flue gas, before it reaches the stack, with droplets of an aqueous solution of sodium aluminate ($Na_2O.Al_2O_3$), the ratio of $Na_20:Al_2O_3$ being greater than 1 to assure a stabilized solution and in which the sodium aluminate used is in an amount effective to remove at least a significant portion of the sulfur-containing compound by virtue of being converted to the sulfates of sodium and aluminum.

4,100,259
PROCESS AND APPARATUS FOR THE PURIFICATION OF FUMES AND GASES AND FOR THE PRODUCTION OF SULFURIC ACID

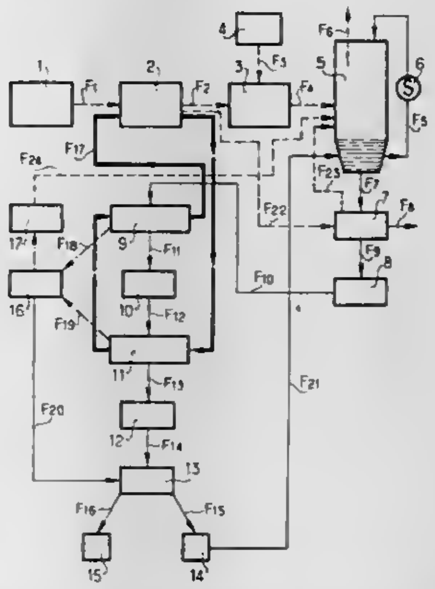
André Salaün, Saint-Ouen, and René Trempn, Gambais, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Continuation of Ser. No. 491,658, Jul. 25, 1974, abandoned. This application Oct. 21, 1976, Ser. No. 734,526

Claims priority, application France, Jul. 26, 1973, 73 27426; May 14, 1974, 74 16616; Jun. 17, 1974, 74 20910; Jun. 26, 1974, 74 22251

Int. Cl.² C01B *17/00, 17/72*

U.S. Cl. 423—242 **19 Claims**



1. A process for removing sulfur dioxide from a sulfur dioxide-containing gas comprising contacting said sulfur dioxide-containing gas and excess oxygen to oxidize the sulfur dioxide with an aqueous washing medium containing (1) $MnSO_4$, (2) sulfuric acid, and (3) complexes thereof formed in the presence of manganese dioxide, said medium exhibiting a maximum absorption in the visible spectrum at 480 and 500 nanometers, the concentration of sulfate, sulfuric acid, and the complexes in said medium corresponding to a composition obtained by

preparing in an aqueous medium a homogeneous mixture comprising 0.5 to 10 g/l of manganese dioxide monohydrate, 20 to 500 g/l of manganese sulfate monohydrate, and 100 to 1,000 g/l of sulfuric acid,

agitating the resultant composition for at least 30 minutes,

diluting the composition so obtained so that the concentration of manganese sulfate therein is from 10 to 20 g/l and the concentration of sulfuric acid is at least 100 g/l.

4,100,260
REGENERATIVE METHOD FOR QUANTITATIVE REMOVAL OF SULFUR DIOXIDE FROM STACK GASES

Lewis W. Elston, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Division of Ser. No. 655,167, Feb. 4, 1976, Pat. No. 4,031,195, which is a continuation-in-part of Ser. No. 359,997, May 14, 1973, abandoned. This application Feb. 22, 1977, Ser. No. 770,669

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **6 Claims**

1. The method of removing SO_2 from effluent gases, which comprises the steps of:

a. contacting a scrubbing liquid which is an aqueous medium containing essentially I_2, with effluent gases which contain SO_2 for a time sufficient substantially completely to absorb the SO_2 and convert same to H_2SO_4 an HI while maintaining the scrubbing liquid at a pH of 2.0–6.9;

b. reacting the scrubbing liquid containing HI with $CaCO_3$ to produce CaI_2;

c. electrolytically converting the CaI_2 of step (b) to I_2; and
d. recycling the I_2 of step (c) to the contacting region of step (a) thereby to form a closed system.

4,100,261
PRODUCTION OF PURE ALKALI METAL PHOSPHATE SOLUTIONS FROM WET-PROCESSED PHOSPHORIC ACID

Klaus-Peter Ehlers, Erftstadt-Lechenich; Siegfried Lischka, Brühl-Vochem, and Siegfried Burkhardt, Brühl-Kierberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1975, Ser. No. 640,772

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1974, 2461064

Int. Cl.² C01B *15/16, 25/26*

U.S. Cl. 423—309 **7 Claims**

1. In the process for making pure alkali metal phosphate solutions by neutralizing wet-processed phosphoric acid with alkali metal hydroxides, carbonates and mixtures thereof, wherein the wet-processed phosphoric acid is neutralized so as to establish a pH-value ranging from 4 to 9, the resulting neutralization sludge consisting substantially of insoluble aluminum and iron phosphates is separated from the alkali metal phosphate solution and scrubbed with water, the sludge so treated is mixed with an alkali metal hydroxide, alkali metal phosphate solution and water-glass so as to establish in the resulting suspension a molar ratio of SiO_2 to Al_2O_3 of at least 2 : 1 and a molar ratio of dissolved alkali metal oxide to dissolved P_2O_5 ranging from 2.9 : 1 to 3.3 : 1, the whole is heated to temperatures ranging from 80° to 100° C to effect breakup of the sludge in the suspension with the resultant formation of a solid matter residue together with a trialkali metal phosphate solution, solid matter residue is separated from the trialkali metal phosphate solution, water-scrubbed, and discharged, the improvement which comprises using as starting material crude wet-processed phosphoric acid containing more than 45 weight % of P_2O_5, diluting the acid with the water employed for scrubbing the separated neutralization sludge and thereby reducing the acid's P_2O_5- content down to 30 to 45 weight %, neutralizing the acid so diluted with alkali metal hydroxides, carbonates and mixtures thereof and with the trialkali metal phosphate solution originating from the processed neutralization sludge, and using the scrubbing water derived by scrubbing the solid matter residue of the breakup of the neutralization sludge as alkali metal solution which is mixed with the water-glass, alkali metal hydroxide and neutralization sludge.

4,100,262
SYNTHESIS OF ZEOLITE ZSM-5

Bruce Patrick Pelrine, Trenton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,379

Int. Cl.² C01B *33/28;* **C07F** *5/06*

U.S. Cl. 423—329 **10 Claims**

1. A method for synthesizing crystalline aluminosilicate zeolite ZSM-5 in a highly twinned, rectangular prismatic crystal form of uniform size which comprises the steps of

preparing a reaction mixture containing sources of sodium oxide, tetraalkylammonium oxide, an oxide of aluminum, an oxide of silicon, water and a tetraureacobalt (II) complex and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3	=	5-100
H_2O/SiO_2	=	0.7-3000
OH^-/SiO_2	=	0.07-10.0
X/SiO_2	=	0.0047-0.047
M/SiO_2	=	0.3-3.0
R/SiO_2	=	0.01-2.0

wherein M is an alkali metal ion and R is a tetraalkylammonium cation, the alkyl groups of which contain 2-5 carbon atoms and X is a tetraureacobalt (II) complex,

and maintaining said mixture at a temperature of from about 100° F to about 400° F until crystals of said zeolite are formed.

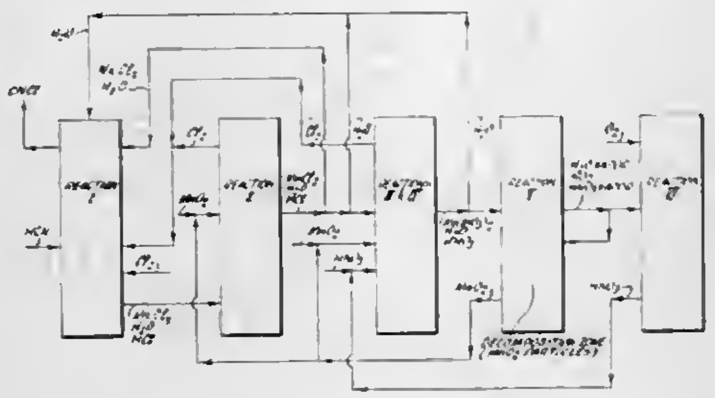
4,100,263
PROCESS FOR PREPARING CYANOGEN CHLORIDE AND GASEOUS CHLORINE

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,596

Int. Cl.² C01B *21/18*

U.S. Cl. 423—383 **5 Claims**



4. A process for preparing cyanogen chloride and gaseous chlorine which comprises the steps of reacting hydrogen cyanide and chlorine in an aqueous manganous chloride solution to form cyanogen chloride and hydrogen chloride dissolved in said manganous chloride solution; recovering the cyanogen chloride; reacting, at elevated temperatures, said hydrogen chloride-manganous chloride solution with an amount of solid manganese dioxide exceeding the the 1:4 molar ratio of manganese dioxide to hydrogen chloride to form gaseous chlorine and a residual manganous chloride solution; recovering said gaseous chlorine; reacting said residual manganous chloride solution with solid manganese dioxide and concentrated nitric acid at elevated temperatures to form gaseous chlorine and an acidic manganous nitrate solution; the molar ratio of manganese dioxide to manganous chloride being in excess of 1:1 and the molar ratio of nitric acid to manganous chloride being in excess of 4:1; and recovering said gaseous chlorine.

4,100,264
PROCESS FOR THE PREPARATION OF CALCIUM CARBONATE FOR USE IN FLUORESCENT LAMP PHOSPHORS

Herman R. Heytmeijer, Hanover Township, Morris County; Larry P. Rusch, Edison, and Giuseppe Grasso, Parsippany Troy Hills, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1976, Ser. No. 754,051

Int. Cl.² C01F *11/18*

U.S. Cl. 423—430 **8 Claims**

1. The method of producing finely-divided phosphor grade calcium carbonate having a calcite crystalline structure and a very low sodium content from calcium chloride having a high sodium impurity content such as 1.6% sodium chloride, which method comprises:

(a) forming finely-divided meta-stable vaterite on a continuous basis by continuously adding to an agitated precipitating tank aqueous solutions of calcium chloride and diammonium carbonate in such respective concentrations as to stoichiometrically produce calcium carbonate precipitate and ammonium chloride;

(b) separating the resulting meta-stable vaterite precipitate from the mother liquor, and then resuspending the separated vaterite in an aqueous medium;

(c) heating the resuspended vaterite to a temperature of at least 80° C for a sufficient period of time to cause the crystal structure of said vaterite to completely convert to calcite; and

(d) recovering the resulting calcite, which has a sodium impurity content in the range of from about 10 to 35 ppm, for use in preparing phosphor materials.

4,100,265
PROCESS FOR PREPARATION OF HIGH QUALITY COKE

Kiyoharu Yoshimura, and Masao Hayashi, both of Izumi, Japan, assignors to Koa Oil Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,645

Int. Cl.² C01B *31/04, 57/00*

U.S. Cl. 423—449 **6 Claims**

1. A three-step process for the preparation of high quality coke which comprises calcining a green coke obtained according to the delayed coking process in a first step at a temperature of about 600° to about 900° C., then cooling the coke in a second step to about 100° C. or lower and thereafter calcining the coke in a third step at a temperature of about 1200° to about 1500° C.

4,100,266
CONTROL SYSTEM FOR A SULFUR PROCESS

Dexter E. Smith, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1977, Ser. No. 838,029

Int. Cl.² C01B *17/04;* **G01N** *7/00*

U.S. Cl. 423—574 R **25 Claims**

1. Apparatus comprising:

a furnace means;

first conduit means for passing a first feed stream containing hydrogen sulfide (H_2S) into said furnace means;

second conduit means for passing a second feed stream containing oxygen into said furnace means to convert part of the H_2S contained in the first feed stream to sulfur dioxide (SO_2);

third conduit means for withdrawing the resulting gaseous reaction mixture, containing free sulfur and unreacted H_2S and SO_2 gases, from said furnace means;

first sulfur removal means to remove at least a part of the free sulfur contained in the said gaseous reaction mixture, thereby producing a denuded gaseous stream containing unreacted H_2S and SO_2;

a catalytic sulfur converter means to convert a portion of the unreacted H_2S and SO_2 gases contained in said denuded gaseous mixture to free sulfur;

second sulfur removal means to remove at least a portion of the free sulfur from the resulting gaseous reaction mixture produced in said catalytic sulfur converter means, thereby producing a primary tail gas stream containing unreacted H_2S and SO_2;

a tail gas cleanup reactor means for further reducing the concentration of H_2S and SO_2 in the primary tail gas stream from said catalytic sulfur converter means;

fourth conduit means for passing a third feed stream containing H_2S gas into said tail gas cleanup reactor means;

means for separating at least part of the free sulfur formed in said tail gas cleanup reactor means from the resulting reaction effluent to produce a secondary tail gas stream;

means for establishing a first signal representative of the actual flow rate of the first feed stream flowing through said first conduit means;

means for establishing a second signal representative of the actual flow rate of the second feed stream flowing through said second conduit means;

means for analyzing said primary tail gas stream flowing from said second sulfur removal means to said tail gas cleanup reactor means and establishing a third signal representative of the H_2S concentration in said primary tail gas stream, a fourth signal representative of the SO_2 concentration in said primary tail gas stream, and a fifth signal representative of the H_2S/SO_2 ratio in said primary tail gas stream;

means for analyzing said secondary tail gas stream and establishing a sixth signal representative of the H_2S concentration in said secondary tail gas stream and a seventh signal representative of a data ready condition;

means for establishing an eighth signal representative of the desired H_2S/SO_2 ratio in said primary tail gas stream;

means for establishing a ninth signal representative of the required volume of said second feed stream necessary to convert a required proportion of the H_2S in a known volume of said first feed stream to SO_2;

means for establishing a 10th signal representative of the desired H_2S concentration in said secondary tail gas stream;

means for producing, in response to said first, said fifth, said eighth, and said ninth signals, an 11th signal representative of the required flow rate of said second feed stream and for utilizing a comparison of said 11th signal and said second signal to manipulate the flow rate of said second feed stream;

means for producing, in response to said first, said seventh and said tenth signals, a 12th signal representative of a feed forward control signal for the H_2S/SO_2 ratio in said primary tail gas stream;

means for producing, in response to said sixth, said seventh and said tenth signals, a 13th signal representative of a feedback control signal for the H_2S concentration in said secondary tail gas stream; and

means for producing, in response to said twelfth and said thirteenth signals, a 14th signal representative of the required flow rate of the third feed stream and for utilizing said 14th signal to manipulate the flow rate of said third feed stream.

17. A method for controlling the conversion of hydrogen sulfide to sulfur, comprising the steps of:

passing a first feed stream containing hydrogen sulfide (H_2S) into a first reaction zone;

passing a second feed stream containing oxygen into said first reaction zone;

in said first reaction zone, converting part of the hydrogen sulfide from said first stream to sulfur dioxide and then reacting part of the thus produced sulfur dioxide with part of the remaining hydrogen sulfide to produce free sulfur;

passing the resulting gaseous reaction mixture containing free sulfur and unreacted hydrogen sulfide and sulfur dioxide gases from said first reaction zone to a first sulfur removal zone and therein removing at least a portion of the free sulfur contained in the mixture, thereby producing a denuded stream containing unreacted hydrogen sulfide and sulfur dioxide;

passing said denuded stream to a catalytic sulfur converter zone and therein converting a portion of the unreacted hydrogen sulfide and sulfur dioxide gases to free sulfur;

passing the resulting gaseous effluent from said catalytic sulfur converter zone to a second sulfur removal zone and therein removing at least a portion of the free sulfur contained in the gaseous effluent to produce a primary tail gas stream containing unreacted hydrogen sulfide and sulfur dioxide;

passing said primary tail gas stream from said second sulfur removal zone to a tail gas cleanup reaction zone;

passing a third feed stream containing hydrogen sulfide gas into said tail gas cleanup reaction zone and therein reacting said primary tail gas stream and said third feed stream;

separating the resulting free sulfur produced in said tail gas cleanup reaction zone to produce a secondary tail gas stream containing the remaining unreacted hydrogen sulfide and sulfur dioxide gases;

establishing a first signal representative of the actual flow rate of said first feed stream;

establishing a second signal representative of the actual flow rate of said second feed stream;

establishing a third signal representative of the hydrogen sulfide concentration in the gas mixture flowing from said second sulfur removal zone, a fourth signal representative of the sulfur dioxide concentration in the gas mixture flowing from said second sulfur removal zone, and a fifth signal representative of the H_2S/SO_2 ratio in the gas mixture flowing from said second sulfur removal zone;

establishing sixth signal representative of the hydrogen sulfide concentration in said secondary tail gas steam and a seventh signal representative of a data ready signal;

establishing an eighth signal representative of the required H_2S/SO_2 ratio in said primary tail gas stream;

establishing a ninth signal representative of the required volume of said second feed stream necessary to convert a required proportion of the hydrogen sulfide in a known volume of said first feed stream to sulfur dioxide;

establishing a 10th signal representative of the desired hydrogen sulfide concentration in said secondary tail gas stream;

producing, in response to said first, said fifth, said eighth and said ninth signals, an 11th signal representative of the required flow rate of said second feed stream and utilizing a comparison of said 11th signal and said second signal to manipulate the flow rate of the said second feed stream;

producing, in response to said first, said third, and said fourth signals, a 12th signal representative of a feed forward control signal for the H_2S/SO_2 ratio in said primary tail gas stream;

producing, in response to said sixth, said seventh, and said tenth signals, a 13th signal representative of a feedback control signal for the hydrogen sulfide concentration in said secondary tail gas stream; and

producing, in response to said twelfth and said thirteenth signals, a 14th signal representative of the required flow rate of said third feed stream and utilizing said 14th signal to manipulate the flow rate of said third feed stream.

4,100,267

METHOD OF DETECTING HEPATITIS B CORE ANTIGEN AND ANTIBODY

Eugene Douglas Shaw, Bridgewater, N.J., assignor to Ortho Diagnostics Inc., Raritan, N.J.

Filed Oct. 1, 1975, Ser. No. 618,644

Int. Cl.² A61K *39/00, 39/42, 43/00;* **G01N** *31/00*

U.S. Cl. 424—1 **6 Claims**

1. The method for detecting hepatitis B core antigen in a material suspected of containing said antigen which comprises contacting said material in a system with antibodies to A-2 plaque virus thereby to cause said antigen if present to cross-react with said antibodies, and then determining whether said cross-reaction has occurred.

4. The method for detecting hepatitis B core antibody in a material suspected of containing said antibody which comprises contacting said material in a system with A-2 plaque virus antigen thereby to cause said antibody if present to cross-react with said antigen, and then determining whether said reaction has occurred.

4,100,268

PREPARATION OF GENTAMICIN SENSITIZED PARTICLES FOR AGGLUTINATION TESTS

George H. Scherr, Park Forest, Ill., assignor to Technam, Inc., Park Forest South, Ill.

Filed Mar. 8, 1976, Ser. No. 664,506

Int. Cl.² A61K *39/00;* **G01N** *31/00, 33/16*

U.S. Cl. 424—12 **16 Claims**

1. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling the resultant gentamicin-protein moiety to washed red blood cells, resulting in a particle consisting essentially of the protein, the red blood cell and coupled gentamicin.

8. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling said gentamicin-protein moiety to microbial cells.

13. A process for the preparation of an agglutinable gentamicin-macromolecule-carrying particle which process comprises covalently coupling gentamicin to a protein with a carbodiimide derivative and adsorbing or covalently coupling said gentamicin-protein moiety to inert polymer particles.

4,100,269

ANTICALCULUS DENTIFRICE

Morton Pader, Teaneck, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 374,351, Jun. 28, 1973, abandoned, which is a continuation of Ser. No. 125,389, Mar. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 800,008, Mar. 17, 1969, abandoned. This application May 6, 1977, Ser. No. 794,532

Int. Cl.² A61K *7/16, 7/22, 7/24, 31/315*

U.S. Cl. 424—49 **31 Claims**

1. A method for the control of calculus on tooth surfaces comprising contacting the tooth surfaces at regular intervals with at least one physiologically acceptable zinc compound selected from the group consisting of zinc tribromosalicylanilide, zinc-2-hexyl-5-chlorosalicylanilide, zinc soap of the C_8 to C_{22} fatty acids, zinc carbonate, zinc benzoate, zinc dl-lactate trihydrate, zinc citrate, zinc hexafluorosilicate, zinc stannate and zinc silicate, in a physiologically acceptable carrier therefor, said carrier being selected from the group consisting of a mouthwash and a dentifrice composition wherein the abrasives in said dentifrice compositions are substantially free of phosphate and calcium, and wherein said dentifrice has a minimum dentin abrasion value of about 50, the concentration of said zinc compound being effective to reduce the rate of accumulation of calculus, and wherein the maximum concentration of zinc is about 5% by weight of the total composition.

4,100,270

ANTIBACTERIAL ORAL COMPOSITION

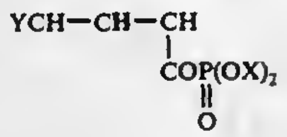
Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,781

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **12 Claims**

1. An oral composition comprising an oral vehicle, a nitrogen containing antibacterial antiplaque agent tending to stain dental surfaces selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms and a water soluble polymeric polyphosphonic compound antistain additive having the recurring group:



$$\begin{array}{l} \text{YCH—CH—CH} \\ \qquad\qquad\quad | \\ \qquad\qquad\text{COP(OX)}_2 \\ \qquad\qquad\qquad \| \\ \qquad\qquad\qquad \text{O} \end{array}$$

wherein X is selected from the group consisting of hydrogen and an orally acceptably action and Y is selected from the group consisting of hydrogen and CH_3, and the unphosphonated recurring groups of said compound have a total molecular weight of at least about 3,500.

4,100,271

CLEAR, WATER-MISCIBLE, LIQUID PHARMACEUTICAL VEHICLES AND COMPOSITIONS WHICH GEL AT BODY TEMPERATURE FOR DRUG DELIVERY TO MUCOUS MEMBRANES

Joseph Z. Krezanoski, Los Altos, Calif., assignor to Cooper Laboratories, Inc., Parsippany, N.J.

Filed Feb. 26, 1976, Ser. No. 661,612

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **17 Claims**

1. A method of therapeutically treating the symptoms of Sjogren's syndrome, ophthalmic edema and eye irritation in a mammal, comprising, topically administering to affected eyes of such mammal, a pharmaceutical composition which consists of a clear, water-miscible, physiologically acceptable, liquid composition which gels to a thickened, non-flowing and adhering consistency at human body temperature, the composition comprising an aqueous solution of a polyoxyethylenepolyoxypropylene block copolymer and having a gel transition temperature in the range of from about 25° to about 40° C.

4. A method of medicinally treating a mucous membrane condition in need of pharmacologic treatment comprising contacting such mucous membrane with a clear, water-miscible, physiologically acceptable, liquid composition which gels to a thickened, non-flowing and adhering consistency after contact with the mucous membrane, the liquid composition comprising a pharmacologically effective amount of a chemical material which is pharmacologically active against said condition, and a pharmaceutical vehicle which is a clear, water-miscible, physiologically acceptable liquid having a gel transition temperature in the range of from about 25° to about 40° C.

4,100,272

METHOD OF INCREASING THE RESISTANCE OF SWINE TO SWINE DYSENTERY INFECTION

Robert D. Glock; Delbert L. Harris, and Kent J. Schwartz, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 31, 1977, Ser. No. 801,745

Int. Cl.² A61K *39/02*

U.S. Cl. 424—92 **6 Claims**

1. The method of increasing the resistance of swine to swine dysentery infection, characterized by parenterally administering to swine while free of active awine dysentery infection at least 1 × 10^9 killed cells of a virulent isolate of *Treponema hyodysenteriae.*

4,100,273

ANTIBIOTIC SUBSTANCE FROM *ACTINOPLANES SARVEPARENSIS* CBS 305.76 (ANTIBIOTIC L 13365)

Hermes Pagani; Francesco Parenti; Carolina Coronelli, and Giorgio Tamoni, all of Milan, Italy, assignors to The Dow Chemical Company, Milan, Italy

Filed May 31, 1977, Ser. No. 802,215

Claims priority, application United Kingdom, Jun. 29, 1976, 26934/76

Int. Cl.² A61K *35/74*

U.S. Cl. 424—117 **3 Claims**

1. Antibiotic L 13365, said antibiotic having the following characteristics:

(a) Melting point: 210° C;

(b) Approximate elemental composition of 51.35 percent carbon, 5.05 percent hydrogen, 10.50 percent nitrogen, 11.05 percent sulfur and 22.05 percent oxygen;

(c) Ultraviolet spectrum: characteristic ultraviolet absorption bands in the following solvent systems

Solvent	λ_{max} (nm)	$E^{1\%}_{1cm}$
Hydrochloric acid 0.1N	360	103
	290 (shoulder)	
	237	326
Buffer 0.15 M	408 (shoulder)	
pH 7.5	378	67
	290 (shoulder)	
	237	326
Buffer 0.15 M	408	99
pH 8.8	290 (shoulder)	
	238	336

(d) Infrared spectrum: characteristic infrared absorption bands in nujol at the following frequencies (cm^{-1}): 3400 (shoulder), 3350, 3200 (shoulder), 3100 (sharp), 2930 and 2870 (nujol), 2800–2400, 2380 (atmospheric carbon dioxide), 1750 (sharp), 1670 (sharp), 1620 (sharp), 1540 (sharp), 1480 (sharp), 1460 and 1380 (nujol), 1420 (sharp), 1340 (sharp), 1320 (sharp), 1280 (sharp), 1240 (sharp), 1195 (sharp), 1170 (sharp), 1145 (sharp), 1120 (sharp), 1075 (broad), 1015 (sharp), 990 (sharp), 935 (sharp), 920 (broad), 900 (sharp), 865 (sharp), 840 (sharp), 800 (sharp), 770 (sharp), 755 (sharp), 740 (sharp), 720 (nujol);

(e) Specific rotation: $-\alpha]_{436}^{25} = +125°$ (C = 0.8 percent in methanol:chloroform 1:1);

(f) Solubility: — Soluble in dimethylsulfoxide, dimethylformamide and in chloroform/methanol mixtures. Slightly soluble in chloroform, methanol, methanol/ethyl acetate mixtures, sodium bicarbonate solutions and glacial acetic acid; insoluble in water and in the other common organic solvents;

(g) Characteristic reactions:

Fehling	positive
Tollens	positive
$KMnO_4$	positive
H_2SO_4 conc.	dark brown color
Ninhydrin	negative
$FeCl_3$	positive
Millon	negative
Schiff	negative
Anthrone	positive
Folin Ciocalteau	negative
Elson Morgan	negative

(h) Ionizable functions: an ionizable function potentiometrically evidenced with $pK_a = 7.8$ (2-methoxyethanol:water 4:1);

(i) R.F. values: chromatography on Whatman paper No. 1; Visualization of the spots by microbiological development on *Staphylococcus aureus*

Eluting System	Rf value
Buffer pH 6.0 saturated n-butanol	0.75
Water saturated n-butanol + 2% p-toluenesulfonic acid	0.80
Water saturated n-butanol + 2% conc. ammonia	0.70
Butanol saturated buffer pH 6.0	0.0
Ammonium chloride (20% W/V in water)	0.0
n-butanol:methanol:water 40:10:20 containing 0.75 g methyl orange	0.90
n-butanol-methanol:water 40:10:30	0.90
water:acetone 1:1	0.35
water saturated ethyl acetate	0.0–0.31

Eluting System	Rf value
chloroform:methanol 85:15	0.51

4,100,274
POLYPEPTIDE

Anand Swaroop Dutta; Barrington John Albert Furr, and Michael Brian Giles, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

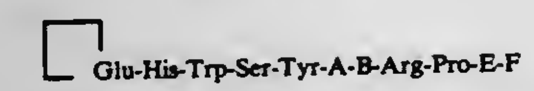
Filed Apr. 22, 1977, Ser. No. 790,003

Claims priority, application United Kingdom, May 11, 1976, 19327/76

Int. Cl.² A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **6 Claims**

1. A polypeptide of the formula:



Glu-His-Trp-Ser-Tyr-A-B-Arg-Pro-E-F

in which A is selected from the group consisting of D-Tyr(Me), D-Ser(Bu^t) and D-Phe, B is selected from the group consisting of Leu or MeLeu, E is Azgly and F is an amino radical, and the pharmaceutically- and veterinarily-acceptable acid-addition salts thereof.

4,100,275
COMPOSITIONS HAVING ANTIBIOTIC PROPERTIES

Frank Ratcliffe Atherton, Welwyn Garden City; Michael John Hall, Welwyn; Cedric Herbert Hassall, Welwyn; Peter Stuart Ringrose, Royston, and Robert Wilson Lambert, Welwyn, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 650,336, Jan. 19, 1976, Pat. No. 4,016,148. This application Jul. 21, 1976, Ser. No. 707,158

Claims priority, application United Kingdom, Jan. 27, 1975, 3417/75; Nov. 20, 1975, 47787/75

Int. Cl.² A61K *31/66, 37/14, 31/545, 35/00*

U.S. Cl. 424—211 **11 Claims**

6. An antibacterial pharmaceutical composition consisting essentially of a pharmaceutically acceptable carrier material and as the active ingredient a mixture of (1R)-1-(L-alanylamino)-ethylphosphonic acid or a pharmaceutically acceptable salt thereof and a cephalosporin selected from the group consisting of cephalothin, cephalexin, cephazolin, cefoxitin, cephamandole, cephaloridin and cephaloglycin wherein the weight ratio of (1R)-1-(L-alanylamino)-ethylphosphonic acid or a pharmaceutically acceptable salt thereof to said cephalosporin is from 1:100 to 100:1; said mixture being presented in said composition in an antibacterially effective amount.

4,100,276
FUSIDIC ACID DERIVATIVES

Welf von Daehne, Rungsted Kyst, and Poul Rodbroe Rasmussen, Frederikssund, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S, Ballerup, Denmark

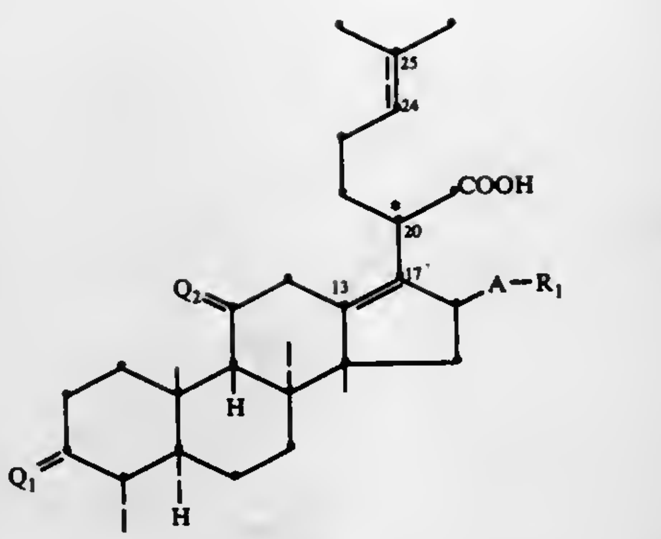
Filed Nov. 24, 1976, Ser. No. 744,978

Claims priority, application United Kingdom, Dec. 3, 1975, 49714/75; Apr. 20, 1976, 16015/76

Int. Cl.² A61K *31/56;* **C07J** *9/00*

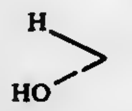
U.S. Cl. 424—238 **53 Claims**

1. A compound of the formula 1:



I

in which formula the dotted line between C-24 and C-25 indicates that the carbon atoms in question are connected by either a double bond or a single bond, and the asterix at C-20 indicates that the compounds exist in two diastereomeric forms; and in which formula Q_1 and Q_2 stand for the group



or oxygen, A represents oxygen or sulphur, and R_1 stands for a straight or branched, unsubstituted or substituted alkyl radical having from 1 to 12 carbon atoms, an alkenyl radical having from 3 to 6 carbon atoms, a cycloalkyl radical having from 3 to 7 carbon atoms in the alicyclic ring, an unsubstituted or halo- or lower alkyl-substituted phenyl-lower alkyl or phenyl radical; a naphthyl radical; or a heterocyclic radical having 5 or 6 ring atoms and containing one oxygen, sulphur or nitrogen atom; the pure diastereomers of the compounds of formula I and mixtures thereof, and pharmaceutically acceptable non-toxic salts and easily hydrolysable esters of the compounds of formula 1.

26. A pharmaceutical preparation in dosage unit form for the enteral or parenteral treatment of patients suffering from bacterial infectious diseases, which comprises as an active ingredient at least one compound of formula 1, or a pharmaceutically acceptable, non-toxic salt or an easily hydrolysable ester thereof, and an atoxic pharmaceutically acceptable carrier, the quantity of the said active compound being between 0.05 g and 1 g.

4,100,277
4,1-BENZOXAZONINE DERIVATIVES AND PROCESS THEREFOR

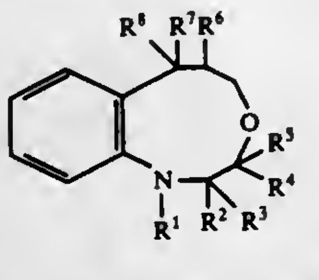
Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,778

Int. Cl.² C07D *267/00;* **A61K** *31/33*

U.S. Cl. 424—244 **31 Claims**

1. A compound of formula 1



(1)

in which R^1 is hydrogen, $CO(CH_2)_nNR^9R^{10}$ wherein n is an integer from 1 to 4 and R^9 and R^{10} each is hydrogen or lower

alkyl, or $CH_2(CH_2)_nNR^9R^{10}$ wherein n, R^9 and R^{10} are as defined herein; R^2 is hydrogen; R^3 is hydrogen; or R^2 and R^3 together are oxo; R^4 is lower alkyl; R^5 is lower alkyl or $(CH_2)_pY$ wherein p is an integer from 1 to 5 and Y is halo, lower alkoxycarbonyl or $CONR^{11}R^{12}$ wherein R^{11} and R^{12} each is hydrogen or lower alkyl; R^6 is hydrogen or lower alkyl; and R^7 is hydrogen and R^8 is amino; or R^7 is hydroxy and R^8 is hydrogen, lower alkyl or phenyl; or R^7 and R^8 together are oxo, with the proviso that when R^2 and R^3 together are oxo and R^4, R^5, R^6, R^7 and R^8 are as defined herein then R^1 is hydrogen; and with the additional proviso that when R^2 and R^3 are hydrogen and R^1, R^4 and R^6 are as defined herein then R^5 is lower alkyl; R^7 is hydroxy; and R^8 is hydrogen, lower alkyl or phenyl, or a therapeutically acceptable salt thereof.

20. A method for treating hypertension in a mammal which comprises administering to said mammal an effective antihypertensive amount of a compound selected from those of formula 1, or a therapeutically acceptable salt thereof, as claimed in claim 1.

4,100,278
NOVEL BENZAZEPINES

Lucien Nedelec, Le Raincy; Daniel Fréchet, Paris; Claude Dumont, Nogent-sur-Marne, and Marie-Helene Kannengiesser, Paris, all of France, assignors to Roussel Uclaf, Paris, France

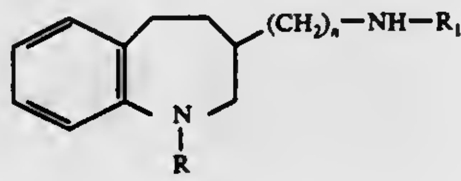
Filed Mar. 30, 1977, Ser. No. 782,747

Claims priority, application France, Mar. 31, 1976, 76 09333

Int. Cl.² A61K *31/55;* **C07D** *223/16*

U.S. Cl. 424—244 **11 Claims**

1. A compound selected from the group consisting of benzazepines of the formula



wherein *n* is 0 or 1 and R and R_1 are individually selected from the group consisting of hydrogen and methyl with the proviso that when R_1 is methyl, R is also methyl and their non-toxic, pharmaceutically acceptable acid addition salts.

9. A method of relieving depression in warm-blooded animals comprising administering to warm-blooded animals an antidepressant amount of at least one compound of claim 1.

4,100,279
Patent Not Issued For This Number

4,100,280
1,3-DIALKYL-6,7-METHOXY-1H-1,2,4-BENZOTHIADIAZINE-1-OXIDES

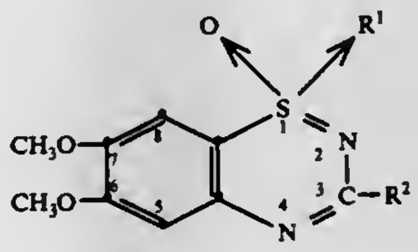
Robert D. Dillard, Zionsville, and Donald E. Pavey, Bargersville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 8, 1977, Ser. No. 822,465

Int. Cl.² C07D *285/24;* **A61K** *31/38, 31/54*

U.S. Cl. 424—246 **8 Claims**

1. A compund of the formula



wherein R^1 and R^2, individually, are C_1—C_3 alkyl, and pharmaceutically-acceptable acid addition salts thereof.

8. The method of reducing blood pressure in a mammal with elevated blood pressure and in need of treatment which comprises administering a hypotensive dose of a compound according to claim 1 sufficient to lower said elevated blood pressure in said hypertensive mammal.

4,100,281
MONO-5-SUBSTITUTED-THIO-3-CHLORO-4H-1,2,6-THIADIAZIN-4-ONE ANTIFUNGAL AGENTS

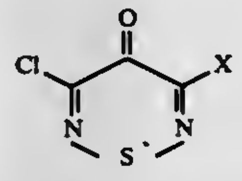
Clinton Joseph Peake; Wayne Nelson Harnish, both of Medina, and Bruce Lloyd Davidson, Middleport, all of N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 30, 1977, Ser. No. 782,816

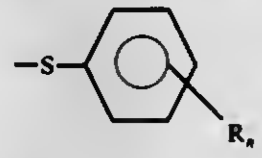
Int. Cl.² A01N *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A method for control of fungal disease of plants comprising applying to the locus where control is desired an effective fungistatic or fungicidal amount of a compound having the formula:



wherein X is alkylthio having 1 to 8 carbon atoms, phenylthio, phenyl (lower)-alkylthio, cycloalkylthio having 5 to 7 ring carbon atoms or substituted phenylthio having the formula:



wherein each R is independently lower alkyl, lower alkoxyl, lower acylamino having 1 to 4 carbon atoms, lower alkoxycarbonyl, nitro, cyano or halogen and *n* is an integar having a value of 1 to 3 inclusive, with the proviso that when R is lower alkyl or halogen *n* maybe an integer having a value of 1 to 5 inclusive.

4,100,282

N-ARYL-N'-(PHENYL- OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

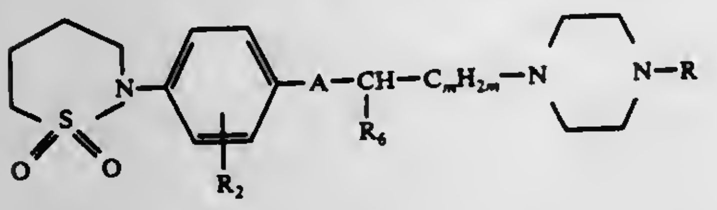
Continuation-in-part of Ser. No. 636,734, Dec. 1, 1975, Pat. No. 4,038,279, which is a continuation-in-part of Ser. No. 427,367, Dec. 21, 1973, Pat. No. 3,941,789. This application May 4, 1977, Ser. No. 793,736

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263211

Int. Cl.² C07D ***279/02;*** **A01K** ***31/54***

U.S. Cl. 424—246 **4 Claims**

1. A racemic or optically active compound of the formula



wherein

R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; tetrahydronaphthyl; indanyl; pyridyl, isoquinolyl; or thiazolyl;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

A is a single carbon-to-carbon bond or $—OCH_2—$,

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanoyloxy of 1 to 4 carbon atoms, and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. The method of depressing the central nervous system of a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective CNS-depressing amount of a compound of claim 1.

4,100,283

GROWTH PROMOTING FEED ADDITIVE OXADIAZINES

Manfred Kühne, Pfeffingen; Clemens Kocher, Therwil, and Jean Jacques Gallay, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

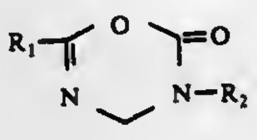
Filed Mar. 24, 1977, Ser. No. 780,897

Claims priority, application Switzerland, Apr. 1, 1976, 4066/76

Int. Cl.² A61K ***31/535***

U.S. Cl. 424—248.5 **1 Claim**

1. A process for promoting the growth of domestic animals and productive livestock which comprises administering to said animals and livestock an effective growth promoting amount of a compound corresponding to the formula



wherein

R_1 represents a 5- or 6-membered, N-, S- or O-containing heterocyclic-aromatic radical, selected from the group consisting of pyrazinyl, pyrrolyl, thiazolyl, imidazolyl, pyrimidinyl, furyl, thienyl, pyridinyl, quinolinyl, indolyl and benzofuranyl optionally substituted by halogen, lower alkyl, phenyl, nitro, cyano, $(R_3)_2NCO—$, $(R_3)_2N—$, $R_3O—$, $R_3SO_2—$, $R_3SO—$ or $R_3S—$,

R_2 represents lower alkyl, C_2–C_6 alkenyl or C_3–C_6 cycloalkyl optionally bound by way of an alkylene bridge, and

R_3 represents lower alkyl, C_2–C_6 alkenyl or alkoxyalkyl having a total of up to 8 carbon atoms, or the quaternary ammonium compounds or N-oxides of the N-containing heterocyclic-aromatic radicals.

4,100,284

1,4-DIOXO- AND 4-OXOQUINOXALINE-2-CARBOXALDEHYDE SULFONYLHYDRAZONES AND CERTAIN DERIVATIVES THEREOF

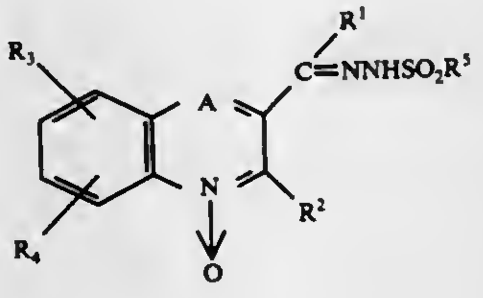
Berkeley W. Cue, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 18, 1977, Ser. No. 760,271

Int. Cl.² C07D ***239/76***

U.S. Cl. 424—250 **14 Claims**

1. A compound of the formula



wherein A is N; R^1, R^2, R^3 and R^4 are each hydrogen; and R^5 is a member selected from the group consisting of methylphenyl and methoxyphenyl.

4,100,285

N-SUBSTITUTED TRIALKOXYBENZYL PIPERAZINE DERIVATIVES

Hiromu Murai, Otsu, and Yoshiaki Aoyagi, Kyoto, both of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

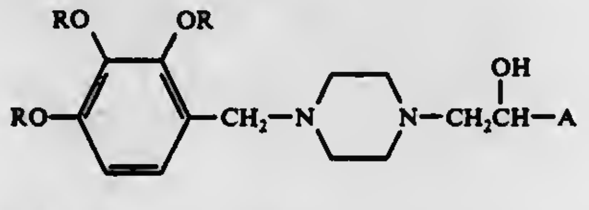
Filed Apr. 1, 1977, Ser. No. 783,561

Claims priority, application Japan, Apr. 9, 1976, 51-40782; Apr. 9, 1976, 51-40783; Apr. 9, 1976, 51-40784

Int. Cl.² C07D ***295/08, 413/06***

U.S. Cl. 424—250 **15 Claims**

1. A compound of the formula:



wherein each

R independently of the other is methyl or ethyl; and

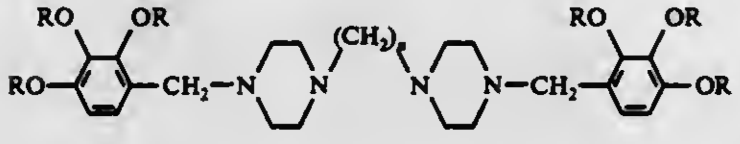
A is hydrogen, methyl, ethyl, hydroxymethyl, phenyl, naphthyloxymethyl or phenoxymethyl unsubstituted or substituted by chloro, bromo, fluoro, hydroxy, methoxy, ethoxy, benzyloxy or alkyl of 1 to 4 carbon atoms,

and the pharmaceutically acceptable acid addition salts thereof.

12. A pharmaceutical composition useful for improving the cardiovascular activity of a human or animal, which comprises a therapeutically effective amount of the compound of claim 1 in combination with a pharmaceutical carrier.

14. The compound N-(2,3,4-trimethoxybenzyl)-N'-(2-morpholinoethyl)piperazine, or the trihydrochloride salt thereof.

15. A compound of the formula:



wherein each

R is independently methyl or ethyl; and *n* has a value of from 2 to 8,

and the pharmacetically acceptable acid addition salts thereof.

4,100,286

2-(SUBSTITUTED HETEROCYCLIC AMINE)BENZOIC ACIDS

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Villebon-/Yvette; Jean-Claude Poignant, Bures/Yvette, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Suresnes, France

Filed Nov. 15, 1976, Ser. No. 741,740

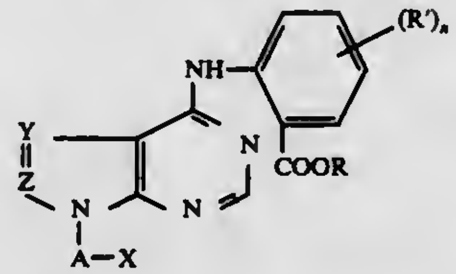
Claims priority, application United Kingdom, Nov. 19, 1975, 47618/75

Int. Cl.² A61K ***31/505, 31/52;*** **C07D** ***473/00, 487/04***

U.S. Cl. 424—251 **10 Claims**

1. A compound selected from the group consisting of:

(A) heterocyclic compounds of the formula I



I

wherein:

one of Y and Z is CH and the other is nitrogen;

A is selected from the group consisting of straight and branched saturated acyclic hydrocarbon chains having from 2 to 6 carbon atoms inclusive;

X is selected from the group consisting of chlorine, hydroxy, alkoxy and alkylthio each having from 1 to 5 carbon atoms inclusive;

R is selected from the froup consisting of hydrogen, alkyl, hydroxyalkyl and dihydroxyalkyl each having from 1 to 3 carbon atoms inclusive;

R' is selected from the group consisting of halogen, alkyl and alkoxy each having from 1 to 3 carbon atoms inclusive, and

n is selected from the group consisting of 0, 1 and 2; and

(B) physiologically tolerable addition salts thereof.

10. A pharmaceutical composition, in unit dosage form, useful in treating convulsions and like CNS disorders of a depressive nature, comprising a pharmaceutically-acceptable carrier and a compound according to claim 1 as active ingredient in an amount effective for the said purpose, at least 10 mg per unit dosage form.

4,100,287

PYRIMIDINE DERIVATIVE

Andre Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Aug. 30, 1977, Ser. No. 829,004

Claims priority, application United Kingdom, Sep. 3, 1976, 36523/76

Int. Cl.² A61K ***31/505;*** **C07D** ***239/42***

U.S. Cl. 424—251 **5 Claims**

1. N-2, 6-dichlorophenyl-2-aminopyrimidine.

4. A therapeutic composition having analgesic activity, said therapeutic composition comprising a carrier and an effective amount of N-2, 6-dichlorophenyl-2-aminopyrimidine.

4,100,288

N-TETRAHYDROFURFURYL-NOROXYMORPHONES, THEIR SALTS, AND ANALGESIC COMPOSITIONS AND METHODS EMPLOYING THEM

Herbert Merz, Ingelheim am Rhein; Gerhard Walther, Bingen (Rhein); Adolf Langbein, Ingelheim am Rhein; Klaus Stockhaus, Bingen (Rhein), and Helmut Wick, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Aug. 13, 1976, Ser. No. 714,045

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1975, 2538075

Int. Cl.² A61K ***31/485;*** **C07D** ***489/08***

U.S. Cl. 424—260 **3 Claims**

1. N-(R-tetrahydrofurfuryl)-noroxymorphone or a non-toxic, pharmacologically acceptable acid addition salt thereof.

2. An analgesic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic amount of a compound of claim 1.

3. The method of relieving pain in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic amount of a compound of claim 1.

4,100,289

AMIDIC DERIVATIVES OF NICOTINIC ACID AS THERAPEUTICS

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau, Italy

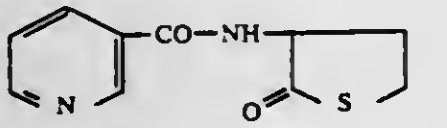
Division of Ser. No. 668,498, Mar. 19, 1976, Pat. No. 4,021,433, which is a continuation-in-part of Ser. No. 451,694, Mar. 15, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,525

Int. Cl.² A61K ***31/455***

U.S. Cl. 424—266 **2 Claims**

1. (Amended) A Pharmaceutical composition for the treatment of elevated serum cholesterol, elevated serum free fatty acid levels, elevated serum lipids and/or impaired BSP clear-

ance containing as an active component thereof an effective amount of the compound homocysteine thiolactone nicotinamide:



and a non-toxic, pharmacologically acceptable salt thereof.

4,100,290

PYRIDINE-4-CARBOXYLIC ACID HYDRAZONES FOR COMBATTING PHYTOPATHOGENIC MICROORGANISMS

Karl Gatzi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

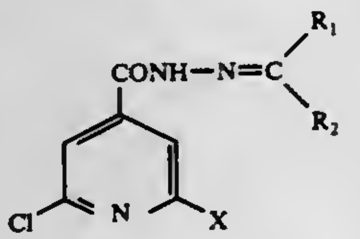
Continuation-in-part of Ser. No. 685,594, May 12, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,863

Claims priority, application Switzerland, May 14, 1975, 06192/75; Apr. 2, 1976, 04148/76

Int. Cl.² A61K *31/455;* **C07D** *213.86*

U.S. Cl. 424—266 **28 Claims**

1. A compound of formula I



wherein

X represents chlorine, methyl or methoxy

R_1 represents hydrogen or C_1-C_6-alkyl, and

R_2 represents C_1-C_6-alkyl, C_3-C_4-alkenyl, alkyl(C_1-C_4)-carbonyl or phenyl, or

R_1 and R_2 together represent a C_4-C_6-alkylene chain, whereby the total number of carbon atoms of the radicals R_1 and R_2 is three or more as well as the microbicidally effective acid addition salts thereof.

15. A method for combatting phytopathogenic microorganisms which comprises applying thereto or to the locus thereof a microbicidally effective amount of a compound as claimed in claim 1.

4,100,291

NOVEL 1,4-BENZODIOXANES

Francois Clemence, Paris, and Daniel Humbert, Fontenay-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

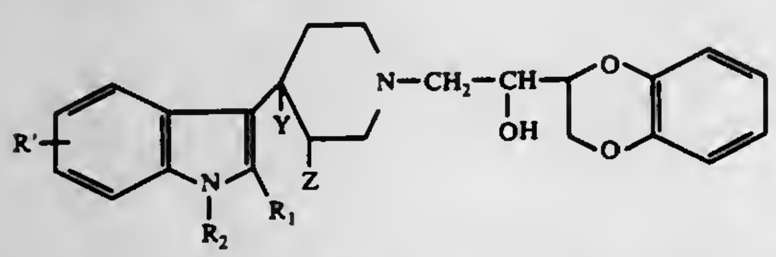
Filed Apr. 28, 1977, Ser. No. 791,927

Claims priority, application France, Apr. 30, 1976, 76 12941

Int. Cl.² C07D *319/20*

U.S. Cl. 424—267 **19 Claims**

1. A compound selected from the group consisting of 1,4-benzodioxanes of the formula



wherein R′ is selected from the group consisting of hydrogen, alkoxy of 1 to 5 carbon atoms, chlorine, bromine and fluorine, R_1 and R_2 are individually selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and Y and Z are hydrogen or together form a double bond in the form of their racemic mixtures or optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts.

4,100,292

2-[N-PHENYL-N-(CYCLOALKYL-METHYL)-AMINO]-2-IMIDAZOLINES AND SALTS THEREOF

Helmut Stähle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein; Klaus Stockhaus, Bingen am Rhein; Wolfgang Hoefke, Budenheim, and Franz Josef Köhn, Bingen am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

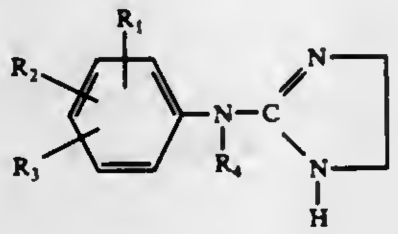
Filed Aug. 12, 1977, Ser. No. 824,044

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636732

Int. Cl.² C07D *233/50;* **A61K** *31/415*

U.S. Cl. 424—273 R **4 Claims**

1. A compound of the formula



wherein

R_1, R_2 and R_3 are hydrogen, fluorine, chlorine, bromine, methyl, ethyl, methoxy, trifluoromethyl or cyano; and

R_4 is (cycloalkyl of 3 to 6 carbon atoms)-methyl; and non-toxic, pharmacologically acceptable acid addition salts thereof.

4. The method of relieving pain in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic amount of a compound of claim 1.

4,100,293

TREATMENT OF HEPATIC DISORDERS WITH THERAPEUTIC COMPOSITIONS COMPRISING KETO ANALOGS OF ESSENTIAL AMINO ACIDS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 461,222, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 355,327, Apr. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 270,986, Jul. 12, 1972, abandoned. This application Mar. 23, 1976, Ser. No. 669,589

Int. Cl.² A61K *31/40, 31/19, 31/195*

U.S. Cl. 424—274 **25 Claims**

1. A composition for improving nitrogen balance in patients having hepatic disorders comprising a mixture in form for oral or parenteral administration to adults suffering from such disorders, said composition consisting essentially of the components in the following approximate proportions by weight:

0.0 to 3.0 grams	phenylpyruvic acid; sodium or calcium salt
4.0 to 8.0 grams	alpha-ketoisovaleric acid; sodium or calcium salt
3.0 to 5.0 grams	alpha ketoisocaproic acid; sodium or calcium salt
0.0 to 3.0 grams	alpha-keto-gamma-methylthiobutyric acid; sodium or calcium salt
2.0 to 4.0 grams	alpha-keto-beta-methylvaleric acid; sodium or calcium salt
~0 to 0.1 gram	L-tryptophan
~0 to 0.4 gram	L-threonine
~0 to 0.4 gram	L-lysine monohydrochloride
1.0 to 4.0 grams	L-arginine.

4,100,294

5-(HYDROXY (SUBSTITUTED) METHYL)-2,3-DIHYDROBENZO FURAN-2-CARBOXYLIC ACID AND ITS DERIVATIVES

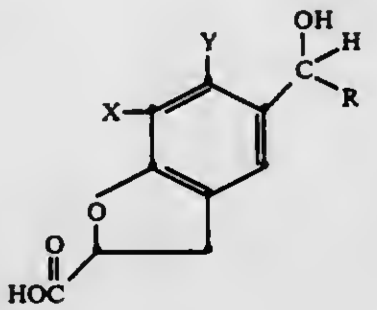
Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., and William Hoffman, both of Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 6, 1976, Ser. No. 747,840

Int. Cl.² C07D *307/82;* **A61K** *31/18, 31/34, 31/425*

U.S. Cl. 424—275 **14 Claims**

1. A compound having the formula:



wherein

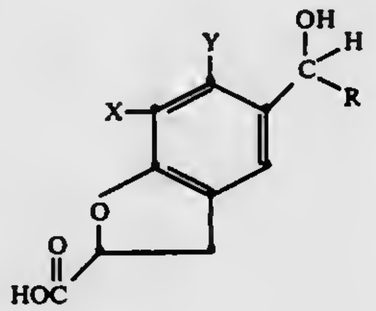
X is halo, methyl or hydrogen;

Y is halo or methyl and

X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; benzyl or mono- or di-nuclear substituted benzyl wherein the substituent is halo, methyl, methoxy or trifluoromethyl, 2-thienyl, 3-thienyl, 5-methyl-2-thienyl, 1,2,5-thiadiazolyl, 3-methyl-1,2,5-thiadiazolyl, 2-furyl, 3-furyl, and 5-methyl-2-furyl, and the non-toxic pharmaceutically acceptable salt, lower alkyl ester and the mono or di lower alkyl, piperidine and morpholine amides thereof.

7. A pharmaceutical composition comprising a therapeutically effective amount of a compound of the formula of



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl,

X and Y can be combined to form a hydrocarbylene radical of from 3 or 4 carbon atoms,

R is phenyl or mono or disubstituted phenyl wherein the substituent is halo, methyl, trifluoromethyl or methoxy; benzyl or mono- or di-nuclear substituted benzyl wherein the substituent is halo, methyl, methoxy or trifluoromethyl, 2-thienyl, 3-thienyl, 5-methyl-2-thienyl, 1,2,5-thiadiazolyl, 3-methyl-1,2,5-thiadiazolyl, 2-furyl, 3-furyl, and 5-methyl-2-furyl, and the non-toxic pharmaceutically acceptable salt, lower alkyl ester and the mono or di lower alkyl, piperidine and morpholine amides thereof and a pharmaceutically acceptable carrier.

4,100,295

DIOXANE OXIME COMPOUNDS AND PESTICIDAL DIOXANE CARBAMOYLOXIME DERIVATIVES

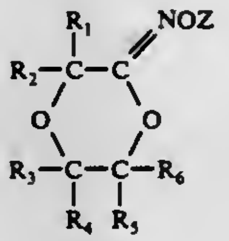
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 699,960, Jun. 25, 1976, Pat. No. 4,062,969. This application Aug. 1, 1977, Ser. No. 820,613

Int. Cl.² A01N *9/28*

U.S. Cl. 424—278 **21 Claims**

1. A compound of the formula:

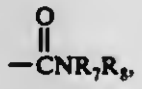


wherein:

R_1 and R_2 are individually hydrogen or alkyl;

R_3, R_4, R_5, and R_6 together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substitutents selected from among fluoro, bromo, chloro, nitro, alkyl, cyano, alkoxy alkylthio or trihalomethyl groups;

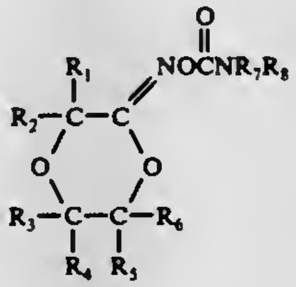
Z is hydrogen or



$$-\overset{O}{\overset{\|}{C}}NR_7R_8,$$

wherein R_7 and R_8 are individually hydrogen or alkyl or when R_7 is alkyl, R_8 may also be alkanoyl or haloalkanoyl; with the proviso that R_1 R_2, R_3, R_4, R_5, R_6, R_7 and R_8 substituents individually may not include more than eight aliphatic carbon atoms.

10. An insecticidal and miticidal composition comprising an acceptable carrier and or the active toxicant and insecticidally or miticidally effective amount of a compound of the formula:



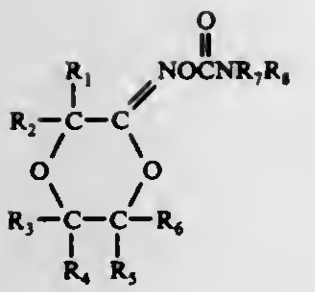
wherein:

R_1 and R_2 are individually hydrogen or alkyl;

R_3, R_4, R_5 and R_6 together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substituents selected from among fluoro, bromo, chloro, nitro, alkyl, cyano, alkoxy, alkylthio or trihalomethyl groups.

R_7 and R_8 are individually hydrogen or alkyl or when R_7 is alkyl, R_8 may also be alkanoyl or haloalkanoyl; with the proviso that R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 substituents individually may not include more than eight aliphatic carbon atoms.

16. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:

R$_1$ and R$_2$ are individually hydrogen or alkyl;

R$_3$, R$_4$, R$_5$ and R$_6$ together form an alkenylene chain completing a benzene ring which may be optionally substituted with from 0 to 4 substituents selected from among fluoro, bromo, chloro, nitro, alkyl, alkanoxy, alkylthio or trihalomethyl groups;

R$_7$ and R$_8$ are individually hydrogen or alkyl or when R$_7$ is alkyl R$_8$ may also be alkanoyl or haloalkanoyl; with the proviso that R$_1$, R$_2$, R$_3$, R$_4$, R$_5$, R$_6$, R$_7$ and R$_8$ substituents individually may not include more than eight aliphatic carbon atoms.

4,100,296
DIOXOLANE DERIVATIVES

Saleem Farooq, Aesch, and Friedrich Karrer, Zofingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

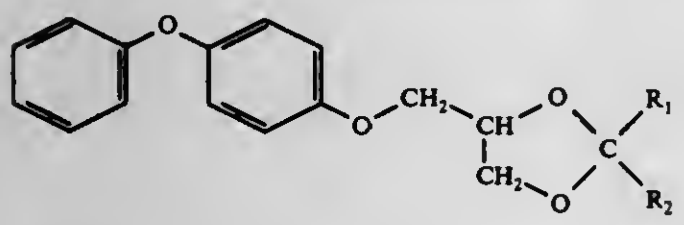
Filed Dec. 7, 1976, Ser. No. 748,268

Claims priority, application Switzerland, Dec. 12, 1975, 16154/75; Dec. 24, 1975, 16784/75; Nov. 15, 1976, 14351/76

Int. Cl.^{2} A61K *31/335;* C07D *317/10;* A01N *9/28*

U.S. Cl. 424—278 **13 Claims**

1. A compound of the general formula 1

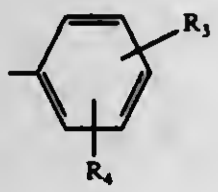


(I),

wherein

R$_1$ represents a hydrogen atom or a C$_1$-C$_4$-alkyl group,

R$_2$ represents the radical



each of R$_3$ and R$_4$ independently represents a hydrogen atom, a halogen atom, a C$_1$-C$_4$-alkyl, methoxy or ethoxy group.

11. An insecticidal and acaricidal composition comprising as active ingredient an insecticidally and acaricidally effective amount of a compound of the general formula 1 as defined in claim 1 in admixture with a suitable carrier therefor.

12. A method for controlling insects and acarids, which comprises applying to the locus thereof an insecticidally and acaricidally effective amount of at least one compound of the general formula I as defined in claim 1.

4,100,297
NOVEL ANTI-ACARID METHODS

Jean André Grandadam, Saint-Maur des Fosses, and Simone Heurtaux, Clichy-sous-Bois, both of France, assignors to Roussel Uclaf, Paris, France

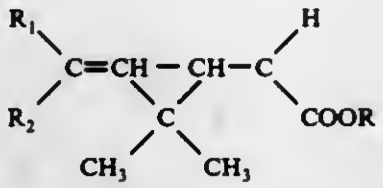
Filed Feb. 22, 1977, Ser. No. 770,303

Claims priority, application France, Feb. 19, 1976, 76 04560

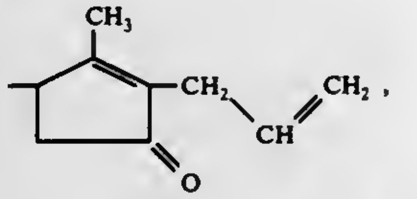
Int. Cl.^{2} A61K *31/275, 31/215*

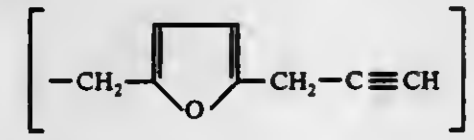
U.S. Cl. 424—304 **16 Claims**

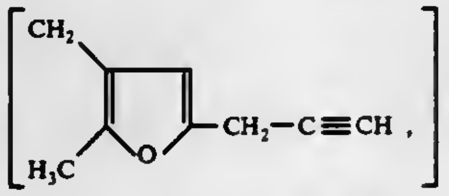
1. A method of combatting acarids in warm-blooded animals comprising topically applying to warm-blooded animals an antiacaridally effective amount of at least one compound selected from the group consisting of cis and trans, racemic and optically active isomers of a compound of the formula

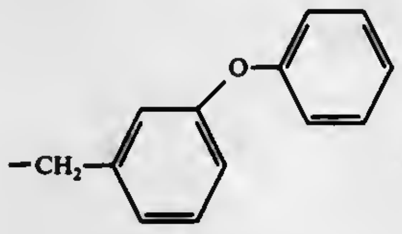


wherein R$_1$ is selected from the group consisting of hydrogen, halogen and alkyl of 1 to 8 carbon atoms, R$_2$ is selected from the group consisting of hydrogen, halogen, alkyl of 1 to 8 carbon atoms and alkoxy carbonyl of 2 to 8 carbon atoms and R$_1$ and R$_2$ taken together with the carbon atom to which they are attached form a cycloalkyl of 3 to 6 carbon atoms and R is selected from the group consisting of

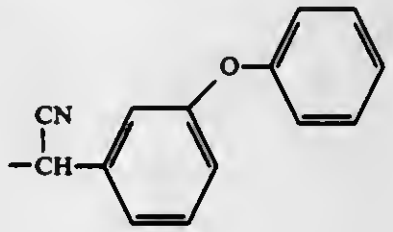








and



4,100,298
DISPIROCYCLOPROPANE CARBOXYLATE PESTICIDES

Royston H. Davis, and Robert J. G. Searle, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

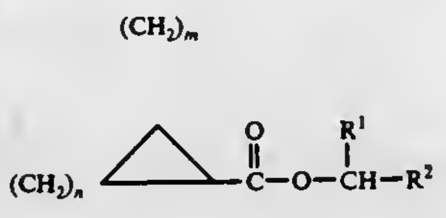
Filed Feb. 23, 1977, Ser. No. 771,236

Claims priority, application United Kingdom, Mar. 22, 1976, 11440/76

Int. Cl.^{2} A01N *9/24;* C07C *121/66;* A01N *9/20*

U.S. Cl. 424—304 **8 Claims**

1. A dispirocyclopropane carboxylate derivative of the formula



wherein *m* and *n* each independently represents an integer of from 2 to 5; R^1 represents a cyano group; and R^2 represents a phenyl group substituted by phenoxy or benzyl.

6. A method of combating insect or arachnid pests at a locus which comprises applying to the locus an insecticidally or acaracidally effective amount of a dispirocyclopropane carboxylate derivative according to claim 1 or a composition thereof.

4,100,299
PHARMACEUTICALLY ACTIVE 2-OMEGA-AMINOALKOXYDIPHENYLMETHYLMETHANES

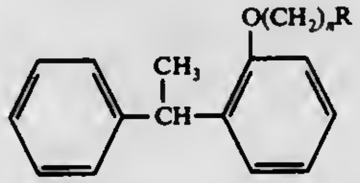
Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Shinji Tonomura, Tokyo, and Hidenobu Ikoma, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 646,521, Jan. 5, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,494

Int. Cl.^{2} A01N *9/20;* C07C *93/06*

U.S. Cl. 424—330 **11 Claims**

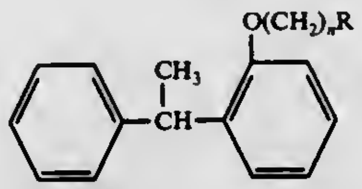
1. A compound having the formula (I):



(I)

wherein R is selected from the group consisting of amino, C$_1$-C$_5$ alkylamino and C$_2$-C$_6$ dialkylamino, and *n* is an integer of 4; or a pharmaceutically acceptable acid addition salt thereof.

8. A method for palliating conditions of depression in warm-blooded animals which comprises administering to said animal an antidepressant effective amount of a compound of the formula (I):



(I)

wherein R is selected from the group consisting of amino, C$_1$-C$_5$ alkylamino and C$_2$-C$_6$ dialkylamino, and *n* is an integer of 4; or a pharmaceutically acceptable acid addition salt thereof.

4,100,300
P-(SUBSTITUTED AND UNSUBSTITUTED-PHENYL)-1-PHENYL-2,3-BUTADIEN-1-OLS AS PHARMACEUTICAL AGENTS

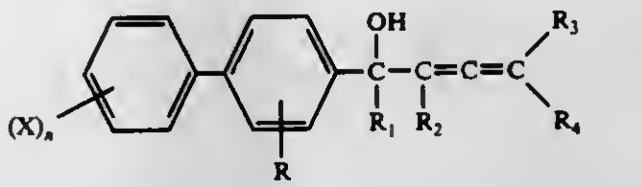
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 614,538, Sep. 18, 1975, Pat. No. 4,032,580, which is a division of Ser. No. 405,478, Oct. 11, 1973, Pat. No. 3,929,902, which is a continuation-in-part of Ser. No. 219,129, Jan. 19, 1972, abandoned. This application Feb. 17, 1977, Ser. No. 769,530

Int. Cl.^{2} A61K *31/045;* C07C *43/20*

U.S. Cl. 424—343 **13 Claims**

1. A pharmaceutical composition suitable for treating inflammation comprising a compound of the formula:



wherein

R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;

R$_1$ is a hydrogen atom or alkyl of 1 to 3 carbon atoms;

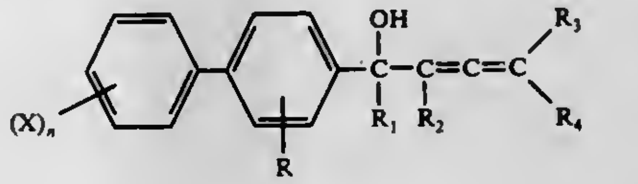
R$_2$ is a hydrogen atom or methyl; and

R$_3$ and R$_4$ are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R$_3$ and R$_4$ is a hydrogen atom when R$_2$ is methyl;

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and

n is an integer from 1 to 5 in an amount of from about 5 to 1500 milligrams; and a pharmaceutically acceptable carrier.

7. The method of treating inflammation in a mammal which comprises administering to said mammal an inflammation-relieving amount of a compound of the formula:



wherein

R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;

R$_1$ is a hydrogen atom or alkyl of 1 to 3 carbon atoms;

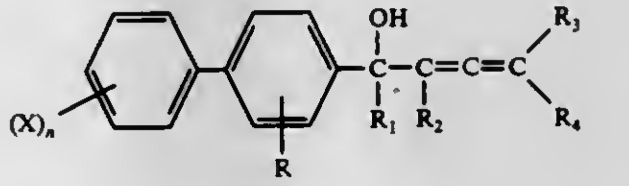
R$_2$ is a hydrogen atom or methyl; and

R$_3$ and R$_4$ are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R$_3$ and R$_4$ is a hydrogen atom when R$_2$ is methyl;

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and

n is an integer from 1 to 5.

12. The method of effecting sedation/tranquillization in a mammal which comprises administering to said mammal a sedating/tranquillizing-effective amount of a compound of the formula:



wherein

- R is a hydrogen atom, or halo having an atomic weight of from about 19 to 80;
- R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;
- R_2 is a hydrogen atom or methyl; and
- R_3 and R_4 are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R_3 and R_4 is a hydrogen atom when R_2 is methyl;
- X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and
- n is an integer from 1 to 5.

4,100,301
CHEWING GUM CONTAINING NON-DUSTING COLORS AND METHOD

Dominick R. Friello, and Raymond L. Roy, both of Danbury, Conn., assignors to Life Savers, Inc., New York, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,430

Int. Cl.^{2} A23G *3/30*

U.S. Cl. 426—3 **5 Claims**

1. A colored chewing gum comprising gum base, flavor, and a non-toxic non-dusting colorant composition dispersed substantially uniformly in and throughout said gum base, said colorant composition comprising one or more FD&C lake colors dispersed in an animal or vegetable food grade fatty acid or oil, said colorant composition being present in an amount within the range of from about 0.03 to about 3% by weight of said colored chewing gum, said chewing gum being substantially uniform in color and color intensity throughout and substantially free of color steaking.

4,100,302
CONTAINER FOR ELECTRICAL RESISTANCE COOKING

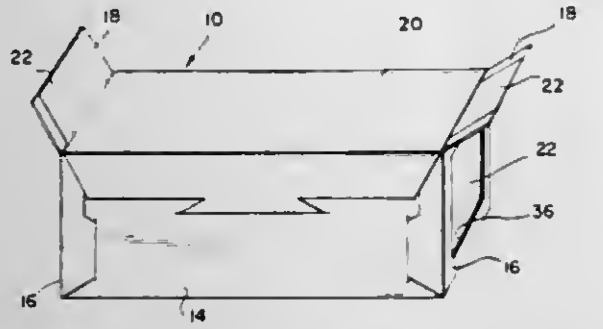
Ernst Theodore Theimer, Rumson, and George E. Heinze, East Brunswick, both of N.J., assignors to Lectrofood Corp., East Brunswick, N.J.

Continuation-in-part of Ser. No. 675,773, Apr. 12, 1976, Pat. No. 4,016,297, which is a continuation-in-part of Ser. No. 446,822, Feb. 28, 1974, Pat. No. 3,966,972. This application Dec. 3, 1976, Ser. No. 747,307

The portion of the term of this patent subseqnent to Jun. 29, 1993, has been disclaimed.

Int. Cl.^{2} B65B *25/22;* A23L *3/32*

U.S. Cl. 426—90 **12 Claims**



1. A container and composition of matter used in connection with the electrical resistance cooking of electrically high conducting food substances which comprises:

(a) An electrically insulated container which defines a food cavity having a substantially uniform longitudinal cross sectional area, and an aperture in each of its two most diametrically opposite ends;

(b) An electrical contact located at each of said diametrically opposite ends and attached to the surface of the container ends while draping the apertures and extending out of the container to a source of electrical energy;

(c) An electrically high conducting food substance within said food cavity;

(d) An electrically high conducting edible composition forming a continuous phase and coated onto and being an integral part of a portion of the electrically high conducting food substance and positioned to make intimate nonarcing contact between the electrically high conducting food substance and the electrical contacts, with the entire portion of the electrically high cooducting edible composition which is in contact with each of said electrical contacts, consisting essentially of:

(i) A gel selected from the group consisting of agar, xanthan gum, tragacanth, guar gum, gum arabic and algin gum; and

(ii) A substantially ionized species selected from the group consisting of sodium chloride, potassium chloride, ammonium chloride, magnesium chloride, sodium glutamate, potassium glutamate, sodium alginate, potassium alginate, ammonium alginate, magnesium alginate, calcium alginate, sodium bicarbonate, potassium bicarbonate, magnesium bicarbonate and calcium bicarbonate,

said electrical contacts located at each of said diametrically opposite ends being flexible electrical contacts located inside the container covering said apertures with said contacts extending outside the container along a flap at each end, said contacts being sufficiently flexible so that a plunging means can be inserted through said apertures and urge the flexible electrical contacts into form fitting contact with said electrically high conducting edible composition and said food substance, wherein the weight ratio gel to substantially ionized species is from about 1:20 up to about 20:1 and wherein the ratio of the surface area of said electrically high conducting food substance coated with said composition of gel and substantially ionized species to surface area of electrically high conducting food substance not coated being in the range of from 1:100 up to 1:10.

4,100,303
ISOPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

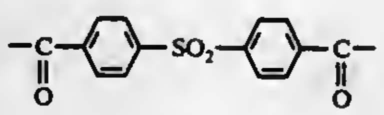
Division of Ser. No. 643,283, Dec. 22, 1975, Pat. No. 4,049,631. This application Jan. 17, 1977, Ser. No. 759,974

Int. Cl.^{2} B65D *85/00;* C12C *1/06*

U.S. Cl. 426—106 **8 Claims**

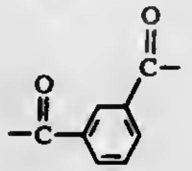
2. In a package comprising a polyester container and foodstuffs or medicines enclosed in said container, the improvement wherein said polyester container is a container formed of a polyester, the repeating units of said polyester consisting essentially of

(a)



and

(b)



and (c) $—O—CH_2—CH_2—O—$

and (d) $—O—CH_2—C(CH_3)_2—CH_2—O—$,

said polyester having an oxygen permeability of less than 15 cc·mil/100 in.^{2}·day·atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 80:20 to about 20:80 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,100,304
METHOD FOR PRODUCING AND PROCESSING FROZEN CONFECTIONS

Harlan R. Getman, Toledo, Ohio, assignor to Vroman Foods, Inc., Toledo, Ohio

Filed May 4, 1977, Ser. No. 793,635

Int. Cl.^{2} A23G *9/04, 9/24*

U.S. Cl. 426—281 **7 Claims**

1. The method of processing confections that become viscous at reduced temperatures including advancing disc-like bodies of viscous confection by a conveyor, the disc-like bodies having central voids, supplying a viscous mixture including fragments of edible solid material to regions adjacents the central voids of the disc-like bodies as the bodies are advanced by the conveyor, successively severing predetermined quantities of the mixture from the supply by a sharp instrumentality, and moving the severed quantities of the mixture by the instrumentality into the central voids in the disc-like bodies.

4,100,305
METHOD OF MAKING AN IMPROVED COFFEE VOLATILES CONCENTRATE

Richard Gregg, Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 5, 1976, Ser. No. 655,608

Int. Cl.^{2} A23C *1/06*

U.S. Cl. 426—385 **8 Claims**

1. A method for preparing a coffee volatiles concentrate from roast and ground coffee comprising the steps of:

(a) uniformly wetting a roast and ground coffee with from about 0.1 to about 0.9 parts water per part of roast and ground coffee, said water being at a temperature of from about 32° F to about 110° F while said coffee is in a turbulent state of fluidization;

(b) contacting said roast and ground coffee, while maintaining the coffee in a state of fluidization, with from about 0.005 to about 0.05 parts of cool steam, per part of roast and ground coffee, thereby to provide volatiles-laden steam and devolatilized roast and ground coffee, said contact being conducted under an absolute pressure of from about 5 to about 100 mm of mercury, the steam having a temperature of from about 32° F to about 110° F, said roast and ground coffee making contact with said steam for about 0.1 to about 45 minutes;

(c) collecting the volatiles-laden steam as a frost by condensation at a temperature of from about $-100°$ F to about $-320°$ F and at an absolute pressure of from about 0 to about 80 mm of mercury;

(d) melting the frost to form a coffee volatiles concentrate by contacting the frost with at least an equal weight of an aqueous coffee extract having a solids content of from about 25% to about 65%; and

wherein said fluidization is mechanically induced under high vacuum within a horizontal mixing shell, by mixing tools which rotate within said shell at high speeds sufficient to impart rapid but gentle motion to the fragile particles of said roast and ground coffee; said mixing tools being so designed such as to lift said fragile particles from the walls of said shell, so that rapid mixing occurs without substantial adverse effect to said fragile particles.

4,100,306
METHOD OF MAKING AN IMPROVED INSTANT COFFEE

Richard Gregg, Greenhills; James A. Weikel, Forest Park; Jayantilal M. Patel, Fairfield, and Richard F. Durchholz, Loveland, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 5, 1976, Ser. No. 655,607

Int. Cl.^{2} A23F *1/08*

U.S. Cl. 426—386 **14 Claims**

1. A method for preparing a soluble instant coffee composition from roast and ground coffee comprising the steps of:

(a) uniformly wetting a semi-bed of roast and ground coffee while the coffee is in a state of mechanical fluidization, with from about 0.1 to about 0.9 parts water per part of roast and ground coffee, said water being at a temperature of from about 32° F. to about 110° F., said roast and ground coffee having a particle size of from about 5 to about 800 microns;

(b) contacting the mechanically fluidized roast and ground coffee with from about 0.005 to about 0.05 parts steam, per part of roast and ground coffee, thereby to provide volatiles-laden steam and devolatilized roast and ground coffee, said contact being conducted under an absolute pressure of from about 5 to about 100 mm of mercury, the steam having a temperature of from about 32° F. to about 110° F., said roast and ground coffee making contact with said steam for about 0.1 to about 45 minutes;

(c) collecting the volatiles-laden steam as a frost by condensation at a temperature of from about $-100°$ F. to about $-320°$ F. and at an absolute pressure of from about 4 to about 80 mm of mercury;

(d) melting the frost to form a volatiles-laden extract by contacting the frost with at least an equal weight of an aqueous coffee extract having a solids content of from about 25% to about 65%;

(e) forming an aqueous slurry of the devolatilized roast and ground coffee and from about 2 parts to about 10 parts of water by dry weight of coffee, said slurry having a temperature of from about 80° F. to about 200° F., and gently agitating the slurry with a low shear agitation system so as to provide a substantially uniform suspension and an extract having a soluble coffee solids content of about 4% to about 15%, and wherein said soluble coffee solids are about 18% to about 27% of said roast and ground coffee on a dry weight basis, said low shear agitation system maintaining a substantially emulsion-free slurry, separating the aqueous extract from released coffee oil and extracted coffee grounds; and

(f) drying the aqueous extracts of steps (d) and (e) to dry and soluble coffee powders; and

(g) combining said powders to provide said instant coffee composition.

4,100,307
DEVICE FOR PRODUCING A PIPE JOINT HAVING AN INTERNAL GROOVE THEREIN

Teryoshi Asano, Kawagoe, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 642,632, Dec. 19, 1975, abandoned. This application Dec. 6, 1977, Ser. No. 857,945

Claims priority, application Japan, Dec. 19, 1974, 49/146369

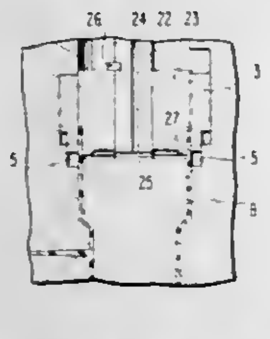
Int. Cl.^{2} B29D *23/03*

U.S. Cl. 425—533 **4 Claims**

1. An apparatus for forming a resin pipe joint having a groove on the internal surface thereof, comprising:

(a) an internal core comprising, a main core body, a projection positioned to define fluid opendings between the base of said main core body and said projection, an auxiliary core member slidable axially on said projection between at least a first position in which said auxiliary core tightly contacts the base of said main core body and a second position which defines an annular gap between said main

core body and said auxiliary core member, said gap communicating with said fluid openings, and a fluid passage in said internal core communicating with said fluid openings;
(b) an outer mold surrounding said internal core;
(c) a sleeve slidable axially on said auxiliary core and within said outer mold from a first position to a second position, said auxiliary core, said outer mold and said sleeve defining a cylindrical resin receiving space when said sleeve is in said first position and defining said cylindrical resin receiving space plus an additional bulge receiving space communicating with said cylindrical resin receiving space when said sleeve is in said second position;



(d) means for introducing resin into said cylindrical resin receiving space when said sleeve and said auxiliary core members are in their respective first positions to form a resin pipe structure;
(e) means for moving said auxiliary core member and sleeve between their respective first and second positions; and
(f) means for introducing fluid under pressure into said fluid passage at least when said sleeve and said auxiliary core members are in their respective second positions to cause said fluid to pass through said fluid openings and said annular gap and pressurize a portion of said resin pipe structure into said bulge receiving space.

4,100,308
PIZZA-LIKE SNACK FOOD DRY MIX AND PROCESS FOR MAKING SAME

Ilija Gawrilow, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 618,669, Oct. 1, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,710

Int. Cl.^{2} A21D *10/00, 10/04*

U.S. Cl. 426—554 **10 Claims**

1. Dry mix adapted for hydration with water to provide a pourable batter which when poured onto a horizontal surface and baked has a chewyness, toughness and crispness resembling traditional yeast-leavened pizza crust consisting essentially of: 65 to 80% flour, 0.5 to 4% chemical leavening agent, 0 to 4% salt, 2 to 7% of solids selected from whey or milk solids, 12 to 22% of sweetener, 0.5 to 5% of fat, 0.5 to 3% of soy flour, 0.5 to 3.5% of powdered egg whites, and 0 to 1% of flavoring agent, wherein said percentages are based on the weight of the mix; said flour being wheat bread flour having a protein content by weight in the range of about 11.5–13.5%.

4,100,309
COATED SUBSTRATE HAVING A LOW COEFFICIENT OF FRICTION HYDROPHILIC COATING AND A METHOD OF MAKING THE SAME

Michael J. Micklus, Somerville, and David T. Ou-Yang, Raritan, both of N.J., assignors to Biosearch Medical Products, Inc., Raritan, N.J.

Filed Aug. 8, 1977, Ser. No. 822,412

Int. Cl.^{2} A61M *23/00*

U.S. Cl. 427—2 **8 Claims**

1. The method of placing on a substrate a hydrophilic coating which has a low coefficient of friction when wetted with a water based liquid comprising:

applying to the substrate a solution having from about 0.4% to about 5% (weight to volume). polyisocyanate and from about 0.3% to about 10% (weight to volume). polyurethane,

evaporating the solvent,

applying a solution having from about 0.5% to about 10% (weight to volume). polyvinylpyrollidone to the thus treated substrate and then evaporating the solvent of the last mentioned solution to form a polyvinyl pyrollidone-polyurethane interpolymer.

4,100,310
METHOD OF DOPING INPURITIES

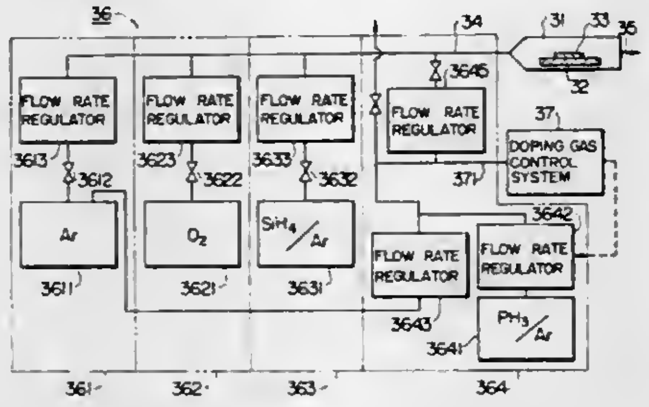
Mitsuru Ura; Takuzo Ogawa; Takaya Suzuki, all of Hitachi; Yosuke Inoue, Tokai, and Masayoshi Nomura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 14, 1976, Ser. No. 648,943

Claims priority, application Japan, Jan. 20, 1975, 50/7754

Int. Cl.^{2} B05D *5/12*

U.S. Cl. 427—8 **14 Claims**



1. In a method of doping an impurity wherein carrier gas from a carrier gas flow path, a semiconductor compound gas from a semiconductor compound gas flow path and a doping gas containing an impurity from a doping gas flow path are mixed up and led to a reaction chamber maintained at a high temperature to form a semiconductor layer doped with a predetermined impurity concentration on a substrate disposed within the reaction chamber, the improvement comprising the steps of picking up a part of said doping gas in said doping gas flow path prior to mixing of said doping gas with said semiconductor compound gas and said carrier gas and leading the part to a gas analyzer, monitoring the impurity concentration in said doping gas, and controlling the impurity concentration in said doping gas to a predetermined value sufficient to produce said semiconductor layer having said predetermined concentration.

4,100,311
PROCESS FOR CURING OF ADHESIVES FOR FLOCKING AND TEXTURING ON HEAT-SENSITIVE SUBSTRATES, BY ELECTRON-BEAM RADIATION

Samuel V. Nablo, Lexington, and Alfred D. Fussa, Needham Heights, both of Mass., assignors to Energy Sciences Inc., Bedford, Mass.

Continuation of Ser. No. 468,818, May 10, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 698,025

Int. Cl.^{2} B05D *1/14, 1/16*

U.S. Cl. 427—44 **6 Claims**

1. A process for curing the adhesive used to hold flock fiber texturing material and the like to a heat-sensitive substrate selected from the group consisting of temperature-sensitive plastics, natural fibers, wood, paper and paper-foil laminates that inherently limits the degree of thermal curing that may be employed and consequently the speed of curing, that comprises, applying an electron-curable adhesive layer of a thickness of the order of a few mils to a heatsensitive substrate, attaching a layer of said texturing material to the adhesive layer with the fibers substantially perpendicular to the layer and with the texturing material layer being of a thickness two to fifty times that of the adhesive layer, passing the assembly of substrate and adhesively secured material transversely past a predetermined elongated region extending over the coextensive width of the substrate, the adhesive layer, and the texturing material, directing unscanned electron curtain beam energy at said predetermined region upon the material at said region simultaneously throughout said region in a direction substantially parallel to the fibers throughout said region, and through the material and upon the adhesive layer substantially perpendicularly thereto throughout said region, adjusting the electron beam to produce an electron dose of the order of 2 megarads ±50% delivered to said adhesive layer throughout said region, of energy of the order of 150 keV ±30% throughout said region, and with a line speed of passing the predetermined region of the order of about 20–80 meters per minute, in order to cure the adhesive without affecting the heat-sensitive substrate.

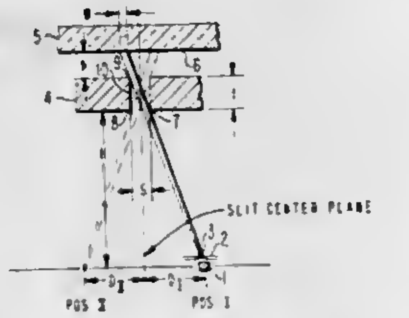
4,100,312
METHOD OF MAKING METAL-PLASTIC LAMINATES

Michael S. Lombardo, Waterbury; Elaine F. Jacovich, Cheshire; Eugene D. D'Ottavio, Thomaston, and John J. Grunwald, New Haven, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Continuation of Ser. No. 629,911, Nov. 7, 1975, abandoned, which is a continuation of Ser. No. 303,369, Nov. 3, 1972, abandoned. This application Dec. 2, 1976, Ser. No. 747,071

Int. Cl.^{2} B05D *5/12;* **B32B** *15/08*

U.S. Cl. 427—96 **11 Claims**



1. The method of producing a final laminate of a self-supported plastic substrate and a permanent metal film covering at least a part of the surface of said substrate, which comprises the steps of forming an initial laminate of the plastic substrate and a sacrificial, temporarily applied, anodized aluminum foil, wherein the interface between such aluminum foil and substrate is treated prior to lamination to provide an organic silicon compound at such interface, said silicon compound being a silane of the general formula R . $Si(R_1)_3$, wherein R is a lower alkyl amino substituted radical and R_1 is a lower alkanoxy radical, then bonding said substrate and aluminum foil together under heat and pressure to form said initial laminate, chemically stripping said aluminum foil from the initial laminate thus formed, and then metallizing at least a part of the stripped surface of the substrate to provide said final laminate.

4,100,313
PROCESS FOR FORMING AN OPTICAL WAVEGUIDE

Jacob Meyer Hammer, Trenton, N.J., and Clyde Carl Neil, Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,885

Int. Cl.^{2} B05D *5/06;* **C23C** *11/08*

U.S. Cl. 427—162 **4 Claims**

1. A process for forming an optical waveguide which comprises:
- (a) positioning an evaporator source for material to be deposited and a substrate upon which material is to be deposited on opposite sides of a mask wherein
  - (i) said material is selected from the group consisting of niobium, titanium, vanadium, chromium, manganese, iron, nickel and cobalt;
  - (ii) said substrate is selected from the group consisting of lithium tantalate and lithium niobate,
  - (iii) said mask has a slit with a width larger than the width of the stripe to be deposited and being thick relative to the width of said slit, and
  - (iv) said evaporator source is at a small acute angle relative to said slit whereby a shadowing effect reduces the effective width of said slit;
- (b) evaporatively depositing material through said slit to produce a stripe of desired width; and
- (c) diffusing the deposited material into the substrate whereby an optical waveguide is formed.

4,100,314
METHOD FOR INCREASING THE STRENGTH AND DENSITY OF CARBONACEOUS PRODUCTS

Rudolph W. Wallouch, Lewiston, N.Y., assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 29, 1977, Ser. No. 782,598

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—228 **10 Claims**

1. A method for increasing density and strength in a baked carbonaceous body, comprising: impregnating said body with a tarry hydrocarbon composition; coating said impregnated body with a thermosetting polymerizable composition, and at least partially curing said latter composition to provide an encasing shell of polymeric material about said body that is mechanically stable during a subsequent baking step to temperatures above the softening and free flowing temperatures for said impregnating composition; and thereafter baking said shell-encased body to effect carbonization of the impregnated and the encasing compositions.

4,100,315
PROCESS FOR LACQUERING METALS

Horst Lauterbach, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,540

Claims priority, application Switzerland, Apr. 13, 1976, 4672/76; Aug. 20, 1976, 10614/76

Int. Cl.^{2} B05D *1/38*

U.S. Cl. 427—379 **8 Claims**

1. A process for the production of an adhesive, non-porous film lacquer on a metal surface which comprises applying to a metal surface an aqueous composition suspension comprising a solid thermosetting synthetic resin having an average granular size between 0.1 and 10 μm and a wetting agent selected from the group consisting of an alkylphenyloxethylate in which the oxethylate has a molecular weight of about 1700, and the alkyl moiety contains 8–12 carbon atoms, and an amino coconut fatty acid oxethylate wherein the oxethylate group which has a molecular weight between about 90 and 440 is bonded to the amino group; drying; and curing said composition.

4,100,316
FORM FOR DECORATIVE WREATH

Laurie M. Lackey, 6825 Beechtree La., Falls Church, Va. 22042

Filed Jul. 14, 1977, Ser. No. 815,643

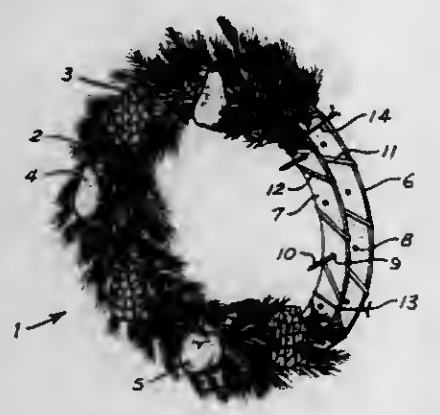
Int. Cl.^{2} A41G *1/00*

U.S. Cl. 428—10 **2 Claims**

1. A composite form for decorative wreaths comprising
- a first annular disc member having a surface whose coefficient of friction is sufficient to inhibit the movement of twigs and branches held thereagainst,
- a second annular disc member having a surface similar to said first annular disc member,
  - said second disc member being narrower than said first disc member,
  - a first elastic band spirally wound about the surface of said first disc member, whereby evergreen branches and

sprigs may be inserted between the elastic band and surface of the disc member,

a second elastic band spirally wound about the surface of said second disc-member, whereby evergreen branches and sprigs may be inserted between the elastic band and surface of the disc member; and



means for fastening together said first and second disc members in a superposed concentric relationship,

whereby more and larger evergreen branches may be added and held between the superposed disc members to produce a composite wreath having a thicker and fuller appearance as compared to the individual disc members.

4,100,317

METAL LEAF

Hiroshi Narui; Ikuo Akune, and Yoslya Kobiki, all of Kyoto, Japan, assignors to Oike & Co., Ltd., Kyoto, Japan
Continuation of Ser. No. 351,952, Apr. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 190,907, Oct. 20, 1971, abandoned. This application May 19, 1975, Ser. No. 578,817
Claims priority, application Japan, Oct. 23, 1970, 45-93740
Int. Cl.^{2} B32B *3/24, 15/08*
U.S. Cl. 428—137 **2 Claims**

1. A metal leaf having a critical self-supportability consisting of

(1) a resinous base layer having a thickness of 0.35 to 1 μ and made of at least one resin selected from the group consisting of acrylic resin, vinyl chloride-vinyl acetate copolymer, polyvinyl butyral, polycarbonate, rosin-modified maleic resin, resol-type or novolak-type phenolic resin, urea resin, melamine resin, nitrocellulose, cellulose acetate, alkyd resin, urethane resin, rosin and shellac,

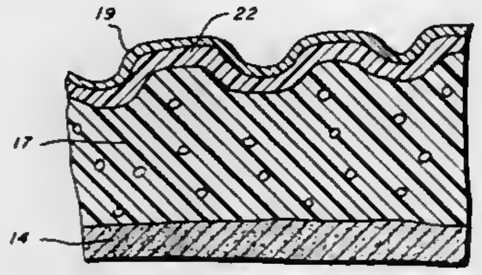
(2) a vacuum-metallized intermediate metal deposition layer a metal selected from the group consisting of gold, silver, aluminum and copper, having a thickness of 0.03 to 0.1 μ, and

(3) a resinous top layer having a thickness of 0.35 to 1 μ and made of at least one resin selected from the group consisting of acrylic resin, vinyl chloride-vinyl acetate copolymer, polyvinyl butyral, polycarbonate, rosin-modified maleic resin, resol-type or novolak-type phenolic resin, urea resin, melamine resin, nitrocellulose, cellulose acetate, alkyd resin, urethane resin, rosin and shellac; layers (1), (2) and (3) having a thickness of 0.73 to 2.1 μ and a tensile strength of 0.01 to 1.4 kg./mm^2.

4,100,318

ACTINIC RADIATION CURED COATING FOR CUSHIONED SHEET GOODS AND METHOD

Thomas J. McCann, Hollywood, and Ernest E. Regan, Ft. Lauderdale, both of Fla., assignors to Dowdflor Corporation, Miami, Fla.
Filed Dec. 27, 1976, Ser. No. 754,431
Int. Cl.^{2} B05D *3/06*
U.S. Cl. 428—159 **38 Claims**



1. A process for producing a cushioned sheet goods product comprising the steps of:

coating a substrate with a flexible foamable vinyl composition and heating to gel the foamable composition,

applying a decorative pattern to the surface of the gelled coating,

coating a clear vinyl overlay over the decorative pattern, and passing through a high temperature oven to fuse the clear vinyl overlay and expand the foam to the required thickness,

cooling the sheet surface to a temperature which permits bonding with an actinic radiation curable coating,

applying an actinic radiation curable coating composition which is essentially solvent free and comprises at least one organic compound having at least two photopolymerizable ethylenically unsaturated groups per molecule and capable of curing upon exposure to actinic radiation to form a continuous coating,

exposing the thus coated sheet to actinic radiation until such coating has set,

thereby achieving physical properties of the actinic radiation cured coating falling within the following range;

Tensile Stength PSI: 2,000–4,000
Elongation %: Greater Than 15
Young's Modulus: 30,000–90,000

whereby the stain resistance, scratch and scuff resistance, abrasion resistance and gloss retention properties are enhanced by adding the actinic radiation curable coating.

26. A cushioned sheet goods comprising, in combination,

a flexible substrate,

a flexible foamable vinyl composition positioned atop the substrate and foamed,

a decorative pattern over the surface of the flexible foamed vinyl composition,

a clear vinyl overlay over the decorative pattern,

and a cured coating which is essentially solvent free and having at least one organic compound having at least two photo-polymerizable ethylenically unsaturated groups per molecule which is fully set,

wherein the physical properties of the cured coating fall within the following range:
Tensile Strength PSI: 2,000–4,000
Elongation %: Greater Than 15
Young's Modulus: 30,000–90,000

4,100,319

STABILIZED NONWOVEN WEB

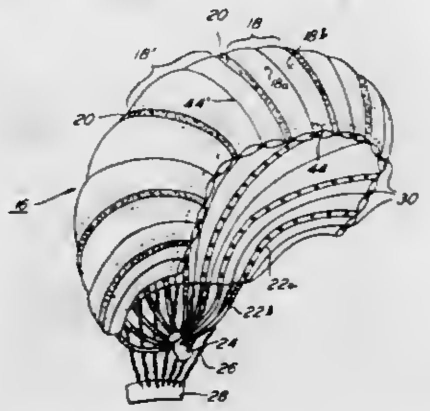
Robert J. Schwartz, Winneconne, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 595,701, Jul. 14, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 791,832
Int. Cl.^{2} D04H *1/58*
U.S. Cl. 428—171 **3 Claims**

1. A nonwoven continuous filament web of polypropylene filaments having a basis weight of about 1–3 oz./yd.^{2}, a surface abrasion resistance on both sides thereof of at least about 20, and basis weight normalized grab tensile strength of at least about 20 lbs./(ox./yd.^{2}), said web being further characterized by the presence of intermittent compressed autogenous bond regions of a size and density to provide textile-like qualities which extend through the thickness of the web with the filaments on both outer surfaces of the bond regions being substantially fused to give a film-like appearance and with the filaments within the interior of the web between both said outer fused surfaces of the bond regions being deformed without substantial fusion to provide delamination resistance.

4,100,320

CUSTOM FITTED, LIGHT WEIGHT, AIR CONDITIONED PROTECTIVE HELMET

Gloria T. Chisum, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Division of Ser. No. 463,944, Apr. 25, 1974, Pat. No. 3,956,773. This application Mar. 1, 1976, Ser. No. 662,475
Int. Cl.^{2} B32B *3/20, 3/00*
U.S. Cl. 428—188 **9 Claims**



9. A liner comprising:

a flexible sheet;

a plurality of elongated flexible cells attached side by side to said sheet, each cell forming a pair of chambers separated by a severable partition, and said chambers of said pairs respectively containing first and second components combinable to produce a foam substance;

a plurality of ventilating air ducts, each duct interposed between adjacent cells; and

severing means for removing the partition separating the two chambers, said means including paddles spanning each of said partitions at one end, and first and second strings movable within respective ones of said pairs of chambers and connected to respective ends of said paddles, said first and second strings extending from said paddles to the other end of said partitions.

4,100,321

POWDERED TONOR IMAGE CONTAINING ARTICLE

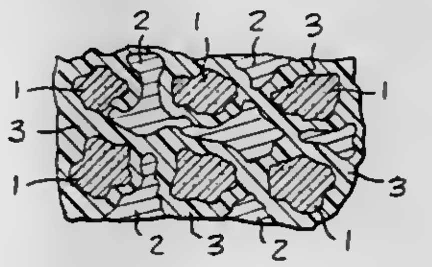
Sheldon Irwin Schlesinger, East Windsor Township, Mercer County, and Ronald J. Boszak, Trenton, both of N.J., assignors to American Can Company, Greenwich, Conn.
Division of Ser. No. 486,169, Jul. 5, 1974, Pat. No. 3,997,344. This application May 26, 1976, Ser. No. 690,307
Int. Cl.^{2} B32B *7/10, 3/00*
U.S. Cl. 428—207 **10 Claims**

1. As an article of manufacture, a composite sheet comprising a support; and, in surface contact therewith, (1) a radiation-responsive non-exposed layer portion over part of the surface of said support containing in admixture a polymer selected from the group consisting of (a) copolymers of glycidyl acrylate and allyl glycidyl ether and (b) terpolymers of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate, and, as a latent curing catalyst, an aromatic diazonium salt of a complex halogenide, said non-exposed layer being imbibed in its surface, a powdered toner applied while said mixture is in a tacky state and (2) an exposed, polymerized, cured insoluble layer portion over part of the surface of said support, said insoluble layer portion being comprised of the photopolymerization product derived from irradiation of a polymer selected from the group consisting of (a) copolymers of glycidyl acrylate and allyl glycidyl ether and (b) terpolymers of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate in the presence of an aromatic diazonium salt of a complex halogenide which decomposed upon exposure to irradiation to release a Lewis Acid effective to initiate polymerization of said polymer; said copolymer and terpolymer in both layer portions having an inherent viscosity of from about 0.09 to 0.28 and an epoxide equivalent of at least about 0.64 per 100g. of polymer, being substantially non-tacky at room temperature, tacky at an elevated temperature and convertible to a non-tacky condition upon exposure to irradiation and said diazonium salt being present in sufficient amount to initiate said polymerization.

4,100,322

FIBER-RESIN-CARBON COMPOSITES AND METHOD OF FABRICATION

Robert W. Seibold, Santa Monica; Haig S. Parechanian, Fountain Valley; William T. Weatherill, La Palma, and Robert E. Lowe, Santa Ana, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Dec. 11, 1974, Ser. No. 531,662
Int. Cl.^{2} B32B *7/00*
U.S. Cl. 428—257 **10 Claims**



1. A plastic composite having improved elevated temperature strength and good thermal insulation properties, which comprises throughout said composite a mixture of carbon and resin matrices, and fibrous reinforcement, forming a bimatrix fibrous reinforcement-carbon-resin solid composite, said carbon of said bimatrix fibrous reinforcement-carbon-resin composite being mechanically locked and adhered to said fibrous reinforcement.

4,100,323

SCRIMLESS FILTER FELT

Herman Hans Forsten, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 681,580, Apr. 29, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,361

Int. Cl.^{2} D04H *1/08*

U.S. Cl. 428—280 **4 Claims**

1. A needled, dimensionally stable, scrimless filter felt comprised of at least 80% by weight poly(m-phenylene isophthalamide) staple fibers having at least a low degree of crystallinity and a staple length of 4 to 16 cm., a felt density of 0.15 to 0.4 g./cm.^{3} and an air permeability of 3 to 30 m.^{3}/min./m.^{2} (0° C. basis, pressure differential = 1.27 g./cm.^{2}), said felt having been heated at 280–350° C under restraint for 1 to 900 seconds.

4,100,324

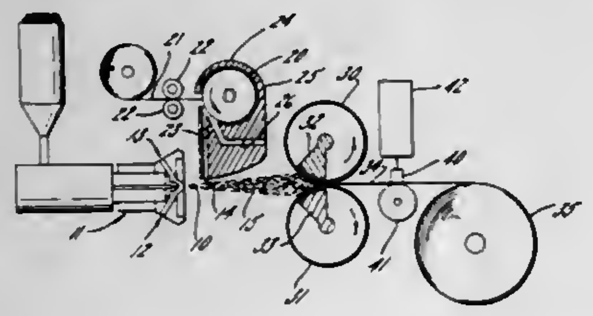
NONWOVEN FABRIC AND METHOD OF PRODUCING SAME

Richard A. Anderson, Menasha; Robert C. Sokolowski, and Kurt W. Ostermeier, both of Harrison, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 454,816, Mar. 26, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,456

Int. Cl.^{2} D04H *1/00*

U.S. Cl. 428—288 **23 Claims**



1. A nonwoven gas-formed fabric-like material having a unique combination of strength, absorbency and hand, said material consisting essentially of a gas-formed matrix of thermoplastic polymeric melt-blown microfibers having an average fiber diameter of less than about 10 microns, and a multiplicity of individualized and gas-formed wood pulp fibers disposed throughout said matrix of microfibers and engaging at least some of said microfibers to space the microfibers apart from each other, said wood pulp fibers being interconnected by and held captive within said matrix of microfibers by mechanical entanglement of said microfibers with said wood pulp fibers, the mechanical enganglement and interconnection of said microfibers and wood pulp fibers alone forming a coherent integrated fibrous structure.

4,100,325

WEATHER RESISTANT COMPOSITES

James William Summers, Bay Village, and George Joseph Kliner, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 13, 1976, Ser. No. 749,939

Int. Cl.^{2} B32B *27/08;* **B44D** *1/44*

U.S. Cl. 428—334 **18 Claims**

1. A weatherable composite adapted for outdoor exposure comprising;

- a. A capstock containing:
  - (1) vinyl chloride polymer having an inherent viscosity of from about 0.45 to about 1.2,
  - (2) at least 6 parts by weight of titanium dioxide per 100 parts by weight of vinyl chloride polymer,
  - (3) from about 10 to less than about 35 parts by weight of a plasticizer per 100 parts by weight of vinyl chloride polymer, and
- b. A substrate selected from the group consisting of rigid vinyl chloride polymers, chlorinated vinyl chloride polymers, and acrylonitrile-butadiene-styrene polymers.

4,100,326

METHOD FOR TREATING A MAGNETIC RECORDING MEDIUM

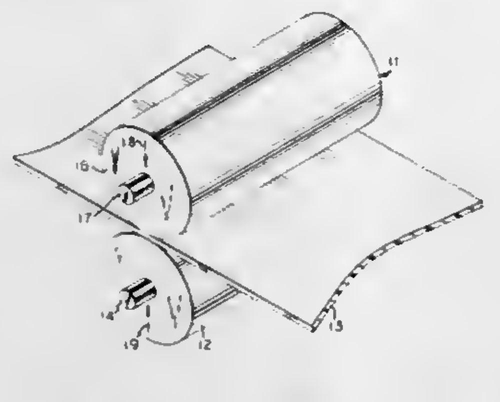
Masashi Somezawa; Shigetaka Higuchi, both of Sendai; Tatsuo Shimizu, and Isao Ishibashi, both of Tagajo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 439,231, Feb. 4, 1974, abandoned. This application Jul. 11, 1975, Ser. No. 595,086

Claims priority, application Japan, Feb. 3, 1973, 48-13968

Int. Cl.^{2} H01F *10/02*

U.S. Cl. 427—130 **6 Claims**



1. A dry-calendering method of treating a magnetic tape formed of a flexible base of non-magnetic material supporting a magnetic layer containing finely-divided magnetic particles dispersed in a flexible binder to have low surface roughness and a high density of magnetic particles comprising the steps of passing said tape, in the absence of an introduced lubricant, between a metal roll and an elastic roll having a polyurethane cylindrical surface with a hardness of no less than approximately 70° measured in Shore D, the temperature of said metal roll being in the range of approximately 40° C. to approximately 200° C. at the cylindrical surface thereof, and the pressure between said rolls being in the range from approximately 50 Kg/cm to approximately 500 Kg/cm, the metal roll contacting said magnetic layer and the elastic roll contacting said flexible base.

4,100,327

ORGANO-SULFUR COMPOSITION FOR FORMING THERMOPARTICULATING COATING

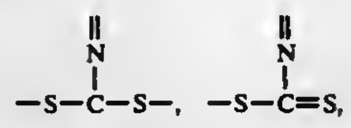
James D. B. Smith, Wilkins Township, Allegheny County; Joseph F. Meier, Export, and David C. Phillips, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 24, 1976, Ser. No. 699,561

Int. Cl.^{2} B32B *27/38;* **C08K** *5/01, 5/06, 5/07*

U.S. Cl. 428—339 **14 Claims**

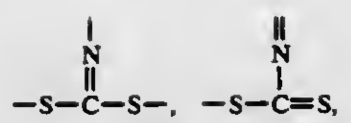
1. A composition comprising about 20 to about 250 phr of at least one non-metallic, non-ionic (covalent) organo-sulfur compound containing the group



$$-\mathrm{S}-\overset{\overset{\|}{\mathrm{N}}}{\overset{|}{\mathrm{C}}}-\mathrm{S}-,\quad -\mathrm{S}-\overset{\overset{\|}{\mathrm{N}}}{\overset{|}{\mathrm{C}}}=\mathrm{S},$$

or mixtures thereof, and a solution of a resinous carrier curable at room temperature and stable at 60° C, and unreactive with said organo-sulfur compound at its thermoparticulation temperature.

12. A thermoparticulating coating comprising a solid layer of a cured resinous carrier containing about 20 to about 250 phr of a non-metallic, non-ionic (covalent) organo-sulfur compound containing the group



$$-\mathrm{S}-\overset{\overset{|}{\mathrm{N}}}{\overset{\|}{\mathrm{C}}}-\mathrm{S}-,\quad -\mathrm{S}-\overset{\overset{\|}{\mathrm{N}}}{\overset{|}{\mathrm{C}}}=\mathrm{S},$$

or mixture thereof, said resinous carrier being curable and stable at 60° C, and unreactive with said organo-sulfur compound at its thermoparticulation temperature.

13. A coating according to claim 12 which is about 1/16 to about ½ inches thick.

4,100,328

BINDER COMPOSITION AND PROCESS FOR PREPARING PRESSURE MOLDED CELLULOSIC ARTICLES

James A. Gallagher, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 4, 1976, Ser. No. 695,902

Int. Cl.^{2} B32B *5/16;* **C08L** *1/00;* **B29J** *5/04*

U.S. Cl. 428—407 **15 Claims**

1. A molding composition suitable for forming a shaped article comprising wood particles having about 2 to about 20% by weight moisture based upon the dry weight of said wood particles and a binder composition capable of being crosslinked coated onto said wood particles and present in the proportion of about 0.5 to about 50% based upon the dry weight of said wood particles, said binder consisting essentially of the mixture of an organic polyisocyanate and 0.5 to about one equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate, said polyol having a functionality greater than 2 wherein said molding composition contains no catalyst and is used in the absence of a mold-release agent.

8. A particle board comprising comminuted wood particles, said particles having about 2 to 20% by weight moisture based upon the dry weight of said wood particles, and a binder coated onto said particles present in the proportion of about 0.5 to about 50% based upon the dry weight of said particles, said binder consisting essentially of the crosslinked reaction product of an organic polyisocyanate and 0.5 to about one equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate, said polyether polyol having a functionality greater than 2 and wherein said binder is utilized in the absence of a catalyst and a mold-release agent.

13. A process for molding wood particles into a discrete shaped product utilizing a binder in the absence of a catalyst and a mold-release agent comprising:

- A. comminuting wood having about 2 to about 20% by weight moisture based upon the dry weight of said wood to provide a plurality of wood particles,
- B. coating said particles with a binder mixture, said binder consisting essentially of an organic polyisocyanate having at least two active isocyanate groups per molecule and about 0.5 to about 1.0 equivalent weight of a polyether polyol based upon one equivalent weight of said organic polyisocyanate wherein said polyol is prepared by reacting a polyhydric alcohol having a functionality greater than 2 with an alkylene oxide and wherein said wood particles are coated with said binder in the proportion of about 0.5 to about 50% based upon the dry weight of said wood particles to form a blended material by spraying with said binder as said particles are tumbled or agitated,
- C. forming said blended material into a loose mat or felt,
- D. placing said mat in a heated press between polished metal plates, and
- E. crosslinking said mat under conditions of heat and pressure.

4,100,329

DRAFTING FILM

William A. Neithardt, Jr., Ridgefield, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Feb. 12, 1976, Ser. No. 657,521

Int. Cl.^{2} B32B *27/38*

U.S. Cl. 428—413 **6 Claims**

1. Drafting sheet material comprising a sheet support having a coating thereon of a composition comprising finely-divided pigment dispersed throughout a binder matrix comprising a cross-polymerized reaction product of (a) an acrylic or methacrylic acid ester vinyl monomer and (b) a polyene/polythiol compound blend.

4,100,330

METHOD FOR COATING GLASS WITH SILICON AND A METAL OXIDE AND RESULTING PRODUCT

Harold E. Donley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1977, Ser. No. 782,150

Int. Cl.^{2} C03C *15/00*

U.S. Cl. 428—429 **9 Claims**

1. A method for producing a coated glass article comprising the steps of:

- a. maintaining a glass substrate at a temperature of at least about 400° C. in a non-oxidizing atmosphere;
- b. contacting a surface of the glass substrate with a silane-containing gas for a sufficient time to form a silicon coating on the glass surface;
- c. maintaining the silicon coated glass at a temperature of at least about 250° C. in an oxidizing atmosphere; and
- d. contacting the silicon coated surface with a coating composition comprising a metal compound which, upon contact with the hot glass surface, thermally decomposes to form a metal oxide coating over the silicon coating on the glass surface.

8. A coated article prepared according to the method of claim 1.

4,100,331

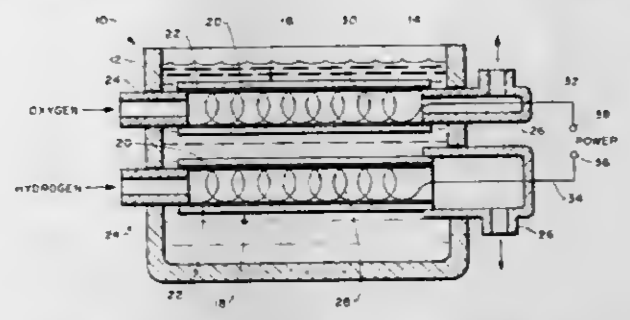
DUAL MEMBRANE, HOLLOW FIBER FUEL CELL AND METHOD OF OPERATING SAME

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of John D. Ingham, La Crescenta, and Daniel D. Lawson, Arcadia, both of Calif.

Filed Feb. 3, 1977, Ser. No. 765,138

Int. Cl.^{2} H01M *4/86*

U.S. Cl. 429—13 **11 Claims**



1. A gaseous fuel cell comprising in combination:

a cell enclosure containing a body of aqueous inorganic acid electrolyte;

a first, gas impermeable, ion-impermeable, tubular electrode formed of at least one fine, filamentary, perfluorosulfonic acid substituted polytetrafluoroethylene synthetic resin hollow fiber having ion-exchange functionality immersed in the body of electrolyte having a gas inlet and a gas outlet, a gas permeable layer of catalytic metal deposited only on the inside surface thereof and a first, high surface area current collector in contact with the catalytic deposit;

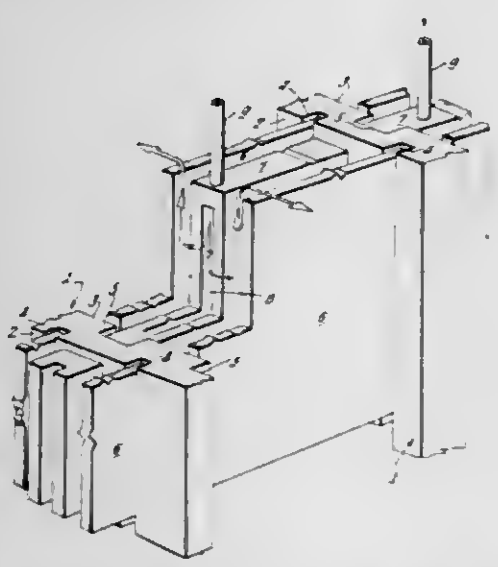
a second, gas impermeable, ion-permeable, tubular counterelectrode formed of at least one fine, filamentary, perfluorosulfonic acid substituted polytetrafluoroethylene synthetic resin, hollow fiber having ion-exchange functionality immersed in the body of electrolyte having a gas inlet and a gas outlet, a gas permeable layer of catalytic metal deposited on the inside surface thereof and a second high surface area current collector in contact with the catalytic deposit;

means for supplying a fuel gas to one of said inlets;

means for supplying a gaseous oxidant to the other of said inlets; and

means connected to said first and second current collectors for extracting electrical energy from the cell.

4,100,332
COMB TYPE BIPOLAR ELECTRODE ELEMENTS AND BATTERY STACKS THEREOF
Peter Carr, Utica, Mich., assignor to Energy Development Associates, Madison Heights, Mich.
Filed Feb. 22, 1977, Ser. No. 770,725
Int. Cl.^{2} H01M *4/06*
U.S. Cl. 429—27 **18 Claims**



1. An improved bipolar electrode for increasing the effective intercell distance as opposed to the actual distance between opposing electrode faces wherein the improvement comprises a comb type element comprising an electrically conductive, chemically inert, generally flat wall having first and second opposing faces, each of said first and second faces having a plurality of spaced, substantially parallel grooves therein, said spaced grooves in said first face being laterally staggered from said spaced grooves in said second face; first and second spaced and generally parallel electrodes having first edges disposed within first and second respective grooves of said spaced parallel grooves in said first face and extending generally perpendicular from the plane of said inert wall; and a third electrode having a first edge disposed within one of the spaced grooves in said second face and extending generally perpendicular from the plane of said inert wall.

4,100,333
BATTERY STRUCTURE
Ronald J. Haas, San Jose, and Donald D. Briggs, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.
Filed May 4, 1977, Ser. No. 793,907
Int. Cl.^{2} H01M *6/42*
U.S. Cl. 429—156 **3 Claims**

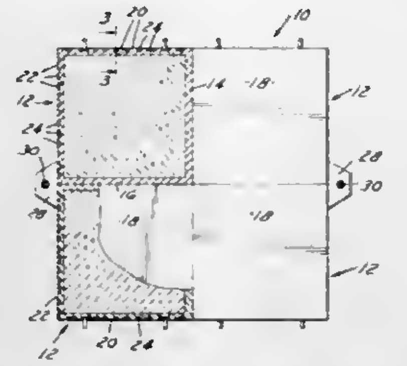
1. A battery structure which comprises:

a plurality of cells;

each cell having a plurality of nonstrengthened cell walls, such nonstrengthened cell walls contacting other nonstrengthened cell walls of other adjacent cells when said cells are in an assembled condition;

each cell also having strengthened cell walls having a strength greater than said nonstrengthened cell walls, such strengthened cell walls not contacting any cell walls of other cells when said cells are in an assembled condition;

a pair of structurally strengthened end plates located at opposite ends of said cells when said cells are in an assembled condition, said end plates providing support for any nonstrengthened cell walls of said cells coming in contact therewith; and



means for holding said cells and said structurally strengthened end plates in an assembled condition, whereby said nonstrengthened cell walls are supported by one another or by said structurally strengthened end plates and said strengthened cell walls of said cells are exposed and not supported by a contacting cell wall.

4,100,334
PROCESS FOR RENDERING POLYMERS DEGRADABLE AND POLYMERS OBTAINED THEREBY
Nicola Palladino, Monterotondo; Marcello Mazzei, Milan, and Walter Marconi, San Donato Milanese, all of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy
Continuation of Ser. No. 441,166, Feb. 11, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,889
Claims priority, application Italy, Jan. 15, 1973, 19199 A/73
Int. Cl.^{2} C08J *3/20*
U.S. Cl. 526—1 **2 Claims**

1. A process for rendering a thermoplastic, film forming polymeric material adapted for use in packaging, degradable through the direct action of sunlight, said process consisting in adding to said polymeric material from 0.1 to 3% by weight of a compound selected from the group consisting of:

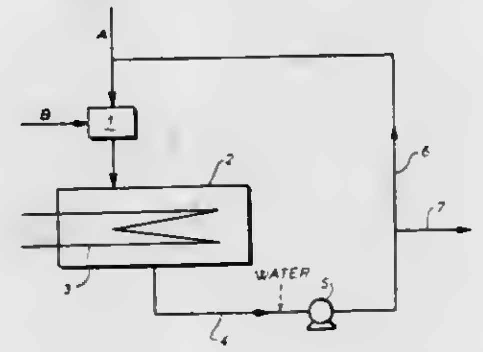
(1) 1,6-diphenylhexatriene;
(2) octa-2,4,6-triene;
(3) 2-methyl-1-3,5-hexatriene; and
(4) 2,6-dimethyl-2,4,6-octatriene.

4,100,335
FINELY DIVIDED SAPONIFIED ETHYLENE-VINYL ACETATE INTERPOLYMERS
Dorothee M. McClain, Cincinnati, Ohio, and Betty L. Vest, Covington, Ky., assignors to National Distillers and Chemical Corp., New York, N.Y.
Continuation of Ser. No. 564,198, Apr. 1, 1975, abandoned. This application Sep. 9, 1976, Ser. No. 721,743
Int. Cl.^{2} C08F *8/12*
U.S. Cl. 526—10 **9 Claims**

1. A process for the simultaneous saponification and dispersion of an ethylene-vinyl acetate interpolymer into a finely divided form which consists essentially of subjecting a mixture of said interpolymer in molten form and water to vigorous agitation at a temperature below the degradation temperature of said interpolymer in the presence of from 0.5 to 25 parts by weight per 100 parts of interpolymer of a water-soluble block

copolymer of ethylene oxide and propylene oxide having a molecular weight above about 3500 and containing at least 50% by weight of ethylene oxide, and in the presence of at least a stoichiometric amount relative to the amount of vinyl acetate units to be saponified, of an organic nitrogen base saponifying agent; cooling the resulting dispersion to below the softening temperature of the resulting saponified interpolymer; and recovering a finely divided dispersion of said interpolymer in which the particles are substantially spherical in shape, exhibit a number average particle size below about 10 microns and are substantially devoid of particles in excess of about 25 microns in diameter.

4,100,336
METHOD FOR THE CONTINUOUS MANUFACTURE OF HYDROCARBON RESINS
Emile Yax, Forbach, and Aurélien Abad, Sarreguemines, both of France, assignors to Societe Chimique des Charbonnages, Courbevoie, France
Filed Mar. 16, 1977, Ser. No. 778,300
Claims priority, application France, Mar. 16, 1976, 76 07564
Int. Cl.^{2} C08F *4/14, 32/06, 32/08, 12/06*
U.S. Cl. 526—67 **9 Claims**



1. In the method for the continuous manufacture of hydrocarbon resins, starting from polymerizable unsaturated hydrocarbons, with controlling of the temperature of the polymerization reaction conducted in the presence as catalyst of a Lewis acid, and comprising the steps of:

forming a mixture of the catalyst and of the hydrocarbon fraction to be polymerized with a view to polymerize said mixture in a reactor, said mixture containing by weight from 0.05 to 0.8 part of catalyst for 100 parts of hydrocarbons; diluting and dispersing said mixture homogeneously by means of, and in, a portion of stream of medium issuing from the reactor in the proportion of from 60 to 300 parts by volume of said stream for one part by volume of the hydrocarbon fraction to be polymerized; said polymerization being carried out in the presence of water; and drawing off the remaining portion of the medium issuing from the reactor so as to isolate the resin obtained therefrom, the improvement wherein

the starting feed comprises 20–70% of polymerizable hydrocarbons consisting essentially of aromatic hydrocarbons with at least one unsaturated acyclic lateral chain or an unsaturated cyclic chain and poly-unsaturated cyclic hydrocarbons, the catalyst comprises boron trifluoride, the amount of water added is up to 2.2 moles per mole of catalyst, and the temperature of the reaction medium is maintained constant between 30° and 120° C for a dwell time of from 10 to 60 minutes, whereby there is selectively obtained a wide range of clear resins having viscosities above 1 poise at 25° C and softening points (KS) of less than 150° C.

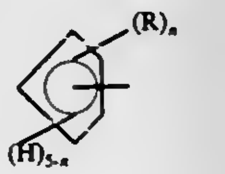
4,100,337
OLEFIN POLYMERIZATION PROCESS AND CATALYST THEREFOR
Allen Noshay, East Brunswick, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.
Division of Ser. No. 700,843, Jun. 29, 1976. This application Aug. 11, 1977, Ser. No. 823,749
Int. Cl.^{2} C08F *4/78, 10/00, 10/02*
U.S. Cl. 526—130 **4 Claims**

1. In a process for catalytically polymerizing ethylene alone or with one or more alpha-olefins, the improvement which comprises employing as the catalyst means a composition comprising at least one organo-chromium compound having the structure:

$Ar_1 — Cr\ (II) — Ar_1$

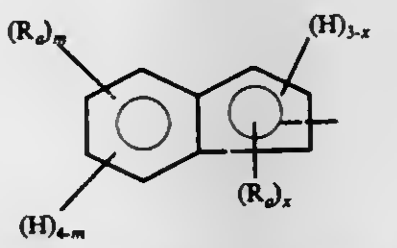
wherein Ar_1 is a monovalent radical selected from the group consisting of:

(1) cyclopentadienyl radicals having the structure



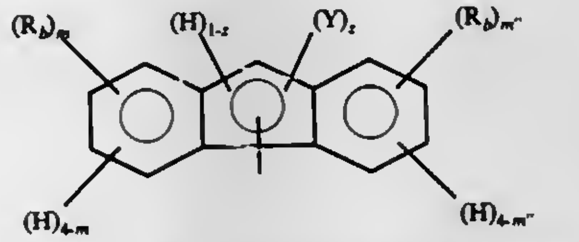
wherein R is a hydrocarbon radical having 1 to about 20 carbon atoms and *n* is an integer having values of 0 to 5;

(2) indenyl radicals having the structure:



wherein each R_a is a hydrocarbon radical having 1 to 10 carbon atoms, *m* is an integer having values of 0 to 4, and *x* is an integer having values of 0 to 3; and

(3) fluorenyl radicals having the structure:



wherein each of R_b is a hydrocarbon radical having 1 to 10 carbon atoms, each of *m* and *m''* is an integer having values of 0 to 4, Y is H or R_b and *z* is an integer having values of 0 to 1; deposited on a silica support fluorided with less than 10% by weight of a fluoridation agent, based on the weight of said support, at a temperature of about 100° C. to about 400° C.

4,100,338

PROCESS FOR PREPARING SOLID POLYMERS OF NORBORNADIENE

George Suld, Springfield; Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Aston, all of Pa., assignors to San Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 31, 1977, Ser. No. 829,313

Int. Cl.^{2} C08F *4/70, 32/06*

U.S. Cl. 526—142 **11 Claims**

1. Process for preparing solid polymer of norbornadiene comprising:

(a) contacting norbornadiene in the presence of a catalytic amount of a homogeneous catalytic system of nickel acetylacetonate or a nickel-phosphine complex selected from the group consisting of nickel dihalide bis(tributylphosphine); nickel dihalide bis(tricyclohexylphosphine); nickel dihalide bis(triphenylphosphine); isopropyl triphenyl phosphonium nickel dihalide bromide triphenylphosphine; nickel dicarbonyl bis(triphenylphosphine); nickel dibromide bis(trisphenylphosphine); nickel acetylacetonate hydrate-1,2 bisdiphenylphosphino ethane and wherein the halide is selected from the group consisting of fluoride, chloride and bromide; and an alkyl aluminum chloride selected from the group consisting of diethyl aluminum chloride, ethyl aluminum dichloride and ethyl aluminum sesquichloride;

(b) having the contacting occurring at a temperature within the range between from about −40° C to about 120° C; and

(c) continuing the contacting until the solid polymer of norbornadiene is prepared.

4,100,339

PROCESS FOR PREPARING ACRYLONITRILE/VINYL CHLORIDE COPOLYMERS HAVING AN INCREASED VISCOSITY WHICH COMPRISES USING ANIONIC/NON-IONIC EMULSIFIER BLENDS

Joachim König, Schildgen; Carlhans Süling, Odenthal, and Günther Boehmke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany.

Filed Feb. 3, 1977, Ser. No. 765,307

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604630

Int. Cl.^{2} C08F *214/06*

U.S. Cl. 526—193 **7 Claims**

1. A process for the preparation of chemically uniform copolymers having increased viscosity and increased molecular weight, comprising of from 20 to 50%, by weight, of acrylonitrile, from 80 to 50%, by weight, of vinyl chloride and, optionally, up to 15%, by weight, of other copolymerisable ethylenically unsaturated compounds, by the method of emulsion polymerisation which comprises carrying out the polymerisation at a pH of from 2 to 6 and a temperature of from 10° to 50° C in the presence of an anion active emulsifier selected from the group consisting of sulphuric acid derivatives, sulphonic acids, phosphoric acid derivatives and phosphonic acids and a non-ionic polyglycol ether emulsifier, such that:

(a) the total amount of anion active and of non-ionic emulsifier is from 0.75 to 8%, by weight, based on the total quantity of monomer, and

(b) the ratio, by weight, of anion active to non-ionic emulsifier is from 10:1 to 1.5:1.

4,100,340

COPOLYMERS CONTAINING PERFLUOROALKYL GROUPS

Karl Waldmann, Bad Soden am Taunus, and Gunter Schnabel, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,537

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609462

Int. Cl.^{2} C08F *214/08*

U.S. Cl. 526—245 **6 Claims**

1. Copolymers of

(A) perfluoroalkylethyl acrylate

$C_nF_{2n+1}CH_2CH_2OCOCH{=}CH_2$

(B) higher alkyl acrylate

$C_mH_{2m+1}OCOCH{=}CH_2$

(C) vinylidene chloride $CH_2 = CCl_2$

(D) acroylbutylurethane

$CH_2{=}CH{-}CONHCOOC_4H_9$

at the weight ratio of

1(A) : 0.22-0.39(B) : 0.45-0.85(C)-0.01-0.15(D)

n being 6, 8, 10, 12 or 14 and *m* being a number from 10 to 16.

4,100,341

URONIC OXIDATION OF CELLULOSE

Marcel Brasey; Alfred D. Schweizer, and James C. Shorrock, all of Geneva, Switzerland, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Mar. 7, 1974, Ser. No. 449,058

Claims priority, application United Kingdom, Mar. 29, 1973, 15188/73

Int. Cl.^{2} C08B *15/02, 15/04*

U.S. Cl. 536—56 **11 Claims**

1. A method of uronic oxidation of cellulose comprising reacting cellulose with at least 100 ml of an oxidizing reactant per 40g of cellulose, said oxidizing reactant selected from the group consisting of

(a) aqueous nitric acid at a concentration of between 35 and 55% containing between 5g and 50g of nitrogen dioxide per 100 ml of aqueous nitric acid; and,

(b) aqueous nitric acid at a concentration of between 60 and 75%, containing between 5g and 30g of nitrogen dioxide per 100 ml of aqueous nitric acid, in which the reaction temperature is between 20° and 60° C when oxidizing reactant (a) is used and between 20° and 40° C when oxidizing reactant (b) is used.

4,100,342

PROCESS OF PRODUCING DEXTRIN CARBOXYLATES

Joseph H. Finley, Metuchen, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 9, 1976, Ser. No. 712,853

Int. Cl.^{2} C08D *37/16;* **C07H** *13/10*

U.S. Cl. 536—103 **4 Claims**

1. In the process of producing a dextrin carboxylate having about 20 to 100 anhydroglucose units of which from about 2.2 to about 3.0 average OH groups per unit are esterified through one of the carboxyls of a non-aromatic polycarboxylic acid of 2–4 carboxyls containing 2 to 10 carbon atoms by reacting the dextrin with at least about 2.8 moles of the anhydride of the polycarboxylic acid, the improvement comprising carrying out the reaction in acetic acid in the presence of a tertiary amine catalyst.

4,100,343

11-DEOXYPROSTAGLANDIN DERIVATIVES

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

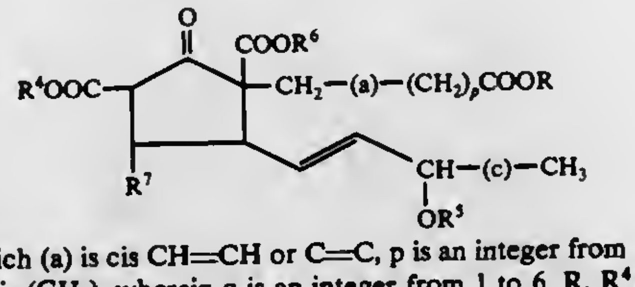
Division of Ser. No. 489,856, Jul. 19, 1974, Pat. No. 4,006,136, which is a division of Ser. No. 238,650, Mar. 27, 1972, Pat. No. 3,849,874. This application Nov. 11, 1976, Ser. No. 741,095

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 542—426 **4 Claims**

1. A compound of the formula



in which (a) is cis CH═CH or C═C, p is an integer from 2 to 4, (c) is $(CH_2)_q$ wherein q is an integer from 1 to 6, R, R^4 and R^6 each are lower alkyl, R^5 is hydrogen or tetrahydropyran-2-yl, and R^7 is hydrogen.

4,100,344

ALKENYL AND ALKINYLUREIDO CEPHALOSPORINS

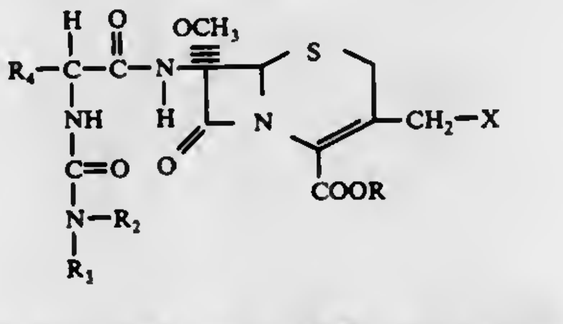
Hermann Brener, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 664,467, Mar. 8, 1976, Pat. No. 4,028,354. This application Mar. 10, 1977, Ser. No. 776,151

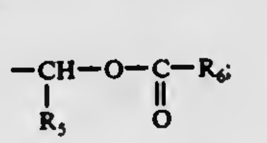
Int. Cl.^{2} C07D *501/36*

U.S. Cl. 544—21 **26 Claims**

1. A compound of the formula

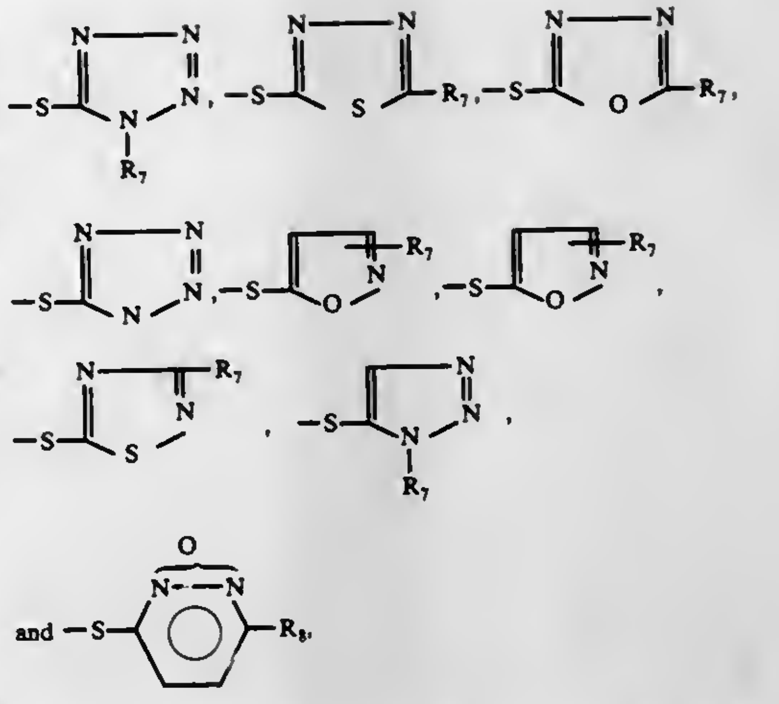


wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl) silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



$$-\underset{\substack{|\\R_5}}{CH}-O-\underset{\substack{\|\\O}}{C}-R_6;$$

R_2 is lower alkenyl or lower alkinyl; R_3 is hydrogen or lower alkyl; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono-substituted or unsubstituted hetereocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; R_6 is lower alkyl; and X is a heterothio group selected from the group consisting of



wherein R_7 is hydrogen or lower alkyl of 1 to 4 carbons and R_8 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

4,100,345

3-(CARBAMOYL)PYRIDINO DERIVATIVES OF 7A-METHOXY UREIDOCEPHALOSPORINS

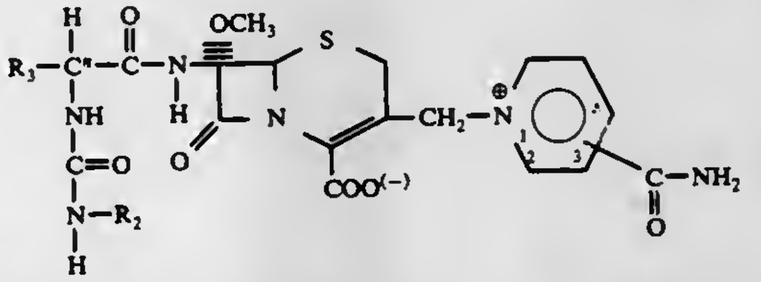
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 664,335, Mar. 5, 1976, Pat. No. 4,024,135. This application Jan. 24, 1977, Ser. No. 761,914

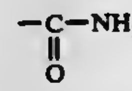
Int. Cl.^{2} C07D *501/40, 501/44*

U.S. Cl. 544—21 **18 Claims**

1. A compound of the formula:



wherein the 7α-methoxy substituent is in the α-configuration; R_2 is hydrogen or lower alkyl; R_3 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a mono-substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; and the



$$-\underset{\substack{\|\\O}}{C}-NH_2$$

substituent is in 2-, or 3- or 4-position.

4,100,346

CERTAIN 7(O-AMINO-METHYL- OR METHYLAMINOMETHYLPHENYL- OR CYCLOHEXADIENYL- OR THIENYLACETAMIDE)-3[1-CARBOXYMETHYL-(OR ETHYL- OR PROPYL-)-TETRAZOL-5-YLTHIOMETHYL]-3-CEPHEM-4-CARBOXYLIC ACIDS

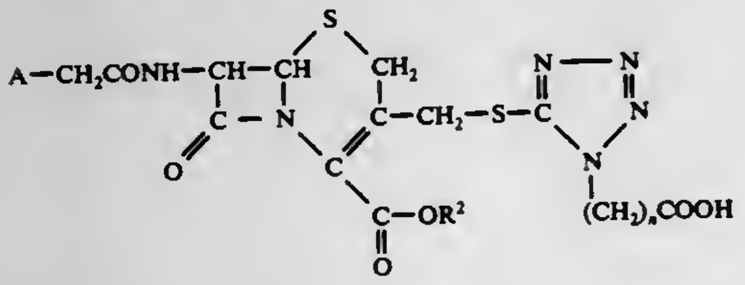
William J. Gottstein, Fayetteville; Murray A. Kaplan, Syracuse, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 590,971, Jun. 27, 1975, which is a continuation-in-part of Ser. No. 502,991, Sep. 3, 1974, abandoned. This application Jun. 11, 1976, Ser. No. 695,231

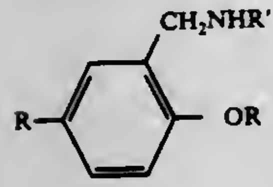
Int. Cl.² C07D *501/36;* A61K *31/545*

U.S. Cl. 544—27 **17 Claims**

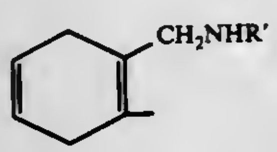
1. A compound having the formula



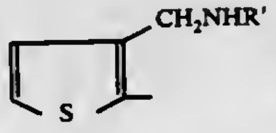
wherein A represents



OR



OR



wherein R is hydrogen, hydroxy or methoxy; R' is hydrogen or methyl; o is one, two or three; and R^2 is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3-phthalidyl or 5-indanyl.

4,100,347

3,4-DIHYDRO-2-METHYL-4-OXO-2H-1,2-BENZOTHIAZINE-3-CARBOXYLIC ACID-1,1-DIOXIDE

Philip D. Hammen, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,572

Int. Cl.² C07D *279/02*

U.S. Cl. 544—49 **1 Claim**

1. Crystalline 3,4-dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxylic acid-1,1-dioxide.

4,100,348

TRIOLS CONTAINING HYDANTOIN RINGS

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

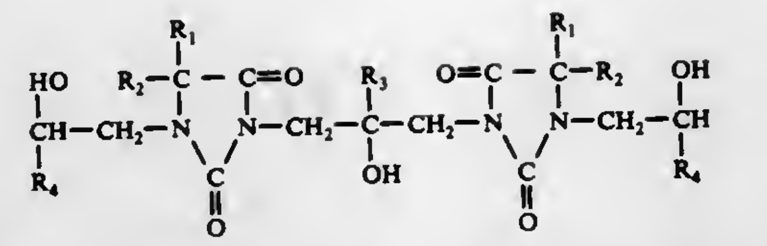
Filed May 21, 1976, Ser. No. 688,647

Claims priority, application Switzerland, May 30, 1975, 6995/75

Int. Cl.² C07D *233/42*

U.S. Cl. 548—310 **3 Claims**

1. A triol of formula I



wherein R_1 and R_2 each denote hydrogen, methyl, ethyl or isobutyl, or together denote tetramethylene or pentamethylene, R_3 denotes hydrogen or methyl, and R_4 denotes hydrogen or methyl or ethyl.

4,100,349

α-ACETYLENIC DERIVATIVES OF HISTAMINE AND RELATED COMPOUNDS

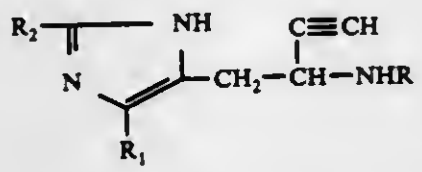
Brian Walter Metcalf, 8, avenue du General de Gaulle, 67000 Strasbourg, and Michel Jung, 1, rue des Dahlias, 67400 Illkirch Graffenstaden, both of France

Filed Jul. 1, 1977, Ser. No. 812,266

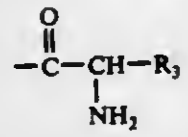
Int. Cl.² C07D *233/64*

U.S. Cl. 548—337 **9 Claims**

1. A compound of the formula



wherein R is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



$$-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle NH_2}{|}}{CH}-R_3$$

wherein R_3 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; each of R_1 and R_2 is hydrogen, halogen selected from fluorine, chlorine, bromine and iodine, or a straight or branched lower alkyl group of from 1 to 4 carbon atoms and may be the same or different with the proviso that when both of R_1 and R_2 are halogen R_1 and R_2 are the same; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,100,350

3-SUBSTITUTED PROPANOIC ACID DERIVATIVES

William Dawson, Camberley; Michael John Foulis, Bracknell; Norman James Albert Gutteridge, Camberley, and Colin William Smith, Bracknell, all of England, assignors to Lilly Industries Ltd., London, England

Division of Ser. No. 459,829, Apr. 10, 1974, Pat. No. 4,027,036. This application Mar. 2, 1977, Ser. No. 773,628

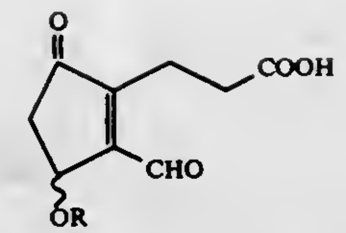
Claims priority, application United Kingdom, Apr. 12, 1973, 17736/73

Int. Cl.² C07C *79/46;* A01N *9/24;* C07C *69/76*

U.S. Cl. 560—20 **4 Claims**

1. A compound selected from the group conisting of

(1) the carboxylic acid of the formula



wherein R is benzoyl, nitrobenzoyl, halobenzoyl, C_{1-4}-alkylbenzoyl or C_{1-4}-alkoxybenzoyl;

(2) its alkali metal salt;

(3) its C_{1-4} alkyl ester; and

(4) its C_{1-4} haloalkyl ester.

4,100,351

METHOD FOR PREPARING AROMATIC URETHANS

Ugo Romano, Milan, and Renato Tesei, San Donato Milanese (Milan), both of Italy, assignors to Anic, S.p.A., Palermo, Italy

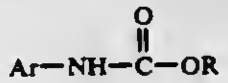
Filed Mar. 24, 1977, Ser. No. 781,065

Claims priority, application Italy, Apr. 14, 1976, 22299 A/76

Int. Cl.² C07C *125/06*

U.S. Cl. 560—24 **6 Claims**

1. The method of preparing an aromatic urethan represented by the general formula:



$$Ar-NH-\overset{\overset{\displaystyle O}{\|}}{C}-OR$$

or

ROCOHN — Ar' — NHCOOR

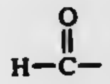
wherein Ar and Ar' are aromatic groups deriving from phenyl, biphenyl, naphthyl, diphenylmethane, unsubstituted or substituted by alkyl, alkylalkoxy or aryl groups, and R is alkyl, which comprises reacting a dialkyl carbonate with an N-acyl derivative of an amine having the formula:

Ar—NH—Ac

or

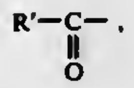
Ac—NH—Ar'—NH—Ac

wherein Ar and Ar' have the significance given above and Ac is



$$H-\overset{\overset{\displaystyle O}{\|}}{C}-$$

or



$$R'-\underset{\underset{\displaystyle O}{\|}}{C}-,$$

R' being an alkyl or an aryl radical, in the presence of a Lewis acid selected from the group consisting of the halides, alcoholates and phenates of aluminum or titanium, in the temperature range of from 50° to 200° C and in the pressure range of from 0.1 to 20 abs. atmospheres.

4,100,352

CYCLOHEXANONE-5,6-BENZO ANALOGUES OF PROSTAGLANDIN

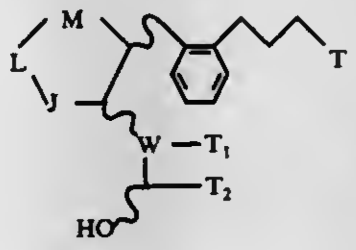
Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,131

Int. Cl.² C07C *177/00, 69/76*

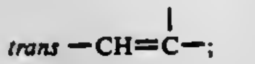
U.S. Cl. 560—53 **5 Claims**

1. A compound of the formula,



in which:

- T is selected from the group consisting of carboxyl or alkoxycarbonyl;
- M is carbonyl;
- L is methylene;
- J is ethylene;
- W is



$$trans\ -CH=\overset{|}{C}-;$$

- T_1 and T_2 are attached to adjacent carbon atoms;
- T_1 is hydrogen only if T_2 is loweralkyl; and
- T_2 is selected from the group consisting of loweralkyl having 1–5 carbon atoms or a polymethylene radical having 4–6 carbon atoms;
- provided, however, that T_2 is the polymethylene radical only when it is joined with W to form a cycloalkylidene radical having 6–8 carbon atoms.

4,100,353

5,6-BENZA ANALOGUES OF PROSTAGLANDIN F

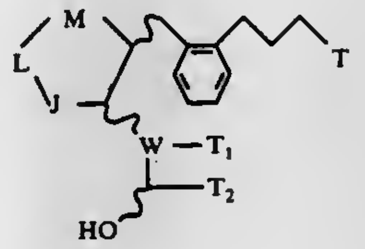
Robert Thomas Buckler, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 671,423, Mar. 29, 1976. This application Apr. 20, 1977, Ser. No. 789,130

Int. Cl.² C07C *177/00*

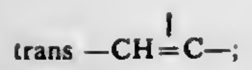
U.S. Cl. 560—55 **6 Claims**

1. A compound of the formula,



in which:

- T is selected from the group consisting of carboxyl or alkoxycarbonyl;
- M is selected from the group consisting of, R-hydroxymethylene or S-hydroxymethylene;
- L is methylene;
- J is selected from the group consisting of R-hydroxymethylene or S-hydroxymethylene;
- W is trans



$$\text{trans } -CH{=}\overset{|}{C}-;$$

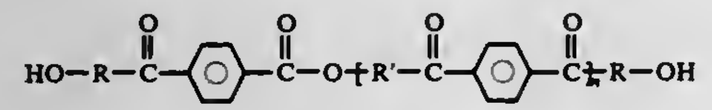
T_1 and T_2 are attached to adjacent carbon atoms;
T_1 is hydrogen; and
T_2 is loweralkyl having 1-5 carbon atoms.

4,100,354
TEREPHTHALATE ESTER POLYOLS

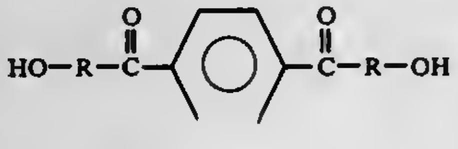
Gwilym E. Owen, Jr., Granville, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio
Filed Aug. 5, 1976, Ser. No. 711,949
Int. Cl.² C07C *69/82*

U.S. Cl. 560—89 **4 Claims**

1. A terephthalate ester polyol comprising the reaction product of a mixture of glycols, monomers and oligomers and a polyhydric alcohol in which said oligomers have the formula



wherein *m* has a value within the range of from 1 to 3, R represents the group $—CH_2CH_2O]_n$ and n has a value within the range of from 0 to 4 and R^1 represents the group $—CH_2CH_2\text{-}O]_x$ and x has a value within the range of from 1 to 4 and in which said monomers have the formula



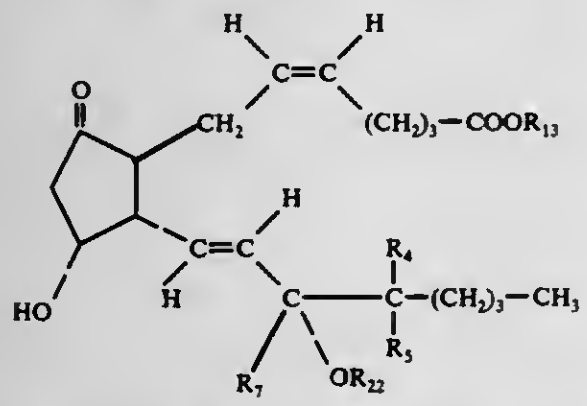
wherein R is as defined above.

4,100,355
8β,12α-PGE₂-TYPE COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 289,317, Sep. 15, 1972, abandoned. This application Jun. 28, 1973, Ser. No. 374,405
Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **1 Claim**

1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl being the same or different;

wherein R_{13} is hydrogen, alkyl of 1 to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with 1, 2, or 3 chloro or alkyl of 1 to 4 carbon atoms, inclusive;

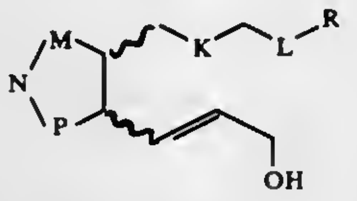
wherein R_{22} is alkyl of 1 to 5 carbon atoms, inclusive; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

4,100,356
DEPENTYL ANALOGUES OF PGE₁

Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Division of Ser. No. 684,569, Feb. 9, 1977, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,480
Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula,



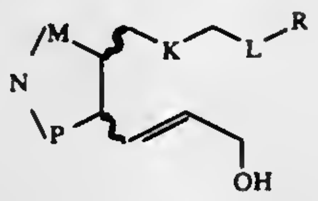
wherein:
L is methylene, ethylene, or trimethylene;
K is ethylene or;
M is carbonyl;
N is methylene;
P is α-hydroxymethylene; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

4,100,357
DEPENTYL ANALOGUES OF PGA₁

Harold Clinton Kluender, Madison, Wis., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Division of Ser. No. 684,569, May 10, 1976, Pat. No. 4,065,493. This application Apr. 14, 1977, Ser. No. 787,481
Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **2 Claims**

1. A compound of the formula,



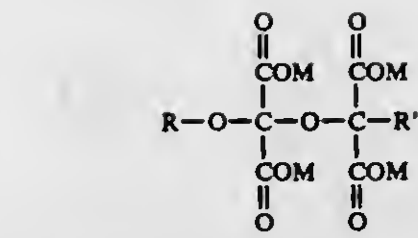
wherein:
L is methylene, ethylene, or trimethylene;
K is ethylene or;
M is carbonyl;
N is methine;
P is methine; and
R is carboxyl; alkoxycarbonyl, the alkyl portion of said alkoxycarbonyl being a lower alkyl radical; or a pharmacologically acceptable non-toxic carboxyl salt.

4,100,358
KETAL POLYCARBOXYLATE COMPOUNDS

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.
Filed Oct. 29, 1976, Ser. No. 736,962
Int. Cl.² C07C *59/22*

U.S. Cl. 560—180 **9 Claims**

1. Compounds of the molecular structure represented by the formula:



$$R-O-\underset{\underset{\underset{O}{\parallel}}{COM}}{\overset{\overset{\overset{O}{\parallel}}{COM}}{C}}-O-\underset{\underset{\underset{O}{\parallel}}{COM}}{\overset{\overset{\overset{O}{\parallel}}{COM}}{C}}-R'$$

wherein M is selected from the group consisting of —H, $—CH_3$, $—C_2H_5$, $—NH_4$, —Na, —K and combinations thereof; R is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, $—CH(CO_2M)_2$, and $—CH_2CO_2M$, and R' is selected from the group consisting of an alkyl radical (branched or straight chain) containing up to about C_{20}, —H, and —OR.

4,100,359
CARBONYLATION OF ALCOHOLS

Louis Schmerling, Riverside, and Edwin H. Homeler, Maywood, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Filed Jan. 12, 1977, Ser. No. 758,615
Int. Cl.² C07C *51/12, 67/36*

U.S. Cl. 560—232 **9 Claims**

1. A process for the carbonylation of a lower alkanol compound which comprises treating said compound with carbon monoxide in the presence of a catalyst consisting essentially of; (1) a cobalt, rhodium, or iridium phthalocyanine compound free of sulfonic acid or sulfonate groups and promoters consisting essentially of both an alkyl halide and a sulfonic acid or sulfonate group donor compound selected from the group consisting of an alkanesulfonic acid, cycloalkanesulfonic acid, arenesulfonic acid, an alkali metal sulfonate, alkaline earth metal sulfonate and ammonium sulfonate, or (2) a cobalt, rhodium, or iridium phthalocyanine compound containing a sulfonic acid or sulfonate group and an alkyl halide promoter, at a temperature in the range of from about 100° to about 250° C. and a pressure within the range of from about 1 to 200 atmospheres, and recovering the resultant carbonylated product.

4,100,360
PROCESS FOR MAKING LOWER ALKYL FORMATES

Donald Lee Smathers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 28, 1977, Ser. No. 772,859
Int. Cl.² C07C *67/36*

U.S. Cl. 560—232 **9 Claims**

1. A process for making lower alkyl formate comprising contacting continuously in a closed reactor having a fixed foraminous bed of resin catalyst, an intimate admixture of gaseous CO and liquid $C_{1\text{-}4}$ alkanol, said resin catalyst being a strongly basic anion exchange resin in which:

(a) the polymer matrix of the anion exchange resin is poly(-styrenedivinylbenzene) and

(b) the ion-active group of the anion exchange resin corresponds to the structural formula $\text{-}CH_2NR_3{}^+$ in which the R groups are independently selected from the group consisting of $C_{1\text{-}4}$ alkyl and hydroxyl-substituted $C_{1\text{-}2}$ alkyl groups by which a reaction mixture is formed containing alkyl formate.

4,100,361
MANUFACTURE OF BUTENEDIOL DIACETATES

Hans-Martin Weitz, Bad Durkheim, and Juergen Hartig, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Sep. 29, 1976, Ser. No. 727,799
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545698
Int. Cl.² C07C *67/05*

U.S. Cl. 560—244 **3 Claims**

1. A process for the manufacture of butenediol diacetates, which comprises: reacting butadiene with oxygen and acetic acid in the liquid phase in contact with an effective amount of a supported catalyst at a pressure from about 1 to 1,000 bars and at a temperature of about 60° to 120° C in which the carrier is active charcoal, wherein the catalyst used contains from about 0.1 to 10% by weight, based on the weight of the catalyst, of platinum, from about 0.1 to 5% by weight, based on the weight of the catalyst, of at least one element selected from the group consisting of tellurium and antimony, and additionally contains from about 0.01 to 1.0% by weight, based on the weight of catalyst, of nickel.

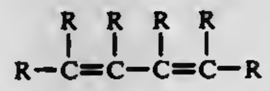
4,100,362
OXIDATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Nov. 19, 1976, Ser. No. 743,195
Int. Cl.² C07C *67/05*

U.S. Cl. 560—246 **15 Claims**

1. A process for the production of unsaturated esters from a conjugated diene which comprises reacting

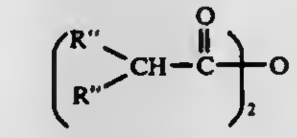
(a) an acyclic conjugated diolefin having from 4 to 16 carbon atoms per molecule of the formula



$$R-\overset{R}{\overset{|}{C}}=\overset{R}{\overset{|}{C}}-\overset{R}{\overset{|}{C}}=\overset{R}{\overset{|}{C}}-R$$

wherein each R is individually selected from the group consisting of —H, —F, —Cl, —Br, —I, —CN, —COOR', alkyl having from 1 to 12 carbon atoms, cycloalkyl having from 5 to 12 carbon atoms and aryl having from 6 to 10 carbon atoms, and combinations thereof, and said R' is selected from the group consisting of —H, alkyl having from 1 to 10 carbon atoms and aryl having from 6 to 10 carbon atoms;

(b) a carboxylic acid anhydride having from 4 to 20 carbon atoms per molecule of the formula



$$\left(\begin{matrix}R''\\R''\end{matrix}{>}CH-\overset{O}{\overset{\|}{C}}\right)_2O$$

wherein each R'' is individually selected from the group consisting of hydrogen and alkyl having from 1 to 8 carbon atoms; and

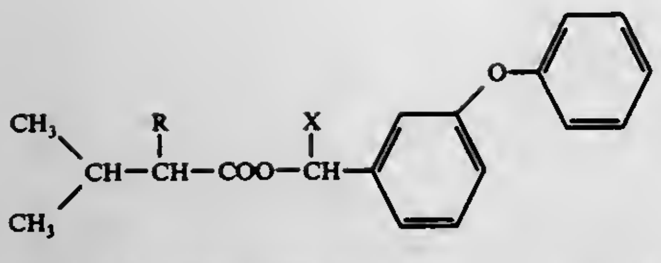
(c) molecular oxygen; in the presence of a catalyst system consisting essentially of cuprous acetate, lithium bromide and 1,2-dibromo-2-butene wherein the amount of copper ion is in the range of from 0.01 to about 1 mole of copper ion per mole of said conjugated diene, the amount of lithium metal ion is in the range of from 0.1 to about 100 moles per mole of copper ion, and the amount of bromide ion is in the range of from 0.1 to about 100 moles per mole of copper ion, and wherein the reaction is carried out in a reaction system wherein the total amount of water present in the initial reaction charge is not greater than about 1 mole of water per mole of copper ion.

4,100,363
2-SUBSTITUTED ISOVALERIC ACID ESTER PESTICIDES

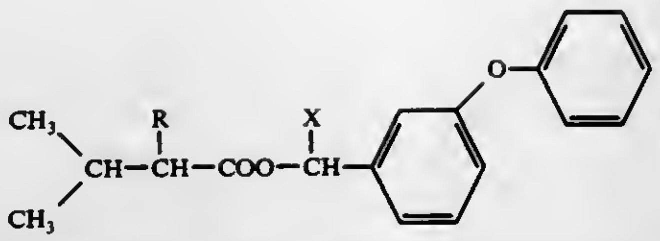
Michael J. Bull, Lower Halstow, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.
Division of Ser. No. 687,483, May 18, 1976, Pat. No. 4,042,710. This application Apr. 14, 1977, Ser. No. 787,684
Claims priority, application United Kingdom, May 23, 1975, 22662/75; Dec. 22, 1975, 52342/75
Int. Cl.² C07C *69/24*; A01N *9/24*

U.S. Cl. 560—255 **3 Claims**

1. A compound of the formula



wherein R is a straight-chain alkyl group of 1 to 16 carbon atoms and X is a hydrogen atom or an ethynyl group.



wherein R is a straight-chain alkyl group of 1 to 16 carbon atoms and X is a hydrogen atom or an ethynyl group.

ELECTRICAL

4,100,364

DC ELECTRIC ARC FURNACE MELT CONNECTION

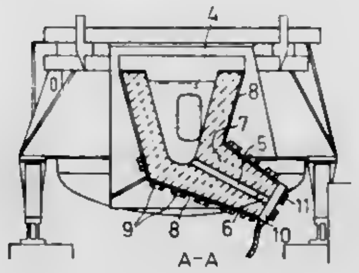
Sten Kollberg, Västerås, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 26, 1977, Ser. No. 790,939

Claims priority, application Sweden, May 7, 1976, 7605217

Int. Cl.^{2} H05B *7/02*

U.S. Cl. 13—9 R **4 Claims**



1. An electric arc furnace comprising a hearth having an inside and outside for containing a melt on its inside, an electrode positioned to form an arc between the electrode and a melt in the hearth when the electrode and melt have connections with an electric power source, an electric melt connection comprising at least one elongated metal connector having inner and outer ends and a refractory enclosure exposing the inner end for contact with and melting by a melt in said hearth, and cooling means for cooling the connector at least between its inner and outer ends for removing heat therefrom at a rate preventing the connector from melting throughout its length to its outer end, said refractory enclosure forming a duct containing said connector and the duct and connector extending at a declination straight and free from curvature from the hearth's said inside at least to the part of the connector prevented from melting by said cooling means.

4,100,365

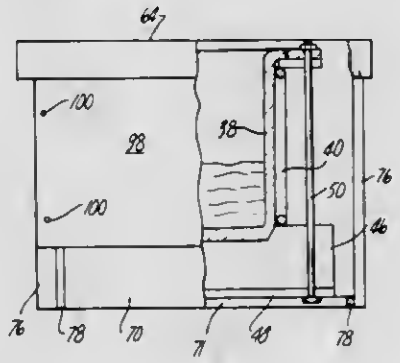
HOUSING FOR AN INDUCTION FURNACE

William J. Duca, Youngstown, Ohio, assignor to American Induction Heating Corporation, Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,152

Int. Cl.^{2} H05B *5/00*

U.S. Cl. 13—27 **10 Claims**



1. A housing for an induction furnace comprising:

upper and lower horizontally disposed metal rings, each ring having end portions being closed by at least one electrically insulating fastener to prevent a continuous current path through the ring;

a plurality of vertically extending columns; and

means joining the ends of said vertically extending columns to said upper and lower rings, respectively, to form a unitary framework for housing internal furnace components, with at least one end of each column being electrically insulated from one of said rings.

4,100,366

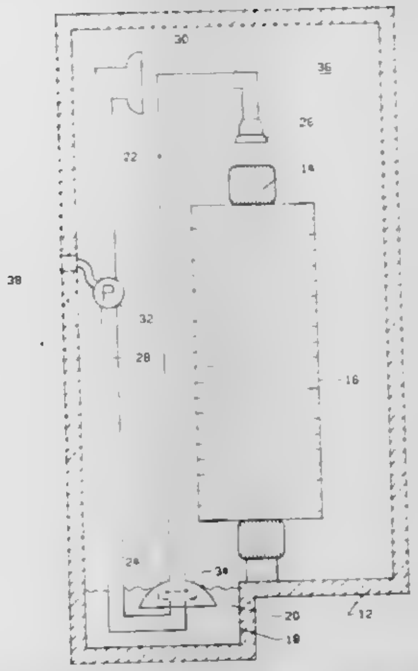
METHOD AND APPARATUS FOR COOLING ELECTRICAL APPARATUS USING VAPOR LIFT PUMP

Whitney Harris Mears, Amherst, N.Y., assignor to Allied Chemical Corporation, Morris Tnwnship, Morris County, N.J.

Filed Dec. 27, 1976, Ser. No. 754,858

Int. Cl.^{2} H01E *27/10*

U.S. Cl. 174—15 R **4 Claims**



1. In an electrical apparatus having a casing with an electrical conductor disposed therein which is subject to temperature changes when in use, said casing being adapted to contain a non-condensable gas and a vaporizable liquid coolant means for applying liquid coolant to the electrical conductor to effect cooling of the electrical conductor by vaporization of the applied liquid coolant, said casing being adapted to permit the vapors of the liquid coolant and the non-condensable gas to intermix within the casing when the vapors evolve to provide a dielectric medium for insulating the electrical conductor; the improvement wherein the means for applying a liquid coolant to the electrical conductor includes a reservoir for condensed liquid coolant and a vapor lift pump having (1) a liquid inlet in said reservoir, (2) a gaseous inlet adjacent the top of the casing and (3) an outlet over said electrical conductor.

4,100,367

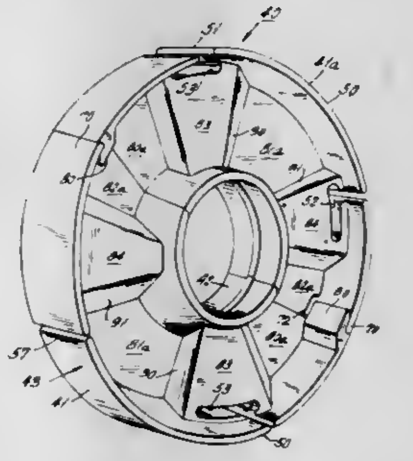
LATCH STRUCTURE FOR INSULATOR SPACER

Philip C. Netzel, Milmont Park, Pa., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 21, 1977, Ser. No. 808,710

Int. Cl.^{2} H01B *9/04*

U.S. Cl. 174—28 **10 Claims**



1. An insulator support disk for supporting the central con-

ductor of a gas-insulated transmission line within an outer grounded housing which is coextensive with said central conductor; said insulator support disk consisting of at least first and second identical segments which fit over the central conductor of a transmission line and define a continnous disk therearound; each of said segments having a central axially extending rim for gripping a central conductor and an axially extending outer rim for gripping the interior of an outer housing; each of said segments having a central web extending between said outer rim and said central rim; and means for securing said segments to one another to define a continuous support disk; said means for securing comprising an integral projecting latch member extending from one end of said outer rim and having spring-type characteristics; and a latch-receiving depression in the outer surface of said outer rim at the end of said outer rim opposite from said one end; said projecting latch member of each of said segments engaging and latching into said latch-receiving depression of the segment adjacent thereto; said projecting latch member of each of said segments and said latch-receiving depressions being centered over the width of said outer rim; said projecting latch members extending across the junction between adjacent segments to block a line-of-sight through said insulator support disk from a central conductor receiving said segments to an outer conductive housing surrounding said central conductor.

4,100,368

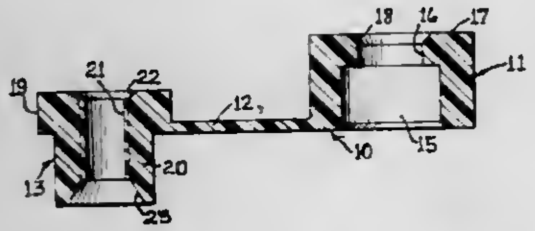
CAPTIVE STANDOFF CONNECTOR

Jack W. Thomsen, La Grange Park, Ill., assignor to Weckesser Company, Inc., Chicago, Ill.

Filed Jan. 7, 1977, Ser. No. 757,630

Int. Cl.² H01B *17/24;* H05K *7/12;* F16B *5/00*

U.S. Cl. 174—138 D **2 Claims**



1. A captive standoff formed from dielectric material for cooperating with a threaded connector to rigidly mount together apertured components in spaced or stacked electrical isolated relationship, comprising
   - (a) an elongated substantially flat flexible strap,
   - (b) a circular bushing formed integral with said strap at one end thereof and extending laterally from one flat side surface thereof,
   - (c) said circular hushing having an outer diameter greater than the aperture formed in the components and provided with an axial bore extending therethrough,
   - (d) a bearing formed integral with said strap at its opposite end and providing portions of different sizes extending laterally from opposite flat side surfaces of said strap,
   - (e) one of said portions of said bearing having an outer diameter equal to the diameter of said axial bore formed through said circular bushing whereby said portion of said bearing may be projected into said axial bore of said bushing,
   - (f) said other portion of said bearing having a peripheral surface larger than the diameter of said axial bore formed in said circular bushing as well as the aperture formed in the component so as to connect said captive standoff to the apertured component when said firstmentioned portion of said bearing is projected into said axial bore of said circular bushing,
   - (g) said bearing having a threaded bore extending therethrough and adapted to threadably receive the threaded connector when the same is projected through said axial bore formed in said circular bushing and into the threaded bore of said bearing for connecting said bearing to said bushing and the apertured component therebetween.

4,100,369

DEVICE FOR NUMERICALLY GENERATING A WAVE WHICH IS PHASE MODULATED AND WHICH IS FREE FROM UNWANTED MODULATION PRODUCTS

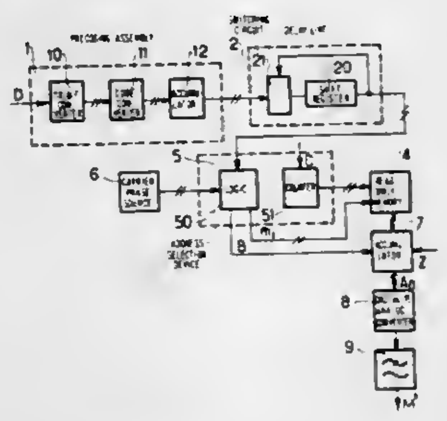
Claude Stenstrom, Palaiseau, and Christian Saint-Supéry, Le Chesnay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Aug. 19, 1976, Ser. No. 715,965

Claims priority, application France, Aug. 29, 1975, 75 26656

Int. Cl.² H04L *27/24*

U.S. Cl. 178—67 **7 Claims**



1. Device for generating an output wave which is phase modulated and which is free from unwanted modulation products, said device receiving at a first frequency digital values representing the modulation phase to be applied to a carrier wave, and generating said output wave in the form of a sequence of digital values delivered at a second frequency, said device comprising:

a source for delivering, at said second frequency, digital values representing the phase of the carrier wave to be modulated,

delay means receiving said digital values representing the modulation phase for sampling them at said second frequency and for delivering, at each period of said second frequency, the digital values representing the modulation phase relative to the r preceding periods of said second frequency,

a memory for storing r groups of digital values, corresponding to a given set of sinusoidal values multiplied by r predetermined coefficients k_1 to k_r, respectively,

address selection means for addressing said memory, said selection means being connected to said delay means and to said source for determining, at each period of said second frequency, r data items representative of the r respective sums of the values of the modulation phase for the r preceding periods and the value of the phase of the carrier for said each period, said memory delivering, in response to said r data items, r sinusoidal values corresponding to said r sums, multiplied respectively by k_1 to k_r, and

adding means for adding, on each period of said second frequency, the r values delivered by said memory,

said coefficients k_1 to k_r being equal to the weighting coefficients of a low-pass non-recursive filter having a given frequency response.

4,100,370

VOICE VERIFICATION SYSTEM BASED ON WORD PRONUNCIATION

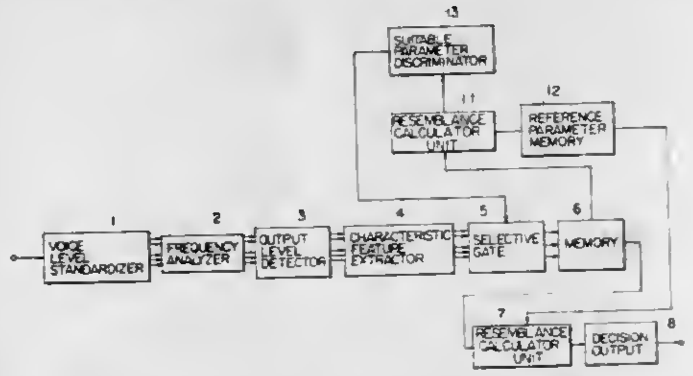
Matsumi Suzuki; Saburo Kitamoto, and Tetsuro Morino, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1976, Ser. No. 750,323

Claims priority, application Japan, Dec. 15, 1975, 50-149320

Int. Cl.² G10L *1/00;* G06F *15/34*

U.S. Cl. 179—1 SB **1 Claim**



13
SUITABLE PARAMETER DISCRIMINATOR
11
RESEMBLANCE CALCULATOR UNIT
12
REFERENCE PARAMETER MEMORY
1
VOICE LEVEL STANDARDIZER
2
FREQUENCY ANALYZER
3
OUTPUT LEVEL DETECTOR
4
CHARACTERISTIC FEATURE EXTRACTOR
5
SELECTIVE GATE
6
MEMORY
7
RESEMBLANCE CALCULATOR UNIT
DECISION OUTPUT
8

1. A word pronunciation voice verifying system, comprising: a voice level standardizing unit for standardizing the input voice level of a speaker whose voice is to be verified, a frequency analyzer unit for analyzing the standardized voice signal and including a plurality of parallel channels each having a different band pass frequency, an output level detector unit for detecting the output level of each of the plurality of channels, a characteristic feature extracting unit for extracting a plurality of characteristic parameters for one vocal sound from the detected output, a selective gate unit for selecting the parameter to be transmitted, based on a parameter selective signal, out of a plurality of characteristic parameters consisting of binary time series patterns for each of the input voices extracted by the characteristic feature extracting unit, a memory unit for storing the characteristic parameter pattern which has passed through the selective gate unit, a reference parameter memory unit for storing the binary time series pattern of the reference parameter, resemblance calculator units for calculating the resemblance between the parameters of the patterns stored in the memory unit and the reference parameter memory unit, respectively, and for calculating the resemblance between the input pattern which has passed through the selective gate and the time series pattern stored in the reference parameter memory unit, a suitable parameter discriminating unit for selecting a suitable parameter corresponding to a maximum resemblance based on the results of the calculation of the resemblance between the contents stored in the memory unit and the reference parameter memory unit by the resemblance calculator units, and for sending out a selective signal relative to the suitable parameter to the selective gate unit and the memory unit, and a discriminating and output unit for discriminating the vocabulary with regard to the pattern of the reference parameter corresponding to the maximum resemblance derived from the results of the calculation of the resemblance between the input pattern and the reference parameter by the resemblance calculator units, and for sending out the result of the discrimination as an output.

4,100,371

LOUDSPEAKER SYSTEM WITH PHASE DIFFERENCE COMPENSATION

Raymond William Bayliff, Hampton, England, assignor to Decca Limited, London, England

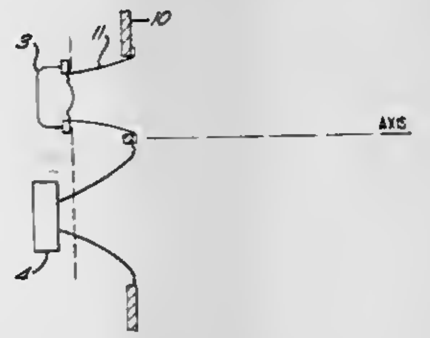
Filed Mar. 17, 1977, Ser. No. 778,472

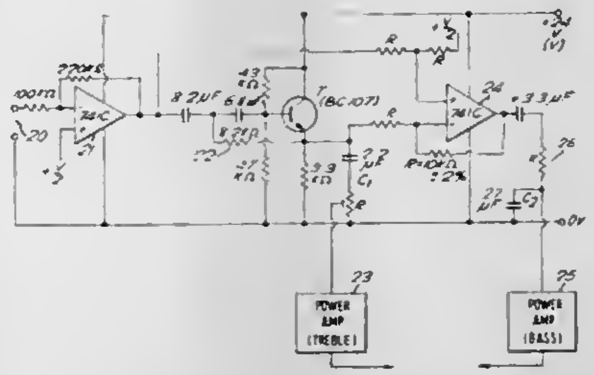
Claims priority, application United Kingdom, Mar. 24, 1976, 11904/76

Int. Cl.² H05K *5/00;* H04R *3/14*

U.S. Cl. 179—1 E **3 Claims**

1. A loudspeaker system comprising: first and second acoustic radiators which respond optimally to electrical signals in a higher frequency range and a lower frequency range respectively, said frequency ranges having a common overlapping region, and said radiators having respective mouths; means for mounting said radiators in a predetermined disposition in which said mouths are co-planar; and means for compensating for phase delay introduced by said second radiator, of lower optimal frequency range, at frequencies in the said overlapping region, this means comprising an acoustic delay disposed between the first radiator, of higher optimal frequency range, and the mouth thereof.





3. A loudspeaker according to claim 1, further comprising: an electrical amplifying circuit which is disposed for the reception of an audio frequency input signal and the production of signals which are uniformly amplified, with respect to the input signal, in a respective one of two adjacent frequency ranges, the circuit including an active high-pass filter, which has substantially unity gain in its pass-band and is coupled to receive the input signal, means for coupling the output of the high-pass filter to said first radiator, an ampllifier which is disposed to amplify the difference between the output of the high-pass filter and the said input signal, and means for coupling this difference to said second radiator.

4,100,372

AUDIO CONSOLE SYSTEM FOR HOME AND VEHICLE

Louis Hypolite, 9321 16th Ave., Apt. 2, St.Michel, Canada

Filed Jan. 21, 1977, Ser. No. 808,535

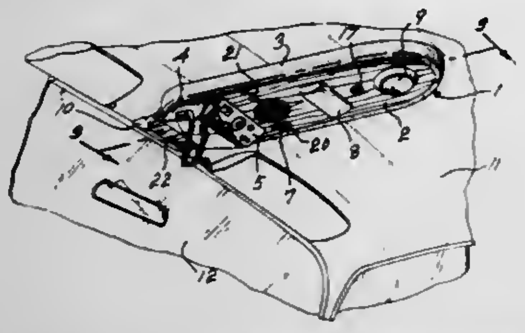
Claims priority, application United Kingdom, Jan. 25, 1977, 26491/77

Int. Cl.² H04R *5/00, 1/02*

U.S. Cl. 179—1 G **11 Claims**

1. An audio console system comprising at least one mounting bracket fixedly securable at the roof of a vehicle cabin and an audio console unit removably securable to said one mounting bracket and including a body forming a recess for a sound reproducing apparatus, a light secured to said body, a first electric plugging device outwardly extending relative to said body and connectable to the electric circuit of the vehicle, a second electric plugging device connected to said first electric plugging device and connectable to said reproducing apparatus, and switch means fixed to said body and operatively con-

necting said light and said second electric plugging device to said first electric plugging device and selectively energizing said light and a sound reproducing apparatus mounted into said recess.



4,100,373

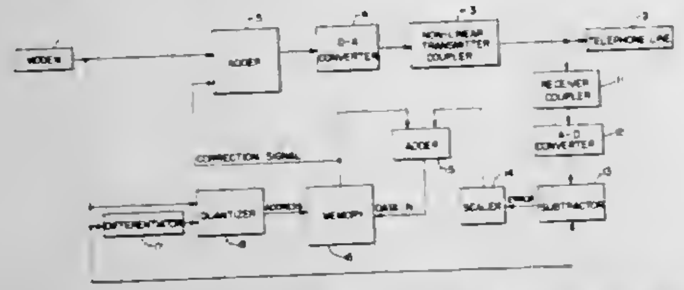
ADAPTIVE LINEARIZING ACOUSTIC COUPLING SYSTEM

Frank A. Perkins, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Sep. 28, 1977, Ser. No. 837,572

Int. Cl.^{2} H04M *11/00*

U.S. Cl. 179—1 C **10 Claims**



1. A system for coupling data signals from a communication input through a telephone interface coupling device to a telephone line connection output comprising, in combination:

first means, coupled to said communication input, for generating a first signal representative of a data signal to be coupled through the system;

second means, coupled to said telephone line connection output for generating a second signal representative of the data signal as coupled through said telephone interface coupling device and appearing at said telephone line connection output;

third means, coupled to said first and second means, for generating and storing a fourth signal representative of distortion introduced into said data signal by said telephone interface coupling device; and

fourth means, coupled to said first and third means, for combining said first and fourth signals to generate a fifth signal representative of a data signal modified by said forth signal and supplying said fifth signal to said telephone interface coupling device to be coupled therethrough to said telephone line connection output, whereby the signal appearing at said telephone line connection output is substantially free of distortion introduced by said telephone interface coupling device.

4,100,374

UNIFORM PERMUTATION PRIVACY SYSTEM

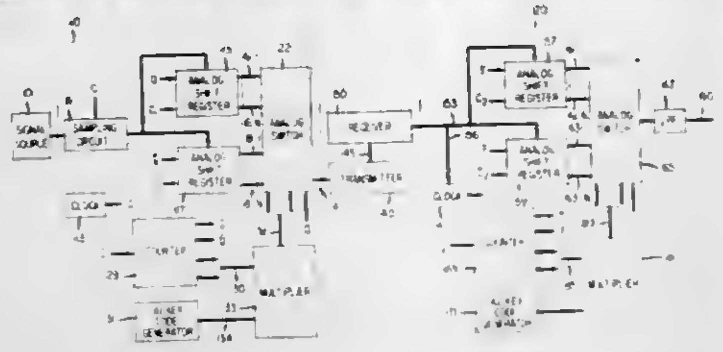
Nuggehally Sampath Jayant, Summit, N.J., and Subhash Chandra Kak, New Delhi, India, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 11, 1977, Ser. No. 786,129

Int. Cl.^{2} H04K *1/06*

U.S. Cl. 179—1.5 S **16 Claims**

1. A privacy communication system comprising means for partitioning an intelligence signal into groups of N successive signal segments; means responsive to each group of signal segments for uniformly permuting the temporal sequence of the N successive segments to form a scrambled signal segment group comprising means for transposing the i^{th} signal segment ($i = 1,2, \ldots N$) to the $K_1 i^{th}$ (modulo N) segment position, where K_1 is an integer prime with respect to N; and means for reconstructing the group of N successive signal segments from the scrambled group comprising means for transposing the j^{th} signal segment ($j = 1,2, \ldots ,N$) of the scrambled segment group to the $K_2 j^{th}$ (modulo N) segment position, where $K_2K_1 = 1$ (modulo N).



4,100,375

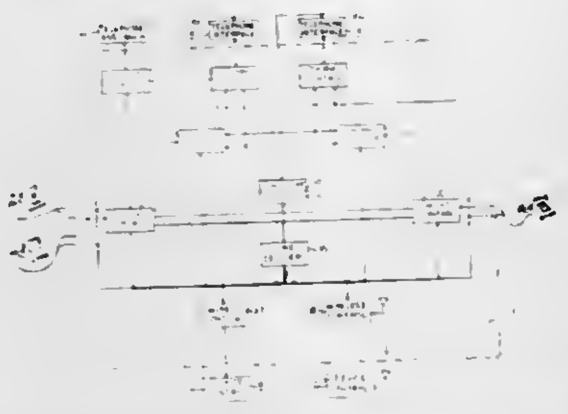
TELEPHONE, INTERCOM AND REMOTE CONTROL SYSTEM

David Lewis Noller, 10402 1/2 Wheatland Ave., Los Angeles, Calif. 91040

Filed Jan. 19, 1977, Ser. No. 760,813

Int. Cl.^{2} H04M *3/58, 9/02, 11/02*

U.S. Cl. 179—2 A **6 Claims**



1. In combination with a key service unit including a digital tone decoder; power supply; a 400 KSU; a utility telephone company interface; and a plurality of single line telephone instruments with digital tone dialing, a combined remote control, intercom and telephone system comprising:

a telephone hookswitch sensing circuit operatively connected to said telephone instruments for triggering a tone decoder control circuit, conditioning the talk path gate circuit to energize with incoming calls when said telephone instrument is not in use, and canceling said conditioning at the termination of the call;

a tone decoder control circuit operatively connected to said hookswitch sensing circuit responding to a telephone off hook and coupling the input of said tone decoder to the talk path of said telephone instruments;

a time delay circuit operatively connected to the tone decoder control circuit to maintain operation of same for a predetermined time interval;

a talk path gate circuit which shifts the operation of said telephones from intercom talk battery to said telephone interfaces in response to said tone decoder output or said 400 KSU circuits signaling of an incoming call, and cancels the operation of said tone decoder control circuit during tone signaling thru the telephone company network;

a HOLD feature control circuit operatively connected to the output of said tone decoder and triggering the operation of said 400 KSU circuits initiating the condition of outside call holding;

A bi-stable remote control circuit operatively connected to said tone decoder causing a maintained switch closure for operation of remote devices in one mode and a maintained open switch condition in the alternate mode, producing an audio hum on the talk path for approximately one second during the transition from closed to open switch conditions.

4,100,376

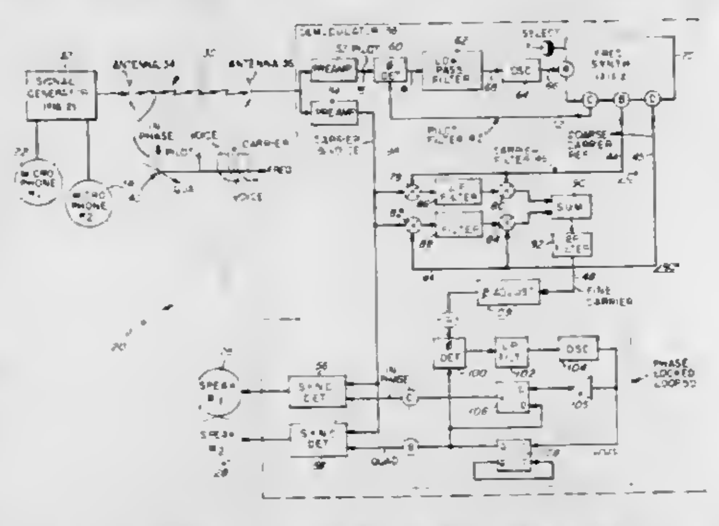
PILOT TONE DEMODULATOR

Saul L. Woythaler, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1977, Ser. No. 757,548

Int. Cl.^{2} H04B *1/68, 3/10*

U.S. Cl. 179—15 BP **3 Claims**



1. A demodulator of a signal bearing data operative with a pilot tone lying outside the spectrum of said data signal, said demodulator comprising:

phase lock means for providing a first signal which is phase locked to said pilot tone, said phase lock means including frequency synthesizing means for generating a carrier reference signal having a frequency proportional to the frequency of said pilot tone;

means coupled to said reference signal for filtering said data signal to extract a carrier therefrom, the frequency of said reference signal approximating the frequency of said carrier, said filtering means including means for mixing said data signal with said reference signal to produce a first lower frequency signal, means for filtering said first lower frequency signal and means for mixing said first lower frequency signal with said reference signal to provide a first component of said carrier; and

means coupled to said filtering means for providing signals bearing inphase and quadrature relationships to said reference signal, and means coupled to said inphase and quadrature signals for synchronously detecting said data signal.

4,100,377

PACKET TRANSMISSION OF SPEECH

James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 28, 1977, Ser. No. 791,782

Int. Cl.^{2} H04J *6/02*

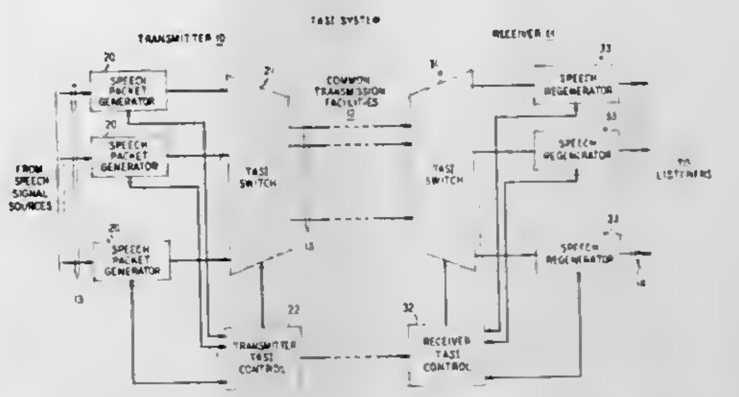
U.S. Cl. 179—15 AS **14 Claims**

1. A multiplex transmission system for transmitting digital signals from a plurality of signal sources, at least one of which is a speech signal source, on common transmission facilities, said system comprising:

a speech packet generator for assembling at least one speech talkspurt into a single digital packet;

means for appending a header block at the beginning of each said digital packet, said header block including a time code indicating the time at which the appended talkspurt was initiated; and

means for launching said digital packet on said multiplex transmission system.



4,100,378

CROSS-CORRELATION ARRANGEMENT

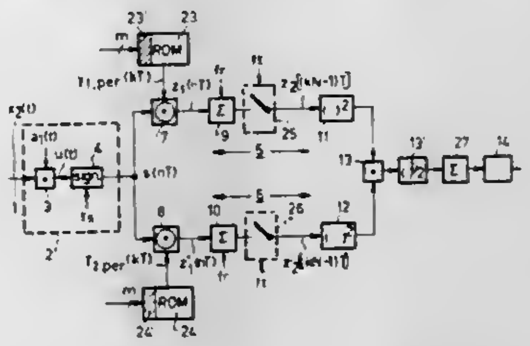
Theodoor Antonius Carel Maria Claasen, and Johannes Bernhard Heinrich Peek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 1, 1976, Ser. No. 728,796

Claims priority, application Netherlands, Oct. 6, 1975, 7511707

Int. Cl.^{2} G01R *23/02;* **H04M** *1/50*

U.S. Cl. 179—84 VF **4 Claims**



1. A cross-correlation arrangement for determining the presence or absence of at least one tone signal $x_2(t)$, having a known frequency and having a given minimum time duration τ_o in an information signal $x_1(t)$ whose form and frequency are unknown, said arrangement comprising

an input channel means for receiving the information signal $x_1(t)$, said input channel comprising:

means comprising adder means and sampling and coding means coupled to said adder means for producing a first series $\{s(nT)\}$ of sum signal samples, said sum signal samples $s(nT)$ being produced with a sampling period T, the relationship between each of the sum signal samples $s(nT)$ and information signal samples $x_1(nT)$ being given by $s(nT) = \text{sign}\ [x_1(nT) + a_1(nT)]$, in which expression $a_1(nT)$ represents a sample of a predetermined auxiliary signal;

a pulse generator means coupled to said sampling means for producing sampling pulses with a period T for controlling the sampling means;

at least two correlating channels each comprising:

multiplying means coupled to said sampling means for producing a series $z_1(nT)$ of signal samples $z_1(nT)$ occurring with a period T, the relation between the signal sample $z_1(nT)$ and the signal samples $s(nT)$ and $y(nT)$ being given by the expression $z_1(nT) = s(nT) \cdot y(nT)$,

first integration means coupled to said multiplying means to which said signal samples $z_1(nT)$ are applied; and means coupled to said first integration means for converting the integration means output signals into a unipolar signal;

adder means having inputs coupled to said converter means respectively and an output;

second integration means coupled to said adder output;

detection means having an input coupled to said second integration means for comparing the signals applied to the detection means with a predetermined reference level and for producing an output signal which characterizes the presence or absence of the tone signal $x_2(t)$ in the information signal $x_1(t)$; and

a pair of generation means coupled to said multiplying means respectively for producing a periodical series $\{y(nT)\}$ comprising a periodical repetition of a sub-series $\{y_{per}(kT)\}$ including of a plurality of N signal samples $y_{per}(kT)$ where $k = 0,1, \ldots N-1$ which occur one after the other with the sampling period T, the relation between the signal samples $y_{per}(kT)$ and the tone signal $x_2(T)$ being given by the expression $y_{per}(kT) = \text{sign}\ \{x_2\ [(p+k)T] + a_2\ [(p+k)T]\}$ where p represents a fixed number; $x_2\ (p+k)T$ the instantaneous value of the tone signal $x_2(t)$ at an instant $(p+k)T$ and $a_2(p+k)T$, the instantaneous value of a second auxiliary signal $a_2(t)$ at the instant $(p+k)T$ and in which the time duration NT of the sub-series $\{y_{per}(kT)\}$ is smaller than or equal to the minimum time τ_o during which the known tone signal $x_2(t)$ is at least present in the information signal $x_{1(t)}$.

4,100,379

COMMUNICATION UNITS

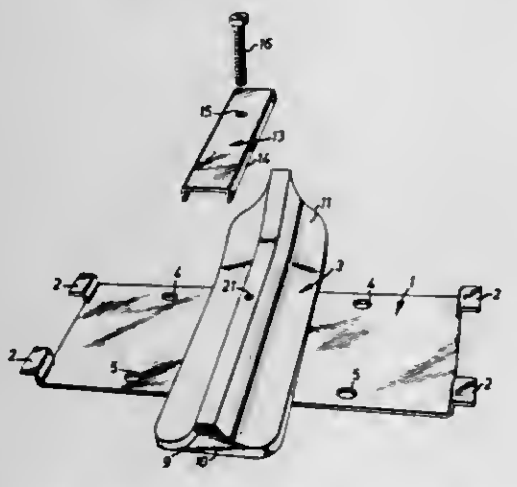
David Carter; Malcolm Withnall; Alan Williams; Digby Ralph Redshaw, all of Warwick, and Richard William Stevens, Surrey, all of Great Britain, assignors to The Post Office, London, England

Filed Feb. 7, 1977, Ser. No. 766,366

Claims priority, application United Kingdom, Feb. 11, 1976, 5438/76

Int. Cl.² H04M *1/11*

U.S. Cl. 179—147 R **4 Claims**



1. A jointing assembly for juxtaposed communication units, such assembly comprising a base element adapted to extend beneath said units, locating parts on the base element for engagement with complimentary parts on the undersurface of the units thereby locating the units in a predetermined side-by-side relationship and means for fixing the assembly to the units and a spacer element attached to the base element against which adjacent side surfaces of juxtaposed units abut.

4,100,380

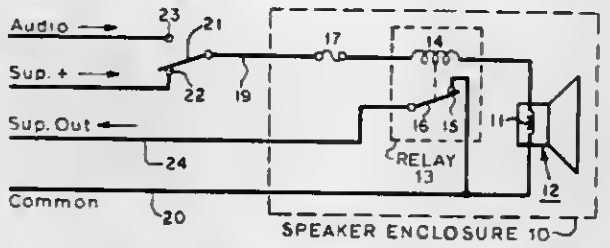
SUPERVISORY CIRCUIT FOR MONITORING SPEAKER COILS

Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Filed Mar. 12, 1976, Ser. No. 666,409

Int. Cl.² H04R *29/00*

U.S. Cl. 179—175.1 A **6 Claims**



1. A supervisory circuit for monitoring the condition of a speaker coil, comprising:

a relay, having a winding and a contact set, which relay winding is coupled in a series circuit with the speaker coil, said relay winding having an impedance of given value and the impedance of the speaker coil being substantially greater than said given value; and

means for applying a potential difference across the series circuit, to maintain the contact set in a given position when current flows through the series circuit of the relay winding and the speaker coil, such that upon opening of the speaker coil, the contact set drops out of the given position to indicate a trouble condition.

4,100,381

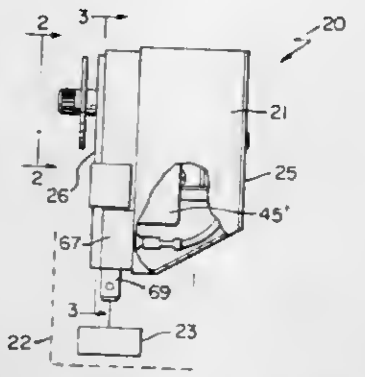
ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Edgar E. Marquis, Newtown, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 18, 1976, Ser. No. 742,756

Int. Cl.² H01H *43/10*

U.S. Cl. 200—38 A **10 Claims**



1. In an electrical switch construction having an electrical switch provided with different operating conditions and having means operatively associated with said switch for causing said switch to be repetitively in one condition thereof a certain percentage of a certain increment of time and for being in another condition thereof for the remainder of said certain increment of time, said means being adapted for selecting the amount of said certain percentage of said certain increment of time within certain limits, said means including a rotatable cam member having a cam part for camming said switch to one of said operating conditions thereof during each revolution of said cam member, the improvement wherein said cam part of said cam member is radially movable relative thereto, said means being adaptable for selecting a radial position of said cam part for camming said switch or a radial position of said cam part that will not cam said switch.

4,100,382

PERMANENT MAGNET LATCH FOR SPEED SWITCHING DEVICE

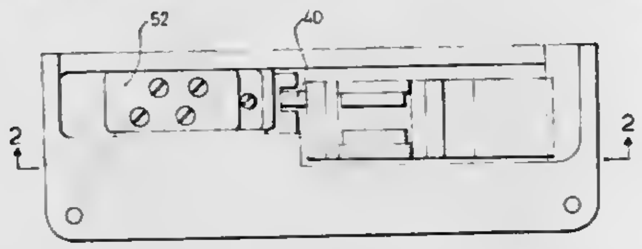
Herbert Hollitscher, Peterborough, Canada, assignor to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Mar. 4, 1977, Ser. No. 774,356

Claims priority, application Canada, Jul. 30, 1976, 958247

Int. Cl.² H01H *35/00*

U.S. Cl. 200—61.46 **7 Claims**



1. In a speed switch for a motor, an electrically conductive disc supported for rotation with the rotor of a motor, a drag member supported adjacent said disc for limited movement and having a permanent magnet linked magnetically with said disc for causing a force on said drag member through electromagnetic interaction between said permanent magnet and the rotating disc, switching means actuated by said limited movement of said drag member, and an improved latching means for restraining said drag member from said limited movement until a predetermined force is developed by said electromagnetic interaction, said latching means comprising a permanent magnet means having a length, height and thickness mounted with its height in a direction at right angles to the plane of said disc and its thickness extending in a plane parallel to the plane of said disc, a pole piece on either side of and engaging said permanent magnet means, said pole pieces defining the thickness of said permanent magnet means, said pole pieces projecting towards said drag member and each terminating in a wedge-shaped, flux concentrating configuration, the drag member having at least three teeth, two of said teeth being separated by at least one intermediate tooth and each one of said two teeth being located opposite to and closely spaced from a respective one of said terminating wedge-shaped ends of said pole pieces, said pole pieces also extending in a direction opposite said terminating wedge-shaped ends and having arm portions extending towards one another and terminating short of one another to define a gap therebetween, and a magnetic shunt means mounted for movement into a position in said gap between said arm portions and into a position withdrawn from said gap for adjustment of the amount of shunted magnetic flux and thereby the latching force.

4,100,383

INDUSTRIAL REVERSING SPEED CONTROL TRIGGER SWITCHES HAVING SNAP-IN MODULES

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 2, 1976, Ser. No. 711,108

Int. Cl.² H01H *9/06;* **H02P** *7/00*

U.S. Cl. 200—157 **14 Claims**

1. An industrial reversing speed control trigger switch of modular construction comprising:

a frame having a trigger aperture therein;

an insulating base including on-off switch contacts and a speed control circuit and means mounting said speed control circuit in said base;

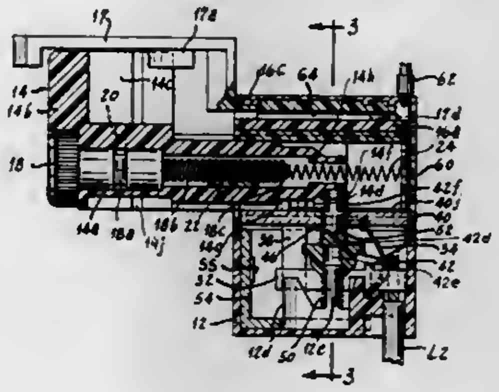
first snap-in means coupling said base to said frame;

a spring-return trigger slidably mounted within said frame on top of said base and extending out through said aperture and comprising means for actuating said on-off switch contacts and means for operating said speed control circuit when said trigger is depressed;

a reversing switch comprising an enclosure and reversing switch movable and stationary contacts housed therein and an operating lever;

second snap-in means coupling said reversing switch enclosure to said frame;

means in said base for making connections between said on-off switch contacts and an external circuit;



means in said enclosure for making connections between said reversing switch contacts and the external circuit;

and internal connector means connecting a reversing switch stationary contact to said speed control circuit.

4,100,384

PUSHBUTTON SWITCH UNIT WITH REVERSIBLE SPRING

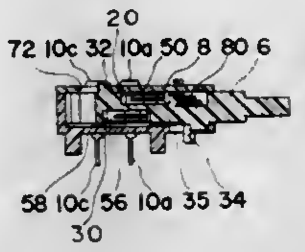
Matsuo Nishioka, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 18, 1976, Ser. No. 715,645

Claims priority, application Japan, Sep. 10, 1975, 50-110226; Sep. 10, 1975, 50-110227

Int. Cl.² H01H *13/56*

U.S. Cl. 200—160 **7 Claims**



1. A push lock switch unit comprising;

a. an elongated housing having an opening at one end thereof and including at least one pair of spaced terminals each having one end situated within said housing and the other end projecting outwards from said housing for external electric connection;

b. an elongated movable body coaxially housed in said elongated housing for axial movement between depressed and projected positions, said movable body having one end extending outwards from said housing through said opening and the other end housed within said housing;

c. spring means connected between said elongated housing and said elongated movable body, said spring means consisting of a spring structure for exerting an expanding force in a diagonal direction with respect to the direction of movement of said elongated movable body for urging said elongated movable body only towards said projected position, said expanding force gradually decreasing as said elongated movable body is moved from said projected position towards said depressed position; and

d. at least one contact member carried by said elongated movable body for electrically connecting said ends of said terminals within said housing to each other when said elongated movable body is moved to said depressed position by the application of an external pushing force to said body.

4,100,385
ELECTRICAL TERMINAL, PARTICULARLY PLUG-TYPE TERMINAL

Max Wutz, Hanau (Main), Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany
Filed Jul. 16, 1976, Ser. No. 705,917
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2536985
Int. Cl.² H01H *1/02*
U.S. Cl. 200—268 **13 Claims**

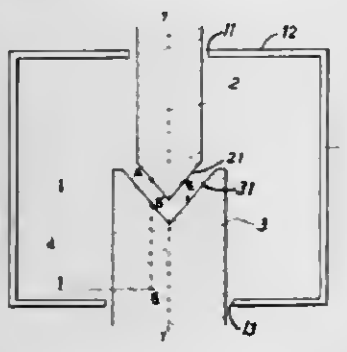
8. Electrical terminal which comprises at least in a contact portion thereof a layer having a thickness of from 2 to 100 μ m of a contact material which is at least one material selected from the group consisting of aluminum, titanium, niobium, chromium, silicon, zirconium, and tantalum and a contact surface comprising;

a porous cover layer of from between 0.01 to 1 μ m thick of a noble metal or noble metal alloy on the surface of said contact material to form an electrical conductive connection therewith; and

an oxide of the contact material integral with said contact material located in the pores of said porous noble metal or noble metal alloy.

4,100,386
PROCESS FOR SINTERING CERAMIC PRODUCTS

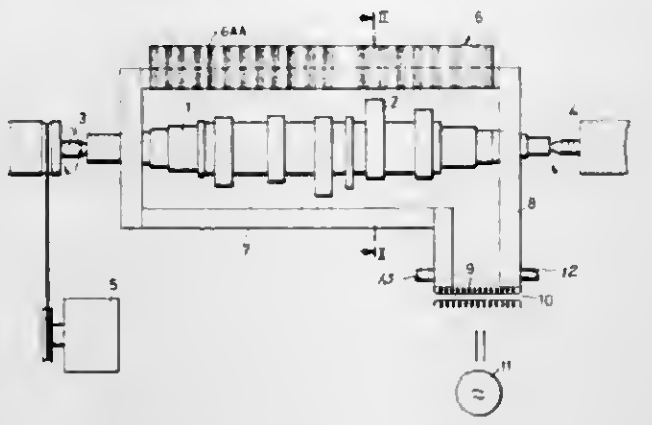
Gerard Bardet, Paris, France, assignor to Automatisme & Technique, Arcueil and Desmarquest Et C.E.C., Montrouge, both of, France
Filed Aug. 23, 1976, Ser. No. 716,552
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 M **5 Claims**



1. A process for sintering or melting ceramic or refractory products in a sounding cavity, comprising placing in a sounding cavity on opposing member in a sounding cavity on opposing member close to but spaced from a ceramic or refractory product in said cavity an opposing member, and subjecting said product and member to the action of a hyperfrequential electromagnetic field to heat them to a predetermined temperature, said opposing member formed from a material having dielectric losses higher than those of said product in the temperature range below said predetermined temperature, whereby the intensity of the hyperfrequential electromagnetic field will be increased locally in the immediate vicinity of the surface area of said product opposed to said member, and said area will be exposed to thermic radiation from said member and be protected by that member from thermic losses.

4,100,387
APPARATUS FOR THE INDUCTIVE HEATING OF WORKPIECES ESPECIALLY FOR THE HEATING OF CAM SHAFTS

Friedhelm Reinke, Remscheid; Ludwig Mackenberger, Neschen, and Eckhard Siefert, Langenberg, all of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Germany.
Filed Aug. 10, 1976, Ser. No. 713,182
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1975, 2538690
Int. Cl.² H05B *5/08*
U.S. Cl. 219—10.57 **3 Claims**



1. An apparatus for inductive heating to surface harden an eccentric workpiece made of hardenable material with extensions disposed eccentrically in relation to its longitudinal axis, said heating apparatus comprising:

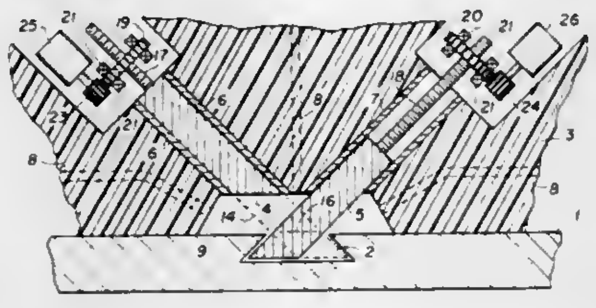
means for clamping said eccentric workpiece for rotation;

driving means acting upon said clamping arrangement for rotating said eccentric workpiece around its longitudinal axis; and

inductor means for inductive heating said eccentric workpiece, disposed at an air distance from the surface of said eccentric workpiece, and including a linear conductor disposed at a distance from the rotational axis of said eccentric workpiece running outside in the direction of the longitudinal axis of the eccentric workpiece, at least as far from said axis as the envelope cylinder surface of the eccentric workpiece, which is assigned to the eccentric extension of the greatest length.

4,100,388
ELECTROEROSION METHOD AND APPARATUS FOR MACHINING UNDERCUT CHANNELS IN A WORKPIECE

Gilbert Meyer, 184 Berkely Ct., Cornwells Heights, Pa. 19020
Filed Jan. 7, 1977, Ser. No. 757,635
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 M **21 Claims**



1. A method of cutting channels of undercut profile in a workpiece by electroerosion machining, comprising the steps of:

securing the workpiece to a fixture body equipped with a plurality of electroerosion tool electrodes movably set therein adjacent to a work space between said fixture body and said workpiece;

advancing a first of said electrodes across said work space and, under control with reference to at least one electroerosion process parameter, obliquely into said workpiece for a predetermined distance to produce a cavity therein;

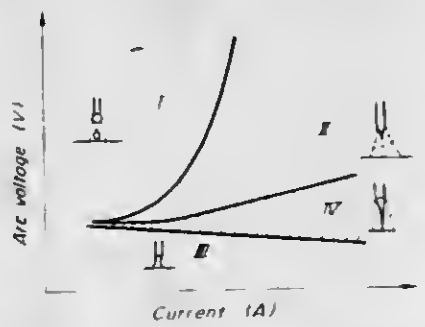
retracting said first electrode from said cavity and from enough of said work space to clear a path for a second electrode of said electrodes across said work space, which path intersects the path of advance and retraction of said first electrode;

advancing said second electrode on said intersecting path across said work space and, under control with reference to at least one electroerosion process parameter, into said workpiece to produce a cavity therein, and

retracting said second electrode from the cavity produced by it and from enough of said work space to clear the path of advance of said first electrode.

4,100,389
METHOD OF HIGH SPEED GAS SHIELDED ARC WELDING

Jinkichi Tanaka; Itaru Watanabe, and Motoaki Suzuki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1976, Ser. No. 751,984
Claims priority, application Japan, Dec. 24, 1975, 50-153463
Int. Cl.² B23K *9/02*
U.S. Cl. 219—74 **11 Claims**



1. In a gas shielded arc welding method for a long seam of formed pipe and the like, the improvement comprising:

feeding a formed pipe, or the like, past a welding station at a high welding speed of at least 3m/min; and

applying, via an electrode having a diameter of at least 3.0mm, a welding voltage and a welding current of at least 400 amperes to said passing formed pipe in the vicinity of the seam to be formed thereon at a combined welding voltage and current level to produce a welding arc and incomplete short circuit transfer so that a pinch force is caused at a tip of the electrode and the molten tip of the electrode is lengthened by the pinch force and is put into contact with the molten metal of the seam, and so that another arc is produced from the side of the electrode, and the molten electrode tip is enclosed in the arc and the pinch force of the arc acts on the molten portion, said combined welding voltage and current level being such that the arc produced by the welding voltage and current does not stop at a time of a short circuit.

4,100,390
CONTROL MEANS FOR TIG TYPE TORCHES AND THE LIKE

George Robert Jackson, Oakford, Pa., assignor to Arcstart, Inc., Oakford, Pa.
Filed Nov. 17, 1975, Ser. No. 632,862
Int. Cl.² B23K *9/10*
U.S. Cl. 219—74 **19 Claims**

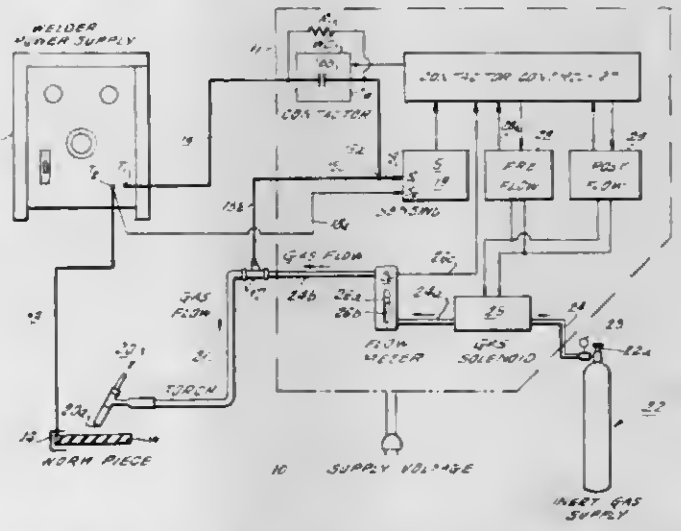
1. In an arc welder including a torch, and a power supply coupled between said torch and a workpiece, control means for selectively supplying power sufficient to initiate and maintain an arc for performing an arc welding operation, said torch including a welding electrode and means for receiving a gas and directing the gas to the welding electrode region, said control means comprising:

current reducing means remotely located from said torch and electrically connected between said torch and said power supply for reducing the current delivered to said torch from said power supply to a level insufficient to initiate welding even though the power supply is energized, while delivering a reduced level of current to the torch and workpiece;

means for selectively short-circuiting said current reducing means;

valve means for selectively coupling the gas receiving means to a gas source;

first sensing means responsive to establishment of an electrical circuit caused when said torch electrode even momentarily contacts said workpiece for opening said valve means and including means for preventing said valve means from closing until after the power delivered to said torch reaches a level sufficient to initiate welding;



first delay means responsive to operation of said first sensing means for activating said short circuiting means a predetermined delay interval after opening of said valve means whereby the power delivered to the workpiece is raised to a level sufficient to initiate and sustain an arc between the torch electrode and the workpiece, while enabling said gas to purge the welding region preparatory to the initiation of an arc; and

second sensing means including second delay means for sensing the engagement of the torch electrode with the workpiece for the interval of said second delay means to deactivate said valve means and activate said short-circuiting means whereby the power is lowered to a level insufficient to maintain an arc and gas purges the welding region for a period sufficient to permit the welding region to cool; said delay period for said second delay means being of a length sufficient to prevent the torch electrode from becoming welded to the workpiece.

4,100,391
PORTABLE SEAM WELDER

William T. Wilbur, New Baltimore, Mich., assignor to Progressive Machinery Corporation, Pontiac, Mich.
Filed Sep. 13, 1976, Ser. No. 722,349
Int. Cl.² B23K *11/06*
U.S. Cl. 219—81 **17 Claims**

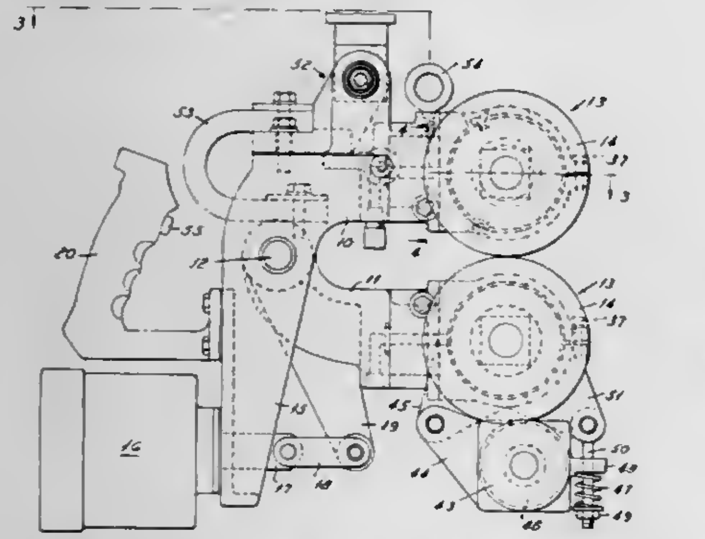
1. A portable seam welder comprising

a pair of arms pivoted to one another about a pivot axis,

a spindle assembly mounted on each arm,

each spindle assembly including a housing, a shaft, and spaced radial and axial bearings electrically isolated from one of said housing and said shaft for rotatably mounting said shaft in said housing about an axis extending generally

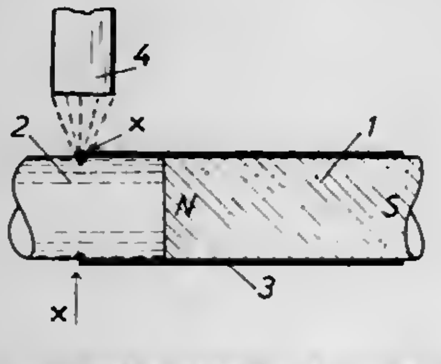
parallel to said pivot axis and perpendicular to the longitudinal axis of its respective arm,
a weld wheel on each shaft,
electrical collector ring contact means independent of said bearings for transmitting power between said housing and said shaft and in turn to said wheel,
handle means on one of said arms for manipulating said welder,
and actuator means operably connected to said arms for pivoting said arms relative to one another for moving said wheels toward and away from one another,
and motor means mounted on said housing of said spindle assembly for applying power to one of said wheels.



4,100,392
ASSEMBLY OF A MAGNET AND A POLE PIECE

Sylvain Maurice Dron, Meudon-la-Foret, and Gerard Maurice Gaspard Evrard, Livry-Gargan, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France

Filed Jul. 7, 1976, Ser. No. 703,304
Claims priority, application France, Jul. 10, 1975, 75 22454
Int. Cl.² B23K *15/00*
U.S. Cl. 219—121 EM **3 Claims**

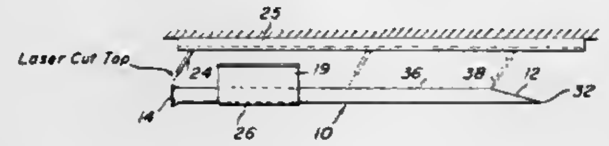


1. A method for joining a magnet to a pole piece with the respective flat faces thereof confronting each other, comprising the steps of truing-up said flat faces, abutting the magnet and the pole piece by their trued flat faces, connecting the magnet to the pole piece by a mechanical constricting tube member made of a non-magnetic material to exert a constrictional circumferential stress both on the magnet and the pole piece, and applying energy from a distance to the constricting member to obtain a weld at a location outside the magnet and only between the constricting member and the pole piece, whereby the retention forces at the common plane of said faces remain after terminaton of said application of energy.

4,100,393
METHOD FOR MAKING A CANNULA USING A LASER AND THE CANNULA MADE THEREBY

Ronald B. Luther, 1737 Bayport Way, Newport Beach, Calif. 92660

Filed Feb. 8, 1977, Ser. No. 766,735
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 LM **4 Claims**



1. A method for making a removable catheterization cannula from tubular cannula stock having a bevel forming a tip end and a distal area comprising the steps of:

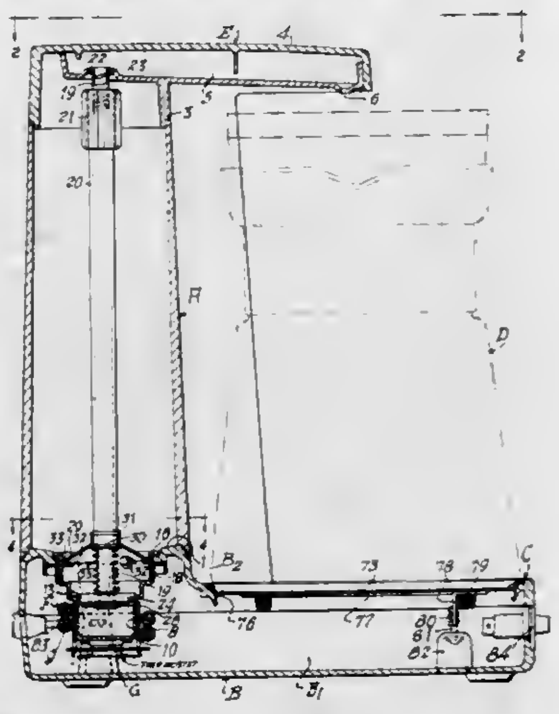
(a) supporting a piece of tubular cannula stock for work operations;
(b) applying to the outside of the wall of said stock from one end of said stock to the other on a straight longitudinal line whose anterior end is at the bevel distal area a laser beam regulated in intensity and duration to cut completely through the wall of said stock to form a straight longitudinal slot in said stock ending at the bevel distal area;
(c) applying to the inside of the wall of said stock opposite said slot from one end of said stock to the other on a straight longitudinal line whose anterior end is at the bevel tip a laser beam regulated in intensity and duration to form a weakened fracture line in the wall of said stock;
(d) contact positioning on the outside of the wall of said stock adjacent said fracture line finger grips so that said finger grips extend on either side of said fracture line;
(e) applying to the area of contact between said stock and said finger grips a laser beam of such intensity and duration as to weld said finger grips to said stock; and
(f) removing the finished tubular cannula stock from the support.

4,100,394
ELECTRIC WATER HEATER AND HOT WATER DISPENSER

George E. Tilp, Short Hills, N.J., assignor to Adams Industries, Inc., Union, N.J.

Filed Dec. 12, 1975, Ser. No. 640,182
Int. Cl.² H05B *1/00;* A47J *31/057;* F24H *1/10;* F04B *19/24*
U.S. Cl. 219—296 **14 Claims**

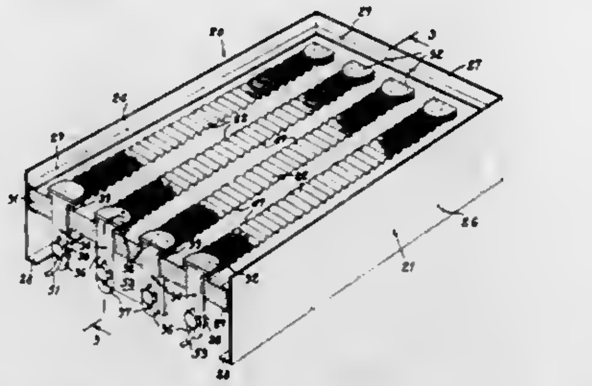
1. An electric water heater and dispenser comprising a water container having an open top and a bottom wall formed with a hole, a pump well mounted in said hole and depending from said bottom wall and having an upwardly facing pump seat, a pump including a pump tube having mounted thereon a perforated pump plate to separably set on said pump seat and a pump valve coactive with said pump plate, so that when said pump plate is set on said seat, water can be heated in said well below said pump plate and discharged through said pump tube, and means manually manipulatable through said open top for positively and removably locking said pump on said pump seat, said means including a retainer plate slidably mounted on said pump tube, coactive locking means on said retainer plate and said pump well engageable by rotation of said retainer plate relative to said well to releasably hold the retainer plate in fixed position relative to said pump well, spring means disposed between said pump plate and said retainer plate to bias said pump plate away from said retainer plate so that said pump plate will be urged into engagement with said pump seat.



4,100,395
EXPANDED ELEMENT RADIANT HEATING DEVICE

Jules Ballard, Teaneck, N.J., assignor to Glenro, Inc., Upper Saddle River, N.J.

Filed Jan. 29, 1976, Ser. No. 700,944
Int. Cl.² H05B *3/26;* H01C *1/14;* H05B *3/08*
U.S. Cl. 219—356 **9 Claims**

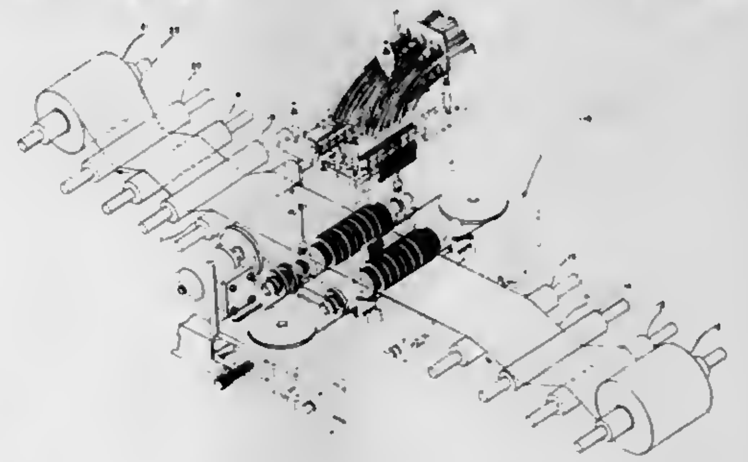


1. A high temperature rapid response heating device capable of operating between 1000° F and 2000° F, comprising at least one expanded, corrugated heating element having flat portions at each of its longitudinal ends, terminal means for each end of said heating element, said terminal means including a metallic terminal bracket of right angle configuration having a short leg of approximate delta shape and a long leg and a flat metallic platelet of approximate delta shape, said short leg being on one side of said flat portion and said platelet being on the other side of said flat portion when said short leg and said platelet are secured together with said heating element flat portion therebetween, means for rigidly securing said terminal means to said flat portions, a refractory backing for carrying said heating element, stapling means for securing strands of said heating element to said refractory backing at spaced intervals along the longitudinal length of said heating element, said long leg of each terminal bracket extending through said refractory backing, adjustable means associated with said long leg of each bracket for securing said terminal means and heating element ends to said refractory backing, a casing for carrying said heating element and refractory backing, and means within said casing for supporting said heating element and refractory backing.

4,100,396
METHOD FOR ELECTRICALLY PERFORATING MOVING WEBS

Richard Hugo Martin, Pisgah Forest, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Division of Ser. No. 654,201, Feb. 2, 1976, Pat. No. 4,029,938. This application Feb. 14, 1977, Ser. No. 768,224
Int. Cl.² H05B *7/18*
U.S. Cl. 219—384 **10 Claims**

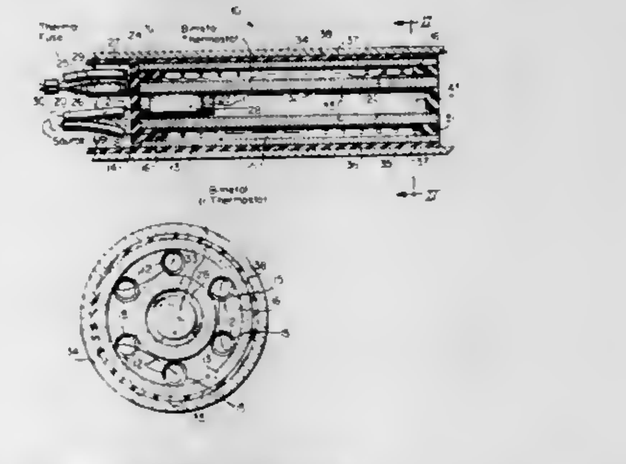


1. A method for perforating paper by electrical discharge comprising passing the paper between spaced discharge and ground electrodes having opposed surfaces moving at right angles toward one another, said discharge electrodes comprising a plurality of equal diameter rotating discs aligned axially in spaced relationship to one another, said ground electrode comprising a narrow endless member moving parallel to the axis of said discs and spaced from the peripheral edges of said discs, and perforating said paper by intermittently discharging an electric current between the edges of each of said discs and said member through the paper.

4,100,397
THERMOSTATICALLY CONTROLLED ELECTRICAL HEATER ASSEMBLY

Yuri Kunimi, Belmont, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jul. 8, 1976, Ser. No. 703,571
Int. Cl.² H05B *1/02, 3/02;* H01H *37/52*
U.S. Cl. 219—512 **9 Claims**



1. A heater assembly comprising:
electrically energized heater means for generating heat;
temperature regulating means substantially encircled by terminal means electrically coupling said temperature regulating means in circuit with said heater means for controlling operation of said heater means over a pre-

ferred operating temperature range of said heater means; and

a heat conducting core of electrically insulating material for supporting said heater means and said temperature regulating means, said core having a cavity and said temperature regulating means being coaxially disposed substantially entirely within said cavity with said terminal means having substantially all of its outer peripheral surface in friction contact with the surface of said cavity, and separated from said heater means by the material of said core, whereby said core and said terminal means provide a thermal path having a selected thermal resistance for conducting heat from said heater means to said temperature regulating means to minimize temperature fluctuation of said heater means.

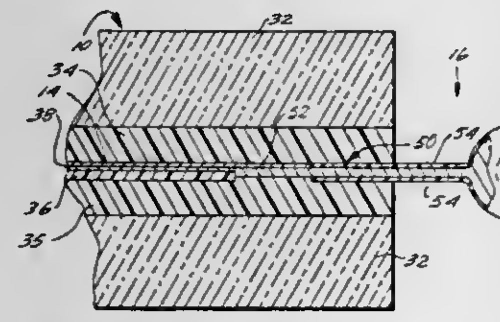
4,100,398
LAMINATED ELECTRICALLY HEATABLE WINDOW WITH ELECTRICAL CONNECTORS

Berton P. Levin, Santa Monica, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Division of Ser. No. 608,091, Aug. 27, 1975, Pat. No. 4,029,942. This application Apr. 22, 1977, Ser. No. 790,042

Int. Cl.² H05B *3/06*

U.S. Cl. 219—541 **21 Claims**



1. A laminated electrically heatable window comprising:

a pair of transparent face plies,

a transparent laminate between the face plies, the transparent laminate including an electrically resistive heating element,

an electrically conductive lead in contact with the resistive element, a portion of the electrically conductive lead extending outside an edge of the face plies,

an electrical cable for conducting electric current to the resistive element,

first electrical connector means comprising a first electrical contact means on the end of the portion of the electrically conductive lead extending outside said edge of the face plies, and second electrical contact means on the end of the cable,

the first and second electrical contact means being engageable as a cooperating electrically conductive pin-and-socket connection for conducting electric current to the resistive element, the electrical contact means including means cooperating to form an electrically insulated exterior surrounding the engaged pin-and-socket connection,

means electrically insulating the portion of the electrical lead extending outside said edge of the face plies and at least a portion of the electrically conductive lead embedded between the face plies near said edge of the face plies,

means forming a seal around the electrically insulated embedded portion of the electrically conductive lead, and

second electrical connector means for making electrical contact with said electrically resistive heating element.

4,100,399
PROGRAMMED CONTROL FOR EFFECT SPINNING AND TWISTING MACHINES

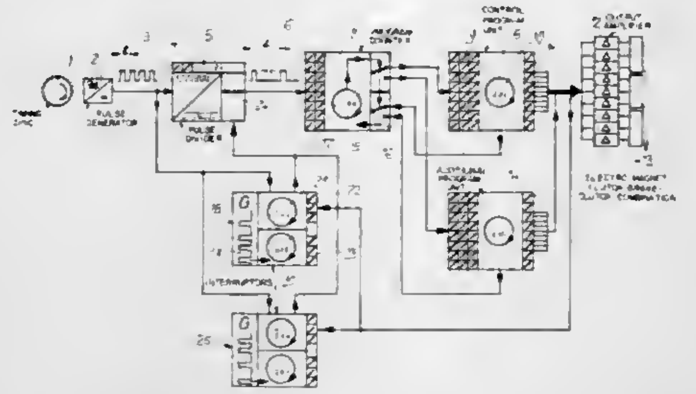
Reinhard Bager, Betzigau, Germany, assignor to Saurer-Allma GmbH, Kempten, Germany

Filed Aug. 31, 1976, Ser. No. 719,214

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 2539341

Int. Cl.² G07C *3/10*

U.S. Cl. 235—92 CC **17 Claims**



1. In a twisting and spinning machine, a switching arrangement for producing effect yarns having at least two thread feeding devices, the speed of at least one of said thread feeding devices being selectively controllable, the improvement comprising an electrical pulse generating timing device synchronous with said machine and at least one manually settable and cyclical electrical pulse counter for producing an electrical pulse pattern at the output thereof in response to a preselected number of pulses supplied thereto, a pulse divider circuit connected between said timing device and said electrical pulse counter and being controlled by said timing device, said pulse generating timing device having a characteristic wherein the electrical pulse period of each pulse delivered to said pulse divider circuit corresponds to a unit of length of a thread supply, said pulse divider circuit having the characteristic of altering the effective time interval of pulses delivered to said pulse counter so that the length thereof is different from the time interval of pulses delivered to said pulse divider circuit from said timing device, and speed control means responsive to the output of said pulse counter for selectively altering the speed of said one thread feeding device.

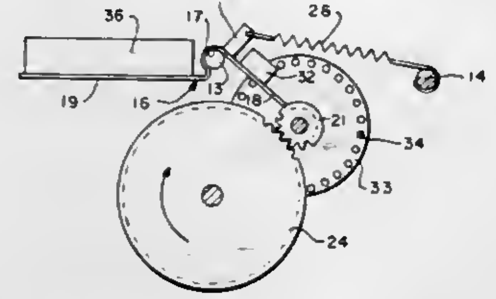
4,100,400
GASOLINE PUMP PRICE ENCODER

John A. Callahan, Houston, and Allan S. Ottenstein, Spring, both of Tex., assignors to RF Products Corp., Houston, Tex.

Filed Sep. 17, 1976, Ser. No. 724,172

Int. Cl.² G06M *1/272;* **B67D** *5/22*

U.S. Cl. 235—92 FL **6 Claims**



1. In an encoder for use with a flow responsive mechanical computer having a gear which rotates at a rate bearing a predetermined relationship to the flow and a stationary frame member spaced from the gear: a base adapted to be removably mounted on the frame member with a bearing surface for engagement with said member in such manner that the base is free to pivot about the member, a gear rotatively mounted on the base and spaced from the bearing surface for driving engagement with the computer gear means yieldably urging the base to pivot about the stationary member to maintain the gears in driving engagement when the encoder is mounted on the computer, and means coupled to the encoder gear for delivering a digital output signal corresponding to the rate at which said gear is driven.

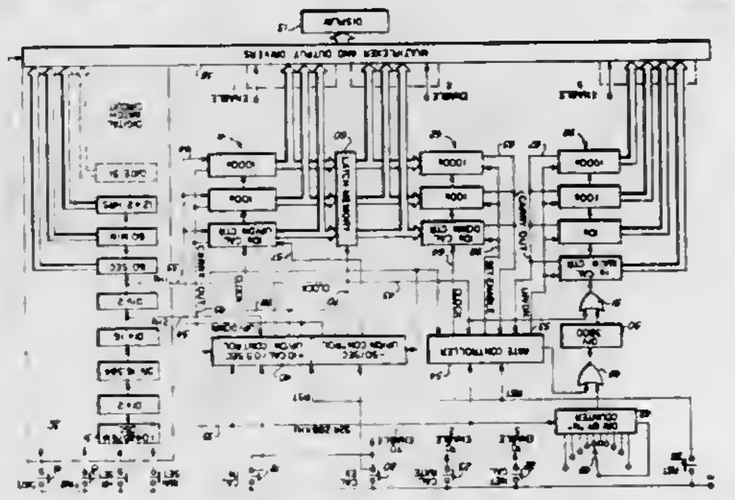
4,100,401
CALORIE CALCULATOR-CHRONOMETER

Eugene F. Tott, and Rita C. Tutt, both of 1501 Nisson Rd., Tustin, Calif. 92680

Filed Jan. 13, 1977, Ser. No. 758,917

Int. Cl.² G06M *3/08*

U.S. Cl. 235—92 T **4 Claims**



1. In an electronic timepiece having a source of constant frequency signals pulses, a time computing circuit coupled to the source of constant frequency signal pulses and producing time information in binary coded decimal form, an electro-optical digital display, a decoder circuit coupling the time computer circuit to the display, and a first manually operated switch coupled to the time computing circuit for energizing the display from the time computing circuit in response to operation of such first switch, an auxiliary calorie calculator data system including in combination:

a main storage counter for storing numerical data indicative of net calories;

a rate controlling circuit coupling said main counter with said source of constant frequency pulses for decrementing the count in said main counter at a predetermined rate;

an auxiliary digital counter;

means including at least a second manually operated switch coupled with said auxiliary counter and with said source of constant frequency pulses to store a count in said auxiliary counter corresponding to caloric intake, said second switch further being coupled with said auxiliary counter for energizing said display from the output of said auxiliary counter in response to operation of said second switch;

means controlled by said second switch for transferring the count from said auxiliary counter to said main counter to increase the count in said main counter by the amount of the count stored in said auxiliary counter;

calorie rate expenditure circuit means including a third manually operated switch for effecting storage of a count in said auxiliary counter corresponding to the rate of expenditure of calories;

a latch memory circuit coupled with said auxiliary counter and operated by said third switch for storing the count present in said auxiliary counter;

a calorie rate down-counter coupled with said latch memory circuit and with said rate controlling circuit for temporarily storing the calorie count stored in said latch memory circuit and for varying the rate at which the count in the main counter is decremented by said rate controlling circuit directly proportional to the count stored in said latch memory circuit; and

a fourth manually operated switch coupled with said main counter for energizing said display from said main counter in response to operation of said fourth switch.

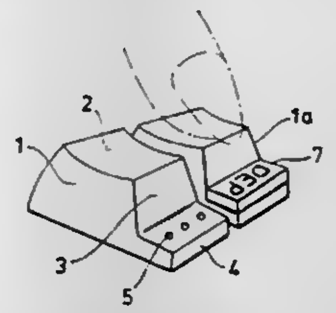
4,100,402
KEYBOARD KEY WITH CHANGEABLE INDICIA

Goran Lundström, Enskede, and Willem Huijsers, Farsta, both of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed Nov. 22, 1976, Ser. No. 743,632

Int. Cl.² G06C *7/02;* **B41J** *5/16*

U.S. Cl. 235—145 R **3 Claims**



1. A key for a keyboard comprising:

a main body portion adapted to be contacted by the operator, the end of the body portion remote from the operator formed with a rear wall defining a recess into which the nail of the operator can extend and terminating in a shelf,

an indicia holding plate mountable on said shelf having a pocket for accepting and holding a label with indicia thereon and an opening into said pocket to permit the label to be exchanged, the top of said plate being transparent to permit the indicia to be viewed,

and mating means on said plate and said shelf for mounting the plate to the shelf.

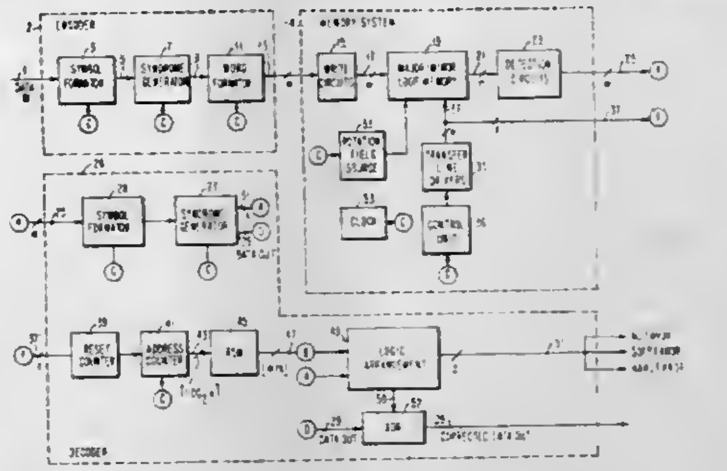
4,100,403
METHOD AND MEANS FOR DISCRIMINATING BETWEEN SYSTEMATIC AND NOISE-INDUCED ERROR IN DATA EXTRACTED FROM WORD ORGANIZED MEMORY ARRAYS

John Scott Eggenberger, Los Altos, and Arvind Motibhai Patel, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,506

Int. Cl.² G06F *11/12;* **G11C** *29/00*

U.S. Cl. 235—312 **9 Claims**



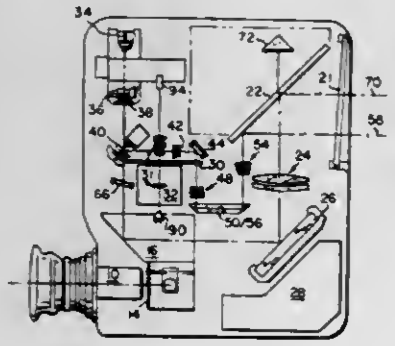
1. A method for discriminating between no error, defect induced error, and noise induced error in formatted data normally stored in and extracted from an addressable memory, said data being inclusive of redundancy patterns, the method comprising the steps of:

forming a table of concordance between each memory address and its defect status;
accessing both formatted data from at least one preselected memory address and the counterpart defect status from the concordance table;
determining the syndrome of the accessed data; and
indicating from the accessed data the presence of either:
- a defect induced error upon the concurrence of a non-zero syndrome and a defect at the counterpart memory address;
- a noise induced error upon the concurrence of a non-zero syndrome and no defect; or
- no error upon the occurrence of a zero syndrome.

4,100,404
BEAM PROJECTOR

Philip M. Johnson, Windham, N.H., and John D. Koppenheimer, Jr., Tewksbury, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 13, 1976, Ser. No. 704,894
Int. Cl.² H04B *9/00*
U.S. Cl. 250—199 **33 Claims**



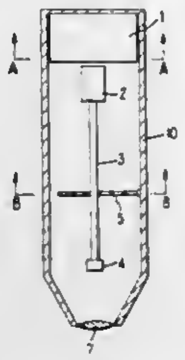
20. A beam projector, comprising:
a source of radiation;
a plurality of separate coded reticles;
means for sequentially moving said separate coded reticles in the path of the beam of said radiation source;
a pseudo-zoom assembly intermediate said source of radiation and said coded reticles;
a mirror disposed intermediate said pseudo-zoom lens assembly and said coded reticles; and
means for moving said mirror out of the path of said radiation source thereby providing a different optical path between said pseudo-zoom lens assembly and said coded reticles such that the focal length of the projector is thereby altered.

4,100,405
PHOTO-ELECTRIC SCANNER FOR LINE FOLLOWING DEVICES

Michael Kondrollochis, 4 Nightingale Rd., Woodley, Berkshire, England

Filed Jan. 3, 1977, Ser. No. 756,422
Int. Cl.² G05B *1/00*
U.S. Cl. 250—202 **8 Claims**

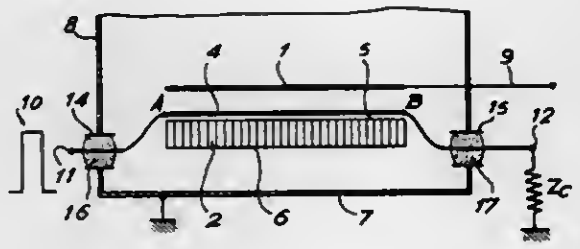
1. A scanning mechanism comprising:
a housing;
a support member carrying a photo-electric cell mounted within said housing and movable to allow said cell to move in an elliptical orbit;
electro-magnetic means mounted within said housing;
magnetic means secured to said support and positioned within a moving field producible by said electro-magnetic means, such that on energisation of said electro-magnetic means by a power supply said moving field thereby causes movement of said magnetic means and said cell in said elliptical orbit; and
optical means mounted in a wall of said housing to direct an image of an object located outside said housing onto said cell.



4,100,406
PHOTOELECTRIC SHUTTER TUBE WITH MICRODUCT WAFER INCORPORATED IN A WAVE PROPAGATION LINE WHICH IS INTEGRATED IN SAID SHUTTER TUBE

Charles Loty, Lesigny, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 10, 1977, Ser. No. 776,277
Claims priority, application France, Mar. 16, 1976, 76 07489
Int. Cl.² H01J *31/50*
U.S. Cl. 250—213 VT **7 Claims**

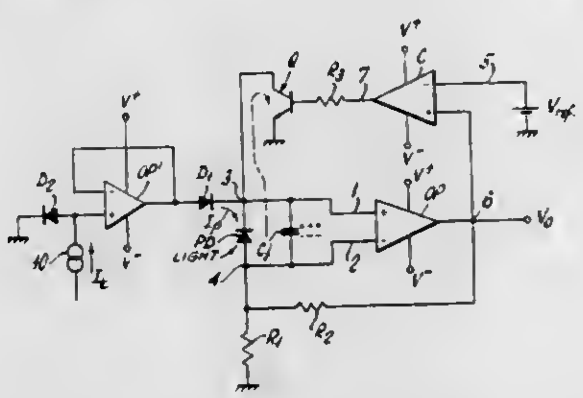


1. A photoelectric shutter tube of the type which essentially comprises in sequence and parallel to each other a photocathode brought to a predetermined electric potential, a secondary-emission microduct wafer, a screen composed of a layer of material which is phosphorescent under the impact of electrons and coated on the wafer side with a so-called screen layer, wherein a metal deposit or so-called wafer layer is applied only on that face of the wafer which is directed towards the photocathode, said wafer layer being brought to a potential which is equal to or higher than that of said photocathode, the space located between wafer and screen layers being so arranged as to provide a wave-propagation line element of the biplanar type in which the conductors are constituted by said layers, the characteristic impedance of said element being equal to that of a propagation line which is located externally of the tube for carrying a pulse signal and to which it is connected, wherein the tube comprises electrically matched means for bringing said line element out through the tube envelope and connecting said element to the external line and wherein a voltage signal is applied to the line element and progressively brings the screen layer to a higher potential than that of the wafer layer.

4,100,407
PHOTOELECTRIC CONVERSION CIRCUIT

Akinori Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,773
Claims priority, application Japan, Jun. 28, 1976, 51-76270
Int. Cl.² H01J *39/12*
U.S. Cl. 250—214 P **2 Claims**

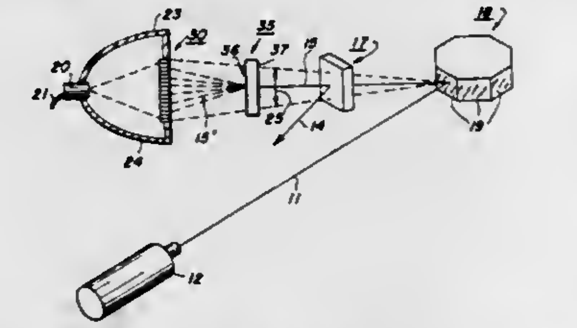


1. A photoelectric conversion circuit comprising a light-receiving element having a parasitic capacitance and producing a signal corresponding to the illumination given thereto, an amplifier having a first and a second terminal connected to the respective terminals of said light-receiving element and producing upon reception of the output signal of said light-receiving element an output voltage corresponding to said output signal, a comparator for comparing the output voltage of said amplifier with a reference voltage, and means for discharging an electric charge stored in said parasitic capacitance of said light-receiving element under the control of the output of said comparator.

4,100,408
SIGNAL GENERATOR FOR RASTER TYPE SCANNERS

Sidney W. Marshall, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1977, Ser. No. 773,445
Int. Cl.² G01D *5/30*
U.S. Cl. 250—230 **6 Claims**

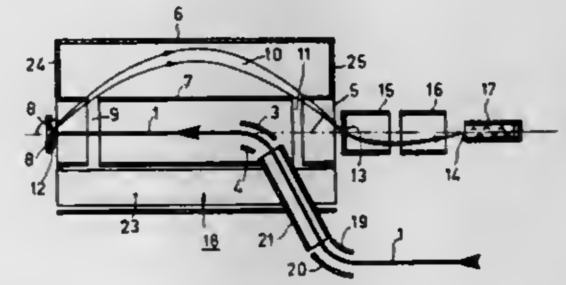


1. In a signal generating apparatus for generating signal pulses in accordance with the sweep of a light beam, the apparatus including aperture means having a succession of spaced apart apertures, the aperture means being astride the path through which the light beam sweeps whereby to produce a succession of light bursts on sweep of the light beam thereacross, and light triggered signal generating means for producing signal pulses in response to the light bursts, the improvement comprising: beam splitting means for separating said light beam into plural secondary light beams, the spacing between said secondary beams being at least equal to the distance between adjoining ones of the apertures in said aperture means, said plural secondary light beams assuring distortion free production of the signal pulses in the event one or more of the apertures in said aperture means are closed or misaligned.

4,100,409
DEVICE FOR ANALYZING A SURFACE LAYER BY MEANS OF ION SCATTERING

Hidde Herman Brongersma, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Continuation of Ser. No. 577,069, May 13, 1975, abandoned, which is a continuation of Ser. No. 432,483, Jan. 11, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,733
Claims priority, application Netherlands, Feb. 3, 1973, 7301496
Int. Cl.² H01J *39/00*
U.S. Cl. 250—305 **2 Claims**

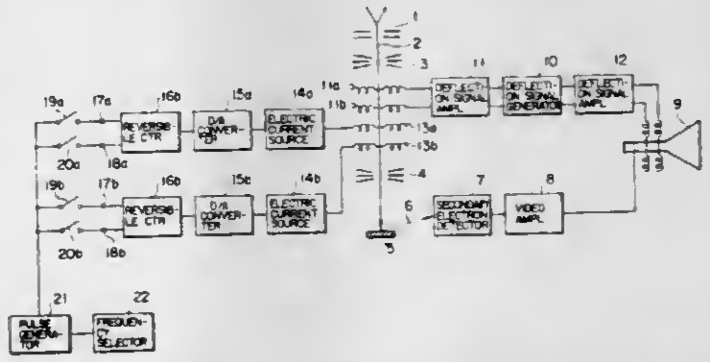


1. In a cylindrical analyzer for charged particles back scattered from a target on the axis of said analyzer, said analyzer including inner and outer concentric electrically conductive tubular electrodes, the inner of said electrodes having longitudinally spaced annular entrance and exit slots for back scattered charged particles, a radial-electric field between said electrodes permitting back scattered charged particles having only a predetermined energy to exit through said exit slot to detector means therefor, the improvement comprising a passageway from the exterior of said analyzer to the interior thereof for cooperation with a primary mono-energetic ion beam source external thereto and deflection means within said analyzer to direct a primary mono-energetic ion beam through said passageway and along the axis of said analyzer for collision with the target on the axis thereof, said passageway comprising: at least two conductive radially aligned longitudinal walls between but spaced from said inner and outer electrodes and defining an acute sector shaped space therebetween, said inner and outer electrodes being absent from at least a portion of the boundary of said sector shaped space to form a passageway from the exterior of said analyzer to the interior thereof, said longitudinal walls being held at a potential between the potentials of said inner and outer electrodes.

4,100,410
APPARATUS FOR SELECTING THE FIELD OF VIEW OF A SAMPLE

Yukichi Ueno, and Toshiaki Nakata, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,206
Claims priority, application Japan, Dec. 24, 1975, 50-153251
Int. Cl.² G01M *23/00*
U.S. Cl. 250—311 **6 Claims**



1. Apparatus for selecting the field of view of a sample, comprising means for irradiating the sample by an irradiation beam, means for generating electric pulses, means capable of

counting said electric pulses both incrementally and decrementally and for generating an electric signal corresponding to the number of the counted pulses, means for deflecting said irradiation beam to irradiate said sample in response to said electric signal, and means for stopping the incremental counting and the decremental counting independently.

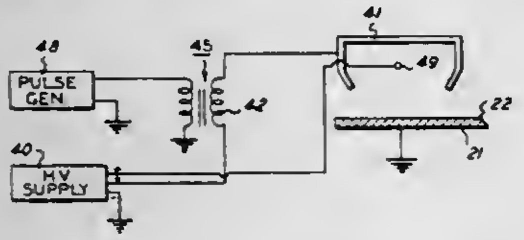
4,100,411
BIASING ARRANGEMENT FOR A CORONA DISCHARGE DEVICE

Thomas G. Davis, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 541,545, Jan. 16, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,725

Int. Cl.² G03G *15/00*

U.S. Cl. 250—324 **14 Claims**



1. A corona discharge device comprising
an elongated corona discharge electrode,
- a conductive shield disposed in partially surrounding relationship with respect to said electrode, said shield being coextensive with said electrode,
- means for applying a high D.C. corona generating potential of a first polarity to said wire,
- means for biasing said shield to a first D.C. potential of said first polarity high enough to substantially extinguish ion formation adjacent said electrode, and
- means for continuously cyclically changing the potential on said shield at a constant rate to a second fixed potential to increase ion production adjacent said electrode and returning said potential to said extinguishing level the duration and frequency of said cyclical changes on said shield operating to direct a substantial majority of said ions under the influence of an electric field to an adjacent surface other than said shield.

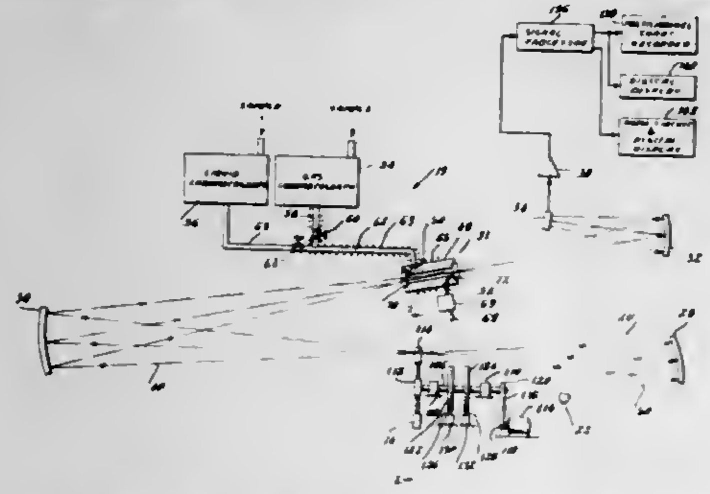
4,100,412
SELECTIVE MULTICHANNEL OPTICAL TIME-SHARED DETECTOR FOR CHROMATOGRAPHY

Harry H. Hansdorff, 270 Westport Rd., Wilton, Conn. 06897

Filed Oct. 29, 1976, Ser. No. 737,106

Int. Cl.² G01N *21/34*

U.S. Cl. 250—343 **13 Claims**



1. A nondispersive chromatographic detector comprising:
- A. a radiant energy source;
- B. flow through sample cell means for positioning a sample for impingement by radiant energy from said source;
- C. chromatograph means including a separation means for causing a sample introduced to aid chromatograph to separate into components which elute successively in time from said separations means;
- D. means coupling said separation means to said flow through cell;
- E. first means for projecting radiant energy from said source toward said container means whereby a sample being analyzed is impinged by radiant energy and absorbs radiation and radiant energy transmitted by the sample is emitted from said container means;
- F. radiant energy intensity detection means;
- G. second means for projecting radiant energy emitted from said container toward said radiant energy detection means whereby said detection means provides an electrical indication representative of the intensity of radiant energy emitted from said container means;
- H. nondispersive radiant energy filter means for transmitting radiant energy incident thereon at a plurality of different predetermined analytical wavelengths, said filter means positioned in a path of projected radiant energy;
- I. means for causing radiant energy to periodically be projected at each of said plurality of analytical wavelengths; and,
- J. means coupled to said radiant energy detection means for providing a simultaneous indication of the intensity of radiant energy impinging on said detection means at each of said plurality of wavelengths.

4,100,413
RADIATION IMAGING APPARATUS WITH IMPROVED ACCURACY

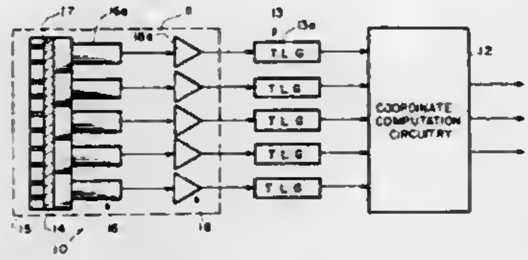
Dan Inbar, Haifa, and Yitzhak Klein, Kiryat Yam, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Sep. 14, 1976, Ser. No. 723,305

Claims priority, application Israel, Sep. 17, 1975, 48113

Int. Cl.² G01T *1/20*

U.S. Cl. 250—366 **9 Claims**



1. In radiation imagimg apparatus of the type having a scintillation crystal responsive to radiation stimuli for producing light events, a plurality of photodetectors arranged in a predetermined array relative to the crystal, each of the photodetectors having a lightsensitive surface facing the crystal and being responsive to a light event for producing an output signal, and coordinate computation circuitry for computing the coordinate of a light event from signals applied thereto, the output signals of each photomultiplier being applied to the coordinate computation circuitry via coupling means associated with each photodetector, the improvement comprising:
- (a) a delay circuit in each coupling means for delaying the output signal of the photodetector with which the coupling means is associated;
- (b) a linear gate in each coupling means for connecting the output of the delay circuit to the coordinate computation circuitry when the gate is activated; and
- (c) decision means responsive to the output signal of at least one photodetector for enabling the linear gate of a coupling means when a predetermined condition is met within the delay time of the delay circuits of the coupling means.

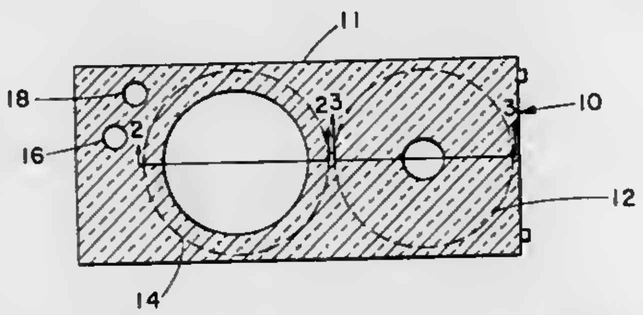
4,100,414
METHOD FOR MEASURING DOSE-EQUIVALENT IN A NEUTRON FLUX WITH AN UNKNOWN ENERGY SPECTRA AND MEANS FOR CARRYING OUT THAT METHOD

Carl H. Distenfeld, Mattituck, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 19, 1977, Ser. No. 760,796

Int. Cl.² G01T *3/00, 1/11*

U.S. Cl. 250—391 **13 Claims**



1. A method for measuring the dose-equivalent accumulated by a person during a period of exposure to a neutron flux having an unknown and/or time varying energy spectrum comprising the steps of:
- (a) Obtaining a first reading reflecting substantially only that portion of said neutron flux, incident during said periods of exposure, having energies in an upper portion of said energy spectrum,
- (b) Obtaining a second reading reflecting both that portion of said flux incident during said periods of exposure and those neutrons backscattered from said person's body during said periods, having energies in a lower portion of said energy spectrum,
- (c) Obtaining a third reading reflecting substantially only that portion of said flux, incident during said periods, having energies in said lower portion of said energy spectrum,
- (d) Combining said readings by means of a predetermined function of said readings whose value is an approximate measure of the dose equivalent accumulated by said person during said periods which value is substantially independent of said energy spectrum.

4,100,415
MODULAR PHOTOCHEMOTHERAPY CHAMBER

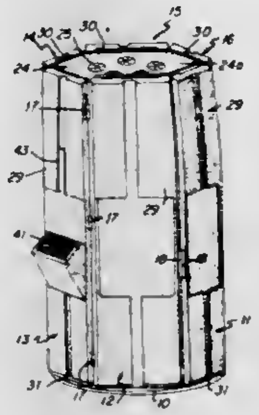
Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 4, 1976, Ser. No. 693,029

Int. Cl.² A61N *5/06*

U.S. Cl. 250—455 **15 Claims**

1. A modular photochemotherapy chamber comprising, in combination:
- a substantially horizontal base member;
- a plurality of side panel assemblies mounted vertically upright on said base member and arranged to form an enclosure;
- each of said side panel assemblies including a plurality of phototherapy lamps disposed vertically thereon and facing the inside of said enclosure, said lamps being adapted, when energized to emit substantially only ultraviolet light;
- means at one end of each of a subplurality of said side panel assemblies for removably attaching the panels to said base member;
- a substantially horizontal top member covering said enclosure and removably attached to the other end of each of said subplurality of side panel assemblies;
- at least one of said side panel assemblies not of said subplurality thereof being removably attached by hinges to an adjacent side panel assembly to thereby provide a door for said enclosure;
- means in said top member for ventilating said enclosure and



- a removable stand disposed on said base member within said enclosure and having reflector means thereon facing toward the top of said enclosure, said stand having a top portion located above the lower ends of said vertically disposed lamps.

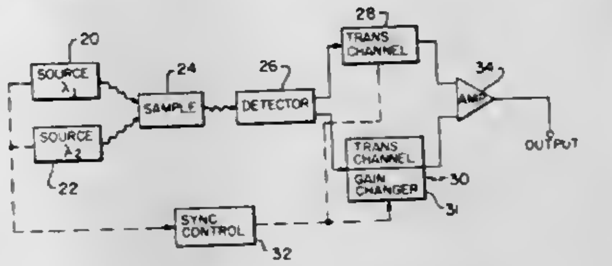
4,100,416
SERUM FLUORESCENCE SUPPRESSION

Tomas R. Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Mar. 2, 1977, Ser. No. 773,546

Int. Cl.² G01N *21/38, 33/16;* G01J *3/30*

U.S. Cl. 250—461 B **10 Claims**



1. Apparatus for assaying fluorescently-tagged antibody-antigen reaction product contained in a specimen of blood serum, said apparatus comprising in combination:
- means for irradiating said specimen with first radiation in the absorption band of the tag of said product so as to stimulate fluorescent emission from said tag;
- means for separately irradiating said specimen with second radiation substantially incapable of stimulating fluorescent emission from said tag;
- means for detecting fluorescent emission from said specimen due to irradiation of said specimen with said first radiation so as to provide a first electrical signal;
- means for detecting fluorescent emission from said specimen due to irradiation of said specimen with said second radiation so as to provide a second electrical signal;
- means for scaling said first and second signals with respect to one another by scaling factor; and
- means for producing as a function of a difference between said first and second signals as scaled, an electrical output signal related to the amount of said antigen in said specimen.

4,100,417
DENTAL X-RAY DIAGNOSTIC DEVICE

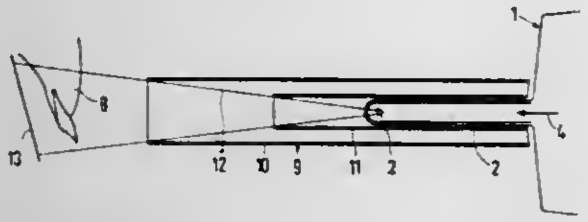
Horst Göetzl, Erlangen; Ulrich Grassme, Nuremberg, and Johannes Seissl, Erlangen-Buckenhof, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, of Germany

Filed Feb. 3, 1977, Ser. No. 765,456

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1976, 2608418

Int. Cl.² G03B *41/16*

U.S. Cl. 250—505 **5 Claims**



1. In a dental X-ray diagnostic device having an X-ray tube whose cathode is provided with means for focusing the emitted electron beam onto an anode with the anode disposed adjacent a sealed end section of a tube projecting from a housing containing the cathode with the device constructed in such a manner that the X-rays issue from the anode in substantially all directions, the device being equipped with a cap constructed of an X-ray absorptive material which can be slipped over the anode tube, the cap being provided with an aperture restricting the emitted X-ray beam thereby allowing simultaneous X-ray photographs of plurality of teeth by placing the anode interiorly of the mouth of the patient, the improvement of an axially elongated hollow-cylindrical open ended tube constructed of X-ray absorptive material, said tube having an internal dimension, at least at one axial end, receivable over the sealed end section of the anode tube, a frontal axial end of said hollow-cylindrical tube remote from the one axial end being open, and the hollow-cylindrical tube projecting beyond the anode remote from the cathode and being dimensioned to provide an X-ray beam exiting from the open frontal end with a predetermined angle with a central ray laying on the axis of the anode tube whereby the hollow-cylindrical tube positioned on the anode tube converts the device to an axial emitter from the anode tube for patient external X-ray source use.

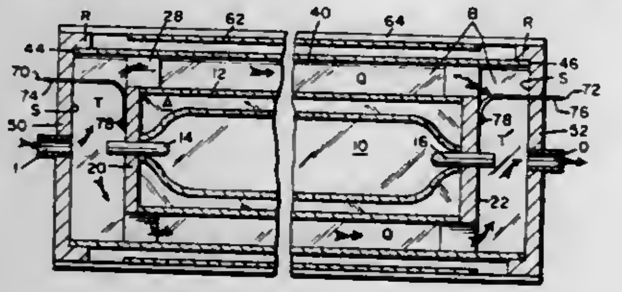
4,100,418
METHOD OF AND MEANS FOR FILTERING THE INFRARED RAYS FROM A SOURCE OF UV RADIATION

George Emmett Brown, Jr., Cincinnati, Ohio, assignor to Gene D. Hoffman, Cincinnati, Ohio

Filed Mar. 4, 1977, Ser. No. 774,234

Int. Cl.² G21K *3/00;* G01J *1/42*

U.S. Cl. 250—510 **27 Claims**



4. The method of absorbing infrared rays while transmitting cool ultraviolet rays from a source of UV radiation, which comprises the steps of:

(a) housing the source of radiation within a moisture-impervious first chamber in which said source of radiation can operate at its rated operating temperature, said chamber being transparent along the light-emitting length of said UV source to infrared and ultraviolet rays,

(b) enclosing said first chamber within a second chamber which is transparent along the light-emitting length of said UV source to infrared and ultraviolet rays; and of

(c) introducing steam into and through the second chamber so that the steam forms a filter media which absorbs the infrared rays and transmits the ultraviolet rays from said source of radiation.

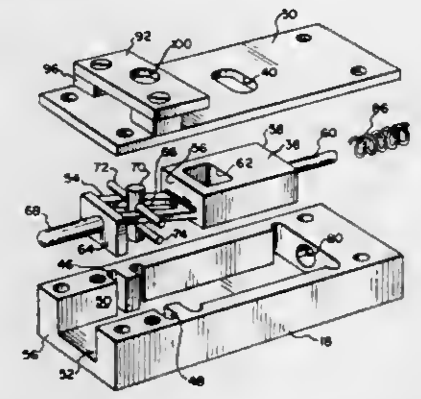
4,100,419
SAFETY INTERLOCK DEVICE

Raul Pedroso, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 5, 1977, Ser. No. 784,663

Int. Cl.² G21F *5/04;* G21K *1/02*

U.S. Cl. 250—514 **14 Claims**



1. A safety interlock device for securing a protective enclosure within which radiation emitting means is employed, the enclosure having an access opening and dislodgeable means for preventing entry to said access opening, the safety interlock device serving to prevent exposure to said radiation when entry is gained to said enclosure: said safety interlock device comprising; a housing receivable within said enclosure, spring-biased shutter means within said housing and capable to block said radiation when said entry is gained, said shutter means movable within said housing between an active blocking condition and a defeated condition permitting passage of such radiation, indicating means coupled to said shutter means to establish visible indication when said shutter means is disposed in blocking condition, latch means secured to said dislodgeable means and being movable in a restricted path adjacent said housing, means defining said restricted path and control means coupled to said shutter means to limit movement of said latch means in said path during the defeated condition of said interlock whereby free entry cannot be obtained while said shutter interlock device is defeated.

4,100,420
DISPLACEMENT TRANSDUCERS

Eric Metcalf, Ropley, England, and Anthony John Ley, Bièvres, France, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Jan. 26, 1977, Ser. No. 763,253

Claims priority, application United Kingdom, Feb. 3, 1976, 04257/76

Int. Cl.² G01N *21/30*

U.S. Cl. 250—561 **15 Claims**

1. A displacement transducer comprising:

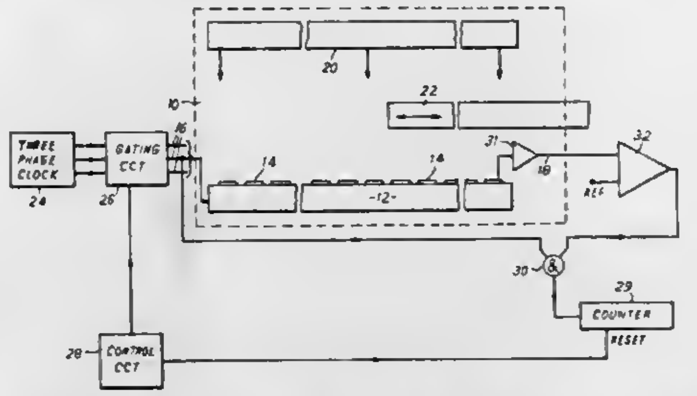
a charge-coupled device having a plurality of light-sensitive stages arranged in a line,

a light source,

an obturating member disposed between the light source and the charge-coupled device, the charge-coupled device and the obturating member being relatively movable in dependence upon the displacement to be transduced so as to vary the amount of light received by, and the charge accumulated in, respective stages of the charge-coupled device in accordance with the relative positions of the charge-coupled device and the obturating member,

a clock pulse generator for applying clock pulses to the charge-coupled device to successively shift the respective charge in each stage of the device towards an output stage, whereby to produce from said output stage an output signal whose level takes a succession of values each corresponding to the charge in a respective stage of the device, and

means responsive to said output signal to derive a signal in accordance with the relative positions of the device and the member.



4,100,421
OZONE-GENERATING APPARATUS

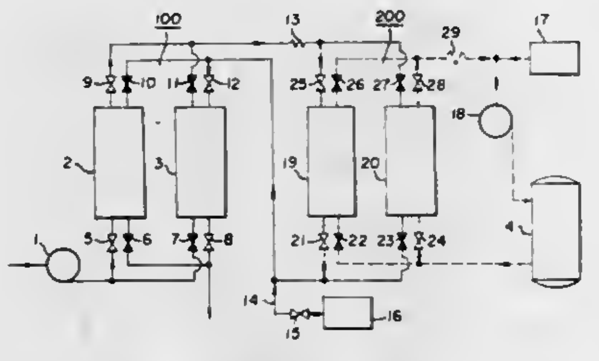
Norikazu Tabata; Takanori Ueno, and Keisuke Namba, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan

Filed Dec. 16, 1976, Ser. No. 751,482

Claims priority, application Japan, Dec. 19, 1975, 50/152521; Jan. 16, 1976, 51/3828; Jan. 19, 1976, 51/4735

Int. Cl.² C01B *13/00*

U.S. Cl. 250—533 **6 Claims**



1. An ozone-generating apparatus which comprises:

an ozonizer;

first and second moisture exchangers, connected to said ozonizer, each containing a synthetic zeolite having a pore diameter of less than 4 Angstroms which adsorbs nitrogen oxides, said exchangers alternately repeating an operation for drying air fed into the ozonizer and an operation for regenerating the moisture adsorbent by the dry ozone-containing air obtained by the ozonizer; and,

means for feeding nitrogen oxides which is operably connected to said first and second moisture exchangers.

4,100,422
LIGHT CONDUCTOR IN A SIGNAL ISOLATOR

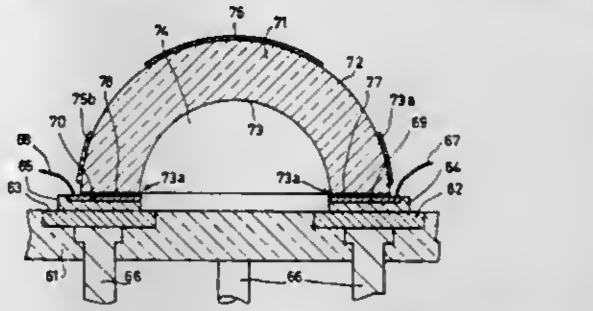
Jacques Claude Thillays, Herouville-St-Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,302

Claims priority, application France, Aug. 29, 1975, 75 26628

Int. Cl.² G02B *27/00*

U.S. Cl. 250—551 **31 Claims**



1. A light conductor, comprising at least one element for conducting light by total reflection, said element being formed from a material having an index of refraction n_1 and has a first main face which bounds an exterior medium having an index of refraction n_2 which is lower than n_1, the first main face having the shape of a part of the surface of a sphere, said part being situated on a side of an arch of a great circle on the sphere, an injection zone of light situated in the proximity of a first end of the arch, a collecting zone of light situated in the proximity of a second end of said arch, the location of the injection and collection zones being such that the distance between each of the collection and injection zones and the center of the sphere being at most equal to the radius of the said sphere and at least equal to the product of the radius of the sphere and the sine of a limit angle equal to the arcsine n_2/n_1.

4,100,423
OPTO-ELECTRONIC TWO-WAY COUPLING

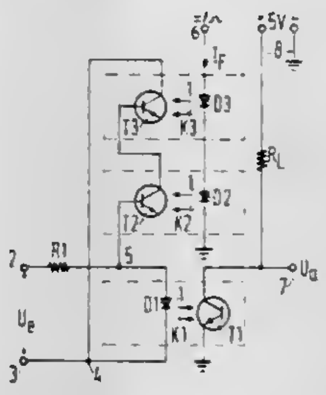
Gerhard Krause, Rosenheim, Egarten, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,661

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614359

Int. Cl.² G02B *27/00*

U.S. Cl. 250—551 **10 Claims**



1. An opto-electronic two-way coupling system having a signal input for signal voltages below 1 volt which is electrically separated from the signal output, said system including a first opto-electronic coupler having a transmitter and receiver and connected via its transmitter to the signal input and via its receiver to the signal output, and at least one additional opto-electronic coupler having a transmitter and receiver with a coupling direction opposite to the first coupler, its receiver connected to the signal input and its transmitter connected to a current source separate from the signal output.

4,100,424

METHOD FOR CONTROLLING A PHOTOGRAPHIC PRINTING EXPOSURE

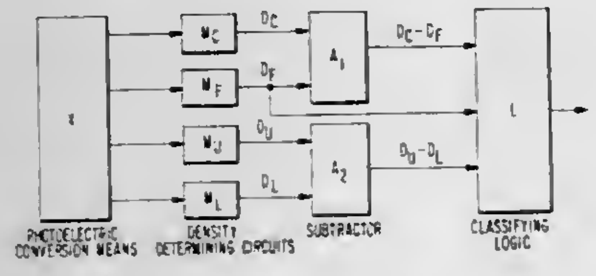
Taizo Akimoto; Takaaki Terashita; Koji Takahashi; Shigeru Watanabe, and Eiichi Asai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara Japan

Filed Aug. 18, 1976, Ser. No. 715,589

Claims priority, application Japan, Aug. 19, 1975, 50-100454

Int. Cl.² G01N *21/30*

U.S. Cl. 250—559 **13 Claims**



1. A method for categorizing film negatives for correcting the exposure amount required to make photographic prints from said negatives, said method comprising:

detecting the transmission density of the entire scene of a negative, a central portion of said negative, a first half portion and a second opposite half portion of said negative;

determining the difference values between said densities of said central portion and entire scene to obtain a first difference value and the difference values between said first and second half portions to obtain a second difference value;

quantizing said first and second difference values and said density of the entire scene into discrete quantized values; and

logically combining said quantized values into exclusive groups corresponding to categories, the particular combination existing for any given negative determining the group and the category of the negative for correction.

4,100,425

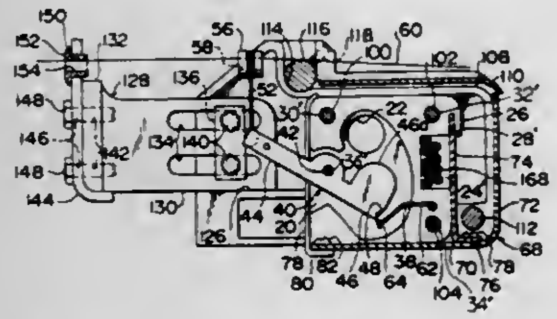
APPARATUS FOR DETECTING BREAK OR SLACKENING OF YARN

Shiuji Ohsawa, No. 10-2, 2-chome, Tsutsumi-cho, Kiryu City, Gumma Prefecture, Japan

Filed Dec. 14, 1976, Ser. No. 750,566

Int. Cl.² D02H *13/08;* D04B *35/16*

U.S. Cl. 250—561 **20 Claims**



1. An apparatus for detecting a break or unusual slackening of a yarn in a plurality of yarns, comprising:

a detector assembly consisting of a plurality of detecting units juxtaposed end-to-end in a longitudinal direction, each of the detecting units comprising a magazine block having front and rear ends substantially parallel with said longitudinal direction and formed with an aperture open at both side ends of the magazine block, the apertures in the magazine blocks of the individual detector units having respective center axes substantially in line with one another, said apertures forming an elongated continuous bore throughout said magazine blocks substantially in parallel with said longitudinal direction: a light-intercepting element which is rotatable about an axis of rotation through said magazine block and substantially parallel with said longitudinal direction and which projects outwardly from the front end of the magazine block, the light-intercepting element being rotatable about said axis of rotation between a first angular position uncovering the aperture at one axial end of the aperture, a second angular position in part covering the aperture at said axial end and a third angular position opposite to said second angular position across said first angular position and uncovering said aperture, said light-intercepting element being in said first angular position by a properly tensioned yarn engaging the element and in said third angular position when the detecting unit including the intercepting element is to be out of use; biasing means urging said light-intercepting element to turn toward said second angular position about said axis of rotation; stop means for bearing said light-intercepting element thereon when the light-intercepting element is in said second angular position; and manually-operated retaining means supported on said magazine block for releasably holding said light-intercepting element in said third angular position thereof;

light-emitting means which is positioned externally of and in proximity to the aperture in the magazine block disposed at one loogitudinal end of said detector assembly and which is operative to project a beam of light into said bore; and

light-sensitive signal generating means positioned externally of and in proximity to the aperture in the magazine block at the other longitudinal end of said detector assembly and operative to deliver a signal in response to the beam of light emitted from said light-emitting means and reaching said signal generating means through said bore.

4,100,426

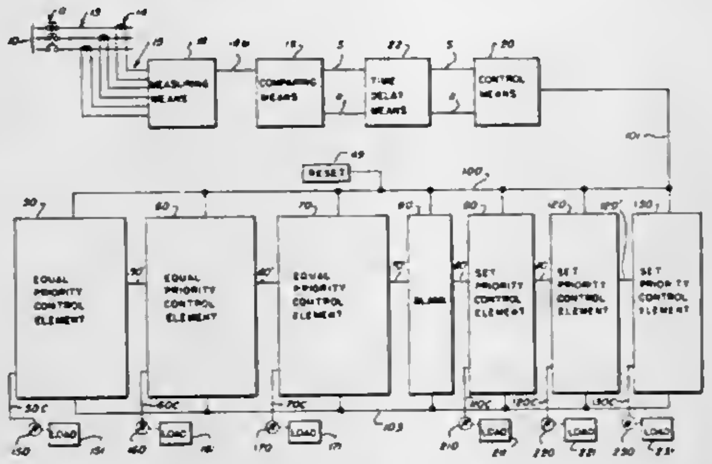
LOAD CONTROLLING MEANS

Stephen W. Baranowski, Fairfield, Conn., and Richard H. McConeghy, Milwaukee, Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Mar. 10, 1976, Ser. No. 665,655

Int. Cl.² H02J *3/00, 3/14*

U.S. Cl. 307—41 **7 Claims**



MEASURING MEANS
COMPARING MEANS
TIME DELAY MEANS
CONTROL MEANS
RESET
EQUAL PRIORITY CONTROL ELEMENT
EQUAL PRIORITY CONTROL ELEMENT
EQUAL PRIORITY CONTROL ELEMENT
SET PRIORITY CONTROL ELEMENT
SET PRIORITY CONTROL ELEMENT
SET PRIORITY CONTROL ELEMENT
LOAD
LOAD
LOAD
LOAD
LOAD
LOAD
50C
60C
70C
103
150
160
170

1. A demand controller for an electrical power system of the type connecting and disconnecting electrical loads from an electrical source to control the level of electrical power consumption comprising:

a sensing means responsive to the current in the power system for producing a first output signal when the current is above a first preselected level for a preselected time and a second output signal when the current is below a second preselected level for a preselected time;

a first group of control elements each connected to respectively control each of a first group of loads and having a means responsive to control signals for connecting and disconnecting its loads in a preselected first priority sequence;

a second group of control elements each connected to respectively control each of a second group of loads and having a means responsive to control signals for connecting and disconnecting its loads in a preselected second priority sequence; and

a control means responsive to the first output signal and the second output signal for producing and selectively delivering control signals to the first and second group of control elements in a preselected sequence.

4,100,427

DEVICE FOR CONVERTING SOLAR ENERGY

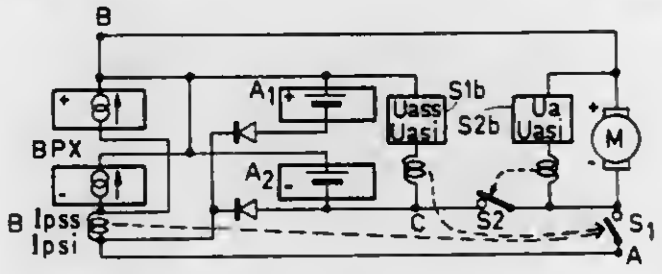
Henri Durand, Paris, and Geert Jan Naaijer, Limeil-Brevannes, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,995

Claims priority, application France, Oct. 31, 1975, 75 33378

Int. Cl.² H02J *1/10*

U.S. Cl. 307—87 **9 Claims**



1. In a device for converting solar energy into electric energy to be supplied to a load of the type which exhibits an in-rush effect, the improvement comprising, a plurality of photocells for converting solar energy into electric energy, a plurality of electric accumulators for storing electric energy supplied by the photocells, the number of photocells being sufficient to provide a peak power and a peak photocell current which under optimum insolation is equal to or is slightly greater than the nominal power and the nominal current, respectively, of the load, means for coupling the photocells to the accumulators and the load, switching means for connecting the load, during the load starting period, to the photocells only so that the load current then is determined only by the photocell current, and detection means responsive to photocell current, load voltage and accumulator voltage for controlling the operation of said switching means.

4,100,428

CONTROL SYSTEM FOR LIMITING THE ELECTRICAL CONSUMPTION OF A DISTRIBUTION NETWORK

Jules Delisle; Adrien Leroux, both of Sherbrooke, and Serge Mathieu, Ste-Foy, all of Canada, assignors to H.O.P. Consulab Inc., Beauport, Canada

Filed Jun. 15, 1976, Ser. No. 696,415

Claims priority, application Canada, Feb. 6, 1976, 245766

Int. Cl.² H05B *1/02;* H01H *37/00*

U.S. Cl. 307—97 **14 Claims**

1. A control system for limiting the electrical demand of a distribution network to a maximum predetermined value while regulating the temperature of one or more thermal loads by connecting and disconnecting a number of heating or cooling elements, comprising:

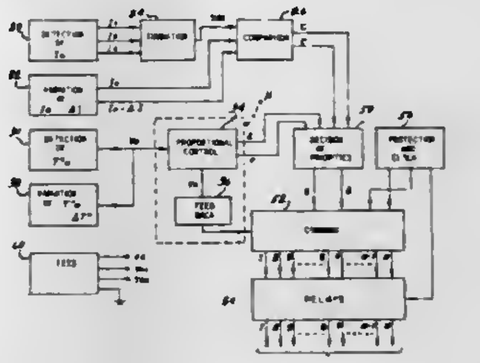
means for measuring the instantaneous demand of said network;

means for comparing the measured demand of said network to said predetermined maximum value;

means for measuring the instantaneous temperature of each said thermal load;

means for determining, for each said thermal load, the difference between the measured temperature and a precetermined temperature for said load;

means for establishing a proportional relation between said difference and the number of elements in a connected state;



priority decision means for determining action to be taken on the connection or disconnection of a number of said elements in response to information received from said comparing means and said relation establishing means: and

means for connecting or disconnecting said number of said elements in response to a decision derived from said priority decision means.

4,100,429

FET LOGIC CIRCUIT FOR THE DETECTION OF A THREE LEVEL INPUT SIGNAL INCLUDING AN UNDETERMINED OPEN LEVEL AS ONE OF THREE LEVELS

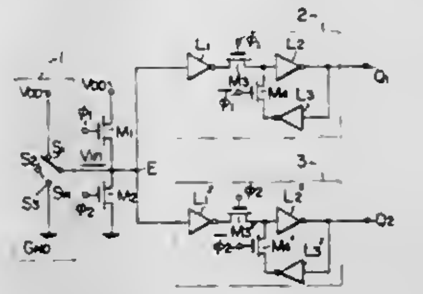
Yoshio Adachi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,141

Claims priority, application Japan, Jan. 7, 1976, 51-784

Int. Cl.² H03K *19/08, 19/40, 17/18, 3/353*

U.S. Cl. 307—205 **17 Claims**



1. A logic circuit comprising

(a) a first power source and a second power source having a lower voltage level than said first power source;

(b) a first and a second switching means, each having an input, an output and a control electrode, said first and second switching means being connected in series between said first and second power sources;

(c) means for generating a three-level input having a first level, a second level and an open level, said three-level input being applied to a junction point of said first and second switching means;

(d) means for generating a first clock pulse signal and a second clock pulse signal out of phase from said first clock pulse signal, said first and second clock pulse signals being applied to the control electrodesof said first and second switching means so as to control the switching operation of said first and second switching means;

wherein the three levels of said three-level inpot can be detected by obtaining ontputs corresponding to said first and second levels when the level of said input is at said first and second levels, and by obtaining, when said level of said input is at said open level, said first level on reception of said first clock pulse and said second level on reception of said second clock pulse.

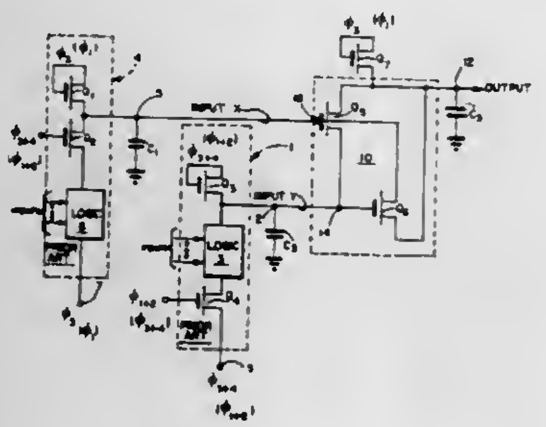
4,100,430
MULTI-PHASE AND GATE

Mark B. Lesser, Laguna Niguel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1977, Ser. No. 774,714

Int. Cl.^{2} H03K *19/22, 19/08*

U.S. Cl. 307—205 **9 Claims**



1. An AND gate having input and output terminals and comprising:

first and second multi-terminal semiconductor devices, each of said multi-terminal devices having respective control and conduction path electrodes;

a control electrode of a first of said multi-terminal semiconductor devices connected to a first conduction path electrode of the second of said multi-terminal semiconductor devices at a first input terminal of said AND gate;

a control electrode of said second multi-terminal semiconductor device connected to a first conduction path electrode of said first semiconductor device at a second input terminal of said AND gate;

a second conduction path electrode of each of said first and second semiconductor devices connected together at an output terminal of said AND gate and

first and second signal source means connected to clock terminal means to receive recurring clock signals having multi-phase clock time intervals;

said first and second signal source means respectively connected to the first and second input terminals of said AND gate for controlling the operation of said AND gate;

the output terminal of said AND gate being precharged during a first of said multi-phase clock intervals;

the output terminal of said AND gate conditionally discharged via the first of said signal source means during a second of said multi-phase clock intervals;

the output terminal of said AND gate electrically isolated from the first and second input terminal means thereof and the first and second signal source means during a third of said multi-phase clock intervals;

the output terminal of said AND gate conditionally discharged via the second of said signal source means during a fourth of said multi-phase clock intervals; and

the output terminal of said AND gate electrically isolated from the first and second input terminal means thereof and the first and second signal source means during fifth and sixth of said multi-phase clock intervals.

4,100,431
INTEGRATED INJECTION LOGIC TO LINEAR HIGH IMPEDANCE CURRENT INTERFACE

James Jacob Stipanuk, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 7, 1976, Ser. No. 730,415

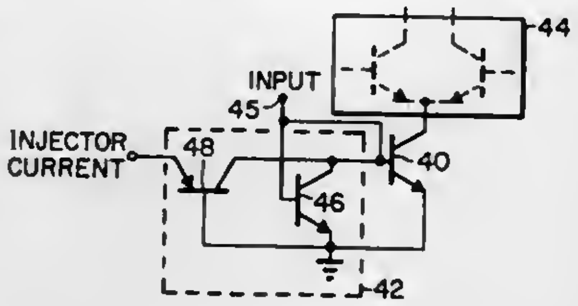
Int. Cl.^{2} H03K *19/08;* **H03F** *31/4;* **H02J** *1/04;* **H03F** *3/45*

U.S. Cl. 307—213 **6 Claims**

1. An integrated circuit comprising:

(a) an I^{2}L circuit having a predetermined breakdown voltage and including a first output transistor having current level I flowing therethrough,

(b) a linear circuit adapted to be coupled to a voltage supply, and



(c) an interface circuit coupled to said first output transistor of said I^{2}L circuit and to said linear circuit, and including means for maintaining said first output transistor out of breakdown and for generating a predetermined current level IA at said linear circuit, where A is a constant.

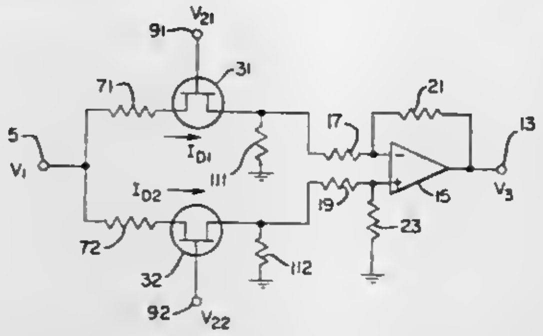
4,100,432
MULTIPLICATION CIRCUIT WITH FIELD EFFECT TRANSISTOR (FET)

Nobuaki Miyakawa, and Masayuki Miki, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 19, 1976, Ser. No. 733,841

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—229 **5 Claims**



1. In a multiplication circuit having a field effect transistor, the drain and gate electrodes of which are supplied with first and second input signals to be multiplied, respectively, the improvement comprising:

a pair of field effect transistors, the drain electrodes of which are supplied in common with the first input signal and the gate electrode of one of which is supplied with the second input signal, the gate electrode of the other field effect transistor being kept at a constant voltage,

resistor means connected to the respective drain electrodes, the resistance value of said resistor means being such that the gradient of the characteristic of the drain current to the first input signal is substantially equal to that of the characteristic of the drain current to the second input signal, and

a differential amplifier having two input terminals which are supplied with the signals corresponding to the drain currents of said field effect transistors respectively.

4,100,433
VOLTAGE TO CURRENT CONVERTER CIRCUIT

William Thomas Duffy, and William Joseph Lillis, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1977, Ser. No. 756,922

Int. Cl.^{2} G06G *7/12, 7/24*

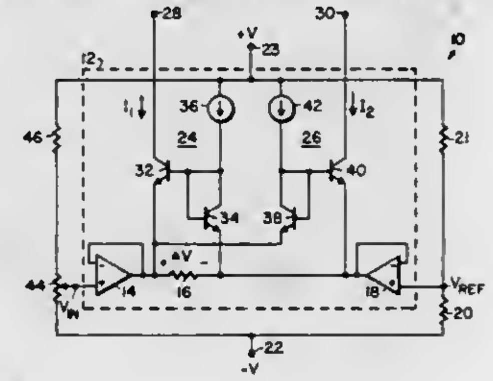
U.S. Cl. 307—229 **13 Claims**

1. A voltage to current converter circuit, comprising:

circuit means adapted to receive both a reference potential and a linear input voltage for establishing a difference voltage across first and second output terminals thereof, the magnitude of said difference voltage being a linear function of the magnitude of said linear input voltage;

first circuit means including first electron control means having first, second and control electrodes for producing at said second electrode a first logarithmic current signal, the magnitude of said first logarithmic current signal being caused to vary as said magnitude of said difference voltage is varied, said first and control electrodes of said first electron control means being coupled respectively to said first and second terminals of said circuit means for establishing a differential voltage; and

second circuit means including second electron control means having first, second and control electrodes for producing at said second electrode a second logarithmic current signal, the magnitude of said second logarithmic current signal having a slope thereto which is opposite in polarity to the slope of said first current signal, said first and control electrodes of said second electron control means being coupled respectively to said second and first terminals of said circuit means for establishing a difference voltage.



4,100,434
GATE CONTROLLING APPARATUS FOR A THYRISTOR VALVE

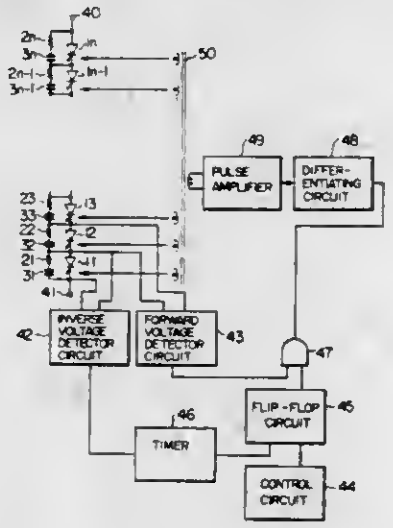
Ryuji Iyotani; Atsumi Watanabe; Hisao Amano, and Fumio Ogata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 24, 1976, Ser. No. 669,751

Claims priority, application Japan, Apr. 7, 1975, 50-41305

Int. Cl.^{2} H03K *17/14*

U.S. Cl. 307—252 L **12 Claims**



1. A gate controlling apparatus for a thyristor valve composed of a plurality of series connected thyristors having different storage characteristics, comprising first means for judging whether a gate signal is to be applied to each of the thyristors in said thyristor valve, second means connected across a single selected one of said thyristors which has the smallest storage charge under equal temperature conditions among said thyristors in said thyristor valve for detecting a forward voltage thereacross, AND means for generating an output at a time when an AND condition between the respective outputs of said first and said second means is satisfied, and pulse amplifier means for providing a narrow gate signal to each of said thyristors of said thyristor valve in response to the output of said AND means.

4,100,435
PHASE CONTROL APPARATUS

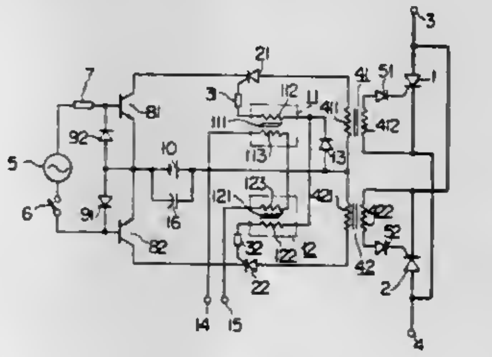
Katsu Komuro, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,962

Claims priority, application Japan, Dec. 25, 1975, 50-156250

Int. Cl.^{2} H03K *5/15*

U.S. Cl. 307—262 **17 Claims**



1. A phase control apparatus comprising:

a synchronizing signal source;

first and second switching devices adapted to be alternately switched by said synchronizing signal source;

a D.C. power supply;

first and second magnetic phase shifters each having a saturable core, an A.C. winding, and a control winding, and A.C. and control windings being wound on said core;

a first load connected in a first closed circuit including said D.C. power supply, said first switching device, and said A.C. winding of said first magnetic phase shifter; and

a second load connected in a second closed circuit including said D.C. power supply, said second switching device, and said A.C. winding of said second magnetic phase shifter;

wherein pulses having predetermined phase angles with respect to the phase angle of the signal from said synchronizing signal source are applied to said first and second loads, said phase angles being determined in accordance with the occurrence of saturation of said saturable cores in said first and second magnetic phase shifters.

4,100,436
CURRENT STABILIZING ARRANGEMENT

Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,360

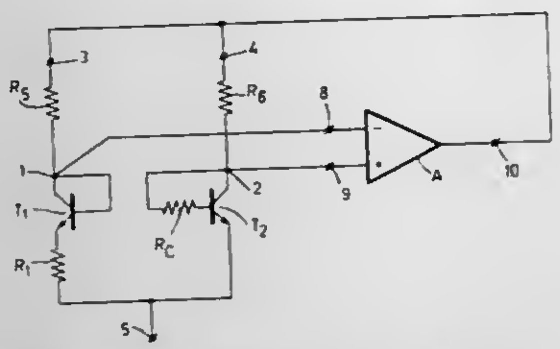
Claims priority, application Netherlands, Oct. 21, 1975, 7512311

Int. Cl.^{2} H03K *17/00*

U.S. Cl. 307—296 R **8 Claims**

1. A current stabilizing arrangement comprising a first voltage control circuit connected between a first point and a first common point, which circuit includes the series connection of a first forward biassed semiconductor junction and a first impedance element, a second voltage control circuit connected between a second point and said first common point, which circuit includes a second forward biassed semiconductor junction, the first and second semiconductor junctions being formed on one semiconductor substrate, a first current path connected between a third point and the first common point, which path also includes said series connection of a first semi-

conductor junction and a first impedance element, a second current path connected between a fourth point and the first common point, which path also includes the second semiconductor junction, a first means for maintaining currents in a mutually fixed ratio in the first and the second current paths so that the arrangement has a stable state for which currents flow



in both current paths, and a second means for maintaining equal voltages across the first and the second voltage control circuits, the second semiconductor junction being the base-emitter junction of a first transistor whose main current path is included in the second current path, and a resistor connected between the base of the first transistor and the second point.

4,100,437

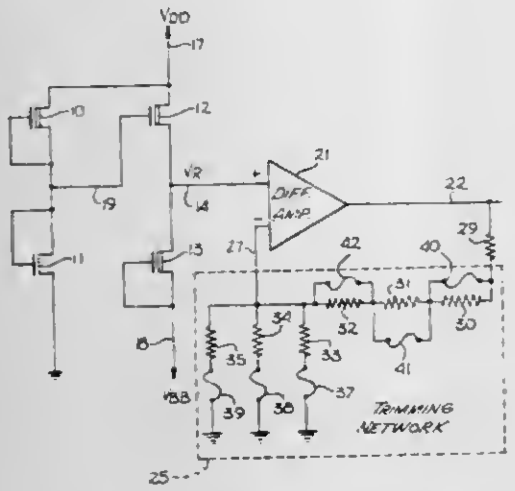
MOS REFERENCE VOLTAGE CIRCUIT

Marcian E. Hoff, Jr., Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 29, 1976, Ser. No. 709,719

Int. Cl.^{2} H03K *3/26*

U.S. Cl. 307—297 **13 Claims**



1. An MOS reference voltage circuit disposed on a substrate and employing devices of the same conductivity type comprising:

an enhancement mode device having a first threshold voltage coupled to receive a first current;

a depletion mode device having a second threshold voltage said second threshold voltage being different than said first threshold voltage said depletion mode device coupled to receive a second current;

circuit means for subtracting one of said first and second threshold voltages from the other of said first and second threshold voltages;

whereby the difference in threshold voltages provides a temperature stable reference voltage.

4,100,438

COMPOUND TRANSISTOR CIRCUITRY

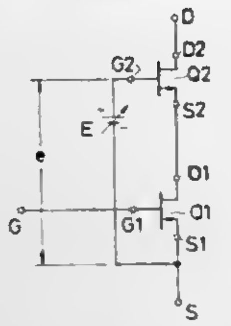
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 14, 1975, Ser. No. 604,762

Claims priority, application Japan, Aug. 21, 1974, 49-95897; Aug. 21, 1974, 49-95900

Int. Cl.^{2} H03F *3/16;* H03K *3/353;* H01L *29/80*

U.S. Cl. 307—304 **20 Claims**



1. A compound transistor circuitry comprising:

a first field effect transistor having a gate electrode, a source electrode and a drain electrode and having a saturated-type output characteristic resembling that of a pentode vacuum tube;

a second field effect transistor having a gate electrode, a source electrode and a drain electrode and having an unsaturating-type output characteristic resembling that of a triode vacuum tube and being connected in series to the drain current path of said first field effect transistor;

a first terminal connected to the gate electrode of said first field effect transistor;

a second terminal connected to the source electrode of said first field effect transistor;

a third terminal connected to the drain electrode of said second field effect transistor; and

a biasing voltage source connected between said gate electrode of said second field effect transistor and said second terminal for providing a biasing voltage across said gate electrode of said second field effect transistor and said second terminal,

said first field effect transistor having a conducting channel of a certain conductivity type which is identical with the conductivity type of the conducting channel of said second field effect transistor,

said biasing voltage having a magnitude and a polarity enabling said second field effect transistor only to become and remain conductive with its said unsaturating-type output characteristic during the state of the drain-source voltage of said first field effect transistor exceeding its pinch-off voltage level.

4,100,439

APPARATUS FOR COOLING THE END ZONES OF THE LAMINATION STACKS OF ELECTRIC MACHINES

Jöachim Boer, and Georg Frankenhauser, both of Mulheim an der Ruhr, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Germany

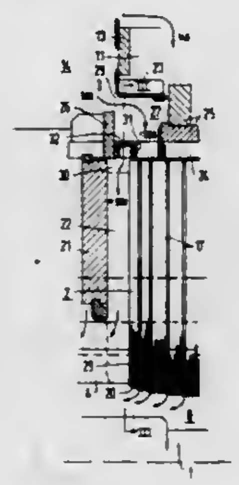
Filed Mar. 10, 1976, Ser. No. 665,535

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1975, 2514255

Int. Cl.^{2} H02K *9/08*

U.S. Cl. 310—57 **3 Claims**

1. In an electrical machine having stator lamination stacks surrounding and spaced from a rotor, the stacks and the rotor defining a machine gap therebetween, radial pressure fingers engaging respective end laminations of the stacks, respective pressure plates clamping the pressure fingers and the stator lamination stacks therebetween, a housing having a space therein surrounding the stator lamination stacks, radial partitions spaced-apart in axial direction of the housing and subdividing the housing space into respective end spaces and a plurality of cooling-gas inlet chambers intermediate thereto, radial channels provided in the stator lamination stacks and connecting the cooling-gas inlet chambers to the machine gap, and blower means for producing a cooling-gas flow from the end spaces, wherein maximum blower pressure prevails, axially through the cooling-gas inlet chambers, radially inwardly through the radial channels and axially outwardly through the machine gap, a device for intensively cooling the end zones of the stator lamination stacks comprising, in vincinity of the end zones of the stator lamination stacks, a cooling-gas distributor chamber separated from the cooling-gas inlet chambers and disposed concentrically to and between the cooling-gas inlet chambers and the stator lamination stacks, said cooling-gas distributor chambers being connected, in parallel with the cooling-gas inlet chambers, to the end spaces, respectively, and to the machine gap, said parallel connection including additional radial channels defined by the respective pressure fingers, the respective pressure plates and the respective end laminations of the stacks and communicating with said cooling-gas distributor chambers so as to receive therein coolant gas for intensely cooling the end laminations directly from the end spaces wherein the maximum blower pressure prevails.



4,100,440

ALTERNATOR-RECTIFIER-REGULATOR UNIT OR MUSHROOM SHAPE FOR VEHICULAR SERVICE

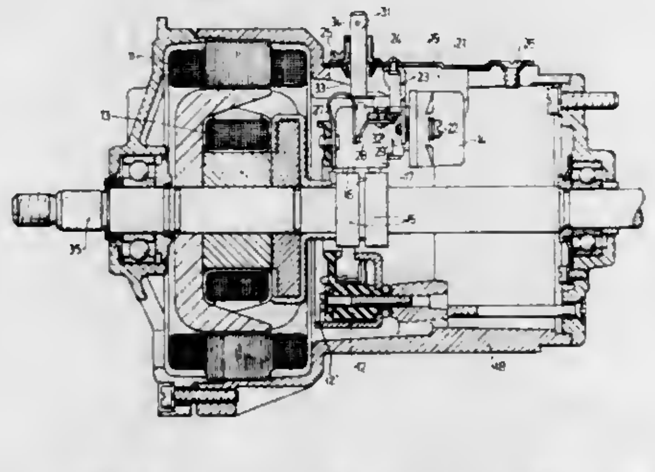
Georg Binder, Stuttgart; Rolf Lindauer, Illingen; Rudiger Sohnle, Stuttgart, all of Germany, and Harald Wahler, Laval, France, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 580,080, May 22, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,766

Claims priority, application Fed. Rep. of Germany, May 22, 1974, 2424788

Int. Cl.^{2} H02K *5/00*

U.S. Cl. 310—89 **4 Claims**



1. Mechanically powered electric current supply unit suitable for vehicular service comprising a multiphase alternator having a stator provided with a multiphase winding, a rotor provided with an excitation winding, slip rings connected to the excitation winding, and a brush holder provided with brushes therein making contact respectively with said slip rings, rectifying means connected to said multiphase winding and voltage regulating means connected to said rectifying means for regulation of the d.c. output voltage of said unit, and incorporating the improvement consisting, in combination, in that:

said alternator, rectifying means and voltage regulating means are contained in a mushroom-shaped casing (18) having an elongated and substantially cylindrical stem portion and a head portion of shorter axial length and larger diameter than said stem portion;

said brush holder (17) of said alternator and said voltage regulating means (14) are combined into a unitary physical structure forming a component of said unit and located in said stem portion of said casing;

said rectifying means (12) are mounted in said stem portion of said casing (18);

the stem portion of said casing (18) is provided with a lateral aperture (19) of a size, shape and location suitable for insertion and removal of said unitary physical structure (14, 17) containing said brush holder and said voltage regulating means;

a cover (21) is provided fully covering said aperture (19) and removably affixed to said casing (18), and

said unitary physical structure (14, 17) containing said brush holder and said voltage regulating means is fastened to said cover (21), while said rectifying (12) means are fastened directly to said casing (18) independently of the fastening of said cover (21) to said casing (18), whereby said unitary structure and said cover together are removable from said casing independently of said rectifying means.

4,100,441

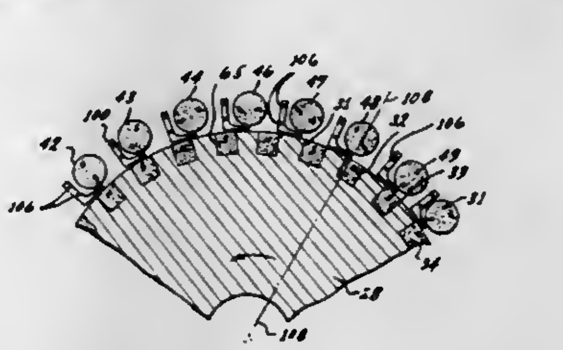
MAGNETIC TRANSMISSION

Alfred Landry, 7589 Caluveado St., Lemon Grove, Calif. 92045

Filed Mar. 18, 1977, Ser. No. 779,159

Int. Cl.^{2} H02K *49/06*

U.S. Cl. 310—103 **3 Claims**



1. An improved magnetic transmission having an output shaft, a free-rotating armature carried by the output shaft, a plurality of permanent magnets carried by said armature, said permanent magnets carried by said armature being magnetically oriented with each adjacent magnet having opposite magnetic polarities, a plurality of drive rotor permanent magnets rotatably mounted on an axis, each drive rotor axis having a fixed radial position with respect to the output shaft and disposed in magnetic proximity with said permanent magnets carried by the armature, and an input drive means coupled to said rotor permanent magnets for rotating said drive rotor permanent magnets in a synchronous relationship, said drive rotor permanent magnets being magnetically oriented for rotating the armature at a speed proportional to the rotating speed of said drive rotor permanent magnets, said permanent magnets carried by the armature and said drive rotor permanent magnets being disposed in discrete sectors in 360°, said

permanent magnets carried by the armature having an odd number in each sector and the drive rotor magnets have one less than the odd number in each sector, said improvement comprising, diamagnetic material positioned between each of said drive rotor permanent magnets and said armature and closely related thereto for diminishing at least a portion of the magnetic forces between said rotor permanent magnets and said permanent magnets carried by said armature, said diamagnetic material is positioned so that only the magnetic force between each of said permanent magnets opposing the rotational direction of said armature is effected.

4,100,442

ELECTRICALLY DRIVEN OSCILLATING CAPACITOR DEVICE

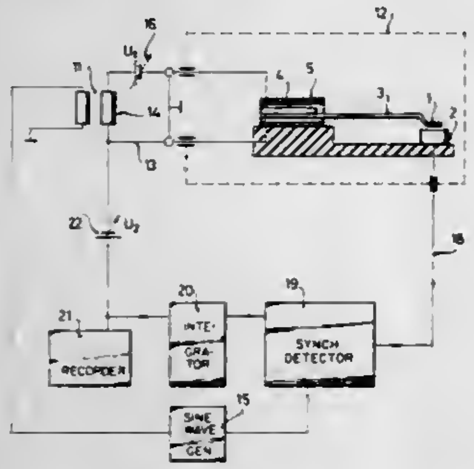
Karl Heinz Besocke, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 21, 1977, Ser. No. 779,837

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613528

Int. Cl.² H01L *41/10*

U.S. Cl. 310—317 **9 Claims**



1. An electrically driven Kelvin probe apparatus for operation as a dynamic electron electrometer or as a contact potential meter comprising, in combination:

a body of piezoelectric material (4);

a spring member (3) mounted so as to be excitable at a frequency of resonance thereof by piezoelectric vibration of said piezoelectric material body and extending away from said piezoelectric material body and providing a movable capacitor electrode (1) at or on a portion of said spring member at a distance from said piezoelectric material body;

means for holding a fixed capacitor electrode (2), of a material to be observed, in spaced proximity to said movable capacitor electrode (1) provided by or on said spring member (3);

a vacuum enclosure, capable of being evacuated to a high vacuum, enclosing said body of piezoelectric material, said spring member and said holding means as well as any electrode (2) held by said holding means;

means (7-11; 15) for applying an alternating voltage of a frequency of resonance of said spring member through said enclosure to said piezoelectric material body so as to cause said piezoelectric material body to vibrate said spring member at said frequency, and

means (16) for superimposing a d-c voltage component on said applied alternating voltage.

4,100,443

ELECTRICAL ROTARY MACHINE

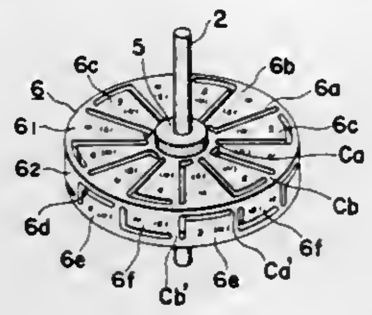
Tomohisa Kuwako, Anjo, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Jun. 9, 1976, Ser. No. 694,334

Claims priority, application Japan, Aug. 13, 1975, 50-98327

Int. Cl.² H02K *21/36*

U.S. Cl. 310—164 **9 Claims**



1. A plural phase electric motor comprising a rotary shaft rotatably supported in a housing, a rotor means of magnetic material having a flat body portion and a peripheral side portion secured to said shaft, a plurality of pole means at angularly spaced positions on said flat body and on said peripheral side portions, a permanent magnet stator means magnetized to provide north and south poles alternating at angular spacings corresponding to the angularly spaced positions of said pole means, a plurality of annular exciting coils corresponding in number to the number of phases of the motor, and a yoke member of magnetic material, said yoke member, exciting coils, stator means being so positioned relative to said rotor that magnetic fluxes developed by the exciting coils form respectively a magnetic loop together with the pole means of said flat body portion and a magnetic loop together with the pole means of said peripheral portion of said rotor.

4,100,444

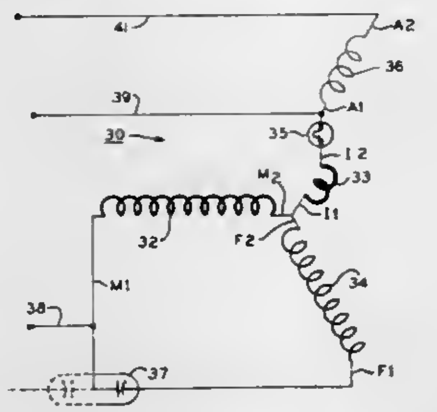
DYNAMOELECTRIC MACHINE WINDING ARRANGEMENT

John H. Boyd, Jr., DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 29, 1975, Ser. No. 617,687

Int. Cl.² H02K *3/00*

U.S. Cl. 310—184 **36 Claims**



1. A non-reversible induction motor particularly adapted for interconnection with a capacitor, for excitation from a single phase power source and for rotation in only one direction; said motor having a magnetic core and a winding circuit comprising at least three winding subcircuits arranged on a magnetic core for establishing a number of instantaneous magnetic poles when the capacitor is connected in series circuit relation with one of the subcircuits and the winding circuit is energized by a single phase power source; the winding circuit including first, second, and third winding phases each of which include winding turns for establishing spaced apart instantaneous magnetic

polar regions; the winding turns of the first, second, and third winding phases being arranged circumferentially around the magnetic core so that the effective centers of next adjacent instantaneous magnetic polar regions of opposite instantaneous polarity of each given winding phase are spaced apart 180 electrical degrees around the core, and so that the effective centers of next adjacent successive ones of the instantaneous magnetic polar regions of the first, second, and third winding phases are spaced apart 60 electrical degrees around the core; wherein at least one of the winding phases is comprised of coil group winding turns that are arranged for establishing at least one real pole and at least one consequent pole; wherein the first winding phase is a primary phase winding comprising wire of a first size, the second winding phase is a capacitor winding comprising wire of a second size smaller than said first size, and the third winding phase is an intermediate phase winding comprising wire of a third size larger than said first size; and wherein said windings each comprise a different number of effective wire turns with the capacitor phase winding having more effective turns than either the primary phase winding or intermediate phase winding, and the intermediate phase winding has less effective turns than either the primary phase winding or the capacitor phase winding.

4,100,445

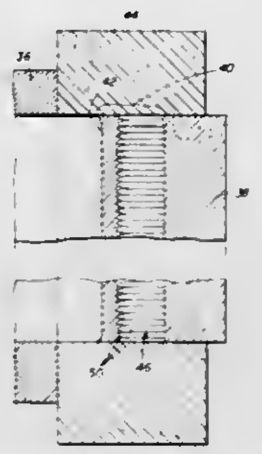
IMAGE OUTPUT SCREEN COMPRISING JUXTAPOSED DOPED ALKALI-HALIDE CRYSTALLINE RODS

Joseph R. Suffredini, Darien, Conn., and Robert A. Hagar, Saratoga, Calif., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,843

Int. Cl.² H01J *39/18*

U.S. Cl. 313—101 **2 Claims**



1. An image intensifier tube comprising:

an envelope having spaced input and output faceplates; an input screen means disposed within the envelope and adjacent the input faceplate for receiving an incident radiational image and emitting an equivalent electron image; and

an output imaging screen means aligned with said input screen means and disposed adjacent the output faceplate for receiving the electron image and producing a corresponding visible light image, the imaging screen means including a layer of juxtaposed crystalline rods disposed axially with respect to the output faceplate in tightly packed side-by-side relationship to a packing density greater than seventy percent of the theoretical maximum value, said crystalline rods being doped alkali-halide material.

4,100,446

LIGHT SOURCE LAMP WITH PARTICULAR ENVELOPE STRUCTURE TO ACCOMMODATE EXTERNAL MAGNETS

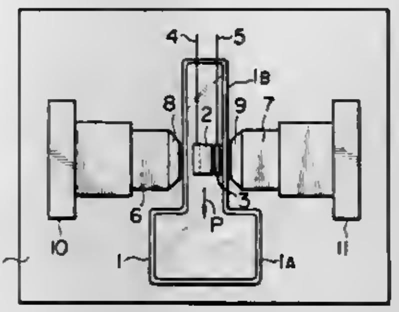
Katsuhito Harada; Hideaki Koizumi, and Konosuke Oishi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1974, Ser. No. 474,812

Claims priority, application Japan, Jun. 1, 1973, 48-60923

Int. Cl.² G01J *3/30;* H01J *61/067, 61/33, 1/50*

U.S. Cl. 313—161 **14 Claims**



1. A lamp comprising a bulb filled with discharging gas, a cathode and an anode disposed in said bulb opposite to each other, an electric power source to cause electric discharge between said cathode and anode so as to produce spectrum of light, and magnets to induce magnetic field to split the spectrum of light, wherein said bulb has at least one transparent portion through which the spectrum of light is taken out, said magnets are disposed outside said bulb and near that portion of said bulb which surrounds said cathode and anode, and the dimension of said portion of said bulb near said magnets in the direction of said magnetic field of said magnets is smaller than at least one of both the dimension of said portion of said bulb near said magnets in any direction not parallel to that of said magnetic field and the dimension of at least one portion of said bulb except said portion of said bulb near said magnets, said cathode being a hollow cathode.

4,100,447

ADDRESSING OF GAS DISCHARGE DISPLAY DEVICES

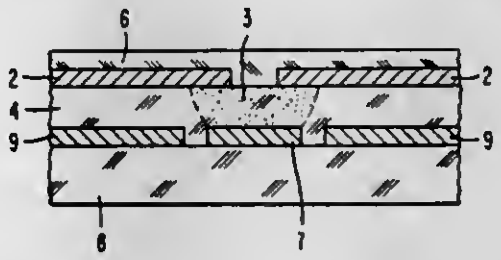
Frank Tsui, and Katherine Tsui, both of Holzgerlingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1975, Ser. No. 598,223

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1974, 2435745

Int. Cl.² H01J *61/00*

U.S. Cl. 313—217 **20 Claims**



1. A gas discharge display device structure of the type having a discharge chamber containing ionizable gas sealed therein, said chamber enclosed by a pair of parallel planar layers held in an enclosing spaced relationship by a circumferential seal, said chamber containing a matrix of coordinate addressable discharge gaps formed by a plurality of pairs of electrodes, a first electrode of each pair of said pairs of electrodes being mounted on one layer of said pair of planar layers and said other electrode of said pair being mounted on the other layer of said pair of planar layers in juxtaposition to said first electrode, the improvement comprising:

at least some portion of said layers being of low conductivity and electrically connecting said electrodes to sustain voltage supply lines for decoupling capacitively induced firing voltages and extinguishing voltages generated on one of said electrodes from others of said electrodes which are also connected to said sustain voltage supply lines.

4,100,448

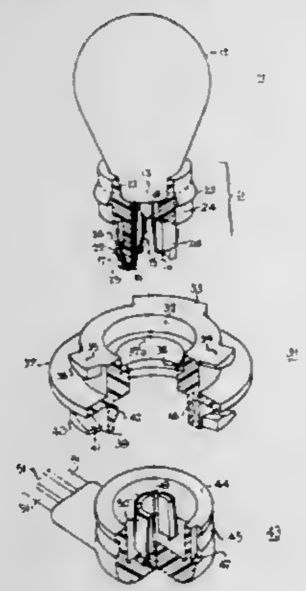
LAMP AND SOCKET ASSEMBLY

Russell W. Chipner, South Euclid, and James C. Graff, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1977, Ser. No. 793,049

Int. Cl.^{2} H01K *1/44*

U.S. Cl. 313—318 **9 Claims**



5. A lamp and socket assembly having at least one filament within a sealed vitreous envelope from which lead wires for the filament extend at the sealed end of the envelope and a base attached to said envelope, said base being suitable for front or rear insertion into a panel or reflector and comprising:

- a first cylindrical member having an enlarged inside diameter portion for receiving the sealed end of said envelope and for establishing the axial position of said envelope with respect to said base, said first cylindrical member further having contact means extending axially away from said envelope to which said lead wires are attached;
- a second cylindrical member having an inside diameter greater than the outside diameter of said first cylindrical member;
- a first annular ring, encircling said first cylindrical member, for establishing the axial position of the second cylindrical member with respect to the first;
- a second annular ring, encircling said second cylindrical member and having an area greater than 50% of the area defined by the outside diameter thereof, axially located at a predetermined position with respect to said one filament to form a reference plane;
- a second cylindrical member having locking tabs at either end thereof to secure said base to said panel or reflector; and
- a third cylindrical member, closed on one end, having a plurality of conductive contacts aligned with said contact means, said third cylindrical member fitting within said second cylindrical member to engage and enclose said contacts.

4,100,449

UNIFORM FILAMENT AND METHOD OF MAKING THE SAME

Robert Allen Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

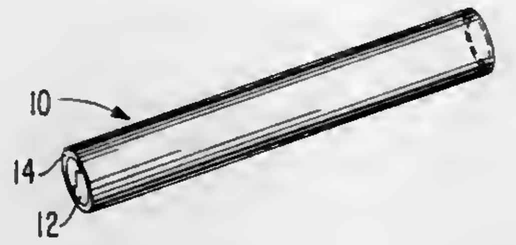
Filed Apr. 5, 1976, Ser. No. 673,865

Int. Cl.^{2} H01J *1/20, 19/14*

U.S. Cl. 313—337 **22 Claims**

1. An electron filament, which comprises:

- a cylindrical body of refractory metal, said body being substantially uniform in cross section about its longitudinal axis, and
- a layer of emissive material concentrically disposed on and around said cylindrical body and along the longitudinal axis thereof with said layer being substantially uniform in thickness.



4,100,450

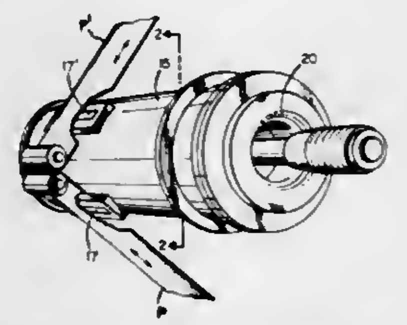
METHOD OF AND APPARATUS FOR GENERATING LONGITUDINAL STRIPS OF ENERGETIC ELECTRON BEAMS

William A. Frutiger, and David E. Overberg, both of Beverly, Mass., assignors to Energy Sciences Inc., Bedford, Mass.

Filed Feb. 17, 1977, Ser. No. 769,535

Int. Cl.^{2} H03J *33/02;* H05H *7/06*

U.S. Cl. 313—360 **12 Claims**



1. Apparatus for generating a longitudinal strip of energetic electrons having, in combination, a longitudinally extending electron-emitting cathode; a plurality of conductive longitudinally extending cylindrical means mounted substantially coaxially with the cathode and concentrically disposed thereabout at successive spaced radial separations therefrom, each being provided with narrow longitudinal slot means substantially radially aligned with one another; means for applying a positive potential to the innermost of the cylindrical means to control the extraction of electrons from the cathode and their egress as a longitudinal electron beam strip through the narrow slot means of the innermost cylindrical means; evacuated housing means surrounding said plurality of cylindrical means and provided with electron-pervious window means substantially radially aligned with said slot means and means for establishing an accelerating-voltage field between the outermost of the cylindrical means and the housing window means; and means for electrically connecting said cylindrical means together and relatively separating the same to provide not only electrostatic shielding but aperture lens-focusing for converging the electron beam strip through the slot means of the said outermost of the cylindrical means into said accelerating field.

4,100,451

FACE PANEL ASSEMBLY FOR A COLOR CATHODE RAY TUBE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation of Ser. No. 498,836, Aug. 19, 1974, which is a continuation of Ser. No. 285,985, Sep. 5, 1972. This application Apr. 12, 1976, Ser. No. 675,653

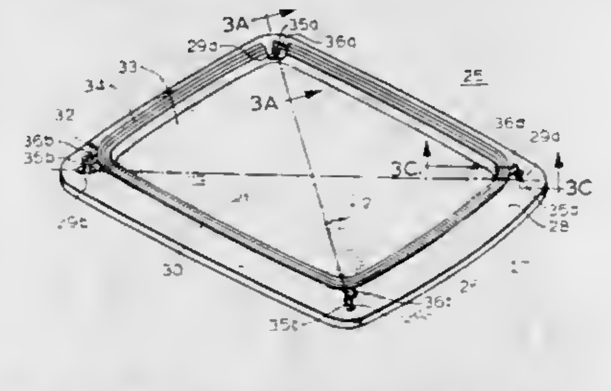
Int. Cl.^{2} H01J *29/07, 31/20*

U.S. Cl. 313—404 **23 Claims**

1. For use in a color cathode ray tube, the combination comprising: an approximately rectangular, flangeless, curved

faceplate supporting on a concave inner surface thereof in a central region a phosphor screen comprising a pattern of red-emissive, blue-emissive and green-emissive phosphor triads, said faceplate being subject, due to its flangeless rectangular construction to twist-wise deformations in configuration which may occur with respect to diagonals of the faceplate;

- a low mass, approximately rectangular, non-self-rigid shadow mask having a central portion which has a curvature related to that of said faceplate inner surface and which contains a pattern of electron-transmissive apertures registered with said pattern of phosphor triads, said mask having a rim portion providing substantial rigidity with respect to axes normal to the sides thereof while providing for flexure of the mask with respect to its diagonals; and



- a mask suspension system for establishing an absolute position of said mask relative to and at a predetermined spacing from said inner surface of said faceplate while effectively imparting the rigidity of the faceplate to the non-self-rigid mask, comprising four suspension means for mechanically coupling said mask directly to corner portions of said concave inner surface of said faceplate which extend outwardly beyond the phosphor screen, said suspension means being located one at each corner of the mask to permit the mask to flex about said diagonals and conform to the contour of the faceplate despite any twist-wise deformation thereof and to thereby maintain said predetermined spacing between said mask and said faceplate inner surface.

4,100,452

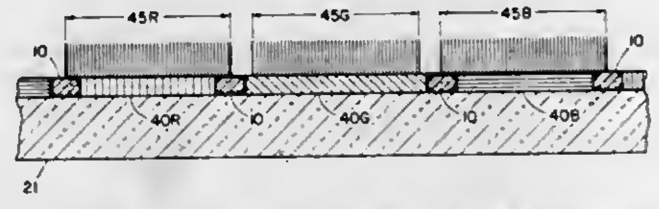
COLOR TELEVISION PICTURE TUBE IMAGE SCREEN HAVING POSITIVE AND NEGATIVE MISREGISTRATION TOLERANCE CONDITIONS

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 2, 1976, Ser. No. 737,961

Int. Cl.^{2} H01J *29/07, 29/32, 31/20*

U.S. Cl. 313—408 **5 Claims**



1. A color television picture tube having an evacuated envelope; an electron gun; a color selection electrode defining a pattern of electron beam passing apertures; and a multi-color image screen having a corresponding pattern of triads of red-light-emissive, blue-light-emissive, and green-light-emissive phosphor elements, the elements being spaced each from one another by a light-absorbing material, said tube being characterized by having within at least selected triads in said pattern of triads a first phosphor element and associated electron beam landing area with either a positive or negative misregistration tolerance condition and the remaining two phosphor elements and associated beam landing areas with an opposite tolerance condition to that obtaining for said first phosphor element.

4,100,453

ELECTRICAL CONNECTION OF ELECTRODES IN MULTIPLE GUN ELECTRODE STRUCTURE

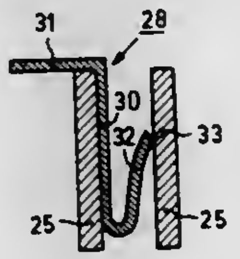
Henricus Fransiscus Petrus van den Einden; Djnurd Anne Geertruid Kamerbeek, and Franciscus Jacobus Rimmelzwaan, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,855

Claims priority, application Netherlands, Sep. 24, 1976, 7610609

Int. Cl.^{2} H01J *29/50, 29/02*

U.S. Cl. 313—417 **5 Claims**



1. A multiple electron gun system for a color display cathode ray tube comprising three electron guns extending substantially parallel to each other and to a longitudinal axis of said tube, each of said guns comprising at least one electrode located in the same region along said axis as the corresponding said electrode of each of the other of said guns, a plurality of rigid insulating support members, a pair of conductive braces connected, respectively, to two of said corresponding electrodes and rigidly engaging a first one of said insulating support members and extending alongside each other in a region between said two corresponding electrodes and said first one of said insulating support members, said multiple electron gun system comprising: a resilient conductive contact ribbon-shaped spring having substantially greater width than thickness, said spring being bent generally V-shaped to bring first and second surface portions thereof into juxtaposition with each other, said generally V-shaped spring being compressed between said pair of braces and extending substantially parallel to said axis, at least one portion of one leg of said ribbon-shaped spring making contact with a first one of said braces at points thereof spaced apart by a distance substantially equal to the width of said ribbon-shaped spring, and a portion of the second leg of said apring being bent slightly outwardly against the other brace of said pair of braces, said second leg having the free end engaging said other brace of said pair of braces and exerting resilient and frictional pressure thereagainst to hold said spring in engagement with said pair of braces.

4,100,454

LOW-VELOCITY ELECTRON EXCITED FLUORESCENT DISPLAY DEVICE

Takashi Hase, Fujisawa; Akiyasu Kagami, Ninomiyamachi Kawawa; Yoshiyuki Mimura, Kamakura; Kinichiro Narita, and Minoru Hiraki, both of Chigasaki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Jan. 20, 1976, Ser. No. 650,613

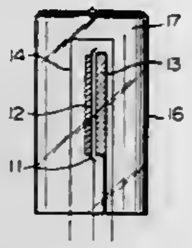
Claims priority, application Japan, Jun. 7, 1975, 50-68685

Int. Cl.^{2} C09K *11/08;* H01J *63/04*

U.S. Cl. 313—495 **4 Claims**

1. A low-velocity electron excited fluorescent display device composed of a vacuum container or tube containing disposed therein at least an anodic plate having formed on one surface thereof a fluorescent screen and a cathode in line-form parallel-

ing said fluorescent screen, said fluorescent screen comprising a gallate-based phosphor represented by the formula



$A(Zn_{1-x}Mg_x)O.Ga_2O_3:BMn$

wherein $0.6 \leqq A \leqq 1.2$, $0 \leqq B \leqq 5 \times 10^{-2}$, and $0 \leqq x \leqq 0.5$.

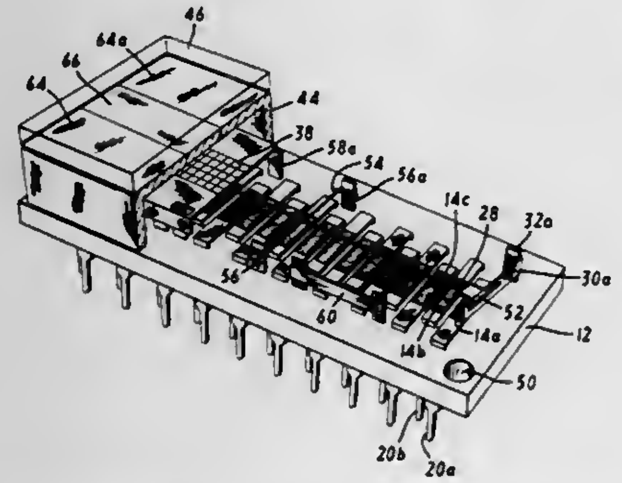
4,100,455
VACUUM FLUORESCENT DISPLAY DEVICE WITH CIRCULAR POLARIZER

Richard DuBois, North Caldwell, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 14, 1976, Ser. No. 732,330

Int. Cl.² H01J *1/72, 63/06;* G02B *27/28*

U.S. Cl. 313—496 **6 Claims**



1. In a vacuum fluorescent display device having at least one electrically heated thermoelectron-emitting filament, at least one phosphor-coated anode, wherein said filament and anode are sealed in an enclosure having a hard vacuum therein, the improvement comprising:

(a) an electrostatic lens inside said enclosure interposed in the line of sight between the viewer and said filament.
(b) said electrostatic lens being a self-supporting substantially planar metallic sheet having a regular pattern of holes therethrough, said sheet and holes in combination forming a foraminous screen;
(c) said holes comprising from about 20 to about 50 percent of the screen area;
(d) a circular polarizer interposed in the line of sight between the viewer and said screen;
(e) a specularly reflecting surface on at least the side of said screen nearer said viewer; and
(f) said foraminous screen being connected to a positive voltage with respect to said filament.

4,100,456
LUMINESCENT DISPLAY PANEL COMPRISING A SEALING MASS FOR ELIMINATING SLOW LEAKS ALONG LEADS

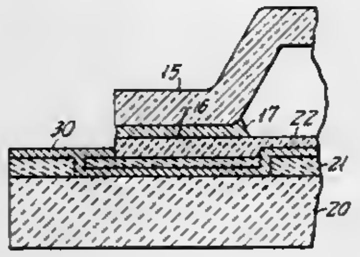
Masaki Kobayakawa; Kazufumi Yawata, both of Izumi; Kazuo Ohta, and Koichi Kumazawa, both of Mine, all of Japan, assignors to Nippon Electric Kagoshima, Ltd., Izumi and Narumi China Corp., Nagoya, both of, Japan

Filed Feb. 1, 1977, Ser. No. 764,648

Claims priority, application Japan, Feb. 6, 1976, 51-12641; Feb. 6, 1976, 51-13427

Int. Cl.² H01J *5/24, 5/26, 5/32*

U.S. Cl. 313—497 **11 Claims**



1. A luminescent display panel which comprises a glass cover comprising a peripheral flange, a substrate-electrode assembly having a pair of principal surfaces and a frame-shaped area along one of said principal surfaces in conformity in shape with said peripheral flange, and a sealing layer substantially between said peripheral flange and said frame-shaped area for hermetically sealing said glass cover and said substrate-electrode assembly to enclose a vacuum space, said frame-shaped area including at least one strip-shaped area extending wholly transversely thereof and partly therealong, said one principal surface comprising a center area surrounded by said frame-shaped area and an edge area outwardly contiguous to said strip-shaped area, said substrate-electrode assembly comprising a single solid insulator substrate having a first and a second surface directed towards said vacuum space and providing the other of said principal surfaces, respectively, a plurality of luminescent anode segments in juxtaposition on said first surface with said center area, a hot cathode in said vacuum space over said anode segments, at least one grid between said cathode and said anode segments, an underlying and an overlying insulator layer successively on said first surface, and a plurality of electroconductive leads electrically connecting said anode segments, cathode, and grid out of said vacuum space and extended along said edge area, said insulator layers exposing said anode segments to said vacuum space and having an exposed surface which said one principal surface comprises, wherein the improvement comprises a sealing mass continguous to said sealing layer for positively eliminating the slow leak of air surrounding said display panel into said vacuum space which is otherwise liable to occur if at least one of said leads that is interposed between said underlying and overlying insulator layers under said center area would have been extended outwardly of said vacuum space continuously along said overlying insulator layer.

4,100,457
VELOCITY MODULATION TUBES EMPLOYING HARMONIC BUNCHING

Christopher John Edgcombe, Coton, England, assignor to English Electric Valve Company Limited, England

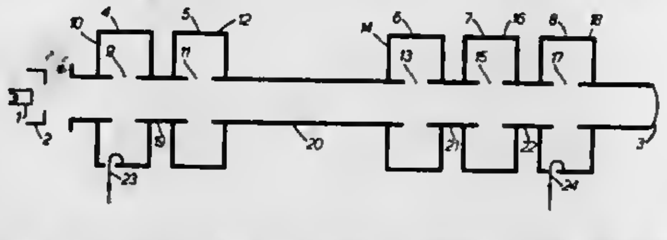
Filed Dec. 13, 1976, Ser. No. 749,989

Claims priority, application United Kingdom, Dec. 13, 1975, 51164/75

Int. Cl.² H01J *23/20*

U.S. Cl. 315—5.51 **3 Claims**

1. A velocity modulation tube having a drift space between at least one pre-buncher resonator system and at least one buncher resonator system, in which the length of said drift space is dimensioned so that the reduced plasma drift angle between the interaction gap in the last pre-buncher resonator system and the interaction gap in the first buncher resonator system is greater than 90°, and wherein at least at said interaction gap in said last pre-buncher resonator system the ratio of



the peak value of the radio frequency voltage occurring at said interaction gap to the d.c. beam voltage lies in the range between approximately $2Wq/w$ and approximately $1.4Wq/w$ wherein Wq is the reduced angular plasma frequency and w is the angular signal frequency.

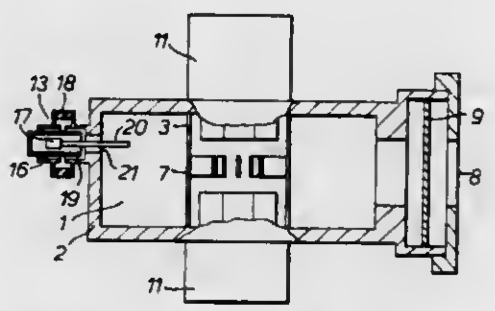
4,100,458
MULTIPACTOR DISCHARGE TUNED CO-AXIAL MAGNETRONS

Alan Hngh Pickering, Springfield; Michael Barry Clive Brady, Maldon, and Peter Frederick Lewis, Chelmsford, all of England, assignors to English Electric Valve Company Limited, England

Filed Dec. 15, 1976, Ser. No. 750,855

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.55 **21 Claims**



1. A co-axial magnetron including an anode structure having a plaurlity of cavities, and a main resonant cavity co-axially surrounding said anode structure, said anode structure including coupling means for coupling the cavities thereof with said main resonant cavity and at least one resonator separate from said main cavity and incorporating a multipactor discharge arrangement for modifying the resonant characteristics of the separate resonator and means for coupling said resonator or resonators symmetrically into the main co-axial resonant cavity of said magnetron.

4,100,459
INDICATOR CIRCUIT FOR ELECTRONIC FLASH APPARATUS

Zenzo Nakamura, Urawa; Syohei Ohtaki, Yokohama; Tokuichi Tsunekawa, Yokohama; Tadashi Ito, Yokohama; Hiroshi Aizawa, Kawasaki, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,736

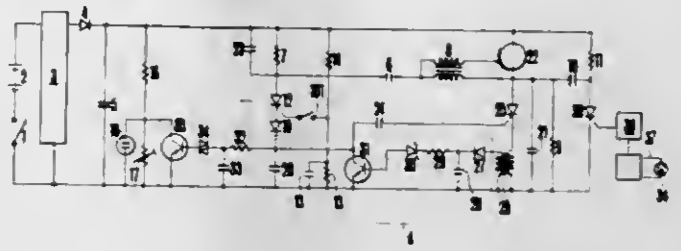
Claims priority, application Japan, Apr. 8, 1975, 50-42570

Int. Cl.² G08B *5/38;* H05B *41/26*

U.S. Cl. 315—136 **13 Claims**

1. An electronic flash apparatus comprising:

(a) a flash means for producing a flash light;
(b) an energy supply circit connected to said flash means for applying to said flash means electric energy which is converted to light energy in said flash means;
(c) a detecting circuit for detecting an output voltage of the energy supply circuit and producing an output signal when the output voltage of said energy supply circuit has reached a predetermined voltage level;
(d) display means having first and second states, which assumes the first state in response to the output signal from said detecting circuit;



(e) signal producing means connected in the discharge path of said energy supply circuit upon response to the ionization of said flash means to produce an electrical signal; and
(f) control means connected to said display means and responsive to the electrical signal from said signal producing means for controlling the output stage of said display means.

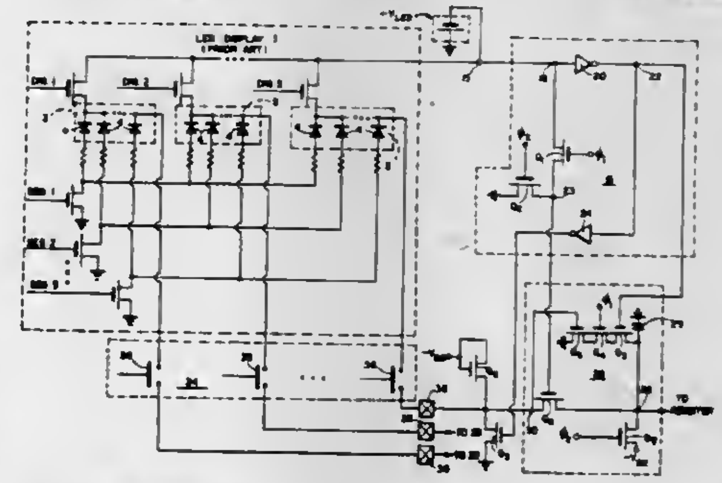
4,100,460
ONE CHIP DIRECT DRIVE AND KEYBOARD SENSING ARRANGEMENT FOR LIGHT EMITTING DIODE AND DIGITRON DISPLAYS

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 2, 1976, Ser. No. 654,678

Int. Cl.² H05B *37/00*

U.S. Cl. 315—162 **10 Claims**

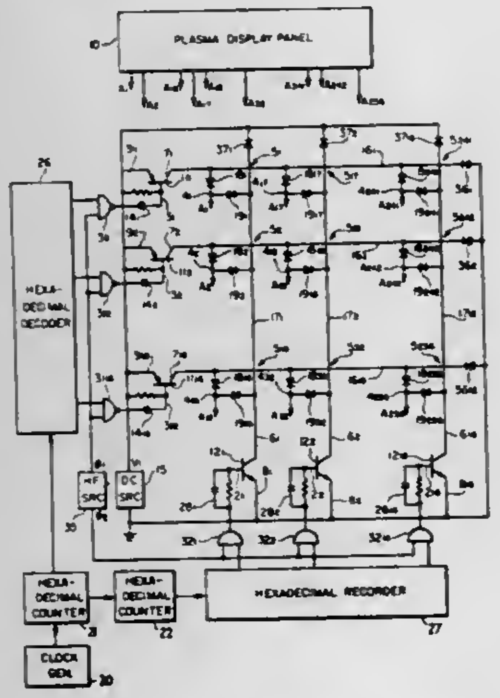


1. In combination,

source means for supplying a plurality of reference potentials,
said source means to be connected to supply a first of said plurality of reference potentials to a first display means during a first mode of operation,
said source means to be connected to supply a second of said plurality of reference potentials to a second display means during a second mode of operation,
logic circuit means having input and output terminal means, said logic circuit means selectively connected to one of said first and second display means,
said logic circuit means including a signal level shifting means selectively connected between said input and output terminal means for activation during said first mode of operation, and
said logic circuit means further including a first inverter means having a first input terminal connected to said logic circuit means input terminal means and an output terminal connected to said logic circuit means output terminal means for activation during said second mode of operation.

4,100,461
DRIVING CIRCUIT FOR A GAS DISCHARGE DISPLAY PANEL

Hiroshi Hada, and Tsutomu Hirayama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Jul. 6, 1976, Ser. No. 703,058
Claims priority, application Japan, Jul. 7, 1975, 50-83269; May 18, 1976, 51-62970[U]
Int. Cl.² H01J *1/53;* **H05B** *37/00*
U.S. Cl. 315—169 TV **4 Claims**



1. A circuit for driving, by the use of a source of a positive voltage, one electrode group of a gas discharge display panel having a pair of electrode groups on opposite sides of gas discharge space, comprising:

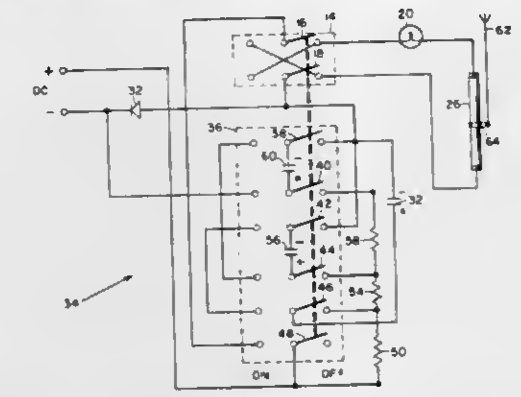
a first plurality of PNP transistors, each having an emitter and a collector electrode;
a second plurality of NPN transistors, each having an emitter and a collector electrode;
first means for connecting the emitter electrodes of said PNP transistors to the positive voltage source and for grounding the emitter electrodes of said NPN transistors;
first conductors, said first plurality in number, connected to the collector electrodes of said PNP transistors;
second conductors, said second plurality in number, connected to the collector electrodes of said NPN transistors, each of said second conductors providing matrix points, said first plurality in number, in cooperation with said first conductors;
forwardly directed diode means each having a predetermined intermediate junction point and connected between said first and second conductors at each of the said matrix points;
second means for connecting the predetermined points to the respective electrodes of said one electrode group;
first diodes, said first plurality in number, connected to said first conductors for clamping the potential of said first conductors to a predetermined potential; and
second diodes, said second plurality in number, connected to said second conductors for clamping the potential of said second conductors to a predetermined potential.

4,100,462
COMBINATION INCANDESCENT/FLUORESCENT LIGHTING SYSTEM

Norvel Jeff McLellan, 1002 N. Main, Pleasanton, Tex. 78064
Filed May 11, 1977, Ser. No. 795,779
Int. Cl.² H05B *35/00, 41/18*
U.S. Cl. 315—179 **12 Claims**

1. A combination incandescent/fluorescent lighting system for providing an efficient, high quality light, said lighting system comprising:

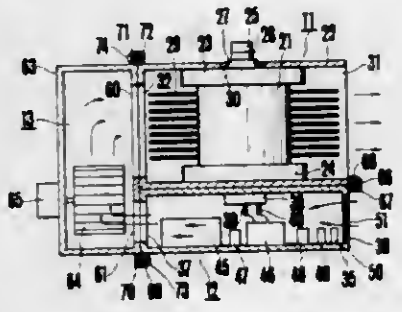
a source of direct current;
incandescent lamp means connected to said source of direct current;
fluorescent lamp means connected in series with said incandescent lamp means and said source of direct current, said incandescent lamp means being a ballast for said fluorescent lamp means;



bypass means in series with said fluorescent lamp means;
auxiliary circuit means in parallel with said bypass means to start current flow through said fluorescent lamp means, said bypass means thereafter maintaining current flow through said incandescent lamp means and fluorescent lamp means;
reversing means for changing the direction of current flow through said fluorescent lamp means during periods when no current is flowing therethrough.

4,100,463
MAGNETRON, POWER SUPPLY, AND FAN INTEGRAL ASSEMBLY

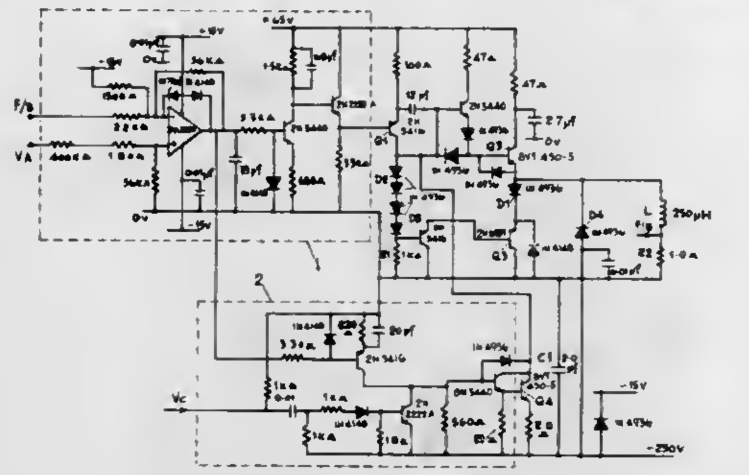
Jiro Sugie, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 30, 1976, Ser. No. 718,829
Claims priority, application Japan, Nov. 5, 1975, 50-132145; Nov. 7, 1975, 50-133083
Int. Cl.² H05B *37/00*
U.S. Cl. 315—205 **15 Claims**



1. Magnetron apparatus comprising a magnetron oscillator unit for generating microwave power, a source unit containing a power source unit for operating said magnetron oscillator unit, a fan unit for circulating cooling air through said magnetron oscillator unit and said source unit, said magnetron unit, power source unit, and fan unit each being contained in a different metal casing, each casing having walls and at least two openings in its walls to provide an air passage through each casing, and means for connecting together the casings into an integral assembly, one air passage opening of a casing being coincident with one air passage opening of a different casing to which it is connected by said connecting means to form an air passage through said connected magnetron, power source, and fan casings having an air inlet opening provided by an opening in a wall of one casing and an air outlet opening provided by an opening in a wall of different casing.

4,100,464
ELECTRIC AMPLIFYING ARRANGEMENTS

Charles William Ovenden, Strood, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England
Filed Aug. 16, 1976, Ser. No. 714,319
Claims priority, application United Kingdom, Aug. 29, 1975, 35724/75
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—397 **8 Claims**



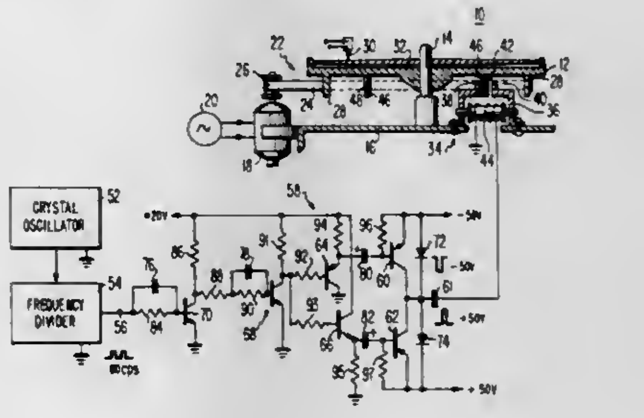
1. An electric amplifying arrangement for supplying current to an inductive load in response to an input signal of saw-tooth waveform comprising:

(A) a first controllable electronic switching device connected between said load and a source of current for said load of one polarity;
(B) a second controllable electronic switching device connected between said load and a source of current for said load of the opposite polarity;
(C) a first discharge path connected with said load to discharge energy supplied to said load via said first switching device;
(D) a second discharge path
  (i) including a third controllable electronic switching device connected with said load to discharge energy supplied to said load via said second switching device; and
(E) control means responsive to said input signal to close said third and first switching devices during consecutive first and second parts of the ramp portion of the input signal respectively, and to close said second switching device during the latter part of the flyback portion of the input signal;
(F) said control means so controlling the discharge of energy from the load through the third switching device, and the supply of current to the load through the first switching device, that a linear relation is maintained between the variation in the load current and the input signal during the said first and second parts of the ramp portion of the input signal.

4,100,465
TURNTABLE SPEED CONTROL SYSTEM

Shunji Hagino, Shikoda Kashiwa, Japan, assignor to RCA Corporation, New York, N.Y.
Filed Jul. 20, 1977, Ser. No. 817,343
Claims priority, application United Kingdom, Aug. 9, 1976, 33121/76; Jul. 1, 1977, 33121/76
Int. Cl.² A02P *5/46*
U.S. Cl. 318—41 **3 Claims**

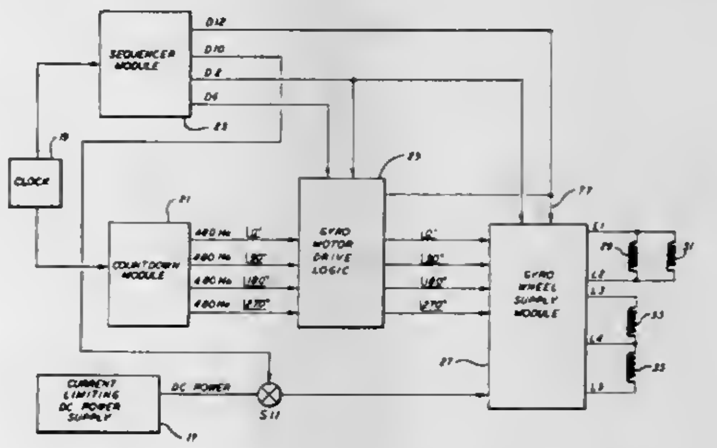
1. A speed control apparatus comprising:
(A) a mounting plate;
(B) a turntable secured for rotation on said mounting plate;
(C) a ring concentrically secured to said turntable for rotation therewith; said ring having a plurality of permanently magnetized poles of alternate polarity symmetrically disposed along its periphery;
(D) rotating means;
(E) variable coupling means for transferring motion of said rotating means to said turntable;
(F) a magnetizable core including a pair of pole pieces having spaced surfaces defining an air gap; said magnetizable core being fixedly secured to said mounting plate such that said permanently magnetized poles pass in succession through said core gap when said turntable is rotating;
(G) a winding for establishing an alternating magnetic field across said core gap when it is energized with alternating current;



wherein said magnetized ring and said energized core form a synchronizer for opposing any departures of the turntable speed from a predetermined speed corresponding to the frequency of the winding energization current divided by half the number of said poles;
(H) a capacitor in a circuit relationship with said core winding for establishing a load which exhibits a resonance at said winding energization current frequency;
(I) means for developing a square wave output at said winding energization current frequency; and
(J) means for applying said square wave output of said developing means to said resonant load.

4,100,466
COLD START SYSTEM FOR MOTORS

George Francis Schroeder, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.
Filed Dec. 10, 1976, Ser. No. 749,651
Int. Cl.² G01F *1/82*
U.S. Cl. 318—102 **7 Claims**

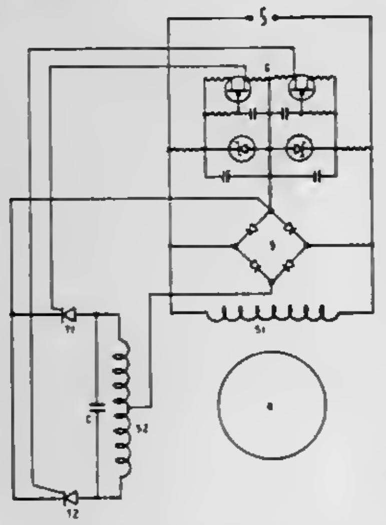


1. A method for rapidly cold starting gyro motors in a gyro platform having at least a vertical gyro motor and an azimuth gyro motor both of which are multiphase motors normally operating at a first frequency said motors being supplied from a supply module comprising a plurality of switches for converting a DC voltage into a square wave AC voltage, said switches being supplied with appropriate switching wave-

forms at the normal operating frequency of the motors, comprising:
- (a) dividing the normal frequency waveforms used to control the switching means to a lower frequency;
- (b) energizing a first phase winding of both of said motors with said lower frequency;
- (c) energizing the other phase windings of one of said motors with said lower frequency for a first predetermined amount of time;
- (d) de-energizing said other windings of said first motor and energizing the other winding of said second motor, at said lower frequency;
- (e) after a second predetermined period of time, energizing all windings of both motors with normal frequency.

4,100,467
TYPE OF SINGLE PHASE INDUCTION MOTOR ASSEMBLY

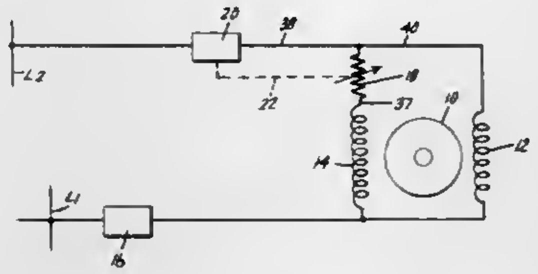
Willis Herbert Charlton, 2/A Byrarong Ave., Wollongong, New South Wales, Australia
Filed Oct. 7, 1976, Ser. No. 730,652
Claims priority, application Australia, Sep. 20, 1973, 4921/73
Int. Cl.² H02P ***1/44***
U.S. Cl. 318—220 R **1 Claim**



1. A single phase induction motor assembly having a rotor and a stator comprising:
- first and second stator windings spaced ninety electrical degrees on the stator core with respect to one another and conpled to the rotor;
- a single phase fixed frequency supply voltage source interconnected to said first stator winding, such that the frequency of the voltages and currents in said first and second stator windings and the speed of the motor are determined by said fixed frequency supply voltage source;
- first and second thyristors interconnected in series with said second stator winding;
- a rectifier bridge circuit interconnected to said single phase fixed frequency supply voltage source and said first and second thyristors for supplying direct current voltage to said first and second thyristors;
- a commutating capacitor interconnected in parallel with said second stator winding and interconnected to said first and second thyristors; and
- circuit means interconnected to said single phase fixed frequency supply voltage source and said first and second thyristors for alternately energizing said first and second thyristors in synchronism with said single phase fixed frequency supply voltage source, such that said first and second thyristors apply a periodic voltage to said second stator winding, said periodic voltage having a fundamental frequency shifted in time phase with respect to said single phase fixed frequency supply voltage source to induce currenta in said windings, such that said winding currenta interact with the rotor to produce a motoring torque at all speeds from standstill to near synchronous speed determined externally by said single phase fixed frequency supply voltage source.

4,100,468
ELECTRIC MOTOR CONTROL AND METHOD

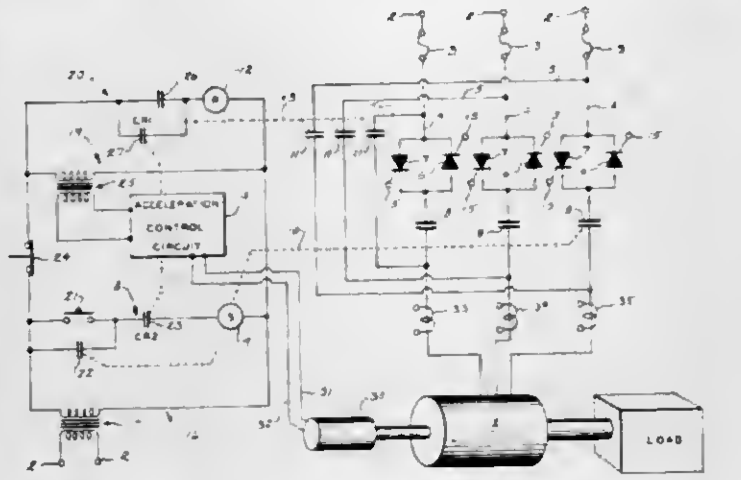
Charles W. Slocum, Spring Lake Heights, N.J., assignor to Sealed Unit Parts Co., Inc., Allenwood, N.J.
Filed Apr. 4, 1977, Ser. No. 784,285
Int. Cl.² H02P ***1/44***
U.S. Cl. 318—221 C **16 Claims**



1. An electric motor control circuit, especially for split phase motors having starting and running windings in respective parallel branches, said circuit comprising; a positive temperature coefficient resistor element in the starting winding branch, a switch having normally closed separable contacts in series with both branches, motor load sensitive means in circuit with at least said running winding and operable at a predetermined motor load to move said contacts to open position, and control means operable when said resistor element is above a predetermined temperature to prevent said switch contacts from closing after having been actuated into open position thereof.

4,100,469
HYBRID MOTOR STARTER

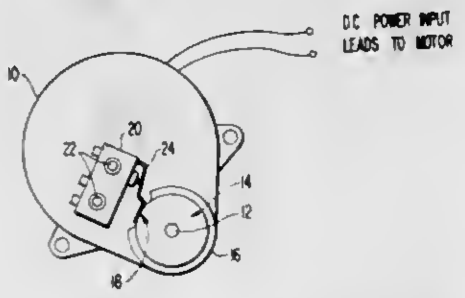
Terrance D. Nelson, and Bruce G. Klippel, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Apr. 25, 1977, Ser. No. 790,571
Int. Cl.² H02D ***5/40***
U.S. Cl. 318—227 **6 Claims**



1. A motor starter for coupling current from a power line to a motor, the combination comprising:
- a first conductive branch connected between the power line and the motor, said first conductive branch including a solid state device suitable for controlling current in said first branch and a set of series connected contacts associated with a start contactor;
- a second conductive branch connected between the power line and the motor in shunt with said first conductive branch, said second conductive branch including a set of contacts associated with a run contactor; and
- a control circuit which includes:
  - (a) a start switch;
  - (b) means coupled to said start switch for energizing said start contactor when said start switch is operated;
  - (c) means coupled to said solid state device for driving it from its nonconductive state to its conductive state after said start contactor is energized;
  - (d) speed feedback means coupled to said motor for sensing motor speed;
  - (e) means coupled to said speed feedback means for energizing said run contactor when said motor reaches a preselected speed; and
  - (f) means coupled to said start contactor for deenergizing the same after said run contactor is energized.

4,100,470
PRECISION DRIVE SYSTEM FOR A CHART RECORDER

Elmer Andrews, Leonia, N.J., assignor to Analytical Measurements, Inc., Chatham, N.J.
Filed Jul. 1, 1976, Ser. No. 701,995
Int. Cl.² H02P ***3/00***
U.S. Cl. 318—466 **8 Claims**

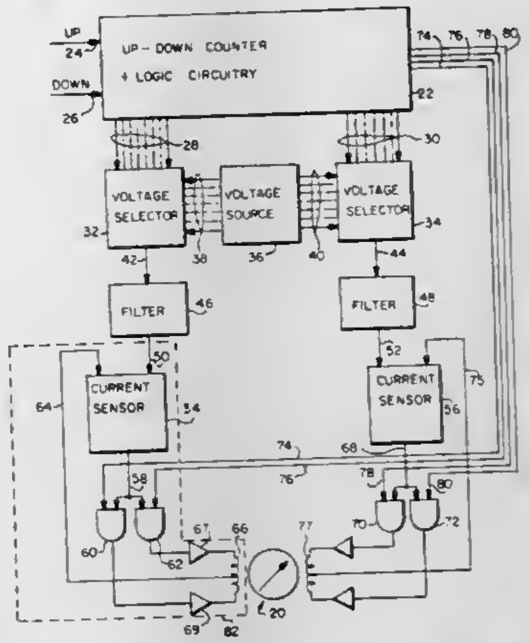


1. A precision chart drive system for a chart recorder comprising:
- a power source;
- a drive motor for driving said chart recorder and having a rotatable output shaft and adapted for electrical connection to said power source;
- a pulse generator operative in response to said power source to provide a pulse at regular time intervals including;
  - an oscillator;
  - means responsive to said oscillator for providing a pulse at regular time intervals;
  - means for differentiating said pulse to provide a spike pulse;
  - means for amplifying said spike pulse to provide a trigger pulse;
- means associated with said pulse generator for selectably varying said pulse rate to provide a selectably variable chart recorder drive speed;
- a motor starting means operative in response to said trigger pulse for starting said motor at said regular time intervals;
- switching means operative in response to said initial motor motion for connecting said motor directly to said power source; and,
- self interrupting means for said motor to turn said motor off after a predetermined angular rotation of said shaft.

4,100,471
STEPPING MOTOR CONTROL CIRCUIT

Eric K. Pritchard, 1702 Plymouth Ct., Bowie, Md. 20716
Continuation of Ser. No. 501,891, Aug. 30, 1974, abandoned.
This application Jul. 20, 1976, Ser. No. 707,129
Int. Cl.² G05B ***19/40***
U.S. Cl. 318—685 **13 Claims**

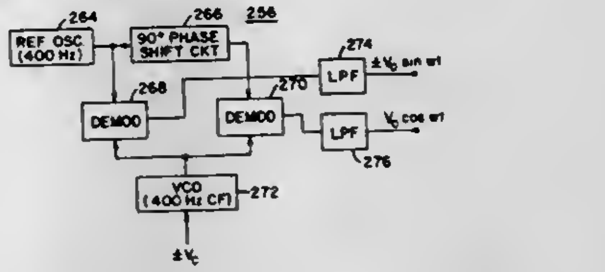
1. A control circuit for a stepping motor having a non-linear transfer function of current to flux, comprising:
- (a) means for receiving an input signal indicative of the desired direction and rate of motor travel,
- (b) means responsive to said input signal for developing a position command signal which is a sinusoidal wave form modified by the inverse of said transfer function, including means for simultaneously developing a plurality of discrete direct voltage signals and means responsive to said input signal for selecting a particular one of said discrete direct voltage signals and developing a command signal therefrom, and



- (c) means responsive to said position command signal for developing an energization signal for said stepping motor.

4,100,472
SATELLITE TRACKING ANTENNA SYSTEM

Joseph Graham Mobley, De Kalb, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.
Division of Ser. No. 598,492, Jul. 23, 1975, Pat. No. 4,035,805.
This application Aug. 19, 1976, Ser. No. 715,731
Int. Cl.² G05B ***19/40***
U.S. Cl. 318—685 **10 Claims**



1. Apparatus for controlling in response to a control voltage the speed and direction of rotation of a two phase D.C. stepper motor having first and second field windings, said apparatus comprising
- means for generating first and second sinusoidal drive voltages which are in quadrature phase relationship, said first voltage being applied to said first winding and said second voltage being applied to said second winding, and
- means responsive to said control voltage for varying the frequency of both said first and second drive voltages and reversing the polarity of said first drive voltage, respectively, for varying the speed and direction of rotation of said motor.

4,100,473
ELECTRIC STEPPER MOTORS

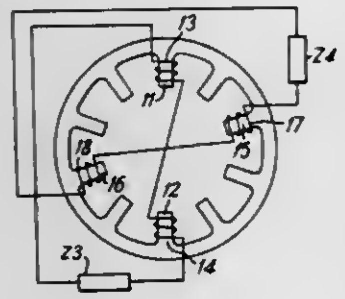
Peter John Lawrenson, and Austin Hughes, both of Leeds, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 573,156, Apr. 30, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,732

Claims priority, application United Kingdom, May 1, 1974, 19132/74

Int. Cl.² H02K *37/00*

U.S. Cl. 318—696 **7 Claims**



1. An electric stepper motor comprising a primary member having a plurality of spaced magnetic poles each wound with a drive coil, said magnetic poles being arranged to be energised in sequence, and a secondary member having at least two magnetic poles, the primary and secondary members being arranged for relative movement caused by switching of the energisation of the drive coils, said motor further comprising at least one coil additional to the drive coils and wound on the primary member, said additional coil being independent of a connection to an external source of voltage which would cause continuous energisation thereof and being connected with an impedance having a resistance component in a closed circuit to dampen oscillation between the primary and secondary members.

4,100,474
MULTI-VOLTAGE VEHICULAR NETWORK SYSTEM

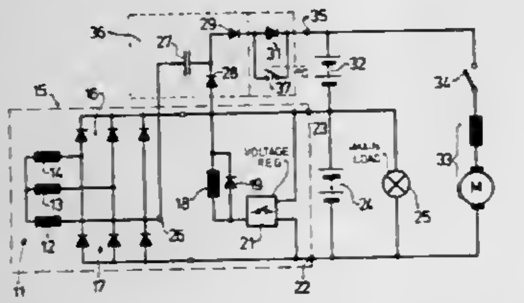
Peter Pfeffer, Lauffen, and Istvan Ragaly, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,438

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603783

Int. Cl.² H02J *7/14*

U.S. Cl. 320—17 **10 Claims**



1. Multi-voltage vehicular network system having
an alternator (11) having armature windings (12, 13, 14) and a field (18);
a rectifier system (15) connected to the armature windings, supplied from the alternator at a first voltage level and providing a d-c output at d-c output terminals (22, 23);
a voltage regulator (21) connected to the alternator, responsive to the alternator voltage at said first voltage level and controlling the output voltage thereof;
a voltage doubling circuit (36) including a capacitor (27) and two series connected diodes (28, 29) and providing output voltage at a second and higher level than said first level at a double voltage output terminal (35), connected to the free terminal of one (29) of said diodes (28, 29),
wherein, the capacitor (27) of the voltage doubling circuit is connected to the junction between the series connected diodes and to an armature winding (12) of the alternator, and the other diode (28) has its free terminal connected to one (23) of the d-c output terminals (22, 23) and forming the output of the rectifier system (15) at said first voltage level to provide a doubled output voltage at said double voltage terminal (35) derived from the alternator supplying the rectifier at said first voltage level and which is regulated in accordance with the control by said voltage regulator (21).

4,100,475
BATTERY TEMPERATURE COMPENSATED BATTERY-CHARGING SYSTEM

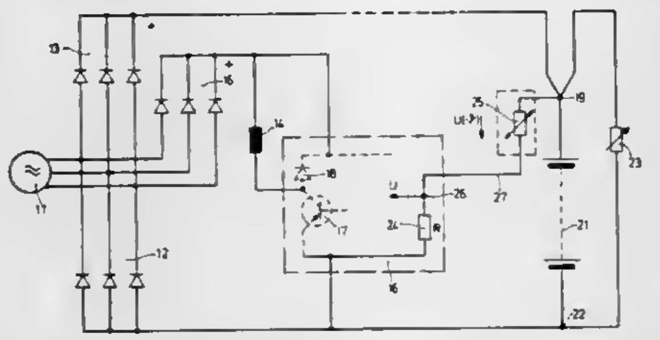
Willi Gansert, Kornwestheim, and Harry Slansky, Mühlacker, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 15, 1976, Ser. No. 705,455

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535245

Int. Cl.² H02J *7/14*

U.S. Cl. 320—35 **10 Claims**



1. Vehicular battery charging equipment comprising, in combination with a battery,
an electric generator having an excitation winding, and
a temperature-sensitive voltage regulator connected to said excitation winding and to said battery and containing, in circuit as components thereof, active semiconductor switching devices and passive circuit components of which at least one has a temperature-sensitive function, said passive circuit components including diodes and resistors, said voltage regulator having a component having a temperature-sensitive function located apart and relatively remote from the remainder of said voltage regulator, said remote component having a temperature-sensitive function constituting a two-terminal circuit portion directly connected with the ungrounded terminal (19) of the battery (21), and in the connection (27) electrically connecting said terminal of the battery (21) with the remainder of the voltage regulator.

4,100,476
SINGLE SECONDARY DIMMING INVERTER/BALLAST FOR GAS DISCHARGE LAMPS

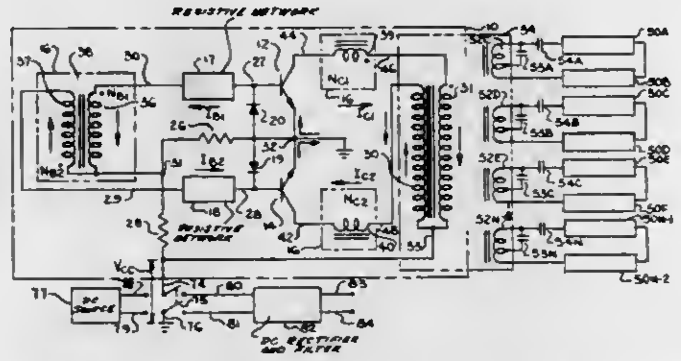
Horace Ghiringhelli, Dumont, N.J., assignor to Isodyne, Inc., Nanuet, N.Y.

Continuation of Ser. No. 572,941, Apr. 29, 1975, Pat. No. 4,016,477. This application Feb. 16, 1977, Ser. No. 769,159

Int. Cl.² H02M *7/00*

U.S. Cl. 315—297 **7 Claims**

1. A dimming inverter ballast for operating and dimming multiple electric gas discharge lamps, which comprises a current feedback inverter and a high leakage transformer, said inverter and said high leakage transformer having a primary coil and a single secondary coil tuned to a high frequency for optimum power transfer and maximum light output from the lamp loads, and wherein a single magnetic path links both the primary coil and the secondary coil.



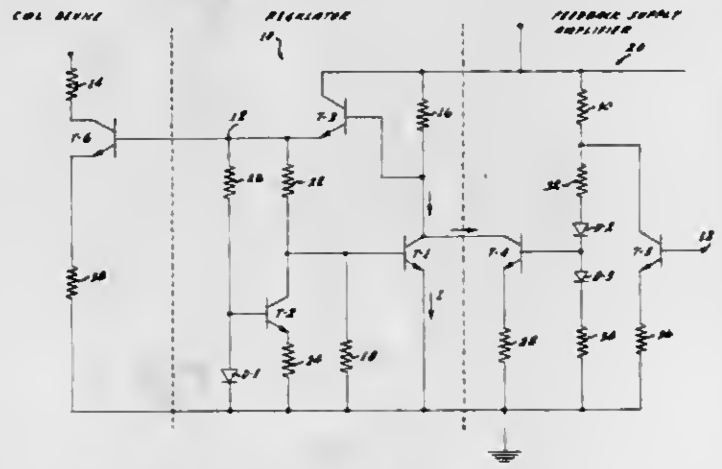
4,100,477
FULLY REGULATED TEMPERATURE COMPENSATED VOLTAGE REGULATOR

Richard K. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 29, 1976, Ser. No. 745,660

Int. Cl.² G05F *5/00*

U.S. Cl. 323—19 **9 Claims**



1. A voltage regulator comprising:
means providing a reference voltage and a positive supply voltage,
circuit means including first and second NPN transistor means connected between said positive supply and said reference voltage and with the base of the first transistor being connected to the collector of the second transistor means so as to be insensitive to changes in temperature,
a feedback supply amplifier circuit means between said positive supply voltage and said reference voltage and connected to said first transistor means whereby the current through said first transistor means is maintained constant, over variation in positive supply voltage, said feedback supply amplifier including third NPN transistor means and circuit means, the collector of said third transistor means being connected to the collector of said first transistor means,
said feedback supply amplifier further including a first, second and third resistance means and a pair of diode means connected in series between said positive supply voltage and said reference voltage with said base of said third transistor means being connected between said pairs of diode means.

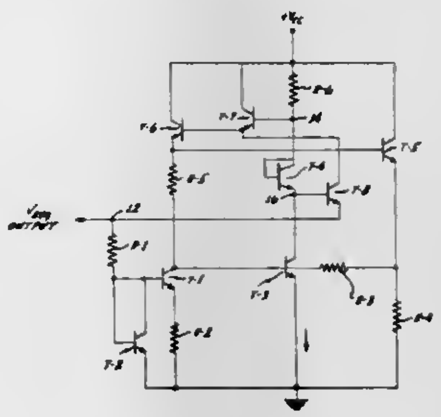
4,100,478
MONOLITHIC REGULATOR FOR CML DEVICES

Richard K. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 28, 1977, Ser. No. 772,767

Int. Cl.² G05F *3/08*

U.S. Cl. 323—19 **5 Claims**



1. In a voltage regulator a temperature compensating circuit so as to be insensitive to changes in temperature and connected to means providing a reference voltage and a positive supply voltage;
the improvement comprising,
means including a first NPN transistor connected between said positive supply and said reference voltage;
an output node;
a supply voltage variation compensation circuit means between said positive supply voltage and said output node so that said output node is constant over variations of positive supply voltage;
said compensation circuit including matched pairs of transistors, one of said transistors of the first of said matched pair being said first NPN transistor with the second of the same matched pair having an emitter electrode connected to the collector electrode of said first transistor to establish a current path between said positive supply and said first NPN transistor, the bases of the second matched pair are also connected to the same current path while the emitter electrode of the transistor of said second matched pair is connected to the collector electrode of the other transistor of the second matched pair and the emitter electrode of the latter is connected to said output node.

4,100,479
ELECTRONIC MONITORING SYSTEM WITH ZENER DIODE TO CONTROL CAPACITOR CHARGING CURRENT

Robert Buck, Kirchbühlweg 128, 7995 Neukirch, Germany

Filed Apr. 12, 1977, Ser. No. 786,805

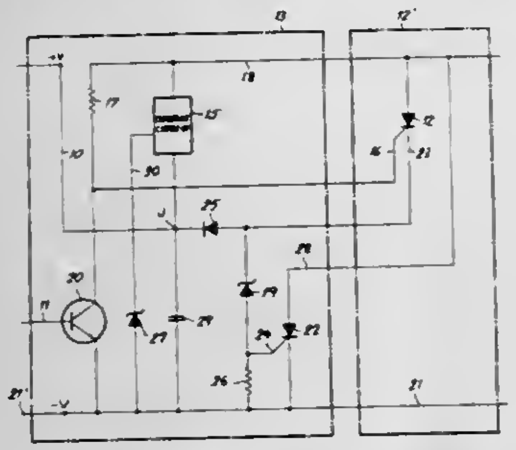
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616265

Int. Cl.² H01H *36/00*

U.S. Cl. 323—19 **10 Claims**

1. An electronic monitoring system comprising:
detector means sensitive to an ambient condition for generating an output signal varying with a change in said condition, said detector means being provided with a pair of power-input terminals;
a voltage-generating network including a storage capacitor and a constant-current unit in series therewith, said terminals being connected across said storage capacitor in an energizing circuit for said detector means;
a source of direct current with a pair of output leads connected across said network for charging said storage capacitor via said constant-current unit, one of said output leads having an extension included in said energizing circuit;

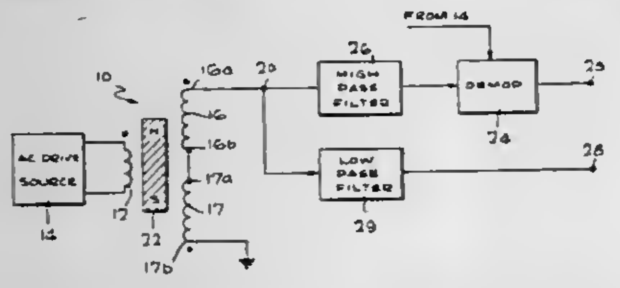
a current-responsive load in series with said source and said constant-current unit;
voltage-controlled variable-impedance means connected in shunt with at least part of said network across said source in series with said load;
electronic control means coupled to said detector means and connected to said variable-impedance means for altering the conductivity thereof in response to changes in said output signal, thereby modifying the flow of current through said load with maintenance of a sufficient voltage drop across said storage capacity to keep said detector means operative; and



an electronic breakdown device connected between said one of said output leads and a control input of said constant-current unit for throttling the flow of charging current into said storage capacitor while drawing a reduced sustaining current from a section of said constant-current unit, lying between said control input and the other of said output leads, upon said storage capacitor reaching a predetermined charging voltage.

4,100,480
POSITION AND VELOCITY SENSORS

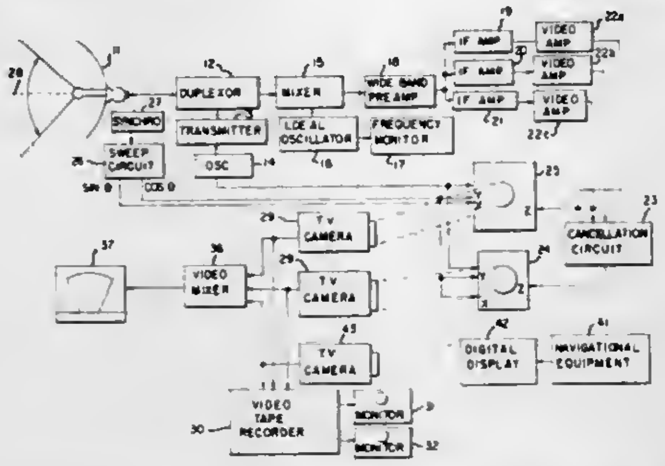
Dan R. Lytle, Canoga Park, and Ronald C. Burski, Simi Valley, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Filed Aug. 20, 1976, Ser. No. 716,162
Int. Cl.² G05F *7/00*
U.S. Cl. 323—51 **31 Claims**



1. In a position sensor including a primary winding to which an AC signal is appliable, first and second secondary windings, a moveable core coupling said primary winding to said secondary windings, and connecting means for connecting said secondary windings so that AC signals induced therein as a function of the AC signal in said primary winding are 180° out of phase with respect to one another, the sensor providing an output signal whose amplitude is a function of the core position with respect to said secondary windings, the improvement comprising:
controllable means included in said connecting means for controlling the connections between the secondary windings to cause said sensor to provide an output signal of a same selected amplitude when said core is at any one of *n* different positions with respect to said secondary windings, where *n* is an integer not less than 2.

4,100,481
HYDROCARBON EXPLORATION WITH DISPLAY OF RE-RADIATED AND REFLECTED MICROWAVE ENERGY

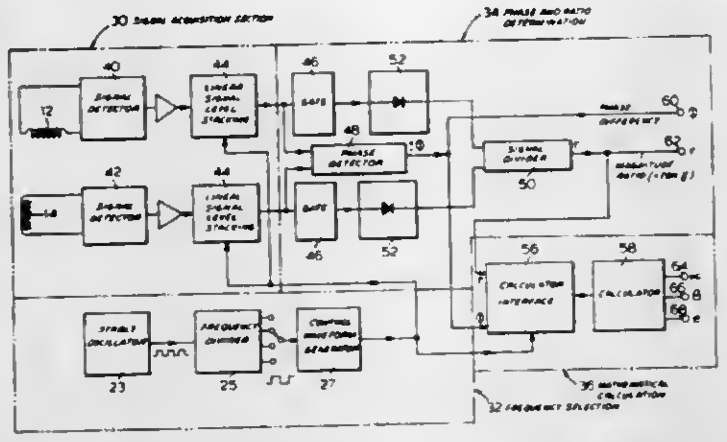
Luke S. Gournay, Rockwall, Tex., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Jan. 21, 1977, Ser. No. 760,885
Int. Cl.² G01V *3/12, 3/16*
U.S. Cl. 324—4 **9 Claims**



1. The method of exploring for hydrocarbon gas seeps comprising:
(a) transporting an antenna along a traverse above the surface of the earth,
(b) radiating from said antenna microwave energy having a transmitter frequency which excites the gas to emit microwave energy at a re-radiated frequency characteristic of a molecular resonance of the particular species of gas,
(c) applying the microwave energy received by said antenna to frequency discriminating circuits which produce a first signal representing reflected energy, a second signal representing both re-radiated and background energy, and a third signal representing only background energy,
(d) applying said second and third signals to a cancellation circuit to produce a fourth signal representing only re-radiated energy, and
(e) simultaneously displaying the re-radiated and reflected microwave energies represented by said first and fourth signals as a display of hydrocarbon gas seeps in relation to topographic features along said traverse.

4,100,482
METHOD AND APPARATUS FOR MEASURING ELLIPSE PARAMETERS OF ELECTROMAGNETIC POLARIZATION IN GEOPHYSICAL EXPLORATION

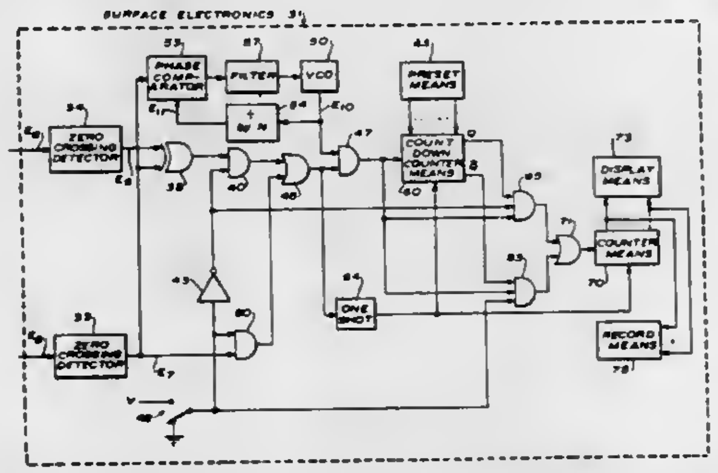
Mitsura Yamashita, Willowdale; Konsaku Hirano, and Nguyen Dang Thai, both of Don Mills, all of Canada, assignors to Mits-Co Geophysics Ltd., Willowdale, Canada
Filed Jun. 29, 1976, Ser. No. 700,775
Int. Cl.² G01V *3/10*
U.S. Cl. 324—6 **15 Claims**



11. Apparatus for detection of geophysical anomalies which manifest themselves by production of a secondary alternating electromagnetic field in the presence of a primary alternating electromagnetic field, where the resultant field is elliptically polarized and the ellipse of polarization is tilted at any location where the presence of said secondary field is being tested for, comprising:
(a) a transmitter capable of transmitting a primary alternating electromagnetic field at at least one frequency, and being capable of being set up and maintained in a first specific orientation at a transmission location during any such transmission procedure;
(b) a receiver including a pair of crossed coils, and being capable of being positioned at a testing location remote from said transmitter and of being set up and maintained in a second specific orientation of said crossed coils at any such testing location during any transmission procedure from said transmitter;
(c) first and second signal detecting means for detecting the presence of a signal on the one of the other of said crossed coils of said receiver, respectively;
(d) phase detector means for detecting and producing a signal which is a functon of the phase difference quantity ϕ between the signals detected on said crossed coils of said receiver;
(e) signal divider means for producing a signal which is a function of the magnitude ratio quantity r of the signals detected on said crossed coils of said receiver; and
(f) calculating means for mathematically analyzing and processing said phase differece quantity ϕ and said magnitude ratio quantity r to obtain such ellipse parameters of polarization of said resultant electromagnetic field as the tilt angle, ellipticity angle and ellipticity ratio thereof.

4,100,483
DIELECTRIC WELL LOGGING SYSTEM AND METHOD WITH ERROR CORRECTION

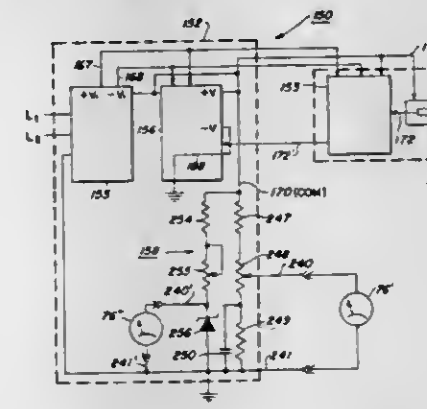
Larry W. Thompson; James R. Bridges, both of Houston, and James A. Fuchs, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 29, 1976, Ser. No. 755,406
Int. Cl.² G01V *3/18, 3/10;* G01R *25/00*
U.S. Cl. 324—6 **20 Claims**



1. A dielectric well logging system comprising a logging tool adapted to be passed through a borehole traversing an earth formation, said logging tool includes means for inducing electrical energy into the earth formation at a radio frequency, and at least two receiver means spaced a predetermined distance apart for providing intermediate frequency signals corresponding to electrical energy received from the formation; cable means connected to the receiver means for transmitting the intermediate frequency signals; and surface electronics including zero crossing detector means connected to the cable means, each detector means receiving a different intermediate frequency signal from the cable means for providing a detector signal whose change in amplitude is representative of the intermediate frequency signal passing through zero, clock pulse means for providing clock pulses at a frequency substantially greater than the frequency of the intermediate frequency signals, gating means connected to the detector means and to the clock pulse means for providing groups of clock pulses in accordance with the detector signals, the number of clock pulses in each group corresponding to the dielectric constant of the earth formation and to a known error, error means connected to the gating means for removing a number of pulses from each group of pulses corresponding to the known error, said error means includes first counter means connected to the gating means for counting the pulses in the groups of pulses and providing a first output signal of one amplitude when the count in the first counter means does not exceed the error count and of another amplitude when the count exceeds an error count, means connected to the first counter means for resetting the first counter means prior to each group of pulses, and switching means connected to the gating means and to the first counter means for blocking the pulses in each group of pulses when the first output signal is of the one amplitude and for passing the pulses in each group of pulses when the first output signal is of the other amplitude.

4,100,484
D.C. ELECTROMETER

Robert F. Buchheit, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 26, 1976, Ser. No. 744,913
Int. Cl.² G01R *5/28*
U.S. Cl. 324—32 **3 Claims**



1. In a d.c. type electrostatic voltmeter for measuring charge voltages on a xerographic plate including a probe adapted for disposition in spaced relation to said plate, the combination of:
signal processing means for processing the signal output from said probe, said signal processing means having at least two inputs;
first control means having an input side and an output side, said first control means output side being coupled to a first input of said signal processing means to provide a reference signal to said signal processing means;
second control means having an input side and an output side, said probe being coupled to said second control means input side, said second control means output side being coupled to a second input of said signal processing means whereby to apply the signal output of said probe to said signal processing means;
a voltage source;
said signal processing means including circuit means coupling said voltage source to the input side of said first control means, said signal processing means controlling said voltage source in response to said reference signal and the signal output of said probe to provide a voltage output to said first control means tending to balance the reference signal from said first control means to said processing means with the signal output of said probe; and
means to calibrate said probe and maintain said balance between said first and second control means while said probe is not in use including
first switch means effective when actuated to couple said

probe and the input side of said second control means to said voltage source;

said circuit means including charge retaining means; and

second switch means effective when actuated to couple said signal processing means with said charge retaining means and the input side of said first control means to produce a balancing potential on said charge retaining means whereby on use of said probe, said charge retaining means provides a voltage output tending to balance the reference signal from said first control means to said processing means with the signal output of said probe.

4,100,485
PHASE DISPLACED MEASUREMENT OF CONTIGUOUS SPHERICAL BALLS

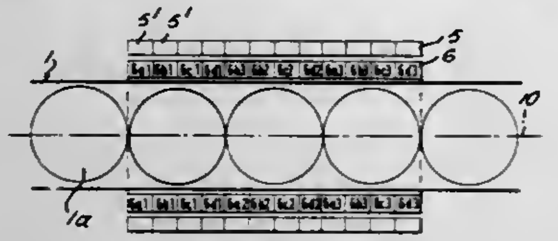
Michael James Rogers, Peterborongh, England, assignor to The Newall Engineering Company Ltd., England

Filed Jul. 27, 1976, Ser. No. 709,086

Claims priority, application United Kingdom, Feb. 17, 1976, 6258/76

Int. Cl.² G01R ***33/00***

U.S. Cl. 324—208 **8 Claims**



1. A position detector comprising a first member, a row of contiguous spherical balls of magnetizable material carried by said first member and disposed in side by side point contact and constrained against movement relative to one another, a second member, a transducer carried by said second member, said first and second members being relatively movable in a direction parallel to the row of balls and to the line of contact thereof, and said transducer comprising means for producing a periodically varying magnetic field through the balls in a direction extending along the line of point contact and means for sensing phase-displaced variations produced in the magnetic field by said relative movement and for producing signals denoting the relative positions of the first and second members, said sensing means comprising at least two pick-up coils which are spaced apart along the row of balls and the line of point contact thereof and through which the balls pass.

4,100,486
MONITOR FOR SEMICONDUCTOR DIFFUSION OPERATIONS

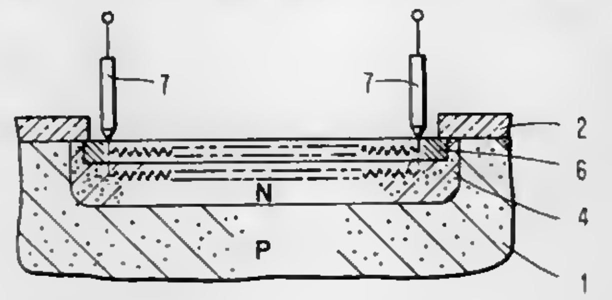
Barry N. Casowitz, Poughkeepsie; Michael D. Cowan, Wappingers Falls, both of N.Y.; Charles B. Humphreys, Essex Junction, Vt., and Akella V. S. Satya, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,691

Int. Cl.² G01R ***27/02***

U.S. Cl. 324—62 **18 Claims**

1. A method of testing continuity defects in a diffused region in a silicon semiconductor substrate comprising forming adjacent a surface portion of said region a silicide of transition metal, and measuring the resistance of said silicide at spaced points thereon.



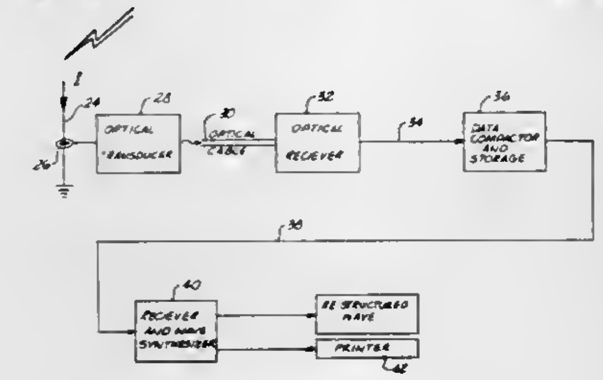
4,100,487
LIGHTNING CURRENT WAVEFORM MEASURING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ronald J. Wojtasinski, Cocoa Beach; Jerry C. Fuchs, Cocoa, both of Fla., and Charles H. Grove, Hantsville, Ala.

Filed Mar. 30, 1977, Ser. No. 782,693

Int. Cl.² G01R ***31/00***

U.S. Cl. 324—96 **6 Claims**



1. An apparatus for monitoring current waveforms produced by lightning strikes comprising:

(a) an elongated member positioned in the vicinity where it is desired to monitor the lightning strikes for having currents generated therein by said lightning strikes;

(b) coil means encircling said elongated member generating a voltage responsive to current flowing through said elongated member;

(c) a light emitting means connected to said coil means generating light waves corresponding to said voltage produced in said coil means;

(d) an optical receiver remotely located from said area in which said lightning strikes are being monitored;

(e) an optical cable connecting said light emitting means with said optical receiver for transmitting said light waves therebetween;

(f) an analog-to-digital converter connected to said optical receiver for converting signals appearing on an output of said optical receiver into digital signals;

(g) a memory for storing information;

(h) a data register interposed between said memory and said analog-to-digital converter for storing the last information received from said analog-to-digital converter,

(i) a comparator means for comparing the information previously stored in said data register with information coming from said analog-to-digital converter for loading the information stored in said data register into said memory when said comparison indicates a predetermined difference

(j) a counter means producing a timing signal;

(k) means for supplying said timing signal to said analog-to-digital converter for synchronizing the loading of said data register and said comparator; and

(l) means for supplying said timing signal to said memory for recording the exact time said information is loaded into said memory from said data register.

4,100,488
APPARATUS FOR MEASURING ELECTRIC CURRENT

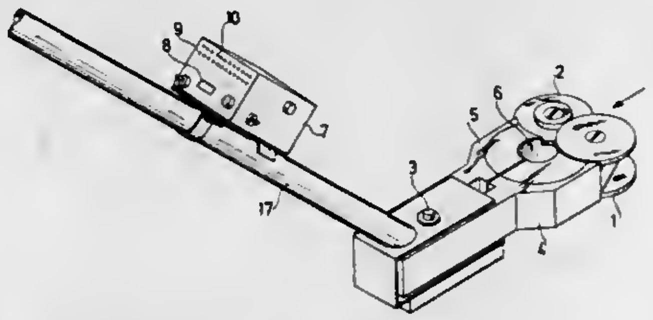
Gerhard Quietzsch, Bad Soden am Taunus; Bernd Greiner, Oberdorfelden, and Lothar Pelz, Oberroden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 727,755

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543828

Int. Cl.² G01R ***1/22***

U.S. Cl. 324—127 **2 Claims**



1. Apparatus for measuring the electrical power supplied to a load via a current conductor as determined by the direct current and superposed alternating current, comprising a pair of jaws pivotally coupled to each other, each of said jaws supporting a respective induction coil, said jaws being normally closed such that said respective induction coils substantially form a toroid; a recess portion in said jaws concentric with said toroid for receiving a current conductor; guide means disposed on said jaws in the vicinity of an end of said jaws remote from the pivotal coupling thereof, said guide means being formed of two rolls; means for moving said jaws toward and away from said current conductor such that forces are exerted on said jaws when said rolls contact said current conductor to urge said jaws to open whereby said guide means guide said current conductor to said recess portion whereat said jaws embrace said current conductor in said recess portion and to release said current conductor from said jaws, respectively; amplifier means coupled to said induction coils and including an integrator for integrating the direct current induced in said induction coils when said jaws are moved toward and embrace said current conductor, and an amplifier, filter and rectifier connected to sense the current induced in said induction coils by the alternating current flowing through said current conductor, and means for displaying an indication of the currents induced in said induction coils.

4,100,489
ELECTRICAL RESISTOR TESTING FIXTURE AND TESTING CHAMBER

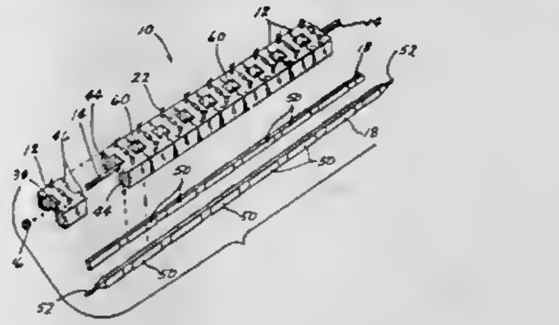
Jerome J. Kneifel, and John C. Veburg, both of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed May 9, 1977, Ser. No. 795,138

Int. Cl.² G01R ***31/00***

U.S. Cl. 324—158 F **9 Claims**

1. An electrical component testing chamber comprising, at least one modular test tray, at least one drawer having a top portion having a plurality of grooves for receivably supporting said modular test trays in horizontal parallel alignment, a first plenum within said drawer having slots beneath said grooves for allowing air flow and having an air inlet at one end of said drawer to receive air flow, a diffusing means covering said slots for maintaining uniform air velocity through said slots, a support structure slidably supporting said drawers in vertical alignment horizontally parallel to each other, a second plenum within said support structure having air outlets meeting said drawer air inlets when the drawer is slidably engaged in said support structure, a valve means at said air outlet for controlling air flow into said plenum, and means for discharging air into said second plenum.



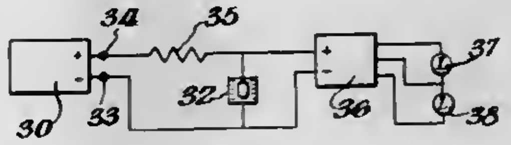
4,100,490
ELAPSED TIME INDICATOR AND ELECTROLYTIC TIMER CELL

David B. Peck; Vincent T. Guntlow, and Paul H. Netherwood, all of Williamstown, Mass., assignors to Diametrics, Inc., Williamstown, Mass.

Filed Mar. 11, 1977, Ser. No. 776,517

Int. Cl.² G04F ***8/00***

U.S. Cl. 324—182 **21 Claims**



1. An elapsed time indicating cell comprising a valve-metal anode; a cathode being separated from said anode by a space; an electrolyte occupying said space; a housing containing said electrolyte; and an anodically formed oxide film overlying the surface of said anode, said film having a thickness corresponding to a formation voltage of less than 3 volts.

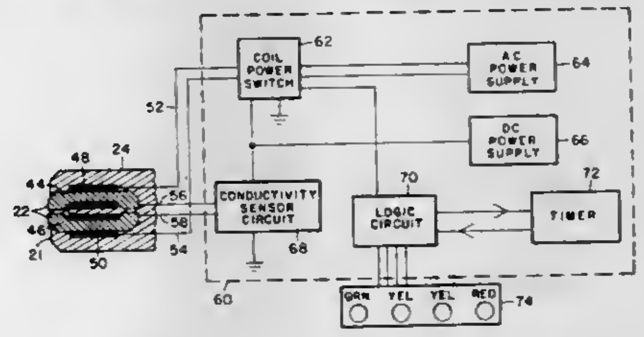
4,100,491
AUTOMATIC SELF-CLEANING FERROMAGNETIC METAL DETECTOR

Francis Marion Newman, Jr., and H. Stanley Silvus, Jr., both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Feb. 28, 1977, Ser. No. 772,658

Int. Cl.² G01R ***33/12***

U.S. Cl. 324—204 **27 Claims**



22. A method of cleaning a ferromagnetic metal detector in a flowing fluid, said method having the following steps: mag-

netizing a semipermanent magnet which magnet is part of said metal detector;

- collecting ferromagnetic particles on said magnetized semipermanent magnet;
- demagnetizing said semipermanent magnet following detection of said particles;
- releasing said collected ferromagnetic particles in said flowing fluid; and
- remagnetizing of said semipermanent magnet.

4,100,492

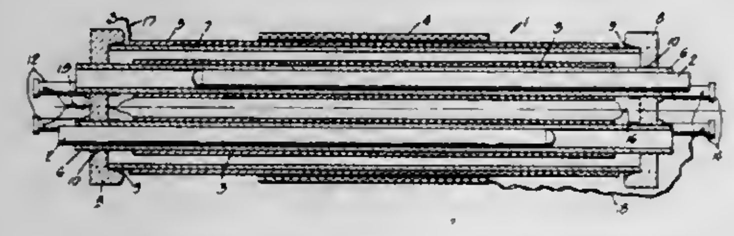
HARMONIC MAGNETIC FIELD PROBE WITH NOVEL CORE CONSTRUCTION

Friedrich M. O. Förster, D-7410 Rentlingen 1, In Laisen 70, Fed. Rep. of Germany

Filed Apr. 30, 1976, Ser. No. 681,814

Int. Cl.^{2} G01R *33/04*

U.S. Cl. 324—254 **7 Claims**



1. In a harmonic magnetic probe for the measurement of magnetic fields or magnetic field gradients having at least one elongated magnetizable probe core, with at least one alternating current carrying excitation winding for effective alternating magnetic saturation of the probe core, and at least one receiver winding for providing an electric signal at the terminals of said winding, which signal is proportional to the magnetic fields or magnetic field gradients being measured, said electrical receiver winding encompassing at least one probe core, the improvement comprising:

- an elongated diamagnetic body having a plurality of parallel straight-line openings extending therethrough, said openings having uniform cross-sections and arranged symmetrically about and equally spaced from a longitudinal axis of said body; and
- a corresponding plurality of magnetizable wires individually received within the body openings, each of said wires having cross-sectional dimensions such that it is received within the body opening in a closely fitting relationship, said diamagnetic body and included wires forming a probe core.

4,100,493

TRANSMISSION SYSTEM FOR SIGNAL TRANSMISSION BY MEANS OF COMPRESSED DELTA MODULATION

Else Carel Dijkmans, and Karel Elbert Kuijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

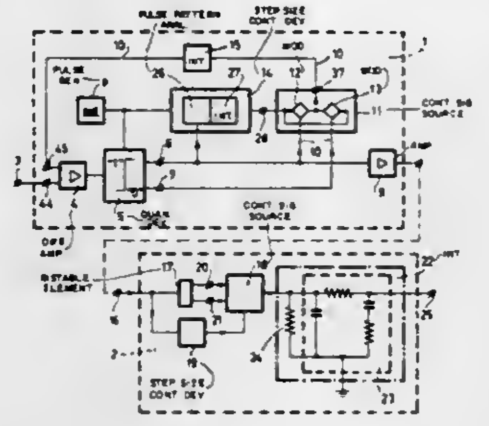
Filed May 25, 1976, Ser. No. 689,905

Claims priority, application Netherlands, Jun. 5, 1975, 7506656

Int. Cl.^{2} H03K *13/22*

U.S. Cl. 325—38 B **2 Claims**

1. A compressed delta modulation transmitter comprising a delta modulator, a feedback circuit comprising a controlled signal source coupled to said modulator, a first integrating network having a first terminal coupled to said controlled signal source, a second terminal coupled to said modulator, and a third terminal, a leakage resistor coupled between said first and third terminals of said integrating network, and a capacitor coupled to said integrating network third terminal and ground, said signal source comprising a pair of current source means for applying current pulses to said integrating network and said leakage resistor.



4,100,494

DYNAMIC CONTROL OF CODE MODULATED PULSE TRANSMISSION

Henricus P. J. Bondewijns; Karel Riemens, and Ludwig D. J. Eggermont, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1976, Ser. No. 703,212

Claims priority, application Netherlands, Jul. 22, 1975, 7508711

Int. Cl.^{2} H03K *13/22*

U.S. Cl. 325—38 B **8 Claims**

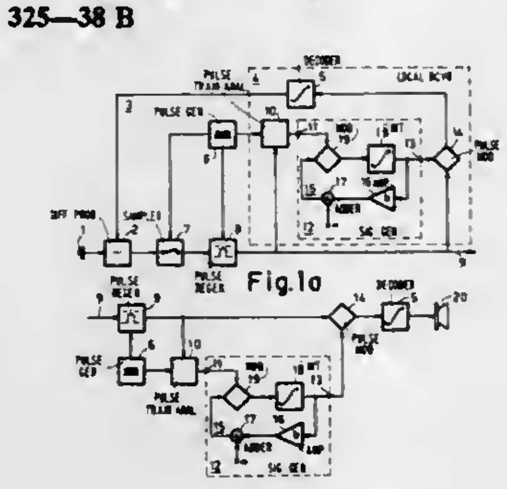


Fig.1a

1. A transmitter for transmitting input signals in pulse code modulation format, said transmitter comprising a PCM modulator having input means for receiving said input signals, modulation control input means, and output means for supplying a PCM format signal to be transmitted with a given modulation index; a local receiver dynamic compression control circuit comprising a pulse train analyzer having an input coupled to said modulator output means and having an output means for supplying output pulses at the occurrence of pulse patterns in said PCM signal which correspond within a selected time interval of at least three successive pulses to a large instantaneous value of said modulation index, and a signal generator including an integrator network having an input, and an output means coupled to said modulator control input means for supplying a dynamic control signal thereto, and a feedback circuit coupled between said integrator input and output and including first device means coupled to said integrator output means for providing a signal having a magnitude with respect to said control signal in accordance with a selected ratio, and a second device means coupled to said analyzer output means, said first device means, and said integrator input for supplying said signal supplied by said first device means to said integrator in accordance with said output pulses.

4,100,495

ADAPTIVE METHOD OF AND MEANS FOR RECOVERING DIGITAL SIGNALS

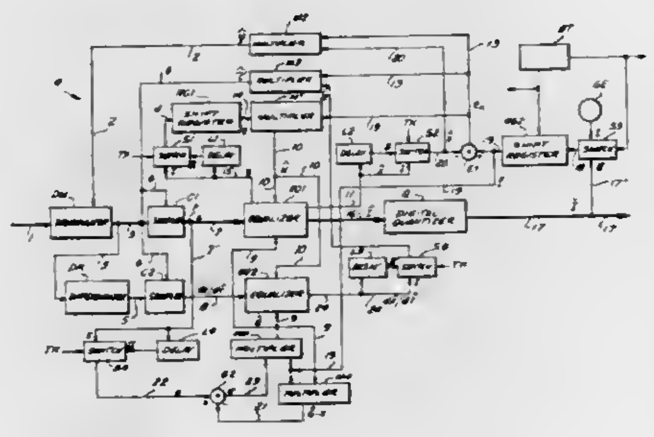
Angelo Luvison, and Giancarlo Pirani, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Continuation-in-part of Ser. No. 745,800, Nov. 29, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,693

Claims priority, application Italy, Nov. 27, 1975, 69922 A/75

Int. Cl.^{2} H04L *25/08*

U.S. Cl. 325—323 **10 Claims**



4. A receiver for an incoming data flow phase-modulated on a carrier arriving over a transmission channel, comprising:

- demodulating means connected to said channel for recovering said data flow;
- sampling means connected to said demodulating means for producing a train of raw data pulses under the control of a locally generated timing signal;
- equalizing means connected to said sampling means for optimizing said raw data pulses by recursive filtering over a multiplicity of sampling cycles under the control of adaptive parameters including a gain coefficient and a channel coefficient, said equalizing means having a first output emitting the optimized data pulses, a second output emitting a reference signal internally synthesized from the vector sum of said raw data pulses weighted by said channel coefficient over said multiplicity of sampling cycles, and a third output emitting an updating signal internally synthesized from the vector sum of the differences between said raw data pulses and said reference signal obtained over said multiplicity of sampling cycles;
- quantizing means connected to said first output for converting said optimized data pulses into outgoing data pulses;
- storage means connected to said quantizing means for preserving said outgoing data pulses for a period corresponding to said multiplicity of sampling cycles;
- adder means connected to said storage means and to said second output for differentially combining the preserved data pulses with said reference signal to produce an error signal;
- a first feedback loop with input connections to said adder means and to said second output for delivering to a control input of said demodulating means an optimized phase signal derived from said error and reference signals;
- a second feedback loop with input connections to said adder means and to said third output for delivering to said equalizing means an optimizing gain coefficient derived from said error and updating signals; and
- a third feedback loop with input connections to said sampling means and to said storage means for delivering to said equalizing means an optimized channel coefficient derived from said raw and stored data pulses.

4,100,496

GHOST CANCELLATION DEVICE

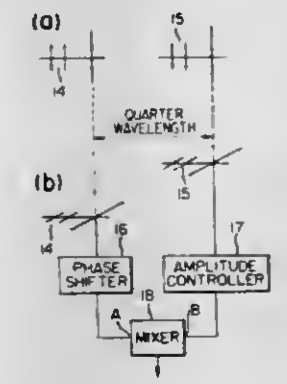
Tsuyoshi Akiyoshi; Namio Yamaguchi, and Keisuke Yamamoto, all of Ibaraki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 2, 1976, Ser. No. 738,105

Claims priority, application Japan, Dec. 11, 1975, 50-136518

Int. Cl.^{2} H04B *1/18, 7/04*

U.S. Cl. 325—369 **3 Claims**



1. A ghost cancellation arrangement, comprising:

- a first antenna bay for receiving a first desired signal M_1 and a first ghost signal G_1 having a different direction of arrival than the signal M_1;
- a second antenna bay spaced from the first bay in a horizontal direction for receiving a second desired signal M_2 of the same frequency and arrival direction as the signal M_1, and a second ghost signal G_2 of the same frequency and arrival direction as the signal G_1,
- means for mechanically and electrically arranging said antenna bays to provide output signals therefrom corresponding to approximately a ¼ wavelength spacing therebetween;
- a mixer for mixing the output signals from the first and second antenna bays;
- phase shifting means between said first bay and said mixer for altering the phase of the signals M_1 and G_1;
- amplitude controlling means between one of said bays and said mixer for altering the amplitudes of the corresponding output signals from said one bay; and
- means for adjusting said phase shifting means and said amplitude controlling means so that the mixer output signal G_o corresponding to the resultant of the ghost signals G_1 and G_1 is in phase or 180° out of phase with the mixer output signal M_o corresponding to the resultant of the desired signals M_1 and M_2, whereby the undesirable effects of said ghost signals are substantially eliminated.

4,100,497

SELECTIVE RESCAN DELAY FOR MULTI-CHANNEL SCANNING RADIO RECEIVER

George H. Fathauer, Mesa, Ariz.; Cecil Ernest Mathis, and Warren L. Williamson, both of Indianapolis, Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Division of Ser. No. 545,432, Jan. 30, 1975, Pat. No. 4,027,251. This application Nov. 12, 1976, Ser. No. 741,475

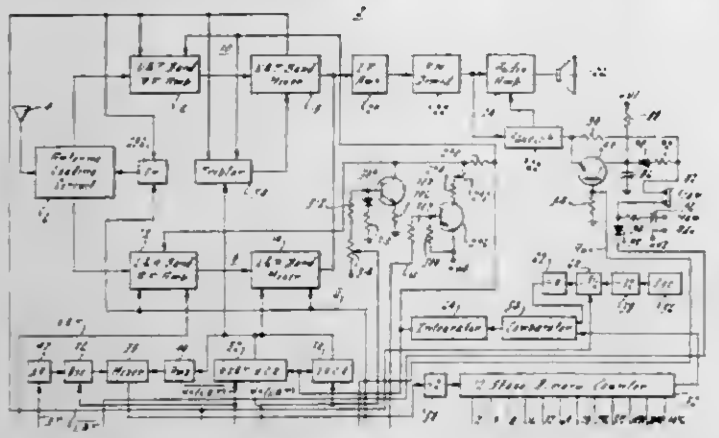
Int. Cl.^{2} H04B *1/32*

U.S. Cl. 325—470 **7 Claims**

4. In a multi-channel scanning radio receiver including scanning means for successively tuning to a plurality of predetermined radio frequency channels; means for detecting the presence of a signal on one of said tuned channels; means responsive to the detection of the signal on the tuned channel for halting said scanning means operation during said signal presence on said tuned channel and enabling resumption of said scanning means operation in response to termination of said signal on said tuned channel; and means responsive to said detection means for delaying the scanning means operation

resumption for a period of time after said signal termination, wherein the improvement comprises:

including memory means means for programming said delaying means to automatically operate only on certain selected ones of said channels thereby facilitating reception of two-way communications on the certain selected channels without delaying the scanning operation on channels having one-way communications.



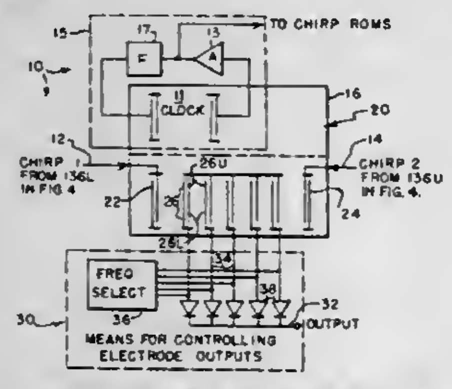
4,100,498
DISCRETE CHIRP FREQUENCY SYNTHESIZER

James M. Alsup, and Harper J. Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1977, Ser. No. 807,863

Int. Cl.^{2} H03B *19/14, 21/02*

U.S. Cl. 328—14 **12 Claims**


15
17
13
TO CHIRP ROMS
10
F
A
11
CLOCK
16
20
12
14
CHIRP 1 FROM 136L IN FIG 4
CHIRP 2 FROM 136U IN FIG. 4.
26U
22
26
24
26L
34
FREQ SELECT
38
32
30
36
OUTPUT
MEANS FOR CONTROLLING ELECTRODE OUTPUTS

AUTOMATIC FREQUENCY—HOP CONTROLLER FOR A SAW SYNTHESIZER, WITH OFFSET LAUNCH INTERDIGITATIONS

1. An automatic frequency-hop controller for a surface acoustic wave (SAW) synthesizer, comprising:

a surface acoustic wave device, adapted to receive the chirp signals, comprising:

a substrate;

a pair of sets of interdigitated electrodes, disposed on the surface of the substrate, one set at each end, the electrodes receiving the electrical chirp signals and transducing them to acoustic waves, which traverse the surface of the substrate; and

another set of interdigitated electrodes, which are output electrodes, also disposed on the surface of the substrate, the electrodes of all sets being parallel, the output set of electrodes being so disposed as to receive the acoustic waves generated by the pair of sets of electrodes, and transduce them back to electrical signals;

means for generating two chirp signals, on a substrate, one chirp signal having a delay with respect to the other, the means of generating either chirp signal comprising a plurality of groups of electrodes, the upper half of each electrode being so disposed with respect to its lower half that the signal received from the top parts of the electrodes has a phase shift of 90°, at a carrier frequency f_c, with respect to the phase shift of the signal received from the corresponding bottom parts of the electrodes; the synthesizer further comprising:

means, including switches which can be enabled, that is, activated, connected to the output set of electrodes, which selectively controls/mixes the transmission of the electrical signals received from the output set of electrodes, the selective controlling/mixing means having the capability of transmitting signals from the output set in any sequence, the frequency of the output signal being determined by the particular output switch which is activated at any given time.

4,100,499
CARRIER SYNCHRONIZATION SYSTEM FOR COHERENT PHASE DEMODULATORS

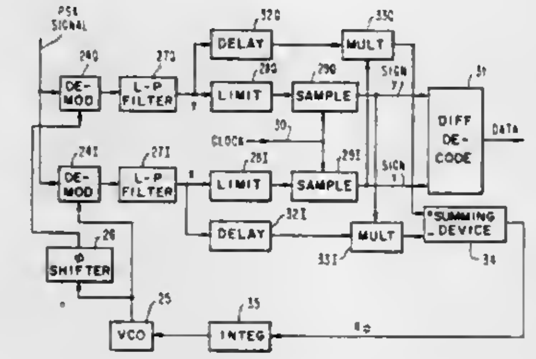
Jean Louis Monrolin, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Flied Oct. 12, 1977, Ser. No. 841,257

Claims priority, application France, Oct. 18, 1976, 76 32450

Int. Cl.^{2} H04L *27/22*

U.S. Cl. 329—50 **2 Claims**



1. In a 4-phase coherent PSK demodulator of the type that includes a phase adjustable reference carrier source,

means for demodulating a received signal with said reference carrier source to provide first and second signals respectively representing the in-phase and quadrature components of said received signal, a phase synchronization system for said reference carrier characterized in that it comprises:

means responsive to said first and second signals to detect the signs thereof and produce in-phase and quadrature sign signals,

multiplier means coupled to receive said first signal and said quadrature sign signal to produce a first product signal and to receive said second signal and said in-phase sign signal to produce a second product signal,

and means coupled to said multiplier means and responsive to said first and second product signals to produce an error signal, said error signal being supplied to said adjustable reference carrier source to control the phase thereof.

4,100,500
ANGLE-MODULATION DETECTOR HAVING PUSH-PULL INPUT APPLIED THROUGH HIGH-PASS FILTERS

Mitsuo Ohsawa, Fujisawa; Yukio Onoe, and Hiroshi Yamagishi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,797

Claims priority, application Japan, Aug. 27, 1976, 51-103053

Int. Cl.^{2} H03D *3/14*

U.S. Cl. 329—103 **16 Claims**

1. A circuit adapted to detect an angle-modulated signal, comprising:

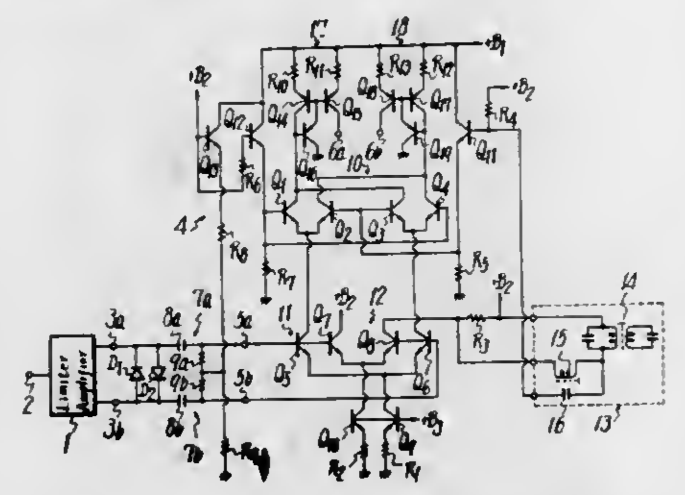
input means having a pair of terminals for supplying an angle-modulated signal to said pair of terminals in push-pull relation;

high-pass filter means coupled to said pair of terminals for transmitting that portion of said supplied angle-modulated signal which exceeds a cut-off frequency, said high-pass

filter means being formed of resistance means and capacitance means;

a differential amplifier having a pair of inputs coupled to said high-pass filter means for receiving the transmitted angle-modulated signal as a reference signal, said reference signal being applied to said pair of inputs in push-pull relation, and said differential amplifier having a pair of outputs;

quadrature generating means responsive to said reference signal for generating a quadrature signal whose phase varies with respect to said reference signal as a function of a change in frequency of said reference signal;



coupling means for coupling said reference signal to said quadrature generating means; and

multiplier means coupled to said pair of outputs of said differential amplifier for receiving output signals produced by said differential amplifier in response to said reference signal applied thereto, said multiplier means also being coupled to said quadrature generating means for receiving said quadrature signal to produce an output signal as a function of the phase difference between said reference and quadrature signals.

4,100,501
AUDIO FREQUENCY POWER AMPLIFIER

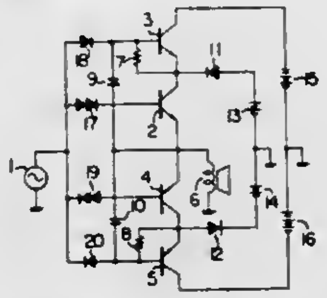
Harushige Nakagaki, Yokohama; Tohru Sampei, Toyokawa; Nobutaka Amada, Toyokawa, and Tatsuo Baba, Toyokawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1977, Ser. No. 767,963

Claims priority, application Japan, Feb. 12, 1976, 51-13220; Feb. 18, 1976, 51-16012

Int. Cl.^{2} H03F *3/26*

U.S. Cl. 330—263 **8 Claims**



1. An audio frequency power amplifier comprising:

first and second transistors of one conductivity type each having an input electrode, a common electrode and an output electrode;

means for applying an input signal to the respective input electrodes of said first and second transistors;

a load connected to the output electrode of said first transistor;

a first D.C. power supply connected to the common electrode of said first transistor for energizing said first transistor and said load;

a diode connected between the common electrode of said first transistor and said first D.C. power supply in a forward direction to a current flowing from said first D.C. power supply;

means for D.C. coupling the common electrode of said first transistor to the output electrode of said second of transistor;

a second D.C. power supply connected to the common electrode of said second transistor and having a voltage higher than that of said first D.C. power supply for energizing said first and second transistors and said load when said second transistor is conductive;

a capacitor connected between the input electrode of said second transistor and the output electrode of said first transistor; and

means for charging up said capacitor when said second transistor is non-conductive.

4,100,502
CLASS B FET AMPLIFIER CIRCUIT

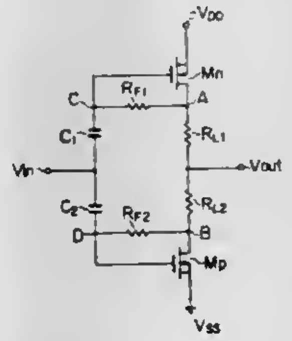
Osamu Yamashiro, Ohmiya, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 31, 1976, Ser. No. 719,238

Claims priority, application Japan, Sep. 3, 1975, 50-105919

Int. Cl.^{2} H03F *3/16*

U.S. Cl. 330—264 **15 Claims**



1. An FET circuit comprising an amplifier stage and a waveform shaping stage; said amplifier stage including a first p-channel FET and a first n-channel FET, means for biasing the gate of each of said FETs at a dc level nearly equal to its drain potential, (means for setting the potential differential between the source and the drain of each of said FETS at a voltage nearly equal to its threshold voltage;) and means for supplying a linear input signal to said gates through respective capacitors; and said waveform shaping stage comprising means for converting a linear signal into a digital signal including a second p-channel FET having a gate coupled to the drain of said first p-channel FET, and a second n-channel FET having a gate coupled to the drain of said first n-channel FET.

4,100,503
CORRELATIVE TRACKING SYSTEM WITH LOCK INDICATOR

William C. Lindsey, Pasadena, Calif.; Heinrich Meyr, Hinterkappelen, Switzerland, and Peter C. King, Ventura, Calif., assignors to W. C. Lindsey Inc., Pasadena, Calif.

Filed Jul. 21, 1976, Ser. No. 707,285

Int. Cl.^{2} H03B *3/04*

U.S. Cl. 331—1 A **4 Claims**

1. In a correlative tracking system having an in-phase phase locked loop including a multiplier, a low pass filter and a VCO having an output signal, said multiplier having a carrier signal input and said VCO output signal as an input, said multiplier having a positive or a negative output signal proportional to in-phase or out-of-phase phase difference between said carrier signal and said VCO output signal, said correlative tracking

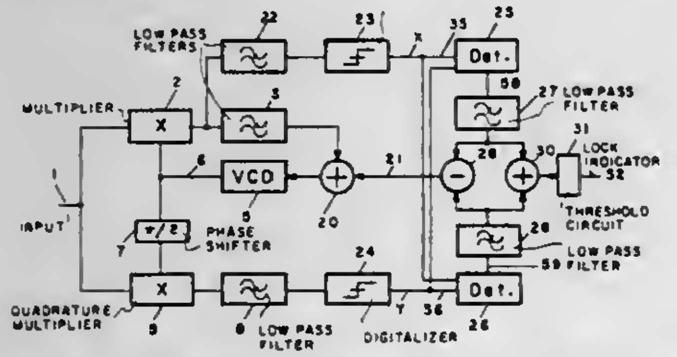
system also having a quadrature multiplier having an input receiving said carrier signal and an input receiving a $\pi/2$ phase shifted replica of said VCO output signal, said quadrature multiplier having a positive or negative output proportional to in-phase or oot-of-phase phase difference between said carrier signal and said phase shifted replica of said VCO output signal, said quadrature multiplier connected to a quadrature low-pass filter having an output indicating the locked status of said in-phase phase locked loop by comparison with a threshold, the improvement which comprises:

a first low pass filter having an input connected to said in-phase phase locked loop multiplier output, said low pass filter having an output;

a first digitizing means having an input connected to said first low pass filter output, said first digitizing means adapted to produce a positive pulse corresponding to $x=1$ or a negative pulse corresponding to $x=0$ when said output of said in-phase phase locked loop multiplier shifts positive or negative;

a second digitizing means having an input connected to said quadrature low pass filter output, said second digitizing means adapted to produce a positive pulse corresponding to $y=1$, or a negative pulse corresponding to $y=0$, when said quadrature multiplier output shifts positive or negative;

first detector means receiving positive and negative pulses corresponding to $x, y=00, 10, 11, 01$, produced by said first and second digitizing means, said first detector means having at least one output pulse when said positive and negative pulses corresponding to $x, y=00, 10, 11, 01$, have been received;



a second low pass filter receiving said output pulse of said first detector means, said second low pass filter having an output;

a second detector means receiving the reverse order of said positive and negative pulses, corresponding to $x, y=00, 01, 11, 10$, produced by said first and second digitizing means, said second detector means having at least one output pulse when the reverse order of said positive and negative pulses, corresponding to $x, y=00, 01, 11, 10$, has been received;

a third low pass filter connected to said output of said second detector means, said third low pass filter having an output;

a first adder connected to said second and said third low pass filter outputs, said first adder adapted to sum a plurality of pulses received from said second and said third low pass filter outputs, said first adder having an output signal proportional to said sum;

a comparator having an input connected to said first adder output, said comparator adapted to compare said sum with a threshold and to produce a signal when said threshold is exceeded, indicating an out of lock status;

differencing means connected to said second and third low pass filter outputs, said differencing means adapted to subtract the number of pulses received from said second low pass filter output from pulses received from said third low pass filter output, said differencing means having an output proportional to said difference; and

a second adder having a first input connected to said in-phase phase locked loop low pass filter output, a second input connected to said differencing means, and an output connected to said VCO, said second adder adapted to algebraically add said signal proportional to said difference from said differencing means, to said phase locked loop low pass filter output, to control said VCO.

4,100,504

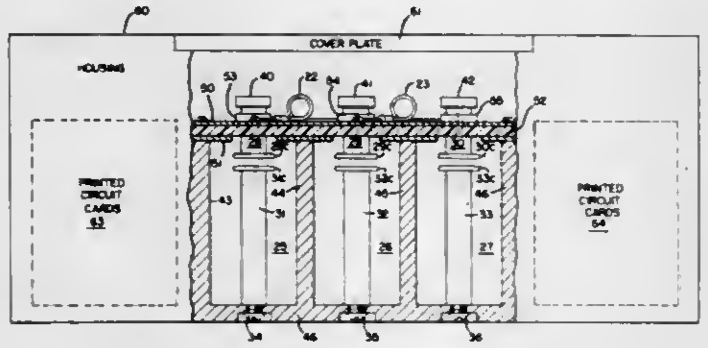
BAND REJECTION FILTER HAVING INTEGRATED IMPEDANCE INVERTER-TUNE CAVITY CONFIGURATION

William E. McGann, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jun. 20, 1977, Ser. No. 808,364

Int. Cl.^{2} H03B *21/02*

U.S. Cl. 331—39 **11 Claims**



1. A band rejection filter arrangement comprising:

an input terminal to which an input signal having a prescribed frequency component to be effectively rejected is to be coupled;

an output terminal from which an output signal absent said prescribed frequency component is to be derived;

a plurality of impedance inverter elements connected in series between said input and output terminals; and

respective tunable resonator cavity elements connected between the junctions of commonly connected impedance inverter elements and a reference potential terminal; wherein

one end of each of said resonator cavity elements is formed of an insulator board having first conductive material disposed on the side thereof facing each cavity; and wherein

on the side of said insulator board facing away from each cavity there is provided a second conductive material, which is connected to said first conductive material, and upon which ones of said impedance inverter elements are affixed.

4,100,505

VARIABLE CREST FACTOR HIGH FREQUENCY GENERATOR APPARATUS

Kenneth W. Belt, Berwyn, and Stuart G. McCarrell, Chicago, both of Ill., assignors to Macan Engineering & Manufacturing Company, Inc., Chicago, Ill.

Filed May 7, 1976, Ser. No. 684,082

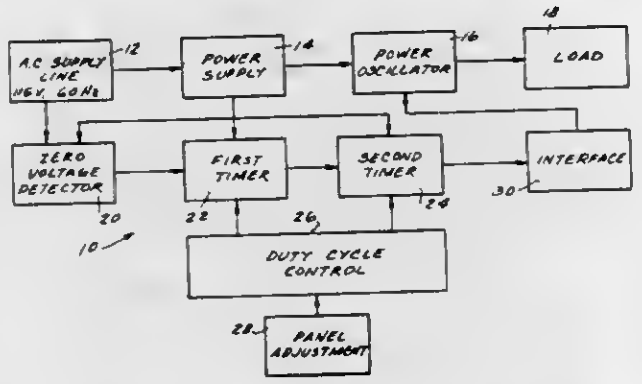
Int. Cl.^{2} A61B *17/36*

U.S. Cl. 331—71 **11 Claims**

1. A method of producing high frequency signal bursts, comprising the steps of:

applying a rectified sinusoidal input voltage to an oscillator to produce high frequency oscillations having an envelope which followa the input voltage wave;

simultaneously monitoring the input voltage wave; and



keying the oscillator on and off symmetrically about peaks of the input voltage wave.

4,100,506

ELECTROMECHANICAL FILTER

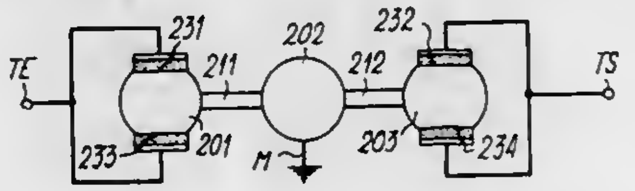
Herbert Ernyei, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Nov. 17, 1976, Ser. No. 742,467

Claims priority, application France, Nov. 20, 1975, 75 35515

Int. Cl.^{2} H03H *9/04, 9/26, 9/32;* H04R *1/22*

U.S. Cl. 333—71 **3 Claims**



1. An electromechanical filter, having a single narrow pass band, comprising:

a plurality of resonators of generally cylindrical shape spaced from each other and having their longitudinal axes parallel and lying in a common plane;

coupling rods extending between and connecting each adjacent pair of said resonators, said rods having their longitudinal axes substantially perpendicular to the longitudinal axes of said resonators;

a pair of floats formed along each outermost resonator of said plurality, said flats being parallel to the longitudinal axes of said coupling rods; and

two pairs of electromechanical transducers, one pair coupled respectively to each pair of said flats to enable input and output connections to the filter.

4,100,507

METHOD FOR EXCITING A GAS DYNAMIC CO_2 LASER AND APPARATUS FOR PERFORMING THE METHOD

Gunthard Born, Taufkirchen; Hans Hermansdorfer, Unterpfaffenhofen; Gunther Sepp, Ottobrun, and Gerhard Grosch, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

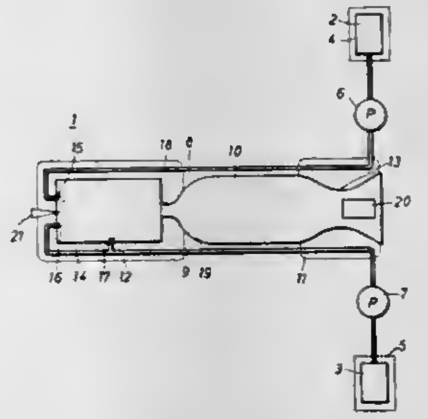
Filed Feb. 17, 1977, Ser. No. 769,780

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608305

Int. Cl.^{2} H01S *3/02*

U.S. Cl. 331—94.5 G **10 Claims**

6. A gas dynamic CO_2 laser comprising combustion chamber means, resonator means, nozzle means interconnecting said combustion chamber means and said resonator means, said nozzle means having an exit cross sectional area and entrance cross sectional area, said exit cross sectional area being at least 100 times larger than said entrance cross sectional area, diffuser means operatively connected to said resonator means, first cooling jacket means arranged around said diffuser means, second cooling jacket means arranged around said combustion chamber means and around said nozzle means, first container means for a liquid fuel, second container means for a liquid oxidizer, injection nozzle means leading into said combustion chamber means, liquid conveying means operatively connecting said injection nozzle means to the respective one of said



first and second container means, said liquid conveying means including liquid conduit means extending through said first and second cooling jacket means, and wherein said combustion chamber means, said nozzle means, and said diffuser means have corrosion resistant inner surfaces, said laser further comprising gas afterburner means operatively connected to said diffuser means.

4,100,508

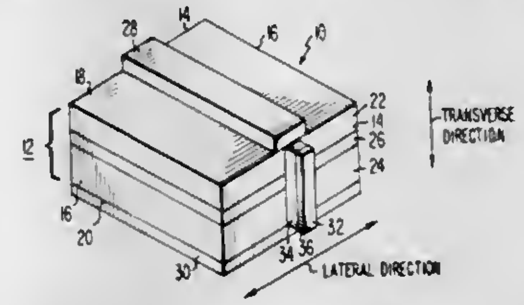
SEMICONDUCTOR LASER HAVING FUNDAMENTAL LATERAL MODE SELECTIVITY

James Pleister Wittke, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,512

Int. Cl.^{2} H01S *3/19*

U.S. Cl. 331—94.5 H **6 Claims**



1. A semiconductor laser capable of fundamental lateral mode selectivity having an optical waveguide which substantially confines optical radiation capable of being generated therein, which comprises:

a rectangular parallelepiped body of semiconductor material having opposed end surfaces, opposed side surfaces extending to said end surfaces, and opposed first and second contact surfaces extending to said end surfaces and said side surfaces, said optical waveguide extending from one end surface to the opposite end surface;

a stripe contact on said first contact surface, said stripe contact being spaced from said side surfaces and extending to said end surfaces, said stripe contact defining the lateral width of said optical waveguide;

an opposite contact on said second contact surface; and

optical reflective means contiguous to the waveguide at the end surfaces, said optical reflective means at at least one of said end surfaces being only within the lateral width of the optical waveguide and having a width in the lateral direction less than the spatial width of the fundamental lateral mode radiation in the absence of the reflective means so as to provide the fundamental lateral mode radiation with greater reflectivity than the higher order lateral mode radiations.

4,100,509
DYESTUFF LASER

Herbert Walther, Cologne; Wolfgang Hartig, Essen-Haarzopf; Adolf Friedrich, and Roderich Raue, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

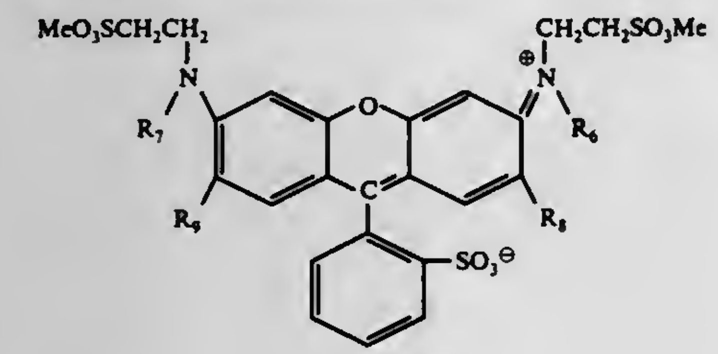
Filed Jul. 2, 1976, Ser. No. 702,080

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529903

Int. Cl.² H01S *3/20*

U.S. Cl. 331—94.5 L **1 Claim**

1. Dyestuff laser comprising a reservoir with a laser dyestuff solution contained therein and a pumping light source connected thereto, which source is capable of exciting the dyestuff solution to emit, characterised in that the dyestuff solution contains, in a solvent which does not interfere with the emission, a dyestuff of the general formula



wherein

- R_6 and R_7 represent hydrogen,
- R_8 and R_9 denote hydrogen or alkyl radicals with 1-2 C atoms and
- Me represents hydrogen, potassium, sodium, ammonium, monoalkylammonium, dialkylammonium or trialkylammonium ions, with alkyl denoting C_1–C_4,

in a concentration which emits laser beams, preferably of 10^{-2} to 10^{-5} mol/liter.

4,100,510
STABILIZATION SYSTEMS FOR IMPATT DIODE MICROWAVE OSCILLATORS OR AMPLIFIERS, AND SIMILAR ACTIVE COMPONENTS

Marcello Reggiani, and Franco Marchetti, both of Roma, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Italy

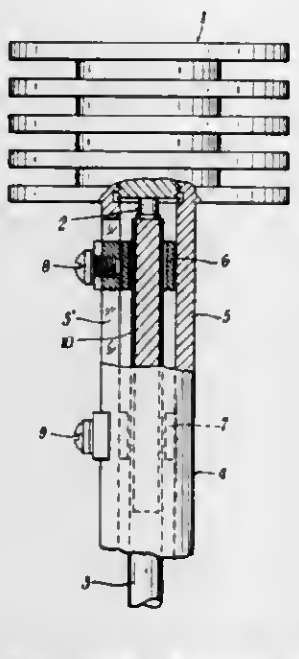
Continuation of Ser. No. 694,856, Jun. 10, 1976. This application Aug. 22, 1977, Ser. No. 826,795

Claims priority, application Italy, Jul. 7, 1975, [illegible] A/75

Int. Cl.² H03B *7/14*

U.S. Cl. 331—107 R **7 Claims**

1. A stabilization system for an impatt-diode microwave oscillator comprising a power supply feed conductor having a substantially filamentary conducting element; support means for electrically and mechanically supporting an impatt-diode, said support means having a return conductor for the diode and a thermal dissipator and forming one terminal of a transmission line; and a ferrite member inductively associated with said power supply feed conductor and adjacent said support means to be in the immediate proximity of the impatt-diode where the electromagnetic field in the operating oscillation mode and at the operating frequency is intense, said ferrite member having a longitudinal size that is great with respect to the transverse size thereof and being formed of a material causing said ferrite member to have negligible losses at the microwave oscillator operating frequencies and high losses at frequencies ten or more times lower than the microwave oscillator operating frequencies.



4,100,511
DELAY LINE OSCILLATOR LOCKED TO A SELECTED FREQUENCY OF A CHIRP DELAY LINE

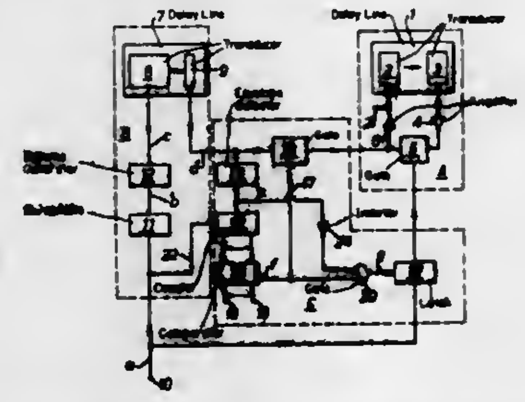
Philip Henry Wisbey, Colchester, England, assignor to The Marconi Company Limited, England

Filed May 28, 1977, Ser. No. 799,085

Claims priority, application United Kingdom, May 28, 1976, [illegible]/76

Int. Cl.² H03B *3/06, 5/32*

U.S. Cl. 331—107 A **3 Claims**



1. A delay line oscillator arrangement including a closed loop delay line oscillator, and a chirp delay line for producing a range of frequencies, means for locking the closed loop oscillator onto one of the frequencies produced by the chirp delay line, and control means arranged to produce timing signals derived from signals produced by the chirp delay line for gating said one of the frequencies produced by the chirp delay line to the delay line oscillator to determine its frequency of oscillation.

4,100,512
CRYSTAL OSCILLATOR COMPENSATED AGAINST FREQUENCY SHIFT DUE TO ACCELERATION

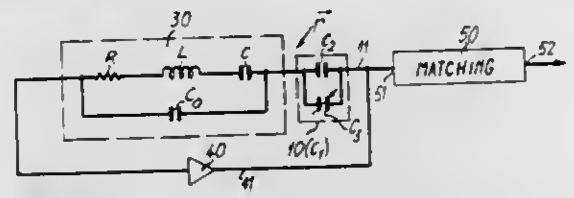
Michel M. Valdois, Chatillon, and Armand B. Dupuy, Cergy-Pontoise, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Aug. 8, 1977, Ser. No. 822,889

Claims priority, application France, Aug. 11, 1976, 76 24571; Aug. 4, 1977, 77 23990

Int. Cl.² H03B *5/32*

U.S. Cl. 331—158 **7 Claims**



1. In an oscillation sustaining loop of an electrical oscillator, that improvement comprising:

- a resonator having a piezoelectric crystal;
- an adjusting capacitance for adjusting the resonator frequency which is connected in series with said resonator, said adjusting capacitance being formed of at least one variable capacitor; and
- means sensitive and responsive to acceleration imposed on said oscillator for controlling said variable capacitor whereby the frequency shift caused by said variable capacitor is opposed and substantially equal to the frequency shift of said resonator caused by the acceleration imposed on said oscillator.

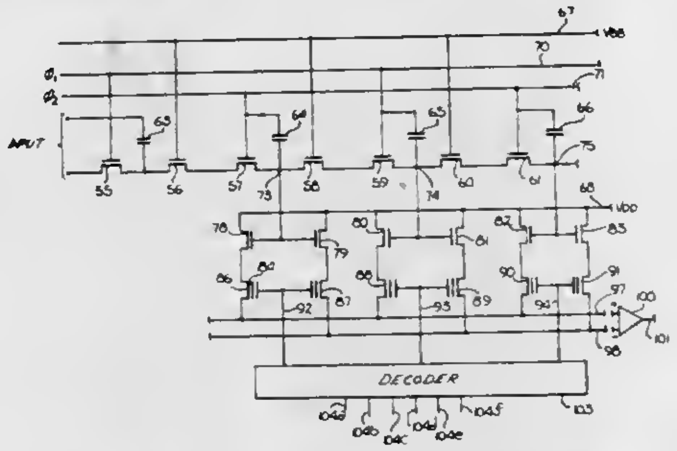
4,100,513
SEMICONDUCTOR FILTERING APPARATUS

Gene P. Weckler, Campbell, Calif., assignor to Reticon Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 687,370, May 17, 1976, which is a continuation-in-part of Ser. No. 614,655, Sep. 18, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,596

Int. Cl.² H03H *7/10, 7/28, 7/30;* H03K *5/159*

U.S. Cl. 333—70 T **13 Claims**



1. In a semiconductor filter which includes a charge transfer means for transferring an input signal, said transfer means including a plurality of nodes for sensing charge in said transfer means, an improvement for selectively coupling said nodes comprising:

- a plurality of electrically programmable MOS devices each of which includes a pair of spaced apart regions disposed in a substrate and a floating gate insulation from, and disposed above, said substrate, each of said floating gates being completely surrounded by oxide, each of said devices being coupled to one of said nodes;
- whereby a connection, or open connection, may be made to nodes in said transfer means by selectively injecting charge onto said floating gates thereby permitting programming of said filter.

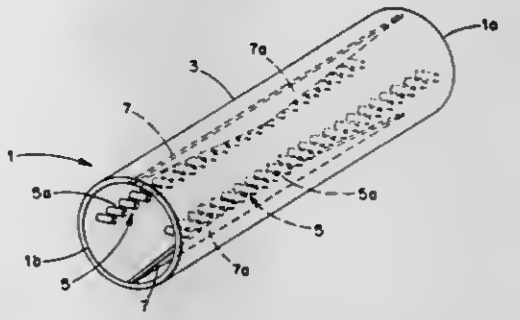
4,100,514
BROADBAND MICROWAVE POLARIZER DEVICE

Joseph G. DiTullio, Woburn, and Leonard I. Parad, Framingham, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 28, 1977, Ser. No. 791,969

Int. Cl.² H01P *1/18*

U.S. Cl. 333—31 A **6 Claims**



1. A broadband microwave polarizer device for introducing a relatively constant phase shift between orthogonal components of signals over a predetermined bandwidth, comprising:

- a section of waveguide having an input end for receiving signals having orthogonal components between which a phase shift is to be introduced, and an output end;
- a pair of opposing rows of pins at inner surface regions of the waveguide, said rows of pins being in a common, first plane; and
- a pair of opposing ridges at other inner surface regions of the waveguide, said ridges being in a common, second plane at an angle to the first plane;

said polarizer device being operative to introduce a phase shift between orthogonal components of signals applied to the input end of the section of waveguide, the phase shifted orthogonal components of the signals appearing at the output end of the section of waveguide, the phase shift introduced between the orthogonal components of the signals applied to the section of waveguide being approximated by

$$\phi_R = A_0 - B_0 + (A_1 - B_1)(f - f_0) + (A_2 - B_2)(f - f_0)^2,$$

where f is the frequency of the signals applied to the section of waveguide, f_0 is the center frequency of the bandwidth over which the polarizer device operates, A_0, A_1 and A_2 are constants associated with the rows of pins, B_0, B_1 and B_2 are constants associated with the pair of opposing ridges;

- the characteristics of the rows of pins and the pair of ridges being selected so that the constants A_1 and B_1 are negative with the value of the constant A_1 being equal to the value of the constant B_1, and so that the constants A_2 and B_2 are positive and essentially equal in value, whereby the phase shift introduced between the orthogonal components of signals applied to the section of waveguide is nearly constant over the bandwidth of the polarizer device.

4,100,515
COMMUNICATION CIRCUIT HAVING PRECISION CAPACITOR MULTIPLIER

Shanti Swarup Gupta, Naperville, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

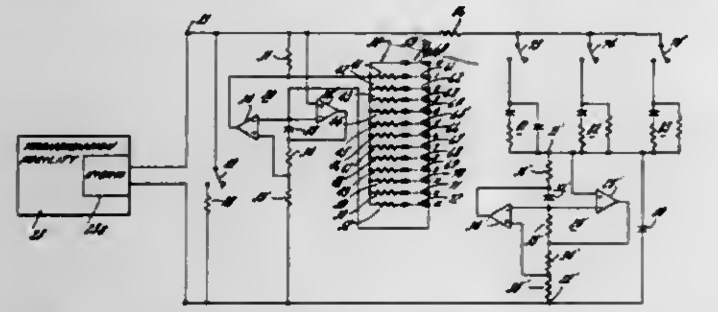
Filed May 5, 1977, Ser. No. 794,002

Int. Cl.² H03H *7/44, 11/00*

U.S. Cl. 333—80 R **8 Claims**

1. In transmission facilities of the type capable of exhibiting a shunt capacitance within a predetermined range dependent on the physical characteristics of the facility, a precision capacitor multiplier in said facility comprising, terminal means con-

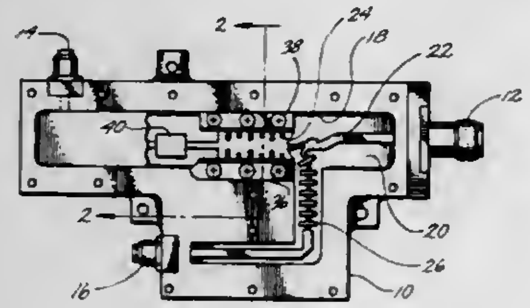
nected to said facility, first through fifth impedances serially connected between said terminal means, first and second amplifier means connected to said serially connected impedances to form a gyrator circuit, the centermost one of said impedances being a precision capacitor, the other four of said impedances being resistors, at least one of said resistors comprising a plurality of individual precision resistors and selector means associated therewith for selectively connecting said resistors in said serial connection, whereby said selector means establishes a factor for multiplying the value of said precision capacitor, said factor being selectable in a range sufficient to balance the capacitance of said transmission facility over said predetermined range.

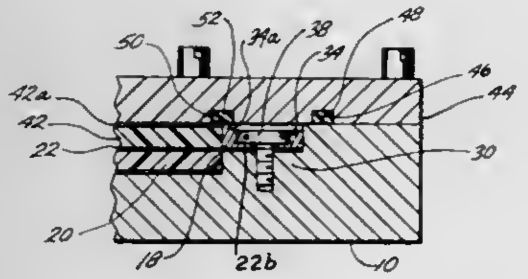


4,100,516
MICROWAVE CIRCUIT HAVING GROUNDING STRUCTURE

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Mar. 18, 1977, Ser. No. 779,128
Int. Cl.² H01P ***5/12, 1/00***
U.S. Cl. 333—6 **8 Claims**





1. In a microwave stripline circuit including two adjacent dielectric substrate members having conductive ground planes on their nonadjacent surfaces;

a chassis of electrically conductive material enclosing said substrate members in contact with said ground planes, said chassis including two members and means for fastening said chassis members, together, an internal chamber being formed in said chassis adjacent said substrate members, one of said chassis members having a length of conductive elastomeric material in its surface facing said chamber,

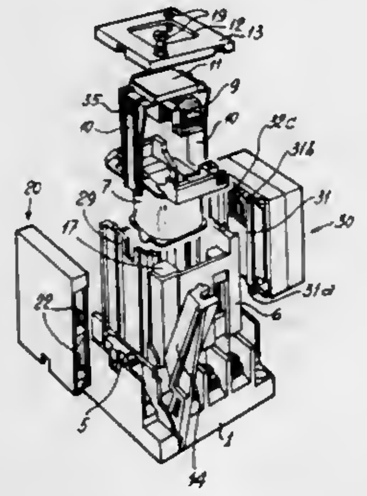
a stripline conductor positioned between the adjacent surfaces of said dielectric substrate members having an extension into said chamber, and

means for securing said extension tightly against a wall of said chamber, said means including a shorting bar having a projection of slightly greater length than the height of said chamber such that said projection penetrates said conductive elastomer when said chassis members are fastened together.

4,100,517
ELECTRICAL CONTACTORS

Giorgio Rodolfi, Varese, Italy, assignor to Bassani Ticino S.p.A., Milan, Italy

Filed Jan. 31, 1977, Ser. No. 764,452
Claims priority, application Italy, Feb. 6, 1976, 304 A/76
Int. Cl.² H01H ***50/04***
U.S. Cl. 335—132 **7 Claims**



1. An electrical contactor comprising a rectangular base carrying at least one pair of spaced fixed contacts, a movable support element carrying movable contacts and disposed on said base, a prismatic casing disposed on said base with its axis perpendicular to said base and having its respective ends open, a solenoid disposed within and supported by said casing and comprising a movable armature having two parallel legs directed towards said base with their free ends resting on said movable support element, two arms hinged to said base near a pair of diagonally opposed corners of the base and having inwardly-directed projections arranged to engage a pair of diagonally opposed corners of the end of said casing remote from said base when said arms are pivoted against said casing, said inwardly-directed projections being provided with threaded holes, a cover plate capable of being superimposed over the end of said casing remote from said base and over said inwardly-directed projections, said cover plate being provided with holes in register with said threaded holes when said arms are pivoted against said casing whereby respective screws can be passed through said holes and engaged within said threaded holes to lock together the above-mentioned parts of the contactors, a push-button connected to said movable armature, and an aperture defined by the cover plate and providing access to said push-button.

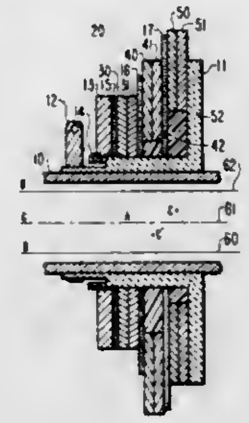
4,100,518
ECCENTRIC CONVERGENCE APPARATUS FOR IN-LINE BEAM CATHODE RAY TUBES

Joseph Leland Smith, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 698,464
Int. Cl.² H01J ***29/68***
U.S. Cl. 335—212 **5 Claims**

2. A convergence device for moving the outer beams of three in-line electron beams within the envelope of a cathode ray tube, comprising:

first magnetic field producing means rotatable about at least a part of a circumference of said envelope for effecting movement of said first outer beam in any direction, said first magnetic field producing means including a first zero magnetic field point located within said envelope between the central beam and the second outer beam for maintaining substantially no movement of said central and second outer beams during rotation of said first magnetic field producing means; and

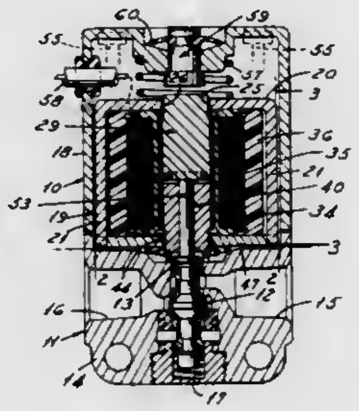


second magnetic field producing means concentrically located and rotatable about at least a part of a circumference of said envelope for effecting movement of both of said outer beams in any direction while maintaining substantially no movement of said central beam during rotation of said second magnetic field producing means, said first and second means combined for converging said outer beams onto said central beam.

4,100,519
ALIGNMENT MEANS FOR A MOVEABLE POLE-PLUNGER ASSEMBLY

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Dec. 31, 1975, Ser. No. 645,915
Int. Cl.² H01F ***7/08***
U.S. Cl. 335—262 **15 Claims**



1. In a solenoid assembly, the combination comprising:

(a) a C-shaped support frame having a transverse member and a pair of leg members;

(b) a solenoid coil assembly mounted within said support frame;

(c) a flux plate releasably mounted between said support frame leg members for retaining said coil assembly against endwise movement in said support frame;

(d) mating retainer means on said coil assembly and said support frame for retaining the coil assembly against sidewise movement in said support frame;

(e) a pole piece movably mounted in an axial bore through said coil assembly and being guided for axial movement by a first bushing mounted in said flux plate;

(f) means for normally biasing said pole piece outwardly of said axial bore in said coil assembly;

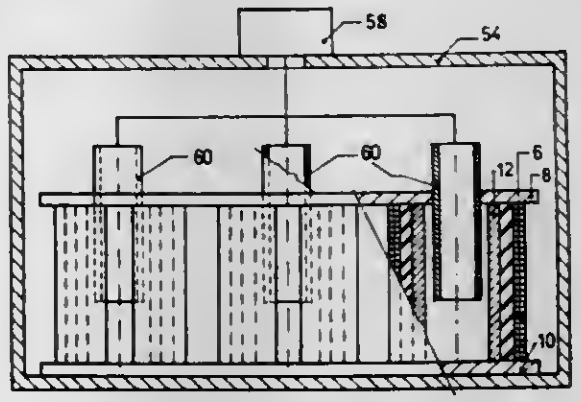
(g) a solenoid plunger movably mounted in said axial bore in said coil assembly and being guided for axial movement by a second bushing mounted in said support frame transverse member; and,

(h) means in said axial bore of said coil assembly and in spaced apart relation to said coil assembly and in close sliding engagement with said solenoid plunger and pole piece for aligning said solenoid plunger and pole piece.

4,100,520
DEVICES FOR CONTROLLING A.C. MOTORS

Mendel Krichevsky, Beer-Sheva, Israel, assignor to Ben-Gurion University of the Negev Research and Development Authority, Beer-Sheva, Israel

Filed Jul. 22, 1975, Ser. No. 595,726
Claims priority, application Israel, Jul. 28, 1974, 45360; Jul. 7, 1975, 47648
Int. Cl.² H01F ***21/02, 17/06***
U.S. Cl. 336—30 **23 Claims**

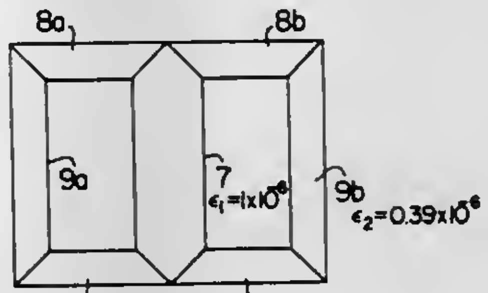


1. A device for controlling an A.C. motor having an electromagnetic field inducing coil witn an axis wound around a conductive element wherein said element comprises at least one inwardly directed opening bound by surface areas of said element and having a gap *a* between said surface areas defined by the formula $a \geqq \delta$, wherein δ is the wave penetrating depth of an instantaneous operating frequency of induced electromagnetic energy, said gap defining an open space within the confines of said element and further characterized in that said coil is wound so as to surround said open space and said element for inducing flux along walls of said element, whereby the exposed surface area of said element is in effect increased for increasing the absorption of the induced energy.

4,100,521
IRON CORE FOR INDUCTION APPARATUSES

Yasuro Hori, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

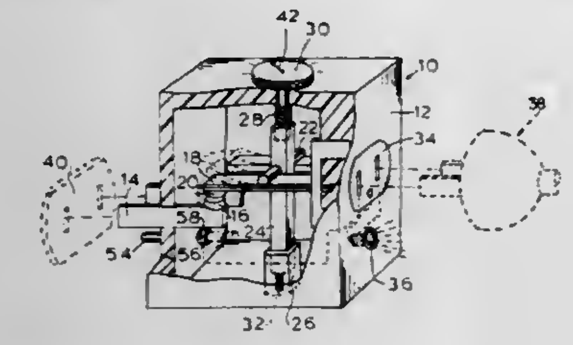
Filed Apr. 15, 1975, Ser. No. 568,192
Int. Cl.² H01F ***27/24***
U.S. Cl. 336—100 **8 Claims**



1. In an iron core for induction apparatuses comprising at least one main leg to be mounted with windings and at least a pair of yokes joined with said main legs, each including a plurality of laminations of silicon steel, the improvement wherein said yokes are formed of silicon steel having a lower magnetostriction with respect to a given magnetic flux density than that of the silicon steel of said main legs, and the magneto-

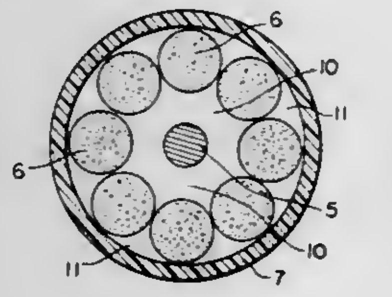
striction of said main legs is at least double that of said yokes with respect to said given magnetic flux density.

4,100,522
CIRCUIT BREAKER WITH ADJUSTABLE SETTING
Jacob Waszmer, 15 E. Bedell St., Freeport, N.Y. 11520
Filed Nov. 22, 1976, Ser. No. 744,163
Int. Cl.² A01H *61/08*
U.S. Cl. 337—68 **10 Claims**



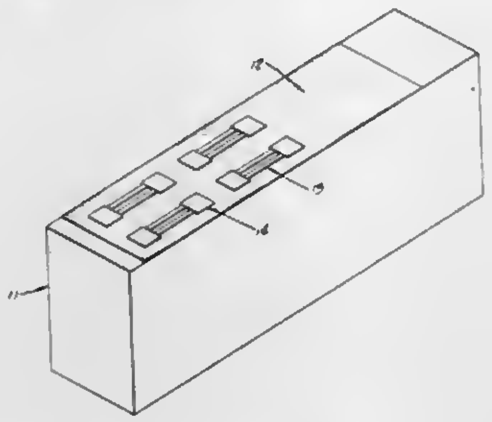
1. A circuit breaker having an adjustable setting comprising:
plug means for connecting the circuit breaker to a current supply;
socket means for connecting the circuit breaker to a load, the circuit-breaker current-supply connecting-means being normally in contact with the circuit-breaker load-connecting means, one of said circuit-breaker means being adapted to be released from contact with the other of said circuit-breaker means at a predetermined release point upon the application of a predetermined amount of heat to said circuit-breaker means; and
adjustment means for varying the release point of said one of said circuit-breaker means from the other of said circuit-breaker means, whereby, upon a predetermined current passing through said circuit-breaker means, said one of said circuit-breaker means is heated to said predetermined amount of heat and released from contact with the other of said circuit-breaker means.

4,100,523
TIME-LAG FUSE
Hiroo Arikawa, Tokyo, and Masaya Maruo, Yokohama, both of Japan, assignors to San-O Industrial Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1976, Ser. No. 743,314
Claims priority, application Japan, Nov. 26, 1975, 50-159303
Int. Cl.² H01H *85/04, 85/18*
U.S. Cl. 337—163 **1 Claim**



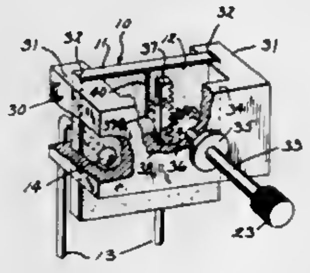
1. A time-lag fuse having improved breaking capacity comprising a fuse element securely disposed within an insulating cylindrical tube, a plurality of sintered ceramic bodies circumferentially disposed within said insulating cylindrical tube in spaced relation to said fuse element, each adjacent pair of said ceramic bodies defining a space between them and said insulating cylindrical tube for buffering the pressure produced by the arc between said ceramic bodies and said insulating cylindrical tube.

4,100,524
ELECTRICAL TRANSDUCER AND METHOD OF MAKING
Thomas Kirsch, Oxnard, Calif., assignor to Gould Inc., Cleveland, Ohio
Filed May 6, 1976, Ser. No. 683,714
Int. Cl.² G01L *1/22*
U.S. Cl. 338—2 **6 Claims**



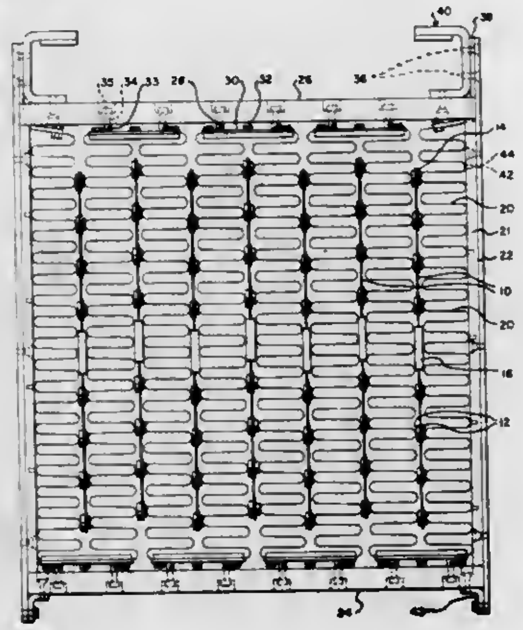
2. A strain gage, comprising:
an electrically conductive substrate;
an insulating layer on said substrate; and
an electrical current conducting element on said insulating layer consisting essentially of 65%-70% by weight of chromium, 18%-32% by weight of silicon monoxide and 3%-12% by weight of nickel.

4,100,525
SINGLE SETTING VARIABLE RESISTOR
Oscar L. Denes, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed May 10, 1976, Ser. No. 684,709
Int. Cl.² H01C *10/00*
U.S. Cl. 338—195 **10 Claims**



1. A kit which makes possible trimming adjustment in the field of the resistance of a resistor adapted for connection into an electrical circuit, said kit comprising:
a. a trimmable resistor having a substrate, a resistive layer deposited upon at least a portion of said substrate, laterally spaced terminal members in electrical connection with said resistive layer and arranged for connection with the electrical circuit, at least a portion of said resistive layer being penetrable and removable for in situ trimming adjustment of said resistor;
b. a manually operable scribing tool for in situ penetration and removal of said portion of said resistive layer to trim the resistance of the resistor;
c. means for orienting said scribing tool in trimming relationship with said resistor.

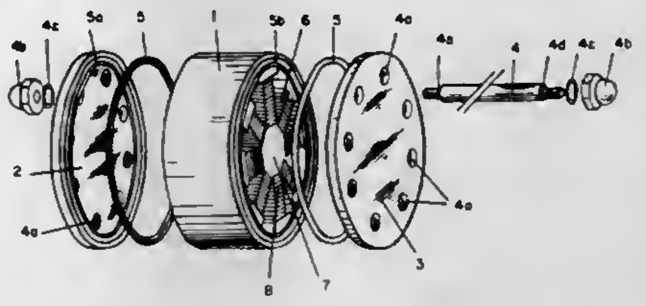
4,100,526
GRID RESISTOR
Victor V. Kirilloff, Murrysville, and William A. Benson, Pittsburgh, both of Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.
Filed Feb. 24, 1977, Ser. No. 771,685
Int. Cl.² H01C *3/00*
U.S. Cl. 338—279 **1 Claim**



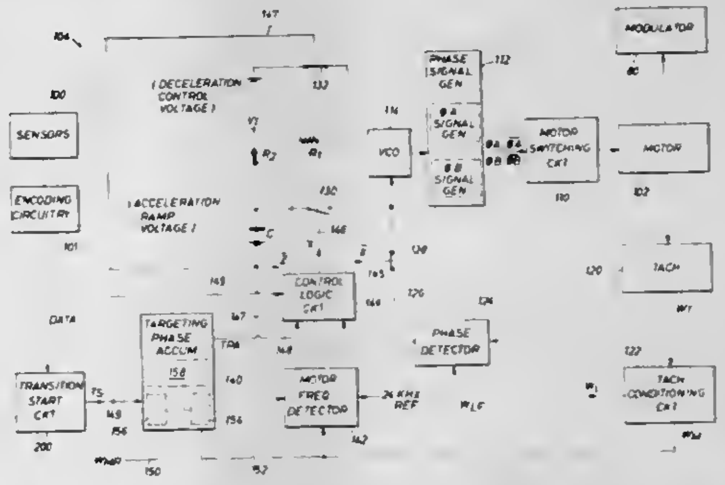
1. A resistor structure forming a grid in a frame having a plurality of longitudinal fan folded electrically conductive resistive ribbons forming tips and supported within the frame wherein the improvement comprises:
(a) a support strip member of electrically conductive material and positioned longitudinally between two adjacent resistive ribbons, the strip member having a plurality of holes with bushings of electrical insulation material inserted in the holes, the ends of the strip member are free and are spaced from the frame;
(b) studs selectively joined to the tips of the resistive ribbons and alternating between tips of the resistive ribbon on one side of the support strip member and tips of the resistive ribbon on the other side of the support strip member, the studs each engage one of the bushings and only one tip with a stud engages each bushing and the tips with the studs abut the bushings engaged, tips without studs are spaced from the support strip member and the tips without studs which are transversely aligned with a bushing abut that bushing; and
(c) a bumper member of electrical insulation material joined on a top edge of the support.

4,100,527
MULTI-DRIVER PIEZOELECTRIC TRANSDUCERS WITH SINGLE COUNTER-MASSES, AND SONAR ANTENNAS MADE THEREFROM
Bernard Tocquet, Sanary, France, assignor to Etat Francais, Paris, France
Filed Feb. 24, 1976, Ser. No. 661,043
Claims priority, application France, Feb. 27, 1975, 75 06079
Int. Cl.² H04B *13/00*
U.S. Cl. 340—10 **7 Claims**

1. A piezoelectric transducer adapted to be immersed in water at great depths, comprising a substantially cylindrical envelope which is rigid in respect of its inner wall, a plurality of piezoelectric drivers disposed within said envelope, each driver being constituted by a stack of piezoelectric elements alternating with electrodes, said envelope being solid and constituting a tight hoop about said piezoelectric drivers, at least one pre-stressing rod for compressing each said stack, an intermediate member common to all of said drivers, to which member said drivers are each secured by said rod, said intermediate member also acting as a counter-mass for said drivers, end pieces for said drivers, said rods passing only through said end pieces and said drivers into said intermediate member, said envelope being non-perforate and being applied to said end pieces as said tight hoop to apply radial stresses thereto which additionally compress said stacks.



4,100,528
MEASURING-WHILE-DRILLING METHOD AND SYSTEM HAVING A DIGITAL MOTOR CONTROL
James I. Bernard, Houston, and Gerald A. Strom, Dayton, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.
Filed Sep. 29, 1976, Ser. No. 727,686
Int. Cl.² G01V *1/40*
U.S. Cl. 340—18 LD **22 Claims**

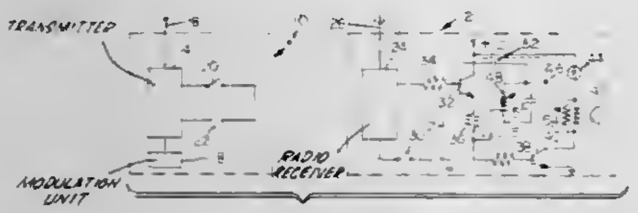


19. In a measuring-while drilling system including a motor driven acoustic generator for imparting to well fluid an acoustic signal having an intermittently constant frequency, the method of momentarily changing the speed of the motor to effect a desired amount of change in the phase state of the signal thereby to provide encoded data states to the signal, comprising the steps of:
(a) changing the speed of the motor in a first direction;
(b) in response to the step of changing, digitally integrating the instantaneous motor speed and the constant frequency motor speed, to thereby generate a pair of digital signals, the difference between said digital signals being indicative of the change in phase of the acoustic signal caused by the changing of the motor speed; and
(c) stopping said motor speed change in the first direction when the difference between said digital signals reaches a predetermined value indicative of a predetermined phase shift which is less than the desired change in phase.

4,100,529
ROAD HAZARD WARNING SYSTEM, INDICATING SPECIFIC HAZARD

Edgar J. Evans, Hillsdale, Mich., assignor to Mews, Inc., Toledo, Ohio

Filed Sep. 13, 1976, Ser. No. 722,691
Int. Cl.² G08G *1/00*
U.S. Cl. 340—32 3 Claims



1. In a warning system to enable drivers of vehicles to be alerted to the presence of road hazards, the combination which comprises:

transmitter means associated with said road hazards for transmitting a pulse length coded radio frequency signal that is unique for each particular road hazard;

receiver means carried by said vehicles for receiving said pulse length coded signal;

audio frequency generator means, comprising an audio frequency circuit connected in a feedback loop of a transistor amplifier, connected with said receiver means for further modulating said pulse length coded signal at an audio frequency, the period of oscillation of said audio frequency circuit serving to modulate said pulse length coded signal without disturbing said pulse length code;

a visible light emitting means connected to the output of said audio frequency generator means for flashing in synchronism with said pulse length code signal from said transmitter; and

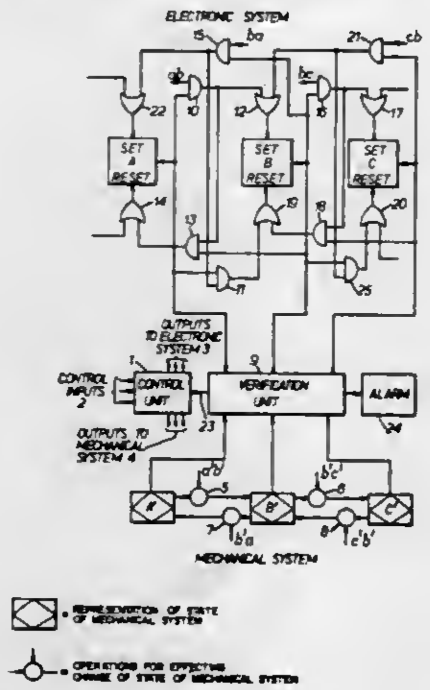
an audible sound emitting means connected in series with said visible light emitting means for sounding an audible warning at the frequency set by said audio frequency generator means and in synchronism with said pulse length code from said transmitter means.

4,100,530
CONTROLLED MECHANICAL SYSTEM

Carl S. den Brinker, and Keith David Nicholls, both of Oakley, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 642,214
Int. Cl.² B60Q *9/00*
U.S. Cl. 340—53 10 Claims

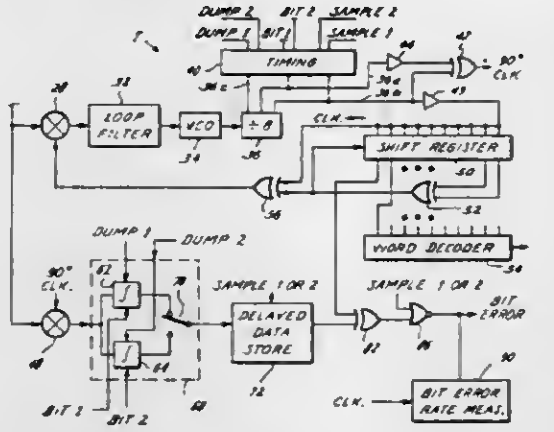
1. A controlled mechanical system comprising a control system and a mechanism which is required to assume individual ones a plurality of different states at different times; said control system including a plurality of stages corresponding to the respective different states required of the mechanism, said stages having set and reset conditions; control unit means for setting a selected stage only when said selected stage is next in operational sequence to a stage already in a set condition and for initiating a corresponding change of state of said mechanism; means interconnecting the stages of said control system for enabling the resetting of a previously set stage in response to the setting of a stage next in operational sequence to said previously set stage; means coupled to the mechanism for producing an indication of the state of the mechanism; means for continuously comparing said indication of the state of the mechanism with the control system stage which is set and for inhibiting the operation of the control unit means in the event of non-correspondence.


ELECTRONIC SYSTEM
SET A RESET
SET B RESET
SET C RESET
ab
ba
bc
cb
OUTPUTS TO ELECTRONIC SYSTEM 3
CONTROL INPUTS 2
CONTROL UNIT
VERIFICATION UNIT
ALARM
OUTPUTS TO MECHANICAL SYSTEM 4
A'
B'
C'
a'b'
b'c'
b'a'
c'b'
MECHANICAL SYSTEM
= REPRESENTATION OF STATE OF MECHANICAL SYSTEM
= OPERATIONS FOR EFFECTING CHANGE OF STATE OF MECHANICAL SYSTEM

4,100,531
BIT ERROR RATE MEASUREMENT ABOVE AND BELOW BIT RATE TRACKING THRESHOLD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Herbert S. Kobayashi, Webster; Joe Fowler, Pearland, both of Tex., and William Kurple, Phoenix, Ariz.

Filed Feb. 3, 1977, Ser. No. 765,167
Int. Cl.² G08C *25/00*
U.S. Cl. 340—146.1 E 12 Claims



1. An apparatus for testing the bit error rate of communication equipment, comprising:

a. means for forming and applying a test digital code signal simulating data to the equipment being tested, said means including means forming a pseudo-random bit sequence for said code signal;

b. means for receiving an incoming signal from the equipment in response to the test signal;

c. tracking means for tracking the incoming signal;

d. means responsive to said tracking means for forming a reproduction of the test digital code signal;

e. comparator means for comparing the reproduction with the incoming signal to detect bit errors in the equipment being tested, said tracking means including

i. means for deriving a clock signal from the incoming signal;

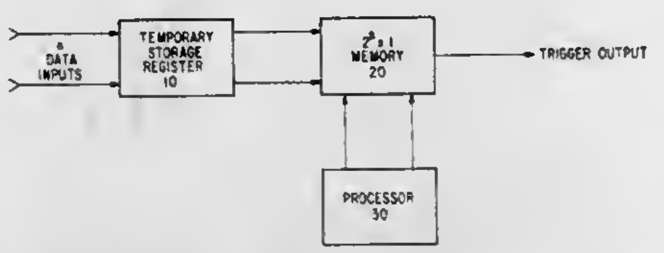
ii. means connected to and responsive to said clock signal deriving means and to said means for forming a reproduction to produce a split phase pseudo-random noise tracking signal; and

iii. means for multiplying the incoming signal with said tracking signal to form an error signal, said clock signal deriving means comprising means for deriving a clock signal in phase quadrature with the incoming signal from the incoming signal.

4,100,532
DIGITAL PATTERN TRIGGERING CIRCUIT

William A. Farnbach, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 19, 1976, Ser. No. 743,188
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 MA 12 Claims



1. A range detector for operation upon a digital signal represented by a combination of bytes, the detector comprising:

first and second memory means, said first and second memory means coupled to receive a byte corresponding to the most significant bits and the next most significant bits of the digital signal respectively, each means having a loading input, a trigger output, an enable output, and two sets of storage elements, each element capable of storing a first or second value, each memory means applying signals to the trigger output and the enable output representative of the values of storage elements selected from the first and second sets respectively in response to the byte received at the input thereof;

coupling means having a first input coupled to receive the enable output of said first memory means, a second input coupled to receive the trigger output of said second memory means and a trigger output for producing an output signal upon detection of signals representative of the first value upon both inputs;

output means with a first input coupled to receive the trigger output of said first memory means, a second input coupled to receive the trigger output of said coupling means, and a trigger output for generating an output signal upon the detection of an input signal representative of the first value upon an input; and

means coupled to the loading inputs of said first and second memory means for storing selected values into selected storage elements.

4,100,533
MULTIPOINT POLLING TECHNIQUE

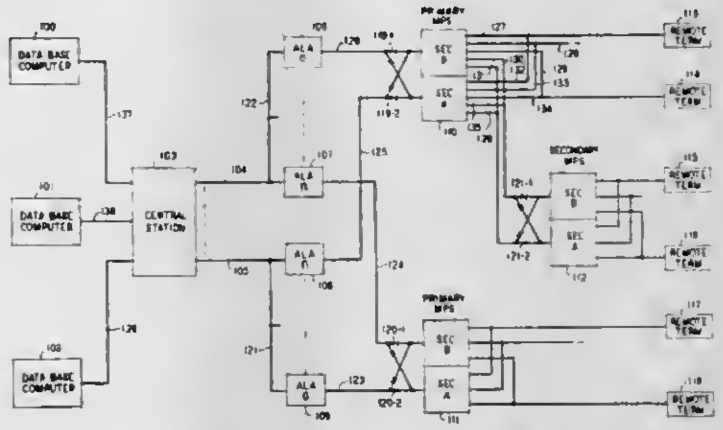
Orlando Napolitano, Millstone Township, Monmouth County; Robert Edward Reid, Bricktown; Burton R. Saltzberg, Middletown; Nathan Harold Stochel, Edison, and John Ronald Tingley, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1976, Ser. No. 747,700
Int. Cl.² H04Q *5/00;* H04J *3/04*
U.S. Cl. 340—147 R 19 Claims

1. A multipoint polling system, comprising a plurality of remote terminals and a central station, the central station including means for providing a list of remote terminal addresses, the list of remote terminal addresses defining selective ones of the remote terminals to be polled via a signaling path extended from the central station to the remote terminals, the list of remote terminal addresses being divided into predefined portions, each portion comprising a plurality of remote terminal addresses, each address in the list appearing in at least one of the portions, characterized in that the polling system further includes:

means for storing one of the portions of the list of remote terminal addresses and for transmitting individual ones of the stored remote terminal addresses to the signaling path, and

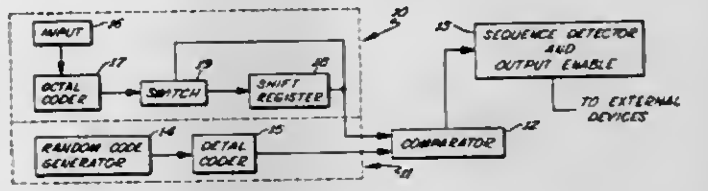
means for periodically requesting a different one of the portions of the list of remote terminal addresses from the providing means and for replacing the stored portion of remote terminal addresses with the requested portion of remote terminal addresses, whereby different subsets of remote terminals defined by the different address list portions are polled.



4,100,534
ELECTRONIC SECURITY SYSTEM

Glynne W. Shifflet, Jr., Minneapolis, Minn., assignor to Tothill Corporation, Oak Brook, Ill.

Filed Dec. 9, 1976, Ser. No. 748,690
Int. Cl.² H04Q *3/00;* G06K *7/06*
U.S. Cl. 340—149 A 34 Claims



1. In a device for obtaining limited access to a plurality of functions in response to the external entry of preselected code sequences of the type having means for entering a code sequence and means for selectively enabling said functions in response to said entered code sequences, the improvement which comprises:

means for sequentially generating a plurality of preselected code sequences, each having a higher rank than all prior generated code sequences;

means for individually comparing said generated code sequences with an entered code sequence to establish their degree of coincidence therewith; and

means responsive to said comparing means for enabling said functions on the occurrance of a preselected degree of coincidence between a generated code sequence and an entered code sequence in predetermined correspondence with rank of a generated code sequence having said preselected degree of coincidence with said entered code sequence.

4,100,535

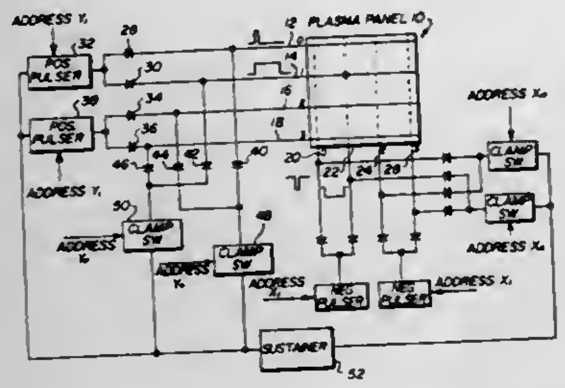
METHOD AND APPARATUS FOR ADDRESSING AND SUSTAINING GAS DISCHARGE PANELS

Donald L. Bitzer, and Paul T. Tucker, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Nov. 2, 1976, Ser. No. 738,066

Int. Cl.² G06F *3/14;* **H01J** *17/48;* **H05B** *37/00*

U.S. Cl. 340—166 R **15 Claims**



1. Apparatus for addressing selected electrodes in an array of electrodes respectively associated with a particular location on a gas discharge panel, said apparatus comprising:

pulse means coupled to a group of said electrodes to charge said group of electrodes to a voltage magnitude sufficient to select a location on said panel;

said pulse means providing a pulse signal having an amplitude substantially equal to said voltage magnitude and a time duration insufficient to select a location on said panel; and

time selection means coupled to said group of electrodes for subsequently timely discharging said voltage magnitude on all except one electrode in said group of electrodes so that only said one electrode has an applied pulse signal amplitude and time duration sufficient to enable selection of a location associated with said one electrode.

4,100,536

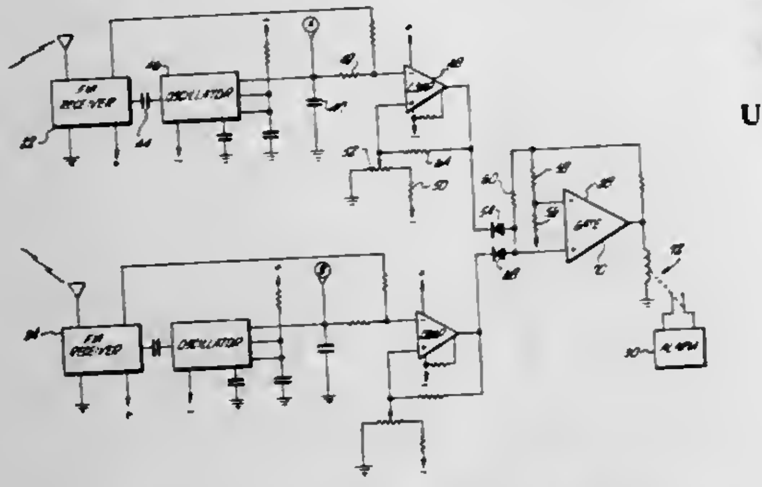
BIO-ALARM SECURITY SYSTEM

Thomas S. Ball, 1637 Butternut Way, Diamond Bar, Calif. 91711, and John D. Rugh, Claremont, Calif., assignors to Thomas S. Ball, Diamond Bar, Calif.

Filed Oct. 7, 1976, Ser. No. 730,376

Int. Cl.² A61B *5/02;* **G08C** *19/26, 19/36*

U.S. Cl. 340—207 R **9 Claims**



1. An alarm system comprising: an alarm; means carried by at least two individuals for detecting the state of psychological arousal in said individuals and emitting separate first signals of varying intensity corresponding to said states of arousal; means for transmitting said signals; means for receiving said signals; means for comparing each of said first signals with predetermined signals, each of said predetermined signals being proportional to the normal state of arousal of the individual from which said first signal was emitted; means for activating said alarm in a predetermined response to the totality of such comparisons.

4,100,537

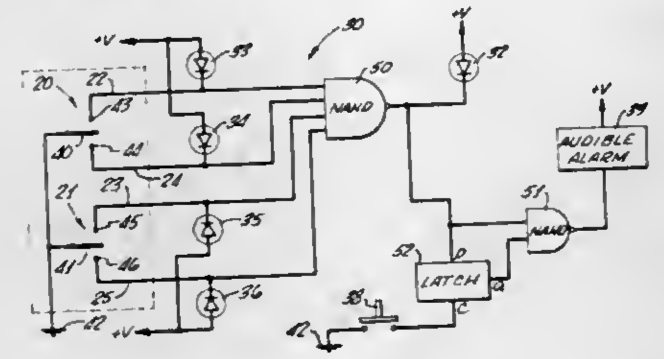
MONITOR FOR GAS PIPING SYSTEM

Peter B. Carlson, Orange, Calif., assignor to Taylor Medical Oxygen Services, Inc., Orange, Calif.

Filed Aug. 8, 1977, Ser. No. 822,927

Int. Cl.² G08B *21/00*

U.S. Cl. 340—626 **5 Claims**



1. Apparatus for monitoring the pressure in a gas line and providing a visual and audible indication of a high or low pressure condition, said gas line having a pressure sensor for generating high and low pressure signals, comprising:

a high pressure visual indicator responsive to said high presure signal for providing a high pressure visual indication;

a low pressure visual indicator responsive to said low pressure signal for providing a low pressure visual indication;

a system normal visual indicator;

means for normally maintaining said system normal visual indicator in an "on" condition;

an audible alarm;

means responsive to either of said high or low pressure signals for turning "off" said system normal visual indicator and for activating said audible alarm; and

manual means for deactivating said audible alarm.

4,100,538

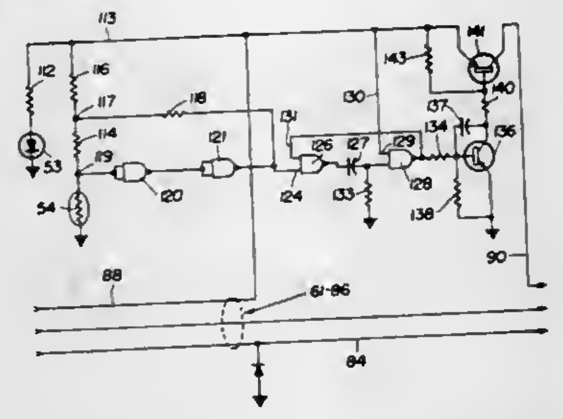
SEED LEVEL SENSOR FOR AUTOMATIC SEED PLANTING APPARATUS

John T. Knepler, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Continuation-in-part of Ser. No. 525,581, Nov. 20, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,515

Int. Cl.² G08B *21/00*

U.S. Cl. 340—617 **14 Claims**



1. A monitor for interconnection with seed planting apparatus having seed dispensing means including a hopper for containing seeds, seed sensing means associated with said dispensing means, and indicator means interconnected with said seed sensing means through electrical lead means for indicating a malfunction of the seed dispensing means, said monitor comprising: first switch means connectible in series in said lead means between said seed sensing means and said indicator means for providing a first switching state during one instance and a second switching state during another instance, seed level sensing means for mounting within the hopper of said seed dispensing means, said seed level sensing means including signal means for producing a first signal condition when the level of seeds within the hopper is above a predetermined level and for producing a second signal condition when the level of seeds within the hopper is below said predetermined level, and circuit means coupled between said seed level sensing means and said first switch means for causing said first switch means to be in said first switching state during said first signal condition and in said second switching state during said second signal condition, said first switching means thereby causing the operation of said indicating means when in said second switching state to give an indication that the seed level within the hopper is below said predetermined level.

4,100,539

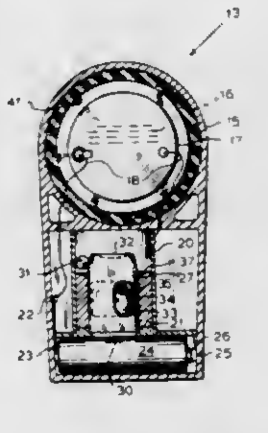
BURGLAR ALARM FOR DOOR KNOB

Oliver B. Stahl, Satellite Bch., and Harlund L. Byron, Ocoee, both of Fla., assignors to Marine Resources, Inc., Fern Park, Fla.

Filed Jan. 31, 1977, Ser. No. 764,401

Int. Cl.² G08B *13/08*

U.S. Cl. 340—546 **13 Claims**



1. An alarm appartus comprising in combination:

a housing having a receptacle formed therein, the receptacle being sized to fit over a door knob, or the like, and being at least partially lined with a resilient material disposed for engaging a door knob to permit movement of said housing with the rotation of a door knob that said housing is attached to;

electrical circuit means disposed in said housing and including operatively connected battery means, annunciator means, and switch means, said switch means including an electrical conductor platform, a movable electrical conductor switching member, and an electrical conducting wall, whereby movement of said housing allows said movable electrical conductor switching member to fall from said platform between said platform and conducting wall to complete a circuit and actuate said annunciator; and

a reset knob located adjacent said housing for resetting an actuated alarm switch means by sliding a reset member to position said movable electrical conductor switching member upon said conductor platform.

4,100,540

METHOD OF DRIVING LIQUID CRYSTAL MATRIX DISPLAY DEVICE TO OBTAIN MAXIMUM CONTRAST AND REDUCE POWER CONSUMPTION

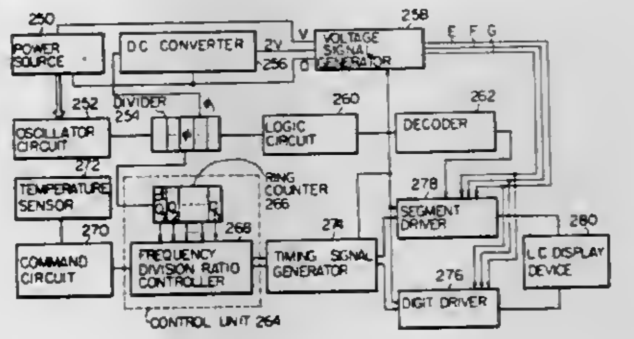
Hiroo Fujita, Sayama; Akira Tsuzuki, Tokyo, and Shigeru Morokawa, Higashiyamato, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,971

Claims priority, application Japan, Nov. 18, 1975, 50-137839; May 7, 1976, 51-051789; Sep. 25, 1976, 51-115055; Sep. 7, 1976, 51-106917

Int. Cl.² G09F *9/32*

U.S. Cl. 340—324 M **5 Claims**

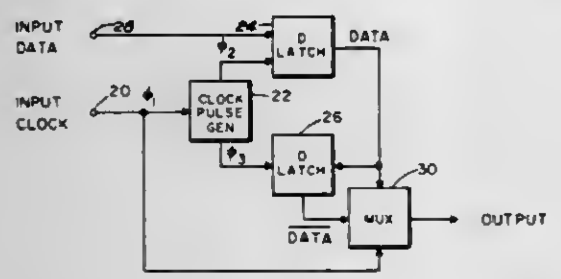


1. In a method of driving a display device comprising a matrix of display elements in an array including a plurality of digit electrodes and a plurality of segment electrodes, in which the display device comprises a liquid crystal having an intrinsic threshold voltage and an intrinsic saturation voltage and is operative at a predetermined operating margin, and in which digit drive signals are applied to said digit electrodes and segment drive signals are applied to said segment electrodes in timed relationship to said application of said digit drive signals, the improvement characterized in that each of the digit drive signals comprises a plurality of first pulse components of a first pulse width and varying at a plurality of voltage potentials during each one cycle period and a plurality of second pulse components of a second pulse width, each of said second pulse components appearing between adjacent ones of said first pulse components during each half cycle period, and each of said segment drive signals comprises a plurality of first pulse components of a pulse width equal to said first pulse width and varying at least two of said plurality of voltage potentials to be effective for providing a potential difference across said digit and segment electrodes to select a light transparent or a light scattering state of said and a plurality of second pulse components of a pulse width equal to said second pulse width and each appearing between adjacent ones of the first pulse components of each of said segment drive signals during said each half cycle period, wherein the second pulse components of said digit drive signals and said segment drive signals are in phase with each other and have the same voltage potential as that corresponding to one of said plurality of voltage potentials during said each half cycle period so that all of said digit electrodes and said segment electrodes are concurrently applied with the same voltage to zero the potential difference across said digit and segment electrodes during said each half cycle period for a predetermined time interval defined by said second pulse width whereby the root-mean-square values of voltages across said digit electrodes and said segment electrodes for the light transparent and light scattering states are close to said intrinsic threshold voltage and said intrinsic saturation voltage of said liquid crystal without changing said operating margin.

4,100,541
HIGH SPEED MANCHESTER ENCODER

Harris A. Quesnell, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1976, Ser. No. 708,779
Int. Cl.^{2} H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**

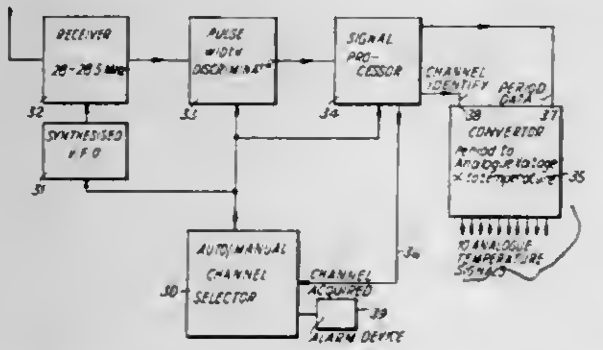


1. A high speed manchester encode comprising:
(a) input means for receiving serial data,
(b) synchronizing means coupled to said input means for providing a first data stream and a second delayed and inverted data stream,
(c) a multiplexer coupled to said synchronizing means for selecting either of said data streams to provide a manchester encoded data stream output.

4,100,542
MEASURING SYSTEM

John Henry Gallant, Upminster, and Michael Robert Thomas Johnson, South Ockendon, both of England, assignors to May & Baker Limited, England

Division of Ser. No. 429,692, Dec. 28, 1973, Pat. No. 3,953,803. This application Jan. 7, 1976, Ser. No. 647,156
Claims priority, application United Kingdom, Jan. 2, 1973, 00218/73
Int. Cl.^{2} H04Q *3/00*
U.S. Cl. 340—518 **8 Claims**

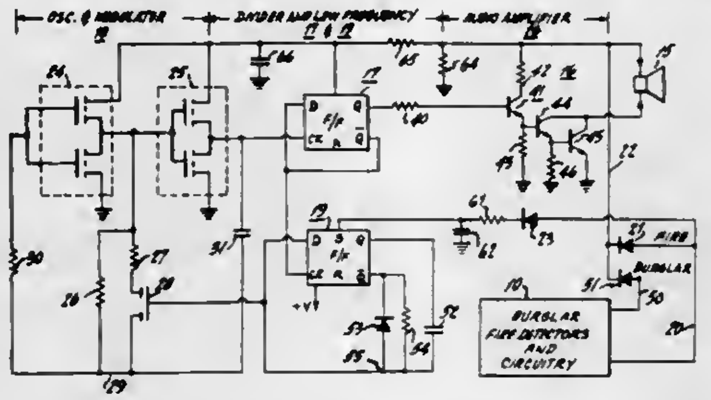


8. A measuring system for transmitting and receiving data from a plurality of sampling points comprising
- a transmitter for each of said sampling points, each of said transmitters having a transducer for detecting variations in the value of a physical parameter being measured, the value of said physical parameter pulse modulating the output signal from said transmitter, and
- a receiving system for receiving the pulse modulated signals from each of said transmitters, said receiving system including
  - a pulse width discriminator for receiving said pulse modulated signals and generating an output signal only when the time difference between successive pulse modulated signals is within a predetermined limit,
  - a channel selector having an output coupled to said pulse width discriminator for selecting the sample point to be interrogated, and
- a signal processor having an output coupled to the output of said channel selector, said signal processor including
  - a first counter for storing a next following signal representative of the instantaneous value of the parameter being measured,
  - a second counter for storing the previous signal representative of the instantaneous value of said parameter, said previous signal being a reference signal,
  - comparison means for comparing said reference signal with said next following signal,
  - means for up-dating said second counter by entering said next following signal held in said first counter into said second counter, said next following signal being the next reference signal, and
  - a clock pulse generator coupled to said first and second counters and to said channel selector, said generator supplying clock pulses to both of said counters in response to a signal from said channel selector.

4,100,543
AUDIBLE ALARM APPARATUS PARTICULARLY ADAPTABLE FOR USE WITH FIRE AND THEFT SECURITY SYSTEMS

Roy Stockdale, Huntington, and Lance Weston, Babylon, both of N.Y., assignors to Napco Security Systems, Inc., Coplaque, N.Y.

Filed Feh. 4, 1977, Ser. No. 765,539
Int. Cl.^{2} G08B *19/00*
U.S. Cl. 340—521 **10 Claims**


OSC. & MODULATOR
DIVIDER AND LOW FREQUENCY
AUDIO AMPLIFIER
FIRE
BURGLAR
BURGLAR FIRE DETECTORS AND CIRCUITRY

1. A circuit for providing an audible alarm at a given frequency by energizing a loud speaker device at said frequency, said frequency provided by a RC controlled oscillator for providing a signal frequency at an output and having an undesireable variation in duty cycle to thereby result in a reduction in the power applied to said loud speaker, the improvement in combination therewith of apparatus for providing a fifty percent duty cycle to said loud speaker, comprising:
(a) a triggerable frequency divider coupled to said oscillator output and operative to divide said signal frequency by a factor of $2n$, where n is a positive integer, said divider operative to provide a divided signal having a fifty percent duty cycle substantially independent of the frequency and duty cycle of said oscillator, and
(b) means for applying said divided signal to said loud speaker device.

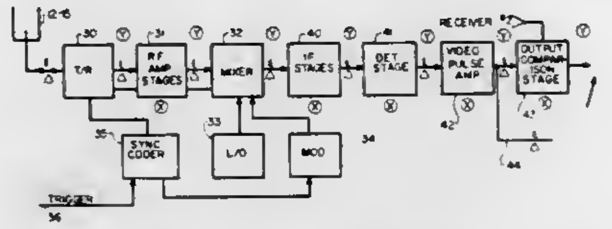
4,100,544
BEACON SYSTEM EMPLOYING RAMPED GAIN RECEIVER

Royal V. Keeran, Upland, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jul. 25, 1977, Ser. No. 818,376
Int. Cl.^{2} G01S *3/32, 9/22*
U.S. Cl. 343—6.5 R **6 Claims**

1. In an interrogator-transponder system including a transmitting and receiving antenna system,
- a pulse transmitter;
- a pulse receiver;
- transmit-receive switch for selectively connecting the antenna system to the transmitter and the pulse receiver in which the pulse receiver responds to return pulses from a transponder on a remote vehicle which transponder reacts to interrogator pulses from the pulse transmitter in which the antenna system includes a plurality of antennas from which the sum and difference components of the receive signals from the transponder are derived and in which the receiver processes the sum Σ and difference Δ signals in part and in two different channels and in which the receiver includes means for comparing the level of the sum Σ channel with respect to the difference Δ channel;

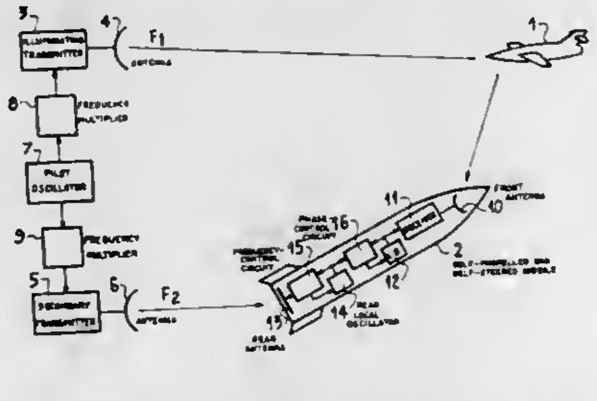
the improvement comprising means for simultaneously varying the gain of the receiver sum Σ signal channel inversely with respect to the receiver difference Δ signal channel.



4,100,545
MISSILE GUIDANCE SYSTEM

Rémy Tabourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 22, 1976, Ser. No. 725,495
Claims priority, application France, Sep. 24, 1975, 75 29266
Int. Cl.^{2} G01S *9/02;* F41G *7/00*
U.S. Cl. 343—7 ED **6 Claims**

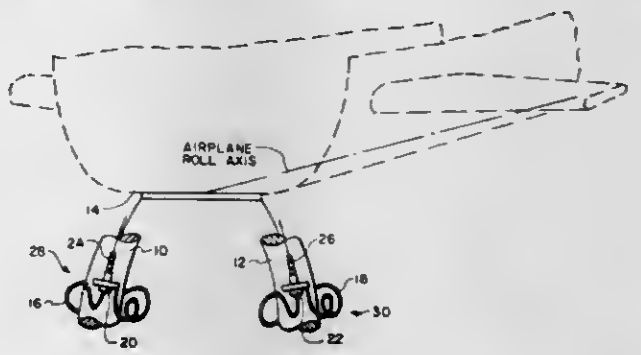


1. In a guidance system for a self-propelled and self-steered missile provided with a rear antenna and a front antenna, in combination:
- a radar station including a pilot oscillator, a first illuminating transmitter coupled to a first antenna and to said pilot oscillator through a first frequency-multiplying circuit to produce a target-illuminating signal at a first frequency F_1, and a second illuminating transmitter coupled to a second antenna and to said pilot oscillator through a second frequency-multiplying circuit to produce a rear reference continuous-wave signal for the missile at a frequency F_2 different from F_1;
- a receiver aboard said missile coupled to said front antenna, a front local oscillator connected to said receiver, a rear local oscillator phase-controlled by the continuous wave received by the rear antenna, and phase-control means comprising a frequency multiplier for controlling the frequency and the phase of said front local oscillator by said rear local oscillator; and
- flight-control means aboard said missile connected to said receiver for directing the missile toward the target.

4,100,546
AIRBORNE ANTENNA SYSTEM EMPLOYING THE AIRFRAME AS AN ANTENNA

Donn V. Campbell, Eatontown, N.J., and Edward J. Paragi, New Haven, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1977, Ser. No. 763,440
Int. Cl.^{2} H01Q *1/28*
U.S. Cl. 343—708 **5 Claims**

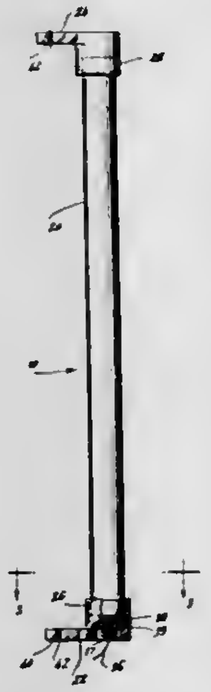


1. A phase front homing airplane antenna array comprising:
- a pair of spaced substantially vertical members of the metallic airframe of said airplane, said members being spaced symmetrically about the longitudinal roll axis of said airplane;
- a pair of like toroidal coils surrounding and electromagnetically coupled to respective portions of said vertical members and positioned symmetrically about said axis, the combination of each of said coils and associated vertical member comprising one of a pair of symmetrical antennas of said array, each coil having a pair of radio frequency feed terminals, and a pair of symmetrical transmission lines connected between respective pairs of said feed terminals and said airplane.

4,100,547
FLUORESCENT TUBE INDICATOR MOUNTED ON ANTENNA

P. Richard Cooke, Yonkers, N.Y., assignor to Midnight Ears, Inc., White Plains, N.Y.

Filed May 26, 1976, Ser. No. 690,251
Int. Cl.^{2} H01Q *1/06*
U.S. Cl. 343—721 **5 Claims**



1. A transmitter antenna attachment for attaching a fluores-

cent lamp on the antenna of a transmitter which lights when said transmitter is activated, comprising in combination

(a) a fluorescent lamp, and

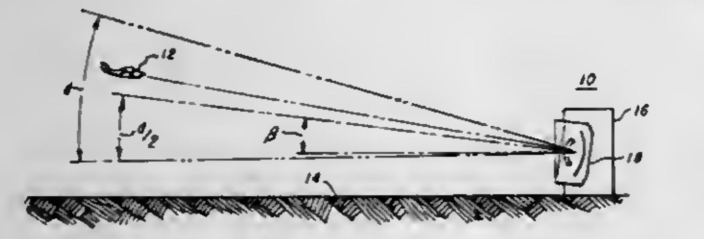
(b) a pair of L-shaped brackets of insulating material having hollow sockets on one extremity thereof adapted when the hollow sockets are positioned facing each other to receive and frictionally engage the ends of said fluorescent lamp for mounting said fluorescent lamp therein between said brackets,

(c) said pair of L-shaped brackets having an opening in the other extremity thereof which are adapted to receive and frictionally engage a transmitter antenna wire for mounting said fluorescent lamp on opposite ends thereof on and substantially parallel to the antenna wire, said lamp being activated by the energy radiated by said antenna wire when the transmitter is activated.

4,100,548
BIFOCAL PILLBOX ANTENNA SYSTEM

Christian Otto Hemmi, Dallas; Oren Byrl Kesler, Richardson, and Richard Thomas Dover, Dallas, all of Tex., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,086
Int. Cl.^{2} H01Q *3/26*
U.S. Cl. 343—837 **14 Claims**



1. An antenna system comprising:

(a) a controller means for forming control voltages and sequential switching signals;

(b) a plurality of scan circuits connected to said controller means for producing RF energy power level outputs in response to said control voltages and sequential switching signals;

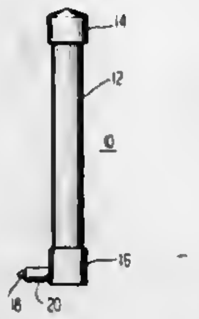
(c) a contoured feed array having a plurality of feed elements connected to said scan circuits, said plurality of feed elements being sequentially energized in response to the outputs of said scan circuits to radiate RF energy having a non-linear phase distributioo; and

(d) a waveguide means connected to said contoured feed array, said waveguide means comprising a plurality of spaced interleaved panels with ends staggered to provide a continuous waveguide having a plurality of stacked portions and including a ground plane bar mounted behind said contoured feed array, a waveguide having a radiating aperture and a plurality of selectively shaped reflectors, said shaped reflectors providing a plurality of focal points having a desired spacing, said plurality of selectively shaped reflectors being mounted in said waveguide intermediate said radiating aperture and said contoured feed array whereby the RF energy radiating from selected feed elements with a non-linear phase distribution is channeled to said plurality of selectively shaped reflectors having said plurality of focal points and reflected with a substantially linear phase distribution and transmitted.

4,100,549
DISPOSABLE MARKER

James R. Hubbard, Moorestown, N.J., assignor to Graphic Controls Corporation, Cherry Hill, N.J.

Continuation-in-part of Ser. No. 554,521, Mar. 3, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,406
Int. Cl.^{2} G01D *15/16;* B67D *3/00;* B43K *5/00*
U.S. Cl. 346—140 A **11 Claims**



1. A disposable instrument marker pen with self-contained ink supply comprised of an elongated plastic-sheathed fibrous ink reservoir material, an end cap on one end thereof, a tip cap on the opposite end thereof, both of said caps sealingly engaged thereon, said tip cap including a capillary nib extending therefrom, said plastic-sheathed fibrous ink reservoir material being cut at said tip cap end thereof, so that said ink reservoir material will cootain an outer end surface area, said capillary nib and said ink reservoir material being adapted to mate at said surface area.

4,100,550
LIQUID JET RECORDER

Rune Elmqvist, Bromma, and Bertil Almgren, Vallingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 11, 1977, Ser. No. 776,768
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2619369
Int. Cl.^{2} G01D *15/18;* B41J *3/04*
U.S. Cl. 346—140 R **10 Claims**

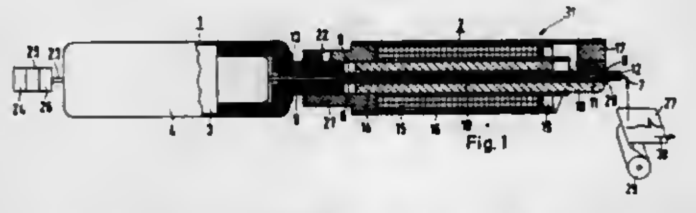


Fig. 1

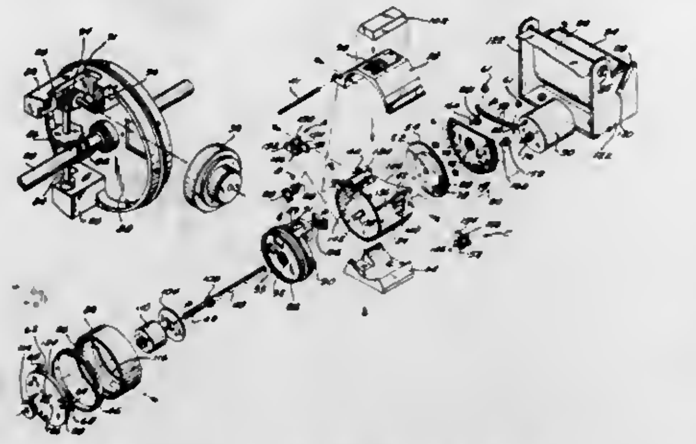
1. In a liquid jet recorder having a capillary tube, a permanent magnet, an electromagnet, said electromagnet comprising a core and a winding, said capillary tube having one end connected to a filter which is connected to a liquid pump, the other end of the capillary tube being bent to form a nozzle to direct a recording jet onto a recording carrier, said permanent magnet being carried on the capillary tube and arranged in an air gap of the electromagnet, the improvement comprising the core of the electromagnet comprising an inner tube with the winding arranged thereon, said inner tube coaxially surrounding the capillary tube with the winding being coaxial with the capillary tube.

4,100,551
ROTARY ELECTRICAL PRINTER AND METHOD

Olin B. King, Hantsville, Ala., assignor to SCI Systems, Inc., Hantsville, Ala.

Filed Sep. 9, 1975, Ser. No. 611,785
Int. Cl.^{2} G03G *17/00*
U.S. Cl. 346—162 **19 Claims**

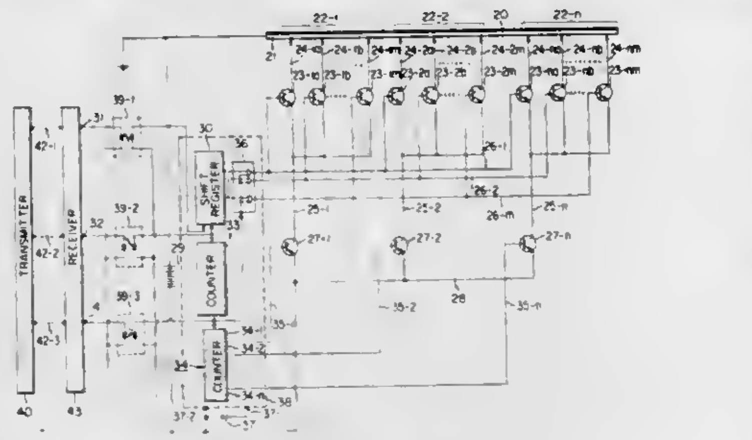
1. In a rotary electrical printer including a rotor, means for rotating said rotor, at least one group of styli on said rotor, feed means for moving a recording sheet past said rotor substantially continuously in a direction transverse to the direction of rotation of said rotor with said styli contacting said sheet, said group including a plurality of axially-spaced styli, and electrical control means for selectively energizing said styli to cause each stylus to form a dot on said sheet at a selected location and thereby form images from transverse rows and circumferential columns of such dots, the styli in said group being positioned closely adjacent to one another so as to form a group of contiguous columns during a single pass of said styli over said recording sheet.



4,100,552
RECORDING APPARATUS FOR A VOLTAGE SENSITIVE RECORDING SYSTEM

Hakaru Muto, Kamakura; Sadasuke Kurabayashi, Kawasaki; Yasushi Takatori, Machida; Isao Yamaguchi, Tokyo, and Asao Watanabe, Higashi Kurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1976, Ser. No. 711,208
Claims priority, application Japan, Aug. 7, 1975, 50-96206
Int. Cl.^{2} G03G *17/00*
U.S. Cl. 346—162 **16 Claims**



1. A recording apparatus comprising:

a recording medium;

recording means disposed in proximity to said recording medium for effecting recording on said recording medium by application of a voltage thereto;

a first switching element having two switching terminals and a control terminal, one of said switching terminals being connected to said recording means;

a second switching element having two switching terminals and a control terminal, one of said switching terminals being connected to the other switching terminal of said first switching element, and said second switching element having a lower withstanding voltage requirement than that of said first switching element;

recording signal generating means for generating recording signal voltages to be applied to the control terminals of said first and second switching elements;

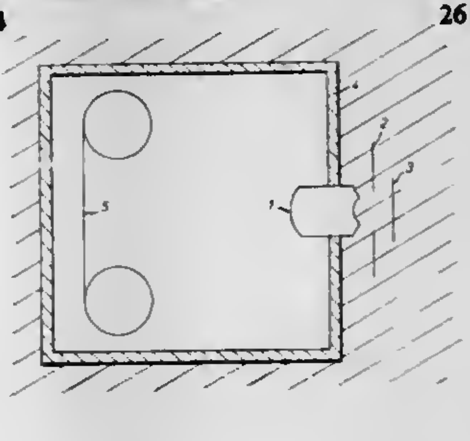
a first power source connected to the other switching terminal of said second switching element, the voltage of said first power source being sufficient to effect recording on said recording medium by being applied thereto; and

a second power source connected between the other switching terminal of said second switching element and said recording signal generating means, the voltage of said second power source being used to provide the said recording signal voltages applied from said recording signal generating means to the control terminals of said first and second switching elements.

4,100,553
UNDER-WATER PHOTOGRAPHIC APPARATUS

Francois Henri Paul Danel, St. Martin D'Uriage, France, assignor to Formaplex S.A., Meylan, France

Filed Aug. 12, 1976, Ser. No. 713,836
Claims priority, application France, Aug. 22, 1975, 75 26348
Int. Cl.^{2} G03B *11/08*
U.S. Cl. 354—64 **26 Claims**



1. A photographic apparatus of the kind comprising a watertight casing which forms internally a dark chamber, a lens which closes towards the front of said dark chamber, a diaphragm adapted to regulate the aperture of said lens, a shutter adapted alternately to cover and uncover said lens, said shutter having a set position wherein said shutter covers said lens and is ready to be actuated to momentarily uncover said lens, a re-setting lever intended to put said shutter in the set position, and a release push-rod for liberating said shutter, in which said diaphragm is arranged in front of the said lens, on the outside of the said casing, so that when the apparatus is immersed in water, said lens and diaphragm are in direct contact with the water.

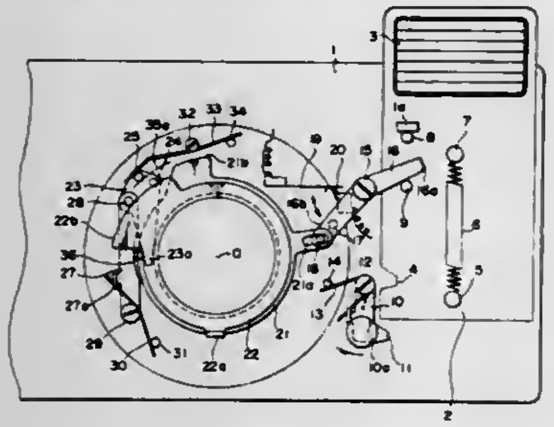
4,100,554
CAMERA

Yaichi Iijima, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1975, Ser. No. 602,916
Claims priority, application Japan, Aug. 13, 1974, 49-97026
Int. Cl.^{2} G03B *15/05*
U.S. Cl. 354—145 **3 Claims**

1. In a camera having a housing, an objective lens, an adjustable disphragm, focusing means, and an automatic exposure controlling device, the combination of means selectively controlling said adjustable diaphragm by said focusing means or by said automatic exposure controlling device, an electronic flash, means movably mounting said electronic flash on said housing from a first position relative to the optical axis of said objective lens to a second position located at a sufficiently greater distance relative to the optical axis of said objective lens to prevent the red-eye phenomenon during the electronic flash operation, and means controlled by movement of said

electronic flash mounting means to its second position for operating said selectively controlling means to transfer control

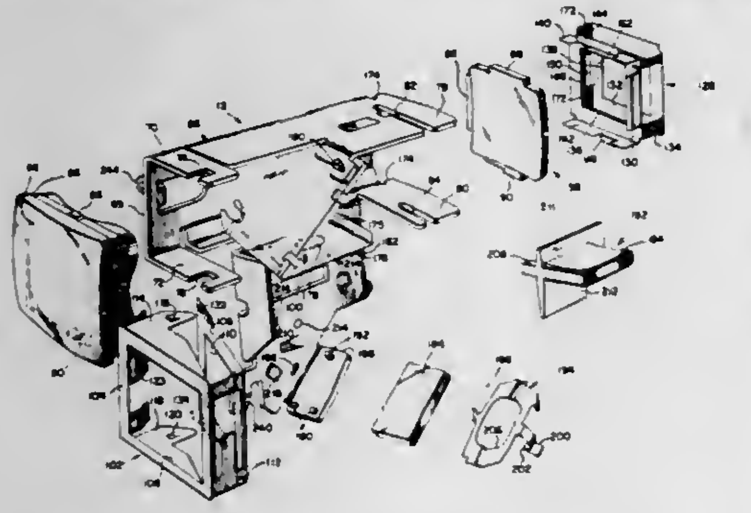


of said adjustable diaphragm from said automatic exposure controlling device to said focusing means.

4,100,555
MODULAR PHOTOGRAPHIC RANGEFINDER CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1977, Ser. No. 784,245
Int. Cl.² G03B *13/20, 13/02;* G01C *3/04*
U.S. Cl. 354—166 **37 Claims**

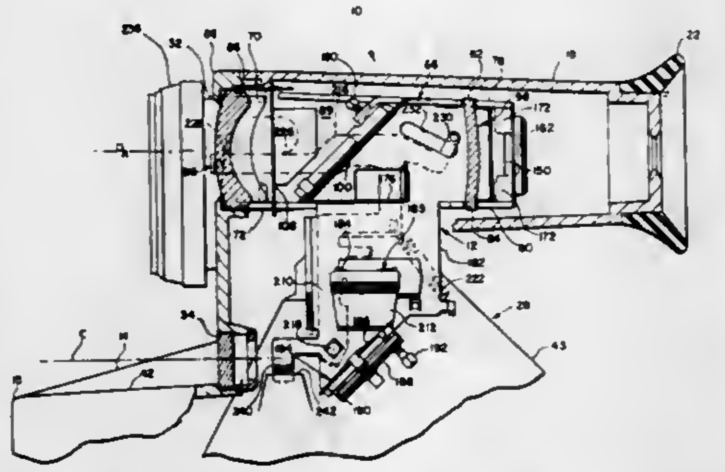


35. A camera of the rangefinder type comprising:
a variable focus objective lens;
a camera housing having portions structured to be normally held in a horizontal plane during a photographic exposure cycle, said camera housing including a front wall portion having a first aperture for accommodating the admission of scene light to said objective lens, a second aperture spaced apart from said first aperture and a third aperture spaced apart from said second aperture along a line which intersects said second aperture and is oblique to the horizontal plane when said camera is held in its said normal position; and
a combined viewing and rangefinding means for imaging scene light received through said second aperture to provide a first image in a field of view generally corresponding to the field of view for said objective lens, and for imaging scene light received through said third aperture to provide a second image in a portion of said field of view, said imaged scene light received through said third aperture being superposed on said imaged scene light received through said second aperture so that said first and second images may be viewable together from a position outside of said camera housing, said combined view and rangefinding means additionally including means for facilitating movement of said second image across said first image along said oblique line when said camera is held in its said normal position, said second image moving in correspondence to camera focusing so that said second image is moved into substantial coincidence with said first image in correspondence to said objective lens assuming a focused condition with respect to the scene to be photographed.

4,100,556
COMBINED VIEW AND RANGEFINDER WITH SPECIALLY CONFIGURED MOVING LENS

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1977, Ser. No. 784,246
Int. Cl.² G03B *13/20;* G01C *3/04*
U.S. Cl. 354—166 **5 Claims**

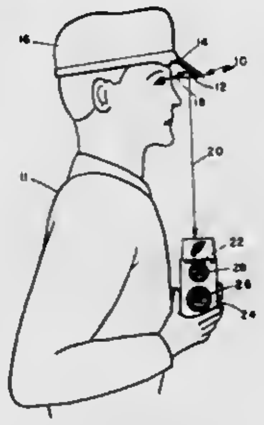


1. A combined view and rangefinder for use in cameras having a variable focus objective lens comprising:
a first lens element for receiving scene light from a scene to be photographed and imaging the scene light so received in a field of view generally corresponding to the field of view for the objective lens of the camera;
an eye lens;
a specularly reflective surface for receiving scene light independent of said first lens element;
a unitary member defining a second lens element for receiving scene light from the scene to be photographed by way of said specularly reflective surface and for imaging the scene light independent of the scene light imaged by said first lens element, said unitary member being of molded plastic construction with at least one integrally molded flange portion extending outward from an edge of said second lens element in a plane generally perpendicular to the optical axis of said second lens element and an integrally molded upstanding wall portion extending laterally outward from said edge of said second lens element in a plane generally parallel to the optical axis of said second lens element;
means for splitting a light beam;
support means for stationing said first lens element, said light beam splitting means and said eye lens in spaced apart alignment so that said first lens element receives and transmits scene light from the scene to be photographed toward said beam splitting means which in turn transmits such scene light toward said eye lens to facilitate viewing of imaged scene light, said support means additionally supporting said unitary member and its said second lens element for limited displacement about a determinate path while also supporting said specularly reflective surface in spaced apart optical alignment with respect to said second lens element on the opposite side of said second lens element from said beam splitting means, said specularly reflective surface operating to angularly deflect scene light to said second lens element whereby scene light received and transmitted to said second lens element is ultimately directed toward said beam splitting means so as to be deflected by said beam splitting means toward said eye lens to accommodate viewing through said eye lens of said scene light imaged by said second lens element, said support means comprising at least one wall member having a longitudinal slot therein through which said flange portion of said unitary member is slidingly inserted for limited reciprocal translation about said determinate path, said upstanding wall portion of said unitary member slidingly engaging at least portions of said wall member during said limited reciprocal translation to inhibit lateral movement in at least one direction of said unitary member with respect to said wall member;
spring means connecting said flange portion of said unitary member for resiliently biasing said flange portion for movement into said slot so as to urge said upstanding wall portion of said unitary member into engagement with said wall member of said support means while simultaneously biasing one major surface of said flange portion against a longitudinal edge of said slot so as to facilitate said reciprocal translation without said flange portion wobbling in said slot; and
means for facilitating movement of said unitary member and its second lens element across said determinate path in correspondence to camera focusing so that said second image is moved into substantial coincidence with said first image in correspondence to the objective lens of the camera assuming a focused condition with respect to the scene to be photographed.

4,100,557
VISOR OPTICAL CAMERA SYSTEM

Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003

Filed May 12, 1977, Ser. No. 796,128
Int. Cl.² G03B *13/08;* A42C *5/00*
U.S. Cl. 354—225 **5 Claims**

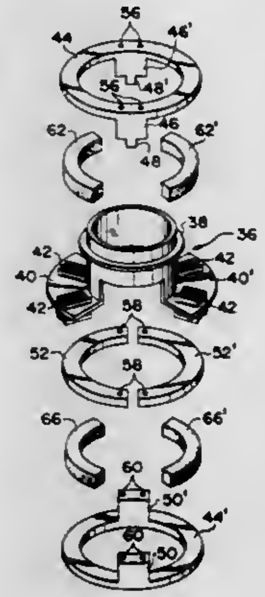


1. A visor optical system for sighting a remotely located camera comprising:
a camera having a vertically oriented viewing screen disposed below eye level of an individual holding the camera, and
a visor mirror supported substantially at eye level and oriented for viewing the camera viewing screen when looking straight ahead so that said camera can be aimed and shot by an individual in directions other than in which the individual is apparently looking.

4,100,558
AUTOMATIC-EXPOSURE CONTROL DEVICE FOR OPTICAL INSTRUMENTS

Hiroshi Koike, No. 5-10, 1-chome, Minami-Azabu, Minato-ku, Tokyo; Shoji Suzuki, No. 11-4-208, 4-chome, Minami-Dai, Sagamihara City, Kanagawa Prefecture, and Takeki Asakawa, No. 3-2, 2-chome, Minami-Azabu, Minato-ku, Tokyo, all of Japan

Division of Ser. Nn. 396,207, Sep. 11, 1973, Pat. No. 3,971,963.
This application Oct. 17, 1975, Ser. No. 623,541
Claims priority, application Japan, Sep. 14, 1972, 47-92386
Int. Cl.² G03B *9/02*
U.S. Cl. 354—271 **7 Claims**

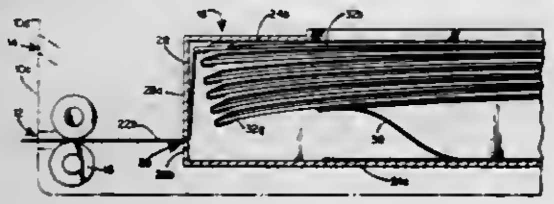


1. A diaphragm-assisted exposure control device, comprising
A. a stationary inner support member (22), constructed from a non-magnetic material, which is formed with a circular opening having a center axis therethrough;
B. a plurality of diaphragm blades (24) which are arranged substantially symmetrically about said center axis and are rotatable about respective axes which are substantially parallel with said center axis, whereby said diaphragm blades are capable of forming therebetween a variable-area aperture having an area which is optimum for the brightness detected by a control signal generating means and having a center axis substantially in line with the center axis of said opening, each said diaphagm blade having a cam slot therein;
C. a stator unit concentrically positioned externally of said inner support member and comprising:
  (1) first and second annular outer pole pieces (44 and 44'), disposed so as to be axially spaced apart from and parallel with each other, said pole pieces having identical radii of curvature and inner pole surfaces in axially opposed relationship,
  (2) first and second semi-circular permanent magnets (62 and 66, 62' and 66'), having:
    (a) outer magnet surfaces which are attached to said inner pole surfaces, and
    (b) first and second inner magnet surfaces which are axially spaced apart in opposed relationship and said identical radii of curvature, and
  (3) an intermediate pole piece (52, 52') which:
    (a) is disposed approximately between and in parallel to said first and second pairs of permanent magnets, and
    (b) is spaced sufficiently far apart from said inner magnet surfaces so as to form first and second air gaps therebetween so that a magnetic field is established across said air gaps and like field poles appear at said inner magnet surfaces and opposite like field poles appear at said outer magnet surfaces, in said first and second outer pole pieces, and in said intermediate pole piece,

- D. a stationary outer support member (70), constructed from a non-magnetic material, which holds said stator unit in position concentrically and externally of said inner support member;
- E. a rotor unit, comprising;
  - (1) a bored non-magnetic cylinder (36) having a flange (40, 40′) extending radially outwardly from one circumferential edge thereof and an opening formed in said flange, and
  - (2) an armature (42, 42′) mounted in said flange within said opening and having the coil thereof wound so that portions extend axially and radially to define an arcuately disposed opening which is located on one side of said flange;
- F. a rotatable support member (72) supporting said rotor unit concentrically and externally of said inner support member and rotatably about the center axis of said opening in the inner support member, said intermediate pole piece being disposed within said arcuately disposed opening without contacting said coils throughout the range of rotation of said rotor unit; and
- G. pins (80) projecting from said rotatable support member respectively into said cam slots substantially in parallel with said center axis of said opening in said inner support member.

4,100,559
APPARATUS FOR PACKAGING AND FOR USING SELF-DEVELOPING PHOTOGRAPHIC FILM
Richard R. Wareham, Marblehead, and Nicholas Gold, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

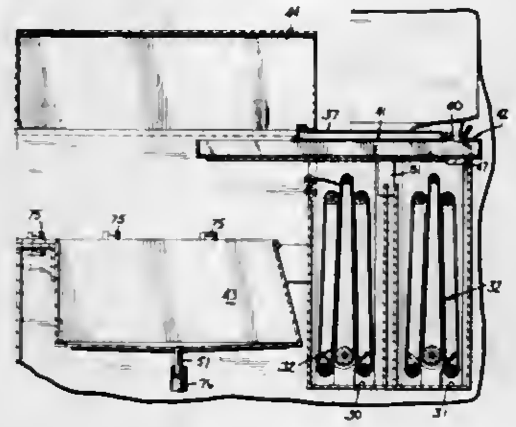
Filed Jan. 3, 1977, Ser. No. 756,266
Int. Cl.^{2} G03B *17/26*
U.S. Cl. 354—277 **12 Claims**



1. A self-developing photographic film cassette comprising:
a plurality of self-developing photographic film units each having an image area of given length intermediate a leading and trailing edge and arranged in sequential stacked relation from first forwardmost to last with respect to each other;
leader means for at least interconnecting the trailing edge of each film unit to the leading edge of the immediately succeeding film unit in said stack;
housing means for holding said stacked film units, said housing means having a forward generally planar wall member adjacent said forwardmost film unit with an exposure window therethrough of substantially the same length as said given length, said housing means additionally including wall means defining an elongated film discharge slot in generally parallel spaced apart relation with respect to the leading edge of the forwardmost of said film units, said wall means including a backward generally planar wall member spaced apart from said forward wall member in generally parallel relation thereto with said stack of film units being disposed between said forward and backward walls, said wall means additionally including peripheral side walls interconnecting said forward and backward walls with that one of said sidewalls most closely spaced from said leading edges of said film units defining said discharge slot, said discharge slot also being more closely spaced to said backward wall member than said forward wall member;
removable light shield means for shielding the forwardmost of said film units from actinic radiation attempting to enter said cassette through its said exposure window;
resilient means for yieldably urging said stacked film units toward said exposure window to move each successive film unit in order of first to last into the forwardmost position adjacent said exposure window upon the withdrawal of each preceding film unit through said discharge slot; and
means for facilitating the withdrawal of said first forwardmost film unit from said discharge slot in said housing means, said wall means being configured to engage the leading edge of each successive film unit in the forwardmost position just as said image area of that film unit is pulled into registration with said exposure window by that portion of said leader means connected directly to the leading edge thereof, with further pulling of said respective leader portion increasing the tension thereof and causing the leading edge of the pulled film unit to assume deflecting engagement with said wall means to effect the advancement of the pulled film unit towards and through said discharge slot, each of said successive engagements between said wall means and a respective film unit, in order of second to last, serving to substantially increase the tension at that portion of the leader means being pulled so as to signify that the next succeeding film unit is in the forwardmost position with its image area in registration with said exposure window.

4,100,560
MULTI-PURPOSE MODIFICATION FOR LITHOGRAPHIC PLATE-MAKER
Frank E. Schochet, 4820 Highway 7, Minneapolis, Minn. 55416

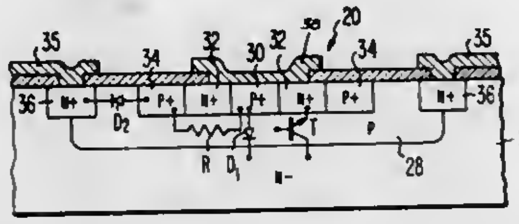
Filed Apr. 22, 1976, Ser. No. 679,511
Int. Cl.^{2} G03D *17/00, 13/02*
U.S. Cl. 354—307 **1 Claim**



1. In an automatic photolithographic machine in which an exposed photolithographic medium is normally transferred automatically from a magazine through an actinically closed chamber including a succession of containers for activating and fixing solutions, to an actinicially unshielded manual access discharge location, the improvement which comprises:
first container means at least partially enclosed in said chamber and removably interposed between the magazine and the containers to prevent normal passage of the medium to said containers and to receive the medium in a first chemical bath in manually accessible fashion;
second container means removably positioned in said discharge location for receiving the medium in a second chemical bath when manually transferred from said first container means; and
means mounted on said machine over said discharge location and the portion of said first container means not enclosed in said chamber, to prevent actinic light from reaching said first container means, while affording manual access to both said container means.

4,100,561
PROTECTIVE CIRCUIT FOR MOS DEVICES
Joel Ollendorf, West Orange, N.J., assignor to RCA Corp., New York, N.Y.

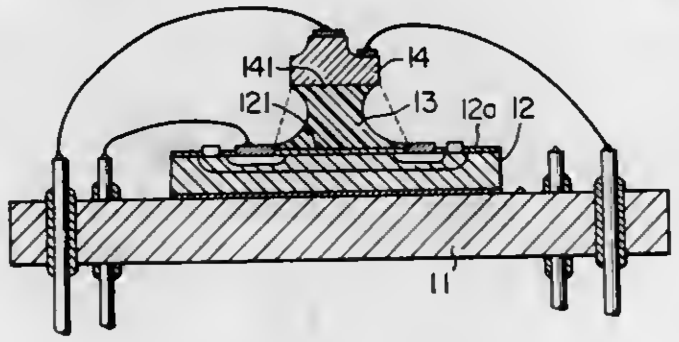
Filed May 24, 1976, Ser. No. 689,269
Int. Cl.^{2} H01L *29/90, 29/78*
U.S. Cl. 357—13 **5 Claims**



1. A device comprising:
(a) a semiconductor substrate of a first conductivity type;
(b) a well region of opposite conductivity type to said substrate extending into said substrate from a surface thereof;
(c) a first region extending into said well region from a surface thereof, said first region being of the same conductivity type as said substrate;
(d) a second region of the same conductivity type as said first region, said second region extending into both said well region and said substrate, said second region being more highly doped than said substrate;
(e) first means for making electrical contact to said second region, said first means thereby making electrical contact to said second region and to said substrate; and
(f) second means for simultaneously contacting said first region and said well region, the portion of said well region contacted by said second means being isolated from said second region by said first region, said second means including a third region of the same conductivity type as said well region but having a higher doping concentration, said third region being surrounded by said first region.

4,100,562
LIGHT COUPLED SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME
Yoshitaka Sugawara; Tsutomu Yatsuo, and Nobutake Konishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

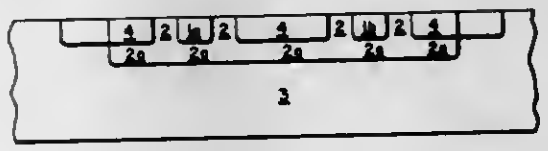
Filed Apr. 19, 1976, Ser. No. 678,171
Claims priority, application Japan, Apr. 30, 1975, 50-52390
Int. Cl.^{2} H01L *31/12*
U.S. Cl. 357—19 **17 Claims**



1. A light coupled semiconductor device comprising:
a light emitting semiconductor element having a surface with at least a part of said surface providing a light emitting area,
a light sensing semiconductor element having a surface with at least a part of said surface providing a light sensing area, said light sensing area facing said light emitting area, and
a light guide made of a single member of light transmissible material and having two opposite end surfaces, one of which is held in wet contact with the light emitting area and the other of which is held in wet contact with said light sensing area so as to not substantially extend beyond said light sensing area.

4,100,563
SEMICONDUCTOR MAGNETIC TRANSDUCERS
Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

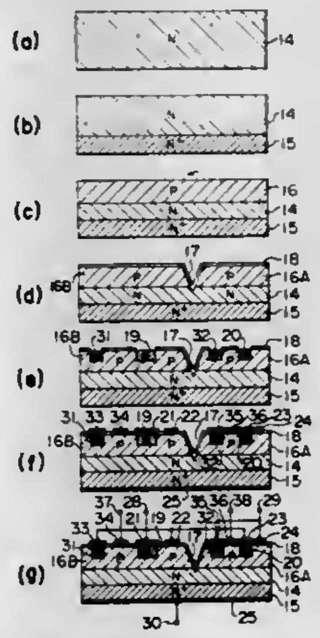
Continuation of Ser. No. 726,891, Sep. 27, 1976, which is a continuation of Ser. No. 537,145, Dec. 30, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,225
Int. Cl.^{2} H01L *27/22, 29/82, 29/96*
U.S. Cl. 357—27 **9 Claims**



1. A semiconductor device for sensing a magnetic field, comprising:
a first major region of a first conductivity type and having a major surface and two contact means for providing current along a path therebetween;
second, third and fourth regions of second conductivity type in p-n junction relation with and mutually isolated by said first region at said surface, said second, third and fourth regions lying along a straight line perpendicular to a straight line connecting said contact means, one of said second, third and fourth regions lying on said straight line connecting said contact means; and
a fifth region of said second conductivity type in p-n junction relation with and completely surrounding said first region at said surface.

4,100,564
POWER TRANSISTOR DEVICE
Takao Sasayama, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 668,433, Mar. 19, 1976, abandoned. This application Dec. 15, 1976, Ser. No. 750,587
Claims priority, application Japan, Apr. 4, 1975, 50-40270
Int. Cl.^{2} H01L *27/02*
U.S. Cl. 357—46 **4 Claims**



1. A power transistor device comprising:
an N-type substrate having two main surfaces;
an N$^+$-type layer formed in one of said two main surfaces of said N-type substrate;
a first and a second P-type layer formed in the other main

surface of said N-type substrate, said first and second P-type layers being electrically isolated from each other;

a first and a second N-type layer formed respectively in said first and second P-type layers, said first N-type layer acting as an emitter for said first P-type layer and said N-type substrate, said second N-type layer acting as an emitter for said second P-type layer as well as said N-type substrate, respectively;

a third N-type layer formed in said first P-type layer, said third N-type layer acting as a collector for said first N-type layer and being spaced apart from said first N-type layer by a portion of said first P-type layer between said first and third N-type layers;

means for electrically connecting said first P-type layer to said third N-type layer;

a fourth N-type layer formed in said second P-type layer and being non-contiguous with said second N-type layer by a predetermined portion of said second P-type layer between said fourth and second N-type layers; and

means for electrically connecting said first N-type layer, said second P-type layer, and said fourth N-type layer to each other.

4,100,565

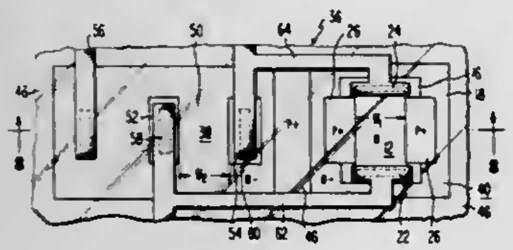
MONOLITHIC RESISTOR FOR COMPENSATING BETA OF A LATERAL TRANSISTOR

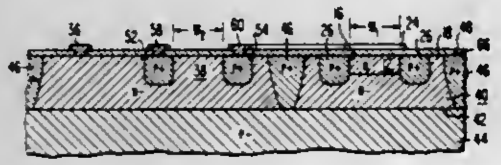
Heshmat Khajezadeh, Somerville, and Stephen Carl Ahrens, Delran, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 656,295, Feb. 9, 1976, Pat. No. 4,057,894. This application Aug. 25, 1977, Ser. No. 827,569

Int. Cl.^{2} H01L *27/02*

U.S. Cl. 357—51 **3 Claims**





1. In a monolithic semiconductor device having a resistor disposed adjacent to a planar surface thereof, said resistor including a first region of one type conductivity adjacent to said surface and having a first and a second ohmic contact thereto, and having a lateral transistor adjacent to said planar surface, said lateral transistor having spaced emitter and collector regions of said opposite type conductivity adjacent to said surface and disposed in a base region of said one type conductivity adjacent to said surface, the improvement comprising:

said first region continuously extending between said first and second ohmic contacts and being disposed in a second region of said one type conductivity adjacent said surface, said second region having a lower impurity concentration than said first region, whereby the conductive path of said resistor is contained within the more-heavily-doped first region,

means for controllably establishing the value of said resistor comprising two additional regions of the opposite type conductivity disposed respectively on opposite sides of said conductive path adjacent to both said surface and the junction between said first and said second regions, said additional regions having a higher impurity concentration and a greater depth than said first region and extending into said first region, whereby the width of said resistor, as measured along the perpendicular to said conductive path at various locations along said conductive path, is defined by the extent of said additional regions into said first region, said additional regions having been formed simultaneously with said emitter and said collector regions while utilizing the same doping mask, whereby any variation in the base width of said transistor, as measured by the distance between said emitter and said collector regions, is proportional to the variation in said width of said resistor, and

circuit means electrically connected to said ohmic contacts and said emitter and said collector regions for connecting said resistor with said transistor to compensate for a variation in the base width of said transistor.

4,100,566

RESIN-SEALED TYPE SEMICONDUCTOR DEVICES AND MANUFACTURING METHOD OF THE SAME

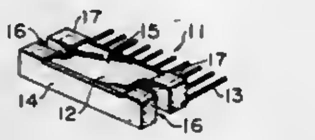
Susumu Okikawa, Ohme, and Hiroshi Mikino, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Japan

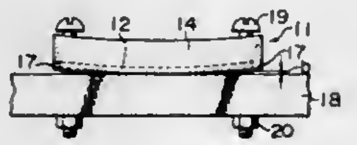
Filed Mar. 23, 1977, Ser. No. 780,327

Claims priority, application Japan, Mar. 24, 1976, 51-31249; Mar. 24, 1976, 51-31250; May 28, 1976, 51-61171

Int. Cl.^{2} H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—70 **16 Claims**





1. A semiconductor device, comprising:

a. a sealing resin body,

b. a heat dissipating plate provided on the lower surface of said resin body and having a smaller thermal expansion coefficient that that of said resin body,

c. a mounting plate for mounting said heat dissipating plate at both ends of said sealing resin body,

d. recesses formed through said sealing resin body and said heat dissipating plate at both ends of said sealing resin body,

e. bolt means inserted through said recesses for securing said heat dissipating plate onto said mounting plate, and

f. protrusions formed at least in the peripheral portions of said recesses.

4,100,567

COMPENSATING TIME-BASED ERRORS IN A REPRODUCED VIDEO SIGNAL

Tadaaki Yoshinaka, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,542

Claims priority, application Japan, Mar. 17, 1976, 51-28991

Int. Cl.^{2} H04N *5/79*

U.S. Cl. 358—8 **10 Claims**

1. Apparatus for compensating time-base errors introduced into a composite color video signal reproduced by a video signal playback system, the composite color video signal including luminance and chrominance components and a horizontal synchronizing signal, said apparatus comprising:

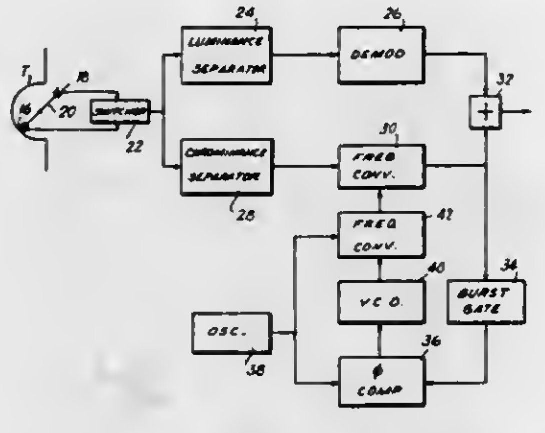
means for receiving said composite color video signal from said video signal playback system;

separating means for separating said luminance and chrominance components from said received composite color video signal;

means for detecting time-base errors in said received composite color video signal;

local oscillator means for generating a local subcarrier reference signal containing the time-base errors detected in said received composite color video signal;

means coupled to said local oscillator means and said separating means for substituting said subcarrier reference signal for the reproduced subcarrier of said chrominance component;



delay means for imparting a time delay to at least said luminance component, said time delay being equal to one horizontal line interval of said composite color video signal; and

combining means coupled to said separating means and to said substituting means for combining said delayed luminance component and the substituted-subcarrier chrominance component into a reformed composite color video signal.

4,100,568

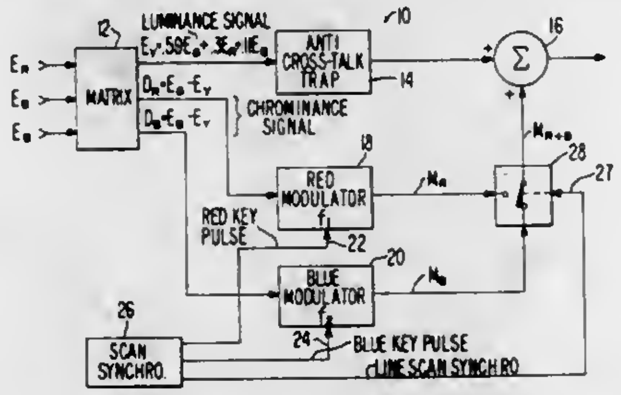
COLOR TELEVISION ENCODER SIGNALS

Donald D. Kline, Palo Alto, Calif., assignor to Commercial Electronics, Inc., Mountain View, Calif.

Filed May 5, 1976, Ser. No. 683,347

Int. Cl.^{2} H04N *9/02*

U.S. Cl. 358—21 **22 Claims**



1. A chrominance modulation system for generating a composite time-multiplexed chrominance signal of a color television encoder comprising:

a first modulator means for modulating a first chrominance signal during first time periods;

a second modulator means for modulating a second chrominance signal during second time periods;

a first oscillator providing a first reference signal at a first subcarrier frequency;

a second oscillator providing a second reference signal at a second subcarrier frequency differing from said first subcarrier frequency;

means coupled to said first modulator means and to said second modulator means for alternately switching said first and second chrominance signals to generate a common time-multiplexed composite chrominance signal;

means for phase synchronizing said first modulator with said first reference signal during said second time period; and

means for phase synchronizing said second modulator with said second reference signal during said first time periods.

4,100,569

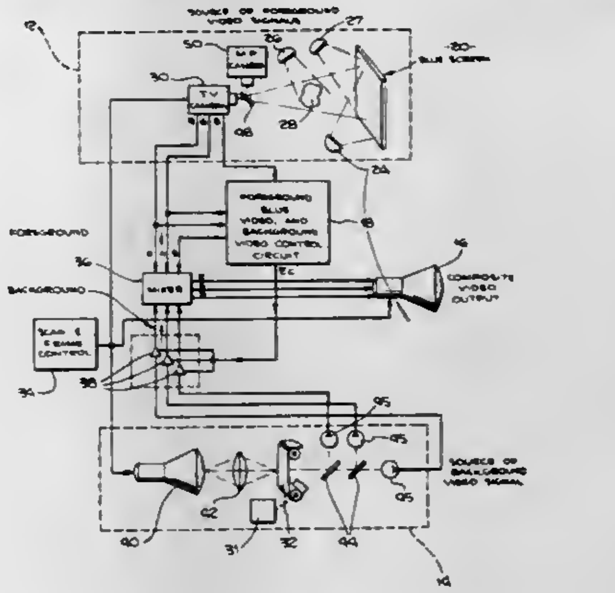
COMPREHENSIVE ELECTRONIC COMPOSITING SYSTEM

Petro Vlahos, 4111 Van Alden, Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 738,740, Nov. 8, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,097

Int. Cl.^{2} H04N *9/535*

U.S. Cl. 358—22 **27 Claims**



1. A comprehensive electronic compositing system of the single color screen type where said single color is a first one of the primary colors, comprising:

a source of color foreground video signals, including at least signals representing red, green and blue;

a source of background video signals;

means for developing a clamping voltage having an instantaneous value equal to a function of the instantaneous value of a second one of said colors plus a function of the difference of the smaller of said two remaining colors subtracted from the larger of said two remaining colors;

means for developing a background control voltage having a value which is a function of the difference between the value of said first foreground video color less a function of the second and third foreground colors;

means for limiting the value of the foreground video signal of said first color in accordance with said clamping voltage;

means for controlling the levels of the background video signals in accordance with the value of said background control voltage; and

means for combining the foreground and background video signals as modified to produce composite foreground and background video signals representing a composite picture.

4,100,570
OPTICAL IMAGE PICKUP SYSTEM

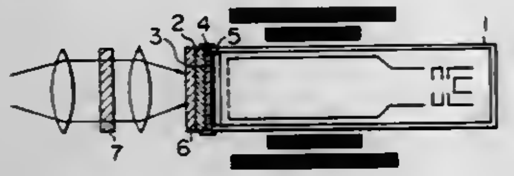
Saburo Nobutoki, Mobara, and Yukio Okano, Osaka, both of Japan, assignors to Hitachi, Ltd. and Minolta Camera Co., Ltd., both of, Japan

Filed Feb. 24, 1976, Ser. No. 660,781

Claims priority, application Japan, Mar. 12, 1975, 50-28977

Int. Cl.^{2} H04N *9/07*

U.S. Cl. 358—44 **14 Claims**



1. An optical image pickup system having an optical transfer function including a stripe-shaped color separation filter, comprising at least one double refraction plate and at least one diffraction grating spatial frequency filter arranged serially in an optical image pickup path, thereby reducing the optical transfer function of said optical image pickup system in at least the chromaticity band spatial frequency range.

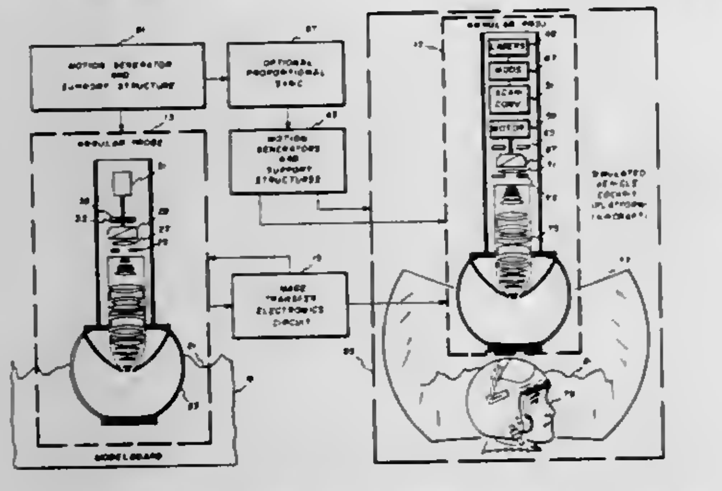
4,100,571
360° NON-PROGRAMMED VISUAL SYSTEM

Wiley V. Dykes, Winter Park, and Frank J. Oharek, Orlando, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1977, Ser. No. 765,170

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 358—87 **25 Claims**



23. A method for displaying a miniature model scene as a life-size replica thereof, comprising the steps of:
probing said miniature model scene and forming an annular optical image thereof;
rotating said annular optical image of said probed miniature model scene at a predetermined speed and in a predetermined direction;
scanning the rotated annular optical image of said probed miniature model scene in such manner as to generate a plurality of electrical signals representative thereof;
reconstructing the scanned rotated annular optical image of said miniature model scene from said plurality of electrical signals;
rotating said reconstructed scanned rotated annular optical image of said miniature model scene at a speed and in a direction that is equal and opposite to that of the previous rotation of the aforesaid annular optical image of said probed miniature model scene; and
projecting said rotated reconstructed optical image of said miniature model scene onto a predetermined viewing screen so as to display a life-size replica thereof.

4,100,572
OPTICAL METHOD AND APPARATUS FOR CARRYING OUT THE METHOD

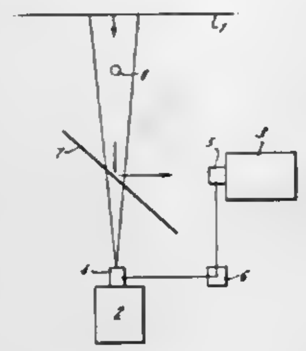
Zoran Perisic, "Gwynfenton",, White Well, St. Teath, Nr. Bodmin, Cornwall, England

Filed Oct. 15, 1976, Ser. No. 732,603

Claims priority, application United Kingdom, Oct. 17, 1975, 42788/75

Int. Cl.^{2} H04N *7/18*

U.S. Cl. 358—93 **17 Claims**



1. A method of providing apparent relative movement in depth between a subject and a background comprising projecting a background onto a reflective surface, placing a subject to which movement is to be imparted in the optical path between the background and a viewer, and providing the viewer with a zoom capability synchronised with zoom conditions imparted to the background such that on the background zooming the viewer zooms to the same degree so that there is no apparent alteration in the background seen by the viewer whereas the subject which is only affected by the zoom capability of the viewer, appears to move relative in depth to the background.

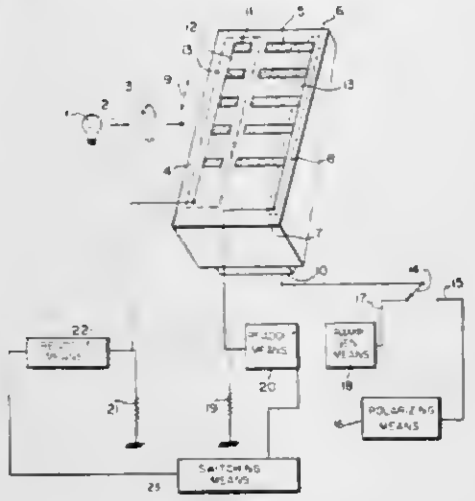
4,100,573
THERMAL IMAGING TRANSDUCER AND SYSTEM

J. Louis Berger, 8614 Camden St., Alexandria, Va. 22308

Filed Sep. 20, 1976, Ser. No. 724,487

Int. Cl.^{2} H04N *5/33*

U.S. Cl. 358—113 **7 Claims**



1. A thermal imaging transducer system comprising a segmented wedge of ferroelectric material responsive to infrared radiation, means for polarizing said wedge using a descending voltage, means to electrically read a signal out of said wedge using an ascending voltage of a polarity the opposite of said descending voltage, such that the system will be responsive to a thermal image.

4,100,574
METHOD FOR ELECTRICALLY READING A RESISTIVE TARGET IN A CAMERA TUBE

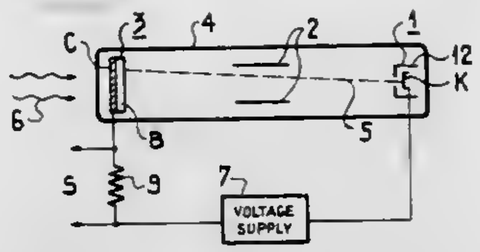
Pierre Félix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 1, 1977, Ser. No. 764,650

Claims priority, application France, Feb. 6, 1976, 76 03332

Int. Cl.^{2} H04N *5/33*

U.S. Cl. 358—113 **6 Claims**



1. A method of operating a camera tube of the type that supplies an electrical signal proportional to incident radiation, said camera tube having an electron gun supplying a beam of electrons, means for guiding and deflecting said beam, towards a target having two faces, the first of said faces receiving said incident radiation and converting it into a spatial distribution of electrical charges, and means for establishing a potential difference between said gun and said target, said method for electrically reading said target, comprising the repetition of a sequence of three phases:

(a). a phase for reading said distribution of charges by means of said electron beam which scans the second face of said target in a succession of N parallel lines forming a raster;
(b) a compensation phase, during which the impact of said electron beam on said target gives rise to a secondary electron emission which positively polarises said second face of the target;
(c) a levelling phase during which the impact of said electron beam on said second face of the target results in the homogenisation of said positive polarisation and during which the beam of electrons goes back in relation to the last line read by a number k of lines, with $k<N$;

the duration of the reading phase being substantially equal to the duration of a line scanning and the duration of each of the levelling and compensation phases being similar; relative to the duration of the raster, to that of a reading phase; and during said compensation phase, said electron beam going back in relation to the last line read by a number $(k-p)$ of lines with $p<k$.

4,100,575
METHOD OF AND APPARATUS FOR MODIFYING A VIDEO SIGNAL TO PREVENT UNAUTHORIZED RECORDING AND REPRODUCTION THEREOF

Minoru Morio, and Masahiro Kambara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

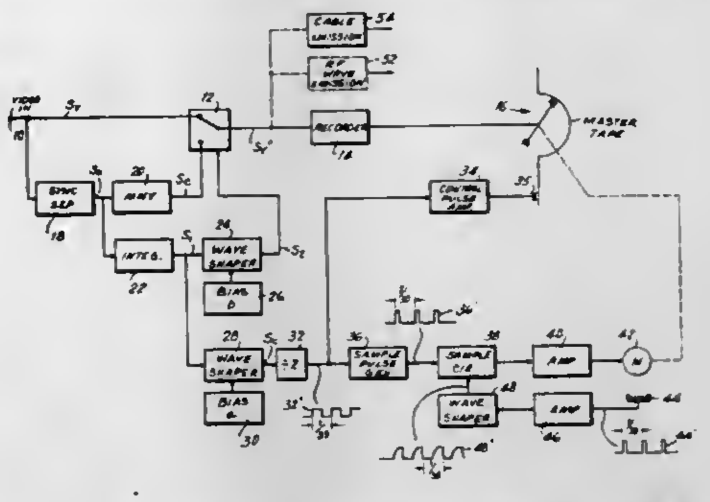
Filed Mar. 17, 1977, Ser. No. 778,709

Claims priority, application Japan, Mar. 22, 1976, 51-31108

Int. Cl.^{2} H04N *1/44*

U.S. Cl. 358—120 **20 Claims**

11. Apparatus for processing a video signal, comprising: receiving means for receiving the video signal, said video signal including a vertical blanking interval during which a set of equalizing pulses followed by a set of vertical synchronizing pulses followed by another set of equalizing pulses are transmitted; generating means for generating simulated equalizing pulses having the same amplitude level and waveshape as said equalizing pulses included in said vertical blanking interval; substituting means for substituting said simulated equalizing pulses for at least some of said vertical synchronizing pulses and said other set of equalizing pulses in said received video signal; and output means to which said received video signal, including said substituted simulated equalizing pulses, are supplied.



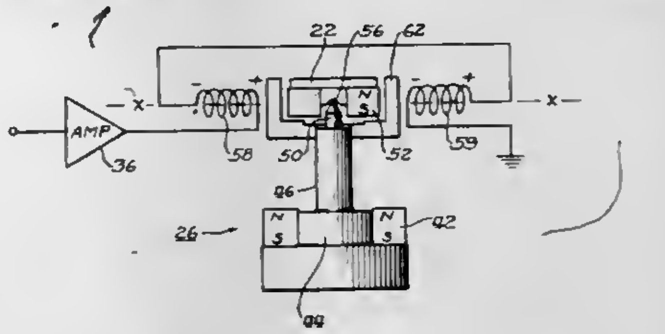
4,100,576
ELECTROMAGNETIC OPTICAL BEAM CONTROLLER HAVING AN EDDY CURRENT DAMPER FOR ARRESTING MECHANICAL RESONANCE

Alfred R. Ditthardt, Glenview, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 28, 1976, Ser. No. 681,092

Int. Cl.^{2} H04N *5/76;* **G11B** *7/08;* **G02B** *27/17*

U.S. Cl. 358—128 **2 Claims**

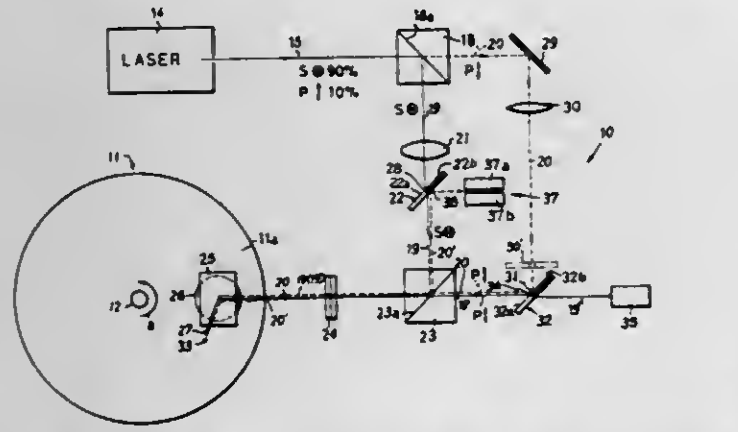


1. In an optical image-reproducing system in which program information stored in a generally spiral track is retrieved by scanning the track with a beam of optical energy and in which is derived a pair of correction signals related to the radial tracking and to the timing of said beam relative to said track, an improved beam control apparatus comprising:
a first ring-shaped, axially poled magnet;
a second axially-poled magnet having a pivot bearing associated therewith and poled in the same direction as said first magnet;
support means comprising a pin cooperating with said bearing for pivotally positioning said second magnet coaxially with and in such proximity to said first magnet that said second magnet is magnetically captivated upon said pin but free for tilting displacement with respect to a pair of orthogonally related axes;
an optical element positioned so that said beam is incident thereon and mechanically coupled to said second magnet for concurrent displacement therewith to redirect the path of said beam;
electromagnetic means positioned along an assigned one of said axes in close proximity to said second magnet and responsive to one of said correction signals to develop a magnetic field, having a magnitude and direction determined by the amplitude and polarity of said applied correction signal, for reacting with the field of said second magnet to effect a desired displacement of said optical element about the other one of said axes; and

damping means comprising a conductive member disposed adjacent to and completely surrounding said second magnet and responsive to the magnetic flux of the field of said second magnet for developing a counter electromagnetic force for reacting with said field of said second magnet to arrest random or uncontrolled movement of said second magnet abont said support pin without inhibiting said desired displacement of said optical element.

4,100,577
APPARATUS FOR OPTICALLY READING SIGNAL INFORMATION RECORDED ON A REFLECTIVE RECORD MEDIUM SURFACE

Yohsuke Naruse, and Mikio Sugiki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Nov. 18, 1976, Ser. No. 743,010
Claims priority, application Japan, Nov. 20, 1975, 50-139525
Int. Cl.² H04N *5/76;* G11B *7/12*
U.S. Cl. 358—128 **5 Claims**

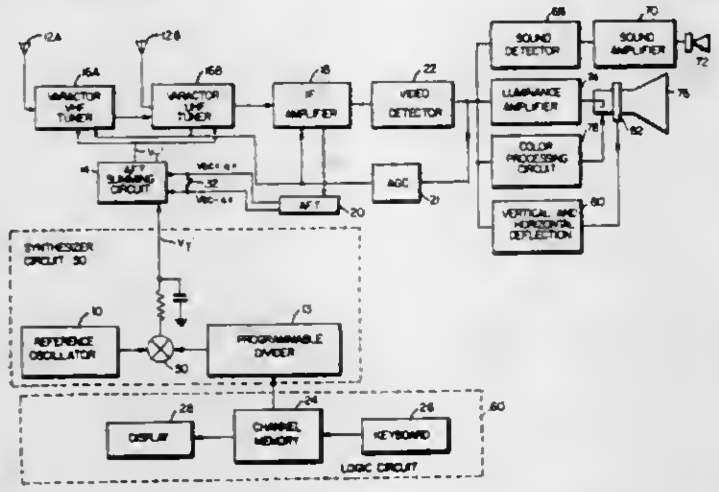


1. An apparatus for optically reading signal information recorded as variations in a series of substantially parallel, adjacent record tracks on a reflective record medium surface, comprising

a light source emitting a light beam;
polarized beam splitting means receiving said light beam from the light source and splitting the same into first and second polarized light beams which are respectively polarized in first and second polarization directions;
means defining a first optical path in which said first polarized light beam is projected against said record medium surface with a relatively small landing spot on the latter embracing only one of said record tracks and reflected from the record medium surface so as to be modulated by the variations in said one track;
means responsive to energy from the modulated first polarized light beam as reflected from said record medium surface for developing an output signal representing the information signal recorded as variations in said one record track on the record medium surface;
means defining a second optical path spaced from said first optical path and in which said second polarized light beam is projected against said record medium surface with a relatively large landing spot on the latter which spans a plurality of said record tracks so as to be reflected from said record medium surface while avoiding modulation of the reflected second polarized light beam by said variations in each of said record tracks;
objective lens means interposed in said first and second optical paths and being movable toward and away from said record medium surface for varying the focus of said first polarized light beam at said record medium surface and for varying the refraction of the reflected second polarized light beam by said objective lens means, respectively; and
focus-servo means including detecting means receiving the reflected second polarized light beam as refracted by said objective lens means for providing a control signal which varies with said refraction, and means responsive to said control signal for moving said objective lens means in the sense to maintain proper focus of said first polarized light beam at said record medium surface.

4,100,578
AFT SUMMING CIRCUIT FOR VARACTOR-TYPE TUNING SYSTEMS

Blayne E. Arneson, Evergreen Park, Ill., assignor to Admiral Corporation, Schaumburg, Ill.
Filed May 3, 1977, Ser. No. 793,364
Int. Cl.² H04N *5/50;* H04B *1/16*
U.S. Cl. 358—191 **16 Claims**



1. In a receiver having tuner means for selectively detecting and processing a transmitted signal, an AFT circuit for providing a correction signal, and channel selection means for providing a tuning signal whose amplitude is indicative of the channel to be tuned by said tuning means, an AFT summing circuit comprising:

amplifier means having first and second inputs for receiving, respectively, the correction signal and the tuning signal, for providing a composite output signal, to be applied to said tuning means and having a tuning signal component and a correction component, said amplifier means including first means for providing a substantially predetermined gain to the tuning signal component, and second means for varying the correction signal component of the composite output signal.

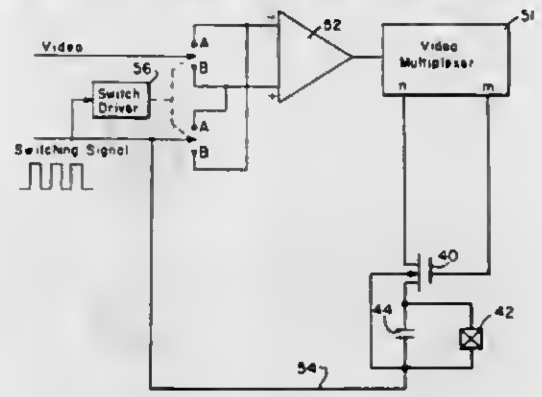
4,100,579
AC OPERATED FLAT PANEL LIQUID CRYSTAL DISPLAY

Michael N. Ernstoff, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Continuation of Ser. No. 509,376, Sep. 24, 1974, abandoned. This application Nov. 29, 1976, Ser. No. 745,722
Int. Cl.² H04N *5/66;* G02F *1/18, 9/32, 1/16*
U.S. Cl. 358—230 **6 Claims**

1. A liquid crystal display system responsive to a video display signal having a frame rate comprising:

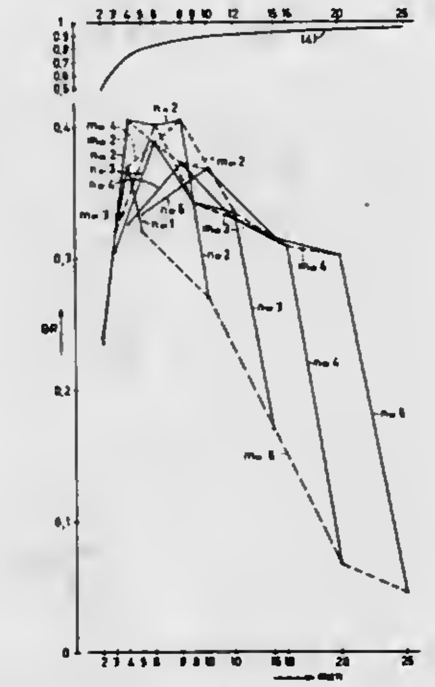
a transparent coverplate having a first electrode structure comprising a multiplicity of electrically independent transparent conductive stripes formed as elements on one of its surfaces;
a second electrode structure formed on a semiconductor wafer having a plurality of elements;
a layer of liquid crystal material sandwiched between said first electrode structure and said second electrode structure;
an insulating spacer providing electrical insulation and physical spacing between said first electrode structure and said second electrode structure;
sealing means for providing retention of said liquid crystal material between said transparent cover plate and said semiconductor wafer;

means for inversion of an applied video signal at a periodic rate equal to the frame rate of a video display signal, thus providing an inverted and a non-inverted video signal at alternate frames;
means for maintaining the polarity of the inverted video signal the same as the polarity of the non-inverted video signal;
means for the sequential application and removal of a constant value of potential to each of said multiplicity of electrically independent transparent conductive stripes at a periodic rate equal to the frame rate of said video display signal; and
addressing means for applying said inverted and said non-inverted video signals, alternately received from the means for inversion, to said second electrode structure whereby the direction of current flow between elements of said first electrode structure and said second electrode structure is reversed at a periodic rate equal to the frame rate of the video display signal.



4,100,580
FACSIMILE SYSTEM

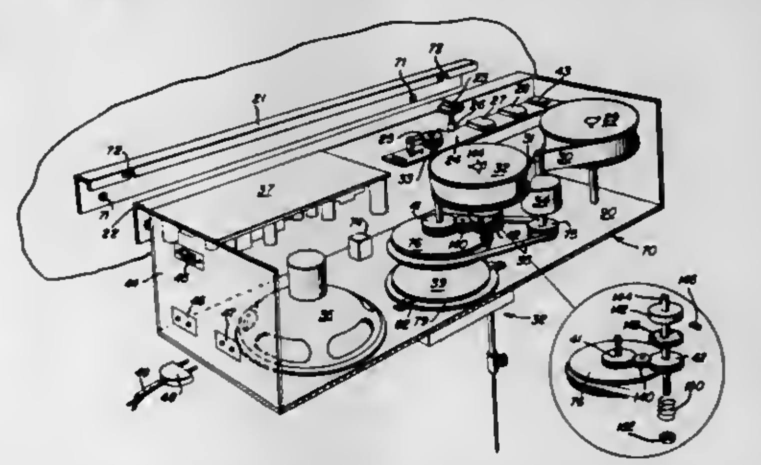
Hermanus Hubertus Hendrikus Groothuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 470,797, May 17, 1974, abandoned.
This application Feb. 19, 1976, Ser. No. 659,428
Claims priority, application Netherlands, Jun. 1, 1973, 7307630
Int. Cl.² H04N *1/40, 7/12*
U.S. Cl. 358—260 **21 Claims**



1. A facsimile transmission system comprising a picture pick-up device means for converting line by line, through lines comprising picture elements, picture information to be transmitted into a picture signal, a picture signal coding circuit having a picture element comparison circuit means for deriving a coded signal from picture signal values associated with adjacent picture information, the signal coded circuit having a clock pulse source means for control purposes and a store means coupled to said clock for storage of the coded signal, the picture element comparison circuit comprising means for comparing the picture element signal values associated with a first number of adjacent lines and a second number of adjacent picture elements or one picture element of each of the said lines, said signal coding circuit having a signal coder means coupled to said coding circuit for supply of a comparison signal thereto which in the presence of one and the same fixed picture signal value in all compared picture elements constituting a group causes the coder to supply a determined fixed code signal and which in the absence of the same fixed picture signal value in all picture elements of the group releases the coder for supplying during processing of the said picture signal values and instantaneous code signal derived as a function of the occurrence of the different picture signal values in the respective compared picture elements of the group.

4,100,581
DOOR ACTUATED MESSAGE DEVICE

Donald J. Slack, 904 Orangewood Dr., Brea, Calif. 92621, and Jay D. Talley, 6352 San Harco Cir., Buena Park, Calif. 90620
Filed Sep. 30, 1976, Ser. No. 728,048
Int. Cl.² G11B *15/48;* H01H *3/16;* G08B *13/08*
U.S. Cl. 360—12 **8 Claims**



1. In combination, an improved actuation mechanism for actuating a message device capable of reproducing a recorded message on opening of a door, the message device having a housing with an aperture extending through one wall thereof, the improvement comprising:

a switch mounted on the message device;
circuit means for electrically connecting the switch to the message device, actuation of the switch actuating the message device;
an actuating arm member connected to the switch and extending therefrom, an inner end portion of the arm member being stationarily mounted to the switch, a distal end portion of the arm member being mounted to the outer end of said inner end portion for movement relative thereto;
a disc having a flange disposed perimetrically thereabout, a portion of the disc being rotatably received within the aperture in the wall of the housing, the flange being of a diameter greater than the aperture, surface portions of the flange abutting surface portions of the wall adjacent the aperature, the switch being mounted to the disc on a surface portion thereof extending externally of the housing through said aperture, the switch extending externally of the housing;
means for retaining the disc in the aperture for rotation therewithin, whereby the position of the switch can be adjusted relative to the housing on rotation of the disc; and,

means for adjusting the position of said distal end portion relative to said inner end portion of the arm member, the distal end portion of the arm member being positioned to contact a portion of the door as the door is opened, thereby to actuate the switch and thus the message device.

4,100,582

AUDIO-VISUAL APPARATUS

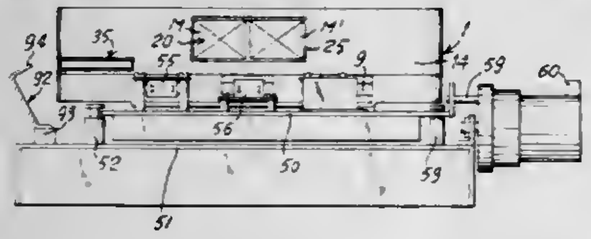
Nardino Righi, Milan, Italy, and Roberto Gavioli, 54, Corso di Porta Vittoria, Milan, Italy (20100), assignors to Eurafrica S.R.L. Societa' per Ricerche Elettroniche e Audiovisivi and Roberto Gavioli, both of Milan, Italy

Filed Nov. 29, 1976, Ser. No. 745,694

Claims priority, application Italy, Nov. 28, 1975, 29780 A/75; May 28, 1976, 23730 A/76

Int. Cl.² G03B *31/06, 31/04;* G11B *15/18*

U.S. Cl. 360—80 **3 Claims**



1. A cartridge for a still image sound-synchronized audio-visual apparatus comprising:

(a) a parallelepiped housing having opposed flat parallel faces, a partition wall intermediate and substantially parallel to said opposed faces dividing said housing into first and second compartments, one of said compartments having positioned therein a payoff spool and a takeup spool for a magnetic tape, said one compartment being apertured to permit the insertion thereinto of at least one magnetic reproduction head and a magnetic tape drive capstan, the other of said compartments having positioned therein a payoff spool and a takeup spool for a photographic film, said other compartment being apertured to permit projection of the images on the photographic film, the payoff and the takeup spools of the respective compartments being coaxially mounted and independently rotatable;

(b) a magnetic tape having sound information thereon wound upon the payoff and takeup spools of said one compartment;

(c) a photographic film having a plurality of frames with visual information thereon wound upon the payoff and takeup spools of said other compartment, and a series of spaced perforations provided along the length of said film; and

(d) means for controlling the movement of said film comprising a lever fulcrummed on said housing having the pivotal axis thereof parallel to the rotational axes of said spools, one end of said lever having means thereon cooperable with a perforation on one of said film frames for selectively arresting the movement thereof, said lever being pivotable by a force applied to the other end thereof so as to pivot between a first position in which said means on said one end of the lever is out of engagement with said film perforation to permit movement thereof and a second position in which said means on said one end of the lever engages with the film perforation to prevent movement thereof, spring means being provided for normally biasing said lever into said second position.

4,100,583

THIN-FILM MAGNETIC HEAD FOR READING AND WRITING INFORMATION

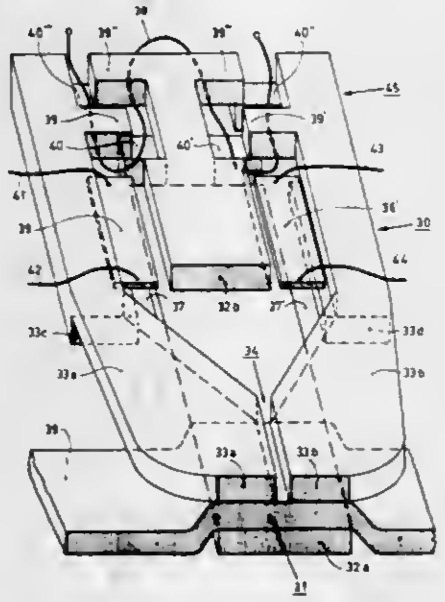
Gerrit J. Koel; Frederik W. Gorter, and Jan T. Gerkema, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,050

Claims priority, application Netherlands, Jul. 17, 1975, 7508533

Int. Cl.² G11B *5/30*

U.S. Cl. 360—113 **2 Claims**



1. A thin-film magnetic head for reading information from and writing information in a track of an associated magnetic recording medium, comprising a magnetically permeable yoke, means coupled thereto for applying a writing current, and a magneto-resistive reading element bridging a gap between two parts of the yoke, said yoke having three limbs: a central limb located in a first plane, and two outer limbs located in a second plane and meeting each other at the area of the central limb while forming a writing/reading gap between the central limb and the outer limbs, an auxiliary gap being present between the outer limbs at the area of the center of the central limb, and that each outer limb, in a place spaced from the writing/reading gap, is separated from the central limb by a gap, said gaps being each bridged by a magneto-resistive element, said magneto-resistive elements cooperating with an associated electric circuit which includes means whereby their signals are subtracted from each other and the difference signal is used to control the position of the head relative to the center of the track.

4,100,584

TRANSDUCER HEAD WITH NARROW CORE STRUCTURE

Michael Isaac Behr, South Pasadena; KoKo Gyi, Thousand Oaks, and Werner Brutsch, Garberville, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 643,994, Dec. 11, 1975, abandoned, which is a division of Ser. No. 587,429, Jun. 16, 1975, Pat. No. 4,017,965. This application Sep. 26, 1977, Ser. No. 836,783

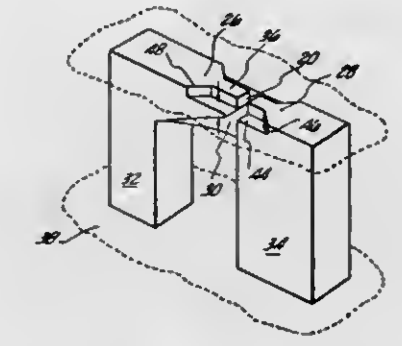
Int. Cl.² G11B *5/22, 5/42;* H01F *7/06*

U.S. Cl. 360—125 **9 Claims**

1. A multiple magnetic head comprising:

a non-magnetic base having a plurality of elongated apertures formed therethrough, said apertures extending in parallel and having center lines spaced equidistantly from each other; and

a ferrite magnetic core member bonded in each one of said apertures and each including a core gap of 100μ inches or less extending in a plane normal to the center line of the apertures, said cores each having laser trepanned surface regions on both sides of the gap forming parallel slots, across said core gap, said slots being spaced apart to define a narrow core portion therebetween having an effective core width within the range of 0.5 mil—1 mil and having



a throat height at least equal to the length of the gap, said slots having a length greater than the length of said core gap and said slots having a long axis extending in parallelism with the center lines of said apertures and having skewed longitudinal ends.

4,100,585

MAGNETIC-TAPE GUIDE ARRANGEMENT

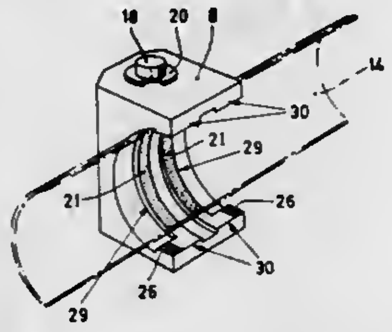
Nanno Van Slageren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,348

Claims priority, application Netherlands, Feb. 4, 1976, 7601106

Int. Cl.² G11B *15/60*

U.S. Cl. 360—130 **2 Claims**



1. A magnetic tape guide arrangement for a transverse scan tape recorder, comprising a head disc rotatable about an axis parallel to a direction of movement of a magnetic tape; two at least partly cylindrical drums coaxial with said axis with one drum disposed each opposite side of the head disc; a pressure piece; means for mounting said pressure piece to be transversely movable relative to said axis of rotation; and resilient means pressing the pressure piece against said drums when said recorder is in an operating condition, each of the drums having a convex guide portion and the pressure piece having concave guide portions disposed to either side of the head disc contacting and guiding the magnetic tape in a locally cupped condition past said head disc, the axial distance between the convex guide portions being greater than the axial distance between the concave guide portions and the pressure piece being located so that an axially extending gap is formed between each concave guide portion and the respective nearer convex guide portion, said drums and said pressure piece having respective convex and concave supporting portions of substantially equal radius of curvature disposed adjacent to the edges of the magnetic tape, said pressure piece and drums contacting each other at said respective supporting portions in response to pressing by said resilient means,

wherein said concave supporting portions and said respective convex supporting portions are disposed axially to each side of the head disc at an axial distance from each other at least as great as the distance between the convex guide portion of one drum and the convex guide portion of the other drum.

4,100,586

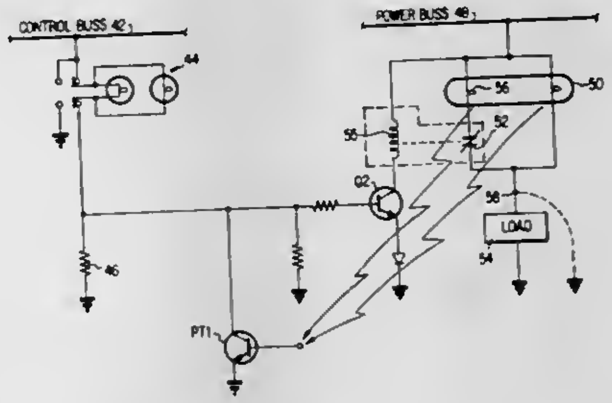
TUNGSTEN LAMP CIRCUIT FOR CURRENT LIMITING AND FAULT INDICATION

Michael Joseph Cronin, Sherman Oaks, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 30, 1976, Ser. No. 755,657

Int. Cl.² H02H *3/16*

U.S. Cl. 361—58 **21 Claims**



1. A current limiting and fault indicating circuit comprising:

first and second power supply terminals;

a load having first and second load terminals, said first load terminal being connected to said first power supply terminal;

first and second lamp filament means connected in parallel between said second power supply terminal and said second load terminal for limiting the flow of current through said fault indicating circuit in the event of a short circuit, for indicating the occurrence of the short circuit by the emission of visible light, and for indicating the status of said lamp filament means; and

switching means for effectively removing one of said lamp filament means from the circuit in response to the occurrence of a short circuit thereby further limiting the flow of current through the circuit as a result of the short circuit.

4,100,587

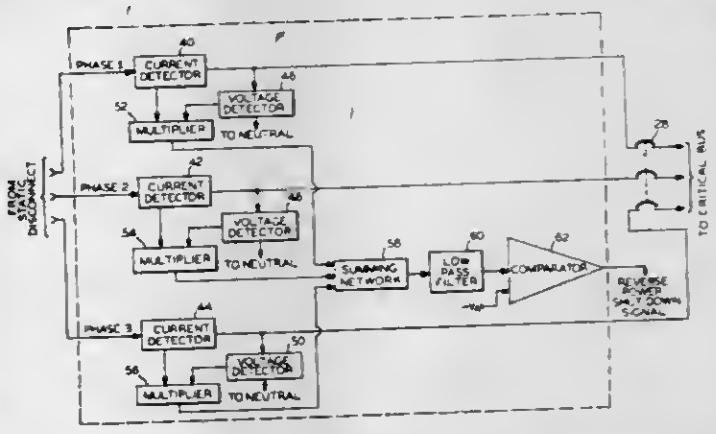
CIRCUIT FOR DETECTING THE FLOW OF AN EXCESS OF REVERSE POWER FROM A LOAD TO A POWER SYSTEM

Thomas E. Anderson; Steven C. Peak, both of Normal, and Ole N. Ibsen, Bloomington, all of Ill., assignors to General Electric Company, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,102

Int. Cl.² H02H *3/42*

U.S. Cl. 361—82 **21 Claims**



1. In a multi-phase uninterruptible power system including a rectifier connected to an AC source, a battery, and an inverter connected to said rectifier and said battery for delivering mul-

ti-phase AC power to a critical load, a circuit disposed between said inverter and the critical load for detecting the flow of an excess of reverse power from the load to said uninterruptible power system is comprised of:

- (a) means within each phase for generating a signal indicative of the instantaneous current flowing within each said phase between said uninterruptible power system and the load;
- (b) means within each phase for generating a signal indicative of the instantaneous output voltage for each said phase of said uninterruptible power system;
- (c) means for multiplying the signal indicative of the instantaneous voltage by the signal indicative of the instantaneous current in each said phase to generate a signal indicative of the instantaneous power flowing within each said phase between said uninterruptible power system and the load;
- (d) means for summing each signal indicative of the instantaneous power for its respective phase; and
- (e) means, responsive to the summed signal, for generating a signal to cause the disconnection of said uninterruptible power system from the load when an excess of reverse power is flowing from the load to said uninterruptible power system.

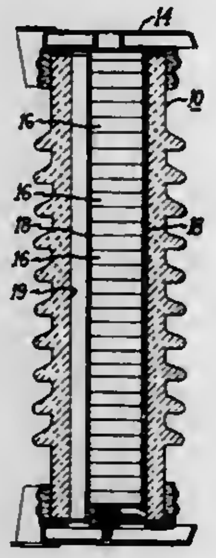
4,100,588
ELECTRICAL OVERVOLTAGE SURGE ARRESTER WITH VARISTOR HEAT TRANSFER AND SINKING MEANS

James S. Kresge, Pittsfield, Mass., assignor to General Electric Company, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,007

Int. Cl.² H02H *3/22*

U.S. Cl. 361—127 **22 Claims**



1. An electrical overvoltage surge arrester, comprising:
a hollow, insulating housing including electrical terminals;
at least one varistor unit containing at least one varistor, said unit being disposed in said housing and electrically connected in series with two of said terminals;
an individual collar of resilient, electrically insulating, thermally conducting material encircling the unit about at least a portion of the perimeter of said unit, said collar being in direct thermally conducting contact with said varistor and with the inside wall of said housing,
said collar including a venting portion which is spaced from said wall to define a venting passageway connecting portions of the interior of said housing to either end of said housing.

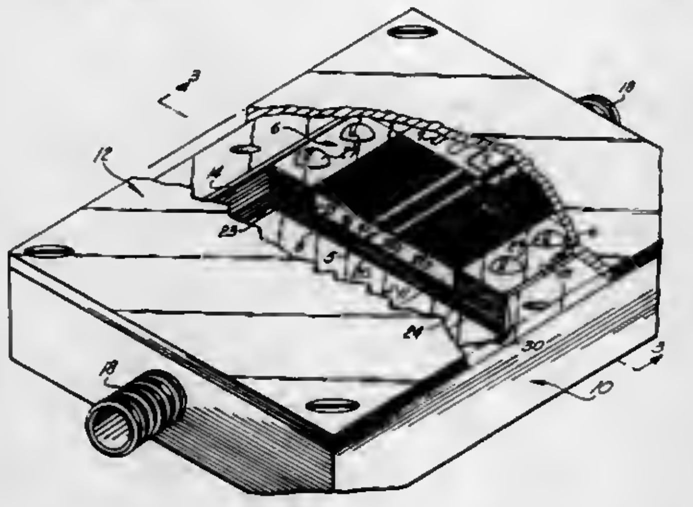
4,100,589
MICROCIRCUIT DEVICE INCLUDING HYBRID CIRCUIT CARRIER

William Edward McGann, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 596,853, Jul. 17, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,601

Int. Cl.² H05K *5/00*

U.S. Cl. 361—399 **7 Claims**



1. A microcircuit device comprised of: a plurality of substrates each having circuitry formed thereon and each of which must be placed in a certain predetermined alignment with respect to at least another of said substrates; a plurality of carriers each associated with a respective substrate and each having a bonding surface to which the respective substrate is to be secured, the boundaries of said bonding surfaces in each case being defined by locating members which are associated with and extend outward from said bonding surface of said carriers, said locating members being spaced apart on said bonding surface by a distance closely matching a longitudinal dimension of said respective substrate, said substrate being positioned therebetween, and closely received thereby so as to provide a certain predetermined alignment, established by the position of said locating members, between each of said substrates and its respective carrier; bonding material for securely bonding each of said substrates to its respective carrier in said predetermined alignment established by said locating members; a housing including a base for partially enclosing all of said carriers and their respective substrate and a cover which may be removably connected to the base to complete the enclosure of said carriers and substrates; and, securing means for removably securing each of said carriers to said base of said housing in preselected positions with respect to one another which have been selected so that the cooperative result of the alignment of said substrates with respect to said carriers and said carriers with respect to said housing is such as to provide the required alignment of said substrates with respect to one another, whereby each said substrate is properly aligned and is readily replaceable within said housing.

4,100,590
SCENE-BRIGHTNESS-DEPENDENT CONTROL OF FLASHBULB FLASH DURATION

Eduard Wagensonner, Aschheim, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

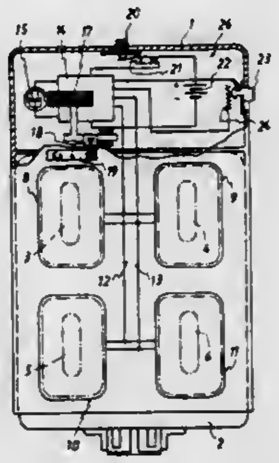
Filed Oct. 22, 1976, Ser. No. 734,988

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1975, 7535234[U]

Int. Cl.² G03B *15/02*

U.S. Cl. 362—16 **9 Claims**

1. An arrangement for effecting scene-brightness-dependent control of the duration of the flash produced by a flashbulb flash unit having at least one flashbulb, the arrangement comprising, in combination, a housing so configured and dimensioned that it can be pushed over and onto the flashbulb flash unit, the housing being provided with at least one controllable-transparency optical unit located to occupy the position in front of the at least one flashbulb of the flash unit when the housing has been pushed into place over the flash unit, and an automatic scene-brightness dependent flash-duration control circuit in the housing connected to the optical unit and operative for controlling the duration of the flash produced by the flashbulb by keeping the optical unit transparent for a scene-brightness-dependent exposure interval and then automatically rendering the optical unit non-transparent, the flash-duration control circuit comprising a battery in the housing, a light sensor in the housing positioned to receive scene light, a light-measuring circuit in the housing and connected to the battery and to the light sensor and operative for generating a signal indicative of total scene light, and a threshold circuit in the housing and connected to the light-measuring circuit and to the controllable-transparency optical unit and operative for rendering the latter non-transparent when the signal generated by the light-measuring circuit has reached a value corresponding to a predetermined total of scene light.



4,100,591
ILLUMINATION UNIT FOR MICROFILM READERS

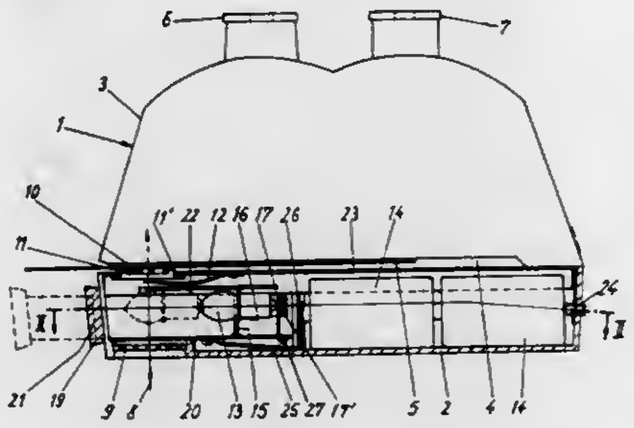
Rudi Schael, Kandinskystr. 27, D-8 Munchen 71, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,394

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1975, 2503379

Int. Cl.² F21L *7/00;* F21V *13/02, 23/04*

U.S. Cl. 362—190 **7 Claims**



1. An illumination device for a microfilm viewer, particularly for a microfilm viewer of the binocular microscope type, wherein the microfilm can be selectively illuminated directly by a light source which is either internal or external independently of each other and wherein the internal light source is independent of an outside source of energy, the improvement comprising a housing permanently attached to the microfilm viewer, a condensing lens disposed in a wall of said housing, a diffusion screen disposed in an opposite wall of said housing along the optical axis of said lens in front of said microfilm, a light bulb and a light bulb support member in said housing displaceable from a first position away from said diffusion screen to a second position placing said light bulb substantially at said optical axis behind said diffusion screen, a push-pull handle displacing said light bulb support member from said first position to said second position, switch means actuated by said push-pull handle for turning on said light bulb in said first position, a cover plate for said lens operated simultaneously by said push-pull handle for uncovering said lens when in said first position and covering said lens when in said second position, and an electrical power supply connected across said light bulb through said switch means.

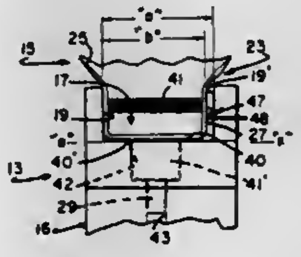
4,100,592
PROJECTION LIGHTING ASSEMBLY AND LAMP UNIT FOR USE THEREIN

Charles E. Henkel, Winchester, and C. Daniel Holmes, Lexington, both of Ky., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 22, 1976, Ser. No. 753,339

Int. Cl.² H04M *1/22*

U.S. Cl. 362—191 **19 Claims**



1. A projection lamp unit for use within an electrically insulative socket defining an opening therein having first and second spacedly positioned and parallel upstanding flat walls, said projection lamp unit comprising:
a base member including a receptacle portion, and a boxlike seating portion for being positioned within said opening within said socket;
a reflector securedly positioned within said receptacle portion of said base member;
a projection lamp securedly positioned within said receptacle portion of said base member in a substantially coaxial relationship with said reflector; and
biasing means located only on one side of said boxlike seating portion of said base member for positively engaging said first upstanding flat wall of said opening to bias said seating portion against said second upstanding flat wall and provide an interference fit between said seating portion and said upstanding flat walls of said socket.

4,100,593
GAS OPERATED UNDERWATER LAMP

Joseph N. Bond, 28 Sarina Dr., Commack, N.Y. 11725

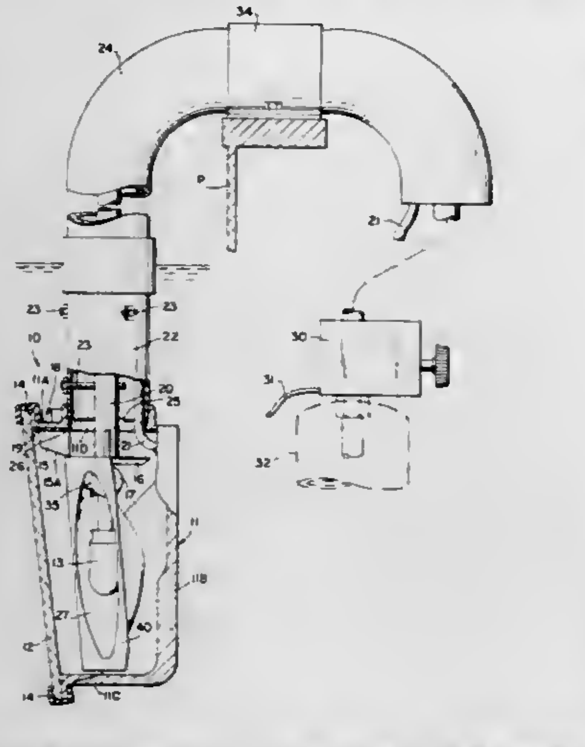
Filed Dec. 20, 1976, Ser. No. 752,020

Int. Cl.² F21V *29/00*

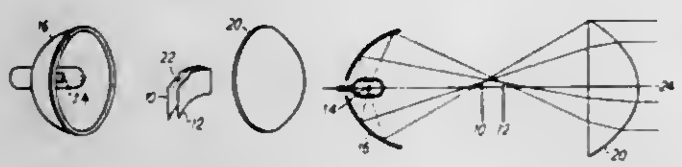
U.S. Cl. 362—267 **9 Claims**

1. A gas operated underwater lamp which comprises a watertight housing having a frontal opening, a translucent cover disposed across said opening and covering same, said cover being connected to the housing in watertight sealed relationship therewith, at least one gas burning incandescent mantle disposed within said housing, first conduit means extending into said housing and communicating with said mantle to supply gas thereto for burning thereby, second conduit means extending into said housing and communicating therewith to vent therefrom products of combustion resulting from the burning of said gas, said housing and cover having heat trans-

fer surfaces which cooperate with said mantle to prevent accumulation within the housing of condensate from products of combustion, when said housing is submersed in a cooling liquid, said housing having a top, a bottom and at least one side wall, said bottom of the housing, each side wall of the housing and said cover having respective coefficients of heat transfer all of which are less than the coefficient of heat transfer of the top of the housing whereby when the lamp is in operation, the top of the housing is cooler than said cover and other portions of the housing.

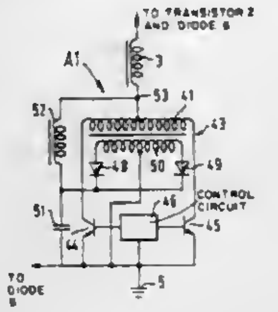


4,100,594
SUPPRESSION OF COLOR FRINGING IN LAMPS
Allan Victor Stewart Gould, London, England, assignor to Thorn Electrical Industries Limited, London, England
Filed Aug. 23, 1976, Ser. No. 716,577
Int. Cl.² F21M *3/00;* **F21P** *5/00*
U.S. Cl. 362—308 **13 Claims**



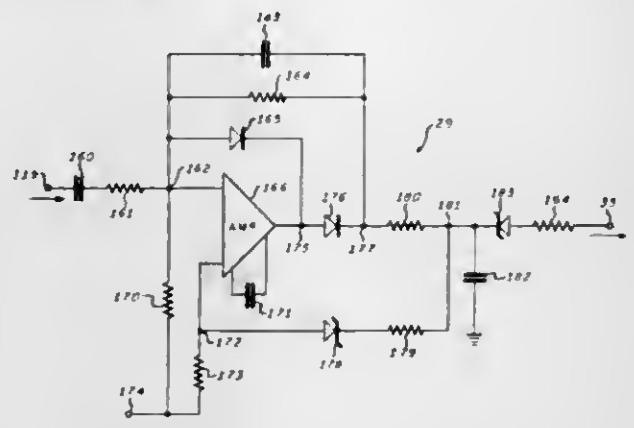
1. A lamp having an optical system for reduction of colour fringing comprising a light source, a projection lens, a mask disposed between the light source and the projection lens to define a cut-off in the projected beam and an optical element forming an image of the light source at or near the mask characterised in that for the mask comprises a nearer mask element which is nearer to the projection lens and a further mask element which is further from the projection lens, the said optical element forming a light source image between the said mask elements, the projection lens has first and second parts which are aligned generally with the masked and unmasked areas of the light source image, the nearer mask element is between the projection lens and the focus of the said first part of the projection lens whereby the said first part produces a virtual erect mask image and the further mask element is located between the light source and the focus of the second part of the projection lens whereby the second part produces a real inverted mask image.

4,100,595
CIRCUIT FOR THE PRODUCTION OF AN OUTPUT VOLTAGE DEPENDING ON AN INPUT DIRECT VOLTAGE AND A GIVEN DESIRED VOLTAGE
Werner Pollmeier, Verl, Fed. Rep. of Germany, assignor to Nisdorf Computer AG, Paderborn, Fed. Rep. of Germany
Filed Nov. 24, 1976, Ser. No. 744,512
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554825
Int. Cl.² H02M *3/335*
U.S. Cl. 363—133 **5 Claims**



1. In a circuit for the production of an output voltage depending on an input direct voltage and a given desired voltage having a series connection comprising a longitudinal regulating member, an inductor and a push-pull current transformer which produces said output voltage and which is fed with said input direct voltage, said inductor and said push-pull current transformer being connected in parallel with a diode which becomes loaded at inductive cut-off voltages in the pass direction, the improvement comprising wherein said push-pull current transformer has a series connection of an impedance coil and a capacitor connected in parallel therewith and a pair of diodes symmetrically connected to said push-pull transformer at the one ends thereof and to each other and a connecting point between said impedance coil and said capacitor at the other ends thereof whereby voltages which are derived symmetrically from said push-pull transformer are conducted each through at least one of said pair of diodes to said capacitor.

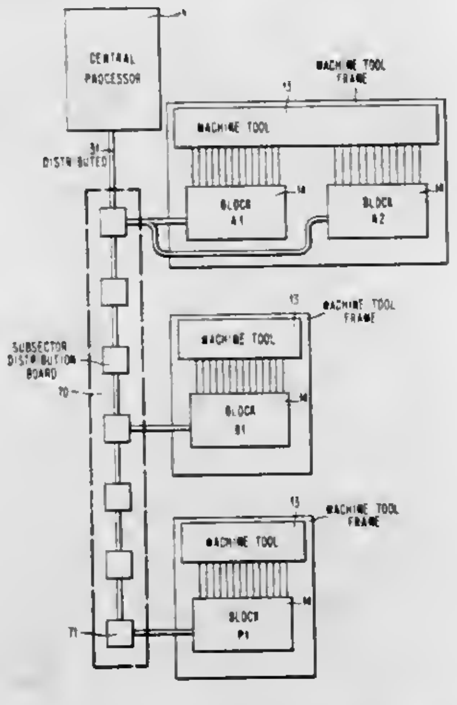
4,100,596
PROTECTED AIRCRAFT POWER AND PHASE CONVERTER
Arland I. Olafson, and Alfred C. Setter, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Mar. 18, 1977, Ser. No. 779,421
Int. Cl.² H02M *5/293*
U.S. Cl. 363—148 **10 Claims**



1. Protected power conversion apparatus adapted to be responsive jointly to aircraft single phase alternating current power supply means and to aircraft direct current power supply means for generating three-phase alternating current aboard an aircraft of substantially greater power level than the maximum power level of said aircraft single phase power supply means, comprising:

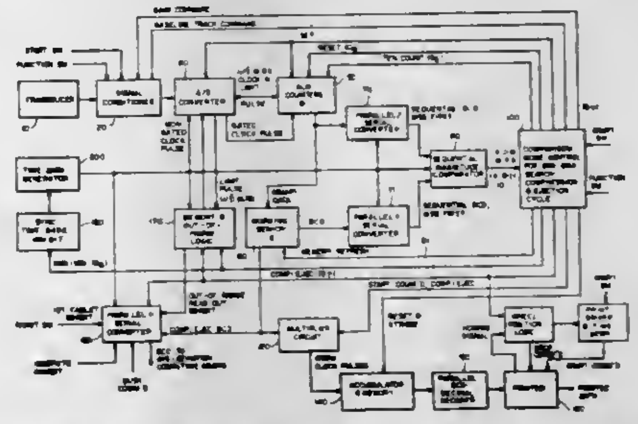
passive network means for shifting the phase of said single phase alternating current by substantially 90°,
gain control amplifier means having signal input means responsive to said network means,
push-pull power amplifier means responsive to said gain control amplifier means,
output transformer means having secondary winding means for providing discrete three-phase output currents,
    said output transformer means having first and second primary winding means,
        said first primary winding means having center tap means,
        said first primary winding means being responsive to said push-pull power amplifier means, and
        said second primary winding means being responsive to said single phase alternating current,
impedance means coupled to said center tap means for sensing the level of said three-phase output currents with respect to a predetermined safe value, and
limiter means responsive to said impedance means for generating a control signal only when said predetermined safe value is exceeded,
said signal input means thereupon being responsive to said limiter means control signal by reducing the output of said gain control amplifier means substantially to zero.

4,100,597
COMPUTER CONTROLLED DISTRIBUTION APPARATUS FOR DISTRIBUTING TRANSACTIONS TO AND FROM CONTROLLED MACHINE TOOLS HAVING MEANS INDEPENDENT OF THE COMPUTER FOR COMPLETING OR STOPPING A TOOL FUNCTION INITIATED BY A COMPUTER TRANSACTION
Alan J. Fleming, Ponghquag, N.Y., and Larry W. Holmstrom, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 2, 1976, Ser. No. 673,161
Int. Cl.² G06F *15/46*
U.S. Cl. 364—474 **6 Claims**



1. A system for controlling a plurality of machine tools comprising
a central processor containing control programs for said machine tools,
a plurality of tool controllers each operatively associated with a machine tool and under the control of said central processor through data instructions communicated from said central processor, and
a multiple channel data bus connected between the central processor and each of the controllers for the communication of said data instructions and other data transactions between the processor and a controller by the transferring of parallel bits of data to and from the processor,
each of said controllers comprising
    at least one tool control unit, adapted, in response to data instructions communicated from the central processor, to provide a digital output to the associated machine tool for controlling a tool function and/or for receiving from said tool, a digital input indicative of a tool condition, and
    means for completing a controlled tool function initiated by a data instruction transaction from the central processor after all data transactions are completed and the processor is no longer in communication with the tool controller.

4,100,598
TABLET PRESS RELATED INSTRUMENTATION FOR USE IN DEVELOPMENT AND CONTROL OF FORMULATIONS OF PHARMACEUTICAL GRANULATIONS
Donald Melvyn Stiel, Pinebrook; Charles Robert Browski, Jersey City; Eric Neugroschel, Metuchen, and Joseph James Williams, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 610,706, Sep. 5, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,141
Int. Cl.² G06F *15/00;* **B28B** *3/00;* **B29C** *3/06*
U.S. Cl. 364—476 **13 Claims**



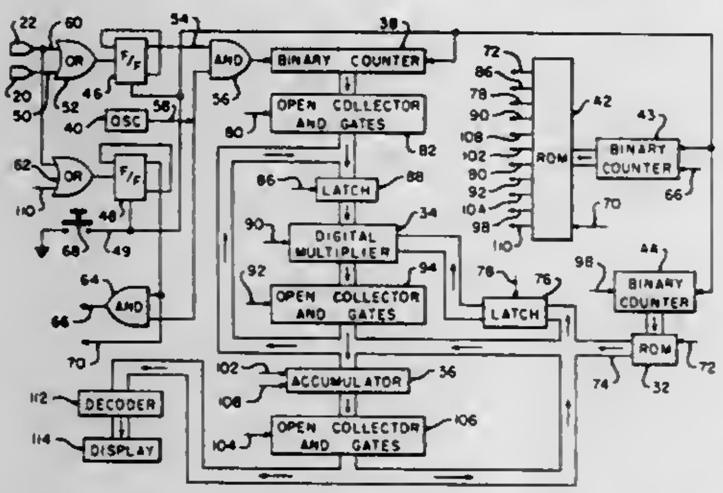
1. Apparatus for use in the development of tabletted granulations comprising:
first means mounted on a tablet press for sensing the forces effected in the tabletting of a granulation and for generating therefrom an analog signal containing compression force and ejection force peak information;
second means connected to said first means for converting said analog signal to a digital representation thereof; and
third means responsive to said second means for automatically distinguishing compression force from ejection force for any one or more tablet formations and for individually deriving in digital form peak compression force and ejection force for each such tablet formation.

4,100,599
METHOD AND APPARATUS FOR DETERMINING VELOCITY OF A MOVING MEMBER
Robert B. Nally, Waterloo, Canada, assignor to NCR Canada Ltd. - NCR Canada LTEE, Mississauga, Canada
Filed Dec. 22, 1976, Ser. No. 753,044
Int. Cl.² G01P *3/36;* **G06F** *15/20*
U.S. Cl. 364—565 **16 Claims**

7. A system for generating a value of the velocity of a moving member comprising:
(a) means for generating a signal representing the time (t) of movement of the member through a predetermined distance (d);
(b) means for storing the value of time;

(c) means for storing values representing the velocity and the successive derivatives of the velocity at a preselected mean value of the time (t_m) of movement through said distance;

(d) and means for adding and multiplying the value of time and the values representing the velocity and the successive derivatives of the velocity to derive a value of the velocity of the moving member in accordance with the terms of a Taylor series expansion of the equation *d/t* developed using the following equation:



$$V^n(t_n) = [d^nV(t)/dt^n]$$

wherein $t = t_m$
$n = n^{th}$ derivtive.

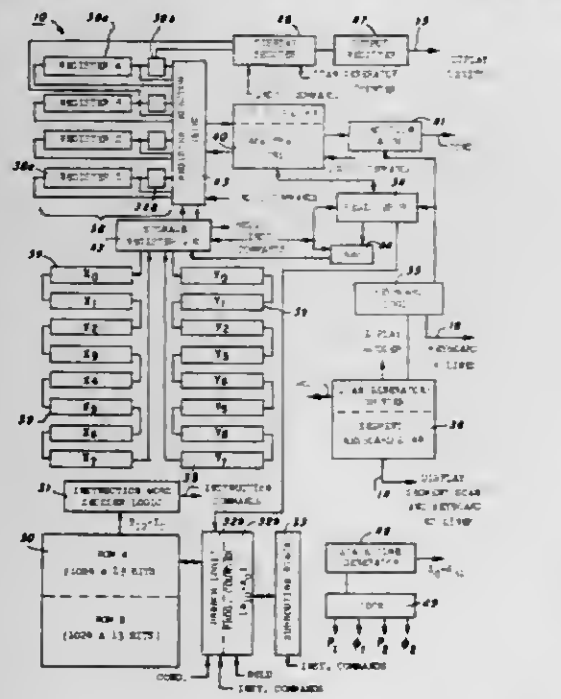
4,100,600

DATA DISPLAY SYSTEM FOR ELECTRONIC CALCULATOR OR MICROPROCESSOR

Larry L. Miles, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,274
Int. Cl.² G06F *3/14*

U.S. Cl. 364—710 **6 Claims**



1. An electronic calculator system having an input means for receiving numeric data and function commands, an arithmetic unit for performing arithmetic operations on the numeric data received by said input means, a memory for storing a number of instruction words and addressable in response to said function commands, instruction word decoder means for decoding instruction words and for controlling said arithmetic unit in response thereto, first and second operational registers for storing numeric data received by said input means and numeric data outputted from said arithmetic unit and a display means for displaying numeric data stored in a first one of said operational registers, said electronic calculator system characterized in that a display decoder is provided, said display decoder comprising:

(a) first logic means responsive to the contents of said first one of said operational memories for providing signals to said display means for actuating said display means to provide a visual display of the numerals represented by the data stored in said first one of said operational registers and

(b) second logic means responsive to the contents of a second one of said operational registers for selectively suppressing said signals to said display means and for providing further signals to said display means enabling said display means to provide a visual display of at least one decimal point.

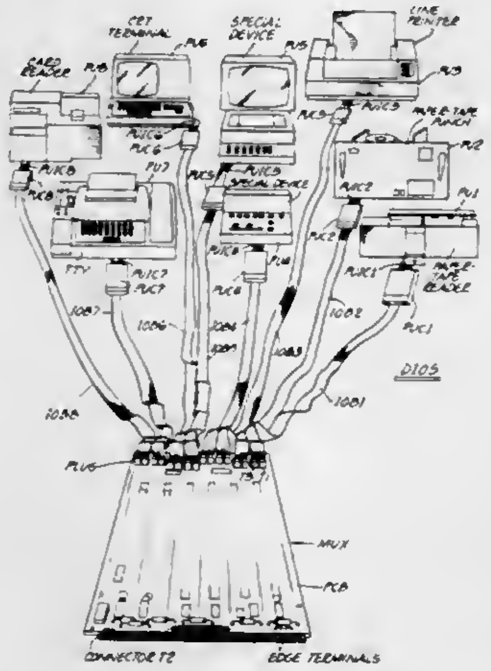
4,100,601

MULTIPLEXER FOR A DISTRIBUTED INPUT/OUT CONTROLLER SYSTEM

Phillip A. Kaufman, Irvine, and Jerry R. Washburn, Alhambra, both of Calif., assignors to Computer Automation, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 644,412, Dec. 24, 1975. This application Jan. 9, 1976, Ser. No. 647,762
Int. Cl.² G06F *3/00, 5/04*

U.S. Cl. 364—200 **9 Claims**



1. In a system for interconnecting a computer unit and at least one peripheral unit and for managing the transfer of sets of data signals from one such peripheral unit to said computer unit, each such set of data signals being coded to represent a word or a portion thereof, and each data signal of each such set having one of a plurality of logic levels, each set of data signals transmitted from said peripheral unit including one signal of each set that represents the parity state of other signals in said set,

a device for selectively forcing the logic level of said one data signal of each set to a predetermined value, said device comprising:

means for selecting said one data signal;

means controlled by signals from such computer unit for selecting a predetermined logic level for said selected one data signal;

logic circuit means for receiving said selected data signal and adapted to transfer said selected data signal with other data signals of such set to said computer unit and for substituting for said selected data signal a substitute data

signal having a logic level equal to said selected predetermined logic level; and

means to transfer to said computer unit said substitute signal in place of said selected signal, and also to transfer the remainder of said set of data signals to said computer unit.

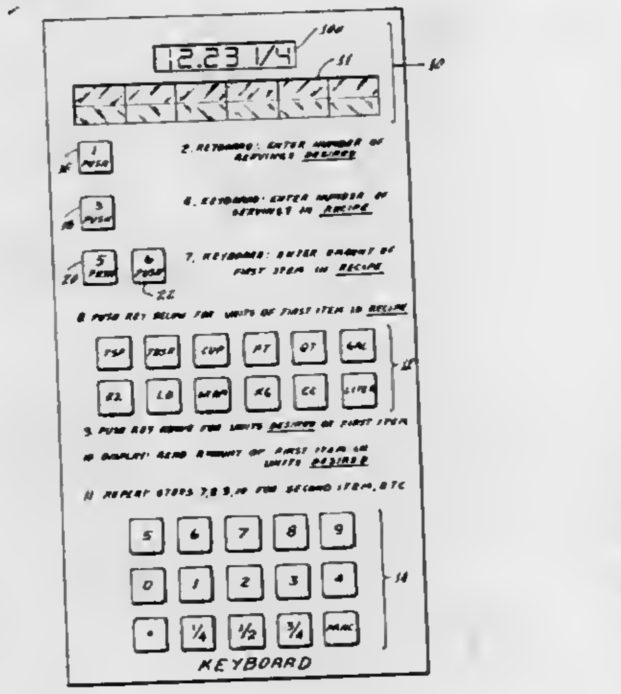
4,100,602

RECIPE CONVERSION CALCULATOR

Ascher H. Shapiro, Jamaica Plain, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 10, 1976, Ser. No. 740,638
Int. Cl.² G06F *5/00*

U.S. Cl. 364—715 **7 Claims**



1. For converting recipes from a given number of servings and given units of measure to a desired number of servings and desired units of measure, a calculator including:

a control panel having keys and associated indicia describing a series of steps by which the user enters data and control signals into the calculator in a sequence compatible with the dedicated structure thereof, said control panel including

a numeric keyboard comprising a plurality of individually actuatable keys for entering the desired number of servings, the given number of servings and the given numerical quantity of each ingredient, and

a keyboard comprising a plurality of individually actuatable keys for entering the given units of measure for each ingredient, each of said keys representing and being labeled with indicia denoting a specific unit of measure;

divider means for operating upon signals representing the desired number and given number of servings to establish the ratio of the desired number to the given number;

register means for storing the calculated servings ratio;

divider means for calculating a conversion factor as a function of desired units and given units of measure;

means for multiplying the signal representing the given numerical quantity of an ingredient by a signal representing the conversion factor to generate a signal representing the correct numerical amount of the ingredient for the desired number of servings and the desired units of measure; and

display means for providing a visual representation of the last-mentioned signal and of the desired units of measure associated therewith.

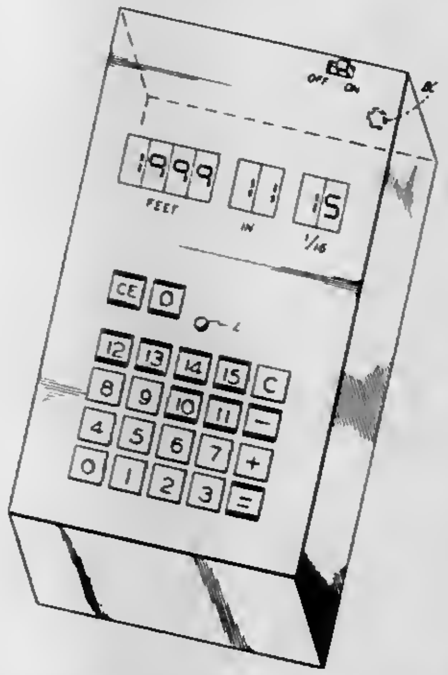
4,100,603

FEET, INCHES AND SIXTEENTHS ADDER

John Oliver Boyd, Houston, Tex., assignor to Joseph Lyndon Boyd, Houston, Tex.

Filed Dec. 16, 1976, Ser. No. 751,448
Int. Cl.² G06F *7/50*

U.S. Cl. 364—771 **23 Claims**



1. Apparatus for adding compound denominate numbers which numbers include a plurality of component dimensions wherein the greatest ratio of the size of any component dimension to that of the next most significant component is *k* and *k* is greater than 10, said apparatus comprising:

A. input means including:
  a keyboard including *k* numerical keys, and encoding means controlled by the keyboard for binary coding all numerals forming a base *k* counting system,

B. operating means including:
  adding means for adding binary coded base *k* numerals,
  modifying means for correcting the result from the adding means when adding numerals belonging to numbers counted in number systems having a base lower than *k*,

C. timing means including:
  entering means for successively feeding the binary coded numerals composing the denominate number from said input means to said adding means, least significant numerals first, and activating the modifying means when numerals belonging to numbers counted in number systems having a base lower than *k* are being added; and

D. output means including:
  readout means to show the corrected result.

4,100,604

FREQUENCY DOMAIN AUTOMATIC EQUALIZER UTILIZING THE DISCRETE FOURIER TRANSFORM

Donald A. Perreault, Thousand Oaks, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 19, 1976, Ser. No. 706,703
Int. Cl.² G06F *7/38*

U.S. Cl. 364—827 **32 Claims**

1. A frequency domain equalizer for automatically equalizing the discrete Fourier components X_n of a received electrical signal $x(t)$ transmitted through a transmission channel comprising:

(a) means for sampling a test pulse transmitted through said transmission channel for providing a discrete set of test sample values f_k, where $k = 0, 1 \ldots N-1$, and N is an integer,

(b) means for calculating the discrete Fourier transform of said test sample values f_k to provide the discrete Fourier components F_n, $n = 0, 1 \ldots N-1$,

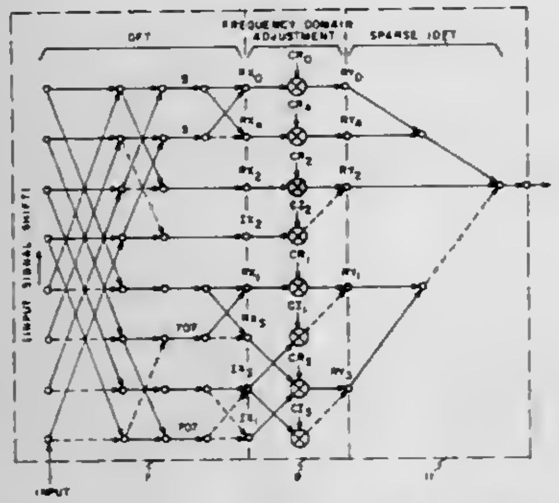
(c) means for providing reference values H_n representing the discrete Fourier components corresponding to an ideal, undistorted test pulse,

(d) means for calculating a correction factor C_n for each value F_n such that

$$C_n \cdot F_n = H_n,$$

(e) means for storing said calculated correction factors C_n,

(f) means for subsequently sampling said received electrical signal $x(t)$ to provide a discrete set of signal sample values x_k, $k = 0, 1 \ldots N-1$,



(g) means for calculating the discrete Fourier transform of said signal sample values x_k to provide the discrete Fourier components X_n,

(h) means for multiplying X_n by the stored correction factors C_n to produce frequency equalized components Y_n for $n = 0, 1 \ldots N-1$ where

$$Y_n = C_n \cdot X_n, \text{ and}$$

(i) means for calculating the inverse discrete Fourier transform of the components Y_n to provide an output signal in the time domain corresponding to said received electrical signal.

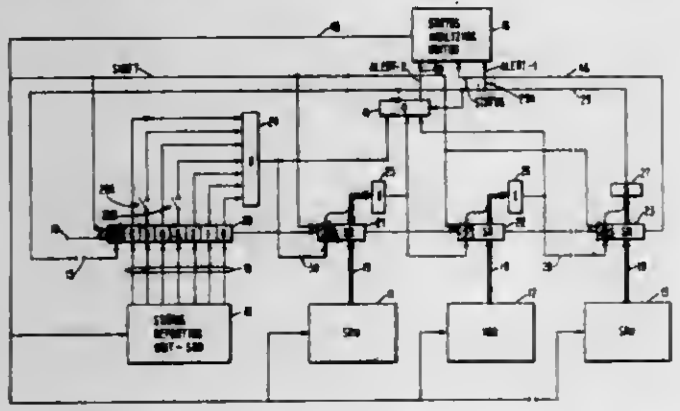
4,100,605
ERROR STATUS REPORTING

Bruce James Holman, Broomfield, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,512

Int. Cl.² G06F *1/00*

U.S. Cl. 364—900 **9 Claims**



1. A digital signal propagation unit, including in combination,

a first plurality of shift registers, each said shift register having a plurality of settable shift register stages, and being interconnected as a single string of serially connected shift registers, and

a plurality less than said first plurality of OR circuits respectively receiving signals from stages of predetermined ones of said plurality of shift registers and each said OR circuits each having an output connected to one of said shift register stages in other than those shift registers from which signals are received by such OR circuit.

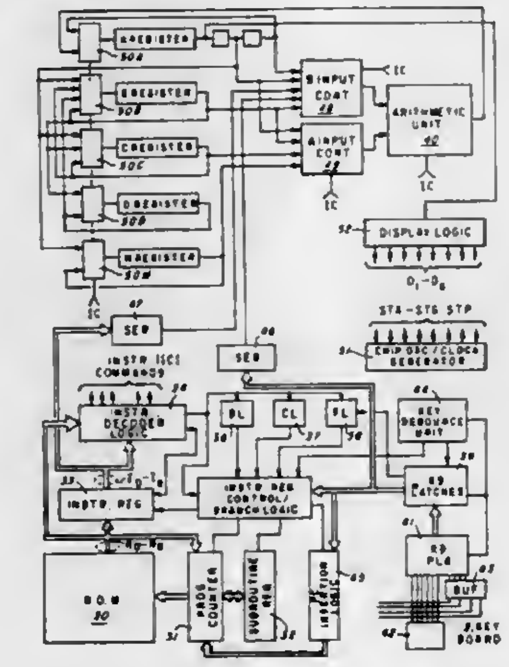
4,100,606
KEY DEBOUNCE SYSTEM FOR ELECTRONIC CALCULATOR OR MICROPROCESSOR

George Lawrence Brantingham, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 9, 1977, Ser. No. 767,086

Int. Cl.² G06F *3/02. 9/00*

U.S. Cl. 364—900 **20 Claims**



1. A key debounce system for an electronic microprocessor system having a data memory for storing numeric data, an arithmetic unit for performing arithmetic operations on the data stored in said data memory, a program counter, an instruction memory for storing a plurality of instruction words controlling the operation of said microprocessor system, including the controlling the transfer of data from said data memory to said arithmetic unit, one of said plurality of instruction words being outputted once each instruction cycle of said microprocessor system according to an instruction word address in said program counter and keyboard sensing means for interfacing said microprocessor system with a keyboard having a plurality of keys, said key debounce system comprising:

(a) means for loading a starting instruction word address in said program counter, said starting instruction word address being generated according to the sensing of the depression of a key on said keyboard by said sensing means, said starting instruction work address being the first address of a set of instruction words collecting said microprocessor system to perform the function indicated by the key depressed;

(b) means for detecting the reading out of particular instruction word from said instruction memory, said particular instruction word being included among said sets of instruction words; and

(c) means for coupling said sensing means and said loading means, said coupling means being disabled after said sensing means has detected a key depression and after said coupling means has coupled information regarding the particular key depressed between said sensing means and said loading means and until:

(i) said detecting means detects the reading out of said particular instruction, and

(ii) no additional key depression is detected by said sensing means during a preselected period having a duration of a plurality of said instruction cycles.

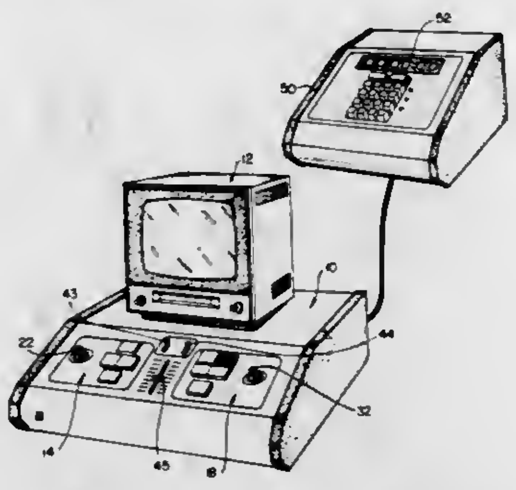
4,100,607
COMPUTER FOR VIDEO TAPE EDITING SYSTEM

William D. Skinner, Newport Beach, Calif., assignor to Convergence Corporation, Irvine, Calif.

Filed Feb. 7, 1977, Ser. No. 765,902

Int. Cl.² G06F *1/00;* **H04N** *5/785*

U.S. Cl. 364—900 **11 Claims**



1. In combination with a video tape editing system for transferring selected video information from a first video tape in a playback video tape recorder to a second video tape in a record video tape recorder, said video tape editing system being controllable to establish a start insert time with respect to the video information transferred from the first video tape to the second video tape, the first and second tapes each having frame-indicating control pulses recorded thereon; a counter circuit connected to said editing system and responsive to the control pulses for producing digital time signals; and a computer connected to the tape editing system and to the counter circuit, said computer including, a digital display circuit, a keyboard, encoding circuitry connected to said keyboard, and logic circuitry connected to said encoding circuitry and to said display circuit to cause the computer to provide an end insert time to the editing system as established by a predetermined time value set up in the display circuit by operation of the keyboard.

4,100,608
EXCHANGE STACK BUFFER MEMORY

Peter K. George, San Jose, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 28, 1977, Ser. No. 773,101

Int. Cl.² G11C *19/08*

U.S. Cl. 365—2 **9 Claims**

1. A magnetic bubble domain memory system comprising

means for establishing and supporting magnetic bubble domains,

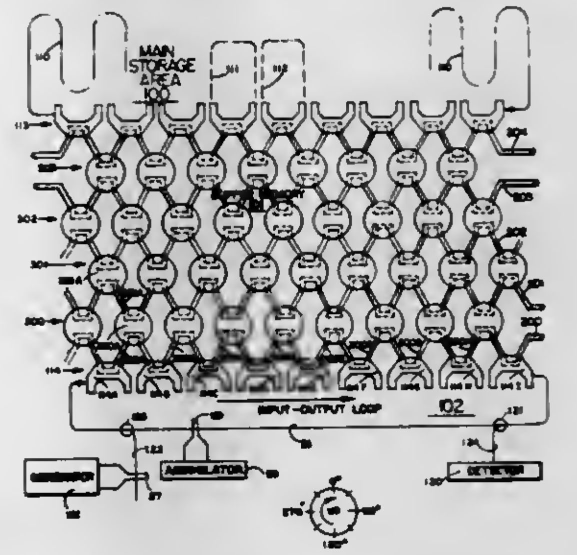
main storage means for storing said magnetic bubble domains,

input-output means for supplying and receiving said magnetic bubble domains to and from said main storage means, and

buffer memory means interposed between said main storage means and said input-output means for temporary storage of said magnetic bubble domains,

said buffer means including an array of discrete storage areas disposed in rows and columns, and

conductor means associated with each row of storage areas in said buffer memory means to selectively control movement of magnetic bubble domains relative to each row of storage areas.



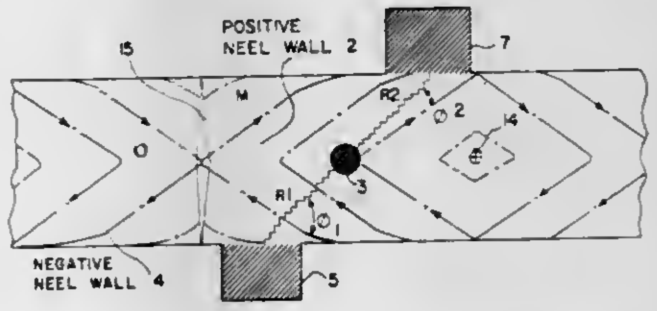
4,100,609
MAGNETORESISTANCE DETECTOR FOR CROSSTIE MEMORIES

Leonard J. Schwee, Colesville; Henry R. Irons, Beltsville; Wallace F. Anderson, Beltsville; Kurt Peter Scharnhorst, Beltsville, and Albert D. Krall, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1976, Ser. No. 720,295

Int. Cl.² G11C *19/08*

U.S. Cl. 365—87 **32 Claims**



13. A serially accessible crosstie memory element, comprising:

a ferromagnetic layer of uniform thickness having regular, symmetrically disposed serriform margins;

a first electrical potential coupled to a first point adjacent to one of the margins;

a second electrical potential coupled to a second point adjacent to one of the margins; and,

a voltage sensitive means coupled across a ground potential and a location disposed about the first and second points and centered between the margins.

4,100,610
ROTATING NOZZLE SPARGING SYSTEM FOR SUSPENSION FERTILIZER TANKS

Douglas Johnston, Decatur, and Robert L. Jannen, Huntsville, both of Ala., assignors to John Blue Company Division of Subscription Television, Inc., New York, N.Y.

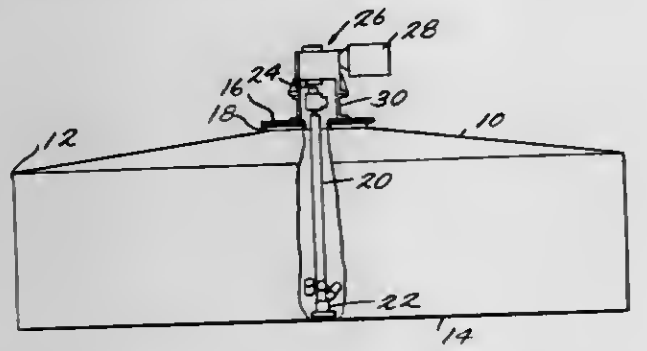
Filed Dec. 23, 1975, Ser. No. 643,644

Int. Cl.² B01F *7/16;* **F16K** *31/12*

U.S. Cl. 366—102 **6 Claims**

1. A sparging means for use in a cylindrical tank having a top, containing liquids having insoluble suspensions therein

that may tend to deposit or crystallize out of the solution on a surface if the liquid is not agitated from time to time, comprising a source for a compressed gas, a distributor means for directing jets of compressed gas periodically against the area to be sparged, said means including a movable header for sweeping said area, means carried on said tank top to rotate said header about a vertical axis cyclically over said area, said drive means including a motor and a hollow shaft connected to said compressed gas source and adapted to be rotatably driven and connected between the motor and the header, said header being supported at the lower end of said shaft and being connected thereto to receive the compressed gas supplied to the hollow shaft, conduit means to deliver compressed gas to said header, a plurality of nozzles on said header and communicating with the compressed gas delivered thereto, each of said nozzles directing jets of compressed gas against different but overlapping confined portions of said area respectively whereby to produce a periodic agitating action over all of the area to be sparged with each cycle that said header sweeps the area, said nozzles being sized progressively to have outlet orifices of 1/16 inch at the end of the header adjacent said axis and 7/32 inch at the end of the header, said compressed gas being supplied in the form of air compressed to a pressure of 150 pounds per square inch, said nozzles having automatically actuated valves therein adapted to close at a pressure of 25 pounds per square inch, and said nozzles project a gas jet having a velocity of 2000 feet per second.



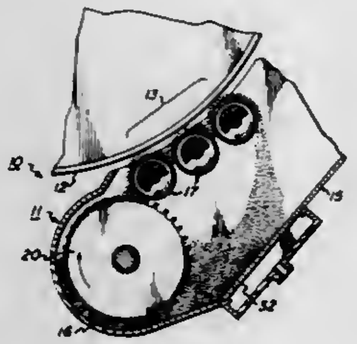
4,100,611
APPARATUS FOR CONTROLLING AIRBORNE PARTICLE EMISSION

Don B. Jugle, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 11, 1976, Ser. No. 685,231

Int. Cl.² B01F *13/06*

U.S. Cl. 366—139 **3 Claims**



1. An improved filtering apparatus for suppressing airborne particle emission from a partially open container comprising

a partially open container for containing a two component powder including a relatively large component and a relatively small component,

means for agitating said two component powder to cause at least a portion of said small component to become airborne particles,

means for generating an air flow into said container through the agitated powder to recombine said airborne particles therewith and

filter means positioned to receive the air flow and any uncombined airborne particles, said filter means having openings smaller than said uncombined particles and being positioned so as to be continuously cleaned by the flow of the two compound powder thereacross.

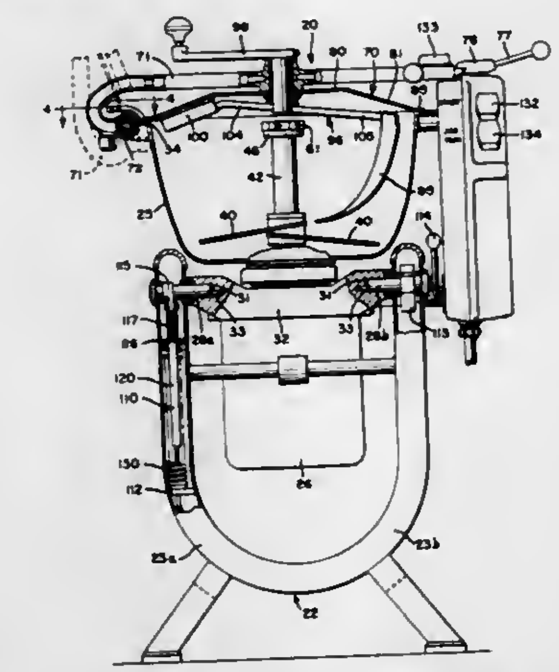
4,100,612
FOOD PROCESSING APPARATUS

Richard D. Hoover; Raymond P. Shaeffer, and Donald A. Brackman, all of c/o Hobart Corporation, World Headquarters, Troy, Ohio 45374

Filed Jun. 6, 1977, Ser. No. 803,460

Int. Cl.² B01F *7/16*

U.S. Cl. 366—143 **9 Claims**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, the improvement comprising:

a. a resilient lid scraper mounted for rotation in scraping contact with the inner surface of the lid,
b. means for rotating said lid scraper around the inner surface of the lid, and
c. the lid being formed of substantially transparent material to provide for viewing the foodstuffs within the bowl with the lid closed and while the motor and food processing blades are being operated without splashing or losing foodstuffs from the bowl, said lid scraper removing and returning foodstuffs from the lid inner surface to the body of foodstuffs within the bowl, and clearing the foodstuffs from said transparent lid for easier viewing when rotated around the inner surface of the lid.

4,100,613
FOOD PROCESSING APPARATUS

Raymond P. Shaeffer, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

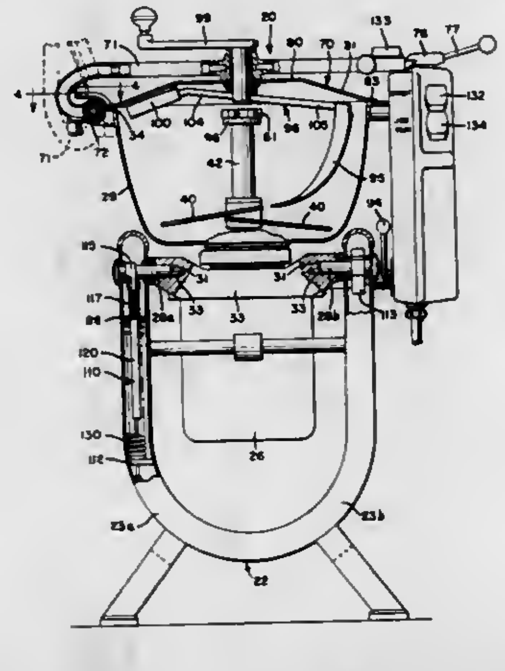
Filed Jun. 6, 1977, Ser. No. 803,458

Int. Cl.² B01F *7/16*

U.S. Cl. 366—143 **5 Claims**

1. A cover system for closing the top of an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl from the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, and food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, comprising:

a. a rigid lid support member,
b. means for securing said lid support member across the top of the bowl,
c. a lid including:
    i. a central flexible portion attached to and supported by said support member,
    ii. an outer stiff portion surrounding and extending from and beyond said central flexible portion, and
    iii. a rim on the outer edge of said stiff portion dimensioned for engaging the upper edge of the mixing bowl, and
d. means for securing said support member and said lid in closed position with said lid rim against the edge of the bowl, and for pressing said support member downwardly against the lid to secure and seal said lid rim against the edge of the bowl, said flexible portion of said lid acting as a spring in response to the downward pressure of said support member thereagainst.



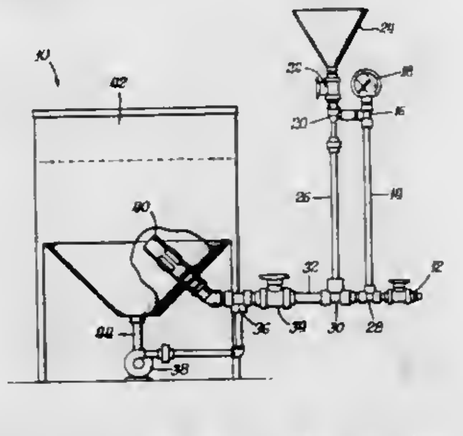
4,100,614
METHOD FOR POLYMER DISSOLUTION

Mikkel G. Mandt, Cedar Falls, Iowa, assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jun. 18, 1976, Ser. No. 697,580

Int. Cl.² B01F *5/02, 5/04, 5/20*

U.S. Cl. 366—154 **4 Claims**



1. In a method for uniformly dissolving a predetermined amount of comminuted organopolymeric water and waste water flocculent in a predetermined amount of water to provide an aqueous flocculent polymer solution containing about .5 percent or less by weight of the flocculent polymer, including the step of introducing the organopolymer flocculent into the interior of a hollow liquid jet of water formed from a pressurized source having a pressure of at least 10 psig. and dispersing the organopolymer flocculent therein to provide a liquid-polymer mixture stream, the improvement comprising subjecting the liquid-polymer mixture stream to ejector mixing in a first ejector mixing zone in which a motive stream of water from a pressurized source having a pressure of at least 10 psig. is provided, and in which said liquid-polymer mixture stream is the educted, secondary stream from said first ejector mixing zone, the ratio of said motive water stream to said secondary polymer mixture being in the range of from about 0.4 to about 1.6, to provide an ejector mixed stream, discharging said ejector mixed stream at a feed pressure of about 10 psig. or less through a second ejector mixing zone as a second motive stream into a tank mixing zone of predetermined volume, said second motive stream serving to educt polymer solution from said tank mixing zone as a secondary stream at a ratio of second motive stream to said tank zone secondary stream in the range of from about 0.4 to about 1.6, and to provide fluid mixing in said tank mixing zone.

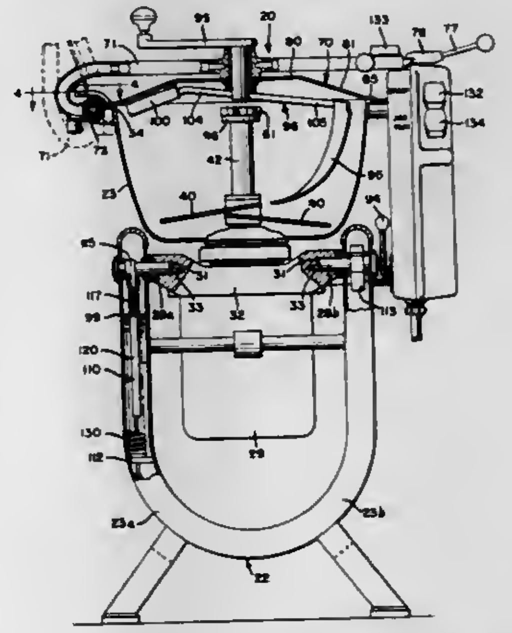
4,100,615
FOOD PROCESSING APPARATUS

James W. Thompson, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,462

Int. Cl.² B01F *7/16*

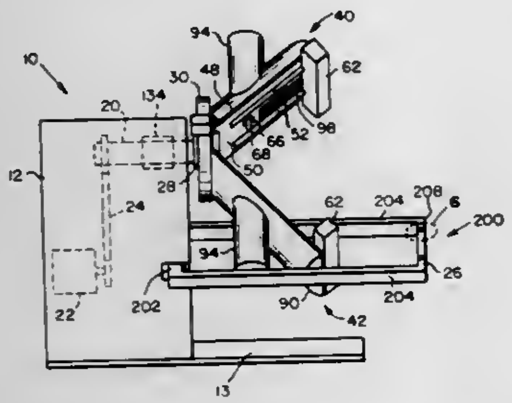
U.S. Cl. 366—169 **1 Claim**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom center thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, a cover system including a lid for closing the top of the bowl, and a mixing baffle blade and support mounted through the center of the lid for rotation along and around the inside surface of the bowl for removing and returning foodstuffs from the side of the bowl to the vicinity of the food processing blades for further processing thereby, the improvement comprising means defining a hollow drive shaft for said mixing baffle blade and support connecting through the center of the lid and being open in the top and bottom thereof for introducing liquids into the mixing bowl directly over the food processing blades and drive shaft while the motor is being operated.

4,100,616
DOCKING STATION

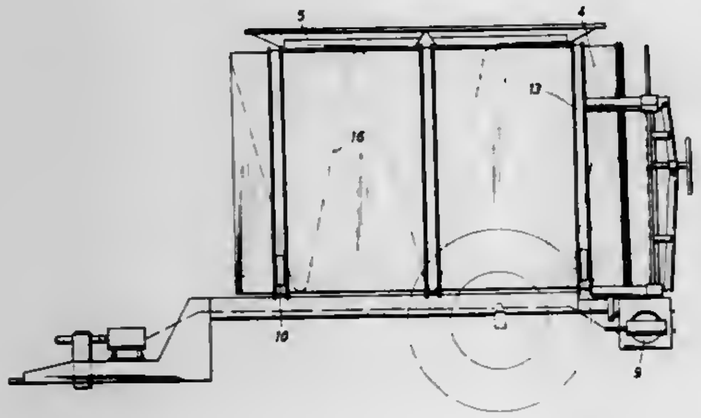
William Wilson, 716 Scott St., Stroudsburg, Pa. 18360
Continuation-in-part of Ser. No. 608,945, Aug. 29, 1975, which is a continuation-in-part of Ser. No. 321,436, Jan. 5, 1973, abandoned. This application Jan. 25, 1977, Ser. No. 762,786
Int. Cl.^{2} B01F *9/04;* **B66C** *1/66*
U.S. Cl. 366—213 **24 Claims**



1. A docking station for supporting and rotating a container comprising a first member, two arms, said arms being coupled to said first member for rotation with said first member and being angularly disposed with respect to each other to define a zone in which a container that is to be supported by said arms will be received, locking means mounted on each of said arms for selective movement into and out of locking engagement with a container to selectively retain it on said arms, means for causing said selective movement coupled to said locking means, and means for rotating said first member.

4,100,617
MIXING AND DISCHARGE APPARATUS

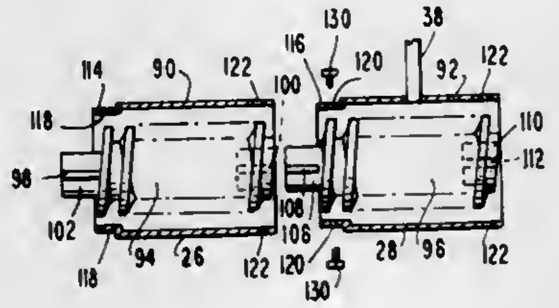
Abraham Hoopman, Aalten, Netherlands, assignor to Hoopman Onderzoek & Ontwikkeling BV, Netherlands
Filed Jul. 6, 1976, Ser. No. 702,430
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1975, 2530553; Oct. 21, 1975, 2546975
Int. Cl.^{2} B01F *9/06*
U.S. Cl. 366—188 **3 Claims**



1. A mixing and discharge apparatus for mixing feed and for uniformly discharging the mixed feed comprising a supporting frame, a hollow drum mounted for rotation on said frame for turning about a longitudinal axis of the drum, means providing an inlet opening into said drum for charging the same with feed, means defining an open discharge end for said drum through which mixed feed may discharge, conveyor plates fixed to the inner wall of the drum for turning with the drum to mix the feed while in said drum and for conveying the feed alone toward said discharge end of the drum, said conveyor plates providing the sole and only conveying of said material in said drum, a cover means mounted at the discharge end of said drum for movement between a closed postion covering said open discharge end of the drum and discharging position in which at least the lower marginal portion of said cover means is spaced from the drum to provide opening for the material to discharge, said cover means including a cover rotatable with said drum, guide means on the circumference of said drum, guide rods attached to said drum being mounted for sliding motion in said guide means, a cylinder means having a piston being located centrally of said cover, links extending radially between said piston and the ends of said guide rods, and anchoring members secured to said cover and supporting said links, said cover being moved by said links between its closed position and its discharge position, and a driven cross feed conveyor below the annular gap.

4,100,618
APPARATUS FOR HIGH INTENSITY SHEAR REFINING OF SOAP

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Continuation-in-part of Ser. No. 575,275, May 6, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,548
Int. Cl.^{2} B01F *7/08*
U.S. Cl. 366—297 **6 Claims**



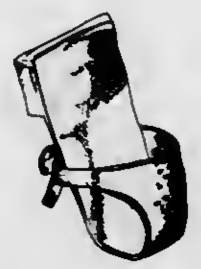
1. An apparatus for the continuous production of soap comprising a plurality of detachable and replaceable sections, each of said sections including a housing and a screw shaft that are coextensive said housing and screw shaft having substantially the same length dimension, each of said screw shafts having flights thereon, each of said sections including means for removably interconnecting said housings and drivingly and removably interconnecting said shafts, and rotating means for rotating said screw shafts at a predetermined rate, said means for drivingly and removably interconnecting said shafts including reduced end portions provided with splines and having complementary sockets and keyways for receiving said end portions and splines, whereby said screw shaft and housing of each section are simultaneously connectable or removable as a unit.

DESIGNS

JULY 11, 1978

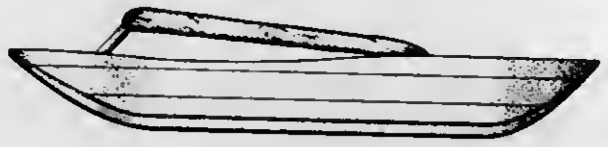
248,426
CHAIR BACK ATTACHABLE BABY RETAINING ARTICLE

Mary Jane Hill, and John R. Hill, both of 3425 W. Gelding Dr., Phoenix, Ariz. 85053
Filed May 3, 1976, Ser. No. 682,206
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—27



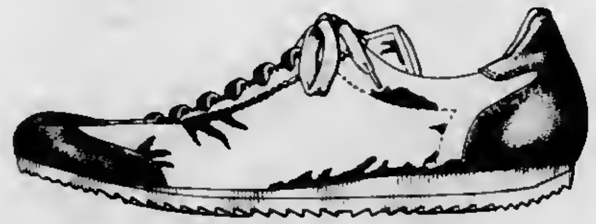
248,427
SANDAL

James K. Wong, 46-194 Nona Loop, Kaneohe, Hi. 96744
Filed Sep. 13, 1976, Ser. No. 722,615
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



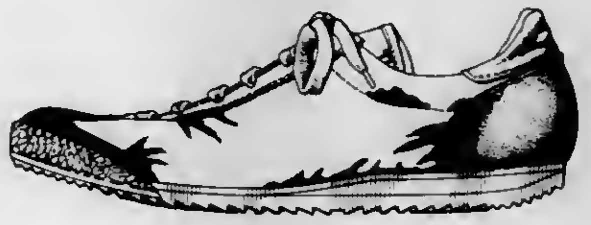
248,428
SPORT SHOE

Sigeoobu Watanabe, Kobe, Japan, assignor to Onitsuka Co., Ltd., Kobe, Japan
Filed Sep. 22, 1976, Ser. No. 725,409
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



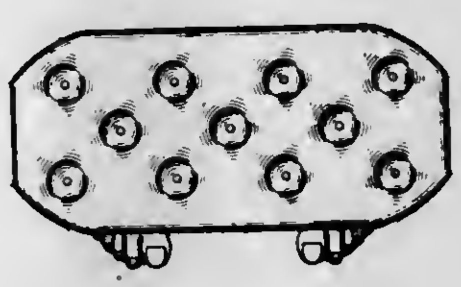
248,429
SPORT SHOE

Masanobu Inohara, Akashi, Japan, assignor to Onitsuka Co., Ltd., Kobe, Japan
Filed Sep. 22, 1976, Ser. No. 725,467
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



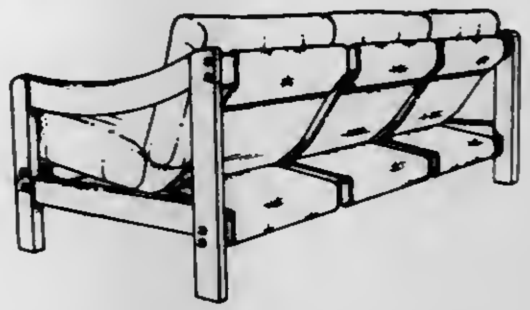
248,430
FOOTSTOOL

Larry E. Bussey, 2537 Seventh St. NE., Canton, Ohio 44704, and James E. Hunter, Jr., 1300 Cherry St. SE., Canton, Ohio 44707
Filed May 6, 1976, Ser. No. 683,663
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



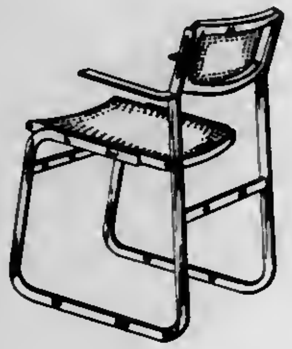
248,431
SOFA OR SIMILAR ARTICLE

Eugene J. Costabile, Oak Lawn, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Nov. 11, 1975, Ser. No. 630,857
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



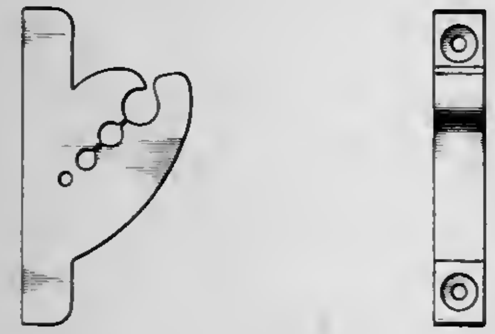
248,432
CHAIR OR SIMILAR ARTICLE

Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc.
Filed Jul. 20, 1976, Ser. No. 706,945
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72



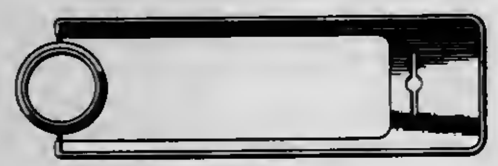
248,433
BRACKET FOR HOLDING FISHING RODS OR THE LIKE

Robert H. McCollum, 2833 Merlin Ave., Fullerton, Calif. 92635
Filed May 27, 1976, Ser. No. 690,533
Term of patent 14 years
Int. Cl. D22—*05;* D6—*04;* D8—*08*
U.S. Cl. D6—125



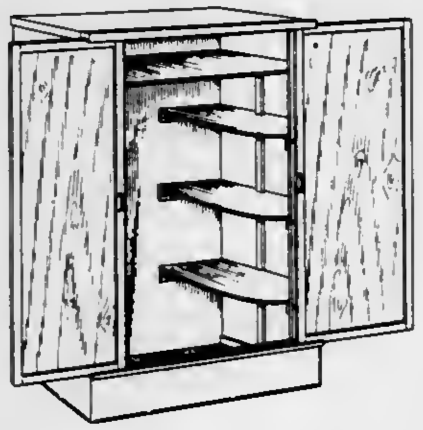
248,434
HANGER FOR GARDEN UTENSILS

Franco Clivio, and Dieter Raffler, both of Mozartstr. 20, D79 Ulm, Fed. Rep. of Germany
Filed Nov. 11, 1976, Ser. No. 741,003
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 741
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—125



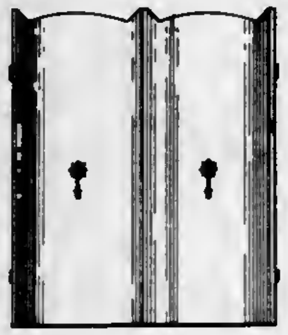
248,435
CABINET

Paul M. Densen, 611 Mountain Dr., South Orange, N.J. 07052
Filed Sep. 27, 1976, Ser. No. 727,212
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



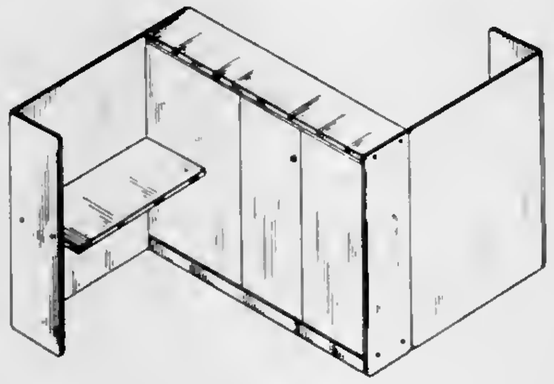
248,436
JEWELRY CABINET

Raymond T. Paszkiewicz, 6424 Frankfort Ave., Baltimore, Md. 21206
Filed Oct. 21, 1976, Ser. No. 734,482
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



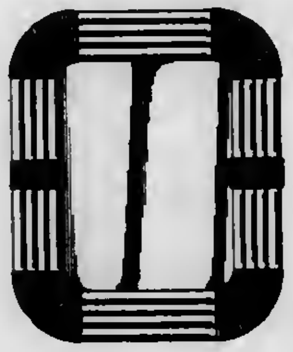
248,437
COMBINED DUAL WORK TABLE AND STORAGE CABINET UNIT

Anthony John Robinson, Woollahra, Australia, assignor to Framac Industries Pty. Limited, Australia
Filed Sep. 21, 1976, Ser. No. 725,076
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—168



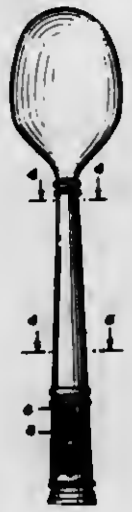
248,438
MIRROR FRAME

David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.
Filed Mar. 31, 1977, Ser. No. 783,292
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241



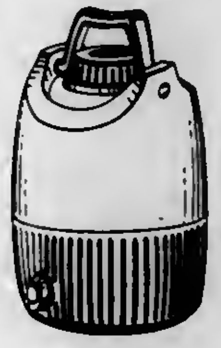
248,439
SPOON OR SIMILAR ARTICLE OF FLATWARE

Ben Siebel, 53b Harrison St., New York, N.Y. 10013, assignor to Oxford Hall Silversmiths, Ltd., New York, N.Y.
Filed Nov. 8, 1976, Ser. No. 739,911
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



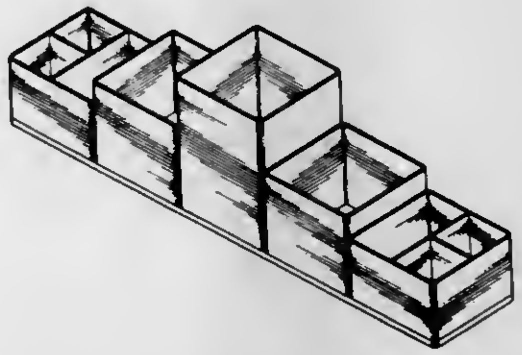
248,440
PICNIC JUG

Neill Edward Bryan; Regis Dean Schulte, and Benjamin Charles Baugh, all of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed Jun. 28, 1976, Ser. No. 700,159
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—61



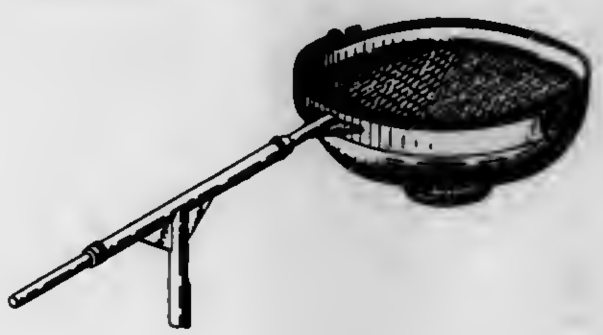
248,441
BAR ORGANIZER FOR STRAWS AND TOOTHPICKS

Dale I. Bausch, 4752 Fairhope Dr., La Mirada, Calif. 90638
Filed Jul. 6, 1976, Ser. No. 702,511
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—75



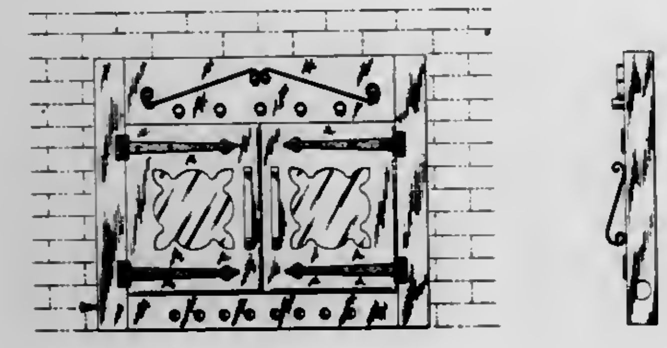
248,442
GIMBALED GRILL FOR BOATS

Frederick S. Rosenberg, 4200 California Rd., Orchard Park, N.Y. 14127
Filed Jul. 19, 1976, Ser. No. 706,191
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109



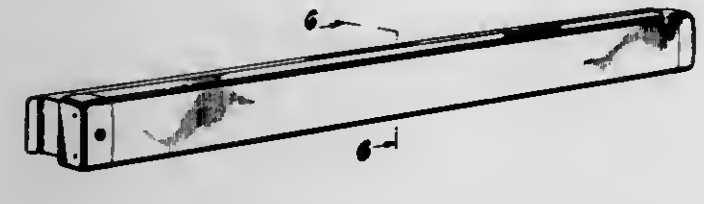
248,443
FIREPLACE SCREEN

Anthony Mancarella, Peters La., Rockfall, Conn. 06481
Filed Feb. 25, 1977, Ser. No. 771,900
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208



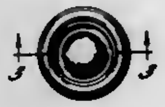
248,444
PANIC OPERATOR FOR EXIT DOORS

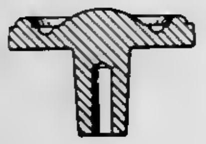
Roger J. Folger, Whittier, and John A. Buzard, Yorba Linda, both of Calif., assignors to Adams Rite Manufacturing Co., Glendale, Calif.
Filed May 19, 1976, Ser. No. 688,489
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—302



248,445
KNOB

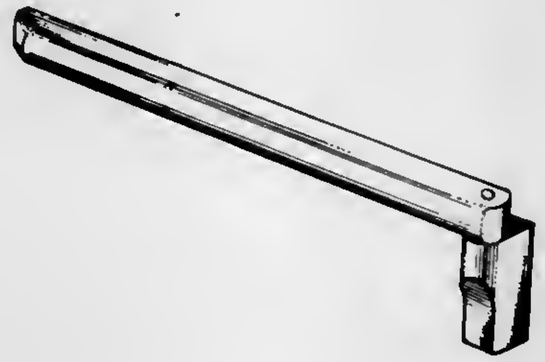
James Marshall Palm, Jr., Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 1, 1976, Ser. No. 746,385
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—310

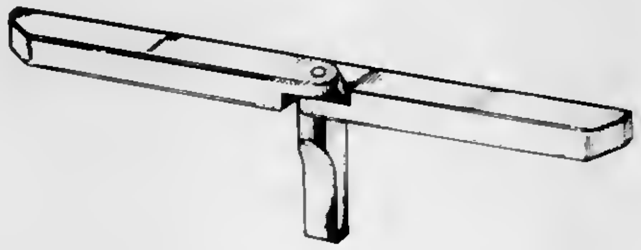




248,446
HINGE

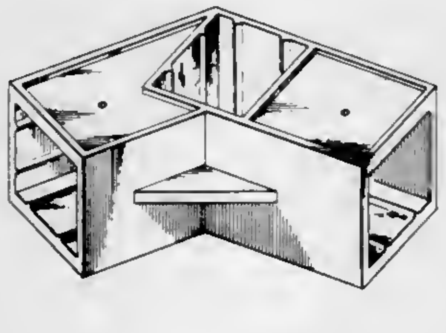
Kenneth W. Mueller, 1126 N. Formosa Ave., Los Angeles, Calif. 90046
Filed Jun. 14, 1976, Ser. No. 695,982
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323





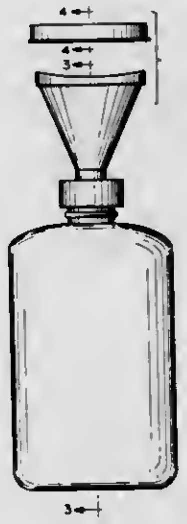
248,447
FRAMING COMPONENT

Helmut J. F. Hornung, 10326 NE. 185th, Bothell, Wash. 98011
Filed Dec. 13, 1976, Ser. No. 749,978
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



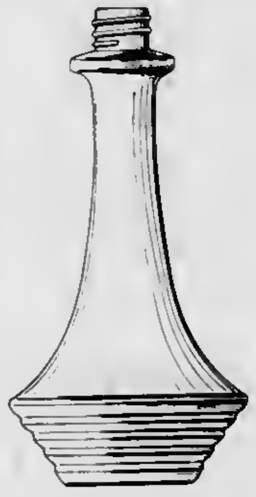
248,448
COMBINED SQUEEZE TYPE EYE WASH DEVICE AND SEALING CAP THEREFOR

George R. McClure, Little Falls, and Bruce E. Kahn, West Orange, both of N.J., assignors to Bel -Art Products, Inc., Pequannock, N.J.
Filed Apr. 22, 1976, Ser. No. 679,458
Term of patent 14 years
Int. Cl. D9—*01;* D24—*04*
U.S. Cl. D9—10



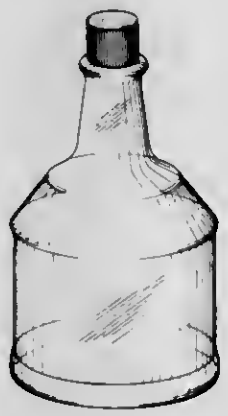
248,449
BOTTLE

Livingston C. Douglas, Leonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 10, 1976, Ser. No. 740,511
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—111



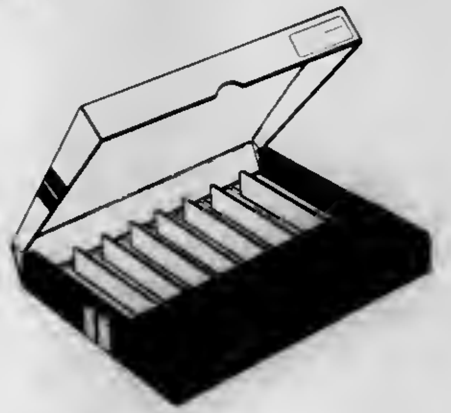
248,450
BOTTLE

Kenji Ekuan, Tokyo, Japan, assignor to Kikkoman Shoyu Co., Ltd., Noda, Japan
Filed Aug. 13, 1976, Ser. No. 714,266
Claims priority, application Japan, Jun. 17, 1976, 51-22929
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128



248,451
PACKAGING CONTAINER

Morris Simon Freed, Newton Centre, and George Walter Ward, Framingham, both of Mass., assignors to Data General Corporation
Filed Dec. 22, 1975, Ser. No. 643,449
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

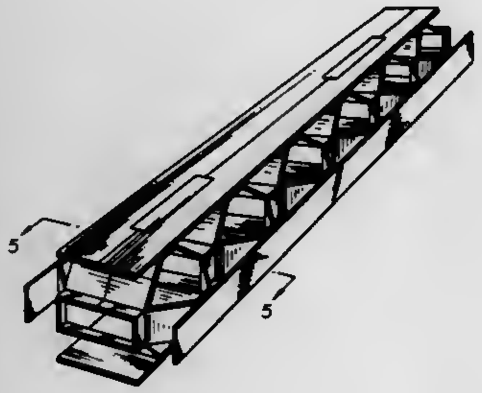


248,452

EGG CARTON OR THE LIKE

Toni Casutt, Kirchweg 45, 8102 Oberengstringen, Switzerland
Filed Mar. 6, 1975, Ser. No. 556,134
Term of patent 14 years
Int. Cl. D9—*03*

U.S. Cl. D9—190

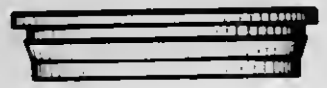


248,453

RESEALING CLOSURE

Kenneth L. Summers, Hudson, Ind., assignor to Riche Corporation
Filed Jun. 1, 1976, Ser. No. 691,611
Term of patent 14 years
Int. Cl. D9—*07*

U.S. Cl. D9—254

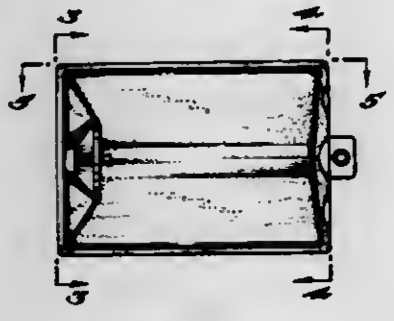


248,454

HEATER CONTROL UNIT

James P. McMullan, 2630 Seaman, El Monte, Calif. 91733
Filed Sep. 27, 1976, Ser. No. 726,741
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—50

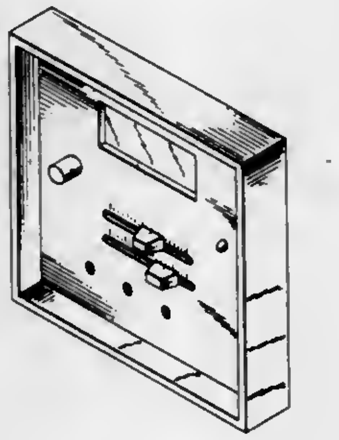


248,455

COVER PLATE FOR A DIGITAL TEMPERATURE CONTROL

Edward T. Cunnie, Monroeville, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 13, 1976, Ser. No. 686,125
Term of patent 14 years
Int. Cl. D10—*07*

U.S. Cl. D10—60

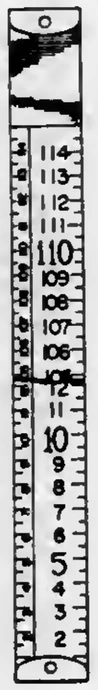


248,456

HEM MEASURING STICK

Eva DeLuca, 25 Sotton Place South, New York, N.Y. 10022
Division of Ser. No. 416,609, Nov. 16, 1973, Pat. No. 239,513.
This application Dec. 19, 1975, Ser. No. 642,616
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—71

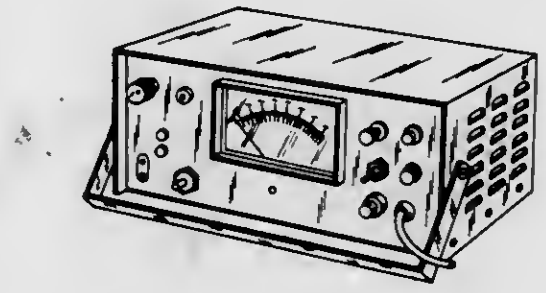


248,457

COMBUSTION GAS ANALYZER FOR MEASURING TEMPERATURE, SMOKE DENSITY AND CO_2 OF FLUE GAS OF AN OIL OR GAS BURNER

Daniel Cullinane, Jr., Topsfield, Mass., assignor to Lynn Products Co., Inc., Lynn, Mass.
Filed Aug. 4, 1975, Ser. No. 601,265
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—81

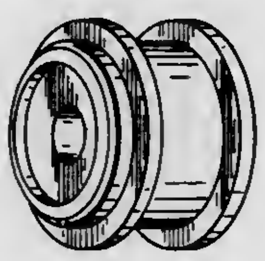


248,458

EARRING FASTENER

Norman Gatof, New York, N.Y., and Robert Russell, Cranston, R.I., assignors to Ciani, Inc., New York, N.Y.
Filed Sep. 13, 1976, Ser. No. 722,831
Term of patent 14 years
Int. Cl. D11—*01*

U.S. Cl. D11—88

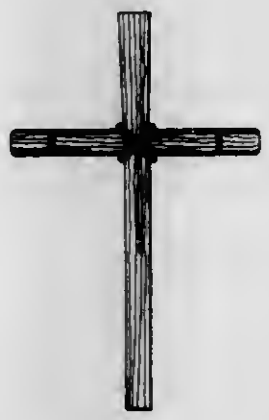


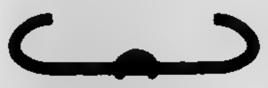
248,459

CROSS

Lawrence D. Newman, Keystone Junior College, La Plume, Pa. 18440
Filed May 27, 1976, Ser. No. 690,680
Term of patent 14 years
Int. Cl. D31—*00*

U.S. Cl. D11—96



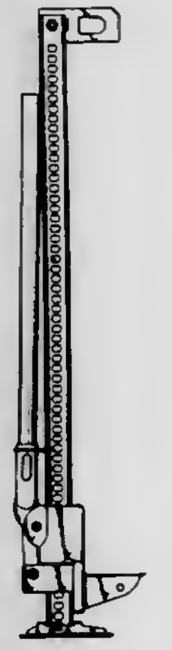


248,460

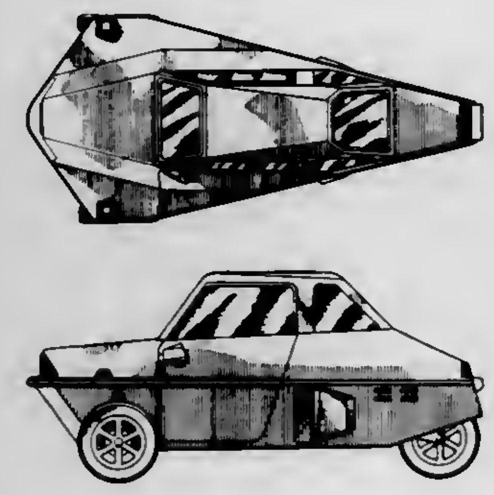
JACK

Keith T. Dunn, Solsberry, and Thomas K. McIntosh, Bloomfield, both of Ind., assignors to The Bloomfield Manufacturing Co., Inc.
Filed May 24, 1976, Ser. No. 689,574
Term of patent 14 years
Int. Cl. D12—*05*

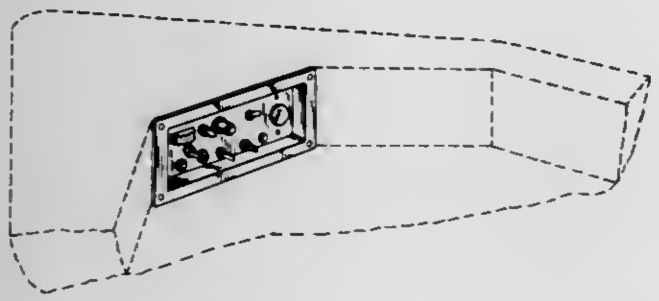
U.S. Cl. D12—55



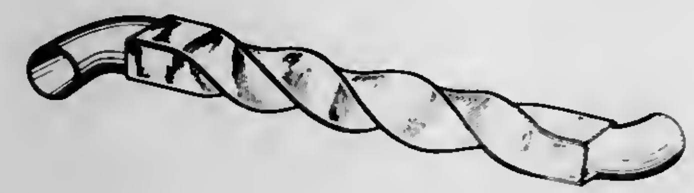
248,461
THREE-WHEELED VEHICLE
O. David Edmonson, 6276 Greenleaf Trail, Apple Valley, Minn. 55124
Filed Jul. 9, 1976, Ser. No. 703,758
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—85



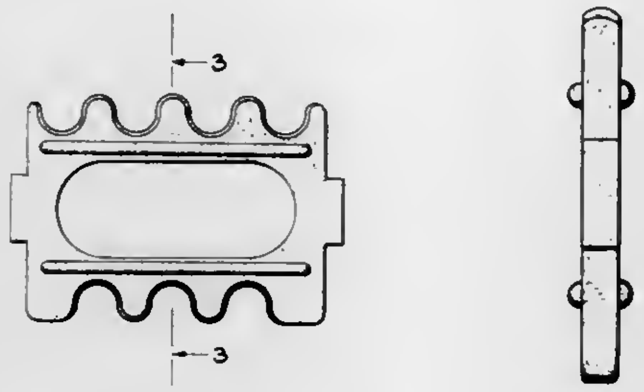
248,462
BOAT CONTROL PANEL
Stuart D. Bell, Quincy, Ill., assignor to Meco-Lectro Products, Inc., Kansas City, Kans.
Filed Sep. 20, 1976, Ser. No. 724,908
Term of patent 14 years
Int. Cl. D12—*06, 16*
U.S. Cl. D12—192



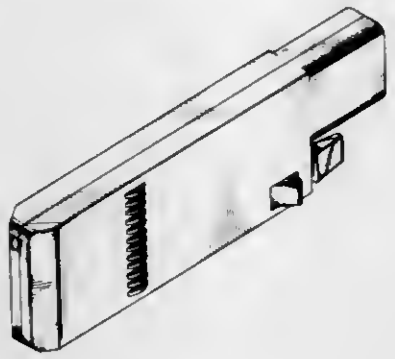
248,463
EXHAUST PIPE
Robert Barnes, 420 Leopard Lilly La., Sparks, Nev. 89431
Filed Apr. 4, 1975, Ser. No. 564,882
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—194



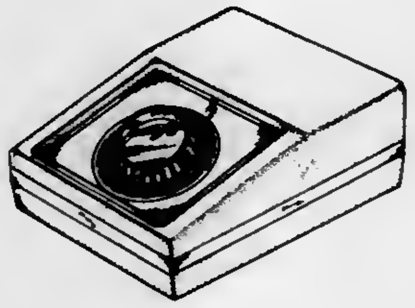
248,464
INSULATOR FOR SUPPORTING THE HEATING COIL OF AN ELECTRIC HEATER
John W. Moore, Max Meadows, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 22, 1976, Ser. No. 744,183
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17



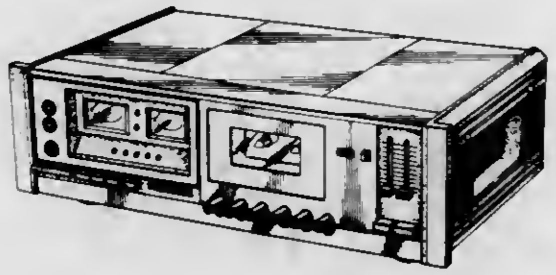
248,465
PLUG FOR MULTICONDUCTOR PATCHING APPARATUS
Charles Louis Roberts, Alexandria, and Jacob Lightsey Wallace, Jr., Springfield, both of Va., assignors to Atlantic Research Corporation, Alexandria, Va.
Filed Jul. 29, 1976, Ser. No. 709,937
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



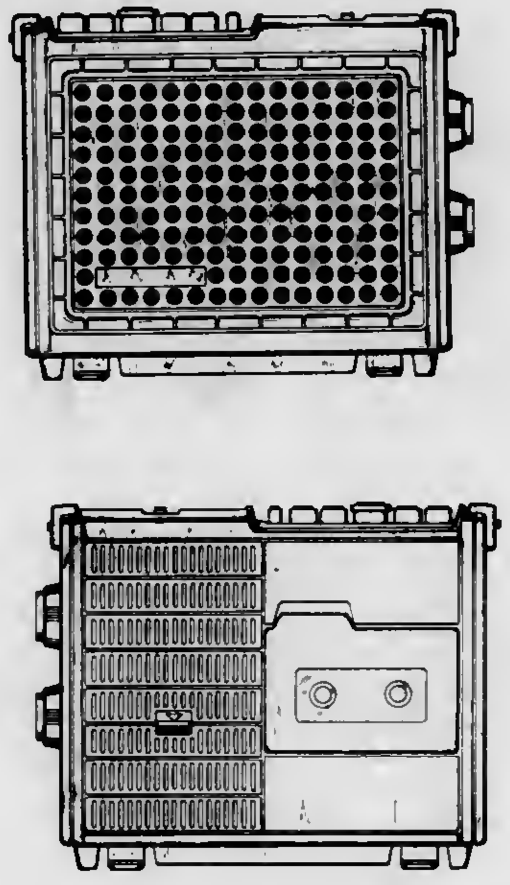
248,466
ANTENNA ROTATOR CONTROL
David D. Tompkins, Columbus, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio
Division of Ser. No. 661,320, Feb. 25, 1976. This application Aug. 3, 1977, Ser. No. 821,532
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



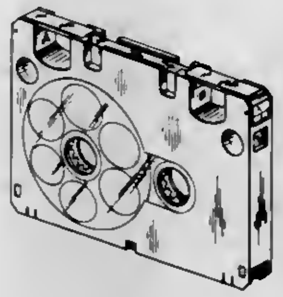
248,467
CASSETTE TAPE DECK
Nobuo Usami, Hatano, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan
Filed May 27, 1976, Ser. No. 690,773
Claims priority, application Japan, Dec. 3, 1975, 50/47492
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



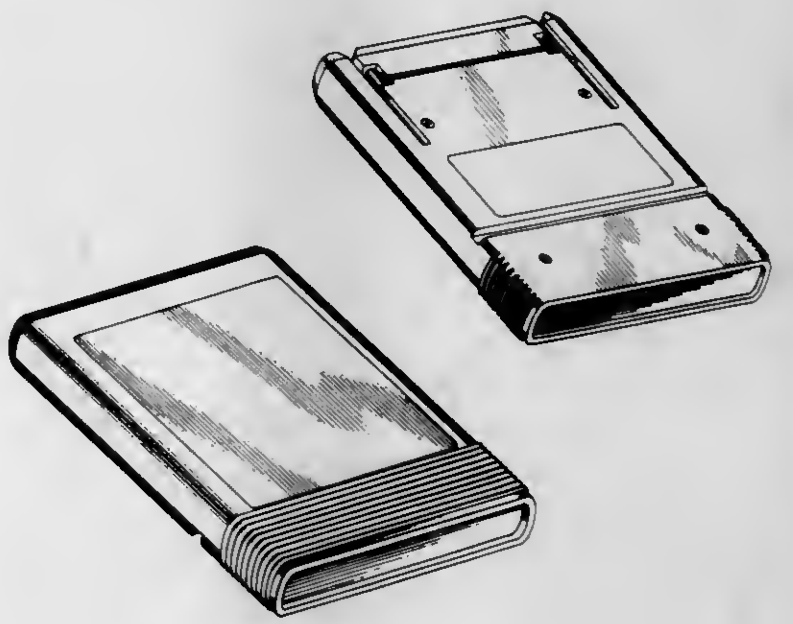
248,468
CASSETTE TAPE RECORDER
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,006
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



248,469
TAPE CASSETTE
Shigeo Takahashi, Urawa, Japan, assignor to Sony Corporation
Filed May 13, 1976, Ser. No. 686,035
Claims priority, application Japan, Nov. 14, 1975, 50/045126
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11



248,470
PLUG-IN CARTRIDGE FOR VIDEO GAME AND THE LIKE
Nicholas F. Talesfore, San Jose, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.
Filed Dec. 13, 1976, Ser. No. 751,357
Term of patent 14 years
Int. Cl. D16—*05, 99*
U.S. Cl. D14—11



248,471
SPEAKER CABINET

Yoshinobu Asai, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

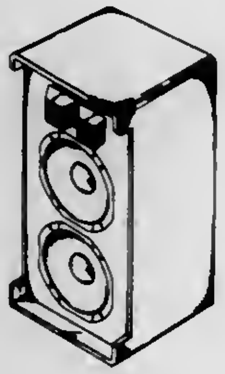
Filed Nov. 4, 1976, Ser. No. 738,972

Claims priority, appilcation Japan, May 20, 1976, 51/18710

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—34



248,472
RADIO RECEIVER

Takeyoshi Kawano, Kyoto, and Kikuo Ohta, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

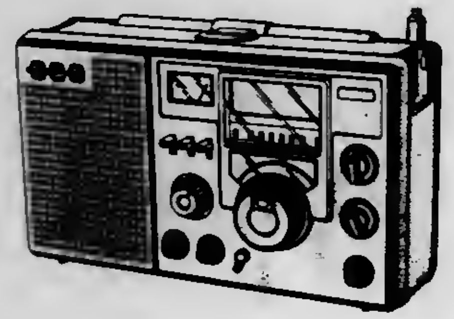
Filed Aug. 18, 1976, Ser. No. 715,595

Claims priority, application Japan, Apr. 15, 1976, 51/13952

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



248,473
TRANSCEIVER

Masanori Hamada, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

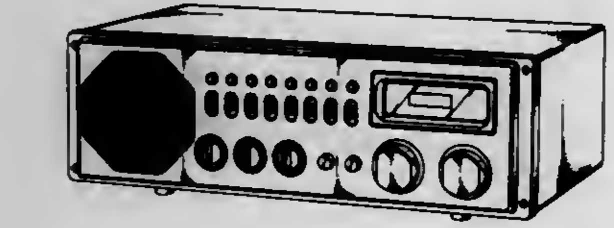
Filed Jun. 16, 1976, Ser. No. 696,653

Claims priority, application Japan, Dec. 26, 1975, 50/52162

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—71



248,474
MOWING DISK

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

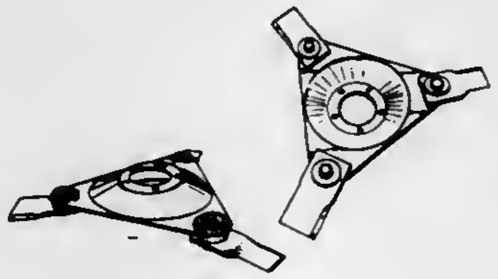
Filed Sep. 30, 1976, Ser. No. 728,022

Claims priority, application Netherlands, Apr. 2, 1976, 1406-01

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—29



248,475
CAB FOR EARTHMOVING VEHICLE OR THE LIKE

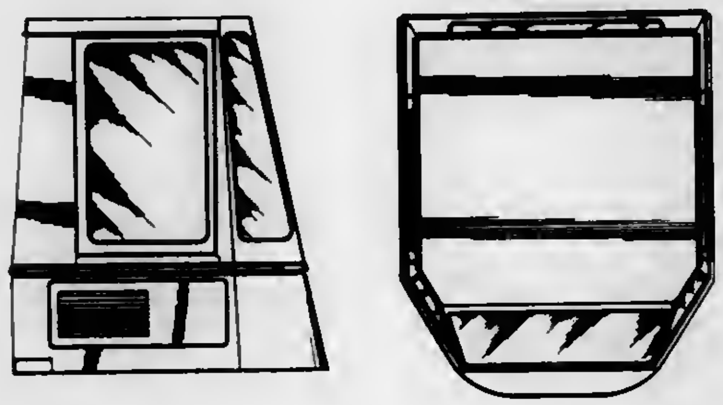
John M. Parks, Peoria; Barry L. Ahrens, Yorkville; William J. Brown, Naperville, and John Molnar, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 15, 1977, Ser. No. 815,952

Term of patent 14 years

Int. Cl. D15—*04*

U.S. Cl. D15—30



248,476
SUCTION NOZZLE

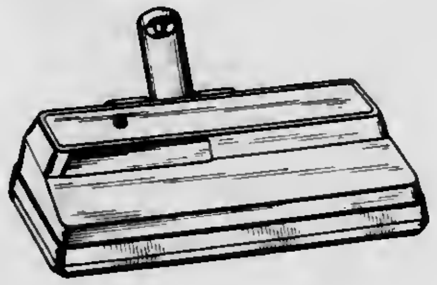
Julian R. Haynes, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Jul. 12, 1976, Ser. No. 704,161

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—63



248,477
FRAME FOR MAKING MACRAME

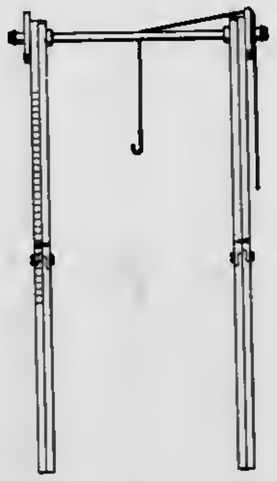
Annie Laurie Morrison, San Diego, Calif., assignor to Morrison Enterprises, San Diego, Calif.

Filed Jun. 24, 1976, Ser. No. 699,647

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—66



248,478
COMBINED AUTOMATIC SEWING MACHINE AND SUPPORTING TABLE

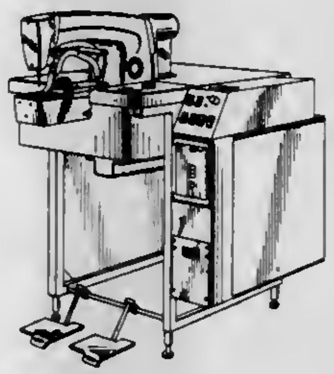
Gerald A. Kraatz, Highland Park, and Robert L. Kosrow, Hoffman Estates, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,538

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—71



248,479
FOUNDRY RISER SLEEVE

Tony William Bastock, Sandbach, England, assignor to Foseco International Limited

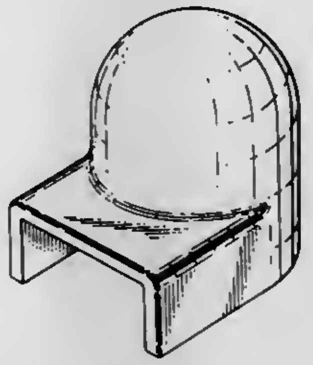
Filed Jun. 13, 1977, Ser. No. 806,165

Claims priority, application United Kingdom, Feb. 3, 1977, 978749/77

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—135



248,480
FOUNDRY RISER SLEEVE

Tuoy William Bastock, Sandbach, England, assignor to Foseco International Limited

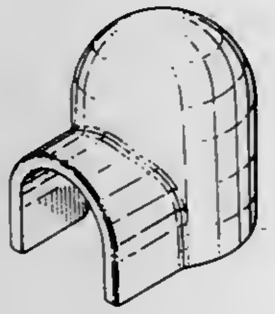
Filed Sep. 7, 1976, Ser. No. 720,655

Claims priority, application United Kingdom, Mar. 19, 1976, 975098/76

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—135



248,481
FOUNDRY RISER SLEEVE

Tooy William Bastock, Sandbach, England, assignor to Foseco International Limited

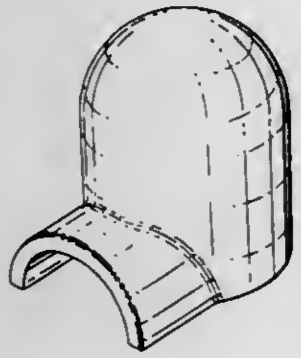
Filed Jun. 13, 1977, Ser. No. 806,164

Claims priority, application United Kingdom, Feb. 3, 1977, 978748/77

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—135



248,482
CHART STRIPPING FINGER

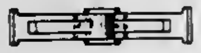
Joseph W. Schaffer, Indianapolis, Ind., assignor to Esterline Augus Instrument Corp.

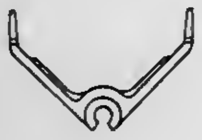
Filed Apr. 19, 1976, Ser. No. 678,224

Term of patent 14 years

Int. Cl. D16—*99*

U.S. Cl. D16—32





248,483
DOCUMENT HANGER

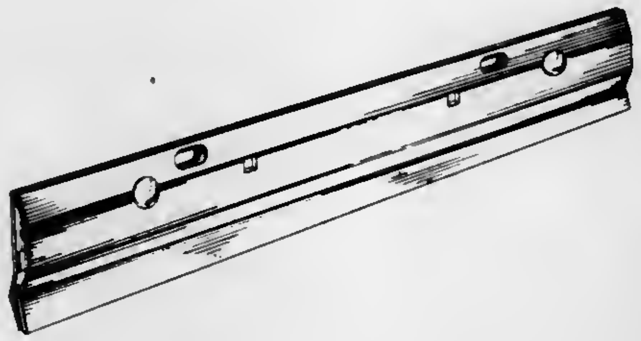
Abram G. Elias, 1527 Greg St., Sparks, Nev. 89431, and Peter G. Elias, 6 Wedgewood Dr., Winnipeg, Manitoba, Canada (R3T 2J8)

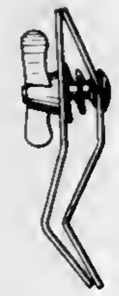
Filed Oct. 6, 1975, Ser. No. 619,568

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—91





248,484
DOCUMENT HOLDER

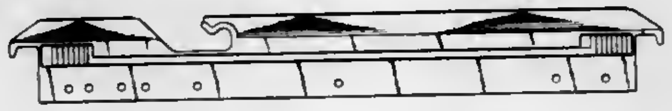
Norman Hedstrom, Worcester; David M. Wright, and Jerome O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.

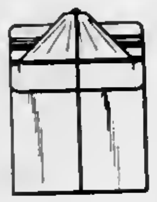
Filed Nov. 12, 1976, Ser. No. 741,226

Term of patent 14 years

Int. Cl. D19—*04*

U.S. Cl. D19—91





248,485
FILTER

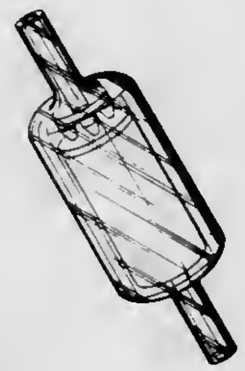
Richard Strauss, Lexington, and Philip C. Kimball, Andover, both of Mass., assignors to Whatman Reeve Angel Limited, Maidstooe, England

Filed Apr. 18, 1977, Ser. No. 788,352

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—4



248,486
FIRE STARTER

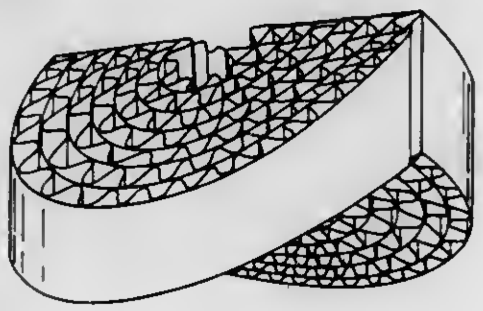
Robert S. Taylor, 1583 Desoto Way, Livermore, Calif. 94550

Filed Jan. 21, 1977, Ser. No. 761,155

Term of patent 14 years

Int. Cl. D23—*05*

U.S. Cl. D23—90.1



248,487
FIRE STARTER

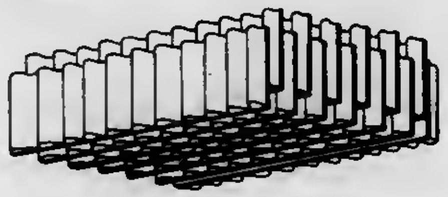
Robert S. Taylor, 1583 DeSoto Way, Livermore, Calif. 94550

Flied Jan. 21, 1977, Ser. No. 761,156

Term of patent 14 years

Int. Cl. D23—*05*

U.S. Cl. D23—90.1



248,488
BLOOD PROCESSING APPARATUS

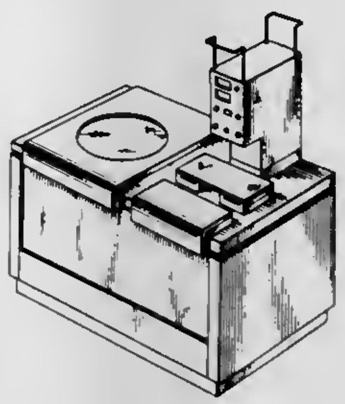
Daniel Ashcraft, 110 S. Juanita, Redondo Beach, Calif. 90277; James G. Bruni, 736-B Center Pl., Manhattan Beach, Calif. 90266; Stephen G. Hauser, 4133 Aleman Dr., Tarzana, Calif. 91356, and Keith S. Keith, 1419 W. 148th St., Gardena, Calif. 90247

Filed Jul. 16, 1976, Ser. No. 705,983

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—1.1



248,489
VENIPUNCTURE TABLE

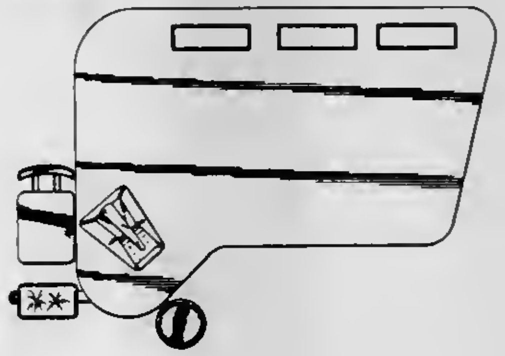
Ceronnie Robinson, 2794 Pasco La., SE., Atlanta, Ga. 30316

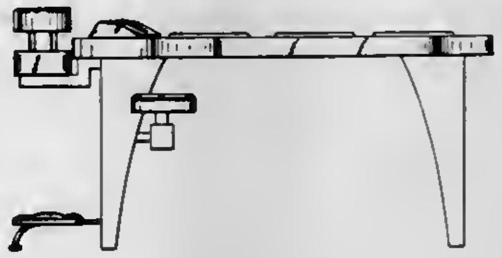
Filed Apr. 27, 1976, Ser. No. 680,764

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—3





248,490

SPHYGMOMANOMETER

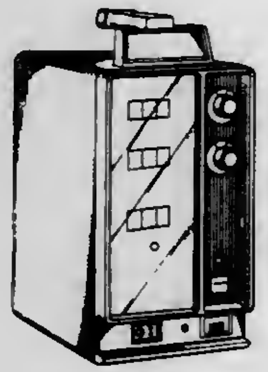
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, La Jolla, Calif.

Filed Oct. 25, 1977, Ser. No. 845,144

Term of patent 14 years

Int. Cl. D14—*01, 99*

U.S. Cl. D24—17



248,491

SYRINGE SHIELD

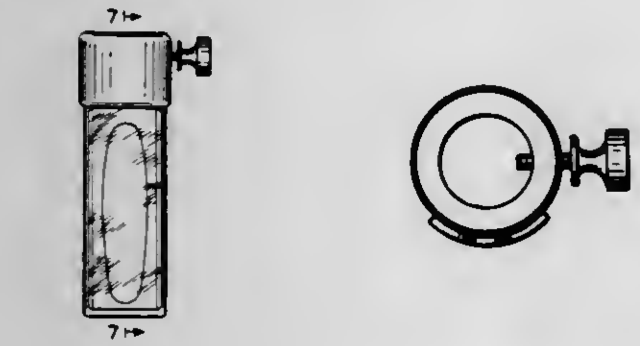
James M. Reiss, P.O. Box 657, Center Moriches, N.Y. 11934

Filed Apr. 15, 1976, Ser. No. 677,316

Term of patent 14 years

Int. Cl. D24—*02, 99*

U.S. Cl. D24—25



248,492

TEMPOROMANDIBULAR JOINT PROSTHESIS

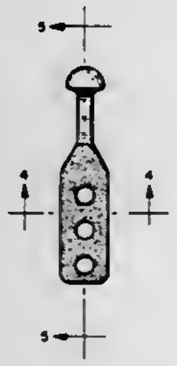
Charles Albert Homsy, 11526 Raintree Circle, Houston, Tex. 77024, and John N. Kent, 5901 Wheeler, Metaire, La. 70003

Filed Jul. 12, 1976, Ser. No. 704,134

Term of patent 14 years

Int. Cl. D24—*03*

U.S. Cl. D24—33



248,493

MASSAGING DEVICE

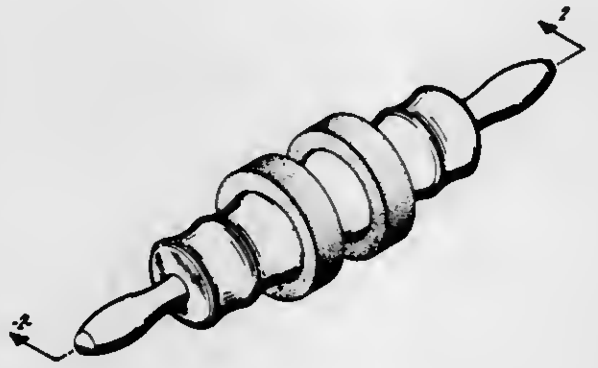
J. D. Moncrief, 3139 Woodmark Ct., Sacramento, Calif. 95821

Filed Mar. 17, 1976, Ser. No. 667,551

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D24—36



248,494

URINARY COLLECTING UNIT

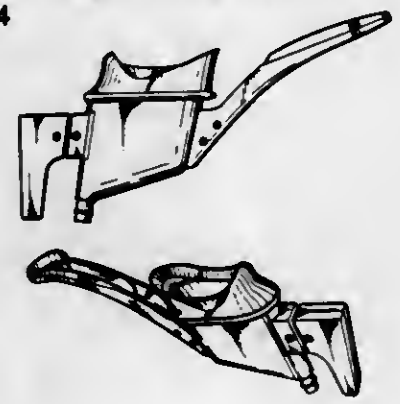
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 692,709

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D24—54



248,495

URINARY COLLECTING UNIT

Shinrokn Nakao, Yokohama; Yoshiyasn Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

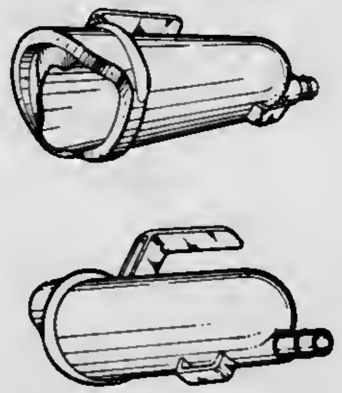
Filed Jun. 4, 1976, Ser. No. 692,710

Claims priority, application Japan, Feb. 19, 1976, 51-5376

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D24—54



248,496

BUILDING

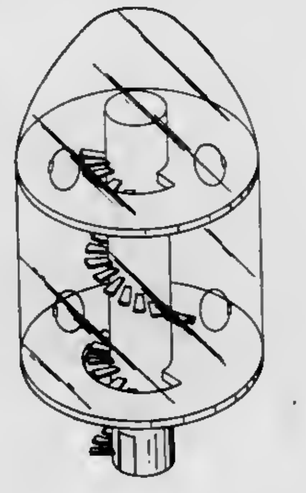
Samuel Mark, 709 Melville Ave., Baltimore, Md. 21218

Filed Oct. 20, 1976, Ser. No. 734,247

Term of patent 14 years

Int. Cl. D25—*03*

U.S. Cl. D25—5



248,497

DISPOSABLE RESPIRATOR

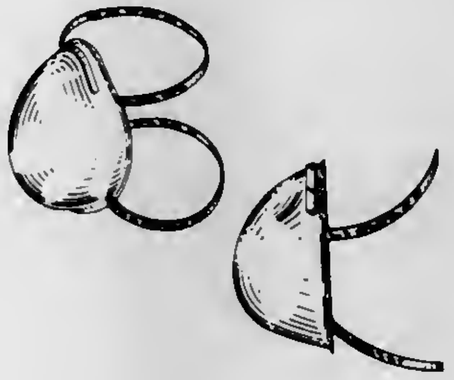
Patrick F. Slosek, Dudley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 20, 1976, Ser. No. 688,507

Term of patent 14 years

Int. Cl. D24—*02, 99;* D29—*02*

U.S. Cl. D29—8



248,498

TOY ROCKET LAUNCHER

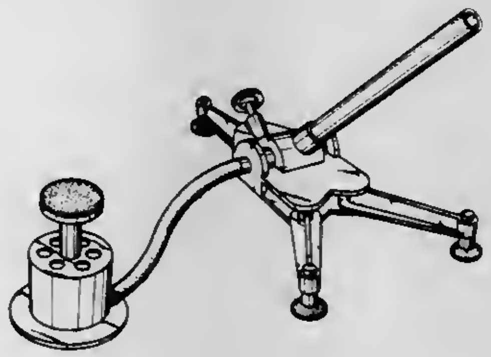
Hisao Kambayashi, 1262 Mabashi, Matsudo-shi, Chiba-ken, Japan

Filed Jan. 5, 1976, Ser. No. 646,575

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—15 PP



248,499

BASE FOR CANDLE HOLDER, LAMP, OR SIMILAR ARTICLE

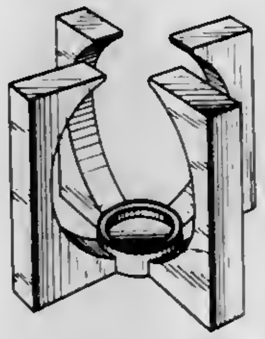
Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.

Filed Mar. 9, 1977, Ser. No. 775,698

Term of patent 14 years

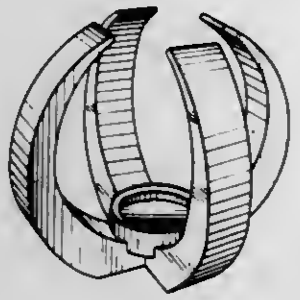
Int. Cl. D26—*01, 05*

U.S. Cl. D48—2



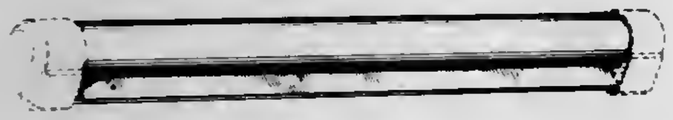
248,500
BASE FOR CANDLE HOLDER, LAMP, OR SIMILAR ARTICLE

Raymond M. Ulrich, and Richard M. Ulrich, both of Washington, Ill., assignors to Ulrich Foundation, Inc., Washington, Ill.
Filed Mar. 9, 1977, Ser. No. 775,703
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2



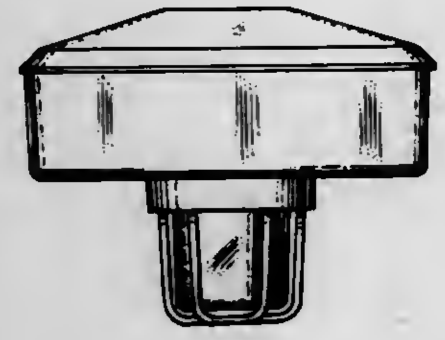
248,501
LAMP UNIT

Elmer G. Fridrich, Chardon, and John M. Davenport, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed May 3, 1976, Ser. No. 682,211
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 F



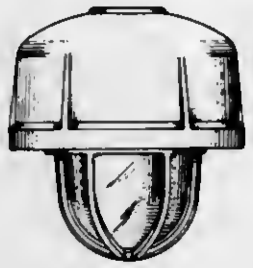
248,502
LUMINAIRE

Clifford M. Laughter, Hendersonville, N.C., assignor to General Electric Company
Filed Jun. 6, 1977, Ser. No. 803,488
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



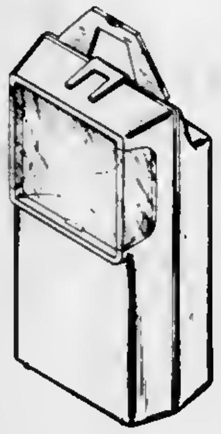
248,503
LUMINAIRE

James L. Grindle, Hendersonville, N.C., assignor to General Electric Company
Filed Jul. 25, 1977, Ser. No. 818,367
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



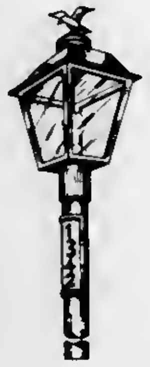
248,504
LANTERN

Nolan Rhoades, Beloit; Daniel C. Oakley, Madison, and Ralph T. Jacobsen, Stoughton, all of Wis., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Nov. 1, 1976, Ser. No. 737,447
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



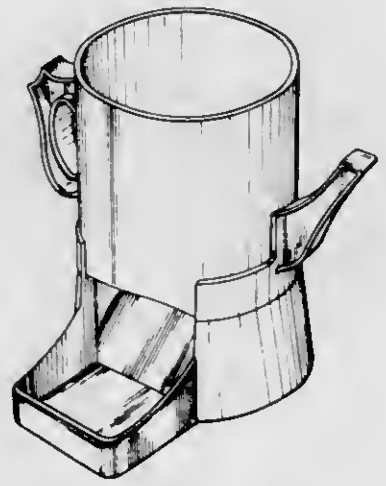
248,505
COMBINED LAMP AND IDENTIFICATION SIGN

Walter Koziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Sep. 29, 1976, Ser. No. 728,019
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—36



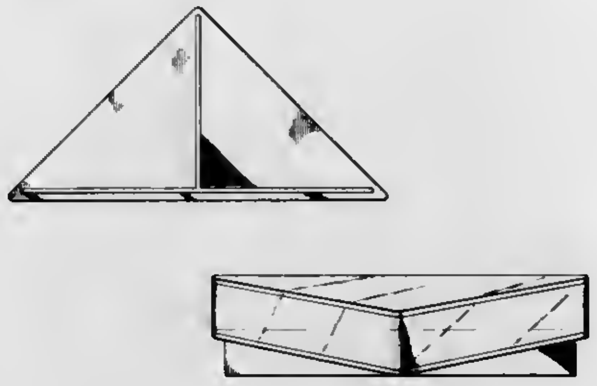
248,506
DISPENSER FOR SWEETS

Amilcare Dogliotti, Nelve, Cuneo, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Cuneo, Italy
Filed Mar. 31, 1976, Ser. No. 672,355
Claims priority, application Italy, Oct. 6, 1975, 53390 B/75
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D52—2 B



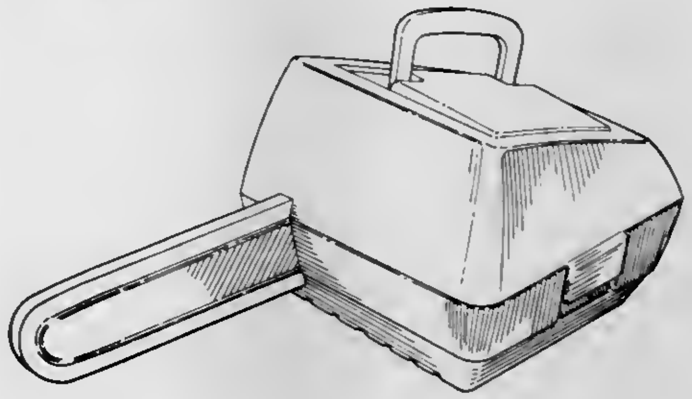
248,507
DISPLAY RECEPTACLE FOR A FOLDED FLAG

John A. Pivec, 3646 Brunswick Ave. N., Crystal, Minn. 55422
Filed Sep. 30, 1976, Ser. No. 728,447
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



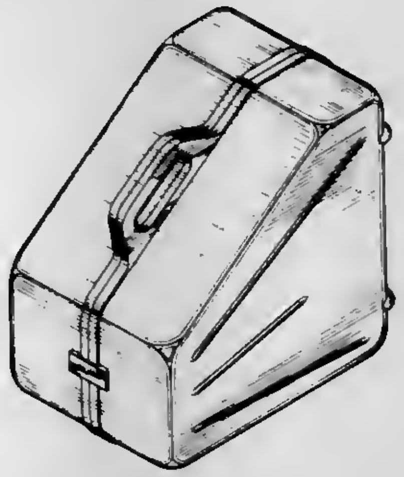
248,508
COMBINED CARRYING AND STORAGE CASE FOR A CHAINSAW

Donald A. Malcolm, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 3, 1976, Ser. No. 747,290
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



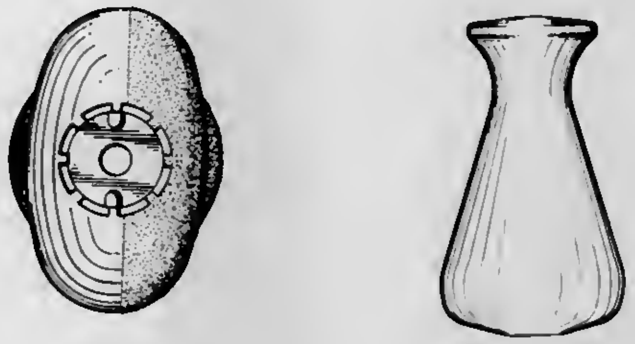
248,509
LUGGAGE CASE

Philip Tait, 1088 Avenue Rd., Toronto, Ontario, Canada (M5N 2E2)
Filed Jun. 4, 1976, Ser. No. 693,206
Claims priority, application Canada, Mar. 11, 1976, 1103761
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 F



248,510
HAND GRIP FOR PATIENT WALKING AIDS

Fred DiVito, Bronx, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.
Filed Jul. 16, 1975, Ser. No. 596,297
Term of patent 14 years
Int. Cl. D3—*03;* D24—*99*
U.S. Cl. D88—5



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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. & H. Mfg. Co.: *See—*
  - Feibelman, Jeffrey A., 4,099,611, Cl. 206-45.140.
- A. J. Bingley Limited: *See—*
  - Whittle, Harry Reed; and Ward, Brooke Armitage, 4,099,830, Cl. 350-6.800.
- A. L. Gebhardt Company: *See—*
  - Holloway, Donald Francis, 4,100,154, Cl. 260-123.700.
- A/S Niro Atomizer: *See—*
  - Hansen, Ove; and Rasmussen, Stig, 4,099,982, Cl. 127-61.000.
- AB Centralsug: *See—*
  - Hyden, Hans Olof, 4,099,457, Cl. 100-42.000.
- AB Ziristor: *See—*
  - Gustafsson, Ake; and Stark, Olof, 4,099,914, Cl. 21-57.000.
- Abad, Aurelien: *See—*
  - Yax, Emile; and Abad, Aurelien, 4,100,336, Cl. 526-67.000.
- Abbott Laboratories: *See—*
  - Standley, Wendell Evert, 4,099,674, Cl. 239-431.000.
- Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, to Nippon Chemical Industrial Co., Ltd.; and Toho Ganryo Kogyo Co., Ltd. Antimony trioxide composition and process of producing the same. 4,100,074, Cl. 252-8.100.
- Abel, Frank Bernard, to Eastman Kodak Company. Contamination sensor. 4,099,861, Cl. 355-15.000.
- Abendroth, Georg: *See—*
  - Tippmer, Kurt; Schmitt, Hubert; Vinke, Heinrich; and Abendroth, Georg, 4,099,929, Cl. 44-1.00F.
- Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Limited. 11-Deoxyprostaglandin derivatives. 4,100,343, Cl. 542-426.000.
- ACF Industries, Inc.: *See—*
  - Bickhaus, James T., 4,099,504, Cl. 123-122.0AB.
  - Casey, Edward H., 4,099,503, Cl. 123-122.0AB.
  - Lindberg, Allen W.; and Gantzert, Thomas R., 4,100,234, Cl. 261-121.00B.
- Acheson Industries, Inc.: *See—*
  - Heath, Allan B.; and Wolfe, Eugene E., 4,099,673, Cl. 239-415.000.
- Acurex Corporation: *See—*
  - Kendall, Robert M.; and Lapson, William F., 4,099,620, Cl. 209-74.00R.
- Ada Pumps, Inc.: *See—*
  - Ogles, Ethridge F., 4,099,447, Cl. 91-218.000.
- Adachi, Yoshio, to Hitachi, Ltd. FET Logic circuit for the detection of a three level input signal including an undetermined open level as one of three levels. 4,100,429, Cl. 307-205.000.
- Adams Industries, Inc.: *See—*
  - Tilp, George E., 4,100,394, Cl. 219-296.000.
- Adams, John: *See—*
  - Stouffer, Richard C.; and Adams, John, 4,099,683, Cl. 242-107.000.
- Adams, John Howard, to Chevron Research Company. Greases containing borate dispersions as extreme-pressure additives. 4,100,080, Cl. 252-18.000.
- Adams, Terence C., to Birtley Engineering Limited. Manufacture of grading and dewatering screens. 4,100,248, Cl. 264-273.000.
- Addressograph Multigraph Corp.: *See—*
  - Foote, Francis C., 4,100,011, Cl. 156-272.000.
  - Rubin, Jack C., 4,100,096, Cl. 252-145.000.
- Adler, Franklin P., to Pullman Incorporated. Lock for a hopper car outlet gate. 4,099,468, Cl. 105-310.000.
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- Adler-Nissen, Jens Lorenz, to Novo Industri A/S. Enzymatic modification of corn gluten. 4,100,151, Cl. 260-112.00G.
- Admiral Corporation: *See—*
  - Arneson, Blayne E., 4,100,578, Cl. 358-191.000.
- AEG-Elotherm, G.m.b.H.: *See—*
  - Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.
- Aepli, Otto T.: *See—*
  - Garvin, Donald F.; and Aepli, Otto T., 4,099,985, Cl. 134-4.000.
- Aerwey Laboratories, Inc.: *See—*
  - Thornwald, Everett D., 4,100,235, Cl. 261-142.000.
- Agency of Industrial Science and Technology: *See—*
  - Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.
- Agfa-Gevaert AG: *See—*
  - Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, 4,099,862, Cl. 355-35.000.
  - Wagensonner, Eduard, 4,100,590, Cl. 362-16.000.
- AGFA-Gevaert N.V.: *See—*
  - Wouters, Albert Paul, 4,099,487, Cl. 118-651.000.
- Ahonen, Ahti Ilmari, to Valmet Oy. Off-the-road vehicles. 4,099,733, Cl. 280-6.100.
- Ahrens, Stephen Carl: *See—*
  - Khajezadeh, Heshmat; and Ahrens, Stephen Carl, 4,100,565, Cl. 357-51.000.
- Air-O-Mulder B.V.: *See—*
  - van Vliet, Cors, 4,099,749, Cl. 285-398.000.
- Airco, Inc.: *See—*
  - Wallouch, Rudolph W., 4,100,314, Cl. 427-228.000.
- Aizawa, Hiroshi: *See—*
  - Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
- Aizawa, Tatsuo: *See—*
  - Takayama, Hiroshi; and Aizawa, Tatsuo, 4,100,087, Cl. 252-62.10P.
- Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, to Fuji Photo Film Co., Ltd. Method for controlling a photographic printing exposure. 4,100,424, Cl. 250-559.000.
- Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Ghost cancellation device. 4,100,496, Cl. 325-369.000.
- Aktiebolaget Atomenergi: *See—*
  - Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, 4,099,555, Cl. 165-55.000.
- Aktiebolaget Carl Munters: *See—*
  - Norback, Per S., 4,099,928, Cl. 29-157.30D.
- Aktiebolaget Karlstads Mekaniska Werkstad: *See—*
  - Wahren, Douglas; Stenberg, Erik Gunnar; and Klerelid, Berndt Erik Ingvar, 4,100,018, Cl. 162-203.000.
- Aktiebolaget Svenska Flaktfabriken: *See—*
  - Gustavsson, Lennart, 4,099,296, Cl. 19-304.000.
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  - Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, 4,100,317, Cl. 428-137.000.
- Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Zeolitic catalysts and method of producing same. 4,100,108, Cl. 252-455.00Z.
- Alberts, Heinrich: *See—*
  - Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.
- Albright, James A., to Velsicol Chemical Corporation. Intumescent fire retardant compositions containing pentaerythritol cyclic diphosphates. 4,099,975, Cl. 106-15.0FP.
- Alcan Aluminum Corporation: *See—*
  - Graham, Hubert P., 4,099,356, Cl. 52-520.000.
- Alcan Research and Development Limited: *See—*
  - Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, 4,099,959, Cl. 75-10.00R.
  - Hardouin, Jean Pierre, 4,099,434, Cl. 83-157.000.
- Alcock, Richard A.; and Guthrie, Robert M., to Rockford Manufacturing Group, Inc. In-line wire drawing machine. 4,099,403, Cl. 72-288.000.
- Alenares, Santiago S. Hydrotherapy apparatus and method for exercising the veins of the leg and foot. 4,099,522, Cl. 128-66.000.
- Alexander, Charles F., Jr., to Brunswick Corporation. High thrust trolling motor. 4,099,478, Cl. 115-18.00E.
- Alexander, Robert W., to Armalite, Inc. Method for producing ice. 4,099,946, Cl. 62-73.000.
- Alfredsson, Bengt Agne: *See—*
  - Reinhardt, Nils; Kuylenstierna, Ulf Vilhelm; and Alfredsson, Bengt Agne, 4,100,251, Cl. 423-63.000.
- Allegheny Ludlum Industries, Inc.: *See—*
  - Chivinsky, Joseph A.; and Deverell, Harry E., 4,099,966, Cl. 75-125.000.
- Allen-Bradley Company: *See—*
  - Denes, Oscar L., 4,100,525, Cl. 338-195.000.
  - Nelson, Terrance D.; and Klippel, Bruce G., 4,100,469, Cl. 318-227.000.
- Allen, Elbert F. Bicycle accessory means. 4,099,738, Cl. 280-289.00D.
- Allen, Herbert, to Cameron Iron Works, Inc. Annular blowout preventer. 4,099,699, Cl. 251-1.00B.
- Allen, Joseph C., to Texaco Inc. Method for recovering viscous petroleum. 4,099,568, Cl. 166-269.000.
- Allen, Terry Mark; and Derfler, William Duane. Lightweight costume head. 4,099,271, Cl. 2-192.000.
- Allied Chemical Corporation: *See—*
  - Anderson, George Bernard, 4,099,707, Cl. 254-35.000.
  - Mears, Whitney Harris, 4,100,366, Cl. 174-15.00R.
  - Stouffer, Richard C.; and Adams, John, 4,099,683, Cl. 242-107.000.
- Allington, Robert William, to Instrumentation Specialties Company. Chemical analyzer. 4,099,921, Cl. 23-253.00R.

- Almgren, Bertil: *See—*
  - Elmqvist, Rune; and Almgren, Bertil, 4,100,530, Cl. 346-140.00R.
- Alsup, James M.; and Whitehouse, Harper J., to United States of America, Navy. Discrete chirp frequency synthesizer. 4,100,498, Cl. 328-14.000.
- Aluminum Company of America: *See—*
  - Bennett, Robert F.; Brouwer, Nicholaas L.; and Stricker, David M., 4,099,418, Cl. 73-622.000.
- Amada, Nobutaka: *See—*
  - Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.
- Amadio, Clive Lyof. Corrective device for clarinets. 4,099,442, Cl. 84-382.000.
- Amano, Hisao: *See—*
  - Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.
- Amax Inc.: *See—*
  - Chou, Eddie C.; Queneau, Paul B.; Laferty, John M.; and Carlberg, John R., 4,100,043, Cl. 204-108.000.
- Amerace Corporation: *See—*
  - Mazzeo, Charles F.; and Waddington, William T., 4,099,826, Cl. 339-198.00R.
- America Pacemaker Corporation: *See—*
  - Chen, Chieh Y.; and Grace, Wesley R., 4,099,530, Cl. 128-419.0PT.
- American Air Filter Company, Inc.: *See—*
  - Onnen, James H., 4,099,938, Cl. 55-230.000.
- American Can Company: *See—*
  - Schlesinger, Sheldon Irwin; and Boszak, Ronald J., 4,100,321, Cl. 428-207.000.
- American Carrier Equipment, Inc.: *See—*
  - Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,099,741, Cl. 280-712.000.
- American Cyanamid Company: *See—*
  - Giglia, Robert Domenico, 4,099,839, Cl. 350-357.000.
- American Home Products Corporation: *See—*
  - Demerson, Christopher A.; and Humber, Leslie G., 4,100,277, Cl. 424-244.000.
  - Garsky, Victor M., 4,100,153, Cl. 260-112.50S.
- American Induction Heating Corporation: *See—*
  - Duca, William J., 4,100,365, Cl. 13-27.000.
- American Screen Printing: *See—*
  - Bubley, Henry J.; Oltra, Claude H.; and Krutsch, John R., 4,099,460, Cl. 101-44.000.
- American Seating Company: *See—*
  - Barecki, Chester J., 4,099,772, Cl. 297-220.000.
- Ames Rubber Corporation: *See—*
  - Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., 4,099,312, Cl. 29-130.000.
- AMF Incorporated: *See—*
  - Caplan, David M., 4,099,715, Cl. 273-63.00E.
  - Peterson, Clifford D., 4,099,366, Cl. 56-13.600.
- Amos, James. Convertible seat-bed unit. 4,099,768, Cl. 297-63.000.
- AMP, Incorporated: *See—*
  - Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., 4,099,615, Cl. 206-329.000.
  - Morgan, Joe Pierce; Phillips, Howard Charles; and Spong, Richard Vernon, 4,099,316, Cl. 29-566.200.
  - Webster, Van Keith, 4,099,827, Cl. 339-228.000.
- Analytical Measurements, Inc.: *See—*
  - Andrews, Elmer, 4,100,470, Cl. 318-466.000.
- Anderson, George Bernard, to Allied Chemical Corporation. Vehicle moving apparatus. 4,099,707, Cl. 254-35.000.
- Anderson, Glenn W.: *See—*
  - Hutchison, Stanley O.; and Anderson, Glenn W., 4,099,563, Cl. 166-191.000.
- Anderson, Ingvar G.: *See—*
  - Mackenzie, Harold B.; and Anderson, Ingvar G., 4,099,473, Cl. 110-219.000.
- Anderson, Keith J. Releasable magnet assembly. 4,099,755, Cl. 292-251.500.
- Anderson, Oscar L.: *See—*
  - Peterson, Wallace W.; and Anderson, Oscar L., 4,099,331, Cl. 33-88.000.
- Anderson, Ralph F., to B. F. Goodrich Company, The. Flexible cover for a chlorine cell. 4,100,053, Cl. 204-279.000.
- Anderson, Richard A.; Sokolowski, Robert C.; and Ostermeier, Kurt W., to Kimberly-Clark Corporation. Nonwoven fabric and method of producing same. 4,100,324, Cl. 428-288.000.
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- Andersson, Clarence A.: *See—*
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- Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, to Pharmacia Fine Chemicals AB. Apparatus for optically analyzing fluids. 4,099,882, Cl. 356-181.000.
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- Andrews, Mena G., to Combustion Engineering, Inc. Internal fuel pin oxidizer. 4,100,020, Cl. 176-68.000.
- Angelier, Nicole: *See—*
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- Anic, S.p.A.: *See—*
  - Romano, Ugo; and Tesei, Renato, 4,100,351, Cl. 560-24.000.
- Ansari, Hifzur Rahman; Unwin, Neville; and Wagner, Horst Richard, to Bush Boake Allen Limited. Isolongifolene Prins reaction compounds in perfumery. 4,100,110, Cl. 252-522.000.
- Antolino, Angelo, to New Colony Inventions, Inc. Selective dispensing utensil. 4,099,654, Cl. 222-184.000.
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  - Jackson, George Robert, 4,100,390, Cl. 219-74.000.
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  - Lee, Robert Wilton, 4,099,878, Cl. 356-128.000.
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  - Alexander, Robert W., 4,099,946, Cl. 62-73.000.
- Armco Steel Corporation: *See—*
  - Schumacher, William J.; and Tanczyn, Harry, 4,099,967, Cl. 75-128.00A.
- Armstrong Cork Company: *See—*
  - Baer, Steven R., 4,100,115, Cl. 521-83.000.
  - Herweh, John E., 4,099,910, Cl. 8-115.500.
- Arneson, Blayne E., to Admiral Corporation. AFT summing circuit for varactor-type tuning systems. 4,100,578, Cl. 358-191.000.
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  - Schmidt, John, Jr.; and Aryamane, Avinash, 4,099,320, Cl. 29-623.000.
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  - Kawasaki, Masahiro; and Tano, Eiichi, 4,099,885, Cl. 356-223.000.
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  - Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, 4,100,424, Cl. 250-559.000.
- Asaka, Urataro, to Honda Giken Kogyo Kabushiki Kaisha. Mixture correction system during rapid acceleration in internal combustion engine with auxiliary combustion chamber. 4,099,492, Cl. 123-32.0ST.
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  - Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki, 4,100,558, Cl. 354-271.000.
- Asano, Hiroaki, to Toyoda Koki Kabushiki-Kaisha. Cam grinding machine with swing table support device. 4,099,349, Cl. 51-101.00R.
- Asano, Teryoshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Device for producing a pipe joint having an internal groove therein. 4,100,307, Cl. 425-533.000.
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  - Kollberg, Sten, 4,100,364, Cl. 13-9.00R.
- Ashman, John Slocum; and Mudrak, Anton, to Harshaw Chemical Company, The. Silane treated antimony compounds. 4,100,075, Cl. 252-8.100.
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- Ashorn, Theodore Heinrich Gustave; and Laine, Paul Elis, to G. A. Serlachius Oy. Method of condensing and/or polymerizing sulfonated lignin containing materials. 4,100,155, Cl. 260-124.00R.
- Askew, James Martin Anderton, to Lucas Industries Limited. Structure facilitating fuel pump assembling. 4,099,895, Cl. 417-499.000.
- Askew, William, to Dresser Europe, S.A. Mining machine. 4,099,787, Cl. 299-43.000.
- Asperger, Robert G.; and Clouse, Robert C., to Dow Chemical Company, The. Quaternary salt-polyamine inhibitor for sour gas conditioning solutions. 4,100,099, Cl. 252-189.000.
- Asperger, Robert G.: *See—*
  - Clouse, Robert C.; and Asperger, Robert G., 4,100,100, Cl. 252-189.000.
- Associated Paper Industries Limited: *See—*
  - Singh, Tej Kuldip, 4,099,342, Cl. 36-44.000.
- Atari Inc.: *See—*
  - Dean, David W.; and Bristow, Stephen D., 4,099,719, Cl. 273-101.200.
- Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, to Hoffmann-La Roche Inc. Compositions having antibiotic properties. 4,100,275, Cl. 424-211.000.
- Atlantic Richfield Company: *See—*
  - Burger, Edward D., 4,099,622, Cl. 209-114.000.
- Aubailly-Delalieu, Marc M., to Societe Anonyme Eau-Gaz-Assainissement. Endless power-driven conveyor with discharge comb. 4,099,610, Cl. 198-729.000.
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  - Kutnyak, Thomas A.; and Dunn, George T., 4,099,744, Cl. 285-7.000.

- Automatisme & Technique: *See—*
  - Bardet, Gerard, 4,100,386, Cl. 219-10.55M.
- Automotive Products Limited: *See—*
  - Higgerson, Raymond, 4,099,604, Cl. 192-111.00A.
  - Temperley, Harry Davison; and Parsons, David, 4,099,600, Cl. 188-73.400.
- Ayerst, McKenna & Harrison Limited: *See—*
  - Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,100,343, Cl. 542-426.000.
- B. Braun Instruments: *See—*
  - Pudenz, Alfred, 4,099,315, Cl. 29-434.000.
- B. F. Goodrich Company, The: *See—*
  - Anderson, Ralph F., 4,100,053, Cl. 204-279.000.
  - Summers, James William; and Kliner, George Joseph, 4,100,325, Cl. 428-334.000.
- Baba, Tatsuo: *See—*
  - Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.
- Bacskai, Robert, to Chevron Research Company. Phosphonium catalyst system for the polymerization of 2-pyrrolidone. 4,100,146, Cl. 528-313.000.
- Baelde, Claude: *See—*
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- Baer, Steven R., to Armstrong Cork Company. High-temperature insulation composite molded product. 4,100,115, Cl. 521-83.000.
- Bager, Reinhard, to Saurer-Allma GmbH. Programmed control for effect spinning and twisting machines. 4,100,399, Cl. 235-92.0CC.
- Baggett, Joseph McClendon; and Krause, Ruben Louis, to Dow Chemical Company, The. Polycarbonates incorporating epihalohydrin residues. 4,100,139, Cl. 528-196.000.
- Bagli, Jehan F.: *See—*
  - Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,100,343, Cl. 542-426.000.
- Bahnfleth, William A.: *See—*
  - Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., 4,099,763, Cl. 296-28.00C.
- Bailey, Terry R.: *See—*
  - Cook, Jack E.; and Bailey, Terry R., 4,099,838, Cl. 350-105.000.
- Baker, Dennis Stanley; and Davies, Glyndwr John, to Glacier Metal Company, Limited, The. Plain bearings. 4,099,804, Cl. 308-237.00R.
- Baker, Howard Burgess, to General Electric Company Limited, The. Machines for inserting electric circuit components on printed circuit boards. 4,099,325, Cl. 29-741.000.
- Balcke-Durr AG: *See—*
  - Fickelscher, Kurt Gerhard, 4,099,427, Cl. 74-804.000.
  - Wohler, Hans-Joachim; and Ilse, Walter, 4,099,675, Cl. 239-498.000.
- Baldwin, David E., Jr.: *See—*
  - Sbeely, Clyde Q., Jr.; and Baldwin, David E., Jr., 4,099,565, Cl. 166-252.000.
- Ball, Thomas S.; and Rugh, John D., to Ball, Thomas S. Bio-alarm security system. 4,100,536, Cl. 340-207.00R.
- Ballard, Jules, to Glenro, Inc. Expanded element radiant heating device. 4,100,395, Cl. 219-356.000.
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  - Selvarajan, Radhakrishnan; and Ballweber, Edward G., 4,100,167, Cl. 260-296.00R.
  - Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.
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  - Wistinghausen, Nikolai K.; and Banninga, Edward P., 4,099,363, Cl. 53-124.00D.
- Baranowski, Stephen W.; and McConeghy, Richard H., to Square D Company. Load controlling means. 4,100,426, Cl. 307-41.000.
- Barch, Herbert W.; and Bohy, August G., to PPG Industries, Inc. Apparatus for producing slubby yarn. 4,099,307, Cl. 28-252.000.
- Bardet, Gerard, to Automatisme & Technique; and Desmarquest Et C.E.C. Process for sintering ceramic products. 4,100,386, Cl. 219-10.55M.
- Barecki, Chester J., to American Seating Company. Seat rack with a replaceable head rest cover. 4,099,772, Cl. 297-220.000.
- Barnes, John A., to R. Ritter Corporation. Airborne pulse magnetron and power supply system. 4,099,807, Cl. 315-127.000.
- Baron, William James; and Kenney, John Thomas, to Western Electric Company, Inc. Method of depositing a metal on a surface. 4,100,037, Cl. 204-15.000.
- Barron, Ellis. Plectrum piano action. 4,099,440, Cl. 84-258.000.
- Barry, Fentress S. Bench for potting of plants and the like. 4,099,811, Cl. 312-211.000.
- Barry, John Kenneth: *See—*
  - Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, 4,099,905, Cl. 425-589.000.
- Bartholomew, Roger F.; and Wu, Che-Kuang, to Corning Glass Works. High refractive index hydrated glasses. 4,099,978, Cl. 106-53.000.
- BASF Aktiengesellschaft: *See—*
  - Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,100,191, Cl. 260-557.00R.
  - Jaedicke, Hagen; Paust, Joachim; and Schneider, Joachim, 4,100,197, Cl. 260-586.00P.
  - Weitz, Hans-Martin; and Hartig, Juergen, 4,100,361, Cl. 560-244.000.
- BASF Wyandotte Corporation: *See—*
  - Gallagher, James A., 4,100,328, Cl. 428-407.000.
  - Garvin, Donald F.; and Aepli, Otto T., 4,099,985, Cl. 134-4.000.
- Bassani, Giovanni, to Dow Corning Corporation. Liquid polymer extrusion process and product. 4,100,240, Cl. 264-108.000.
- Bassani Ticino S.p.A.: *See—*
  - Rodolfi, Giorgio, 4,100,517, Cl. 335-132.000.
- Bauer, Dieter: *See—*
  - Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, 4,100,195, Cl. 260-576.000.
- Baues, Peter; and Plaettner, Rolf, to Siemens Aktiengesellschaft. Optical control device for integrated optical circuit. 4,099,836, Cl. 350-96.140.
- Baum, Werner: *See—*
  - Frankle, Helmut; and Baum, Werner, 4,099,584, Cl. 175-14.000.
- Baxter Travenol Laboratories, Inc.: *See—*
  - Heiss, Louis Robert, 4,099,920, Cl. 23-253.00R.
- Bayer Aktiengesellschaft: *See—*
  - Breer, Karl, 4,099,652, Cl. 222-135.000.
  - Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.
  - Fischler, Hans-Michael; Bauer, Dieter; and Quast, Hein, 4,100,195, Cl. 260-576.000.
  - Freitag, Dieter; and Nouvertne, Werner, 4,100,130, Cl. 260-37.0PC.
  - Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.
  - Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 4,099,280, Cl. 9-6.00P.
  - Konig, Joachim; Suling, Carlhans; and Boehmke, Gunther, 4,100,339, Cl. 526-193.000.
  - Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.
  - Meyer, Rolf-Volker; and Dhein, Rolf, 4,100,223, Cl. 260-857.00L.
  - Walther, Herbert; Hartig, Wolfgang; Friedrich, Adolf; and Raue, Roderich, 4,100,509, Cl. 331-94.50L.
  - Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.
- Bayerische Motoren Werke Aktiengesellschaft: *See—*
  - Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, 4,099,770, Cl. 297-216.000.
  - Lehr, Werner, 4,099,778, Cl. 297-386.000.
  - Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., 4,099,645, Cl. 220-304.000.
- Bayliff, Raymond William, to Decca Limited. Loudspeaker system with phase difference compensation. 4,100,371, Cl. 179-1.00E.
- Baylis, Shelby M.; and Szauer, Jorge S. Biopsy apparatus. 4,099,518, Cl. 128-2.00B.
- BBC Brown, Boveri & Company, Ltd.: *See—*
  - Menth, Anton; Nagel, Hartmut; and Perry, Antony James, 4,099,995, Cl. 148-101.000.
- Beatrice Foods Company: *See—*
  - Pezzuto, Michael, Jr., 4,100,125, Cl. 260-29.6TA.
- Beck, Arnold, to Buttner-Schilde-Haas Aktiengesellschaft. Arrangement for and method of inserting a nozzle unit into an opening of a spinning device. 4,099,898, Cl. 425-192.00S.
- Beck, Don D. Pipe handling apparatus. 4,099,630, Cl. 214-2.500.
- Becker, Frederick R., III, to Metropolitan Wire Corporation. Convertible cart. 4,099,735, Cl. 280-79.300.
- Becker, Robert J.: *See—*
  - Cueman, Glenn F.; and Becker, Robert J., 4,099,524, Cl. 128-78.000.
- Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., to Caterpillar Tractor Co. Work vehicle and ring gear bearing arrangement therefor. 4,099,577, Cl. 172-781.000.
- Beckmann, Martin Josef; and Swann, Ferris George. Low pressure gas burner. 4,099,908, Cl. 431-284.000.
- Beers, Melvin D., to General Electric Company. Curable compositions and process. 4,100,129, Cl. 260-37.0SB.
- Beguin, Jean Claude; and Guerit, Pierre, to Servimetal. Method of using MgCl$_2$-KCl flux for purification of an aluminum alloy preparation. 4,099,965, Cl. 75-68.00R.
- Behr, Michael Isaac; Gyi, KoKo; and Brutsch, Werner, to Burroughs Corporation. Transducer head with narrow core structure. 4,100,584, Cl. 360-125.000.
- Belanger, Jean-Yves: *See—*
  - Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.
- Bell, Charles M.: *See—*
  - Hamlett, Sidney J.; and Bell, Charles M., 4,099,474, Cl. 112-258.000.
- Bell, Frederick Koonce; and Tuss, John Joseph, to Bendix Corporation, The. Coordinate measuring machine having auxiliary air bearing. 4,099,800, Cl. 308-6.00R.
- Bell, George Robert: *See—*
  - Oakley, Ervin Carvis; Bell, George Robert; and Poole, William Eugene, 4,099,808, Cl. 312-138.00R.
- Bell, Henry O. Apparatus and method for hanging and orienting a wall hanging. 4,099,698, Cl. 248-493.000.
- Bell & Howell Company: *See—*
  - Lang, John W., Jr., 4,099,869, Cl. 355-108.000.
- Bell, Leo A., to Martin-Decker Company, a division of Gardner-Denver. Drilling fluid compensation device. 4,099,582, Cl. 175-5.000.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Carlisle, Arthur Wallace; and Frey, Dean Rudisill, 4,099,822, Cl. 339-98.000.
  - Cho, Alfred Yi; and Tsang, Won-Tien, 4,099,305, Cl. 29-579.000.
  - D'Alessio, Alfonso Joseph, 4,099,823, Cl. 339-113.00B.

- Flanagan, James Loton, 4,100,377, Cl. 179-15.0AS.
- French, William George; and MacChesney, John Burnette, 4,099,835, Cl. 350-96.300.
- Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, 4,100,374, Cl. 179-1.50S.
- Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, 4,100,533, Cl. 340-147.00R.
- Vazirani, Hargovind Nihchaldas, 4,099,837, Cl. 350-96.290.
- Warner, Arthur Woodward, Jr., 4,099,832, Cl. 350-96.210.

Belt, Kenneth W.; and McCarrell, Stuart G., to Macan Engineering & Manufacturing Company, Inc. Variable crest factor high frequency generator apparatus. 4,100,505, Cl. 331-71.000.

Belyshev, Leonid Lavrentievich; Gorokhov, Veniamin Ivanovich; and Chuvpilo, Albert Vladimirovich. Device for application of paste to internal surface of cylindrical electrode of primary cell. 4,099,549, Cl. 141-32.000.

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- Krichevsky, Mendel, 4,100,520, Cl. 336-30.000.

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- Sommer, Klaus; and Raab, Guenter, 4,100,067, Cl. 210-58.000.

Bender, Ulrich, to Emil Bender, Firma. Manufacture of grids. 4,099,309, Cl. 29-2.000.

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- Cadeddu, Leonardo, 4,099,380, Cl. 60-588.000.

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- Bell, Frederick Koonce; and Tuss, John Joseph, 4,099,800, Cl. 308-6.00R.
- Bouvier, Alfred Joseph, 4,099,323, Cl. 29-629.000.
- Edmond, James Junior, 4,099,409, Cl. 73-133.00R.
- Hall, Roger D., 4,100,516, Cl. 333-6.000.
- Reddy, Junuthula Nirdosh, 4,099,491, Cl. 123-32.0EE.

Beneteau, Donald Joseph. Apparatus for piercing sheet material. 4,099,436, Cl. 83-617.000.

Bennett, Robert F.; Brouwer, Nicholaas L.; and Stricker, David M., to Aluminum Company of America. System for determining tube eccentricity. 4,099,418, Cl. 73-622.000.

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- Kirilloff, Victor V.; and Benson, William A., 4,100,526, Cl. 338-279.000.

Benuska, Alfred L., to V.I.P. Engineered Products Corporation. Automatic web winder. 4,099,682, Cl. 242-56.00R.

Berg, Rudolph G.; and Hetzel, Donald S., to Pfizer Inc. Preparation of citraconic anhydride. 4,100,179, Cl. 260-346.750.

Berg, Stig Ove; and Persson, Rolf Tore, to C J Wennberg AB. Arrangement for withdrawing material from a silo. 4,099,632, Cl. 214-17.0DA.

Berger, Abraham William; and Stubbs, Harry Eugene. Sulfur detecting apparatus comprising holmium, and erbium filters. 4,099,883, Cl. 356-187.000.

Berger, J. Louis. Thermal imaging transducer and system. 4,100,573, Cl. 358-113.000.

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- Bergh, George G.; and Bergh, Robert G., 4,099,647, Cl. 220-334.000.

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- Bergstein, Robert M., 4,099,665, Cl. 220-403.000.

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Berkman, Vitaly Iosifovich: *See—*
- Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.

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- Millheiser, Melvin; and Berliner, Wallace H., 4,099,444, Cl. 85-8.800.

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Berry, Milton E.; and Cofer, Daniel B., to Southwire Company. Method and apparatus for production of hot-formed metallic rod. 4,099,399, Cl. 72-38.000.

Berstermann, Wilhelm: *See—*
- Grisar, Ulrich; and Berstermann, Wilhelm, 4,099,873, Cl. 356-86.000.

Bertele, Ludwig. Variable focal lens having a divergent front element. 4,099,844, Cl. 350-184.000.

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Betensky, Ellis I.: *See—*
- Lawson, John A.; and Betensky, Ellis I., 4,099,849, Cl. 350-214.000.

Bethlehem Steel Corporation: *See—*
- MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., 4,099,958, Cl. 75-0.5BA.

Beurer, Peter; Luthi, Johannes; and Portaleoni, Libero, to Sulzer Brothers Limited. Apparatus for the treatment of liquids. 4,100,071, Cl. 210-197.000.

Beyers, Billy Wesley, Jr., to RCA Corporation. Timekeeping apparatus with power line dropout provisions. 4,099,372, Cl. 58-85.300.

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- Japs, Archie B., 4,099,376, Cl. 60-253.000.
- Magistro, Angelo Joseph, 4,100,211, Cl. 260-656.00R.

Bialorucki, Edward J.; Bradley, Ronald W.; and Carl, David G., to Owens-Illinois, Inc. Electrostatically coating hollow glass articles. 4,099,486, Cl. 118-635.000.

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- Latsch, Reinard; and Bianchi, Valerio, 4,099,493, Cl. 123-32.0EA.

Bickhaus, James T., to ACF Industries, Inc. Throttle structure for an internal combustion engine. 4,099,504, Cl. 123-122.0AB.

Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, to Agfa-Gevaert AG. Method and apparatus for evaluating developed photographic films preparatory to reproduction. 4,099,862, Cl. 355-35.000.

Biesecker, James E.: *See—*
- Gwozdz, Joseph W.; Biesecker, James E.; and Snyder, Charles R., 4,099,753, Cl. 292-177.000.

Biller, Horst, to Mannesmannrohren-Werke, A.G. Stretch reducing of hollow stock. 4,099,402, Cl. 72-234.000.

Billington, Evans R.; and Nicholas, William, to Golconda Corporation. Thermal-manual control valve. 4,099,551, Cl. 141-388.000.

Bilow, Norman; and Kimmel, Boyce G., to Hughes Aircraft Company. Ethnyl terminated polyimide composites. 4,100,138, Cl. 526-262.000.

Binder, Georg; Lindauer, Rolf; Sohnle, Rudiger; and Wahler, Harald, to Robert Bosch GmbH. Alternator-rectifier-regulator unit or mushroom shape for vehicular service. 4,100,440, Cl. 310-89.000.

Binkley, Carl R.; Keir, John B.; and Semchena, John H., to Sperry Rand Corporation. Power transmission. 4,099,541, Cl. 137-596.130.

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- Micklus, Michael J.; and Ou-Yang, David T., 4,100,309, Cl. 427-2.000.

Birtley Engineering Limited: *See—*
- Adams, Terence C., 4,100,248, Cl. 264-273.000.

Bissett, Robert Stuart: *See—*
- Theimer, Ernst Theodore; and Bissett, Robert Stuart, 4,099,454, Cl. 99-358.000.

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Bitzer, Donald L.; and Tucker, Paul T., to University of Illinois Foundation. Method and apparatus for addressing and sustaining gas discharge panels. 4,100,535, Cl. 340-166.00R.

Bjorkman, Rune Harald: *See—*
- Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.

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- Seifert, Peter, 4,099,458, Cl. 100-116.000.

Blackwell, Henry Wayne, to Dresser Industries, Inc. Oilwell swab cup. 4,099,451, Cl. 92-241.000.

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- Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.

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Blann, Ellis L. Container support. 4,099,693, Cl. 248-210.000.

Blinow, Igor, to Polaroid Corporation. Combined view and rangefinder with specially configured moving/lens. 4,100,556, Cl. 354-166.000.

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- Hirschfeld, Tomas R., 4,100,416, Cl. 250-461.00B.

Blodgett, Norman S.: *See—*
- Haddad, Daniel G., 4,099,716, Cl. 273-73.00E.

Bloomer, Ivan; and Young, Ronald William, to Carrier Drysys Limited. Treating paint waste solids. 4,100,066, Cl. 210-44.000.

Blount, David H. Process for the production of amine silicate compounds and their resinous condensation products. 4,100,112, Cl. 260-185.000.

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  - Alexander, Charles F., Jr., 4,099,478, Cl. 115-18.00E.
- Brutsch, Werner: *See—*
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  - Ansari, Hifzur Rahman; Unwin, Neville; and Wagner, Horst Richard, 4,100,110, Cl. 252-522.000.
- Bustos, Rafael T., to Leggett & Platt, Incorporated. Display rack. 4,099,625, Cl. 211-49.00R.
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- Butt, Sheldon H., to Olin Corporation. Solar absorber plate design. 4,099,559, Cl. 165-170.000.
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  - Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.
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- Carr, Peter, to Energy Development Associates. Comb type bipolar electrode elements and battery stacks thereof. 4,100,332, Cl. 429-27.000.
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  - Runyan, Gary L., 4,099,705, Cl. 251-171.000.
  - Wesley, John, 4,099,308, Cl. 28-273.000..
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- CGEE Alsthom S.A.: *See—*
  - Debaigt, Jean, 4,099,821, Cl. 339-91.00R.
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  - Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 4,099,909, Cl. 8-41.00C.
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  - Farooq, Saleem; and Karrer, Friedrich, 4,100,296, Cl. 424-278.000.
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  - Miller, Ralph, 4,100,263, Cl. 423-383.000.
  - Mueller, Karl, 4,100,225, Cl. 260-878.00R.
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  - Andrews, Mena G., 4,100,020, Cl. 176-68.000.
  - Sander, Georg; Jacobson, Sven Eric; and Ericson, Ake Magnus Ivar, 4,099,471, Cl. 110-182.500.
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- Cooke, P. Richard, to Midnight Ears, Inc. Fluorescent tube indicator mounted on antenna. 4,100,547, Cl. 343-721.000.
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- Davis, William R.: *See—*
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  - Waugh, Dale L., 4,099,737, Cl. 280-261.000.
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  - Bayliff, Raymond William, 4,100,371, Cl. 179-1.00E.
- Decker, Donald H.; Davis, William R.; and Falleti, Duane W. Blood sampling apparatus. 4,099,520, Cl. 128-2.00F.
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  - Gutlhuber, Friedrich; Jager, Adolf; and Ufholz, Heinrich, 4,099,926, Cl. 23-286.000.
- DeLano, Don L., to Microdot Inc. Lamp socket. 4,099,820, Cl. 339-88.00R.
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- DeNoyer, Donald B., to Sterling, Inc. Auger feed granulator. 4,099,677, Cl. 241-186.00A.
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  - Immordino, Vincent J., 4,099,650, Cl. 221-266.000.
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- Ditthardt, Alfred R., to Zenith Radio Corporation. Electromagnetic optical beam controller having an eddy current damper for arresting mechanical resonance. 4,100,576, Cl. 358-128.000.
- DiTullio, Joseph G.; and Parad, Leonard I., to GTE Sylvania Incorporated. Broadband microwave polarizer device. 4,100,514, Cl. 333-31.00A.
- Dix, Joseph F.; and Sampson, Joseph, to Crown Cork & Seal Company, Inc. Apparatus for and method of closing containers. 4,099,361, Cl. 53-42.000.
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  - Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Scbedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.
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  - Bogan, Gary W.; and Hickner, Richard A., 4,100,045, Cl. 204-159.160.
  - Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., 4,100,256, Cl. 423-220.000.
  - Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., 4,100,227, Cl. 260-880.00R.
  - Christenson, Christopher P.; and McNamee, Gary M., 4,099,984, Cl. 134-2.000.
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  - Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., 4,100,228, Cl. 260-880.00R.
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  - Brooks, William T.; and Legrow, Gary E., 4,100,090, Cl. 252-63.700.
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- Dron, Sylvain Maurice; and Evrard, Gerard Maurice Gaspard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA). Assembly of a magnet and a pole piece. 4,100,392, Cl. 219-121.0EM.
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- D'Silva, Themistocles D. J., to Union Carbide Corporation. Dioxane oxime compounds and pesticidal dioxane carbamoyloxime derivatives. 4,100,295, Cl. 424-278.000.
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- Duca, William J., to American Induction Heating Corporation. Housing for an induction furnace. 4,100,365, Cl. 13-27.000.
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- Dullinger, Karl, to Kronseder, Hermann. Conveying and reject apparatus for upright standing bottles. 4,099,621, Cl. 209-98.000.
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- Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of oligourethanes. 4,100,144, Cl. 260-860.000.
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- DuRocher, Gideon A., to Essex Group, Inc. Combination insulating sleeve and electrical contact member for electro-plating rack. 4,100,054, Cl. 204-297.00W.
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- Dwyer, Francis G., to Mobil Oil Corporation. Isomerization of monocyclic alkyl aromatic hydrocarbons. 4,100,214, Cl. 260-668.00A.
- Dyball, Reginald Gordon. Attachment for a power tool. 4,099,552, Cl. 144-134.00D.
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- Dykes, Wiley V.; and Oharek, Frank J., to United States of America, Navy. 360° Non-programmed visual system. 4,100,571, Cl. 358-87.000.
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- Ebner, Peter R., to Itek Corporation. Protective container for font disc segments. 4,099,618, Cl. 206-454.000.
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- Edmond, James Junior, to Bendix Corporation, The. Multi-axis load cell with arcuate flexures. 4,099,409, Cl. 73-133.00R.
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- Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, to Hoechst Aktiengesellschaft. Production of pure alkali metal phosphate solutions from wet-processed phosphoric acid. 4,100,261, Cl. 423-309.000.
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- Eickholt, Hubert; and Heinzel, Gunter, to Polysius AG. Separator. 4,100,061, Cl. 209-139.00A.
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  - Zimmerman, Dennis M.; and Marshall, Winston S., 4,100,166, Cl. 260-289.00D.
- Elliot, George: *See—*
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  - Ovenden, Charles William, 4,100,464, Cl. 315-397.000.
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- Emmons, William D.; Sperry, Peter R.; and Nyi, Kayson, to Rnhm and Haas Company. Air-dry curable compositions comprising dicyclopentenyl (meth) acrylate copolymers and non-volatile reactive monomer, and cured coatings and impregnations obtained therefrom. 4,100,133, Cl. 260-45.90L.
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  - Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,100,458, Cl. 315-39.550.
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- Essex Group, Inc.: *See—*
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  - Hudson, John Colin, 4,099,365, Cl. 56-13.500.
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  - Creed, Sherman H., 4,099,547, Cl. 141-5.000.
  - Finley, Joseph H., 4,100,342, Cl. 536-103.000.
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  - Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, 4,099,640, Cl. 220-6.000.
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- Franklin, Earl W., to Owens-Illinois, Inc. Thermally crystallizable glasses and glass-ceramics made therefrom. 4,100,001, Cl. 106-39.700.
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- Freeman, Robin John, to Vision Engineering, Ltd. High magnification optical apparatus with rotatable reflective lenticulated surface. 4,099,831, Cl. 350-9.000.
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  - Fukuhara, Masao, 4,099,391, Cl. 66-121.000.
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- Fussa, Alfred D.: *See—*
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  - Brasey, Marcel; Schweizer, Alfred D.; and Shorrock, James C., 4,100,341, Cl. 536-56.000.
- Gallant, John Henry; and Johnson, Michael Robert Thomas, to May & Baker Limited. Measuring system. 4,100,542, Cl. 340-518.000.
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- Gange, Robert Allen, to RCA Corporation. Uniform filament and method of making the same. 4,100,449, Cl. 313-337.000.
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- Gantzert, Thomas R.: *See—*
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- Gatzi, Karl, to Ciba-Geigy Corporation. Pyridine-4-carboxylic acid hydrazones for combatting phytopathogenic microorganisms. 4,100,290, Cl. 424-266.000.
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- General Dynamics Corporation: *See—*
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- General Electric Company: *See—*
  - Anderson, Thomas E.; Peak, Steven C.; and Ibsen, Ole N., 4,100,587, Cl. 361-82.000.
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  - Boyd, John H., Jr., 4,100,444, Cl. 310-184.000.
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  - McNeal, Walter P., 4,100,005, Cl. 156-73.100.
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  - Stegmaier, Louis T.; and Reynolds, Howard, 4,099,828, Cl. 339-258.00F.
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- General Mills Chemicals, Inc.: *See—*
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- George, Peter K., to Rockwell International Corporation. Exchange stack buffer memory. 4,100,608, Cl. 365-2.000.
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- Geringer, Arthur V. Electric lock. 4,099,752, Cl. 292-144.000.
- Gerkema, Jan T.: *See—*
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  - Weirich, Walter; and Wildforster, Heinrich, 4,099,782, Cl. 299-1.000.
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- Ghiringhelli, Horace, to Isodyne, Inc. Single secondary dimming inverter/ballast for gas discharge lamps. 4,100,476, Cl. 315-297.000.
- Giardini, Dante S.; and Hamburg, Douglas R., to Ford Motor Company. Vapor temperature controlled exhaust gas heat exchanger. 4,099,499, Cl. 123-122.00E.
- Gibbons, Harold M., to FMC Corporation. Marine loading arm jumper assembly. 4,099,542, Cl. 137-615.000.
- Gibson, Larry R. Foot warmer. 4,099,341, Cl. 36-7.300.
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- Giglia, Robert Domenico, to American Cyanamid Company. Faster addressing of electrochromic displays. 4,099,839, Cl. 350-357.000.
- Giles, Michael Brian: *See—*
  - Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, 4,100,274, Cl. 424-177.000.
- Gilles, Theodore C.: *See—*
  - Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
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- Gilligan, Patrick J.; and Schrupp, Kenneth D., to Pako Corporation. Light source for photographic printer. 4,099,864, Cl. 355-37.000.
- Gillis, Robert E. Concave-convex structure with spaced fittings for intersecting flexible rods. 4,099,533, Cl. 135-3.00E.
- Gimenez, Aurelio Helde. Self tightening elastic clamp, particularly a hose clamp. 4,099,298, Cl. 24-27.000.

- Giovenco, Silvia: *See—*
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- Giron, Jacques Pierre Max, to Scolarma. Method of and apparatus for molding a receptacle. 4,100,249, Cl. 264-313.000.
- GKN Sankey Limited: *See—*
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- GKN Transmissions Limited: *See—*
  - Forster, Brian Michael, 4,099,333, Cl. 33-203.120.
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- Glanvall, Rune Valdemar, to Stal Refrigeration AB. Rotary compressor. 4,099,896, Cl. 418-184.000.
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  - Ballard, Jules, 4,100,395, Cl. 219-356.000.
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  - Billington, Evans R.; and Nicholas, William, 4,099,551, Cl. 141-388.000.
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  - Wareham, Richard R.; and Gold, Nicholas, 4,100,559, Cl. 354-277.000.
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- Goloff, Alexander; and Keske, Frank E., to Caterpillar Tractor Co. Fuel spray. 4,099,494, Cl. 123-32.0JV.
- Gonzales, Boris, to Societe Anonyme Automobiles Citroen. Speed limiter devices for automobiles. 4,099,592, Cl. 180-108.000.
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  - Hampshire, William J., 4,100,241, Cl. 264-113.000.
- Goold, Reed: *See—*
  - Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.
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- Gorter, Frederik W.: *See—*
  - Koel, Gerrit J.; Gorter, Frederik W.; and Gerkema, Jan T., 4,100,583, Cl. 360-113.000.
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- Gosswiller, Earl W., to Federal Signal Corporation. Supervisory circuit for monitoring speaker coils. 4,100,380, Cl. 179-175.10A.
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  - Phillips, Charles Walter, 4,099,313, Cl. 29-416.000.
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  - Paitula, Hannu Olli, 4,099,685, Cl. 242-107.40B.
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- Graube, Andrejs, to Hughes Aircraft Company. Method for fabricating reflection infrared holograms. 4,099,971, Cl. 96-27.00H.
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- Groves, Ian Stanley: *See—*
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  - MacKay, Patrick W.; Vera, Enrique Martinez; and de la Pena, Ramon, 4,099,962, Cl. 75-26.000.
- Grzesik, Michel Edouard, to Societe Anonyme POCLAIN. Endless track for vehicle. 4,099,797, Cl. 305-54.000.
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  - Blaisdell, Ronald G.; and Hough, Harold L., 4,100,415, Cl. 250-455.000.
  - Brennan, Leon E.; Lagermasini, Joseph P.; and Rarig, Larry L., 4,099,607, Cl. 198-341.000.
  - DiTullio, Joseph G.; and Parad, Leonard I., 4,100,514, Cl. 333-31.00A.
  - Henkel, Charles E.; and Holmes, C. Daniel, 4,100,592, Cl. 362-191.000.
  - Messier, Russell F.; and Wolfe, Robert W., 4,100,101, Cl. 252-301.40H.

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  - Gubelmann, William S., deceased; and Grier, William R., 4,099,606, Cl. 400-4.000.
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  - Frenette, Lionel G., 4,099,636, Cl. 214-152.000.
- Guilhem, Jacques R.; and Jean, Pierre, to Gaz-Transport. Apparatus for transporting fluids at low temperature. 4,099,649, Cl. 220-439.000.
- Gunnell, Thomas J., to Phillips Petroleum Company. Carbon black pelleter. 4,099,899, Cl. 425-222.000.
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- Gupta, Shanti Swarup, to Wescom, Inc. Communication circuit having precision capacitor multiplier. 4,100,515, Cl. 333-80.00R.
- Gurov, Evgeny Ivanovich: *See—*
  - Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.
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- Gustavsson, Lennart, to Aktiebolaget Svenska Flaktfabriken. Method and apparatus for forming a material web. 4,099,296, Cl. 19-304.000.
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- Gutermuth, Paul, Jr.: *See—*
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- H & H Equipment Co.: *See—*
  - McGee, Donald J., 4,099,740, Cl. 280-678.000.
- H.O.P. Consulab Inc.: *See—*
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- Haag, Werner O.: *See—*
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- Haake, Frederick L., to United States of America, Navy. Ignition device for missile motors. 4,099,465, Cl. 102-204.000.
- Haas, Ronald J.; and Briggs, Donald D., to Ford Aerospace & Communications Corp. Battery structure. 4,100,333, Cl. 429-156.000.
- Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Imaging composition. 4,100,088, Cl. 252-62.520.
- Habermeier, Jurgen, to Ciba-Geigy Corporation. Triols containing hydantoin rings. 4,100,348, Cl. 548-310.000.
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- Haddad, Daniel G., to Blodgett, Norman S., a part interest. Game racket. 4,099,716, Cl. 273-73.00E.
- Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Control system to regulate the wall temperature of a pressure vessel. 4,099,554, Cl. 165-32.000.
- Hagar, Robert A.: *See—*
  - Suffredini, Joseph R.; and Hagar, Robert A., 4,100,445, Cl. 313-101.000.
- Hagino, Shunji, to RCA Corporation. Turntable speed control system. 4,100,465, Cl. 318-41.000.
- Haley, Jack R.: *See—*
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  - Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.
- Hall, Roger D., to Bendix Corporation, The. Microwave circuit having grounding structure. 4,100,516, Cl. 333-6.000.
- Halm, Hans, to Niveau AG, Firma. Index card register with selector device. 4,100,060, Cl. 209-80.500.
- Hamburg, Douglas R.: *See—*
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- Hamlett, Sidney J.; and Bell, Charles M., to White Sewing Machine Company. Convertible open-arm sewing machine. 4,099,474, Cl. 112-258.000.
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- Hammen, Philip D., to Pfizer Inc. 3,4-Dihydro-2-methyl-4-oxo-2H-1,2-benzothiazine-3-carboxylic acid-1,1-dioxide. 4,100,347, Cl. 544-49.000.
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- Hammer, Jacob Meyer; and Neil, Clyde Carl, to RCA Corporation. Process for forming an optical waveguide. 4,100,313, Cl. 427-162.000.
- Hampshire, William J., to Goodyear Tire & Rubber Company, The. Method for manufacturing curved bodies of fiber reinforced plastic. 4,100,241, Cl. 264-113.000.
- Hampton, Edward L.: *See—*
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- Hansen, Ove; and Rasmussen, Stig, to A/S Niro Atomizer. Method of evaporating and spray drying of a sucrose solution. 4,099,982, Cl. 127-61.000.
- Hanson, Wallace E., to Champion International Corporation. Display carton for lamp fixtures. 4,099,612, Cl. 206-45.190.
- Harada, Katsuhito; Koizumi, Hideaki; and Oishi, Konosuke, to Hitachi, Ltd. Light source lamp with particular envelope structure to accommodate external magnets. 4,100,446, Cl. 313-161.000.
- Hardouin, Jean Pierre, to Alcan Research and Development Limited. Sawing apparatus. 4,099,434, Cl. 83-157.000.
- Hareng, Michel; and Le Berre, Serge, to Thomson-CSF. Thermo-optic liquid-crystal device for real-time display of animated images. 4,099,857, Cl. 350-351.000.
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- Harlin, Herbert, to Karl Harlin & Co. Pantograph copying attachment. 4,099,446, Cl. 90-13.100.
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- Harnish, Wayne Nelson: *See—*
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  - Straayer, Ronald Jack, 4,099,829, Cl. 350-6.100.
- Harris, Delbert L.: *See—*
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- Hart, John Peter: *See—*
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- Hartmann, Ludwig, to Maschinenfabrik Hellmut Geiger. Method and apparatus for the biological cleansing of waste water. 4,100,063, Cl. 210-17.000.
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  - Poe, Lloyd R.; and Sawyer, Frank L., 4,099,751, Cl. 292-139.000.
- Hartzell, Robert Eugene, Jr., to Systron-Donner Corporation. Temperature compensation circuit for a fluid damped servo system. 4,099,415, Cl. 73-497.000.
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- Hashimoto, Eiichi: *See—*
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Henry, Clemence J.: *See—*
Savoit, Robert E.; and Henry, Clemence J., 4,099,915, Cl. 21-60.50A.

Herbein, Herbert H., to Ripple Twist Mills, Inc. Circular knitting machine. 4,099,389, Cl. 66-9.00R.

Hermansdorfer, Hans: *See—*
Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.

Herrett, Wilfred H.: *See—*
Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.

Herweh, John E., to Armstrong Cork Company. Surface modification of polymeric substrates via interaction with azido formyl or azido sulfonyl compounds. 4,099,910, Cl. 8-115.500.

Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Stable organic dispersions which can be cured with little shrinkage, based on unsaturated polyester resins and thermoplastic polymers. 4,100,224, Cl. 260-862.000.

Hetzel, Donald S.: *See—*
Berg, Rudolph G.; and Hetzel, Donald S., 4,100,179, Cl. 260-346.750.

Heurtaux, Simone: *See—*
Grandadam, Jean Andre; and Heurtaux, Simone, 4,100,297, Cl. 424-304.000.

Hewitt Soap Company, Inc., The: *See—*
O'Roark, James R., 4,100,097, Cl. 252-145.000.

Hewlett-Packard Company: *See—*
Farnbach, William A., 4,100,532, Cl. 340-146.3MA.

Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, to Westinghouse Electric Corp. Process for the preparation of calcium carbonate for use in fluorescent lamp phosphors. 4,100,264, Cl. 423-430.000.

Hickner, Richard A.: *See—*
Bogan, Gary W.; and Hickner, Richard A., 4,100,045, Cl. 204-159.160.

Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., to Marvin Glass & Associates. Vibratory drawing device. 4,099,330, Cl. 33-18.00R.

Hicks, Terence Alan: *See—*
Dunwell, David William; Evans, Delme; and Hicks, Terence Alan, 4,100,168, Cl. 260-299.000.

Higgerson, Raymond, to Automotive Products Limited. Friction clutch with integral adjuster. 4,099,604, Cl. 192-111.00A.

High Voltage Engineering Corporation: *See—*
Merrill, Edward W., 4,099,859, Cl. 351-160.000.

Higuchi, Shigetaka: *See—*
Somezawa, Masashi; Higuchi, Shigetaka; Shimizu, Tatsuo; and Ishibashi, Isao, 4,100,326, Cl. 427-130.000.

Hilfman, Lee, to UOP Inc. Hydroprocessing of hydrocarbons. 4,100,058, Cl. 208-264.000.

Hill, Colin Barry: *See—*
Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, 4,100,004, Cl. 156-60.000.

Hill, Harry Elwyn, to R. T. Vanderbilt Company, Inc. Stabilized polyolefin composition. 4,100,132, Cl. 260-42.460.

Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., to Ames Rubber Corporation. Elastomeric roll with sealed ends. 4,099,312, Cl. 29-130.000.

Hindman, Thomas Wayne, Sr.: *See—*
Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., 4,099,283, Cl. 10-107.0PH.

Hindu Incense: *See—*
Gardner, Helen J.; and Gardner, Samuel M., 4,099,916, Cl. 21-116.000.

Hipps, Larry W. Electro-hydraulic brake actuating system. 4,099,790, Cl. 303-7.000.

Hiraki, Minoru: *See—*
Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.

Hirano, Kousaku: *See—*
Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, 4,100,482, Cl. 324-6.000.

Hirayama, Tsutomu: *See—*
Hada, Hiroshi; and Hirayama, Tsutomu, 4,100,461, Cl. 315-169.0TV.

Hirschfeld, Tomas R., to Block Engineering, Inc. Serum fluorescence suppression. 4,100,416, Cl. 250-461.00B.

Hiszpanski, Jan A., to FMC Corporation. Sweeper with recirculation hood having an unobstructed pickup window. 4,099,290, Cl. 15-340.000.

Hitachi Cable, Ltd.: *See—*
Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.

Hitachi Chemical Company, Ltd.: *See—*
Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, 4,100,120, Cl. 260-22.0CB.

Hitachi, Ltd.: *See—*
Adachi, Yoshio, 4,100,429, Cl. 307-205.000.
Harada, Katsuhito; Koizumi, Hideaki; and Oishi, Konosuke, 4,100,446, Cl. 313-161.000.
Hashimoto, Hideyuki, 4,099,509, Cl. 123-148.0AC.
Hori, Yasuro, 4,100,521, Cl. 336-100.000.
Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.
Kato, Shigeo; Saito, Sakae; and Morita, Osamu, 4,099,348, Cl. 51-92.00R.
Komuro, Katsu, 4,100,435, Cl. 307-262.000.
Matsuzaki, Hideo; and Yajima, Keiji, 4,099,550, Cl. 141-51.000.
Miura, Kiyoshi; and Tomita, Yoshifumi, 4,099,973, Cl. 96-115.00R.
Miyakawa, Nobuaki; and Miki, Masayuki, 4,100,432, Cl. 307-229.000.
Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.
Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, 4,100,114, Cl. 521-175.000.
Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, 4,100,501, Cl. 330-263.000.
Nobutoki, Saburo; and Okano, Yukio, 4,100,570, Cl. 358-44.000.
Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, 4,100,118, Cl. 260-18.0PT.
Okikawa, Susumu; and Mikino, Hiroshi, 4,100,566, Cl. 357-70.000.
Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.
Osakabe, Kuniharu, 4,099,848, Cl. 350-189.000.
Sasaki, Toshiyuki, 4,099,498, Cl. 123-117.00R.
Sasayama, Takao, 4,100,564, Cl. 357-46.000.
Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Konishi, Nobutake, 4,100,562, Cl. 357-19.000.
Sugie, Jiro, 4,100,463, Cl. 315-205.000.
Ueno, Yukichi; and Nakata, Toshiaki, 4,100,410, Cl. 250-311.000.

Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
Yamashiro, Osamu, 4,100,502, Cl. 330-264.000.

Hitachi Medical Corporation: *See—*
Kuroda, Masao; Kondo, Toshio; Ogawa, Toshio; and Ono, Sekijyuro, 4,099,419, Cl. 73-626.000.

Hitachi Plant Engineering and Construction Co., Ltd.: *See—*
Sahara, Tamotsu, 4,099,573, Cl. 169-37.000.

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having a touch vibrato effect. 4,099,438, Cl. 84-1.250.

Hobart Corporation: *See—*
Morphy, Paul H., 4,099,812, Cl. 312-214.000.
Shaeffer, Raymond P., 4,100,613, Cl. 366-143.000.
Thompson, James W., 4,100,615, Cl. 366-169.000.

Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of unsaturated amines employing a palladium compound co-catalyzed with a phosphonite ligand. 4,100,194, Cl. 260-576.000.

Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Production of N-(alkadienyl)amines. 4,100,196, Cl. 260-585.00D.

Hoch, Manfried L.: *See—*
Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., 4,099,368, Cl. 56-208.000.

Hockenberger, Lothar; Soyka, Manfred; and Wilhelm, Gerhard, to Rutgerswerke Aktiengesellschaft. Storage-stable, very quickly hardenable, one-component sealant based on mercapto-terminated polymers. 4,100,148, Cl. 528-374.000.

Hodakowski, Leonard Edward; and Osborn, Claiborn Lee, to Union Carbide Corporation. Radiation polymerizable cycloalkenyl derivatives of acrylated epoxidized fatty oils or fatty acids. 4,100,046, Cl. 204-159.230.

Hoebing, Robert J. Door security guard. 4,099,754, Cl. 292-206.000.

Hoechst Aktiengesellschaft: *See—*
Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, 4,100,261, Cl. 423-309.000.
Kleber, Rolf; and Steckelberg, Willi, 4,100,078, Cl. 252-8.900.
Quietzsch, Gerhard; Greiner, Bernd; and Pelz, Lothar, 4,100,488, Cl. 324-127.000.
Schroter, Herbert; and Stein, Eckehard, 4,099,868, Cl. 355-106.000.
Waldmann, Karl; and Schnabel, Gunter, 4,100,340, Cl. 526-245.000.

Hoefke, Wolfgang: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; Stockhaus, Klaus; Hoefke, Wolfgang; and Kohn, Franz Josef, 4,100,292, Cl. 424-273.00R.

Hoff, Marcian E., Jr., to Intel Corporation. MOS reference voltage circuit. 4,100,437, Cl. 307-297.000.

Hoffart, Ronald J. Track pad. 4,099,794, Cl. 305-13.000.

Hoffman, Gene D.: *See—*
Brown, George Emmett, Jr., 4,100,418, Cl. 250-510.000.

Hoffman, William: *See—*
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.

Hoffmann-La Roche Inc.: *See—*
Atherton, Frank Ratcliffe; Hall, Michael John; Hassall, Cedric Herbert; Ringrose, Peter Stuart; and Lambert, Robert Wilson, 4,100,275, Cl. 424-211.000.
Chan, Ka-Kong; and Saucy, Gabriel, 4,100,175, Cl. 260-345.500.
Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,100,173, Cl. 260-333.000.
Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.
Westley, John; and Liu, Chao-Min, 4,100,171, Cl. 260-326.330.

Hollenbeck, Alfred L.; De Tuerk, Alison V.; and Cooper, John T., to Western Gear Corporation. Down hold packing gland and method for long stroke pumper. 4,099,571, Cl. 166-315.000.

Hollitscher, Herbert, to Canadian General Electric Co., Ltd. Permanent magnet latch for speed switching device. 4,100,382, Cl. 200-61.460.

Holloway, Donald Francis, to A. L. Gebhardt Company. Process for recovery and separation of nutritious protein hydrolysate and chromium from chrome leather scrap. 4,100,154, Cl. 260-123.700.

Hollyford Enterprises, Inc.: *See—*
Shinn, Robert C., Jr., 4,099,695, Cl. 248-351.000.

Holman, Bruce James, to International Business Machines Corporation. Error status reporting. 4,100,605, Cl. 364-900.000.

Holmes, C. Daniel: *See—*
Henkel, Charles E.; and Holmes, C. Daniel, 4,100,592, Cl. 362-191.000.

Holmstrom, Larry W.: *See—*
Fleming, Alan J.; and Holmstrom, Larry W., 4,100,597, Cl. 364-474.000.

Holter, Heinz. Extraction of charge gases from coke ovens. 4,100,033, Cl. 201-27.000.

Holtorf, Ehrhard T., to Ferrero GmbH. Display and transportation case for uniform packs. 4,099,613, Cl. 206-45.340.

Homeier, Edwin H.: *See—*
Schmerling, Louis; and Homeier, Edwin H., 4,100,359, Cl. 560-232.000.

Hommez, Etienne R. O. C.: *See—*
Carnewal, Jose A. C. L.; and Hommez, Etienne R. O. C., 4,099,942, Cl. 55-396.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Asaka, Urataro, 4,099,492, Cl. 123-32.0ST.
Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, 4,099,496, Cl. 123-41.310.
Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, 4,099,500, Cl. 123-122.0AB.
Okura, Takao; Hashimoto, Eiichi; and Ohama, Yasumichi, 4,099,502, Cl. 123-122.0AC.

Honeywell Inc.: *See—*
Pinckaers, B. Hubert, 4,099,906, Cl. 431-66.000.

Honig, Gunter: *See—*
Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, 4,099,495, Cl. 123-32.0EB.

Hooker Chemicals & Plastics Corp.: *See—*
Cook, Edward H., Jr.; and Marks, Gerald R., 4,100,050, Cl. 204-252.000.
Schwartz, Willis T., Jr., 4,100,229, Cl. 260-887.000.

Hoopman, Abraham, to Hoopman Onderzoek & Ontwikkeling BV. Mixing and discharge apparatus. 4,100,617, Cl. 366-188.000.

Hoopman Onderzoek & Ontwikkeling BV: *See—*
Hoopman, Abraham, 4,100,617, Cl. 366-188.000.

Hoover Ball and Bearing Company: *See—*
Mizelle, Ned W., 4,099,775, Cl. 297-303.000.

Hoover, Richard D.; Shaeffer, Raymond P.; and Brackman, Donald A. Food processing apparatus. 4,100,612, Cl. 366-143.000.

Hopcroft, Francis J. Waste-water treatment system. 4,100,073, Cl. 210-532.00S.

Hoppe, Peter; Leyer, Helmut; and Muller, Johann, to Bayer Aktiengesellschaft. Hull, mold therefor, and process for producing same. 4,099,280, Cl. 9-6.00P.

Hori, Yasuro, to Hitachi, Ltd. Iron core for induction apparatuses. 4,100,521, Cl. 336-100.000.

Horikawa, Masayuki; Takata, Yataro; and Sumiyoshi, Kikuo, to Oiles Kogyo Kabushiki Kaisha. Method for manufacturing bearings or other anti-friction elements formed of lubricant contained polyacetal. 4,100,245, Cl. 264-211.000.

Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Composite material having wear- and impact-resisting surface and process for producing same. 4,099,988, Cl. 148-3.000.

Horn, Peter: *See—*
Fischer, Roman; Fliege, Werner; Koernig, Wolfgang; and Horn, Peter, 4,100,191, Cl. 260-557.00R.

Horwitz, Howard James, to Horwitz, Spencer G., a part interest. Swivel book assembly. 4,099,694, Cl. 248-339.000.

Horwitz, Spencer G.: *See—*
Horwitz, Howard James, 4,099,694, Cl. 248-339.000.

Hota, Kazunori: *See—*
Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,099,934, Cl. 51-295.000.

Houdaille Industries, Inc.: *See—*
Mandt, Mikkel G., 4,100,614, Cl. 366-154.000.
Powell, John H.; and Callahan, James J., 4,099,597, Cl. 184-27.00B.

Hough, Harold L.: *See—*
Blaisdell, Ronald G.; and Hough, Harold L., 4,100,415, Cl. 250-455.000.

Houlihan, William J., to Sandoz, Inc. Imidazo [2,1-A]isoquinolines. 4,100,165, Cl. 260-288.0CF.

House, Bennie L. Blade-type holder for paper rolls. 4,099,681, Cl. 242-55.200.

House, Ralph, to Chevron Research Company. Polymerization of 2-pyrrolidone with catalyst prepared from the reaction product of CO_2 and anhydrous potassium pyrrolidonate. 4,100,145, Cl. 528-312.000.

Howell, William L. Parenteral fluid administration sets. 4,099,527, Cl. 128-214.00C.

Hubachek, Louis H. Light emitting walking cane. 4,099,535, Cl. 135-66.000.

Hubbard, James R., to Graphic Controls Corporation. Disposable marker. 4,100,549, Cl. 346-140.00A.

Hudler, Charles William; Swanson, Clare Eugene; Sundin, George Holger; and Niemi, Ilmer Issac, to Conwed Corporation. Sorbent boom with flotation and apparatus and method for stuffing same. 4,099,619, Cl. 206-524.100.

Hudson, John Colin, to F.W. McConnel Limited. Harvesting of sugar cane. 4,099,365, Cl. 56-13.500.

Huff, Larry Dean, to RCA Corporation. Automatic disc wiping apparatus. 4,099,724, Cl. 274-47.000.

Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, to Gates Rubber Company, The. Method of producing spirally wound electrochemical cells. 4,099,401, Cl. 72-147.000.

Hughes Aircraft Company: *See—*
Bilow, Norman; and Kimmel, Boyce G., 4,100,138, Cl. 526-262.000.
Ernstoff, Michael N., 4,100,579, Cl. 358-230.000.
Graube, Andrejs, 4,099,971, Cl. 96-27.00H.
Su, Stephen C., 4,099,317, Cl. 29-571.000.

Hughes, Austin: *See—*
Lawrenson, Peter John; and Hughes, Austin, 4,100,473, Cl. 318-696.000.

Hugin Kassaregister AB: *See—*
Lundstrom, Goran; and Huijsers, Willem, 4,100,402, Cl. 235-145.00R.

Huijsers, Willem: *See—*
Lundstrom, Goran; and Huijsers, Willem, 4,100,402, Cl. 235-145.00R.

Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, to Hultdins Verkstads AB. Gripping device. 4,099,762, Cl. 294-88.000.

Hultdin, Ove Anders: *See—*
Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 4,099,762, Cl. 294-88.000.

- Hultdins Verkstads AB: *See—*
  - Hultdin, Gustaf Matteus; and Hultdin, Ove Anders, 4,099,762, Cl. 294-88.000.
- Humber, Leslie G.: *See—*
  - Demerson, Christopher A.; and Humber, Leslie G., 4,100,277, Cl. 424-244.000.
- Humbert, Daniel: *See—*
  - Clemence, Francois; and Humbert, Daniel, 4,100,291, Cl. 424-267.000.
- Humphreys, Charles B.: *See—*
  - Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.
- Huni, Jean-Paul Robert: *See—*
  - Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, 4,099,959, Cl. 75-10.00R.
- Hunt, William Valentine; and Ducker, Frank Edward Mayhew, to Watkins & Watson Limited. Support appliances having articulated sections. 4,099,276, Cl. 5-72.000.
- Hunter Investment Company: *See—*
  - Damon, Ralph S., 4,099,488, Cl. 122-156.000.
- Hurletron Altair, Inc.: *See—*
  - Coberley, Daniel A.; and Hutchison, Joel F., 4,099,462, Cl. 101-153.000.
- Husemann, Heinz; and Heitkamp, Herbert, to Gewerkschaft Eisenhutte Westfalia. Drive shield for tunneling apparatus and a method for operating such a shield. 4,099,388, Cl. 61-85.000.
- Husky Industries Inc.: *See—*
  - Elberg, Anton J., 4,100,032, Cl. 201-27.000.
- Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., to United States of America, Air Force. Procedure for removing aluminum from an $Al\text{-}Al_3Ni$ two-phase matrix. 4,100,044, Cl. 204-146.000.
- Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, to Procter & Gamble Company, The. Peroxyacid bleach composition having improved exotherm control. 4,100,095, Cl. 252-99.000.
- Hutchisoo, Joel F.: *See—*
  - Coberley, Daniel A.; and Hutchison, Joel F., 4,099,462, Cl. 101-153.000.
- Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Steam injection system for use in a well. 4,099,563, Cl. 166-191.000.
- Hutchison, Stanley O., to Chevron Research Company. Low heat conductive frangible centralizers. 4,099,564, Cl. 166-241.000.
- Hyden, Hans Olof, to AB Centralsug. Method for discharging refuse. 4,099,457, Cl. 100-42.000.
- Hydes, Paul Cedric; and Cleare, Michael James, to Johnson, Matthey & Co., Limited. Osmium compounds. 4,100,158, Cl. 544-225.000.
- Hydra Corporation: *See—*
  - Bowley, Wallace W., 4,099,281, Cl. 9-8.00R.
- Hydrocarbon Research, Inc.: *See—*
  - Johnson, Clarence A.; and Sben, John, 4,099,933, Cl. 48-202.000.
  - Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, 4,100,107, Cl. 252-443.000.
- Hypolite, Louis. Audio console system for home and vehicle. 4,100,372, Cl. 179-1.00G.
- Ibsen, Ole N.: *See—*
  - Anderson, Thomas E.; Peak, Steven C.; and Ibsen, Ole N., 4,100,587, Cl. 361-82.000.
- Ichikawa, Kiyoshi: *See—*
  - Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
- Ichikawa, Kunihiro; Mie, Terumi; and Ona, Isao, to Toray Silicone Company, Ltd. Silicone binding compositions useful in preparing gaskets and packings. 4,100,124, Cl. 260-29.20M.
- Ichikawa, Yataro; Suzuki, Nobuo; and Sawaki, Toru, to Teijin, Limited. Process for hydrogenating unsaturated aldehydes to unsaturated alcohols. 4,100,180, Cl. 260-347.800.
- ICI Americas Inc.: *See—*
  - Rutledge, Thomas F., 4,100,202, Cl. 568-730.000.
  - Rutledge, Thomas F., 4,100,203, Cl. 568-730.000.
  - Rutledge, Thomas F., 4,100,204, Cl. 568-730.000.
  - Rutledge, Thomas F., 4,100,205, Cl. 568-730.000.
  - Rutledge, Thomas F., 4,100,206, Cl. 568-730.000.
- Ideal-Aerosmith, Inc.: *See—*
  - Lush, William, 4,099,703, Cl. 251-122.000.
- Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera. 4,100,554, Cl. 354-145.000.
- Iio, Toshimitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Anti-skid vehicle brake system with fluid pressure actuated regulating valve. 4,099,793, Cl. 303-116.000.
- Ikawa, Katsuya; and Tanaka, Yuichi, to Riken Piston Ring Industrial Co. Ltd. High duty ductile case iron and its heat treatment method. 4,099,994, Cl. 148-35.000.
- Ikoma, Hidenobu: *See—*
  - Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.
- Illinois Tool Works Inc.: *See—*
  - Klygis, Julius Mindaugas, 4,099,616, Cl. 206-427.000.
- Ilse, Walter: *See—*
  - Wohler, Hans-Joachim; and Ilse, Walter, 4,099,675, Cl. 239-498.000.
- Imai, Tomoyasu: *See—*
  - Suzuki, Ikuo; Imai, Tomoyasu; Kitajima, Masato; and Hota, Kazunori, 4,099,934, Cl. 51-295.000.
- Imai, Toshihiro, to Olympus Optical Co., Ltd. Compact large-aperture photographic lens system with long back focal length. 4,099,843, Cl. 350-176.000.
- Imamura, Makoto: *See—*
  - Ohte, Akira; and Imamura, Makoto, 4,099,413, Cl. 73-359.00R.
- Immordino, Vincent J., to Display Originals, Inc. Convertible blister-card package. 4,099,650, Cl. 221-266.000.
- Imperial Chemical Industries Limited: *See—*
  - Cross, Graham Westwood; and Reid, Thomas James, 4,099,464, Cl. 102-24.0HC.
  - Dutta, Anand Swaroop; Furr, Barrington John Albert; and Giles, Michael Brian, 4,100,274, Cl. 424-177.000.
  - Wright, Donald, 4,100,186, Cl. 260-465.80D.
- In Situ Technology, Inc.: *See—*
  - Terry, Ruel Carlton, 4,099,567, Cl. 166-261.000.
- Inbar, Dan; and Klein, Yitzhak, to Elscint Ltd. Radiation imaging apparatus with improved accuracy. 4,100,413, Cl. 250-366.000.
- Incom International Inc.: *See—*
  - Papp, Louis S., 4,099,540, Cl. 137-493.800.
- Indra, Jaromir, to Vysoke uceni technicke. Fuel injection for diesel engines having controlled-rate pressure relief means. 4,099,894, Cl. 417-499.000.
- Industrie Pirelli S.p.A.: *See—*
  - Cicognani, Mario; and Mirabelli, Bruno, 4,099,422, Cl. 74-231.00C.
- Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft: *See—*
  - Miller, Harry B., 4,099,680, Cl. 242-18.00A.
- Ingham, John D.: *See—*
  - United States of America, National Aeronautics and Space Administration; Ingham, John D.; and Lawson, Daniel D., 4,100,331, Cl. 429-13.000.
- Inglee, Clinton F., to United States of America, Navy. Exhaust plume reduction and cooling system. 4,099,375, Cl. 60-39.500.
- Inoue, Hiroo; and Kishimoto, Isao, to Nippon Air Brake Co., Ltd., The. Remote control apparatus for marine engines. 4,099,476, Cl. 114-144.00R.
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- Institut Cerac SA.: *See—*
  - Cooper, George A., 4,099,784, Cl. 299-10.000.
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  - Allington, Robert William, 4,099,921, Cl. 23-253.00R.
- Instrumentation Technology Corp.: *See—*
  - Moya, Ephraim F., 4,099,686, Cl. 242-198.000.
- Intel Corporation: *See—*
  - Hoff, Marcian E., Jr., 4,100,437, Cl. 307-297.000.
- Intercontinental Truck Body - Montana, Inc.: *See—*
  - Compaan, Pieter, 4,099,358, Cl. 52-588.000.
- International Business Machines Corporation: *See—*
  - Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, 4,100,039, Cl. 204-43.00N.
  - Casowitz, Barry N.; Cowan, Michael D.; Humphreys, Charles B.; and Satya, Akella V. S., 4,100,486, Cl. 324-62.000.
  - Eggenberger, John Scott; and Patel, Arvind Motibhai, 4,100,403, Cl. 235-312.000.
  - Fleming, Alan J.; and Holmstrom, Larry W., 4,100,597, Cl. 364-474.000.
  - Holman, Bruce James, 4,100,605, Cl. 364-900.000.
  - Jambotkar, Chakrapani Gajanan, 4,099,987, Cl. 148-1.500.
  - Jones, Rick Owen; and Ulrich, Michael Henry, 4,099,866, Cl. 355-58.000.
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  - Tsui, Frank; and Tsui, Katherine, 4,100,447, Cl. 313-217.000.
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  - Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., 4,099,368, Cl. 56-208.000.
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  - Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., 4,100,272, Cl. 424-92.000.
- Ireland, Richard D.: *See—*
  - Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,099,661, Cl. 228-107.000.
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  - Schwee, Leonard J.; Irons, Henry R.; Anderson, Wallace F.; Scharnhorst, Kurt Peter; and Krall, Albert D., 4,100,609, Cl. 365-87.000.
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  - Somezawa, Masashi; Higuchi, Shigetaka; Shimizu, Tatsuo; and Ishibashi, Isao, 4,100,326, Cl. 427-130.000.
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- Ishikawa, Soji. Cleaners for chalk erasers. 4,099,286, Cl. 15-142.000.
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  - Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
- Isodyne, Inc.: *See—*
  - Ghiringhelli, Horace, 4,100,476, Cl. 315-297.000.
- Isono, Nobujiro, to Shin Nippon Kinzoku Co., Ltd. Adjustably louvered roof plate assembly. 4,099,346, Cl. 49-82.000.
- Itakura, Tsuyoshi; and Willinger, Allan H. Vent valve of an air pump. 4,099,544, Cl. 137-856.000.
- Itek Corporation: *See—*
  - Ebner, Peter R., 4,099,618, Cl. 206-454.000.

- Ito, Tadashi: *See—*
  - Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,100,459, Cl. 315-136.000.
- Ito, Yoshikane. Fruit plucking device. 4,099,367, Cl. 56-336.000.
- Ito, Yukio, to Nitto Kogaku Kabushiki Kaisha. Zoom lens system capable of close-up photography. 4,099,847, Cl. 350-187.000.
- ITW Limited: *See—*
  - Palmer, John P.; Clinch, Colin W.F.; and Harley, David N., 4,099,757, Cl. 292-336.300.
- Ivanova, Nadezhda Borisovna: *See—*
  - Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.
- Ivchenko, Anatoly Ivanovich: *See—*
  - Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; Zvenyachkin, Viktor Matveevich; Ivchenko, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; and Fedorov, Evgeny Petrovich, 4,099,572, Cl. 169-12.000.
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- Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, to Hitachi, Ltd. Gate controlling apparatus for a thyristor valve. 4,100,434, Cl. 307-252.00L.
- Jabour, Richard J. Slip-on rubber gloves. 4,099,270, Cl. 2-168.000.
- Jackson, George Robert, to Arcstart, Inc. Control means for tig type torches and the like. 4,100,390, Cl. 219-74.000.
- Jackson, Samuel H., to Kings Electronics Co., Inc. Coaxial adapter. 4,099,825, Cl. 339-177.00E.
- Jacobs Corporation, The: *See—*
  - Jacobs, David L., 4,099,769, Cl. 297-204.000.
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- Jacobson, Sven Eric: *See—*
  - Sander, Georg; Jacobson, Sven Eric; and Ericson, Ake Magnus Ivar, 4,099,471, Cl. 110-182.500.
- Jacovich, Elaine F.: *See—*
  - Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Orunwald, John J., 4,100,312, Cl. 427-96.000.
- Jaedicke, Hagen; Paust, Joachim; and Schneider, Joachim, to BASF Aktiengesellschaft. Manufacture of echinenone. 4,100,197, Cl. 260-586.00P.
- Jager, Adolf: *See—*
  - Gutlhuber, Friedrich; Jager, Adolf; and Ufholz, Heinrich, 4,099,926, Cl. 23-286.000.
- Jambor, Arno: *See—*
  - Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.
- Jambotkar, Chakrapani Gajanan, to International Business Machines Corporation. Fabricating integrated circuits incorporating high-performance bipolar transistors. 4,099,987, Cl. 148-1.500.
- Jannen, Robert L.: *See—*
  - Johnston, Douglas; and Jannen, Robert L., 4,100,610, Cl. 366-102.000.
- Japan Steel Works LTD: *See—*
  - Nonaka, Hidehiro, 4,100,244, Cl. 264-211.000.
- Japs, Archie B., to BF Goodrich Company, The. Gas generator and solid propellant with a silicon-oxygen compound as a burning rate modifier, and method for making the same. 4,099,376, Cl. 60-253.000.
- Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, to Bell Telephone Laboratories, Incorporated. Uniform permutation privacy system. 4,100,374, Cl. 179-1.50S.
- Jayne, Murray Lawrence. Runway sander. 4,099,688, Cl. 244-103.00R.
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  - Guilhem, Jacques R.; and Jean, Pierre, 4,099,649, Cl. 220-439.000.
- Jenaer Glaswerk Schott & Gen.: *See—*
  - Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.
- Jersey Nuclear-AVCO Isotopes, Inc.: *See—*
  - Glickler, Sheldon L.; and DeBaryshe, Paul G., 4,099,853, Cl. 350-310.000.
- Jezl, James L.; and Peters, Edwin F., to Standard Oil Company (Indiana). Drying and finishing operations in slurry or bulk phase polymerization processes. 4,099,335, Cl. 34-9.000.
- Jilani, Atiq A., to Borg-Warner Corporation. High-speed agricultural disc. 4,099,576, Cl. 172-555.000.
- Jinno, Michio. Asphalt recycle system. 4,100,059, Cl. 209-3.000.
- Johannes Fuchs, Firma: *See—*
  - Thierer, Georg; and Dolinsek, Hans, 4,099,631, Cl. 214-10.000.
- Johansson, Arne: *See—*
  - Sterner, Thore; and Johansson, Arne, 4,099,676, Cl. 239-687.000.
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- John Blue Company Division of Subscription Television, Inc.: *See—*
  - Johnston, Douglas; and Jannen, Robert L., 4,100,610, Cl. 366-102.000.
- John Dusenbery Company, Inc.: *See—*
  - Young, Roger W., 4,099,435, Cl. 83-614.000.
- Johns Hopkins University, The: *See—*
  - Walser, Mackenzie, 4,100,160, Cl. 424-274.000.
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- Johns-Manville Corporation: *See—*
  - Meserole, Robert Henry, 4,099,747, Cl. 285-174.000.
  - Olds, Leonard Elmo, 4,099,949, Cl. 65-17.000.
- Johnson, Barry C.: *See—*
  - Pops, Horace; and Johnson, Barry C., 4,099,991, Cl. 148-11.50C.
- Johnsoo, Bruce K., to Polaroid Corporation. Modular photographic rangefinder camera. 4,100,555, Cl. 354-166.000.
- Johnson, Clarence A.; and Shen, John, to Hydrocarbon Research, Inc. Process for the multiple zone gasification of coal. 4,099,933, Cl. 48-202.000.
- Johnson, David Leroy; and Matusek, Chester Joseph, to Motorola, Inc. Mechanism for feeding and inserting pins into circuit board. 4,099,324, Cl. 29-739.000.
- Johnson, George E.: *See—*
  - Rodesch, Dale F.; and Johnson, George E., 4,099,722, Cl. 273-143.00R.
- Johnson, Matthey & Co., Limited: *See—*
  - Hydes, Paul Cedric; and Cleare, Michael James, 4,100,158, Cl. 544-225.000.
- Johnson, Michael Robert Thomas: *See—*
  - Gallant, John Henry; and Johnson, Michael Robert Thomas, 4,100,542, Cl. 340-518.000.
- Johnson, Philip M.; and Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Beam projector. 4,100,404, Cl. 250-199.000.
- Johnston, Douglas; and Jannen, Robert L., to John Blue Company Division of Subscription Television, Inc. Rotating nozzle sparging system for suspension fertilizer tanks. 4,100,610, Cl. 366-102.000.
- Jones, Frederick W.: *See—*
  - Dick, Charles B.; Knutson, Curtis L.; Jones, Frederick W.; and Ireland, Richard D., 4,099,661, Cl. 228-107.000.
- Jones, John P., Jr., to Mobil Oil Corporation. Ullage gage. 4,099,332, Cl. 33-126.70R.
- Jones, Rick Owen; and Ulrich, Michael Henry, to International Business Machines Corporation. Focal adjustment on a single-focus lens in a continuously variable magnification system. 4,099,866, Cl. 355-58.000.
- Jongkind, Jan C., to M&T Chemicals Inc. Plating on aluminum alloys. 4,100,038, Cl. 204-38.00B.
- Joo, Laszlo. Bicycle cable locking device. 4,099,394, Cl. 70-233.000.
- Jordan, Cy Edward; and Weaver, Casimir Paul, to United States of America, Interior. System for the dielectrophoretic separation of particulate and granular material. 4,100,068, Cl. 204-300.00R.
- Josephy, Karl: *See—*
  - Gordon, Gerald A.; and Josephy, Karl, 4,100,236, Cl. 264-8.000.
- Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., to McKellar, Robert L., a part interest. Device for centering and maintaining short spool pieces. 4,099,283, Cl. 10-107.0PH.
- Jugle, Don B., to Xerox Corporation. Apparatus for controlling airborne particle emission. 4,100,611, Cl. 366-139.000.
- Julian, Donald Victor: *See—*
  - Hutchins, James Peyton; Julian, Donald Victor; and Burns, Michael Eugene, 4,100,095, Cl. 252-99.000.
- Jung, Michel: *See—*
  - Metcalf, Brian Walter; and Jung, Michel, 4,100,349, Cl. 548-337.000.
- K. K. Tokai Rika Denki Seisakusho: *See—*
  - Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.
- Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
  - Steinmetz, Dietmar, 4,099,798, Cl. 308-3.500.
- Kabushiki Kaisha Komatsu Seisakusho: *See—*
  - Orimoto, Koji; Uno, Masataka; Oomachi, Yoshio; and Nishimura, Yoshitaka, 4,099,449, Cl. 91-358.00A.
- Kabushiki Kaisha Kubota Seisakusho: *See—*
  - Uchida, Tadahiro, 4,099,667, Cl. 233-24.000.
- Kabushiki-Kaisha Nakajima: *See—*
  - Nakajima, Hiromu, 4,099,662, Cl. 228-151.000.
- Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
  - Kuwako, Tomohisa, 4,100,443, Cl. 310-164.000.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
  - Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
- Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
  - Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
- Kagami, Akiyasu: *See—*
  - Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.
- Kagoura, Tetsuro, to Yoshida Kogyo K.K. Latch assembly. 4,099,756, Cl. 292-336.300.
- Kaiser Aluminum & Chemical Corporation: *See—*
  - Dorsey, Geoffrey A., Jr., 4,099,989, Cl. 148-6.270.
- Kak, Subhash Chandra: *See—*
  - Jayant, Nuggehally Sampath; and Kak, Subhash Chandra, 4,100,374, Cl. 179-1.50S.
- Kakei, Hiroshi: *See—*
  - Iwamoto, Kyoichi; and Kakei, Hiroshi, 4,100,222, Cl. 260-837.0PV.
- Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Method for transportation of viscous hydrocarbons by pipeline. 4,099,537, Cl. 137-13.000.
- Kalman, Kenneth S.: *See—*
  - Sterling, Thomas S.; Belanger, Jean-Yves; and Kalman, Kenneth S., 4,100,000, Cl. 149-4.000.

- Kamata, Norio: *See*—
  - Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sakado, 4,100,025, Cl. 195-31.00F.
- Kambara, Masahiro: *See*—
  - Morio, Minoru; and Kambara, Masahiro, 4,100,575, Cl. 358-120.000.
- Kamerbeek, Djuurd Anne Geertruid: *See*—
  - van den Einden, Henricus Fransiscus Petrus; Kamerbeek, Djuurd Anne Geertruid; and Rimmelzwaan, Franciscus Jacobus, 4,100,453, Cl. 313-417.000.
- Kamm, Roland: *See*—
  - Knappe, Bernhard, 4,099,803, Cl. 308-215.000.
- Kamyr, Inc.: *See*—
  - Sherman, Michael I., 4,100,069, Cl. 210-109.000.
- Kanamaru, Kiyoshi: *See*—
  - Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.
- Kaneko, Masanobu, to Nippon Kogaku K.K. Wide field eyepiece lens system. 4,099,842, Cl. 350-175.00E.
- Kanengieter, Glenn G.; and Krumholz, Frank C., to Owatonna Manufacturing Company, Inc. Fluffer shield system for crop harvester. 4,099,364, Cl. 56-1.000.
- Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, to Daimler-Benz Aktiengesellschaft. Fastening of the inner roof covering of motor vehicles. 4,099,767, Cl. 296-137.00A.
- Kannengiesser, Marie-Helene: *See*—
  - Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, 4,100,278, Cl. 424-244.000.
- Kanner, Bernard: *See*—
  - Mui, Jeffrey Y. P.; and Kanner, Bernard, 4,100,172, Cl. 260-327.00H.
- Kanno, Sakado: *See*—
  - Enokizono, Shigehiro; Kamata, Norio; and Kanno, Sakado, 4,100,025, Cl. 195-31.00F.
- Kano, Tsutomu. Method and an apparatus for stereoscopic measurement utilizing a three-dimeosional image. 4,099,880, Cl. 356-164.000.
- Kao, James T. F., to Ethyl Corporation. Chemical process. 4,100,188, Cl. 260-535.00P.
- Kao Soap Co., Ltd.: *See*—
  - Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.
- Kapag Manufacturing Co. Limited: *See*—
  - Loads, Frederic Walter, 4,099,345, Cl. 47-56.000.
- Kaplan, Jean-Pierre: *See*—
  - Gerecke, Max; Kyburz, Emilio; and Kaplan, Jean-Pierre, 4,100,173, Cl. 260-333.000.
- Kaplan, Murray A.: *See*—
  - Gottstein, William J.; Kaplan, Murray A.; and Granatek, Alphonse P., 4,100,346, Cl. 544-27.000.
- Kaplan, Sam H., to Zenith Radio Corporation. Color television picture tube image screen having positive and negative misregistration tolerance conditioos. 4,100,452, Cl. 313-408.000.
- Kaplan, Steven. Coffee-maker assembly. 4,099,453, Cl. 99-306.000.
- Karasinski, Frederick: *See*—
  - Senior, Robert B.; and Karasinski, Frederick, 4,099,428, Cl. 81-9.510.
- Kark, Uwe. Composite roll with roll ring of material which is sensitive to tensile stress. 4,099,311, Cl. 29-126.000.
- Karl Harlin & Co.: *See*—
  - Harlin, Herbert, 4,099,446, Cl. 90-13.100.
- Karol, Frederick John: *See*—
  - Levine, Isaac Jacob; and Karol, Frederick John, 4,100,105, Cl. 252-429.00R.
  - Noshay, Allen; and Karol, Frederick John, 4,100,337, Cl. 526-130.000.
- Karrer, Friedrich: *See*—
  - Farooq, Saleem; and Karrer, Friedrich, 4,100,296, Cl. 424-278.000.
- Kato, Shigeo; Saito, Sakae; and Morita, Osamu, to Hitachi, Ltd. Machining arrangement with means to isolate vibrations from the working spindle. 4,099,348, Cl. 51-92.00R.
- Katoh, Takashi: *See*—
  - Hasegawa, Junzo; Hayashi, Yasutaka; Suzuki, Yasuhiko; Katoh, Takashi; Tsunekawa, Takahiko; and Tanaka, Akira, 4,099,297, Cl. 19-240.000.
- Katzen, Stanley J.; and Rekers, Louis J., to National Petro Chemicals Corporation. Catalytic materials as for olefin polymerization. 4,100,104, Cl. 252-428.000.
- Kaufman, Paul Richard: *See*—
  - Goldberg, Gerald; and Kaufman, Paul Richard, 4,100,126, Cl. 260-29.6AQ.
- Kaufman, Phillip A.; and Washburn, Jerry R., to Computer Automation, Inc. Multiplexer for a distributed input/out controller system. 4,100,601, Cl. 364-200.000.
- Kaufmann, Peter, to Mettler Instrumente, AG. Electromagnetic compensation weighing apparatus including preloading and load-responsive current components. 4,099,587, Cl. 177-210.0EM.
- Kavick, Edward M., to Samuel Moore and Company. Hose coupling assembly. 4,099,748, Cl. 285-256.000.
- Kawamoto, Mineo: *See*—
  - Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.
- Kawamura, Naoto; Tajima, Akira; and Tanaka, Katumi, to Canon Kabushiki Kaisha. Variable magnification lens system. 4,099,846, Cl. 350-186.000.
- Kawasaki Jukogyo Kabushiki Kaisha: *See*—
  - Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, 4,099,988, Cl. 148-3.000.
- Kawasaki, Masahiro; and Tano, Eiichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital display circuit for camera exposure meter. 4,099,885, Cl. 356-223.000.
- Kaye, Ronald Swynerton. Carburetors. 4,100,232, Cl. 261-36.00A.
- Kazama, Seiji: *See*—
  - Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.
- Keana, John F. W., to State Board of Higher Education For and on Behalf of the University of Oregon. Proxyl nitroxides as spin labels. 4,099,918, Cl. 23-230.00R.
- Keeran, Royal V., to General Dynamics Corporation. Beacoo system employing ramped gain receiver. 4,100,544, Cl. 343-6.50R.
- Keglewitsch, Josef, to Bunker Ramo Corporation. Modular termination system for telecommunication devices. 4,099,819, Cl. 339-75.00M.
- Keir, John B.: *See*—
  - Binkley, Carl R.; Keir, John B.; and Semchena, John H., 4,099,541, Cl. 137-596.130.
- Keller, Rolf; and Polzer, Erich, to Voith Getriebe KG. Hydrodynamic transmission for vehicles. 4,099,426, Cl. 74-730.000.
- Kellogg, Harlan F. Free standing shelving system. 4,099,472, Cl. 108-114.000.
- Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-hydroxy-2β-arylmethoxymethyl-4α-tetrahydropyranacetic acids. 4,100,176, Cl. 260-345.70P.
- Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-hydroxy-2-arylmethoxymethyl-4α-tetrahydropyranacetic acid alkyl esters. 4,100,177, Cl. 260-345.80P.
- Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-methoxy-2-arylmethoxymethyl-4α-tetrahydropyranacetic acid alkyl esters. 4,100,178, Cl. 260-345.80P.
- Kendall, Robert M.; and Lapson, William F., to Acurex Corporation. Rejector drive system for sorting apparatus. 4,099,620, Cl. 209-74.00R.
- Kennecke, Mario: *See*—
  - Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
  - Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.
- Kenney, John Thomas: *See*—
  - Baron, William James; and Kenney, John Thomas, 4,100,037, Cl. 204-15.000.
- Kent, Eric George, to Polysar Limited. Trans-polyisoprene compositions. 4,100,122, Cl. 260-28.50B.
- Kepes, George B.: *See*—
  - Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.
- Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
  - Besocke, Karl Heinz, 4,100,442, Cl. 310-317.000.
- Kerr, William J., to Chicago Lock Co. Pick-resistant axial split-pin tumbler-type lock mechanism. 4,099,396, Cl. 70-363.000.
- Keske, Frank E.: *See*—
  - Goloff, Alexander; and Keske, Frank E., 4,099,494, Cl. 123-32.0JV.
- Kesler, Oren Byrl: *See*—
  - Hemmi, Christian Otto; Kesler, Oren Byrl; and Dover, Richard Thomas, 4,100,548, Cl. 343-837.000.
- Keuffel & Esser Company: *See*—
  - Neithardt, William A., Jr., 4,100,329, Cl. 428-413.000.
- Keystone Consolidated Industries, Inc.: *See*—
  - Dauenbaugh, Robert L., 4,099,397, Cl. 70-371.000.
- Khajezadeh, Heshmat; and Ahrens, Stephen Carl, to RCA Corporation. Monolithic resistor for compensating beta of a lateral transistor. 4,100,565, Cl. 357-51.000.
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- Lee, Jeffrey A.: *See—*
  - Christensen, Bryan L.; Sampson, William J.; Brogger, Ronald L.; and Lee, Jeffrey A., 4,099,285, Cl. 15-83.000.
- Lee, Robert Wilton, to Argosystems, Inc. Remote probing apparatus and method. 4,099,878, Cl. 356-128.000.
- Leesona Corporation: *See—*
  - Bradbury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.
- Leggett & Platt, Incorporated: *See—*
  - Bustos, Rafael T., 4,099,625, Cl. 211-49.00R.
  - Crum, Donald; Goff, McKinley; and Hampton, Edward L., 4,099,776, Cl. 297-329.000.
  - Sandham, Edwin C., 4,099,774, Cl. 297-298.000.
- Legrand, Jules: *See—*
  - Rondeaux, Louis; Legrand, Jules; and Baelde, Claude, 4,099,953, Cl. 65-335.000.
- Legrow, Gary E.: *See—*
  - Brooks, William T.; and Legrow, Gary E., 4,100,090, Cl. 252-63.700.
- Lehr, Werner, to Bayerische Motoren Werke Aktiengesellschaft. Retention installation for children in motor vehicles. 4,099,778, Cl. 297-386.000.
- Leibach, Heinrich, to Motoren- und Turbinen-Union Munchen GmbH. Device for control of an aircraft. 4,099,671, Cl. 239-265.290.
- Leidal, Shirley Margaret, to Upjohn Company, The. Stem adjustment seal for reaction injection molding machine. 4,099,919, Cl. 23-252.00R.
- Leigh, Peter Alexander: *See—*
  - Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.
- Lemieux, Raymond Urgel; and Vukov, Rastko, to Polysar Limited. Crosslinking of hydroxyl-containing polymers with polyaldehyde compounds. 4,100,137, Cl. 526-21.000.
- Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., to AMP, Incorporated. Carrier strip mounted electrical components. 4,099,615, Cl. 206-329.000.
- Lennox Industries, Inc.: *See—*
  - Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.
- Lenox Machine Company: *See—*
  - Grody, Donald R.; and Fitzpatrick, Donald C., 4,099,711, Cl. 271-64.000.
- Leo Pharmaceutical Products Ltd. A/S: *See—*
  - von Daehne, Welf; and Rasmussen, Poul Rodbroe, 4,100,276, Cl. 424-238.000.
- Leonard, Thomas E.; and Buckner, Walter E., to Lucky Manufacturing Company. Gondola car loader. 4,099,635, Cl. 214-152.000.
- Leotta, Samuel S. Collapsible work station. 4,099,809, Cl. 312-140.200.
- Lerman, Michael A., to Standard Oil Company (Indiana). Greater water resistance and shorter drying time in water soluble enamel paints. 4,100,119, Cl. 260-22.0CB.
- Leroux, Adrien: *See—*
  - Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, 4,100,428, Cl. 307-97.000.
- Lesser, Mark B., to Rockwell International Corporation. Multi-phase and gate. 4,100,430, Cl. 307-205.000.
- Lester, Allan Gerald. Building panels, and a building and method utilizing building panels. 4,099,357, Cl. 52-533.000.
- Lever Brothers Company: *See—*
  - Pader, Morton, 4,100,269, Cl. 424-49.000.
- Levin, Berton P., to Sierracin Corporation, The. Laminated electrically heatable window with electrical connectors. 4,100,398, Cl. 219-541.000.
- Levine, Isaac Jacob; and Karol, Frederick John, to Union Carbide Corporation. Titanium-modified silyl chromate catalysts for ethylene polymerization. 4,100,105, Cl. 252-429.00R.
- Lewalter, Jurgen: *See—*
  - Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.
- Lewis, David Roger: *See—*
  - Cox, Terence Allan; and Lewis, David Roger, 4,099,815, Cl. 312-330.00R.
- Lewis, Pauls & Associates, Ltd.: *See—*
  - Boxer, Leo M.; and Boxer, Robert W., 4,099,639, Cl. 215-209.000.
- Lewis, Peter Frederick: *See—*
  - Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, 4,100,458, Cl. 315-39.550.
- Ley, Anthony John: *See—*
  - Metcalf, Eric; and Ley, Anthony John, 4,100,420, Cl. 250-561.000.
- Leyer, Helmut: *See—*
  - Hoppe, Peter; Leyer, Helmut; and Muller, Johann, 4,099,280, Cl. 9-6.00P.
- Li, George S., to Standard Oil Company, The. Indene-chlorobutyl rubber copolymers. 4,100,226, Cl. 260-879.000.
- Libbey, William J., to Continental Oil Company. Separation of alkyl alcohols from alkyldimethylamines. 4,100,209, Cl. 568-918.00D.
- Life Savers, Inc.: *See—*
  - Friello, Dominick R.; and Roy, Raymond L., 4,100,301, Cl. 426-3.000.
- Lillis, William Joseph: *See—*
  - Duffy, William Thomas; and Lillis, William Joseph, 4,100,433, Cl. 307-229.000.
- Lilly Industries Ltd.: *See—*
  - Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,100,350, Cl. 560-20.000.
  - Dunwell, David William; Evans, Delme; and Hicks, Terence Alan, 4,100,168, Cl. 260-299.000.
- Lindauer, Rolf: *See—*
  - Binder, Georg; Lindauer, Rolf; Sohnle, Rudiger; and Wahler, Harald, 4,100,440, Cl. 310-89.000.
- Lindberg, Allen W.; and Gantzert, Thomas R., to ACF Industries, Inc. Air metering apparatus. 4,100,234, Cl. 261-121.00B.
- Linde Aktiengesellschaft: *See—*
  - Skolaude, Werner, 4,099,945, Cl. 62-30.000.
- Lindsey, William C.; Meyr, Heinrich; and King, Peter C., to W. C. Lindsey Inc. Correlative tracking system with lock indicator. 4,100,503, Cl. 331-1.00A.
- Lipschutz, Paul, to Societe Neiman SA. Lock key, method for its manufacture and lock employing this key. 4,099,398, Cl. 70-406.000.
- Liquichimica Robassomero S.p.A.: *See—*
  - Peditto, Andrea; Fossati, Franco; and Petrillo, Vincenzo, 4,100,085, Cl. 252-42.700.
- Lischka, Siegfried: *See—*
  - Ehlers, Klaus-Peter; Lischka, Siegfried; and Burkhardt, Siegfried, 4,100,261, Cl. 423-309.000.
- Littelfuse, Inc.: *See—*
  - Aryamane, Avinash P., 4,099,321, Cl. 29-623.000.
  - Schmidt, John, Jr.; and Aryamane, Avinash, 4,099,320, Cl. 29-623.000.
  - Tait, Robert J., 4,099,322, Cl. 29-623.000.
- Liu, Chao-Min: *See—*
  - Westley, John; and Liu, Chao-Min, 4,100,171, Cl. 260-326.330.
- Lloyd, Raymond A.: *See—*
  - Feilchenfeld, Michal M.; Daggett, Kenneth E.; and Lloyd, Raymond A., 4,099,668, Cl. 235-304.000.
- Loads, Frederic Walter, to Kapag Manufacturing Co. Limited. Production of turf. 4,099,345, Cl. 47-56.000.
- Lockheed Aircraft Corporation: *See—*
  - Cronin, Michael Joseph, 4,100,586, Cl. 361-58.000.
- Loctite (Ireland) Limited: *See—*
  - O'Sullivan, Denis Joseph, 4,100,141, Cl. 526-301.000.
- Loeb, Leopold: *See—*
  - Spauschus, Hans O.; and Loeb, Leopold, 4,100,092, Cl. 252-70.000.
- Logander, Pehr Ingemar. Lottery ticket. 4,099,721, Cl. 273-139.000.
- Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., to MacDermid Incorporated. Method of making metal-plastic laminates. 4,100,312, Cl. 427-96.000.
- Lonati, Francesco. Yarn cutting and gripping device for a circular knitting machine. 4,099,392, Cl. 66-140.00R.
- Lonza A. G.: *See—*
  - Eriksson, Jan Bertil; and Dadekian, Zaven Armen, 4,100,210, Cl. 260-652.00R.
- Lonza, Ltd.: *See—*
  - Stefani, Giancarlo; and Fontana, Pietro, 4,100,106, Cl. 252-437.000.
- Lorenz, Leo J., to Massey-Ferguson Inc. Roof construction. 4,099,766, Cl. 296-137.00B.
- Loty, Charles, to Commissariat a l'Energie Atomique. Photoelectric shutter tube with microduct wafer incorporated in a wave propagation line which is integrated in said shutter tube. 4,100,406, Cl. 250-213.0VT.
- Louit, Henri, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Method for measuring the pre-stress in hoop-bound anuluses of rectangular cross-section and made of piezoelectric ceramic material. 4,099,407, Cl. 73-88.50R.
- Loustaunau, Louie E., to Raymond Lee Organization, Inc., a part interest. Rotation indicators for cassette reels. 4,099,480, Cl. 116-135.000.
- Lowe, Robert E.: *See—*
  - Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., 4,100,322, Cl. 428-257.000.
- Lowery, Fred. Skateboard brake. 4,099,734, Cl. 280-11.200.
- Lowrey, Thomas Patrick, to Walker, Harry C.; and Sukalac, David E., part interest to each. Therapeutic device. 4,099,523, Cl. 128-75.000.

Lubrizol Corporation, The: *See—*

Clason, Donald Lynn; Pindar, John Francis; and Cohen, Jerome Martin, 4,100,082, Cl. 252-33.400.

Luc, Andre R., to Tridon-Serflex S.A. Screw type clamping collar. 4,099,304, Cl. 24-274.00R.

Lucas Electrical Limited: *See—*

Hawthorne, Horace Stanley, 4,099,329, Cl. 32-2.000.

Lucas Industries Limited: *See—*

Askew, James Martin Anderton, 4,099,895, Cl. 417-499.000.

Luce, David A., to Norlin Music, Inc. Electronic musical instrument with dynamically responsive keyboard. 4,099,439, Cl. 84-1.260.

Luck, Russell M.: *See—*

Gainer, Gordon C.; and Luck, Russell M., 4,099,805, Cl. 308-240.000.

Lucke, Helmut: *See—*

Heinemann, Otto; Schossler, Werner; Lucke, Helmut; Krumme, Helmut; and Heiringhoff, Burkhard, 4,099,802, Cl. 308-9.000.

Lucky Manufacturing Company: *See—*

Leonard, Thomas E.; and Buckner, Walter E., 4,099,635, Cl. 214-152.000.

Ludwigson, David C., to United States Steel Corporation. Method for testing sheet metals. 4,099,408, Cl. 73-95.000.

Lundberg, Robert D.: *See—*

Sartori, Guido; and Lundberg, Robert D., 4,100,128, Cl. 260-33.6UA.

Lundstrom, Goran; and Huijsers, Willem, to Hugin Kassaregister AB. Keyboard key with changeable indicia. 4,100,402, Cl. 235-145.00R.

Lush, William, to Ideal-Aerosmith, Inc. Self-cleaning precision metering valve. 4,099,703, Cl. 251-122.000.

Luther, Ronald B. Method for making a cannula using a laser and the cannula made thereby. 4,100,393, Cl. 219-121.0LM.

Luthi, Johannes: *See—*

Beurer, Peter; Luthi, Johannes; and Portaleoni, Libero, 4,100,071, Cl. 210-197.000.

Lutz, Edgar: *See—*

Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.

Luvison, Angelo; and Pirani, Giancarlo, to CSELT - Centro Studi e Laboratori Telecomunicazioni. Adaptive method of and means for recovering digital signals. 4,100,495, Cl. 325-323.000.

Luz, Karl: *See—*

Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.

Luzzi, Antoine, to Societe General de Constructions Electriques et Mecaniques Alsthom s.a. Optical probe for the measurement of speeds in a fluid flow. 4,099,870, Cl. 356-28.000.

Lyle Development, Inc.: *See—*

Oberloier, William, 4,099,902, Cl. 425-388.000.

Lyons, Charles E.: *See—*

Bredeweg, Corwin J.; Dennis, Kent S.; and Lyons, Charles E., 4,100,227, Cl. 260-880.00R.

Dennis, Kent S.; Lyons, Charles E.; and Bredeweg, Corwin J., 4,100,228, Cl. 260-880.00R.

Lyons, James E.: *See—*

Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,100,216, Cl. 260-666.0PY.

Lyons, John E., to Eutectic Corporation. Apparatus for applying metal coatings to a metal substrate. 4,099,481, Cl. 118-8.000.

Lytle, Dan R.; and Burski, Ronald C., to Dataproducts Corporation. Position and velocity sensors. 4,100,480, Cl. 323-51.000.

M&T Chemicals Inc.: *See—*

Jongkind, Jan C., 4,100,038, Cl. 204-38.00B.

MAC Valves, Inc.: *See—*

Neff, James A., 4,100,519, Cl. 335-262.000.

Macan Engineering & Manufacturing Company, Inc.: *See—*

Belt, Kenneth W.; and McCarrell, Stuart G., 4,100,505, Cl. 331-71.000.

MacChesney, John Burnette: *See—*

French, William George; and MacChesney, John Burnette, 4,099,835, Cl. 350-96.300.

MacDermid Incorporated: *See—*

Lombardo, Michael S.; Jacovich, Elaine F.; D'Ottavio, Eugene D.; and Grunwald, John J., 4,100,312, Cl. 427-96.000.

Machlett Laboratories, Inc., The: *See—*

Suffredini, Joseph R.; and Hagar, Robert A., 4,100,445, Cl. 313-101.000.

MacKay, Patrick W.; Vera, Enrique Martinez; and de la Pena, Ramon, to Grupo Industrial Alfa, S.A. Method and apparatus for measuring and controlling the percentage reduction of ore in a moving bed gaseous reduction reactor. 4,099,962, Cl. 75-26.000.

MacKay, Patrick W., to Fierro Esponja, S.A. Method for the batchwise reduction of metal ores. 4,099,963, Cl. 75-35.000.

MacKellar, Jeremy Margreave; Dryden, Christopher Michael; and Brazendale, Peter Alan, to Plessey S.A. Limited. Sequential initiation of explosions. 4,099,467, Cl. 102-217.000.

Mackenberger, Ludwig: *See—*

Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.

Mackenroth, Einhard. Structural joints. 4,099,887, Cl. 403-4.000.

Mackenzie, Harold B.; and Anderson, Ingvar G., to New Life Foundation. Fuel handling, metering and preparation apparatus and method. 4,099,473, Cl. 110-219.000.

Mackert, Robert J.; Storm, Donald P.; and Hoch, Manfried L., to International Harvester Company. Gathering unit control apparatus. 4,099,368, Cl. 56-208.000.

MacRae, Donald R.; Gold, Richard G.; Sandall, William R.; and Thompson, Charles D., to Bethlehem Steel Corporation. Method of producing vanadium. 4,099,958, Cl. 75-0.5BA.

Maekawa, Iwao; Uchigasaki, Isao; and Kumazaki, Sakato, to Hitachi Chemical Company, Ltd. Resinous composition. 4,100,120, Cl. 260-22.0CB.

Maertz, Josef: *See—*

Elsholz, Joachim; Bortfeld, Manfred; Maertz, Josef; and Poser, Erhard, 4,099,770, Cl. 297-216.000.

Maffet, Vere, to UOP Inc. Organic waste drying process. 4,099,336, Cl. 34-12.000.

Magan, Phillip R., to Olin Corporation. Stabilized solutions of sodium dithionite. 4,100,098, Cl. 252-188.000.

Maggiulli, Cataldo Aldino; Burness, Donald MacArthur; and Perkins, William Clarence, to Eastman Kodak Company. Use of novel ethers as oxydimethylating agents. 4,100,200, Cl. 260-609.00R.

Magistro, Angelo Joseph, to BF Goodrich Company, The. Process for preparation of ethylene and vinyl chloride from ethane. 4,100,211, Cl. 260-656.00R.

Magnavox Company, The: *See—*

Devendorf, Alan E., 4,099,646, Cl. 220-324.000.

Magnussen, Robert O., Jr. Modular rack. 4,099,626, Cl. 211-60.00R.

Maier, Marianne: *See—*

Kuhn-Kuhnenfeld, Franz; Kirsten, Dietmar; and Maier, Marianne, 4,100,014, Cl. 156-647.000.

Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., to Caterpillar Tractor Co. Seal construction for vehicles. 4,099,763, Cl. 296-28.00C.

Mandt, Mikkel G., to Houdaille Industries, Inc. Method for polymer dissolution. 4,100,614, Cl. 366-154.000.

Manier, Francis Rene Daniel; and Caullet, Pierre Leon Adolphe, to Produits Chimiques Ugine Kuhlmann. Spin dyeing of acrylic fibres. 4,100,131, Cl. 260-42.210.

Mannesmannrohren-Werke, A.G.: *See—*

Biller, Horst, 4,099,402, Cl. 72-234.000.

Manning, James B.: *See—*

Bretthauer, Harry, 4,099,289, Cl. 15-244.00R.

Marblehead Lime Company: *See—*

Henery, Maurice D.; Snyder, Ernest B.; and Walker, Walter W., 4,099,964, Cl. 75-52.000.

Marchetti, Franco: *See—*

Reggiani, Marcello; and Marchetti, Franco, 4,100,510, Cl. 331-107.00R.

Marconi Company Limited, The: *See—*

Wisbey, Philip Henry; and Elliot, George, 4,099,855, Cl. 350-333.000.

Wisbey, Philip Henry, 4,100,511, Cl. 331-107.00A.

Marconi, Walter: *See—*

Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 4,100,334, Cl. 526-1.000.

Prosperi, Giulio; Marconi, Walter; Giovenco, Silvia; and Morisi, Franco, 4,100,029, Cl. 195-68.000.

Marcraft Recreation Inc.: *See—*

Marks, Nathan, 4,099,718, Cl. 273-73.00C.

Maret, Bernard: *See—*

Maret, Jean Paul; and Maret, Bernard, 4,099,581, Cl. 173-133.000.

Maret, Jean Paul; and Maret, Bernard. Explosive-cartridge powered hammer or impact tool. 4,099,581, Cl. 173-133.000.

Margen, Peter Heinrich Erwin; Bosaeus, Jan Anders; and Skarud, Bengt Olof Roland, to Aktiebolaget Atomenergi. Convector having a flattened plastic tube spiral. 4,099,555, Cl. 165-55.000.

Marine Resources, Inc.: *See—*

Stahl, Oliver B.; and Byron, Harlund L., 4,100,539, Cl. 340-546.000.

Marks, Gerald R.: *See—*

Cook, Edward H., Jr.; and Marks, Gerald R., 4,100,050, Cl. 204-252.000.

Marks, Nathan, to Marcraft Recreation Inc. Racquet frame construction. 4,099,718, Cl. 273-73.00C.

Marquis, Edgar E., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,100,381, Cl. 200-38.00A.

Marshall, Sidney W., to Xerox Corporation. Signal generator for raster type scanners. 4,100,408, Cl. 250-230.000.

Marshall, Winston S.: *See—*

Zimmerman, Dennis M.; and Marshall, Winston S., 4,100,166, Cl. 260-289.00D.

Martin, Alfred Charles, to Westland Aircraft Limited. Helicopter rotors. 4,099,892, Cl. 416-134.00A.

Martin-Decker Company, a division of Gardner-Denver: *See—*

Bell, Leo A., 4,099,582, Cl. 175-5.000.

Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, to Uniroyal, Inc. Method of making adjuvant for elastomeric composition. 4,100,182, Cl. 260-429.900.

Martin, Merrill D. Automatic sheet handling apparatus. 4,099,712, Cl. 271-184.000.

Martin, Richard Hugo, to Olin Corporation. Method for electrically perforating moving webs. 4,100,396, Cl. 219-384.000.

Martin, Robert P., Sr. Sound attenuating engine cover. 4,099,590, Cl. 180-69.00C.

Martin, T. Edward, to Connelly, Arthur J., a part interest. Rate of penetration recorder. 4,099,410, Cl. 73-151.500.

Martines, Vincent C.; and Campbell, Ramsey G., to Stauffer Chemical Company. Production of perchloromethyl mercaptan. 4,100,190, Cl. 260-543.00H.

Maruhnic, Peter: *See—*

Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, 4,100,107, Cl. 252-443.000.

Maruo, Masaya: *See—*

Arikawa, Hiroo; and Maruo, Masaya, 4,100,523, Cl. 337-163.000.

Marvin Glass & Associates: *See—*

Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., 4,099,330, Cl. 33-18.00R.

Marwitz, Hans-Gunther v.d.: *See—*

Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., 4,099,645, Cl. 220-304.000.

Mascher, Werner. Filter-type gas mask and breathing device arranged in a carrying case. 4,099,526, Cl. 128-146.600.

Mascherin, Enio. Coin holder having rib retained closure. 4,099,532, Cl. 133-5.00A.

Maschinenfabrik Hellmut Geiger: *See—*

Hartmann, Ludwig, 4,100,063, Cl. 210-17.000.

Masco Corporation of Indiana: *See—*

Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.

Mascotte, Lawrence L.; and Rayson, Robert L. Grill and brush guard and utility rack for a vehicle. 4,099,760, Cl. 293-73.000.

Mase, Yoji, to Kondo Manufacturing Co., Ltd. Feed mechanism. 4,099,450, Cl. 91-403.000.

Mason, Peter Alan: *See—*

Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, 4,100,142, Cl. 526-68.000.

Maspero, Federico; and Perrotti, Emilio, to Snam Progetti S.p.A. Process for the production of unsaturated compounds. 4,100,208, Cl. 568-902.000.

Massachusetts Institute of Technology: *See—*

Shapiro, Ascher H., 4,100,602, Cl. 364-715.000.

Massey-Ferguson Inc.: *See—*

Lorenz, Leo J., 4,099,766, Cl. 296-137.00B.

Mathews, Robert P. Seat adapted to be mounted on vehicle tire. 4,099,771, Cl. 297-217.000.

Mathieu, Serge: *See—*

Delisle, Jules; Leroux, Adrien; and Mathieu, Serge, 4,100,428, Cl. 307-97.000.

Mathis, Cecil Ernest: *See—*

Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.

Matsui, Akio: *See—*

Horiuchi, Kaoru; Matsui, Akio; and Okamoto, Yoshio, 4,099,988, Cl. 148-3.000.

Matsui, Sei, to Nippon Kogaku K.K. Wide angle photographic lens. 4,099,850, Cl. 350-215.000.

Matsushita Electric Industrial Co., Ltd.: *See—*

Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.

Nishioka, Matsuo, 4,100,384, Cl. 200-160.000.

Matsuzaki, Hideo; and Yajima, Keiji, to Hitachi, Ltd. Apparatus for filling liquid crystal into the cells of liquid crystal display devices. 4,099,550, Cl. 141-51.000.

Matthews, Frank M.; and McClain, Terry O. Safety buckle. 4,099,306, Cl. 24-69.0SB.

Mattoon, Roland W. Device for limiting leakage from well head stuffing box assembly. 4,099,562, Cl. 166-84.000.

Matusek, Chester Joseph: *See—*

Johnson, David Leroy; and Matusek, Chester Joseph, 4,099,324, Cl. 29-739.000.

Maus, Leo Donald, to Exxon Production Research Company. Gas lift system for marine drilling riser. 4,099,583, Cl. 175-7.000.

Max Rittenbaum, Inc.: *See—*

Rittenbaum, Max; and Rittenbaum, Jeffrey A., 4,099,288, Cl. 15-228.000.

May & Baker Limited: *See—*

Gallant, John Henry; and Johnson, Michael Robert Thomas, 4,100,542, Cl. 340-518.000.

Mayer, Ronald Yves: *See—*

Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.

Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Polyurethane foams from polyether polyols which contain amide groups. 4,100,116, Cl. 521-167.000.

Mazodier, Jean-Louis: *See—*

Perrot, Rene; and Mazodier, Jean-Louis, 4,099,314, Cl. 29-420.000.

Mazzei, Marcello: *See—*

Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 4,100,334, Cl. 526-1.000.

Mazzeb, Charles F.; and Waddington, William T., to Amerace Corporation. Feed-through terminal block. 4,099,826, Cl. 339-198.00R.

McCabe, Francis J. Telescoping heat responsive releasing means. 4,099,292, Cl. 16-48.500.

McCain, G. Howard, to Diamond Shamrock Corporation. Electrolytic cell membrane and method of preparation by plasma polymerization of polyamide or polytetrafluoroethylene thin films onto polymeric substrates. 4,100,113, Cl. 521-38.000.

McCann, Thomas J.; and Regan, Ernest E., to Dowdflor Corporation. Actinic radiation cured coating for cushioned sheet goods and method. 4,100,318, Cl. 428-159.000.

McCarrell, Stuart G.: *See—*

Belt, Kenneth W.; and McCarrell, Stuart G., 4,100,505, Cl. 331-71.000.

McCarroll, John James: *See—*

Brown, David Emmerson; Clark, John Trevor Kent; McCarroll, John James; and Sims, Malcolm Leslie, 4,099,990, Cl. 148-6.350.

McCarthy, Robert O. Animal leg brace. 4,099,525, Cl. 128-87.00R.

McCarty, William H., to Mobil Oil Corporation. Ultraviolet curable aqueous coatings. 4,100,047, Cl. 204-159.230.

McClain, Dorothee M.; and Vest, Betty L., to National Distillers and Chemical Corp. Finely divided saponified ethylene-vinyl acetate interpolymers. 4,100,335, Cl. 526-10.000.

McClain, Terry O.: *See—*

Matthews, Frank M.; and McClain, Terry O., 4,099,306, Cl. 24-69.0SB.

McClelland, Donald H.: *See—*

Hug, Leonard F.; McClelland, Donald H.; and Uba, Toshio, 4,099,401, Cl. 72-147.000.

McCombie, Alan Keith, to Molins Machine Company Limited. Apparatus for feeding articles. 4,099,608, Cl. 198-347.000.

McConeghy, Richard H.: *See—*

Baranowski, Stephen W.; and McConeghy, Richard H., 4,100,426, Cl. 307-41.000.

McConnaughey, Paul W.: *See—*

Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,099,939, Cl. 55-246.000.

McDonald, Byron A. Digester and process for converting organic matter to methane and fertilizer. 4,100,023, Cl. 195-27.000.

McDonnell Douglas Corporation: *See—*

Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., 4,100,322, Cl. 428-257.000.

McGann, Rodney: *See—*

Paull, Peter L.; and McGann, Rodney, 4,099,382, Cl. 60-648.000.

Paull, Peter L.; and McGann, Rodney, 4,099,383, Cl. 60-648.000.

McGann, William E., to Harris Corporation. Band rejection filter having integrated impedance inverter-tune cavity configuration. 4,100,504, Cl. 331-39.000.

McGann, William Edward, to Harris Corporation. Microcircuit device including hybrid circuit carrier. 4,100,589, Cl. 361-399.000.

McGee, Donald J., to H & H Equipment Co. Spring-air tandem suspension. 4,099,740, Cl. 280-678.000.

McGrew, James D. Method of forming eye splice in double braided line. 4,099,750, Cl. 289-1.500.

McIntire, John E.: *See—*

McIntire, Kendrick H.; and McIntire, John E., 4,099,511, Cl. 126-190.000.

McIntire, Kendrick H.; and McIntire, John E. Removable fuel door on a wood burning stove. 4,099,511, Cl. 126-190.000.

McIntire, Robert Lee; and McIntire, Timothy Lee. Combined motor puller and stand. 4,099,634, Cl. 214-86.00R.

McIntire, Timothy Lee: *See—*

McIntire, Robert Lee; and McIntire, Timothy Lee, 4,099,634, Cl. 214-86.00R.

McIntyre, Neil: *See—*

Cooper, Kenneth; Groves, Ian Stanley; Leigh, Peter Alexander; McIntyre, Neil; O'Hara, Sydney; and Speight, John Donald, 4,099,318, Cl. 29-578.000.

McKearin, John W. Portable book rack. 4,099,624, Cl. 211-42.000.

McKellar, Robert L.: *See—*

Jueckstock, Dale Allen; and Hindman, Thomas Wayne, Sr., 4,099,283, Cl. 10-107.0PH.

McKinney, Claude O., to Standard Oil Company (Indiana). Apparatus for regeneration of catalyst. 4,099,927, Cl. 23-288.00B.

McKinney Manufacturing Company: *See—*

Gwozdz, Joseph W.; Biesecker, James E.; and Snyder, Charles R., 4,099,753, Cl. 292-177.000.

McLellan, Norvel Jeff. Combination incandescent/fluorescent lighting system. 4,100,462, Cl. 315-179.000.

McMackins, Dudley E.: *See—*

Hobbs, Charles F.; and McMackins, Dudley E., 4,100,194, Cl. 260-576.000.

Hobbs, Charles F.; and McMackins, Dudley E., 4,100,196, Cl. 260-585.00D.

McMahon, Donald H.; and Thaxter, James B., to Sperry Rand Corporation. Coaxial multi-detector system and method for measuring the extinction coefficient of an atmospheric scattering medium. 4,099,875, Cl. 356-103.000.

McNamee, Gary M.: *See—*

Christenson, Christopher P.; and McNamee, Gary M., 4,099,984, Cl. 134-2.000.

Christenson, Christopher P.; Faller, John W.; and McNamee, Gary M., 4,100,183, Cl. 260-438.100.

McNeal, Walter P., to General Electric Company. Method of making a dynamoelectric machine insulator. 4,100,005, Cl. 156-73.100.

McRae, Duncan Ross. Solar energy collector. 4,099,517, Cl. 126-271.000.

Means, James E.: *See—*

Redmond, Stephen L.; Means, James E.; and Osburn, Michael R., 4,099,466, Cl. 102-215.000.

Mears, Whitney Harris, to Allied Chemical Corporation. Method and apparatus for cooling electrical apparatus using vapor lift pump. 4,100,366, Cl. 174-15.00R.

Medler, Albert S.; and Myers, Donald L., to Plastigage Corporation. Apparatus for forming resin embedded antenna. 4,100,013, Cl. 156-441.000.

Meier, Joseph F.: *See—*

Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,100,327, Cl. 428-339.000.

Meihofer, Edward F.; Corcoran, George F.; and Clifford, John W., to Butler Automatic, Inc. Driven nip roll splicer. 4,100,012, Cl. 156-351.000.

Meiller, Francois; and Mirabel, Bernard, to Rhone-Poulenc Industries.

Method of separating proteins by ion exchange. 4,100,149, Cl. 260-112.00R.

Meinzer, Willy L., to Viking Industries, Inc. Non-explosive initiator. 4,099,818, Cl. 339-45.00R.

Melnichuk, Nikolai Ivanovich: *See—*

Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Meloichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Melvin, Terence: *See—*

Martin, Frank Stephen; Melvin, Terence; and Pieroni, Joseph Kirby, 4,100,182, Cl. 260-429.900.

Mendelsohn, Charles Richard, deceased; and Mendelsohn, Phyllis Jane, executrix. Stabilized kite. 4,099,690, Cl. 244-153.00R.

Mendelsoho, Phyllis Jane, executrix: *See—*

Mendelsohn, Charles Richard, deceased; and Mendelsohn, Phyllis Jane, executrix, 4,099,690, Cl. 244-153.00R.

Meoth, Anton; Nagel, Hartmut; and Perry, Antony James, to BBC Brown, Boveri & Company, Ltd. Copper-hardened permanent-magnet alloy. 4,099,995, Cl. 148-101.000.

Mentrup, Anton: *See—*

Renth, Ernst-Otto; Mentrup, Aaton; Schromm, Kurt; and Danneberg, Peter, 4,100,282, Cl. 424-246.000.

Mercier, Jules, to Rhone-Poulenc Industries. Recovery of acetic acid from dilute aqueous solutions thereof. 4,100,189, Cl. 260-541.000.

Merck & Co., Inc.: *See—*

Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.

Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,100,193, Cl. 260-563.00P.

Vander Zwan, Michael C., 4,100,159, Cl. 544-277.000.

Merrill, Edward W., to High Voltage Engineering Corporation. Contact lens having a smooth surface layer of a hydrophilic polymer. 4,099,859, Cl. 351-160.000.

Merten, Rudolf: *See—*

Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.

Merz AG Dulliken: *See—*

Vig, Istvan, 4,099,889, Cl. 408-239.00R.

Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, to Boehringer Ingelheim GmbH. N-Tetrahydrofurfuryl-ooroxymorphones, their salts, and analgesic compositions and methods employing them. 4,100,288, Cl. 424-260.000.

Meserole, Robert Henry, to Johns-Manville Corporation. Air duct connecting assembly. 4,099,747, Cl. 285-174.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*

Born, Gunthard; Hermansdorfer, Hans; Sepp, Gunther; and Grosch, Gerhard, 4,100,507, Cl. 331-94.50G.

Singelmann, Dietrich; Strobl, Heinrich; and Munding, German, 4,099,445, Cl. 89-7.000.

Messier, Russell F.; and Wolfe, Robert W., to GTE Sylvania Incorporated. Europium-activated alkaline earth fluorohalide x-ray phosphors and method for preparing the same. 4,100,101, Cl. 252-301.40H.

Metcalf, Brian Walter; and Jung, Michel. α-Acetylenic derivatives of histamine and related compounds. 4,100,349, Cl. 548-337.000.

Metcalf, Eric; and Ley, Anthony John, to Solartron Electronic Group Limited, The. Displacement transducers. 4,100,420, Cl. 250-561.000.

Metropolitan Wire Corporation: *See—*

Becker, Frederick R., III, 4,099,735, Cl. 280-79.300.

Mettler Instrumeote, AG: *See—*

Kaufmann, Peter, 4,099,587, Cl. 177-210.0EM.

Metzeler Kautschuk AG: *See—*

Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, 4,099,656, Cl. 224-5.00W.

Mews, Inc.: *See—*

Evans, Edgar J., 4,100,529, Cl. 340-32.000.

Meyer, Gilbert. Electroerosion method and apparatus for machining undercut channels in a workpiece. 4,100,388, Cl. 219-69.00M.

Meyer, Rolf-Volker; and Dheio, Rolf, to Bayer Aktiengesellschaft. Process for the production of high-impact thermoplastic moulding compositions. 4,100,223, Cl. 260-857.00L.

Meyr, Heinrich: *See—*

Lindsey, William C.; Meyr, Heinrich; and King, Peter C., 4,100,503, Cl. 331-1.00A.

Michne, William F., to Sterling Drug Inc. 2,6-Methano-3-benzazocines. 4,100,164, Cl. 260-287.00B.

Micklus, Michael J.; and Ou-Yang, David T., to Biosearch Medical Products, Inc. Coated substrate having a low coefficient of friction hydrophilic coating and a method of making the same. 4,100,309, Cl. 427-2.000.

Microdot Inc.: *See—*

DeLano, Don L., 4,099,820, Cl. 339-88.00R.

Midnight Ears, Inc.: *See—*

Cooke, P. Richard, 4,100,547, Cl. 343-721.000.

Mie, Terumi: *See—*

Ichikawa, Kunihiro; Mie, Terumi; and Ona, Isao, 4,100,124, Cl. 260-29.20M.

Mikami, Yasao: *See—*

Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, 4,099,284, Cl. 15-42.000.

Miki, Masayuki: *See—*

Miyakawa, Nobuaki; and Miki, Masayuki, 4,100,432, Cl. 307-229.000.

Mikino, Hiroshi: *See—*

Okikawa, Susumu; and Mikino, Hiroshi, 4,100,566, Cl. 357-70.000.

Milberger, Ernest C., to Standard Oil Company, The. Automatic catalytic screening unit. 4,099,923, Cl. 23-254.00R.

Miles Laboratories, Inc.: *See—*

Buckler, Robert Thomas, 4,100,185, Cl. 260-465.00F.

Buckler, Robert Thomas, 4,100,352, Cl. 560-53.000.

Buckler, Robert Thomas, 4,100,353, Cl. 560-55.000.

Kluender, Harold Clinton, 4,100,356, Cl. 560-121.000.

Kluender, Harold Clinton, 4,100,357, Cl. 560-121.000.

Miles, Larry L., to Texas Instruments Incorporated. Data display system for electronic calculator or microprocessor. 4,100,600, Cl. 364-710.000.

Miller, Gordon H., to Texaco Inc. Polymerization of aliphatic nitriles. 4,100,147, Cl. 528-362.000.

Miller, Grigory Grigorievich: *See—*

Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeoy Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Miller, Harry B., to Industrie-Werke Karlsruhe-Augsburg Aktiengesellschaft. Winder for yarn and the like. 4,099,680, Cl. 242-18.00A.

Miller, Ralph, to Ciba-Geigy Corporation. Process for preparing cyanogen chloride and gaseous chlorine. 4,100,263, Cl. 423-383.000.

Millheiser, Melvin; and Berliner, Wallace H., to Waldes Kohinoor, Inc. Radially assembled friction-grip self-locking rings. 4,099,444, Cl. 85-8.800.

Milligan, Jimmy L.: *See—*

Maier, Roger F.; Milligan, Jimmy L.; Bahnfleth, William A.; and Taylor, James L., 4,099,763, Cl. 296-28.00C.

Mimura, Yoshiyuki: *See—*

Hase, Takashi; Kagami, Akiyasu; Mimura, Yoshiyuki; Narita, Kinichiro; and Hiraki, Minoru, 4,100,454, Cl. 313-495.000.

Mindick, Morris: *See—*

Vossos, Peter H.; Mindick, Morris; and Koskan, Larry P., 4,100,258, Cl. 423-242.000.

Mine Safety Appliances Company: *See—*

Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,099,939, Cl. 55-246.000.

Minnesota Mining and Manufacturing Company: *See—*

Bittner, John E.; and Dodsworth, Robert S., 4,099,816, Cl. 339-17.0CF.

Cook, Jack E.; and Bailey, Terry R., 4,099,838, Cl. 350-105.000.

Oliveira, Robert J., 4,099,874, Cl. 356-102.000.

Oliveira, Robert J., 4,099,886, Cl. 356-244.000.

Robins, Janis; and Zollinger, J. Lamar, 4,100,134, Cl. 528-10.000.

Minolta Camera Co., Ltd.: *See—*

Nobutoki, Saburo; and Okano, Yukio, 4,100,570, Cl. 358-44.000.

Mirabel, Bernard: *See—*

Meiller, Francois; and Mirabel, Bernard, 4,100,149, Cl. 260-112.00R.

Mirabelli, Bruno: *See—*

Cicognani, Mario; and Mirabelli, Bruno, 4,099,422, Cl. 74-231.00C.

Mishakov, Vladimir Nikiforovich: *See—*

Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Mita Iodustrial Co. Ltd.: *See—*

Takayama, Hiroshi; and Aizawa, Tatsuo, 4,100,087, Cl. 252-62.10P.

Mitchell, Robert Lynn. Battery terminal cleaner. 4,099,310, Cl. 29-79.000.

Mits-Co Geophysics Ltd.: *See—*

Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, 4,100,482, Cl. 324-6.000.

Mitsubishi Chemical Industries Limited: *See—*

Kikumoto, Ryoji; Tobe, Akihiro; Tonomura, Shinji; and Ikoma, Hidenobu, 4,100,299, Cl. 424-330.000.

Sato, Yururu; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenj:; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

Mitsubishi Denki Kabushiki Kaisha: *See—*

Tabata, Norikazu; Ueno, Takanori; and Namba, Keisuke, 4,100,421, Cl. 250-533.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*

Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, 4,100,072, Cl. 210-242.00S.

Mitsui Kinzoku Engineering Service Co., Ltd.: *See—*

Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.

Mitsui Mining & Smelting Co., Ltd.: *See—*

Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.

Mitsui Polychemicals, Co., Ltd.: *See—*

Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.

Mitter & Co.: *See—*

Mitter, Mathias, 4,099,461, Cl. 101-119.000.

Mitter, Mathias, to Mitter & Co. Control device for controlling the level of a liquid in a container. 4,099,461, Cl. 101-119.000.

Miura, Kiyoshi; and Tomita, Yoshifumi, to Hitachi, Ltd. Photo-sensitive bis-azide containing composition. 4,099,973, Cl. 96-115.00R.

Miyakawa, Nobuaki; and Miki, Masayuki, to Hitachi, Ltd. Multiplication circuit with field effect transistor (FET). 4,100,432, Cl. 307-229.000.

Miyamoto, Reiji: *See—*

Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.

Mizelle, Ned W., to Hoover Ball and Bearing Company. Chair control with tilt lock. 4,099,775, Cl. 297-303.000.

Mizukura, Noboru: *See—*

Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenjl; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

Mobil Oil Corporation: *See—*

Chen, Nai Y., 4,100,215, Cl. 260-671.00M.

Chen, Nai Yuen; and Haag, Werner O., 4,100,218, Cl. 260-673.000.

Dwyer, Francis G., 4,100,214, Cl. 260-668.00A.

Gournay, Luke S., 4,100,481, Cl. 324-4.000.

Jones, Joho P., Jr., 4,099,332, Cl. 33-126.70R.

McCarty, William H., 4,100,047, Cl. 204-159.230.

Murphy, William R.; and Rowe, Carleton N., 4,100,083, Cl. 252-34.000.

Pelrine, Bruce Patrick, 4,100,262, Cl. 423-329.000.

Rodewald, Paul G., 4,100,213, Cl. 260-666.00P.

Rodewald, Paul G., 4,100,219, Cl. 260-682.000.

Wardwell, John Albert; Stewert, Ray Alan; and Chow, Ralph Gee, 4,099,643, Cl. 220-222.000.

Young, Lewis Brewster, 4,100,217, Cl. 260-671.00R.

Mobley, Joseph Graham, to Scientific-Atlanta, Inc. Satellite tracking antenna system. 4,100,472, Cl. 318-685.000.

Mochizuki, Yoshifumi; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Electronic optical display alarm timepiece. 4,099,371, Cl. 58-22.700.

Molins, Desmond Walter, to Molins Limited. Receptacle emptying device for elongated cylindrical elements. 4,099,637, Cl. 214-306.000.

Molins Limited: *See—*

Molins, Desmond Walter, 4,099,637, Cl. 214-306.000.

Molins Machine Company Limited: *See—*

McCombie, Alan Keith, 4,099,608, Cl. 198-347.000.

Mong, William K.; and Zoric, Michael T., to Westinghouse Air Brake Company. Vented ball type angle cock. 4,099,543, Cl. 137-625.220.

Monrolin, Jean Louis, to International Business Machines Corporation. Carrier synchronization system for coherent phase demodulators. 4,100,499, Cl. 329-50.000.

Monsanto Company: *See—*

Hobbs, Charles F.; and McMackins, Dudley E., 4,100,194, Cl. 260-576.000.

Hobbs, Charles F.; and McMackins, Dudley E., 4,100,196, Cl. 260-585.00D.

Lannert, Kent P., 4,100,358, Cl. 560-180.000.

Moore, Bruce H., to Samuel Moore and Company. Method of making push-pull cable conduit and product. 4,099,425, Cl. 74-501.00P.

Moracchioli, Robert: *See—*

Bricard, Alain; de Cachard, Maurice; Ooffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,557, Cl. 165-104.00S.

Bricard, Alain; de Cachard, Maurice; Goffinet, Pierre; Kurka, Gerard; and Moracchioli, Robert, 4,099,558, Cl. 165-104.00S.

Morain, Eldon W.: *See—*

Cole, Judson C.; and Morain, Eldon W., 4,099,670, Cl. 239-205.000.

Morgan Construction Company: *See—*

Salter, Lowell S., Jr., 4,099,731, Cl. 277-164.000.

Morgan, Joe Pierce; Phillips, Howard Charles; and Spong, Richard Vernon, to AMP Incorporated. Apparatus for inserting displation type terminals into cavities. 4,099,316, Cl. 29-566.200.

Mori, Eizo; and Mori, Takao. Garden shears. 4,099,326, Cl. 30-135.000.

Mori, Haruo, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine having exhaust emission control system. 4,099,497, Cl. 123-117.00A.

Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and K. K. Tokai Rika Denki Seisakusho. Seat belt system. 4,099,684, Cl. 242-107.000.

Mori, Takao: *See—*

Mori, Eizo; and Mori, Takao, 4,099,326, Cl. 30-135.000.

Morimoto, Yuko: *See—*

Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Kazuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.

Morinaga Milk Industry Co., Ltd.: *See—*

Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, 4,100,022, Cl. 195-1.800.

Morino, Tetsuro: *See—*

Suzuki, Matsumi; Kitamoto, Saburo; and Morino, Tetsuro, 4,100,370, Cl. 179-1.0SB.

Morio, Minoru; and Kambara, Masahiro, to Sony Corporation. Method of and apparatus for modifying a video signal to prevent unauthorized recording and reproduction thereof. 4,100,575, Cl. 358-120.000.

Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, to Hitachi, Ltd. Electroless copper solution. 4,099,974, Cl. 106-1.230.

Morisi, Franco: *See—*

Prosperi, Giulio; Marconi, Walter; Giovenco, Silvia; and Morisi, Franco, 4,100,029, Cl. 195-68.000.

Morita, Osamu: *See—*

Kato, Shigeo; Saito, Sakae; and Morita, Osamu, 4,099,348, Cl. 51-92.00R.

Morokawa, Shigeru: *See—*

Fujita, Hiroo; Tsuzuki, Akira; and Morokawa, Shigeru, 4,100,540, Cl. 340-324.00M.

Mochizuki, Yoshifumi; and Morokawa, Shigeru, 4,099,371, Cl. 58-22.700.

Mororowich, Walter, to Upjohn Company, The. Inter-phenylene-PG amides. 4,100,192, Cl. 260-558.00R.

Morphy, Paul H., to Hobart Corporation. Insulated cabinet and method of construction. 4,099,812, Cl. 312-214.000.

Morris, John C.; Weidman, James K.; and Prior, Michael D., to Riverside Clay Company. Apparatus for applying granular refractory material to surfaces. 4,099,708, Cl. 266-281.000.

Morrison, Howard J.: *See—*

Hicks, Alan A.; Brand, Derek A.; and Morrison, Howard J., 4,099,330, Cl. 33-18.00R.

Mortensen, Donald G.; and Strand, Dennis P., to FMC Corporation. Impulse filter cleaner. 4,099,940, Cl. 55-300.000.

Mosebach Manufacturing Company: *See—*

Kirilloff, Victor V.; and Benson, William A., 4,100,526, Cl. 338-279.000.

Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, to Securicum S.A. Method of making carbon fibers and resin-impregnated carbon fibers. 4,100,004, Cl. 156-60.000.

Motoren- und Turbinen-Union Munchen GmbH: *See—*

Leibach, Heinrich, 4,099,671, Cl. 239-265.290.

Weiler, Wolfgang, 4,099,727, Cl. 277-3.000.

Motorola, Inc.: *See—*

Clark, Lowell E., 4,100,563, Cl. 357-27.000.

Duffy, William Thomas; and Lillis, William Joseph, 4,100,433, Cl. 307-229.000.

Johnson, David Leroy; and Matusek, Chester Joseph, 4,099,324, Cl. 29-739.000.

Stipanuk, James Jacob, 4,100,431, Cl. 307-213.000.

Moya, Ephraim F., to Instrumentation Technology Corp. Receptacle for tape cartridge. 4,099,686, Cl. 242-198.000.

Mudrak, Anton: *See—*

Ashman, John Slocum; and Mudrak, Anton, 4,100,075, Cl. 252-8.100.

Ashman, John Slocum; Burt, Gerald Dennis; and Mudrak, Anton, 4,100,076, Cl. 252-8.100.

Burt, Gerald Dennis; and Mudrak, Anton, 4,100,077, Cl. 252-8.100.

Mueller, Karl, to Ciba-Geigy Corporation. Stable polymer compositions containing perfluoroalkyl groups and process for making. 4,100,225, Cl. 260-878.00R.

Mueller, Rudolf: *See—*

Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.

Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.

Mui, Jeffrey Y. P.; and Kanner, Bernard, to Union Carbide Corporation. Sulfur containing norbornanyl silicon compounds. 4,100,172, Cl. 260-327.00H.

Mui, Jeffrey Yick-Pui; and Pines, Arthur Noah, to Union Carbide Corporation. Sulfur containing silane coupling agents. 4,099,981, Cl. 106-308.00Q.

Mukai, Junji: *See—*

Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, 4,100,114, Cl. 521-175.000.

Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, 4,100,118, Cl. 260-18.0PT.

Mukai, Kunio: *See—*

Hasbimoto, Shunichi; and Mukai, Kunio, 4,099,954, Cl. 71-87.000.

Muller, Alain, to Compagnie Francaise de Raffinage. Catalyst and a process for their preparation. 4,100,109, Cl. 252-465.000.

Muller, Hans-Jurgen: *See—*

Dunwald, Willi; Lewalter, Jurgen; Merten, Rudolf; and Muller, Hans-Jurgen, 4,100,144, Cl. 260-860.000.

Muller, Hermann; and Schaaber, Otto. Process for producing an extremely hard mixed carbide layer on ferrous materials to increase their resistance to wear. 4,099,993, Cl. 148-14.000.

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Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,099,369, Cl. 56-314.000.

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Andren, Lars-Goran Hjalmar; Bjorkman, Rune Harald; Easterday, Richard Lee; and Munktell, Hans Gosta, 4,099,882, Cl. 356-181.000.

Mura, Lawrence A.: *See—*

Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.

Murai, Hiromu; and Aoyagi, Yoshiaki, to Nippon Shinyaku Co., Ltd.

N-substituted trialkoxybenzyl piperazine derivatives. 4,100,285, Cl. 424-250.000.

- Murakami, Kanji: *See—*
  - Morishita, Hirosada; Kawamoto, Mineo; Wajima, Motoyo; and Murakami, Kanji, 4,099,974, Cl. 106-1.230.
- Murakami, Yoshio; and Nakazawa, Takezo, to Mitsui Mining & Smelting Co., Ltd.; and Mitsui Kinzoku Engineering Service Co., Ltd. Impeller type pump having seal means and protective means. 4,099,890, Cl. 415-170.00A.
- Murphy, William R.; and Rowe, Carleton N., to Mobil Oil Corporation. Lubricant compositions containing an amine salt of a half ester of succinic acid. 4,100,083, Cl. 252-34.000.
- Muth, Hans-Albrecht; Reissig, Dirk; and Marwitz, Hans-Gunther v.d., to Bayerische Motoren Werke Aktiengesellschaft. Fuel tank, especially for motorcycles. 4,099,645, Cl. 220-304.000.
- Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, to Canon Kabushiki Kaisha. Recording apparatus for a voltage sensitive recording system. 4,100,552, Cl. 346-162.000.
- Muto, Teruhide, to Shinko Industries Co., Ltd.; and Toyonaka Kosakusho Co., Ltd. Apparatus for providing adhesive strips of predetermined length. 4,099,433, Cl. 83-155.000.
- MWA Company: *See—*
  - Hasty, Jerry N., 4,099,350, Cl. 51-338.000.
- Myer, Floyd L.: *See—*
  - Smith, Kenneth E.; and Myer, Floyd L., 4,099,594, Cl. 180-14.00B.
- Myers, Donald L.: *See—*
  - Medler, Albert S.; and Myers, Donald L., 4,100,013, Cl. 156-441.000.
- Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, to Sun Oil Company of Pennsylvania. Preparation of beta-methyltetramethylene nortricyclane. 4,100,216, Cl. 260-666.0PY.
- Myers, Harry K., Jr.: *See—*
  - Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,100,338, Cl. 526-142.000.
- N.B.F. Company, Inc.: *See—*
  - Foley, Newman Clarence, 4,099,739, Cl. 280-504.000.
- Naaijer, Geert Jan: *See—*
  - Durand, Henri; and Naaijer, Geert Jan, 4,100,427, Cl. 307-87.000.
- Nablo, Samuel V.; and Fussa, Alfred D., to Energy Sciences Inc. Process for curing of adhesives for flocking and texturing on heat-sensitive substrates, by electron-beam radiation. 4,100,311, Cl. 427-44.000.
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  - Shinozaki, Mamoru; Takahama, Yuichi; Tubaki, Hachiro; Nagasawa, Kazuo; and Mikami, Yasao, 4,099,284, Cl. 15-42.000.
- Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor heat shield. 4,099,496, Cl. 123-41.310.
- Nagata, Kazuhiro: *See—*
  - Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, 4,100,022, Cl. 195-1.800.
- Nagawa, Yuji: *See—*
  - Fujino, Masahiko; Nishimura, Osamu; Nagawa, Yuji; and Fukuda, Naohisa, 4,100,152, Cl. 260-112.5TR.
- Nagel, Hartmut: *See—*
  - Menth, Anton; Nagel, Hartmut; and Perry, Antony James, 4,099,995, Cl. 148-101.000.
- Naka, Reishi; Narahara, Toshikazu; and Mukai, Junji, to Hitachi, Ltd. Polyurethane foam composition. 4,100,114, Cl. 521-175.000.
- Nakada, Akira: *See—*
  - Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
- Nakagaki, Harushige; Sampei, Tohru; Amada, Nobutaka; and Baba, Tatsuo, to Hitachi, Ltd. Audio frequency power amplifier. 4,100,501, Cl. 330-263.000.
- Nakaisumi, Yasushi: *See—*
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- Nakajima, Hiromu, to Kabushiki-Kaisha Nakajima. Method and apparatus for producing welded steel tubes having large square cross sectioo. 4,099,662, Cl. 228-151.000.
- Nakajima, Shigeo; and Endo, Hajime, to Taiheiyo Engineering Incorporated. Apparatus for drawing the shearers. 4,099,786, Cl. 299-43.000.
- Nakajima, Takayoshi; Sonoda, Hiroshi; Sasaki, Katsutoshi; and Hane, Teruaki, to Chisso Corportion. Method of and apparatus for producing hollow-cylindrically shaped fibrous articles. 4,100,009, Cl. 156-184.000.
- Nakamura, Zenzo; Ohtaki, Syohei; Tsunekawa, Tokuichi; Ito, Tadashi; Aizawa, Hiroshi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Indicator circuit for electronic flash apparatus. 4,100,459, Cl. 315-136.000.
- Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust system for internal combustion engine. 4,099,500, Cl. 123-122.0AB.
- Nakata, Toshiaki: *See—*
  - Okumura, Masahide; Sakitani, Yoshio; Nakaisumi, Yasushi; and Nakata, Toshiaki, 4,099,704, Cl. 251-134.000.
  - Ueno, Yukichi; and Nakata, Toshiaki, 4,100,410, Cl. 250-311.000.
- Nakatsubo, Toshio; and Nishikawa, Masaji, to Olympus Optical Co., Ltd. Improved electrographic process for producing a plurality of copies. 4,099,863, Cl. 355-3.0SC.
- Nakazawa, Takezo: *See—*
  - Murakami, Yoshio; and Nakazawa, Takezo, 4,099,890, Cl. 415-170.00A.
- Nalco Chemical Company: *See—*
  - Selvarajan, Radhakrishnan; and Ballweber, Edward G., 4,100,167, Cl. 260-296.00R.
  - Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,100,231, Cl. 260-978.000.
  - Vossos, Peter H.; Mindick, Morris; and Koskan, Larry P., 4,100,258, Cl. 423-242.000.
- Nally, Robert B., to NCR Canada Ltd. - NCR Canada LTEE. Method and apparatus for determining velocity of a moving member. 4,100,599, Cl. 364-565.000.
- Namba, Keisuke: *See—*
  - Tabata, Norikazu; Ueno, Takanori; and Namba, Keisuke, 4,100,421, Cl. 250-533.000.
- Napco Security Systems, Inc.: *See—*
  - Stockdale, Roy; and Weston, Lance, 4,100,543, Cl. 340-521.000.
- Napolitano, Orlando; Reid, Robert Edward; Saltzberg, Burton R.; Stochel, Nathan Harold; and Tingley, John Ronald, to Bell Telephone Laboratories, Incorporated. Multipoint polling technique. 4,100,533, Cl. 340-147.00R.
- Narahara, Toshikazu: *See—*
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- Narasaki, Shiro: *See—*
  - Tatsumi, Tetsujiro; Miyamoto, Reiji; Narasaki, Shiro; Kazama, Seiji; and Tanaka, Michio, 4,099,638, Cl. 215-12.00R.
- Nardi, John C.: *See—*
  - Hussey, Charles L.; Nardi, John C.; Fannin, Armand A., Jr.; King, Lowell A.; and Erbacher, John K., 4,100,044, Cl. 204-146.000.
- Narita, Kinichiro: *See—*
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- Narita, Yoshihiro: *See—*
  - Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.
- Narui, Hiroshi; Akune, Ikuo; and Kobiki, Yosiya, to Oike & Co., Ltd. Metal leaf. 4,100,317, Cl. 428-137.000.
- Narumi China Corp.: *See—*
  - Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.
- Naruse, Yohsuke; and Sugiki, Mikio, to Sony Corporation. Apparatus for optically reading signal information recorded on a reflective record medium surface. 4,100,577, Cl. 358-128.000.
- Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, to Cincinnati Milacron Inc. Injection molding machine base. 4,099,905, Cl. 425-589.000.
- Nash, Paul. Optical inspection systems. 4,099,884, Cl. 356-200.000.
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  - McClain, Dorothee M.; and Vest, Betty L., 4,100,335, Cl. 526-10.000.
- National Petro Chemicals Corporation: *See—*
  - Katzen, Stanley J.; and Rekers, Louis J., 4,100,104, Cl. 252-428.000.
- National Research Development Corporation: *See—*
  - Lawrenson, Peter John; and Hughes, Austin, 4,100,473, Cl. 318-696.000.
  - Woolvet, George Albert; and Tolley, Bryan Peter, 4,099,411, Cl. 73-141.00R.
- National Semiconductor Corporation: *See—*
  - Schultz, James Edward; and Burns, Carmen D., 4,099,660, Cl. 228-13.000.
- Natural Resources Guardianship International, Inc.: *See—*
  - Webb, Harry Matthew, 4,099,930, Cl. 44-56.000.
- NB Jackets Company: *See—*
  - Dorman, Isidore, 4,099,362, Cl. 53-123.000.
- NCR Canada Ltd. - NCR Canada LTEE: *See—*
  - Nally, Robert B., 4,100,599, Cl. 364-565.000.
- NCR Corporation: *See—*
  - Foris, Peter L.; Brown, Robert W.; and Phillips, Paul S., Jr., 4,100,103, Cl. 252-316.000.
- Nebash, Stanley P.: *See—*
  - Vancheri, Frank J.; Nebash, Stanley P.; and McConnaughey, Paul W., 4,099,939, Cl. 55-246.000.
- Nedelec, Lucien; Frechet, Daniel; Dumont, Claude; and Kannengiesser, Marie-Helene, to Roussel Uclaf. Novel benzazepines. 4,100,278, Cl. 424-244.000.
- Neff, James A., to MAC Valves, Inc. Alignment means for a moveable pole-plunger assembly. 4,100,519, Cl. 335-262.000.
- Nehrbass, John. Method of measuring the instantaneous flow rate of urine discharge. 4,099,412, Cl. 73-209.000.
- Neil, Clyde Carl: *See—*
  - Hammer, Jacob Meyer; and Neil, Clyde Carl, 4,100,313, Cl. 427-162.000.
- Neithardt, William A., Jr., to Keuffel & Esser Company. Drafting film. 4,100,329, Cl. 428-413.000.
- Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-cis-4,5-didehydro-9-deoxy-PGD_2 compounds. 4,100,198, Cl. 260-586.00R.
- Nelson, Paul M., to Wilson Industries, Inc. Overshot cutter with flexible release cage. 4,099,561, Cl. 166-55.100.
- Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. Process for the preparation of 2-(5H-dibenzo[a,d]cyclohepten-5-on-2-yl)acetic, propionic and butyric acids and intermediates. 4,100,174, Cl. 260-340.90R.
- Nelson, Terrance D.; and Klippel, Bruce G., to Allen-Bradley Company. Hybrid motor starter. 4,100,469, Cl. 318-227.000.
- Nergard, Orv, to Dart Industries, Inc. Drinking receptacle cover and valve assembly. 4,099,642, Cl. 220-90.400.

- Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, to Sea Containers, Ltd. Collapsible containers. 4,099,640, Cl. 220-6.000.
- Nestor Engineering Associates, Inc.: *See—*
  - Nestor, Jack; and Slepyan, David H., 4,099,521, Cl. 128-020.000.
- Nestor, Jack; and Slepyan, David H., to Nestor Engineering Associates, Inc. Surgical retractor adjustable mounting apparatus. 4,099,521, Cl. 128-020.000.
- Netherwood, Paul H.: *See—*
  - Peck, David B.; Guntlow, Vincent T.; and Netherwood, Paul H., 4,100,490, Cl. 324-182.000.
- Netzel, Philip C., to Electric Power Research Institute. Latch structure for insulator spacer. 4,100,367, Cl. 174-28.000.
- Neugroschel, Eric: *See—*
  - Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.
- Neumann, Henning; Schalausky, Horst; and Britschinn, Horst, to Metzeler Kautschuk AG. Multi-purpose carrying bag or case. 4,099,656, Cl. 224-5.00W.
- Neuroth, Norbert: *See—*
  - Faulstich, Marga; Neuroth, Norbert; Reitmayer, Franz; and Krolla, Georg, 4,099,834, Cl. 350-96.340.
- New Colony Inventions, Inc.: *See—*
  - Antolino, Angelo, 4,099,654, Cl. 222-184.000.
- New Life Foundation: *See—*
  - Mackenzie, Harold B.; and Anderson, Ingvar G., 4,099,473, Cl. 110-219.000.
- Newall Engineering Company Ltd., The: *See—*
  - Rogers, Michael James, 4,100,485, Cl. 324-208.000.
- Newman, Francis Marion, Jr.; and Silvus, H. Stanley, Jr., to Southwest Research Institute. Automatic self-cleaning ferromagnetic metal detector. 4,100,491, Cl. 324-204.000.
- Nicholas, William: *See—*
  - Billington, Evans R.; and Nicholas, William, 4,099,551, Cl. 141-388.000.
- Nicholls, Keith David: *See—*
  - den Brinker, Carl S.; and Nicholls, Keith David, 4,100,530, Cl. 340-53.000.
- Nickell, Louis G., to W. R. Grace & Co. Ripening of sugarcane by use of alcohols. 4,099,957, Cl. 71-122.000.
- Niemi, Ilmer Issac: *See—*
  - Hudler, Charles William; Swanson, Clare Eugene; Sundin, George Holger; and Niemi, Ilmer Issac, 4,099,619, Cl. 206-524.100.
- Nihon Technical Kabushiki Kaisha: *See—*
  - Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.
- Niki, Masao: *See—*
  - Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.
- Niklas, Ludwig, to Krautkramer-Branson, Incorporated. Resolution real-time ultrasonic imaging apparatus. 4,099,416, Cl. 73-602.000.
- Nippon Air Brake Co., Ltd., The: *See—*
  - Inoue, Hiroo; and Kishimoto, Isao, 4,099,476, Cl. 114-144.00R.
- Nippon Chemical Industrial Co., Ltd.: *See—*
  - Abe, Nobuyoshi; Kubo, Shigenaga; and Kanamaru, Kiyoshi, 4,100,074, Cl. 252-8.100.
- Nippon Electric Co., Ltd.: *See—*
  - Hada, Hiroshi; and Hirayama, Tsutomu, 4,100,461, Cl. 315-169.0TV.
  - Takahashi, Akinori, 4,100,407, Cl. 250-214.00P.
- Nippon Electric Kagoshima, Ltd.: *See—*
  - Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.
- Nippon Gakki Seizo Kabushiki Kaisha: *See—*
  - Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.
  - Yokoyama, Kenji, 4,100,438, Cl. 307-304.000.
- Nippon Kogaku K.K.: *See—*
  - Kaneko, Masanobu, 4,099,842, Cl. 350-175.00E.
  - Matsui, Sei, 4,099,850, Cl. 350-215.000.
- Nippon Kokan Kabushiki Kaisha: *See—*
  - Tanaka, Jinkichi; Watanabe, Itaru; and Suzuki, Motoaki, 4,100,389, Cl. 219-74.000.
- Nippon Oil Company, Ltd.: *See—*
  - Shinomura, Toshihiko, 4,100,238, Cl. 264-49.000.
- Nippon Shinyaku Co., Ltd.: *See—*
  - Murai, Hiromu; and Aoyagi, Yoshiaki, 4,100,285, Cl. 424-250.000.
- Nippon Soken, Inc.: *See—*
  - Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, 4,099,922, Cl. 23-254.00E.
- Nischk, Gunther: *See—*
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- Nisdorf Computer AG: *See—*
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- Nishikawa, Masaji: *See—*
  - Nakatsubo, Toshio; and Nishikawa, Masaji, 4,099,863, Cl. 355-3.0SC.
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  - Orimoto, Koji; Uno, Masataka; Oomachi, Yoshio; and Nishimura, Yoshitaka, 4,099,449, Cl. 91-358.00A.
- Nishioka, Matsuo, to Matsushita Electric Industrial Co., Ltd. Pushbutton switch unit with reversible spring. 4,100,384, Cl. 200-160.000.
- Nisper, Kenneth J., to Questor Corporation. Piston ring construction. 4,099,730, Cl. 277-139.000.
- Nissan Motor Company, Limited: *See—*
  - Yoshimura, Tooru; and Kuroda, Hiroshi, 4,099,377, Cl. 60-276.000.
- Nist, Ferdinand J., Jr., to Seattle Box Co. Shipping bundle for numerous pipe lengths. 4,099,617, Cl. 206-443.000.
- Nitto Kogaku Kabushiki Kaisha: *See—*
  - Ito, Yukio, 4,099,847, Cl. 350-187.000.
- Niveau AG, Firma: *See—*
  - Halm, Hans, 4,100,060, Cl. 209-80.500.
- Nobutoki, Saburo; and Okano, Yukio, to Hitachi, Ltd.; and Minolta Camera Co., Ltd. Optical image pickup system. 4,100,570, Cl. 358-44.000.
- Nogami, Tomoyuki; and Ohta, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic brake pressure control apparatus for vehicles. 4,099,791, Cl. 303-24.00F.
- Noguchi, Yoshikazu; Senda, Katsuyuki; and Kobashi, Mamoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system. 4,099,508, Cl. 123-148.0DC.
- Noller, David Lewis. Telephone, intercom and remote control system. 4,100,375, Cl. 179-2.00A.
- Nomura, Masayoshi: *See—*
  - Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
- Non, Tse Quong. Passive restraint system with head and knee restraint. 4,099,743, Cl. 280-753.000.
- Nonaka, Hidehiro, to Japan Steel Works LTD. Method for directly cooling melted thermoplastic resins. 4,100,244, Cl. 264-211.000.
- Noonan, Joseph. Heat-conserving cooking utensil. 4,099,512, Cl. 126-246.000.
- Norback, Per S., to Aktiebolaget Carl Munters. Method of manufacturing a heat exchanger body for recuperative exchangers. 4,099,928, Cl. 29-157.30D.
- Nordson Corporation: *See—*
  - Scholl, Charles H.; and Reighard, Alan B., 4,099,653, Cl. 222-146.0HE.
- Norlin Music, Inc.: *See—*
  - Luce, David A., 4,099,439, Cl. 84-1.260.
- Norris, Alan Hedley; Cromer, Edwin Dwain; and Chambley, Phillip Wayne, to Champion International Corporation. Space print head draw rolls. 4,099,393, Cl. 68-22.00R.
- North, Robert Jarl, to Harmon Colors Corporation. Process for producing gamma quinacridone solid solutions. 4,099,980, Cl. 106-288.00Q.
- North, Robert Jarl, to Harmon Colors. Process for preparing gamma quinacridone from polyphosphoric acid and alcohol. 4,100,162, Cl. 260-279.0QA.
- Northern Telecom Limited: *See—*
  - Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., 4,100,002, Cl. 156-48.000.
- Noshay, Allen; and Karol, Frederick John, to Union Carbide Corporation. Olefin polymerization process and catalyst therefor. 4,100,337, Cl. 526-130.000.
- Noury, Jerry L., Jr.: *See—*
  - Stavrou, Paul Constantine; and Slack, William Frederick, 4,099,437, Cl. 84-1.010.
- Nouvertne, Werner: *See—*
  - Freitag, Dieter; and Nouvertne, Werner, 4,100,130, Cl. 260-37.0PC.
- Novo Industri A/S: *See—*
  - Adler-Nissen, Jens Lorenz, 4,100,024, Cl. 195-29.000.
  - Adler-Nissen, Jens Lorenz, 4,100,151, Cl. 260-112.00G.
- Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, to Hitachi, Ltd. Thermosetting resin composition. 4,100,118, Cl. 260-18.0PT.
- Nuovo Pignone S.p.A.: *See—*
  - Santucci, Nicola, 4,099,546, Cl. 139-27.000.
- Nuttall, Wayne E.; and Page, William H., to United States Steel Corporation. Low emission multiple sealing system for floating roof tanks. 4,099,644, Cl. 220-225.000.
- Nyberg, David Dolph: *See—*
  - Cammack, Travers Kregg, II; and Nyberg, David Dolph, 4,100,089, Cl. 252-63.000.
- Nyi, Kayson: *See—*
  - Emmons, William D.; Sperry, Peter R.; and Nyi, Kayson, 4,100,133, Cl. 260-45.90L.
- Nylykke, Hans Peter Glud, to Danfoss A/S. Stuffing box backstop ring. 4,099,729, Cl. 277-96.100.
- Oakley, Ervin Carvis; Bell, George Robert; and Poole, William Eugene, to ECO Industries, Inc. Upright vault-like steel cabinet for guns and valuables. 4,099,808, Cl. 312-138.00R.
- Oberloier, William, to Lyle Development, Inc. Thermoforming machine. 4,099,902, Cl. 425-388.000.
- Oetjen, Heinrich: *See—*
  - Gutermuth, Paul; Oetjen, Heinrich; and Gutermuth, Paul, Jr., 4,099,941, Cl. 55-269.000.
- Offer, Robert: *See—*
  - Fischman, Kurt; Offer, Robert; Rudner, Bernard; and Shepard, David, 4,099,943, Cl. 55-487.000.
- Office National d'Etudes et de Recherches Aerospatiales: *See—*
  - Valdois, Michel M.; and Dupuy, Armand B., 4,100,512, Cl. 331-158.000.
- Ogasa, Katsuhiro; Kuboyama, Morio; Saito, Minoru; and Nagata, Kazuhiro, to Morinaga Milk Industry Co., Ltd. Process for preparing a curing agent for myelogenic leukemia. 4,100,022, Cl. 195-1.800.
- Ogata, Fumio: *See—*
  - Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.

Ogawa, Takuzo: *See—*
  Ura, Mitsuru; Ogawa, Takuzo; Suzuki, Takaya; Inoue, Yosuke; and Nomura, Masayoshi, 4,100,310, Cl. 427-8.000.
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Peditto, Andrea; Fossati, Franco; and Petrillo, Vincenzo, to Liquichimica Robassomero S.p.A. Process for the preparation of additives for lubricating oils. 4,100,085, Cl. 252-42.700.
Pedroso, Raul, to Coulter Electronics, Inc. Safety interlock device. 4,100,419, Cl. 250-514.000.
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Perkins, Frank A., to Harris Corporation. Adaptive linearizing acoustic coupling system. 4,100,373, Cl. 179-1.00C.
Perkins, William Clarence: *See—*
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Perreault, Donald A., to Xerox Corporation. Frequency domain automatic equalizer utilizing the discrete Fourier transform. 4,100,604, Cl. 364-827.000.
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Peter, Heinz; Reinehr, Dieter; and Troxler, Eduard, to Ciba-Geigy Corporation. Curable mixtures. 4,100,111, Cl. 528-116.000.
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  Cue, Berkeley W., 4,100,284, Cl. 424-250.000.
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- Phillips, Howard Charles: *See—*
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- Phillips, Kenneth G.: *See—*
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  - Smith, Dexter E., 4,100,266, Cl. 423-574.00R.
  - Stapp, Paul R., 4,100,362, Cl. 560-246.000.
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- Pickering, Alan Hugh; Brady, Michael Barry Clive; and Lewis, Peter Frederick, to English Electric Valve Company Limited. Multipactor discharge tuned co-axial magnetrons. 4,100,458, Cl. 315-39.550.
- Pickles, John, to Crosrol Limited. A method of removing a carding web from a carding machine. 4,099,295, Cl. 19-106.00R.
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- Pittman, John B., to Telex Computer Products, Inc. Solenoid operated cone brake. 4,099,601, Cl. 188-163.000.
- Pitts, Frank, to Engelhard Minerals & Chemicals Corporation. Metal extraction process. 4,100,252, Cl. 423-68.000.
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  - Gange, Robert Allen, 4,100,449, Cl. 313-337.000.
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  - Hammer, Jacob Meyer; and Neil, Clyde Carl, 4,100,313, Cl. 427-162.000.
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  - Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Gurov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.
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  - Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., 4,099,312, Cl. 29-130.000.
- Sacks, Bernard R. Adjustable tension tennis racket. 4,099,717, Cl. 273-73.00E.
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  - Kornhauser, Murray, 4,099,759, Cl. 293-71.00P.
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  - Kondo, Kiyoshi; Tunemoto, Daiei; Sugimoto, Kikuo; and Takahatake, Yuriko, 4,100,184, Cl. 260-464.000.
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- Salter, Loweli S., Jr., to Morgan Constructioo Company. Seal. 4,099,731, Cl. 277-164.000.
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  - Dix, Joseph F.; and Sampson, Joseph, 4,099,361, Cl. 53-42.000.
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  - Kavick, Edward M., 4,099,748, Cl. 285-256.000.
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  - Arikawa, Hiroo; and Maruo, Masaya, 4,100,523, Cl. 337-163.000.
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  - Johnson, Philip M.; and Kuppenheimer, John D., Jr., 4,100,404, Cl. 250-199.000.
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  - Galantay, Eugene E., 4,100,300, Cl. 424-343.000.
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  - Arimitsu, Tetsuya, 4,099,479, Cl. 115-41.00R.
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  - Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,099,970, Cl. 96-1.50N.
- Sasaki, Toshiyuki, to Hitachi, Ltd. Contactless ignition apparatus for internal combustion engine. 4,099,498, Cl. 123-117.00R.
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- Saucy, Gabriel: *See—*
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  - Mullin, Joseph V.; and Sauer, W. Edwin, 4,099,338, Cl. 34-35.000.
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  - Bager, Reinhard, 4,100,399, Cl. 235-92.0CC.
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- Savoit, Robert E.; and Henry, Clemence J., to Texaco Inc. Method for retarding the evaporation of water. 4,099,915, Cl. 21-60.50A.
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  - Muller, Hermann; and Schaaber, Otto, 4,099,993, Cl. 148-14.000.
- Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, to Fiber Industries, Inc. Polyester process and product. 4,100,142, Cl. 526-68.000.
- Schael, Rudi. Illumination unit for microfilm readers. 4,100,591, Cl. 362-190.000.
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  - Chu, Joseph Y.; and Schank, Richard L., 4,100,135, Cl. 528-11.000.
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  - Kuzin, Eduard Nikolaevich; Fainzilber, Mikhail Leibovich; Ivanova, Nadezhda Borisovna; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Schedrovitsky, Savaty Solomonovich; Berkman, Vitaly Iosifovich; and Syrkov, Anatoly Borisovich, 4,099,334, Cl. 33-346.000.
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  - Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.
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- Schertz, William W., to United States of America, Energy. Fabrication of trough-shaped solar collectors. 4,099,515, Cl. 126-271.000.
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- Schlemmer, John E. Machine for removing floor covering. 4,099,328, Cl. 30-172.000.
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  - Bernard, James I.; and Strom, Gerald A., 4,100,528, Cl. 340-18.0LD.
- Schmerling, Louis; and Homeier, Edwin H., to UOP Inc. Carbonylation of alcohols. 4,100,359, Cl. 560-232.000.
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  - Brill, Klaus; and Schmid, Gunter, 4,099,663, Cl. 228-159.000.
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- Schmidhuber, Karl, to Recaro GmbH & Co. Airline passenger seat. 4,099,780, Cl. 297-411.000.
- Schmidt, Fritz: *See—*
  - Kontsch, Otmar; and Schmidt, Fritz, 4,099,746, Cl. 285-119.000.
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  - Waldmann, Karl; and Schnabel, Gunter, 4,100,340, Cl. 526-245.000.
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  - Myers, Harry K., Jr.; Lyons, James E.; and Schneider, Abraham, 4,100,216, Cl. 260-666.0PY.
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  - Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, 4,100,143, Cl. 526-301.000.
- Schochet, Frank E. Multi-purpose modification for lithographic platemaker. 4,100,560, Cl. 354-307.000.
- Scholl, Charles H.; and Reighard, Alan B., to Nordson Corporation. Molten adhesive dispensing device. 4,099,653, Cl. 222-146.0HE.
- Schoppelrey, Victor H. Mechanically adjustable electric outlet device. 4,099,824, Cl. 339-157.00C.
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- Schott, Donald E., to Thomas C. Wilson, Inc. Versatile expanding apparatus for tubes and the like. 4,099,400, Cl. 72-122.000.
- Schroeder, George Francis, to Singer Company, The. Cold start system for motors. 4,100,466, Cl. 318-102.000.
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- Schroter, Herbert; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Copying apparatus, in particular photoprinting apparatus, comprising a developing chamber which operates according to the dry-development principle, and a dosing device for liquid developer medium. 4,099,868, Cl. 355-106.000.
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  - Gilligan, Patrick J.; and Schrupp, Kenneth D., 4,099,864, Cl. 355-37.000.
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  - Bruggert, Paul; and Schuller, Georges, 4,099,299, Cl. 24-73.0PS.
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- Schultz, Norman W. Automobile lock mechanism. 4,099,593, Cl. 180-114.000.
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  - Hess, Bernhard; Raichle, Karl; Bottenbruch, Ludwig; Schulz-Walz, Hansjochen; and Alberts, Heinrich, 4,100,224, Cl. 260-862.000.
- Schumacher, William J.; and Tanczyn, Harry, to Armco Steel Corpora-

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  - Koller, Stefan; Reinker, Dieter; and Schwander, Hans Rudolf, 4,099,909, Cl. 8-41.00C.
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  - Glock, Robert D.; Harris, Delbert L.; and Schwartz, Kent J., 4,100,272, Cl. 424-92.000.
- Schwartz, Robert J., to Kimberly-Clark Corporation. Stabilized nonwoven web. 4,100,319, Cl. 428-171.000.
- Schwartz, Willis T., Jr, to Hooker Chemicals & Plastics Corp. Low profile additives in polyester systems. 4,100,229, Cl. 260-887.000.
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- Schwenninger, Ronald L., to PPG Industries, Inc. Movable submersible dam barrier for use in a glass forming chamber. 4,099,952, Cl. 65-182.00R.
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  - King, Olin B., 4,100,551, Cl. 346-162.000.
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  - Regnier, Gilbert; Canevari, Roger; Poignant, Jean-Claude; and Laubie, Michel, 4,100,286, Cl. 424-251.000.
- Scientific-Atlanta, Inc.: *See—*
  - Mobley, Joseph Graham, 4,100,472, Cl. 318-685.000.
- Scifres, Donald R.: *See—*
  - Burnham, Robert D.; and Scifres, Donald R., 4,099,999, Cl. 148-187.000.
- SCM Corporation: *See—*
  - Gawrilow, Ilija, 4,100,308, Cl. 426-554.000.
  - Phillips, C. Frank; and Leavens, Dwight E., 4,100,181, Cl. 260-416.000.
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  - Giron, Jacques Pierre Max, 4,100,249, Cl. 264-313.000.
- Scouten, Charles G.; and Hamilton, Willard C., to Xerox Corporation. Dicarboxylic acid bis-amides in electrostatic imaging compositions and processes. 4,099,968, Cl. 96-1.0SD.
- Scripto, Inc.: *See—*
  - Fuller, David Lee, 4,099,907, Cl. 431-254.000.
- Sea Containers, Ltd.: *See—*
  - Nessfield, Stanley; Foster, John Elliott; and Clive-Smith, Martin, 4,099,640, Cl. 220-6.000.
- Sealed Unit Parts Co., Inc.: *See—*
  - Slocum, Charles W., 4,100,468, Cl. 318-221.00C.
- Searle, Robert J. G.: *See—*
  - Bull, Michael J.; and Searle, Robert J. G., 4,100,363, Cl. 560-255.000.
  - Davis, Royston H.; and Searle, Robert J. G., 4,100,298, Cl. 424-304.000.
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  - Nist, Ferdinand J., Jr., 4,099,617, Cl. 206-443.000.
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  - Moss, Maurice; Hill, Colin Barry; and Rowland, Michael Roger, 4,100,004, Cl. 156-60.000.
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- Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., to McDonnell Douglas Corporation. Fiber-resin-carbon composites and method of fabrication. 4,100,322, Cl. 428-257.000.
- Seifert, Peter, to Black Clawson Company, The. Cone press. 4,099,458, Cl. 100-116.000.
- Seissl, Johannes: *See—*
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- Selvarajan, Radhakrishnan; and Ballweber, Edward G., to Nalco Chemical Company. Production of 1-aminoalkane-1, 1-diphosphonic acids using phosphorous acid and nitriles in a non-aqueous system. 4,100,167, Cl. 260-296.00R.
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  - Binkley, Carl R.; Keir, John B.; and Semchena, John H., 4,099,541, Cl. 137-596.130.
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  - Heissenberger, Oswald, 4,099,614, Cl. 206-299.000.
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- Senior, Robert B.; and Karasinski, Frederick, to Gardner-Denver Company. Cutting and insulation stripping apparatus for twisted wire pair. 4,099,428, Cl. 81-9.510.
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  - Hauk, Ernest D., 4,099,429, Cl. 81-57.170.
  - Hauk, Thomas D.; and Hauk, Ernest D., 4,099,405, Cl. 73-46.000.
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  - Beguin, Jean Claude; and Guerit, Pierre, 4,099,965, Cl. 75-68.00R.
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- Shaeffer, Raymond P., to Hobart Corporation. Food processing apparatus. 4,100,613, Cl. 366-143.000.
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- Shaffer, Roy E., to United States of America, Army. Composition for screening infra-red radiation. 4,100,102, Cl. 252-305.000.
- Shaffer, Walter M., to Caterpillar Tractor Co. Blocking valve for power steering for lift trucks. 4,099,378, Cl. 60-413.000.
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  - Henderson, Kenneth James, 4,099,483, Cl. 118-49.100.
- Shapiro, Ascher H., to Massachusetts Institute of Technology. Recipe conversion calculator. 4,100,602, Cl. 364-715.000.
- Sharma, Mahindar N.: *See—*
  - White, Eugene B.; and Sharma, Mahindar N., 4,100,070, Cl. 210-136.000.
- Sharp, Dennis J. Door hinges. 4,099,347, Cl. 49-399.000.
- Sharp, Herbert John: *See—*
  - Shead, Terence Humphrey Charles; Hart, Frederick Leslie; and Sharp, Herbert John, 4,100,247, Cl. 264-271.000.
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  - Sinkovitz, Gloria DiMarco; and Sharpe, Andrew Jackson, Jr., 4,100,079, Cl. 252-8.55C.
- Shaw, Eugene Douglas, to Ortho Diagnostics Inc. Method of detecting hepatitis B core antigen and antibody. 4,100,267, Cl. 424-1.000.
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  - Sheahan, Ray Albert; and Sheahan, Dorothy Marie, 4,099,672, Cl. 239-317.000.
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- Sheely, Clyde Q., Jr.; and Baldwin, David E., Jr., to Continental Oil Company. Single well tracer method to evaluate enhanced recovery. 4,099,565, Cl. 166-252.000.
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  - Bull, Michael J.; and Searle, Robert J. G., 4,100,363, Cl. 560-255.000.
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  - Pilgram, Kurt H. G., 4,099,956, Cl. 71-120.000.
- Shen, John: *See—*
  - Johnson, Clarence A.; and Shen, John, 4,099,933, Cl. 48-202.000.
- Shepard, David: *See—*
  - Fischman, Kurt; Offer, Robert; Rudner, Bernard; and Shepard, David, 4,099,943, Cl. 55-487.000.
- Sherman, Michael I., to Kamyr, Inc. Two-stage pulp thickening. 4,100,069, Cl. 210-109.000.
- Sherritt Gordon Mines Limited: *See—*
  - Swinkels, Godefridus M., 4,100,250, Cl. 423-34.000.
- Shetty, Bola Vithal, to Pennwalt Corporation. Anorectic adamantane derivatives and method of using the same. 4,100,170, Cl. 424-325.000.
- Shields, James E., to Eli Lilly and Company. Somatostatin analogs and intermediates thereto. 4,100,117, Cl. 260-8.000.
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  - Bozzelli, John W.; Bremer, Donald N.; and Shier, George D., 4,100,256, Cl. 423-220.000.
- Shifflet, Glynne W., Jr., to Tuthill Corporation. Electronic security system. 4,100,534, Cl. 340-149.00A.
- Shiina, Akira. Mudguard for a vehicle. 4,099,736, Cl. 280-154.50R.
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  - Lemke, Timothy Allen; and Shultz, Edmond Franklin, Jr., 4,099,615, Cl. 206-329.000.
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  - Reinke, Friedhelm; Mackenberger, Ludwig; and Siefert, Eckhard, 4,100,387, Cl. 219-10.570.
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  - Baues, Peter; and Plaettner, Rolf, 4,099,836, Cl. 350-96.140.
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  - Levin, Berton P., 4,100,398, Cl. 219-541.000.
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  - Cavazza, Claudio, 4,100,289, Cl. 424-266.000.
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- Singh, Tej Kuldip, to Associated Paper Industries Limited. Footwear. 4,099,342, Cl. 36-44.000.
- Sinkovitz, Gloria DiMarco; and Sharpe, Andrew Jackson, Jr., to Calgon Corporation. Polymers for acid thickening. 4,100,079, Cl. 252-8.55C.
- Sivachenko, Eugene W. High strength corrugated metal plate and method of fabricating same. 4,099,359, Cl. 52-630.000.
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  - Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,099,605, Cl. 192-98.000.
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- Skrivseth, Robert K., to SolaRay, Inc. Solar heating collector. 4,099,513, Cl. 126-270.000.
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- Smith, Dexter E., to Phillips Petroleum Company. Control system for a sulfur process. 4,100,266, Cl. 423-574.00R.
- Smith, George E., to Continental Oil Company. Apparatus for quenching delayed coke. 4,100,035, Cl. 202-227.000.
- Smith, James Curtis: *See—*
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- Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Metal acetyl acetonate composition for forming thermoparticulating coating. 4,100,121, Cl. 260-23.0EP.
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- Smith, Jimmy B.; and Haley, Jack R., to Peabody Coal Company. Quenching method. 4,100,034, Cl. 201-39.000.
- Smith, Joseph Leland, to RCA Corporation. Eccentric convergence apparatus for in-line beam cathode ray tubes. 4,100,518, Cl. 335-212.000.
- Smith, Kenneth E.; and Myer, Floyd L., to Sperry Rand Corporation. Tongue-mounted assembly for supporting an implement driveline. 4,099,594, Cl. 180-14.00B.
- Smith, Leo J.: *See—*
  - Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., 4,099,609, Cl. 198-395.000.
- Smrt, Thomas J. Marking apparatus with measuring device. 4,099,482, Cl. 118-9.000.
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  - Palladino, Nicola; Mazzei, Marcello; and Marconi, Walter, 4,100,334, Cl. 526-1.000.
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- Snelson, Kenneth. Model for atomic forms. 4,099,339, Cl. 35-18.00A.
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- Societe Anonyme Automobiles Citroen: *See—*
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- Societe Anonyme Eau-Gaz-Assainissement: *See—*
  - Aubailly-Delalieu, Marc M., 4,099,610, Cl. 198-729.000.
- Societe Anonyme POCLAIN: *See—*
  - Grzesik, Michel Edouard, 4,099,797, Cl. 305-54.000.
- Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal: *See—*
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- Societe Chimique des Charbonnages: *See—*
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- Societe de Vente de l'Aluminium Pechiney: *See—*
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- Societe d'Etudes de Produits Chimiques: *See—*
  - Esanu, Andre, 4,100,287, Cl. 424-251.000.
- Societe General de Constructions Electriques et Mecaniques Alsthom s.a.: *See—*
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- Societe Lignes Telegraphiques et Telephoniques: *See—*
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- Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA): *See—*
  - Dron, Sylvain Maurice; and Evrard, Gerard Maurice Gaspard, 4,100,392, Cl. 219-121.0EM.
- Societe Neiman SA: *See—*
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- SolaRay, Inc.: *See—*
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  - Morio, Minoru; and Kambara, Masahiro, 4,100,575, Cl. 358-120.000.
  - Naruse, Yohsuke; and Sugiki, Mikio, 4,100,577, Cl. 358-128.000.
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  - Yoshinaka, Tadaaki, 4,100,567, Cl. 358-8.000.
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  - Dewing, Ernest William; Huni, Jean-Paul Robert; Sood, Raman Radha; and Southam, Frederick William, 4,099,959, Cl. 75-10.00R.
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  - Carlson, Peter B., 4,100,537, Cl. 340-626.000.
- Technam, Inc.: *See—*
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- Temperley, Harry Davison; and Parsons, David, to Automotive Products Limited. Disc brake assembly. 4,099,600, Cl. 188-73.400.
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  - Kalfoglou, George; and Flournoy, Kenneth H., 4,099,537, Cl. 137-13.000.
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  - Powell, Justin C., 4,100,091, Cl. 252-70.000.
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  - Savoit, Robert E.; and Henry, Clemence J., 4,099,915, Cl. 21-60.50A.
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- Thillays, Jacques Claude, to U.S. Philips Corporation. Light conductor in a signal isolator. 4,100,422, Cl. 250-551.000.
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- Thompson, James W., to Hobart Corporation. Food processing apparatus. 4,100,615, Cl. 366-169.000.
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- Thomsen, Jack W., to Weckesser Company, Inc. Captive standoff connector. 4,100,368, Cl. 174-138.00D.
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  - Hareng, Michel; and Le Berre, Serge, 4,099,857, Cl. 350-351.000.
  - Tabourier, Remy, 4,100,545, Cl. 343-7.0ED.
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- Threatt, James W. Expandable shaft. 4,099,732, Cl. 279-2.00A.
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- Trunnell, Harold K. Curved metal clamp plate. 4,099,788, Cl. 301-105.00R.
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- Tutt, Rita C.: *See—*
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  - Levine, Isaac Jacob; and Karol, Frederick John, 4,100,105, Cl. 252-429.00R.
  - Mui, Jeffrey Y. P.; and Kanner, Bernard, 4,100,172, Cl. 260-327.00H.
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    - Griffin, William W., Jr.; and Pierce, Robert M., 4,099,373, Cl. 60-39.670.
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    - Laible, Roy C.; and Brynjolfsson, Ari, 4,099,726, Cl. 277-1.000.
    - Russell, William J., 4,100,015, Cl. 156-665.000.
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    - Groff, Russell Dennis; and Vatovec, Richard John, 4,100,019, Cl. 176-50.000.
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  Boudewijns, Henricus P. J.; Riemens, Karel; and Eggermont, Ludwig D. J., 4,100,494, Cl. 325-38.00B.
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  van den Einden, Henricus Fransiscus Petrus; Kamerbeek, Djuurd Anne Geertruid; and Rimmelzwaan, Franciscus Jacobus, 4,100,453, Cl. 313-417.000.
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Waszmer, Jacob. Circuit breaker with adjustable setting. 4,100,522, Cl. 337-68.000.
Watanabe, Asao: *See—*
  Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asan, 4,100,552, Cl. 346-162.000.
Watanabe, Atsumi: *See—*
  Iyotani, Ryuji; Watanabe, Atsumi; Amano, Hisao; and Ogata, Fumio, 4,100,434, Cl. 307-252.00L.
Watanabe, Itaru: *See—*
  Tanaka, Jinkichi; Watanabe, Itaru; and Suzuki, Motoaki, 4,100,389, Cl. 219-74.000.
Watanabe, Kazumasa: *See—*
  Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.
Watanabe, Masao: *See—*
  Nakano, Soichi; Ohama, Yasumichi; and Watanabe, Masao, 4,099,500, Cl. 123-122.0AB.
Watanabe, Shigeru: *See—*
  Akimoto, Taizo; Terashita, Takaaki; Takahashi, Koji; Watanabe, Shigeru; and Asai, Eiichi, 4,100,424, Cl. 250-559.000.
Watkins, Mervyn M. Stander apparatus providing varying degrees of weight bearing for patient therapy. 4,099,277, Cl. 5-81.00R.
Watkins & Watson Limited: *See—*
  Hunt, William Valentine; and Ducker, Frank Edward Mayhew, 4,099,276, Cl. 5-72.000.
Waugh, Dale L., to Dayco Corporation. Bicycle belt drive system. 4,099,737, Cl. 280-261.000.
Waugh, Robert E., to D. L. Auld Company, The. Method for making decorative emblems. 4,100,010, Cl. 156-242.000.
Wauhop, Billy Joe, Jr. Method of curing concrete articles by water vaporization. 4,099,337, Cl. 34-26.000.
Weatherill, William T.: *See—*
  Seibold, Robert W.; Parechanian, Haig S.; Weatherill, William T.; and Lowe, Robert E., 4,100,322, Cl. 428-257.000.
Weaver, Casimir Paul: *See—*
  Jordan, Cy Edward; and Weaver, Casimir Paul, 4,100,068, Cl. 204-300.00R.
Weaver, Marvin P.: *See—*
  Steele, Everett T., Jr.; and Weaver, Marvin P., 4,099,706, Cl. 251-367.000.
Webb, Harry Matthew, to Natural Resources Guardianship International, Inc. Catalytic fuel additive for gasoline and diesel engines. 4,099,930, Cl. 44-56.000.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 4-androstene-3,17-dione derivatives. 4,100,026, Cl. 195-51.00G.
Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of 4-androstene-3,17-dione derivatives. 4,100,027, Cl. 195-51.00G.
Webster, Van Keith, to AMP Incorporated. Latching device. 4,099,827, Cl. 339-228.000.

Weckesser Company, Inc.: *See—*

Thomsen, Jack W., 4,100,368, Cl. 174-138.00D.

Weckler, Gene P., to Reticon Corporation. Semiconductor filtering apparatus. 4,100,513, Cl. 333-70.00T.

Wehrman, Marvin D.: *See—*

Swanson, Everts W.; and Wehrman, Marvin D., 4,099,691, Cl. 244-207.000.

Weidman, James K.: *See—*

Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,099,708, Cl. 266-281.000.

Weikel, James A.: *See—*

Gregg, Richard; Weikel, James A.; Patel, Jayantilal M.; and Durchholz, Richard F., 4,100,306, Cl. 426-386.000.

Weiler, Wolfgang, to Motoren-und Turbinen-Union Munchen GmbH. Seal system for a gas turbine engine or the like. 4,099,727, Cl. 277-3.000.

Weirich, Walter; and Wildforster, Heinrich, to Gewerkschaft Eisenhutte Westfalia. Control system for a mineral mining installation. 4,099,782, Cl. 299-1.000.

Weisbach, Gunter: *See—*

Zimmermann, Hans; Rudolph, Otfried; Peter, Gunter; and Weisbach, Gunter, 4,099,463, Cl. 101-230.000.

Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, to VEB Werk fur Fernsehelektronik. Nematic liquid crystalline substances. 4,099,856, Cl. 350-350.000.

Weitz, Hans-Martin; and Hartig, Juergen, to BASF Aktiengesellschaft. Manufacture of butenediol diacetates. 4,100,361, Cl. 560-244.000.

Welles, Theodore W. Composite bag for hard crusted bakery products. 4,099,666, Cl. 229-62.000.

Wenger, La Von Gene; and Osterhaus, Elmer John, to Wenger Manufacturing. Double-eatrusion apparatus for producing dense, uniformly layered vegetable protein meat analogue. 4,099,455, Cl. 99-450.100.

Wenger Manufacturing: *See—*

Wenger, La Von Gene; and Osterhaus, Elmer John, 4,099,455, Cl. 99-450.100.

Wenzel, Werner: *See—*

Olschewski, Bernd; and Wenzel, Werner, 4,099,960, Cl. 75-11.000.

Wescom, Inc.: *See—*

Gupta, Shanti Swarup, 4,100,515, Cl. 333-80.00R.

Wesley, John, to Celanese Corporation. Turbulence generating yarn feed needle. 4,099,308, Cl. 28-273.000.

Wessel, Wolf: *See—*

Stumpp, Gerhard; Wessel, Wolf; and Stein, Volkard, 4,099,505, Cl. 123-139.0AW.

Westermann, Peter Henry, to British Petroleum Company Limited, The. Polychloroprene-containing blends. 4,100,123, Cl. 260-28.50B.

Western Electric Company, Inc.: *See—*

Baron, William James; and Kenney, John Thomas, 4,100,037, Cl. 204-15.000.

Trusch, Kenneth Paul, 4,100,003, Cl. 156-54.000.

Western Gear Corporation: *See—*

Hollenbeck, Alfred L.; De Tuerk, Alison V.; and Cooper, John T., 4,099,571, Cl. 166-315.000.

Westervelt, Rudy G.: *See—*

Stouffer, James R.; and Westervelt, Rudy G., 4,099,420, Cl. 73-629.000.

Westinghouse Air Brake Company: *See—*

Kolkman, Dick J., 4,099,692, Cl. 246-34.0CT.

Mong, William K.; and Zoric, Michael T., 4,099,543, Cl. 137-625.220.

Temple, Fred, 4,099,702, Cl. 251-95.000.

Wright, Raymond C., 4,099,742, Cl. 280-714.000.

Westinghouse Electric Corp.: *See—*

Carr, Frank J., 4,099,591, Cl. 180-98.000.

Feilchenfeld, Michal M.; Daggett, Kenneth E.; and Lloyd, Raymond A., 4,099,668, Cl. 235-304.000.

Foster-Pegg, Richard W., 4,099,374, Cl. 60-39.120.

Gainer, Gordon C.; and Luck, Russell M., 4,099,805, Cl. 308-240.000.

Heytmeijer, Herman R.; Rusch, Larry P.; and Grasso, Giuseppe, 4,100,264, Cl. 423-430.000.

Lange, Frederick F.; and Andersson, Clarence A., 4,099,979, Cl. 106-58.000.

Randall, Charles E., 4,099,599, Cl. 187-52.00R.

Silverblatt, Bernard L., 4,100,021, Cl. 176-87.000.

Silvestri, George J., Jr., 4,099,385, Cl. 60-678.000.

Smith, James D. B.; and Phillips, David C., 4,100,121, Cl. 260-23.0EP.

Smith, James D. B.; Meier, Joseph F.; and Phillips, David C., 4,100,327, Cl. 428-339.000.

Westland Aircraft Limited: *See—*

Martin, Alfred Charles, 4,099,892, Cl. 416-134.00A.

Westley, John; and Liu, Chao-Min, to Hoffmann-La Roche Inc. New antibiotic X-14547. 4,100,171, Cl. 260-326.330.

Weston, Lance: *See—*

Stockdale, Roy; and Weston, Lance, 4,100,543, Cl. 340-521.000.

White, Eugene B.; and Sharma, Mahindar N., to Filters International, Inc. Apparatus for use in water purification particularly sewage treatments. 4,100,070, Cl. 210-136.000.

White, John U. Fluorescence spectrophotometer. 4,099,872, Cl. 356-85.000.

White Sewing Machine Company: *See—*

Hamlett, Sidney J.; and Bell, Charles M., 4,099,474, Cl. 112-258.000.

Whitehouse, Harper J.: *See—*

Alsup, James M.; and Whitehouse, Harper J., 4,100,498, Cl. 328-14.000.

Whitin Machine Works, Inc.: *See—*

Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., 4,099,609, Cl. 198-395.000.

Whittle, Harry Reed; and Ward, Brooke Armitage, to A. J. Bingley Limited. Optical systems including polygonal mirrors rotatable about two axes. 4,099,830, Cl. 350-6.800.

Wiatt, James Gordon: *See—*

Nash, Myrwin William; Barry, John Kenneth; and Wiatt, James Gordon, 4,099,905, Cl. 425-589.000.

Wick, Helmut: *See—*

Merz, Herbert; Walther, Gerhard; Langbein, Adolf; Stockhaus, Klaus; and Wick, Helmut, 4,100,288, Cl. 424-260.000.

Wickes Corporation, The: *See—*

Kreucher, David L., 4,099,431, Cl. 82-9.000.

Wiechert, Rudolf: *See—*

Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,026, Cl. 195-51.00G.

Weber, Alfred; Kennecke, Mario; Mueller, Rudolf; Eder, Ulrich; and Wiechert, Rudolf, 4,100,027, Cl. 195-51.00G.

Wiegeleben, Adalbert: *See—*

Weissflog, Wolfgang; Schubert, Hermann; Kresse, Horst; Wiegeleben, Adalbert; and Demus, Dietrich, 4,099,856, Cl. 350-350.000.

Wiese, Winfred John, to Borg-Warner Corporation. Mechanical seal assembly. 4,099,728, Cl. 277-96.000.

Wilbur, William T., to Progressive Machinery Corporation. Portable seam welder. 4,100,391, Cl. 219-81.000.

Wildforster, Heinrich: *See—*

Weirich, Walter; and Wildforster, Heinrich, 4,099,782, Cl. 299-1.000.

Wiley, Donald F., to Cosden Technology, Inc. Co-eatrusion of ABS/-polystyrene multiple-layered sheeting. 4,100,237, Cl. 264-40.600.

Wilfert, Karl, deceased: *See—*

Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.

Wilfert, Thomas, heir: *See—*

Schmid, Walter; Jambor, Arno; Wilfert, Karl, deceased; and Wilfert, Thomas, heir, 4,099,792, Cl. 303-113.000.

Wilhelm, Gerhard: *See—*

Hockenberger, Lothar; Soyka, Manfred; and Wilhelm, Gerhard, 4,100,148, Cl. 528-374.000.

Williams, Alan: *See—*

Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Digby Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.

Williams, Billy L.: *See—*

Burnham, Roger R.; Chapin, Merlin K.; Cook, David A.; Gilles, Theodore C.; and Williams, Billy L., 4,099,553, Cl. 165-22.000.

Williams, Francis N.: *See—*

Kieronski, John P.; Williams, Francis N.; and Smith, Leo J., 4,099,609, Cl. 198-395.000.

Williams, James R., to Trans Research Development Corporation. DC electric car with auxiliary power and AC drive motor. 4,099,589, Cl. 180-65.00A.

Williams, Joseph James: *See—*

Stiel, Donald Melvyn; Browski, Charles Robert; Neugroschel, Eric; and Williams, Joseph James, 4,100,598, Cl. 364-476.000.

Williamson, Warren L.: *See—*

Fathauer, George H.; Mathis, Cecil Ernest; and Williamson, Warren L., 4,100,497, Cl. 325-470.000.

Willinger, Allan H.: *See—*

Itakura, Tsuyoshi; and Willinger, Allan H., 4,099,544, Cl. 137-856.000.

Willis, Charles W. Fencing game set. 4,099,714, Cl. 273-1.00F.

Wilson Industries, Inc.: *See—*

Nelson, Paul M., 4,099,561, Cl. 166-55.100.

Wilson, William. Docking station. 4,100,616, Cl. 366-213.000.

Winiarski, Edward J.: *See—*

Bradhury, Christopher G.; Buchan, Walter; Winiarski, Edward J.; and Kropa, Gomer E., 4,099,900, Cl. 425-313.000.

Winkler, Hans-Georg: *See—*

Rode, Ernst-Dietrich; and Winkler, Hans-Georg, 4,100,036, Cl. 204-14.00R.

Wisbey, Philip Henry; and Elliot, George, to Marconi Company Limited, The. Liquid crystal display arrangements. 4,099,855, Cl. 350-333.000.

Wisbey, Philip Henry, to Marconi Company Limited, The. Delay line oscillator locked to a selected frequency of a chirp delay line. 4,100,511, Cl. 331-107.00A.

Wissinger, Waldemar; and Gauchel, Peter, to Dynamit Nobel Aktiengesellschaft. Process for the sizing of coextruded, multiple-layer extruded profiles from thermoplastic synthetic resins. 4,100,243, Cl. 264-171.000.

Wistinghausen, Nikolai K.; and Banninga, Edward P., to Fiberglas Canada Ltd. Apparatus for compressing and packaging articles. 4,099,363, Cl. 53-124.00D.

Withnall, Malcolm: *See—*

Carter, David; Withnall, Malcolm; Williams, Alan; Redshaw, Dighy Ralph; and Stevens, Richard William, 4,100,379, Cl. 179-147.00R.

Wittenberg, Lester H. Process for preparing high purity lactose. 4,099,983, Cl. 127-63.000.

Wittke, James Pleister, to RCA Corporation. Semiconductor laser having fundamental lateral mode selectivity. 4,100,508, Cl. 331-94.50H.

Wohler, Hans-Joachim; and Ilse, Walter, to Balcke-Durr AG. Sprinkler head for water spray cooling installations. 4,099,675, Cl. 239-498.000.

Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., to Goold, Reed; Wojcik, Charles W.; Cooper, Gerald D.; and Herrett, Wilfred H. Process for electroainning metals from a metal-bearing solids slurry. 4,100,042, Cl. 204-105.00R.

Wojcik, Charles W.: *See—*

Wojcik, Bruce C.; Herrett, Wilfred H.; Cooper, Gerald D.; Goold, Reed; and Wojcik, Charles W., 4,100,042, Cl. 204-105.00R.

Wojtasinski, Ronald J.: *See—*

United States of America, National Aeronautics and Space Administration; Wojtasinski, Ronald J.; Fuchs, Jerry C.; and Grove, Charles H., 4,100,487, Cl. 324-96.000.

Wolak, Edward A. Tie pin. 4,099,300, Cl. 24-49.0CF.

Wolf, Gerhard Dieter; Schnoor, Werner; Voegele, Jean-Claude; Reinehr, Ulrich; and Nischk, Gunther, to Bayer Aktiengesellschaft. Filaments which may be cross-linked comprising at least 65% acrylonitrile and 0.5–10% N-methylol derivative of a urethane. 4,100,143, Cl. 526-301.000.

Wolfe, Eugene E.: *See—*

Heath, Allan B.; and Wolfe, Eugene E., 4,099,673, Cl. 239-415.000.

Wolfe, Robert W.: *See—*

Messier, Russell F.; and Wolfe, Robert W., 4,100,101, Cl. 252-301.40H.

Wolff, Egon E.: *See—*

Beckham, Joel M.; Easterling, Gene B.; Ringel, Reginald K.; and Wolff, Egon E., 4,099,577, Cl. 172-781.000.

Wolk, Ronald H.; Rovesti, William; and Maruhnic, Peter, to Hydrocarbon Research, Inc. Desulfurization of fuel gas at high temperature using supported molten metal carbonate absorbent. 4,100,107, Cl. 252-443.000.

Wolters, Gerbard, to Daimler-Benz Aktiengesellschaft. Seal of the upper area of a wet cylinder liner. 4,099,725, Cl. 277-1.000.

Woltersdorf, Otto W., Jr.: *See—*

Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William, 4,100,294, Cl. 424-275.000.

Woolvet, George Albert; and Tolley, Bryan Peter, to National Research Development Corp. Strain measurement. 4,099,411, Cl. 73-141.00R.

Woulbroun, John M.: *See—*

Francel, Josef; King, James E.; and Woulbroun, John M., 4,099,977, Cl. 106-53.000.

Wouters, Albert Paul, to AGFA-Gevaert N.V. Roller with adjustable length. 4,099,487, Cl. 118-651.000.

Woythaler, Saul L., to Raytheon Company. Pilot tone demodulator. 4,100,376, Cl. 179-15.0BP.

Woytiuk, Leo Victor; Mayer, Ronald Yves; and Kepes, George B., to Northern Telecom Limited. Method for producing powder filled cable. 4,100,002, Cl. 156-48.000.

Wright, Donald, to Imperial Chemical Industries Limited. Organic nitriles. 4,100,186, Cl. 260-465.80D.

Wright, Raymond C., to Westinghouse Air Brake Company. Control valve device for vehicle air springs. 4,099,742, Cl. 280-714.000.

Wu, Che-Kuang: *See—*

Bartholomew, Roger F.; and Wu, Che-Kuang, 4,099,978, Cl. 106-53.000.

Wutz, Max, to W. C. Heraeus GmbH. Electrical terminal, particularly plug-type terminal. 4,100,385, Cl. 200-268.000.

Xerox Corporation: *See—*

Buchheit, Robert F., 4,100,484, Cl. 324-32.000.

Burnham, Robert D.; and Scifres, Donald R., 4,099,999, Cl. 148-187.000.

Chu, Joseph Y.; and Schank, Richard L., 4,100,135, Cl. 528-11.000.

Davis, Thomas G., 4,100,411, Cl. 250-324.000.

Haas, Werner E. L.; and Dir, Gary A., 4,100,088, Cl. 252-62.520.

Jugle, Don B., 4,100,611, Cl. 366-139.000.

Leder, Lewis B., 4,099,969, Cl. 96-1.50R.

Marshall, Sidney W., 4,100,408, Cl. 250-230.000.

Perreault, Donald A., 4,100,604, Cl. 364-827.000.

Scouten, Charles G.; and Hamilton, Willard C., 4,099,968, Cl. 96-1.0SD.

Stange, Klaus K., 4,099,810, Cl. 312-183.000.

Yajima, Keiji: *See—*

Matsuzaki, Hideo; and Yajima, Keiji, 4,099,550, Cl. 141-51.000.

Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, to Research Institute for Iron, Steel and other Metals of the Tohoku University, The. Silicon carbide fibers having a high strength and a method for producing said fibers. 4,100,233, Cl. 423-345.000.

Yamada, Shigeru: *See—*

Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Isii, Sigeki, 4,099,438, Cl. 84-1.250.

Yamagishi, Hiroshi: *See—*

Ohsawa, Mitsuo; Onoe, Yukio; and Yamagishi, Hiroshi, 4,100,500, Cl. 329-103.000.

Yamagishi, Shohei: *See—*

Ohashi, Tamaki; Shosakai, Shigemasa; Yamagishi, Shohei; and Taniguchi, Kunihiro, 4,099,421, Cl. 74-10.330.

Yamaguchi, Akihiro: *See—*

Okazaki, Mitsuo; Yamaguchi, Akihiro; and Sasaki, Masaomi, 4,099,970, Cl. 96-1.50N.

Yamaguchi, Isao: *See—*

Muto, Hakaru; Kurabayashi, Sadasuke; Takatori, Yasushi; Yamaguchi, Isao; and Watanabe, Asao, 4,100,552, Cl. 346-162.000.

Yamaguchi, Namio: *See—*

Akiyosbi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.

Yamaguchi, Tuyoshi: *See—*

Takano, Hideo; Saito, Satoshi; Sato, Tadashi; Yamaguchi, Tuyoshi; and Narita, Yoshihiro, 4,099,897, Cl. 425-4.00C.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*

Arimitsu, Tetsuya, 4,099,479, Cl. 115-41.00R.

Iio, Toshimitsu, 4,099,793, Cl. 303-116.000.

Yamamoto, Keisuke: *See—*

Akiyoshi, Tsuyoshi; Yamaguchi, Namio; and Yamamoto, Keisuke, 4,100,496, Cl. 325-369.000.

Yamamoto, Yukio; and Sakashita, Masami, to Yoshida Kogyo, K.K. Closure construction having adjustable catch assembly. 4,099,758, Cl. 292-341.180.

Yamashiro, Osamu, to Hitachi, Ltd. Class B FET amplifier circuit. 4,100,502, Cl. 330-264.000.

Yamashita, Mitsura; Hirano, Kousaku; and Thai, Nguyen Dang, to Mits-Co Geophysics Ltd. Method and apparatus for measuring ellipse parameters of electromagnetic polarization in geophysical exploration. 4,100,482, Cl. 324-6.000.

Yamazaki, Shozo: *See—*

Uchida, Shoji; Takeshita, Hiroshi; and Yamazaki, Shozo, 4,100,072, Cl. 210-242.00S.

Yanagimoto Manufacturing Co., Ltd.: *See—*

Sunahara, Hiroshi; Ishihara, Yutaka; Tanaka, Karuhiko; and Morimoto, Yuko, 4,099,871, Cl. 356-73.000.

Yanagioka, Hiroshi; Shimizu, Shinichi; and Tamura, Kouichi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Apparatus for desulfurization of flue gas. 4,099,925, Cl. 23-285.000.

Yankee, Ernest W., to Upjohn Company, The. $8\beta,12\alpha$-PGE$_2$-type compounds. 4,100,355, Cl. 560-121.000.

Yasuda, Eturo; Sato, Susumu; Segawa, Yoshihiro; Hattori, Tadashi; and Aoki, Keiji, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Gas component detection apparatus. 4,099,922, Cl. 23-254.00E.

Yasumatsu, Jun: *See—*

Mori, Mamoru; Yasumatsu, Jun; and Kubota, Tatsushi, 4,099,684, Cl. 242-107.000.

Yates, Jeffrey L. Tuning fork improvement. 4,099,443, Cl. 84-457.000.

Yates, William Harold: *See—*

Schaefer, Peter; Mason, Peter Alan; and Yates, William Harold, 4,100,142, Cl. 526-68.000.

Yatsuo, Tsutomu: *See—*

Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Konishi, Nobutake, 4,100,562, Cl. 357-19.000.

Yawata, Kazufumi: *See—*

Kobayakawa, Masaki; Yawata, Kazufumi; Ohta, Kazuo; and Kumazawa, Koichi, 4,100,456, Cl. 313-497.000.

Yax, Emile; and Abad, Aurelien, to Societe Chimique des Charbonnages. Method for the continuous manufacture of hydrocarbon resins. 4,100,336, Cl. 526-67.000.

Yokogawa Electric Works, Ltd.: *See—*

Ohte, Akira; and Imamura, Makoto, 4,099,413, Cl. 73-359.00R.

Yokono, Hitoshi: *See—*

Numata, Shun-ichi; Yokono, Hitoshi; and Mukai, Junji, 4,100,118, Cl. 260-18.0PT.

Yokota, Yukinaga: *See—*

Fukusaki, Hiroshi; Niki, Masao; and Yokota, Yukinaga, 4,100,127, Cl. 260-29.6NR.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Compound transistor circuitry. 4,100,438, Cl. 307-304.000.

York, Edward Robert: *See—*

Caricchio, Jerome Joseph, Jr.; and York, Edward Robert, 4,100,039, Cl. 204-43.00N.

Yoshida, Hidetoshi: *See—*

Kimura, Shozo; and Yoshida, Hidetoshi, 4,100,041, Cl. 204-58.000.

Yoshida, Kenji: *See—*

Sato, Yuzuru; Kobayashi, Ryuichiro; Kunieda, Naoshi; Watanabe, Kazumasa; Mizukura, Noboru; Yoshida, Kenji; and Oya, Tadanori, 4,099,972, Cl. 96-29.00D.

Yoshida Kogyo K.K.: *See—*

Fujisaki, Yoshinori, 4,099,301, Cl. 24-205.00R.

Kagoura, Tetsuro, 4,099,756, Cl. 292-336.300.

Yamamoto, Yukio; and Sakashita, Masami, 4,099,758, Cl. 292-341.180.

Yoshihara, Mitsuji: *See—*

Nagase, Hidenobu; Kishida, Eiji; and Yoshihara, Mitsuji, 4,099,496, Cl. 123-41.310.

Yoshimura, Kiyoharu; and Hayashi, Masao, to Koa Oil Co., Ltd. Process for preparation of high quality coke. 4,100,265, Cl. 423-449.000.

Yoshimura, Tooru; and Kuroda, Hiroshi, to Nissan Motor Company, Limited. Internal combustion engine equipped with catalytic converter. 4,099,377, Cl. 60-276.000.

Yoshinaka, Tadaaki, to Sony Corporation. Compensating time-based errors in a reproduced video signal. 4,100,567, Cl. 358-8.000.

Young, Gerald H. Oscillating engine. 4,099,448, Cl. 91-339.000.

Young, Lewis Brewster, to Mobil Oil Corporation. Selective production of para-substituted benzenes. 4,100,217, Cl. 260-671.00R.

Young, Roger W., to John Dusenbery Company, Inc. Cutting knife for winding machines. 4,099,435, Cl. 83-614.000.

Young, Ronald William: *See—*

Bloomer, Ivan; and Young, Ronald William, 4,100,066, Cl. 210-44.000.

Young, Wen. Flow control device for fluids flowing in a closed conduit. 4,099,700, Cl. 251-7,000.

Zaglio, Sergio, to Calzificio Golden Lady S.a.s. di Grassi Nerino & C. Device for the oriented collection of stockings, panty-hose and like articles. 4,099,789, Cl. 302-2.00R.

Zahid, Abduz, to Greer Hydraulics, Inc. Large port pressure accumulator. 4,099,545, Cl. 138-30.000.

Zahir, Abdul-Cader; and Renner, Alfred, to Ciba-Geigy Corporation. Process for the manufacture of crosslinked polymers which contain imide groups. 4,100,140, Cl. 526-90.000.

Zahn, Wolfgang: *See—*
Bickl, Horst; Findeis, Gunter; Treiber, Helmut; and Zahn, Wolfgang, 4,099,862, Cl. 355-35.000.

Zechnall, Martin: *See—*
Kiencke, Uwe; Flaig, Ulrich; Zechnall, Martin; and Honig, Gunter, 4,099,495, Cl. 123-32.0EB.

Zenith Radio Corporation: *See—*
Ditthardt, Alfred R., 4,100,576, Cl. 358-128.000.
Kaplan, Sam H., 4,100,452, Cl. 313-408.000.
Palac, Kazimir, 4,100,451, Cl. 313-404.000.

Zeren, Joseph D. Expanding arrowhead. 4,099,720, Cl. 273-106.50B.

Ziemann, Heinz: *See—*
Mazanek, Jan; Blahak, Johannes; Wagner, Kuno; and Ziemann, Heinz, 4,100,116, Cl. 521-167.000.

Zimmer, U.S.A. Inc.: *See—*
Cueman, Glenn F.; and Becker, Robert J., 4,099,524, Cl. 128-78.000.

Zimmerman, Dennis M.; and Marshall, Winston S., to Eli Lilly and Company. Novel cis N-cyclopropylmethyl decahydroisoquinoline. 4,100,166, Cl. 260-289.00D.

Zimmermann, Hans; Rudolph, Otfried; Peter, Gunter; and Weisbach, Gunter, to VEB Polygraph Leipzig Kombinat Fuer Polygraphische Maschinen und Ausruestungen. Support arrangement for guiding sheets through a printing machine. 4,099,463, Cl. 101-230.000.

Zollinger, J. Lamar: *See—*
Robins, Janis; and Zollinger, J. Lamar, 4,100,134, Cl. 528-10.000.

Zoric, Michael T.: *See—*
Mong, William K.; and Zoric, Michael T., 4,099,543, Cl. 137-625.220.

Zubkov, Vitaly Semenovich: *See—*
Verty, Vladimir Grigorievich; Voronin, Pavel Grigorievich; Ourov, Evgeny Ivanovich; Zubkov, Vitaly Semenovich; Melnichuk, Nikolai Ivanovich; Miller, Grigory Grigorievich; Mishakov, Vladimir Nikiforovich; Sukrushev, Vitaly Stepanovich; Ruzin, Leonid Mikhailovich; and Tabakov, Vladimir Pavlovich, 4,099,783, Cl. 299-2.000.

Zufich, Anthony C. Backpack and frame apparatus. 4,099,657, Cl. 224-25.00A.

Zvenyachkin, Viktor Matveevich: *See—*
Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; Zvenyachkin, Viktor Matveevich; Ivchenko, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; and Fedorov, Evgeny Petrovich, 4,099,572, Cl. 169-12.000.

Zweigart, Gerhard: *See—*
Kania, Siegmund; Zweigart, Gerhard; Luz, Karl; and Lutz, Edgar, 4,099,767, Cl. 296-137.00A.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, David: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

Baxter Travenol Laboratories, Inc.: *See—*
Fekete, Lajos F.; and Holst, Stephen L., Re. 29,698, Cl. 260-112.00B.

Berggren, Edith O., executrix: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Berggren, L. John, deceased: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Blake, Charles H., to Outboard Marine Corporation. Outboard motor with speed regulator for DC permanent magnet motor. Re. 29,695, Cl. 115-18.00E.

Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and by Berggren, Edith O., executrix, to Monsanto Company. Apparatus improvements in temperature-conditioning parts. Re. 29,696, Cl. 432-124.000.

Dow Corning Corporation: *See—*
Mink, Alan E., Re. 29,697, Cl. 260-37.0SB.

Fekete, Lajos F.; and Holst, Stephen L., to Baxter Travenol Laboratories, Inc. Stabilization of AHF using heparin. Re. 29,698, Cl. 260-112.00B.

Foll, Gerhard; and Lahm, Heinrich, to Index-Werke KG Hahn & Tessky. Tool support for use in machine tools particularly in turning machines. Re. 29,694, Cl. 29-36.000.

Holst, Stephen L.: *See—*
Fekete, Lajos F.; and Holst, Stephen L., Re. 29,698, Cl. 260-112.00B.

Index-Werke KG Hahn & Tessky: *See—*
Foll, Gerhard; and Lahm, Heinrich, Re. 29,694, Cl. 29-36.000.

Kelly, Robert J.; Miller, Robert; and Adams, David, to Uniroyal, Inc. Adhesion of polyester to rubber using an adhesive containing added metal compounds. Re. 29,699, Cl. 428-414.000.

Lahm, Heinrich: *See—*
Foll, Gerhard; and Lahm, Heinrich, Re. 29,694, Cl. 29-36.000.

Little, Arthur J.; and Mayer, William R., to Stewart-Warner Corporation. Timed buzzer. Re. 29,701, Cl. 340-403.000.

Mayer, William R.: *See—*
Little, Arthur J.; and Mayer, William R., Re. 29,701, Cl. 340-403.000.

Miller, Robert: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

Mink, Alan E., to Dow Corning Corporation. Low temperature solventless silicone resins. Re. 29,697, Cl. 260-37.0SB.

Monsanto Company: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Outboard Marine Corporation: *See—*
Blake, Charles H., Re. 29,695, Cl. 115-18.00E.

Reilly, Joseph R.: *See—*
Chin, Charles L. D.; Reilly, Joseph R.; Berggren, L. John, deceased; and Berggren, Edith O., executrix, Re. 29,696, Cl. 432-124.000.

Stewart-Warner Corporation: *See—*
Little, Arthur J.; and Mayer, William R., Re. 29,701, Cl. 340-403.000.

Uniroyal, Inc.: *See—*
Kelly, Robert J.; Miller, Robert; and Adams, David, Re. 29,699, Cl. 428-414.000.

U.S. Philips Corporation: *See—*
van de Plassche, Rudy Johan, Re. 29,700, Cl. 330-257.000.

van de Plassche, Rudy Johan, to U.S. Philips Corporation. Voltage-current converter. Re. 29,700, Cl. 330-257.000.

LIST OF PLANT PATENTEES

B. L. Cobia, Inc.: *See—*
Cobia, Barnell L.; and Griffith, Stephen H., 4,276, Cl. 88.000.

Cobia, Barnell L.; and Griffith, Stephen H., to B. L. Cobia, Inc. Piperaceae plant family. 4,276, 7-11-78, Cl. 88.000.

Griffith, Stephen H.: *See—*
Cobia, Barnell L.; and Griffith, Stephen H., 4,276, Cl. 88.000.

Hommes, Gerard Dirk, to Marlboro Bulb Farms. Dutch iris plant named Apollo. 4,279, 7-11-78, Cl. 68.000.

Marlboro Bulb Farms: *See—*
Hommes, Gerard Dirk, 4,279, Cl. 68.000.

Moore, Ralph S. Rose plant. 4,277, 7-11-78, Cl. 9.000.

Woolcock, Edward P. Miniature rose plant. 4,278, 7-11-78, Cl. 9.000.

LIST OF DESIGN PATENTEES

Adams Rite Manufacturing Co.: *See—*
Folger, Roger J.; and Buzard, John A., 248,444, Cl. D8-302.000.

Adler, Peter: *See—*
Tougas, David; Adler, Peter; and Liszt, Mark, 248,438, Cl. D6-241.000.

Ahrens, Barry L.: *See—*
Parks, John M.; Ahrens, Barry L.; Brown, William J.; and Molnar, John, 248,475, Cl. D15-30.000.

American Optical Corporation: *See—*
Slosek, Patrick F., 248,497, Cl. D29-8.000.

Amerock Corporation: *See—*
Palm, James Marshall, Jr., 248,445, Cl. D8-310.000.

Asai, Yoshinobu, to Sansui Electric Co., Ltd. Speaker cabinet. 248,471, 7-11-78, Cl. D14-34.000.

Ashcraft, Daniel; Bruni, James G.; Hauser, Stephen G.; and Keith, Keith S. Blood processing apparatus. 248,488, 7-11-78, Cl. D24-1.100.

Atlantic Research Corporation: *See—*
Roberts, Charles Louis; and Wallace, Jacob Lightsey, Jr., 248,465, Cl. D13-24.000.

Barnes, Robert. Exhaust pipe. 248,463, 7-11-78, Cl. D12-194.000.

Bastock, Tony William, to Foseco International Limited. Foundry riser sleeve. 248,479, 7-11-78, Cl. D15-135.000.

Bastock, Tony William, to Foseco International Limited. Foundry riser sleeve. 248,480, 7-11-78, Cl. D15-135.000.

Bastock, Tony William, to Foseco International Limited. Foundry riser sleeve. 248,481, 7-11-78, Cl. D15-135.000.

Baugh, Benjamin Charles: *See—*
Bryan, Neill Edward; Schulte, Regis Dean; and Baugh, Benjamin Charles, 248,440, Cl. D7-61.000.

Bausch, Dale I. Bar organizer for straws and toothpicks. 248,441, 7-11-78, Cl. D7-75.000.

Beatrice Foods Co.: *See—*
Koziol, Walter, 248,505, Cl. D48-36.000.

Bel -Art Products, Inc.: *See—*
McClure, George R.; and Kahn, Bruce E., 248,448, Cl. D9-10.000.

Bell, Stuart D., to Meco-Lectro Products, Inc. Boat control panel. 248,462, 7-11-78, Cl. D12-192.000.

Bloomfield Manufacturing Co., Inc., The: *See—*
Dunn, Keith T.; and McIntosh, Thomas K., 248,460, Cl. D12-55.000.

- Brown, William J.: *See—*
  - Parks, John M.; Ahrens, Barry L.; Brown, William J.; and Molnar, John, 248,475, Cl. D15-30.000.
- Bruni, James G.: *See—*
  - Ashcraft, Daniel; Bruni, James G.; Hauser, Stephen G.; and Keith, Keith S., 248,488, Cl. D24-1.100.
- Bryan, Neill Edward; Schulte, Regis Dean; and Baugh, Benjamin Charles, to Coleman Company, Inc., The. Picnic jug. 248,440, 7-11-78, Cl. D7-61.000.
- Bussey, Larry E.; and Hunter, James E., Jr. Footstool. 248,430, 7-11-78, Cl. D6-36.000.
- Buzard, John A.: *See—*
  - Folger, Roger J.; and Buzard, John A., 248,444, Cl. D8-302.000.
- Casutt, Toni. Egg carton or the like. 248,452, 7-11-78, Cl. D9-190.000.
- Caterpillar Tractor Co.: *See—*
  - Parks, John M.; Ahrens, Barry L.; Brown, William J.; and Molnar, John, 248,475, Cl. D15-30.000.
- Ciani, Inc.: *See—*
  - Gatof, Norman; and Russell, Robert, 248,458, Cl. D11-88.000.
- Clivio, Franco; and Raffler, Dieter. Hanger for garden utensils. 248,434, 7-11-78, Cl. D6-125.000.
- Coleman Company, Inc., The: *See—*
  - Bryan, Neill Edward; Schulte, Regis Dean; and Baugh, Benjamin Charles, 248,440, Cl. D7-61.000.
- Colgate-Palmolive Company: *See—*
  - Douglas, Livingston C., 248,449, Cl. D9-111.000.
- Combi Co., Ltd.: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,494, Cl. D24-54.000.
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,495, Cl. D24-54.000.
- Costabile, Eugene J., to Futorian Corporation. Sofa or similar article. 248,431, 7-11-78, Cl. D6-63.000.
- Crown Controls Corporation: *See—*
  - Tompkins, David D., 248,466, Cl. D13-32.000.
- Culbertson, Richard, to General Electric Company. Cassette tape recorder. 248,468, 7-11-78, Cl. D14-6.000.
- Cullinane, Daniel, Jr., to Lynn Products Co., Inc. Combustion gas analyzer for measuring temperature, smoke density and CO_2 of flue gas of an oil or gas burner. 248,457, 7-11-78, Cl. D10-81.000.
- Cunnie, Edward T., to Emerson Electric Co. Cover plate for a digital temperature control. 248,455, 7-11-78, Cl. D10-60.000.
- Data General Corporation: *See—*
  - Freed, Morris Simon; and Ward, George Walter, 248,451, Cl. D9-184.000.
- Davenport, John M.: *See—*
  - Fridrich, Elmer G.; and Davenport, John M., 248,501, Cl. D48-20.00F.
- DeLuca, Eva. Hem measuring stick. 248,456, 7-11-78, Cl. D10-71.000.
- Densen, Paul M. Cabinet. 248,435, 7-11-78, Cl. D6-159.000.
- DiVito, Fred, to Lumex, Inc. Hand grip for patient walking aids. 248,510, 7-11-78, Cl. D88-5.000.
- Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Dispenser for sweets. 248,506, 7-11-78, Cl. D52-2.00B.
- Douglas, Livingston C., to Colgate-Palmolive Company. Bottle. 248,449, 7-11-78, Cl. D9-111.000.
- Dunn, Keith T.; and McIntosh, Thomas K., to Bloomfield Manufacturing Co., Inc., The. Jack. 248,460, 7-11-78, Cl. D12-55.000.
- Edmonson, O. David. Three-wheeled vehicle. 248,461, 7-11-78, Cl. D12-85.000.
- Ekuan, Kenji, to Kikkoman Shoyu Co., Ltd. Bottle. 248,450, 7-11-78, Cl. D9-128.000.
- Elias, Abram G.; and Elias, Peter G. Document hanger. 248,483, 7-11-78, Cl. D19-91.000.
- Elias, Peter G.: *See—*
  - Elias, Abram G.; and Elias, Peter G., 248,483, Cl. D19-91.000.
- Emerson Electric Co.: *See—*
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  - Moore, John W., 248,464, Cl. D13-17.000.
- ESB Incorporated: *See—*
  - Rhoades, Nolan; Oakley, Daniel C.; and Jacobsen, Ralph T., 248,504, Cl. D48-24.00R.
- Esterline Augus Instrument Corp.: *See—*
  - Schaffer, Joseph W., 248,482, Cl. D16-32.000.
- Fairchild Camera and Instrument Corp.: *See—*
  - Talesfore, Nicholas F., 248,470, Cl. D14-11.000.
- Folger, Roger J.; and Buzard, John A., to Adams Rite Manufacturing Co. Panic operator for exit doors. 248,444, 7-11-78, Cl. D8-302.000.
- Foseco International Limited: *See—*
  - Bastock, Tony William, 248,479, Cl. D15-135.000.
  - Bastock, Tony William, 248,480, Cl. D15-135.000.
  - Bastock, Tony William, 248,481, Cl. D15-135.000.
- Framac Industries Pty. Limited: *See—*
  - Robinson, Anthony John, 248,437, Cl. D6-168.000.
- Freed, Morris Simon; and Ward, George Walter, to Data General Corporation. Packaging container. 248,451, 7-11-78, Cl. D9-184.000.
- Fridrich, Elmer G.; and Davenport, John M., to General Electric Company. Lamp unit. 248,501, 7-11-78, Cl. D48-20.00F.
- Futorian Corporation: *See—*
  - Costabile, Eugene J., 248,431, Cl. D6-63.000.
- Gatof, Norman; and Russell, Robert, to Ciani, Inc. Earring fastener. 248,458, 7-11-78, Cl. D11-88.000.
- General Electric Company: *See—*
  - Culbertson, Richard, 248,468, Cl. D14-6.000.
  - Fridrich, Elmer G.; and Davenport, John M., 248,501, Cl. D48-20.00F.
  - Grindle, James L., 248,503, Cl. D48-23.00R.
  - Laughter, Clifford M., 248,502, Cl. D48-23.00R.
- Grindle, James L., to General Electric Company. Luminaire. 248,503, 7-11-78, Cl. D48-23.00R.
- Hamada, Masanori, to Matsushita Electric Industrial Co., Ltd. Transceiver. 248,473, 7-11-78, Cl. D14-71.000.
- Hauser, Stephen G.: *See—*
  - Ashcraft, Daniel; Bruni, James G.; Hauser, Stephen G.; and Keith, Keith S., 248,488, Cl. D24-1.100.
- Haynes, Julian R., to Sunbeam Corporation. Suction nozzle. 248,476, 7-11-78, Cl. D15-63.000.
- Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, to Wright Line Inc. Document holder. 248,484, 7-11-78, Cl. D19-91.000.
- Hill, John R.: *See—*
  - Hill, Mary Jane; and Hill, John R., 248,426, Cl. D2-27.000.
- Hill, Mary Jane; and Hill, John R. Chair back attachable baby retaining article. 248,426, 7-11-78, Cl. D2-27.000.
- Homsy, Charles Albert; and Kent, John N. Temporomandibular joint prosthesis. 248,492, 7-11-78, Cl. D24-33.000.
- Hornung, Helmut J. F. Framing component. 248,447, 7-11-78, Cl. D8-354.000.
- Hunter, James E., Jr.: *See—*
  - Bussey, Larry E.; and Hunter, James E., Jr., 248,430, Cl. D6-36.000.
- Inohara, Masanobu, to Onitsuka Co., Ltd. Sport shoe. 248,429, 7-11-78, Cl. D2-309.000.
- Ishii, Kenshun: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,494, Cl. D24-54.000.
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,495, Cl. D24-54.000.
- Ishii, Yoshiyasu: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,494, Cl. D24-54.000.
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 248,495, Cl. D24-54.000.
- IVAC Corporation: *See—*
  - Manno, Joseph J., 248,490, Cl. D24-17.000.
- Jacobsen, Ralph T.: *See—*
  - Rhoades, Nolan; Oakley, Daniel C.; and Jacobsen, Ralph T., 248,504, Cl. D48-24.00R.
- Kahn, Bruce E.: *See—*
  - McClure, George R.; and Kahn, Bruce E., 248,448, Cl. D9-10.000.
- Kambayashi, Hisao. Toy rocket launcher. 248,498, 7-11-78, Cl. D34-15.0PP.
- Kawano, Takeyoshi; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 248,472, 7-11-78, Cl. D14-70.000.
- Keith, Keith S.: *See—*
  - Ashcraft, Daniel; Bruni, James G.; Hauser, Stephen G.; and Keith, Keith S., 248,488, Cl. D24-1.100.
- Kent, John N.: *See—*
  - Homsy, Charles Albert; and Kent, John N., 248,492, Cl. D24-33.000.
- Kikkoman Shoyu Co., Ltd.: *See—*
  - Ekuan, Kenji, 248,450, Cl. D9-128.000.
- Kimball, Philip C.: *See—*
  - Strauss, Richard; and Kimball; Philip C., 248,485, Cl. D23-4.000.
- Kosrow, Robert L.: *See—*
  - Kraatz, Gerald A.; and Kosrow, Robert L., 248,478, Cl. D15-71.000.
- Koziol, Walter, to Beatrice Foods Co. Combined lamp and identification sign. 248,505, 7-11-78, Cl. D48-36.000.
- Kraatz, Gerald A.; and Kosrow, Robert L., to Union Special Corporation. Combined automatic sewing machine and supporting table. 248,478, 7-11-78, Cl. D15-71.000.
- Laughter, Clifford M., to General Electric Company. Luminaire. 248,502, 7-11-78, Cl. D48-23.00R.
- Liszt, Mark: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,438, Cl. D6-241.000.
- Lucid Lines, Inc.: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,438, Cl. D6-241.000.
- Lumex, Inc.: *See—*
  - DiVito, Fred, 248,510, Cl. D88-5.000.
- Lynn Products Co., Inc.: *See—*
  - Cullinane, Daniel, Jr., 248,457, Cl. D10-81.000.
- Malcolm, Donald A., to W. R. Grace & Co. Combined carrying and storage case for a chainsaw. 248,508, 7-11-78, Cl. D87-1.00R.
- Mancarella, Anthony. Fireplace screen. 248,443, 7-11-78, Cl. D7-208.000.
- Manno, Joseph J., to IVAC Corporation. Sphygmomanometer. 248,490, 7-11-78, Cl. D24-17.000.
- Mark, Samuel. Building. 248,496, 7-11-78, Cl. D25-5.000.
- Matsushita Electric Industrial Co., Ltd.: *See—*
  - Hamada, Masanori, 248,473, Cl. D14-71.000.
  - Kawano, Takeyoshi; and Ohta, Kikuo, 248,472, Cl. D14-70.000.
- McClure, George R.; and Kahn, Bruce E., to Bel -Art Products, Inc. Combined squeeze type eye wash device and sealing cap therefor. 248,448, 7-11-78, Cl. D9-10.000.
- McCollum, Robert H. Bracket for holding fishing rods or the like. 248,433, 7-11-78, Cl. D6-125.000.
- McIntosh, Thomas K.: *See—*
  - Dunn, Keith T.; and McIntosh, Thomas K., 248,460, Cl. D12-55.000.
- McMullan, James P. Heater control unit. 248,454, 7-11-78, Cl. D10-50.000.

- Meco-Lectro Products, Inc.: *See—*
  - Bell, Stuart D., 248,462, Cl. D12-192.000.
- Molnar, John: *See—*
  - Parks, John M.; Ahrens, Barry L.; Brown, William J.; and Molnar, John, 248,475, Cl. D15-30.000.
- Moncrief, J. D. Massaging device. 248,493, 7-11-78, Cl. D24-36.000.
- Moore, John W., to Emerson Electric Co. Insulator for supporting the heating coil of an electric heater. 248,464, 7-11-78, Cl. D13-17.000.
- Morrison, Annie Laurie, to Morrison Enterprises. Frame for making macrame. 248,477, 7-11-78, Cl. D15-66.000.
- Morrison Enterprises: *See—*
  - Morrison, Annie Laurie, 248,477, Cl. D15-66.000.
- Mueller, Kenneth W. Hinge. 248,446, 7-11-78, Cl. D8-323.000.
- Multinorm B.V.: *See—*
  - Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 248,474, Cl. D15-29.000.
- Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, to Combi Co., Ltd. Urinary collecting unit. 248,494, 7-11-78, Cl. D24-54.000.
- Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, to Combi Co., Ltd. Urinary collecting unit. 248,495, 7-11-78, Cl. D24-54.000.
- Newman, Lawrence D. Cross. 248,459, 7-11-78, Cl. D11-96.000.
- Oakley, Daniel C.: *See—*
  - Rhoades, Nolan; Oakley, Daniel C.; and Jacobsen, Ralph T., 248,504, Cl. D48-24.00R.
- Ohta, Kikuo: *See—*
  - Kawano, Takeyoshi; and Ohta, Kikuo, 248,472, Cl. D14-70.000.
- Onitsuka Co., Ltd.: *See—*
  - Inohara, Masanobu, 248,429, Cl. D2-309.000.
  - Watanabe, Sigenobu, 248,428, Cl. D2-309.000.
- Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm B.V. Mowing disk. 248,474, 7-11-78, Cl. D15-29.000.
- O'Toole, Jerome: *See—*
  - Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, 248,484, Cl. D19-91.000.
- Oxford Hall Silversmiths, Ltd.: *See—*
  - Siebel, Ben, 248,439, Cl. D7-137.000.
- P. Ferrero & C. S.p.A.: *See—*
  - Dogliotti, Amilcare, 248,506, Cl. D52-2.00B.
- Palm, James Marshall, Jr., fo Amerock Corporation. Knob. 248,445, 7-11-78, Cl. D8-310.000.
- Parks, John M.; Ahrens, Barry L.; Brown, William J.; and Molnar, John, to Caterpillar Tractor Co. Cab for earthmoving vehicle or the like. 248,475, 7-11-78, Cl. D15-30.000.
- Paszkiewicz, Raymond T. Jewelry cabinet. 248,436, 7-11-78, Cl. D6-167.000.
- Petersen, Warren D. Chair or similar article. 248,432, 7-11-78, Cl. D6-72.000.
- Pivec, John A. Display receptacle for a folded flag. 248,507, 7-11-78, Cl. D87-1.00R.
- Raffler, Dieter: *See—*
  - Clivio, Franco; and Raffler, Dieter, 248,434, Cl. D6-125.000.
- Reiss, James M. Syringe shield. 248,491, 7-11-78, Cl. D24-25.000.
- Rhoades, Nolan; Oakley, Daniel C.; and Jacobsen, Ralph T., to ESB Incorporated. Lantern. 248,504, 7-11-78, Cl. D48-24.00R.
- Riche Corporation: *See—*
  - Summers, Kenneth L., 248,453, Cl. D9-254.000.
- Roberts, Charles Louis; and Wallace, Jacob Lightsey, Jr., to Atlantic Research Corporation. Plug for multiconductor patching apparatus. 248,465, 7-11-78, Cl. D13-24.000.
- Robinson, Anthony John, to Framac Industries Pty. Limited. Combined dual work table and storage cabinet unit. 248,437, 7-11-78, Cl. D6-168.000.
- Robinson, Ceronnie. Venipuncture table. 248,489, 7-11-78, Cl. D24-3.000.
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- Russell, Robert: *See—*
  - Gatof, Norman; and Russell, Robert, 248,458, Cl. D11-88.000.
- Sansui Electric Co., Ltd.: *See—*
  - Asai, Yoshinobu, 248,471, Cl. D14-34.000.
- Schaffer, Joseph W., to Esterline Augus Instrument Corp. Chart stripping finger. 248,482, 7-11-78, Cl. D16-32.000.
- Schulte, Regis Dean: *See—*
  - Bryan, Neill Edward; Schulte, Regis Dean; and Baugh, Benjamin Charles, 248,440, Cl. D7-61.000.
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- Slosek, Patrick F., to American Optical Corporation. Disposable respirator. 248,497, 7-11-78, Cl. D29-8.000.
- Sony Corporation: *See—*
  - Takahashi, Shigeo, 248,469, Cl. D14-11.000.
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- Summers, Kenneth L., to Riche Corporation. Resealing closure. 248,453, 7-11-78, Cl. D9-254.000.
- Sunbeam Corporation: *See—*
  - Haynes, Julian R., 248,476, Cl. D15-63.000.
- Tait, Philip. Luggage case. 248,509, 7-11-78, Cl. D87-5.00F.
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- Taylor, Robert S. Fire starter. 248,486, 7-11-78, Cl. D23-90.100.
- Taylor, Robert S. Fire starter. 248,487, 7-11-78, Cl. D23-90.100.
- Tompkins, David D., to Crown Controls Corporation. Antenna rotator control. 248,466, 7-11-78, Cl. D13-32.000.
- Tougas, David; Adler, Peter; and Liszt, Mark, to Lucid Lines, Inc. Mirror frame. 248,438, 7-11-78, Cl. D6-241.000.
- Ulrich Foundation, Inc.: *See—*
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,499, Cl. D48-2.000.
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- Ulrich, Raymond M.; and Ulrich, Richard M., to Ulrich Foundation, Inc. Base for candle holder, lamp, or similar article. 248,499, 7-11-78, Cl. D48-2.000.
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- Ulrich, Richard M.: *See—*
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,499, Cl. D48-2.000.
  - Ulrich, Raymond M.; and Ulrich, Richard M., 248,500, Cl. D48-2.000.
- Union Special Corporation: *See—*
  - Kraatz, Gerald A.; and Kosrow, Robert L., 248,478, Cl. D15-71.000.
- Usami, Nobuo, to Victor Company of Japan, Ltd. Cassette tape deck. 248,467, 7-11-78, Cl. D14-6.000.
- van Staveren, Hendricus Cornelis: *See—*
  - Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 248,474, Cl. D15-29.000.
- Victor Company of Japan, Ltd.: *See—*
  - Usami, Nobuo, 248,467, Cl. D14-6.000.
- W. R. Grace & Co.: *See—*
  - Malcolm, Donald A., 248,508, Cl. D87-1.00R.
- Wallace, Jacob Lightsey, Jr.: *See—*
  - Roberts, Charles Louis; and Wallace, Jacob Lightsey, Jr., 248,465, Cl. D13-24.000.
- Ward, George Walter: *See—*
  - Freed, Morris Simon; and Ward, George Walter, 248,451, Cl. D9-184.000.
- Watanabe, Sigenobu, to Onitsuka Co., Ltd. Sport shoe. 248,428, 7-11-78, Cl. D2-309.000.
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  - Strauss, Richard; and Kimball, Philip C., 248,485, Cl. D23-4.000.
- Wong, James K. Sandal. 248,427, 7-11-78, Cl. D2-270.000.
- Wright, David M.: *See—*
  - Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, 248,484, Cl. D19-91.000.
- Wright Line Inc.: *See—*
  - Hedstrom, Norman; Wright, David M.; and O'Toole, Jerome, 248,484, Cl. D19-91.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 11, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16	4,099,269
168	4,099,270
192	4,099,271

CLASS 4

148	4,099,272
173 R	4,099,273
286	4,099,274

CLASS 5

18 R	4,099,275
72	4,099,276
81 R	4,099,277
361 B	4,099,278

CLASS 8

41 C	4,099,909
115.5	4,099,910
125	4,099,911
137	4,099,912
173	4,099,913

CLASS 9

1.2	4,099,279
6 P	4,099,280
8 R	4,099,281
8.3 E	4,099,282

CLASS 10

107 PH	4,099,283

CLASS 13

9 R	4,100,364
27	4,100,365

CLASS 15

42	4,099,284
83	4,099,285
142	4,099,286
182	4,099,287
228	4,099,288
244 R	4,099,289
340	4,099,290
390	4,099,291

CLASS 16

48.5	4,099,292
149	4,099,293

CLASS 17

50	4,099,294

CLASS 19

106 R	4,099,295
240	4,099,297
304	4,099,296

CLASS 21

57	4,099,914
60.5 A	4,099,915
116	4,099,916

CLASS 23

230 B	4,099,917
230 R	4,099,918
252 R	4,099,919
253 R	4,099,920
	4,099,921
254 E	4,099,922
254 R	4,099,923
273 SP	4,099,924
285	4,099,925
286	4,099,926
288 B	4,099,927

CLASS 24

27	4,099,298
49 CF	4,099,300
69 SB	4,099,306
73 PS	4,099,299
205 R	4,099,301
205.15 R	4,099,302
217 R	4,099,303
274 R	4,099,304

CLASS 28

252	4,099,307
273	4,099,308

CLASS 29

2	4,099,309
36	Re.29,694
79	4,099,310
126	4,099,311
130	4,099,312
157.3 D	4,099,928
416	4,099,313
420	4,099,314
434	4,099,315
566.2	4,099,316
571	4,099,317
578	4,099,318
579	4,099,305
611	4,099,319
623	4,099,320
	4,099,321
	4,099,322
629	4,099,323
739	4,099,324
741	4,099,325

CLASS 30

135	4,099,326
161	4,099,327
172	4,099,328

CLASS 32

2	4,099,329

CLASS 33

18 R	4,099,330
88	4,099,331
126.7 R	4,099,332
203.12	4,099,333
346	4,099,334

CLASS 34

9	4,099,335
12	4,099,336
26	4,099,337
35	4,099,338

CLASS 35

18 A	4,099,339
19 R	4,099,340

CLASS 36

7.3	4,099,341
44	4,099,342

CLASS 43

42.19	4,099,343

CLASS 44

1 F	4,099,929
56	4,099,930
80	4,099,931

CLASS 47

26	4,099,344
56	4,099,345

CLASS 48

197 R	4,099,932
202	4,099,933

CLASS 49

82	4,099,346
399	4,099,347

CLASS 51

92 R	4,099,348
101 R	4,099,349
295	4,099,934
309 R	4,099,935
338	4,099,350

CLASS 52

2	4,099,351
80	4,099,352
139	4,099,353
146	4,099,354
404	4,099,355
520	4,099,356
533	4,099,357
588	4,099,358
630	4,099,359
745	4,099,360

CLASS 53

42	4,099,361
123	4,099,362
124 D	4,099,363

CLASS 55

75	4,099,936
212	4,099,937
230	4,099,938
246	4,099,939
269	4,099,941
300	4,099,940
396	4,099,942
487	4,099,943
501	4,099,944

CLASS 56

1	4,099,364
13.5	4,099,365
13.6	4,099,366
208	4,099,368
314	4,099,369
336	4,099,367

CLASS 57

144	4,099,370

CLASS 58

22.7	4,099,371
85.5	4,099,372

CLASS 60

39.12	4,099,374
39.5	4,099,375
39.67	4,099,373
253	4,099,376
276	4,099,377
413	4,099,378
427	4,099,379
588	4,099,380
641	4,099,381
648	4,099,382
	4,099,383
657	4,099,384
678	4,099,385

CLASS 61

45 R	4,099,386
63	4,099,387
85	4,099,388

CLASS 62

30	4,099,945
73	4,099,946
532	4,099,947

CLASS 65

1	4,099,948
17	4,099,949
99 A	4,099,950
135	4,099,951
182 R	4,099,952
335	4,099,953

CLASS 66

9 R	4,099,389
50 R	4,099,390
121	4,099,391
140 R	4,099,392

CLASS 68

22 R	4,099,393

CLASS 70

233	4,099,394
360	4,099,395
363	4,099,396
371	4,099,397
406	4,099,398

CLASS 71

87	4,099,954
98	4,099,955
120	4,099,956
122	4,099,957

CLASS 72

38	4,099,399
122	4,099,400
147	4,099,401
234	4,099,402
288	4,099,403

CLASS 73

45.2	4,099,404
46	4,099,405
73	4,099,406
88.5 R	4,099,407
95	4,099,408
133 R	4,099,409
141 R	4,099,411
151.5	4,099,410
209	4,099,412
359 R	4,099,413
373	4,099,414
497	4,099,415
602	4,099,416
606	4,099,417
622	4,099,418
626	4,099,419
629	4,099,420

CLASS 74

10.33	4,099,421
231 C	4,099,422
243 R	4,099,423
251 R	4,099,424
501 P	4,099,425
730	4,099,426
804	4,099,427

CLASS 75

0.5 BA	4,099,958
10 R	4,099,959
11	4,099,960
20 F	4,099,961
26	4,099,962
35	4,099,963
52	4,099,964
68 R	4,099,965
125	4,099,966
128 A	4,099,967

CLASS 81

9.51	4,099,428
57.17	4,099,429
58.1	4,099,430

CLASS 82

9	4,099,431
14 A	4,099,432

CLASS 83

155	4,099,433
157	4,099,434
614	4,099,435
617	4,099,436

CLASS 84

1.01	4,099,437
1.25	4,099,438
1.26	4,099,439
258	4,099,440
327	4,099,441
382	4,099,442
457	4,099,443

CLASS 85

8.8	4,099,444

CLASS 89

7	4,099,445

CLASS 90

13.1	4,099,446

CLASS 91

218	4,099,447
339	4,099,448
358 A	4,099,449
403	4,099,450

CLASS 92

241	4,099,451

CLASS 96

1 SD	4,099,968
1.5 N	4,099,970
1.5 R	4,099,969
27 H	4,099,971
29 D	4,099,972
115 R	4,099,973

CLASS 98

58	4,099,452

CLASS 99

306	4,099,453
358	4,099,454
450.1	4,099,455
638	4,099,456

CLASS 100

42	4,099,457
116	4,099,458

CLASS 101

35	4,099,459
44	4,099,460
119	4,099,461
153	4,099,462
230	4,099,463

CLASS 102

24 HC	4,099,464
204	4,099,465
215	4,099,466
217	4,099,467

CLASS 105

310	4,099,468

CLASS 106

1.23	4,099,974
15 FP	4,099,975
15 R	4,099,976
39.7	4,100,001
53	4,099,977
	4,099,978
58	4,099,979
288 Q	4,099,980
308 Q	4,099,981

CLASS 108

1	4,099,469
26	4,099,470
114	4,099,472

CLASS 110

182.5	4,099,471
219	4,099,473

CLASS 112

258	4,099,474

CLASS 113

116 QA	4,099,475

CLASS 114

144 R	4,099,476
281	4,099,477

CLASS 115

18 E	Re.29,695
	4,099,478
41 R	4,099,479

CLASS 116

135	4,099,480

CLASS 118

8	4,099,481
9	4,099,482
49.1	4,099,483
117	4,099,484
301	4,099,485
635	4,099,486
651	4,099,487

CLASS 122

156	4,099,488

CLASS 123

3	4,099,489
32 EA	4,099,493
32 EB	4,099,495
32 EE	4,099,491
32 JV	4,099,494
32 ST	4,099,492
41.31	4,099,496
117 A	4,099,497
117 R	4,099,498
122 AB	4,099,500
	4,099,503
	4,099,504
122 AC	4,099,502
122 E	4,099,499
	4,099,501
139 AW	4,099,505
140 J	4,099,506
148 AC	4,099,509
148 D	4,099,510
148 DC	4,099,508
148 E	4,099,507
210	4,099,490

CLASS 126

190	4,099,511
246	4,099,512
270	4,099,513
	4,099,514
271	4,099,515
	4,099,516
	4,099,517

CLASS 127

61	4,099,982
63	4,099,983

CLASS 128

2 B	4,099,518
2 F	4,099,520
2.1 R	4,099,519
66	4,099,522
75	4,099,523
78	4,099,524
87 R	4,099,525
020	4,099,521
146.6	4,099,526
214 C	4,099,527
214.4	4,099,528
305	4,099,529
419 PT	4,099,530

CLASS 131

17 R	4,099,531

CLASS 133

5 A	4,099,532

CLASS 134

2	4,099,984
4	4,099,985

CLASS 135

3 E	4,099,533
4 A	4,099,534
66	4,099,535

CLASS 136

89 TF	4,099,986

CLASS 137

2	4,099,536
13	4,099,537
73	4,099,538
84	4,099,539
493.8	4,099,540
596.13	4,099,541
615	4,099,542
625.22	4,099,543
856	4,099,544

CLASS 138

30	4,099,545

CLASS 139

27	4,099,546

CLASS 141

5	4,099,547
27	4,099,548
32	4,099,549
51	4,099,550
388	4,099,551

CLASS 144

134 D	4,099,552

CLASS 148

1.5	4,099,987
3	4,099,988
6.27	4,099,989
6.35	4,099,990
11.5 C	4,099,991
11.5 N	4,099,992
14	4,099,993
35	4,099,994
101	4,099,995
131	4,099,996
187	4,099,997
	4,099,998
	4,099,999

CLASS 149

4	4,100,000

CLASS 156

48	4,100,002
54	4,100,003
60	4,100,004
73.1	4,100,005
78	4,100,006
86	4,100,007
180	4,100,008
184	4,100,009
242	4,100,010
272	4,100,011
351	4,100,012

441 4,100,013
647 4,100,014
665 4,100,015

CLASS 162

16 4,100,016
111 4,100,017
203 4,100,018

CLASS 165

22 4,099,553
32 4,099,554
55 4,099,555
96 4,099,556
104 S 4,099,557
4,099,558
170 4,099,559

CLASS 166

0.5 4,099,560
55.1 4,099,561
84 4,099,562
191 4,099,563
241 4,099,564
252 4,099,365
260 4,099,566
261 4,099,567
269 4,099,568
273 4,099,569
303 4,099,570
315 4,099,571

CLASS 169

12 4,099,572
37 4,099,573
47 4,099,574

CLASS 172

59 4,099,575
555 4,099,576
781 4,099,577
802 4,099,578

CLASS 173

4 4,099,579
118 4,099,580
133 4,099,581

CLASS 174

15 R 4,100,366
28 4,100,367
138 D 4,100,368

CLASS 175

5 4,099,582
7 4,099,583
14 4,099,584
320 4,099,585

CLASS 176

50 4,100,019
68 4,100,020
87 4,100,021

CLASS 177

159 4,099,586
210 EM 4,099,587

CLASS 178

67 4,100,369

CLASS 179

1 C 4,100,373
1 E 4,100,371
1 G 4,100,372
1 SB 4,100,370
1.5 S 4,100,374
2 A 4,100,375
15 AS 4,100,377
15 BP 4,100,376
84 VF 4,100,378
147 R 4,100,379
175.1 A 4,100,380

CLASS 180

14 B 4,099,594
44 F 4,099,588
65 A 4,099,589
69 C 4,099,590
98 4,099,591
108 4,099,592
114 4,099,593

CLASS 182

48 4,099,595
4,099,596

CLASS 184

27 B 4,099,597
106 4,099,598

CLASS 187

52 R 4,099,599

CLASS 188

73.4 4,099,600
163 4,099,601
300 4,099,602

CLASS 192

3.31 4,099,603
98 4,099,605
111 A 4,099,604

CLASS 195

1.8 4,100,022
27 4,100,023
29 4,100,024
31 F 4,100,025
51 G 4,100,026
4,100,027
66 R 4,100,028
68 4,100,029
103.5 R 4,100,030

CLASS 198

341 4,099,607
347 4,099,608
395 4,099,609
729 4,099,610

CLASS 200

38 A 4,100,381
61.46 4,100,382
157 4,100,383
160 4,100,384
268 4,100,385

CLASS 201

6 4,100,031
27 4,100,032
4,100,033
39 4,100,034

CLASS 202

227 4,100,035

CLASS 204

14 R 4,100,036
15 4,100,037
38 B 4,100,038
43 N 4,100,039
55 R 4,100,040
58 4,100,041
105 R 4,100,042
108 4,100,043
146 4,100,044
159.16 4,100,045
159.23 4,100,046
4,100,047
195 P 4,100,048
242 4,100,049
252 4,100,050
266 4,100,051
268 4,100,052
279 4,100,053
297 W 4,100,054
298 4,100,055
300 R 4,100,068

CLASS 206

45.14 4,099,611
45.19 4,099,612
45.34 4,099,613
299 4,099,614
329 4,099,615
427 4,099,616
443 4,099,617
454 4,099,618
524.1 4,099,619

CLASS 208

57 4,100,056
206 4,100,057
264 4,100,058

CLASS 209

3 4,100,059
74 R 4,099,620
80.5 4,100,060
98 4,099,621
114 4,099,622
139 A 4,100,061

CLASS 210

14 4,100,062
17 4,100,063
23 H 4,100,064
38 B 4,100,065
44 4,100,066
58 4,100,067
109 4,100,069
136 4,100,070
197 4,100,071
242 S 4,100,072
532 S 4,100,073

CLASS 211

41 4,099,623
42 4,099,624
49 R 4,099,625
60 R 4,099,626
163 4,099,627

CLASS 212

65 4,099,628

CLASS 214

1 HH 4,099,629
2.5 4,099,630
10 4,099,631
17 DA 4,099,632
4,099,633
86 R 4,099,634
152 4,099,635
4,099,636
306 4,099,637

CLASS 215

12 R 4,099,638
209 4,099,639

CLASS 219

10.55 M 4,100,386
10.57 4,100,387
69 M 4,100,388
74 4,100,389
4,100,390
81 4,100,391
121 EM 4,100,392
121 LM 4,100,393
296 4,100,394
356 4,100,395
384 4,100,396
512 4,100,397
541 4,100,398

CLASS 220

6 4,099,640
90.4 4,099,642
222 4,099,643
225 4,099,644
304 4,099,645
324 4,099,646
334 4,099,647
340 4,099,648
403 4,099,665
439 4,099,649
444 4,099,641

CLASS 221

266 4,099,650

CLASS 222

94 4,099,651
135 4,099,652
146 HE 4,099,653
184 4,099,654
211 4,099,655

CLASS 224

5 W 4,099,656
23 A 4,099,657
42.1 F 4,099,658

CLASS 227

130 4,099,659

CLASS 228

13 4,099,660
107 4,099,661
151 4,099,662
159 4,099,663

CLASS 229

5.7 4,099,664
62 4,099,666

CLASS 233

24 4,099,667

CLASS 235

92 CC 4,100,399
92 FL 4,100,400
92 T 4,100,401
145 R 4,100,402
304 4,099,668
312 4,100,403

CLASS 239

11 4,099,669
205 4,099,670
265.29 4,099,671
317 4,099,672
415 4,099,673
431 4,099,674
498 4,099,675
687 4,099,676

CLASS 241

186 A 4,099,677
243 4,099,678

CLASS 242

18 A 4,099,680
18 PW 4,099,679
55.2 4,099,681
56 R 4,099,682
107 4,099,683
4,099,684
107.4 B 4,099,685
198 4,099,686

CLASS 244

7 R 4,099,687
103 R 4,099,688
136 4,099,689
153 R 4,099,690
207 4,099,691

CLASS 246

34 CT 4,099,692

CLASS 248

210 4,099,693
339 4,099,694
351 4,099,695
358 R 4,099,696
385 4,099,697
493 4,099,698

CLASS 250

199 4,100,404
202 4,100,405
213 VT 4,100,406
214 P 4,100,407
230 4,100,408
305 4,100,409
311 4,100,410
324 4,100,411
343 4,100,412
366 4,100,413
391 4,100,414
455 4,100,415
461 B 4,100,416
505 4,100,417
510 4,100,418
514 4,100,419
533 4,100,421
551 4,100,422
4,100,423
559 4,100,424
561 4,100,420
4,100,425

CLASS 251

1 B 4,099,699
7 4,099,700
30 4,099,701
95 4,099,702
122 4,099,703
134 4,099,704
171 4,099,705
367 4,099,706

CLASS 252

8.1 4,100,074
4,100,075
4,100,076
4,100,077
8.55 C 4,100,079
8.9 4,100,078
18 4,100,080
25 4,100,081
33.4 4,100,082
34 4,100,083
39 4,100,084
42.7 4,100,085
50 4,100,086
62.1 P 4,100,087
62.52 4,100,088
63 4,100,089
63.7 4,100,090
70 4,100,091
4,100,092
89 R 4,100,093
4,100,094
99 4,100,095
145 4,100,096
4,100,097
188 4,100,098
189 4,100,099
4,100,100
301.4 H 4,100,101
305 4,100,102
316 4,100,103
428 4,100,104
429 R 4,100,105
437 4,100,106
443 4,100,107
455 Z 4,100,108
465 4,100,109
522 4,100,110

CLASS 254

35 4,099,707

CLASS 260

8 4,100,117
18 PT 4,100,118
22 CB 4,100,119
4,100,120
23 EP 4,100,121
28.5 B 4,100,122
4,100,123
29.2 M 4,100,124
29.6 AQ 4,100,126
29.6 NR 4,100,127
29.6 TA 4,100,125
33.6 UA 4,100,128
37 PC 4,100,130
37 SB Re.29,697
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42.21 4,100,131
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45.9 L 4,100,133
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112 G 4,100,151
112 R 4,100,149
4,100,150
112.5 S 4,100,153
112.5 TR 4,100,152
123.7 4,100,154
124 R 4,100,155
174 4,100,156
4,100,157
185 4,100,112
279 QA 4,100,162
283 SA 4,100,163
287 B 4,100,164
288 CF 4,100,165
289 D 4,100,166
296 R 4,100,167
299 4,100,168
306.8 R 4,100,169
326.33 4,100,171
327 H 4,100,172
333 4,100,173
340.9 R 4,100,174
345.5 4,100,175
345.7 P 4,100,176
345.8 P 4,100,177
4,100,178
346.75 4,100,179
347.8 4,100,180
416 4,100,181
429.9 4,100,182
438.1 4,100,183
464 4,100,184
465 F 4,100,185
465.8 D 4,100,186
502.5 4,100,187
535 P 4,100,188
541 4,100,189
543 H 4,100,190
557 R 4,100,191
558 R 4,100,192
563 P 4,100,193
576 4,100,194
4,100,195
585 D 4,100,196
586 P 4,100,197
586 R 4,100,198
606.5 B 4,100,199
609 R 4,100,200
615 A 4,100,201
652 R 4,100,210
656 R 4,100,211
660 4,100,212
666 P 4,100,213
666 PY 4,100,216
668 A 4,100,214
671 M 4,100,215
671 R 4,100,217
673 4,100,218
682 4,100,219
683.15 R 4,100,220
835 4,100,221
837 PV 4,100,222
857 L 4,100,223
860 4,100,144
862 4,100,224
878 R 4,100,225
879 4,100,226
880 R 4,100,227
4,100,228
887 4,100,229
972 4,100,230
978 4,100,231

CLASS 261

36 A 4,100,232
121 B 4,100,234
142 4,100,235

CLASS 264

8 4,100,236
40.6 4,100,237
49 4,100,238
102 4,100,239
108 4,100,240
113 4,100,241
115 4,100,242
171 4,100,243
211 4,100,244
4,100,245
230 4,100,246
271 4,100,247
273 4,100,248
313 4,100,249

CLASS 266

44 4,099,709
281 4,099,708

CLASS 270

68 A 4,099,710

CLASS 271

64 4,099,711
184 4,099,712

CLASS 272

93 4,099,713

CLASS 273

1 F 4,099,714
63 E 4,099,715
73 C 4,099,718
73 E 4,099,716
4,099,717
101.2 4,099,719
106.5 B 4,099,720
139 4,099,721
143 R 4,099,722
241 4,099,723

CLASS 274

47 4,099,724

CLASS 277

1 4,099,725
4,099,726
3 4,099,727
96 4,099,728
96.1 4,099,729
139 4,099,730
164 4,099,731

CLASS 279

2 A 4,099,732

CLASS 280

6.1 4,099,733
11.2 4,099,734
79.3 4,099,735
154.5 R 4,099,736
261 4,099,737
289 D 4,099,738
504 4,099,739
678 4,099,740
712 4,099,741
714 4,099,742
753 4,099,743

CLASS 285

7 4,099,744
24 4,099,745
119 4,099,746
174 4,099,747
256 4,099,748
398 4,099,749

CLASS 289

1.5 4,099,750

CLASS 292

139 4,099,751
144 4,099,752
177 4,099,753
206 4,099,754
251.5 4,099,755
336.3 4,099,756
4,099,757
341.18 4,099,758

CLASS 293

71 P 4,099,759
73 4,099,760

CLASS 294

86 R 4,099,761
88 4,099,762

CLASS 296

24 R 4,099,764
28 C 4,099,763
93 4,099,765
137 A 4,099,767
137 B 4,099,766

CLASS 297

63 4,099,768
204 4,099,769
216 4,099,770
217 4,099,771
220 4,099,772
270 4,099,773
298 4,099,774
303 4,099,775
329 4,099,776
375 4,099,777
386 4,099,778
408 4,099,779
411 4,099,780

CLASS 299

1 4,099,781
4,099,782
2 4,099,783
10 4,099,784
11 4,099,785
43 4,099,786
4,099,787

CLASS 301

105 R 4,099,788

CLASS 302

2 R 4,099,789

CLASS 303

7 4,099,790
24 F 4,099,791
113 4,099,792
116 4,099,793

CLASS 305

13 4,099,794
18 4,099,795
46 4,099,796
54 4,099,797

CLASS 307

41 4,100,426
87 4,100,427
97 4,100,428
205 4,100,429
4,100,430
213 4,100,431
229 4,100,432
4,100,433
252 L 4,100,434
262 4,100,435
296 R 4,100,436
297 4,100,437
304 4,100,438

CLASS 308

3.5 4,099,798
5 R 4,099,799
6 R 4,099,800
9 4,099,801
4,099,802
215 4,099,803
237 R 4,099,804
240 4,099,805

CLASS 310

57 4,100,439
89 4,100,440
103 4,100,441
164 4,100,443
184 4,100,444
317 4,100,442

CLASS 312

117 4,099,806
138 R 4,099,808
140.2 4,099,809
183 4,099,810
211 4,099,811
214 4,099,812
243 4,099,813
317 R 4,099,814
330 R 4,099,815

CLASS 313

101 4,100,445
161 4,100,446
217 4,100,447
318 4,100,448
337 4,100,449
360 4,100,450
404 4,100,451
408 4,100,452
417 4,100,453
495 4,100,454
496 4,100,455
497 4,100,456

CLASS 315

5.51 4,100,457
39.55 4,100,458
127 4,099,807
136 4,100,459
162 4,100,460
169 TV 4,100,461
179 4,100,462
205 4,100,463
297 4,100,476
397 4,100,464

CLASS 318

41 4,100,465
102 4,100,466
220 R 4,100,467
221 C 4,100,468
227 4,100,469
466 4,100,470
685 4,100,471
4,100,472
696 4,100,473

CLASS 320

17 4,100,474
35 4,100,475

CLASS 323

19 4,100,477
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CLASS 324

4 4,100,481
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208 4,100,485
254 4,100,492

CLASS 325

38 B 4,100,493
4,100,494
323 4,100,495
369 4,100,496
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CLASS 328

14 4,100,498

CLASS 329

50 4,100,499
103 4,100,500

CLASS 330

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263 4,100,501
264 4,100,502

CLASS 331

1 A 4,100,503
39 4,100,504
71 4,100,505
94.5 G 4,100,507
94.5 H 4,100,508
94.5 L 4,100,509
107 A 4,100,511
107 R 4,100,510
158 4,100,512

CLASS 333

6 4,100,516
31 A 4,100,514
70 T 4,100,513
71 4,100,306
80 R 4,100,515

CLASS 335

37 4,099,865
132 4,100,517
212 4,100,518
262 4,100,519

CLASS 336

30 4,100,520
100 4,100,521

CLASS 337

68 4,100,522
163 4,100,523

CLASS 338

2 4,100,524
195 4,100,525
279 4,100,526

CLASS 339

17 CF 4,099,816
22 B 4,099,817
45 R 4,099,818
75 M 4,099,819
88 R 4,099,820
91 R 4,099,821
98 4,099,822
113 B 4,099,823
157 C 4,099,824
177 E 4,099,825
198 R 4,099,826
228 4,099,827
258 F 4,099,828

CLASS 340

10 4,100,527
18 LD 4,100,528
32 4,100,529
53 4,100,530
146.1 E 4,100,531
146.3 MA 4,100,532
147 R 4,100,533
149 A 4,100,534
166 R 4,100,535
207 R 4,100,536
324 M 4,100,540
347 DD 4,100,541
403 Re.29,701
518 4,100,542
521 4,100,543
546 4,100,539
617 4,100,538
626 4,100,537

CLASS 343

6.5 R 4,100,544
7 ED 4,100,545
708 4,100,546
721 4,100,547
837 4,100,548

CLASS 346

140 A 4,100,549
140 R 4,100,550
162 4,100,551
4,100,552

CLASS 350

6.1 4,099,829
6.8 4,099,830
9 4,099,831
96.14 4,099,836
96.21 4,099,832
96.25 4,099,833
96.29 4,099,837
96.30 4,099,835
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105 4,099,838
166 4,099,840
173 4,099,841
175 E 4,099,842
176 4,099,843
184 4,099,844
4,099,845
186 4,099,846
187 4,099,847
189 4,099,848
214 4,099,849
215 4,099,850
246 4,099,851
247 4,099,852
310 4,099,853
312 4,099,854
333 4,099,855
350 4,099,856
351 4,099,857
357 4,099,839

CLASS 351

62 4,099,858
160 4,099,859

CLASS 354

64 4,100,553
145 4,100,554
166 4,100,555
4,100,556
225 4,100,557
271 4,100,558
277 4,100,559
307 4,100,560

CLASS 355

3 SC 4,099,863
14 4,099,860
15 4,099,861
35 4,099,862
37 4,099,864
58 4,099,866
73 4,099,867
106 4,099,868
108 4,099,869

CLASS 356

28 4,099,870
73 4,099,871
85 4,099,872
86 4,099,873
102 4,099,874
103 4,099,875
106 LR 4,099,876
124 4,099,877
128 4,099,878
141 4,099,879
164 4,099,880
171 4,099,881
181 4,099,882
187 4,099,883
200 4,099,884
223 4,099,885
244 4,099,886

CLASS 357

13 4,100,561
19 4,100,562
27 4,100,563
46 4,100,564
51 4,100,565
70 4,100,566

CLASS 358

8 4,100,567
21 4,100,568
22 4,100,569
44 4,100,570
87 4,100,571
93 4,100,572
113 4,100,573
4,100,574
120 4,100,575
128 4,100,576
4,100,577
191 4,100,578
230 4,100,579
260 4,100,580

CLASS 360

12 4,100,581
80 4,100,582
113 4,100,583
125 4,100,584
130 4,100,585

CLASS 361

58 4,100,586
82 4,100,587
127 4,100,588
399 4,100,589

CLASS 362

16 4,100,590
190 4,100,591
191 4,100,592
267 4,100,593
308 4,100,594

CLASS 363

133 4,100,595
148 4,100,596

CLASS 364

200 4,100,601
474 4,100,597
476 4,100,598
565 4,100,599
710 4,100,600
715 4,100,602
771 4,100,603
827 4,100,604
900 4,100,605
4,100,606
4,100,607

CLASS 365

2 4,100,608
87 4,100,609

CLASS 366

102 4,100,610
139 4,100,611
143 4,100,612
4,100,613
154 4,100,614
169 4,100,615
188 4,100,617
213 4,100,616
297 4,100,618

CLASS 400

4 4,099,606

CLASS 403

4,099,887
172 4,099,888

CLASS 408

239 R 4,099,889

CLASS 415

170 A 4,099,890
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134 A 4,099,892

CLASS 417

300 4,099,893
499 4,099,894
4,099,895

CLASS 418

184 4,099,896

CLASS 423

34 4,100,250
63 4,100,251
68 4,100,252
87 4,100,253
163 4,100,254
210 4,100,255
220 4,100,256
226 4,100,257
242 4,100,258
4,100,259
4,100,260
309 4,100,261
329 4,100,262
345 4,100,233
383 4,100,263
430 4,100,264
449 4,100,265
574 R 4,100,266

CLASS 424

1 4,100,267
12 4,100,268
49 4,100,269
54 4,100,270
78 4,100,271
92 4,100,272
117 4,100,273
177 4,100,274
211 4,100,275
238 4,100,276
244 4,100,277
4,100,278
246 4,100,280
4,100,281
4,100,282
248.5 4,100,283
250 4,100,284
4,100,285
251 4,100,286
4,100,287
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266 4,100,289
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273 R 4,100,292
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4,100,161
4,100,293
275 4,100,294
278 4,100,295
4,100,296
304 4,100,297
4,100,298
325 4,100,170
330 4,100,299
343 4,100,300

CLASS 425

4 C 4,099,897
192 S 4,099,898
222 4,099,899
313 4,099,900
388 4,099,901
4,099,902
4,099,903
533 4,100,307
563 4,099,904
589 4,099,905

CLASS 426

3 4,100,301
90 4,100,302
106 4,100,303
281 4,100,304
385 4,100,305
386 4,100,306
554 4,100,308

CLASS 427

2 4,100,309
8 4,100,310
44 4,100,311
96 4,100,312
130 4,100,326
162 4,100,313
228 4,100,314
379 4,100,315

CLASS 428

10 4,100,316
137 4,100,317
159 4,100,318
171 4,100,319
188 4,100,320
207 4,100,321
257 4,100,322
280 4,100,323
288 4,100,324
334 4,100,325
339 4,100,327
407 4,100,328
413 4,100,329
414 Re.29,699
429 4,100,330

CLASS 429

13 4,100,331
27 4,100,332
156 4,100,333

CLASS 431

66 4,099,906
254 4,099,907
284 4,099,908

CLASS 432

124 Re.29,696

CLASS 521

38 4,100,113
83 4,100,115
167 4,100,116
175 4,100,114

CLASS 526

1 4,100,334
10 4,100,335
21 4,100,137
67 4,100,336
68 4,100,142
90 4,100,140
130 4,100,337
142 4,100,338
193 4,100,339
245 4,100,340
262 4,100,138
301 4,100,141
4,100,143

CLASS 528

10 4,100,134
11 4,100,135
4,100,136
116 4,100,111
196 4,100,139
312 4,100,145
313 4,100,146
362 4,100,147
374 4,100,148

CLASS 536

56 4,100,341
103 4,100,342

CLASS 542

426 4,100,343

CLASS 544

21 4,100,344
4,100,345
27 4,100,346
49 4,100,347
225 4,100,158
277 4,100,159

CLASS 548

310 4,100,348
337 4,100,349

CLASS 560

20 4,100,350
24 4,100,351
53 4,100,352
55 4,100,353
89 4,100,354
121 4,100,355
4,100,356
4,100,357
180 4,100,358
232 4,100,359
4,100,360
244 4,100,361
246 4,100,362
255 4,100,363

CLASS 568

730 4,100,202
4,100,203
4,100,204
4,100,205
4,100,206
804 4,100,207
902 4,100,208
918 D 4,100,209

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	270	248,427		137	248,439		71	248,456			248,470			248,484	D34—	15 PP	248,498
	309	248,428		208	248,443		81	248,457		34	248,471	D23—	4	248,485	D48—	2	248,499
		248,429	D8—	302	248,444	D11—	88	248,458		70	248,472		90.1	248,486			248,500
D6—	36	248,430		310	248,445		96	248,459		71	248,473			248,487		20 F	248,501
	63	248,431		323	248,446	D12—	55	248,460	D15—	29	248,474	D24—	1.1	248,488		23 R	248,502
	72	248,432		354	248,447		85	248,461		30	248,475		3	248,489			248,503
	125	248,433	D9—	10	248,448		192	248,462		63	248,476		17	248,490		24 R	248,504
		248,434		111	248,449		194	248,463		66	248,477		25	248,491		36	248,505
	159	248,435		128	248,450	D13—	17	248,464		71	248,478		33	248,492	D52—	2 B	248,506
	167	248,436		184	248,451		24	248,465		135	248,479		36	248,493	D87—	1 R	248,507
	168	248,437		190	248,452		32	248,466			248,480		54	248,494			248,508
	241	248,438		254	248,453	D14—	6	248,467			248,481			248,495		5 F	248,509
D7—	61	248,440	D10—	50	248,454			248,468	D16—	32	248,482	D25—	5	248,496	D88—	5	248,510
	75	248,441															

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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4 : 4,100,003
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Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,272,120, Re. S.N. 901,002, Filed Apr. 27, 1978, Cl. 101/56, ADDRESS PRINTING MACHINE WITH ROLLER PLATENS, Dean W. Johnson, Owner of Record: *Addressograph-Multigraph Corporation, Cleveland, Ohio,* Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 337

3,766,663, Re. S.N. 901,019, Filed Apr. 27, 1978, Cl. 34/168, PREHEATER FOR LIME KILN, Marshall F. Parsons, Owner of Record: *Detroit Lime Company, Detroit, Mich.*, Attorney or Agent: Paul F. Seibold, et al., Ex. Gp.: 344

3,770,727, Re. S.N. 905,569, Filed May 12, 1978, Cl. 260/240.8, NOVEL BASIC PYRAZOLINE DYES, Alfred Brack, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 117

3,824,064, Re. S.N. 901,767, Filed May 1, 1978, Cl. 431/328, INFRA-RED PROCESS BURNER, Rudolph S. Bratko, Owner of Record: *Slyman Manufacturing Corp., Cleveland, Ohio,* Attorney or Agent: Lowell L. Heinke, Ex. Gp.: 344

3,892,139, Re. S.N. 904,004, Filed May 8, 1978, Cl. 74/116, VARIABLE SPEED TRANSMISSION, Trevor L. Harris, Owner of Record: *Harris Dynamics, Costa Mesa, Calif.*, Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 345

3,913,947, Re. S.N. 904,005, Filed May 8, 1978, Cl. 280/236, VEHICLE WITH VARIABLE SPEED TRANSMISSION, Trevor L. Harris, Owner of Record: *Harris Dynamics, Costa Mesa, Calif.*, Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 316

3,957,176, Re. S.N. 907,278, Filed May 18, 1978, Cl. 222/185, DISPOSABLE PUTTY DISPENSER, Lloyd E. Marston, Owner of Record: *Dynatran/Bondo Corporation, Atlanta, Ga.*, Attorney or Agent: Harold D. Jones, Jr., et al., Ex. Gp.: 311

3,980,751, Re. S.N. 909,589, Filed May 25, 1978, Cl. 423/54, ION EXCHANGE CHROMATE REMOVAL, Frank R. Foulkes, Owner of Record: *Huron Chemicals Limited, Kingston, Ontario, Canada,* Attorney or Agent: George H. Spencer, et al., Ex. Gp.: 113

3,988,647, Re. S.N. 899,096, Filed Apr. 21, 1978, Cl. 361/397, METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY, Donald A. Bolon, et al., Owner of Record: *General Electric Company, Schenectady, N.Y.*, Attorney or Agent: John F. McDevitt, et al., Ex. Gp.: 217

4,011,052, Re. S.N. 863,543, Filed Dec. 23, 1977, Cl. 75/231, ELECTRICAL CONTACT MATERIAL AND PROCESS, Terrence Ardern Davies, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard T. Guttman, et al., Ex. Gp.: 223

4,011,053, Re. S.N. 863,542, Filed Dec. 23, 1977, Cl. 75/231, ELECTRICAL CONTACT MATERIAL AND PROCESS, Terrence Ardern Davies, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard T. Guttman, et al., Ex. Gp.: 223

4,014,039, Re. S.N. 908,655, Filed May 23, 1978, Cl. 360/72, AUTOMATIC PROGRAM LOCATOR FOR TAPE DECKS, Tatsuhiro Yasunaga, Owner of Record: *Sharp Kabushiki Kaisha,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 235

4,020,854, Re. S.N. 907,274, Filed May 18, 1978, Cl. 132/9, DEVICE AND METHOD FOR PROGRAMMED HAIR COLORING, Lorenzo Caruso, Owner of Record: *Inventor,* Attorney or Agent: Alfons Puishes, Ex. Gp.: 333

4,022,481, Re. S.N. 907,962, Filed May 22, 1978, Cl. 277/96.1, COMPLIANT STRUCTURAL MEMBERS, John V. Long, et al., Owner of Record: *International Harvester Co., San Diego, Calif.*, Attorney or Agent: Richard D. Multer, et al., Ex. Gp.: 241

4,036,244, Re. S.N. 908,518, Filed May 22, 1978, Cl. 135/4 R, VERTICAL ARCH SHELTER, Carl F. Huddle, Owner of Record: *Tension Structures Company, Pleasant Ridge, Mich.*, Attorney or Agent: None, Ex. Gp.: 354

4,078,270, Re. S.N. 906,769, Filed May 16, 1978, Cl. 5/181, ADJUSTABLE BED-FRAME, Richard A. Nowell, Owner of Record: *Pressed Steel Corporation, Santa Fe Springs, Calif.*, Attorney or Agent: Max Dressler, et al., Ex. Gp.: 357

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4,080,608
4,080,765
4,080,938
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4,082,140

Disclaimers

3,438,706.—*Hiroshi Tanaka, Shinkichi Takahashi,* and *Tetsuo Hasegawa,* Tokyo, and *Toshihiko Sato,* Saitama-ken, Japan. ELECTROPHOTOGRAPHIC DEVICE. Patent dated Apr. 15, 1969. Disclaimer filed Apr 18, 1077. by assignee. *Cannon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2 and 4 of said patent.

3,821,651.—*George H. Fathauer, Decatur, Ill.*, and *Cecil E. Mathis,* Indianapolis, Ind. SCANNING CONTROL CIRCUIT FOR USE IN SIGNAL-SEEKING RADIO RECEIVER. Patent dated June 28, 1974. Disclaimer filed May 25, 1978, by the assignee, *Masco Corporation of Indiana.*

Hereby enters this disclaimer to claims 1–19 of said patent.

3,873,924.—*George H. Fathauer,* Decatur, Ill. SIGNAL SEEKING RADIO RECEIVERS. Patent dated Mar. 25, 1975. Disclaimer, filed May 25, 1978, by the assignee, *Masco Corporation of Indiana.*

Hereby enters this disclaimer to claims 1–17 of said patent.

4,015,127.—*Allen J. Sharkins,* Lower Burrell, Pa. MONITORING FILM PARAMETERS USING POLARIMETRY OF OPTICAL RADIATION. Patent dated Mar. 29, 1977. Disclaimer filed June 5, 1978, by the assignee, *Aluminum Company of America.*

Hereby enters this disclaimer to all claims of said patent.

4,041,055.—*Kenneth Paul Shephard* and *Verlan H. Van Rheenen,* Portage, Mich. PROCESS FOR THE PREPARATION OF 17-HYDROXYPROGESTERONES AND CORTICOIDS FROM ANDROSTENES. Patent dated Aug. 9, 1977. Disclaimer filed May 22, 1978, by the assignee, *The Upjohn Company.*

Hereby enters this disclaimer to claim 84 of said patent.

4,081,152.—*Cyril Henderson,* Woodland Hills, Calif. DUAL TENSION RETRACTOR. Patent dated Mar. 28, 1978. Disclaimer filed May 30, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

Errata

All reference to Patent No. 4,090,595 to Hugh A. Zindler and Sheldon D. Pollow of Wisconsin for BRAKE RELEASED CLUTCH MECHANISM appearing in the OFFICIAL GAZETTE of May 23, 1078 should be deleted since no patent was granted.

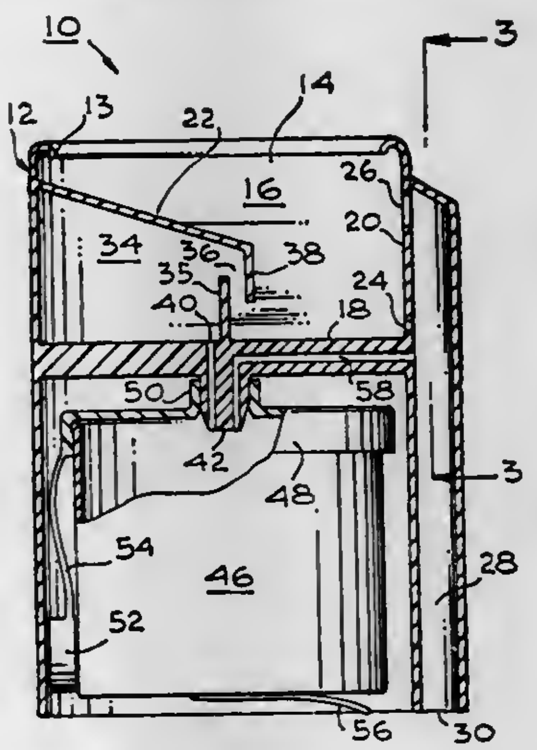
All reference to Patent No. 4,091,051 to Ronald Anthony Fava of Pennsylvania for THERMOPLASTIC MOLDING COMPOSITION COMPRISING STYRENE-MALEIMIDE AND POLYCARBONATE appearing in the OFFICIAL GAZETTE of May 23, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,093,494 to Wolfgang Neidhart of Switzerland for WELDING DEVICE FOR WELDING PLASTIC STRIPS appearing in the OFFICIAL GAZETTE of June 6, 1978 should be deleted since no patent was granted.

All reference to Patent No. 4,095,009 to Colin Anolick, Vivian Marie Robinson, and Charles Winfield Stewart, Sr. of Delaware for UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE appearing in the OFFICIAL GAZETTE of June 13, 1978 should be deleted since no patent was granted.

SPECIAL ERRATUM

The drawing shown under Patent No. 4,040,791 on page 707 in the OFFICIAL GAZETTE of August 9, 1977 is in error. The following drawing should have been printed instead:



National Technical Information Service

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half Street, SW.
Washington, D.C. 20324

Patent application 706,048. Simplified High Accuracy Guidance System. Filed July 20, 1976.

Patent application 858,972. Laser Ranger Test System. Filed Dec. 9, 1977.

Patent application 863,026. Readily Curable Fluorocarbon Ether Bibenzoxazole Polymers. Filed Dec. 21, 1977.

Patent application 865,271. Monophospha-S-Triazines. Filed Dec. 28, 1977.

Patent application 865,467. Breech Closure Mechanism. Filed Dec. 29, 1977.

Patent application 865,754. 3db Hybrid Coupler Switch. Filed Dec. 29, 1977.

Patent application 865,755. Disappearing Alignment Marks for Election Beam Pattern Generation. Filed Dec. 29, 1977.

Patent application 866.143. Offset Correction Apparatus for a Successive Approximation A/D Converter. Filed Dec. 30, 1977.

Patent application 866.144. Modulating Vernier Flap Control System. Filed Dec. 30, 1977.

Patent application 866.185. Method for Prestressing Turbine Disks. Filed Dec. 30, 1977.

Patent application 866.187. Broadband Waveguide Lens Antenna and Method of Fabrication. Filed Dec. 30, 1977.

Patent application 866.189. Precision Pointing and Tracking Control System. Filed Dec. 30, 1977.

Patent application 866,432. Radiation Dose Rate Hardened Light Detector. Filed Jan. 3, 1978.

Patent application 866,433. Nonlinearly Variable Gain Apparatus. Filed Jan. 3, 1978.

Patent application 866,725. An Altitude Simulator. Filed Jan. 3, 1978.

Patent application 866.726. Composite Fan Blade Platform Double Wedge Centrifugal Seal. Filed Jan. 3, 1978.

Patent application 866.741. Containment and Release Device for Fluids. Filed Jan. 3, 1978.

Patent application 866,742. Wide Band Adjustable Brewster Angle Polarizer. Filed Jan. 3, 1978.

Patent application 866,743. Direct Frequency Synthesizer. Filed Jan. 3, 1978.

Patent application 868,354. A Selectable Servo Ratio and Dual Speed Control System for Large Centrifuge Units. Filed Jan. 10, 1978.

Patent application 868.355. Fluoroalkyleneether Silicate Copolymers. Filed Jan. 10, 1078.

Patent application 871,067. Adding Frequency Agility to Fire-Control Radars. Filed Jan. 20, 1978.

Patent application 871,866. Improved Fabry-Perot Diplexer. Filed Jan. 24, 1978.

Patent 4,068,903. Adaptive Skid Detector Threshold Apparatus. Filed Dec. 8, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,977. Jet Engine Tail Pipe Flow Deflector. Filed May 11, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,069,999. Spring Type Dogging Device. Filed Nov. 10, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,205. Aluminum Arsenide Eutactic Gallium Arsenide Solar Cell. Filed Dec. 8, 1076. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,591. Error Corrected Error Amplifier. Filed July 19, 1976. Patented Jan. 24, 1078. Not available NTIS.

Patent 4,070,595. Apparatus for the Acceleration of Ions in the Virtual Cathode of an Intense Relativistic Electron Beam. Filed Dec. 8, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,636. Plural Loop Spark Gap RF Pulse Radiation Converter. Filed Nov. 24, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,071,864. Flexible Recording Head Mounting Assembly. Filed Jan. 16, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services Division., Federal Bldg., Agricultural Research Service
Hyattsville, Md. 20782

Patent application 880,000. Synthetic Cephalotaxine Esters Having Antileukemic Activity. Filed Feb. 22, 1978.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 3,986,490. Reducing Heat Loss From the Energy Absorber of a Solar Collector. Filed July 24, 1975. Patented Oct. 19, 1976. Not available NTIS.

Patent 4,018,654. Pretreatment of Coal During Transport. Filed Sept. 5, 1974. Patented Apr. 19, 1977. Not available NTIS.

Patent 4,018,663. Coal Liquefaction Process. Filed Jan. 5, 1976. Patented Apr. 17, 1977. Not available NTIS.

Patent 4,025,317. High Pressure Rotary Piston Coal Feeder for Coal Gasification Applications. Filed Aug. 12, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,026,356. Method for In Situ Gasification of a Subterranean Coal Bed. Filed Apr. 29, 1976. Patented May 31, 1977. Not available NTIS.

Patent 4,032,618. Conversion of Ammonia Into Hydrogen and Nitrogen by Reaction With a Sulfided Catalyst. Filed May 11, 1976. Patented June 28, 1977. Not available NTIS.

Patent 4,060,867. Cyclic Flow Underground Coal Gasification Process. Filed Dec. 17, 1076. Patented Dec. 17, 1976. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Building, Bethesda, Md. 20014

Patent application 843,367. Method of Employing Oral TRH. Filed Oct. 19. 1977.

Patent application 855,910. 1,2-Diaminocyclohexane Platinum (II) Complexes Having Antineoplastic Activity. Filed Nov. 29, 1977.

Patent application 865,985. Enhancement of Cholesterol Combining Properties of Saponins. Filed Dec. 30, 1977.

Patent application 873,704. Powder Blower Device. Filed Jan. 30, 1978.

Patent 4,074,367. Prosthetic Load-Lift Hook Locking Mechanism. Filed Sept. 16, 1976. Patented Feb. 21, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 840,939. Fluidic Combustion of a Solid Fuel Ramjet. Filed Oct. 11, 1977.

Patent application 852,646. Parabolic Optical Waveguide Horns and Design Thereof. Filed Nov. 18, 1977.

Patent application 858,873. Wide Field-of-View Michelson Filter. Filed Dec. 8, 1977.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

Patent application 873,993. A System for Delivering $SiCl_4$ to a Chemical Reactor. Filed Jan. 31, 1978.

Patent application 876,298. Drop Foot Corrective Device. Filed Feb. 9, 1978.

Patent application 876,299. Solar Cell Angular Position Transducer. Filed Feb. 9, 1978.

Patent application 876,440. Method and Apparatus for Eliminating Luminol Interference Material. Filed Feb. 9, 1078.

Patent application 876,441. A System and Method for Obtaining Wide Screen Schlieren Photographs. Filed Feb. 9. 1978.

Patent application 878,539. Attaching of Strain Gages to Substrates. Filed Feb. 16, 1978.

Patent application 878,540. Fuselage Structure Using Advanced Technology Metal Matrix Fiber Reinforced Composites. Filed Feb. 16, 1978.

Patent application 883,094. Spacesuit Mobility Joints. Filed Mar. 3, 1978.

Patent 3,514,785. Emergency Space-Suit Helmet. Filed Feb. 24, 1966. Patented June 2, 1970. Not available NTIS.

Patent 4,055,004. Full Color Hybrid Display for Aircraft Simulators. Filed Oct. 17, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,416. Tantalum Modified Ferritic Iron Base Alloys.. Filed Jan. 21, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,447. Directionally Solidified Eutectic Gamma-Gamma Nickel-Base Superalloys. Filed May 7. 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,705. Thermal Barrier Coating System. Filed May 14, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,068,495. Closed Loop Spray Cooling Apparatus. Filed Mar. 31, 1976. Patented Jan. 17, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 20, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-22-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-11-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-1-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-5-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications: Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-3-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. G. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-10-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-3-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents .... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents .... Numbers 2,055 to 2,066, inclusive

REISSUES

JULY 18, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

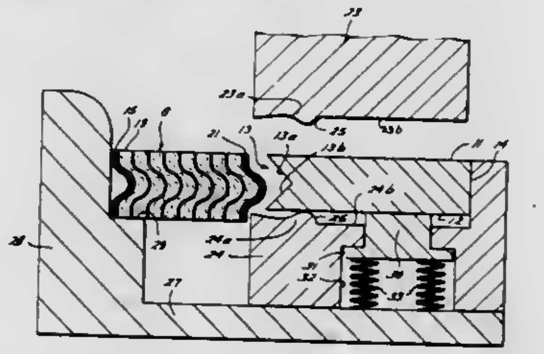
Re. 29,702
SPIRAL WOUND GASKET ASSEMBLY METHOD

A. B. Owen, and Bruce M. Gifford, both of Harris County, Tex., assignors to Lamons Metal Gasket Company, Houston, Tex.

Original No. 4,019,244, dated Apr. 26, 1977, Ser. No. 658,509, Feb. 17, 1976. Application for reissue Jun. 16, 1977, Ser. No. 807,314

Int. Cl.^{2} B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—520 **9 Claims**



1. A method of forming a spiral wound gasket assembly having a gasket ring and an [ouer] *outer* metal gauge ring with flat [guide] *gauge* surfaces between an inner groove and an outer peripheral edge, wherein the improvement comprising the steps of:

forming a spiral gasket ring with the exterior diameter of the ring allowing positioning of the ring in the gauge ring groove;

positioning the gasket ring within the gauge ring; and

deforming a portion of the gauge ring to reduce the size of the gauge ring groove to tighten and retain the gasket ring within the groove.

Re. 29,703
NON-INVASIVELY MEASURING ARTERIAL OXYGEN TENSION

Irving Fatt, Berkeley, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Original No. 3,893,444, dated Jul. 8, 1975, Ser. No. 434,191, Jan. 17, 1974. Continuation-in-part of Ser. No. 273,422, Jul. 20, 1972, abandoned. Application for reissue Mar. 22, 1976, Ser. No. 668,867

Int. Cl.^{2} A61B *5/00*

U.S. Cl. 128—2 E **14 Claims**

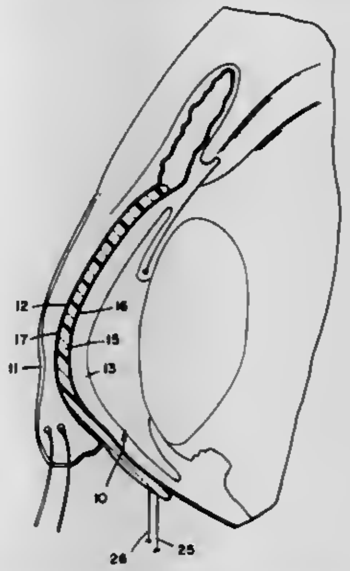
13. Apparatus for non-invasively indicating continuous arterial oxygen tension of a patient, comprising

1. a scleral contact lens member having an oxygen-sensing electrode assembly secured to said lens member and sensing at the outer surface thereof, so that said contact lens member can be placed between the cornea of the patient's eye and his eyelid,

2. means for applying voltage to said electrode,

3. means for sensing the current passed, and

4. means indicating said sensed current in relation to the oxygen tension as modified by factors corresponding to the relation between the slope and origin of the arterial oxygen tension to palpebral conjunctival oxygen tension.



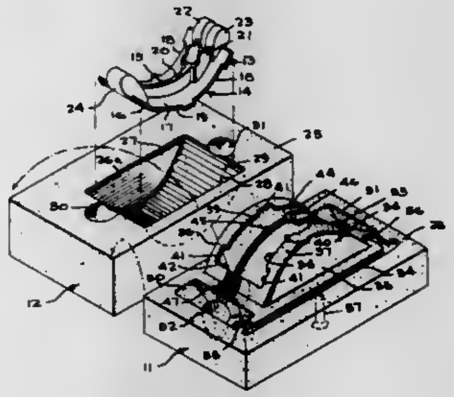
Re. 29,704
METHOD OF CASTING BRAKE SHOES

Harry D. Bradshaw, Cordele, Ala.; Roland W. McKenzie, Culpeper, Va., and Hunter R. McKinney, Laurinburg, N.C., assignors to Standard Forge and Axle Co., Montgomery, Ala.

Original No. 3,753,460, dated Aug. 21, 1973, Ser. No. 174,634, Aug. 25, 1971. Application for reissue Apr. 7, 1976, Ser. No. 674,319

Int. Cl.^{2} B22C *9/22;* **B22D** *23/00*

U.S. Cl. 164—131 **8 Claims**



1. A method of casting a brake shoe having an arcuate table section and at least one rib section disposed on the concave side of said table section comprising forming at least one mold cavity and cooperating sprue, runner and riser cavities in the cope and drag sections of a mold assembly, so that the axis of curvature of the mold surface forming the outer surface of the table section of the resultant cast brake shoe is disposed substantially parallel to the parting plane of said cope and drag sections *forming said outer surface of said table section entirely in one of said sections as said continuous arcuate surface suitable for mounting a brake lining thereon,* assembling the cope and drag sections of the mold assembly so that said cavities are cooperatively related, pouring molten metal through said sprue and runner into said mold cavities, and removing the cast brake shoe from the mold assembly.

Re. 29,705
RUPTURABLE BLISTER PILL PACKAGE WITH SAFETY BACKING

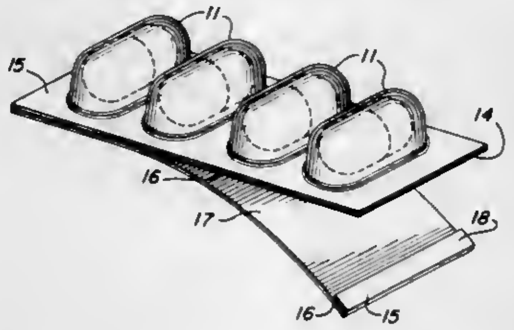
Newton L. Compere, 3202 Heiden Dr., Lake Bluff, Ill. 62621
Original No. 3,809,221, dated May 7, 1974, Ser. No. 296,192, Oct. 10, 1972. Application for reissue May 4, 1976, Ser. No. 683,091
Int. Cl.² B65D *83/04*
U.S. Cl. 206—531 **15 Claims**

1. A protective childproof package comprising:

a first sheet having at least one flexible blister which forms a compartment, said at least one blister being adapted to receive a *salid* medicament; said first sheet having a line of weakening along one edge;

a second sheet of rupturable material *coextensive with said first sheet having no perforations above said compartment, and* secured *along its entire surface, except below said blister,* to the first sheet, closing and sealing said compartment formed by the blister in the first sheet; and having a line of weakening along one edge so that when secured to the first sheet, the line of weakening in said first and second sheets are on the same edge of the package; and

a third imperforate sheet *coextensive with said second sheet and* sealably secured *along its entire surface* to the second sheet which third sheet has sufficient strength so that it can neither be ruptured nor forced out of engagement with the second sheet when force is applied to the medicament from the blister side of the package.



PLANT PATENTS

GRANTED JULY 18, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,280
CHRYSANTHEMUM PLANT

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.
Filed May 17, 1977, Ser. No. 798,089
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its medium sized white blooms which appear in a clubby spray formation, its excellent performance as a spring, summer and fall potted plant and as a natural season garden flower, its uniform 7-week photoperiodic flowering response under greenhouse potted plant culture, its normally tall, upright growth habit, and its tolerance of high soluble salt conditions.

4,281
ROSE PLANT

Samuel D. McGredy, P.O. Box 14-100, Auckland, New Zealand
Filed Sep. 19, 1977, Ser. No. 834,504
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by high centered, attractive bicolored flowers with thick petals and good substance, borne primarily singly and having a spiral, circular outline, and a vigorous, upright growing plant habit, with long stems and large foliage, and of particularly good disease resistance.

4,282
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia St., Ontario, Calif. 91761
Filed Sep. 29, 1977, Ser. No. 837,747
Int. Cl.² A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of Rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a very large cherry pink to a rosey red bloom, the bloom comprising exceptionally large individual petals, with a large quantity of petals, the large quantity and size of petals providing a much more rounded large bud, the petals being translucent and appearing to be almost silken and of great substance, the ability to hold longer as a garden flower and cut rose, and the plant being less leggy and open with fewer thorns and more waxy foliage leaflets.

PATENTS

GRANTED JUL. 18, 1978

ERRATA

For CLASS	See PATENT NO.
242–031	4,100,658
180–006.2	4,101,004
400–144.3	4,101,006
400–124	4,101,017
400–582	4,101,018
229–034 R	4,101,048
229–002.5 R	4,101,049
229–003.5 R	4,101,050
229–017 R	4,101,051
229–023 R	4,101,052
296–037.7	4,101,062
235–092 MT	4,101,071
366–142	4,101,116
272–097	4,101,136
350–096.24	4,101,188
428–624	4,101,328
250–504	4,101,424
521–028	4,101,460
521–032	4,101,461
521–115	4,101,462
521–088	4,101,464
521–118	4,101,465
521–115	4,101,466
521–079	4,101,467
521–115	4,101,468
521–083	4,101,469
521–118	4,101,470
521–121	4,101,471
521–085	4,101,472
526–193	4,101,513
528–109	4,101,514
252–182	4,101,515
528–112	4,101,516
528–271	4,101,517
528–100	4,101,518
528–197	4,101,519
528–248	4,101,520
528–242	4,101,521
528–292	4,101,522
528–309	4,101,523
528–288	4,101,524
528–309	4,101,525
528–179	4,101,526
528–073	4,101,527
528–067	4,101,529
528–045	4,101,530
528–315	4,101,531

ERRATA – Continued

528–311	4,101,532
528–491	4,101,533
544–408	4,101,546
544–294	4,101,547
544–284	4,101,548
544–301	4,101,549
544–387	4,101,550
165–014	4,101,886

PATENTS

GRANTED JULY 18, 1978

GENERAL AND MECHANICAL

4,100,619

PROTECTIVE HELMET

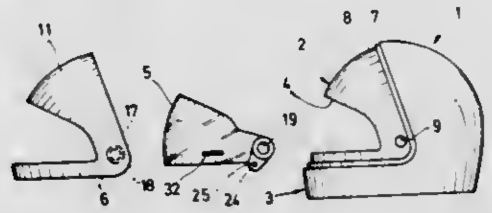
Corina Piëch, Gänkopf No. 30, 7000 Stuttgart 1, Fed. Rep. of Germany, and Wolfram Schleicher, Stuttgart, Fed. Rep. of Germany, assignors to Corina Piëch, Stuttgart, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,151

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603490; Mar. 2, 1976, 2608626; Aug. 23, 1976, 7626308[U]

Int. Cl.^{2} A61F *9/00*

U.S. Cl. 2—10 **7 Claims**



1. A protective helemt, comprising
(a) a hollow generally hemi-spherical helmet shell member (41) open at its bottom end and including a front portion containing a viewing window opening (44);
(b) an annular transparent visor member (45) arranged concentrically within said shell member opposite said window opening, said visor member being arranged with its axis extending vertically, said visor member having a diameter corresponding generally with the horizontal diameter of said shell member and containing a window opening; and
(c) means (42, 43) connecting said visor member with said shell member for rotation about its vertical axis, said visor member being rotatable between an open position in which said visor window opening and said helmet shell window opening are in alignment, and a closed position in which the transparent portion of said visor member is opposite said helmet shell window opening.

4,100,620

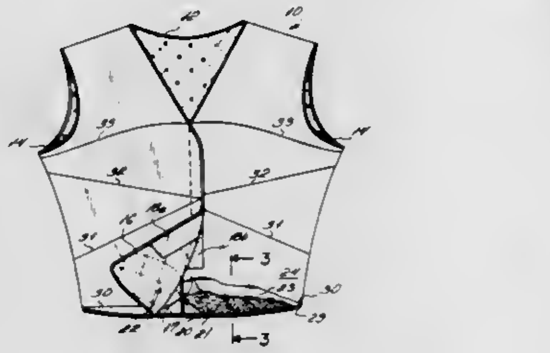
BODY PROTECTOR

Ann Pecoraro, 389 W. Valley Stream Blvd., Valley Stream, N.Y. 11580

Filed Feb. 20, 1976, Ser. No. 659,831

Int. Cl.^{2} A41D *1/04*

U.S. Cl. 2—102 **7 Claims**



1. A protective garment for sports use comprising:
an outer ply of cloth;
an inner ply of cloth;
a ply of foamed polyethylene padding between said inner and outer plies of cloth;
a ply of fibrous padding between the said ply of foamed polyethylene padding and said inner ply of cloth; and
the plies of cloth and padding being permanently stitched together.

4,100,621

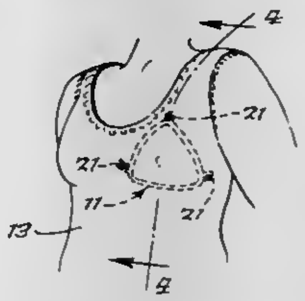
ARTIFICIAL BREAST AND NIGHTGOWN INCORPORATING SAME

Marion Carol Ettipio, 70 Alma Ave., Buffalo, N.Y. 14215

Continuation-in-part of Ser. No. 603,542, Aug. 11, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,090

Int. Cl.^{2} A41D *9/00*

U.S. Cl. 2—114 **3 Claims**



2. A nightgown suitable for fastening thereto of a mastectomy prosthetic article which is a light weight substantially breast-shaped pad of substantially equilateral triangular outline shape when viewed from the front thereof, with a lower side of the triangle being substantially horizontal and with the other two upper sides being rounded, with the pad being of rounded substantially conical shape when viewed from a side, and being composed of a substantially conically shaped front wall, fibrous shaping material sufficient to hold the front wall in desired breast shape and a convexly arcing back wall fastened to the front wall about the sides thereof and retaining the shaping material in the pad, a hook tape held to the upper corner of the pad and extending substantially vertically and away from the pad and hook tapes held to each of the lower corners of the pad and extending substantially horizontally and away from the pad, with the hooks of the hook tapes being on the sides of such tapes facing the nightgown when the article is attached to the nightgown and with the tapes being outside the triangular outline of the pad which comprises pile tapes permanently fastened on the inside of a bosom area of the nightgown and adapted to have the hook tapes of the mastectomy prosthetic article fastened to them to hold such article in place on the inside of the nightgown, while pile tapes are of areas greater than those of the hook tapes and extend beyond the edges of such hook tapes so as to facilitate adjustable fitting of the prosthetic article to the nightgown.

4,100,622

SHIRT CONSTRUCTION

James Edwin Joelg, Jr., 4514 Hamlin, Corpus Christi, Tex. 78411

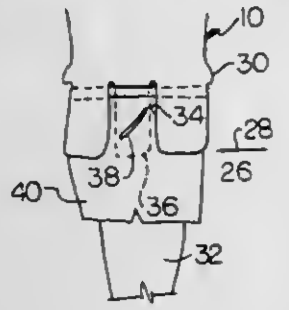
Filed Aug. 30, 1976, Ser. No. 718,477

Int. Cl.^{2} A41D *27/20*

U.S. Cl. 2—115 **7 Claims**

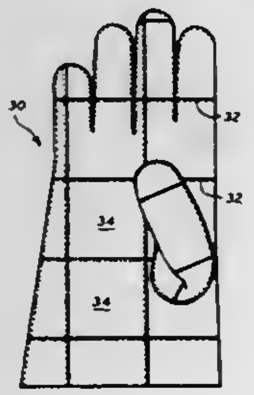
1. An article of apparel comprising
a shirt substantially larger than infant size providing
  a torso encircling portion having
    a front, a back and a pair of sides; and
    a lower peripheral edge residing between the belt line and the thigh of a wearer, the peripheral edge having a pair of reentrant slots, on a side of the torso encir-

cling portion, defining a flap therebetween, the flap being positioned to overlie a pocket on the pants of a wearer and being freely liftable to provide access to said pocket.



4,100,623
GENUINE LEATHER FABRIC AND METHOD FOR MAKING SAME

Murray Strongwater, 822 Moore St., Woodmere, N.Y. 11598
Filed Feb. 10, 1977, Ser. No. 767,508
Int. Cl.^{2} A41D *19/02*
U.S. Cl. 2—158 **3 Claims**

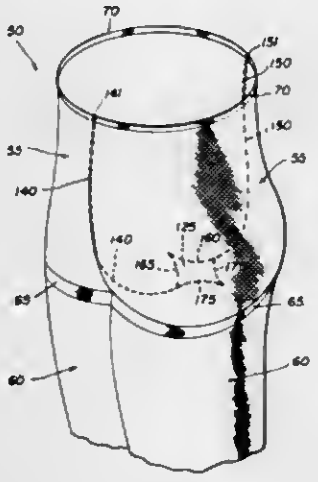


1. A genuine leather glove comprising a plurality of single layer, unsupported geometrical sections cut from genuine leather left over scrap, said sections being of selectively predetermined configurations and being secured to each other in end-to-end and side-by-side relation to form a continuous piece having ornamental characteristics imparted thereto by said secured together sections of predetermined geometrical configuration, said piece being cut into a panel comprising left and right portions in mirror symmetrical relation to each other, each of said portions including four discrete upwardly extending elongated segments, said left and right portions being stitched to each other along their outer and upper periphery to define a glove body having four finger stalls, one of said panel portions having an opening the contour of which has secured thereto a thumb stall made from said piece, whereby the entire glove has imparted thereto the ornamental characteristics of said continuous piece.

4,100,624
METHOD AND APPARATUS FOR FORMING A COMBINATION GARMENT AND PRODUCTS THEREOF

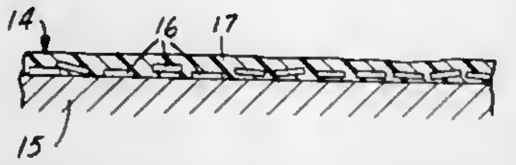
Farris L. Davis, West Fork, Ark., assignor to Bear Brand Hosiery Co., Chicago, Ill.
Filed Jul. 12, 1976, Ser. No. 704,700
Int. Cl.^{2} A41B *9/04*
U.S. Cl. 2—409 **9 Claims**

1. A method of forming a combination garment having a crotch area therein from a crotch piece and two circularly knit tubular blank members each having a leg portion and an upper portion terminating in an open end, the method comprising simultaneously slitting the blank members between the open ends thereof and the areas thereof corresponding to the crotch area of the combination garment to provide longitudinally extending free edges thereon while firmly gripping the blank members adjacent to said free edges and along substantially the entire length of said edges, continuously seaming the free edges on the two blank members between first aligned points adjacent to the open ends thereof and a first predetermined point adjacent to the crotch area to provide a first seam and between a second predetermined point adjacent to the crotch area and second aligned points opposite the first aligned points and adjacent to the open ends of said blank members to provide a second seam, the first and second predetermined points at the inner ends of the first and second seams in the crotch area being spaced apart to provide an opening to receive the crotch piece therebetween, aligning one edge of the crotch piece with one of the free edges on the blank members between the seams in the crotch area and seaming the aligned edges between the crotch end of one of the seams and the crotch end of the other of the seams, and aligning the other edge of the crotch piece with the other of the free edges on the blank members between the seams in the crotch area and seaming the aligned edges between the crotch end of one of the seams and the crotch end of the other of the seams, thereby to form a completed combination garment.



4,100,625
HELMETS AND OTHER ARTICLES REFLECTORIZED WITH RETROREFLECTIVE PLATELET PARTICLES

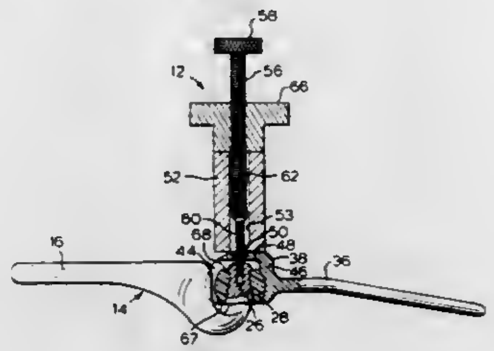
Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation of Ser. No. 743,889, Nov. 22, 1976, abandoned, which is a division of Ser. No. 592,744, Jul. 2, 1975, Pat. No. 4,004,930. This application Jul. 18, 1977, Ser. No. 816,583
Int. Cl.^{2} A42B *1/06*
U.S. Cl. 2—410 **6 Claims**



1. An article carrying on a surface of the article a coating that comprises a transparent binder film and retroreflective platelet particles dispersed in said film; said platelet particles comprising flat segments cut from a larger retroreflective sheeting; the shortest dimension of a face of the segments averaging at least about one-and-one-half times the thickness of the segments and the segments including a monolayer of retroreflective elements optically exposed over at least one face of the segments; the index of refraction of said binder film being such that said segments retroreflect light incident on the film.

4,100,626
WRIST IMPLANT APPARATUS

Robert Charles White, Beamsville, Canada, assignor to Ontario Research Foundation, Mississauga, Canada
Filed Apr. 29, 1977, Ser. No. 792,124
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1.91 **6 Claims**



1. A wrist implant apparatus comprising:
a radial component having an elongated portion for insertion into the radius,
a support portion integral with one end of the elongated portion, and a pin member integral with and supported by the support portion, the pin member being centrally waisted and having its axis substantially at right angles to the said elongated portion,
a ring of low-friction material, the ring having a part-spherical outer surface and a central passageway shaped to be complementary with and to receive said pin member, and
a metacarpal component having an elongated portion for insertion into a metacarpal bone, and a receiving portion defining a part-spherical cavity adapted to receive said ring snugly but rotatably.

4,100,627
LOW OILING GEL FILLED FLEXIBLE ARTICLES AND GELS THEREFOR

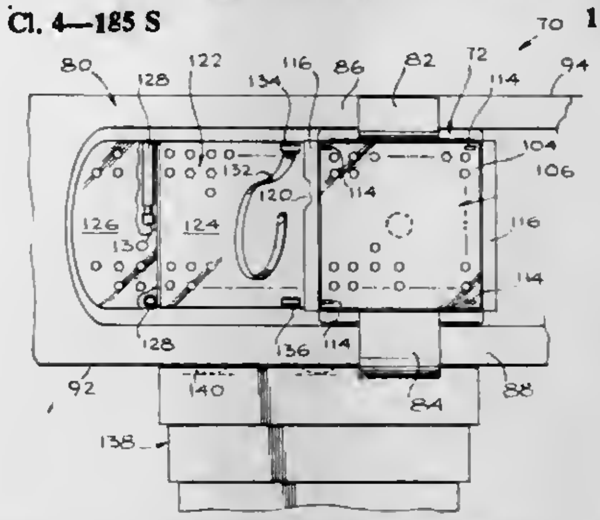
Alfred P. Brill, III, Laurinburg, N.C., assignor to Dow Corning Corporation, Midland, Mich.
Continuation-in-part of Ser. No. 690,706, May 27, 1976, abandoned. This application Dec. 29, 1976, Ser. No. 755,322
Int. Cl.^{2} A61F *1/24;* A41C *3/10*
U.S. Cl. 3—36 **12 Claims**

1. A gel filled flexible article comprising a flexible container having at least a portion of the container wall composed of silicone rubber which is less than 0.0015 meters thick and said silicone rubber comprising a gum which is essentially polydimethylsiloxane, said container containing silicone gel which at least contacts the container wall composed of silicone rubber, said gel has a penetration of from 10 to 60 millimeters and produces a linear swell of the silicone rubber when said silicone rubber is encapsulated in the gel for 21 days at room temperature of less than 5 percent, and said gel comprising a crosslinked essentially polydimethylsiloxane.

11. A silicone gel comprising a crosslinked essentially polydimethylsiloxane having a penetration of from 20 to 60 millimeters being prepared by mixing a methylphenylvinylsiloxy endblocked polydimethylsiloxane having a viscosity of 0.1 to 6 pascal-seconds at 25° C., a sufficient amount of a dimethylhydrogensiloxy endblocked polydimethylsiloxane having a viscosity of less than 5 pascal-seconds at 25° C. to provide an effective viscosity for the methylphenylvinylsiloxy endblocked polydimethylsiloxane of from 4.5 to 30 pascal-seconds at 25° C., a polymethylsiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule present in an amount to provide a ratio of silicon-bonded hydrogen atoms to vinyl radicals in the total composition of from 0.3 to 0.74 and a catalytic amount of a compatible platinum catalyst, and thereafter curing the composition to obtain a gel.

4,100,628
ADJUSTABLE SAFETY SEATING DEVICE FOR BATHTUBS

Gertrude K. Franzl, 105-25 65th Ave., Forest Hills, N.Y. 11375
Filed Feb. 19, 1976, Ser. No. 659,378
Int. Cl.^{2} A47K *3/12*
U.S. Cl. 4—185 S **12 Claims**



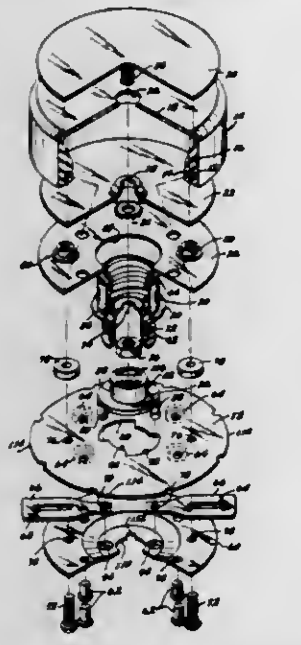
1. An improved adjustable safety seating device for bathtubs, said device comprising, in combination:
a. a support frame including:
  1. a plurality of interconnected, tubular, longitudinally-extending frame members,
    said frame members including a plurality of substantially parallel and horizontally extending telescoping members supported by and conforming to the contour of the base portion of a bathtub,
    said frame members further including a plurality of substantially parallel and vertically extending members lying adjacent to and conforming to the contour of the inner sides of said bathtub, and
  2. frame adjustment means to enable adjustment of the frame members to bathtubs having variable inside dimensions, and
  3. a seat anchoring means including an anchor post and seat positioning means enabling vertical adjustment of a seat member with respect to said anchor post, and
b. a seat including:
  1. a generally horizontal, porous, body-supporting top, and
  2. a generally vertical center post depending from said top and connected to said anchor post through said seat positioning means.

4,100,629
AIRCRAFT LAVATORY DRAIN PLUG

Kendall Jones, North Hollywood, and Boyce M. Hill, Los Angeles, both of Calif., assignors to Viking Industries, Inc., Chatsworth, Calif.
Filed Feb. 7, 1977, Ser. No. 766,017
Int. Cl.^{2} A47K *1/14*
U.S. Cl. 4—295 **27 Claims**

1. A drain plug for axial insertion into a conduit having an inner surface, including
a cup-shaped resilient member having a closed end and an open end and having a sidewall having an outer surface and conforming in configuration to the inner surface of the conduit and with the thickness of the sidewall tapering at the inner wall of the member from the open end to the closed end and thicker at the open end and with the cup-shaped member in a relaxed state slidable into the conduit and in a compressed state having at least the portion of the sidewall adjacent the closed end flexed radially outward and sealed against the inner surface of the conduit,
a first clamp plate disposed on the outer surface of the closed end of the cup-shaped member,
a seal plate disposed to close the open end of the cup-shaped member and spaced from the first clamp plate,
sealing means intercoupling the first clamp plate and the seal plate for providing relative axial movement of the clamp

plate and the seal plate for providing a first spaced relationship between the clamp and the seal plates with the cup-shaped member in the compressed state and for providing a second spaced relationship between the clamp and the seal plates with the cup-shaped member in the relaxed state.



4,100,630
RECLINING FURNITURE

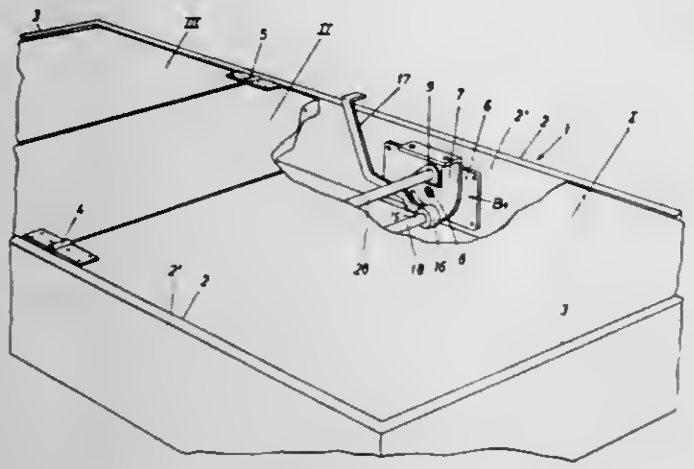
Odo Klose, Am Freudenberg 19, D-5600 Wuppertal 1, and Alfred von Schuckmann, Nordstrasse 32 a, D-5657 Haan, both of Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,457

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602638; Oct. 29, 1976, 2649460

Int. Cl.^{2} A47C *3/32;* A61G *7/10*

U.S. Cl. 5—66 **17 Claims**



1. Reclining furniture having rest surfaces formed in at least two parts, defining rest surface sections hingedly connected with one another, and arranged adjustable in inclination to achieve a seating position such that a gore disposed in the range of a hinge axis is lowered during the raising of a raiseable of the rest surface sections, comprising

a border frame of the reclining furniture having opposite inner surfaces,

two mounting means arranged opposite one another on said opposite inner surfaces of the frame for supporting the raiseable rest surface section and each of said mounting means including

a pivot axle means including a pivot axle for operatively pivotally mounting the raiseable rest surface section, said pivot axle being spaced from the gore and disposed under the raiseable rest surface section,

a second axle,

a lever mounted in pendulum manner on said second axle, said pivot axle being mounted on said lever,

means for blocking at least the pendulum movement of said lever.

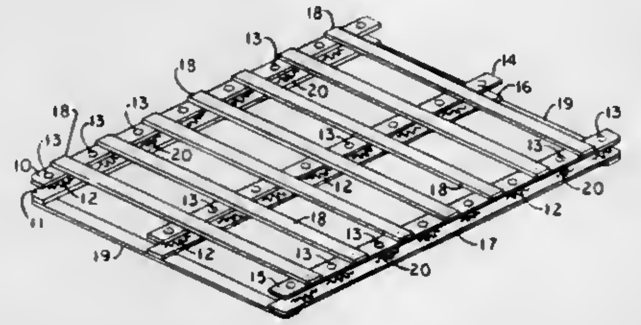
4,100,631
BOX-SPRING ASSEMBLY

Norman Slone, 3954-626 Water Oak Rd., Virginia Beach, Va. 23452

Filed May 13, 1976, Ser. No. 685,781

Int. Cl.^{2} A47C *23/05*

U.S. Cl. 5—239 **7 Claims**



1. A box-spring assembly for use with a conventional bed frame for cooperatively receiving a mattress comprising two pairs of longitudinally extending side support members and at least one pair of intermediate support members, said pairs of support member being spacially aligned and having a top and bottom portion with resilient means therebetween, each resilient means being spaced from said support members by independent upper and lower guard means, said guard means having a hardness greater than said support member, said guard member having sufficient area dimensions to protect said support member when said resilient member is in its compressed configuration, said top portion includes a series of apertures for access to said resilient means, a plurality of transverse bracing members connected to said pairs of support members to maintain spacial alignment of said support members whereby the weight from a mattress placed thereon will be evenly distributed.

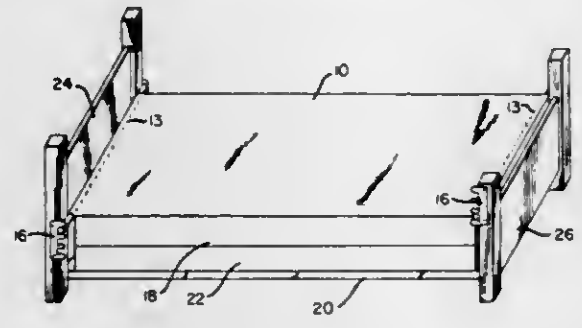
4,100,632
BEDDING

Anna M. Johnson, 37331 Park Ave., Willoughby, Ohio 44094

Filed Aug. 30, 1976, Ser. No. 718,837

Int. Cl.^{2} A47G *9/04*

U.S. Cl. 5—334 R **1 Claim**



1. In combination with a mattress supported on a frame having a headboard and a footboard, a bottom sheet comprising a flat rectangular panel of a size to cover the top of said mattress, means securing the ends of the bottom sheet to the headboard and footboard comprising a hem provided at each end of the bottom sheet, rods positioned in said hems with said rods having ends extending outwardly beyond the edges of said bottom sheet and having wedge-like projections on said extending ends, first spaced brackets secured to said headboard adjacent the top corner of said mattress and at a lower level than second spaced brackets secured to said footboard adjacent the bottom corner of said mattress, each of said brackets being provided with a plurality of vertically spaced notches adapted to receive said wedge-like projections on the ends of said rods, a top sheet and other bedclothing having hems at the foot ends thereof accommodating similar rods, whereby the bottom sheet is secured to appropriate notches in the brackets secured to the footboard and headboard to hold said bottom sheet under tension and the top sheet and other bedclothes are secured at their foot ends in others of said vertically spaced notches in the brackets secured to the footboard.

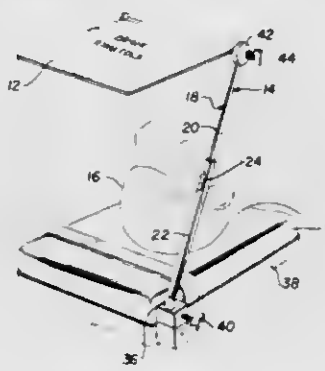
4,100,633
COMBINATION SUN SCREEN AND PILLOW

Jose Luis Pintos, 1004 Park Plz., Isla Verde, P.R. 00913

Filed Apr. 27, 1977, Ser. No. 791,329

Int. Cl.^{2} A47G *9/00*

U.S. Cl. 5—337 **1 Claim**



1. In a combination sun screen and pillow comprising:

(a) a pillow;

(b) a sun screen; and

(c) first means mounting said sun screen on said pillow such that, in use, said sun screen shades the face of the person resting his head on said pillow,

the improvements wherein:

(d) said first means comprises:

(i) at least one telescopically extensible rod whereby the distance between said pillow and said sun screen can be adjusted;

(ii) universal joint means for varying the angle between said pillow and said telescopically extensible rod, whereby said rod can be swung in both directions in the plane of said pillow in order to adjust the orientation of said sun screen relative to said pillow; and

(iii) means for varying the angle between said sun screen and said telescopically extensible rod;

(e) said sun screen comprises second means for holding a book open and in place on the side of said sun screen adjacent to said pillow, whereby a person resting his head on said pillow can read the book;

(f) said sun screen comprises a mirror carried on the side of said sun screen adjacent to said pillow, whereby a person resting his head on said pillow can use said mirror;

(g) a radio is mounted in or on said pillow; and

(h) said pillow contains a double compartment for the retention of the personal belongings of the person using the device.

4,100,634
WATER MATTRESS CONSTRUCTION

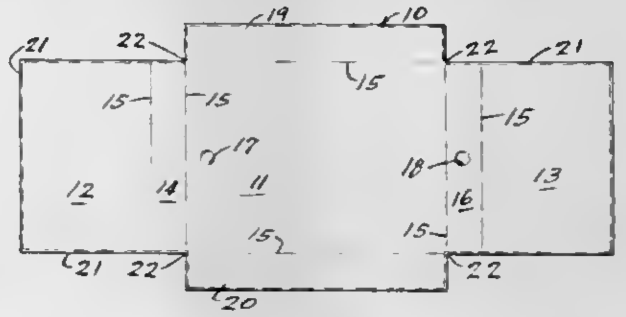
Gary L. Benjamin, Mount Blanchard, Ohio, assignor to Kuss Corporation, Findlay, Ohio

Filed Oct. 6, 1976, Ser. No. 729,906

Int. Cl.^{2} A47C *23/02, 23/04*

U.S. Cl. 5—365 **1 Claim**

1. A water mattress of three-dimensional, rectangular box-like construction fabricated from a unitary sheet of flexible material, said sheet being contoured to include only a top panel, a pair of vertical side panels integral with and folded downwardly on either side of said top panel, a pair of top and bottom vertical end panels integral with and folded downwardly at either end of said top panel, a first bottom panel portion folded horizontally inwardly from the lower edge of one of said vertical end panels, a second bottom panel portion folded horizontally inwardly from the lower edge of the other of said vertical end panels and in lapped seam engagement with said first bottom panel portion on the underside of the mattress, a lap seam between the adjacent edges of adjacent side and end panels forming the vertical corners of the mattress, lap seams between the adjacent edges of said downwardly folded side panels and the edges of said horizontally and inwardly folded bottom panels, and at least one means within said mattress for filling or evacuating fluid therefrom.



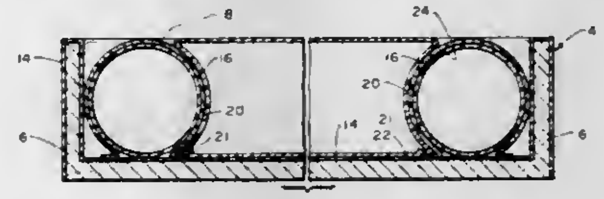
4,100,635
WATER BED CONSTRUCTION

Michael W. Mitchell, 606 Esplanade, Redondo Beach, Calif. 90277, and James C. Hauser, 26621 Westvale Rd., Palos Verdes, Calif. 90274

Filed Jan. 31, 1977, Ser. No. 764,388

Int. Cl.^{2} A47C *27/08*

U.S. Cl. 5—368 **8 Claims**



1. An improved water bed structure comprising the combination:

a. a water bed frame having a four-sided configuration and forming a compartment;

b. at least two spaced apart, separate, independent and distinct, about parallel, expansible members along two opposed lateral edges of said compartment and adapted to be selectively expansible along the depth of said compartment and to form a continuum surface with a separate water mattress, hereinafter defined; and

c. an independent and separate water mattress overlying said at least two expansible members and being retained within said compartment.

4,100,636
CUTTER

Theodor Ott, Mönthal, and Max Gaisser, Zollikerberg, both of Switzerland, assignors to Theodor Ott, Mönthal, Switzerland

Filed Sep. 19, 1975, Ser. No. 614,781

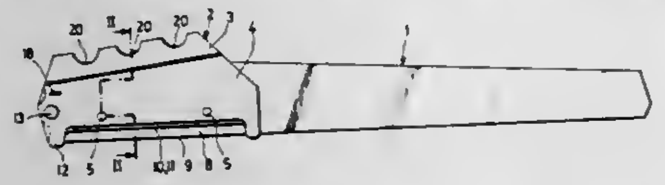
Claims priority, application Switzerland, Jul. 18, 1975, 9425/75

Int. Cl.^{2} B25F *1/00;* B26B *29/00*

U.S. Cl. 7—158 **12 Claims**

1. A cutter, particularly a grass edge cutter, comprising a handle; a blade having two elongated cutting edges spaced from each other in a direction transverse to the direction of elongation of said cutting edges and each formed with opposite end regions spaced from each other in said direction of elonga-

tion; and means for supporting said blade on said handle, having a pair of clamping members operative for clamping said blade therebetween in an operative position, and for releasing said blade so as to detach the latter therefrom, said clamping members in said operative position protecting at least one of said end regions of one of said cutting edges from wear whereas the remainder of said one cutting edge is exposed, and said clamping members in said operative position simultaneously also completely protecting the other cutting edge, at least one of said clamping members having a first projecting portion located in the vicinity of said one end region of said one cutting edge and extending for a predetermined distance in a first direction transverse to said direction of elongation and beyond said one cutting edge so as to protect said one end region of said one cutting edge from wear, and a second projecting portion located in the vicinity of said other cutting edge and extending for a predetermined distance in a second transverse direction substantially opposite to said first transverse direction and beyond said other cutting edge so as to completely protect said other cutting edge.



4,100,637

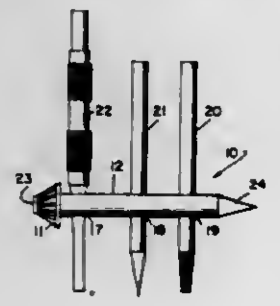
COMBINATION TOOL

Fred J. Grieser, Sr., 1417 Barton Rd., Lake Worth, Fla. 33460, and Fred J. Grieser, Jr., 101 Neptune Dr., Hypoluxo, Fla. 33462

Continuation-in-part of Ser. No. 604,112, Aug. 13, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 669,765

Int. Cl.² B25F *1/00*

U.S. Cl. 7—158 **7 Claims**



1. A combination tool comprising a chuck key having a fixed bevel gear and a shaft extending from said bevel gear, said gear engaging a like bevel on a drill holding chuck for actuating said chuck, a plurality of openings formed in said shaft and a plurality of tools mounted on said shaft, a blow receiving area at one end of said shaft and a tapered pointed end at the opposite end thereof for forming a marker point on a surface by imposing a blow on said blow receiving area.

4,100,638

FORGING MACHINE

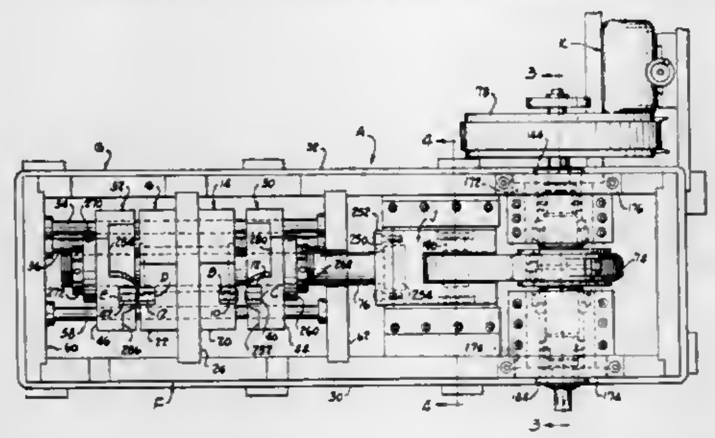
Donald A. Fischer, Strongsville, Ohio, assignor to Kalt Manufacturing Company, North Ridgeville, Ohio

Filed Mar. 21, 1977, Ser. No. 779,348

Int. Cl.² B21K *1/44;* B21J *9/18, 13/04*

U.S. Cl. 10—15 **11 Claims**

1. A forging machine comprising a stationary frame, a stationary die support incorporated in or fixed with respect to said frame, a second die support, a crankshaft rotatably supported in said frame by adjustable tapered roller bearings, means for rotating said crankshaft, a connecting rod or pitman operatively connected to said crankshaft by adjustable tapered roller berings and to said second die support by adjustable tapered roller bearings to move a die carried thereby to and from a die carried by said stationary die support upon rotation of said crankshaft.



4,100,639

METHODS OF AN APPARATUS FOR WRAPPING JACKETS AROUND BOOKS

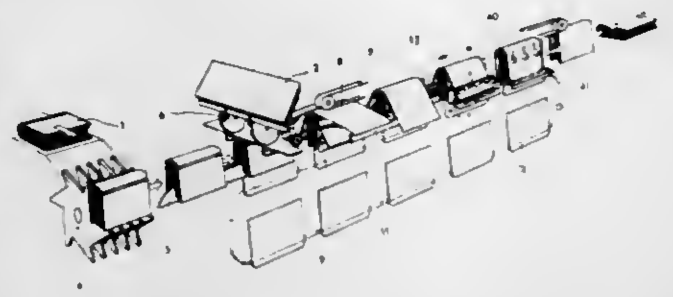
Günter Dietrich, Hille, Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Germany

Filed Jun. 2, 1977, Ser. No. 802,624

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620047

Int. Cl.² B42C *11/02*

U.S. Cl. 11—1 R **17 Claims**



1. A method for the application of jackets to books comprising the steps of:
- opening the covers of the book outwardly from the book block to angles of approximately 30°;
- depositing an unfolded jacket sheet on the book, the jacket sheet being in contact with the book in the spine region thereof intermediate the ends of the sheet;
- folding edge portions of the jacket about the oppositely disposed front edges of the book cover with the aid of heat to form jacket flaps; and
- closing the book cover.

4. In apparatus for the automatic application of jackets to books, said apparatus including a conveyor mechanism which transports the books along a predetermined path, the improvement comprising:
- means for opening the covers of a book on the conveyor mechanism outwardly with respect to the book block;
- roller means for supporting the opened covers at substantially equal predetermined angles with respect to a plane passing through the book block in a direction parallel to the block defining pages;
- means for depositing an unfolded jacket sheet on the book, the jacket sheet contacting the book in the region of the spine thereof intermediate the edges of the sheet;
- means for contacting and urging the jacket sheet downwardly and into contact with the covers whereby the jacket sheet will be pulled tightly over the book spine;
- means for folding opposite edge portions of the jacket sheet about the front edges of the book covers to define a pair of jacket flaps; and
- means for heating the jacket sheet where it passes about the front edges of the book covers.

4,100,640

BINDING MACHINE

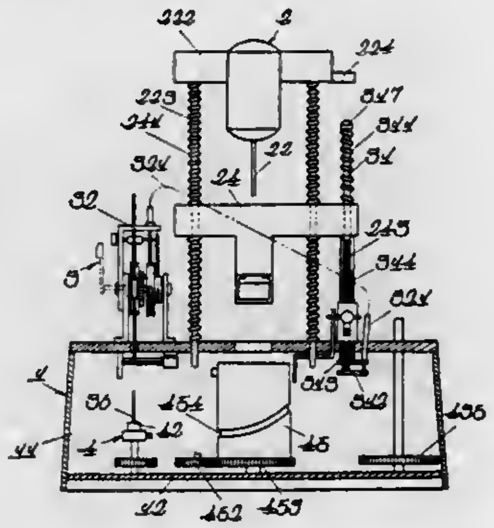
Yasukatsu Takimoto, Sakai, Japan, assignor to Nakabayashi Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1977, Ser. No. 823,878

Claims priority, application Japan, Aug. 11, 1976, 51-96559

Int. Cl.² B42C *19/00*

U.S. Cl. 11—1 R **5 Claims**



1. A binding machine comprising:
- means for forming a binding bore through stacked papers to be bound having a drill adapted to be raised and lowered with respect to a base of the machine for forming the binding bore, and pressing members for pressing stacked papers, supported by a support plate for said drill through a spring and adapted to be lowered accompanying said drill, said pressing member having a retaining rod for retaining the lowered position of said drill;
- means for feeding plastic tube of a predetermined length adapted to be started by an actuation of a starting rod adapted to be moved as said drill is driven into said stacked papers to form said binding bore, so as to feed said plastic tube by a length substantially equal to the thickness or height of said stacked papers, said means for feeding plastic tube being further adapted to sever the fed plastic tube during the upward movement of said drill; and
- means for forming a binding cord adapted to bring a lower heating mold provided at its center with a receiving needle adapted to be supplied with the severed plastic tube and an upper heating mold into alignment with the binding bore formed through said stacked paper and into engagement with each other, said means for forming the binding cord being further adapted to raise said lower heating mold to insert said severed plastic tube into said binding bore until the upper end of said severed plastic tube comes to be pressed to said upper heating mold, so as to melt the upper and lower ends of said plastic tube and form these ends into respective flanges, thereby to form said binding cord.

4,100,641

SWIMMING POOL CLEANERS

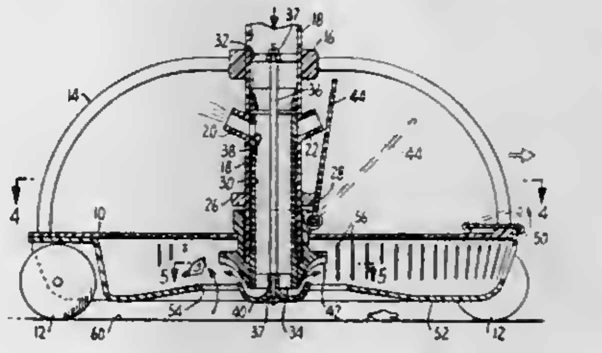
Andrew L. Pansini, 180 Los Cerros Dr., Greenbrae, Calif. 94904

Filed Jun. 24, 1976, Ser. No. 699,304

Int. Cl.² E04H *3/20;* A47L *5/00*

U.S. Cl. 15—1.7 **20 Claims**

4. An automatic pool cleaner comprising a wheel-supported carrier, a water supply conduit, tube means mounted on the carrier for receiving water from said conduit, drive jet nozzle means associated with said tube means to receive water from the latter and drive said carrier, means for controlling the direction of flow of water from said nozzle means to thereby control the direction of movement of said carrier, and means responsive to the ambient pressure condition of said pool water to control said means for controlling the direction of flow of water from said nozzle means.



4,100,642

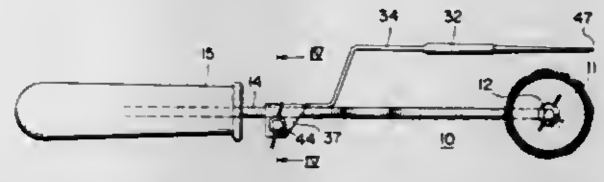
PAINT ROLLER AND BRUSH COMBINATION

Charles K. Gabor, Astoria, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,071

Int. Cl.² A46B *15/00;* B05C *17/02*

U.S. Cl. 15—114 **1 Claim**



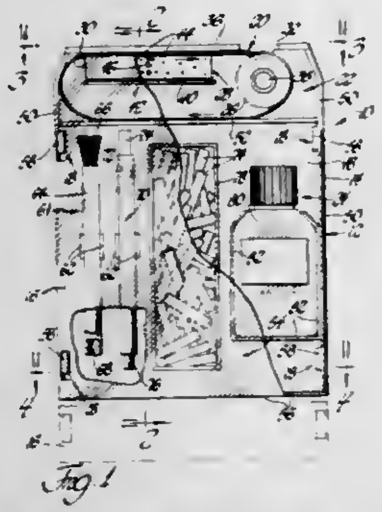
1. A paint roller unit to which a paint brush unit is adjustably mounted so that the brush unit may simultaneously contact a surface against which the roller of the roller unit is rolled,
- said roller unit formed of a paint roller rotatably mounted to a crank arm, said crank arm lying substantially in a single plane and terminating in a straight handle section extending substantially perpendicular to the axle section of the crank arm and pointing away from the general mid-point thereof,
- said brush unit formed of a plurality of bristles fixed, lying in a plane substantially parallel to the handle section, fixed to a first section of a sheet member and overlying the paint roller, with a second opposed section of said sheet member bent as a U-shaped clamp section of a size to fit about the straight handle section of the roller unit, said first and second sections of the sheet member joined by an intermediate section that extends at an angle to the said first and second sections so as to orient the said first section in a plane substantially parallel to and spaced from the said handle section of the roller unit in the attached position of the brush unit to the roller unit,
- said clamp section of the roller unit formed with a hole in each leg of the U-shaped section, with a bolt mounted in one of said holes and threadably engaged to the other of said holes such that tightening of said bolt serves to adjustably clamp the legs of the clamp section together about the straight handle section of the roller unit, said handle section and said clamp section of a size to permit adjustment of the position of the bristles with respect to the roller in a direction parallel to the axis of the handle section when said bolt is loosened.

4,100,643

MAGNETIC TAPE SENSING HEAD CLEANER

Richard C. Horian, 1740 Strickland Dr., Bloomfield Hills, Mich. 48013, and James G. Horian, 7340 Indiana, Dearborn, Mich. 48126

Filed Jun. 20, 1977, Ser. No. 807,699
Int. Cl.² G11B *3/58*
U.S. Cl. 15—246 **6 Claims**



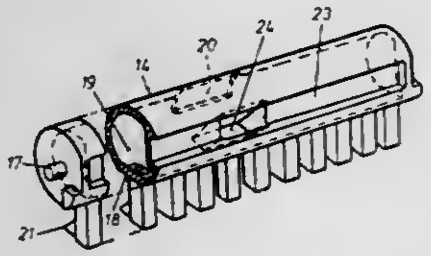
1. A magnetic tape sensing head cleaner comprising: a hollow housing including a pair of housing members; said housing including an intermediate wall dividing the housing into a cleaning loop compartment on one side thereof and a storage compartment on the other side thereof; the housing also including an apertured end wall spaced from the intermediate wall located on said one side thereof; latch means for fixedly securing the housing members to each other in a closed position while selectively permitting repeated relative movement therebetween to an open position and subsequent movement back to as well as securement in the closed position; and said cleaning loop compartment of the housing including a track for receiving a replaceable cleaning loop with the housing members in the open position such that the loop is enclosed when the housing members are subsequently secured to each other in the closed position and moves around the track adjacent the apertured end wall to clean a magnetic tape sensing head positioned adjacent the end wall, the housing members being movable to the open position to permit replacement of the cleaning loop when the loop is no longer capable of cleaning the sensing head.

4,100,644

VACUUM CLEANER NOZZLE WITH ROTATABLE COMB-SHAPED PART

Erik Karl Gustav Johansson, Sollentuna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Continuation-in-part of Ser. No. 651,166, Jan. 21, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,319
Claims priority, application Sweden, Jan. 29, 1975, 7500974
Int. Cl.² A47L *9/06*
U.S. Cl. 15—397 **4 Claims**



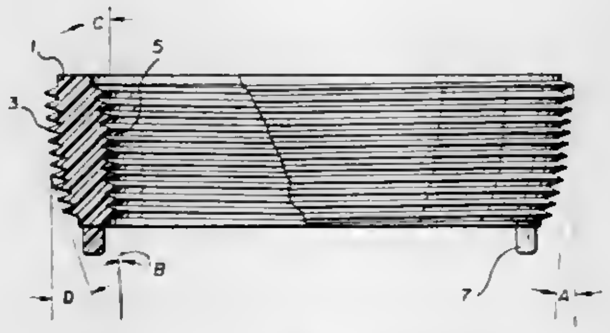
1. In a vacuum cleaner nozzle having a suction channel for conducting dust-laden air to a dust container the improvement comprising a hollow housing connected to said suction channel, an elongated part having a body and a comb; said body having spaced first and second channels extending in different planes, means mounting said part in said housing for rotation therein and positioning said part adjacent to the surface to be cleaned; the teeth of said comb being hollow and open at their free ends; the opposite ends of said teeth being connected to said first channel; in a first position of said rotatable part, said comb being in an extended position, whereby an air flow path is formed through said hollow teeth, said first channel and said suction channel; and in a second position of said part said comb being retracted into a position within said hollow housing whereby an air flow path is formed through said second channel and said suction channel.

4,100,645

BUSHING

Earl Meyers, Kitchener, Canada, assignor to Clemmer Industries (1964) Limited, Waterloo, Canada

Filed Jul. 15, 1977, Ser. No. 815,896
Claims priority, application Canada, Apr. 18, 1977, 276353
Int. Cl.² B65D *55/00*
U.S. Cl. 16—2 **9 Claims**



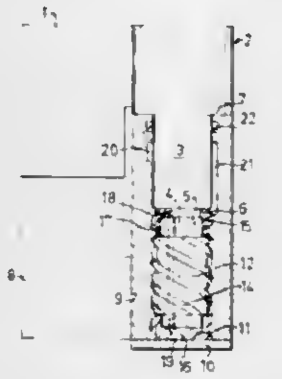
1. A bushing for use with an underground storage tank, consisting of a wall having inner and outer screw threads, the outer thread being a standard taper of 1°47′ over most of its length, and the inner thread being a non-standard larger taper than the outer thread over most of its length, the outer thread having a taper for the last few threads at its smallest outer diameter of the bushing of a larger angle than the major part of the outer thread.

4,100,646

SELF-CLOSING HINGE

Ewald Ingemar Emanuel Schubeis, Tegnergatan 9, S-111 40 Stockholm, Sweden

Filed Feb. 28, 1977, Ser. No. 772,740
Int. Cl.² E05F *3/20;* E05D *11/02*
U.S. Cl. 16—54 **7 Claims**



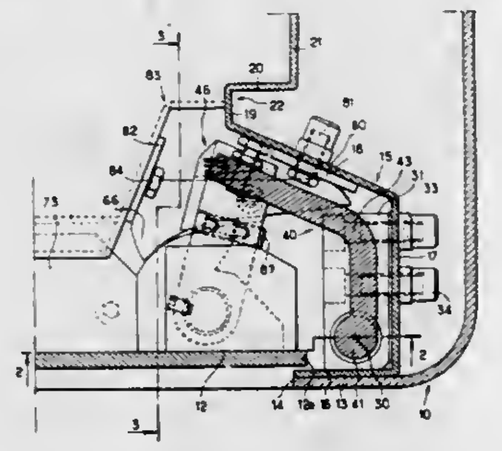
1. A hinge for supporting a door and the like in a frame therefore in such a manner that the hinge lifts the door vertically upwards, when the door is swung out of the frame and upon release of the door automatically swings the door back into the frame under the action of the weight of the door, said hinge comprising a first and a second hinge member adapted to be secured to said door and said frame, respectively, said first hinge member including a hinge bolt and said second hinge member including a sleeve comprising an upper cylindrical portion in which said hinge bolt is rotatably and axially displaceably journalled and a portion at its lower end provided with an internal thread, a ring member in the lower portion of said sleeve, said ring member having an external thread cooperating with the thread in said sleeve, said hinge bolt having a lower end portion journalled in a non-rotatable but axially displaceable manner in said ring member and said hinge bolt having a downwardly facing annular shoulder located within said sleeve and above said lower portion of said hinge bolt, the arrangement being such that said ring member upon initial relative rotation between said hinge bolt and said sleeve in a door-opening direction is freely screwed a distance upwards in said sleeve without engaging said annular shoulder on said hinge bolt and upon continued relative rotation engages said shoulder on said hinge bolt and thereby lifts same together with the door.

4,100,647

PIVOT DEVICE FOR DOORS OF STRONG BOXES, SAFES OR THE LIKE

François Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed May 18, 1977, Ser. No. 798,189
Claims priority, application France, May 25, 1976, 76 15810
Int. Cl.² E05D *11/10. 3/06*
U.S. Cl. 16—139 **6 Claims**



1. In a container such as a safe having an opening and a swinging door attached thereto; a pivot device which comprises:

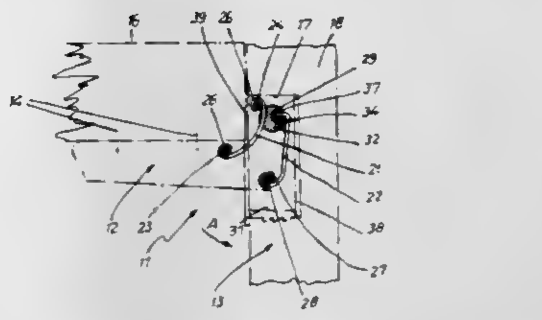
- a shaped section including first and second branches, the first branch having a free end, said second branch having an end, a first pivot shaft connected to the free end of said first branch of the section, said pivot shaft being rotatably mounted in said container,
- pivot means attached to the end of the second branch of the section and having an axis parallel to that of said first pivot shaft, said door being attached to said pivot means,
- a rocker, a second pivot shaft rotatably mounting said rocker on said shaped section, said second pivot shaft having an axis extending parallel to the axes of said first pivot shaft and said pivot means, said rocker including a tooth and a curved portion.
- an element mounted on the inner face of said door and having a curved portion complementary with said curved portion of the rocker, said element further having a recess,
- said curved portions of said element and said rocker being positioned to contact each other and said recess being positioned to receive said tooth of the rocker,
- first stop means for said rocker for preventing rotation of said rocker when said complementary curved portions contact each other in order to allow the rotation of the door around the pivot means,
- second stop means on the shaped section positioned so that the door comes in contact with said second stop means at the end of a first movement of opening of the door by rotation around said pivot means, and
- spring means for urging the tooth of the rocker into the recess during a second movement of opening of the door by rotation around said first pivot shaft.

4,100,648

HINGE

Kurt Krautter, Alpirsbach, Germany, assignor to Hetal-Werke Franz Hettich KG, Germany

Filed Jul. 7, 1976, Ser. No. 703,306
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1975, 2530321; Oct. 24, 1975, 2547602; Jan. 30, 1976, 2603465
Int. Cl.² E05D *3/06*
U.S. Cl. 16—163 **19 Claims**



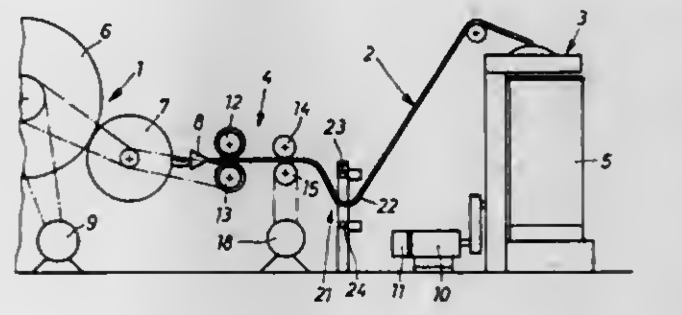
1. A hinge comprising a first part adapted to be fastened to a furniture body and a second part adapted to be fastened to a door, said parts being interconnected for relative movement by means of a pair of guide links which are each mounted on pivots on said respective first and second parts of the hinge so as to constitute an articulated arrangement for lifting the door off the furniture body when the former is being opened, at least one of said pair of guide links being eccentrically arranged relative to an axis of its pivot connected to said second part, and the location at which said one guide link applies its force eccentrically on said pivot being rotatable around the axis.

4,100,649

METHOD AND APPARATUS FOR PRODUCING A UNIFORM TEXTILE FIBER SLIVER

Hans Erismann, Fislisbach, and Werner Graf, Freienbach, both of Switzerland, assignors to Graf & Cie. A.-G., Rapperswil, Switzerland

Filed Sep. 21, 1976, Ser. No. 725,245
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1975, 2543839
Int. Cl.² D01G *31/00;* D01H *5/32*
U.S. Cl. 19—0.2 **14 Claims**



1. An apparatus for producing a uniform textile fiber sliver, comprising: a sliver supply device for delivering a fiber sliver, a take-up device for the fiber sliver, means for driving the take-up device independently of the supply device, a regulation drafting arrangement located between the supply device and the take-up device, said regulation drafting arrangement comprising a pair of measuring rolls and a pair of drafting rolls, means for independently driving said pair of drafting rolls, means for driving one of the measuring rolls of the pair of

measuring rolls by means of the supply device, the other measuring roll being deflectable as a function of the change in thickness of the fiber sliver guided between the measuring rolls, regulation means for regulating the drive speed of the pair of drafting rolls and the take-up device as a function of the deflection of said other measuring roll and for the additional regulation of the drive speed of the take-up device as a function of the length of the fiber sliver between the pair of drafting rolls and the take-up device, a measuring value receiver connected with the regulation means, said measuring value receiver generating signals proportional to the drive speed of the supply device and the measuring roll driven thereby, said signals being delivered to the regulation means as an additional guide magnitude and processed therein for regulating the drive speed of the pair of drafting rolls and the take-up device, a monitoring device cooperating with the regulation means and arranged between the pair of drafting rolls and the take-up device for monitoring the through-hang of the loop of the fiber sliver, said monitoring device comprising an upper trigger location responsive to a minimum through-hang of the fiber sliver loop and a lower trigger location responsive to the maximum through-hang of the fiber sliver loop, said regulation means processing signals generated at each trigger location for the additional regulation of the drive speed of the take-up device in such a manner that upon response of the upper trigger location the drive speed of the take-up device is reduced for such length of time until the lower trigger location responds, whereafter the drive speed of the take-up device is increased for such length of time until the upper trigger location again response, and stop means operatively connected to the sliver supply device to stop said supply device when the drafting magnitude of the regulation drafting arrangement assumes a value falling outside of a fixed range.

4,100,650
ADJUSTABLE FEED PLATE

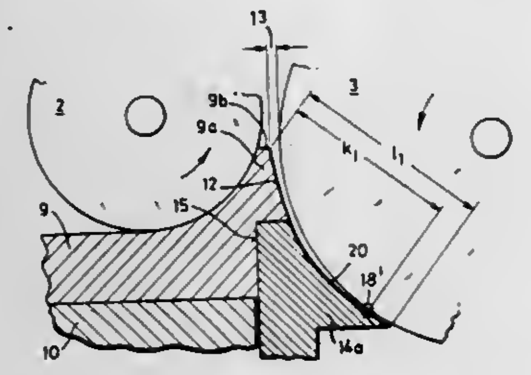
Walter Wirth; Robert Siegmund, both of Dulmen, and Wilhelm Borgert, Rorup, all of Fed. Rep. of Germany, assignors to Hergeth KG Muschinenfabrik und Apparatebann, Fed. Rep. of Germany

Continuation of Ser. No. 567,409, Apr. 11, 1975, abandoned. This application Sep. 28, 1976, Ser. No. 727,442

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1974, 2418413

Int. Cl.² D01G *15/40*

U.S. Cl. 19—105 **7 Claims**



1. Apparatus for feeding fibrous material to a carding machine or the like ocmprising at least one rotatable roll having an exterior cylindrical surface, first and second separate curved surfaces both in opposing relationship to said cylindrical surface and defining therewith a trough through which is adapted to pass the fibrous material, said first surface preceding said second surface in the direction of travel of the fibrous material through said trough, said second surface defining an immediate generally unbroken smooth continuation of said first surface, said trough including an entrance end portion defined by an upstreammost end of said first surface and said cylindrical surface adapted to initially receive the fibrous material, said trough having an exit end portion defined between said second surface and said cylindrical surface from which is adapted to exit the fibrous material, said trough progressively curvingly convergingly tapering in a direction from said entrance end portion toward said exit end portion, said trough having a minimum cross-sectional dimension established between said cylindrical surface and said second surface defining a tear-off point for the fibrous material, said tear-off point being upstream of said exit end portion, an imaginary straight line through said tear-off point being in tangential relationship to said second surface and said cylindrical surface, and the radius of curvature of both said first and second surfaces is identical and corresponds to the radius of said first surface defining the maximum cross-sectional dimension of said trough.

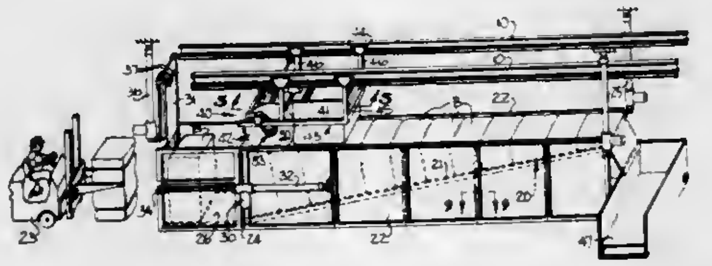
4,100,651
APPARATUS AND METHOD FOR REMOVING AND BLENDING FIBERS FROM A PLURALITY OF FIBER BALES

William D. Wornall, Charlotte, N.C., and Nick Valk, Greeneville, Tenn., assignors to Aldrich Machine Works, Greenwood, S.C.

Filed Jun. 22, 1977, Ser. No. 808,781

Int. Cl.² D01G *13/00*

U.S. Cl. 19—145.5 **12 Claims**



1. A method of removing and blending fibers from a plurality of fiber bales, said method comprising

positioning a predetermined number of fiber bales in a row in abutting relation on a horizontally oriented elongate support having an input end and an output end,

slowly moving the output end of the elongate support upwardly to move and reposition the support from the horizontal orientation to a predetermined inclined orientation while repeatedly moving a fiber removing device in a predetermined substantially horizontal path of travel along the row of bales while engaging uppermost portions of the bales with the fiber removing device and removing fibers from the bales to thereby maintain the upper surface of the bales lying substantially in the horizontal path of travel,

repeatedly moving the fiber removing device and removing fibers from the bales after the bale support has reached the predetermined inclined orientation, while engaging the endmost fiber bale at the input end of the now inclined bale support and pushing such endmost bale up the inclined support to thereby advance the entire row of bales along the support toward the output end and to also cause the upper surfaces of the respective fiber bales to be moved upwardly closer to the fiber removing device, and

periodically positioning at least one fresh fiber bale at the input end of the bale support and pushing such bale toward and into engagement with the next adjacent fiber bale on the bale support to thereby replenish the supply of fiber bales on the bale support.

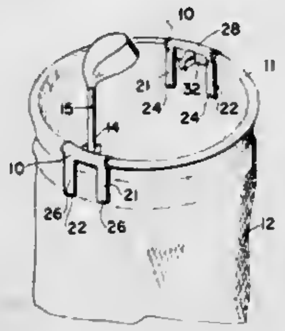
4,100,652
GOLF CLUB ANCHOR

Fred E. Carlson, New City, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,421

Int. Cl.² A63B *55/00*

U.S. Cl. 24—3 R **2 Claims**



1. An anchor clip shaped to detachably fit about the opposed sides of the rim of a golf club bag and formed with a clamp clip of a size to detachably camp about a golf club shank, said clamp clip extending, when the device is installed on a golf club bag, in the radial direction towards the central axis of the attached golf club bag; in which the anchor clip is shaped with a pair of spaced U-shaped members, each said U-shaped member formed of a pair of legs oriented in substantially parallel configuration to each other and to the legs of the other U-shaped member, with both U-shaped members joined to a common mid-section, with the clamp clip shaped as a U-shaped member mounted at its mid-section to the said common mid-section so as to extend along an axis perpendicular to that of the spaced U-shaped members, said anchor clip mid-section bent along an arcuate path so as to follow and fit above a circular rim of a golf club bag when each of the pair of U-shaped members are engaged about the sides of the rim of a said golf club bag.

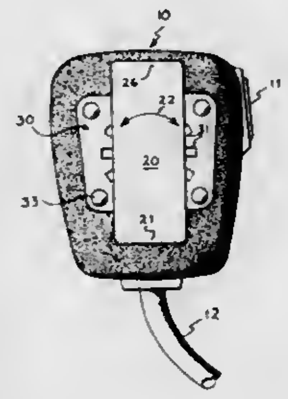
4,100,653
DEVICE FOR ATTACHING A MICROPHONE-SPEAKER TO AN ARTICLE OF CLOTHING

Paul F. Sensabaugh, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 16, 1977, Ser. No. 825,089

Int. Cl.² A45F *5/02*

U.S. Cl. 24—3 J **13 Claims**



1. An improved arrangement for removably attaching a microphone-speaker and the like to thin material such as clothing and the like comprising:

a. a first flat surface having a plurality of depressions spaced along a circular arc spaced a selected radial distance from a center;

b. a spring rotatably attached to said surface at said center and extending from said center for a distance at least as great as said radial distance;

c. said spring having a flat surface contacting said first flat surface and having a projection facing said first flat surface for engaging said depressions in said first flat surface;

d. a clip pivotally mounted on said spring and extending from its pivotal mounting in a direction towards said center to an engaging end of said clip;

e. means for resiliently urging said clip engaging end toward said first flat surface for removably holding said thin material between said engaging end and said first flat surface;

f. and said flat spring being resiliently urged to cause said projection to engage said first flat surface and to fit into one of said depressions in response to said flat spring being rotated to the desired location, thereby locating said clip at the desired rotational position with respect to said flat surface.

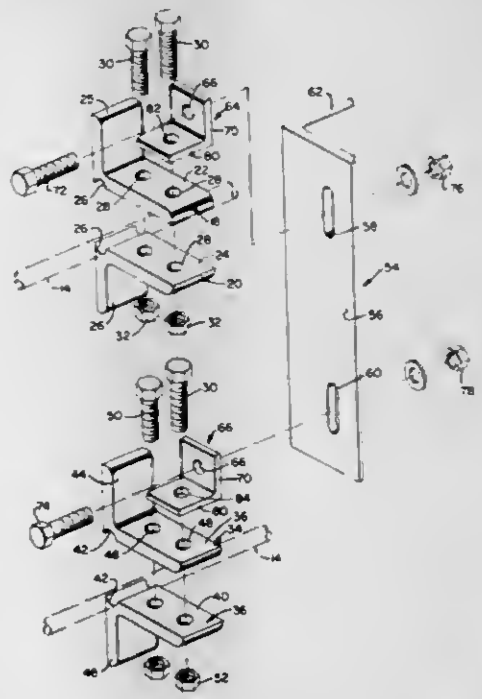
4,100,654
MECHANISM FOR GRIPPING HOOPS ENCIRCLING BUILDING STRUCTURES

Sheng P. Sheng, Williamstown, W. Va., assignor to Marietta Concrete Company, Marietta, Ohio

Filed May 6, 1977, Ser. No. 794,528

Int. Cl.² E04B *1/32*

U.S. Cl. 24—20 R **7 Claims**



1. A mechanism for gripping hoops encircling a structure, comprising:

first and second angles having first legs abutting each other and second legs for engaging the structure;

channels of semi-circular cross-section provided in said first legs defining when said first legs are in abutting relationship a substantially circular passageway through which one of the hoops passes; and

means adjustably securing said first legs together.

4,100,655
BELT BUCKLE

Gregory A. Langley, 200 W. 16th St., New York, N.Y. 10011

Filed May 10, 1976, Ser. No. 684,590

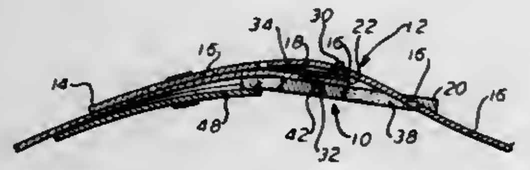
Int. Cl.² F41B *13/04;* A45C *11/10;* A44B *11/20*

U.S. Cl. 24—163 K **5 Claims**

1. A buckle for a belt of the type having a plurality of regularly spaced holes along a first end and the buckle engaged with the second end, or similar wearing apparel, comprising:

(a) a substantially rigid buckle member having a loop for receiving therethrough the first of two ends of the belt; and

(b) interlocking means permanently affixed to the second end of the belt releasably interlocking with the first end of the belt, after the first end has been passed through said



loop, and releasably interlocking with said buckle member.

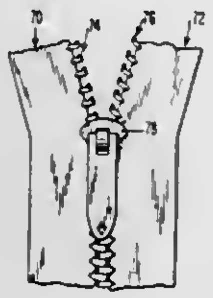
4,100,656
SLIDE FASTENER STRINGER AND METHOD OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application Jan. 12, 1976, Ser. No. 648,428

Int. Cl.^{2} A44B *19/40*

U.S. Cl. 24—205.16 C **57 Claims**



1. A stringer for a slide fastener comprising
- a carrier tape formed from a strip of polymer film longitudinally folded at one edge;
- said carrier tape having a plurality of spaced slits formed in the strip transversely over the one edge defining looped strap portions extending over the one edge between the slits;
- a continuous coupling element having a plurality of successive sections each including a head portion extending from a respective slit of the plurality of slits, and including an interconnecting portion extending through a respective one of the looped strap portions and joined with an adjoining section; and
- a plurality of reinforcing sections of fiber secured to the strip and extending transverse the one edge of the strip over the respective interconnecting portions.

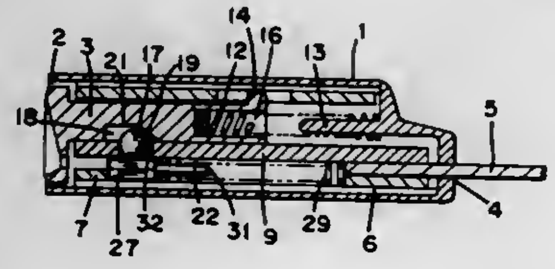
4,100,657
DETENT ACTION BUCKLE

Horst Minolla, Norderstedt, Germany, assignor to Klippan GmbH Hamburg, Germany

Filed Jul. 7, 1976, Ser. No. 703,381

Int. Cl.^{2} A44B *11/26*

U.S. Cl. 24—230 AL **13 Claims**



1. A buckle for receiving a tongue comprising:

(a) a buckle having a first and second plate, each with a flat surface parallel to that of the other, said surfaces being spaced to accept the forward part of the tongue between them, said forward part of the tongue and said first plate each having an opening therethrough, which openings substantially coincide when the tongue is fully inserted between the surfaces, thereby forming a chamber;

(b) a detent disposed within the chamber formed by the first plate and the tongue when the latter is fully inserted;

(c) a tongue release member having a slideable surface in contact with the upper surface of the first plate, said slideable surface of the tongue release member having an elongated cavity which is longer than the opening in the first plate, said tongue release member limited in its slideable motion from a first position where a forepart of the elongated cavity substantially coincides with the opening in the first plate, and a second position wherein the rear part of the elongated cavity substantially coincides with the opening in the first plate, said forepart of the elongated cavity having a depth such that taken together with the opening in the first plate, the detent can be completely contained in the space formed thereby, without extending beyond the exposed surface of the first plate, and the rear part of the elongated cavity having a depth less than that of the forepart, such that when taken together with the opening in the first plate, the detent cannot be completely contained in the space formed thereby, but extends beyond the exposed surface of the first plate; and

(d) an outwardly biased tongue ejecting member, slideably positioned between the first and second plate in the path of the inserted tongue, said ejecting member limited in its forward movement in response to its bias, to a position to block the opening in the first plate, thereby retaining the detent in the closed space produced by the forepart of the cavity of the tongue ejecting member together with the opening in the first plate; whereby the inserted tongue displaces the tongue ejector allowing the detent to enter said chamber formed by the coincidence of the opening in the first plate with that of the inserted tongue, thus latching the tongue when the tongue release member is moved to its second position, but resulting in the ejection of the tongue when the tongue release member is moved to its first position.

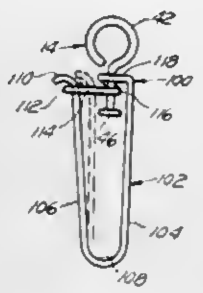
4,100,658
FISHING LURE-AND-LINE SNAP SWIVEL

John P. Nikota, 876 Riverdale, Windsor, Canada (N8S 4C1)

Continuation-in-part of Ser. No. 708,308, Jul. 26, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 774,600

Int. Cl.^{2} A44B *13/02*

U.S. Cl. 24—231 **10 Claims**



1. A fishing lure-and-line snap swivel, comprising
- a fishing line connector having thereon a shank with a line attachment portion and a retaining abutment fixedly mounted on said shank and disposed in spaced relationship to said line attachment portion,
- and a one-piece bent wire fishing lure connector including a bearing loop portion disposed on said shank between said line attachment portion and said retaining abutment and relatively rotatably receiving said shank and also including a reversely-bent lure attachment portion extending from one end of said bearing loop portion and a closure portion extending from the other end of said bearing loop portion across the open end of said lure attachment portion,
- said lure attachment portion and said closure portion having releasable latch and keeper portions respectively disposed upon the outer ends thereof in proximity to one another and to said bearing loop portion and movable into and out of interlocking engagement with one another.

4,100,659
PROCESS FOR TEXTURIZING FILAMENTS

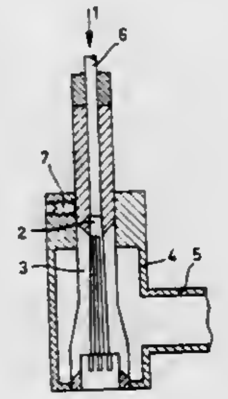
Wolfgang Bauer, Heidelberg; Wolfgang Martin, Ludwigshafen, and Erwin Lebrer, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 555,632, Mar. 5, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,237

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1974, 2410429

Int. Cl.^{2} D02G *1/12, 1/16, 1/20*

U.S. Cl. 28—255 **4 Claims**



1. In a process for crimping filaments wherein the filaments are passed through two zones of a treatment chamber by means of a heated carrier gas and wherein carrier gas is removed radially from the second zone of the treatment chamber, the improvement which comprises: adjusting the amount of gas radially drawn off from said second zone whereby substantially no air motion is present at the exit end of the second zone except that resulting from the passage of the crimped filaments, the bulk of said carrier air being removed from substantially the first 75 percent of the total length of the second zone, said filaments being compressed and crimped within said second zone.

4,100,660
APPARATUS FOR THE HEAT TREATMENT OF RUNNING THREADS BY MEANS OF SATURATED STEAM

Franz Nemecek, Dusseldorf; Edgar Muscbelknautz, Leverkusen; Wolfgang Lindner, Dormagen, and Herbert Prelss, Leverkusen, all of Germany, assignors to Bayer Aktiengesellscoaft, Leverkusen, Germany

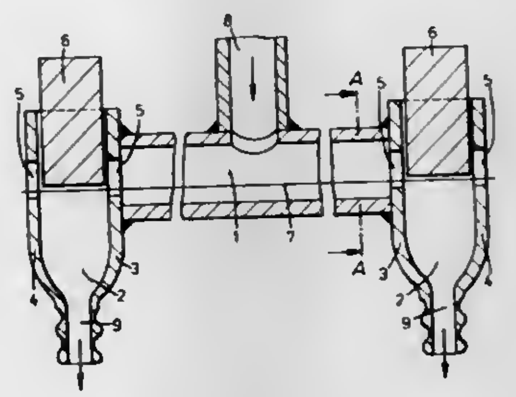
Filed Sep. 12, 1977, Ser. No. 832,756

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643787

Int. Cl.^{2} D02G *1/16*

U.S. Cl. 28—271 **9 Claims**

1. An apparatus for the heat treatment of running threads, comprising a heating chamber having openings in the walls thereof through which, in use, the thread travels, shutter means for varying the area of the said openings, and means for supplying saturated steam to the heating chamber.



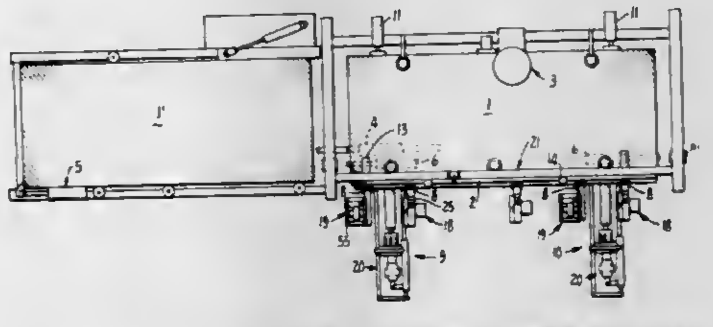
4,100,661
DOOR HINGE APPLYING APPARATUS

Edward G. Cheak, Chico, Calif., assignor to Norfield Manufacturing Co., Chico, Calif.

Division of Ser. No. 520,200, Nov. 4, 1974, Pat. No. 3,979,817. This application May 19, 1976, Ser. No. 687,787

Int. Cl.^{2} B27F *5/12;* **B27M** *1/08*

U.S. Cl. 29—33 K **8 Claims**



1. An apparatus for hingedly connecting an adjacent pair of work members each having elongate butt-receiving surfaces, by conventional hingedly connected butt hinges each having butts to be seated in mortises of outlines corresponding to the outlines of the butts, and each butt having a plurality of screw holes in a predetermined pattern for screws to secure said butts in said mortises;

(a) means for supporting said work members and means connected to said work member supporting means for holding said butt-receiving surfaces having said mortises therein spaced apart in the same vertical plane and facing in the same direction for receiving the butts of said butt hinge in said mortises;

(b) a screwdriver unit, and means connected to said work member supporting means for supporting said unit for movement to and from said mortises when said work members are supported in said positions, and unit-moving means connected with said unit for so moving it;

(c) hinge supporting means movably mounted on said unit, said hinge supporting means including resilient means biasing said hinge supporting means in advance of said screwdriver unit prior to its engagement with the butt-receiving surfaces, said hinge supporting means releasably supporting said hinge thereon for movement therewith to said mortises and for firmly seating the butts of said hinge in said mortises with one butt in the mortise in one work member and the other in the mortise in the other work member and for holding said butts in said mortises until the butts are screwed to the work members;

(d) a plurality of screwdriver bits rotatably supported on said unit for movement therewith each in alignment with one of the holes in said butts when said butts are seated in said mortises and means for releasably holding a screw on each bit in said alignment with one of the holes in said butts;

(e) means supporting said bits for simultaneous movement relative to said hinge supporting means for simultaneously driving said screws through the holes in said butts and into said work members when said butts are seated in said mortises; and

(f) means for simultaneously rotating said bits during driving of said screws by said bits and while said hinge is held by said hinge supporting means.

4,100,662
CONTROLLED DEFLECTION ROLL

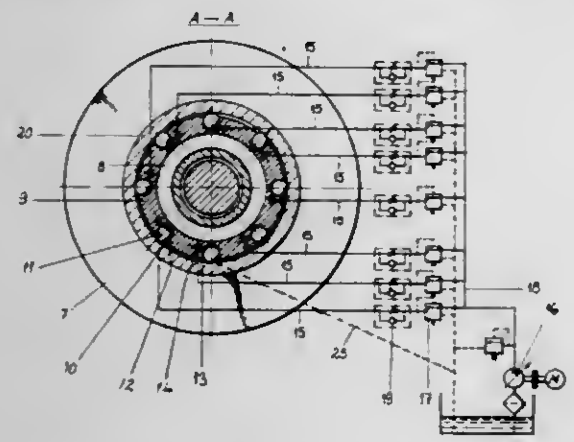
Pertti Lauri Metso, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Dec. 27, 1976, Ser. No. 754,520

Claims priority, application Finland, Jan. 21, 1975, 750135

Int. Cl.^{2} B21B *13/02*

U.S. Cl. 29—110 **10 Claims**



1. In a controlled deflection roll apparatus having a stationary base means, an inner shaft supported by said base means for rotation relative thereto, an outer roll shell attached to the shaft at a central lengthwise portion thereof for support thereby and rotation therewith, and fluid pressure operated jack means operable to exert supporting forces on the roll shell at the ends thereof to control the deflection of the roll shell by load forces acting thereon, the improvement which comprises: a bearing having a stationary part and having a rotary part connected to said roll shell for rotation therewith, and said jack means having a plurality of reaction elements aligned along respective radial paths and responsive to the influence of fluid pressure to generate forces directed along said respective paths and applied to the stationary part of said bearing and transmitted through the rotary part thereof to the roll shell to control the deflection thereof by said load forces, said radial paths being generally statinary with respect to said base means, said jack means having fluid flow paths to said reaction elements accommodating the adjustment of the fluid pressure influencing respective reaction elements for corresponding adjustment of said generated forces.

4,100,663
CARBURETOR, KIT AND TOOL FOR USE THEREIN

James R. Crum, P. O. Box 1271, St. Charles, Mo. 63301

Filed Apr. 29, 1977, Ser. No. 792,216

Int. Cl.^{2} B23P *15/00*

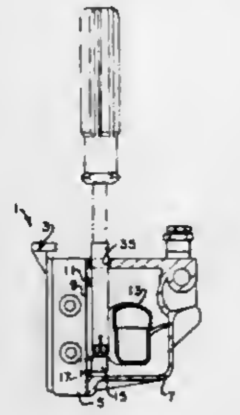
U.S. Cl. 29—156.4 R **8 Claims**

1. A method of simplifying changing the jets of a carburetor of the type including a carburetor body, a metering block on the side of the carburetor body, a pair of jets threaded into the exterior of the metering block, and a float chamber defined in part by said metering block and in part by a float bowl, said method comprising, in a desired order, the steps of:

replacing said jets with adapters, each adapter including an L-shaped passage, one end of said passage communicating with the metering block and the other end forming an upwardly facing threaded bore for threaded replacement jets,

providing access opening means in an upper wall of said float bowl for removing said replacement jets from said adapters and replacing said replacement jets in said adapters without removing said float bowl from said metering block, and

assembling said replacement jets within said upwardly facing threaded bores of said adapters.



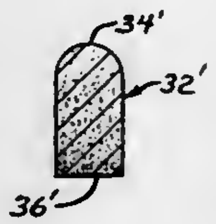
4,100,664
APEX SEAL FOR ROTARY ENGINES

Chris Robert Straesser, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 541,810, Jan. 17, 1975, abandoned. This application Sep. 22, 1975, Ser. No. 615,779

Int. Cl.^{2} B23P *15/06*

U.S. Cl. 29—156.6 **1 Claim**



1. The method of forming a seal for rotary engines having different coefficients of thermal expansion at opposite edges comprising the steps of:

(a) providing a mold having a shape corresponding approximately to the desired shape of the seal to be formed;

(b) introducing in to the mold a layer of sinterable material having a first coefficient of thermal expansion;

(c) thereafter introducing into the mold a strip of low-ash paper;

(d) repeating, seriatim, steps (b) and (c) using materials, each having different coefficients of thermal expansion until the desired number of layers, each separated by a strip of low-ash paper have been received in the mold;

(e) compacting the materials in the mold;

(f) sintering the materials; and

(g) thereafter finish machining the seal to a desired final configuration with the layers of different coefficients of thermal expansion providing a different coefficient of thermal expansion from top to bottom of the seal.

4,100,665
MACHINE FOR SEPARATING ROLLS OF CLOTH FROM THE SHAFTS ON WHICH THEY ARE ROLLED

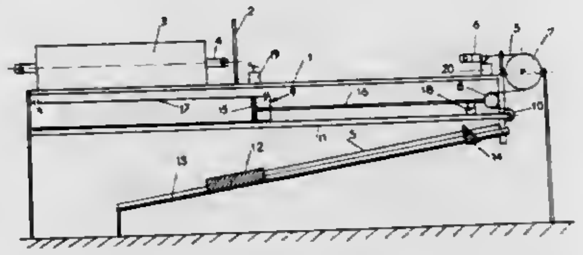
Jean Rourat, Chemin de la Fouillouse, Riorges (Loire), and Marcel Rourat, 65 Rue Lucien Sampaix, Roanne (Loire), both of France

Filed Aug. 12, 1976, Ser. No. 713,959

Claims priority, application France, Aug. 12, 1975, 75 25592

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—252 **15 Claims**



1. A machine for extracting a shaft from a roll of woven or knitted textile cloth, wherein said shaft has at least one end projecting from the cloth rolled thereon, said machine comprising:

a fixed frame;

stop means mounted to said frame;

means for positioning said roll adjacent said stop;

a traction cable having holding means at one end, said holding means adapted to attach said one end of the cable to said projecting end of the shaft;

means for tensioning said traction cable attachable to the opposite free end of said cable; and

means for actuating said traction cable interposed said one end and said means for tensioning, whereby when said roll is positioned against said stop and said holding means is attached to said projecting end of the shaft, said actuating means is operative to extract said shaft from said roll of cloth.

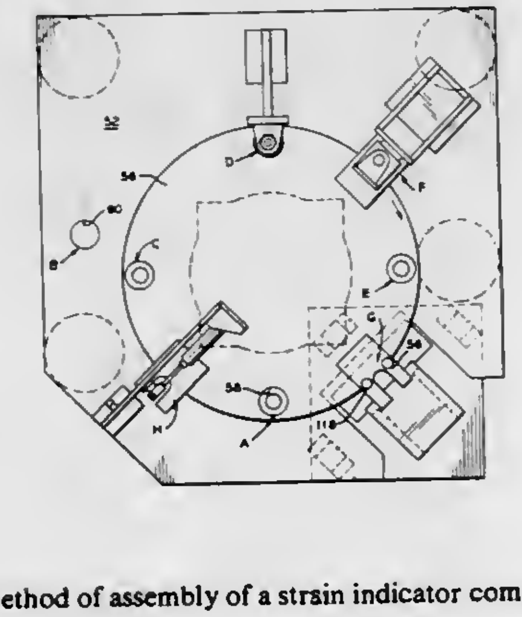
4,100,666
ASSEMBLY METHOD

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Filed May 2, 1977, Ser. No. 792,933

Int. Cl.^{2} B23Q *17/00*

U.S. Cl. 29—407 **9 Claims**



1. A method of assembly of a strain indicator comprising the steps of:

(a) providing a tensile element;

(b) providing an indicator, said indicator having means to produce a visual effect which is a function of the strain on said tensile element;

(c) inserting said indicator at least partially into said tensile element;

(d) exerting a tensile pull on said tensile element so as to create a visual effect at said indicator;

(e) optically measuring said visual effect with said tensile member under load;

(f) comparing the results of optical measurement with a standard; whereby,

the quality of the strain indicator is verified under load.

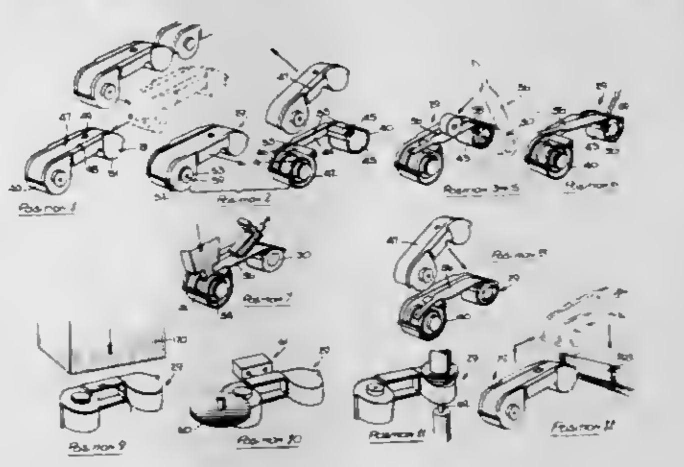
4,100,667
METHOD AND MEANS FOR LOADING FILM CARTRIDGES

Carl A. Napor, Glen Ridge; Charles G. Krumm, Wyckoff, and Joseph Kucich, Palisades Park, all of N.J., assignors to Kahle Engineering Co., Union City, N.J.

Filed May 18, 1976, Ser. No. 687,638

Int. Cl.^{2} B23P *21/00*

U.S. Cl. 29—429 **36 Claims**



1. An improved cartridge loading means for inserting film scrolls into cartridges having removable covers comprising the combination of:

a loading head;

a movable support for presenting said head to a plurality of loading positions;

means for driving said support;

a nest having a cartridge receiving means thereon and being movably mounted on said loading head;

means for moving said nest from a first attitude with the cartridge cover positioned upwardly to a second attitude on said loading head with the cartridge side walls positioned upwardly;

means for removing and for reapplying covers from a cartridge in said nest and for inserting the film scrolls when said nest is in its first attitude; and

means for sealing the cartridge covers to the cartridges when said nest is in said second attitude.

4,100,668
METHOD OF MAKING A RUNG ASSEMBLY FOR A LADDER

George Robert Ruff, Newberry, and Danny O'Brian Derrick, Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Division of Ser. No. 591,957, Jun. 30, 1975, abandoned. This application Jul. 14, 1976, Ser. No. 705,163

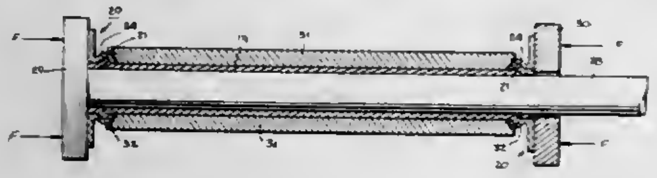
Int. Cl.^{2} B21D *39/00;* B23P *11/02*

U.S. Cl. 29—523 **2 Claims**

1. A method of making a rung assembly for a ladder comprising

supporting a rung having a pair of hollow ends throughout the inside of each said end and partially on the outside of each said end;

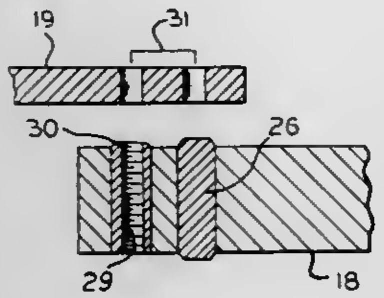
mounting a flanged fitting having an annular collar and a radially directed flange over each said end of said rung; and



compressing said ends of said rung longitudinally to swage each respective rung end and said annular collar of a fitting simultaneously to form outwardly directed interlocking peripheral beads thereon located in the unsupported outside of said rung and collar adjacent said ends of said rung.

4,100,669
CASTING PROCESS

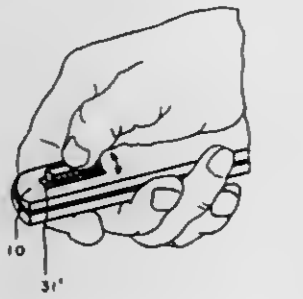
Steven J. Pemper, 1638 W. Pierce St., Milwaukee, Wis. 53204
Continuation-in-part of Ser. No. 554,559, Mar. 3, 1975, abandoned, which is a division of Ser. No. 302,731, Nov. 1, 1972, abandoned. This application May 4, 1976, Ser. No. 682,991
Int. Cl.^{2} B22D *19/00*
U.S. Cl. 29—527.6 **5 Claims**



1. A process for producing castings, comprising the steps of forming a mold to the shape and dimensions of a casting, forming a depression in the interior surface of said mold, positioning an end portion of a insert of a machinable metallic meterial in said depression, casting a second metallic material having a substantially greater hardness than said first metallic material in said mold and substantially surrounding said insert, cooling said casting, removing said mold with said end portion of the insert projecting beyond the casting, machining the projecting end portion of the insert, and thereafter hardending the machined end portion of the insert.

4,100,670
IC INSERTION TOOL

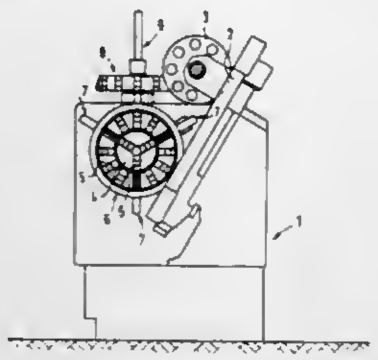
Marvin Kober, Spring Valley, N.Y., and Jarda Dvorak, Ringwood, N.J., assignors to OK Machine & Tool Corp., New York, N.Y.
Filed Jul. 6, 1977, Ser. No. 813,270
Int. Cl.^{2} H05K *3/32*
U.S. Cl. 29—564.1 **8 Claims**



1. An insertion tool comprising a handle portion having an electrical component gripping end, said gripping end comprising means for gripping the sides of the electrical component and forming a cavity for receiving the gripped electrical component and for restraining rearward movement of the gripped component, and means for biasing the gripping means into a forwardly-projecting position, said gripping means being retractable within the handle when pressure is applied overcoming the biasing means, whereby retraction of the gripping means causes ejection of the electrical component from its receiving cavity.

4,100,671
ARRANGEMENT FOR AUTOMATICALLY CHANGING THE CLAMPING JAWS OF THE CHUCK OF A MACHINE TOOL

Wilhelm Junike; Klaus Rall, both of Hanover; Wolfgang Schaefer, Langenhagen, and Günther Twiefel, Burgwedel, all of Germany, assignors to Gildemeister AG, Bielefeld, Germany
Filed May 19, 1977, Ser. No. 798,605
Int. Cl.^{2} B23Q *3/00, 3/155*
U.S. Cl. 29—568 **23 Claims**



1. A device for automatically changing clamping jaws of a rotatable chuck of a machine tool comprising:

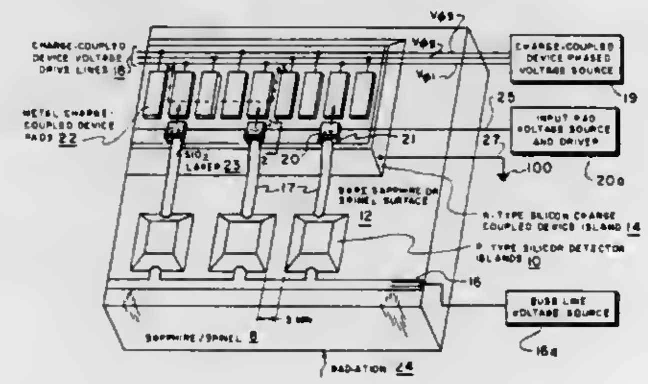
a plurality of clamping jaws for engaging a workpiece;
a clamping jaw magazine having guide means carrying the clamping jaws;
a chuck having guide means adapted to receive the clamping jaws;
means for aligning said guide means adapted to receive the clamping jaws with said guide means carrying said clamping jaws; and
means for transferring at least one clamping jaw between the magazine and the chuck when said guide means adapted to receive the clamping jaws is aligned with said guide means carrying the clamping jaws.

4,100,672
METHOD OF PREPARATION OF SOS EXTRINSIC INFRARED DETECTOR AND READ-OUT DEVICE

Gerard J. King, Alexandria, and Joseph F. Martino, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 705,641, Jul. 15, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,370
Int. Cl.^{2} B01J *17/00*
U.S. Cl. 29—577 C **6 Claims**

1. A method of preparing a SOS extrinsic IR detector and readout device on an epitaxial structure comprising the steps of:

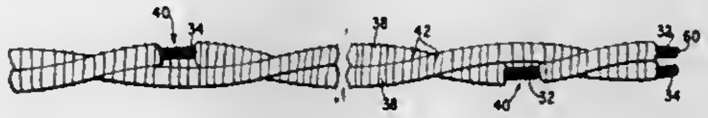
providing a single crystal sapphire substrate;
epitaxially depositing a layer of single crystal silicon on one side of said sapphire substrate;
masking said layer of single crystal silicon with etch masks to delineate a plurality of detector islands and a CCD signal readout structure;
non-slective chemically etching through said layer of single crystal silicon down to said sapphire substrate to delineate a plurality of individual intrinsic silicon detector islands and a silicon CCD signal readout structure in proximity thereto on one side of said sapphire substrate;
unmasking said layer of single crystal silicon as delineated in step three;
covering said silicon CCD signal readout structure with a protective mask and doping said plurality of individual intrinsic silicon detector islands with slow or rapid diffusant dopant materials into a plurality of individual extrinsic silicon detectors possessing a desired infrared wavelength region wherein said slow or rapid diffusant dopant materials are kept out of said silicon CCD readout structure;
removing said protective mask from said silicon CCD readout structure and masking said plurality of individual extrinsic silicon detector islands;
diffusing a plurality of slow diffusant type input diffusions into the portion of said silicon CCD readout structure that is adjacent said plurality of extrinsic silicon detector islands;
growing an insulating layer over said silicon CCD readout structure;
photolithographically etching away the portion of said insulation layer that is directly over said plurality of slow diffusant type input diffusions;
cleaning said substrate surfaces;
evaporating a metallized layer over the silicon device side of said substrate;


VΦ3
VΦ2
VΦ1
CHARGE-COUPLED DEVICE VOLTAGE DRIVE LINES 18
CHARGE-COUPLED DEVICE PHASED VOLTAGE SOURCE
19
25
METAL CHARGE-COUPLED DEVICE PADS 22
INPUT PAD VOLTAGE SOURCE AND DRIVER
21
27
SiO2 LAYER 23
20
100
20a
17
BARE SAPPHIRE OR SPINEL SURFACE 12
N-TYPE SILICON CHARGE COUPLED DEVICE ISLAND 14
P TYPE SILICON DETECTOR ISLANDS 10
16
BUSS LINE VOLTAGE SOURCE
16a
SAPPHIRE/SPINEL 8
RADIATION 24

photolithographically etching away said metallized layer to leave the following conductive structures thereon, a lead from said silicon CCD readout structure to an electrical ground; a buss line common to the inputs of all of said plurality of extrinsic silicon detectors; a plurality of detector output leads connected between an output side of said plurality of extrinsic silicon detectors and said plurality of input diffusions; a plurality of input structure pads and a lead electrically connecting said plurality of input structure pads; a plurality of CCD pads; and a plurality of CCD voltage drive lines having individually electrically isolated lines that are electrically connected to intermittently repeated numbers of said plurality of CCD pads of said plurality of CCD pads in some preselected phasing and whrein said plurality of input structure pads are positioned between each of said plurality of input diffusions and adjacent to said intermittently repeated numbers of said plurality of CCD pads in which each of said plurality of input structure pads is positioned opposite the common connection of said CCD voltage drive line in said preselected phasing;
providing a buss line voltage source to said buss line for providing flow of carriers in said plurality of extrinsic silicon detectors when infrared radiation impinges thereon;
providing an input pad voltage source and driver to said common metallic lead electrically connecting said input structure pads; and
providing a CCD phased voltage source having phased voltages connected to individual lines of said plurality of CCD voltage drive lines to provide CCD signal readout of signals generated in said plurality of extrinsic silicon detectors by infrared radiation impinging thereon in which said input pad voltage source and driver sequentially switches a voltage to all of said plurality of extrinsic silicon detectors and inject these readout signals in the layer of said silicon CCD signal readout structure that is immediately below said plurality of metal CCD pads.

4,100,673
METHOD OF MAKING HIGH TEMPERATURE PARALLEL RESISTANCE PIPE HEATER

Joseph E. Leavines, P.O. Box 310, 2 Sierra Cir., New Braunfels, Tex. 78130
Division of Ser. No. 683,299, May 5, 1977, Pat. No. 4,037,083. This application Jul. 7, 1977, Ser. No. 813,445
Int. Cl.^{2} H05B *3/00*
U.S. Cl. 29—611 **2 Claims**



1. The method of making a high-temperature parallel-resistance sheathed pipe heater cable capable of being operated at a temperature level of approximately 600° F on a sustained basis and capable of withstanding temporary occasional heating up to 1,000° F comprising the steps of

providing a pair of flexible electrical conductors each including at least nineteen fine strands of nickel-clad copper wire,
wrapping a primary layer of micaceous insulation around each of said conductors,
braiding a secondary insulation layer of fiberglass threads tightly over said primary layer, said threads each being coated with an anti-fraying agent,
stripping short sections of both primary and secondary insulation layers from said conductors at uniformly spaced intervals to expose bared segments of the conductors, each of said bared segments having the same predetermined length and being spaced from its neighbors by an interval of the same predetermined length,
positioning said pair of stripped insulated conductors side-by-side with the bared segments of one being located mid-way between the bared segments of the other,
twisting said pair of conductors together to form a twisted pair for holding the two conductors in position with the bared segments of one conductor alternating in occurrence with the bared segments of the other conductor along the twisted pair,
helically wrapping a nickel-alloy resistance wire around said twisted pair of conductors with at least two bights of the resistance wire engaging each of said bared conductor segments for providing a multiplicity of contact points of high unit area pressure where each of said bights of the nickel-alloy resistance wire presses against the nickel-clad surfaces of the fine copper strands,
wrapping another layer of micaceous insulation over said helically-wound resistance wire,
braiding an outer jacket of fiberglass threads tightly over said latter micaceous insulation layer to form a jacketed heater cable assembly, and
inserting said assembly into a stainless steel tube to form the sheathed heater cable.

4,100,674
METHOD FOR MAKING A SIDE TERMINAL WELD

Ralph G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.
Filed Feb. 2, 1977, Ser. No. 764,833
Int. Cl.^{2} H01M *2/22*
U.S. Cl. 29—623.5 **2 Claims**

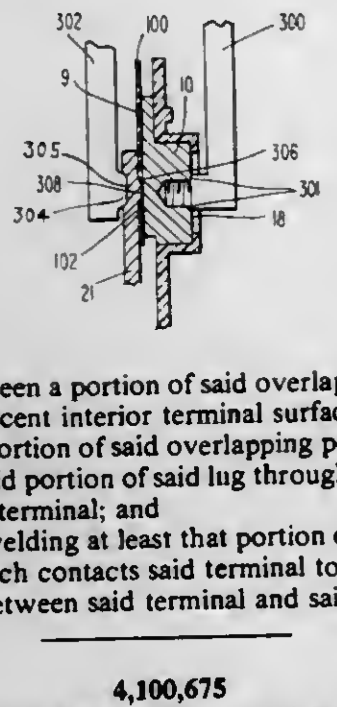
1. A method for connecting battery terminals to battery lugs

in a battery, said battery having a case having at least one terminal through a wall thereof, said battery case having at least one group of battery plates within a cell, said group having at least one strap having a portion of a lug disposed adjacent and overlapping at least a portion of an interior surface of said terminal, said method comprising:

(a) providing insulating material with an aperture defined therein, between a portion of said overlapping lug surface and said adjacent interior terminal surface;

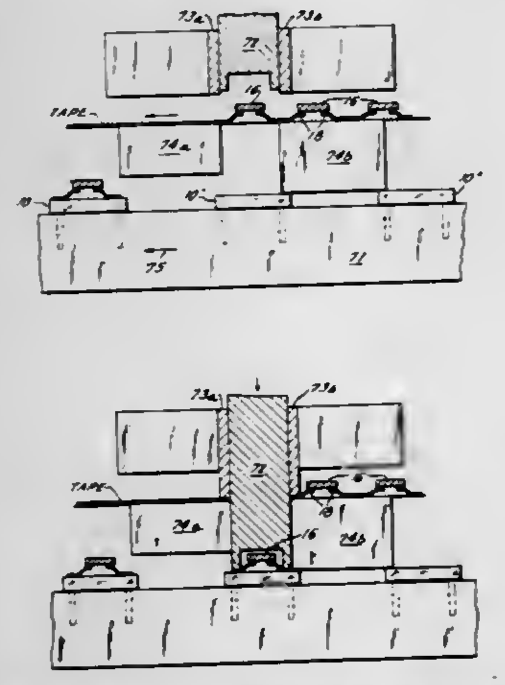
(b) pressing a portion of said overlapping portion of said lug to extrude said portion of said lug through said aperture to contact said terminal; and

(c) resistance welding at least that portion of said lug to said terminal which contacts said terminal to form an integral connector between said terminal and said lug.



4,100,675
NOVEL METHOD AND APPARATUS FOR HERMETIC ENCAPSULATION FOR INTEGRATED CIRCUITS AND THE LIKE

David Thomas Landsittel, New Providence, N.J., assignor to Mansol Ceramics Company, Belleville, N.J.
Filed Nov. 1, 1976, Ser. No. 737,286
Int. Cl.² H05K *3/28*
U.S. Cl. 29—627 **13 Claims**



1. A package assembly for hermetically sealing semi-conductor type chips and the like, comprising:

a base member formed of an insulating material and having a chip mounting surface formed on one side thereof;

at least one row of openings formed in said base member, one end of each of said openings terminating at said mounting surface;

a plurality of conductive pins extending through said opening, one end of each of said pins defining a lead mounting surface, a major portion of said one end of each of said pins being planar and substantially flush with said mounting surface;

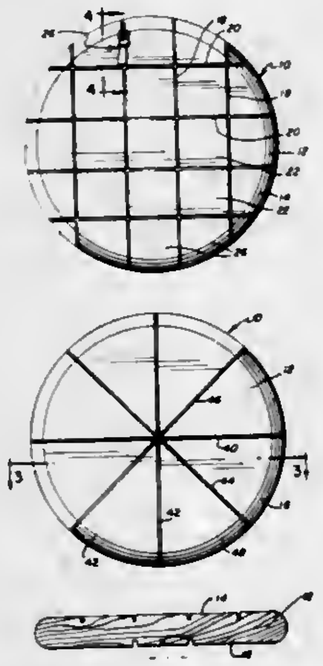
said base member including means for forming a hermetic seal between each of said pins and their associated pin openings;

a lid formed of an insulating material having a mating surface abutting said mounting surface, said mating surface of said lid overlying said one end of said pins and including a recess formed therein, said recess defining a hollow interior volume adapted to receive a semi-conductor chip or the like; and

sealing means located between said mating surface of said lid and said mounting surface of said base member for hermetically isolating each of said pin seals from each other and from said recess.

4,100,676
PIZZA CUTTING BOARD

Robert H. Ferguson, 311 S. Windsor Dr., Arlingtoo Heights, Ill. 60004
Filed Apr. 20, 1977, Ser. No. 789,210
Int. Cl.² B26B *29/00*
U.S. Cl. 30—292 **2 Claims**



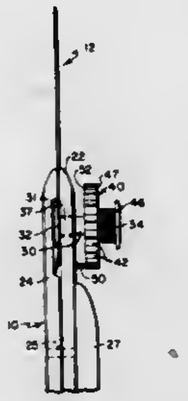
1. In a pizza cutting device comprising a base having a pair of oppositely facing flat surfaces and a plurality of slots formed in each one of said flat surfaces, said slots formed in one of said surfaces pass through a common point located substantially at the midportion of said one surface and some of said slots in the other of said surfaces lie parallel to each other and the remaining slots in said other of said surfaces lie parallel to each other and are perpendicular to and intersect the first-named some of said slots, and hand-drawn cutting means having a cutting edge for cutting said pizza in the pattern established by said slots by drawing said cutting means across said base such that a pizza resting on said surface can be cut by the cutting edge of the cutting means, and said slots in both surfaces are of a width and a depth to coact with said cutting edge of the cutting means to produce a clean and complete cut through the pizza resting on said base.

4,100,677
PRECISION CUTTING TOOL

Adolph L. Jeff, 155 Park La., Rochester, N.Y. 14625
Filed Feb. 15, 1977, Ser. No. 768,726
Int. Cl.² B26B *1/00*
U.S. Cl. 30—321 **3 Claims**

1. A precision cutting instrument of the type adapted for use by graphic artists, said cutting instrument comprising: an elongated handle having a longitudinal axis extending along the length thereof; a planar cutting blade having a cutting edge and a tang portion spaced therefrom; and clamping means mounted

on one end of said handle for detachably clamping the tang portion of the blade to said one end of the handle to position said blade in one of a plurality of predetermined angular positions relative to said axis, said clamping means comprising: (a) a shaft for supporting said blade on said one end of the handle; (b) means for rotatably mounting said shaft on said one end of the handle; (c) means for keying said blade to said shaft so as to rotate therewith, whereby the angular position of said blade relative to said axis is governed by the angular position of said shaft; and (d) locking means for selectively preventing rotational movement of said shaft in at least one direction while said blade is positioned in one of said plurality off predetermined angular positions, said locking means comprising: (i) a disc-member having a plurality of spaced indentations formed in the periphery thereof, said disc being journalled to rotate with said shaft and being slidably mounted on said shaft for axial movement between first and second spaced positions; (ii) a pin member rigidly mounted on said one end of the handle and extending outwardly therefrom to engage one of said indentations while said disc is in said first position, and thereby prevent rotational movement of said shaft, said pin member being of a length shorter than the spacing between said first and second positions, whereby said pin member disengages said indentation upon movement of said disc to said second position, and thereby allows said shaft to rotate; and (iii) means for urging said disc into said first position.



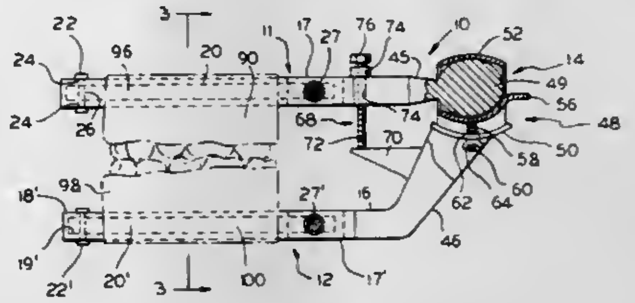
4,100,678
METAL BRACKET FOR USE IN ORTHODONTIC TREATMENT

Kenichi Yatabe, 1-5, 4-Chome Shimo Meguro, Meguro-Ku, Tokyo, Japan
Filed Oct. 18, 1976, Ser. No. 733,486
Claims priority, application Japan, Oct. 20, 1975, 50-142657[U]
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 A **4 Claims**

1. A metal bracket for use in orthodontic treatment which comprises a bracket body for receiving and securing a wire which transmits orthodontic force to the tooth and a support base for supporting said bracket body and which is adhered to the tooth, a plurality of fine pores in the form of undercut pores being formed in the support base by blowing fine particles of solids entrained in a pressurized fluid against the support base and then immersing the resulting scarred base in an oxidizing solution.

4,100,679
DENTAL ARTICULATOR

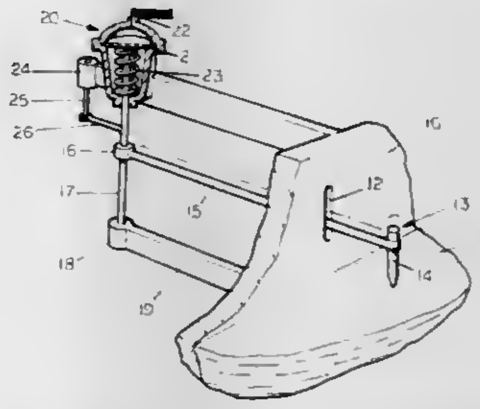
Israel Mogilevsky, 3909 N. 51st Blvd., Milwaukee, Wis. 53216
Filed Aug. 9, 1976, Ser. No. 712,496
Int. Cl.² A61C *11/00*
U.S. Cl. 32—32 **10 Claims**



1. An articulator for dental models including upper and lower clamp portions, first pivot means interconnecting said clamp portions, each of said upper and lower clamp portions including a frame portion and a pair of elongated clip members extending generally away from said first pivot means and each having a remote end and a relatively proximate end with respect to said first pivot means, first resilient means connecting the remote end of one clip member of each pair to the remote end of the other clip member thereof for urging one clip member of each pair of clip members toward the other, the remote end of the other clip member of each pair being pivotally mounted by second and third pivot means on its associated frame portion and at the end thereof remote from said first pivot means and additional resilient means associated with each clamp portion for urging the proximate ends of said clip members inwardly, whereby a dental model may be resiliently clamped between said clip members.

4,100,680
SENSING THE LEVEL OF MOLTEN GLASS IN A TANK

Robert R. Rough, Sr., Toledo, and Homer D. F. Peters, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toldeo, Ohio
Filed May 2, 1977, Ser. No. 792,758
Int. Cl.² G01B *5/18;* **G01F** *23/04*
U.S. Cl. 33—126.7 A **2 Claims**



1. Apparatus for gauging the level of molten glass in a tank, comprising:

an electrical sensing probe;

a reversible electric motor;

operating connections between the probe and the motor for moving the former into and out of contact with the molten glass;

a motor control connected to said motor for reversing the operation of said motor upon contact of said probe with the molten glass in said tank;

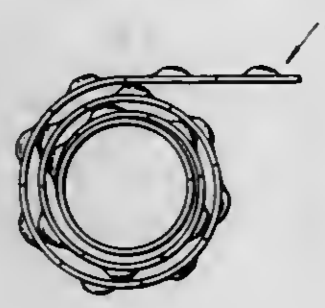
solenoid means connected to said probe, said solenoid means being carried by an arm;

means driving said arm from said motor;

means pivotally mounting said probe to said arm; and

means connecting said probe to the armature of said solenoid for rapidly moving said probe out of contact with the molten glass.

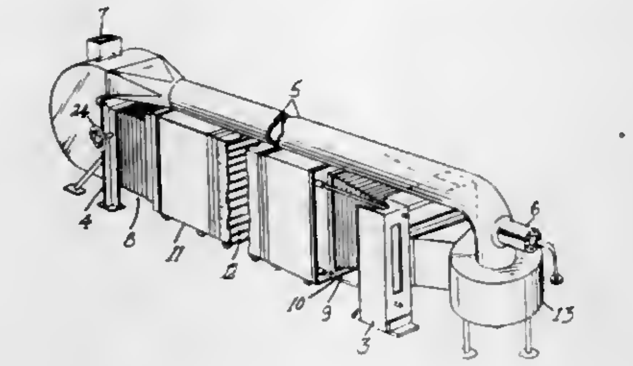
4,100,681
PICTURE FRAME LEVELING DEVICE
Bruce L. Hollander, 1025 Tyler St., Hollywood, Fla. 33020
Filed Nov. 8, 1976, Ser. No. 739,603
Int. Cl.² B32B *3/00;* B65D *65/28*
U.S. Cl. 33—389 **3 Claims**



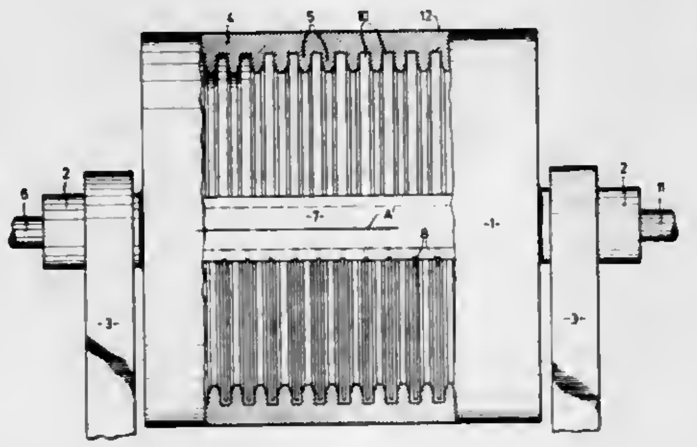
1. A spirit level device comrising:
- a. a flexible base member;
- b. a flexible transparent blister member having a longitudinal cavity of blister-like shape;
- c. adhesive means affixing said blister member in face-to-face engagement against one side of said base member to define therewith a closed cavity chamber;
- d. a liquid filling most of said chamber;
- e. a bubble filling the remainder of said chamber not filled by said liquid;
- f. means on said blister member for indicating the leveling position of said bubble in said cavity chamber;
- g. a coating of pressure sensitive adhesive on the outside of said base member; and
- h. a protective cover strip covering said pressure-sensitive adhesive on the outside of said base member;
- i. said blister member being formed with a plurality of longitudinal cavities equidistantly spaced therealong, said base member being substantially coextensive with said blister member, each of the closed cavity chambers thereby defined being filled with liquid and an air bubble.

4,100,682
TREATMENT OF COMMODITIES THROUGH CONTACT WITH FLUID MEDIA
John H. Corrigan, 62 Judith Rd., Emmarentia, Johannesburg, Transvaal, South Africa
Filed Mar. 31, 1976, Ser. No. 672,316
Claims priority, application South Africa, Apr. 10, 1977, 77/1844
Int. Cl.² F26B *3/04*
U.S. Cl. 34—22 **12 Claims**

1. Apparatus for subjecting commodities to treatment through contact with fluid media including a plurality of movable conveyances having walls and being arranged so as to form a conveyance train which forms a part of a single endless fluid conveying duct, having walls and opposite ends, with the walls of said part of said duct formed by the walls of said conveyances, in which the treatment to which the commodities is to be subjected takes place with fluid passing progressively through the conveyances forming the conveyance train, a fluid inlet station means and a fluid outlet station means at opposite ends of the conveyance train and between which the conveyance train is located, and a circulating duct which links the outlet station to the inlet station as a portion of the endless duct.

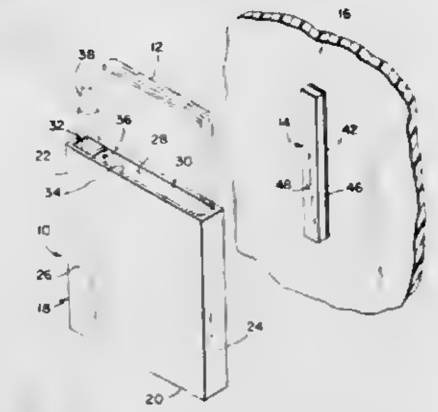


4,100,683
DRYING CYLINDER FOR A PAPER MAKING MACHINE
Bruno Barp, Rudolfstetten, Switzerland, and Herbert Holik, Ravensburg, Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany
Filed May 5, 1976, Ser. No. 683,379
Claims priority, application Switzerland, May 12, 1975, 6030/75
Int. Cl.² F26B *11/02*
U.S. Cl. 34—124 **10 Claims**



1. A drying cylinder for a paper-making machine comprising
a cylindrical barrel disposed on a longitudinal axis;
a plurality of annular ribs disposed peripherally within and on said barrel in spaced relation to define recesses therebetween, each said rib having an axis perpendicular to said longitudinal axis and a profile situated in a zone bounded outwardly by a hexagon symmetrical about said rib axis and consisting of a rectangle of a width equal to a rib width and a height equal to 0.75 times a rib height and an adjoining trapezium having a width of 0.65 times said rib width at the maximum rib height, and bounded inwardly by a pentagon symmetrical about said rib axis of a width of 0.7 times said rib width at the mid-height of said rib and which has a vertex at said maximum rib height; and
a plurality of tubes for removing condensate within said barrel, each tube extending into a respective recess between two adjacent ribs.

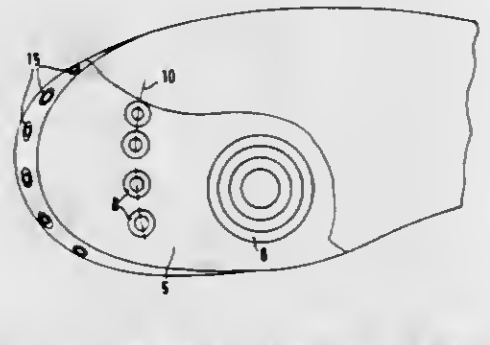
4,100,684
HOLDER DEVICE FOR PAPER ARTICLES AND WRITING INSTRUMENTS
Stuart Berger, 12 Overton Rd., East Windsor, N.J. 08520
Filed Jun. 21, 1976, Ser. No. 698,073
Int. Cl.² A47F *7/00;* A47B *96/06;* B43L *5/02*
U.S. Cl. 35—62 **7 Claims**



1. A holder device adapted for receiving paper articles and writing means therein and for being removably secured to a stationary object, which comprises:
- (a) an elongated bar member, said bar member including a ferrous metallic element having an adhesive layer deposited thereon, said adhesive layer adhesively adhering said metallic element to said stationary object, said bar member further including two elongated sections, and a hinge means joining said sections;
- (b) a housing having at least two vertical compartments therein with an open top, one said compartment for receiving said paper articles, and other of said compartments for receiving said writing means; and
- (c) means for removably securing said housing to said bar member, said removable securing means including a permanent magnet mounted on said housing, said permanent magnet removably receivable onto said metallic bar member.

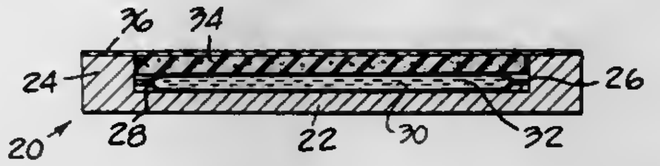
3. A device according to claim 1, wherein a blackboard element is affixed onto said housing.

4,100,685
SPORTS SHOE
Adolf Dassler, Am Bahnhof, D-8522 Herzogenaurach, Fed. Rep. of Germany
Filed Jan. 21, 1977, Ser. No. 761,057
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602310
Int. Cl.² A43B *7/06*
U.S. Cl. 36—3 B **14 Claims**



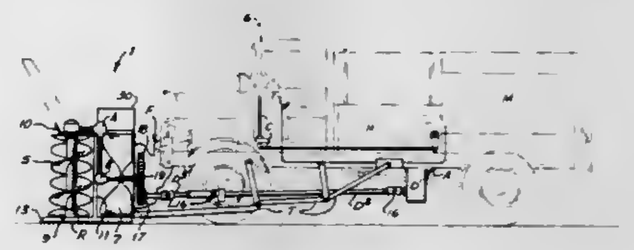
1. A sports shoe having a toe end and a flexible plastics outsole, venting channels extending through said outsole between the exterior and interior of the sole and orifices to said venting channels at the interior of the shoe, wherein said channels and orifices are arranged on an imaginary line which extends beneath the hollows of the toes of the wearer, between the ball of the foot and the balls of the toes of the wearer.

4,100,686
SHOE SOLE CONSTRUCTION
Thomas E. Sgarlato, 354 Bachman Ave., Los Gatos, Calif. 95030; Gary A. Eston, 420 Maple St., Redwood City, Calif. 94063, and Thomas E. Freeman, 100 Arch St., Redwood City, Calif. 94062
Filed Sep. 6, 1977, Ser. No. 830,690
Int. Cl.² A63B *21/00*
U.S. Cl. 36—29 **8 Claims**



1. A shoe construction comprising:
- (a) a sole means defining a recessed area;
- (b) a flexible bladder defining a fluid tight cavity, said bladder disposed within said recessed area; and
- (c) a volume of liquid disposed within and only partially filling said fluid tight bladder cavity whereby liquid may freely flow from one portion of said cavity to another portion of said cavity.

4,100,687
VERTICAL AUGER SNOW REMOVAL DEVICE
Adolph Jeswine, 735 8th Ave., Helena, Mont. 59601
Filed Sep. 3, 1976, Ser. No. 720,408
Int. Cl.² E01H *5/00*
U.S. Cl. 37—43 K **3 Claims**



1. A snow removal device comprising, in combination, a snow blower fan having a horizontal axis, a first vertical auger at one side of the fan axis and in front of the fan, a second vertical auger beside the first auger, at the other side of the fan axis and in front of the fan, said first auger having a continuous right hand helix blade originating near the bottom of the auger and ending near the top of the auger, means said second auger having a continuous left-hand helix blade originating near the bottom of said second auger and ending near the top of said second auger mounting said augers for rotation about parallel vertical axes with said right hand helix auger to the right of the fan centerline, as viewed from in front of the augers and looking toward the fan, and said left hand helix auger to the left of the fan centerline, as viewed from in front of the augers and looking toward the fan, so that the front portions of the blades of the augers slope toward each other, drive means for rotating the augers in synchronism toward each other so that said front portions of the blades which slope toward each other convey snow toward the vertical plane including the fan axis, said fan having a diameter approximately equal to the height of each auger and having its axis disposed in a generally horizontal plane mid-way between the ends of the augers so that all snow conveyed toward the fan by the augers is removed by the fan without danger of clogging in the region between the fan and the augers, and further comprising, third and fourth vertical augers in a common horizontal plane with said first and second augers, means mounting said third auger beside said first auger, and means mounting said fourth auger beside said second auger, said third auger being identical to said first auger, and

said fourth auger being identical to aid second auger, and drive means for rotating said first and third augers in the same direction and toward the fan and for rotating the second and fourth augers in the same direction and toward the fan, said drive means including positive gearing for rotating said augers at the same speed and in synchronism, said auger blades of the first and third augers being essentially tangent to each other at two locations, and said auger blades of said second and fourth augers being essentially tangent to each other at two locations, to provide inwardly sloping continuous blade surfaces across the two augers at each side of the fan axis, said essentially tangent surfaces causing snow to slide toward the vertical plane of the fan axis in a continuous fashion, said drive means for rotating the augers in synchronism maintaining said essentially tangent relationship for all rotational positions of said augers.

4,100,688

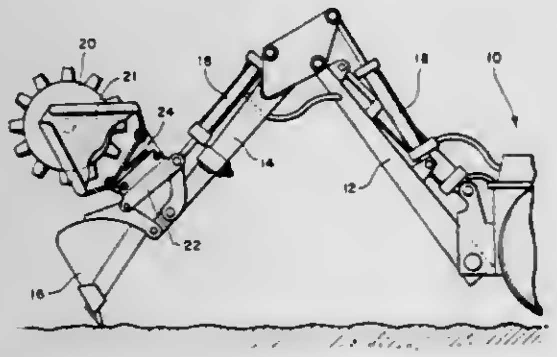
EARTH WORKING APPARATUS

Warren W. Grist, Universal City, Tex., assignor to Earth Pack, Inc., San Antonio, Tex.

Filed Aug. 19, 1976, Ser. No. 715,667

Int. Cl.² A01B *29/04;* **B66F** *9/00;* **E01C** *19/00*

U.S. Cl. 37—117.5 **6 Claims**



1. In an earth excavating and compacting apparatus having a boom, an excavating bucket, a compacting roller and hydraulic means for manipulating said bucket and roller, the improvement comprising:

means for removably coupling said compacting roller into operative engagement with said boom including a link member connecting said bucket to said hydraulic means, means associated with said link member for receiving and engaging a mounting bracket of said bucket upon an upward movement of said boom, and means for locking said mounting bracket to said link member to secure said roller in operating position.

4,100,689

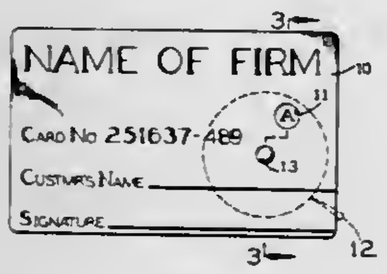
TRANSACTION CARD

Abel U. Broune, 1950 S. Ocean Dr., Hallandale, Fla. 33009

Filed Jul. 24, 1975, Ser. No. 598,889

Int. Cl.² G09F *3/02*

U.S. Cl. 40—2.2 **1 Claim**



1. In a transaction card (1) having permanent indicia on the front providing part of the coded designation of an authorized user, the improvement which comprises:

means providing a window in said card and (2) a disc rotatably mounted on the back ofthe card said disc carrying on its front face a circularly arranged series of visual indicia which registers individually in succession with said window as the disc is turned for viewing said window from the front of the card, a selected one of said indicia on the disc when visible through said window completing the coded designation of the authorized user and said disc having said indicia on the front for viewing through said window has the same indicia at the same positions on the back and said card has a mark on the back pointing to the indicium on the back of the disc which is the same as the indicium on the front of the disc that is visible at said window.

4,100,690

FOLDED COMPOSITE STRUCTURE

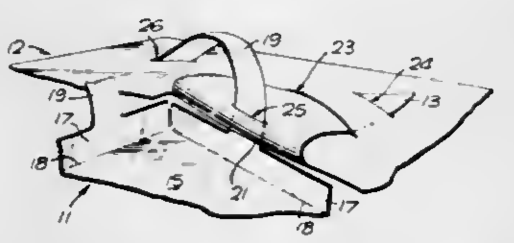
John Edward O'Neill, Teal House, 34 Broad St., Penryn, Cornwall, England

Filed Dec. 7, 1976, Ser. No. 748,291

Claims priority, application United Kingdom, Dec. 10, 1975, 50554/75

Int. Cl.² G09F *1/12*

U.S. Cl. 40—154 **9 Claims**



1. A folded structure in the form of a frame for receiving pictures, postcards and the like, comprising:

at least first and second members of foldable laminar material,

a first set of tabs projecting from the periphery of said first member,

said second member being provided with:

a first set of slots,

a second set of slots,

a third set of slots, and

a first set of tabs having slots therein, tabs of said first set of tabs of said first member passing through respective slots of said first set on said second member and through the slots of respective tabs of said first set on said second member, the tabs of said first set of said second member being rolled over and inserted through respective slots of said second set of slots of said second member, and the tabs of said first set of said first member being folded over and inserted through respective slots of said third set of slots of said second member whereby to provide a gripping effect to hold said first and second members together to form a structure with a recessed central region the sides of which have an overhanging lip, and a surrounding border.

4,100,691

SAFETY CARTRIDGE INDICATOR FOR GUNS

Michael M. Wicklund, 2902 S. Delaware, Englewood, Colo. 80110

Filed Dec. 6, 1976, Ser. No. 747,629

Int. Cl.² F41C *27/12*

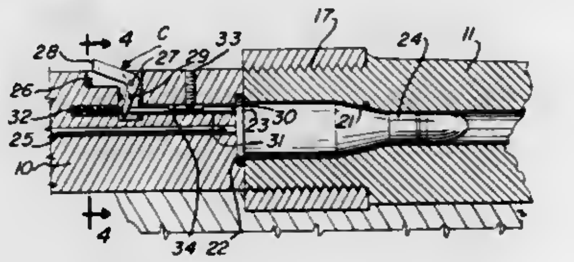
U.S. Cl. 42—1 D **2 Claims**

1. A chambered cartridge indicator for fire arms having a fire arm receiver including a sliding and rotatable bolt engaging a cartridge chamber and a cartridge ejection slot in the firearm receiver comprising:

(a) reciprocable cartridge contact means mounted in a bore in the bolt including means to reciprocably secure said contact means in the bore, said contact means being positioned to contact a chambered cartridge and slide in an opposite direction from such cartridge and extend into the chamber in the absence of a cartridge,

(b) pivoted striker means mounted in the bolt positioned to contact said contact means in the presence of a chambered cartridge and be pivoted thereby,

(c) slot means in said bolt communicating with said striker means and positioned so as to be within the confines of the cartridge ejection slot with the bolt in closed position and at an angle to the sight line of the fire arm,



(d) indicator means mounted in said slot means connected to said striker means and positioned to extend above the surface of the bolt and below the metal around the cartridge ejection slot when the bolt is closed and said contact means pivots said striker means, and

(e) spring bias means normally holding said contact emans from pivoting said striker means and normally holding said indicator means below the surface of the bolt.

4,100,692

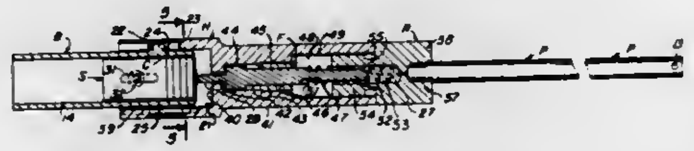
UNDERWATER PROTECTION DEVICE

Larry D. Cameron, 16690 W. 11th Ave., Golden, Colo. 80401, and Albert W. Jacque, 1600 Balsam St., Lakewood, Colo. 80215

Filed Aug. 2, 1977, Ser. No. 821,081

Int. Cl.² F41C *27/00*

U.S. Cl. 42—1 L **10 Claims**



1. An underwater protection device comprising, in combination:

a generally cylindrical barrel having outer, laterally extending cam means and a bore for receiving a shell, with a rear rim of said shell abutting the rear end of said barrel;

a housing for receiving said barrel axially, having reception means for movement of said barrel inwardly into said housing and having interlocking means for restraining said barrel against outward movement but permitting inward movement to a predetemined extent;

said housing having means for constraining said barrel to longitudinal movement when so interlocked; and

firing pin means for engaging the rear end of said shell to maintain said barrel in an outward interlocked position and for firing said shell upon impact of the outer end of said barrel with a water inhabitant, resulting in inward longitudinal movement of said barrel.

4,100,693

STRIKER CARTRIDGE

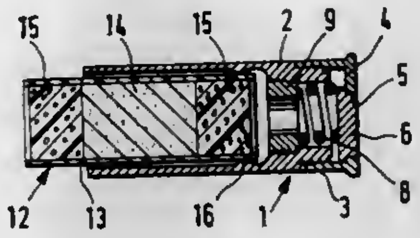
Theo Cech, Dobersbergerstr. 6, Karlstein, Thaya, Austria (3822)

Filed Feb. 1, 1977, Ser. No. 764,634

Claims priority, application Austria, Feb. 3, 1976, 736/76

Int. Cl.² F41C *27/08*

U.S. Cl. 42—1 N **12 Claims**



1. A striker cartridge for weapons with central firing cartridges, especially for shotguns, consisting of a jacket similar to a regular cartridge jacket and including a generally tubular side wall and a bottom wall, in whose bottom wall a circular opening is provided in the impact area of the weapon's firing pin and into which opening an impact element is inserted from the inside of the jacket and biased by a resilient spring oppositely to the impact direction of the firing pin, the improvement consisting in that the opening (5) for receiving the impact element (6) is arranged eccentrically to the jacket's longitudinal axis, and the impact element is rotatably mounted in this opening.

4,100,694

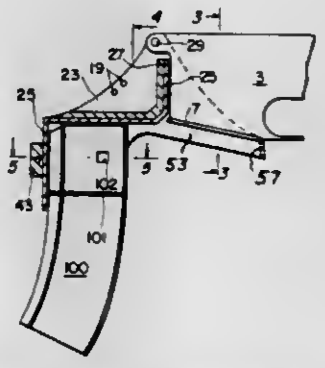
READY MAGAZINE HOLDER

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Oct. 5, 1977, Ser. No. 839,596

Int. Cl.² F41C *27/00*

U.S. Cl. 42—90 **9 Claims**



1. A ready magazine holder comprising: a frame adapted for mounting on a firearm; support means on said frame adapted for supporting a magazine in a correct orientation for insertion into a magazine receptacle on said firearm; guide means on said frame positionally adapted for directing translational movement of said magazine from said support means toward said receptacle; and stop means on said frame positionally adapted for terminating said movement with said magazine aligned with said receptacle.

4,100,695

FISHING ROD JIGGING APPARATUS

James A. Blanchard, 55 Woodbury St., Keene, N.H. 03431

Filed Dec. 15, 1976, Ser. No. 750,765

Int. Cl.² A01K *97/10*

U.S. Cl. 43—19.2 **1 Claim**

1. An apparatus for controlling the motion of a fishing rod, comprising:

a housing having a top, a bottom and enclosing sides;

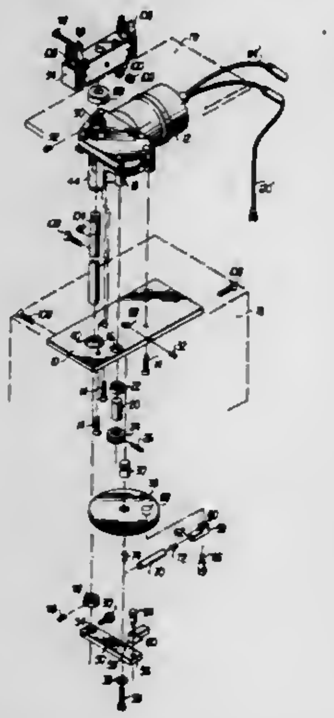
a mounting plate located in said housing between said top and said bottom;

a motor mounted on one side of and supported by said mounting plate;

a drive gear mounted on the opposite side of said mounting plate and directly connected by a drive shaft to said motor for rotation thereby;

an output shaft mounted for rotation in said housing and extending exteriorly thereof;

a first link located in said housing and connected to said output shaft for rotation therewith;



means for supporting a fishing rod exteriorly of said housing, said means being attached to said output shaft for rotation therewith;

a second link located in said housing and pivotally connected through respective first and second pivot members to said driven gear and said first link, whereby said output shaft is caused to oscillate as said driven gear is rotated by said motor through said drive gear.

said second link formed with threaded end portions, and a pair of screws extending from said end portions into engagement with said pivot members allowing the effective length of said second link to be adjusted, whereby the amplitude of said oscillation is correspondingly varied.

4,100,696

TRANSFER MECHANISM INTENDED FOR USE WITH MOVABLE FIGURINES

Toyotsugu Ogasawara, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 17, 1977, Ser. No. 759,648

Int. Cl.² A63H *18/14*

U.S. Cl. 46—40 **8 Claims**

1. A transfer mechanism for use in transferring articles from one location to another location which includes:

a support structure provided with transfer platforms which are spaced from one another,

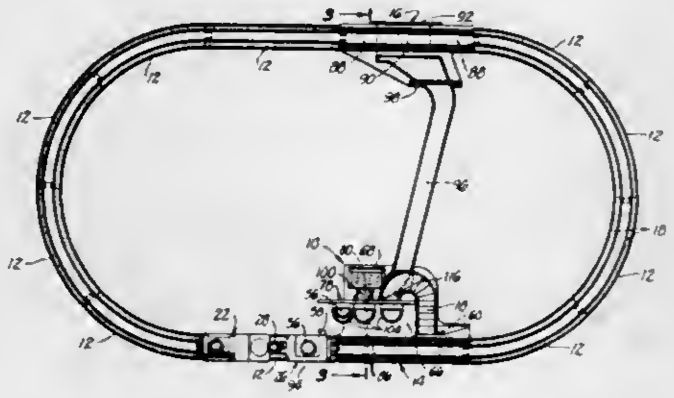
a wheel having front and back sides located vertically so that said back side of said wheel is located adjacent to said platforms,

means rotatably mounting said wheel for rotation relative to said support structure about a horizontal axis,

said wheel having at least one opening extending between said front and back sides of a shape approximating the shape of an article to be transferred using said transfer mechanism and sufficiently large so that such an article may be moved through said opening,

a carrier pivotally mounted on the front side of said wheel adjacent to said opening, said carrier having an entrance adjacent to said front side of said wheel of a shape and dimension corresponding to that of said opening,

said carrier being sufficiently heavy so as to pivot relative to said wheel by the action of gravity during the rotation of said wheel,



said carrier being located on said wheel in a position in which said wheel closes off said entrance to said carrier when said wheel and said carrier are in positions other than adjacent to said platform.

4,100,697

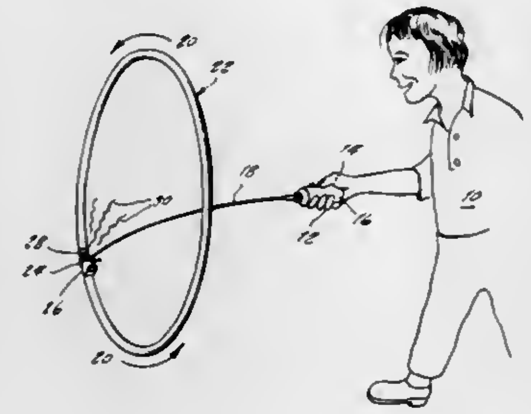
HOOP TOY

Daniel Ward, 541 Vanessa Crescent, Mississauga, Ontario, Canada (L5H 2N4)

Filed Aug. 24, 1976, Ser. No. 717,023

Int. Cl.² A63H *33/26*

U.S. Cl. 46—269 **6 Claims**



1. A hoop toy comprising a length of hollow tubing, a joining device, said joining device having the ends of said length of hollow tubing fixedly secured thereto forming a hoop, a handle, said handle forming a housing, a shaft, said housing containing a motor and power supply means therewithin, a flexible wire-like element, one end of said wire-like element removably secured to said joining device, the other end of said wire-like element removably secured to said shaft, said shaft passing through an opening in said housing, said shaft being rotated by said motor when said motor is being energized by said power supply means, tone generating means for generating an audible tone upon the rotation of said hoop about a line, said line passing through a plane engaging the outermost surface of said hoop, wherein said tone generating means includes a compartment, said compartment being disposed within said joining device, a pair of orifices being disposed in the walls of said joining device and fluidly communicating to said compartment, a plate, said plate being fixedly secured to the surface of said joining device adjacent one of said pair of orifices, the other of said pair of orifices creating a whistling tone upon the ingress of moving air through said one of said pair of orifices and the egress of said moving air through said other of said pair of orifices.

4,100,698

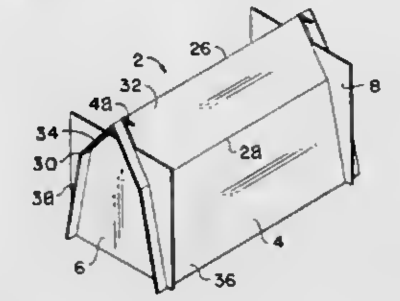
PORTABLE GREENHOUSE

Christopher Fries, 61 Cramary Way, Inverness, Calif. 94937

Filed Sep. 17, 1976, Ser. No. 724,253

Int. Cl.² A01G *13/04*

U.S. Cl. 47—29 **14 Claims**



1. A portable greenhouse comprising

a light-transmitting roof section comprising a roof panel of synthetic resin having opposed end edges and opposed lateral edges with at least one fold line extending between said end edges and disposed between said lateral edges, said roof panel being folded along said fold line to form said roof section having open ends, and

a pair of end panels, one each removably attached to said roof section adjacent each said end edge thereof to at least partially close the ends of said greenhouse, portions of each said end panel being slotted to straddle portions of the adjacent said roof section.

4,100,699

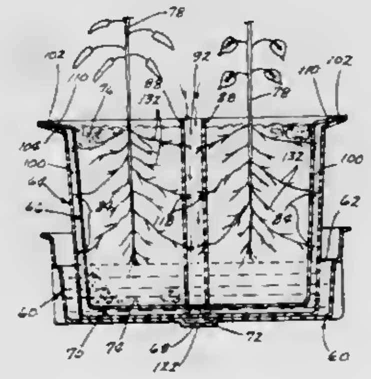
AERATED CONTINUOUSLY WATERED PLANT AND SEED ORGANIC GROWING MEDIUM AND CONTAINER FOR SAME

William Skaife, Dubuque, Iowa, assignor to Margaret R. Skaife, Trustee, Dubuque, Iowa

Continuation-in-part of Ser. No. 693,637, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 577,863, May 15, 1973, Pat. No. 3,961,444. This application Jul. 12, 1976, Ser. No. 704,190

Int. Cl.² A01G *25/00*

U.S. Cl. 47—81 **6 Claims**



1. A continuously aerated and watered seed or plant growing medium and container comprising,

a first container having a wall,

a growing medium in said first container sufficiently porous to allow air to freely circulate therethrough and having properties allowing capillary action to transmit water throughout the growing medium,

a water supply in continuous contact with said growing medium to substantially wet said growing medium and maintain it in a substantially wetted condition throughout,

an air source in continuous communication with said growing medium to provide a substantially continuous supply of air throughout said growing medium with said air having been humidified by passing through said wetted growing medium and thereby being adapted to provide humidified air to seed or plant roots in the growing medium,

said first container including sidewalls in contact with the sides of said growing medium,

an enclosure being provided in which said first container is positioned and said enclosure being larger than said first container to provide a chamber along at least a portion of said first container to provide humid air to said growing medium, and said chamber being in communication with said water supply,

said enclosure including a second container, larger than said first container and having coextensive sidewalls in spaced relation to define said chamber, and

a third container being provided and said second container being positioned in said third container, said third container being sufficiently larger than said second container to provide a second chamber between said second and third container and said growing medium being provided in said second chamber and said growing medium in said second chamber being accessible by roots of said plants in said first container through said openings in the sidewalls of said first and second containers.

4,100,700

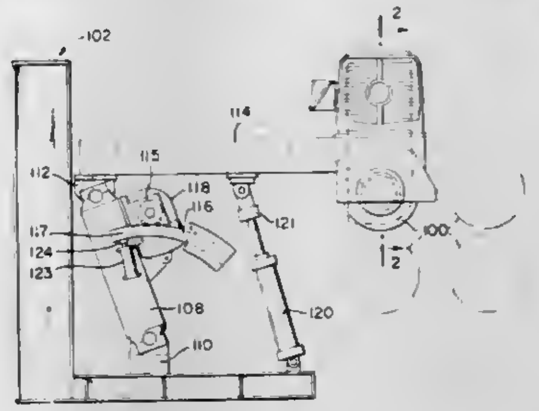
WORKPIECE CONDITIONING GRINDER SYSTEM

Allen E. Peirce, Lynnwood; Robert F. Obear, Everett, and David E. Olson, Snohomish, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed Dec. 7, 1976, Ser. No. 748,293

Int. Cl.² B24B *7/02*

U.S. Cl. 51—92 R **20 Claims**



1. In a grinding machine for conditioning the surface of an elongated workpiece, said machine having a rotating grinding head and powered means for providing reciprocating movement between said grinding head and said workpiece along the longitudinal axis of said workpiece, a grinding machine control system, comprising:

vertical actuator means for controlling the grinding force exerted between said grinding head and said workpiece in a direction normal to the surface of said workpiece;

horizontal actuator means for incrementally moving said grinding head transverse to said reciprocating motion and providing an indication of the length of said increment;

power transducer means for providing an actual power indication corresponding to the mechanical power imparted to said grinding head about the rotational axis of said head;

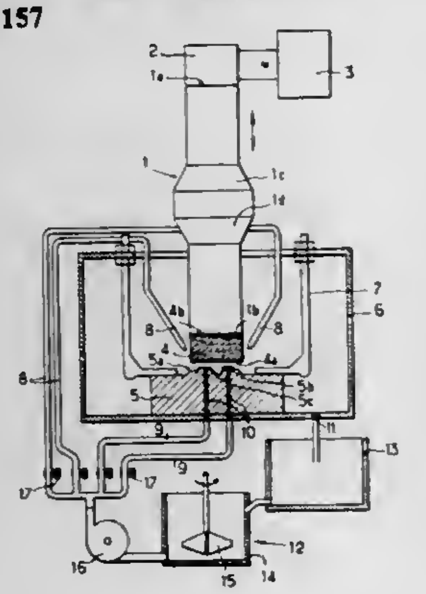
workpiece velocity transducer means for providing a workpiece velocity indication corresponding to the relative velocity between said workpiece and grinding head in the direction of said reciprocating motion;

calculator means receiving the output of said velocity transducer means and said horizontal actuator means, said calculator means utilizing said workpiece velocity indication and said increment length indication to compute a required power indication corresponding to the grinding head rotational power required to form a cut having a predetermined depth under specific grinding conditions; and

comparator means receiving the outputs of said power transducer means and said calculator means to cause said vertical actuating means to increase said grinding force responsive to required power being greater than actual power, and to decrease said grinding force responsive to required power being less than actual power.

4,100,701
ULTRASONIC MACHINING

Louis Pierre Bessaguet, Landouge, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), France
Filed Aug. 4, 1976, Ser. No. 711,444
Claims priority, application France, Aug. 5, 1975, 75 24409
Int. Cl.² B24B *19/00*
U.S. Cl. 51—157 **8 Claims**

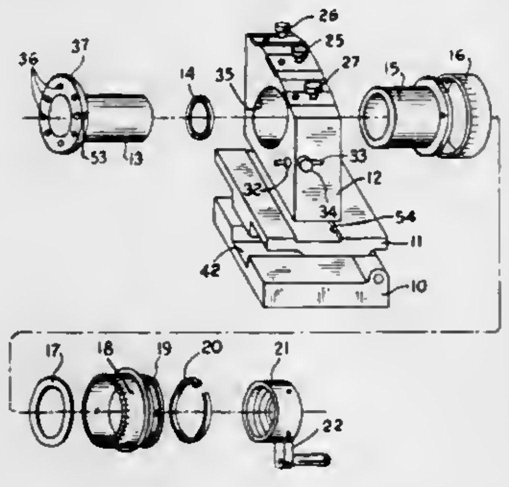


1. In an ultrasonic machining installation for producing a relief contour on a work-piece by means of a tool, an improvement comprising:
- means defining a machining enclosure;
- means for securing said tool on the bottom of said enclosure;
- a support for said work-piece above the bottom of said enclosure;
- means for imposing ultrasonic frequency vibrations on said work-piece comprising:
  - an electrical ultrasonic frequency vibration generator;
  - a vibratory part coupled to said generator; and
  - a transducer for converting electrical oscillations into mechanical vibrations;
- means for driving said work-piece vertically above the bottom of said enclosure;
- means defining at least one passage for supplying an abrasive in a liquid vehicle, this passage delivering to the interior of the machining enclosure and being capable of supplying the abrasive/liquid mixture at a level above that of the upper face of said tool; and
- a recycling assembly for recycling the abrasive/liquid mixture connected to an orifice situated in the bottom of said machining enclosure.

4,100,702
FAST GRIND FIXTURE

Bruno J. Zapart, 3624 N. Janssen St., Chicago, Ill. 60613
Filed Jun. 3, 1977, Ser. No. 803,087
Int. Cl.² B24B *41/04*
U.S. Cl. 51—216 H **8 Claims**

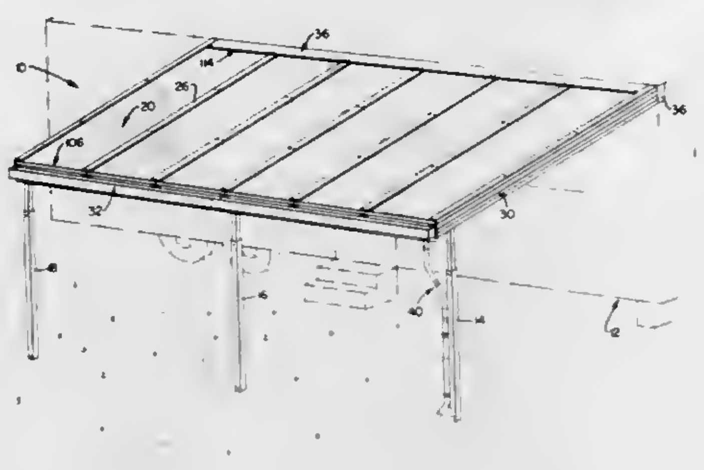
1. An indexing fixture adapted for operation with a workholding collet, said fixture comprising:
- a rigid upstanding housing generally rectangular in horizontal section, a cylindrical bore extending longitudinally through said housing;
- a fixed cylindrical hollow open-ended tubular member snugly fitted coaxially in the bore of said housing and an outwardly directed radial rearward flange disposed at one end of said fixed member, said rearward flange interfacially engaging the rearward wall of said housing;
- a revoluble hollow open-ended cylindrical spindle slip-fitted in said fixed tubular member and projecting rearwardly therefrom, and an outwardly directed radial forward flange at the forward end of said spindle, said flange being positioned forwardly beyond the forward wall of said housing;
- a toothed indexing wheel rigidly secured to the rearwardly projecting portion of said spindle and indicating means associated with the indexing wheel effective to designate the rotary angular position of said spindle;
- a collet-receiving internally threaded manipulating ring loosely keyed to said indexing wheel and freely rotatable thereon;
- at least one rotatable indexer extending downwardly through the top of said housing and having a portion movable into the rotary path of said indexing wheel;
- a detent reciprocably slidable into and from said housing, said detent being disposed adjacent to said forward flange and selectively movable to engagement therewith;
- at least one detent-engaging dog mounted on said forward flange adjacent to said housing; and
- selectively positionable fastening means removably securing said dog to said flange along any chosen diameter of the forward flange.

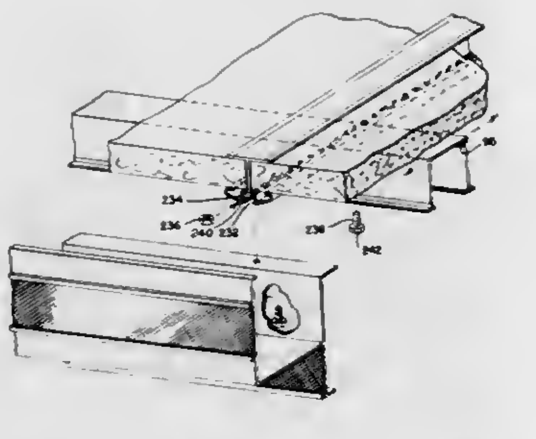


4,100,703
AWNING ASSEMBLY

Raymond W. Sickler, R.D. 2, Wellsburg, N.Y. 14894
Filed Feb. 22, 1977, Ser. No. 770,791
Int. Cl.² E04D *13/08*
U.S. Cl. 52—16 **7 Claims**

1. A roof comprising:
- a plurality of elongate panels;
- supporting means including support posts and roof supporting means connected on said posts for supporting said panels;
- a plurality of elongate connecting means on the lateral edges of said panels for connecting adjacent panels together, said connecting means including a top flange adapted to contact a top surface of each adjoining panel connected by said each connecting means, a web member projecting downwardly from said top flange to contact a peripheral end edge surface of the adjacent ends of each of said adjoining panels, and a bottom flange adapted to contact a bottom surface of each of said adjoining panels, said connecting means bottom flanges each including a first horizontal segment attached at one side to said web, a vertical segment having one side thereof connected to another side of said horizontal segment, a second horizontal flange attached at one side thereof to another side of said vertical segment and extending toward said web for defining a fastener receiving channel, an inclined segment attached at one side thereof to said vertical segment another side and angling outwardly and upwardly from said vertical segment another side, a U-shaped segment having one leg thereof connected to another side of said inclined segment and another leg thereof extending towards said web and being essentially coplanar with said first horizontal segment to contact the undersurface of one of said panels; and
- a plurality of fastener means connecting said connecting means to said roof supporting means, said fastener means each including a nut received in one of the channels defined by said channel defining means.

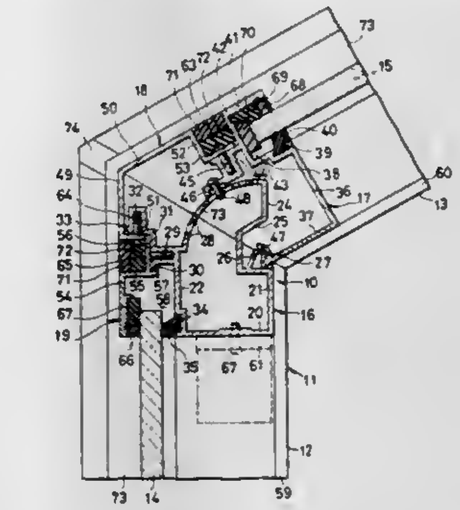




4,100,704
ADJUSTABLE TRANSOM ASSEMBLY

Eiryo Oogami, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Sep. 17, 1976, Ser. No. 724,594
Claims priority, application Japan, Sep. 22, 1975, 50-130425[U]
Int. Cl.² E04D *1/35*
U.S. Cl. 52—65 **9 Claims**

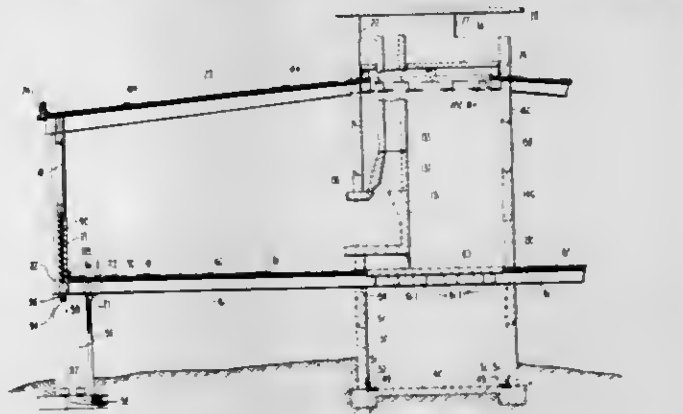
1. An adjustable transom assembly for attachment to a mullion having two portions inclined at an angle with respect to each other, comprising:
- (a) a first member adapted to be fixed to one of the portions of the mullion and having an arcuate wall;
- (b) first arcuate support means located substantially at the center of curvature of said arcuate wall and radially spaced from said arcuate wall, and carried by said first member;
- (c) a second member adapted to be fixed to the other of the portions of the mullion;
- (d) second arcuate support means carried by said second member and engaging said first arcuate support means and tiltable about the axis of said first arcuate support means with a corresponding variable portion of said arcuate wall being received in said second member;
- (e) an arm secured to said second member and freely movable over the convex side of said arcuate wall remotely from both said arcuate support means, and releaseably connected to said arcuate wall at a selected position causing said second member to be inclined at the afore-mentioned angle with respect to said first member;



- (f) a third member having a pair of wall portions inclined at the first-mentioned angle with respect to each other and having their ends, as viewed in transverse cross-section, fixed to said first and second members, respectively, in surrounding relation to said convex side of said arcuate wall; and
- (g) said arcuate wall being enclosed between said third member and said first and second arcuate support means.

4,100,705
PRECAST BUILDING STRUCTURE

Silvio Diana, 203 Yoakum Pkwy., Alexandria, Va. 22304
Filed Feb. 10, 1977, Ser. No. 767,590
Int. Cl.² E04B *1/34*
U.S. Cl. 52—82 **19 Claims**



1. A building assembly comprising in combination a foundation system comprising a concrete slab means cast on the ground and having at least a central load bearing surface area and at least a perimetrical load bearing surface area along the line of the perimetrical walls of the building,
- at least one precast central core member resting on the surface of said central load bearing surface of said slab, said at least one core member having an upper surface adapted to receive and support the beam end portions of a plurality of roof panel members as defined hereafter,
- a plurality of precast wall members of equal length and defining a regular polygon bounded by straight sides of equal length with all the interior angles being equal and other than 90° and resting on said perimetrical load bearing surface of said slab,
- a plurality of "T" beamed roof panel members, each beamed roof panel member having a central beam portion adapted to span between the central core member and the juncture

between two adjacent wall panel members and a pair of laterally flanged concrete portions disposed to equal sides, respectively, of said central beam member and tapering from the end resting on said walls inwardly to the end resting on said central core element, each of said pair of laterally flanged portions being dispersed to each side of said beam at an angle which is a function of the angle of inclination of each roof panel element with respect to the horizontal and the number of roof panel elements and having at opposite sides thereof complementary lapped edges co-operatively associated with the lapped edge of an adjacent roof panel member, respectively.

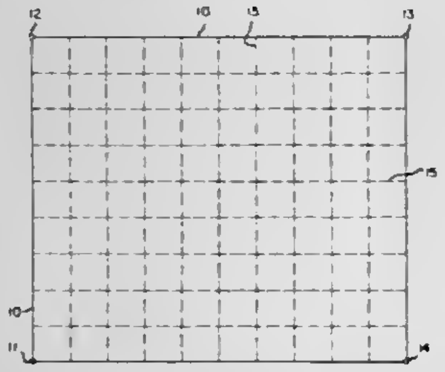
4,100,706
ADVERSE CONDITIONING SYSTEM

John A. White, 123-10 Ocean Promenade, Belle Harbor, N.Y. 11713

Continuation-in-part of Ser. No. 681,538, Apr. 29, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,411

Int. Cl.² E04B ***1/72***

U.S. Cl. 52—101 **4 Claims**



1. A system covering an area of ground for adverse conditioning web-footed aquatic birds against roosting in said area, the system comprising a grid of intersecting elongated members each not greater than one-sixteenth inch in diameter and thus sufficiently thin that a web-footed aquatic bird cannot roost upon an individual member and each laterally spaced from adjacent elongated members a distance of from about 1 to about 6 feet, members of the grid being spaced from the ground at said area a distance no greater than about 8 inches, whereby a web-footed aquatic bird will be adversely conditioned against roosting in said area by the trauma caused it by its contacting said elongated members during some of its descents into and ascents from said area which will occur before it has become so adversely conditioned as to avoid alighting and roosting in said area.

4,100,707
TELESCOPIC BOOM FOR PORTABLE CRANES

Wilhelm Kranefeld, Wetter, and Helmut Schneider, Kamen-Methler, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

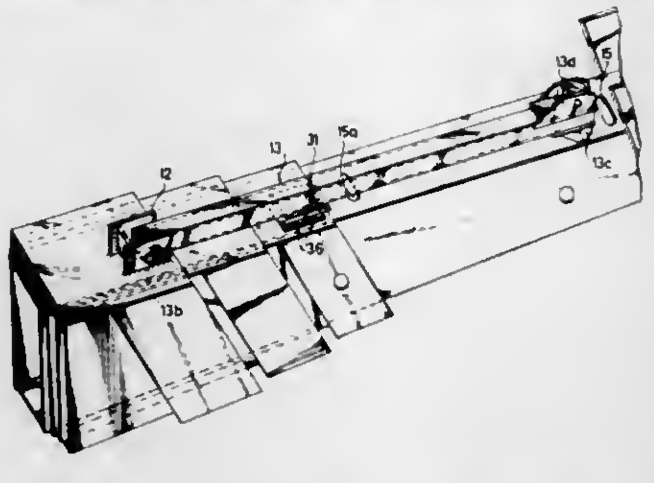
Filed Aug. 24, 1977, Ser. No. 827,306

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638185

Int. Cl.² B66C ***23/04***

U.S. Cl. 52—115 **4 Claims**

1. A telescopic boom, for portable cranes, which comprises:
a main boom;
at least one hydraulically operated telescopic slide telescopically associated with said main boom;
at least one mechanically operated telescopic slide telescopically associated with said at least one hydraulically operated telescopic slide and said main boom, said at least one hydraulically operated telescopic slide and said at least one mechanically operated telescopic slide being adapted to be respectively extended from and retracted into said main boom, slots being provided along said at least one mechanically operated telescopic slide transverse to the direction of extension and retraction thereof;
a retaining rod, one end of which is detachably connectable to said main boom;
a pressure piece detachably connectable to a portion of the other end of said retaining rod;
a cam associated with said pressure piece for cooperation with said slots during extension of said at least one mechanically operated telescopic slide;
a tensioning piece detachably connectable to a portion of said other end of said retaining rod 180° from said pressure piece;
a pawl associated with said tensioning piece; and
a stop cam associated with said pawl for cooperation with said slots during retraction of said at least one mechanically operated telescopic slide.



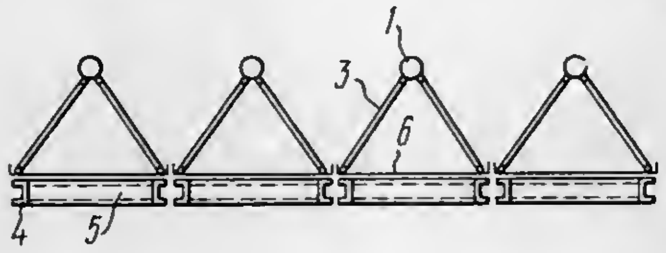
4,100,708
BUILDING ROOFING STRUCTURE

Anatoly Pavlovich Bobrovnikov, ulitsa Usacheva, 25, kv. 91; Gennady Grigorievich Mikhailov, ulitsa Bolotnikovskaya, 24, korpus 7, kv. 65; Gennady Ivanovich Soloviev, ulitsa Davydkovskaya, 6, kv. 102, and Sergei Grigorievich Chatchenko, ulitsa Govorova, 16, korpus 4, kv. 24, all of Moscow, U.S.S.R.

Filed Jan. 10, 1977, Ser. No. 757,973

Int. Cl.² E04C ***3/10***

U.S. Cl. 52—222 **4 Claims**



1. A building roofing structure comprising a plurality of alike structural units disposed extending generally longitudinally in parallel relationship; each unit comprising a plurality of members connected to define an arch, a plurality of paired hangers connected to the arch disposed paired along the span of the arch substantially normal thereto in plan, each pair of hangars defining similar and equal sides of a triangular configuration in cross section with the arch defining the apex, each end of the arch being bifurcated and defining a pair of hangars at an angle relative to the longitudinal direction of the arch and each defining a continuation of the arch, laterally spaced parallel ties remote from the arch connected to respective ones of the paired hangers at ends thereof opposite to the ends thereof connected to said arch, each of the ties of each unit comprising a plurality of longitudinal chords, a plurality of crosspieces connecting the ties transversely of each of the corresponding units at points where the paired hangers are connected to

respective ones of the two parallel ties of a unit; and each unit having prestressed sheet material overlying the space between the parallel ties and crosspieces therein and secured to the ties to thereby participate in the load-bearing of each unit.

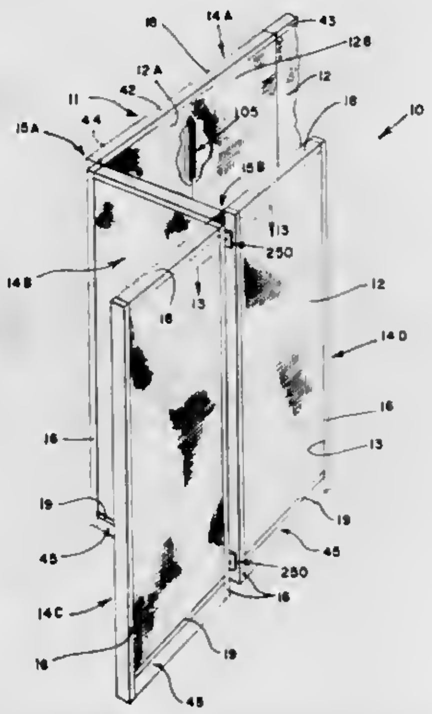
4,100,709
FRAME CONSTRUCTION FOR A DIVIDER WALL

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Sep. 30, 1976, Ser. No. 728,383

Int. Cl.² E04B ***2/74***

U.S. Cl. 52—239 **41 Claims**



1. A frame for a free-standing, vertical divider wall comprising: a plurality of structural components having identical generally C-shaped cross sections; each of which has a guideway having opposed flanges and extending longitudinally of said structural component at least in proximity to the ends thereof; at least two of said structural components being disposed as vertical support members; a connector plug received within at least the guideway of a vertically disposed support member; at least two of said structural components being horizontally disposed and vertically spaced as top and lower members; at least one anchor and at least one aligning block received within the guideway of a horizontally disposed member; said aligning block presents lug means which extend longitudinally outwardly of said horizontally disposed member; fastening means operative between said anchor and said connector plug to secure a corner connection between said horizontally and vertically disposed members in order to delineate a quadrilateral panel receiving locus; and, at least one notch recessed in said opposed flanges of said vertically disposed members, the lug means presented from said aligning block being received in said notch.

4,100,710
TONGUE-GROOVE CONNECTION

Josef Kowallik, Freudenberg, Fed. Rep. of Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

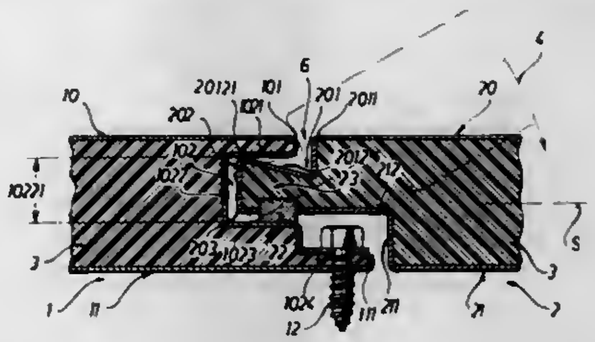
Filed Dec. 23, 1975, Ser. No. 643,623

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1974, 2461428

Int. Cl.² E04C ***1/10***

U.S. Cl. 52—309.9 **8 Claims**

1. A tongue-groove connection which includes: a first member having an end face with a groove therein, a second member having an end face with a part thereof forming a tongue and engaging said groove, a sealing strip carried by said tongue intermediate the ends thereof and sealingly interposed between said tongue and groove, a screw means extending through a portion of said first member for connecting said first member to an under structure, said first member being at the outside thereof at the entrance to said groove provided with an abutment section, and said tongue being provided with a guiding surface for cooperation with said abutment section to aid the introduction of said tongue into said groove, the width of said groove being less than the total thickness of said tongue and sealing strip when the latter have not been introduced yet into said groove, each of said first and second members comprising



a core layer of synthetic hard foam with oppositely located main surfaces and with side surfaces laterally thereof, each of said first and second members also comprising two cover layers respectively covering said main surfaces, one of the ends of said groove having an extension which includes one of said main surfaces, and one of said cover layers for the other one of said main surfaces of said first member forming the side and bottom surfaces of said groove and also covering that side of said extension which faces away from said one of said main surfaces.

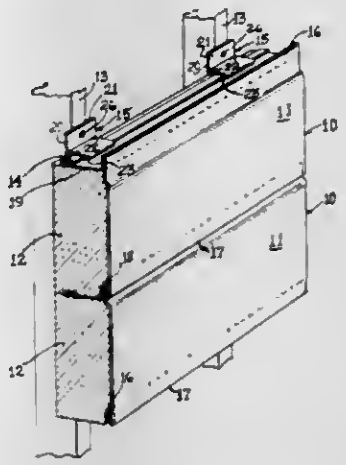
4,100,711
PREFABRICATED INSULATING PANEL

Victor Skuran, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 807,248

Int. Cl.² E04B ***1/62, 2/00***

U.S. Cl. 52—489 **3 Claims**



1. A prefabricated insulating panel assembly adapted to be mounted in interconnected relationship with other panels on a support member comprising
(a) an outer metallic sheet carrying a batt of insulating material on its inner face,
(b) a covering flange provided by one horizontal edge of said outer sheet and extending over a portion of the top edge of the insulating material carried thereby,
(c) means provided by said one horizontal edge of said outer sheet extending perpendicularly with respect thereto for providing overlapping interconnection between corresponding means provided by a juxtapositioned panel adapted to be mounted upon the support member,
(d) a clip formed along the inner edge of said covering flange

and extending perpendicularly to and opening in the direction of said one horizontal edge of said sheet,

(e) a hanger mounted on said clip and providing a vertical mounting plate extending parallel to said outer metallic sheet,

(f) means on said hanger adapted to contact said clip so as to cam the same in the direction away from the support member when said clip is connected to said hanger and said panels are placed in interconnected juxtaposition upon the support member, and

(g) a fastener adapted to be carried by said vertical mounting plate of said hanger securing the panels onto the support member.

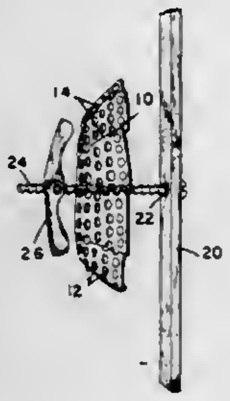
4,100,712
HOLE REPAIR KIT

Henry F. Hyman, 3718 Old San Jose Rd., Santa Cruz, Calif. 95065

Continuation-in-part of Ser. No. 664,374, Mar. 5, 1976, abandoned. This application Jun. 1, 1976, Ser. No. 691,506

Int. Cl.² E04G *23/02*

U.S. Cl. 52—514 **6 Claims**



1. A repair kit for holes in walls or the like which comprises only a single support plate dimensioned to bridge a hole to be repaired in a wall and having a flexible peripheral portion incuding partial radial slits extending inwardly from its peripheral edge which allows the plate to be pushed through the hole of smaller dimensions and subsequent expansion into hole-bridging relationship,

a reaction member of sufficient length to bridge the hole, and means interconnecting said support plate and said reaction member to hold them against opposed surfaces of the wall.

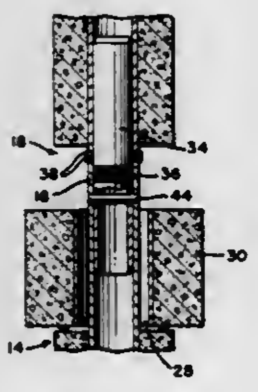
4,100,713
STRUCTURAL CONNECTION

Theodore W. Shoe, Fletcher, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Filed Dec. 16, 1976, Ser. No. 751,029

Int. Cl.² E04H *12/00;* **E06B** *1/04*

U.S. Cl. 52—648 **6 Claims**



1. In a precast concrete structural framework including vertically superimposed, upper and lower, precast columns each having hollow tubing cast therein and extending longitudinally thereof, spindle means received in said tubing in non-vertical load transmitting relationship to said columns, means encircling said spindle means and transferring vertical load from said upper to said lower column, and a precast beam having a vertically extending opening therethrough, said beam intersecting said superimposed columns with said opening in said beam at the intersection thereof with said columns, the improvement comprising:

a portion of said tubing in one of said columns extending a substantial distance beyond an end thereof through said opening in said beam and toward an opposing end of the other of said columns, and

a portion of said tubing in said other of said columns extending therefrom no more than a short distance relative to said portion of said tubing extending a substantial distance beyond said end of said one of said columns.

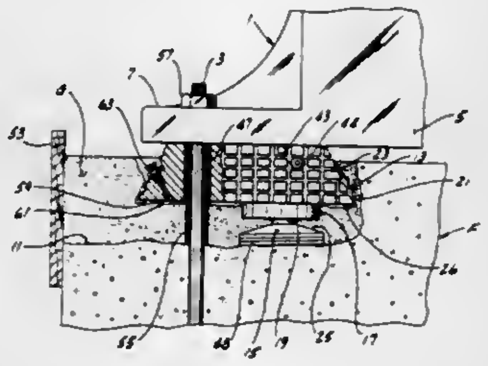
4,100,714
METHOD OF POSITIONING AND SUPPORTING A MACHINE

Morris Randall Stith, Jr., R.R. #1, Box 13, Webster, Ky. 40176

Filed Sep. 22, 1976, Ser. No. 725,374

Int. Cl.² F16M *5/00*

U.S. Cl. 52—741 **9 Claims**



1. The method of positioning and supporting an object, such as a large machine or other structure, on a foundation comprising the steps of:

placing a plurality of hydraulic jacking units between the foundation and the object, each of said units having a first member engageable with the object to be positioned and supported, a base member engageable with the foundation, and piston and cylinder means between the first member and the base member so that upon the application of hydraulic pressure to the piston and cylinder means, the first member moves relative to the base member, said first member having a generally downwardly facing surface;

introducing a liquid under pressure into each of said jacking units to move the object relative to the foundation to a selected position, said liquid constituting a hydraulic working fluid;

maintaining said liquid in each of said jacking units under pressure so as to support said object in its selected position;

introducing a flowable, hardenable material, such as grout, around the jacking units with the hardenable material filling the space between said downwardly facing surface and said foundation;

effecting the hardening of said hardenable material for fixing said jacking units in their selected positions; and

relieving said pressure from said liquid within said jacking units after said hardenable material has hardened so as to insure that substantially all of the loading applied to the jacking units by said object is carried by said hardenable material bearing against said downwardly facing surface.

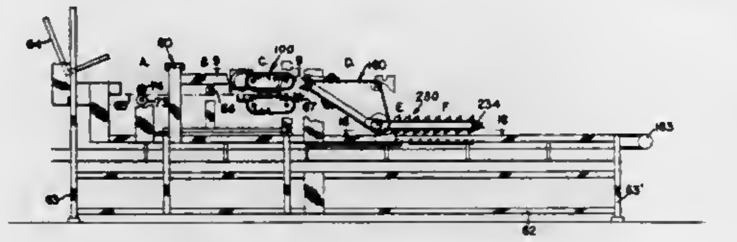
4,100,715
BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Jun. 13, 1977, Ser. No. 805,855

Int. Cl.² B65B *21/24*

U.S. Cl. 53—48 **19 Claims**



1. A machine for packaging a group of articles having the general shape of beverage bottles in a wrap-around type blank of foldable sheet material which is cut and scored to provide hingedly connected top, side and bottom wall panels with certain portions of said panels being adapted to be initially folded at least in part prior to assembly with a group of the articles, said machine comprising conveyor means for continuously advancing cut and scored blanks through successive work stations, continuously traveling means at certain of said work stations along said blank advancing conveyor means for partially folding panel portions of successive blanks into package forming position prior to application to a group of articles of predetermined number, conveyor means for advancing groups of articles in a path below the path of travel of said blank advancing conveyor means to a blank and article assembly station, conveyor means for transferring successive partially folded blanks from said blank conveyor means to a position at said assembly station for deposit on a group of articles advancing on said article conveyor means, means operative at said assembly station for seating successive partially folded blanks on said groups of articles and means disposed along said article conveyor means for further folding certain of the panels and securing the same in final package forming position.

4,100,716
CLAMPING MACHINE

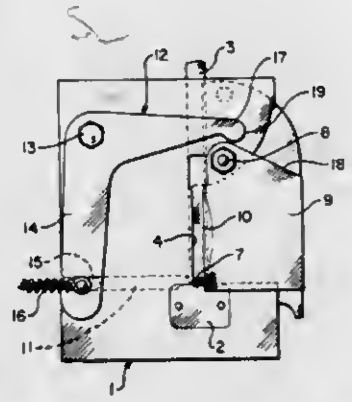
Angel Lorenzo Barroso, Ronda Carlos III, s.n., Mataro (Barcelona), Spain

Filed Jan. 22, 1976, Ser. No. 651,423

Claims priority, application Spain, Jan. 24, 1975, 209.592[U]

Int. Cl.² B65B *51/08*

U.S. Cl. 53—138 A **5 Claims**



1. A clamping machine for closing sausage casing by means of a clamp comprising a support plate, means forming an opening in said support plate for the introduction of sausage casing to be clamped, a closing piece capable of rotating on said plate to close said opening for clamping, a clamp pushing device, a closing die including a clamp receiving portion, means forming a passage interior of said support plate with said passage opening into said receiving portion, a bar disposed in said passage, said bar being movable in said passage between a retracted position in which said bar is withdrawn into said passageway and an ejection position in which said bar projects from said passageway into a position for contacting and displacing a recently closed clamp on said die, a lever on said support plate having a pivot and two arms, one arm being connected to said bar and the second arm contacting an edge of said closing piece such that rotation of said closing piece causes said lever to move said bar from said retracted position to said ejection position so as to project from said passage and contact and thereby dislodge a recently closed clamp from said die.

4,100,717
FOLDED SEAL FOR PLASTIC SHEETING AND FORMING APPARATUS

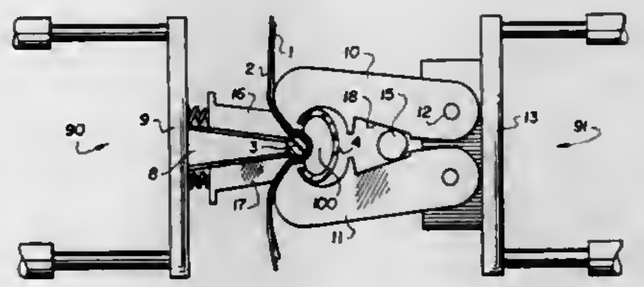
Martti Kontinen, Ohjaajantie 16 A 12, 00400 Helsinki 40, Finland

Filed Mar. 7, 1977, Ser. No. 775,198

Claims priority, application Finland, Jun. 2, 1976, 761562

Int. Cl.² B65B *51/04, 7/06*

U.S. Cl. 53—138 R **2 Claims**



1. An apparatus for making a seal having a retaining rod wrapped with a portion of sheeting material to be sealed and enveloped by a slotted tube having slot edges biased toward each other comprising: a guide means for supporting the retaining rod, sealing means spaced from said guide means and movable toward said guide, said sealing means gaving gripping surfaces for supporting the slotted tube in a manner so as to hold the slotted tube with its slot edges facing the retaining rod held in said guiding means, means for positioning sheeting material to be sealed between said guide and sealing means, means for moving said sealing means toward said guiding means to cause a portion of the sheeting material to be wrapped around the retaining rod and to direct the retaining rod with the sheeting material therearound into the slot of said slotted tube, said slotted tube being closable over said sheeting and said rod and the edges of said tube bounding said slot being movable together to seal said sheeting; said guiding means further comprising a carriage, a thrusting bar extending from said carriage for supporting the retaining rod, at least one guiding jaw slidably mounted to a side of said thrusting bar and biased toward the retaining rod to form a guide space with said thrusting bar for the retaining rod; said sealing means further comprising a second carriage which is movable with respect to said guiding means carriage, a second thrusting bar for supporting the slotted tube in a position facing the retaining rod held in said thrusting bar of said guiding means, at least one guiding jaw slidably mounted to a side of said second thrusting bar and biased toward the slotted tube held by said second thrusting bar to form a second guiding spaced for said slotted tube, said retaining rod guiding space and said slotted tube guiding space being combined when said sealing means is moved toward said guiding means and said space being reduced in size when said guiding jaws of said guiding means and sealing means are forced against each other and against said respective guiding jaw biasing.

4,100,718

MEANS FOR THE PRODUCTION AND FILLING OF A PARALLELEPIPEDIC PACKET

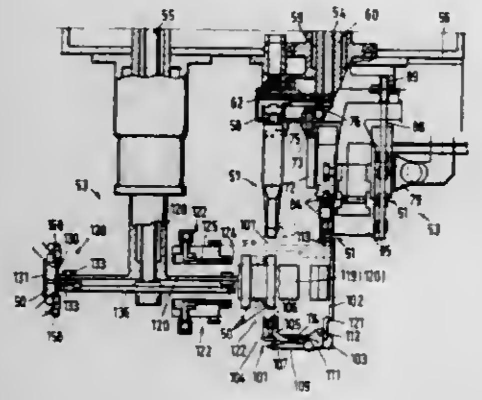
Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,267

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613277

Int. Cl.² B65B *11/28, 49/08*

U.S. Cl. 53—234 **50 Claims**



1. An apparatus for the production of parallelepipedic packets from a foldable cut-out shape of composite foil for the reception of cigarettes, the cut-out shape tubularly enclosing the packet content and having protruding end flaps folded over the end faces of the cigarettes, characterised by: a winding turret (52) having a plurality of mandrels (51) mounted thereon, each for the reception of a cut-out shape (32) for the production of a packet tube (50), means for rotating the mandrels about their own longitudinal axes, a folding turret (53) having devices mounted thereon for filling the packet tube (50) and closing it by folding its end flaps (40 to 43), and means for transfering the packet tube from the winding mandrels to the folding turret.

4,100,719

FLOATING HOOK ARRANGEMENT FOR AN APPARATUS FOR BAGGING GARMENTS

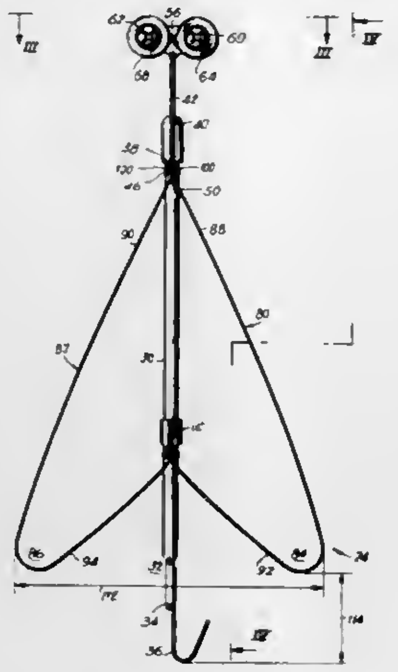
Murray Jelling, Roslyn Heights; Alexander Kahn, Massapequa; Ernest George Moore, East Meadow, and Michael Friedman, Brooklyn, all of N.Y., assignors to U.S. Dynamics Corporation, Amityville, N.Y.

Continuation of Ser. No. 707,653, Jul. 22, 1976, Pat. No. 4,027,461. This application Mar. 16, 1977, Ser. No. 778,237

Int. Cl.² B65B *43/26, 67/02*

U.S. Cl. 53—241 **7 Claims**

1. Apparatus comprising a hook, and means supporting said hook in suspended relation and including an elongated support connected to said hook and further means on said support and longitudinally aligned with said hook for spreading bags pulled down over said hook to enable articles suspended on said hook to be bagged while protecting the bags from the hook, said further means having a transverse dimension at least equal to that of said hook, said further means flaring outwardly and downwardly towards said hook.



4,100,720

GRAIN TANK AND GRAIN CONVEYOR MEANS OF HARVESTING MACHINES

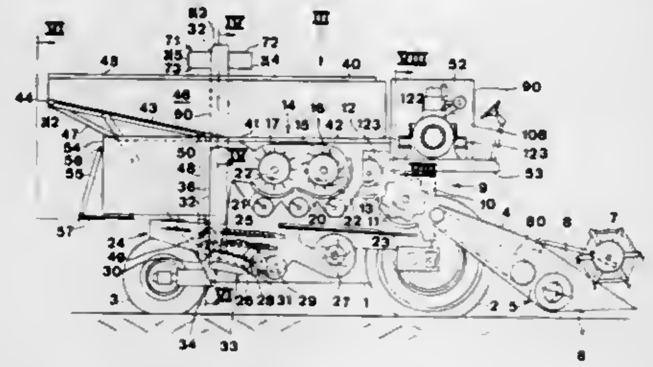
José A. C. L. Carnewal, Eeklo; Frans J. G. C. Decoene, Zedelgem, both of Belgium, and Cornelis G. M. Muijs, Flagey-Echezeaux, France, assignors to Clayson N.V., Zedelgem, Belgium

Filed Jun. 23, 1976, Ser. No. 699,114

Claims priority, application United Kingdom, Jun. 26, 1975, 27066/75

Int. Cl.² A01D *45/00*

U.S. Cl. 56—14.6 **22 Claims**



1. An agricultural harvesting machine comprising:

a chassis adapted to travel across a field,

means on the chassis for conveying crop material from the field to the chassis,

means mounted on said chassis and adapted to receive crop material from the conveying means for threshing and separating grain from the crop material,

means mounted on said chassis for receiving threshed and separated grain from the threshing and separating means and for cleaning said grain,

a grain tank pivotally mounted on said chassis at a location above the level of the cleaning means for temporarily holding cleaned grain therein,

conveyor means mounted between the cleaning means and the grain tank for loading cleaned grain in the grain tank and

means connected between the chassis and the grain tank for tipping the grain tank and for discharging grain contained therein rearwardly of the machine.

4,100,721

APPARATUS FOR TWISTING INSULATED CONDUCTORS FOR USE IN MULTICONDUCTOR COMMUNICATION CABLE INTO QUADS

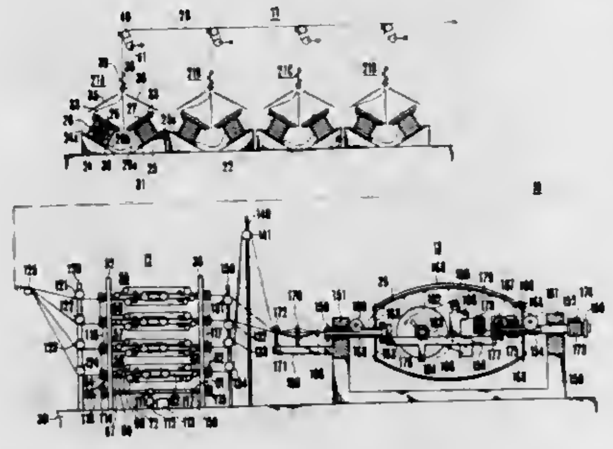
Nishikawa Seiichi; Hasebe Shuji; Ohashi Kazuhiko; Kobayashi Shigeyuki, and Maekawa Kazuyuki, all of Sakura, Japan, assignors to The Fujikura Cable Works, Ltd., Japan

Continuation of Ser. No. 578,105, May 16, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,628

Claims priority, application Japan, Jun. 28, 1974, 49-73225; Jul. 29, 1974, 49-85988

Int. Cl.² H01B *13/02*

U.S. Cl. 57—34 AT **22 Claims**



1. A twisting apparatus for twisting insulated conductor wire used in the manufacture of cables, comprising:

(a) a pay-off means including four bobbin holder sets each set comprising a pair of bobbins, guide means over each of said bobbin holders so that a spool with insulated conductor wire thereon on one of said pair can be idle and replaced while a spool on the other bobbin holder of said pair is paying off insulated conductor wire and when material from said other spool is exhausted, said one spool pays-off insulated conductor wire as said other spool is idle;

(b) pre-twisting means for providing S and Z direction twists to said insulated conductor wire comprising four pre-twisting units, each pre-twisting unit having a tubular fore rotary member and a tubular rear rotary member, means for driving said fore and rear rotary members at the same speed, means for periodically reversing the directions of rotations thereof at the same time, frame means for rotatably supporting said fore and rear rotary members on a straight line and in a spaced apart relationship, a floating platform disposed between said fore and rear rotary members to be rotatable relative thereto, said floating platform comprising two pairs of substantially rectangular plates, one of said pairs rotatably mounted to said fore rotary members, the other pair rotatably mounted to said rear rotary member, each plate of said pair of plates connected to each other by a pin member, said pin member extending substantially perpendicular to each plate, a connecting plate means for connecting the pair of plates mounted adjacent the fore rotary member to the pair of plates mounted adjacent the rear rotary members, a fore guide pulley centrally mounted between said pair of plates mounted to said fore rotary member on said pin member, a rear guide pulley centrally mounted between said pair of plates mounted to said rear rotary member on said pin member, a plurality of insulated conductor wire accumulating pulleys mounted on both sides of said fore and rear guide pulleys on both of said pin members, a pair of deflecting pulleys mounted to said connecting plate means, said deflecting pulleys having their axes of rotation perpendicular to said pin member, an inlet guide roller mounted on the inlet side of said fore rotary member, an outlet guide roller mounted on the outlet side of said rear rotary member, a plurality of guide means provided for said fore and rear rotary members and mounted thereon, means for passing an insulated conductor wire paid off from said pay-off means successively through said inlet guide roller, one guide means of said fore rotary member, one guide means of said rear rotary member, and from the rear guide means to the rear guide pulley, alternately around said front and rear accumulating pulleys on one side of said guide pulley, around said pair of deflecting pulleys, and alternately around said front and rear accumulating pulleys on the other side of said guide pulley, and then around said fore guide pulley, the other guide means of said fore rotary member, the other guide means of said rear rotary member and said outlet guide roller;

(d) a twisting means for receiving four insulted conductor wires from the pre-twisting means and twisting them into a star quad including a converging die receiving said pre-twisted insulated conductor wires, a tubular rotary member fed by said die, a flyer and a near and far end fed by said tubular rotary member at the near end and an end guide roller at the far end, a drive wheel within said flyer adapted to receive several turns of insulated conductor wire fed by said end guide roller;

(d) a take up bobbin in said flyer fed by said drive wheel for taking up the twisted star guad; and

(e) said pretwisting means being operable independently of said twisting means to vary the number of pretwists provided to individual insulated conductor wires and to vary the ratio of the number of pretwists to the pitch of twisting of the resultant star quad whereby capacitance imbalance is made more uniform and cross-talk characteristics of the star quad optimized.

4,100,722

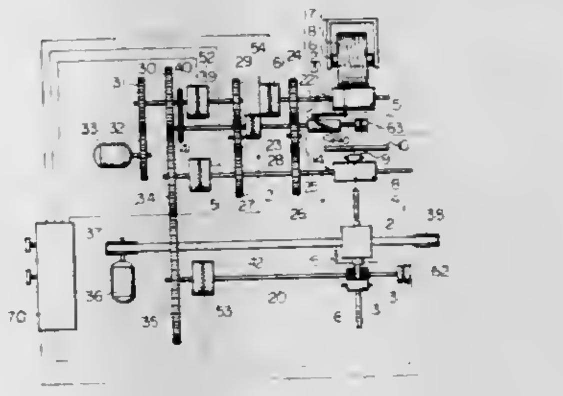
METHOD OF AUTOMATICALLY PIECING UP A YARN IN AN OPEN-END SPINNING MACHINE AND AN OPEN-END SPINNING MACHINE FOR CARRYING OUT THE SAME

Osamu Suzuki, Obu; Shozo Ueda, Kariya, and Ichiro Tashiro, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 18, 1977, Ser. No. 788,126

Int. Cl.² D01H *13/04, 15/00*

U.S. Cl. 57—34 R **5 Claims**



2. An open-end spinning machine comprising:

feed rollers for supplying fibers to a combing roller so as to comb said fibers;

a spinning rotor for collecting said combed fibers into a yarn and for twisting said yarn;

a delivery tube disposed at a position upstream of said spinning rotor;

a pair of draw off roller means for withdrawing said yarn from said spinning rotor, said draw off roller means being disposed so as to be rotatable in both normal and opposite rotating directions;

a traverse guide for traversing said yarn along a bobbin;

a winding drum for rotating said bobbin by engaging said bobbin along a line of contact therebetween to wind said yarn around said bobbin and form a cheese, said winding drum being disposed so as to be rotatable in both normal and opposite rotating directions; and

controlling means, for controlling said feed rollers, said spinning rotor, said pair of draw off roller means, said traverse guide and said winding drum according to a predetermined program, the traverse of said traverse guide being started after a pieced joint between an end of said yarn and a newly spun yarn reaches the line of contact between said winding drum and said cheese wound around said bobbin.

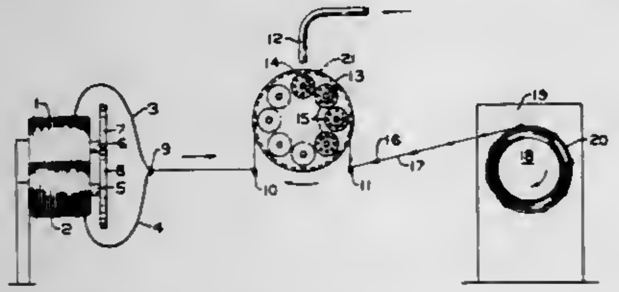
4,100,723
APPARATUS FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Boby, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, and a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,690

Int. Cl.² D02G *3/34*

U.S. Cl. 57—34 B **2 Claims**



1. An apparatus for producing a slubby strand comprising in combination a surface including means to receive a textile strand thereon, means to rapidly draw said textile strand from said surface and means to introduce high pressure fluid onto said surface and to create a pair of fluid vortices above said surface while said strand is being drawn over said surface to thereby produce slubs in said strand.

4,100,724
APPARATUS FOR DYEING FILAMENTARY MATERIAL

Karl Bous, Sternstr. 74, 5600 Wuppertal 2, Germany

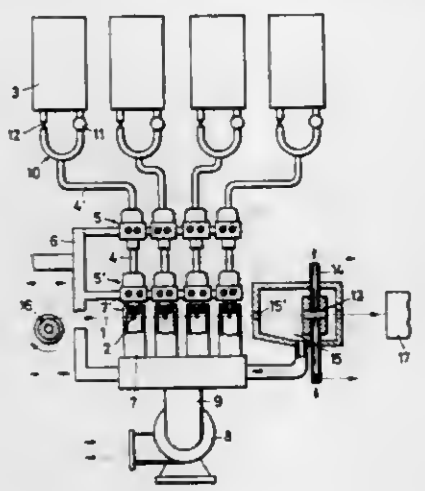
Filed Nov. 23, 1976, Ser. No. 744,394

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554132

Int. Cl.² D06B *1/02;* D01H *13/30*

U.S. Cl. 57—35 **12 Claims**

1. Apparatus for dyeing filamentary textile material or the like in a varying manner along the length thereof, the combination comprising means for feeding such filamentary material along a predetermined path of travel; nozzle means for spraying a fluid dye; means for maintaining said filamentary material under tension and moving said filamentary material at high speed as it moves along said path of travel; said nozzle means being located adjacent said path of travel whereby spray emitted from said nozzle means may engage said filamentary material; a source of fluid dye; conduit means for conveying fluid dye from said dye source to said nozzle means; a plurality of valve means disposed in said conduit means in series relation; and means for opening and closing said valve means in adjustable phase relationship whereby short dye spray pulses are generated and emitted through said nozzle means; said valve means being actuated by the opening and closing means into open and close positions in an out-of-phase relationship such that said plurality of valve means are all open for a time interval enabling fluid dye to pass from said conduit means into said nozzle means for said time interval which is less than the time interval any valve means is in the open position.



4,100,725
YARN HAVING ALTERNATING ENTANGLED AND UNENTANGLED LENGTHS

Bernard Magel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 599,144, Jul. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 708,209, Jul. 23, 1976, abandoned. This application Sep. 20, 1976, Ser. No. 725,017

Int. Cl.² D02G *3/22, 3/34*

U.S. Cl. 57—140 J **33 Claims**

1. A yarn of organic fibers which has zero twist and random lengths of tightly entangled fibers as nodes having substantially zero twist, the nodes comprising an average of about 20%-70% of the yarn length, and having a retentivity of at least 75% and alternating with random lengths of substantially unentangled asymmetrically splayed fibers in intervals having an average length of about 3-12 mm.

4,100,726
METHOD FOR PRODUCING SLUBBY YARN

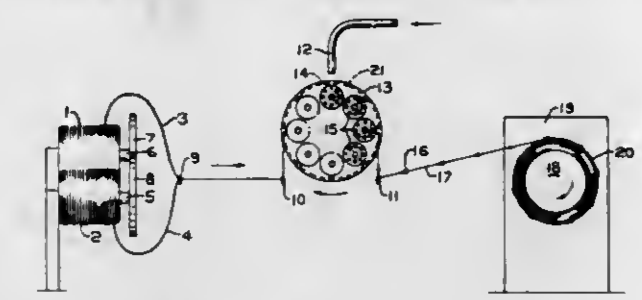
Herbert W. Barch, Natrona Heights, and August G. Boby, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, and a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,689

Int. Cl.² D02G *3/34*

U.S. Cl. 57—157 F **11 Claims**

1. A method of providing a slubby strand of fibers comprising passing a consolidated strand containing a multiplicity of fibers over a surface, introducing onto the surface of the strand a fluid at high pressure continuously, twisting and bulking the strand with said fluid, and collecting from said surface a twisted strand having slubs thereon.



4,100,727
METHOD OF MAKING A CORE YARN

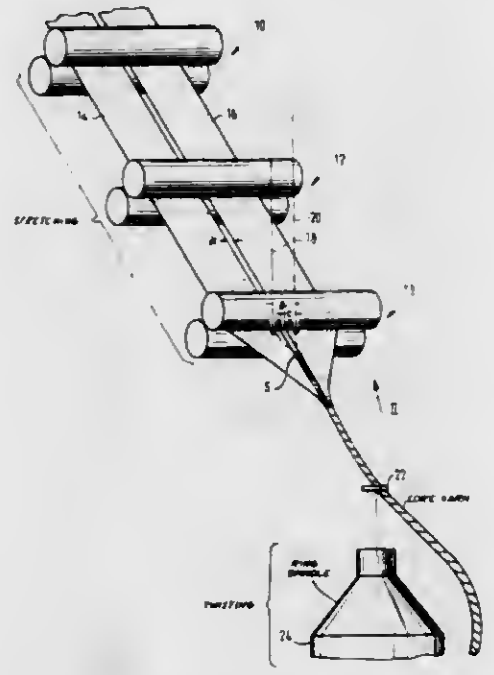
Edmund Hamel, Romanshorn, Switzerland, assignor to OFA AG, Horn, Switzerland

Filed Apr. 22, 1977, Ser. No. 790,088

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 2645119

Int. Cl.² D02G *3/38*

U.S. Cl. 57—160 **11 Claims**



1. A process for producing a core yarn comprising the steps of:

stretching a pair of fiber-fleece slubbing strips in a stretching apparatus having a plurality of roller pairs engaging the slubbing strips in the nips thereof, the slubbing strips emerging from a last roller pair of said apparatus;

maintaining a close spacing of proximal edges of said slubbing strips at least in and through the nip of said last roller pair with said spacing being less than 2 mm;

feeding respective core threads onto said slubbing strips in the nip of said last roller pair with each of the core threads being spaced from the respective proximal edge by a distance less than the width of the respective slubbing strip; and

twisting both of said slubbing strips and said core threads together immediately downstream of said last roller pair to form the core yarn.

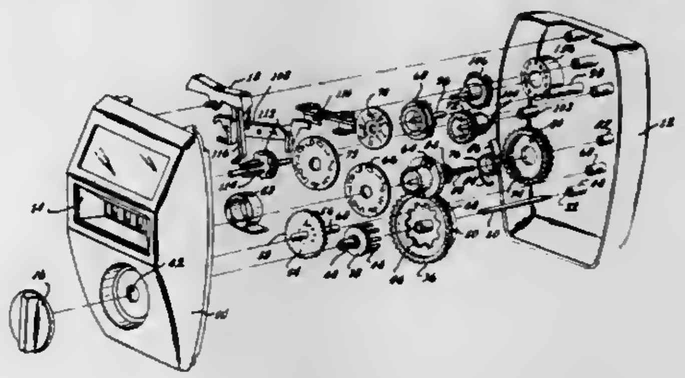
4,100,728
MECHANICAL DIGITAL STOPWATCH

Richard Shib-Teng Chang, Rolling Hills Estates, and Edmuod Emil Landsinger, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 26, 1976, Ser. No. 745,287

Int. Cl.² G04F *7/04*

U.S. Cl. 58—74 **6 Claims**



1. In a mechanical watch for measuring a period of elapsed time, the combination comprising:

a housing having a display window;

spring means within the housing;

windup means for winding said spring means;

a decade counter within said housing and having a digital output for displaying in said display window a plurality of digits indicative of the elapsed time measurement;

a ratchet mechanism operatively connected between said counter and said windup means and responsive to the winding thereof for resetting said counter, said ratchet mechanism including a pawl member coupled with an internally toothed ratchet gear;

escapement means; and

switch means operable to enable said spring means to actuate said decade counter under control of said escapement means, said pawl member being rotatable with respect to said ratchet gear when said windup means is actuated with said switch means disabled and being rotated with said ratchet gear when said switch means is enabled.

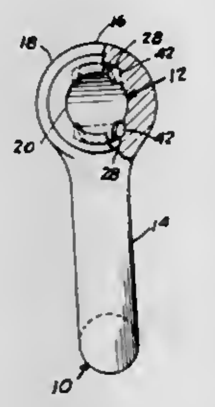
4,100,729
CHAIN SHACKLE

Avellino J. Bartoletto, 25460 Novi Rd., Novi, Mich. 48050

Filed Jul. 11, 1977, Ser. No. 814,441

Int. Cl.² F16G *15/02*

U.S. Cl. 59—86 **18 Claims**



1. In combination, a shackle having a generally U-shaped body portion terminating in a pair of laterlly space opposed ears, each ear having a bore therein axially aligned with the bore in the other ear, at least one of said bores extending completely through its respective ear, said one bore being radially enlarged at an axial portion thereof intermediate its ends, a pin extending through said one bore and into the other bore, said pin having a pair of generally axially extending fingers at the

end thereof disposed within said one bore, said fingers being flared radially outwardly into said enlarged bore portion to thereby lock the pin axially on the shackle.

4,100,730

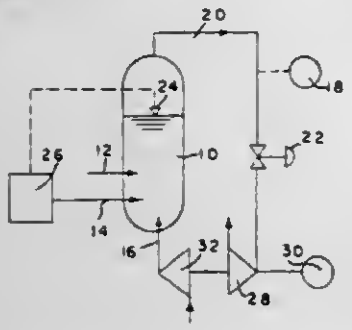
REGULATION OF A WET AIR OXIDATION UNIT FOR PRODUCTION OF USEFUL ENERGY

Louis Atwater Pradt, Wausau, Wis., assignor to Sterling Drug, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 583,754, Jun. 4, 1975, abandoned. This application May 24, 1976, Ser. No. 689,264

Int. Cl.² F02C *3/20;* **F02G** *3/00*

U.S. Cl. 60—39.05 **15 Claims**



1. A wet oxidation apparatus comprising a reactor, means for continuously introducing combustible materials, water and an oxygen containing gas into the reactor, the heat of combustion of the material in the reactor being sufficient to evaporate substantially all of the water introduced into the reactor in excess of that necessary to maintain a substantially constant liquid level in the reactor, and means controlling the quantity of water fed to the reactor to maintain the water level therein substantially constant, and a gas and water vapor outlet for the reactor.

4,100,731

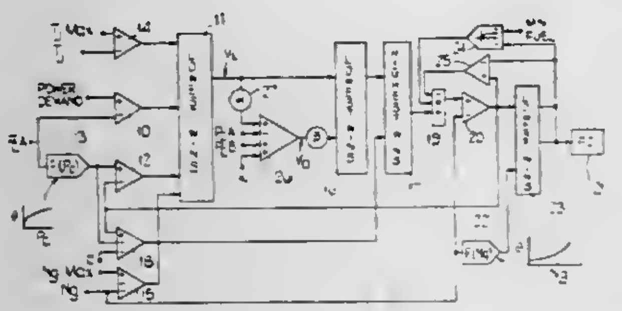
FUEL CONTROL FOR A MULTI-ENGINE GAS TURBINE INSTALLATION

Roderick Stewart James, Solihull, and Maurice Edward Lloyd, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 1, 1976, Ser. No. 746,347

Int. Cl.² F02C *9/02, 9/08*

U.S. Cl. 60—39.15 **4 Claims**



1. An electronic fuel control for a multi engine gas turbine installation comprising a plurality of control channels for the respective engines, each control channel including an error signal integrator, first difference signal generating circuit for comparing the output of the integrator with a signal corresponding to the value of an engine parameter, a fuel supply system controlling the supply of fuel to the associated engine in accordance with the output of the first difference signal generating circuit, error signal generating means for comparing the desired value of an engine parameter with the actual value thereof, limiter means for limiting the output of the error signal generating means during acceleration to a value determined by engine operating conditions, the output of said limiter means being applied as said error signal to the integrator when the engines are running in a normal matched condition, and further limiter means in each channel for further limiting the output of said limiter means when the values of a parameter of the engine controlled by that channel and of the other or another engine of the system differ, said further limiter means including a second difference signal generating circuit having inputs corresponding to the error signal from the limiter means of at least one of the control channels and a signal corresponding to the difference between the value of said parameter for the two engines.

4,100,732

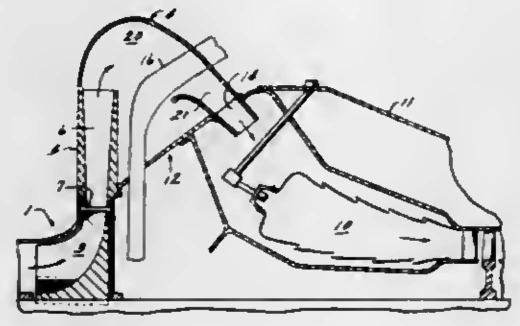
CENTRIFUGAL COMPRESSOR ADVANCED DUMP DIFFUSER

Alexander Connor Bryans, Reading; Barry Weinstein, Georgetown; Neil Roger Brookes, Topsfield, and John William Vdovlak, Marblehead, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 2, 1976, Ser. No. 746,974

Int. Cl.² F02C *3/08*

U.S. Cl. 60—39.36 **3 Claims**



1. A diffuser for diffusing the accelerated gas flow from a centrifugal compressor to an annular combustor comprising:

an annular housing circumscribing the centrifugal compressor;

a plurality of diffuser passages spaced about the circumference of the housing and extending therethrough for diffusing the flow exiting the compressor;

a transition region disposed intermediate the outlet of the diffuser passages and the inlet to the combustor said transition region further including a reduced area neck portion,

plenum means disposed in said transition region upstream of said neck portion for expanding the gas flow exiting the diffuser passages and correspondingly reducing the velocity of said gas flow; and

a plurality of circumferentially spaced deswirl vanes in said transition region upstream of the inlet to the combustor.

4,100,733

PREMIX COMBUSTOR

Edmund Emil Striebel, South Windsor; Theodore Richard Koblish, Wallingford; Thomas Joseph Madden, Vernon, and Roger Halsted James, Wallingford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 4, 1976, Ser. No. 729,436

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.74 B **30 Claims**

1. Fuel supply means comprising:

an essentially cylindrical member forming the outer wall of the supply means;

an upstream plate-like member which is affixed to the cylindrical outer wall and which forms the upstream wall of the supply means;

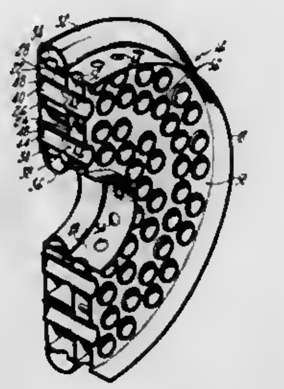
a downstream plate-like member which is affixed to the cylindrical outer wall at a location spaced axially from the upstream plate-like member forming a fuel chamber therebetween;

a divider which is spaced axially between the upstream and downstream plate-like members to form a primary section and an axially adjacent, secondary section within the fuel chamber;

means for directing fuel to the primary section of the fuel chamber;

means for directing fuel to the secondary section of the fuel chamber;

a plurality of open ended, mixing tubes which penetrate the upstream and downstream plate-like members and are adapted to flow air therethrough across the fuel supply means, each tube having at least one orifice through which fuel is flowable from the primary section for mixing with the through flowing air; and



a plurality of open ended, mixing tubes which penetrate the upstream and downstream plate-like members and are adapted to flow air therethrough across the fuel supply means, each tube having at least one orifice through which fuel is flowable from the secondary section for mixing with the through flowing air.

4,100,734

EXHAUST GAS PURIFICATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

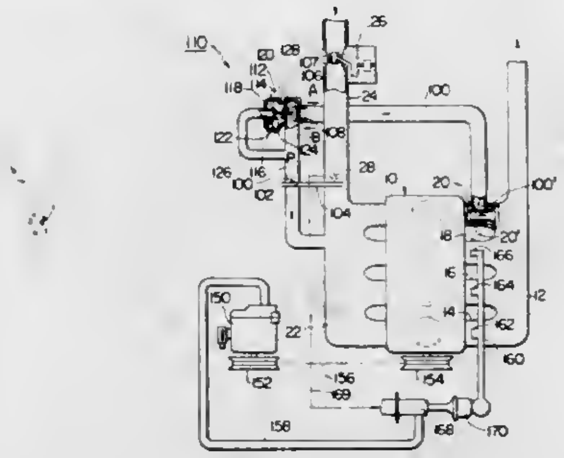
Tadashi Ozaki; Tokio Kobama, both of Nishio, and Hideki Obayashi, Hoi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 4, 1977, Ser. No. 756,702

Claims priority, application Japan, Jan. 12, 1976, 51-2546; Jan. 23, 1976, 51-6937; Mar. 5, 1976, 51-24342

Int. Cl.² F02M *25/06;* **F02B** *75/10*

U.S. Cl. 60—278 **20 Claims**



1. An exhaust gas purification system for an internal combustion engine comprising an E.G.R. passage for recirculating engine exhaust gases from an exhaust system of an internal combustion engine back into an intake system thereof downstream of a throttle valve of said engine, a first E.G.R. control valve disposed in said E.G.R. passage and operatively connected to said throttle valve to control the E.G.R. flow through said E.G.R. passage into said engine, a second E.G.R. control valve disposed in said E.G.R. passage upstream of said first E.G.R. control valve to control the E.G.R. flow through said E.G.R. passage toward said first E.G.R. control valve, and means for controlling said second E.G.R. control valve so that the pressure of engine exhaust gases in said E.G.R. passage between said first and second E.G.R. control valves is maintained substantially constant.

4,100,735

SECONDARY AIR CONTROL SYSTEM IN AN INTERNAL COMBUSTION ENGINE

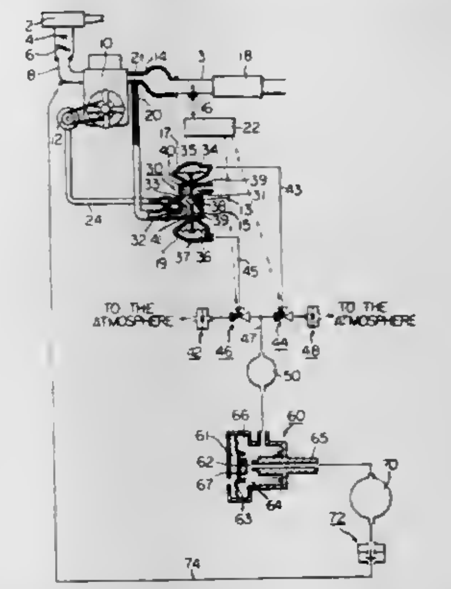
Hideo Miyagi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 7, 1977, Ser. No. 775,031

Claims priority, application Japan, Nov. 15, 1976, 51-136241

Int. Cl.² F01N *3/10;* **F02B** *75/10*

U.S. Cl. 60—276 **12 Claims**



1. A secondary air control system in an internal combustion engine comprising a diaphragm-operated secondary air control valve for feeding a controlled amount of secondary air from an air pump into an exhaust system of the engine and a vacuum switching valve means for alternately switching circuits of an operative vacuum which acts on said secondary air control valve, in response to the A/F equivalence ratio λ of the exhaust gas, wherein the improvement comprises a vacuum control valve provided with a diaphragm chamber which is connected to said vacuum switching valve means via a first vacuum reservoir tank and is connected to an intake vacuum area via a second vacuum reservoir tank having a check valve which opens only when the intake vacuum is stronger than the vacuum in the second vacuum reservoir tank for storing the higher vacuum in said secondary vacuum reservoir tank, the connection of said diaphragm chamber of said vacuum control valve and said second vacuum reservoir tank being established only when said vacuum control valve is in an open position, said vacuum control valve being opened when the vacuum in said first vacuum reservoir tank reaches below a predetermined value thus filling said first vacuum reservoir tank with the higher vacuum stored in said second vacuum reservoir tank, and resulting in maintaining the operative vacuum in said first vacuum reservoir tank substantially constant.

4,100,736

SPARK-IGNITION INTERNAL COMBUSTION ENGINE EQUIPPED WITH EXHAUST GAS RECIRCULATION SYSTEM

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, and Yasuo Takagi, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 19, 1976, Ser. No. 687,932

Claims priority, application Japan, May 22, 1975, 50-61274

Int. Cl.² F02M *25/06*

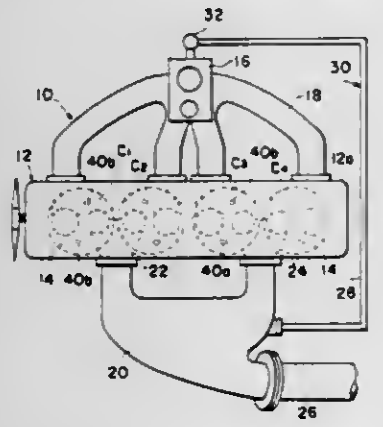
U.S. Cl. 60—278 **7 Claims**

1. A spark-ignition internal combustion engine having a cylinder with a bore therein of a specified diameter, comprising:

means defining a combustion chamber capable of producing squish turbulence of the air-fuel mixture supplied from the air-fuel mixture supply means of the engine, the combustion chamber defining means including a cylinder head having a radially disposed flat surface closing the upper end of the cylinder, said cylinder head having a hemispherical concavity formed concentrically with the bore of the cylinder, said hemispherical concavity forming a major part of the combustion chamber and being smaller in diameter at said radially disposed flat surface than that of the cylinder bore thereby defining an annular flat squish area and in which the diameter of said hemispherical concavity is in the range from 0.94 to 0.99 times of the diameter of the cylinder bore, and a piston reciprocally disposed within the cylinder and cooperating with said annular flat squish area to produce squish turbulence;

exhaust gas recirculating means for recirculating the exhaust gases of the engine into the combustion chamber in the maximum amount of 10 to 50% by volume of the amount of the intake air which is inducted through the air-fuel mixture supply means into the combustion chamber; and

a plurality of spark plugs disposed in the combustion chamber for igniting the air-fuel mixture containing the exhaust gases.



4,100,737

EXHAUST GAS PURIFYING SYSTEM EMPLOYING AN EXHAUST GAS FLOW CONTROLLER

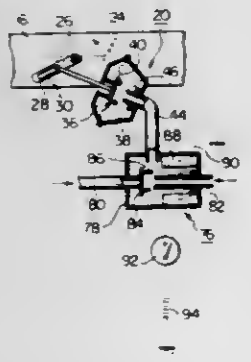
Kunihiko Sugihara, Yokohama City, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 7, 1976, Ser. No. 674,832

Claims priority, application Japan, May 21, 1975, 50/60668

Int. Cl.² F02B *75/10*

U.S. Cl. 60—292 **3 Claims**



1. An exhaust gas purifying system for use with an internal combustion engine having an intake conduit system and an exhaust conduit system, said intake conduit system including an air-fuel mixture supply means having an air-fuel mixture passage downstream of a throttle valve, said exhaust gas purifying system comprising: an afterburning device disposed in use in said exhaust conduit of said internal combustion engine, said afterburning device comprising an oxidizing catalyst converter or a thermal reactor; a damper door swingably disposed in said exhaust conduit downstream of said afterburning device for partially closing and fully opening a discharge passage of said exhaust conduit; a damper door actuator having therein a moveable member actuated in response to application of a vacuum to said actuator; linkage means for transmitting the movements of said moveable member to said damper door to rotate said damper door in a direction to partially close the passage of said exhaust conduit system when a vacuum is applied to said actuator; a solenoid valve having a first casing, a tube providing communication between the casing and the interior of said damper door actuator; first and second tubes projecting into said first casing from opposite sides of said casing and having open ends facing each other in said first casing, said first and second tubes being in communication with the interior of an air-fuel mixture passage in the internal combustion engine and the atmosphere, respectively; a valve member of magnetic material moveable between the open ends of said first and second tubes to selectively and alternatively close the same; a compression spring disposed in said first casing continuously biasing said valve member in a direction to close the open end of said first tube; a solenoid coil disposed in said first casing attracting said valve member when energized to move it to close the open end of said second tube; and a throttle valve switch electrically connected to said solenoid coil to control energization of said coil when the throttle valve of said intake conduit system almost closes said air-fuel mixture passage.

4,100,738

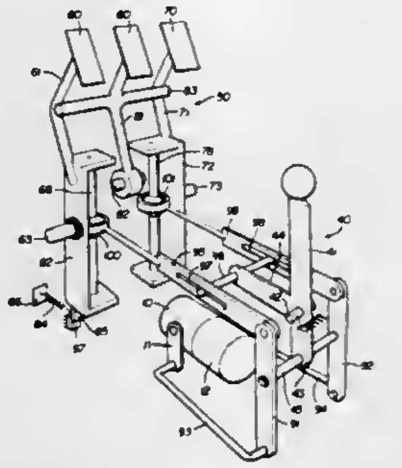
METHOD AND APPARATUS FOR STEERING

David H. Seaberg, Davenport, and Gou-Lian Kao, Bettendorf, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 17, 1977, Ser. No. 778,409

Int. Cl.² F16D *31/00;* F15B *13/09*

U.S. Cl. 60—327 **11 Claims**



1. A mechanical linkage system for independently regulating the power output from a pair of independently operable, variable power sources, with said power sources having respective displaceable output control regulators, comprising:

- a single, pivotally mounted speed control lever;
- a pair of first linkage means interconnecting said speed control lever with a respective output control regulator for equally displacing said regulators upon pivotal movement of said speed control lever to obtain equivalent power output from each of said power sources;
- a pair of independently movable power reducing members; and
- a pair of second linkage means respectively interconnecting each power reducing member with one of said first linkage means for independently varying the output of one of said power sources upon independent movement of one of said power reducing members, without moving the control lever and without varying the output of the other power source.

4,100,739

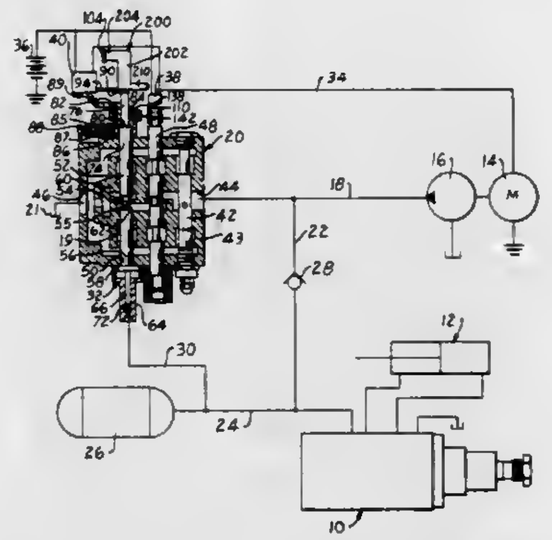
PRESSURE SENSITIVE CHARGING MEANS FOR A STEERING SYSTEM

Walter Moore Shaffer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 759,953, Jan. 17, 1977, abandoned. This application Sep. 16, 1977, Ser. No. 833,898

Int. Cl.² F15B *1/02, 11/16*

U.S. Cl. 60—413 **22 Claims**



15. A control member, a valve spool, said control member slidably carried on said valve spool, a retaining means for retaining said control member in one of at least two positions relative to said valve spool, actuation means operatively connected to said control member for moving said control member in one direction only relative to said valve spool until said retaining means engages with an abutment, resilient means urging said control member and said valve spool in a direction opposite to the direction of movement by said actuation means, and means for independently moving said valve spool in a direction opposite to the direction of movement by said actuation means.

4,100,740

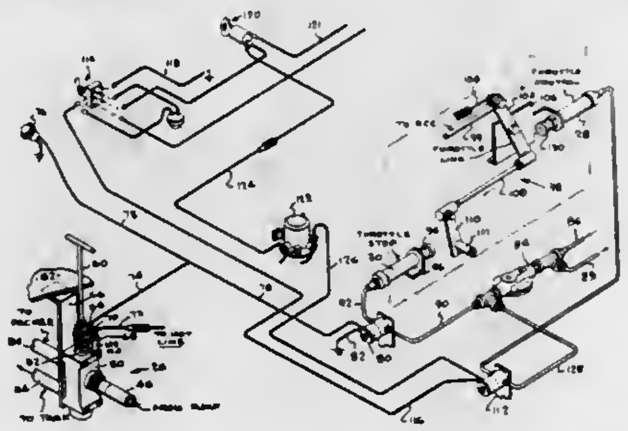
REFUSE VEHICLE HYDRAULIC SUPPLY SYSTEM

Melvin E. Stewart, Rapidan, Va., assignor to City Tank Corporation, Culpeper, Va.

Filed May 23, 1977, Ser. No. 799,648

Int. Cl.² F15B *15/18*

U.S. Cl. 60—431 **17 Claims**



1. A hydraulic fluid supply system for providing pressurized fluid to fluid actuated components on a refuse collection vehicle, said system comprising a fluid tank, a pump operatively connected to the crankshaft of the refuse vehicle engine for continuous operation, said pump having an inlet communicating with said tank, diversion means having an inlet communicating with the outlet of said pump and having an outlet selectively communicable with said tank and said fluid actuated components on said refuse collection vehicle, and means for increasing the idle speed of the engine to a predetermined actuation idle speed when the diversion means outlet is communicating with said fluid actuated components.

4,100,741

HOT-GAS ENGINE

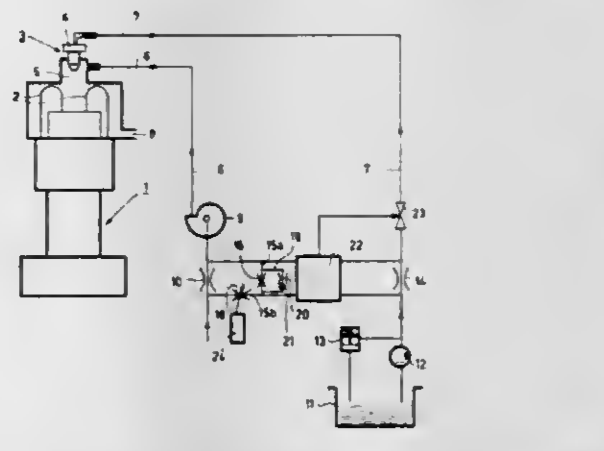
Albertus Peter Johannes Michels, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,702

Claims priority, application Netherlands, Apr. 6, 1976, 7603554

Int. Cl.² F02G *1/06*

U.S. Cl. 60—517 **3 Claims**



1. A hot-gas engine, comprising at least one combustion chamber having connected to it at least one supply duct for combustion air, including a restriction, and at least one supply duct for fuel, the quantity of fuel to be supplied to the combustion chamber being controlled in proportion to the supplied quantity of combustion air by means of a control device which comprises a differential pressure sensor which communicates with the air supply duct upstream and downstream from the restriction, characterized in that upstream and downstream from the restriction a branch duct is connected to the air supply duct, said branch duct comprising a first duct portion which includes a first flow resistance element and a second duct portion which includes a second flow resistance element, the differential pressure sensor being connected to the first duct portion upstream and downstream from the first flow resistance element, the second flow resistance element being subject to control means which, by controlling the flow resistance in response to variations of ambient air temperature and pressure, correct the differential pressure to be sensed by the sensor for the said variations.

4,100,742

TURBOCOMPOUND ENGINE WITH TURBOCHARGER CONTROL

James L. Harp, Jr., Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

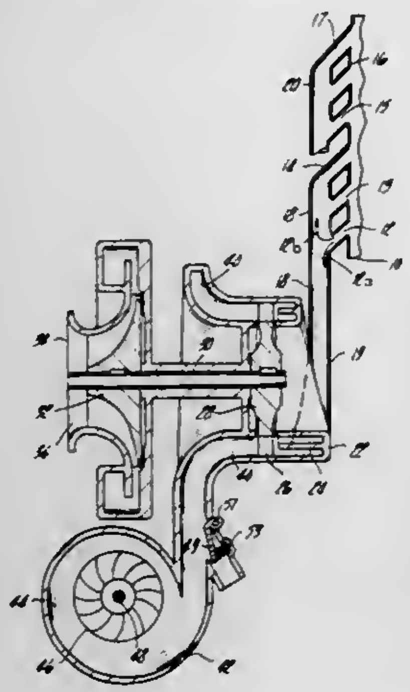
Filed Dec. 9, 1976, Ser. No. 748,975

Int. Cl.² F02D *23/00*

U.S. Cl. 60—602 **1 Claim**

1. An exhaust energy extraction system for an engine having two groups of cylinders, said system comprising plural manifolds, each receiving exhaust pressure pulses from one group of cylinders; the manifolds being connected to alternate-firing cylinders, whereby successive pulses are delivered to different manifolds; each manifold having a flow area approximately the same as the exhaust valve area for an individual engine cylinder whereby linear flow velocity of each pulse is maintained during transport thereof through the manifold; a first axial flow turbine having an inlet volute that is internally partitioned to define an inner annular volute section for directing gas onto the inner blade areas of the turbine rotor, and an outer annular volute section for directing gas onto the outer blade areas of the turbine rotor; the inlet volute being operatively located so

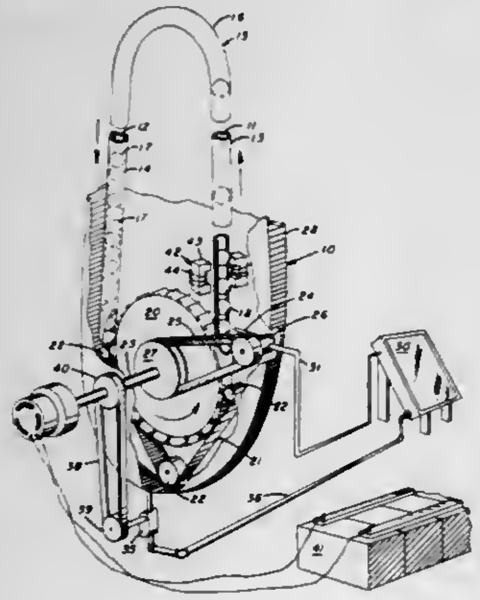
that its inner annular volute section is connected to one of the manifolds, and its outer annular volute section is connected to the other manifold; a second radial flow turbine receiving the total output from the axial flow turbine; a diffuser of gradually increasing flow area connecting the outlet of the axial flow turbine to the inlet of the radial flow turbine, whereby velocity pressure in the gas is converted to static pressure by the time the gas enters the rotor of the radial flow turbine; a pressure-responsive vent valve controlled by pressures within the diffuser for venting gas from the system when the static pressure in the diffuser begins to exert a choking effect on pulse flow through the axial flow turbine; a centrifugal air compressor mechanically connected to the rotor of the axial flow turbine for air supercharging the engine; said radial flow turbine being mechanically connected to the output shaft of the engine to augment useful engine output.



4,100,743
GRAVITY ENGINE

Harold E. Trumbull; Howard C. Davis, both of Upper Arlington, and Robert A. Yano, Worthington, all of Ohio, assignors to The Northwestern Mutual Life Insurance Company, Milwaukee, Wis.

Filed Dec. 20, 1976, Ser. No. 752,674
Int. Cl.² F03G *3/02*
U.S. Cl. 60—639 **29 Claims**

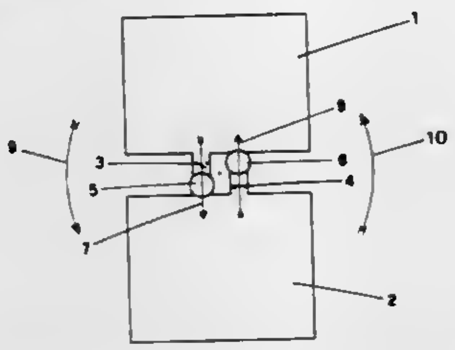


1. Energy conversion apparatus comprising a pair of generally adjacent vertical passageways, a plurality of bodies freely movable within said passageways, a fluid medium expander means at the bottom portion of a first of said passageways for imparting a force to successive ones of said bodies to accelerate them upwardly in said one passageway against the force of gravity, the magnitude of said force being great enough to cause successive ones of the bodies to reach the top of the first passageway, means at the top of said first passageway to direct said bodies to the top of the second of said passageways where they are stackes and permitted to descend by gravity in the second passageway, and means at the bottom of the second passageway for converting at least a portion of the potential energy of bodies falling in the second passageway to another form of energy while directing said bodies to the bottom of said first passageway where they are again accelerated upwardly by imparting a force thereto.

4,100,744
INSTALLATION FOR THE PRODUCTION OF ENERGY WHICH UTILIZES A SOURCE OF HEAT OR NATURAL THERMIC DIFFERENCES IN LEVEL

Delio De Munari, Via Dante 13, Quinto Vicentino (Vicenza), Italy

Filed Mar. 23, 1977, Ser. No. 780,476
Claims priority, application Italy, Dec. 10, 1976, 85622 A/76
Int. Cl.² F01K *25/10*
U.S. Cl. 60—651 **9 Claims**

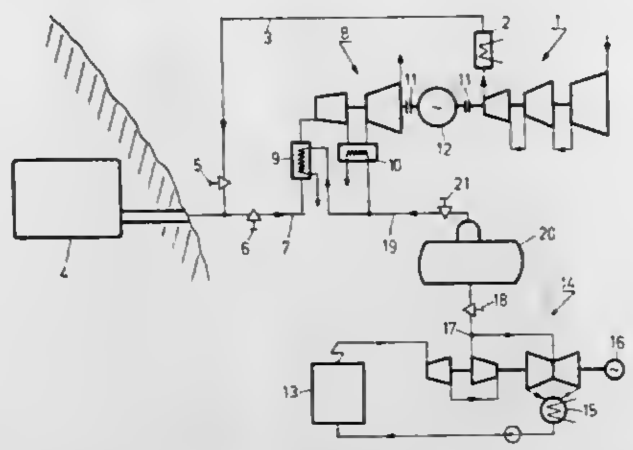


1. An installation for the production of energy of the type which utilizes a source of heat or natural thermic differences which comprises two containers of suitable dimensions, the first container containing a fluid in the liquid state and being capable of transmitting the heat to said fluid, the second container being used for holding the fluid after completion of the thermodynamic cycle and after it has returned to the liquid state, a cooling source for cooling said second container, said second container being at a temperature and at a pressure lower than the temperature and the pressure which prevail in said first container, conduit means for connecting said first and second container, said fluid having a boiling point at one atmosphere lower than the minimum temperature of the cooling source in the location of the installation, said fluid being capable of undergoing a change from the liquid to gaseous state, and a device capable of utilizing the kinetic energy of the fluid and transforming said energy into mechanical energy, said device being placed in the conduit means between the first and the second container, said fluid being converted from the liquid to the gaseous state upon entry in said device and returning to the liquid state in the interior of said second container.

4,100,745
THERMAL POWER PLANT WITH COMPRESSED AIR STORAGE

Georg Gyarmathy, Zollikon, and Hans Pfenninger, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 28, 1977, Ser. No. 763,336
Claims priority, application Switzerland, Mar. 15, 1976, 3165/76
Int. Cl.² F02C *1/04, 7/00*
U.S. Cl. 60—652 **13 Claims**

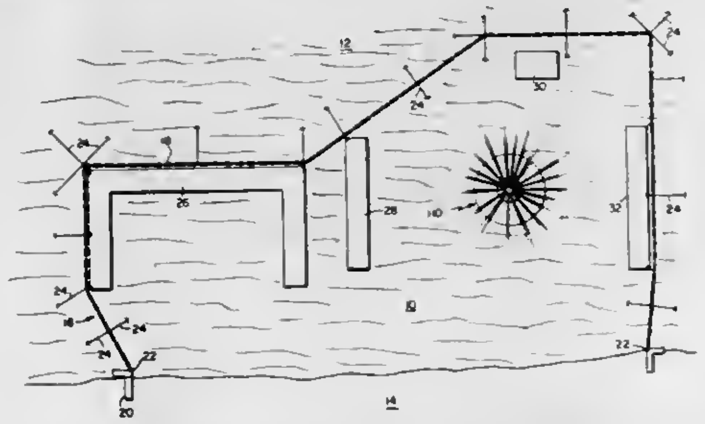


1. In a thermal power plant of the type which produces compressed air by use of excess energy generated during off-peak load periods and which is accumulated in a storage tank, the stored compressed air being withdrawn from said tank and delivered to a hot-air turbine through a compressed air line extending from said storage tank to said hot-air turbine during peak load periods for generation of additional energy, the improvement comprising:
  a heat exchanger included in said compressed air line;
  a steam turbine for producing bleeder steam; and,
  means for supplying said bleeder steam to said heat exchanger for heating said compressed air prior to delivery to said hot-air turbine.

4,100,746
PROTECTED AQUATIC SPORTS AREA

Paul Preus, 21 Smith Rd., Toms River, N.J. 08753

Filed Jun. 13, 1977, Ser. No. 805,981
Int. Cl.² E02B *15/04;* E04H *3/16*
U.S. Cl. 61—1 F **5 Claims**

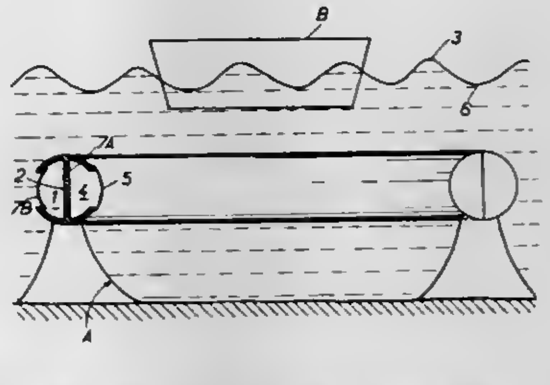


1. An isolated and protected aquatic sports zone in a portion of a larger shore-bounded body of water comprising a pair of spaced pier bulkheads defining the length of the protected zone along the shore of the body of water, a plurality of water impervious boom sections, each of said boom sections including a generally tubular flotation element and an integral water impervious depending skirt, each tubular element having an upstanding fin and hand grips spaced along said fin, each depending skirt having ballasting means along the lower edge thereof and means connecting each tubular element and depending skirt in end-to-end relation, means connecting the ends of the connected boom sections to said pair of spaced pier bulkheads, a second skirt member, means releasably connecting the top of the second skirt member to the top of the flotation elements, further means releasably connecting the lower end of the integral skirt to said second skirt, said second skirt having a length greater than the depth of the water at the point of deployment and ballasting means carried at the lower end of said second skirt, anchor means, and means attaching the anchor means to the boom sections at spaced intervals to thereby define a fixed protected aquatic sports zone.

4,100,747
SWELL ABATEMENT DEVICE

Pierre Jean Alphonse Facon, Le Perray en Yvelines, France, assignor to Bertin & Cie, Plaisir, France

Filed Aug. 10, 1976, Ser. No. 713,230
Int. Cl.² E02B *3/06*
U.S. Cl. 61—5 **3 Claims**



1. Swell abatement device for establishing a relatively quiescent zone on an agitated water surface, by means of a swell damper responsive to variations in water level between the crest and the trough of waves, said damper comprising:
  completely submerged first and second enclosures both extending entirely within the liquid mass, i.e., under the minimum datum level defined by the trough of the waves,
  first one-way flow orifice means on said first enclosure arranged for the in-flow of water into said first enclosure upon external overpressure,
  second one-way flow orifice means on said second enclosure arranged for the out-flow of water from said second enclosure, and
  hydraulic energy dissipating passage means connecting said first enclosure with said second enclosure.

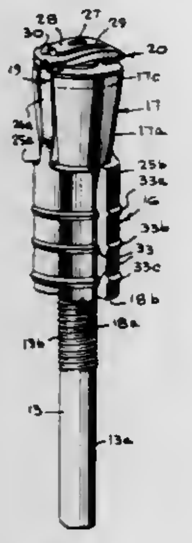
4,100,748
MINE ROOF OR ROCK BOLT EXPANSION ANCHOR OF THE BAIL TYPE

Roger M. Hansen, Birmingham, Ala., assignor to Stratabolt Corporation, Pelham, Ala.

Filed Jan. 7, 1977, Ser. No. 760,452
Int. Cl.² E21D *21/00;* F16B *13/04*
U.S. Cl. 61—45 B **15 Claims**

1. An expansion anchor for mine roofs and the like comprising an expansible shell formed from an integral unitary blank of sheet metal having a pair of initially substantially rectangular leaves interconnected to each other at proximal ends thereof by a bail strap and free at the other ends thereof, said bail strap being bent to a U-shape and said leaves being bent to semi-cylindrical shape concentric with a bolt axis with their side edges in mutual abutment defining a generally cylindrical exterior for engagement with the walls of a mine ceiling bore, said bail strap having an enlarged circular top portion midway along its length and straight narrow leg portions extending in parallelism therefrom to said proximal ends of the leaves, an expander cone nut having an internally threaded bore and located in confined relation between said leaves and between said leg portions and having a generally frusto conical outer

surface convergently tapering to a smaller diameter end interposed between said leaves to abut the leaves and spread them outwardly, a bolt threaded through the cone nut for moving the nut downwardly in the shell and bring progressively larger diameter portions of said outer surface against the leaves for spreading the leaves outwardly, said circular top portion of the bail having an pop-out center formed by a pair of substantially semicircular arcuate cuts therethrough defining a concentric circle interrupted by a pair of frangible uncut attachment sections, said pop-out center being of slightly larger diameter than the bolt and aligned with and adjacent the free end of the bolt to be abutted by the same and popped out upon predetermined rotation of the bolt and form an aperture for passage of the bolt through said top portion, and said circular top portion of said bail strap including said pop-out center and the remaining encircling portion being shaped in an upwardly convex cylindrical path having its axis of revolution passing through the bolt and with the uncut attachment sections arranged along a diametric axis paralleling the axis of revolution of said cylindrical path to facilitate centering of the bolt relative to the circular top portion upon engagement thereof.



4,100,749
METHOD AND DEVICE FOR LINING CHAMBERS AND GALLERIES

Gerd Radner, Herne; Christoph Zillessen, Recklinghausen; Walter Zywietz, Dortmund; Franz Gantke, Dortmund-Kirchderne, and Harald Walter, Dortmund, all of Germany, assignors to Runkoble, A. G. Essen, Germany

Filed May 9, 1977, Ser. No. 795,348

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621361

Int. Cl.² E21D *11/22*

U.S. Cl. 61—45 C **27 Claims**

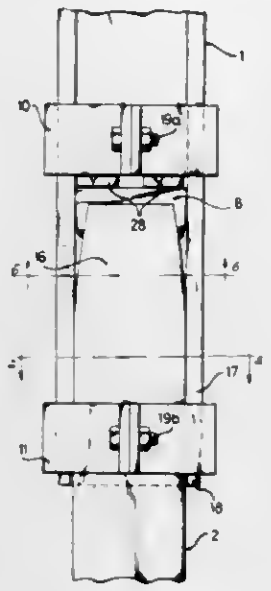
1. A method for lining chambers and galleries, especially mining and tunnelling galleries, with a deformable frame including first and second segments having end portions, one of which is capable of being slid into another for joinder, said segments having a generally C-shaped cross section with a pair of arms joined by an intermediate connection member having an exterior flange, said method comprising the steps of:

altering the cross-sectional configuration of the end portion of at least one of the segments for permitting sliding joinder of said second segment into said first segment;

inserting the end portion of the second segment into the end portion of the first segment with the C-shaped sections of the segments opening in opposite directions to form a closed tube in the region of the overlapped end portions;

positioning a wedge means in operative association with the overlapped end portion of at least the second segment for placing the overlapped end portions of said first and second segments in frictional engagement and to establish, at least in part, a predetermined resistance to further insertion of the second segment into the first segment;

placing the arms of the first segment in abutment with the sides of the flange of the connecting member of the second segment; and



peripherally compressing the first and second segments, at least adjacent to the area of frictional engagement of said end portions, to further establish the predetermined insertion resistance.

4,100,750
METHOD FOR THE PRODUCTION OF PILES CAST IN THE GROUND AND HOLLOW AUGER FOR IMPLEMENTING THE METHOD

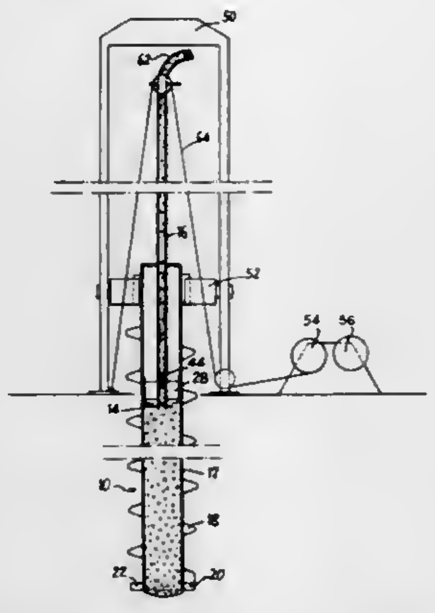
Jean-Marie Labrue, 31, rue Gustave-Gaillard, 33 Saint-Medard-en-Jailes, France

Filed Jul. 12, 1976, Ser. No. 704,403

Claims priority, application France, Jul. 17, 1975, 75 22328

Int. Cl.² E02D *5/34*

U.S. Cl. 61—53.64 **3 Claims**



1. Method for producing piles cast in the ground, according to which a hole is drilled in the ground by means of a hollow auger and the auger is then raised progressively from the drill-hole whilst simultaneously injecting concrete under pressure into the hole thus obtained, characterized in that an auger is used provided with a blade support tube and a removable cutting head which is able to slide in a sealed manner in the blade support tube of the auger, and in that the injection of concrete takes place through a central passageway provided in the cutting head, which is undertaken in two successive stages, comprising a first stage in which concrete is injected into the support tube by progressively raising the cutting head to a predetermined level, namely zero level in the latter, and a second stage in which the auger is raised from the drill-hole by exerting a constant pressure on the cutting head and whilst injecting concrete in order to maintain this head at the predetermined level.

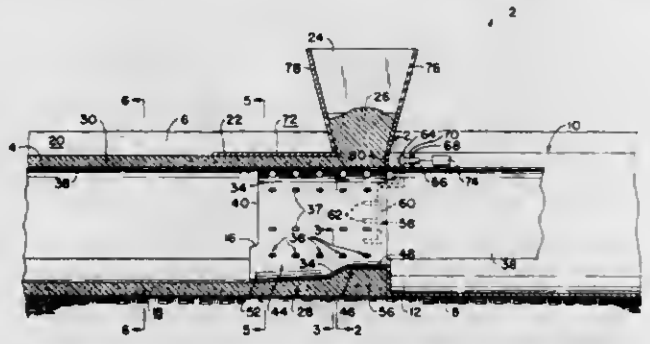
4,100,751
CONTINUOUS CONCRETE PIPE LAYING MACHINE

Larry V. Thomason, 4196 E. Herndon, Clovis, Calif. 93612

Filed Jan. 31, 1977, Ser. No. 764,118

Int. Cl.² F16L *1/02;* E02D *29/10*

U.S. Cl. 61—72.2 **27 Claims**



1. Apparatus for forming a continuous length of concrete pipe in an open trench by pouring fresh concrete and giving it a tubular shape before it hardens, the apparatus comprising: sled means having forward and aft ends for movement through the trench in a forward direction; interior mold means connected to the sled for pouring fresh concrete thereabout and forming an interior surface of the pipe, the interior mold means being positioned aft of the sled means so that a space is formed between a lower portion of the mold means and a bottom portion of the trench, the space for defining a wall thickness for a lower portion of the pipe; exterior mold means connected to the sled means for shaping an exterior surface of the pipe not in contact with and supporting by walls of the trench; a member reciprocably mounted to the interior mold means for continuously compressing and consolidating freshly poured concrete disposed in the space as the sled means is drawn through the trench and the mold means shapes the pipe; and means for reciprocating the member at a relatively low rate which is insufficient to loosen dirt and sand in the trench or to cause vibrations of the mold means.

4,100,752
SUBSEA RISER SYSTEM

Albert R. Tucker, Spring, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 15, 1976, Ser. No. 723,380

Int. Cl.² E02B *17/00*

U.S. Cl. 61—86 **13 Claims**

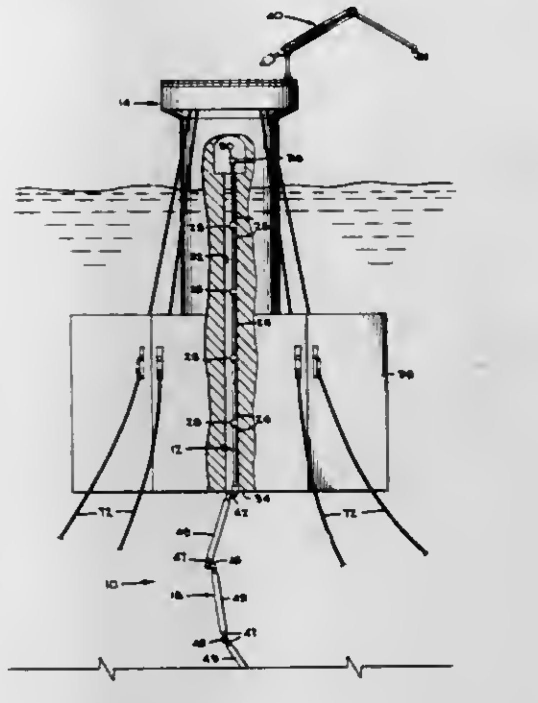
1. A subsea well production riser apparatus extending between an underwater production station and a production station located at the water surface, comprising

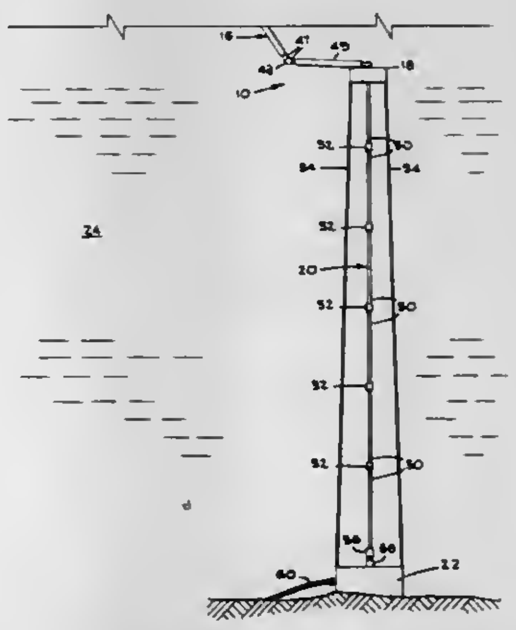
(a) an upper riser section extending downwardly from a support thereof at the surface production station,

(b) a lower riser section extending upwardly from the underwater production station to a submerged support for said lower section, said lower section being supported in tension with respect to said underwater station,

(c) a middle riser section intermediate said upper and lower riser sections and interconnecting said two riser sections to establish a fluid flow conduit therewith, said middle riser section being flexible to accommodate movement of the surface production station with respect to the underwater station, and

(d) a submerged platform means intermediate said surface production station and said underwater station, said submerged platform means being secured to an underwater foundation by means other than said lower riser section and having positive buoyancy.





4,100,753
MARINE STRUCTURE WITH RISER CONDUCTOR AND PIPELINE CONNECTION

George E. Mott, Metairie, and Ronald D. Seguin, New Orleans, both of La., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,401

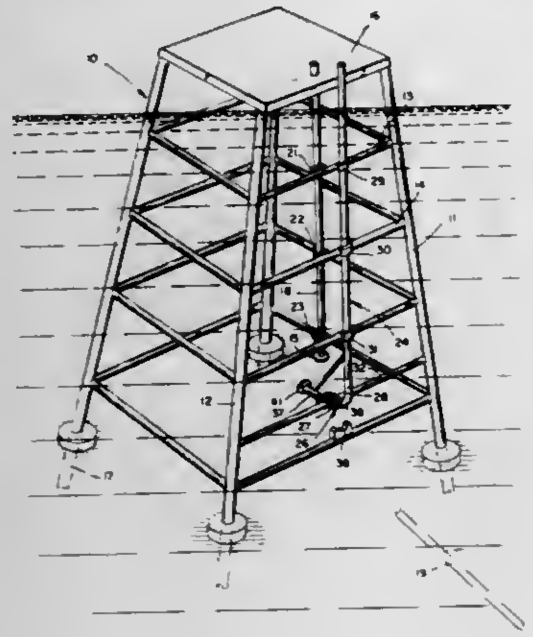
Int. Cl.² E02B *17/00*

U.S. Cl. 61—86 **9 Claims**

1. A marine structure having upper and lower ends, for use in an offshore body of water, being adapted to engage a fluid carrying pipeline supported at the ocean floor, said marine structure including at least one upstanding support column having upper and lower ends, and a deck carried at the upper end of said at least one support column,

a fluid conductor operably depending from said at least one support column having one end disposed at said deck, and a coupling end disposed adjacent to the marine structure's lower end, said fluid conductor being longitudinally slidable to a limited degree, along said at least one support column,

an elongated provisional conductor comprising; a pipe section releasably disposed adjacent to said fluid conductor, prior to being connected with said pipeline and a connecting segment depending from and forming an adjunct to said pipe section at the marine structure's lower end, operably connecting said structure with said provisional conductor at a point spaced from the end of said connecting segment whereby pivotal movement of said provisional conductor to dispose the pipe section at the ocean floor, will align said connector segment with said conductor coupling end to permit fluid tight engagement of the latter two members.



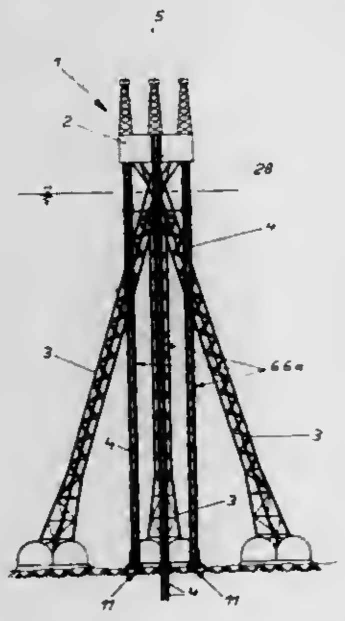
4,100,754
METHOD AND APPARATUS FOR INSTALLING PIPES IN OFF-SHORE LOCATIONS

Rudolf Vogel, Jägerweg 6, D3320 Salzgitter 51, Fed. Rep. of Germany

Filed Jul. 28, 1976, Ser. No. 709,302

Int. Cl.^{2} E02B *17/00;* E21B *15/02*

U.S. Cl. 61—98 **15 Claims**



1. In an off-shore installation for extracting fluids from the sea bed and including a platform into the sea bed and operable to conduct the fluid from the point of extraction thereof from the sea bed to the platform, the improvement in combination therewith which comprises; at least two pipes in parallel coextensive relation forming a group, and members connecting the pipes of the group together as a complete bundle fabricated on-shore to form a unitary assembly or pipe package effective for transport and installation off-shore, said connecting members including sleeve portions surrounding the pies of the respective group, the pipes being axially movable in said sleeve portions, and means for locking the pipes to the respective sleeve portions.

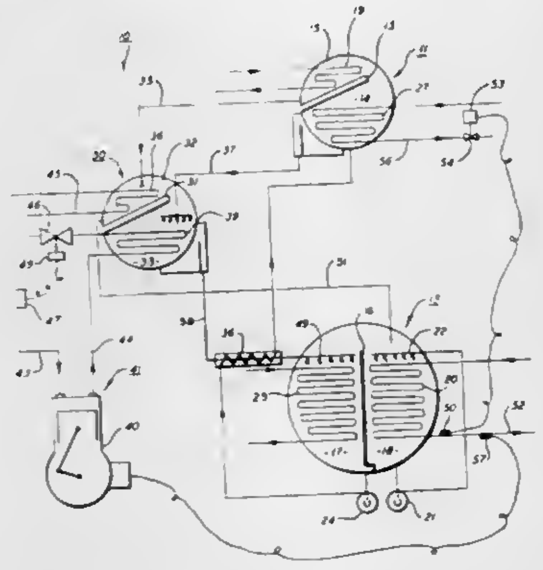
4,100,755
ABSORPTION REFRIGERATION SYSTEM UTILIZING SOLAR ENERGY

Louis H. Leonard, DeWitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,034

Int. Cl.^{2} F25B *27/00, 15/00, 27/02*

U.S. Cl. 62—2 **18 Claims**



1. In an absorption refrigeration system having a primary generator for processing an absorptive solution therein and a primary condenser for condensing refrigerant therein, the improvement comprising

a secondary generator operatively connected to the primary generator to receive processed solution from the primary generator,

a secondary condenser operatively connected to said primary condenser to receive refrigerant condensate therefrom, and

a compression driven refrigeration circuit having a first heat exchanger in heat transfer relation with the refrigerant contained in the secondary condenser and a second heat exchanger in heat transfer relationship with the solution contained within the secondary generator whereby the heat of condensation developed in the secondary condenser is transferred into the secondary generator.

4,100,756
SOLAR POWERED ABSORPTION REFRIGERATION SYSTEM

Clarence Elmo Albertson, Villa Park, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

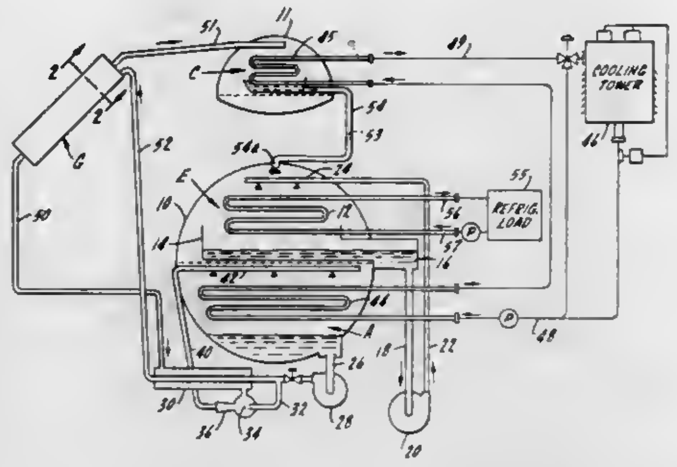
Filed Dec. 29, 1976, Ser. No. 755,329

Int. Cl.^{2} F25B *27/00, 15/00;* F24J *3/02;* 62 *2;148;324;476*

U.S. Cl. 62—2 **3 Claims**

1. An absorption refrigeration system comprising: an evaporator, an absorber, a generator and a condenser all connected in a closed, continuous cycle referigeration circuit with relatively concentrated absorbent solution flowing to the absorber to absorb water vapor from the evaporator and relatively dilute absorbent solution flowing from the absorber to the generator to be concentrated with concomitant release of water vapor to be conducted to the condenser, said generator including a solar collector for providing thermal energy to the absorbent solution to be concentrated, said solar collector including a series of inclined channels into which said relatively dilute solution is introduced in such a way that the channels are not completely filled with solution and a vapor space is maintained at the upper portion thereof, the exterior

surface of said channels being provided with a solar absorbing surface; means for directing water vapor to said condenser; and means for conducting relatively concentrated absorbent solution to said absorber.



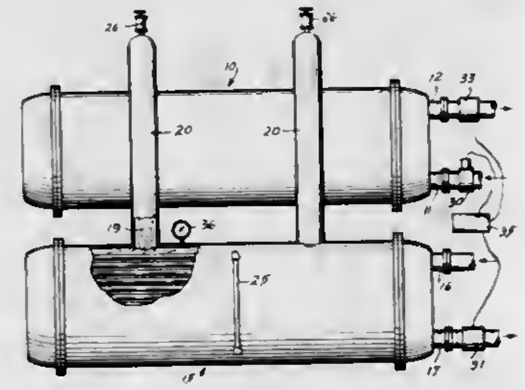
4,100,757
CLOSED CIRCUIT AMMONIA SYSTEM FOR LIQUID HEATING FROM WATER

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed May 4, 1977, Ser. No. 793,651

Int. Cl.^{2} F17C *7/02*

U.S. Cl. 62—52 **4 Claims**



1. Apparatus for raising the temperature of a liquefied gas which is at a temperature substantially below the freezing point of water, comprising first and second enclosed vessels, the first mounted at a higher elevation than the second, first conduit means connecting the upper portion of the second vessel to the upper portion of the first vessel for the flow of vapor from the second vessel to the first vessel, second conduit means connecting the lower portion of the first vessel to the lower portion of the second vessel for the flow of condensed liquid from the first vessel to the second vessel, first tube means for passing liquefied gas into and out of said first vessel, second tube means for passing a heating liquid into and out of said second vessel, valve means for controlling the flow through said first tube means, temperature responsive means for sensing the temperature of the heating liquid flowing out of said second vessel, and control means responsive to said temperature responsive means for operating the valve means of said first tube means.

4,100,758
VACUUM ASSIST FUEL SYSTEM

Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,248

Int. Cl.^{2} F17C *7/02*

U.S. Cl. 62—54 **7 Claims**

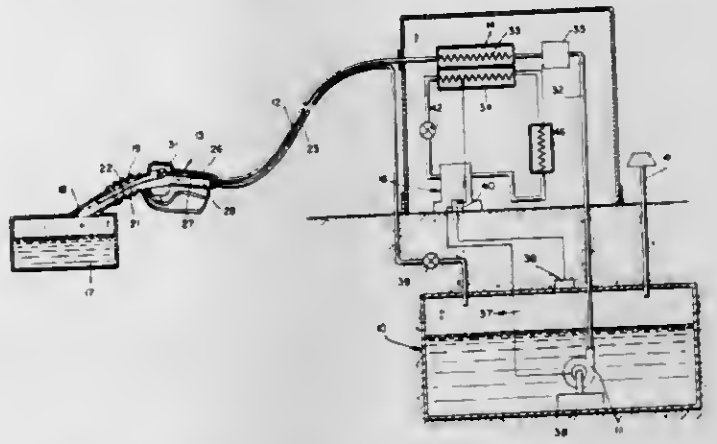
1. In a system for conducting a vaporizable fuel from a storage facility therefor, into a receiving tank having an inlet port, and for concurrently conducting a vaporous stream from said receiving tank to said storage facility, which system includes;

a fuel dispensing nozzle detachably, sealably connected with said receiving tank inlet port,

a liquid pumping circuit, including pumping means having a pump inlet communicated to a source of fuel in said storage facility, and having a discharge port,

and an elongated conductor including a liquid carrying conduit communicating said fuel dispensing nozzle with said pumping means discharge port, and a vapor carrying conduit communicating said nozzle with said storage facility,

the improvement therein of a heat transfer member disposed intermediate said pumping means discharge port and said liquid carrying conductor to receive a stream of fuel from said storage facility and to adjust the temperature of said fuel stream prior to said stream entering said receiving tank.



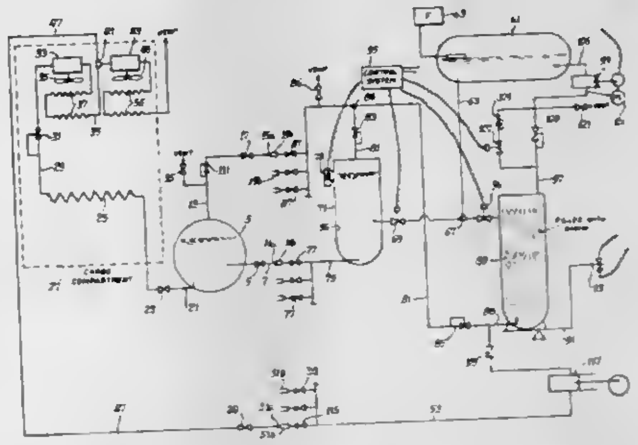
4,100,759
CO_2 VEHICLE REFRIGERATION SUPPORT SYSTEMS

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

Filed Nov. 1, 1976, Ser. No. 737,439

Int. Cl.^{2} F17C *7/02*

U.S. Cl. 62—55 **10 Claims**



1. A method for filling vehicle tanks with low pressure liquid carbon dioxide and for providing standby cooling of the cargo compartments of said vehicles, which method comprises

supplying a holding chamber with liquid CO_2 from a high pressure liquid CO_2 storage vessel system,

reducing the pressure of said liquid CO_2 to about 60 p.s.i.g. or below to create CO_2 vapor and CO_2 snow thereby forming a low-temperature coolant reservoir of CO_2 snow in said holding chamber,

removing and compressing said CO_2 vapor from said holding chamber and returning said compressed CO_2 vapor to said storage vessel system,

supplying liquid CO_2 from said high pressure storage vessel system to the vehicle tank at a pressure below about 125 psig and condensing the vapor created as a result of the formation of said lower pressure liquid by melting said CO_2 snow in said holding chamber,

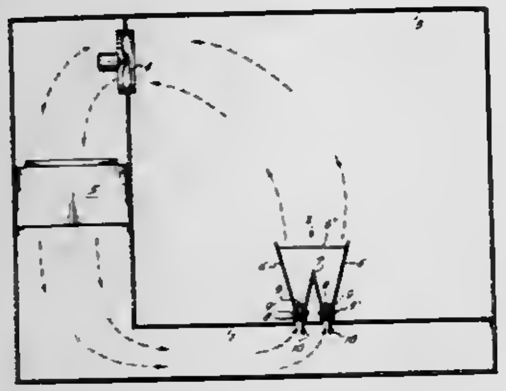
flowing liquid CO_2 from said vehicle tank through heat exchange means in the cargo compartment and vaporizing said liquid therein to cool the cargo compartment,

expanding said vapor from said heat exchange means to lower the temperature thereof,

passing said expanded vapor through additional heat exchange means in the cargo compartment, and

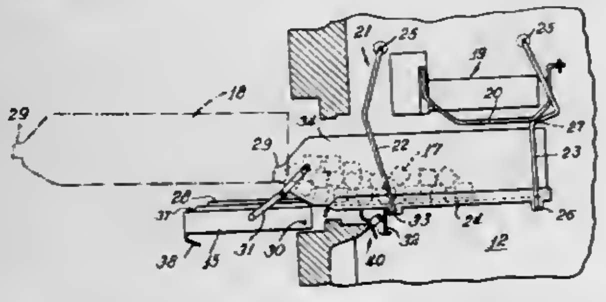
recovering said expanded vapor from said additional heat exchange means by compressing said vapor and injecting said compressed vapor into said holding chamber so as to condense said injected vapor by melting said solid CO_2 snow.

4,100,760
FLUID SUSPENSION FREEZER AND METHOD
Paul L. Cheney, 4104-12th South, Seattle, Wash. 98108
Continuation-in-part of Ser. No. 384,034, Jul. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 204,940, Dec. 6, 1971, abandoned. This application May 27, 1975, Ser. No. 581,372
Int. Cl.² F25D *17/00*
U.S. Cl. 62—57 **22 Claims**



1. Treating apparatus comprising a trough, at least a portion of said trough flaring upwardly and the walls of a portion of the trough below said upwardly flaring portion are steeper than the walls of said upwardly flaring portion, means for supplying to said trough particulate material to be treated, and means for supplying gas to said trough moving upward through and longitudinally of said trough through the particulate material in said trough for exerting dynamic supporting force on the particles of such particulate material, which force is at least nearly equal to the weight of such particles, and for simultaneously moving the particles of the particulate material lengthwise of said trough.

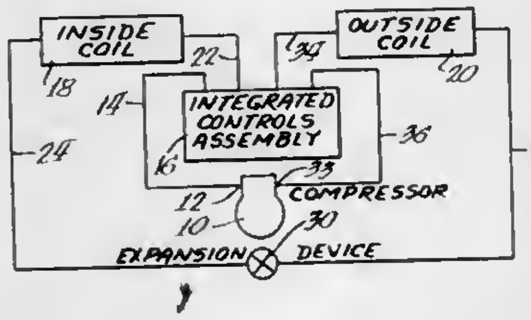
4,100,761
MOVABLE ICE RECEPTACLE
William John Linstromberg, and Charles Thomas Rutledge, both of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 10, 1976, Ser. No. 749,537
Int. Cl.² F25C *1/00*
U.S. Cl. 62—137 **12 Claims**



1. In a refrigeration appliance having a cabinet defining a freezing space, an ice maker located within said freezing space, a sensing arm for controlling operation of said ice maker, an ice collecting receptacle, and support means for carrying said receptacle within said space for movement between an ice storage position and an ice access position, said sensing arm extending downwardly into the receptacle when the receptacle is in the ice storage position to sense the level of ice collected therein, the improvement comprising

cooperating camming means on said support means and said sensing arm for positioning said sensing arm suitably to prevent operation of the ice maker as an incident of preselected movement of said support means from said ice storage position toward the ice access position.

4,100,762
INTEGRATED CONTROLS ASSEMBLY
Gerald L. Davis, and Timothy C. Scott, both of Bristol, Va., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Nov. 2, 1976, Ser. No. 737,990
Int. Cl.² F25B *13/00, 47/00, 43/00*
U.S. Cl. 62—160 **20 Claims**



1. An integrated controls assembly for use in a heat pump or the like including first and second heat exchangers, said heat exchangers being in fluid communication through an expansion device, and a compressor in fluid communication with each of said heat exchangers to circulate refrigerant through said heat exchangers and said expansion device, the integrated controls assembly comprising:

(a) an accumulator communicating with each of said heat exchangers and with the discharge outlet and suction inlet of said compressor;

(b) a first conduit leading from the discharge outlet of said compressor with a section of said conduit being within said accumulator;

(c) second and third conduits placing said accumulator in communication with said first and said second heat exchangers, respectively;

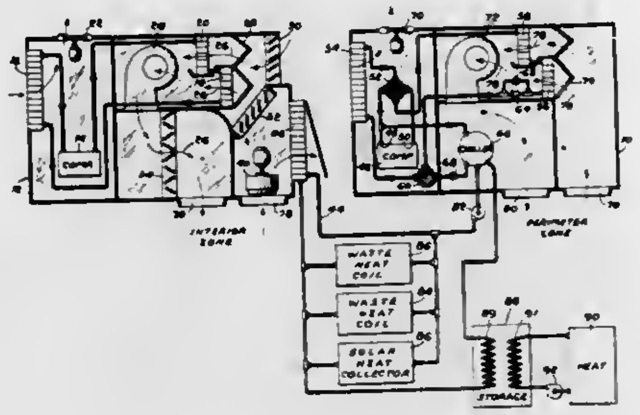
(d) a reversing valve assembly within said accumulator and placing said first conduit in selective communication with either said second conduit or said third conduit and placing the conduit not communicating with the first conduit in communication with the interior of said accumulator;

(e) a bypass valve associated with said first conduit to place said first conduit in fluid communication with the interior of said accumulator in response to heat;

(f) an oil conduit communicating with the lowermost section of said tank; and

(g) a combination aspirator/check valve having a gas inlet within said accumulator and connected to said oil conduit and a fourth conduit leading to the suction inlet of the compressor for the simultaneous return of oil and gaseous refrigerant from the interior of said accumulator to the said suction inlet by the gas flow creating a partial vacuum to draw oil through the oil conduit for return with the gas to said suction inlet of the compressor.

4,100,763
MULTI-SOURCE HEAT PUMP HVAC SYSTEM
Herbert M. Brody, Cherry Hill, N.J., assignor to International Telephone & Telegraph Corporation, Nutley, N.J.
Continuation of Ser. No. 698,233, Jun. 21, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,903
Int. Cl.² F25B *27/02, 27/00, 13/00;* **F25D** *17/06*
U.S. Cl. 62—238 **25 Claims**



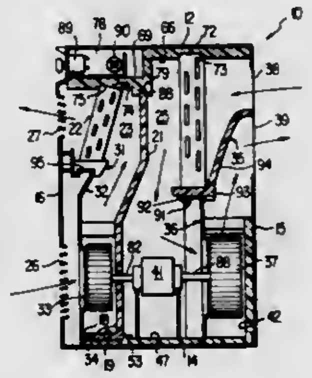
17. In an air-conditioning system of the type adapted to provide fresh uncooled air to a zone to be conditioned and including means for removing warm zone air from the conditioned zone and exhausting at least a portion of the removed warm zone air to the atmosphere, the improvement comprising:

a waste heat recovery means disposed in the path of the exhausted warm zone air for recovering heat therefrom;

heat pump means for chilling a liquid and extracting usable heat therefrom; and

liquid circulating means interconnecting said waste heat recovery means and said heat pump means for circulating a liquid through said heat recovery means and said heat pump means so that the chilled liquid from the heat pump means may absorb heat from the warm exhausted zone air passing through the waste heat recovery means and the heat pump means may extract the heat from said circulating liquid.

4,100,764
AIR-CONDITIONING APPARATUS
Mitsuo Murano, Fujinomiya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan
Filed Apr. 29, 1977, Ser. No. 792,343
Claims priority, application Japan, Apr. 30, 1976, 51-49700; Jun. 29, 1976, 51-76940
Int. Cl.² F25D *21/14, 23/12, 19/00*
U.S. Cl. 62—289 **16 Claims**



1. An air conditioning apparatus comprising:

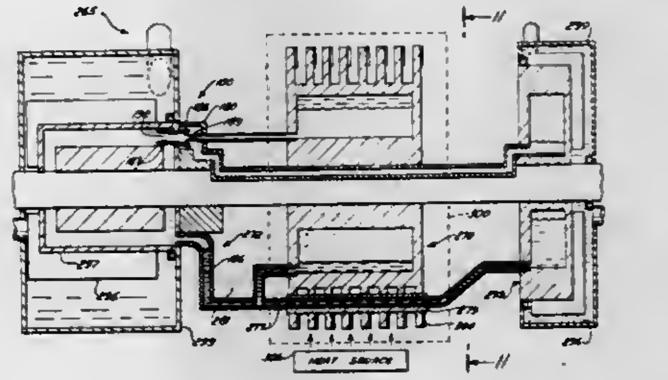
a cabinet structure consisting of bottom, right side, left side, top, front and rear walls;

a refrigeration system arranged in said cabinet structure;

an insulation structure made of foamed plastic insulating material consisting of bottom, right side, left side and top insulation boards for thermally insulating said cabinet structure, each of which is in a closely mating relationship with said corresponding wall and each having catch means therewith for interconnecting adjoining insulation boards together and for fixedly disposing therebetween components of said refrigeration system, when assembled; and

a partition member made of the same material as that of said insulating structure, with its bottom, right, left and top sides firmly and fixedly positioned by said catch means of said insulating structure for dividing the cabinet interior into an interior compartment, including an interior fan case housing an interior fan, and an exterior compartment, including an exterior fan case housing an exterior fan.

4,100,765
ROTARY THERMODYNAMIC APPARATUS
Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025
Division of Ser. No. 461,452, Apr. 16, 1974, which is a division of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Sep. 16, 1976, Ser. No. 723,714
Int. Cl.² F25B *3/00*
U.S. Cl. 62—499 **7 Claims**



1. Thermodynamic apparatus comprising, in combination, a rotor means for rotating said rotor, conduit means in said rotor having a first section for guiding the flow of fluid radially outwardly from the axis of rotation of said rotor, and a second section connected to said first section at a location spaced radially outwardly from said axis for guiding the flow of fluid back towards said axis, further conduit means joining said first and second conduit sections to conduct a fluid therebetween at a second location which is spaced inwardly towards said axis from said first location, means for creating a continuous difference between the average density of a first volume element of fluid in said first section and a second volume element of fluid in said second section comprising heat exchange means for introducing heat into said fluid at one location and for permitting heat to flow therefrom at another location; said first and second volume elements being equal and being located at equal average radial distances from said axis, and means connected to said conduit means for pressurizing and then expanding the fluid, said means for rotating said rotor comprising a source of pressurized gas, nozzle means connected to said source and directed at said rotor to create a tangential gas flow component impinging upon said rotor.

5. In a rotary thermodynamic device including a rotor containing fluid flow conduit means, means in said rotor actuated by a flow of heat from a lower temperature source to a higher temperature source for developing a fluid stream, reaction means in said rotor having a surface relatively stationary with respect to the environment of said rotor, and means for directing said stream against said surface to rotate said rotor.

4,100,766

FLAT KNITTING MACHINE HAVING FOUR OPPOSED NEEDLE BEDS

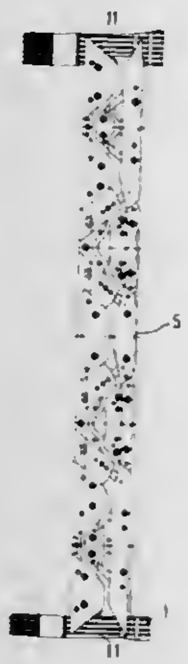
Gottfried Kuhnert, Aalen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Postfach, Germany

Continuation-in-part of Ser. No. 599,436, Jul. 28, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,382

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1974, 2436450

Int. Cl.² D04B *7/04*

U.S. Cl. 66—64 **1 Claim**



1. A flat knitting machine comprised of two flat V-bed knitting machines each having two opposed needle beds alternately arranged to provide front and back main beds and front and back auxiliary beds located above the main beds, wherein each of said beds are the same length each main bed and the auxiliary bed which faces it from a pair of cooperating needle beds, and single carriage means arranged to transverse the entire length of all the needle beds and including cam means for imparting knitting and loop transferring motions to the needles on both the main beds and both the auxiliary beds, said cam means comprising two transfer cams operable in both directions of traverse as a leading and trailing transfer cam and a double stitch cam system interposed between them.

4,100,767

KNITTING MACHINE PATTERN MECHANISM

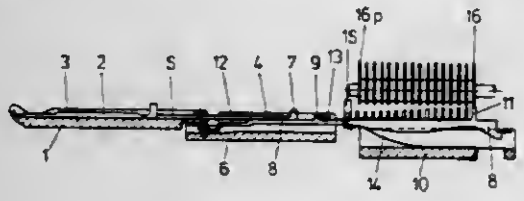
Hans Schieber, Bopfingen, and Reinhold Schimko, Aalen-Wasseralfingen, both of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Oct. 12, 1977, Ser. No. 841,420

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646410

Int. Cl.² D04B *7/00*

U.S. Cl. 66—75.2 **21 Claims**



1. A knitting machine pattern mechanism comprising a needle support means, a plurality of needle control means movably carried by said needle support means, butt means on each of said needle control means, said butt means being in staggered formation, cam means movable relative to said needle support means, a plurality of control members for selectively determining the positions of said needle control means, means mounting said control members for movement relative to the needle support means between two of said butt means positioned successively in the direction of cam movement, and means operative to mechanically move said control members to and retain said control members in selected positions appropriate to a particular pattern.

4,100,768

METHOD AND APPARATUS OF SELECTING NEEDLES OF A KNITTING MACHINE

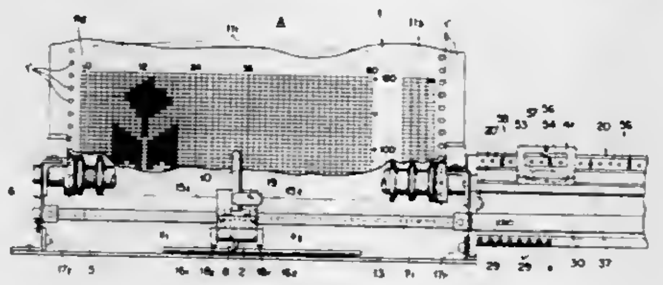
Shigeo Kamikura; Hideaki Itagaki, and Ryolti Kawaoka, all of Kodaira, Japan, assignors to Silver Seiko Co., Ltd., Kodaira, Japan

Continuation-in-part of Ser. No. 789,287, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 686,380, May 14, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,534

Claims priority, application Japan, May 24, 1975, 50-61480

Int. Cl.² D04B *7/00, 15/66*

U.S. Cl. 66—75.2 **21 Claims**



12. A patterning system in a straight knitting machine having a main body provided thereon with a needle bed for knitting needles and a carriage slidably mounted on said needle bed, comprising, in combination, needle selection means including an electromagnet for selectively operating said knitting needles,

- input means for providing control signals, and
- control circuit means for selective energization of said electromagnet and electrically connected to said input means, said control circuit means including a program memory having therein signals representative of data for needle selection at least for a course of knitting, said control circuit means further including read-out means for reading said signals out of said program memory in response to said control signals provided by said input means, said input means including a defining means for defining a range in which needle selection is to be effective in accordance with signals read out of said program memory, said defining means including a pair of boundary members mounted on and manually displaceable relative to said needle bed.

4,100,769

CIRCULAR KNITTING MACHINE METHOD FOR MANUFACTURING ONE PIECE PANTY HOSE OR THE LIKE

Siegfried Nürk, Körnerstrasse 5, 7470 Albstadt 3, Fed. Rep. of Germany

Filed May 5, 1976, Ser. No. 683,429

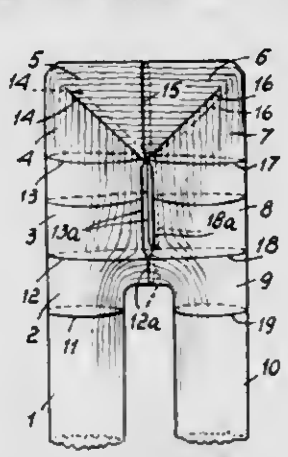
Claims priority, application Italy, Jan. 15, 1976, 19300/76

Int. Cl.² A41B *9/14;* **D04B** *1/00*

U.S. Cl. 66—177 **3 Claims**

1. A method for manufacturing panty hose or like fabrics on a circular knitting machine having at least one needle cylinder, comprising knitting a first leg portion with continuous rotary motion of said at least one cylinder and with all the needles operating, simultaneously inactivating a certain number of needles and causing them to hold the fabric on termination of

said leg portion, knitting with the remaining needles by reciprocating said at least one needle cylinder a first part of constant width consisting of a number of partial courses defining a selvedge at their ends, progressively reducing the operating needles by progressively inactivating needles on the two sides of the group of operating needles and causing said progressively inactivated needles to hold the fabric, progressively increasing the operating needles by progressively activating said progressively inactivated needles until the same number of operating needles has been attained as during the knitting of said first part, further progressively reducing and further progressively increasing the operating needles as during said progressively reducing step and said progressively increasing step, knitting a second part of constant width extending substantially over the same number of courses as said first part, simultaneously activating all the needles causing said at least one needle cylinder to pass into continuous rotary motion and knitting a second leg portion with all the needles, cutting the central part of the fabric to define a waist opening, and sewing said two parts of constant width at the selvedges on the two sides over the entire height of said parts.



4,100,770

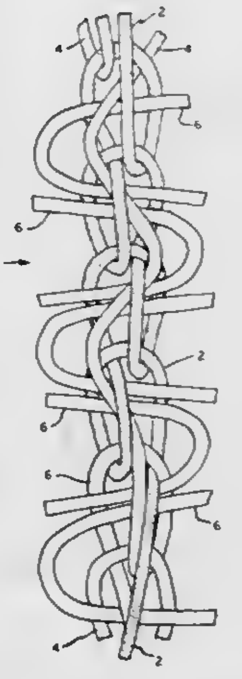
PROCESS AND NONRAVELING KNIT TUBULAR PRODUCTS HAVING AXIAL STRETCH

Simone Charles Titone, Birchrunville, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1976, Ser. No. 736,459

Int. Cl.² D04B *23/06, 23/02, 23/12*

U.S. Cl. 66—193 **5 Claims**



2. A ravel resistant warp knit fabric comprising

a. wales, each comprising a plurality of ends of elastomer yarn and consisting essentially of (i) a succession of at least 4 chain stitches of one of said ends of elastomer yarn alternating with a succession of at least 4 chain stitches of at least one other of said ends of said elastomer yarn, each of said chain stitches consisting essentially of only a single end of said elastomer yarn, and (ii) portions of each said one and said other ends of elastomer yarn laid into the succession of chain stitches of said other and said one ends of elastomer yarn, respectively, and

b. inelastic yarn interconnecting said wales together to form said fabric, said fabric having at least 20,000 denier of said elastomer yarn per cm of fabric width.

4,100,771

METHOD AND APPARATUS FOR FLEXIBILIZING LEATHER

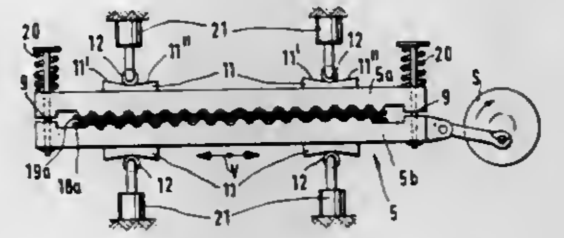
Jiri Dokoupil, Hochstrasse 9, D-6251 Gückingen, of Germany

Filed Sep. 20, 1976, Ser. No. 724,771

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543412

Int. Cl.² C14B *1/40*

U.S. Cl. 69—33 **24 Claims**



5. An apparatus for flexibilizing or softening leather or the like material, comprising at least two spaced tools for entraining an area section of said material therebetween, means for moving at least one of said tools in a direction opposite to said other tool and transverse to the direction of travel of said material for imposing an alternating deformation on a piece of said material, said tools extending at least partially over the piece of material and arranged at a mutual spacing from one another in a direction substantially parallel to the plane of the piece of material, said moving means imparting a path of travel to said tools comprising at least in one section thereof a component directed essentially parallel to the plane of the piece of material, said moving tools imparting at least shearing forces to said material essentially parallel to the plane of said material to cause flexibilizing deformation of said material being entrained by said tools.

4,100,772

CONTINUOUS LEATHER PROCESSING MACHINE

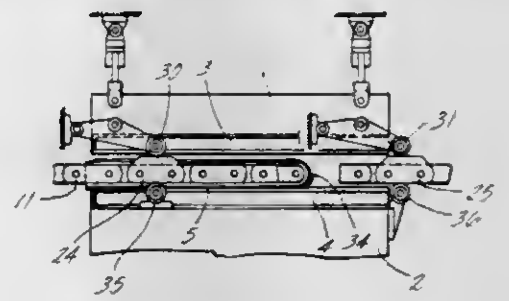
Heinz Dennstädt, Oberusel, and Walter Baum, Frankfurt, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Oct. 27, 1977, Ser. No. 846,028

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2650576

Int. Cl.² C14B *17/00*

U.S. Cl. 69—47 **13 Claims**



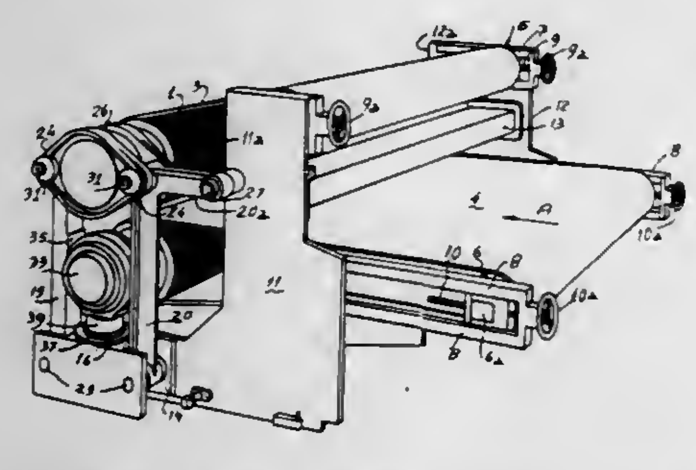
1. A machine for the continuous processing of hides, comprising:

a table board guided longitudinally through an arrangement

of processing tools disposed opposite each other, wherein each hide is disposed approximately in the middle thereof around the front edge of said table board;
means for displacing said hide with respect to said table board to permit the middle strip of hide which covered the front edge of said table board to be displaced for processing thereof;
said processing tools include a first processing tool and a second processing tool;
said second tool being in contact with said hide for a period of time to effectuate said displacement of said hide with respect to said table board, by at least the width of the front edge of the table board.

4,100,773
DRYING PRESS FOR HIDES

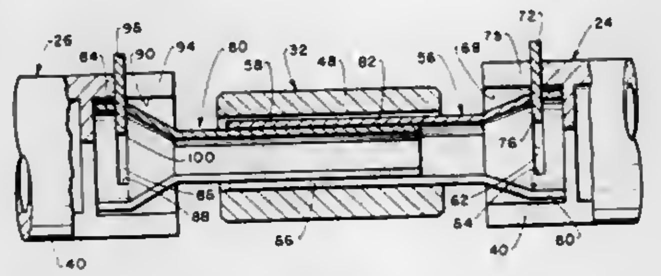
Silvio Repetto, Modena, Italy, assignor to S.p.A. Luigi Rizzi & C., Modena, Italy
Filed Aug. 16, 1976, Ser. No. 714,755
Claims priority, application Italy, Sep. 3, 1975, 26874 A/75
Int. Cl.^{2} C14B *1/30;* **B30B** *9/24*
U.S. Cl. 69—48 **5 Claims**



1. An endless belt press comprising
(a) an upper endless belt and a lower endless belt cooperating with the upper belt,
(b) a belt support roller and a belt tensioning roller for each of the belts, the endless belts being trained over the support and tensioning rollers therefor,
  (1) the support rollers, with the belts trained thereover, defining a press nip therebetween,
(c) a pair of end supports for each of the support rollers,
(d) a pair of thrust means, a respective one of the end supports of the support roller for the lower belt resting on a respective one of the thrust means and the thrust means being arranged to exert a thrust against the support roller for the lower belt for displacing the same towards the support roller for the upper belt,
(e) two pairs of like bracing members,
  (1) the bracing members of each pair having one end pivoted to a respective one of the thrust means for pivoting in a plane substantially perpendicular to the axes of the support rollers,
  (2) each pair of bracing members defining a guide for the displacement of the end supports of the support roller for the lower belt and
  (3) the end supports of the support roller for the upper belt being detachably fixed to the other ends of each pair of bracing members,
(f) a pivot mounting for one of the end supports of each support roller, the pivot mounting being arranged to permit pivoting of the support rollers in a plane defined by the axes of the support rollers, and
(g) traction means connected to the one end support of each support roller for pivoting the support rollers on the pivot mounting whereby the other end supports thereof are raised and the raised end support of the support roller for the lower belt no longer rests on the thrust means.

4,100,774
LOCKSET HAVING IMPROVED TORQUE BLADE CONSTRUCTION

Paul G. Solovieff, Tustin, and Robert E. Cyran, Anaheim, both of Calif., assignors to Emhart Industries, Inc., Farmington, Conn.
Filed May 18, 1977, Ser. No. 798,182
Int. Cl.^{2} E05B *17/04*
U.S. Cl. 70—380 **25 Claims**

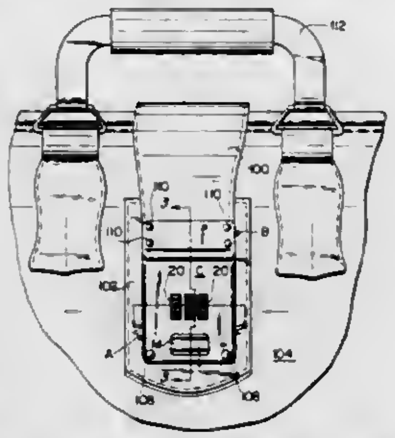


1. In a lockset of the type having a latch bolt operably connected to a latch operating mechanism mountable in a door for reciprocation of the latch bolt between door edge extended and retracted positions, the latch operating mechanism having a crank hub partially oppositely rotatable for reciprocally moving said latch bolt, first and second actuators mounted at opposite faces of the door operably connected to the crank hub selectively operable for producing said crank hub partial rotations and said latch bolt reciprocations; the improvement comprising: a tubular female torque blade operably connected at an outer end to said first actuator partially rotatable thereby, said female torque blade having an inner end axially slideably positioned in an axial opening through said crank hub, said female torque blade including engagement means at least at said inner end automatically operable between said inner end and crank hub upon said slideable positioning positively requiring preset single position relative circumferential positioning between said inner end and crank hub during said slideable positioning and transmitting rotative motion directly between said inner end and crank hub; a male torque blade operably connected at an outer end to said second actuator partially rotatable thereby, said male torque blade having an inner end axially slideably positioned partially telescoped by said female torque blade inner end, said male torque blade including engagement means at least at said inner end automatically operable between said female and male torque blade inner ends upon said slideable positioning positively requiring preset single position relative circumferential positioning between said inner ends during said slideable positioning and transmitting rotative motion directly between said inner ends and by said female torque blade inner end directly to said crank hub.

4,100,775
COMBINATION LOCK

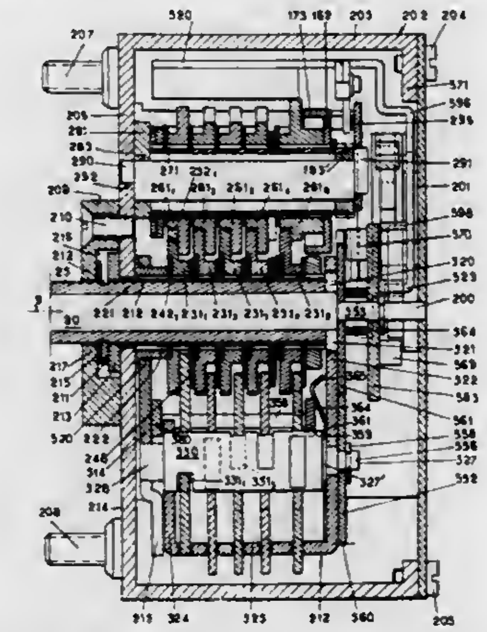
Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.
Filed Jan. 12, 1977, Ser. No. 763,687
Int. Cl.^{2} E05B *65/48*
U.S. Cl. 70—3 **11 Claims**

1. A combination lock cooperable with a hasp, the combination lock comprising a shaft, dials having indicia thereon, sleeve means for each dial on the shaft, each sleeve means having a flange and a flat portion, a slotted bolt member having the dials extending therethrough adjacent the sleeve means, means pivotally mounting the bolt member, resilient means urging the bolt member against the sleeve means, a latch member mounted to overlie the bolt member for sliding movement in a plane perpendicular to the longitudinal axis of the shaft between a latching position where the latch member is engageable with the hasp and a release positon, means provided by the bolt member and cooperable means provided by the latch member to block movement of the latch member toward release position when a flange engages and pivots the bolt member against the force of the resilient means, and means provided by the latch member to allow by-passing the bolt member and movement of the latch member to release position when all flat portions are in engagement with the bolt member.



4,100,776
COMBINATION LOCK FOR SAFES AND THE LIKE

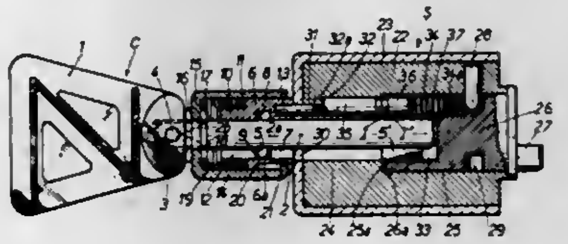
François Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France
Filed Dec. 17, 1976, Ser. No. 751,639
Claims priority, application France, Dec. 31, 1975, 75 40357
Int. Cl.^{2} E05B *37/12*
U.S. Cl. 70—303 A **19 Claims**



1. A combination lock for controlling the motion of a lock latch, comprising:
(a) A plurality of components having notches formed therein, each displacable as a function of a numeral in the combination so that, upon display of the right combination, the notches are aligned to permit actuation of means for retraction of said latch;
(b) first means actuatable selectively to displace any one of said components to a position corresponding to a particular numeral in said combination and to provide an indiation of said position;
(c) second means actuatable to determine which of said components is to be displacable by actuation of said first means;
(d) a rake actuated by said first means for engaging said notches when there are aligned to permit actuation of means for retracting said latch, said rake being held at a distance from said notched components during the displacement thereof; and
(e) a frictional coupling means between said first means and said rake for limiting the force exerted on said rake by said first means.

4,100,777
LOCKING DEVICES

Pierre André Gaston Fredon, Hameau des Tilleuls (Le coulon), 4, rue des Charmes, 94320 Thiais, France
Filed Jul. 12, 1976, Ser. No. 704,667
Claims priority, application France, Jul. 18, 1975, 75 22512
Int. Cl.^{2} E05B *27/00, 19/12*
U.S. Cl. 70—363 **14 Claims**



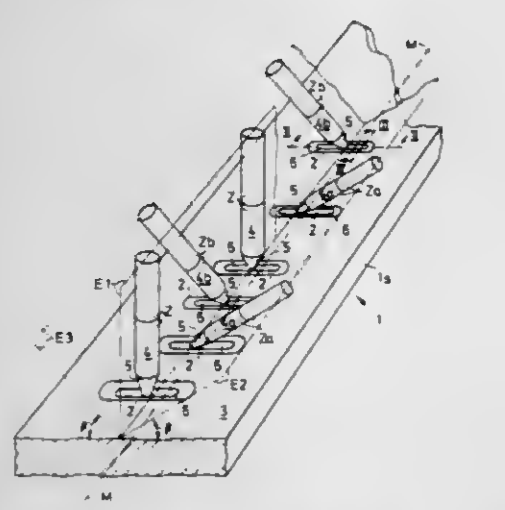
1. A combination of a key and a lock, said key comprising:
a shaft;
a manual grip at one end of said shaft;
a key bit at the other end of said shaft;
a radial projection extending from said shaft between said grip and said bit;
a bush mounted on said shaft and defining a translation groove for said projection and a rotation groove for said projection, said grooves intersecting one another and receiving said projection;
a plurality of pegs on said bush and extending parallel to said shaft towards said key bit; and
means for resiliently urging said bush to a locking position in which said projection engages only said translation groove which extends parallel to said shaft, said rotation groove extending circumferentially of said bush; and
said lock comprising:
a stator member defining a key entry passage shaped to receive said key bit and said shaft and also defining a corresponding plurality of parallel passages shaped and arranged to receive said plurality of pegs;
a rotor member mounted to said stator member and shaped and arranged to receive said key bit and the respective end of said shaft and to be rotatable thereby relative to the stator member;
a corresponding plurality of resiliently outwardly biased pins mounted in said rotor member to engage in said plurality of parallel passages and thereby lock said rotor member to said stator member;
a further plurality of pins in said parallel passages to abut said first said plurality of pins, said pegs being of such lengths that when said key is engaged with said lock so as to locate said radial projection in said rotation groove and thereby render said shaft free to rotate relative to said bush, said pegs urge said pluralities of pins in positions such that said rotor member is free to rotate relative to said stator member; and
lock actuating means mounted to said rotor member.

4,100,778
KEY WITH TRANSVERSE SLOTS AND METHOD OF MAKING SAME

Heinrich Gretler, Hinwil, Switzerland, assignor to Baner Kaba AG Sicherheits-Schliessyteme, Wetzilon, Switzerland
Filed Oct. 13, 1976, Ser. No. 732,094
Claims priority, application Switzerland, May 20, 1976, 6380/76
Int. Cl.^{2} E05B *27/04*
U.S. Cl. 70—406 **5 Claims**

1. A key having an elongated substantially rectangular shank portion for use in combination with a cylinder lock of the type having a generally rectangular key slot for receiving the shank portion and a plurality of sets of tumbler pins, at least one of said sets being inclined relative to a side of said slot, the key comprising

means in at least one surface of said shank portion defining a plurality of elongated recesses for receiving the distal ends of tumbler pins in said sets,
the longer dimensions of each of said recesses extending transversely perpendicular to the longitudinal insertion direction of said shank portion,

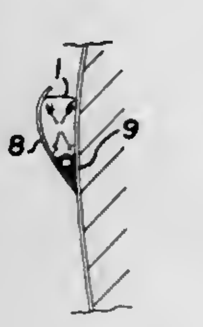


said recesses having base surfaces spaced from said one surface, the spacing of selected ones of said base surfaces from said one surface being significantly different from the spacing of the remaining ones of said base surfaces from said one surface.

4,100,779

KEY CHAIN RETAINER

Joseph D. Schachter, 866 Elm St., Manitoba, Canada
Filed Apr. 4, 1977, Ser. No. 784,151
Claims priority, application Canada, Feb. 28, 1977, 272840
Int. Cl.² A44B *15/00*
U.S. Cl. 70—456 R **7 Claims**



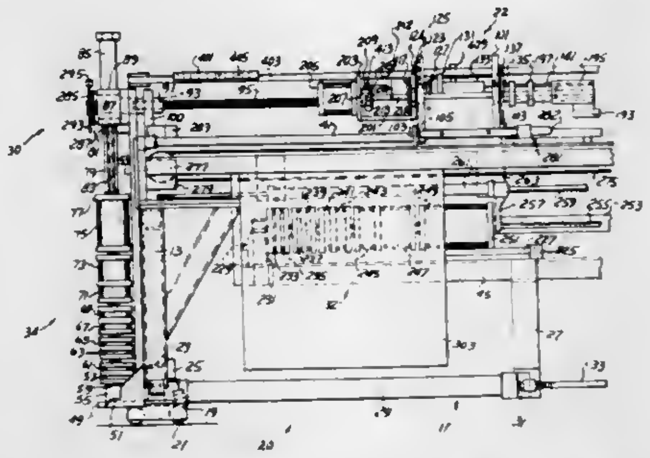
1. A key retainer comprising a block of resilient compressible foam material, and means for holding said key comprised of a chain passing through a hole completely through the block of material, fixed at one end to a button having a diameter substantially wider than the hole, the button being located directly against the surface of the block of material, the hole having diameter smaller than the width of the chain whereby the sides of the hole retain the chain in position by friction.

4,100,780

PROGRAM CONTROLLED TUBE BENDING MACHINE AND A BINARY FEED MECHANISM FOR USE THEREIN

Frank Sassak, c/o Bend-Rite Inc., 2215 Howard Ave., Detroit, Mich. 48216
Filed Jan. 2, 1976, Ser. No. 646,152
Int. Cl.² B21B *37/14;* F15B *21/02*
U.S. Cl. 72—7 **14 Claims**

1. A binary controlled tube bending apparatus for programably forming a plurality of bends at predetermined spaced locations along the length of a tubular workpiece, each of said bends having a predetermined radial orientation with respect to any other bend and each having a predetermined depth of bend, said apparatus comprising:
an elongated work support;
a bending station mounted at one end of said support and having a movable bending die, the depth of the bend formed in said workpiece being determined by the amount of displacement of said bending die with respect to a normal position;
a carriage slidably mounted on said work support for reciprocal movement toward and away from said bending station;
a rotatable arbor assembly mounted on said carriage for movement therewith, said arbor assembly releasably clamping said workpiece during said longitudinal positioning and radial orienting operations;
a first program storing information relating to the number of longitudinal feed increments which said workpiece must be advanced to properly position the next sucessive predetermined bend location at the bending station;
a first circuit means for reading said stored information and generating a plurality of control signals representative thereof;
a first binary feed mechanism having a feed member and a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled to said feed member and responsive to said plurality of control signals for actuating different ones of said assemblies for cumulatively adding the sum of said binary piston strokes to advance said feed member a predetermined programed number of longitudinal feed increments;
a longitudinal feed assembly coupled to said carriage and responsive to the advancement of said feed member for longitudinally positioning said workpiece so as to position the next successive predetermined bend location before said bending station;
a second program storing information relating to the radial orientation of the next successive bend with respect to the previous bend;
a second circuit for reading said stored information and generating a plurality of rotational control signals representative thereof;
a second binary feed mechanism having a feed member and a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled to said feed member and responsive to said plurality of rotational control signals for actuating different ones of said assemblies for cumulatively adding the sum of said binary piston strokes to advance or retract said feed member a predetermined programed number of rotational feed increments;
an arbor assembly rotating means responsive to the advancing or retracting of said feed member to rotate said workpiece to said predetermined programmed radial orientation;

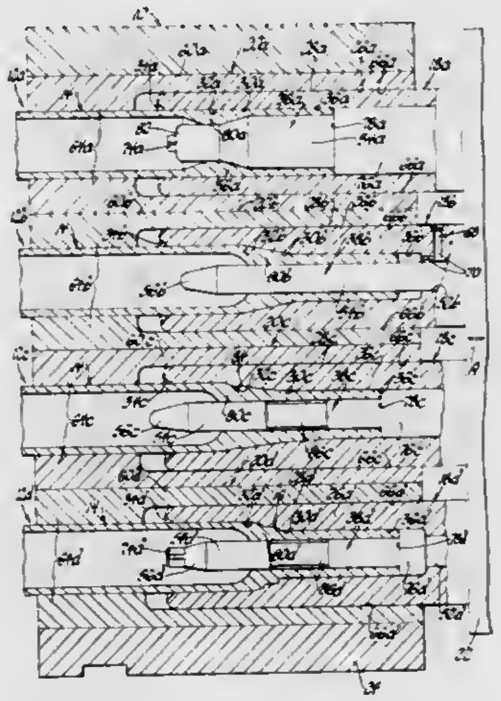


a third program storing information relating to the predetermined depth of a given bend to be formed in the workpiece;
a third circuit for reading said stored information and generating a plurality of depth limit control signals;
a positionable limit switch responsive to said movable die having attained a predetermined position with respect thereto for deactivating said bending die and re storing it to said normal position; and
a third binary feed mechanism mounting said limit switch and having a plurality of cylinder-piston assemblies, each of said assemblies having a different length piston stroke representing a different binary number, said assemblies being serially coupled and responsive to said plurality of depth limit control signals for cumulatively adding the sum of said binary piston strokes to position said limit switch to a predetermined location so as to terminate bending when said predetermined programmed depth of bend is attained.

4,100,781

AXLE SPINDLE FORMING METHOD

Joseph H. Zawacki, Detroit, and John P. Dutton, Dearborn Heights, both of Mich., assignors to Lear Siegler, Inc., Detroit, Mich.
Filed Mar. 2, 1977, Ser. No. 773,456
Int. Cl.² B21B *45/02;* B21D *22/00*
U.S. Cl. 72—41 **7 Claims**



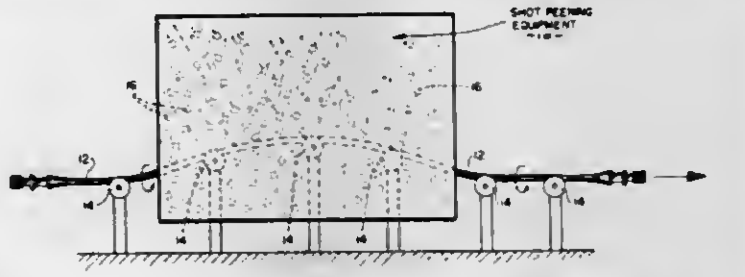
1. A method for hot forging a round axle spindle comprising: gripping a hollow axle blank having a heated end on which a round spindle is to be forged; positioning a hollow punch having an annular inner work surface and an elongated central mandrel fixed in a space relationship within the work surface adjacent the axle blank end; and moving the punch relative to the axle blank such that the mandrel is received within the axle blank heated end as the punch work surface forges the axle blank about the mandrel for a greater distance than the spacing between the work surface and the mandrel so as to thereby forge a round axle spindle.

4,100,782

SHOT PEENING PROCESS

Robert A. Clay, 17392 Laurie La., Tustin, Calif. 92680
Filed Nov. 1, 1976, Ser. No. 737,540
Int. Cl.² B24C *1/00*
U.S. Cl. 72—53 **1 Claim**

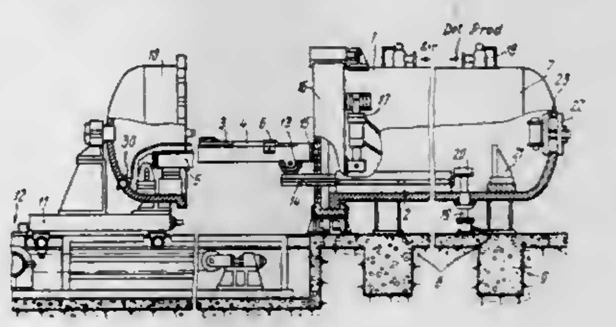
1. A shot peening process for the treatment of elongated members such as rods, pipes, and the like, said process comprising: passing the elongated member through shot peening equipment along an arcuate path to subject the surface of the elongated member to cold working by streams of shot directed at its surface within the equipment, and rotating the elongated member about its longitudinal axis as it is passed through the shot peening equipment to provide a continuous flexing action thereto.



4,100,783

INSTALLATION FOR EXPLOSION MACHINING OF ARTICLES

Vitaly Stepanovich Gambarov, ulitsa Promyshlennaya, 8, kv. 73; Alexandr Fedorovich Demchuk, ulitsa Tereshkovoi, 12, kv. 6; Vladlen Alexeevich Okladnikov, ulitsa Oleko Dundicha, 29, kv. 13; Boris Leonidovich Troinin, ulitsa Grekova, 13; Andrei Andreevich Deribas, ulitsa Pravdy, 1, kv. 20; Alexandr Grigorievich Tsarenko, ulitsa Axenova, 11, kv. 401; Valentin Ivanovich Fetisov, ulitsa Tenistaya, 3, kv. 16; Veniamin Yakovlevich Khenkin, ulitsa Fizkulturnaya, 23, kv. 15; Georgy Petrovich Neupokoev, ulitsa Pervomaiskaya 162, kv. 16, all of Novosibirsk; Vladislav Vitalievich Drapaljuk, kvartal 12, 7, kv. 11, Donetsk Rostovskoi oblasti, and Mstislav Vladimirovich Gentse, ulitsa Pervomaiskaya, 190, kv. 13, Novosibirsk, all of U.S.S.R.
Filed Feb. 14, 1977, Ser. No. 768,619
Int. Cl.² B21D *26/02*
U.S. Cl. 72—56 **4 Claims**



1. An installation for explosion working of articles comprising explosion chamber means having a chamber split into a movable part and a stationary part; a work table installed in the stationary part of said chamber; a movable platform having one of its ends articulated to said movable part of said chamber for joint movement therewith so that in one extreme position said platform is set on said work table and said chamber is closed and in the other extreme position said platform is free from said work table and said chamber is fully open; clamps attached to the platform for gripping articles to be explosively treated; a charge initiating system positioned in the chamber for initiating a charge for explosively treating the article; and a system for ventilating the chamber.

4,100,784
FINNED TUBING

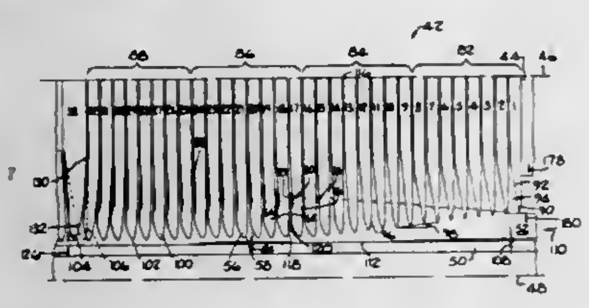
Hector Thomas, Johannesburg, South Africa, assignor to Heat Exchangers Africa Limited, Johannesburg, South Africa

Filed Jul. 27, 1977, Ser. No. 819,658

Claims priority, application South Africa, Aug. 9, 1976, 76/4761

Int. Cl.^{2} B21H *3/12*

U.S. Cl. 72—98 47 Claims



1. A method of manufacturing finned tubing from tubular metal fin stock on a tube liner by means of a plurality of rollers rotatably drivable by means of arbors and each roller including a plurality of axially arranged forming discs, the method including deforming the metal of the fin stock to form a fin by forcing the metal into a restricted radially directed axial space defined between adjacent forming discs so that metal is uninterruptedly in contact with a portion of the axially directed face of one disc defining the restricted space but is only in partial contact with the opposing axially directed face of the adjacent disc defining the restricted space, there being no contact over a radially extending portion spaced radially inwardly from the disc periphery.

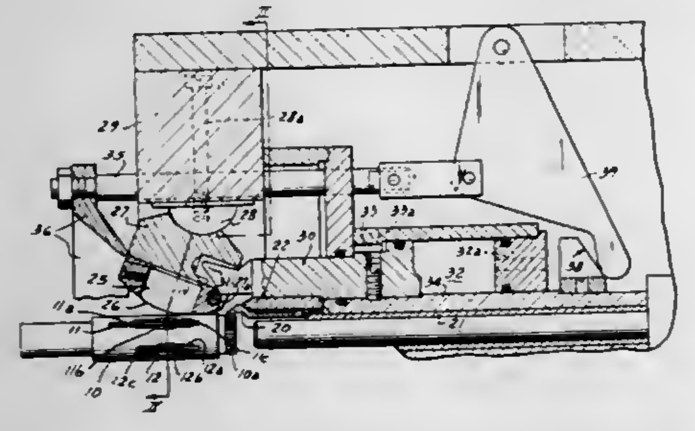
4,100,785
METHOD AND APPARATUS FOR MANUFACTURING VALVE COMPONENTS

Arthur E. Bishop, 5516 Westwood La., Birmingham, Mich. 48010

Continuation of Ser. No. 436,511, Jan. 25, 1974, abandoned, which is a division of Ser. No. 124,903, Mar. 16, 1971, Pat. No. 3,800,306, which is a division of Ser. No. 802,359, Feb. 26, 1969, Pat. No. 3,591,136. This application Apr. 22, 1977, Ser. No. 790,091

Int. Cl.^{2} B21K *1/24*

U.S. Cl. 72—189 3 Claims



1. Apparatus for embossing a plurality of peripherally spaced axially extending irregularly shaped valve port depressions into a cylindrical valve core comprising: first means supporting said core, and positively gripping it for movement along its axis, a plurality of identical embossing tool members mounted pivotally for movement of their forming surfaces generally axially and radially toward said core and into interference fit therewith, means moving said first means axially and contacting said tool members at one end thereof and simultaneously forcing said tool members to pivot into said core progressively while moving said core progressively directly under said pivots in exactly timed relation to said tool members; said tool members having their radially inwardly facing surface shaped with the precision configuration in plan and depth of the final form of said valve port of said core whereby the precise final port form in depth and width is embossed in said core.

4,100,786
FEED MECHANISM FOR PILGER ROLLING MILLS

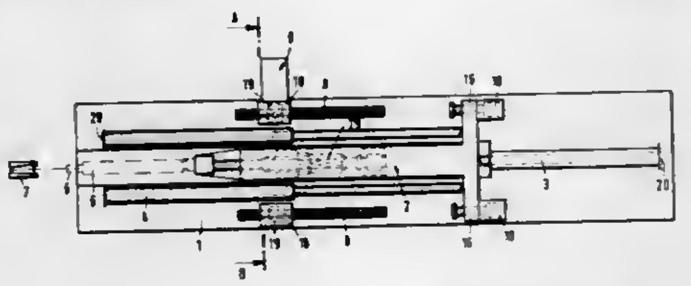
Walter Vom Dorp; Hans Georg Ritter, both of Monchen-Gladbach, and Fritz Witteck, Viersen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,553

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617662

Int. Cl.^{2} B21B *17/06*

U.S. Cl. 72—252 14 Claims



1. In a feed mechanism for hot rolling pilger mills and including a stationary bed, a feeder for connection to a mandrel, hydraulic means for advancing and retracting the feeder in a direction of rolling and opposite thereto, and a geared drive for selective coupling to the feeder to limit movement of the feeder during pilger rolling, the improvement comprising:

resiliently reacting means disposed in relation to the feeder, the geared drive and the bed for limiting reaction forces from the feeder upon the geared drive and having a resilient bias to provide a resilient reaction force in excess of the force exerted upon the feeder by the hydraulic means during edvancing and

during pilgering the retraction and reaction forces together exceed the advance forces by 50%.

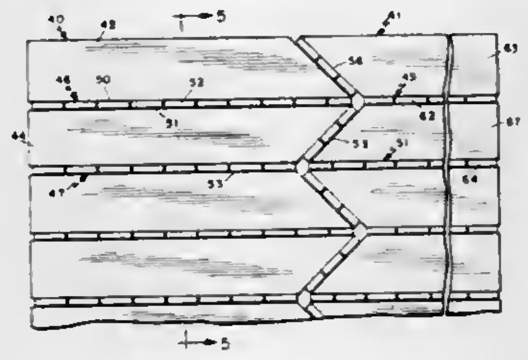
4,100,787
METHOD AND APPARATUS FOR MAKING RECTANGULAR CORRUGATED EXPANSION JOINTS

George Thomas Straza, and Edward Leon Parr, both of El Cajon, assignors to Straza Enterprizes, Ltd., El Cajon, Calif.

Division of Ser. No. 656,130, Feb. 9, 1976, Pat. No. 4,052,948. This application Jul. 29, 1977, Ser. No. 820,083

Int. Cl.^{2} B21D *13/10*

U.S. Cl. 72—310 4 Claims



1. Apparatus for use in making a corrugated corner piece comprising:

a pair of hinge plate members,

each of said hinge plate members comprising a plurality of elongated flat plates that are joined together along their adjacent parallel side edges by a tubular hinge member comprising a plurality of tubular hinge elements with a pin fitting through the hinge elements,

each plate member having at a given location along the length thereof a line of a plurality of hinge elements extending at an angle to the side edges of the plate members,

the angle of each line of hinge elements being at a cross angle to the hinge element line of the adjacent plate member, forming a zig-zag orientation of the cross hinge elements in a direction normal to the longitudinal edge of each of the plate members,

and clevis means comprising a pair of adjacent fingers jointed at one end and having internal longitudinal grooves for fitting over adjacent and aligned longitudinal hinge members holding the hinge members and a blank positioned therebetween in a sandwiched alignment.

4,100,788
BLANKING AND FORMING PRESS FOR SHEET METAL CAPS

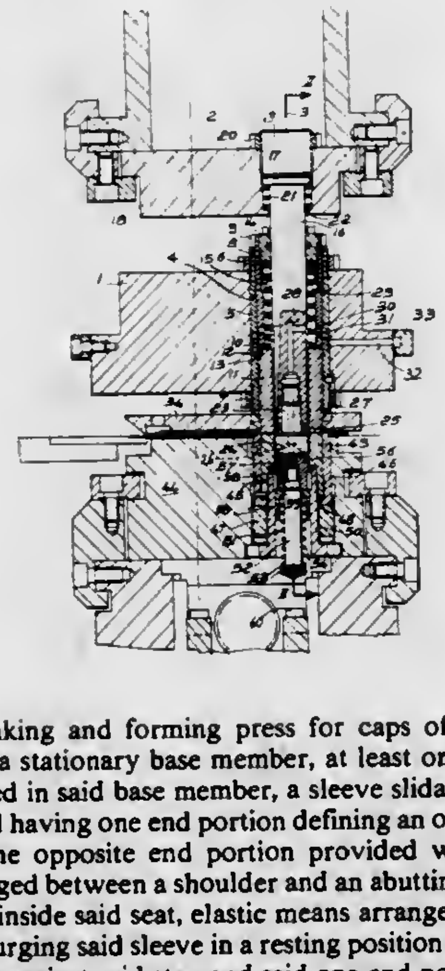
Rino Morini, Via San Francesco 35, Imola (Province of Bologna), Italy

Filed Apr. 4, 1977, Ser. No. 784,864

Claims priority, application Italy, Apr. 13, 1976, 3399 A/76

Int. Cl.^{2} B21D *24/16*

U.S. Cl. 72—329 2 Claims



1. A blanking and forming press for caps of sheet metal comprising a stationary base member, at least one cylindrical seat provided in said base member, a sleeve slidable guided in said seat and having one end portion defining an outer blanking edge and the opposite end portion provided with an outer collar arranged between a shoulder and an abutting step which are formed inside said seat, elastic means arranged in said seat and axially urging said sleeve in a resting position in which said collar abuts against said step and said one end portion extends out of said seat, said elastic means permitting said collar to abut against said shoulder when the sleeve is forced in the opposite direction, a first ram member movably supported with respect to said stationary base member on one side thereof, a rod extending through said sleeve and coaxially thereto and having one end connected to said first ram member, a forming punch connected to the opposite end of said rod, a cutting ring arranged between said forming punch and said rod, said ring being guided in said sleeve, a second ram member movably supported with respect to said stationary base member and on the side thereof opposite to that on which the first ram is located, a cylindrical die coaxial to said rod and supported by said second ram member, said cylindrical die having an inner blanking edge cooperating with the outer blanking edge of said sleeve, a cylindrical drawing element positioned inside said die and defining an axial bore for receiving the punch and the cutting ring, said element forming a recess with said die for receiving the one end portion of said sleeve, a presser plate elastically supported by said stationary base member and arranged between the latter and the second ram member, means for moving said first and second ram members toward and away from the stationary base member thus permitting positioning of a sheet metal between the presser plate and the cylindrical die when the ram members are spaced apart from the base member and then causing, as the ram members approach each other, clamping of the sheet metal between the cylindrical die and the presser plate, penetration of the sleeve within said recess, whereby a circular sheet metal disc is blanked and then clamped between said sleeve and cylindrical element, advancing the punch against said disc thus causing the clamped portion of the disc to slip within said bore and trimming of the peripheral portion of the disc by said cutting ring.

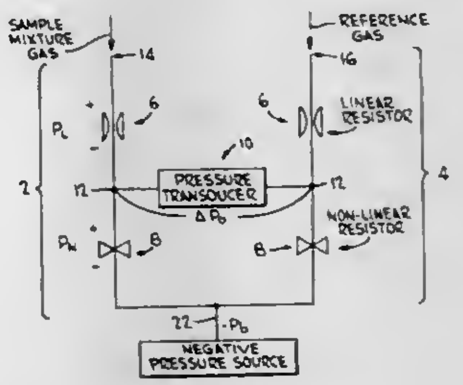
4,100,789
FLUIDIC PARTIAL PRESSURE SENSOR

James W. Joyce, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1977, Ser. No. 819,745

Int. Cl.^{2} G01N *31/00*

U.S. Cl. 73—23 8 Claims



1. A fluidic partial pressure sensor for obtaining direct indication of the partial pressure of gas constituent in a mixture which comprises:

a first input channel for receiving a reference gas;

a second input channel for receiving a sample mixture gas;

a fluidic bridge which comprises a pair of linear resistors connected respectively to each of the input channels, a pair of non-linear resistors connected at a first junction in series to each of the linear resistors and at a second junction to a reference output channel, and means for sensing pressure across the bridge; and

a means for creating a constant pressure drop across the fluidic bridge, wherein the characteristics of the linear and non-linear resistors' geometry is determined by the equation

$$\theta = \frac{b\rho P_b}{(a\mu)^2}$$

where

P_b = the pressure drop across the bridge

a and b = geometric constants for the linear and non-linear resistors in the bridge circuit

ρ = the density of the reference gas

μ = the viscosity of the reference gas and

θ has a value of approximately 0.05 or less at the anticipated ambient pressures at which the sensor will operate.

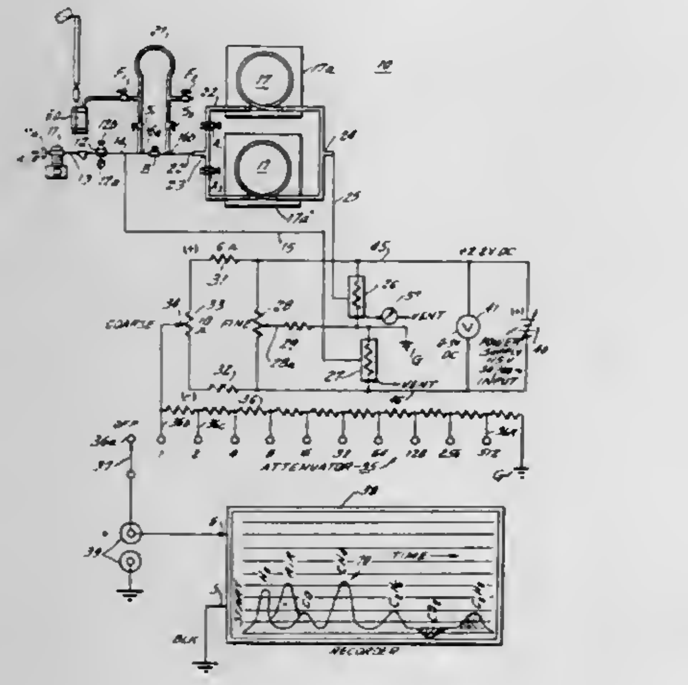
4,100,790
ELECTRONIC ORSAT FOR GAS ANALYSIS

Gerald J. Harvey, Westbury, N.Y., assignor to William Printz Company, Inc., Westbury, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,617

Int. Cl.^{2} G01N *31/08*

U.S. Cl. 73—23.1 **1 Claim**



1. A method for determining the percent concentration of oxygen and nitrogen in a gas sample provided within a storage container and having unknown quantities of nitrogen and oxygen, which method employs air as a carrier gas, comprising the steps of:

(a) adjusting a bridge circuit having filaments in two arms of said bridge, said filaments having conductivities which vary as a function of the constituents in the gas passing therethrough, so that the output signal of the bridge circuit is null when the bridge circuit is balanced:

(b) limiting the maximum magnitude of the output signal developed by the bridge circuit as a result of the most extreme unbalanced condition measureable by the bridge circuit, and identifying said magnitude as having an arbitrary value of 100 units;

(c) passing the gas sample from the storage container through a separating column containing an adsorptive material using air as a carrier which is injected into the storage container at a predetermined pressure;

(d) passing the mixture of the sample gas and air emitted from the output of the columm over a first filament of said bridge circuit;

(e) simultaneously passing the air directly from its source over the remaining filament of the bridge circuit so as to generate a substantially continuous signal which is representative of the ratio of conductivities of said first and second filaments whose peak value at a predetermined time interval represents a concentration of $N_2 + O_2$ and whose polarity represents the deficiency of nitrogen or oxygen relating to the concentration of nitrogen and oxygen in air, a positive polarity peak relative to a reference level representing a percentage of oxygen in the gas sample of less than 21/100 and a negative polarity peak relative to the reference level representing a percentage of oxygen in said gas sample of greater than 21/100;

(f) determining the exact percentage ratio of nitrogen in the nitrogen plus oxygen constituents of the gas sample by increasing 21% of the peak value of the signal occurring at the aforesaid predetermined time interval by 79 units.

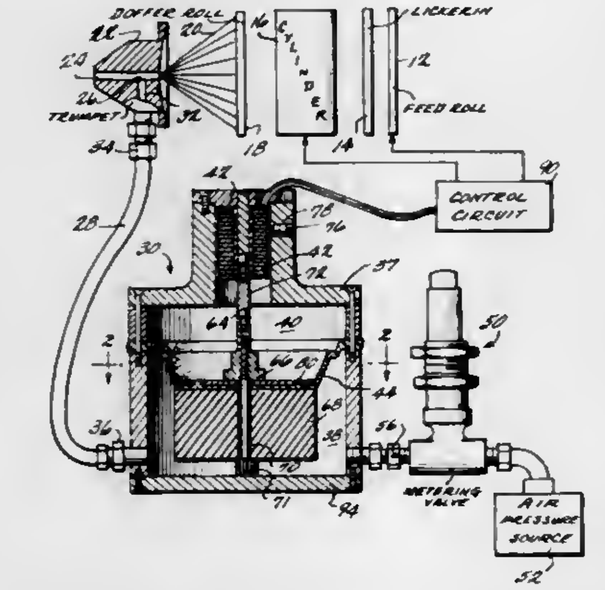
4,100,791
AUTO-LEVELER

George J. Miller; Kenneth G. Lytton, and James E. Donnelly, all of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Filed May 2, 1977, Ser. No. 792,765

Int. Cl.^{2} G01B *13/08*

U.S. Cl. 73—37.7 **5 Claims**



1. An apparatus for producing an electrical output signal which varies as a function of the thickness of a sliver of textile fibers comprising:

a first member having a bore extending therethrough through which said sliver travels and a port opening into said bore;

a valve member having an input for receiving pressurized air, an outlet for said pressurized air and means defining an escape port through which pressurized air escapes from said outlet to the atmosphere;

a hollow housing sensor means including a housing member defining an inner space, a flexible diaphragm dividing said inner space into a lower averaging compartment and an upper compartment, means for connecting said lower compartment to said outlet of said valve member and to said port of said first member, a shaft fixed to said diaphragm for vertical movement with said diaphragm in response to changes of pressure in said lower compartment resulting from changes in thickness of said sliver passing through said bore, said shaft having a magnetic portion in said upper compartment, a weight member fixed to said shaft and located in said lower compartment for urging said diaphragm and shaft downward, and at least one coil wound about said shaft in said upper compartment so that vertical movements of said shaft produce said output signal in said coil as said magnetic portion moves with respect to said coil.

4,100,792
APPARATUS FOR THE TESTING OF A BRAKE SYSTEM

Heinz Lelber, Leimen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 1, 1977, Ser. No. 773,254

Claims priority, appiication Fed. Rep. of Germany, Mar. 18, 1976, 2611369

Int. Cl.^{2} G01L *5/28*

U.S. Cl. 73—39 **5 Claims**

1. Apparatus for the testing of a brake system comprising:

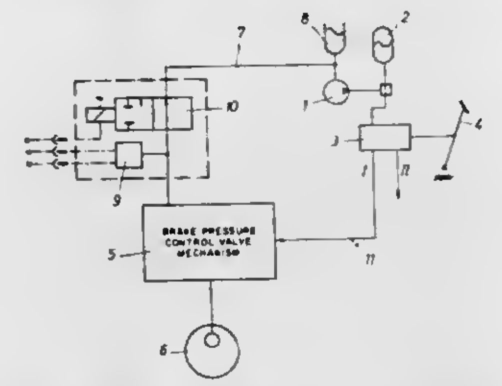
a brake cylinder having an outlet line and a return line;

a dual actuated brake pressure control valve mechanism connected to said outlet of said brake cylinder;

a pressure sensor connected to said return line downstream of said control valve mechanism;

a discriminator connected to said pressure sensor for comparing actual pressures gauged by said sensor with an optimal pressure; the improvement wherein:

a selectively switchable double-acting electromagnetic valve is connected in said return line downstream of said sensor, said double-acting valve serving to open and close said return line; whereby pressure conditions in said brake cylinder can be gauged and said double-acting valve opened to permit a pressure decrease in said dual actuated brake pressure control valve mechanism.



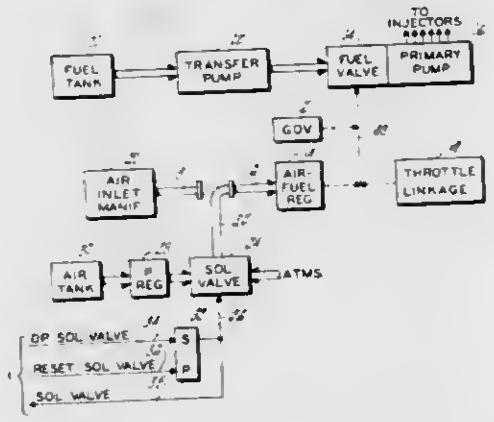
4,100,793
AIR/FUEL REGULATOR DIAGNOSTICS FOR INTERNAL COMBUSTION ENGINE

Henry E. Goetsch, Windsor, Conn.; James A. Cook, Agawam, Mass., and Lee R. Armstrong, Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,092

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—118 **6 Claims**



6. In the method of testing an engine air/fuel ratio regulator while mounted on an internal combustion engine, the steps of:

causing the engine to accelerate under the throttle from a low speed to a high speed with the air/fuel ratio regulator thereof forced to provide full fuel to the engine, while the engine is loaded only with its own inertia, drag and accessories, and measuring an indication of full fuel horsepower demonstrated by the engine during the acceleration thereof;

causing the engine to accelerate under full throttle from a low speed to a high speed with the air/fuel ratio regulator thereof forced to provide limited fuel to the engine, while the engine is loaded only with its own inertia, drag and accessories, and measuring an indication of fuel-limited horsepower demonstrated by the engine during the acceleration thereof; and

subtracting the indication of fuel-limited horsepower from the indication of full fuel horsepower and providing a manifestation of the difference as a measure of effective operation of the air/fuel ratio regulator of the engine.

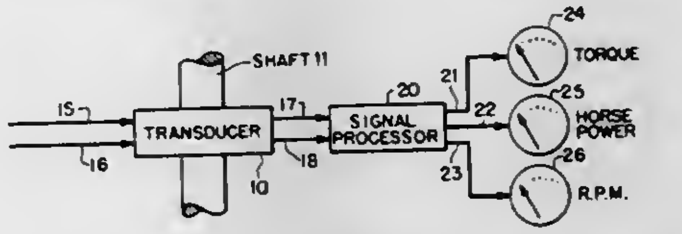
4,100,794
SYSTEM FOR MEASURING TORQUE AND SPEED OF ROTATING SHAFT

Edwin Joseph Meixner, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 6, 1976, Ser. No. 747,577

Int. Cl.^{2} G01L *3/24*

U.S. Cl. 73—136 A **14 Claims**



1. An indicating system for providing information regarding the torque and the speed of a rotatable shaft, comprising:

a transducer, including a first magnetic core assembly having a plurality of electrical windings thereon, and means for coupling all the windings in a first electrical circuit, and second and third magnetic core assemblies, each substantially identical to the first magnetic core assembly, with each having a plurality of electrical windings thereon, and means for coupling such windings of the second and third magnetic core assemblies in a series circuit;

means for supplying an a-c signal to the electrical circuit, to provide an energizing flux from the first magnetic core assembly;

a signal processor, including a detector circuit, for producing an output signal related to at least one of the torque and speed parameters of the rotatable shaft;

means, coupled to the signal processor, for providing the shaft torque and/or speed information as the output signal is received from the signal processor; and

switch means, coupled between the signal processor and the series circuit formed by the electrical windings on the second and third magnetic core assemblies, for determining whether the signal processor output signal connotes torque or speed information.

4,100,795
PROCESS AND A SYSTEM FOR MEASURING AND RECORDING UNDULATORY DEFORMATIONS OF A RAIL SURFACE

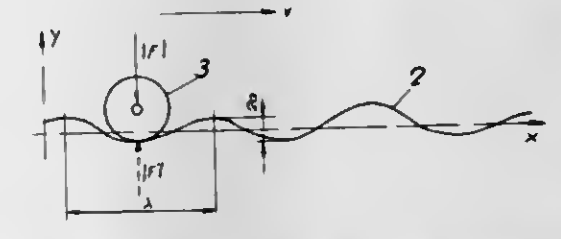
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland and Frank Speno Railroad Ballast Cleaning Co., Inc., Ithaca, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,440

Claims priority, application Switzerland, Mar. 14, 1975, 3232/75

Int. Cl.^{2} B61K *9/00*

U.S. Cl. 73—146 **17 Claims**



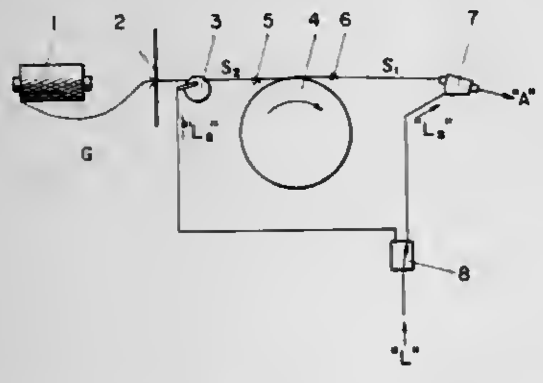
10. A system for measuring and recording undulatory deformations along a rail surface, comprising means mountable on a rail-born vehicle for feeling said deformations along the surface, an accelerometer connected to said feeling means to generate a voltage signal representative to the vertical acceleration induced in the feeling means by said undulatory deformations, means connected to said accelerometer for amplifying

the voltage signal, means including a filter connected to the amplifying means for filtering the amplified signal as a function of the velocity of the vehicle, said filter having a central frequency and band width which vary such that the response characteristics of the filter to wavelengths of the undulations of the rail falling within a range desired to be measured are substantially independent of the velocity, means connected to the filtering means for twice integrating the filtered signal, means connected to the integrating means for rectifying the integrated signal, means connected to the rectifying means for amplitude-modulating the rectified signal in direct proportion to the velocity of the vehicle, means connected to the amplitude-modulating means for filtering the modulated signal to eliminate spurious signals having extremely high amplitude and frequency with respect to said modulated signal and means connected to the amplitude-modulating means for recording the resulting signal.

4,100,796
TEST APPARATUS

Joachim Gayler; Rolf Remy; Werner Moeller, and Fritz G. Holler, all of Wuppertal, Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 27, 1977, Ser. No. 846,048
Int. Cl.^{2} G01N *3/34, 3/36*
U.S. Cl. 73—160 **3 Claims**



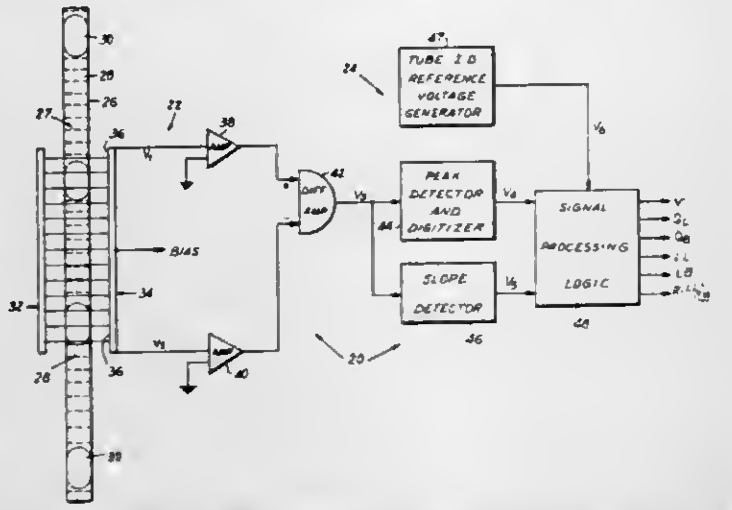
1. An improvement in yarn test devices including a yarn package supply, an adjustable drive godet, and a yarn suction device in series; the improvement comprising an intermittantly operable yarn tensioning device located between the yarn package supply and drive godet and means for alternately actuating the yarn suction device and the yarn tensioning device to accelerate and decelerate a yarn being tested between a full running condition and a full stop condition.

4,100,797
NON-INVASIVE METHOD AND APPARATUS FOR INSTANTANEOUS FLOW MEASUREMENT OF A SEGMENTED FLUID STREAM

Bruce J. Oberhardt, Hartsdale, and Donald F. Kopelman, Hastings-on-Hudson, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,928
Int. Cl.^{2} G01F *1/56*
U.S. Cl. 73—194 E **17 Claims**

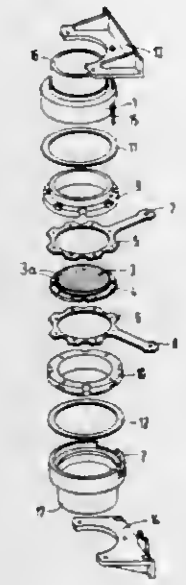
1. In non-invasive apparatus for the instantaneous measurement of the velocity of flow in an optically transparent conduit of a continuous fluid stream which comprises one fluid segmented by another fluid of different optical density to result in alternating segments of said one fluid and said another fluid, respectively, the improvements comprising, flow signal generation means including a light source disposed to one side of said conduit, position sensitive optical detecting means having an active surface disposed to the other side of said conduit in such manner that the light from said light source which passes through said fluid stream will impinge upon said active surface, said position sensitive optical detecting means being operable to detect the position of the centroid of the light which impinges on said active surface and to provide output signals proportional thereto and which change in accordance with change in said centroid position, means to operate upon said signals to provide a flow signal having a characteristic which is representative of the instantaneous velocity of flow of said segmented fluid stream in said conduit, flow signal processing means operatively connected to said flow signal generation means, means to apply a reference signal representative of the inner diameter of said conduit to said flow signal processing means, and detecting means in said signal processing means operable to detect said characteristic and combine the same with said reference signal to provide a signal indicative of the instantaneous flow rate of said fluid stream through said conduit.



4,100,798
FLOW METER WITH PIEZO-CERAMIC RESISTANCE ELEMENT

Keoth Nilsson, Akersberga, and Olov Ekström, Brottby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1977, Ser. No. 782,189
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622117
Int. Cl.^{2} G01F *1/36*
U.S. Cl. 73—194 E **7 Claims**



1. A flow meter for medical pulmonary function diagnoses comprising:

a flow tube having an interior cross-section;

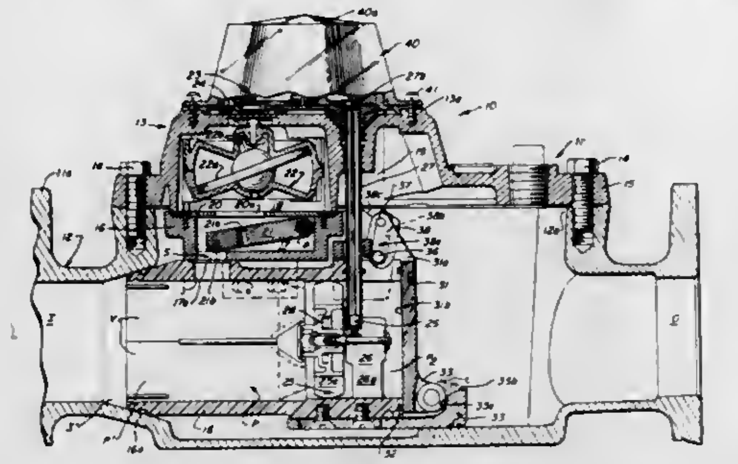
a flow resistance element comprising a piezo-ceramic material having through-flow passages for a respiratory gas; and

an electrical contact means associated operatively with said flow resistance element for measuring electrical characteristics of the piezo-ceramic material as a gas is passed through the meter.

4,100,799
COMPOUND METER ASSEMBLY

Allen C. Bradham, III, and Edward A. Seruga, both of Milwaukee, Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Dec. 1, 1976, Ser. No. 746,536
Int. Cl.^{2} G01F *7/00*
U.S. Cl. 73—197 **31 Claims**

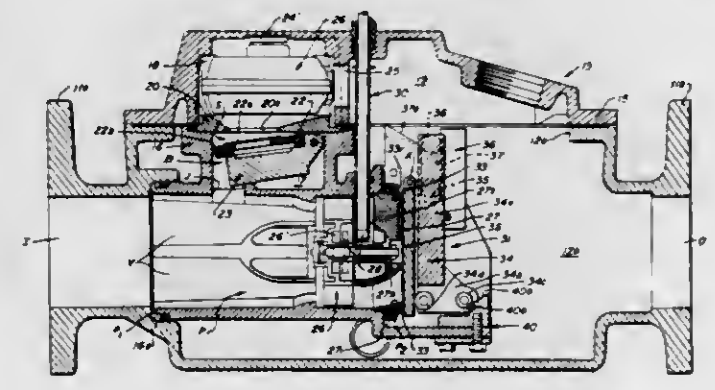


1. A meter assembly for accurately measuring variable liquid flow therethrough, said assembly comprising a housing having an inlet and an outlet, and primary and secondary passageways in communication with said inlet and said outlet; a first meter disposed within said primary passageway and being adapted to measure high rates of liquid flow through said assembly; a second meter disposed within said secondary passageway and being adapted to measure low rates of liquid flow through said assembly; a first valve disposed within said secondary passageway and movable to a substantially closed position when the liquid flow therethrough is increasing and has exceeded a first predetermined flow rate thereby causing a sudden pressure impulse to be produced and the liquid flow to be substantially diverted to said primary passageway; a second valve disposed within said primary passageway and being responsive to said pressure impulse; and means for holding said second valve in a closed position with a predetermined locking force, said locking force being overcome by said pressure impulse to permit movement of said second valve to an open position whereby said second valve moves from a fully closed position to an open position at said predetermined flow rate to thereafter permit liquid flow through said primary passageway to said outlet.

4,100,800
FLOW CONTROL ASSEMBLIES

Thomas E. Pelt, Milwaukee, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Dec. 1, 1976, Ser. No. 746,537
Int. Cl.^{2} G01F *7/00*
U.S. Cl. 73—197 **29 Claims**

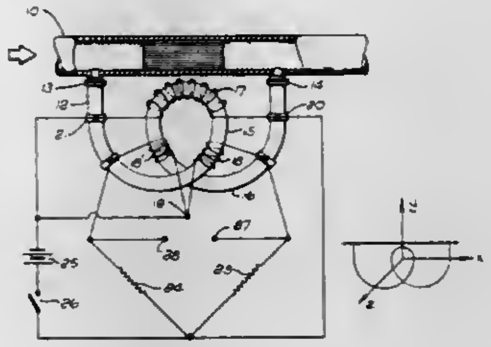


1. A meter assembly for accurately measuring variable liquid flow therethrough, said assembly comprising a housing having an inlet and outlet, and primary and secondary passageways in communication with said inlet and outlet; a first meter disposed within said primary passageway and being adapted to accurately measure high rates of liquid flow through said assembly; a second meter disposed within said secondary passageway and being adapted to accurately measure low rates of liquid flow through said assembly; a first valve disposed within said secondary passageway and movable to substantially a closed position when the liquid flow therethrough is increasing and has exceeded a first predetermined flow rate whereby a sudden pressure impulse is momentarily produced and the liquid flow is substantially diverted to said primary passageway; and a second valve disposed within said primary passageway and movable from a normally closed position to an open position when the sudden pressure impulse is momentarily exerted on the upstream side of said second valve and the liquid flow is diverted from the secondary passageway to said primary passageway, means for holding said second valve in a closed position with a predetermined locking force, said locking force being overcome by said pressure impulse to permit movement of said second valve to an open position; said second valve including first and second sections mounted for movement independently of one another, said first section being movable against a seat in said closed position to preclude flow through said primary passageway, and said second section engaging said first section to move said first section into said closed position and effect such holding of said first section in said closed position.

4,100,801
MASS FLOW SENSING SYSTEM

Dan B. LeMay, Palos Verdes Estates, Calif., assignor to Tylan Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 656,543, Feb. 9, 1976, Pat. No. 4,056,975. This application Apr. 25, 1977, Ser. No. 790,512
The portion of the term of this patent subsequent to Nov. 8, 1994, has been disclaimed.
Int. Cl.^{2} G01F *1/68*
U.S. Cl. 73—202 **27 Claims**



1. In apparatus for measuring the rate of mass flow of a fluid in a first conduit wherein a sensing conduit is communicatingly connected thereto by inlet means and outlet means and including a heating coil and temperature sensitive resistor coils wound around the external surface of said sensing conduit intermediate said inlet means and outlet means, means for heating said heating coil and detecting a temperature differential between said temperature sensitive coils, the improvement according to which said sensing conduit defines at least one helix loop intermediate said inlet means and outlet means and forming a continuous passageway providing reversal flow of said fluid therebetween, said loop being substantially in a plane parallel to the direction of flow of fluid in said first conduit, said heating coil being wound around a portion of said looped tube and said temperature sensitive coils being wound one on each side of said heating coil.

4,100,802

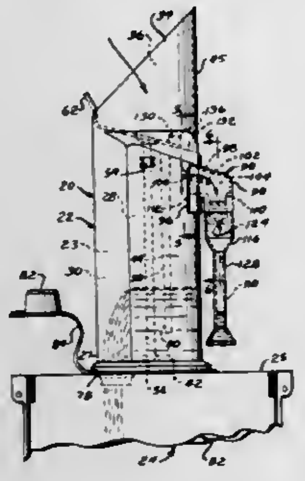
LIQUID MEASURING DEVICE

Terry N. Layton, Wheeling, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 8, 1977, Ser. No. 804,653

Int. Cl.² G01F *1/02*

U.S. Cl. 73—215 **14 Claims**



1. A device for measuring a liquid discharge, comprising: a hollow receptacle having an inlet port adjacent an upper end of the receptacle to receive the liquid discharge and channel means communicating with the inlet port to receive the liquid passing through the inlet port, means for diverting only a portion of the discharge from the channel means while permitting passage of an additional portion of the discharge through the channel means, cavity means to receive the diverted portion of the discharge from the diverting means, a collection chamber below the cavity means to receive liquid from the cavity means, and means for limiting passage of liquid from the cavity means into the collection chamber, said additional portion of the discharge passing through the channel means without passing into the cavity means.

4,100,803

APPARATUS FOR MEASURING THE VOLUME OF A FLOWING FLUID, PARTICULARLY A GAS IN PIPES

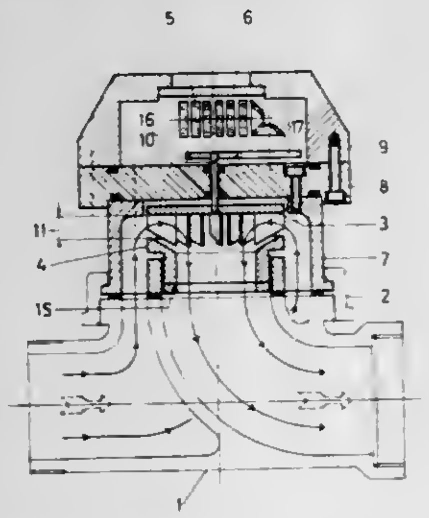
Heinz Gass, Kriens, Switzerland, assignor to Gas- und Wassermesserfabrik AG, Switzerland

Filed Apr. 18, 1977, Ser. No. 788,617

Claims priority, application Switzerland, May 18, 1976, 6204/76

Int. Cl.² G01F *1/08*

U.S. Cl. 73—230 **2 Claims**



1. Apparatus for measuring the volume of fluid flow in a pipe, said apparatus comprising:

a single duct pipe connection mounted in said pipe;

a housing mounted on said pipe connection;

a measuring wheel having a plurality of blades thereon rotatably mounted within said housing;

an adjusting ring within said housing coaxial with said measuring wheel, said adjusting ring, together with the interior of said housing, forming a variable width annular clearance surrounding said measuring wheel, at least part of the fluid flowing in said pipe being made to flow into said pipe connection, into said housing and through said annular clearance and measuring wheel blades to cause said measuring wheel to rotate, said apparatus being adjustable by axially moving said adjusting ring within said housing; and

means within said housing for indicating the volume of fluid which has flowed through said pipe, said measuring wheel being coupled to and operating said indicating means;

the end of said adjusting ring adjacent said measuring wheel being concave conical in shape, said blades of said measuring wheel being convex conical, substantially matching the shape of said adjusting ring opening, whereby exchange of momentum of the fluid flow to said measuring wheel by means of contacting the blades thereof takes place uniformly in all areas of said annular clearance.

4,100,804

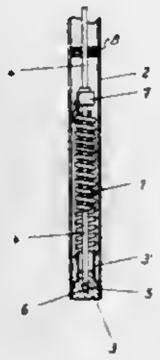
BIMETALLIC TEMPERATURE MEASURING DEVICE

Jean Pierre Gorgerat, Echandens, Switzerland, assignor to Roeger S.A., Crissler, Switzerland

Filed Jul. 19, 1976, Ser. No. 706,892

Int. Cl.² G01K *5/64*

U.S. Cl. 73—363.9 **2 Claims**



1. A bimetallic temperature measuring device comprising:

a probe tube having a terminal end;

a rotary arbor mounted in the probe tube for attachment to an indicating member remote from the terminal end;

a support mounted in the probe tube adjacent the terminal end;

a helically-wound bimetal strip disposed in the probe tube and having first and second opposite ends, the first end being connected to the support;

the support being configured to provide abutment means for rotatably supporting an end of the arbor adjacent the terminal end of the probe tube;

collar means connected to the second end of the strip and attachable to the arbor at such a predetermined position remote from the terminal end of the probe tube relative to the strip for maintaining the strip under sufficient tension and for developing a predetermined force urging the arbor against the abutment means, thereby to prevent vibration of the strip at the resonant frequency thereof;

and auxiliary means for maintaining the pressure of said arbor against said abutment means.

4,100,805

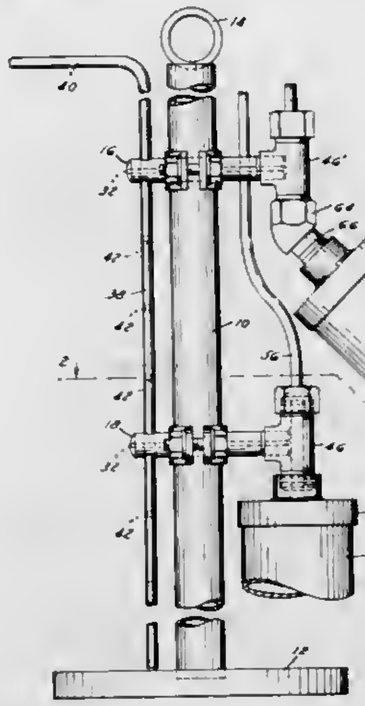
SETTLING BASIN SAMPLER

George E. Cossin, Comiran Consulting Engineers, Soraya Ave., No. 1 Kouchen Mojdehi, Tehran, Iran

Filed Apr. 25, 1977, Ser. No. 790,274

Int. Cl.² G01N *1/14*

U.S. Cl. 73—421 B **8 Claims**



1. A multiple sampler for settling basins and the like comprising, in combination:

an elongated column,

means for supporting the column in a vertical position in the fluid in the settling basin,

a plurality of valves on the column at vertically spaced apart locations each having an inlet port exposed to fluid in the basin at the depth of the valve and an outlet port,

individual containers removably connected to the outlet port of each valve for individually receiving fluid admitted through the valve, and

means operable from above the surface of fluid in the basin for opening and closing the valves.

4,100,806

SAMPLING ROD FOR CORROSIVE GASES OR FUMES IN AN INCINERATOR, PARTICULARLY WHEN INSTALLED ON A SHIP

Jacques Carbonnelle, Boulogne Billancourt; Gerard Chevalier, Orsay, and Pierre Zettwoog, Le Perray en Yvelines, all of France, assignors to Commissariat a l'Energie Atomique, Paris Cedex, France

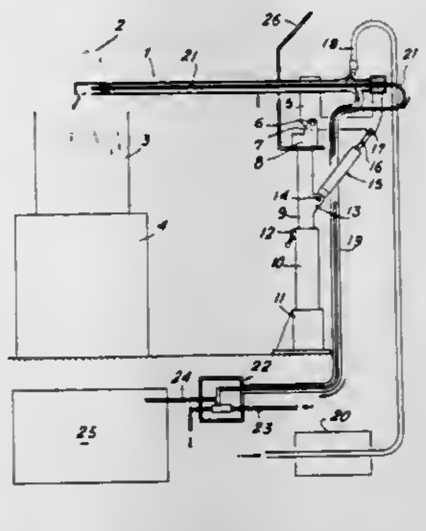
Filed Feb. 10, 1977, Ser. No. 767,620

Claims priority, application France, Apr. 2, 1976, 76 09624

Int. Cl.² G01N *1/24*

U.S. Cl. 73—421.5 A **7 Claims**

1. A sampling rod for corrosive gases or fumes in an incinerator comprising in a coaxial construction a central tube for the suction of gases made from a plastic material resistant to the corrosion by these high temperature gases, a first metallic tube forming a reinforcement for the central tube and enveloping the latter, a second metallic tube surrounding the first tube and defining with the latter an annular space traversed by a liquid fluid for the cooling of the gases circulating in the central tube and for maintaining said gases at an appropriate temperature, a layer of a thermally insulating material having a fibrous structure surrounding the second metallic tube and an outer jacket made from a refractory material which resists the mechanical and thermal shocks and ensures the distribution of the external heat in the insulating material, the space between the first and second metallic tubes traversed by the cooling fluid being separated into two annular and coaxial regions by an intermediate tube open at its end adjacent to that where the gases enter the central tube, whereby the cooling fluid is circulated in such a way that the outflow of said fluid firstly takes place in the annular region defined between the intermediate tube and the second metallic tube and then in the annular region between the intermediate tube and the first metallic tube, said two regions being connected respectively to a fluid supply tube and a fluid discharge tube at locations opposite to the end of the central tube via which the entry of the sampled gases takes place, the central tube extending axially beyond the two metallic tubes downstream of the cooling fluid supply and discharge tubes to issue into the casing of a compressed air pump thus creating in the central tube a suction vacuum of the gases to be sampled, an apparatus for analyzing the content of said gases, another tube extending to said analyzing apparatus and being connected to said central tube at a location upstream of the pump, a rocking support on which is articulated the sampling rod at its end opposite to that via which the gases pass into the central tube, and an extendable jack articulated on the rod to ensure the raising or substantially horizontal positioning of the latter with the end of the central tube in the sampling area.



4,100,807

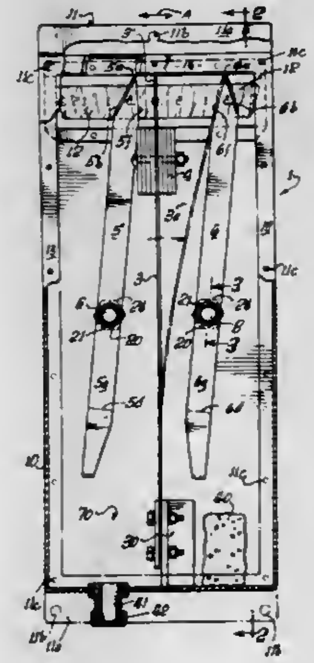
PEAK-RECORDING ACCELEROMETER

Paul D. Engdahl, 2850 Monterey Ave., Costa Mesa, Calif. 92626

Filed Jan. 10, 1977, Ser. No. 805,325

Int. Cl.² G01P *15/04*

U.S. Cl. 73—492 **8 Claims**



1. A peak-recording accelerometer comprising:

a sealable case having a transparent window and a calibrated scale readable therethrough:

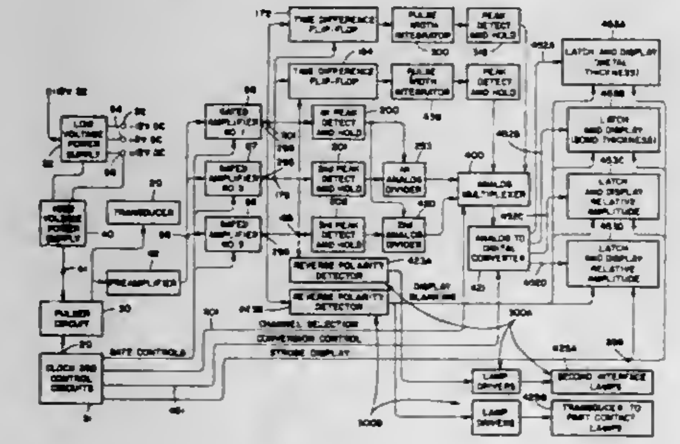
an acceleration-responsive mass-spring system mounted in said case and comprising a weighted resilient cantilever reed with its free end providing a main pointer deflectable along said scale; and
at least one holding-pointer having a rotary frictional connection to pivot means and having a tip portion engageable by said main pointer,
said holding-pointer having a tail portion extending beyond said pivot means and proportioned and weighted to balance it against linear acceleration,
said pivot means comprising a shaft extending with sealing means through said case; and
a reset knob on the outer end of said shaft;
whereby said main pointer is adapted to push said holding pointer to a peak deflection against the friction of said frictional connection, said holding pointer retaining and recording said deflection until it is reset by said knob, and wherein:
an equivalent pivot point of said reed lies approximately in a plane intermediate its length, and
said pivot means of said holding pointers lie generally in the same plane.

4,100,808

APPARATUS FOR EVALUATING A BOND

Charles B. Evans, Arlington; John D. Fenton, Fort Worth, and Bonner W. Staff, Grand Prairie, all of Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Oct. 22, 1975, Ser. No. 624,620
Int. Cl.^{2} G01N *29/00*
U.S. Cl. 73—588 22 Claims



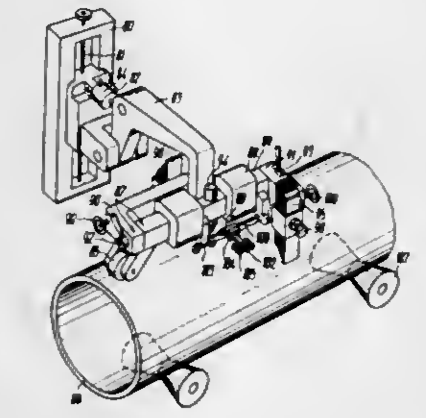
1. Apparatus for evaluating a bond between first and second structures bonded together by an intermediate layer of adhesive to form a composite construction, the first structure having a first surface and an oppositely facing, second surface having at least partial contact with the layer of adhesive, the second structure having a surface facing the layer of adhesive and having at least partial contact with the layer of adhesive, the apparatus comprising:
means for transmitting a pulse of ultrasonic wave energy, of a wavelength shorter than the thickness of the first structure and shorter than the thickness of the intermediate adhesive layer, the pulse being of a duration at least as short as approximately 1.5 wave cycles, into the first structure and the adhesive layer from a location adjacent the outer face of the first structure and for receiving any subsequent pulses reflected from portions of the composite construction, whereby a first reflected pulse may be reflected from the first surface of the first structure and at least a second reflected pulse may be subsequently reflected from the interface between the first structure and the adhesive layer; and
means responsive to the reception, by the pulse transmitting and receiving means, of the first and second reflected pulses, and any third pulse reflected from the interface between the adhesive layer and the second structure, for producing an output signal indicative of effective bonding of the adhesive layer to both structures upon the reception by the pulse transmitting and receiving means of second and third pulses of amplitudes within respective, predetermined ranges.

4,100,809

METHOD FOR EXCITATION AND RECEPTION OF ULTRASONIC PLATE WAVES IN WORKPIECES AND DEVICES FOR REALIZING SAME

Vladimir Timofeevich Bobrov, ulitsa Zelinskogo 12, kv. 127; Jury Avraamovich Druzhaev, prospekt K. Marxa 2, kv. 19, and Nelli Alexandrovna Lebedeva, ulitsa Kh. Livshits 29, kv. 25, all of Kishinev, U.S.S.R.

Filed Jul. 23, 1976, Ser. No. 708,263
Claims priority, application U.S.S.R., Jul. 28, 1975, 2164385
Int. Cl.^{2} G01N *29/04*
U.S. Cl. 73—638 21 Claims



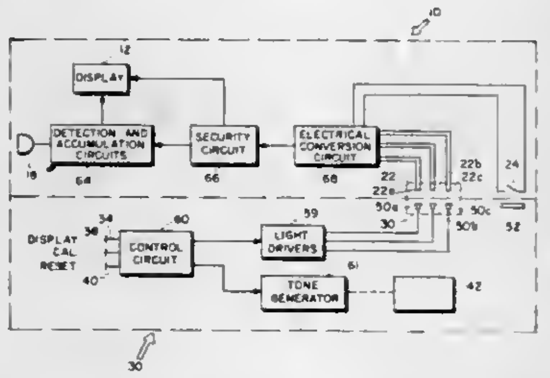
1. A method of excitation and reception of ultrasonic plate waves in a workpiece comprising generating a high-frequency electromagnetic field acting on the surface of the workpiece by a transducer consisting of a system of flat radiators forming a comb-like structure positioned discretely in the direction of radiation with a pitch divisible by the wavelength; applying a magnetizing field to the workpiece whose vector is parallel to the surface of the workpiece in the area of the high-frequency electromagnetic field, and orienting the vector of the magnetizing field for exciting transverse (shear) plate waves with respect to the transducer of flat radiators at an angle α relative to the direction of radiation, wherein $|\alpha| > 0$.

4,100,810

LIGHT COUPLED READ-OUT SYSTEM FOR NOISE DOSIMETER

Gordon R. Sima, Jr., Joppa Township, Harford County, and John L. Taylor, Jr., Baltimore, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 3, 1977, Ser. No. 803,172
Int. Cl.^{2} G01H *3/12*
U.S. Cl. 73—647 6 Claims



1. In an audio dosimeter wherein a memory contains an indication which is a measure of noise dose and a display

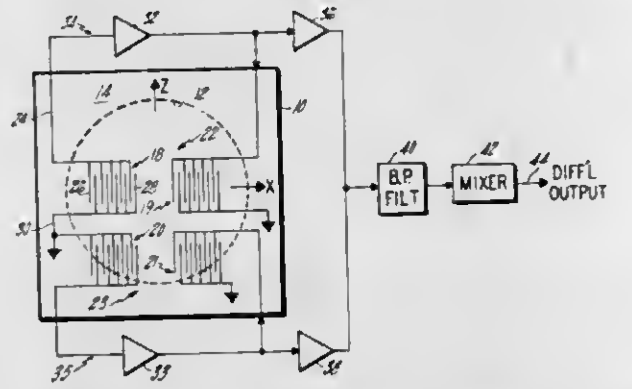
device on which said indication is shown, means for showing the memorized indication on said display device comprising a base station for generating a sequence of light encoded signals to said dosimeter and light signal decoding circuits in said dosimeter responsive to said light encoded signals for showing said indication on said display.

4,100,811

DIFFERENTIAL SURFACE ACOUSTIC WAVE TRANSDUCER

Donald E. Cullen, Manchester, and Thomas M. Reeder, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,106
Int. Cl.^{2} G01L *1/16*
U.S. Cl. 73—654 2 Claims



2. A differential surface acoustic wave oscillator for measuring a parameter capable of inducing strain, comprising:
a piezoelectric diaphragm having a principal surface;
a pair of oscillators, each of said oscillators including an amplifier and a surface acoustic wave delay line connected in feedback relation with said amplifier, said delay lines formed at respective portions of said surface so that each of said oscillators has a frequence dependent on strain of the related portion of said diaphragm which is opposite in sense to that of the other of said oscillators; and
mixing means for providing as an output of said transducer the frequency difference between said oscillators, whereby the sensitivity of said transducer to strain is greater than that of either of said oscillators and the sensitivity in frequency of each of said oscillators to temperature is substantially canceled by said mixing means.

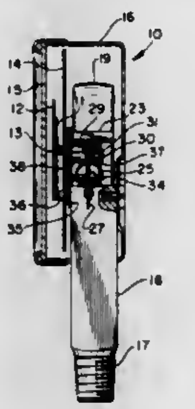
4,100,812

DRY PRESSURE GAUGE WITH DAMPENED NEEDLE MOVEMENT

Tommy L. Gray, Dallas, and Sam R. Crowe, Plano, both of Tex., assignors to Span Instruments, Plano, Tex.

Filed Jan. 5, 1977, Ser. No. 757,035
Int. Cl.^{2} G01L *7/04*
U.S. Cl. 73—732 12 Claims

1. In a pressure gauge with dampened indicator movement: pressure change sensor means having an operational movement end; driven mechanism means including a gauge indicator; mass weight means added to said mechanism means; looped spring interconnect means connected at a first side to the operational movement end of said pressure change sensor means, and connected at a second side to said driven mechanism means; and wherein said looped spring interconnect means is a single strand spring loop in substantially circular form.

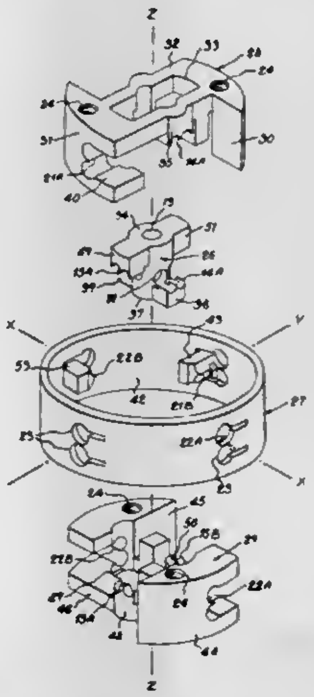


4,100,813

FLEXURE SUSPENSION ASSEMBLY

Peter Luciano Previte, Paterson, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed May 13, 1976, Ser. No. 686,127
Int. Cl.^{2} G01C *19/02*
U.S. Cl. 74—5 F 12 Claims



1. A flexure suspension assembly comprising
a. first mounting means having a first longitudinal axis;
b. first gimbal means;
c. a first pair of single axis flexure joints coupling said first gimbal means to said first mounting means for rotation therewith about said first longitudinal axis, said first flexure joints having a second longitudinal axis substantially parallel to said first longitudinal axis and a first bending axis orthogonal thereto to permit relative angular rotation between said first gimbal means and said first mounting means about said first bending axis;
d. second gimbal means;
e. a second pair of single axis flexure joints coupling said second gimbal means to said first mounting means for rotation therewith about said first longitudinal axis, said second flexure joints having a third longitudinal axis substantially parallel to said first longitudinal axis and a second bending axis orthogonal to said longitudinal axes and said first bending axis to permit relative angular rotation between said second gimbal means and said first mounting means about said second bending axis;

f. second mounting means;

g. a third pair of single axis flexure joints coupling said second mounting means to said first gimbal means having a fourth longitudinal axis substantially perpendicular to said first longitudinal axis and a third bending axis aligned with said second bending axis; and

h. a fourth pair of single axis flexure joints coupling said second mounting means to said second gimbal means, said fourth single axis flexure joints having a fifth longitudinal axis substantially perpendicular to said first longitudinal axis and a fourth bending axis aligned with said first bending axis, whereby said first and second mounting means are coupled for rotation together about said first longitudinal axis and for relative angular rotation therebetween about both of said first and second axes.

4,100,814

SIX-BOX LINKAGE MECHANISM

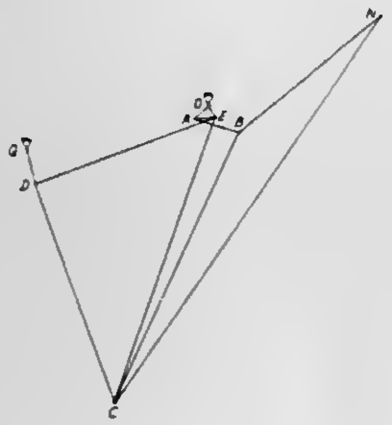
Gordon Richard Wray, Loughborough, and Ruth Mary Parry, Ringwood, both of England, assignors to National Research Development Corporation, London, England

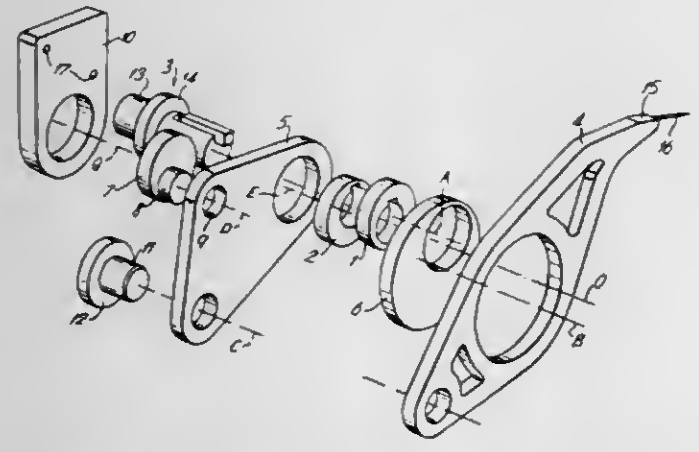
Continuation of Ser. No. 647,982, Jan. 8, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,204

Claims priority, application United Kingdom, Jan. 10, 1975, 01106/75

Int. Cl.^{2} F16H ***21/18***

U.S. Cl. 74—43 **15 Claims**





1. Means for effecting movement of an object in a closed loop planar path comprising a six-bar linkage mechanism the dimensions of the link members of which are derived from a four-bar linkage and a second linkage cognate with said four-bar linkage, said four-bar linkage being dimensioned to generate a path passing through at least selected precision points, on an idealized version of said closed loop path, said six-bar linkage mechanism including a link member which maintains a substantially fixed attitude relative to a given plane in space during execution of at least an appreciable portion of the path, said object forming at least part of or being mounted on said link member for movement therewith.

4,100,815

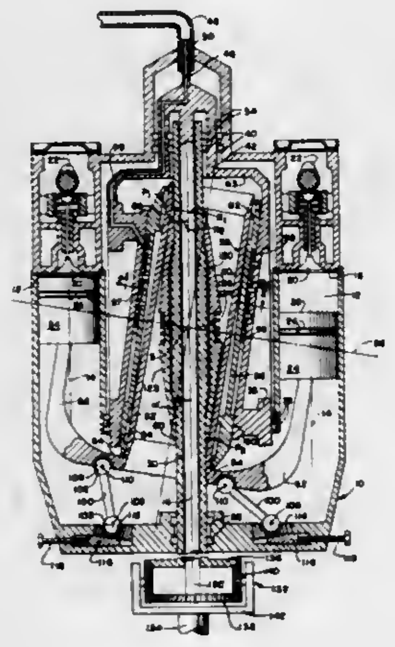
VARIABLE DISPLACEMENT PISTON ENGINE

Yves Jean Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed Nov. 22, 1976, Ser. No. 743,600

Int. Cl.^{2} F16H ***23/60***

U.S. Cl. 74—60 **18 Claims**



1. A piston engine comprising:

a frame;

a first shaft supported by said frame for rotation on a first axis;

a nutatable member having first and second surfaces of revolution mutually concentric with a second axis intersecting said first axis at a point of axes intersection;

support means rotatable on said first axis and journalled with said second concentric surface of revolution to support said nutating member for movement of said second axis in a biconical path having a central apex coincident with said point of axes intersection;

a pair of oppositely convergent cone-like members coupled for rotation with said first shaft and spaced equidistantly from said point of axes intersection on said first axis, said cone-like members being in rolling engagement with said first surface of revolution on said nutatable member;

at least one piston reciprocable in a cylinder defined by said frame and having one end face spaced from said piston;

means interconnecting said piston and said nutating member to drive said second axis in said biconical path upon piston reciprocation to rotate said support member in one direction of rotation on said first axis and to rotate said first shaft in an opposite direction of rotation at a rotational speed determined by the radii of said cone-like members at points of contact thereon with said first nutating member surface of revolution;

means to vary the angle of said first and second axes intersection for in phase adjustment of both the distance of piston reciprocation and the rotational speed of said first shaft between minimum and maximum values for a given frequency of piston reciprocation; and

an epicyclic gear train having torque output means and two torque input means, said first shaft being connected to one of said torque input means and said support member being connected to the other of said two torque input means.

4,100,816

MANUAL CONTROL APPARATUS

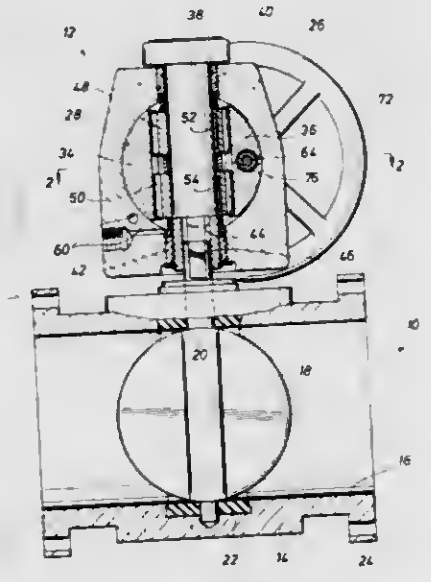
Malcolm D. Clark, 4 St. Ronans Drive, Glascow G413 SJ, Scotland

Filed Oct. 22, 1976, Ser. No. 734,828

Claims priority, application United Kingdom, Nov. 29, 1975, 49136/75

Int. Cl.^{2} F16H ***27/02, 29/20;*** **F16K** ***31/53;*** **F15B** ***13/10***

U.S. Cl. 74—89.14 **22 Claims**



1. An actuator and override mechanism comprising:

a housing having a chamber therein;

a drive member disposed in said chamber for movement therein;

an elongate torque transmission member rotatably mounted in said housing and extending into said chamber;

an annular connector disposed at least partially between said torque transmission member and said drive member, said connector being connected to said torque transmission member for longitudinal but non-rotating movement therealong and threadedly connected to said drive member for relative movement of said drive member and said connector upon rotation of said torque transmission member;

means fixing said torque transmission member against longitudinal movement with respect to said housing;

a pair of spaced stop means for limiting longitudinal movement of said connector along said torque transmission member;

and means for rotating said torque transmission member.

2. An actuator and override mechanism comprising:

a housing having a chamber therein;

a drive member disposed in said chamber for reciprocation therein;

an elongate torque transmission member rotatably mounted in said housing and extending into said chamber, the axis of said torque transmission member being generally parallel to the path of said drive member, and said drive member being telescopically mounted on said torque transmission member for said reciprocation;

an annular connector disposed at least partially between said torque transmission and said drive member, said connector being connected to said torque transmission member for longitudinal but not rotating movemment therealong and threadedly connected to said drive member for relative longitudinal movement of said drive member and said drive member and said connector upon rotation of said torque transmission member;

means fixing said torque transmission member against longitudinal movement with respect to said housing;

a pair of spaced stop means for limiting longitudinal movement of said connector along said torque transmission member;

and means for rotating said torque transmission member.

4,100,817

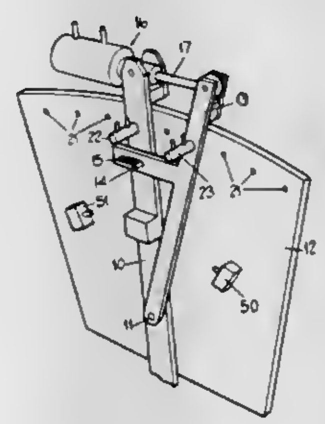
AUTOMATIC INDEXING MECHANISM

Peter Ryan, and Harry Bradley, both of Burnley, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 14, 1976, Ser. No. 676,689

Int. Cl.^{2} F16H ***27/00***

U.S. Cl. 74—111 **6 Claims**



1. An automatic indexing mechanism comprising a plate and a member mounted for relative pivotal movement, a row of spaced locations on said plate, first and second stops movable into and out of engagement with said locations on said plate, said first stop being mounted for movement with said member, an element movably attached to said member and movable relative thereto to a limited extent, said second stop being mounted for movement with said element, reciprocating means for effecting relative movement between said member and said element, and control means for controlling the reciprocation of said reciprocatable means and movement of said members and said element and thereby said first and second stops and the engagement of said stops with said plate so as to cause reciprocation of said reciprocatable means while one of said first and second stops is engaged and the other of said first and second stops is disengaged in a manner to effect relative movement between said plate and said member.

4,100,818

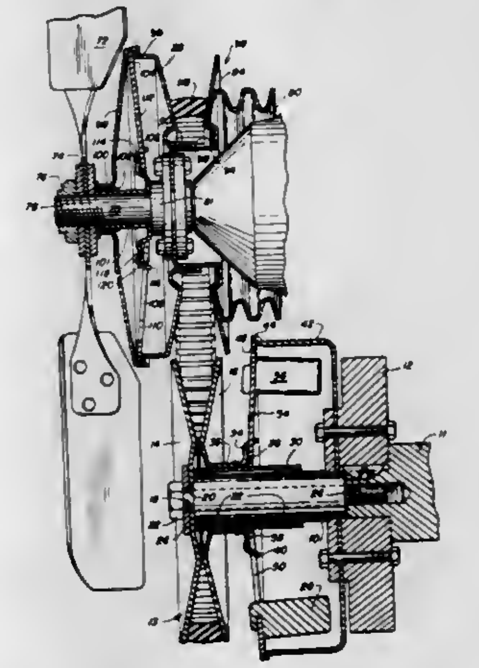
DRIVE SYSTEM

Gary A. Woollard, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 13, 1976, Ser. No. 722,937

Int. Cl.^{2} F16H ***9/00***

U.S. Cl. 74—230.17 E **6 Claims**



1. Apparatus for driving accessories disposed between a

drive shaft connected to an engine in a vehicle and a driven shaft connected to one or more accessories; the combination comprising:

a first variable pulley rotationally associated with the drive shaft and having a fixed flange connected to the drive shaft and a movable flange movable axially of said fixed flange and the drive sahft;

means for moving said movable flange axially away from said fixed flange above a predetermined speed above zero speed of the drive shaft;

said moving means comprising a disc spring biasing said movable flange and centrifugally responsive means associated with said disc spring actuated by centrifugal force above said predetermined speed of the drive shaft to change the bias of said spring and effect movement of said movable flange;

means connected to said drive shaft and constructed with means to positively couple said disc spring to said drive shaft, said coupling means comprising at least a pair of cooperating flat surfaces, one surface on said connected means and one on the periphery of said disc spring;

a second variable pulley rotationally associated with the driven shaft and the accessories and having a fixed flange connected to the driven shaft and a movable flange movable axially of said fixed flange and said driven shaft;

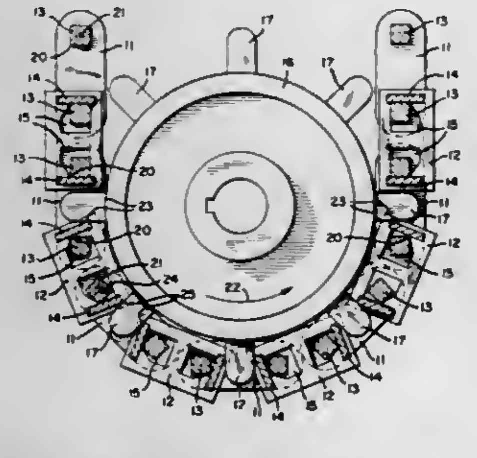
disc spring means urging said movable flange of said second pulley axially toward said fixed flange thereof;

means connected to said driven means and constructed with means to positively coupled said disc spring means to said driven shaft, said coupling means comprising at least a pair of cooperating flat surfaces, one surface on said last-named connected means and one on the periphery of said disc spring means;

drive means between said variable pulleys effective to provide the drive therebetween with the drive ratio between the pulleys determined by the position of the movable flanges with respect to their respective fixed flanges;

said apparatus being constructed and arranged to provide substantially a fixed ratio drive between the drive and driven shafts at relatively low drive shaft speeds and also to provide substantially a constant speed of the driven shaft for speeds for the drive shaft above said predetermined speed thereof throughout the major portion of the normal vehicle operating range.

4,100,819
ARRIS SPROCKET CHAIN
Erkki Topias Lehtola, Kaskinen, Finland, assignor to Oy Tahka AB, Kaskinen, Finland
Filed May 6, 1976, Ser. No. 683,904
Claims priority, application Finland, May 14, 1975, 751420
Int. Cl.^{2} F16G *13/00*
U.S. Cl. 74—245 R **3 Claims**



1. An arris sprocket chain comprising

(a) a plurality of first links each including a pair of longitudinal plates interconnected in spaced relation by a pair of fulcrum pins fixedly secured to said plates adjacent the opposite ends thereof,

(b) means on each of said pins defining an arris extending parallel with the axis of said pin and lying outside the center line connecting the axes of said pair of pins and within the space between lines extending through said pin axes normal to said center line,

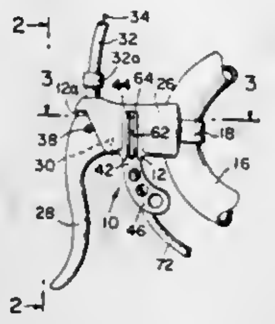
(c) a plurality of second links alternating with said first links,

(d) each of said second links comprising a pair of longitudinally extending side plates interconnected in spaced relation by a pair of transverse plates fixedly secured thereto adjacent the opposite ends thereof,

(e) each of said second links being received between said longitudinal plates of a pair of said first links, and

(f) said second link side plates having holes therein receiving one of said fulcrum pins of each of said pair of first links freely therethrough with said arrises of said pins in pivoting contact with the opposed surfaces of said transverse plates to effect change in the pitch of said chain in passage around a sprocket wheel.

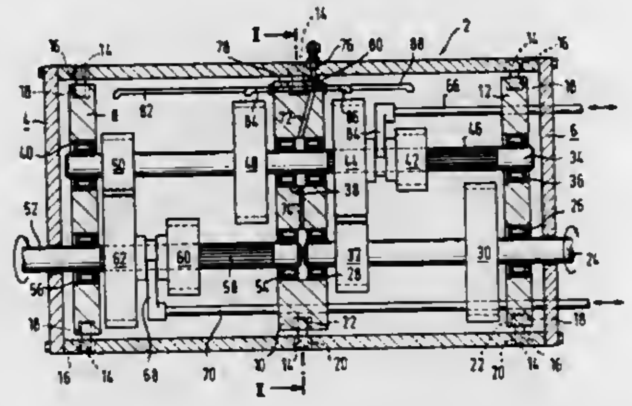
4,100,820
SHIFT LEVER AND INTEGRAL HANDBRAKE APPARATUS
Joel Evett, 287 Washington St., Newton, Mass. 02158
Filed Sep. 13, 1976, Ser. No. 722,685
Int. Cl.^{2} G05G *1/24, 5/16;* F16D *67/00*
U.S. Cl. 74—489 **12 Claims**



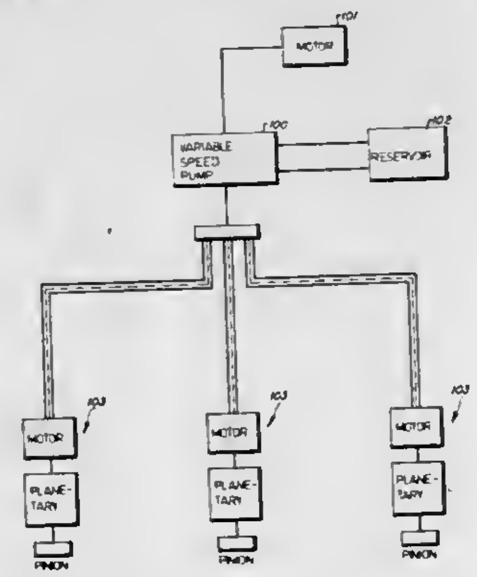
1. A shift apparatus and integral handbrake assembly adapted to mount on a handlebar comprising handbrake bracket means on which pivots a handbrake lever, a pivotal shift lever integrally carried by said handbrake bracket, said shift lever having one end formed as a shift barrel and the other end formed as a finger paddle, said handbrake bracket being formed with a slot and having an interior region formed with partition means on which said shift barrel pivotally mounts, the last-mentioned mounting being such that a portion of said shift lever is disposed through said slot thereby to place said handle extending from said handbrake bracket, means for coupling said shift lever to a Bowden cable, and means for placing a controlled drag on said shift barrel whereby pivoting said finger paddle operates to provide the mechanical advantage necessary to overcome the drag placed on said shift barrel and thereby effect a relative lengthening or shortening of the Bowden cable.

4,100,821
MULTISTAGE GEAR CONTROLLING MECHANISM
Michael Geiger, Starnberg, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany
Filed Nov. 8, 1976, Ser. No. 739,734
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1975, 2551934
Int. Cl.^{2} F16H *57/02*
U.S. Cl. 74—606 R **10 Claims**

1. In a multistage gear controlling mechanism which is arranged in a gear housing having several walls which are arranged one behind the other for supporting the gear shafts, the improvement comprising wherein the walls are constructed as individual support plates separate from the gear housing and which are mounted in the gear housing, said support plates having unfinished peripheral edge surfaces and being smaller in dimension than the inside dimension of said housing to define a gap therebetween encircling said support plates, first means defining a plurality of recesses in said peripheral edges of each of said individual support plates, second means defining openings through the walls of said housing, said recesses on said peripheral edges of said support plates being positionable for axial alignment with said openings, index bolt means supported in said housing walls for fixedly locating said support plates in said housing, said index bolt means extending from outside of said housing wall laterally inwardly across said gap and into said recesses in said peripheral edge surfaces of said support plates.



4,100,822
DRIVE SYSTEM FOR A MOVING MECHANISM
Allan Rosman, Dr Fleming 51, Madrid 16, Spain
Filed Apr. 19, 1976, Ser. No. 678,434
Int. Cl.^{2} F16H *37/06, 47/00;* F16D *31/02;* B66D *3/16*
U.S. Cl. 74—674 **86 Claims**



1. A drive system comprising:

a. a pair of annular members,

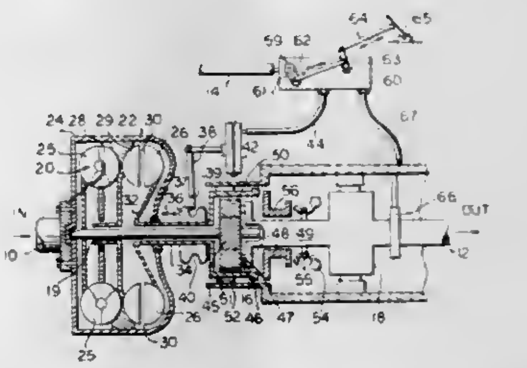
b. each said annular member being laterally spaced with respect to each other and carrying first engagement means,

c. means disposed adjacent each annular member for rotatably mounting the annular members,

d. drive motor means disposed adjacent to each annular member of said pair and carrying second engagement means which couple to the first engagement means on each said annular member, and

e. means for operating the drive motor means to move each of the annular members about an axis of rotation.

4,100,823
AUTOMATIC TRANSMISSION
John Krist, 618 Tedwyn Dr., Mississauga, Ontario, Canada (L5A 1K2)
Filed Apr. 5, 1976, Ser. No. 673,921
Int. Cl.^{2} B60K *41/16*
U.S. Cl. 74—863 **4 Claims**

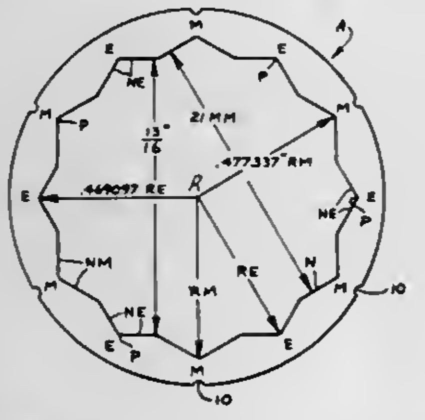


1. An automatic transmission for engines and vehicles having an engine crankshaft and a vehicle drive shaft, comprising transmission housing means, power input shaft means journaled in said transmission housing means for delivering power from said engine crankshaft, torque converter means in said housing means for receiving power from said input shaft means including fluid coupling unit means, said fluid coupling unit means including primary and secondary torque converter means, first impeller means, first turbine means for being driven by said first impeller means, second impeller means, second turbine means for being driven by said second impeller means, regulating means for regulating the transmission of power from said impeller means to said respective turbine means, planetary gear system means including a plurality of intermeshing gear means rotatable by power derived from said engine crankshaft, vacuum controlled means capable of connection to said engine for controlling the operation of said torque converter means and said gear system means, said vacuum control means including operation regulating housing means, first vacuum sensing duct means connectable to said regulating housing means from the engine manifold of said engine for sensing the vacuum existing therein under varying engine drive conditions, vacuum actuator diaphragm means connected to said operation regulating housing means for being actuated by varying conditions in said engine manifold, linkage lever means for coupling said vacuum actuator diaphragm means with said second turbine means for regulating the interspacing between said second impeller means and said second turbine means for regulating the torque produced therebetween, said second turbine means including second turbine shaft means movable with said second turbine means, annular ring gear means carried by said second turbine shaft means for rotation therewith, sun gear means carried by said input shaft means for rotation therewith, and planetary gear system means engageable with said sun gear means and said ring gear means for mutual adjustable degrees of intercoupling thereof.

4,100,824
ROTARY TOOL FOR DRIVING ENGLISH AND METRIC THREADED MEMBERS
Jon V. Marschke, Cloquet, Minn., assignor to SURELAB Superior Research Laboratories, Inc., West St. Paul, Minn.
Continuation-in-part of Ser. No. 554,721, Mar. 3, 1975, abandoned. This application Jun. 4, 1976, Ser. No. 693,103
Int. Cl.^{2} B25B *13/06*
U.S. Cl. 81—121 R **3 Claims**

1. A rotary tool for driving a threaded member such as a nut or bolt or the like having a head sized in either the English or the metric system, the tool having an opening for reception of the head of the threaded member, the opening having a first set of six notches equally spaced about its periphery and sized for

engagement with the English-sized head of a threaded member, and having a second set of six notches interposed between the notches of the first set and sized for engagement with a metric-sized head of a threaded member, all of the notches being intersected by a plane normal to the axis of rotation of the tool, and the relationship of the English sized notches to the metric sized notches being given by the formula



$$SM = 0.79375B$$

wherein SM represents the number of millimeters in the metric system, and B is the number of 32nds of an inch in the English system, SM and B both being taken to nearest integers.

4,100,825
CONTROLS FOR MULTI SPINDLE LATHES

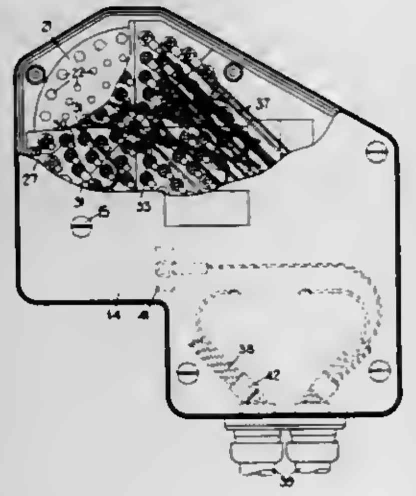
Edmund Alexander McConnell, Coventry; Norman Yearsley, Kenilworth, and Alec Gordon Blockley, Coventry, all of England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Dec. 7, 1976, Ser. No. 748,349

Claims priority, application United Kingdom, Dec. 13, 1975, 51170/75

Int. Cl.^{2} B23B *3/34*

U.S. Cl. 82—3 **14 Claims**



1. A multi spindle lathe comprising:
a machine base;
a spindle drum mounted on the machine base;
drive means for indexing the spindle drum with respect to the machine base about an index axis in equal steps of $m/360°$, where m is a finite integer greater than unity, whereby the spindle drum is brought in succession into m different index positions;
n spindles, where n is a finite integer greater than unity and not greater than m, the spindles being mounted in the spindle drum and defining respective spindle axes which are all in the same orientation with respect to the index axis, and each pair of spindles which are adjacently disposed about the index axis being angularly spaced about the index axis by an angle which is an integral multiple of $m/360°$;
a plurality of electrical circuits associated with the spindle drum; and
a multi pole rotary electrical switch for controlling said electrical circuits and having a part which is fixed with respect to the machine base and a part which is rotatable with respect to the machine base about a switch axis and is arranged to index about said switch axis in synchronism with the spindle drum, whereby the rotatable part is brought in succession into m different index positions about said switch axis, the fixed and rotatable parts each having m.p cooperable contacts thereon, where p is a finite integer greater than unity, said contacts being arranged in the fixed and rotatable parts in respective circular arrays centered on the switch axis, each array being made up of m arcs subtending equal respective angles at the switch axis and each arc including p contacts, the contacts of each arc being similarly disposed so that at each of the m index positions of the spindle drum the contacts of the fixed part engage respective contacts of the rotatable part for controlling the electrical circuits respectively.

4,100,826
TOOL HOLDING APPARATUS IN AN NC LATHE

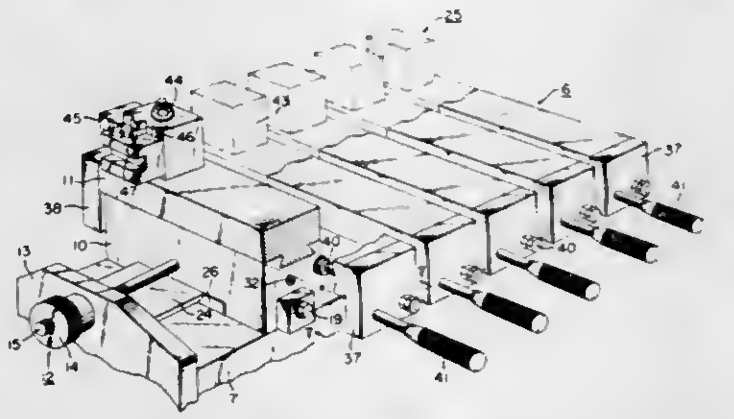
Taro Takahashi, No. 667-5, Oaza-Tsuchikawa, Ojiya-shi, Nigata-ken, Japan

Filed Aug. 8, 1977, Ser. No. 822,576

Claims priority, application Japan, Aug. 13, 1976, 51-97371

Int. Cl.^{2} B23B *21/00, 3/00*

U.S. Cl. 82—25 **6 Claims**



1. A tool holding apparatus in an NC lathe, which comprises a cross slide; plural tool post assemblies which are mounted on said cross slide in parallel with a main spindle and to be movable independently of one another in a direction perpendicular to the main spindle, said tool post assembly including a lower slide post which is movable on the cross slide and an upper slide post which is mounted on said lower slide post and is movable in a direction parallel to the main spindle; an oil pressure cylinder and a stop signal generator for sending a stop signal to the NC apparatus which are installed on said lower slide post, said oil pressure cylinder including a piston which moves in the cylinder and is associated with the upper slide post; and a means provided in the upper slide post so as to actuate the stop signal generator at the termination of forward and backward stroke of said post.

4,100,827
BAR STOCK FEED TUBE ASSEMBLY

Norbert A. Flemming, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

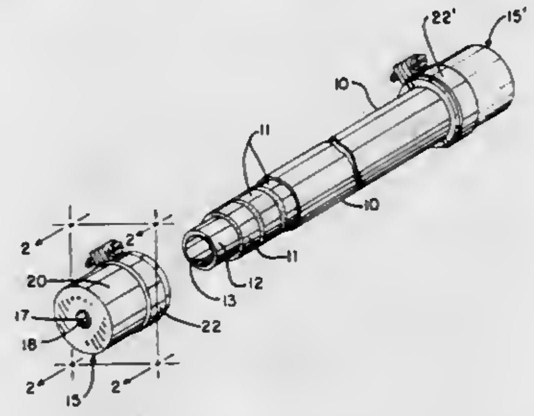
Filed Apr. 6, 1977, Ser. No. 784,984

Int. Cl.^{2} B23B *25/00;* B23Q *5/22;* B65G *11/00;* F16L *11/00*

U.S. Cl. 82—38 A **7 Claims**

1. A bar stock feed tube assembly comprising an outer, substantially-tubular reinforcing jacket, an anechoic feed tube

of synthetic polymeric material mounted within the reinforcing jacket, a resilient sound-damping material disposed under compression between the feed tube and the reinforcing jacket,



and an end cap having an orifice adapted to receive bar stock mounted over the end of the feed tube to secure the anechoic feed tube within the reinforcing jacket.

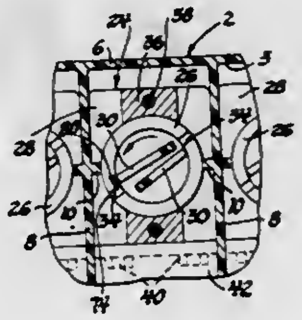
4,100,828
APPARATUS FOR RIB TRIMMING OF UNIVERSALLY MOLDED BATTERY CONTAINER

Robert H. Thuoe, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 715,070, Aug. 17, 1976, Pat. No. 4,041,603. This application May 19, 1977, Ser. No. 798,592

Int. Cl.^{2} B26D *3/00, 3/28*

U.S. Cl. 83—1 **2 Claims**



2. A tool for trimming the cell-pack-retaining ribs of a battery case, said case comprising at least two opposed walls defined in part a cell compartment and a plurality of oversized ribs extending outwardly from said walls in opposed relation one to the other, said tool comprising: rotatable tubular blades including rib-shaving edges and adapted for insertion into said compartment with said edges aligned with said ribs and spaced from said walls for uniformly shaving back said ribs to a predetermined elevation beyond their associated wall; guide means rotatably journalling said blades and adapted to engage said walls immediately adjacent said ribs for maintaining said spacing between said blades and walls throughout the full extent of the tool's insertion; and shearing means on said guide means adjacent said edges for cooperating with said rotatable blades to snip off shavings produced at the bases thereof.

4,100,829
APPARATUS FOR SHEARING METALLIC BARS

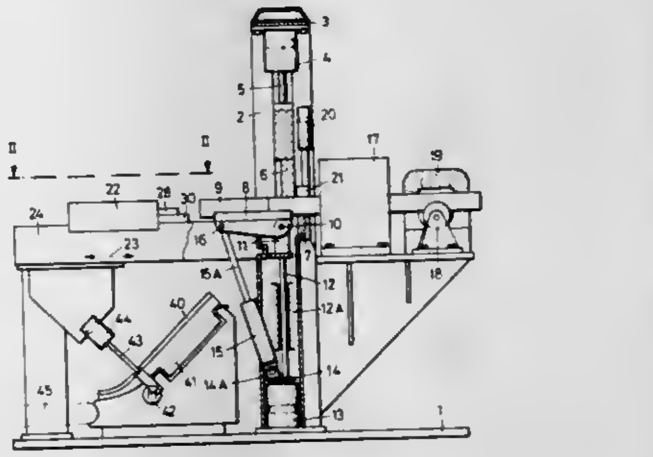
Ernst Stangl, Remscheid-Reinshagen; Rolf Gies, Remscheid-Goldenberg; Hans-Jürgen Model, and Edgar Stengel, both of Remscheid, all of Germany, assignors to AEG-Elotherm, G.m.b.H., Remscheid-Hasten, Germany

Filed Jun. 21, 1977, Ser. No. 808,629

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2631989

Int. Cl.^{2} B26D *5/20*

U.S. Cl. 83—106 **4 Claims**



1. A shearing apparatus for shearing heated metal into bars comprising:
means for transporting said material in the longitudinal direction;
means for clamping said material in a shearing position;
stop means for limiting the longitudinal movement of said bars;
means for shearing a bar in the shearing position;
means behind said shearing means for exerting a force on said bar in said longitudinal direction; and
means for detecting movement of said bar from said force to indicate that the bar is incorrectly dimensioned.

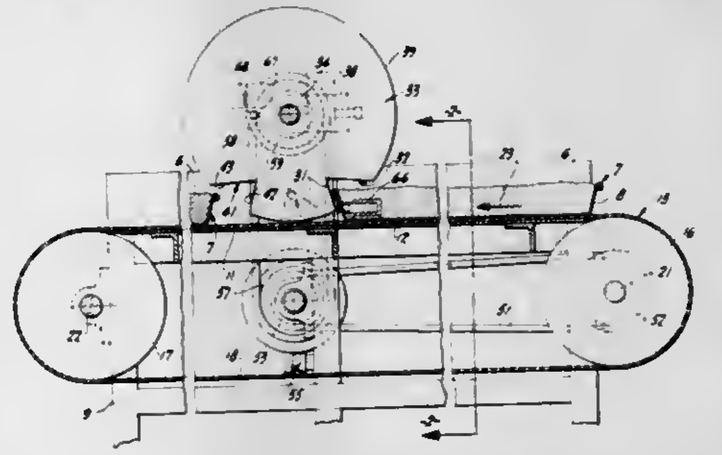
4,100,830
SHEET CAKE CUTTER

Charles Lakatos, San Francisco, Calif., assignor to Fantasia Confections, Inc., South San Francisco, Calif.

Filed Sep. 2, 1977, Ser. No. 830,195

Int. Cl.^{2} B26D *4/04, 4/16, 3/22*

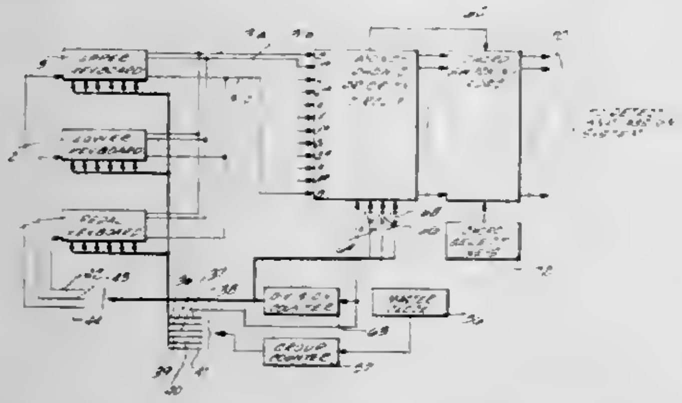
U.S. Cl. 83—371 **8 Claims**



1. A sheet cake cutter comprising a frame, a conveyor on said frame adapted to advance on said frame a pan having a rim and containing a sheet cake, a cutter disc having therein an edge notch interengageable with said rim, and means on said frame for mounting said disc for rotation relative to said frame with said disc extending into said pan and said edge notch in interengagement with said rim.

4,100,831
AUTOMATIC DIGITAL CIRCUIT FOR GENERATING CHORDS IN A DIGITAL ORGAN

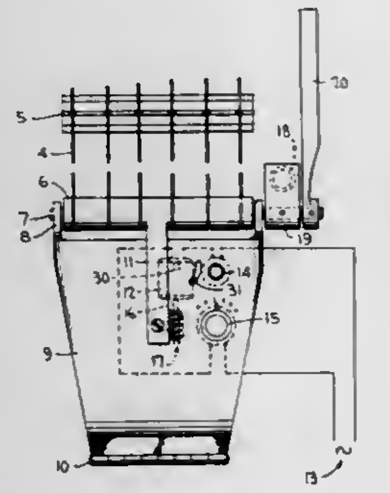
Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan
Filed Aug. 9, 1976, Ser. No. 712,736
Int. Cl.^{2} G10H *1/00, 3/06*
U.S. Cl. 84—1.01 **6 Claims**



1. In a keyboard instrument having a plurality of keys and a plurality of note selection switches, each key actuating one of said note selection switches, apparatus for generating predetermined chords in response to actuating a single key comprising: means connecting the note selection switches in groups, the switches in each group corresponding to the notes in one octave, means including the switches in each group for selectively connecting a signal to an associated one of a plurality of output lines when a key in the group is operated, there being one output line for each note in the group, input chord control means generating signals coded to indicate a selected one of a plurality of different types of musical chords, switching logic means responsive to a signal on any one of said output lines and to the coded signals indicating a particular type of chord for selectively coupling said signal on one of said output lines to particular additional ones of said output lines corresponding to the notes in the particular chord, and means responsive to the signals on said output lines for generating corresponding tones within an octave.

4,100,832
TREMOLO FOR A STRING INSTRUMENT

James R. Peterson, Rte. 1, Box 664, Wilton, Calif. 95693
Filed Jul. 26, 1976, Ser. No. 708,427
Int. Cl.^{2} G10D *3/12*
U.S. Cl. 84—313 **8 Claims**



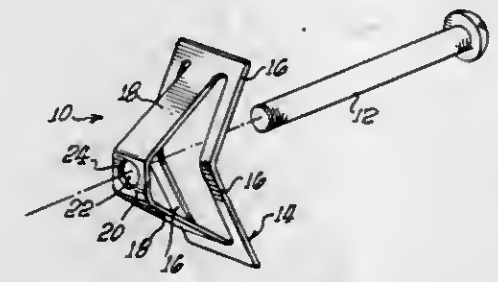
1. A tremolo for a string instrument having a plurality of strings stretched across a body, the tremolo comprising:

a movable elongated member coupled to the strings at one of their ends and having its longitudinal axis extending along an axis transverse to the strings and said elongated member being rotatable about its longitudinal axis so as to be movable in a direction transverse to its longitudinal axis; and,

drive means for automatically moving said movable member in a direction transverse to its longitudinal axis at a selected frequency so as to vary the tension within the strings and render a tremulous effect, said drive means including an electrical drive motor having a rotatable output shaft and coupling means coupled between said output shaft and said elongated member for transferring the rotational movement of said shaft into a movement of said elongated member at the selected frequency, and said coupling means including a coupling lever coupled to said elongated member and an eccentric cam mounted on said shaft in such a position so that as it is rotated by said drive means said cam causes said coupling lever to generate a rotational movement of said elongated member about its longitudinal axis.

4,100,833
BLIND FASTENER

Christopher Eric Nessa, 24732 Glenwood Dr., El Toro, Calif. 92630
Filed Jun. 27, 1977, Ser. No. 810,175
Int. Cl.^{2} F16B *35/04*
U.S. Cl. 85—3 S **13 Claims**

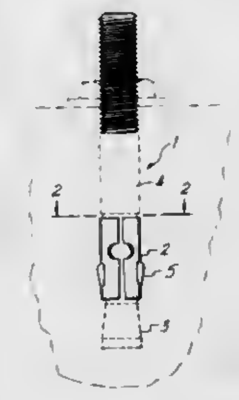


1. A blind fastener formed of a single piece of resilient sheet material, said blind fastener comprising a base, said base being of V-shape in longitudinal cross-section to provide a pair of wings, said base comprising an outer frame of said sheet material and an internally disposed opening, a strap integral with said base and overlying said opening, said strap being a strip of said material connected at its opposed ends to said outer frame and extending inwardly from said wings to provide opposed columns disposed at more acute angles than said wings, a cental portion integral with and connecting the adjacent outer ends of said columns, said central portion having an aperture therethrough, said aperture having means to engage the shank of a cooperating bolt.

4,100,834
CONTROLLING HARDNESS OF ANCHOR BOLT EXPANSION SLEEVES

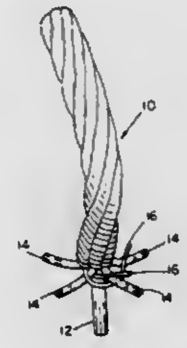
Frederick John Harris, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.
Filed Dec. 10, 1976, Ser. No. 749,599
Int. Cl.^{2} F16B *13/06*
U.S. Cl. 85—77 **2 Claims**

1. An anchor for use in a pre-drilled hole in masonry or the like, said anchor including a sleeve structure of a work hardenable material having a Brinell hardness number in the range of 100 to 230 expandable into contract with the side of said hole, said sleeve including one or more extruded external protuberances adapted to initially engage the sidewall of said hole, said sleeve being annealed from an initial hardness exceeding a 230 Brinell hardness number to said Brinell hardness number in the range of 100 to 230 to reduce the effect of work hardening occasioned by the fabrication process, thereby allowing flattening of said protruberances and facilitating full area engagement of said sleeve with the side of said hole whereby formation of localized areas of stress concentration is prevented.



4,100,835
BRAIDED PACKING

Peter F. Kozlowski, Billerica, Mass., assignor to A. W. Chesterton Company, Stoneham, Mass.
Filed Dec. 27, 1976, Ser. No. 754,254
Int. Cl.^{2} D04C *1/06*
U.S. Cl. 87—1 **9 Claims**

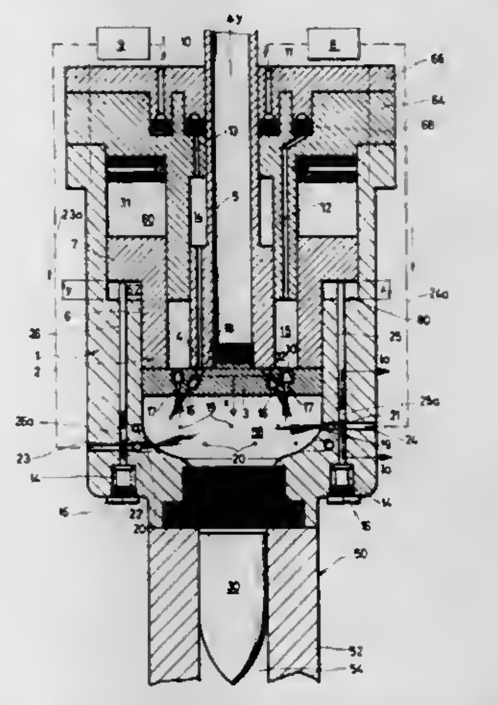


1. Braided packing comprising a plurality of outer core strands extending generally axially along said packing and a plurality of braid strands braided together about said core strands, said outer core strands extending helically along said packing and forming with said braid strands a braid having a normal helical twist in one direction and said braid strands extending over said core strands in a continuous helical pattern in a direction opposite said one direction.

4,100,836
COMBUSTION CHAMBER SYSTEM FOR THE PRODUCTION OF PROPELLING GASES

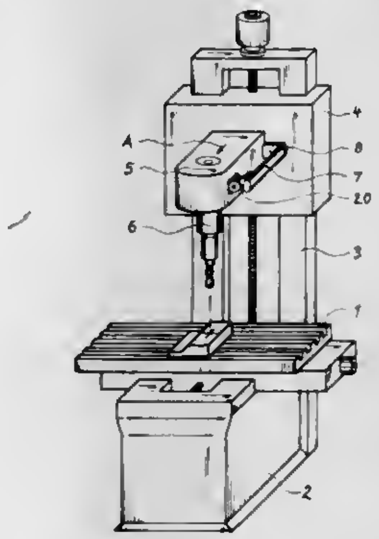
Heinrich Hofmann, Gröbenzell, Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Germany
Filed Sep. 22, 1969, Ser. No. 862,638
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1968, 1728074
Int. Cl.^{2} F41F *1/04*
U.S. Cl. 89—7 **7 Claims**

1. A driving force generating system, particularly for propelling a device such as a projectile in a fire arm, comprising wall means defining a combustion chamber, a piston movable in said combustion chamber, propellant component supply tank means, pump means connected between said supply tank means and said combustion chamber and being operable by movement of said piston in a working stroke to deliver propellant components into said combustion chamber, additional propellant supply means connected between said propellant supply tank means and said combustion chamber, nozzle means associated with said supply means for discharging the propellant into said combustion chamber, a control member disposed in the path of said piston, a spring biasing said control member in a direction to project it into the path of movement of said piston, said control member being contractable by said piston in a return movement to move it against the force of said spring to cause the discharge of propellant from said nozzle means for directing an additional amount of propellant components from said supply tank means into said combustion chamber toward the end of the return movement of said piston.



4,100,837
TEMPERATURE COMPENSATED MEASURING DEVICE

Walter Köhler, Gütersloh, Germany, assignor to Norte-Klessmann & Co. K.G., Gutersloh, Germany
Filed Dec. 21, 1976, Ser. No. 752,963
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558625
Int. Cl.^{2} B23C *7/00;* B23B *49/00*
U.S. Cl. 90—11 R **9 Claims**



1. A thermal compensation measuring device for positioning on an arm between a cutter spindle and frame of a machine tool comprising at least one steel rod, first means fixed to one end of said steel rod and adopted to be connected to said arm for supporting the steel rod in the direction of the arm, at least one aluminum rod, second means fixed to one end of said aluminum rod and to the other end of said steel rod, said second means supporting said aluminum rod parallel to the steel rod with its other end extending toward said one end of the steel rod, a further steel rod, third means fixed to one end of said further

steel rod and to the other end of said aluminum rod, said third means supporting said further steel rod to be mutually parallel with the steel and aluminum rods with its other end extending toward said one end of the aluminum rod, and measuring means connected near the other end of said further steel rod for interacting with a stationary point on the arm of the machine tool.

4,100,838

VACUUM AUGMENTATION DEVICE

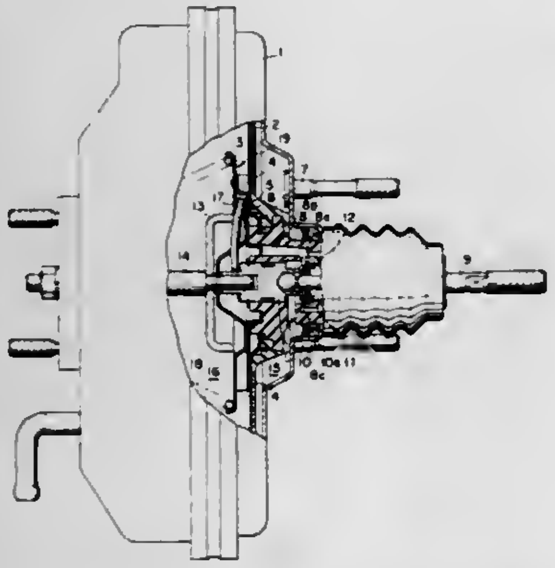
Kiyoshi Tateoka, Fujisawa; Hiromi Ando, Tokyo, and Tomizo Azuma, Yamato, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 7, 1976, Ser. No. 748,321

Claims priority, application Japan, Dec. 13, 1975, 50-148598

Int. Cl.^{2} F15B *9/10;* F01B *31/12*

U.S. Cl. 91—1 **7 Claims**



1. A vacuum augmentation device of the type usable with a push rod actuated vehicle braking system and having
a hollow body,
a plunger assembly shiftably mounted in said body and actuatable by said push rod for movement of said plunger assembly from a standby to an operated position thereof in response to actuation of said push rod,
an output rod shiftably mounted in said body to be moved with augmented force in response to movement of said plunger assembly to its operated position,
a shiftable diaphragm-piston mechanism mounted in said body between a pair of fluid chambers within the latter,
means for subjecting one of said chambers to a fluid pressure different from atmospheric pressure,
valve means operably associated with said plunger assembly for placing said chambers in communication with each other to maintain both of said chambers at substantially the same fluid pressure when said plunger assembly is in its standby position, and for isolating said chambers from fluid communication with each other and placing the other of said chambers in communication with the atmosphere for shifting said diaphragm-piston mechanism in response to the fluid pressure differential presented between said chambers when said plunger assembly is moved to its operated position,
a generally cup-shaped fulcrum plate mounted on said output rod for transmitting a force to the latter for moving the same and having an edge portion generally concentric with the axis of said output rod and facing in a direction generally toward said plunger assembly and said diaphragm-piston mechanism,
a number of reaction levers extending generally radially with respect to the axis of said output rod, each having a pair of oppositely facing side surfaces, and each disposed with a radially inner portion of one of said surfaces engageable by said plunger assembly and a radially intermediate portion of the other of said surfaces engageable with said edge portion of said fulcrum plate,
and means for operably coupling a radially outer portion of said one surface of each reaction lever with said diaphragm-piston mechanism,
the improvement of which is characterized by said coupling means including:
a mounting plate member extending between said radially outer portion of said one surface of each reaction lever and said diaphragm-piston mechanism and in engagement with the latter;
an elongate fulcrum pin for each reaction lever; and
pin retention means formed on said mounting plate for each pin respectively for holding the latter in disposition for longitudinal, substantially line contact of an intermediate portion of said pin between its ends with said radially outer portion of said one surface of the corresponding reaction lever.

4,100,839

VACUUM AUGMENTATION DEVICE

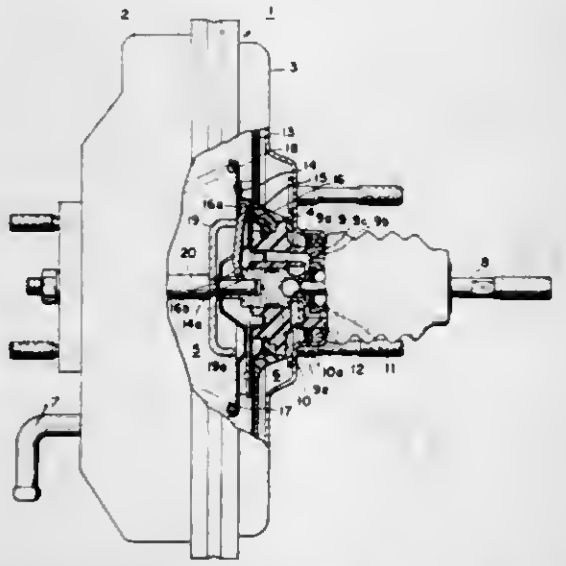
Hiromi Ando, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 10, 1976, Ser. No. 749,306

Claims priority, application Japan, Apr. 13, 1976, 51-45740[U]

Int. Cl.^{2} F15B *9/10;* F01B *19/00;* F16J *3/02*

U.S. Cl. 91—369 B **3 Claims**



1. A vacuum augmentation device having a diaphragm which divides a shell body into two chambers and, in one operating condition of the device, receives a differential pressure on the opposite sides of said diaphragm, said differential pressure being transferred to one face of a plurality of reaction levers through a piston plate and then to an output rod to produce a reaction force which is transferred back to the other face of said reaction levers and then to an input rod, characterized in that a metal mounting plate is interposed between said piston plate and said reaction levers, there is a pin for serving as a fulcrum for each of said reaction levers, and said metal mounting plate is provided with pin retention pawls oppositely juxtaposed with the sides of said pins to position the same with respect to said reaction levers and with pin engaging pawls for engaging end portions of said pins to prevent the pins from coming off said metal mounting plate member.

4,100,840

RADIAL PISTON MACHINE

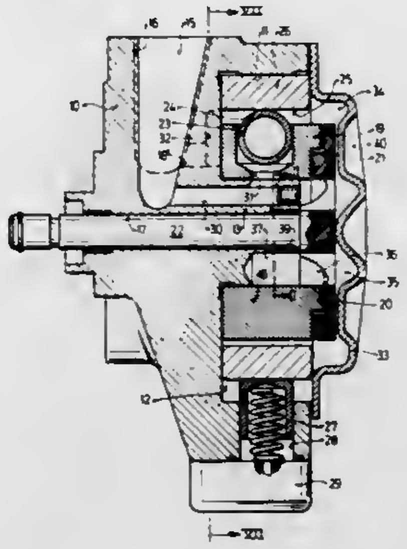
Paul Bosch, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1976, Ser. No. 742,125

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552442

Int. Cl.^{2} F01B *13/06*

U.S. Cl. 91—491 **9 Claims**



1. A radial piston machine comprising a housing having a control trunnion integrally formed therewith and an annular portion surrounding said control trunnion radially spaced therefrom to form an annular chamber open at one side; a cover closing the open side of said chamber; a rotor rotatably mounted on said control trunnion and having a plurality of radial bores having open inner and outer ends; a plurality of pistons respectively slidable in said bores and having outer ends projecting through said open outer ends of said bores beyond the outer periphery of said rotor; a displacement ring in said chamber eccentrically arranged with respect to said rotor and having an inner surface engaged by the outer ends of said pistons to move the latter during rotation of said rotor between suction and compression strokes, said inner surface of said displacement ring being radially spaced from the outer surface of said rotor and forming therewith a radial gap of varying height; an inlet channel in said housing on the side of said rotor opposite of said cover; passage means in said housing providing communication between said inlet channel and said gap; a suctions slot in said trunnion communicating during rotation of said rotor with the inner ends of those bores in which the pistons move radially outwardly along the suction stroke; a cross-slot in said trunnion opposite said suction slot and communicating during rotation of said rotor with the inner ends of those bores in which the pistons move radially inwardly along the compression stroke; an outlet channel in said housing; at least one bore through said trunnion substantially parallel to the axis thereof and providing communication between said cross-slot and said outlet channel; an axial bore in said trunnion and a shaft extending through said axial bore and with one end thereof beyond the housing at the side of the latter opposite said cover; coupling means at the other end of said shaft for coupling the shaft to the rotor, said coupling means comprising a coupling disc, and said rotor and said coupling disc being provided with interengaging radial slots and ridges, said coupling disc having axial passages permitting flow of fluid therethrough into said suction slot; and channel means in said cover and providing communication between said gap and said suction slot, said channel means comprising an outer annular channel in the region of said gap, an inner annular channel in the region of said axial passages in said coupling disc, and a plurality of connecting channels displaced circumferentially from each other and providing communication between said outer and said inner annular channel.

4,100,841

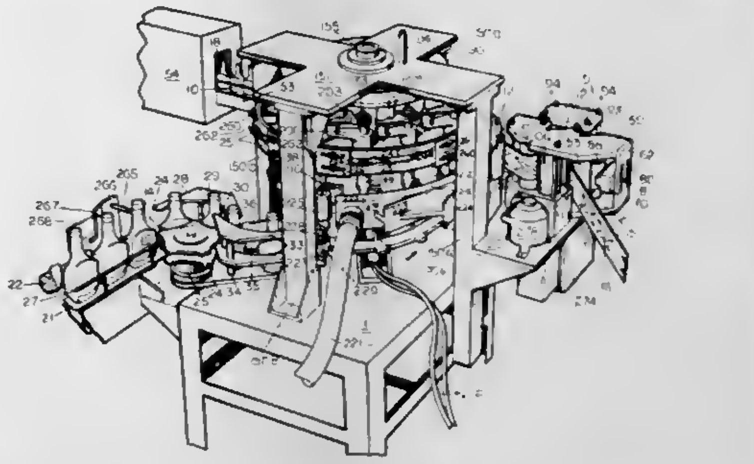
WEB HANDLING APPARATUS FOR PRODUCING SHRUNKEN PILFER-PROOF NECK LABELS FOR CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 526,124, Nov. 22, 1974, Pat. No. 4,013,496, and a continuation-in-part of Ser. No. 514,370, Oct. 15, 1974, Pat. No. 3,951,292. This application May 25, 1976, Ser. No. 689,885

Int. Cl.^{2} B31D *5/04;* B31F *7/00*

U.S. Cl. 93—1 G **6 Claims**



1. Web handling apparatus comprising
pull roll means in engagement with a web of flexible organic thermoplastic material for moving the web in a longitudinal forward direction,
power means connected to said pull roll means for driving the latter,
a web scoring device through which said web is reeved comprising
a scoring back-up roll rotatable about a central longitudinal axis,
a knife element,
a knife holder supporting the knife element,
adjustable support means for said knife holder adjacent said scoring back-up roll holding the knife element normal to the axis of said scoring back-up roll and yieldable in a direction away from the scoring back-up roll.
said knife element engaging the web at a longitudinal line of cut thereon in the direction of travel of the web, said support means holding the knife for partial depth slitting of the web to provide a score line along said line of cut, and
means engaging the scored web for providing cross-pleats therein comprising
a back-up roll having a relatively yieldable peripheral surface rotatably mounted on an axis for engaging the moving web, and
a rotary pleating tool rotatably mounted on an axis parallel to the axis of said last mentioned back-up roll, said pleating tool including an elongated tip extending substantially across said web width and engaging said web for compressing the web material against said back-up roll.

4,100,842

APPARATUS FOR FORMING A CONTAINER

Frank P. Richards, Prairie Village, Kans.; Raymond C. Taylor, Grand View; Jerry W. Young, Weston, both of Mo., and Silvio T. Farfaglia, Fulton, N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1977, Ser. No. 798,197

Int. Cl.^{2} B31B *17/02*

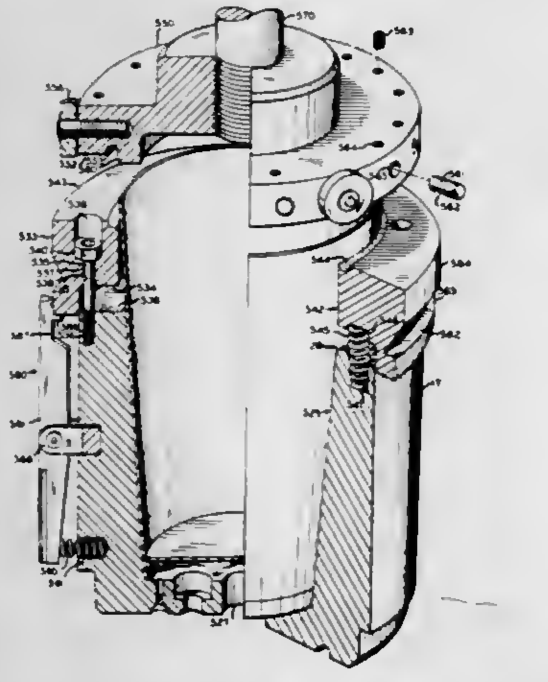
U.S. Cl. 93—39 C **8 Claims**

1. An apparatus for forming a container having a side wall and a bottom closure member, said apparatus including:
(a) a support;
(b) conveying means mounted on said support and being

operable for conveying a mandrel from one station of the apparatus to an adjacent station of the apparatus;

(c) bottom closure forming means positioned adjacent said conveying means and adapted for forming a bottom closure member and transferring same to said mandrel, said bottom closure forming means including:
  (1) a forming die having a plurality of different sized forming areas;
  (2) feed means cooperating with said forming die and being operable for feeding bottom blanks to said forming die;
  (3) a plunger arrangement positioned adjacent said die and adapted to move a blank from said feed means into said die, said plunger arrangement having a plurality of different sized portions for cooperating with a respective forming area to form a plurality of sapced apart fold lines on said blank; and
  (4) fourth means connected to said plunger arrangement and operable to selectively move same into said die and retract same from said die;

(d) side wall blank feeding means positioned adjacent said conveying means and adapted for feeding a side wall blank to the mandrel carrying said bottom closure member, said side wall feeding means including:
  (1) a support member;



  (2) a first arm means pivotally mounted on said support member and having a free end;
  (3) a second arm means pivotally mounted on said support member and spaced from said first arm means and having a free end;
  (4) a first member pivotally connected to said first arm means and second arm means adjacent the respective free ends;
  (5) a feed member mounted on said first arm means and movable therewith, said feed member is spaced from a portion of said first member forming a side wall blank receiving throat therebetween, said feed member being operably connected to drive means for effecting operation thereof;
  (6) conveying means positioned adjacent said feed member and operable for conveying a side wall blank fed by the feed member through the throat to a point of use, said conveying means being operably connected to drive means for effecting operation thereof;
  (7) a magazine for storing a plurality of side wall blanks;
  (8) heating means adapted for heating side marginal portions of said side wall blank;

(e) wrapping means positioned adjacent said conveying means and adapted for wrapping a side wall blank about a mandrel carrying same and overlapping the side marginal portions thereof and holding the side overlapped marginal portions in engagement with one another for securing same together, said wrapping means including:
  (1) a clamping means associated with each of said mandrels to hold an intermediate portion of a blank therebetween;
  (2) first and second folding wing means each of said first and second folding wing means having a frame, a wiping blade, and means for resiliently mounting the wiping blade in the frame for movement of the blade along the line radial to the longitudinal axis of said mandrel when said a blank wrapping position; said first and second folding wing means being positioned for the wiping blades to contact the outer surface of the thus held blank on opposite sides of said clamping means;
  (3) fifth means for rotating each of said first and second folding wing means about the longitudinal axis of a said mandrel in the blank wrapping position to wrap the blank about said mandrel with one side margin of said blank overlapping the opposite side margin of said blank; and
  (4) said fifth means comprising a carriage, guide means for supporting said carriage, means for effecting forward and retractive motion of said carriage in said guide means in a reciprocating manner, first and second shafts, said second shaft being a sleeve positioned coaxially with and about an intermediate portion of said first shaft, said carriage having means defining first and second slots therein extending at least generally transversely to said direction of the reciprocating motion, a first slide element positioned in said first slot in operative engagement therewith, means connecting said first slide element to said first shaft for smoothly rotating said first shaft responsive to movement of said first slide element transfer sleeve to said direction of the reciprocating motion, a second slide element positioned in said second slot in operative engagement therewith, and means connecting said second slide element to said second shaft for smoothly rotating said second shaft responsive to movement of said second slide element transversely to said direction of the reciprocating motion;

(f) container bottom forming means positioned adjacent said conveying means and adapted for reverse bending a portion of the side wall blank over a skirt portion of the bottom closure member and moving same into engagement with one another for securing same together;

(g) bead forming means positioned adjacent portion of said conveying means and adapted for forming a bead on an edge of a partially formed container at the open end thereof, said bead forming means including:
  (1) a container receiving recaptacle having an open free end with a first surface defining the free end, said receptacle having a container receiving pocket therein extending inwardly from the open free end;
  (2) a ring having a through bore communicating with said pocket, said ring also having second and third surfaces with said second surface being adjacent said first surface;
  (3) first means movably mounting said ring on said receptacle wherein said ring is movable between an extended position away from said receptacle and a retracted position adjacent said receptacle with said first means also biasing said ring to the extended position, said ring having an annular first groove recessed in said third surface;
  (4) latch means cooperating with said ring and operable to releasably retain said ring in its retracted position;
  (5) second means cooperating with said latch means for selectively releasing same from retaining said ring in its retracted position;
  (6) a forming head positioned adjacent said ring and having a fourth surface with an annular second groove therein selectively cooperating with said first groove to form a substantially enclosed bead forming groove; and
  (7) third means having said forming head mounted on a portion thereof, said third means being operable for rotating said forming head and for selectively moving said forming head between an extended position adjacent to and engaging said ring and a retracted position remote from said ring.

4,100,843
METHOD AND APPARATUS FOR ERECTING FOLDED BLANKS

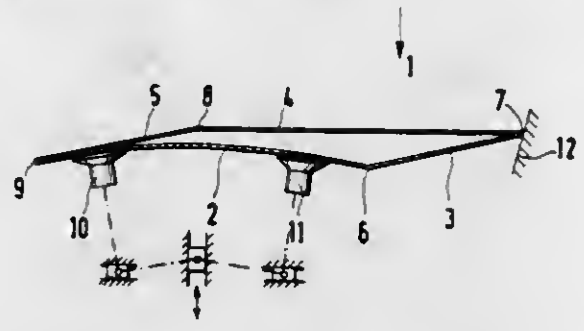
Walter Dietrich, Auenwald, and Manfred Bauer, Weinstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 11, 1977, Ser. No. 767,861

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606017

Int. Cl.² B31B *1/80*

U.S. Cl. 93—53 M **6 Claims**



1. A method for opening and erecting a tubular, substantially flat blank, especially a folded box blank having pairs of sides of different length, comprising the steps of:
  advancing plural suction elements into a position to engage one long side wall of said flat blank;
  applying vacuum to said suction elements;
  retracting said plural suction elements together with said side wall of said flat blank to begin erecting said flat blank;
  moving said flat blank into engagement with a stop means; and
  continuing to pull said flat blank into a fully opened erect state.

4,100,844
BOX BLANK PUNCHING TOOL

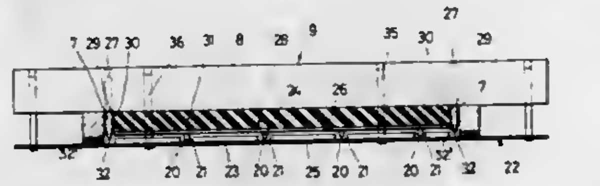
Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to R & S Stanzformen GmbH, Bergen-Enkheim, Fed. Rep. of Germany

Filed Jun. 21, 1976, Ser. No. 697,747

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1975, 7519878[U]; Oct. 15, 1975, 2546082

Int. Cl.² B31B *1/20*

U.S. Cl. 93—59 ES **6 Claims**



1. In a punching tool for making folding box blanks, including a male die member having a support base plate with punching knives secured to said support base plate, said punching knives defining the contours and cut lines of said blanks, with embossing projections also supported by said support base plate, and with a female die member with grooves therein arranged for cooperation with said male die member, the improvement comprising embossing plate means, said embossing projections extending from said embossing plate means in the same direction as said punching knives, said embossing plate means being movably held by said support base plate within the contour defined by said punching knives, elastic means interposed between said embossing plate means and said support base plate so that said embossing projections extend beyond the plane defined by the cutting edges of the punching knives when the elastic means are uncompressed, said female die member comprising a female plate member with raised fields thereon, said raised fields being spaced from each other to define said grooves which cooperate with said embossing projections, said punching knives comprising chamfers forming a cutting edge proper and a portion of uniform and reduced cross-section immediately adjacent to said chamfers forming the cutting edge proper, said reduced cross-section permitting the free movement of said embossing plate means, said elastic means comprising a compressible rubber elastic layer interposed between said embossing plate means and said support base plate, whereby the embossing plate means serves as an ejector when said rubber elastic layer expands after it has been compressed.

4,100,845
METHOD AND MACHINE FOR PRODUCING FILTER ELEMENTS FOR TOBACCO SMOKE

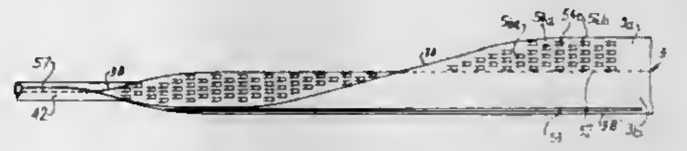
Kurt A. Körber, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Apr. 27, 1976, Ser. No. 680,722

Claims priority, application Luxembourg, May 15, 1975, 72749

Int. Cl.² A24C *5/50*

U.S. Cl. 93—77 FT **21 Claims**



1. A method of producing and processing a continuous filter rod, comprising the steps of conveying a continuous web of flexible material, particularly paper, lengthwise along a predetermined path; partially removing from the moving web a plurality of lugs which continue to adhere to the web and deflecting the lugs to one side of the web, said removing step comprising providing the web with incisions surrounding openings which develop in the web as a result of said deflecting step; converting the web into a continuous multi-walled rod wherein an outer tubular wall surrounds an inner tubular wall and said lugs extend into the interior of said inner wall, said openings being provided in said inner wall and being surrounded by said outer wall; and subdividing said rod into discrete rod-like filter elements each of which contains a plurality of lugs, as considered in the axial and circumferential directions of the filter element, so that said lugs and said walls form a labyrinth for the flow of a gaseous fluid through the respective filter element.

4,100,846
METHOD OF FORMING FIBER CANS

Francis R. Reid, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

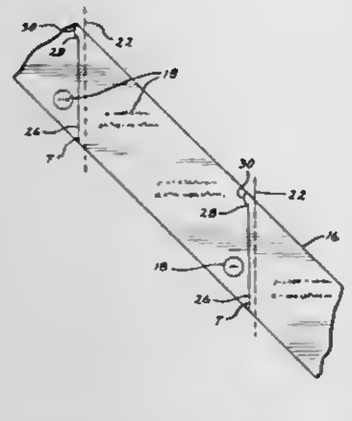
Filed Jun. 30, 1976, Ser. No. 701,315

Int. Cl.² B31C *3/00*

U.S. Cl. 93—94 R **4 Claims**

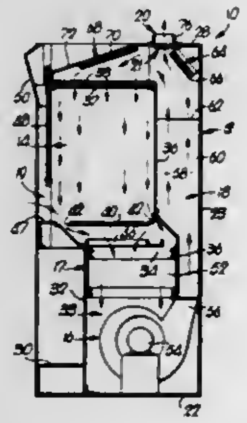
1. A method for forming a fiber can comprising providing an elongated winding mandrel, continuously winding a strip of fiber can body material onto the winding mandrel, continuously winding a strip of label material onto the strip of body stock material and just prior to applying the label strip to the body stock strip making a flying cut in the label by partially

severing the label strip to define a partial collar cut extending circumferentially of the cans being formed, said collar cut extending from one edge thereof in the direction of the opposite edge and having a termination point spaced from the opposite edge with a ligament of unsevered label material between the termination point and said opposite edge.



4,100,847
CONVERTIBLE, LAMINAR FLOW BIOLOGICAL SAFETY CABINET APPARATUS

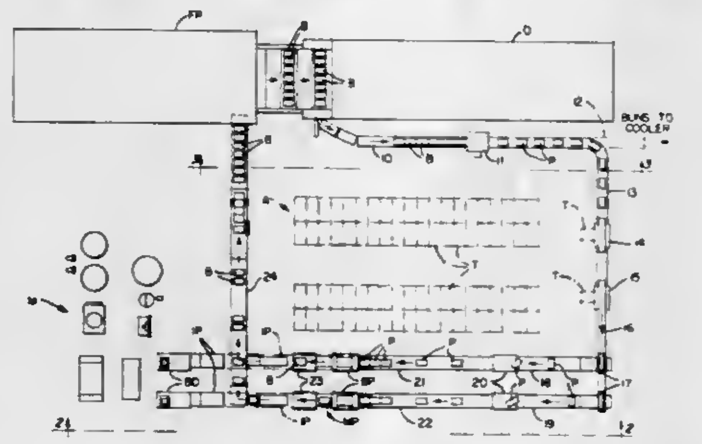
Robert O. Nnrton, Chesterfield, Mo., assignor to Labconco Corporation, Kansas City, Mo.
Filed Dec. 20, 1976, Ser. No. 752,800
Int. Cl.^{2} F23J *11/00*
U.S. Cl. 98—115 LH **4 Claims**



1. Biological safety cabinet apparatus, comprising:
upright cabinet structure including means defining a continuous air path allowing recirculation of air within the cabinet structure, a work compartment defining a portion of said path and located and arranged for generally vertical, downwardly directed airflow therethrough, a fresh air inlet communicating directly with said compartment, and an air discharge outlet;
means presenting a generally horizontally disposed work surface positioned within said compartment and adjacent said air inlet;
filter means located directly beneath said work surface for removing contaminants from air traveling along said path and preventing discharge of said contaminants through said outlet;
fan means below said filter means for pulling ambient air into said air path through said inlet and moving air along said path;
air diffuser means above said work surface and located in said air path for creating generally vertical laminar flow of air throughout the entirety of said compartment; and
movable damper means adjacent said outlet for simultaneously varying the amount of air discharged from the outlet, the amount of fresh air introduced through said inlet, and the laminar flow characteristics of the air traveling through said compartment.

4,100,848
HIGH SPEED BUN PRODUCTION SYSTEM

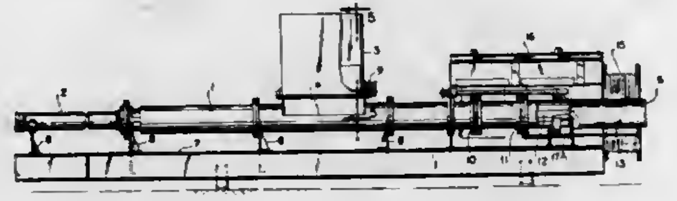
Glean R. Grissinger, York, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Jun. 27, 1974, Ser. No. 483,830
Int. Cl.^{2} A21B *7/00*
U.S. Cl. 99—353 **4 Claims**



1. A high speed bun dough piece pan conveying and bun dough piece handling system, comprising an intermediate proofer having a vertical section and a horizontal section joined at one end thereof to an upper end of the vertical section and extending outwardly at its other end in spaced relation to the vertical section, dough piece conveying means in the intermediate proofer for receiving dough pieces and conveying them through the intermediate proofer to proof the dough pieces, a moulder-panner unit adjacent and spaced below said other end of the horizontal section of the intermediate proofer and receiving dough pieces from said intermediate proofer, said dough pieces being formed into bun dough pieces in said moulder-panner unit, said moulder-panner unit having rectilinear pan conveying means having a longitudinal axis and rectilinearly conveying pans toward said intermediate proofer vertical section, said moulder-panner unit having bun dough piece conveying means positioned to receive the bun dough pieces and to convey the bun dough pieces to a depositing location whereat said bun dough pieces are moved from said bun dough piece conveying means and deposited in an empty pan, and rectilinear empty pan conveyor means having a longitudinal axis and located adjacent said moulder-panner unit for rectilinearly conveying empty pans to said moulder-panner unit, said empty pan conveyor means extending in a substantially straight line to the moulder-panner unit, and being in longitudinal linear alignment with said moulder-panner unit pan conveying means and cooperating therewith to transfer said empty pan to a receiving location which is adjacent said depositing location whereat said empty pans receive said bun dough pieces deposited therein from said bun dough piece conveying means, said empty pan conveyor means being arranged to convey empty pans rectilinearly toward the intermediate proofer vertical section to deliver said empty pans to said moulder-panner unit pan conveying means adjacent said intermediate proofer horizontal section other end so that said empty pans are conveyed by said moulder-panner unit conveying means and said empty pan conveyor means toward said intermediate proofer vertical section along paths on said empty pan conveyor means and said empty pan conveying means which paths are longitudinally aligned with each other in the vicinity of said intermediate proofer.

4,100,849
CONTROL SYSTEM FOR REFUSE COMPACTER

John Franklin Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed May 26, 1976, Ser. No. 690,281
Int. Cl.^{2} B30B *15/26*
U.S. Cl. 100—41 **7 Claims**

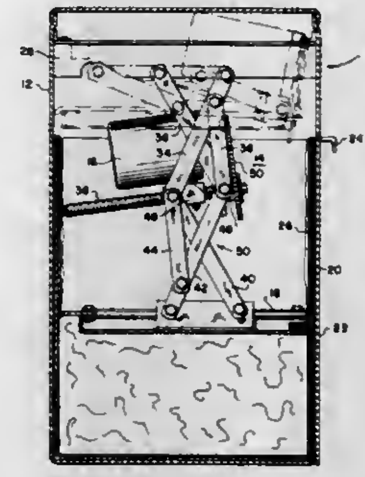


1. A process for automatically controlling the amount of restriction in apparatus for compacting refuse comprising (a) a cylindrical tube having an inlet end, a discharge end and a compaction zone therebetween, a lock-out point located near the forward end of the compaction zone, and a last smallest practicable interval of forward ram travel located downstream of the lock-out point, (b) an axially-aligned, reciprocating, driven ram in the inlet end of said tube, said ram being capable of traveling through the compaction zone, (c) a discharge port in the open discharge end of said tube, and (d) a plurality of restrictors near the discharge end of the tube for controlling the compaction pressure exerted by the refuse, said restrictors being capable of being moved inward and outward during each ram stroke in response to changes in the ram pressure required to advance the refuse through said tube, said process comprising the steps of:
(1) measuring the ram pressure during the last smallest practicable interval of forward ram travel,
(2) adjusting the restrictors inward a predetermined distance if the ram pressure measured in step (1) is less than a predetermined pressure P_1,
(3) measuring the ram pressure when the ram is at the lock-out point in its forward stroke,
(4) overriding step (2) by making no inward restrictor adjustment if the pressure measured in step (3) is less than a predetermined lock-out pressure P_3, where P_3 is the lock-out pressure and is less than P_1,
(5) measuring the ram pressures during at least the last smallest practicable interval of forward ram travel, and
(6) adjusting the restrictors outward a predetermined distance if the ram pressure measured in step (5) is greater than a predetermined pressure P_2, where P_2 is greater than P_1.

4,100,850
DRIVE MECHANISM FOR TRASH COMPACTORS

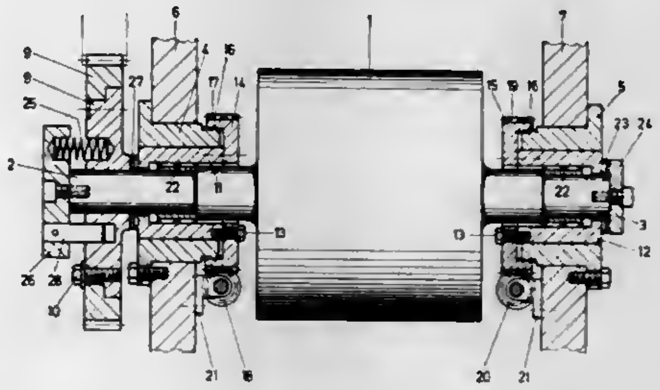
David W. Wolbrink, Hartford; William A. Kaepernick, Horicon; Du Wayne M. Sellinger, and Dieter W. Otte, both of Hartford, all of Wis., assignors to Broan Manufacturing Co., Inc., Hartford, Wis.
Filed Dec. 10, 1976, Ser. No. 749,470
Int. Cl.^{2} B30B *1/18*
U.S. Cl. 100—287 **24 Claims**

1. A trash compactor having a ram movable in a frame into and out of a compaction position by means of a lead screw coupled to one of said ram or frame, said ram being subject to eccentric loading which alters the position of the screw, the improvement comprising;
a nut threaded on the lead screw for axial movement along the lead screw responsive to relative rotation between said screw and nut, said nut having opposing faces through which said screw extends, and a housing surrounding said nut for providing said relative rotation between said nut and screw, said housing having a pair of walls lying generally normal to the lead screw and loosely embracing said nut along said faces for permitting relative pivotal movement of said nut with respect to said housing about an axis generally normal to the lead screw, the faces of said nut having corners which abut said walls during said relative pivotal movement, said corners being beveled to facilitate said movement and to limit the movement to that necessary to accommodate a limited range of alterations in the position of the screw, said housing being coupled to the other of said ram or frame for providing movement to the ram responsive to relative rotation between the nut and screw.



4,100,851
DEVICE FOR ADJUSTING LATERAL AND CIRCUMFERENTIAL REGISTRY IN ROTARY PRINTING MACHINES

Hans-Georg Jahn, Wiesenbach, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany
Filed Oct. 31, 1977, Ser. No. 846,848
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 7634679
Int. Cl.^{2} B41F *13/14*
U.S. Cl. 101—248 **2 Claims**

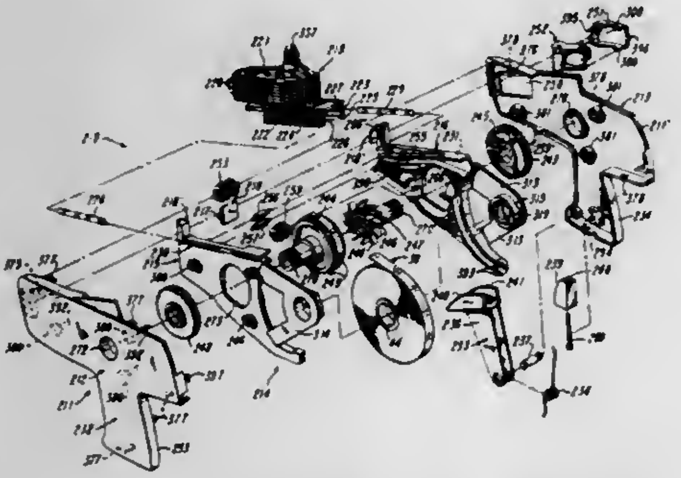


1. In a rotary printing machine having a plate cylinder journalled at opposite ends thereof in a respective bearing and having a helical drive gear for the plate cylinder mounted on the journal thereof, a device for adjusting lateral register by axial shifting of the plate cylinder and for adjusting circumferential register by axial shifting of the helical drive gear, the device comprising adjusting members disposed so as to act coaxially upon at least one of the plate cylinder and the drive gear therefor, said adjusting members including a sliding bushing disposed in each bearing of the plate cylinder, a toothed rim threadedly adjustable at each of the plate-cylinder bearings and connected to the respective sliding bushing, and a respective worm spindle meshingly engaging each said toothed rim, a disc member secured to the plate-cylinder journal at one of the bearings, and first thrust bearing means engageable with said disc, the sliding bushing at the one bearing being adjustable so as to bear through said first thrust bearing means against said disc for effecting lateral register adjustment, the

helical drive gear being mounted for sliding on the journal at the other of the bearings, an entrainer disc also mounted on the journal at the other of the bearings, compression spring means for bracing the helical drive gear against said entrainer disc, and second thrust bearing means engageable with said helical drive gear, the sliding bushing at the other bearing being adjustable so as to bear through said second thrust bearing means against the helical drive gear for effecting circumferential register adjustment.

4,100,852
LABEL PRINTING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Continuation of Ser. No. 449,157, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Apr. 14, 1975, Ser. No. 567,658
Int. Cl.² B41F *1/46*
U.S. Cl. 101—295 **35 Claims**

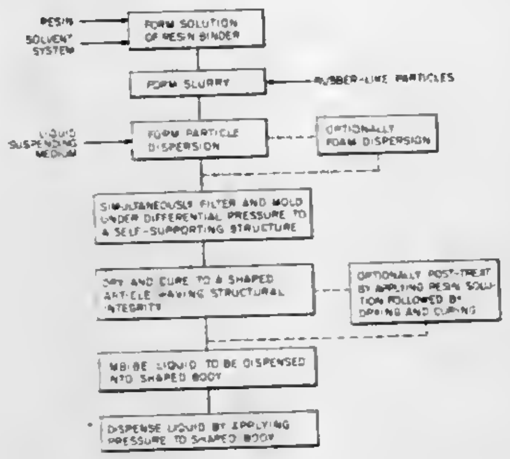


1. For a printing apparatus: an inker including an ink roller and a one-piece inker body, means for rotatably mounting the ink roller to one end portion of the inker body, the inker body being comprised of moldable plastics material, a spring finger having first and second end portions and having a curvature located between its first and second end portions, the spring finger being connected at its first end portion to the inker body, the spring finger being disposed at the other end portion of the inker body, the spring finger being adapted to act on a part of a printing apparatus for resiliently urging the inker body and the ink roller which it mounts in one direction, and inker body mounting means including separate pivot means connected to the inker body, said inker body mounting means being disposed on opposite sides of the curvature in the spring finger, the inker being adapted to be pivoted at the pivot means.

4,100,853
METHOD OF FORMING A POROUS SHAPED BODY CAPABLE OF RETAINING LIQUIDS THEREIN

John J. Clancy, Westwood, and Robert C. Wells, Arlington, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Filed Aug. 9, 1976, Ser. No. 712,441
Int. Cl.² B29D *27/04*
U.S. Cl. 101—401.1 **30 Claims**

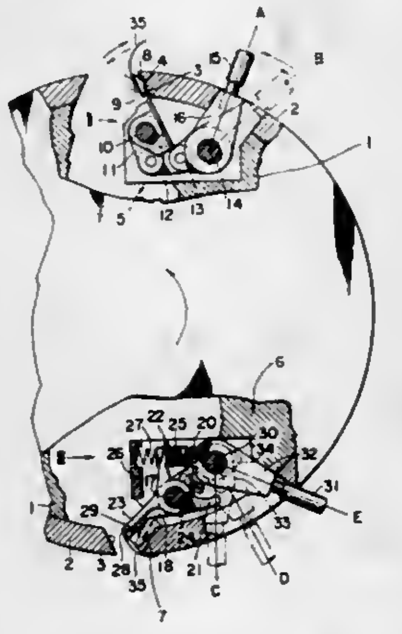
29. A method for controllably dispensing a liquid to a receptor surface, comprising:
a. forming a slurry of rubber-like particles in a solution of a heat-activatable resin binder in a solvent system containing a major amount of a first solvent for said resin binder and a minor amount of a second solvent for said resin binder, said first solvent being a non-solvent for the rubber-like particles and said second solvent being a softening agent for the rubber-like particles, said first and said second solvents for the resin binder being miscible with each other;
b. combining a liquid-suspending medium with said slurry to form a dispersion of said rubber-like particles;
c. introducing said dispersion into a mold having at least one porous wall member;
d. applying a differential pressure of from about 5 to about 100 psi across the mold to remove liquids therefrom and to form the solids into a porous shaped body which is self-supporting;


RESIN
SOLVENT SYSTEM
FORM SOLUTION OF RESIN BINDER
FORM SLURRY
RUBBER-LIKE PARTICLES
LIQUID SUSPENDING MEDIUM
FORM PARTICLE DISPERSION
OPTIONALLY FOAM DISPERSION
SIMULTANEOUSLY FILTER AND MOLD UNDER DIFFERENTIAL PRESSURE TO A SELF-SUPPORTING STRUCTURE
DRY AND CURE TO A SHAPED ARTICLE HAVING STRUCTURAL INTEGRITY
OPTIONALLY POST-TREAT BY APPLYING RESIN SOLUTION FOLLOWED BY DRYING AND CURING
IMBIBE LIQUID TO BE DISPENSED INTO SHAPED BODY
DISPENSE LIQUID BY APPLYING PRESSURE TO SHAPED BODY

e. heating said shaped body to an elevated temperature to cure the resin binder and thereby provide structural integrity to said porous shaped body;
f. contacting the porous shaped body with liquid to be controllably dispensed under conditions whereby said liquid is imbibed into pores of said porous shaped body; and,
g. bringing said porous shaped body into pressure contact with the receptor surface to controllably dispense liquid to said receptor surface.

4,100,854
DEVICE FOR MOUNTING RESIN PLATE ONTO PLATE CYLINDER

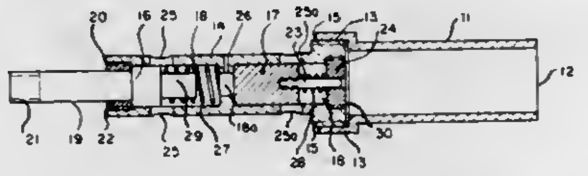
Yuji Fujishiro, and Hideo Ohta, both of Tokyo, Japan, assignors to Japan Society for Promotion of Machine Industry, Tokyo, Japan
Filed Aug. 28, 1974, Ser. No. 501,466
Claims priority, application Japan,
Int. Cl.² B41F *27/06*
U.S. Cl. 101—415.1 **1 Claim**



1. A device for mounting a plastic film based resin plate for use in printing on a plate cylinder, characterized in that said device comprises a first groove formed along one longitudinal side edge of each of two members having a symmetrical semicircular section which constitute a plate cylinder, and each consisting of a plate cylinder proper and a plate cylinder outer ring, a fixing member made of a resilient material and having formed thereon a first wedge-shaped protrusion adapted to fit into the groove, with said fixing member being fixedly secured to a freely rotatable first support shaft, said first support shaft being mounted at a position adjacent to the first groove and connected through linkage composed of a first arm, a link and a second arm connected to a first operating rod, a second support shaft mounted at a position adjacent to the other longitudinal side edge of each of said two members, said second support shaft having fitted thereon and fixedly secured thereto a tension member formed with a second groove and a holding member having formed thereon a second protrusion adapted to fit into the second groove, a third support shaft adapted to be rotated by operating a second operating rod, and a cam for operating the tension member and a cam for operating the holding member fixedly secured to the third support shaft, said cams being arranged in an angular relationship so that the tension member is kept away from the holding member when the first operating rod is located at an unlocked or open position, and the first wedge-shaped protrusion of the holding member fits into the second groove of the tension member when the second operating rod is located at a locking position, and further the tension member and the holding member are rotated together away from said other longitudinal side edge while the first wedge-shaped protrusion remains fitted into the groove, when the second operating rod is rotated from the locking position to a tensioning position.

4,100,855
UNDERWATER POWER HEAD

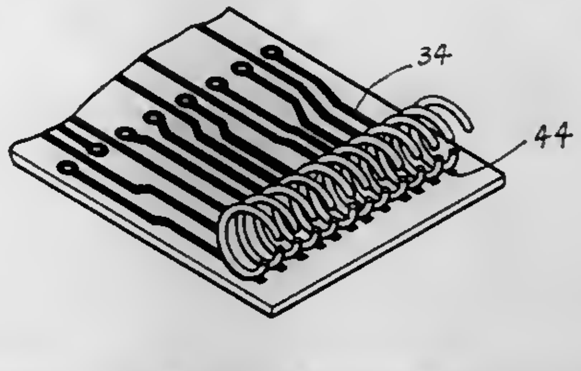
Larry John O'Callaghan, Flat 10, 132 Sixth Ave., Inglewood, Australia
Filed Mar. 25, 1977, Ser. No. 781,215
Claims priority, application Australia, May 11, 1976, 13846/76
Int. Cl.² F42B *13/54*
U.S. Cl. 102—48 **5 Claims**



1. A power head for a fishing spear comprising a chamber to house an explosive cartridge open at one end, and a firing mechanism detachably secured to the other end of the chamber, said mechanism comprising a cylinder having two pistons slidably mounted therein and spaced apart, said first piston being connected to a piston rod projecting from the end of the cylinder remote from the chamber and said second piston being fitted with a firing pin adapted to act on a cartridge in the chamber, said cylinder being provided with a plurality of spaced ports through which water can enter and fill the space in the cylinder between the pistons, the first ports being adapted to be closed as the first piston moves along the cylinder towards the chamber and the second ports being adapted to be closed as the second piston moves in the same direction, the movement of the second piston being effected through water trapped in the cylinder between the two pistons after the first ports have been closed.

4,100,856
FUZE ENCODER

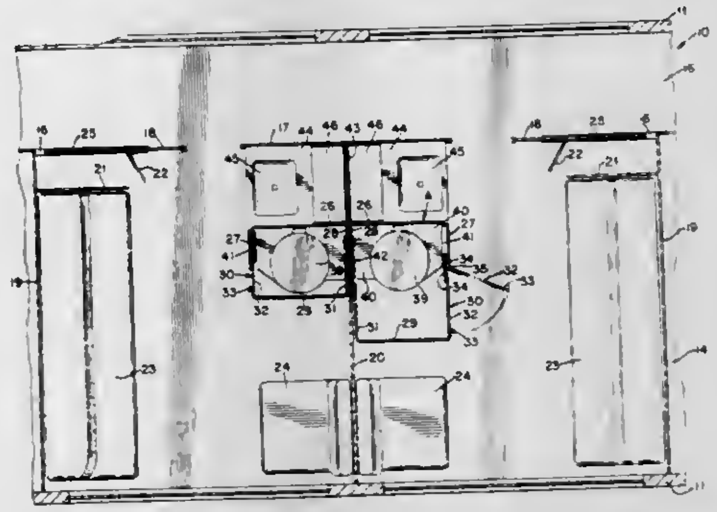
Richard Thomas Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.
Filed Feb. 17, 1977, Ser. No. 769,757
Int. Cl.² F42C *19/06;* G06K *7/04;* H01R *9/00*
U.S. Cl. 102—206 **10 Claims**



1. A method of manufacture of a contact assembly having a plurality of contact springs comprising:
providing a support having a like plurality of spaced apart conductive lands;
providing a helical spring having a like plurality of turns;
disposing each of said turns adjacent a respective one of said lands;
mechanically and electrically fixing a portion of each of said turns to the respective adjacent land; and
cutting each turn.

4,100,857
PASSAGEWAY BETWEEN ADJACENT RAILWAY PASSENGER CAR COMPARTMENTS

Jack E. Gutridge, Dyer, and Walter J. Marulic, Gary, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed Apr. 11, 1977, Ser. No. 786,752
Int. Cl.² B61D *35/00*
U.S. Cl. 105—323 **5 Claims**



1. In a railway passenger car having a pair of compartments disposed in side by side relation and including an outer wall and a wall structure defining the inner side of the compartments and having door openings providing access from each compartment to an aisle in said car, the improvement comprising:
a telescoping divider wall separating said compartments and extending between said outer wall and said wall structure and having a portion slidable toward and away from said outer wall to respectively close off the compartments from each other and to provide a passageway between said compartments,
a sanitary closet including an enclosure in each compartment disposed at opposite sides of said divider wall intermediate the ends thereof,

each enclosure comprising a fixed section and a U-shaped extension section,

said fixed section having a first wall extending transversely from the divider wall into the respective compartment and having a second wall extending from the edge of the first wall remote from the divider wall in laterally spaced relation and generally parallel therewith,

said U-shaped extension section including inner and outer wall members and an interconnecting end wall member, and

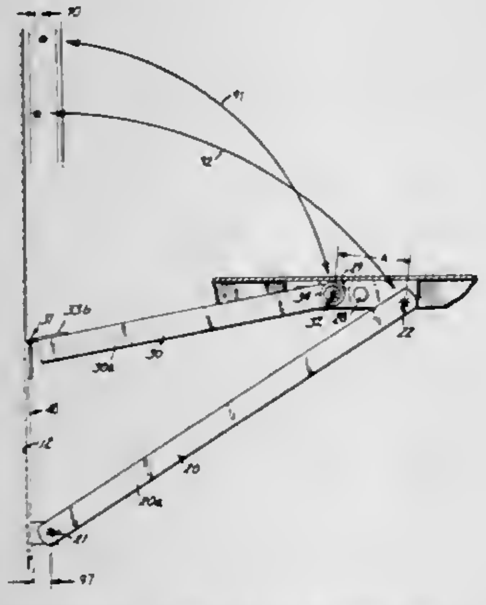
each said extension section being separately telescopable into the respective fixed section from said passageway between said compartments and said interconnecting end wall members being transversely alignable with respect to each other and with respect to the end of the divider wall when it is in its retracted position to provide a wide aisle therebetween attendant to said slidable portion of the divider wall being telescoped to provide said passageway.

4,100,858
FOLDING WALL TABLE

Richard C. Bue, Chaska, and Casey L. Carlson, Minneapolis, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed Jan. 21, 1977, Ser. No. 760,851
Int. Cl.² A47B *5/00*

U.S. Cl. 108—48 **10 Claims**



1. A folding wall table adapted for attachment to a wall for movement between a storage position vertically disposed adjacent the wall and a usable position horizontally extending from the wall, comprising:

a table surface member;

upper and lower hinge arm means;

upper and lower wall pivot means for pivotally connecting said upper and lower hinge arm means respectively to said wall with the pivot axis of said upper hinge arm means higher than the pivot axis of said lower hinge arm means;

upper and lower table pivot means for pivotally connecting said upper and lower hinge arm means respectively to the underside of said table surface member with the pivot axis of said upper table pivot means positioned closer to the wall, when the table is in its usable position, than the pivot axis of said lower table pivot means;

said hinge arm means and said pivot means for allowing movement of said table surface member between its usable and its storage position with the underside of the table folding against the wall in the storage position; and

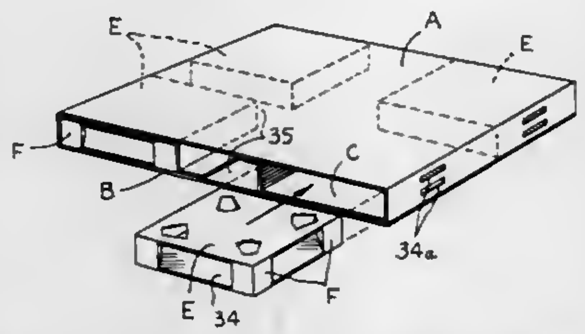
the pivot axis of said lower table pivot means being spaced below a plane passing through the pivot axis of said upper table pivot means and parallel with the table surface when in its usable position, so that the pivot axis of said lower table pivot passes through a plane containing the upper hinge arm and its pivot axes to provide an overcenter resistance force as the table moves through an intermediate position near the storage position.

4,100,859
FORK LIFT PALLET

Alexander B. Clark, Jr., Box 2012, Hendersonville, N.C. 28739

Filed Sep. 7, 1976, Ser. No. 720,963
Int. Cl.² B65D *19/34*

U.S. Cl. 108—51.3 **6 Claims**



5. A support member for a fork lift pallet comprising:

a substantially rectangular cardboard blank;

opposed end walls defined by spaced pairs of transverse scores in said blank;

each of said end walls being spaced inwardly of opposed edges of said blank defining top flaps when said blank is folded along said scores;

opposed side walls defined by a plurality of longitudinal scores adjacent each edge of said blank;

a pair of inwardly foldable vertical flaps hinged at opposed ends thereof adjacent spaced intermediate portions of at least one of said walls; and

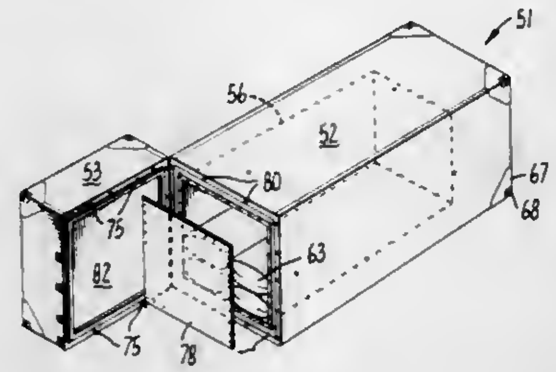
said flaps when folded inwardly forming a triangular tubular core at each corner of said support member and fork lift openings therebetween.

4,100,860
SAFE TRANSPORATION OF HAZARDOUS MATERIALS

Kenneth A. Gablin, Burton, and Larry J. Hansen, Tacoma, both of Wash., assignors to Nuclear Engineering Co., Inc., Louisville, Ky.

Continuation of Ser. No. 171,713, Aug. 13, 1971, abandoned. This application Nov. 26, 1973, Ser. No. 418,928
Int. Cl.² E04B *2/02;* B65D *25/18*

U.S. Cl. 109—83 **28 Claims**



1. In a shipping container overpack for protected transportation of hazardous materials and the like,

a receptacle formed in a plurality of sections,

a resilient gasket positionable in sealing engagement between said sections for releasably sealing them together to provide a leakproof overpack,

attachment means for operatively engaging and releasably securing said sections together with said gasket positioned in sealing engagement therebetween,

at least one of said sections being defined by wall structures, comprising

an inner liner,

an outer shell spaced from said inner liner,

reinforcing plates positioned at the inner surfaces of said outer shell for resisting penetration of said outer shell by external objects and

a layer of foam material sandwiched between and adhered to said inner liner and said outer shell and

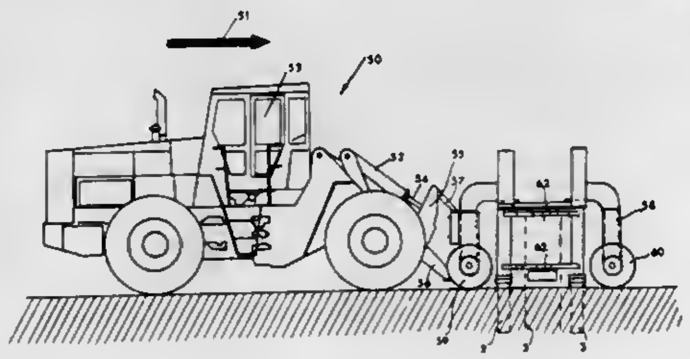
wall means joining said inner liner and outer shell to enclose said layer of foam material.

4,100,861
SOIL STABILIZING APPARATUS

Gunnar Olsson, (Matrosvagen 7), Svortkarrsvagen 24, S-133 00 Saltjobaden, Sweden

Division of Ser. No. 735,363, Oct. 26, 1976, Pat. No. 4,063,523. This application Sep. 6, 1977, Ser. No. 830,976
Int. Cl.² A01C *23/02*

U.S. Cl. 111—7 **9 Claims**



1. An apparatus for mixing into a ground layer a ground stabilizing material in solid or liquid form, said apparatus comprising:

a carrier,

means for moving said carrier in an endless path above the ground surface,

said carrier including a number of material injecting members,

a storage container carrying ground stabilizing material,

means for transferring said material from said storage container to said material injecting members, the improvement wherein:

said means for moving said carrier in an endless path above the ground surface comprises means for moving said material injecting members in a substantially linear portion of the endless path across the travelling direction of the vehicle,

means for agitating the material injecting members during its passage, and

means for variably proportioning material at its departure from the material injecting members.

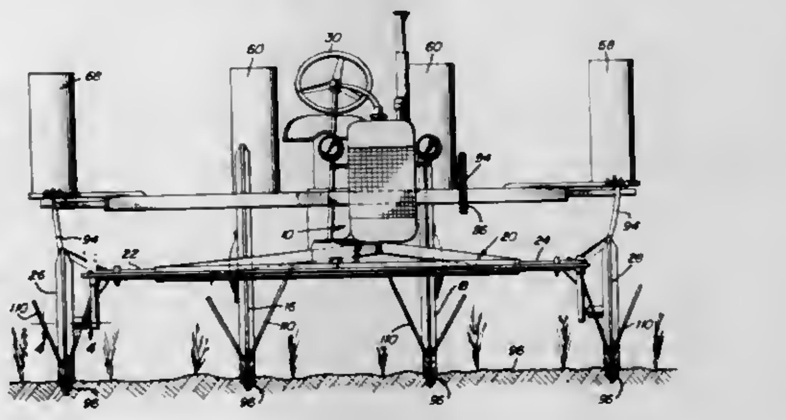
4,100,862
4-ROW TRAC PLANTER

Robert P. Mowen, and Jacob D. Gettings, both of R.R. #4, Jerseyville, Ill. 62052

Filed Mar. 21, 1977, Ser. No. 779,737
Int. Cl.² A01C *5/00*

U.S. Cl. 111—52 **3 Claims**

1. A trac planter comprising a frame including journalled narrow front and rear pairs of opposite side wheels, a prime mover mounted on said frame and drivingly connected to at least one pair of said wheels, said frame defining a longitudinal center line, said wheels being disposed in four vertical planes paralleling said center line and spaced equally apart transversely of said frame, said wheels including narrow outer peripheral portions adapted, due to the gross weight of said planter, to form narrow depressed tracks in cultivated ground over which said planter travels, and seed planting means supported from said frame and including narrow depending seed discharging means disposed immediately rearwardly of each of said wheels, in the corresponding vertical plane, and operative to discharge seeds into the depressed ground tracks formed by said wheels, the outer peripheral portions of said wheels being generally V-shaped in cross-sectional shape with their apex portions facing generally radially outwardly of the corresponding axes of rotation of said wheels, each of said wheels having a rearwardly and upwardly opening and inclined generally V-shaped standing crop divider operatively supported from said frame immediately ahead of the lower forward quadrant of the corresponding wheel, said frame, other than said depending seed discharging means and said standing crop dividers being devoid of portions thereof projecting more than slightly below the axes of rotation of said wheels, the lower portions of said wheels, below elevations thereon spaced only slightly below said axes of rotation thereof, being of axial thicknesses no greater than the width of said outer peripheral portions, said wheels being supported from said frame with their axes of rotation spaced below said frame.

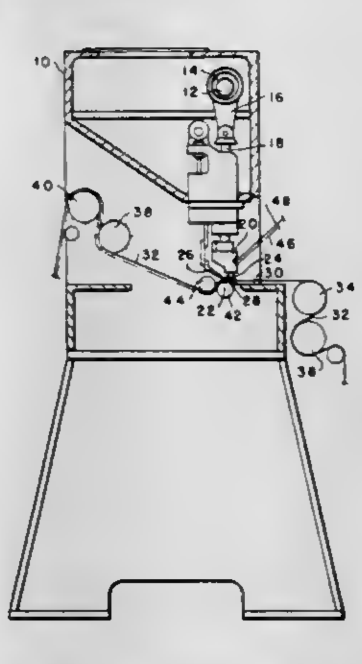


4,100,863
TUFTING MACHINE

Willard Harmond Shortte, Jr., La Grange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 662,262, Feb. 27, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,222
Int. Cl.² D05C *15/28*

U.S. Cl. 112—79 R **1 Claim**



1. Apparatus to produce a tufted pile fabric comprising: a frame, a needle bar mounted in said frame, a first means to reciprocate said needle bar, at least two rows of hollow tufting needles mounted on said needle bar, a needle plate, means to supply a backing material to said rows of hollow tufting needles over said needle plate, means to supply yarn to each of said hollow needles to project the loops of yarn beyond the tip

of the needle through said needle plate and the backing material by the action of fluid streams moving through the needles, nip roll means mounted closely adjacent said hollow tufting needles with the centerline of each below said needle plate and on the side of said needles away from the means to supply backing material to guide tufted fabric away from said needles and means to periodically move said roll means laterally of said tufting needles to shift the lateral position of said backing material to lessen the rowing effect in the tufted fabric.

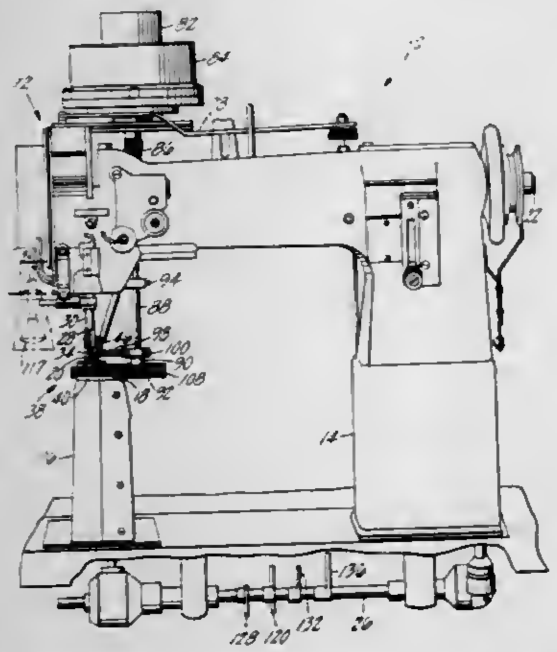
4,100,864
AUTOMATIC WORK GUIDANCE MECHANISM

Edward Spencer Babson, Ipswich; Donald Franklin Herdeg, South Hamilton, and William Burrows Mercaldi, Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Filed Jan. 17, 1977, Ser. No. 760,138

Int. Cl.² D05B *19/00, 27/14*

U.S. Cl. 112—121.11 16 Claims



1. A machine comprising a tool movable toward and from a workpiece to be progressively processed, means for slidably supporting the workpiece adjacent to the operating locality of the tool, and a compound feeding-steering means movably mounted on and engageable solely with the opposite side of the workpiece from said workpiece supporting means for progressively orienting the workpiece by exerting torque while feeding it thereon, said feeding-steering means being responsive to predetermined pattern means which is movable synchronously with the work to automatically determine the operating path of the tool on the work.

5. A sewing machine having a head and a work supporting surface spaced therefrom, stitching means carried by the head and including a needle reciprocable relative to a portion of the work supporting surface, and a unitary feeding-steering element movably mounted on the opposite side of the work from said portion of the work supporting surface for guiding a workpiece thereon, said feeding-steering element being responsive to a predetermined pattern control means thus to apply a turning moment to the work and about the axis of the needle incrementally to guide the work automatically during each increment the work is fed.

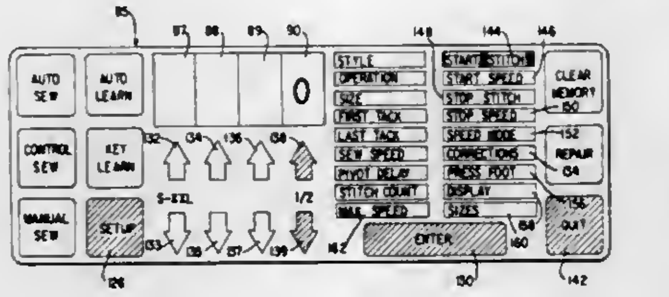
4,100,865
PROGRAMMABLE SEWING MACHINE OPERABLE IN A PLURALITY OF MODES

John Vernon Landan, Jr.; Barney Dean Hants, both of Mountain Lakes; Frederick Alexander Rupinski, Lyndhurst, and Alfred John Zenger, Montville, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,889

Int. Cl.² D05B *19/00*

U.S. Cl. 112—121.11 11 Claims



1. A programmable sewing system comprising:

a sewing machine having a plurality of components operable selectively manually and automatically;

a programmable computer having memory means and a plurality of input terminals coupled to said sewing machine for receiving signals indicative of operation of said components of said sewing machine, and a plurality of output terminals coupled to said sewing machine for actuating operation of said components of said sewing machine;

a manually actuated control panel coupled to said computer for entering sewing instructions, said control panel including display means coupled to said computer for receiving display information therefrom;

said system having a first mode of operation selected by way of said control panel wherein basic sewing system operating conditions may be introduced to said computer memory means for subsequent control of said system, said conditions including maximum speed of sewing machine operation, number of start stitches initiating a sequence of stitching operations and speed at which accomplished, and number of stop stitches terminating each segment of said sequence of stitching operations, and speed at which accomplished.

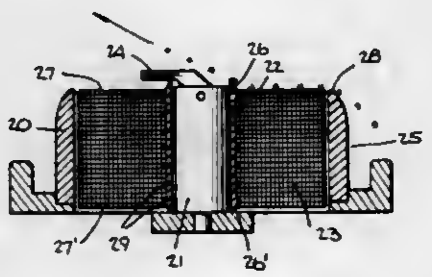
4,100,866
CORE CONSTRUCTION FOR A SEWING MACHINE BOBBIN

Michael R. Philips, Pomona, N.Y., assignor to Jonathan Temple Incorporated, Hackensack, N.J.

Filed Mar. 31, 1977, Ser. No. 783,406

Int. Cl.² D05B *57/28*

U.S. Cl. 112—231 5 Claims



1. In a sewing machine bobbin adapted for disposal in a bobbin case, said bobbin including a hollow cylindrical core on which a thread mass is wound adapted for slidable disposal over a center post mounted in said bobbin case, said bobbin case including latch means mounted on said post for securing said cylindrical core and said thread mass in said bobbin case, and said post and said latch means having a combined axial length greater than the axial width of said bobbin case, the improvement comprising said hollow cylindrical core having the edge of at least one end thereof axially tapered radially inwardly along the axis of said core away from said end towards said center post, said thread mass being wound on said core so that said tapered edge extends axially outwardly along said core axis beyond the surface of said thread mass, said edge having an axial length which is greater than the axial distance between said bobbin case and said latch means, said edge cooperating with said latch means to limit movement of said core on said post so that said surface of said thread mass does not extend axially beyond said bobbin case.

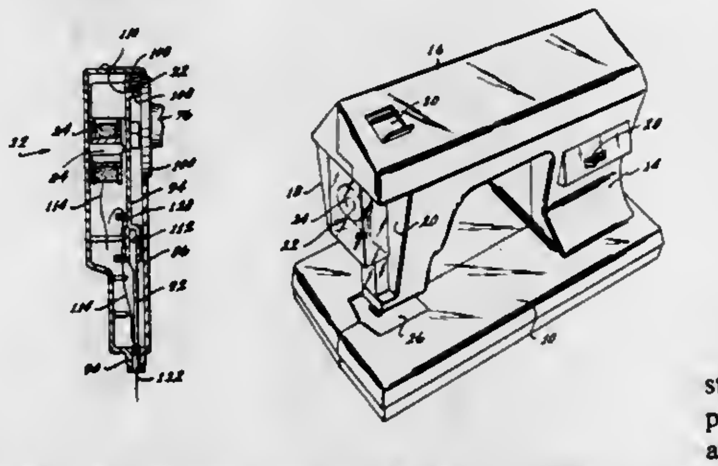
4,100,867
SEWING MACHINE

Sidney Bass, Los Angeles, and Hubert Allen Rich, Westminster, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 21, 1977, Ser. No. 761,381

Int. Cl.² D05B *55/00, 69/22*

U.S. Cl. 112—270 12 Claims



1. In a sewing machine, the combination comprising:

a housing having a bed and an overhanging bracket arm terminating in a head, said head having a recessed surface in a side thereof with said surface generally perpendicular to said bed;

a driving member rotatably mounted in said housing and having a portion thereof extending outwardly through an aperture in said recessed surface;

means within said housing for rotating said driving member;

a cartridge engaging said head within said recessed surface, said cartridge having a planar surface with an aperture therein in communication with said portion of said driving member;

a needle carrier slidably mounted on said planar surface within said cartridge for actuation by said driving member for reciprocating movement toward and away from said bed;

a needle secured to said needle carrier, said cartridge having an opening in alignment with said needle and in proximity to said bed for passage therethrough of said needle, said needle being substantially contained within said cartridge with said needle carrier at its maximum distance away from said bed; and

looping means within said bed for coacting with said needle whereby to generate a stitch in material sewn on said sewing machine.

4,100,868
APPARATUS FOR LIMITING MAXIMUM NUMBER OF STITCHES OF SEWING-MACHINES

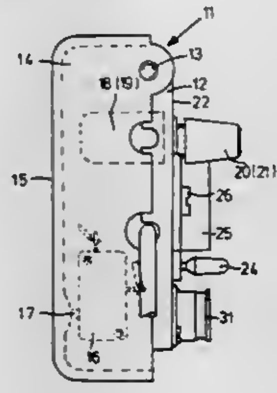
Harry Reinecke, Walldorf, and Gerhard Bachmann, Eppelheim, both of Germany, assignors to Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate, Schwetzingen, Germany

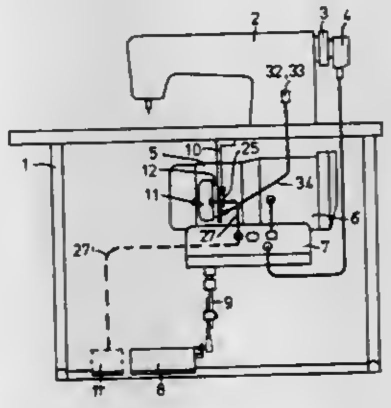
Filed Dec. 9, 1976, Ser. No. 749,094

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 7539310[U]

Int. Cl.² D05B *69/18*

U.S. Cl. 112—277 8 Claims





1. In an apparatus for limiting the maximum number of stiches of sewing machines having a motor, a clutch and brake part associated with the motor, control means for the clutch and brake, and regulating circuit means including a first and a second potentiometer and switch means in circuit to limit the maximum rotational speed of the drive, the improvement wherein said switch means includes a contact switch, a position switch and an independent knee switch having a first surface and a second surface, said first surface being swivelable about an axis; an actuating member connected to said contact switch, said actuating member being in contact with said first surface and said position switch being mounted on said second surface; and adjusting members coupled to respective ones of said two potentiometers for allowing adjustment thereof, said adjusting members being positioned on a surface of said knee switch.

4,100,869
EXPANDING CRIMP TOOL FOR VALVED DISPENSERS AND THE LIKE

Jerome A. Gross, 6304 S. Rosebury, St. Louis, Mo. 63105

Filed Jan. 26, 1977, Ser. No. 762,497

Int. Cl.² B21D *37/00*

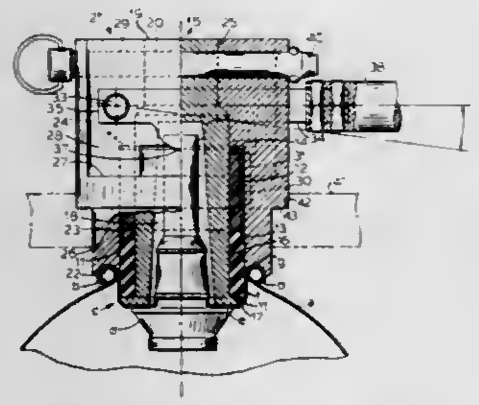
U.S. Cl. 113—18 R 5 Claims

1. For crimping into the mouth of a dispensing can a valve mounting cup of the type having a convex rim and an inner wall extending downward therefrom to a valve-mounting surface, a crimping tool, comprising

an outer member having a vertical axis and having a lower surface portion adapted to fit onto such convex rim and having a cylindrical inner restraining surface, an inner member secured thereto in fixed position and having an outer cylindrical restraining surface spaced radially inward from said inner surface of the outer member and extending axially downward a fixed distance beyond its said lower surface portion and terminating in a radially outward base flange,

a rubber-like sleeve positioned on said flange and extending upward therefrom beyond said lower surface portion of said outer member into the said space between the said spaced restraining surfaces,

annular piston means fitted between said restraining surfaces in said space and having a lower edge upon said rubber-like sleeve, and

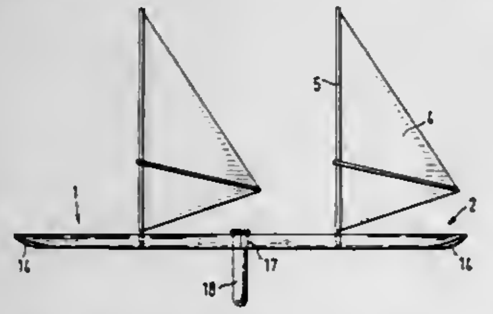


means to force said piston means downward against the upper edge of said rubber-like sleeve, whereby, as it is compressed downward between said cylindrical restraining surfaces said rubber-like sleeve is shortened axially and bulges radially outward in the fixed space between the said base flange and the lower surface portion of the outer member,

thereby to draw the inner wall of such mounting cup radially outward over that part of its area whose depth corresponds to the said fixed distance.

4,100,870
SURFBOARD

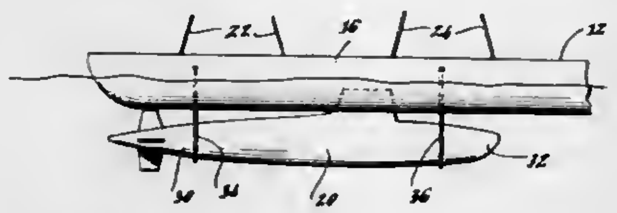
Ernstfried Prade, Nijmegen, Netherlands, assignor to Mistral Windsurfing AG, Zurich, Switzerland
Filed Apr. 1, 1977, Ser. No. 783,845
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 7610087[U]; Mar. 10, 1977, 7707436[U]
Int. Cl.^{2} B63H *9/04*
U.S. Cl. 114—39 **18 Claims**



1. A sailboard having an unstayed rig, said sailboard comprising: a surfboard having a keel box and a retractable keel; a mast; a universal joint mounting said mast on said surfboard; a sail having a neck and a lower bolt-rope; spars having nocks and fixed to the mast for the retention and adjustment of said mast and sail, said sail being attached between said mast and the nocks of said spars, the lower bolt-rope of said sail extending from the nocks of said spars to said mast at a downward inclination, said spars being fixed to said mast above the neck of said sail; wherein said surfboard is provided with a coupling portion for coupling said surfboard to a similar surfboard by a flexible coupling means to form a composite surfer, said coupling means allowing relative movement of said coupled surfboards, said coupling portions being disposed at the stern of each said surfboard for coupling said surfboards stern to stern, to form a tandem surfer.

4,100,871
RESCUE APPARATUS FOR SUBMERGED VESSELS

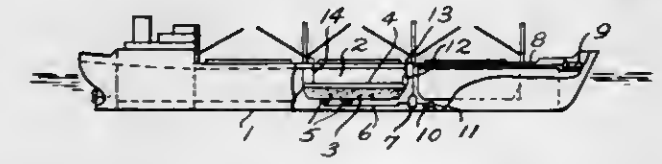
Arnold Forde, 1801 N. Ventura Rd. #65, Oxnard, Calif. 93030
Filed Apr. 7, 1977, Ser. No. 785,428
Int. Cl.^{2} B63C *7/00*
U.S. Cl. 114—51 **4 Claims**



1. Apparatus for positioning a submerged vessel near the surface of a water body which comprises a ship having two integral hull sections extending generally parallel to each other to define an area between said hulls, derrick means including winch and cable means attached to said hulls for lifting said submerged vessel into said area, and at least two U-shaped vessel support bars each extending across said area and pivotally mounted at opposiing ends to each hull for rotation in a direction transverse to the longitudinal axis of said hulls.

4,100,872
SLURRY VESSEL

Yoshiyuki Matsuno, Nagasaki; Hiroshi Kobayashi, and Ryo Watanabe, both of Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 580,472, May 22, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,360
Claims priority, application Japan, May 22, 1974, 49/57483
Int. Cl.^{2} B63B *25/04*
U.S. Cl. 114—73 **2 Claims**



1. A slurry vessel, including:

at least one arrangement of side walls and bottom wall together constituting wall means defining a hold for containing a layer of slurry comprising grains suspended in a liquid, which slurry is to be transported during a cruise of the vessel, during which cruise, the grains will be gradually precipitating, gradually producing an upper layer of supernatant liquid, and a lower layer of increased solids content slurry precipitant that is tending to increase in bulk density through consolidation, a gradually lowering interfacial surface forms and becomes better defined between said upper layer of liquid and said lower layer of slurry;

vacuum dewatering means comprising:

dewatering port means communicating with the hold through the wall means;

a vacuum tank connected to the dewatering port means and having a level up to which it is anticipated the vacuum tank may become filled with liquid;

a vacuum pump connected to the vacuum tank above said anticipated liquid level therein;

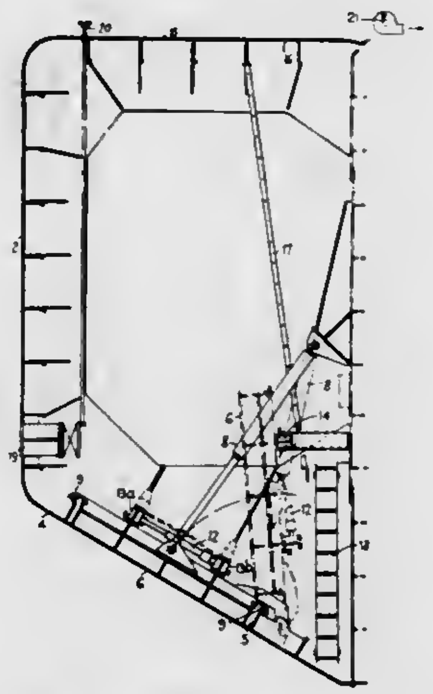
a drain pump connected to the vacuum tank for communication with the liquid drawn into the tank by the vacuum pump; and

a drain line connected to the drain pump, for removing accumulating liquid from the vacuum tank;

means for detecting the level of the interfacial surface between the slurry contained in the hold and the supernatant liquid from which the slurry is precipitating, as a way of monitoring the degree of consolidation of the slurry, whereby the vacuum dewatering means may be operated when the degree of consolidation exceeds a predetermined value, to ensure that when the vessel reaches its destination, the slurry will not have consolidated to so great a degree as to hamper unloading, this level detecting means being constituted by a flat, essentially horizontally disposed plate having a plurality of generally vertical perforations which are adapted to allow free flow of supernatant liquid therethrough and means for suspending said plate, said plate being made of a material with specific gravity that is larger than that of the supernatant liquid of said slurry, but smaller than that of said slurry so that when lowered, via said suspending means, said plate will sink through any overlying supernatant liquid of said slurry and come to rest upon said slurry.

4,100,873
FLOATING CRAFT

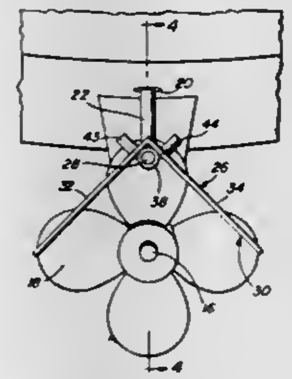
Willem Paul Kaldenbach, Delft, Netherlands, assignor to Netherlands Offshore Company (Nederlandse Maatschappij voor Werken Buitengaats) B.V., Delft, Netherlands
Filed Nov. 1, 1976, Ser. No. 737,581
Claims priority, application United Kingdom, Nov. 14, 1975, 47133/75
Int. Cl.^{2} B63B *43/06*
U.S. Cl. 114—125 **1 Claim**



1. A floating vessel equipped with at least one crane for lifting heavy loads and comprising a plurality of tank means each having wall means defining at least part of the outer surface of the vessel which is in contact with the sea, each said tank means being located at least in part below the water-line of the vessel, means defining a plurality of large openings in said wall means of each of said tank means, each of said openings serving to connect the interior of its associated tank means with the sea and being so disposed below the said water-line and of such large size relative to the sizes of the tank means as to permit the sea water to flow substantially freely into and out of the associated tank means in accordance with the motion of the sea, closure means for each said opening, means mounting each said closure means for movement relative to its associated opening between a closed position in which the closure means closes its associated opening in a substantially water-tight manner and an open position, means for actuating each said closure means between its said closed and open positions and vice versa, whereby to change at least one of the roll and pitch periods of the vessel and wherein each closure means comprises a door pivotally mounted for movement within its associated tank means, between its closed position in sealing relation with the means defining its associated opening and its open position, said actuating means comprises hydraulic cylinder means for moving said door between said positions, and hydraulically actuated locking means on said door operable to lock the door in both its closed and open position.

4,100,874
FLAP RUDDER

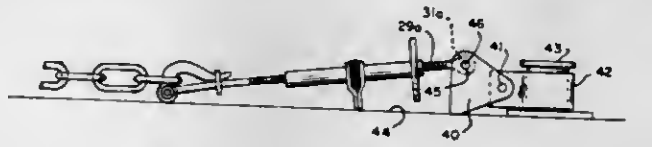
Delatte U. Wright, Star Rte. 1, Box 569F, Rockport, Tex. 78382
Filed Apr. 8, 1977, Ser. No. 786,481
Int. Cl.^{2} B63H *25/06*
U.S. Cl. 114—162 **9 Claims**



1. In combination with a boat hull including a generally horizontal propeller shaft having a marine propeller mounted thereon, a rudder assembly oscillatably supported from said hull in horizontal registry with and behind said propeller and for angular displacement about an upstanding axis, said rudder assembly including mounting means defining a horizontal pivot axis and a rudder member supported from said mounting means for free oscillation, between limits, about said horizontal pivot axis, said rudder member including a pair of relatively angulated and adjacent rudder panels including adjacent generaly parallel marginal edges joined together, said rudder panels, upon oscillation of said rudder member relative to said mounting means about said horizontal axis, oscillating in unison in the same directions relative to said mounting means, said marginal edges generally paralleling said horizontal pivot axis and the included angle defined by said rudder panels opening downwardly.

4,100,875
CONNECTORS

William W. Patterson, III, and Eugene F. Grapes, both of c/o W. W. Patterson Co., 830 Brocket St., Pittsburgh, Pa. 15233
Filed Mar. 28, 1977, Ser. No. 782,049
Int. Cl.^{2} B63B *21/00*
U.S. Cl. 114—251 **6 Claims**



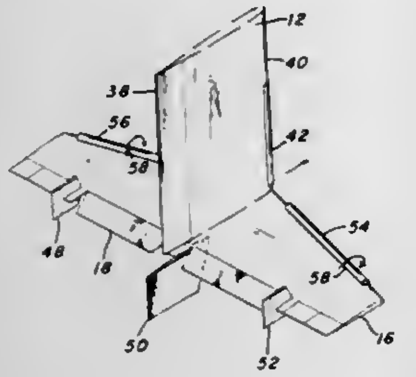
1. Connector means for barges and the like comprising a threaded ratchet tube, a central ratchet drive for rotating said tube, an annular drive wheel surrounding and connected to said tube for rotating the same, separate right and left hand threaded screw members having one end threaded into said tube, fastening means on the other end of each said screw members and removable anchor means adapted to engage a surface over which the ratchet tube extends and pivotally secured to one of said fastening means on said separate screw members on the end remote from said tube and holding said

tube and fastening means at an angle above said surface so as to have said tubes a distance greater than the radius of said annular drive wheel whereby the drive wheel is always free of the surface to facilitate turning by hand.

4,100,876
HYDROFOIL FIXED STRUT STEERING CONTROL

Christiaan C. Feleus, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 18, 1977, Ser. No. 797,984
Int. Cl.^{2} B63B *1/18*
U.S. Cl. 114—274 **3 Claims**

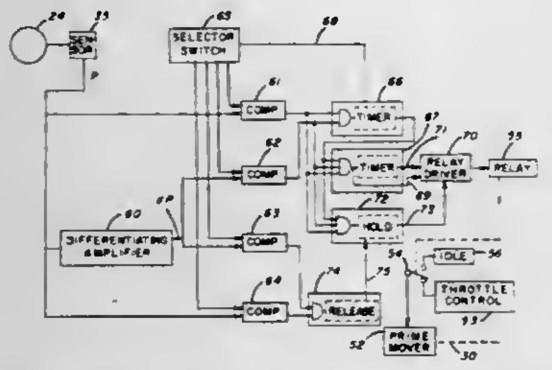


1. A steering control for hydrofoil craft comprising a non-rotatable vertical strut element secured to the bottom portion of the craft, a submergible foil element carried at the bottom of said strut, a trailing edge rotatable rudder operatively associated with at least one of said elements, at least one rotatable roller mounted at the leading edge of said strut, said roller being exposed to liquid impinging on the leading edge of the strut as the hydrofoil craft traverses the surface of a body of water, said roller being stationary when the hydrofoil craft is not turning whereby the forces on opposite sides of the strut will be substantially the same, and means for rotating said roller in coordination with said rudder during a turn of the hydrofoil craft to thereby reduce side forces on the strut which are opposing the turn.

4,100,877
PROTECTIVE CONTROL SYSTEM FOR WATER-JET PROPULSION SYSTEMS

John H. Scott, Issaquah, and Walter R. Weist, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1976, Ser. No. 727,023
Int. Cl.^{2} B63H *11/08*
U.S. Cl. 115—11 **7 Claims**

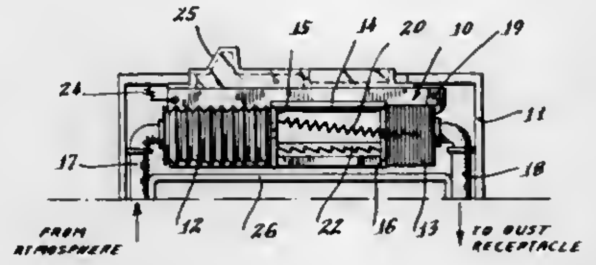


1. In a propulsion system for watercraft having an inlet for water, pump means for discharging said water in a jet to provide a propulsive force and a prime mover for driving the pump means, a control system for said prime mover including means for generating a pressure signal proportional to the water pressure in said inlet and a rate signal proportional to the rate of change of said water pressure, and means for setting said prime mover to idling speed when both of said signals fall below first predetermined reference levels and remain below said levels for a predetermined time.

4,100,878
VACUUM CLEANER DUST CONTAINER FILLING INDICATOR DEVICE

Karl Eric Leinfelt, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Dec. 2, 1976, Ser. No. 746,813
Claims priority, application Sweden, Dec. 5, 1975, 7513734
Int. Cl.^{2} A47L *9/00;* G01D *21/00*
U.S. Cl. 116—114 AD **8 Claims**



1. An indicator device for a vacuum cleaner visible from the outside thereof and showing the amount of filling of a vacuum cleaner dust container comprising: a casing for said indicator device having a transparent portion, a pair of resilient spaced closed bodies in said casing, a frame for said closed bodies in said casing, means interconnecting said closed bodies and mounted in said casing, said means comprising a frame having end pieces each of which is secured to an adjacent one of said closed bodies and arranged laterally of its respective end piece, a conduit connecting one of said closed bodies to the atmosphere, another conduit connecting the other of said closed bodies to the interior of said dust container, said closed bodies acting under the influence of the pressure differential between the atmosphere and the interior of said dust container to expand and contrast said closed bodies so that movement occurs linearly in said indicator device which can be visually observed through said transparent portion to indicate the amount of filling present at any given time in said dust container.

4,100,879
DEVICE FOR EPITAXIAL GROWING OF SEMICONDUCTOR PERIODIC STRUCTURES FROM GAS PHASE

Grigory Borisovich Goldin, Pervomaiskaya ulitsa, 66, kv. 147; Valentin Petrovich Khlebnikov, Lomonosovsky prospekt, 34, kv. 93; Jury Vasilievich Jushkov, prospekt Mira, 188, kv. 60; Vadim Nikolaevich Maslov, ulitsa A. Tolstogo, 22/2, kv. 101; Oleg Evgenievich Korobov, Golikovsky pereulok, 13, kv. 6; Vladimir Petrovich Kuklev, Frunzensky val, 38, kv. 47, all of Moscow; Vladimir Grigorievich Demyanets, prospekt Mira, 9, kv. 57, Fryazino Moskovskoi oblasti; Ljudvig Alexandrovich Dolomanov, ulitsa Uritskogo, 12^{a}, kv. 10, Ljubertsy Moskovskoi oblasti; Emilia Stanislavovna Kudeyarova, Leningradskaya ulitsa, 4"b", kv. 29, Podolsk Moskovskol oblasti; Vladimir Viktorovich Nechaev, Avtozavodskaya ulitsa 9/1, kv. 24, Moscow; Ellin Petrovich Bochkarev, Leninsky prospekt, 71/11, kv. 385, Moscow; Nikolai Georgievich Voronin, ulitsa Petrozavodskaya, 15, korpus 2, kv. 164, Moscow, and Jury Anatolievich Drozdov, ulitsa Krasny Kazanets, 1, korpus 2, kv. 92, Moscow, all of U.S.S.R.

Filed Feb. 8, 1977, Ser. No. 766,775
Int. Cl.^{2} C23C *13/08*
U.S. Cl. 118—49.1 **16 Claims**

1. A device for epitaxial growing of semiconductor periodic structures from a gas phase, comprising:

a vertical tubular reactioo vessel filled with gas and having an inlet and an outlet for said gas containing an agent for carrying out the chemical reaction;

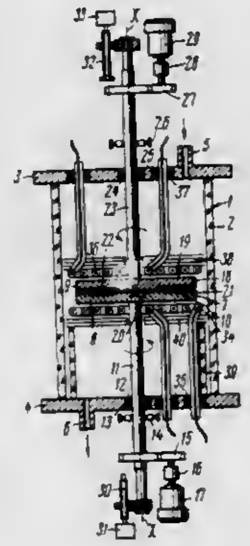
a first disk located in said vessel and having an external surface and an operational surface, at least one substrate being placed near its periphery;

a first electric motor for rotating said first disk about the vertical axis of said vessel, which is located outside vessel and mechanically connected to said first disk;

at least two sources of substances forming the layers of said semiconductor periodic structure being grown;

a second disk located in said vessel near said first disk and coaxial thereto, said second disk having a diameter equal to the diameter of said first disk, said second disk having an external surface and an operational surface parallel to said operational surface of said first disk and holding at least two said substance sources adjoining each other and alternating in the direction of rotation of said second disk about said vertical axis of said vessel;

a second electric motor for rotating said second disk about said vertical axis of said vessel, which is located outside said vessel and mechanically connected to said second disk;



a drive for shifting a disk along said vertical axis of said vessel and located outside the vessel and mechanically connected to one of said disks;

a heater of a substrate located in said vessel near said external surface of said first disk;

a heater of sources located in said vessel near said external surface of said second disk;

both said heaters having a flat heating front and ensuring a temperature field with flat isothermal surfaces parallel to said operational surfaces of said disks;

at least one of said sources being a first semiconductor material with composition corresponding to the composition of the first group of layers of said periodic semiconductor structure being grown;

at least the second of said sources being made of a second semiconductor material with composition corresponding to the composition of the layers of said structure;

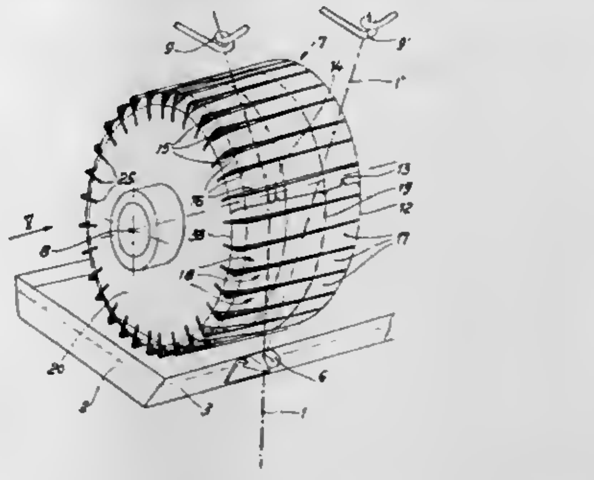
said disks being located with a clearance between the surfaces of said substrate and a respective source, selected from an interval from 50 microns to 5 mm.

4,100,880
APPARATUS FOR THE TREATMENT OF THREAD AND THE LIKE

Erhard T. May, c/o Kellenberg Strasse, D-8960 Kempten, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,418
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636058
Int. Cl.^{2} B05C *1/08*
U.S. Cl. 118—234 **9 Claims**

1. In apparatus for the treatment of thread and the like with a treatment fluid such as liquid wax, oil and the like, during the winding process of the thread on a cross-wound bobbin and the like mounted on a pirn tube rotating at constant speed, said apparatus including a treatment roller driven at a constant rotational speed, one part of the peripheral area thereof dipping into a bath containing the treatment fluid, said treatment roller having on its peripheral area axially extending grooves, two thread guides, the first one of said guides being stationary and the second one of said guides being movable substantially parallel to the axle of the treatment roller, and which are installed in such manner that the thread which is stretched therebetween lies against the peripheral area of the treatment roller over a certain length, the improvement which comprises

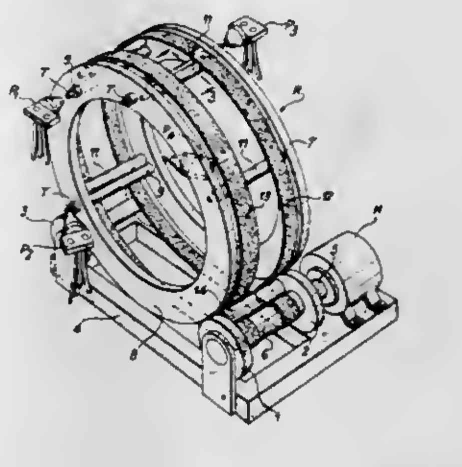


said treatment roller having a cylindrical first circumference segment area adjacent one end of the roller and a second circumference segment area adjacent thereto and having radially disposed and axially extending small webs, the free edges of which enter into the circumference surface of said second cylindrical circumference segment area and which form therebetween said axial grooves, said grooves having a depth which begins at zero on the inner borderline of said first cylindrical circumference segment area and which toward the other end of said treatment roller increase overproportionally to the groove length.

4,100,881
APPARATUS FOR APPLYING A COVERING ON HEAT-SENSITIVE ARTICLES BY MEANS OF A BLOWPIPE

Félix d'Andréa, Asnieres, and Louis Minjolle, Tarbes, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 24, 1972, Ser. No. 229,224
Claims priority, application France, Feb. 24, 1972, 71.06249
Int. Cl.^{2} B05B *13/02;* B05C *5/00*
U.S. Cl. 118—319 **4 Claims**



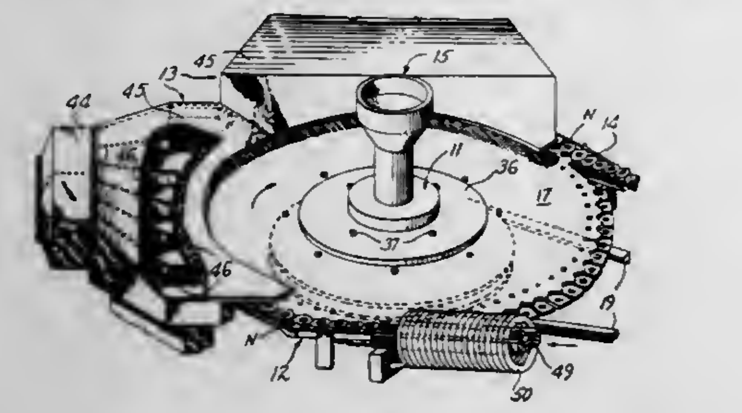
1. An apparatus for producing a covering comprising at least one stationary blowpipe for spraying or blasting, a continuous moving support member bearing the article for treatment, drive means for said support adapted to present the article to the blowpipe at intervals, the exposure time of the same zone of the article to spraying or blasting being very short relative to

the time between two consecutive exposures, said support being a wheel, two lateral rims for said wheel, article support members rotatably mounted between said rims and means for engaging the articles on said support members as to move solidly therewith in all movements of said support members.

4,100,882

APPARATUS FOR MAKING LOCKING NUTS

Richard J. Duffy, Salem, and Philip J. Rodden, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.
Continuation-in-part of Ser. No. 704,294, Jul. 12, 1976, Pat. No. 4,054,688. This application Oct. 20, 1976, Ser. No. 734,383
Int. Cl.² B05C *7/02, 19/00*
U.S. Cl. 118—620 **9 Claims**



1. Apparatus for applying locking patches of resilient resin to a succession of internally threaded articles having openings at both ends of the threaded portions comprising:

a feeder to supply said threaded articles in substantially continuous succession;

a support for receiving said threaded articles from said feeder for conveying them in a first substantially fixed relation with respect to said support for a first portion of a path for treatment of successive articles with the axes of their threaded portions in an up and down position and with the openings at the upper and lower ends of the threaded portions substantially uncovered;

means for heating said threaded portions of said articles to a temperature above the softening point of resin to be applied;

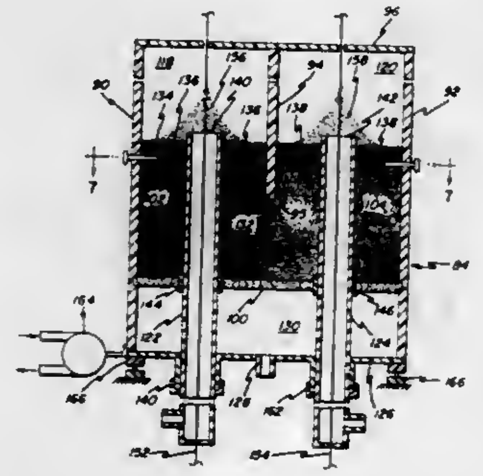
means associated with each of said articles and in substantially fixed relation to a first resin deposition area of threaded surface of its associated article for directing particles of heat fusible resin upwardly through said openings at the lower ends of each of said articles against said first area of each of said threaded portions of said articles in said first portion of said path to cause said resin particles to be softened by heat from said threaded portions and to build up a deposit on each said first area; and

means between said first portion and a second portion of said path acting on successive articles on said support to turn them about the axes of said threaded portions through a predetermined angle from said first relation to a second substantially fixed relation with respect to its associated directing means and said support for said second portion of said path to position a further area of each of said threaded portions, angularly spaced from each said first area, to receive resin particles from said directing means and to build up a deposit on said further area of each of said articles in said second portion of said path.

4,100,883

APPARATUS FOR ELECTROSTATIC DEPOSITION ON A RUNNING CONDUCTOR

John H. Lupinski, Scotia, and Bernard Gorowitz, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,236
Int. Cl.² B05B *5/00*
U.S. Cl. 118—630 **6 Claims**



1. An apparatus for continuously and simultaneously coating a plurality of elongate electrical conductors, comprising:

(A) a container having a lower portion for containing a fluidized bed of electrically chargeable powder and an upper portion adjoining the lower portion for deposition of electrically charged powder onto the conductors,

(B) a plurality of spaced apart hollow members disposed in the lower portion of the container, each of said hollow members providing a passageway from the exterior of the container to the interior of the container and having an upwardly extending portion terminating in an open upper end defining an interface between the upper and lower portions of the container,

(C) means for advancing each elongate electrical conductor along a path respectively through a different one of said hollow members, upwardly out of the upwardly extending portion thereof, and through the top of the upper container portion,

(D) a porous member adapted to pass a gaseous medium upwardly therethrough so that the medium fluidizes the powder to provide said fluidized bed, said porous member disposed at a lower end of the lower portion of the container,

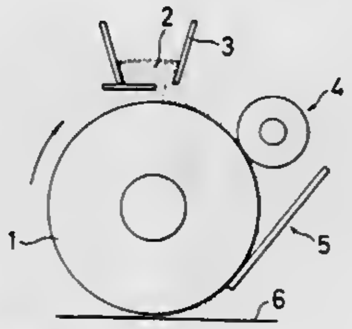
(E) barrier means dividing said upper portion of the container into a plurality of compartments equal in number to the number of said hollow members, each of said compartments being disposed above only one of said hollow member open upper ends, said barrier means having a lower end spaced above said porous member and disposed lower than each hollow member upper end, and

(F) electrode means operably associated with the container and operable at an electrical potential different from the electrical potential of the conductors, whereby charged particles are transferred from the fluidized bed to each conductor in the region of the upper portion of the container adjacently above the open upper end of the hollow member through which such conductor is advanced.

4,100,884

RUBBER DEVELOPER ROLLER USING SINGLE COMPONENT TONER

Nobuo Mochizuki, Matsudo, and Hiromi Demizu, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Feb. 15, 1977, Ser. No. 768,828
Claims priority, application Japan, Feb. 25, 1976, 51-19542; Apr. 13, 1976, 51-41469; May 26, 1976, 51-60831
Int. Cl.² G03G *15/08*
U.S. Cl. 118—653 **19 Claims**



1. An apparatus for developing an electrostatic image on an electrostatic image bearing member, comprising:

a rotatable developing roller disposed adjacent said electrostatic image bearing member, at least the surface of the roller being formed of an elastic rubber and containing an additive which improves its release capability with respect to a toner;

supply means for uniformly supplying to the surface of the developing roller one-component developer having a volumetric resistivity of not less than $10^6\ \Omega$ cm;

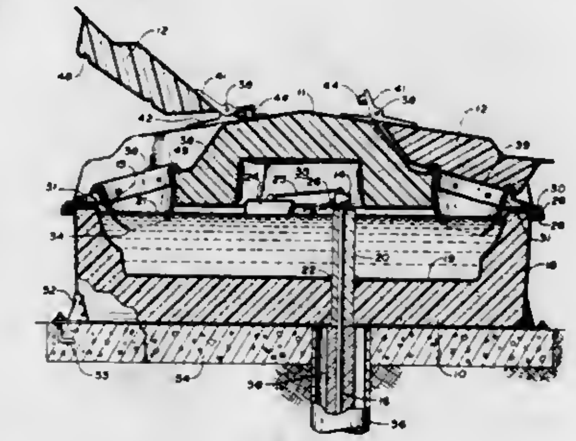
charging means disposed forwardly of the location of the supply means as viewed in the direction of rotation of the developing roller for charging the developer on the developing roller to the opposite polarity from the polarity of the electric charge which forms an electrostatic image on said image bearing member; and

means for rotating the developing roller in a manner such that the ratio of the peripheral speed of the developing roller to the speed of movement of the image bearing member is equal to or greater than 1.0.

4,100,885

STOCK WATERER

Lawrence E. Kapplinger, Spring Lake Park, Minn., assignor to Advanced Engineering & Manufacturing Company, Inc., Minneapolis, Minn.
Filed Dec. 6, 1976, Ser. No. 748,059
Int. Cl.² A01K *7/02*
U.S. Cl. 119—73 **11 Claims**



1. A stock watering device comprising:

an insulated tank for receiving a quantity of water, said insulated tank having an insulated cover portion;

means for maintaining the water within said insulated tank at a predetermined level;

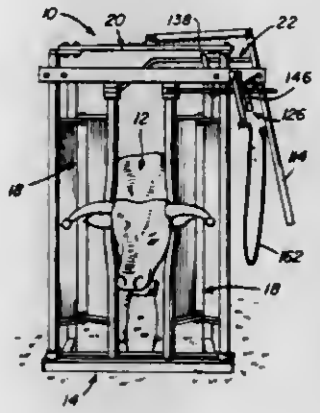
at least one drinking well provided in said insulated cover portion for providing limited drinking access to the water within said insulated tank, said drinking well being joined with said insulated cover portion at a peripheral edge of said drinking well to form a generally airtight seal therewith and having a lower continuous edge extending below said predetermined level to form an effective seal between the interior of said insulated tank and the ambient weather conditions and a continuous upper surface portion forming a closed loop; and

a lid pivotally connected with said insulated cover portion at a point spaced from said continuous upper surface portion, said lid being movable between an open and a closed position with respect to said drinking well and having a seat portion for engagement with said upper continuous surface along substantialy the entire length thereof when said lid is in a closed position.

4,100,886

AUTOMATIC HEADGATE FOR ANIMALS

Jerry D. Wade, Rte. 2, Box 76, and Phillip H. Geisler, Rte. 1, Box 40, both of Galena, Kans. 66739
Filed Aug. 26, 1976, Ser. No. 718,037
Int. Cl.² A61D *3/00*
U.S. Cl. 119—98 **16 Claims**



15. An automatic headgate for animals, comprising a rigid frame, gate means operatively mounted on the frame for movement between an open position and a closed position, force-applying means rendered operative in response to deformation thereof for biasing the gate means to the closed position, selectively operated means connected to the gate means and the force-applying means for simultaneously displaying the gate means to the open position and deforming the force-applying means to render the same operative, and lock means for holding the gate means against movement to the closed position under the bias of the force-applying means and releasable in response to opening pressure applied to the gate means in the open position thereof.

4,100,887

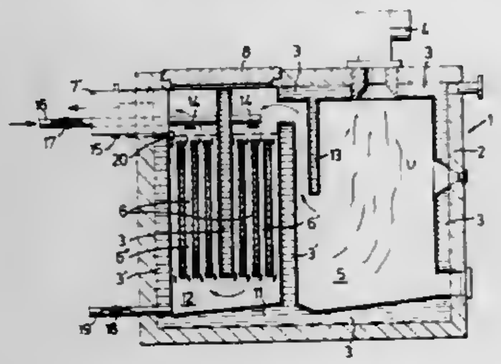
IMPROVMENTS IN OR RELATING TO BOILERS

Karl Gunnar Malmström, 1 Privatvägen, S-132 00 Saltsjö-boo, and Karl Lennart Mattsson, 28 Erstaviksvägen, S-130 12 Alta, both of Sweden
Filed Nov. 19, 1976, Ser. No. 743,180
Claims priority, application Sweden, Dec. 3, 1975, 75136101; Feb. 4, 1976, 7601220
Int. Cl.² F22B *37/52*
U.S. Cl. 122—379 **7 Claims**

1. A boiler of the type having convection surfaces located adjacent to and in communication with a combustion chamber,

a floor and upstanding walls forming a water-tight container for the convection surfaces with said walls extending sufficiently high to permit water to cover the convection surfaces while permitting communication with the combustion chamber,

means for filling the water-tight container with water for



dissolving soot and other deposits on the convection surfaces to clean said surfaces, and

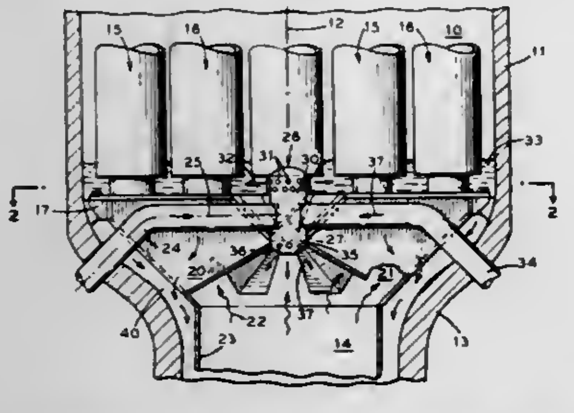
means for removing the contaminated water from the water-tight container.

4,100,888
VAPOR GENERATOR STEAM DRUM SPRAY HEAD
Floyd A. Fasnacht, Jr., Massillon, Ohio, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,053

Int. Cl.^{2} F22D *11/00*

U.S. Cl. 122—438 **2 Claims**



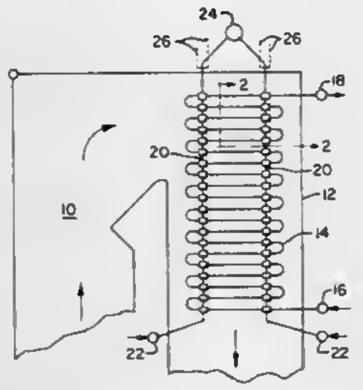
1. Apparatus for supplying feedwater and cooldown fluid to a steam drum comprising a wall that establishes a longitudinal center line within the steam drum, a feedwater spray head disposed within the steam drum having a longitudinal center line that is generally in alignment and coincident with said steam drum center line, said spray head having at least one feedwater discharge perforation formed in the surface thereof, a feedwater inlet pipe penetrating said surface to establish fluid communication with said spray head to enable feedwater to flow from said feedwater inlet pipe through said spray head and out through said perforation into said steam drum, a water tight diaphragm positioned within said spray head in order to divide the interior volume of said spray head into at least two portions, one of said two portions providing said fluid communication between said feedwater inlet pipe and said feedwater discharge perforation and the other portion of said two portions accommodating the cooldown fluid to control temperature within the steam drum.

4,100,889
BAND TYPE TUBE SUPPORT
Norman Chanine Chayes, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 7, 1977, Ser. No. 785,483

Int. Cl.^{2} F22B *37/24*

U.S. Cl. 122—510 **1 Claim**



1. In combination, a vertical gas pass through which hot gasses flow, a heat exchanger including at least two horizontal, adjacent tube means, a tube support for the horizontal tube means including a vertical support tube positioned intermediate the two horizontal tube means, a pair of lugs, welded to opposite sides of the vertical tube, band means encircling the two horizontal tube means, the band means resting on and being supported by the lugs, said band means encompassing the vertical tube also, said band means being loose enough to permit relative movement between the two horizontal tube means, and also relative movement between the vertical tube and each of the horizontal tube means.

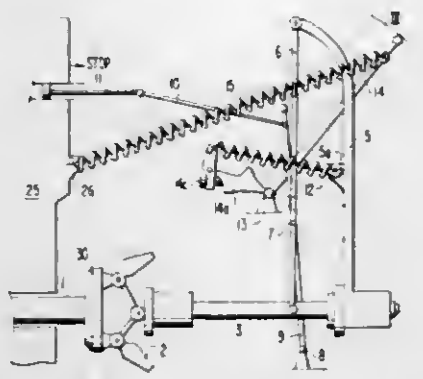
4,100,890
MECHANICAL GOVERNOR FOR INTERNAL COMBUSTION ENGINE
Koichi Mori, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,717

Claims priority, application Japan, Jun. 13, 1975, 50-79427[U]

Int. Cl.^{2} F02D *1/04, 1/02, 1/00*

U.S. Cl. 123—140 R **2 Claims**



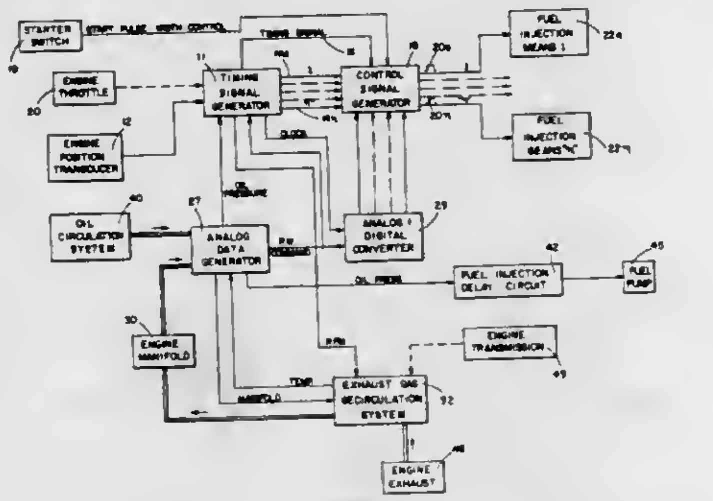
1. In a mechanical governor apparatus of a fuel injection pump for an internal combustion engine of the type having, a control lever the position of which is determined by the force on an accelerator pedal, a fuel determining control rod moveable by said control lever, a governor and a governor spring for exerting a force on said control lever opposite to that exerted on said pedal, and a balance spring connected between a housing and said control lever to oppose the force applied to said control lever by said accelerator and a means on said control lever for balancing the force of said governor spring, the improvement comprising, a first support member fixed to said housing, a second support member pivotally mounted on said control lever and adjustable with respect to said lever, one end of said balance spring being connected to said first support member and the other being connected to said second supporting member.

4,100,891
ELECTRONIC FUEL INJECTION CONTROL SYSTEM
Elmer A. Williams, San Angelo, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 7, 1974, Ser. No. 495,359

Int. Cl.^{2} F02B *3/00*

U.S. Cl. 123—32 EB **26 Claims**



1. An electronic system for controlling fuel injection into the cylinders of an internal combustion engine comprising:
- timing signal generator means for generating a series of pulses in sequence, the leading edge of each of said pulses corresponding to the opening of the intake valve of one of the engine cylinders respectively,
- means for generating a digital pulse count signal which varies with preselected engine parameters comprising means for generating a voltage having a magnitude inversely proportional to intake manifold vacuum, means for generating a voltage having a magnitude inversely proportional to engine temperature means for summing said voltages to provide a single analog signal, analog/digital converter means for converting said analog signal to a digital signal, and storage means for storing said digital signal, said analog/digital converter means including means for periodically generating an updated digital signal in accordance with a more current value of the analog signal and providing said updated signal to said storage means, and
- control signal generator means responsive to the outputs of said timing signal generator means and said storage means for generating a pulse signal for controlling the fuel injection for each of the cylinders, each of said pulse signals having a leading edge which corresponds to the leading edge of a respective one of the pulse outputs of the timing signal generator means and a duration in accordance with said digital signal pulse count.

4,100,892
CLOSED-LOOP MIXTURE CONTROL FOR AN INTERNAL COMBUSTION ENGINE OF A ROADWAY VEHICLE WITH MEANS FOR COMPENSATING FOR FUEL DEFICIENCY DURING VEHICLE START-UP PERIODS
Masaharu Asano, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

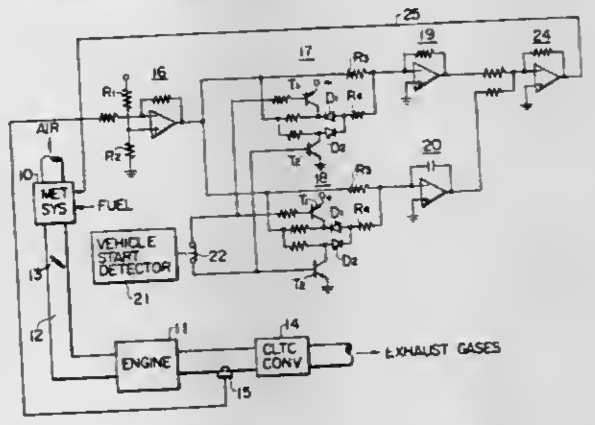
Filed May 11, 1976, Ser. No. 685,255

Claims priority, application Japan, May 12, 1975, 50-54614; Dec. 6, 1975, 50-63691

Int. Cl.^{2} F02B *3/00*

U.S. Cl. 123—32 EE **2 Claims**

1. A closed-loop mixture control system for an internal combustion engine of a roadway vehicle, said engine including means for supplying air and fuel in a controlled ratio thereto, said system comprising:
- means for generating a first signal representing the concentration of an exhaust composition of the emissions from said engine;
- means for comparing the first signal with a reference value to generate a second signal indicating the deviation of the air-fuel ration in said emissions from said reference value;
- a vehicle start detector for generating an output only at the instant when the vehicle is being started from a rest, idle condition;
- means for generating a compensating signal in response to the output from said vehicle start detector;
- control amplifier means responsive to the second signal for generating a control signal which adjusts said air-fuel supply means in the direction of the deviation of said air-fuel ratio in said emissions from said reference value;
- a summation circuit providing summation of the control signal and the compensating signal so that the air-fuel supply means is adjusted to supply an enriched mixture to said engine when the vehicle is started from a rest, idle condition;
- said vehicle start detector including means for generating a step change DC signal in response to the detection of said vehicle being started from a rest, idle condition, and said compensating signal generating means comprising a differentiator for differentiating the leading edge of the step change DC signal for enriching said air-fuel ratio supplied by said air-fuel supply means.



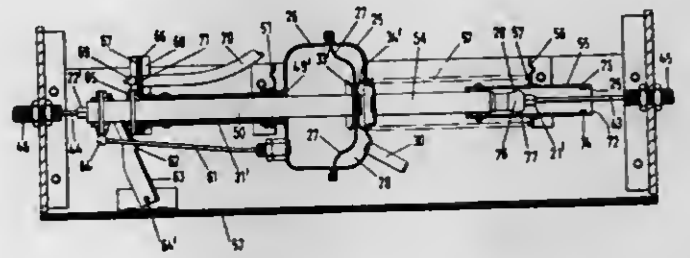
4,100,893
PRESSURE-RESPONSIVE TRANSDUCER FOR REGULATING INTERNAL COMBUSTION ENGINE
David Henry Butcher, Stanford House, Slinfold, near Horsham, Sussex, England

Filed Mar. 4, 1975, Ser. No. 555,302

Claims priority, application United Kingdom, Mar. 7, 1974, 10193/74

Int. Cl.^{2} F02D *11/08*

U.S. Cl. 123—103 B **14 Claims**



1. Apparatus for regulating an internal combustion engine having, for supplying air to the engine, a movable throttling device followed by an air intake duct and having an operator's control member linked with the engine for controlling the speed thereof, said control member being movable between a minimum speed position and a maximum speed position, said apparatus comprising a pressure responsive transducer adapted

for connection with the intake duct to respond to air pressure therein, mechanical output means responsive to the transducer, and thence to said air pressure, for actuation of the throttling device to oppose increase of said air pressure, when the control member is moved within a range extending from the minimum speed position to an intermediate position short of the maximum speed position and means separate from the transducer adapted and arranged to over-ride the mechanical output means and thereby prevent said opposition to increase of said air pressure when the control member is moved between said intermediate position and said maximum speed position.

4,100,894

FLOW RESTRICTOR

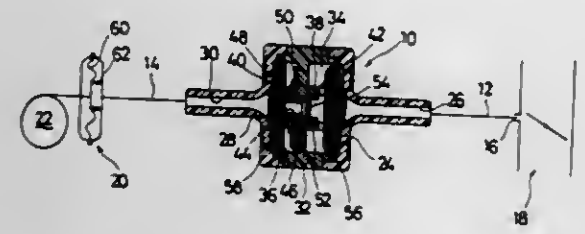
Tooru Tamura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Oct. 15, 1976, Ser. No. 732,754

Claims priority, application Japan, Oct. 16, 1975, 50-141226[U]; Nov. 5, 1975, 50-151199[U]

Int. Cl.² F16K *21/02*

U.S. Cl. 123—117 A **9 Claims**



1. A flow restrictor comprising:

a housing defining an enclosed chamber therein;

a partition wall, dividing said chamber into first and second separate pressure chambers each of which has a port connected thereto, and having at least one aperture for providing fluidic communication between said first and second chambers;

an annular, flexible, umbrella-shaped valve an inner portion of which is secured to said partition wall, said valve closing said at least one aperture for interrupting said fluidic communication between said first and second chambers when the vacuum in said first chamber is greater than that in said second chamber, and opening said aperture for establishing fluidic communication between said first and second chambers when the vacuum in said second chamber is greater than that in said first chamber;

an orifice member having an orifice and secured to said partition wall for permitting restricted fluidic communication between said first and second chambers; and

filter means positioned between said partition wall and each of said ports, the outer periphery portion of each filter being respectively securely sandwiched between said housing and said partition wall;

said partition wall, said valve, and said orifice member being coaxially arranged and wherein said partition wall is provided with a cylindrical projection axially projecting from one side of said partition wall and said orifice member is pressedly inserted into said projection.

4,100,895

ELECTRONIC IGNITION TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori; Minoru Nishida, and Yoshiki Ueno, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 7, 1976, Ser. No. 730,594

Claims priority, application Japan, Oct. 13, 1975, 50-123662

Int. Cl.² F02P *5/00*

U.S. Cl. 123—117 R **10 Claims**

1. An electronic ignition timing control system for electronically controlling the ignition timing of an internal combustion engine having a crankshaft and having associated therewith ignition means responsive to an ignition signal applied thereto for effecting said ignition, said timing control system comprising:

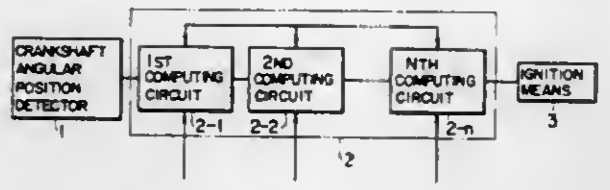
crankshaft angular position detecting means responsive to the angular position of said crankshaft for producing detection output pulses indicative of a period during which the crankshaft rotates between first and second predetermined angular positions; and .

an ignition timing computing circuit including a plurality of individual computing circuits each thereof having:

an integration capacitor;

means responsive to said detection output pulses for selectively charging said capacitor during said period;

a charging and discharging control circuit connected to said capacitor and responsive to first and second control signals applied thereto, said first control signal being indicative of an engine parameter, said control circuit including means for selectively initiating discharge of said capacitor in accordance with said second control signal and, means for varying at least one of the charging and discharging currents of said capacitor in accordance with said engine parameter;



a capacitor voltage detecting circuit connected to said capacitor and responsive to the voltage across said capacitor for generating a discharge termination output signal indicative of said capacitor being discharged to a predetermined value; and

said respective individual computing circuits being connected in a predetermined sequence, the discharge termination output signal of the just previous individual computing circuit in said sequence being applied as said control circuit second control signal to the next successive individual computing circuit in said sequence, said detection output pulses being applied to the first computing circuit in said sequence as said control circuit second control signal, and said discharge termination output signal of the last individual computing circuit in said sequence being applied as said ignition signal to said ignition means.

4,100,896

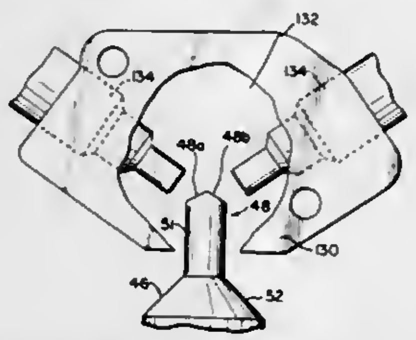
COMPUTER CONTROLLED SONIC FUEL SYSTEM

Arthur K. Thatcher, Merritt Island, Fla. 32952, and Ed R. McCarter, 1521 Sunnyside Dr., Maitland, Fla. 32751

Division of Ser. No. 293,377, Sep. 29, 1972, Pat. No. 3,893,434. This application Jul. 3, 1975, Ser. No. 593,001

Int. Cl.² F02M *27/08*

U.S. Cl. 123—119 EE **10 Claims**



1. A sonic fuel system for providing fuel from a fuel source to the air stream to the intake manifold of an internal combustion engine comprising fuel input means connected to provide fuel from said fuel source, sonic means for receiving fuel from said fuel input means and providing a fuel dispersion to said airstream, said sonic means including transducer means having an active surface for producing sonic wave energy, power concentrator means secured to the active surface of said transducer means and having a concentrator active surface which is of a smaller area than the area of the active surface of the transducer means spaced from the active surface of said transducer means, said power concentrator means operating to concentrate the sonic wave energy from the active surface of said transducer means at said concentrator active surface and including an elongate body portion extending from a base portion secured to the active surface of said transducer means to a terminal end portion spaced therefrom, said terminal end portion including said concentrator active surface, the elongate body portion of said power concentrator means including a tapered section, a first, substantially cylindircal end section extending between said tapered section and the terminal end portion of said power concentrator means, and a second substantially cylindrical end section which is larger in diameter than said first end section extending between said tapered section and the base portion of said power concentrator means, and mounting means for mounting said sonic means with the terminal end portion of said power concentrator means adjacent the path of said airstream.

4,100,897

APPARATUS FOR REGULATING THE FUEL-AIR MIXTURE DELIVERED TO AN INTERNAL COMBUSTION ENGINE

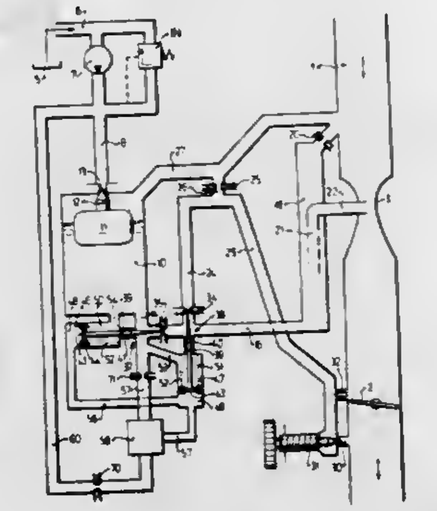
Johannes Brettschneider, Ludwigsburg; Gerhard Bertling, Vaihingen, and Hans Georg Zeller, Grafenau, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 2, 1976, Ser. No. 737,978

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552207

Int. Cl.² F02B *33/00;* **F02D** *35/00*

U.S. Cl. 123—119 EC **27 Claims**



1. In an apparatus for regulating the fuel-air mixture delivered to an internal combustion engine including: a carburetor having a fixed venturi; a fuel chamber; at least one orifice defining means; at least one throttle device connected to the fuel chamber and the orifice defining means, and actuated by a variable fuel pressure for varying the cross-sectional flow area of the orifice defining means and thereby influencing the fuel-air mixture in accordance with parameters characterizing the operational behavior of the engine.

4,100,898

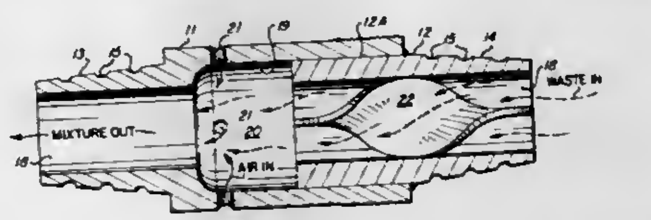
COMBINATION CRANKCASE VENTILATION VALVE AND SUPPLEMENTARY CARBURETOR

Fred Mineck, Phoenix, Ariz., assignor to Dorothy J. Archer, Phoenix, Ariz.; Jay A. Mineck, Montclair, Calif. and Warren F. B. Lindsley, Phoenix, Ariz., part interest to each

Filed May 26, 1977, Ser. No. 800,727

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 B **13 Claims**



1. A device for ventilating and aerating crankcase gaseous fumes before transmitting said fumes to the manifold of an internal combustion engine comprising:

a tubular housing,

one end of said housing defining an intake port and the other end of said housing defining an outlet port,

said housing defining therewithin a gaseous fume mixing chamber,

a plurality of openings spacedly positioned around the periphery of said housing forming air inlet ports interconnecting atmospheric air with the interior of said chamber,

a deflecting vane mounted within said housing for swirling the gaseous fumes received through said intake port and discharging said swirling gases into said chamber, wherein the swirling gaseous fumes are aerated by air injected into said swirling gaseous fumes prior to discharge out of said outlet port, and

a valve assembly,

said assembly being mounted within said intake port of said housing for receiving and venting through said housing the crankcase fumes,

said outlet port of said housing being connectable to an intake manifold of the internal combustion engine.

4,100,899

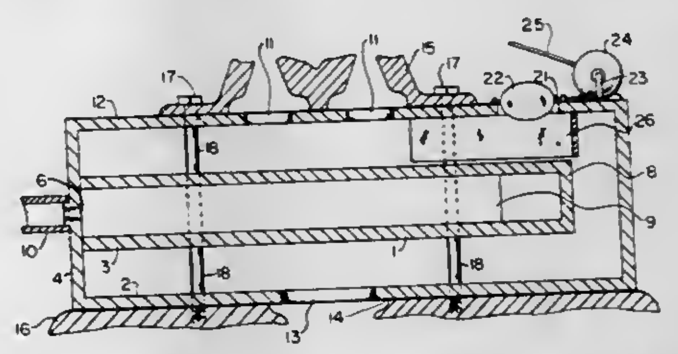
CARBURETOR HEATER

Robert S. Chilton, Route 1, Lawton, Iowa 51030

Filed Nov. 12, 1976, Ser. No. 741,317

Int. Cl.² F02M *31/08*

U.S. Cl. 123—122 A **5 Claims**



1. An apparatus for improving the combustion characteristics of an air/fuel mixture for an engine, the engine having a carburetor for introducing an air/fuel mixture into the intake port of an engine block, the apparatus being so positioned to allow a fluid flow from the carburetor through the apparatus and into the intake port of the engine block, said apparatus comprising:

(a) a first closed chamber having a top and an opposing bottom, including first and second openings in said top and bottom, respectively and further including a supplemental opening therein;

(b) a second closed chamber positioned within said first chamber allowing a fluid flow passage from said first opening in said first closed chamber to said second opening in said first closed chamber;

(c) means for introducing and means for exhausting warm gases into and out of said second closed chamber, such that the air/fuel mixture from the carburetor is passed through said first opening in said first closed chamber, around said second closed chamber where the air/fuel mixture is at least partially vaporized, and through said second opening in said closed first chamber, through the intake port of the engine;

(d) a baffle between said means for introducing warm gases and said means for exhausting the warm gases from said second closed chamber, such that said second closed chamber is more uniformly heated by the exhaust gases; and

(e) pneumatically activated valve means for controlling the volume of fluid flow into said first chamber through said supplemental opening, wherein the pneumatically activated valve means is responsive to pressure variations of the fluid flow through the apparatus.

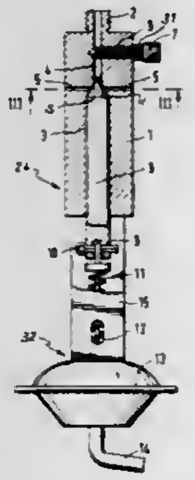
4,100,900
METHOD AND APPARATUS FOR CONTROLLING THE AIR OF COMBUSTION OF CARBURETOR ENGINES

Wilhelm Straub, Bruno de Ezeta 12, Circuito Navegantes, Cd. Satelite, Edo, Mexico

Filed Jun. 1, 1976, Ser. No. 691,786

Int. Cl.² F02M *23/04*

U.S. Cl. 123—124 R **2 Claims**



1. Apparatus for controlling the air of combustion of a carburetor engine, said engine including a carburetor for producing a mixture of fuel and air, a combustion chamber, a vacuum operated pneumatic spark control system, and conduit means connecting said carburetor with said combustion chamber, said conduit means having an inlet opening therein, and said apparatus comprising: valve means connected with said conduit means inlet opening, and operable to be moved progressively from a closed position to an open position to admit a progressively increasing volume of additional air of combustion into said conduit means for blending with the mixture of fuel and air flowing therethrough from said carburetor to said combustion chamber, said valve means including: a valve body having a main bore and a reduced outlet bore therein, connected by a frusto-conical valve seat, said outlet bore being connected to said conduit means inlet opening, and said valve body further having at least one air inlet bore, said air inlet bore opening on said valve seat and extending tangentially to the longitudinal axis of said main bore whereby to encourage turbulence in the air flowing through said valve; and a valve stem received in said main bore, and having a conical head thereon that is engageable with said valve seat to close said valve; and actuator means connected to operate said valve means between said closed and said open positions in direct dependency upon the rotational speed of said carburetor engine, said actuator means including: an actuator housing having a diaphragm mounted therein, said diaphragm being connected with the vacuum of the pneumatic spark control system of said carburetor engine and being operated thereby; an operating stem carried by said diaphragm and connected directly with said valve stem; and resilient means mounted and arranged to urge said valve stem toward a valve "closed" position against valve opening force generated by said diaphragm.

4,100,901
FUEL INJECTION SYSTEM

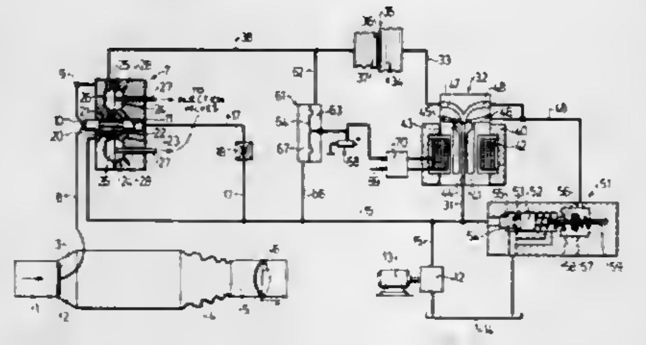
Manfred Krämer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 20, 1976, Ser. No. 650,734

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1975, 2502159

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AW **11 Claims**



1. In a fuel injection system for internal combustion engines, said system including a fuel tank, a source of pressurized fuel, fuel injection valves and a fuel metering and distributing assembly for simultaneous metering of fuel to said injection valves, and further including diaphragm valves disposed between said distributing assembly and each of said injection valves, each of said diaphragm valves having a first and second chamber, said first chamber being exposed to fluid pressure downstream of said distributing assembly in the valve-opening sense, the improvement comprising:

a fluid pressure modulator with an outlet which is connected to said second chamber in at least one of said diaphragm valves, said pressure modulator having internal fluid passages and including electromagnetically actuated means for directing the flow of fluid selectively through said passages, thereby determining the static pressure at said outlet and in said second chamber for controlling the fluid pressure therein in dependence on engine data;

a pressure transformer connected between said second chambers and said pressure modulator; and

each of said second chambers is connected in fluid communication with each other said second chamber.

4,100,902
FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES OF SPARK IGNITION TYPE

Tooru Kosuda, Okazaki; Michihiro Ohashi, Handa; Eiji Tanaka, Anjo; Hiroshi Mochizuki, Okazaki, and Seikou Abe, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 13, 1976, Ser. No. 750,192

Claims priority, application Japan, Dec. 16, 1975, 50/150380

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 BC **14 Claims**

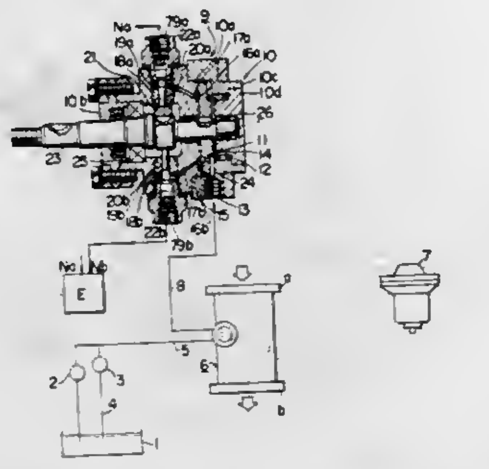
1. A fuel injection system for an internal combustion engine of spark ignition type comprising:

a fuel metering means for controllably metering a continuous flow of fuel fed to said internal combustion engine in dependence upon flow rate of intake air inducted to said engine;

a fuel distributing device comprising a plurality of fuel receiving ports provided in number equal to that of the cylinders of said engine and a fuel distributing means adapted to sequentially communicate with said fuel receiving ports as driven by said engine thereby to distribute the metered fuel received from said fuel metering means to said receiving ports;

a fuel pressure-feeding means comprising a plurality of chambers equal in number to the cylinders of said engine and each communicated with each of said fuel receiving ports, fuel pressure-feeding members watch reciprocally accommodated within each of said chambers, driving means for driving said fuel-feeding members at predetermined cycle to perform the reciprocal movements within said chambers depending upon the revolution number of said engine, and discharge valves each connected to each of said chambers, said discharge valves being opened when a pressure in said chambers exceeds a predetermined level, thereby to pressure feed intermittently said distributed fuel from said fuel distributing means in accordance with said reciprocal movements of said pressure-feeding members; and

fuel injection valve means provided in number equal to that of the cylinders of said engine and communicated with said chambers of said pressure-feeding means to receive intermittently supplied fuel thereby to feed the received fuel into the associated cylinders of said engine.



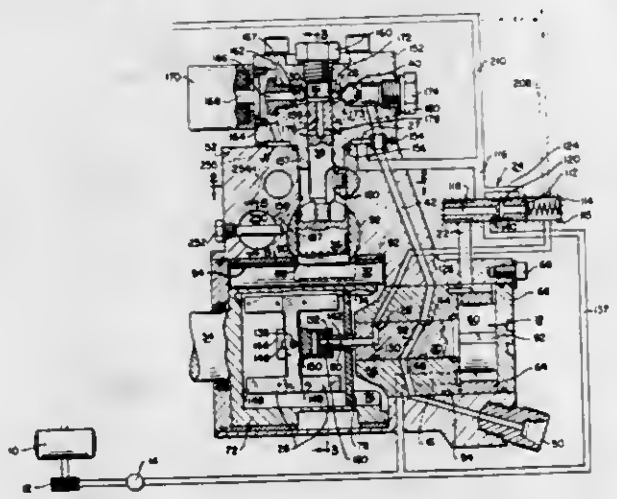
4,100,903
ROTARY DISTRIBUTOR FUEL INJECTION PUMP

Vernon D. Roosa, West Hartford, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 13, 1976, Ser. No. 750,276

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AQ **37 Claims**



1. A liquid fuel injection pump suited for the delivery of measured charges of liquid fuel under high pressure sequentially to the cylinders of an associated engine comprising a pump chamber wherein the charges are pressurized to high pressure, a pump plunger reciprocably mounted in said pump chamber, a stop for said pump plunger to limit the maximum volume of said chamber, mechanical means for driving said pump plunger in a direction to reduce the volume of said pump chamber to pressurize the fuel therein, hydraulic means to power said pump plunger in the opposite direction, said hydraulic means including a passage containing fuel under pressure in continuous communication with said pump chamber, a one way valve in said passage unseated by the pressure therein after the release of the pump plunger by said mechanical means to power the plunger against said stop and fully charge said pump chamber priorto each pumping stroke of the pump plunger, and a spill chamber which communicates with a spill port of said pump plunger to terminate the pumping stroke of said pump plunger by spilling the remainder of the charge of fuel in said pumping chamber, a dump port in the wall of said spill chamber, a spring biased piston in said spill chamber to control the dumping of fuel through said dump port, said spill chamber communicating with said pump chamber upon the release of the pump plunger by the mechanical means to provide an auxiliary quantity of fuel to assist in the charging of the pump chamber during the subsequent charging stroke of the pump plunger.

4,100,904
FUEL INJECTION SYSTEM

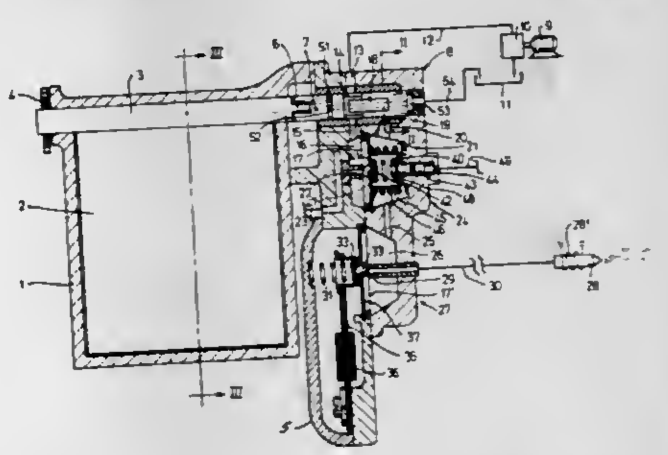
Konrad Eckert, Stuttgart; Heinrich Knapp, Leonberg-Silberberg, and Gerhard Stumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 507,076, Sep. 18, 1974, abandoned. This application Jan. 11, 1977, Ser. No. 758,369

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1973, 2348860

Int. Cl.² F02M *37/14*

U.S. Cl. 123—139 AW **11 Claims**



1. In a fuel injection system for mixture compressing, externally ignited internal combustion engines, which provides continuous fuel injection into the induction tube of the engine and which includes a fuel pump, a housing, a displaceably mounted air measuring member, means providing a resetting force to the displacement of the air measuring member, and a fuel metering valve with the air measuring member being mounted within the induction tube of the engine in series relation with an arbitrarily adjustable butterfly valve, and with the fuel metering valve being mounted within the housing and having a movable valve member which is displaced by the movements of the air measuring member so as to provide fuel metering in proportion to the air flow, the improvement comprising:

means for changing the fuel pressure downstream of the fuel metering valve in the fuel injection line whereby the fuel air mixture ratio is mediately changed; and

means for changing the differential pressure across the metering valve, which operate in response to the change in the fuel pressure downstream of the fuel metering valve,

wherein said means for changing the differential pressure includes:

a differential pressure valve connected to the fuel metering valve for setting the pressure differential across the fuel metering valve, said differential pressure valve being embodied as a flat-seat diaphragm valve;

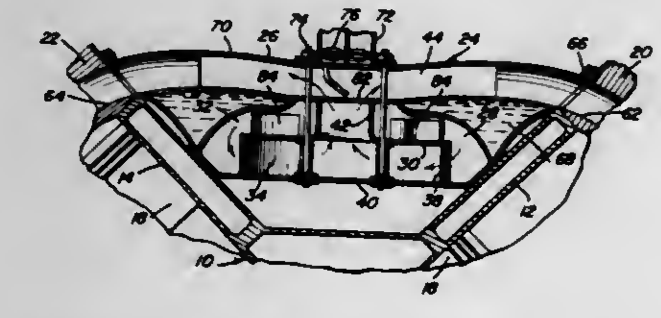
a differential pressure spring, for biasing the differential pressure valve in the direction of closure;

a warm-up piston, slidingly disposed in the housing; and

a warm-up spring, said warm-up spring biasing the differential pressure valve in the direction of closure; whereby said warm-up piston mediately supports one end of said differential pressure spring and mediately supports one end of said warm-up spring.

4,100,905
FUEL VAPORIZER

Joe M. Nolan, P. O. Box 1263, Longview, Tex. 75601
Filed May 31, 1977, Ser. No. 802,242
Int. Cl.^{2} F02M *29/00*
U.S. Cl. 123—141 **9 Claims**

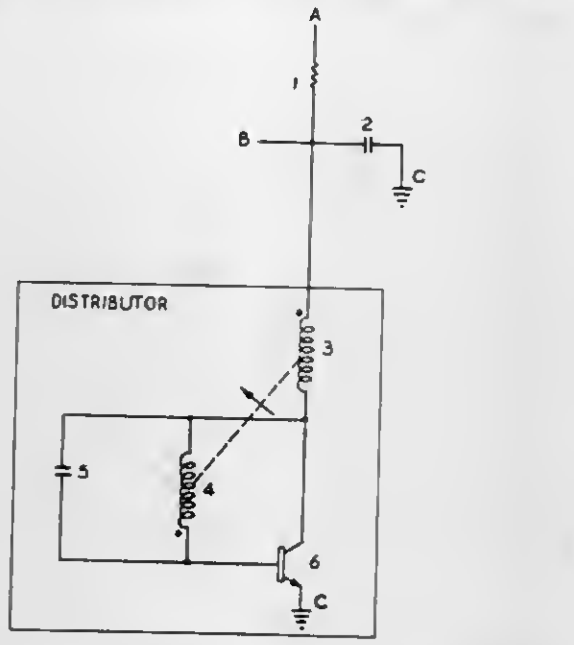


1. A fuel vaporizer for a V-type internal combustion engine, said vaporizer comprising a hollow intake manifold-type body for mounting between the cylinder banks of a V-type engine, said hollow body including means defining vertically oriented inlet passage means, a horizontally enlarged lower chamber into whose upper central portion the lower end of said intake passage means opens, a horizontal baffle disposed in and dividing the lower chamber into upper and lower chamber sections communicated with each other in corresponding outer peripheral zones thereof spaced outwardly of corresponding peripheral portions of said baffle, and vertically oriented outlet passage means whose lower end opens downwardly through a central portion of said baffle, said body further including means defining an upper chamber above said lower chamber and vertically through which said inlet passage means extends, said outlet passage means opening upwardly centrally into said upper chamber, said body additionally including means defining peripherally spaced intake runner passages opening outwardly of opposite sides of said body at points spaced therealong for registry with inlet ports formed in cylinder beads mounted on said cylinder banks, and a fuel and air charge forming device having an outlet end coupled to the upper end of said inlet passage.

4,100,906
PULSE GENERATOR FOR ENERGY DISCHARGE SYSTEM

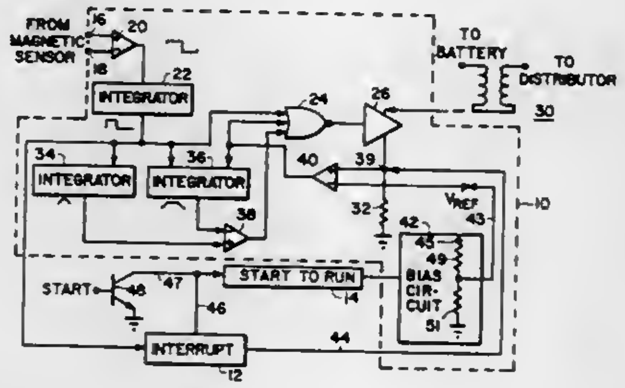
Floyd M. Minks, Rte. 1, Box 66, Kissimmee, Fla. 32741, and Floyd A. Minks, Box 252, Ridgetop, Tenn. 37152
Continuation-in-part of Ser. No. 181,445, Sep. 17, 1971, Pat. No. 3,837,325. This application Apr. 16, 1974, Ser. No. 461,392
Int. Cl.^{2} F02P *5/04, 1/00*
U.S. Cl. 123—148 E **3 Claims**

1. In an ignition system a gated oscillator containing a variable magnetic circuit for controlling said oscillator, an amplifying device to supply the gain required for oscillation, a source of power for said amplifying device, a bias network for supplying power from said power source to establish the steady-state operating point of said amplifying device such that variations in the voltage of said source of power vary the steady-state current through but has little effect on the steady-state voltage across said amplifying device and means to produce ignition pulses corresponding to the gating of said gated oscillator.



4,100,907
START-TO-RUN CIRCUIT FOR AN ELECTRONIC IGNITION SYSTEM

William F. Davis, and Wilson David Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 2, 1976, Ser. No. 702,155
Int. Cl.^{2} F02P *11/00, 9/00, 15/00*
U.S. Cl. 123—148 S **17 Claims**



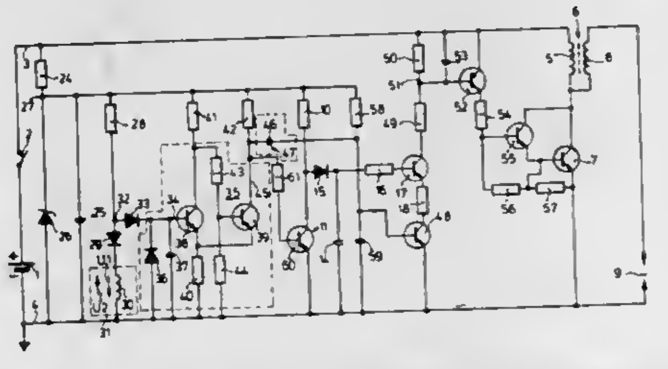
1. In an ignition system suitable to receive timing signals generated in timed relationship to engine rpm for discharging and charging an ignition coil to produce spark to operate the engine, the ignition system including a first circuit responsive to the initiation of each successive timing signal for generating an output signal of a predetermined duration, a charging current circuit coupled between the first circuit and the ignition coil which is rendered conductive in the absence of the output signal from the first circuit for providing current to charge the ignition coil and being rendered nonconductive by the output signal to cause the ignition coil to be discharged, a bias circuit for producing a first potential during normal engine operation, a current limiting circuit coupled to the charging current circuit and receiving the first potential for limiting the magnitude of the charging current to a value determined by said first potential, the improvement comprising in combination:

interrupt circuit means having an input coupled to the output of the first circuit and an output coupled to the current limiting circuit for producing an output signal to cause the current limiting circuit to prevent charging of the ignition coil when the engine rpm is below a predetermined rpm such that engine operation is inhibited; and

start-to-run circuit means baving an input coupled to said interrupt circuit means and an output coupled to the bias circuit for causing the magnitude of the first potential to be increased to a second potential during starting of the engine such that the current conducted through the ignition coil is increased during engine starting conditions to facilitate engine start-up.

4,100,908
SEMICONDUCTOR IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Reinhard Leussink, Vaihingen, Enz, and Walter Ruf, Korntal-Munchingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 21, 1976, Ser. No. 707,320
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533082
Int. Cl.^{2} F02P *3/04, 3/00*
U.S. Cl. 123—148 E **11 Claims**



1. Semiconductor ignition system for an internal combustion engine comprising an ignition coil (6);

a main switching transistor (7) connected in series with the primary (5) of the ignition coil (6);

an ignition breaker switch (11) connected to and controlling conduction or blocking of the switching transistor (7) in accordance with commanded ignition events;

a control circuit including a control capacitor (14) and a control transistor (17) connected to the switching transistor (7) to control the switching transistor to non-conduction or blocked state if the engine should be stopped with the ignition breaker switch (11) closed,

and a capacitor discharge circuit (16, 18;) for the control capacitor (14) dimensioned for gradual discharge of the capacitor, and connected to the base-emitter path of the control transistor (17), the collector-emitter path of the control transistor being connected to control conductivity of the switching transistor (7) so that discharge of the control capacitor (14), gradually, through said base-emitter path of the control transistor (17) will gradually change the conductivity of its collector-emitter path and hence provide for gradual change of conductivity of the main switching transistor (7) and gradual change-over to blocked state thereof and hence prevent generation of a high-voltage pulse in the secondary (8) of the coil (6).

4,100,909
LUBRICATION SYSTEM FOR AIR-COOLED ENGINES

Keiichi Nakano, and Kouji Nakai, both of Sakaishi, Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Apr. 26, 1977, Ser. No. 790,974
Claims priority, application Japan, Jan. 24, 1977, 52/7140
Int. Cl.^{2} F01M *1/00*
U.S. Cl. 123—196 AB **7 Claims**

1. In an air-cooled engine baving an air-cooled lubrication system, the combination of:

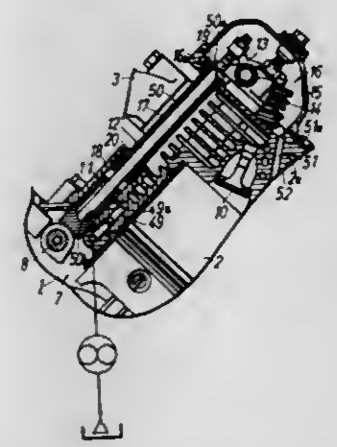
a crankcase having a chamber therein, the lower portion of said crankcase chamber being a reservoir for containing lubricating oil;

at least one cylinder mounted on said crankcase to project therefrom, said cylinder having cooling fins thereon and being provided with a head chamber at its head end;

valve means associated with said cylinder, and including valve operating arm means housed within said head chamber;

push rod means associated with said valve operating arm means, and including at least one push rod extending between said head chamber and said crankcase;

housing means enclosing said push rod, and forming an annular supply passage thereabout;



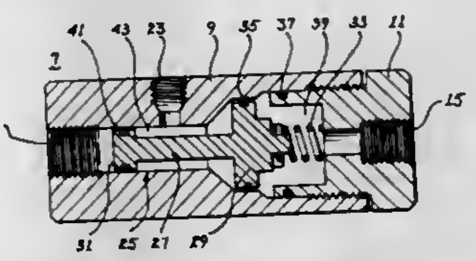
a lubricant pump mounted within said crankcase chamber and arranged to be at least partially immersed in lubricating oil contained in said reservoir portion of said chamber, whereby the operating chamber of said pump is assured to contain lubricating oil before start-up;

passage means connecting said lubricant pump with said annular supply passage, to supply lubricating oil to said head chamber; and

return passage means leading from said head chamber to said crankcase chamber, said return passage means extending through said cooling fins whereby air flowing over said fins is effective to cool the returning lubricating oil.

4,100,910
PRESSURE RATIO VALVE

Bill G. Davis, Phoenix, Ariz., assignor to Jetco, Inc., Phoenix, Ariz.
Filed Mar. 18, 1977, Ser. No. 778,851
Int. Cl.^{2} F01M *1/00, 1/18*
U.S. Cl. 123—196 S **10 Claims**



1. In an engine having engine protection means for reducing the engine RPM to a safe level in response to an engine oil pressure below an acceptable level, and a fuel pump for supplying fuel at a pressure linearly related to the engine RPM, a valve for continuously sensing both the oil pressure and the fuel pressure of the engine, and for reducing the engine oil pressure below the acceptable level in response to a fuel pressure-oil pressure ratio in excess of a predetermined magnitude, said valve comprising in combination:

a. a body defining an internal, longitudinally extending bore;
b. an oil inlet port providing a passage for entry of oil under pressure into said bore;
c. a fuel inlet port providing a passage for entry of fuel under pressure into said bore;
d. an oil outlet port communicating with said bore;
e. a piston slidably moveable in said bore interposed between said oil inlet port and said fuel inlet port, said piston hav-

ing a first pressure receiving heat communicating with said oil inlet port and a second pressure receiving head communicating with said fuel inlet port, said piston having a first position wherein said first pressure receiving head is in blocking relationship between said oil inlet port and said oil outlet port, and a second position wherein said first pressure receiving head is in non-blocking relationship between said oil inlet port and said oil outlet port, and

f. biasing means exerting a predetermined force urging said piston into the first position, said predetermined force being sufficient to maintain said piston in the first position so long as the force exerted by the fuel under pressure on said second pressure receiving head does not exceed the combination of said predetermined force and the force exerted by said oil under pressure on said first pressure receiving head;

whereby said piston is urged into the second position when the fuel pressure-oil pressure ratio exceeds the predetermined magnitude for reducing the engine oil pressure below the acceptable level and thereby activating the engine protection means.

4,100,911
ROTARY PISTON INTERNAL COMBUSTION ENGINE

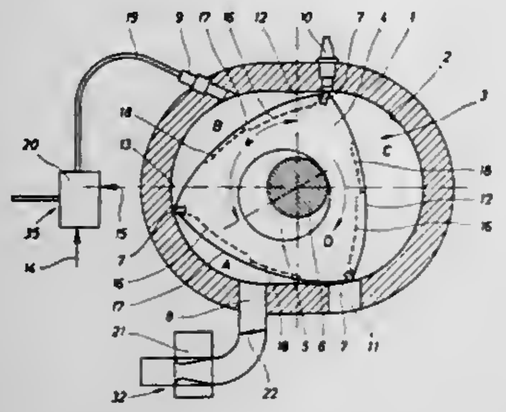
Günter Krömer, Heilbronn, Fed. Rep. of Germany, assignor to Audi Nsu Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 3, 1976, Ser. No. 720,247

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540702

Int. Cl.² F03B *53/10*

U.S. Cl. 123—205 **5 Claims**



1. A rotary piston internal combustion engine of trochoidal construction with spark ignition and fuel injection comprising:

a. a housing made up of a peripheral wall portion with a two-lobed inner peripheral surface having first and second nodes on its minor axis and two parallel side wall portions;
b. an eccentric carrying shaft and a three-cornered piston being mounted in the housing to rotate on the eccentric of the eccentric-carrying shaft;
c. a recess provided in the leading half of each flank of the piston, looking in the direction of rotation, said recesses defining together with the inner peripheral surface of the housing variable volume working chambers;
d. a transfer passage extending from the recess of each flank into the region of the trailing half of the flank;
e. an inlet passage, with a fuel metering device and a throttle valve, located in the housing near the first minor-axis node;
f. an exhaust port in the housing near the first minor-axis node for the excape of burnt gases;
g. at least one sparking plug mounted in the region of the peripheral surface where compression takes place, said sparking plug being placed at a point following the second node looking in the direction of rotation of the piston in the region in which, at the instant of passage of an apex seal of the piston, substantially equal pressure prevail in the two adjacent working chambers;
h. at least one injection nozzle mounted in the region of the inner peripheral surface where compression takes place, said injection nozzle being mounted ahead of the second node, looking in the direction of rotation, and arranged in an inclined manner to spray fuel towards the piston in such a way that the stream of fuel is directed into the recess during rotation of the piston in a region between 40° and 100° eccentric angle ahead of top dead center resulting in a local enrichment of the fuel/air mixture in the recess;
i. a fuel control device regulating the quantity of fuel fed to the fuel metering device and the injection nozzle so that there is always present in the recess at the instant of ignition a fuel/air mixture of 0.9 to 1.1 λ substantially independently of fuel/air ratio in the working chambers, the overall quantity of fuel when the throttle is closed being supplied mainly to the injection nozzle, whereas in the remaining conditions of operation, it is supplied through the fuel metering device; and
j. in the substantially top dead center position of the piston an overall compression chamber is formed and an essentially closed off chamber part is formed by the recess in the piston and the adjacent surfaces of the housing, said closed off chamber part containing an ignitable mixture substantially independently of the fuel/air ratio in the overall compression chamber and being substantially opposite the sparking plug at the instant of ignition, the ignitable mixture being capable of being ignited by the plug, so that the resulting flame which on further rotation of the piston passes from the trailing part of the recess at relatively high velocity through the transfer passage to ignite the incoming fuel/air mixture in the remainder of the compression chamber.

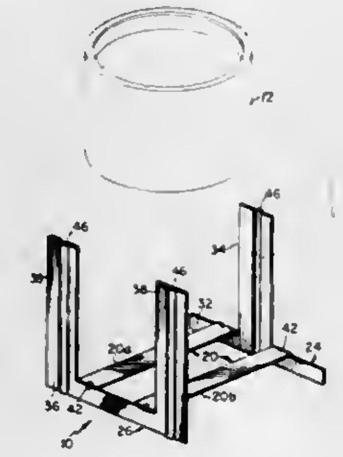
4,100,912
PORTABLE CAMP STOVE

Tuthill Doane, 373 School St., Westbury, N.Y. 11590

Filed Jul. 16, 1976, Ser. No. 705,773

Int. Cl.² F24C *15/08*

U.S. Cl. 126—43 **9 Claims**



1. In combination: a container of cooking fuel having a given height and a portable camp stove for supporting the container during use above a given plane and a cooking utensil over said container, said stove comprising:

a flat blank of bendable sheet metal or the like having means defining elongated slots therein for delineating

(i) a container support,
(ii) a first side member connected to said support along at least one first bending line and having a first portion disposed on one side of said first bending line and a second portion disposed on the other side of said first bending line and
(iii) a second side member connected to said support along at least one second bending line and having a first portion disposed on one side of second bending line and a second portion disposed on the other side of said second bending line, wherein the second portions of each of said side members have a length greater than said given height and are disposed parallel to each other and configured to closely receive said container therebetween when the stove is erected and said container rests upon said support; and

wherein said stove is erected by inwardly bending said first and second side members with respect to said container support along said first and second bending lines respectively, disposing each side member substantially perpendicular to said support wherein said first portions of said side members are positioned below said support for disposing the support above the given plane and wherein said second portions of said side members are simultaneously disposed above said support while maintaining the coplanar relationship between said first and second portion of each side member for supporting a utensil placed thereon over said support and thereby over said fuel container resting thereon.

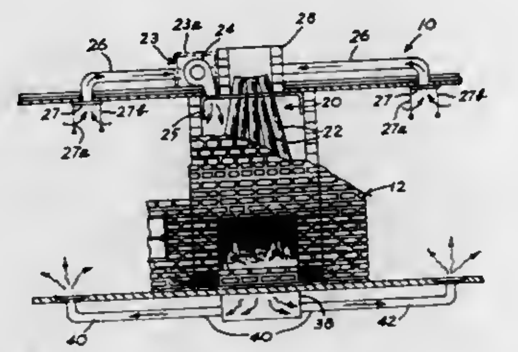
4,100,913
FIREPLACE HEATING SYSTEM

Ernest DeLoy Armstrong, 5523 Latigo, Boise, Id. 83705

Filed Oct. 29, 1974, Ser. No. 518,414

Int. Cl.² F24B *7/00*

U.S. Cl. 126—121 **2 Claims**



1. A fireplace heating system for a building structure comprising, in combination,

(a) a fireplace including a firebox,
(b) a chimney,
(c) a heat exchanger bounded in part by the firebox and including a multiplicity of heat conductive metallic tubes which connect the fireplace with the chimney, whereby the hot products of combustion are all adequately conducted to the chimney for discharge to the outside atmosphere, the heat exchanger including a chamber of larger flow capacity than the combined tubes, through which chamber the tubes pass,
(d) means for withdrawing breathable air from the top of a room and propelling it downward through said chamber of the heat exchanger for exposure to contact with the outsides of the tubes thereof,
(e) means for delivering the reheated air from the heat exchanger to the lower, habitable part of a room of the building, said withdrawing and delivering means having a flow capacity nearly enough comparable to that of the heat exchanger chamber to avoid objectionable overheating of the returned air and also to avoid discharge of the returned air at an objectionably high velocity, and
(f) a firm support for the fireplace, said support including a tier composed essentially of hollow concrete blocks disposed above floor level and constructed and arranged to form contiouously open passage means volumetrically proportioned to deliver moderately reheated, returned air at low velocity and in substantial quantity to the room in which the fireplace is located, at points substantially at floor level.

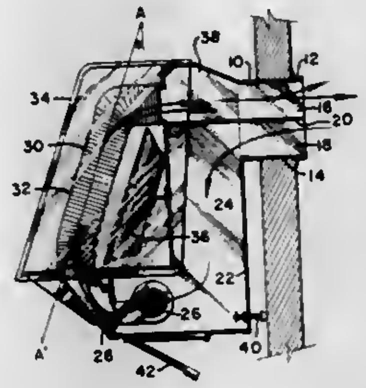
4,100,914
SOLAR ENERGY COLLECTOR

Salvion Ed Williams, 6531 S. Atchinson Wy., Englewood, Colo. 80110

Filed Jun. 13, 1977, Ser. No. 798,637

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



1. In a solar energy collector having a reflector and a plurality of tubular members in sealing engagement between an upper warm air dispensing manifold and a lower cool air collecting manifold wherein the improvement comprises, in combination:

(1) A substantially horizontal housing section adapted for insertion into an opening in the wall of a building, such as an existing window frame, said horizontal section containing an upper duct for dispensing warm air into the building and a separate lower duct for collecting relatively cool air from within the building;
(2) a substantially vertical housing section which is attached to the horizontal housing section, said vertical housing section containing,
  (a) an air intake duct in air carrying connection with the lower duct of the horizontal housing section,
  (b) an air pumping means,
  (c) a lower manifold for directing the cooler air dispensed by the pumping means into a plurality of tubular members,
  (d) a plurality of opague coated corrugated metal tubular members in air carrying connection between the lower manifold and an upper manifold, wherein air is heated by the action of the sun's rays on the outer walls of said tubular members and rises in the tubular members to the upper manifold through both the natural tendency of warm air to rise, and the action of the air pumping means,
  (e) an upper manifold for collecting the rising warm air and directing said air into the upper duct of the horizontal housing section,
(3) a reflecting surface on the side of the tubular members away from the sun and being substantially coextensive with said tubular members, said reflecting surface being positioned a distance not more than four times the diameter of the tubular members which are farthest away from the reflecting surface;
(4) a transparent enclosure which engages between the lower manifold, the upper manifold, and the two vertical sides of the vertical housing section to enclose the tubular members.

4,100,915
SOLAR ENERGY HEATING APPARATUS

Ingemar Carlson, Nybrnvag 6, 78100 Borlange, Sweden

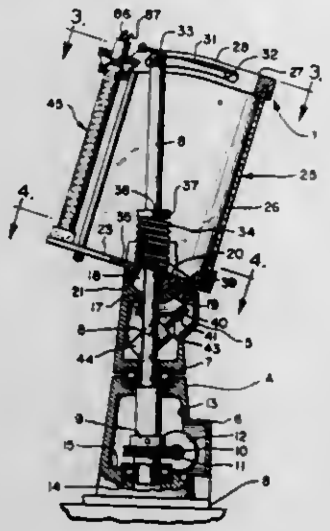
Filed Feb. 18, 1977, Ser. No. 770,096

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **17 Claims**

1. In a solar heat collector, a support, means carried thereon for absorbing solar heat,

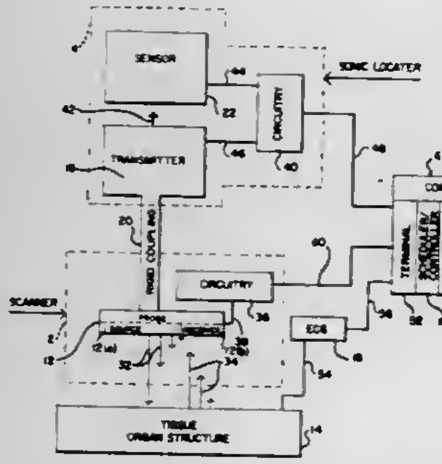
said means comprising first dark heat absorbent surfaces disposed for direct impingement by solar rays,
said means comprising other highly polished reflective surfaces,
said first heat absorbent surfaces having an angle of incidence with the sun rays for deflecting at least a portion of said rays toward said reflective surfaces,



and said means having other second dark heat absorbent surfaces disposed both to direct impingement by the sun's rays and also to the reflected rays,
and means for conducting heat from both heat absorbent surfaces to a use area.

4,100,916
THREE-DIMENSIONAL ULTRASONIC IMAGING OF ANIMAL SOFT TISSUE

Donald L. King, 19 Searles Rd., Darien, Conn. 06820
Filed Apr. 27, 1976, Ser. No. 680,885
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 V **16 Claims**

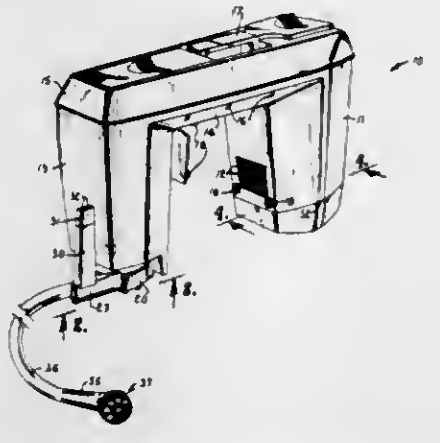


1. An apparatus for collecting three-dimensional data on the size, shape, location and nature of animal soft tissue organ structures within the animal and reconstructing the data outside the animal to provide a representation of the size, shape, location and nature of the structure in three dimensions which comprises:

(a) a first means having:
 (i) a source transmitting acoustical waves into the tissue; and
 (ii) a receiver for receiving waves from the tissue and detecting measurable physical characteristics of the waves
and the first means producing electronic output signals corresponding to the characteristics of the waves;
(b) a second means having:
 (i) a transmitter means which remains in a known spatial relationship with respect to the source and receiver of the first means, and emits into space a plurality of energy waves from a plurality of discrete points; and
 (ii) a sensing means which is spaced from the transmitter means and senses each energy wave from each discrete point of the transmitter means in three dimensions known as X, Y and Z
and the second means producing electronic output signals corresponding to each wave from the plurality of discrete points; and
(c) a computer means electrically coupled to the first and second means receiving the output signals from the first and second means and processing and assembling the data transmitted by the signals and displaying the data in a form for determining one or more of the size, shape, location and nature of the tissue in three dimensions.

4,100,917
HYDROTHERAPY UNIT

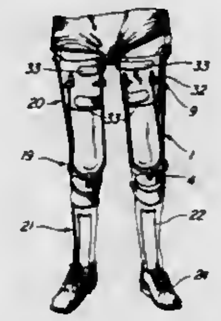
Henry J. Talge, Leawood; Samuel L. McNair, and Verne L. Zugenbuhler, both of Kansas City, all of Mo., assignors to Dazey Products Co., Industrial Airport, Kans.
Filed Oct. 18, 1976, Ser. No. 733,231
Int. Cl.² A61H *9/00*
U.S. Cl. 128—66 **22 Claims**



1. Hydrotherapy apparatus for circulating water in a tub, said apparatus comprising:
a frame;
a pump housing mounted on said frame at a location to be immersed in the water, said pump housing having an inlet for receiving water and first and second outlets for discharging water, said first outlet directing water into the tub for circulation therein;
an accessory operable to receive and apply the water from said second outlet;
means for coupling said accessory with said second outlet to receive water therefrom;
an air tube disposed in communication with said first outlet to deliver air thereto, said air tube having an air inlet located above the water level in the tub for receiving air; and
a hollow aspirating member located partially in said air tube and presenting a conduit which provides communication between said air tube and first outlet, said member having an upstream portion and a downstream portion, said upstream portion projecting into said first outlet a greater distance than said downstream portion, whereby suction is caused by water flowing through said first outlet to induce air flow through said air tube and into said first outlet by aspiration.

4,100,918
DYNAMIC ORTHOTIC KNEE EXTENSION ASSIST DEVICE

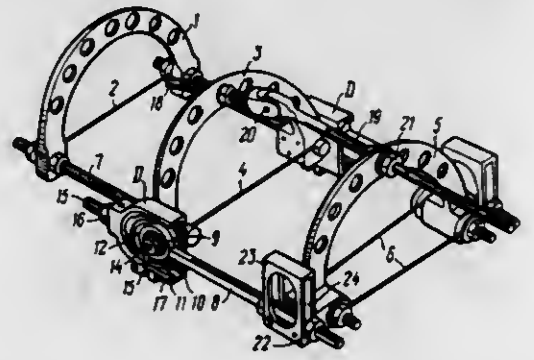
John Glancy, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.
Filed Mar. 25, 1977, Ser. No. 781,123
Int. Cl.² A61F *3/00, 5/00*
U.S. Cl. 128—80 F **6 Claims**



1. A dynamic knee extension assist orthotic device comprising:
cuff means adapted to be secured to a patient's thigh;
mounting means adapted to be secured to the patient's leg below the knee;
knee brace means rigidly secured between the mounting means and the cuff means;
elongated elastic means capable of exerting a predetermined force;
means for adjusting the tension of the elastic means;
pivotal means for securing the elastic means intermediate its ends to the mounting means; and
means for removably mounting each end of the elastic means to the cuff means at a predetermined tension;
whereby, the elastic means provides a controlled knee.

4,100,919
APPARATUS FOR SURGICAL TREATMENT OF BONES AND JOINTS

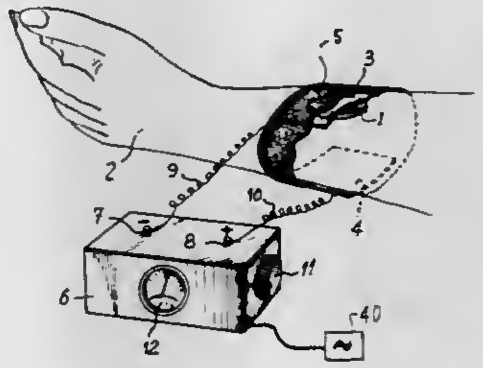
Oganes Vardanovich Oganesyan, and Nikolai Ivanovich Pyanov, both of Moscow, U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut Travmatologii I Ortopedii Imeni N.N. Priorova, U.S.S.R.
Filed Dec. 8, 1976, Ser. No. 748,753
Int. Cl.² A61F *5/04*
U.S. Cl. 128—84 B **10 Claims**



1. An apparatus for the surgical treatment of bones and joints, comprising at least a supporting and a rotatable stirrups, wire spokes secured in said stirrups and intended for being drawn through juxtapositional segments of bones or joints, said rotatable stirrup and the spokes associated therewith forming a rigid system, while said supporting stirrup and the spokes associated therewith form another rigid system, distractors intended to interconnect said rigid systems, hinge joint fastenings of said distractors, situated at the two ends of the wire spoke of the supporting stirrup, the position of the axis of said hinge joint fastenings determining that of the axis of rotation of the apparatus, and a regulator of the position of the apparatus' axis of rotation, including a means for rotating the fulcrum of the hinge joint fastening of the distractors along a circumference relative to the axis of the wire spoke of said supporting stirrup, as well as a means for moving the fulcrums of the hinge joints along the distractors interconnecting said supporting and rotatable stirrups.

4,100,920
METHOD AND APPARATUS FOR TRANSFERRING MICROORGANISMS THROUGH THE SKIN BARRIER

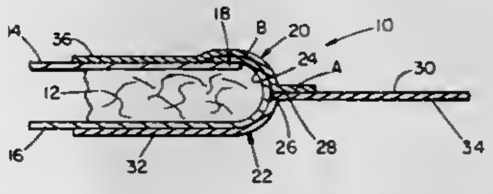
Jacqueline Marie George Juliette Le Goaster, 6, rue Raffet, 75016 Paris, Seine, France
Filed Aug. 19, 1976, Ser. No. 715,708
Claims priority, application France, Sep. 2, 1975, 75 26888; Apr. 22, 1976, 76 11924
Int. Cl.² A61N *1/30*
U.S. Cl. 128—172.1 **18 Claims**



9. A system for transferring microorganisms through the skin barrier comprising a pair of electrodes, a source of continuous current, an electrical connection between said source and said electrodes, a nutrient solution containing the said microorganisms, the said nutrient solution being adapted to be applied to the skin barrier, and the said electrodes being adapted to be arranged against the skin barrier, at least one of the electrodes being adapted to be arranged upon the part of the skin barrier to which is applied the nutrient solution containing the said microorganisms during use, said at least one electrode containing said solution.

4,100,921
DIAPER FASTENER

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 29, 1973, Ser. No. 410,375
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **30 Claims**

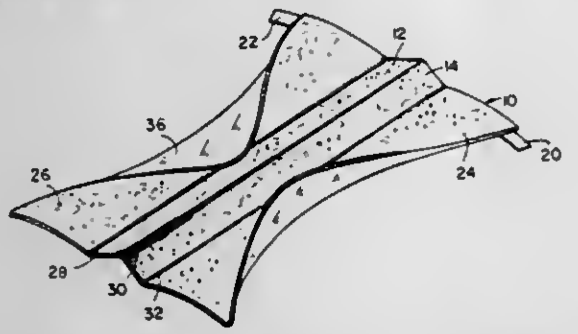


1. In combination with a diaper having an inner surface, an outer surface, and a lateral edge, a fastener for securing said diaper to the diaper wearer comprising first and second pieces of tape each having a first surface having an adhesive disposed thereon and a second surface which is free of adhesive, a major portion of said first tape first surface being adhesively secured to said inner surface of said diaper for securing the first tape thereto and and a minor portion of said first tape first surface extending beyond said lateral edge of said diaper when said diaper is placed on the wearer and being adhesively secured to a first minor portion of said second tape first surface, and a second portion of said second tape first surface being releasably secured to said first tape second surface prior to placement of said diaper on said diaper wearer whereby, when said

diaper is to be placed on the wearer said second portion may be peeled from said first tape second surface and secured to another portion of said diaper.

4,100,922
DISPOSABLE DIAPER

John Michael Hernandez, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jul. 9, 1975, Ser. No. 594,345
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **1 Claim**



1. A disposable diaper substantially rectangular in shape and having only four longitudinal sections, said diaper comprising in order, a water pervious layer, an absorbent pad layer and a water impervious layer, two of said sections being a pair of abutting, substantially centrally located longitudinal panels defined by three substantially parallel longitudinal folds extending the length of said diaper, said panels being of approximately equal width and the combined width of said panels being from one-fourth to one-half the width of said diaper, a flap portion adjacent each of said panels, said adhesive means on each of said panels approximately centrally located longitudinally thereof, said adhesive means being deposits of adhesive extending less than the width of each of said panels, said flap portions overlying said deposits of adhesive and only partially overlying said water pervious layer and secured thereto by said deposits of adhesive to form an hour glass configuration, with the corners of the diaper lying flat, adbesive tab means attached to said water impervious layer at least one corner of said diaper, said water impervious layer comprising a thin, flexible plastic material of polyethylene, polypropylene or polyvinyl chloride, said absorbent pad layer being cellulose wadding, said water pervious layer being hydrophobic paper.

4,100,923
EXTRA-AMNIOTIC ADMINISTRATION DEVICE

Edward M. Southern, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Dec. 16, 1976, Ser. No. 751,096
Int. Cl.² A61M *25/00*
U.S. Cl. 128—348 **5 Claims**

1. A device for administering liquid medication to the extra-amniotic space of an impregnated uterus, comprising:

an elongated, resiliently flexible tube open at opposite ends thereof and of sufficient lenth to extend through the cervix and into said extra-amniotic space of a uterus at one end and into the birth canal at the other end;

first conduit means connected to the other end of said tube means and extendable through and beyond the birth canal for permitting a liquid medication to be supplied through said tube into said extra-amniotic space;

first and second flanges secured to said tube and being spaced from each other along said tube by a distance approximately equal to the distance between the uterus and the birth canal at the opposite ends of the cervix;

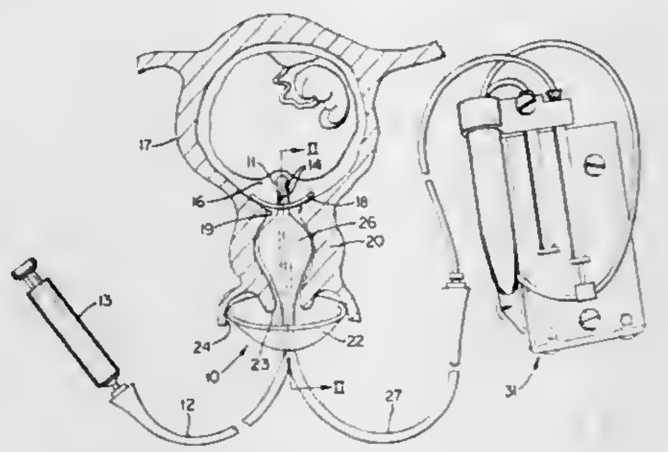
said first flange being positionable within the extra-amniotic space of said impregnated uterus directly adjacent the internal os of the cervix for preventing accidental ejection of the tube from the uterus;

said second flange being cup-shaped and positionable within the birth canal closely adjacent the external os of the cervix for preventing accidental ascension of the tube relative to the uterus, said cup-shaped second flange having a central portion thereof disposed closely adjacent but slightly spaced from the external os to collect any liquid medication which seeps back through the cervix, the cup-shaped second flange having a rim which is snugly engageable with the wall of the birth canal surrounding the external os;

a resiliently flexible, inflatable, substantially cylindrical member disposed between said flanges and connected to said tube to define a fluid-tight annular chamber surrounding said tube, said member when inflated snugly engaging the wall of the cervix; and

second conduit means connected to said chamber within said inflatable member and extendable therefrom through and beyond said birth canal for supplying an inflating fluid to said chamber.

3. A method for delivering a liquid medication into the extra-amniotic space of an impregnated uterus, comprising the steps of:



providing an elongated open-ended tube having a first flange thereon adjacent one end thereof and a second cup-shaped flange which opens toward the first flange and is spaced therefrom along said tube by a preselected distance which is slightly greater than the length of the cervix;

inserting the tube through the birth canal and the cervix so that said one end thereof extends into said extra-amniotic space;

positioning said tube so that said first flange is disposed within the extra-amniotic space closely adjacent the internal os of the cervix for preventing accidental ejection of the tube and said second flange is disposed closely adjacent but slightly spaced from the external os of the cervix for preventing accidental insertion of the tube;

causing a supply of said medication to flow through said tube and into said extra-amniotic space;

preventing the escape of said medication from said extra-amniotic space into said birth canal by collecting any seepage of medication through the cervix within said cup-shaped second flange; and

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4,100,924
SHOULDER STRAP

Frieda M. Rosenberg, 145 Crescent Beach Dr., Burlingtoo, Vt. 05401
Filed Jun. 16, 1977, Ser. No. 807,119
Iot. Cl.² A41C *3/00*
U.S. Cl. 128—510 **10 Claims**

1. A shoulder strap for extending over a person's shoulder to support a load from the person's shoulder, said strap comprising:

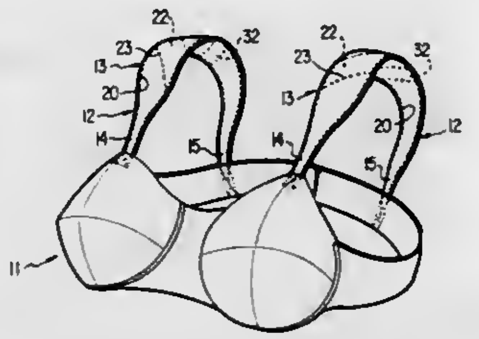
a flexible elongated main strap portion having end portions, each of which is secured to the load;

a widened flexible intermediate portion having front and rear ends;

a first single pocket extending diagonally to the length of the strap across the intermediate portion adjacent to the front end of the intermediate portion;

a single stay member disposed within said first pocket;

a second single pocket having a width less than the width of the first pocket and extending at an angle to the length of the strap across the intermediate portion adjacent to the rear end of the intermediate portion; and

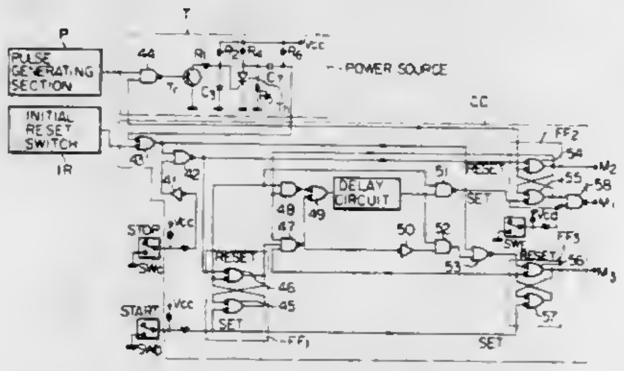


a single stay member disposed within said second pocket; whereby:

said first and second stay members substantially bridge the scapula and clavicle of the person's shoulder without interfering with arterial or venous drainage of the shoulder.

4,100,925
COIN JAMMING DETECTING DEVICE

Motoaki Fukunaga, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan
Filed Dec. 17, 1976, Ser. No. 751,708
Claims priority, application Japan, Dec. 26, 1975, 50/156914
Int. Cl.² G07D *3/00*
U.S. Cl. 133—3 F **2 Claims**



1. A coin jamming detecting device in an apparatus comprising a coin receiving means for receiving coins from outside and a coin moving means for moving coins delivered thereto by the coin receiving means into a coin storing section, which device comprises:

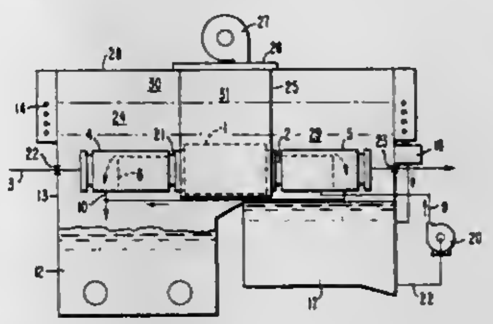
a pulse generating means associated with said coin moving means for generating pulses at time intervals proportional to the time interval of an operation cycle of said coin moving means;

a timer means operatively connected to said pulse generating means, for producing an abnormal signal when the time interval between said pulses generated by said pulse generating means becomes longer than a predetermined period of time; and

a drive control means operatively connected to said timer means, for stopping the operations of said coin receiving means and said coin moving means upon reception of said abnormal signal.

4,100,926
APPARATUS FOR ULTRASONIC CLEANING WITH LIQUID SOLVENT IN A BLANKET OF VAPOR

Richard C. Heim, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 22, 1976, Ser. No. 725,214
Int. Cl.² B08B *3/12*
U.S. Cl. 134—64 R **3 Claims**



1. Apparatus for ultrasonic cleaning with liquid solvent comprising:

an enclosure;

means in a first region of said enclosure containing liquid solvent for generating vapor from said liquid solvent;

means in a second region of said enclosure for condensing said vapor, said second region means being spaced from said first region means and said first and second region means defining therebetween a third region of said enclosure occupied by saturated vapor;

means in said third region containing liquid solvent;

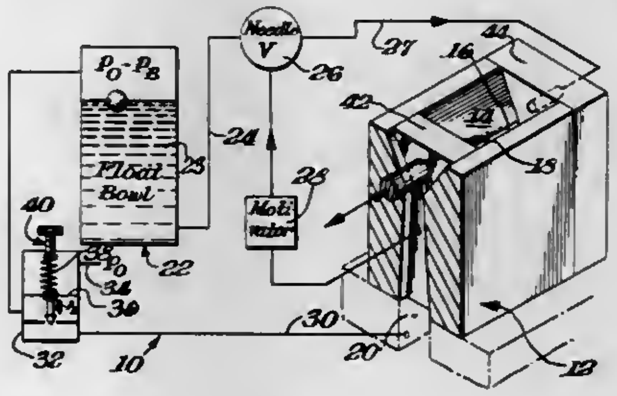
transducer means mounted in said third region for applying ultrasonic energy to said third region liquid solvent;

an elongated workpiece passed through said enclosure in said third region thereof, and passed through said third region liquid solvent for conducting ultrasonic cleaning of said workpiece by said transducer means; and

means provided in said third region for insulating said transducer means from said vapor and said liquid solvent.

4,100,927
FLUID FLOW REGULATION

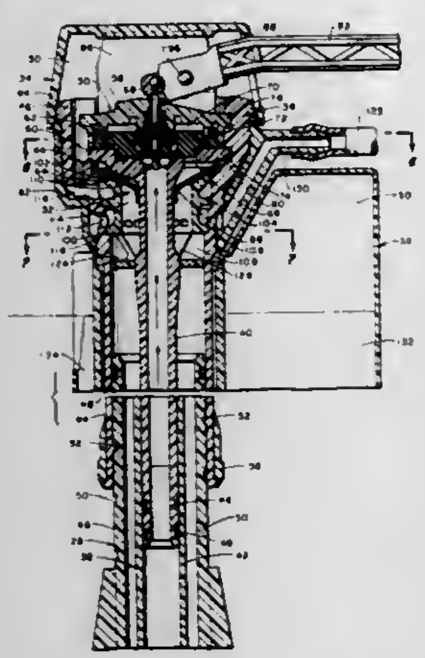
Casper W. Barnes, Jr., Newport Beach, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 485,518, Jul. 3, 1974, Pat. No. 3,987,132.
This application Jun. 18, 1976, Ser. No. 697,419
Int. Cl.² G05D *7/01*
U.S. Cl. 137—9 **1 Claim**



1. A method of varying the mass flow rate of fluid across a turbulent-flow valve in direct proportion to changes in pressure differential across the valve comprising the steps of delivering fluid under pressure to a turbulent-flow valve, and applying a fixed pressure bias to the fluid upstream of the valve, the fixed pressure bias being of such a magnitude that the mass flow rate of fluid through the valve varies directly with variations in the pressure differential across the valve when these variations are within a selected pressure range.

4,100,928
BALL COCK CONSTRUCTION FOR CONTROLLING THE LEVEL OF LIQUIDS SUCH AS WATER IN TANKS

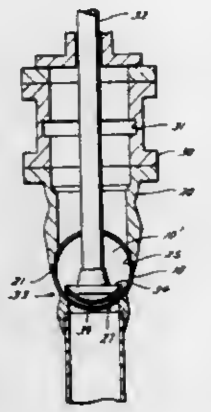
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631
Filed Jul. 19, 1976, Ser. No. 706,479
Int. Cl.^{2} F16L *55/00;* F16K *31/34*
U.S. Cl. 137—15 **17 Claims**



7. In a method of forming a vertically adjustable ball cock for controlling the level of liquids such as water in a tank, the ball cock being of the type having a vertical inlet tube downwardly securable to a tank bottom wall in communication with a water supply and upwardly secured to a float controlled valve, a vertical outlet tube telescoping said inlet tube spaced radially outwardly therefrom for the flow of water downwardly therebetween, said outlet tube being downwardly securable to said tank bottom wall and upwardly secured to said valve, and a water outlet opening communicating into said tank at a lower extremity of said outlet tube; the steps of: forming and positioning each of said inlet and outlet tubes having vertically end telescoping upper and lower parts with said inlet parts vertically communicating and said outlet parts vertically communicating during varying amounts of said vertical end telescoping; during said forming and positioning, rigidly generally radially interengaging said upper and lower parts of said outlet tube normally positively resisting at least straight vertical movement between said inlet and outlet tube upper and lower parts; during said formation of said radial interengagement of said outlet tube upper and lower parts, forming said radial interengagement selectively operable for increasing and decreasing said outlet tube upper and lower part end telescoping by forming a spiral groove on one of said outlet tube upper and lower parts radially engaged by a rigid radial projection formed on the other of said outlet tube upper and lower parts thereby permitting increasing and decreasing of said outlet tube upper and lower part end telescoping by selective relative rotation between said outlet tube upper and lower parts carrying said inlet tube parts therewith with resultant final selected positioning always normally positively resisting said at least straight vertical movement to permit selective varying of the overall vertical height of said ball cock; terminating said spiral groove spaced from its tube part telescoping end termination normally preventing vertical separation of said outlet tube upper and lower parts during said relative rotation between said tube upper and lower parts by retaining said engagement of said radial projection with said spiral groove; during said forming of said groove and projection radial interengagement selectively operable, forming said groove and projection radial interengagement selectively operable at any adjusted vertical height of said ball cock for permitting selective complete radial separation of said groove and projection radial interengagement to permit complete vertical separation between said inlet and outlet tube upper parts and said inlet and outlet tube lower parts.

4,100,929
ACROSS THE LINE PLUGGING APPARATUS AND METHOD

George W. Harrison, Houston, Tex., assignor to Team, Inc., Alvin, Tex.
Filed Aug. 2, 1976, Ser. No. 710,585
Int. Cl.^{2} F16L *55/10;* F16K *43/00*
U.S. Cl. 137—15 **8 Claims**



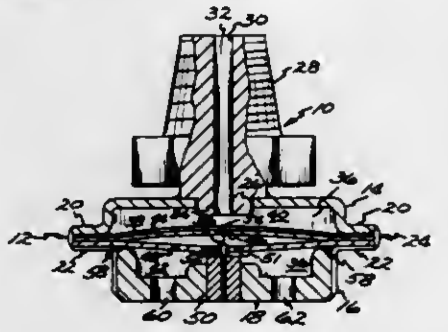
1. A method of sealing across a main line to plug a branch line having an opening therein communicating with the interior of the main line comprising the steps of:

(a) forming an opening in the main line across from the opening between the branch line and the main line;
(b) inserting a plug through the formed opening and into the main line;
(c) forming a sealing engagement between the plug and the circumferential periphery of the main line around the opening communicating the branch line with the main line; and
(d) inserting at least a portion of the plug inwardly into the opening communicating the branch line with the main line.

2. The method of sealing set forth in claim 1, including the step of welding a flange member to the main line where the opening is to be formed; and
mounting a valve body to the flange member for inserting the plug into the main line.

4,100,930
PRESSURE RELIEF VALVE

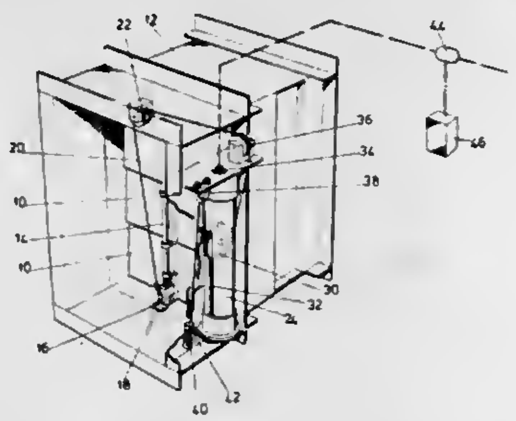
John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed May 3, 1976, Ser. No. 682,558
Int. Cl.^{2} F16K *17/40*
U.S. Cl. 137—68 R **4 Claims**



1. A pressure responsive relief valve comprising a housing having a chamber to be placed in communication at one side of the chamber with a pressure zone to be monitored, a membrane formed with a dished configuration positioned in the chamber to divide the chamber into a first part at said one chamber side and a second part separated from said first part by the membrane, a disc member of a concave-convex dished configuration generally the same as that of the membrane disposed in the second chamber part nested against and conforming to said membrane with its convex side facing the first chamber part movably supporting the membrane in a first position against the zone of pressure in the first chamber part, the dished member having an aperture therein and being substantially coextensive in area with the membrane and being movable with snap action to an inverted dished configuration in response to the occurrence of a selected pressure level in the first chamber part for permitting the membrane to move to a second position in the chamber, and membrane piercing means mounted in the second chamber part to extend through the dished disc member aperture to pierce the membrane for venting the pressure zone being monitored when the dished member moves to said inverted dished configuration.

4,100,931
FIRE DAMPER

Frederick William Pantland, Tralee, Ireland, and Ernest Francis Pantland, Johannesburg, South Africa, assignors to Leonard Joseph Fisher, Sandton, South Africa
Filed Jul. 12, 1976, Ser. No. 704,599
Claims priority, application South Africa, Jul. 18, 1975, 75/4627
Int. Cl.^{2} F16K *17/38*
U.S. Cl. 137—77 **5 Claims**



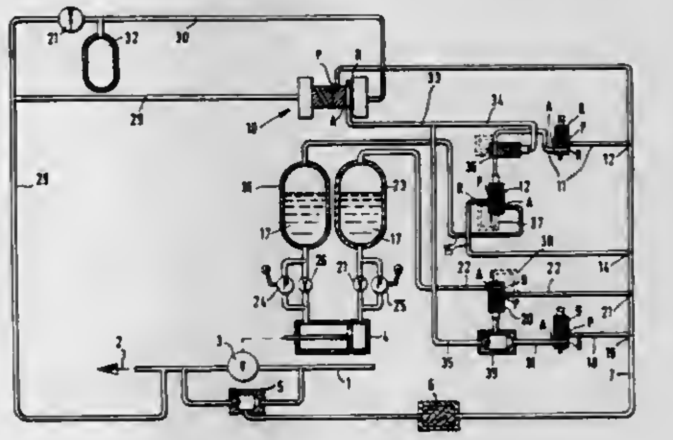
1. A fire damper comprising an orifice, at least one flap pivoted in the orifice between a first position in which it closed the orifice and a second position in which the orifice is fully open, a winching motor, a motion transmitting linkage operable by the motor and including a fusible link, one end of the linkage being connected to the flap, the motor being adapted to be energized by compressed air fed through a solenoid controlled valve so that energization of the motor causes the flap to open provided that the fusible link is still intact whereas de-energization of the motor causes the flap to close, and a smoke detector adapted to close the valve in the presence of smoke and thereby cause the motor to become de-energized, said smoke detector being further adapted to open the valve in the absence of smoke and thereby cause the motor to become energized.

4,100,932
PIPE BURST SAFETY DEVICE FOR NATURAL GAS PIPE LINES OR THE LIKE

Hermann Schmitz, Haan, Fed. Rep. of Germany, assignor to P.D. Rasspe Soehne, Solingen, Fed. Rep. of Germany
Filed May 28, 1976, Ser. No. 690,877
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541734
Int. Cl.^{2} F16K *31/12*
U.S. Cl. 137—488 **5 Claims**

1. In a pipe burst safety device for automatically closing a flow control valve connected in a pipe line for transmitting fluid under pressure, wherein in response to a drop in pressure within the pipe line the flow control valve is operated and closed by a fluid actuator means receiving fluid pressure from the pipe line at a location upstream of the flow control valve, the combination of:

a fluid line connected to the pipe line downstream of the flow control valve and having two parallel branches, one of said branches having a pressure drop transmitting delay means connected therein;
a differential pressure valve connected with said two parallel branches, and comprising:
a housing containing two aligned, spaced, generally cylindrical end chambers disposed on opposite sides of an enlarged, generally cylindrical central chamber, each of said end chambers having an inlet port therein, and said end chambers being joined to said generally cylindrical central chamber by abutment shoulders disposed to lie in parallel planes that extend perpendicular to the longitudinal axis of said central chamber;
a slide received within said enlarged central chamber, and movable toward either of said end chambers into sealing engagement with said abutment shoulders, the inlet port of the second of said end chambers being connected with said one branch, and the inlet port of the first of said end chambers being connected with the other of said branches; and
resilient means arranged to urge said slide to move toward said second end chamber, said slide normally being shifted toward said first end chamber into sealing engagement with the abutment shoulder there located when said end chambers receive full working pressure from the pipe line, whereby the effective pressure area of said slide presented to said second end chamber is then substantially greater than the effective pressure area presented to said first end chamber; and
means controlled by the movements of said slide for controlling the connection of said fluid actuator means to the pipe line, including a switch valve connected between said pipe line and said fluid actuator means and arranged to be operated by the movements of said slide, said switch valve being arranged to be opened when said slide shifts toward said second chamber in response to a drop in pressure in said pipe line transmitted to said differential valve by said fluid line, said fluid actuator means including:
an acutstor unit, including a double acting hydraulic cylinder having first and second inlets;
a pair of pressure actuated, two-position main valves connected respectively with said first and said second inlets of said hydraulic cylinders; and
means connecting said switch valve with said main valve, arranged to operate said main valves to close said flow control valve when said differential pressure valve senses a drop in pressure in said pipe line downstream of said flow control valve, said two main valves being connected by pipes to said pipe line upstream of the flow control valve for transmitting pressure to said actuator unit.



4,100,933

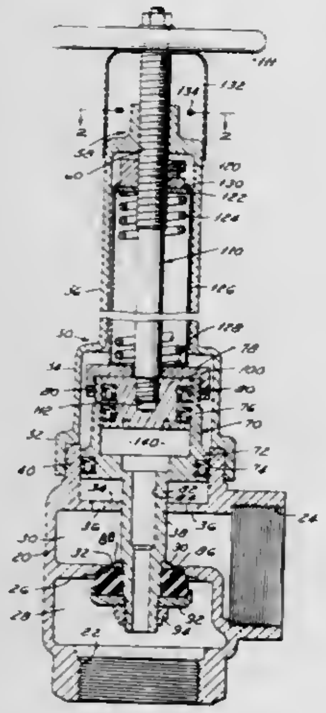
FIRE PROTECTION WATER SUPPLY VALVE

John T. Davey, and Lawrence P. Kahn, both of Toledo, Ohio, assignors to Seco Manufacturing, Inc., Toledo, Ohio

Filed Jun. 2, 1975, Ser. No. 582,845

Int. Cl.^{2} G05D *16/00;* F16K *31/363*

U.S. Cl. 137—495 **4 Claims**



1. In a fire protection water supply valve of the type including a base housing having an inlet opening and an outlet opening separated by a septum having a valve opening and seat therein and a cylinder portion above said seat, that improvement which comprises:

(a) a valve and piston assembly connected by a hollow shaft slidable in said housing comprising a valve movable to open and close said seat and a piston spaced from said valve slidable in said cylinder portion of said housing, the bottom of said piston proximal to said outlet being open to said outlet opening, a portion of the top of the piston having an area smaller than the bottom of said piston being open to said inlet opening through said hollow shaft,

(b) spring means mechanically biasing said piston to an open position,

(c) means including a control element manually selectively operable in two directions from without said base housing disposed to mechanically shift said piston to move said valve to a closed position to decommission said piston and to move said valve to an open position, and

(d) a top housing secured to said base housing,

(e) said piston being hollow to provide an enclosed chamber therewithin, said control element being movable in said chamber, and said last means comprises a shaft movable axially in said top housing to control the position of said control element in said chamber and the position of said valve.

4,100,934

RECIPROCATING REFRIGERANT COMPRESSOR VALVE ARRANGEMENT

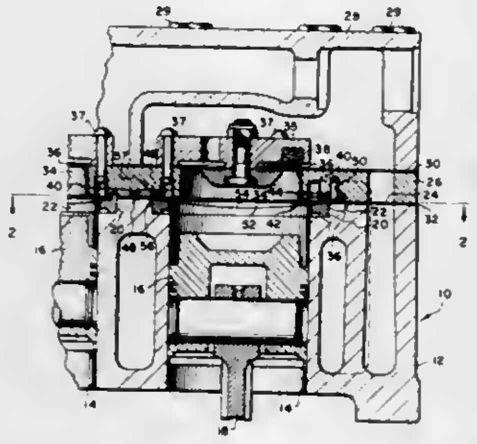
Arthur L. Butterworth, and Joseph F. Niedzwiecki, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed May 16, 1977, Ser. No. 797,155

Int. Cl.^{2} F16K *15/14, 51/00*

U.S. Cl. 137—512 **18 Claims**

1. In a compressor apparatus the combination of: a cylinder body having a generally planar face and a cylinder defined in said cylinder body opening at one end thereof to said generally planar face, a valve plate overlying said face and having inlet and discharge passageways therein for conveying a compressible fluid to and from said cylinder, said valve plate including an annular valve seat at one end of one of said passageways; an annular valve disposed in face-to-face abutting relationship with said valve seat; a valve stop in said cylinder body below said valve plate for limiting the axial movement of said valve in its open position; said valve stop including a flange extending upwardly beyond said face; said valve plate having a recess at said valve seat receiving said flange.



4,100,935

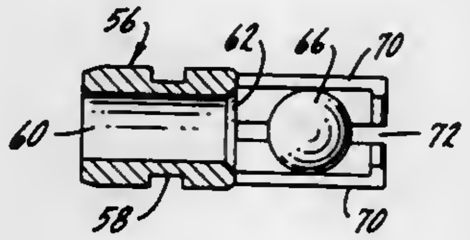
CHECK VALVE FOR HEAT PUMP SYSTEMS

James Ranck Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 28, 1977, Ser. No. 792,070

Int. Cl.^{2} F16K *15/04*

U.S. Cl. 137—533.11 **5 Claims**



1. A check valve comprising a generally cylindrical valve body adapted to be held within a tubular sleeve, said valve body having a central fluid passage terminating with a valve seat on the outlet side thereof; a moveable ball member adapted to engage said valve seat and prevent fluid flow when seated; means defining a cage for said ball member including a plurality of arms extending axially with a stop portion to arrest further movement of said ball member, the cross-sectional area of said arms blocking flow around said ball member to the extent that the flow area past the ball, when the valve is in its open position, is between 15–35% of the area across said central fluid passage.

4,100,936

THREE-WAY HYDRAULIC VALVE

Jean-Claude Turion, Paulhan, France, assignor to Irrifrance, Paulhan, France

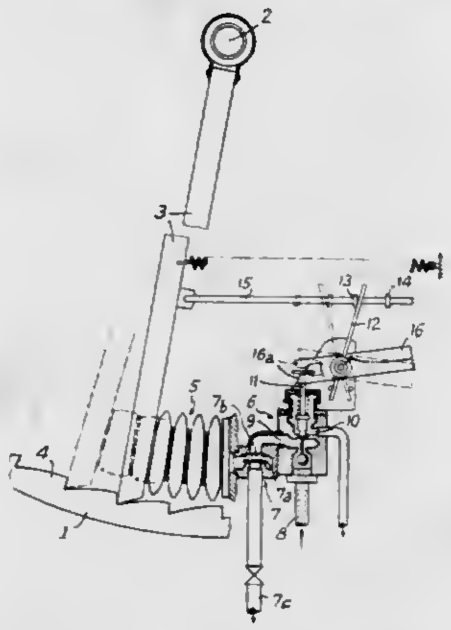
Filed May 17, 1976, Ser. No. 686,810

Claims priority, application France, May 30, 1975, 75 17354

Int. Cl.^{2} F15B *13/04;* F16K *11/14*

U.S. Cl. 137—596.2 **3 Claims**

1. A three way hydraulic valve intended for distributing a liquid containing impurities, comprising: a housing having first inlet way formed therein for said liquid and second and third liquid outlet ways formed therein, said housing having a valve seat formed therein located between said first and second ways and a valve seat located between said second and third ways, a ball valve located in said first way for engagement with said seat between said first and second ways solely under the influence of the pressure of said liquid in said first inlet way; a conical needle valve in said housing; spring means for biasing said needle valve on said seat located between said second and third ways, said seat for the needle valve having an orifice of a diameter smaller than that of the orifice of the seat of said ball valve, and means for adjusting the compression of said spring so that the force it exerts is lower than the thrust necessary for opening the ball valve when it is maintained closed by the pressure of liquid in said first way and greater than the thrust exerted by the liquid on the needle valve when it is closed, so that said valve is stable in two positions; a maneuvering rod outside the valve body operatively connected to said needle valve, said needle valve including an extension abutting on said ball and maintaining it open when the needle valve is closed.



4,100,937

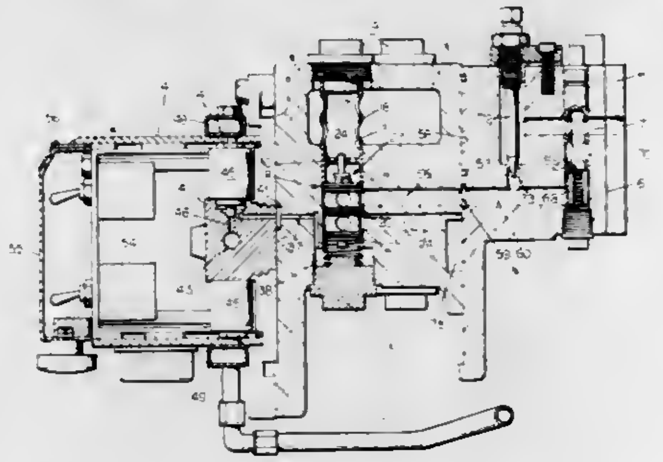
VALVE BLOCK

James D. Mallory, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 16, 1976, Ser. No. 714,878

Int. Cl.^{2} F16K *11/10*

U.S. Cl. 137—596.16 **16 Claims**



1. A valve block for an individual section glassware forming machine comprising:

a first casting having a plurality of generally vertically positioned poppet valves, said poppet valves being arranged in two adjacent rows;

individual pilot air inlet passages extending from one wall of said casting to each of said plurality of poppet valves;

a second casting having a pilot air manifold extending parallel to said one wall;

a plurality of passages from said manifold communicating with the pilot air passages;

a plurality of solenoid operated valves carried by said second casting for connecting and disconnecting said supply of pilot air to said plurality of passages from said manifold;

a third casting connected to the opposite wall of said first casting;

a plurality of openings in said third casting communicating with a plurality of openings in said first casting;

a supply of operating air in said first casting in a manifold chamber extending the length of said first casting;

a plurality of passages extending through said third casting adapted to communicate with the "kiss block" of an IS machine;

an exhaust header extending the length of said first casting; and

an exhaust manifold in said third casting having an opening in the wall thereof in communication with said exhaust header.

4,100,938

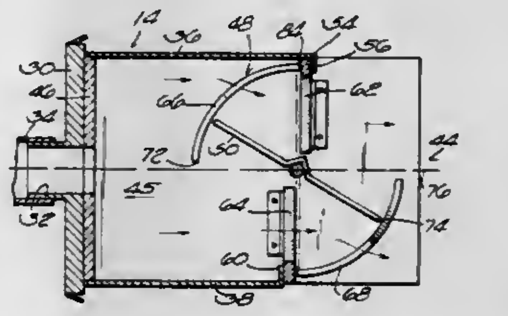
FLOW CONTROL UNIT FOR AIR DISTRIBUTION SYSTEM

Konstantins Dravnieks, Madison; Rueben Zahler, Verona, and Gordon C. Sylvester, Madison, all of Wis., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 16, 1976, Ser. No. 751,439

Int. Cl.^{2} F16K *47/14*

U.S. Cl. 137—625.31 **8 Claims**



1. A control unit for an air distribution system comprising

a housing having an inlet, an outlet and a flow passage extending between said inlet and said outlet; and

a flow control assembly disposed in said housing for controlling the volume of air flowing through said flow passage including

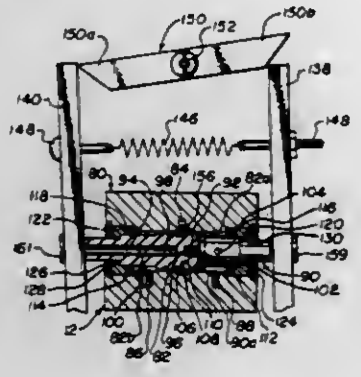
a damper mounted for pivotal movement, about an axis extending transversely for said flow passage, between an open position and a closed position to shut off flow through said flow passage, said damper having opposed transversely extending outer edges,

first and second transversely extending perforate members including a plurality of relatively small orifices and disposed in generally surrounding relationship and in close proximity to the arcuate travel path of said damper outer edges, said first and second perforate members each having a transversely extending open edge and being arranged such that, during an initial portion of damper travel from the closed position towards the open position, said damper cooperates with said perforate members to cause substantially all of the air flowing from said inlet to said outlet to pass through said orifices and such that, during a subsequent portion of damper travel toward the fully open position, an open flow passage exists between said damper and said open edges.

4,100,939

TIME CYCLE ACTUATOR

Robert E. Meynig, 2609 Sheraton, Denton, Tex. 76201
Division of Ser. No. 632,341, Nov. 17, 1975, Pat. No. 3,993,098.
This application Jul. 30, 1976, Ser. No. 710,172
Int. Cl.² G05D *7/00*
U.S. Cl. 137—627.5 **5 Claims**



1. A valve comprising a body having a bore formed therein, said bore communicating with an inlet; and said bore further having an annular groove formed in the middle thereof; a valve element having an annular groove formed about the periphery of the valve element dividing the valve element into two equal portions, said valve element further having a bore formed centrally therethrough and a pair of ports formed on opposite sides of the annular groove in the valve element communicating with the bore of the body; a partition to divide said bore in said valve element in half; an O-ring secured in said annular groove on the valve element and the groove formed in the bore of the body such that the inlet is sealed when the O-ring is centrally aligned; a pair of O-rings secured about each end of the valve elements to seal between the valve element and the bore of the body; means to limit longitudinal movement of said valve element in said bore of the body; outlet means formed on each side of the inlet communicating with the bore of the body and each port in the valve element; seal means comprising a pair of seals at opposite ends of the valve; and means to alternately move each said seal means into engagement with the associated end of bore of said valve element, said seal means closing and sealing the end of the bore through said valve element, said seal means further moving said valve element inwardly to connect the inlet with one of the outlet means and open said inlet to allow flow of fluid to the outlet and moving the seal means on the opposite end away from the end of said valve element, to open and to vent the opposite end of the valve element and opposite outlet means to the atmosphere.

4,100,940

TRICKLE EMITTER FOR SUBTERRANEAN IRRIGATION

Robert Wayne Spears, 13672 Wheeler Ave., Sylmar, Calif. 91342
Continuation of Ser. No. 233,156, Mar. 9, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,641
Int. Cl.² F16K *15/04*
U.S. Cl. 137—877 **8 Claims**

1. In an emitter for dispensing water at a minute rate from a pipe, for subterranean irrigation:

means on the top of said pipe defining an open top valve cage;

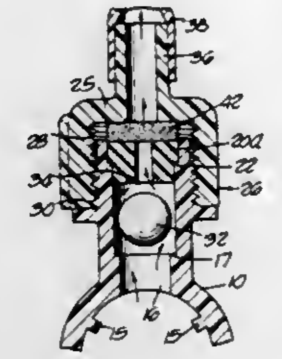
a closure screw threadedly engaging the top of said cage and having a tubular nipple extending upwardly and communicating with the interior of said cage;

a flexible hose of relatively small diameter telescopically connected to said nipple;

a valve member in said cage free to rise to an upper valve seat in the cage in response to initial water flow through the cage, there being a minute passage by-passing the seat for releasing water from the cage when the valve member is in the seat, said valve seat being an elastomer bushing;

the lower portion of said bushing being of reduced diameter to define a downwardly facing outer circumferential shoulder;

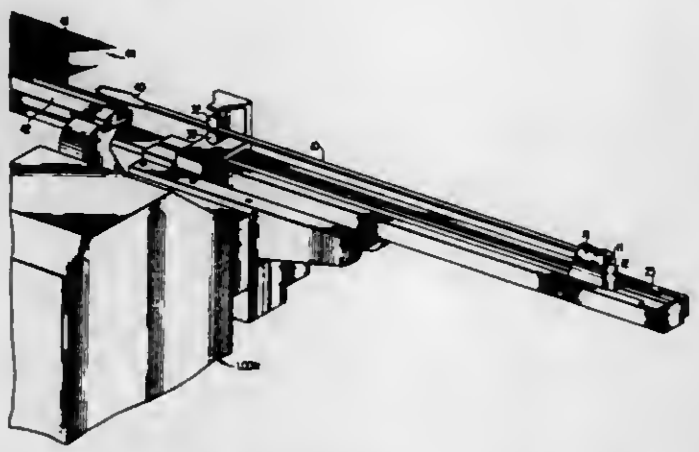
the upper portion of the valve cage being enlarged to define an upwardly facing inner circumferential shoulder to mate with the bushing shoulder to permit the closure to be screw threadedly tightened to compress the bushing between the closure and the inner circumferential shoulder of the valve cage.



4,100,941

RAPIER LOOMS

David Ainsworth, Darwen; Allan Beckett, Blackburn, and Cyril Millward Atkinson, Barrowford, all of England, assignors to Northrop Weaving Machinery Limited, England
Filed Jan. 4, 1976, Ser. No. 692,714
Claims priority, application United Kingdom, May 6, 1975, 24225/75
Int. Cl.² D03D *47/12*
U.S. Cl. 139—449 **11 Claims**



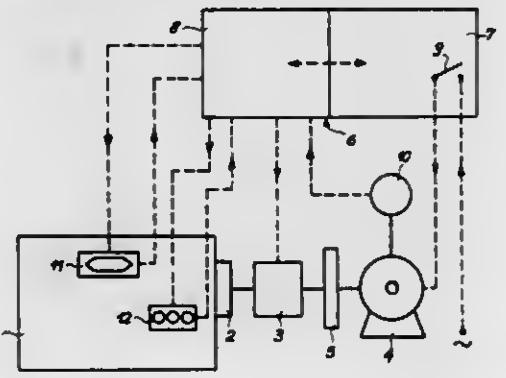
1. A rapier loom wherein a rapier reciprocally moves into and out of a shed, said loom comprising:

(a) means supporting said shed,
(b) at least one longitudinally extending rapier having a butt end and arranged to pass through said shed,
(c) a gripper element at the end of said rapier opposite said butt end adapted to engage and transport a weft thread through said shed,
(d) means defining an upwardly facing longitudinally extending slide channel extending below said rapier and shed and outwardly from one side of said shed and parallel to said rapier,
(e) a drive rack slidably mounted in said slide channel below said rapier and shed and including a plurality of teeth facing downwardly,
(f) drive means including a drive gear arranged below said shed and slide channel and projecting upwardly into said slide channel to mesh with said teeth and reciprocate said drive rack and means for rotating said drive gear back and forth, and
(g) means securing together said drive rack adjacent one end thereof and said rapier adjacent said butt end in spaced relationship with said drive rack and rapier extending substantially parallel to each other in the same direction from said securing means such that when said drive rack is reciprocated below said shed said rapier is simultaneously reciprocated into and out of said shed to transport said weft thread through said shed.

4,100,942

DRIVE, CONTROL AND MONITORING DEVICE FOR LOOMS

Rudolf Tschudi, Wald, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland
Filed Sep. 23, 1976, Ser. No. 726,004
Claims priority, application Switzerland, Sep. 30, 1975, 12645/75
Int. Cl.² D03D *51/00*
U.S. Cl. 139—1 R **4 Claims**

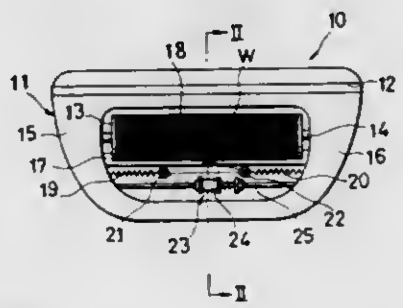


1. A drive, control, and monitoring device for looms comprising a drive motor connected to the power line, a flywheel operatively connected with the drive motor, an electromagnetic brake and clutch unit operatively positioned between the flywheel and the crankshaft of the loom, means for controlling and monitoring the weaving process, and means for producing additional source of current to the control and monitoring means to provide electrical energy for the controling of the clutch part of the electromagnetic brake and clutch unit and for the monitoring of the weaving process.

4,100,943

SHUTTLE FOR RIBBON LOOMS

Seiko Terada, Uozu; Hissei Nishiyama, Fuchu, and Masaatsu Oofusa, Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Japan
Filed Dec. 17, 1976, Ser. No. 751,697
Claims priority, application Japan, Dec. 29, 1975, 51/178457; Dec. 29, 1975, 51/178458
Int. Cl.² D03D *35/00;* **D03J** *5/24*
U.S. Cl. 139—201 **2 Claims**



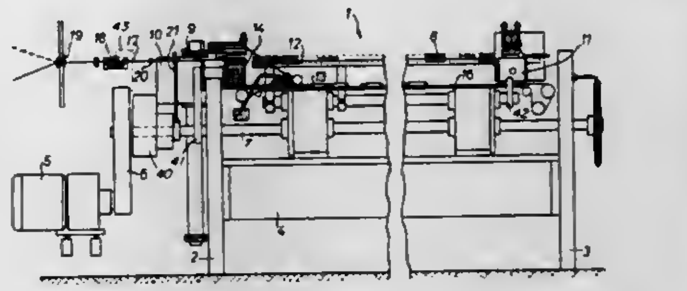
1. A shuttle for a ribbon loom comprising:

(a) a housing;
(b) a bobbin supported in said housing for carrying a thread to be wound therearound and for rotation about a given axis;
(c) a tensioning means in said housing for keeping the thread under constant tension while being unwound from said bobbin and running, said tensioning means including a roller for adjusting the tension of the thread and supported on said housing for rotation about an axis located forward of the rotation axis of said bobbin, said roller being disposed to receive thread unwound from the bobbin and to pay out such thread as received in a backward direction; and
(d) a thread discharge eyelet supported on said housing for discharging the thread therethrough out of said housing, said thread discharge eyelet being located at a predetermined distance from the plane defined by the axes of said bobbin and roller, in a position forward of the bobbin rotation axis and backward from the roller rotation axis.

4,100,944

METHOD AND APPARATUS FOR TRANSFERRING THE WEFT

Cesare Germani, Como, Italy, assignor to Omita S.p.A., Italy
Filed Sep. 7, 1976, Ser. No. 721,312
Claims priority, application Switzerland, Sep. 19, 1975, 12184/75
Int. Cl.² D03D *47/24*
U.S. Cl. 139—439 **6 Claims**



1. A method for transferring the cut end of a weft to a second shuttle in a loom with sliding shuttles, each of said shuttles having a clamp to engage the weft, the weft having been introduced into the shed by means of a first shuttle and subsequently cut adjacent the shed on the intake side thereof, said loom further including a shuttle supply drum with a plurality of guide slots adapted to carry said shuttles into shooting position, said weft extending from a supply bobbin through a storage lever to the intake side of said drum and through one of said guide slots to a point adjacent the intake side of the shed, said method comprising the steps of:

rotating said drum to position said second shuttle in shooting position;

frictionally engaging that portion of the weft extending through the first guide slot from which said first shuttle was shot;

retracting the weft, by moving said storage lever, through said first guide slot to a point whereby the cut end of the weft remains in said first guide slot adjacent the intake side of said drum;

holding the weft adjacent the cut end thereof against the inlet face of said supply drum adjacent the clamp of said second shuttle;

opening the shuttle clamp in said second shuttle;

positively laterally drawing a portion of the weft adjacent the cut end thereof into said second shuttle clamp by means of a guide hook; and

closing said second shuttle clamp thereby securing the cut end of the weft therein.

4,100,945

APPARATUS FOR WITHDRAWING LENO WASTE IN WEAVING MACHINES

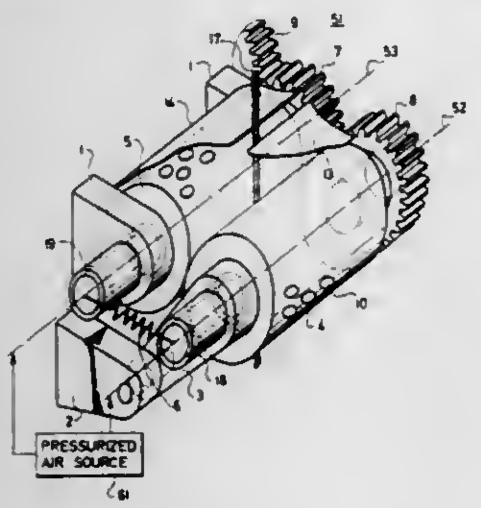
Josef Resch, Rychnov nad Kneznou; Jan Matuska, and Jindrich Trejtnar, both of Tyniste nad Orlici, all of Czechoslovakia, assignors to Elitex Koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Jun. 28, 1976, Ser. No. 700,402

Claims priority, application Czechoslovakia, Aug. 25, 1975, 5775-75

Int. Cl.² D03D *49/00*

U.S. Cl. 139—291 C **1 Claim**



1. In an apparatus for withdrawing leno waste in a weaving machine, comprising first and second rollers having parallel axes of rotation and disposed in adjacent relation to define a leno waste-advancing nip area therebetween to which the leno waste is introduced so that the rollers normally contact the leno waste only in the nip area, and means associated with the weaving machine for positively driving the first and second rollers to advance the introducing leno waste through the nip area in a first direction perpendicular to the axes of the rollers, the improvement in which the rollers are hollow cylinders having a plurality of peripheral apertures communicating with the hollow interior thereof and in which the apparatus further comprises means associated with each cylinder for introducing a pressurized gas axially into the interior of the respective cylinders to exit from the associated peripheral apertures thereof, whereby portions of the leno waste tending to adhere to a section of each roller as such section has passed through the nip area will be propelled away from the section, the apparatus further comprising a contoured housing surrounding the first and second cylinders and extending in the first direction, the housing having a relatively wide, convex central portion disposed radially outwardly from the periphery of the respective cylinders and a pair of axially opposed, relatively narrow inlet and outlet end portions individually surrounding the path of advance of the leno waste upstream and downstream, respectively, of the central portion, whereby pressurized gas exiting from the peripheral apertures of the first and second cylinders within the central portion of the housing is propelled symmetrically and axially outward through the inlet and outlet end ports of the housing to entrain and tension the leno waste advancing through the housing.

4,100,946

DEVICE FOR CUTTING VELVET BANDS ON LAPPET LOOMS

Marco Limonta, Via A. di Savoia, 9, I-20049 Concorezzo, (Milan), Italy

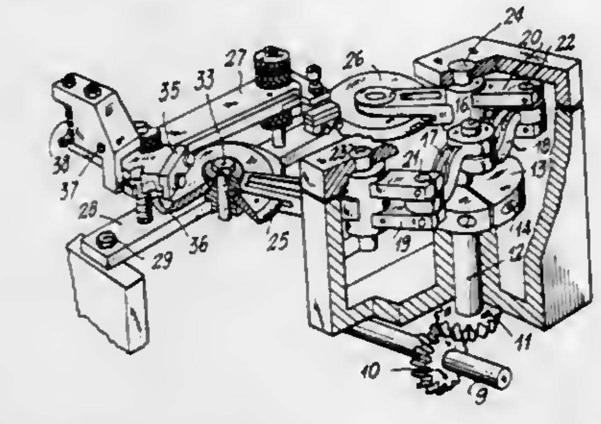
Filed Oct. 7, 1976, Ser. No. 730,461

Claims priority, application Italy, Oct. 14, 1975, 2931 A/75

Int. Cl.² D03D *39/18, 39/24*

U.S. Cl. 139—291 C **8 Claims**

1. In a device for cutting a material such as the pile of a double velvet band during movement of the latter along a predetermined path, blade-carrying means and support means supporting said blade-carrying means for movement back and forth across the path of movement of the material which is to be cut, drive means operatively connected with said blade-carrying means for moving the same with respect to said support means back and forth across said path, a circular cutting blade having a circular peripheral cutting edge, said blade being carried by said blade-carrying means for cutting the material, and releasable fixing means releasably fixing said blade to said blade-carrying means for movement with but not with respect to said blade-carrying means, so that during each pass of the blade-carrying means across the path of the material which is to be cut by said blade only a portion of the periphery of the latter is utilized for cutting the material, while from time to time said releasable fixing means can be released to change the angular position of said blade with respect to said blade-carrying means, so as to bring an unworn portion of the periphery of the blade into an operative position.



4,100,947

APPARATUS FOR SELECTIVELY INSERTING WEFT YARNS INTO THE SHED IN A WEAVING LOOM

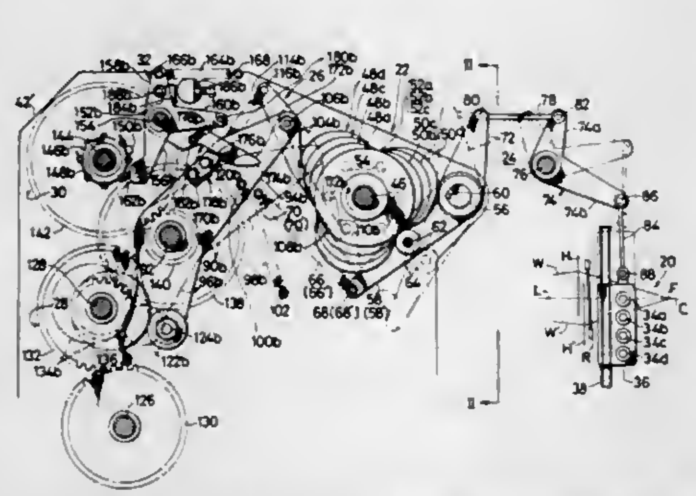
Yukio Mizuno, Kodiaira, Japan, assignor to Nissan Motor Company, Limited

Filed Oct. 1, 1976, Ser. No. 728,879

Claims priority, application Japan, Oct. 5, 1975, 50-120035; Dec. 2, 1975, 50-144098

Int. Cl.² D03D *47/38*

U.S. Cl. 139—453 **19 Claims**



1. An apparatus for selectively inserting weft yarns into the shed in a weaving loom, comprising, in combination, a weft insertion unit including a plurality of weft shooting members each movable into a position aligned with said shed, weft selector cam means having a plurality of conditions respectively operative to hold said weft shooting members in alignment with said shed, a link mechanism operatively connecting said cam means to said weft insertion unit for moving selected one of said weft shooting nozzles into the position aligned with said shed when said cam means is actuated from one of said conditions into another, cam actuating means operative to

drive said cam means between said conditions thereof in each cycle of operation of the loom, intermittent-motion drive means for driving said cam actuating means alternately into first and second conditions engaging said cam means in different positional relationships to the cam means, the cam actuating means being operative to drive said cam means between said conditions thereof when the cam actuating means is driven from said first condition into said second condition and thereafter from the second condition back into the first condition by said intermittent-motion drive means, weft selector signal supply means storing signals representative of a predetermined schedule in accordance with which the weft yarns are to be selectively inserted into said shed, locking means responsive to the signals delivered from said signal supply means for locking said cam actuating means in a condition inoperative to drive said cam means in response to one signal from the signal supply means and releasing the cam actuating means from the inoperative condition in response to another signal from the signal supply means, the cam actuating means in the inoperative condition thereof being held in engagement with said cam means and said intermittent-motion drive means and having a predetermined allowance of movement to be movable from said first condition toward said second condition thereof and then backwardly to the first condition, and said locking means having means operative to release said cam actuating means at a predetermined time interval corresponding to said predetermined allowance of movement after said another signal is impressed on said locking means.

4,100,948

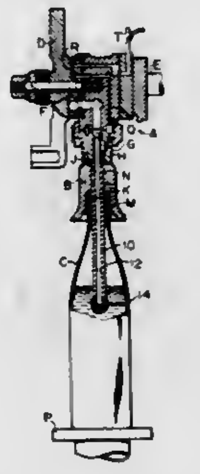
LIQUID FILLING TUBE WITH PROTECTIVE TIP

Alfred A. Abramoska, Jr., Medina, Ohio, assignor to Arthur Products Co., Medina, Ohio

Filed Jan. 19, 1977, Ser. No. 760,685

Int. Cl.² B65B *3/04;* **B67C** *3/02*

U.S. Cl. 141—392 **7 Claims**



1. A filling device for a container filling machine for verticl disposition within a container as the container is being filled with a fluid, which comprises:

a filling tube having an interior axially extending passage through which the fluid may pass as the container is being filled, the tube having a lower end adapted for insertion downwardly into the container, the tube having an upper end with means for attachment to the filling machine, the lower end having a threaded portion with a pair of annular sealing portions, one sealing portion on either side of the threaded portion, each sealing portion comprising two nonparallel sealing surfaces; and

a protective end tip member secured to the lower end of the tube, the tip member formed of a soft low moisture absorbent material, the tip member having a threaded portion which engages the threaded portion of the tube to fixedly secure the tip member to the tube, the tip member having a pair of annular sealing portions, one sealing portion on either side of the internally threaded portion, each sealing portion comprising two nonparallel sealing surfaces, the sealing surfaces corresponding to the sealing surfaces of the tube which abut the sealing surfaces of the tube to form a tight seal, the tip member having a dispensing hole which communicates with the passage in the tube.

4,100,949

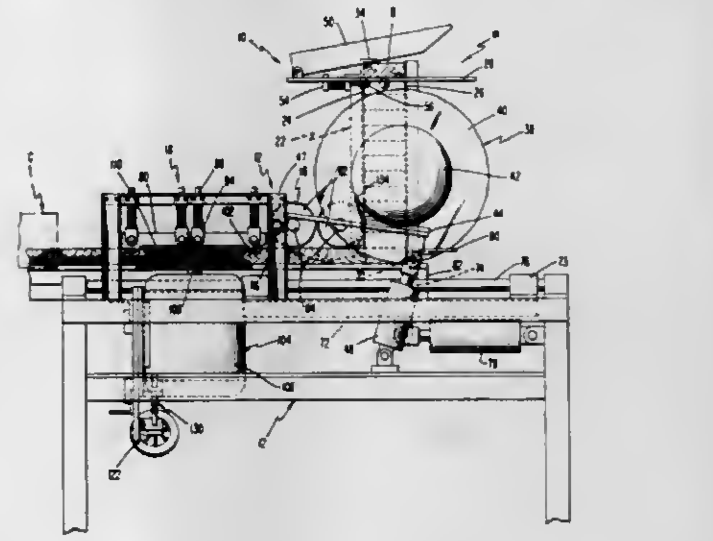
WEB FORMING APPARATUS

Clarence F. Carter, Danville, Ill., assignor to Carter Industries, Inc., Danville, Ill.

Filed Dec. 30, 1976, Ser. No. 755,632

Int. Cl.² B27C *9/04, 5/00*

U.S. Cl. 144—3 R **11 Claims**



1. A machine for forming beveled webs comprising:

a table for receiving a board to be cut;

a vertical hopper having an upwardly open inlet end adjacent said table;

a first power driven cutter disposed adjacent said table;

means for shifting said first cutter toward and away from cutting engagement with a board on said table, such that a portion of said board lying above said hopper is severed from the remainder of said board to form a web suitable for entry into said hopper;

support means located beneath said hopper for receiving and supporting said web;

a pair of bevel cutters situated at opposite sides of said support means, each bevel cutter comprising a pair of co-axially arranged, power-driven router heads having inclined cutting faces, forming a cutting angle therebetween, for cutting top and bottom bevels in each end of the web;

pusher means located adjacent the bottom of said hopper; and

means for driving said pusher means alternately forwardly and rearwardly to displace webs from said hopper and form a row of webs on said support means and to advance the webs an incremental distance toward engagement with said bevel cutters during each forward stroke.

4,100,950

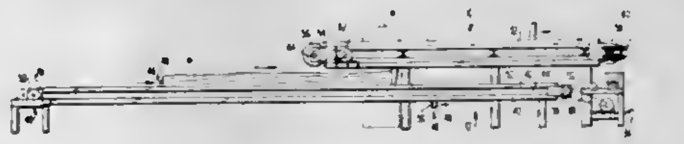
END DOGGING FEEDING DEVICE

Clyde W. Stearns, Box 1016, Kalispell, Mont. 59901

Filed Jan. 26, 1977, Ser. No. 762,939

Int. Cl.² B27C *1/12*

U.S. Cl. 144—242 D **12 Claims**



1. A feeding device for continuously feeding logs through a machine cutting center for removing the sides thereof to form a center flitch comprising:

a lower track assembly including a lower track having beginning, central and terminal portions, lower gripping means for engaging the center portion of the rear face of a log disposed in longitudinal alignment with said lower track, and first drive means coupled to aid lower gripping means for conveying said lower gripping means along said lower track from the beginning to the termination thereof;

machine cutting means disposed adjacent the center of said lower track for removing the side portions of a log as said log is conveyed through the central portion of said track;

an upper track assembly disposed over the central and terminal portions of said lower track assembly including an upper track, upper gripping means for engaging the center portion of the forward face of a log engaged by said lower gripping means before it enters said cutting means, and second drive means coupled to said upper gripping means for urging the log against said lower gripping means as said log is conveyed along said lower track through said cutting means;

said upper and lower gripping means being adapted to hold said log as it passes along said track through said cutting means and to release the center flitch of said log after the log passes through said cutting means; stabilizing means cooperable between said upper gripping means and said lower track for stabilizing said upper gripping means against lateral movement while said means engages the central portion of the forward face of a log.

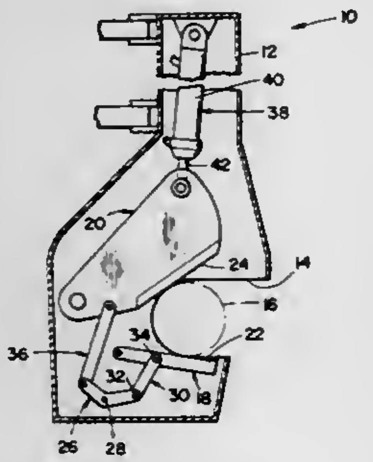
4,100,951
TREE SHEAR-PIVOTED SECONDARY BLADE

Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,739

Int. Cl.^{2} A01G *23/08*

U.S. Cl. 144—309 AC **7 Claims**



1. Tree cutting apparatus comprising:

frame means;

a first blade movably mounted relative to the frame means;

a second blade movably mounted relative to the frame means, the body of a tree being positionable between the first and second blades;

means operatively connected with one of the first and second blades for moving said one of the first and second blades into the body of a tree; and

means operatively interconnecting the first and second blades for providing that (i) operation of said means operatively connected with one of the first and second blades to move said one of the first and second blades into and cutting the body of a tree provides movement of the other of first and second blades into and cutting the body of a tree, and for providing (ii) at least a partial withdrawal of the other of the first and second blades upon the one of the first and second blades having made a partial cut of the body of a tree, and for providing that (iii) the one of the first and second blades continues cutting of the body of a tree subsequent to the cutting action of the other blade, wherein the means operatively interconnecting the first and second blades comprise link means;

said link means including a first link means pivotally mounted relative to the frame means, a second link means pivotally connected to the first link means and the first blade, and a third link means pivotally connected to the first link means and the second blade.

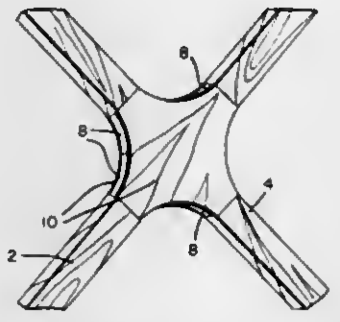
4,100,952
METHOD FOR JOINING CROSSED SUPPORT MEMBERS TO EACH OTHER

Robert J. Neudorfer, P.O. Box 601, Crosset Hill Rd., Waterbury, Vt. 05676

Filed Jan. 26, 1977, Ser. No. 762,632

Int. Cl.^{2} B27F *1/00;* F16M *11/20*

U.S. Cl. 144—314 B **1 Claim**



1. The method of fabricating crossing support members comprising the steps of:

(A) forming a half-lap joint section in each of a pair of said support members;

(B) joining said pair of said support members to each other at said half-lap joint sections whereby said support members intersect each other;

(C) securing triangularly-shaped blocks to said support members in the angles formed by the intersection of said support members with each other;

(D) and applying a facing to the surfaces of said triangularly-shaped blocks and said support members which lie in a common plane with each other, said facing being inlaid in said triangularly-shaped blocks and said support members.

4,100,953
FLEXIBLE COLLAPSIBLE CONTAINER DEFINING RELATIVELY RIGID SHOULDER AND BASE AT OPPOSITE ENDS

Joe A. Miller, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

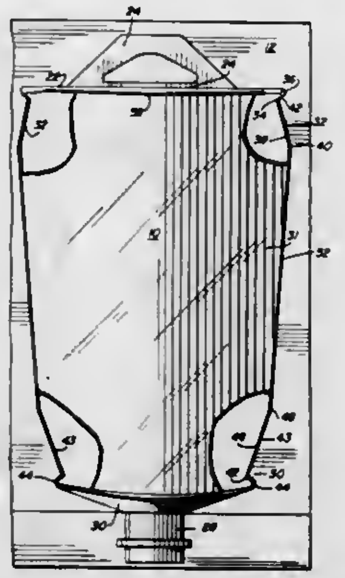
Continuation-in-part of Ser. No. 526,093, Nov. 21, 1974, abandoned, and Ser. No. 669,058, Mar. 22, 1976, which is a division of Ser. No. 526,093,. This application Dec. 16, 1976, Ser. No. 751,613

The portion of the term of this patent subsequent to May 9, 1995, has been disclaimed.

Int. Cl.^{2} B65D *1/02*

U.S. Cl. 150—0.5 **10 Claims**

1. In a flexible, collapsible container defining a relatively rigid shoulder and neck portion at one end, a relatively rigid base at the other end, and a flexible, tubular wall between said shoulder and base, the improvement comprising, in combination, said container defining, in its original, unstressed condition, first and second pairs of oppositely-disposed gussets defined in said flexible wall and positioned respectively adjacent said shoulder and said base, the first pair of gussets each defining in said wall a recessed, fold line positioned adjacent to and generally parallel with the adjacent edge of said shoulder, the second pair of gussets each defining a recessed, fold line positioned adjacent to and generally parallel with the adjacent edge of said base, each gusset portion also defining in said walls a pair of lines of folding weakness which join together in angular relationship to define an apex, said lines of weakness extending toward respective ends of their associated recessed, fold line to define a generally triangular arrangement, whereby, upon collapse of said shoulder, said gussets fold outwardly respectively from the shoulder and base.



4,100,954
DOWEL OR ANCHORING MEANS

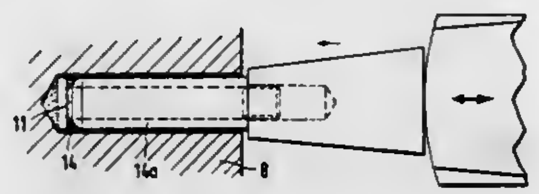
Dieter Müller, Berga Str. 3a, 8136 Percha; Wilhelm Endlich, Mimosenstra. 7, 8 Munich 45, and Siegfried Kügler, Haus Nr. 12, 8041 Fahrenzhausen, all of Germany

Continuation of Ser. No. 583,000, Jun. 2, 1975, abandoned, which is a continuation of Ser. No. 205,158, Dec. 6, 1971, abandoned. This application Oct. 27, 1976, Ser. No. 736,152

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1970, 2059852

Int. Cl.^{2} F16B *39/00*

U.S. Cl. 151—41.7 **11 Claims**



1. An arrangement for anchoring objects to support structures, especially support structures of lightweight building materials, comprising an anchoring element insertable with clearance into an anchoring hole in a support structure and including an elongated member having a straight cylindrical external surface, and an elongated one-piece cylindrical sleeve having a central passage of substantially constant cross section for fittingly receiving said member therein for sliding advancement of said sleeve longitudinally of said member in a path immediately surrounding said external surface of said member; and means for securing said anchoring element in the anchoring hole, essentially consisting of a hardenable substance having two components at least one of which is encapsulated in microcapsules and disposed on said external surface of said member in the form of a layer initially rigidly connected to the latter and located in said path to be stripped from said member by said sleeve during sliding advancement thereof in said path into the anchoring hole with concomitant rupturing of the microcapsules and resulting formation of an intimate mixture of said components which is displaced by said sleeve during said advancement thereof out of said path and into the clearance to subsequently harden therein, said anchoring element being secured in the anchoring hole exclusively by said substance after the latter has hardened.

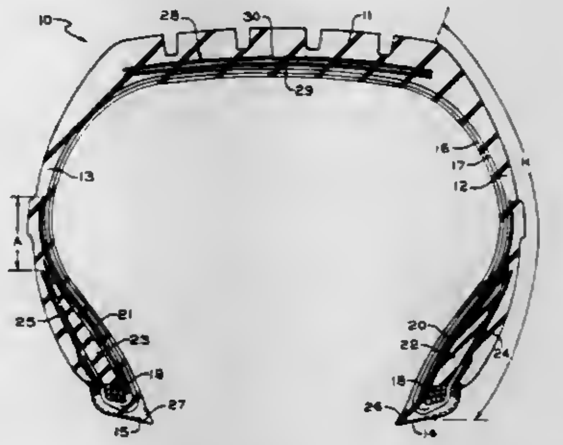
4,100,955
PNEUMATIC TIRE

Marion G. Pottinger, Akron; Edward G. Miller, Jr., Uniontown, and Charles Patrick, Tallmadge, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 8, 1977, Ser. No. 804,668

Int. Cl.^{2} B60C *15/06*

U.S. Cl. 152—362 CS **13 Claims**



1. A pneumatic tire comprising a generally toroidal carcass including a generally cylindrical crown portion and a pair of convex sidewalls terminating in axially spaced beads with each bead including an annular bead core, the said carcass reinforced by generally radially extending reinforcing cords surmounted in the crown region by a substantially inextensible belt formed of at least two plies of parallel cords extending at an angle to the circumferential centerline of the tire, and with the sidewalls and crown portions of the carcass covered by elastomer, characterized in that each sidewall includes first and second annular reinforcing portions formed of cords extending respectively at opposite acute angles relative to the circumference of the base of the adjacent bead with an annular filler of elastomer, generally triangular in cross section, positioned between said portions adjacent the bead core and extending into the tire sidewall to a location intermediate the radially outer edges of the said portions, the end regions of all of said radially extending cords being turned axially outwardly.

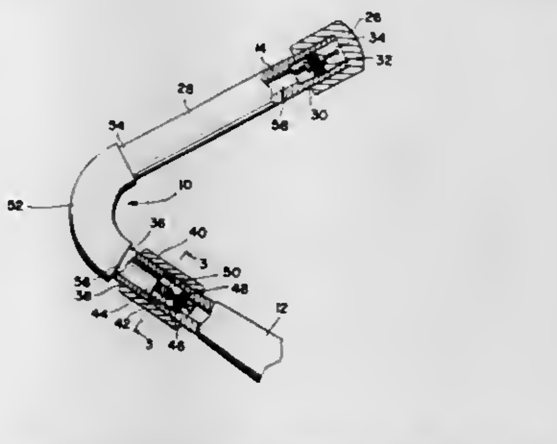
4,100,956
TIRE INFLATION COUPLING APPARATUS

Richard M. Marshall, and Margaret V. Marshall, both of The Renaissance, Apt. 20-06 1360 S. Ocean Blvd., Pompano Beach, Fla. 33062

Filed Mar. 14, 1977, Ser. No. 776,837

Int. Cl.^{2} B60C *29/00*

U.S. Cl. 152—427 **2 Claims**

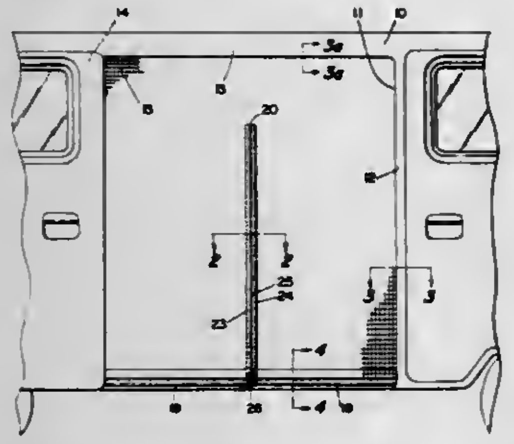


1. A tire inflation coupling apparatus comprising a first length of rigid pipe, one end of said first pipe having external threads thereon, a tube, said tube having internal threads fixed to the interior surface of the interior wall thereof, a circular plate, said circular plate being disposed within said tube, said circular plate having the lateral surfaces thereof being disposed

substantially at right angles to the longitudinal axis of said tube, said circular plate having at least one opening communicating between said lateral surfaces, said tube threadingly engaged to said external threads on said first pipe, a second length of rigid pipe, one end of said second pipe containing a check valve therein, said check valve having a stem rod affixed thereto, said check valve being biased in a closed position, a length of rubber-like hose, said hose being preformed having the ends thereof at an acute angle to each other, the other end of said first pipe being disposed inserted into one end of said hose, the other end of said second pipe being disposed inserted into the other end of said hose, said hose being flexible so as to respond to a change in air pressure within said hose causing said angle to change, whereby serving to indicate the inflation of the tire.

4,100,957
SCREENS FOR SIDE AND REAR DOOR OPENINGS OF VANS AND LIKE VEHICLES

Warren E. Shelton, 15733 Pearl Rd., Cleveland, Ohio 44136, assignor to Warren E. Shelton, Cleveland, Ohio
Filed Aug. 24, 1977, Ser. No. 827,354
Int. Cl.^{2} A47H *3/00*
U.S. Cl. 160—368 R **8 Claims**

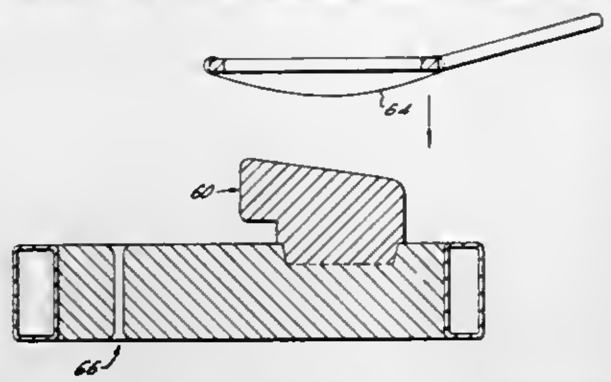


1. In combination with a side or rear door opening of a van or like vehicle, fastening means secured to the interior of said vehicle adjacent the sides and top of said opening and facing the interior of said vehicle, a screen having marginal portions provided with fastening means secured to said first-named fastening means and facing in a direction exteriorly of said vehicle and removable from said first-named fastening means by a stripping action, a vehicle floor having an edge recessed from said opening, additional fastening means secured to the recessed floor edge adjacent said opening and facing in a direction exteriorly of said vehicle, said screen having a marginal portion provided with fastening means secured to said additional fastening means and removable from said additional fastening means by a stripping action, the fastening means on said last-named marginal portion facing in a direction interiorly of said vehicle.

4,100,958
MOULDING PROCESS FOR METALS

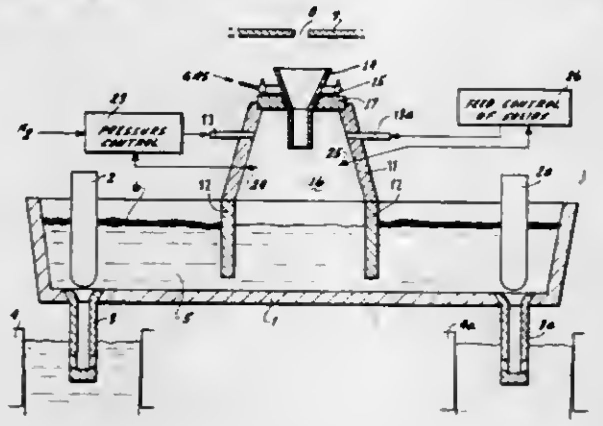
John Workman, Lough House, Greyabbey, County Down, Northern Ireland
Division of Ser. No. 653,891, Jan. 30, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,625
Claims priority, application United Kingdom, Jan. 31, 1975, 4222/75
Int. Cl.^{2} B22D *9/00*
U.S. Cl. 164—7 **3 Claims**

1. A method of locating a core in a mould, which mould comprises a body of binderless moulding material located between films of thin plastics material in a mould box having hollow walls which are perforated at the interface with the body of moulding material, said body of moulding material being held together by the application of sub-atmospheric pressure to the mould box and having a plastics-film-covered surface which is contoured to define a core print, said method comprising the steps of perforating the film of plastics material at the core print, and adhering the core to the core print by the effect of suction through said perforations at the core print.



4,100,959
TREATING A STREAM OF MOLTEN METAL

Hans Gruner; Hans Schrewe, both of Duisburg; Gerd Diederich, Angermund; Claus-Dieter Haufe, Duisburg, and Fritz-Peter Pleschiutschnigg, Angermund, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany
Filed Feb. 22, 1977, Ser. No. 770,449
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607735
Int. Cl.^{2} B22D *11/10*
U.S. Cl. 164—56 **13 Claims**



1. Method of treating and preventing reoxidation of molten metals in a process for continuous casting and while pouring from a first vessel into a second vessel, the metal leaving the second vessel continuously for continuous casting, wherein a third vessel surrounds the metal as poured from the first vessel, the third vessel defining a reaction chamber being larger than the stream of pouring metal and being closed but for inlets for the poured metal and additives, the steps of measuring the pressure in said third vessel; and

feeding at least one treatment substance into the third vessel at such a rate that the gaseous state of the substance establishes an excess pressure in the third vessel, said feeding maintains an excess pressure in the chamber of sufficient quantity to prevent the influx of ambient air into that vessel and replenishes the substance as it is being drawn into the molten metal as leaving the second vessel.

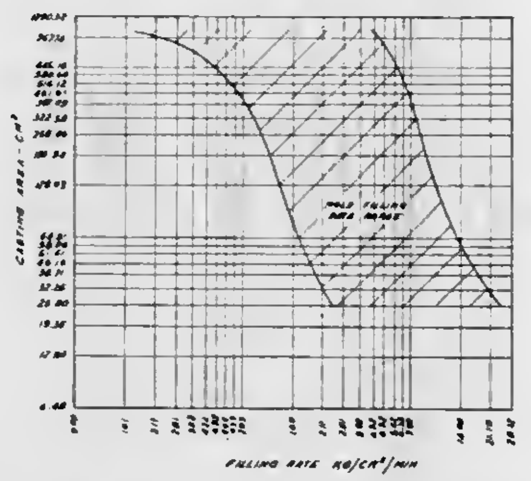
4,100,960
METHOD AND APPARATUS FOR CASTING METALS

Leonard Watts, North Woodmere, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Filed Jan. 28, 1977, Ser. No. 763,478
Int. Cl.^{2} B22D *27/04*
U.S. Cl. 164—119 **12 Claims**

1. A method of casting a metal article in an elongated mold having a cross-sectional area substantially between 25.8 cm^2 and 967.74 cm^2, a thermal conductivity of at least 0.20 cal/cm^2/cm/° C/sec., and a length at least as long as the article to be cast, said mold having top and bottom portions comprising:

inclining said mold to the vertical;

introducing molten metal from a source through said bottom portion of said mold at a filling rate substantially between 0.239 kg/cm^2/min. and 23.9 kg/cm^2/min., the combination of filling rate and cross-sectional area of the mold being defined by the hatched area of the graph as shown in FIG. 3;



flowing molten metal along said mold by applying a differential pressure across said source and said top portion of said mold;

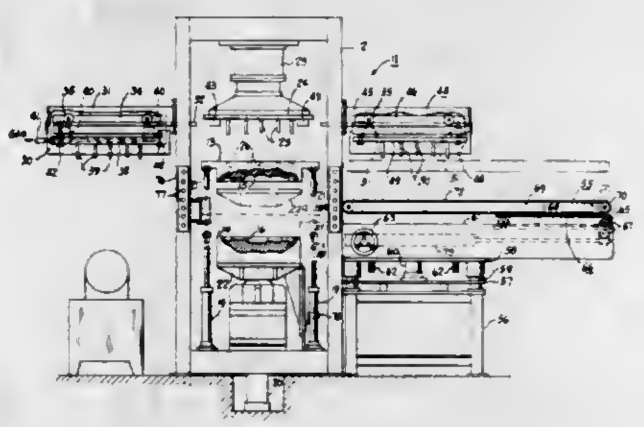
cooling the mold while regulating the flow of said molten metal therealong to form a solidified casting shell which, during casting, occupies at least 40% of the cross-sectional mold area and has a molten core;

flowing molten metal from said source to extend said casting shell and said molten core toward said top portion of said mold; and

subsequently solidifying said molten core.

4,100,961
FOUNDRY MOLDING MACHINE

Harold R. Goss, Richmond Heights; Michael A. Krutilla, Chagrin Falls, both of Ohio, and Wendell M. Doolin, Bloomfield Hills, Mich., assignors to Acme-Cleveland Corporation, Cleveland, Ohio
Filed Nov. 18, 1976, Ser. No. 742,860
Int. Cl.^{2} B22C *13/12, 15/24, 17/02*
U.S. Cl. 164—180 **16 Claims**



1. A foundry machine, comprising, in combination,

a frame,

first and second mold boxes mounted in said frame for mutual cooperation defining a mold cavity for a mold,

means on said frame to invest mold material into said mold cavity,

curing means on said frame to at least partially cure mold material in said mold cavity to form a mold,

ejection means mounted in the machine and cooperable with said first mold box in a position above said first mold box,

motive means mounted on said frame and connected to relatively move said mold boxes and connected to move said first mold box relative to said ejection means,

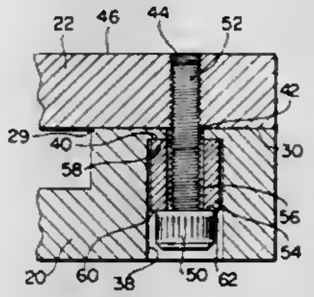
transfer means mounted on said frame,

power means connected to one of said transfer means and said first mold box to relatively move said transfer means and said first mold box to an ejection position with said transfer means beneath said first mold box and mold therein,

and control means connected to provide a sequence of operation to actuate said motive means to close said mold boxes and invest mold material into said mold cavity and at least partially cure a mold in said mold cavity, to actuate said motive means to separate said mold boxes, to actuate said power means to relatively move said transfer means and said first mold box to said ejection position, to actuate said motive means to lift said first mold box to eject the mold by said ejection means onto said transfer means and to actuate said power means to transfer the mold away from said first mold box.

4,100,962
CASTING DIE

Robert B. Housman, Plainville, Mass., assignor to James H. Housman, No. Attleboro, Mass.
Filed Feb. 28, 1977, Ser. No. 773,062
Int. Cl.^{2} B22D *11/04*
U.S. Cl. 164—435 **13 Claims**



1. A casting die comprising separate upper and lower opposed die segments formed of a material having high temperature resistance and a low coefficient of heat expansion and enclosing a longitudinally orientated open ended casting cavity therebetween, said segments each having body side portions including respective generally flat inner surfaces outwardly disposed to either side of said cavity and in direct face-to-face contact with each other and in part defining a continuous uninterrupted wall of said cavity, and retaining means for maintaining the relative positioning of said segments with respect to each other so as to prevent separation of said surfaces from each other along said cavity wall during the heating of said die, said retaining means including a plurality of inwardly directed openings and headed bolts, each of said openings being longitudinally oriented along the side portions of one of said die segments and having a reduced bore portion formed therein, each of said headed bolts being received in a reduced bore portion and passing through said one die segment and into fixed engagement with the respective body side portion of the other of said segments, a hollow bushing receiving said bolt disposed within each such opening and contacting the opening bottom at one end thereof and the bolt head at the other end thereof, said bushing having a higher coefficient of thermal expansion than said bolt so that upon heating of the die the bushings will expand relatively greater than said bolts thereby progressively tensioning said bolts so as to maintain said die segments in engagement with each other .

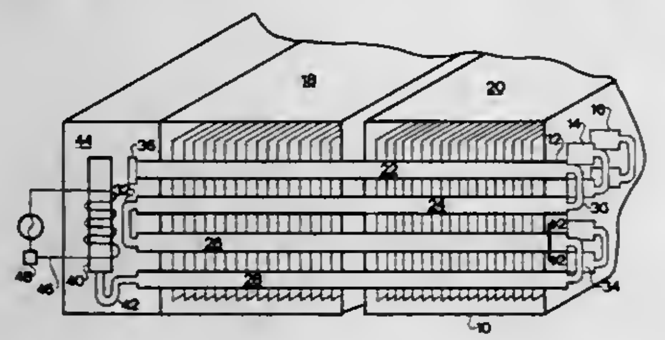
4,100,963
HEAT EXCHANGE SYSTEM

Warren H. Dillenbeck, 1100 Edgedale Dr., Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 524,546, Nov. 18, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 642,751

Int. Cl.^{2} F24D *11/00, 15/00;* F28D *7/08, 15/00*

U.S. Cl. 165—17 18 Claims



1. In combination with a heat exchange tube of the type having one end in communication with a cooler medium, the other end in communication with a warmer medium, and a working fluid therein with a liquid phase and a vapor phase within the operating temperature range of said tube, an improved control device comprising a reservoir for said working fluid operatively connected to said one end and a heating means operatively associated with said reservoir, said heating means being turned on and off responsive to prescribed temperature conditions, whereby the thermosiphon effect of said heat exchange tube may be modulated by the activation and deactivation of said heating means.

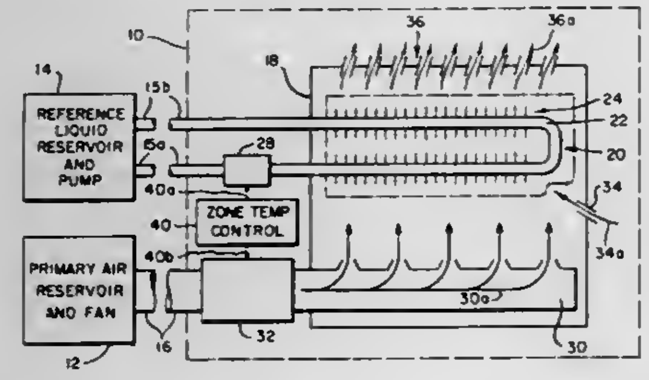
4,100,964
INDUCTION VENTILATION SYSTEM

Dimiter Gorchev, Washington, D.C., and John D. McGraw, Stow, Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Mar. 31, 1976, Ser. No. 672,125

Int. Cl.^{2} B60H *1/00*

U.S. Cl. 165—40 9 Claims



1. An induction ventilation system for one or more zones comprising, in combination:

A. a plurality of heat exchangers, each exchanger being associated with a zone,

B. means for passing a reference liquid from a reference liquid reservoir through said heat exchangers,

C. a primary air injector associated with each heat exchanger, including means for injecting air at an adjustable primary air flow rate from a primary air reservoir, across the associated heat exchanger, and into the associated zone, whereby the temperature of said primary air is convectively modified by said heat exchanger,

D. a secondary air inlet means associated with each heat exchanger, said inlet means being responsive to the flow rate of said injected primary air to induce a secondary air flow at a secondary air flow rate related to said primary air flow rate, said secondary air flow passing from said associated zone, across said associated heat exchanger and returning to said associated zone, whereby the temperature of said secondary air is convectively modified by said heat exchanger, and

E. a zone temperature control including:

i. selectively operative means associated with each heat exchanger to adjust the flow rate of said primary air into said zone whereby the heat capacity of the primary and secondary air entering said associated zone is related to said primary air flow rate,

ii. a liquid flow rate control means operative in a first mode to maintain the flow rate of said reference liquid through at least one of said heat exchangers to be equal to a predetermined constant over the full range of variation of said primary air flow rate.

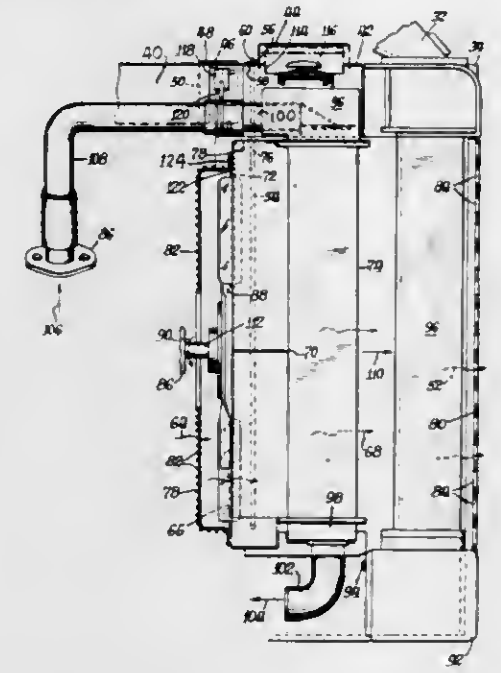
4,100,965
AUTOMOTIVE FAN SHROUD FOR SCREENING DEBRIS

Kenneth J. Kolinger, Riverside; Norman E. Williams, Park Ridge; Donald M. Earley, Glen Ellyn, and William R. Golden, Bloomingdale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 629,442, Nov. 6, 1975, Pat. No. 4,018,270. This application Jan. 7, 1977, Ser. No. 757,727

Int. Cl.^{2} F28F *19/00*

U.S. Cl. 165—119 6 Claims



1. In a power unit guard and cooling structure incorporating heat exchange means disposed so as to be exposed to a stream of fan-blown-air by confronting same at a point longitudinally along the path thereof,

an improved automotive type radiator-fan shroud for interposition to direct air and at the same time to remove air-borne trash therefrom; and

defining a generally circular, through opening adapted to surround a fan; said shroud including radiator-attachment means, the fan having air-directing blades for moving air through said opening under pressure and longitudinally therefrom under pressure in a path through the plane of said attachment means;

said shroud including therein an air screen across said path which is generally coextensive with the transverse dimensions of the shroud and which is interposed in place therein so that the plane of the air screen is directly between the planes respectively of the attachment means and of the fan opening;

said shroud also including essentially straight side walls, and essentially straight guides affixed thereto for the screen, so as with respect to said longitudinal path to be transversely disposed similarly to the air screen and to hold the latter in its place.

4,100,966
OIL RECOVERY PROCESS USING AN EMULSION SLUG WITH TAPERED SURFACTANT CONCENTRATION

Issam S. Bousaid, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,680

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 166—273 8 Claims

1. A method of recovering oil from a subterranean oil-bearing formation having in communication therewith at least one injection well and at least one production well comprising:

(a) injecting into the formation via the injection well a slug comprising a hydrocarbon-in-water emulsion containing a small amount of a surfactant,

(b) injecting water into the formation via the injection well; and

(c) recovering oil from the formation via the said production well and wherein the concentration of the surfactant in the said slug is increased as the slug is injected into the said formation.

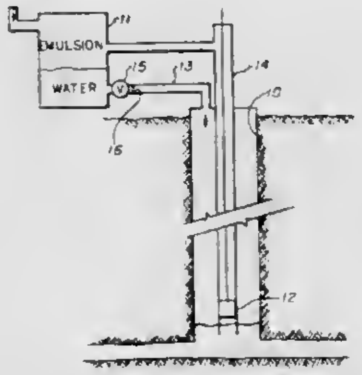
4,100,967
SYSTEM FOR DECREASING RESISTANCE TO FLOW OF CRUDE OIL UP FROM A WELL OR THROUGH A PIPELINE

Joseph C. Allen, Bellaire, and Sze-Foo Chien, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 535,896, Dec. 23, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,946

Int. Cl.^{2} B67D *5/60;* F17D *1/16*

U.S. Cl. 166—68 5 Claims



1. A system for flowing crude oil at temperatures above 32° F. from deep in a well to the surface with decreased resistance to flow comprising,

(a) means for supplying water down the oil well to an oil-water mixing means,

(b) said mixing means comprising means for mixing only water with the crude oil in the bottom of the well until an emulsion consisting of water and oil passes through the inversion point where the emulsion transforms from a water-in-oil emulsion to a lower viscosity oil-in-water emulsion contains, by volume, about 5 percent to 9 percent oil and 95 percent to 91 percent water, respectively, and

(c) energy means for flowing the water-in-oil emulsion to the surface for producing more crude oil more economically and with less energy from a well than for producing unemulsified crude oil from the well utilizing expensive chemicals which are prohibitive in cost, practicality, and safety.

4. A system for transporting crude oil at temperatures above 32° F. through a pipeline with decreased resistance to flow comprising,

(a) means for supplying water and crude oil to a mixing means,

(b) said mixing means comprising means for mixing only water with the crude oil until an emulsion consisting of water and oil passes through the inversion point where the emulsion changes from a water-in-oil emulsion to a lower viscosity oil-in-water emulsion at temperatures above 32° F. that contains, by volume, about 5 percent to 9 percent oil and 95 percent to 91 percent water, respectively, and

(c) propulsion means for transporting said oil-in-water emulsion at temperatures above 32° F. through the pipeline whereby more oil can be transported through the pipeline when so emulsed with water more economically and less energy is required than for transporting unemulsified crude oil in the pipeline utilizing expensive chemicals which are prohibitive in cost, practicality, and safety.

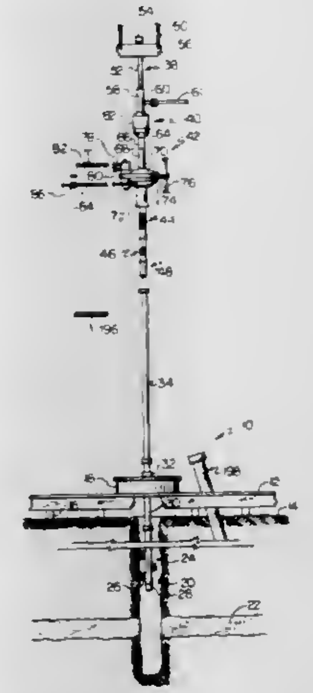
4,100,968
TECHNIQUE FOR RUNNING CASING

Charles George Delano, 6449 Long Meadow, Corpus Christi, Tex. 78413

Filed Aug. 30, 1976, Ser. No. 718,476

Int. Cl.^{2} E21B *23/00, 3/02*

U.S. Cl. 166—315 19 Claims



1. A method of making up pipe joints, each having an internal passage providing an intermediate unthreaded internal surface, an end female threaded section and an end male threaded section, adjacent a rotary table on a drilling rig and running the pipe in a well, comprising

temporarily vertically suspending a first pipe joint through the rotary table in a position with one of the threaded sections exposed;

engaging and connecting the intermediate unthreaded internal surface of a second pipe joint with a tool and defining an open annulus between the tool and second joint;

positioning the second pipe joint above and in alignment with the first joint by the use of the tool;

lowering the second joint into threading engagement with the exposed threaded section of the first joint;

relatively rotating the first and second joints through the tool connection for making up the threaded sections thereby connecting the first and second joints;

pumping fluid through the tool into the connected pipe joints while the tool and pipe joints are connected;

sealing the annulus between the tool and second pipe joint for directing all fluid into the pipe joint;

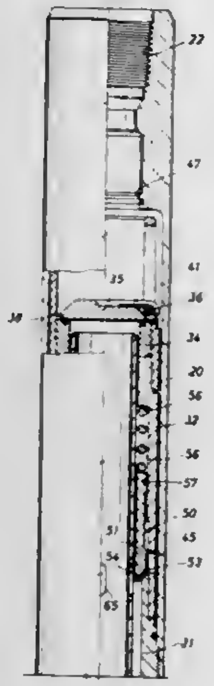
releasing the first joint from suspension through the rotary table;

lowering the first and second joints through the rotary table into the well through the tool connection; and

temporarily vertically suspending the second joint through the rotary table in a position with one of the threaded sections exposed.

4,100,969
TUBING TESTER VALVE APPARATUS

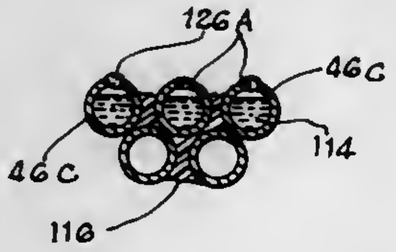
Ervin Randermann, Jr., Beasley, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Mar. 28, 1977, Ser. No. 782,269
Int. Cl.² E21B *43/12;* F16K *31/16*
U.S. Cl. 166—324 **13 Claims**



1. Valve apparatus adapted for use in a well, comprising: inner and outer tubular members telescopically disposed and arranged for relative movement between extended and contracted positions, said members defining a flow passage; first valve means responsive to relative movement of said members to extended position for closing said flow passage to downward flow of fluids; second valve means for equalizing pressures in said flow passage above and below said first valve means; means engageable with said second valve means in response to relative movement of said members to contracted position for shifting said second valve means to open position; and spring-loaded actuator means also responsive to movement of said members to said contracted position for opening said first valve means subsequent to the opening of said second valve means.

4,100,970
PANEL FORMED OF HOLLOW PLASTIC BALLS CONTAINING A FIRE RETARDANT LIQUID

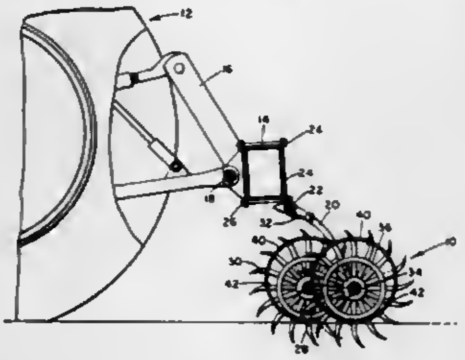
Alvin Kreske, Jr., Rte. 5, Box 407, Valparaiso, Ind. 46383
Filed Oct. 7, 1974, Ser. No. 512,847
Int. Cl.² A62C *35/10;* E04B *1/92*
U.S. Cl. 169—57 **6 Claims**



1. A panel for use in building construction comprising a plurality of hollow balls having a thickness at least equal to a multiple of the average cross section of the hollow balls, each ball abutting a plurality of other balls of the panel and adhering thereto to form a self supporting structure, each of said balls having a substantially symmetrical exterior surface and a portion of all of the balls on at least one surface of said panel extending t a common contour, said balls being constructed of plastic which softens responsive to temperatures above a threshold value, at least a portion of the balls on said one surface of the panel containing a fire retardant liquid which vaporizes at temperatures above the threshold value, whereby subjecting the panel to temperatures above the threshold value softens the plastic of the balls and vaporizes the fire retardant liquid to cause the balls containing the fire retardant liquid to rupture and release vapor of the fire retardant liquid.

4,100,971
ROTARY HOE STRIPPING MEANS

Darrel Lee Hoanold, Winterset, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Aug. 2, 1976, Ser. No. 710,237
Int. Cl.² A01B *23/00*
U.S. Cl. 172—547 **10 Claims**

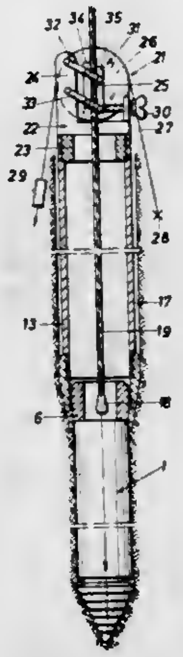


1. A rotary hoe wheel of the type having a central hub member and a plurality of radially extending tine members secured to the hub, the improvement residing in a tine cleaning means comprising: a separate ring member closely adjacent each side of the wheel, the diameter of said ring members being equal to or less than the wheel; and means loosely coupling the ring members together for limited movement relative to one another, for rotation with the wheel and for radial sliding movement along the tine members in substantial unison.

4,100,972
DISPLACEMENT HAMMER APPARATUS FOR SINKING AND LINING BOREHOLES

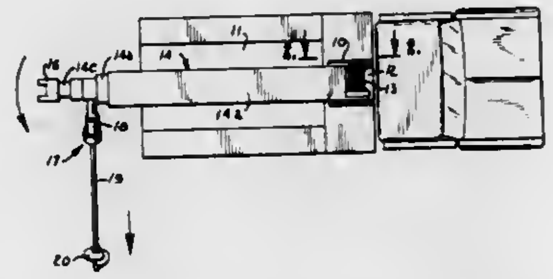
Paul Schmidt, Reiherstrasse, 5940, Lennestadt, Saalhausen, Germany
Filed Mar. 11, 1977, Ser. No. 776,914
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611677
Int. Cl.² E21B *11/02*
U.S. Cl. 173—23 **4 Claims**

1. In apparatus for sinking a borehole in the ground, said apparatus comprising a self-propelled displacement hammer including a tubular housing having a front end and a rear end, and a percussion mechanism for driving said housing forwards in the direction of said front end, the improvement comprising a follow-up tube, means for attaching said follow-up tube to said rear end of said housing, a bracing cable device and means for mounting said bracing cable device on said follow-up tube at an end thereof remote from said housing, said bracing cable device including a bracing cable and means for exerting an axial push on said tube from said bracing cable, said bracing cable device further including a bearing piece, means for mounting said bearing piece at said end of said follow-up tube remote from said housing, a cable guide sheave, means rotatably mounting said sheave on said bearing piece, means extending said bracing cable over said sheave, means for fixing one end of said cable and a pulling device fixed to the other end of said cable for tensioning said cable to exert said push on said tube, a clamping device carried on said bearing piece, a pulling rope extending from said housing through said follow-up tube, said clamping piece being operative to clamp said pulling rope to said tube, a cap fixed in the rear end of said housing, means defining a rope pocket in said cap, and means fixing one end of said rope in said rope pocket.



4,100,973
SIDE LOAD PROTECTION ARRANGEMENT FOR ROTATING EQUIPMENT

Frank D. Freudenthal, Saint Joseph, Mo., assignor to Altec Industries, Inc., Saint Joseph, Mo.
Filed Apr. 5, 1976, Ser. No. 673,600
Int. Cl.² E21C *5/00*
U.S. Cl. 173—44 **7 Claims**



1. A rotation drive mechanism for driving a rotatably supported body which is subject to being side loaded in a manner tending to rotate the body, said drive mechanism comprising:

a motor having an activated state and a deactivated state;

drive linkage coupling said motor with said body to drivingly rotate the latter;

a brake mechanism associated with said drive linkage, said brake mechanism being yieldably biased into engagement to prevent rotation of the body when said motor is deactivated and operable to release from engagement to permit rotation of said body when said motor is activated; and

a brake release means operable when said motor is in a deactivated state to at least partially disengage said brake mechanism to allow back driving of the body when the side load to which said body is subjected exceeds a preselected level,

said brake release means comprising:

a fluid chamber for receiving pressurized fluid to act on said brake mechanism to partially release same;

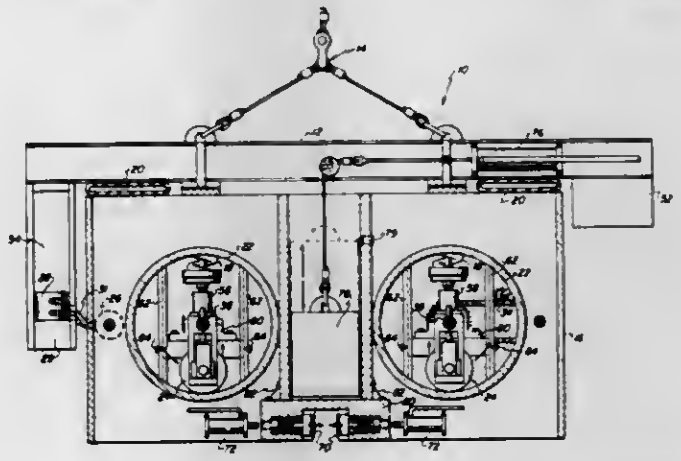
a fluid supply line leading to said chamber for delivering pressurized fluid thereto through an inlet port;

means responsive to side loads on said body for forcing pressurized fluid through said supply line and into said chamber with said motor deactivated; and

said fluid chamber having an outlet port, said outlet port being an orifice substantially smaller in size than said inlet port.

4,100,974
MACHINE SUSPENDED FROM A CRANE OR SIMILAR DEVICE FOR DRIVING AND EXTRACTING PILING AND THE LIKE

Charles R. Pepe, Old Quarry Rd., Alpine, N.J. 07620
Filed Jan. 6, 1977, Ser. No. 757,206
Int. Cl.² E02D *7/06*
U.S. Cl. 173—49 **12 Claims**



1. A machine for being suspended from a crane, or a similar device, for driving and extracting piling and the like with forces which simulate the impact obtained with a conventional reciprocating pile hammer, said machine comprising:

a horizontal support member;

a frame below the horizontal support member;

suspension means coupling the horizontal support member and the frame for permitting vertical movement of the frame toward and away from the horizontal support member;

a pair of races located side by side in the frame and defining a corresponding pair of paths of travel spaced horizontally from one another and located in a common vertical plane, the races being circular and each having a diameter of about 24 inches to about 72 inches;

a heavily weighted roller mounted for rotation within each race, each roller weighing between about 200 pounds and about 1000 pounds and being rotatable about a horizontal axis perpendicular to the common vertical plane;

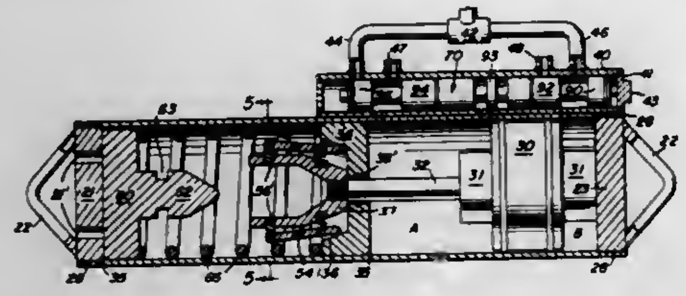
means for rotating the weighted rollers in synchronism at a low rate of rotation to move each roller along a corresponding path of travel whereby the rollers will generate forces upon the frame, the rate of rotation being about 50 to about 800 revolutions per minute and the synchronism being such that the horizontal components of the forces are in opposite directions and cancel one another, while the vertical components of the forces are in the same direction and establish alternating upward and downward forces which simulate the impact of a conventional reciprocating pile hammer;

the horizontal support member being weighted so as to tend to remain stationary while the frame is displaced vertically relative to the support member in response to rotation of the weighted rollers; and

the suspension means including resilient means enabling vertical displacement of the frame relative to the support member in the range of about 1 inch to about 5 inches.

4,100,975
POWER BOOSTER

Gladys T. Jarman, Brunswick, Ga., assignor to Davis R. Jarman and Virgil Hinson, both of Brunswick, Ga.
Filed Apr. 27, 1976, Ser. No. 680,795
Int. Cl.^{2} H01R *5/00*
U.S. Cl. 173—91 **2 Claims**

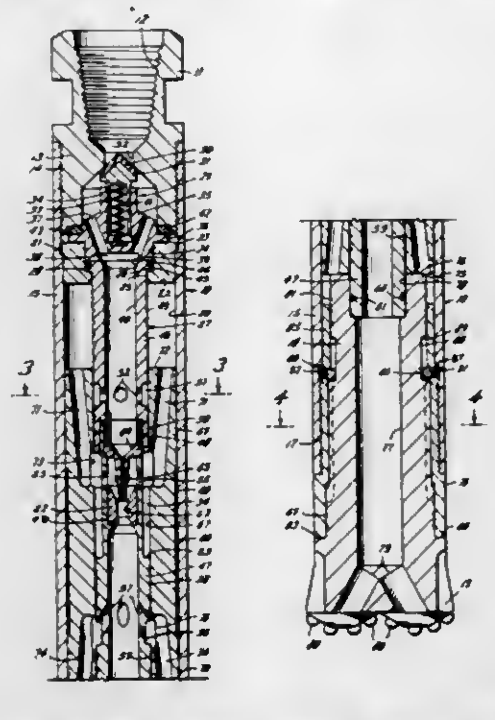


1. A power booster assembly comprising; a hollow cylinder member with spaced end walls, a piston and rod mounted for reciprocating movement within the cylinder member, a hammerhead slidably contained entirely within the cylinder biased to a one of the end walls of the cylinder member provided with an air passage, latch means mounted on the rod and spaced from the piston for alternately gripping and releasing the hammerhead, valve means associated with the cylinder member for feeding input fluid into the cylinder member to effect reciprocation of the piston within the cylinder member, and the latch means being arranged for releasing the hammerhead at one end of the longitudinal movement thereof with the rod and cause the hammerhead to release from the rod and strike the one of the end walls to create a shock thereon, the latch means including a support member on the connecting rod and opposite the piston and at least one latching finger on the support member for catching and releasing a projecting member extending from the hammerhead and facing inwardly of the cylinder member, the latch means including means having a cam surface arranged substantially midway of the cylinder member for engagement with the latching finger to effect the release thereof from the latch connection with the hammerhead projection, adjustable means provided between the cam surface and the latching finger for varying the point of engagement therebetween, the at least one latching finger being a plurality of like latching fingers and associated adjusting means, and the adjusting means including an adjustable set screw provided with a cam ball on one end thereof and appropriately mounted by means of the screw portion in associated screw threaded apertures in the ends of each finger.

4,100,976
PNEUMATIC IMPACT DRILLING TOOL

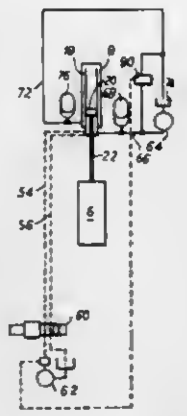
Charles W. Stone, Garden City, Mich., assignor to Reed Tool Co., Houston, Tex.
Filed Dec. 6, 1976, Ser. No. 748,011
Int. Cl.^{2} B25D *9/00*
U.S. Cl. 173—133 **10 Claims**

1. An impact drilling tool for connection in a string of drilling pipe comprising
- an upper sub for connection to said drilling pipe,
- a casing with an upper end connected to said upper sub,
- an anvil member slidably positioned in the lower end of said casing and having a bit member on its lower end extending outside said casing,
- a hammer piston positioned in said casing above said anvil member for reciprocal movement longitudinally of said casing to strike said anvil member repeatedly,
- a feeder tube for feeding compressed pneumatic fluid from said drilling pipe extending longitudinally of said casing through said hammer piston and into the upper end of said anvil member,
- a venturi member positioned in said feeder tube intermediate the ends thereof and within said hammer piston for producing a partial vacuum adjacent thereto upon passage of pneumatic fluid therethrough at a high velocity,
- a passageway extending through the wall of said feeder tube from a point adjacent said venturi member to a point within said hammer member, and
- a plurality of passages, including said last-named passageway, and valve openings cooperable therewith in said feeder tube and said hammer piston to apply compressed pneumatic fluid to one end of said hammer piston and said vacuum to the other end thereof when in one position and to apply vacuum to said one end and compressed pneumatic fluid to said other end when said hammer piston is in another position, for effecting reciprocal movement thereof substantially all of the spent penumatic fluid exhausting from said tool through said passageway.



4,100,977
DROP HAMMERS

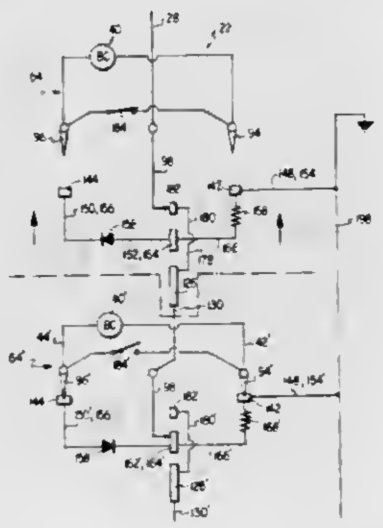
Roger Michael Elliott, Ipswich, England, assignor to BSP International Foundations Limited, Ipswich, England
Filed May 16, 1977, Ser. No. 797,232
Claims priority, application United Kingdom, May 21, 1976, 21195/76
Int. Cl.^{2} B25D *9/00*
U.S. Cl. 173—134 **4 Claims**



1. A drop hammer comprising a hammer weight, a hydraulic ram connected to said weight for displacing said weight, said ram comprising an upwardly extending cylinder and a piston slidable in said cylinder, respective internal chambers of the cylinder being formed thereby above and below the piston, an outer casing surrounding the cylinder, an outer annular space being formed thereby between the cylinder and the outer casing, said space being in permanent communication with an upper end of the cylinder chamber above the piston, a hydraulic pressure source for supplying pressure fluid to said chambers, a control valve for said fluid and for interconnecting said internal chambers of the cylinder and being disposed at the lower end of the cylinder and co-axially with the cylinder and piston, said outer annular space forming a continuation of said cylinder chamber above the piston leading to the control valve, control means comprising a control device externally of said valve and connected thereto for actuating the valve to control the supply of pressure fluid and to connect and disconnect the internal chambers of the cylinder for reciprocation of the hammer weight.

4,100,978
TECHNIQUE FOR DISARMING AND ARMING ELECTRICALLY FIREABLE EXPLOSIVE WELL TOOL

Gene T. Boop, 3922 Devonshire, Corpus Christi, Tex. 78413
Division of Ser. No. 535,355, Dec. 23, 1974, Pat. No. 4,007,796.
This application Nov. 29, 1976, Ser. No. 745,686
Int. Cl.^{2} E21B *43/116*
U.S. Cl. 175—4.55 **8 Claims**

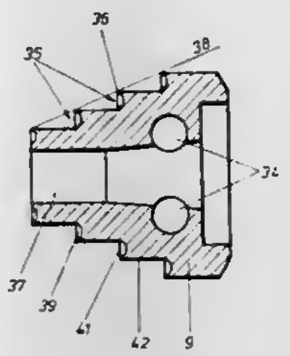


1. A method of using, in a well extending from the surface into the earth, a plurality of electrically fireable explosive devices each having a pair of terminals, and a pair of electrical leads enabling electrical communication between the surface and the pairs of terminals comprising the steps of
- separating, at the surface, a plurality of the pairs of terminals from each of the electrical leads;
- running the devices into the well;
- after the devices are in the well, arming a first device including connecting the pair of terminals thereof to the pair of leads while maintaining the other devices unarmed;
- passing an electrical current through the pair of leads and terminals of the first device and detonating the first device; and
- arming a second of the devices including connecting the pair of terminals thereof to the pair of leads while maintaining the other unfired devices unarmed.

4,100,979
PNEUMATIC PERCUSSION BORING DEVICE

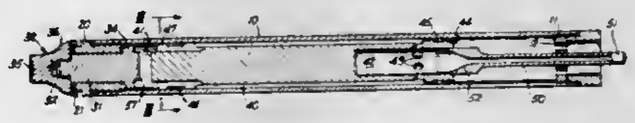
Paul Schmidt, Reiherstrasse, Lennestadt, Fed. Rep. of Germany (594)
Filed Dec. 17, 1976, Ser. No. 751,970
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558842
Int. Cl.^{2} E21B *11/02*
U.S. Cl. 175—19 **6 Claims**

1. A pneumatic percussion earth boring device comprising: a tubular housing having a forward end and a rearward end; a percussive boring tool mounted generally centrally of said housing in said forward end thereof, said percussive boring tool being configured to chisel into an earth formation when said tool is percussively reciprocated in said housing; a percussive piston mounted for reciprocating movement in said housing and adapted upon forward reciprocating movement thereof to act percussively on said boring tool; pneumatic means for reciprocating said piston; a displacement piece mounted on said boring tool for reciprocal motion therewith in order to laterally displace earth about said boring tool when said earth boring device is operating to traverse an earth formation for forming a boring therethrough; and a plurality of cutters on said displacement piece, each of said cutters comprising an annular knife edge extending about said displacement piece, said knife edges of each cutter being spaced apart axially of said boring tool and arranged concentrically thereabout with the diameters of said knife edges increasing stepwise in a direction rearwardly of said displacement piece, and an annular concave undercut portion facing forwardly of said displacement piece extending radially inwardly of said displacement piece from each of said knife edges.



4,100,980
SELF-PROPELLED PNEUMATIC BURROWING DEVICE

Gustav Jenne, Essen-Kettwig, Fed. Rep. of Germany, assignor to Jenne & Strahm AG fur Tiefbautechnik, Sarnen-Wilen, Switzerland
Filed May 27, 1976, Ser. No. 690,629
Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524210; May 31, 1975, 2524211
Int. Cl.^{2} E21B *11/02*
U.S. Cl. 175—19 **12 Claims**



1. A pneumatic burrowing device designed to propel itself through the ground along a straight line by crushing and/or displacing the materials which it encounters in its path. the device comprising in combination:
- an elongated tubular casing defining a cylindrical bore and a longitudinal center axis and movement axis of the device;
- a percussion head arranged on the forward extremity of the casing in alignment with said center axis and guided so as to be axially freely movable a limited distance in relation to the casing;
- two pairs of cooperating axial abutment faces defined by the casing and by the percussion head, respectively, said abutment faces determining between them the distance over which the percussion head is freely displaceable;
- means for axially respositioning at least one of said abutment faces relative to the other abutment faces so as to adjust said distance of displaceability;
- a massive percussion plunger received and guided inside said casing bore for reciprocating axial fore and aft movements, the percussion plunger having a rearwardly open control bore in its rear portion;
- a control barrel arranged in axial alignment with the casing bore and reaching from the rear of the device a distance into the casing bore, the control barrel being held in place by the casing and having connected to it a rearwardly

extending supply line for compressed air, while carrying on its forward extremity an outwardly cylindrical control barrel head matching in its diameter the control bore of the percussion plunger and serving as a plunger valve in cooperation with the latter; and

air flow controlling means defined by said percussion plunger bore and said cooperating control barrel head for deriving from a flow of compressed air received through said supply line a continuously cycling reciprocating motion of the percussion plunger between axial stroke limits which are determined by the axial position of said control barrel head, whereby said barrel head is normally so positioned that the percussion plunger, in its forward motion, strikes the percussion head before reaching the forward stroke reversal point determined by said air flow controlling means, thereby forcibly advancing the percussion head a certain distance against the materials situated in the path of the device; and wherein

the distance over which the percussion head is axially freely displaceable in relation to the casing is adjustable to be slightly greater than the normal distance of advance of the percussion head in the ground per impact.

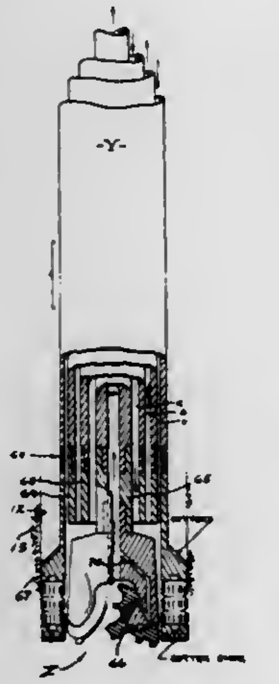
4,100,981
EARTH BORING APPARATUS FOR GEOLOGICAL DRILLING AND CORING

John D. Chaffin, 851 Haverford Ave., Pacific Palisades, Calif. 90272

Filed Feb. 4, 1977, Ser. No. 765,679

Int. Cl.^{2} E21B *49/00, 7/18, 21/00*

U.S. Cl. 175—60 58 Claims



1. A method of drilling and continuously sampling geological formations and including the steps of:
forming a continuous bore hole in the earth by drilling with a multiplicity of at least two concentric drill pipes and each of which rotates a drill bit;
removing particulate matter from the drill bits at the bottom of the bore hole by means of reverse air vacuum and entrainment thereof in at least one fluid circuit pumped through the center drill pipe and annulus within the other drill pipe;
separating the entrained particulate matter from said fluid circuit;
and, continuously collecting the separated particulate matter for disposition and core sampling.

18. Apparatus for drilling and continuously sampling geological formations, and including:
a multiplicity of at least two concentric drill pipes defining fluid channels extending centrally therethrough and therebetween, and separate drill means carried at the lower end of the central and outermost drill pipes respectively for forming a continuous bore hole in the earth;
means for driveably rotating, raising and lowering said concentric drill pipes, and having a swivel-manifold with separate connections in fluid communication with fluid channels extending centrally therethrough and therebetween;
means for selectively pumping fluid through said swivel-manifold in separate communication with said fluid channels;
and, means continuously separating particulate matter entrained in said fluid from the drill means at the bottom of the bore hole, for disposition and core sampling.

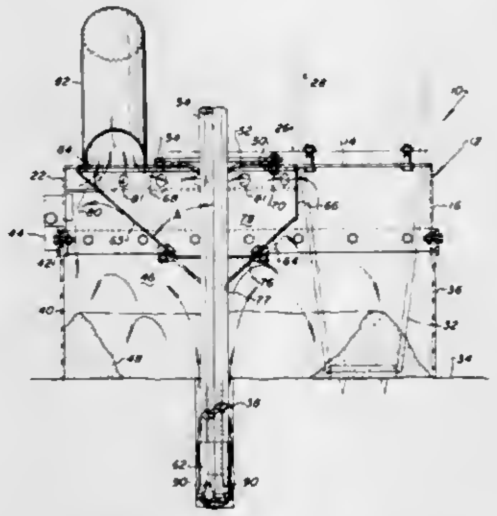
4,100,982
DRILL CUTTINGS SEPARATION AND CONTROL APPARATUS

Brendan Michael Wilkinson, Salem, and Erasmo Belfiore, Roanoke, both of Va., assignors to Gardner-Denver Company, Dallas, Tex.

Filed May 5, 1977, Ser. No. 794,273

Int. Cl.^{2} E21B *21/00*

U.S. Cl. 175—206 8 Claims



1. A drill cuttings separation and control apparatus for use with a rock drill rig wherein drill cuttings are forcibly ejected from the drill hole by pressure air, said apparatus comprising:
a hood including a transverse deck and depending sidewalls engageable with the ground surface to form a first substantially enclosed space around a drill hole;
an opening in said deck for admitting a drill stem into said drill hole;
flexible sealing means disposed in said opening and around said drill stem;
a drill cuttings deflector disposed within said first enclosed space and characterized by a conical wall portion disposed around and spaced from said drill stem, and a base contiguous with said deck, said conical wall portion depending from said base toward said drill hole;
said deflector defining in part a second enclosed space;
aperture means formed in said deflector for admitting air and air-borne drill cuttings from said first enclosed space to said second enclosed space; and,
an opening into said second enclosed space and in communication with means for evacuating air and air-borne drill cuttings from said first enclosed space and said second enclosed space.

4,100,983
BORING DEVICE

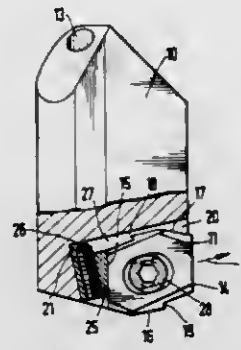
Lothar Herrmann, Metzingen, and Gotthold Schur, Riederich, both of Fed. Rep. of Germany, assignors to Firma Botek Praezisions-Bohrtechnik Schur & Co., Riederich, Fed. Rep. of Germany

Filed May 10, 1976, Ser. No. 684,979

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522565; Dec. 18, 1975, 2556943

Int. Cl.^{2} E21B *9/00*

U.S. Cl. 175—383 8 Claims



1. In a boring device adjustable in at least a first radial direction for boring holes of selectable diameter, a bore head having an external recess therein bounded by upper and lower surfaces extending in at least the first direction, at least one of the lower surfaces of the recess having a first pattern of longitudinal indentations extending along the first direction, a cutting plate having first and second opposed surfaces separated by at least third and fourth opposed surfaces, each of the first and second surfaces having cutting edges therein at least one of the third and fourth surfaces having a second pattern of longitudinal indentations complementary to and interfitting with the first pattern of indentations on the lower surface of the recess whereby said lower surface provides a guideway for the radial adjustment of the cutting plate when the cutting plate is positioned within the recess, the cutting plate further having an elongated central slot extending substantially parallel to the third and fourth surfaces of the cutting plate, and releasable securing means cooperable with the slot in the cutting plate for reversibly supporting the cutting plate in the recess with a selected one of the third and fourth surfaces thereof contacting the lower surface of the recess.

4,100,984
NET WEIGHER WITH BUILT-IN CHECKWEIGHER

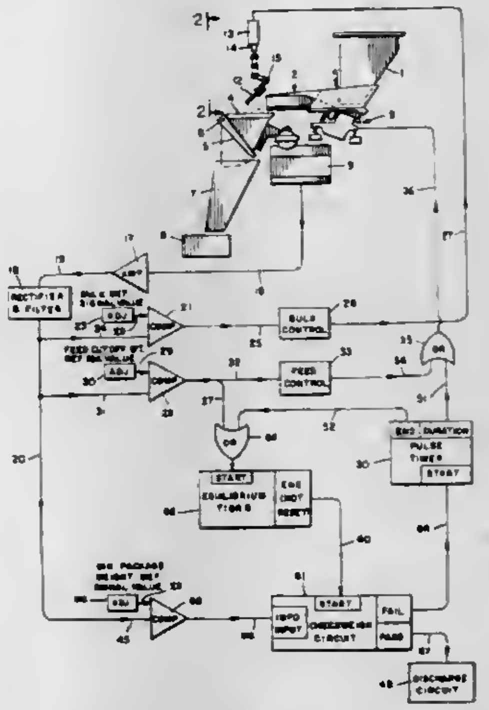
King L. Klopfenstein, Prospect Heights, and Robert H. Connors, Chicago, both of Ill., assignors to Triangle Package Machinery Co., Chicago, Ill.

Filed Jul. 2, 1976, Ser. No. 702,354

Int. Cl.^{2} G01G *13/04*

U.S. Cl. 177—50 13 Claims

1. Apparatus for controlling the weight of product charges fed into a vertically displaceable receptacle, comprising
(a) bulk feeder means for feeding product to said receptacle;
(b) dribble feeder means for feeding product to said receptacle at a rate slower than that of the bulk feed, after the bulk feed stops,
(c) weighing means, including an electronic sensing device with related electronic circuitry, operatively associated with said receptacle and operable to detect the displacement of said receptacle thereby to sense the weight of product in said receptacle, said weighing means having
(1) a bulk feed cut-off setting,
(2) a dribble feed cut-off setting which is different than said bulk feed cut-off setting, and
(3) a minimum package weight setting which is different than either of said bulk feed cut-off setting or said dribble feed cut-off setting,
(d) bulk feed control means operable in response to said sensing device sensing said bulk feed cut-off setting to provide a signal to stop flow of product from said bulk feeder means when the apparent weight of product in said receptacle being sensed is at least equal to the bulk feed cut-off setting,
(e) first dribble feed control means operable in response to said sensing device sensing said dribble feed cut-off setting to provide a signal to stop flow of product from said dribble feeder means when the apparent weight of product in said receptacle being sensed is at least equal to the dribble feed cut-off setting,
(f) said weighing means also including checkweighing means operable after the flow of product to said receptacle from said dribble feeder means has stopped to determine whether the weight being sensed by said sensing device is over or under said minimum package weight setting,
(g) second dribble feed control means operable after operation of said checkweighing means and in response thereto to provide a signal to activate the same dribble feeder means to feed a further charge of product to the same receptacle if the weight of product being sensed is less than the minimum package weight, and
(h) means, operable when the weight of product in said receptacle being sensed by said weighing means is at least equal to the minimum package weight setting, to discharge product from said receptacle.



4,100,985
VIBRATION-RESISTANT BALANCE

Eugen Meier, Meilen, Switzerland, assignor to Mettler Instrumente Ag, Greifensee-Zurich, Switzerland

Filed May 2, 1977, Ser. No. 792,598

Claims priority, application Switzerland, Oct. 8, 1976, 12789/76

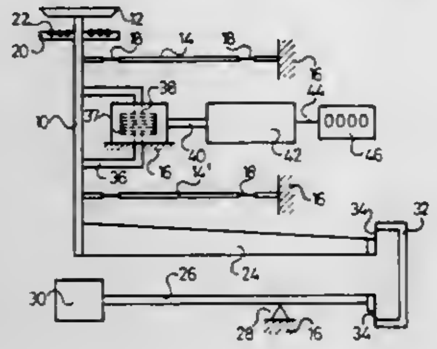
Int. Cl.^{2} G01G *23/12*

U.S. Cl. 177—189 6 Claims

1. In a balance, in combination:
(a) a support;
(b) an elongated pan carrier;
(c) guide means pivoted to said support for angular movement about a first axis and connected to said pan carrier for guiding movement of the same toward and away from a position of equilibrium relative to said support, the direction of elongation of said pan carrier during said movement thereof remaining parallel to said direction of elongation in said position of equilibrium;
(d) electrically operated means for opposing said movement;
(e) a lever mounted on said support for pivoting movement about a second axis, said lever having two arms;

(f) coupling means coupling one of said arms to said pan carrier for joint movement; and

(g) a counterweight on the other arm of said lever, said



counterweight being offset from said second axis in a predetermined direction transverse to said second axis, said pan carrier being offset from said first axis in said predetermined direction.

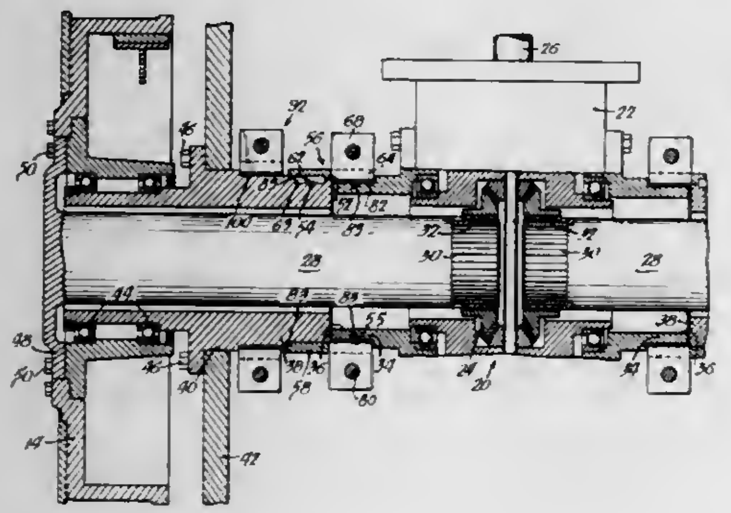
4,100,986
SPLIT PILLOW BLOCK FOR MOUNTING A DIFFERENTIAL

William M. Shipitalo, Novelty, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 20, 1977, Ser. No. 799,068

Int. Cl.^{2} B60K *17/16*

U.S. Cl. 180—75 **11 Claims**



1. In a vehicle, the combination of:
a vehicle frame;
an elongated, hollow wheel spindle mounted on said frame;
a wheel rotatably mounted on one end of said spindle;
a differential gear assembly having a housing with a tubular protrusion terminating in an opening aligned with the other end of said spindle;
a drive shaft within said spindle and removably connected to said wheel and to said differential gear assembly; and
a split pillow block interconnecting said spindle other end and said housing and including a tubular collar disposed about one of said spindle other end and said protrusion, an integral partial collar disposed partially about the other of said spindle other end and said protrusion, and a separate partial collar mating with said integral partial collar and removably secured thereto about said other of said spindle other end and said protrusion.

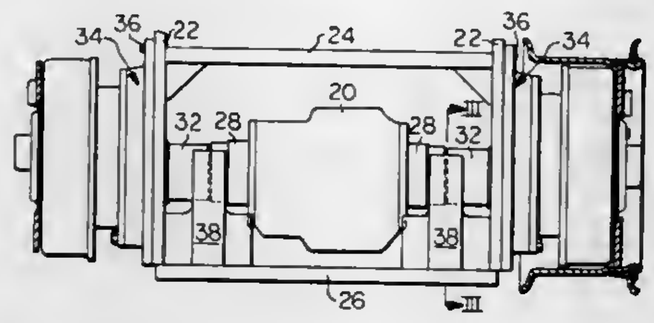
4,100,987
CRADLE FOR A DIFFERENTIAL

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 9, 1977, Ser. No. 795,038

Int. Cl.^{2} B60K *17/16*

U.S. Cl. 180—75 **11 Claims**



1. A lift truck comprising:
means defining a vehicle frame including spaced side frame members;
wheels on said frame including two final drive units, one on each side of the frame and secured thereto;
a differential mounted on said frame and connected to both said final drive units, said differential including a housing having opposed, outwardly directed drive train component tunnels extending to a corresponding one of said final drive units; and
a pair of cradles on opposite sides of said frame, each having a generally upwardly facing differential tunnel supporting surface, each said surface having substantially the same shape as the adjacent part of the corresponding tunnel and being slightly larger in size to support the differential during assembly while allowing minimal shifting thereof to achieve alignment of parts during assembly.

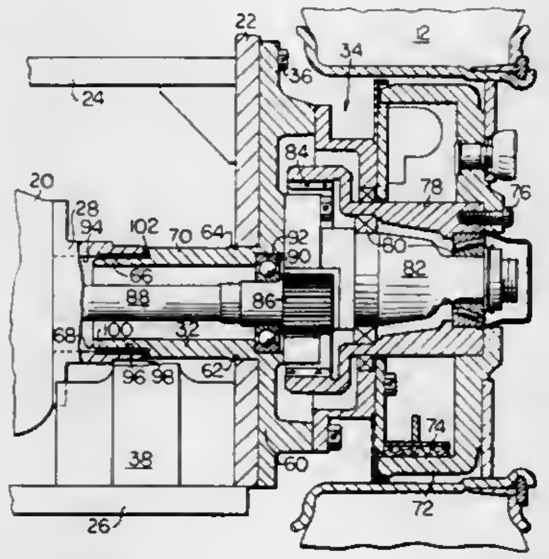
4,100,988
VEHICLE INCLUDING DIFFERENTIAL MOUNTING

Harold V. Hildebrecht, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 9, 1977, Ser. No. 795,039

Int. Cl.^{2} B60K *17/16*

U.S. Cl. 180—75 **4 Claims**



1. In a vehicle such as a lift truck or the like, the combination of:
a vehicle frame having two spaced apart side frame members;
drive means for the vehicle including a differential having a housing disposed between said frame members with oppositely directed drive train tunnels extending towards a respective one of said frame members;

an opening in each side frame member and aligned with the associated drive train tunnel;
a pair of final drive units including wheel spindles, one on each side of said frame, and each final drive unit having a mounting plate abutting an associated side frame member on the side thereof remote from said differential, and a sleeve for housing a drive component and extending from the mounting plate through the opening in the associated side frame member for connection to the associated tunnel; and
means securing each said mounting plate to the associated side frame member;
whereby loading on said vehicle will be transmitted directly to said vehicle frame and said differential will not support vehicle loads.

4,100,989
PNEUMATIC CELL FOR GAS CONFINEMENT IN SURFACE EFFECT VEHICLE

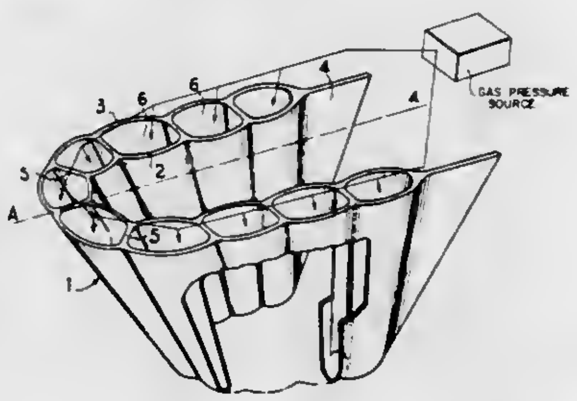
Jean Luc Y. Barbot, Les Lilas, and Philippe M. Remon-Beauvais, Ris-Orangis, both of France, assignors to Etat Francais, Paris, France

Filed Jun. 23, 1976, Ser. No. 698,813

Claims priority, application France, Jun. 27, 1975, 75 20205

Int. Cl.^{2} B60V *1/16*

U.S. Cl. 180—127 **21 Claims**



1. A flexible gas cushion confinement cell for a ground-effect vehicle, which comprises two flexible walls (2,3) which extend substantially parallel to one another, and flexible partitions (5) which extend transversely of the walls (2,3) and which join them together over at least part of their height, said walls (2,3) defining in conjunction with one another and with said partitions (5) juxtaposed compartments (6) which have open upper ends to enable them to be connected to means for supplying gas under pressure, and which are at least substantially closed at their lower ends, said walls being at least partly in the form of part of a truncated conoid and cooperatively defining a frustoconoidal sector having major and minor bases at said upper and lower ends respectively.

4,100,990
STEERING APPARATUS

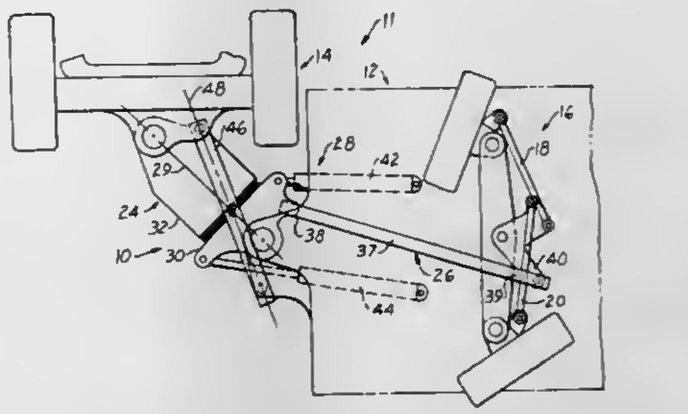
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,900

Int. Cl.^{2} B62D *5/10*

U.S. Cl. 180—135 **7 Claims**

1. Steering apparatus for a vehicle having first and second sections and Ackerman steering apparatus connected to said first section, comprising:
a coupling assembly connected to said first and second sections and being laterally, pivotally movable toward and from the first section and toward and from the second section;
means for moving said first section relative to said coupling assembly; means for automatically controllably changing the lateral orientation of said first section relative to said second section; and
a linkage mechanism pivotally connected to said coupling assembly and Ackerman steering apparatus and being of a



construction and arrangement sufficient for actuating said Ackerman steering apparatus in response to and as a function of the pivotal movement of said coupling assembly relative to said first section.

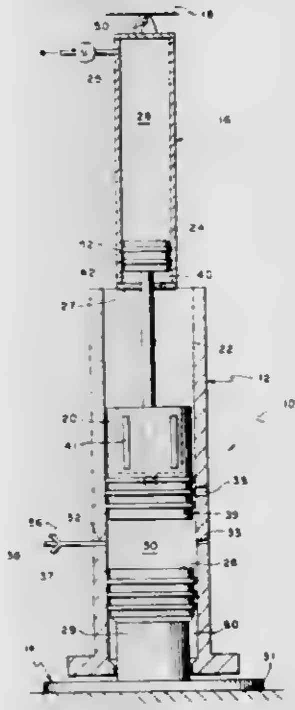
4,100,991
FAST CYCLE SEISMIC GAS EXPLODER AND METHOD

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 11, 1976, Ser. No. 740,704

Int. Cl.^{2} G01V *1/10*

U.S. Cl. 181—117 **12 Claims**

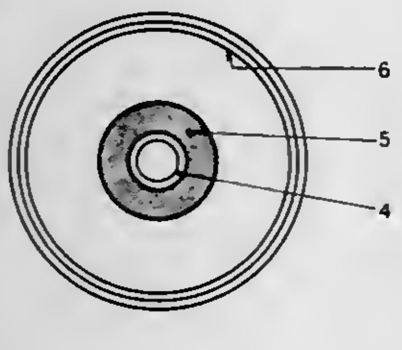


1. A method of injecting a compressional pulse into the earth utilizing a seismic gas exploder with a closed expansible detonation chamber formed within an upstanding cylindrical housing between a rigid top and a rigid bottom comprising:
(a) placing said rigid bottom into direct contact with the earth,
(b) injecting a charge of combustible gas mixture into said detonation chamber,
(c) igniting said mixture to initiate a gas explosion adapted to apply a compressional pulse to the earth through said rigid bottom and to drive said rigid top upwardly,
(d) utilizing the upward motion of said rigid top to compress an air spring external to said housing, and
(e) applying the energy of said compressed air spring thereafter to aid gravity acceleration of said rigid top in a downward direction.

4,100,992
LOUDSPEAKER

Weber Louis Rebde, and Joël Anders Rebde, both of 9 rue de la Mairie, Bavans (Doubs), France

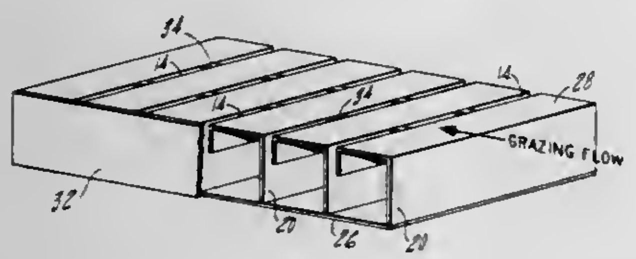
Continuation-in-part of Ser. No. 602,003, Aug. 5, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,718
Claims priority, application France, Aug. 12, 1974, 74 27923
Int. Cl.² G10K *13/00*
U.S. Cl. 181—166 **5 Claims**



1. A loudspeaker comprising a porous diaphragm having an outside edge, an electromagnetic drive means mounted on a central area of the diaphragm for displacing the diaphragm and a hard ring forming a junction between said diaphragm and said drive means, said diaphragm being totally permeated with a stiffening material in a portion of the area between said ring and said outer edge without increasing the thickness of the diaphragm thereby improving the acoustic characteristics of said loudspeaker as compared with an equivalent unstiffened diaphragm.

4,100,993
ACOUSTIC LINER

Ernest Feder, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Apr. 15, 1976, Ser. No. 677,335
Int. Cl.² F01N *1/02*
U.S. Cl. 181—213 **5 Claims**



1. An acoustic low frequency sound suppressor liner comprising a backing sheet, a plurality of elongated flat surface members parallelly spaced to said backing sheet defining a facing sheet exposed to the grazing flow of a substantial velocity and sound pressure and upstanding spaced side wall members extending therebetween defining a plurality of sound suppressing cavities, lip means spaced from one of said wall members extending from one edge of each of said flat surface members extending into each of said cavities to define with said one of said wall members a volume chamber supporting a column of air communicating internally of each of said cavities, the width and depth of said volume chamber establishing the mass reactance whereby the depth of each of said cavities is sized for a given sound attenuation by selecting said mass reactance for a predetermined frequency intended to be attenuated, said volume chamber extending in a lateral direction with respect to said grazing flow, each of said upstanding side wall members form a common wall for adjacent cavities and said lip means is angularly spaced with respect to the adjacent upstanding wall and is in a volume increasing direction from the entrance to the exit which together defines the volume chamber.

2. An acoustic low frequency sound suppressor liner mounted in a duct and exposed to grazing flow of fluid having substantially high velocity and high sound pressures, said liner comprising:

a backing sheet;

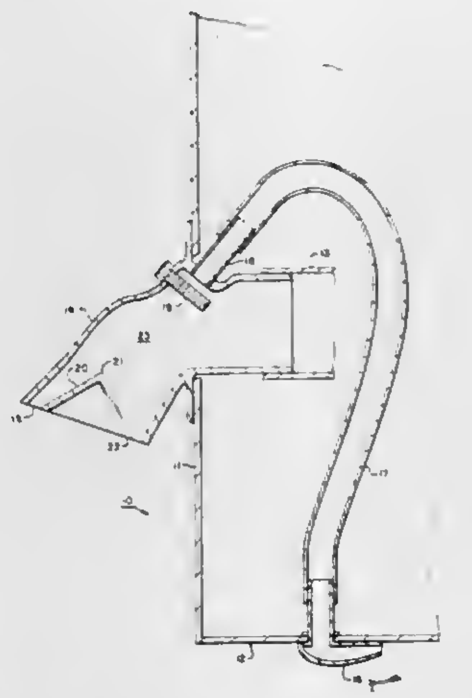
a plurality of elongated flat surface members parallely spaced to said backing sheet defining a facing sheet exposed to said grazing flow;

an upstanding, spaced side wall member extending from said backing sheet to one elongated edge of each of said surface members to define a plurality of sound suppressing cavities, said each side wall member forming a common wall between adjacent cavities; and

lip means extending from the other elongated edge of each of said surface members into each of said cavities, said lip means being spaced from one of said wall members to define therewith a volume chamber having a first slot communicating with said grazing flow and a second slot communicating with each of said cavities, the width and depth of said volume chamber cooperating with the volume of the associated cavity to determine the resonant frequency of sound attenuated thereby, said slots extending laterally with respect to said grazing flow.

4,100,994
MARINE EXHAUST SILENCER

Robert B. Stuart, Penn Yan, N.Y., assignor to Penn Yan Boats, Incorporated, Penn Yan, N.Y.
Filed Jul. 15, 1976, Ser. No. 705,683
Int. Cl.² F01N *3/04*
U.S. Cl. 181—261 **8 Claims**



1. A silencer for quieting the exhaust output from the output end of an exhaust passageway for a marine engine for a boat, said silencer comprising:

a. the cross-sectional area of said exhaust passage way from said engine being substantially enlarged in a region immediately upstream of said output end for substantially expanding and cooling said exhaust gases just before said exhaust gases reach said output end;

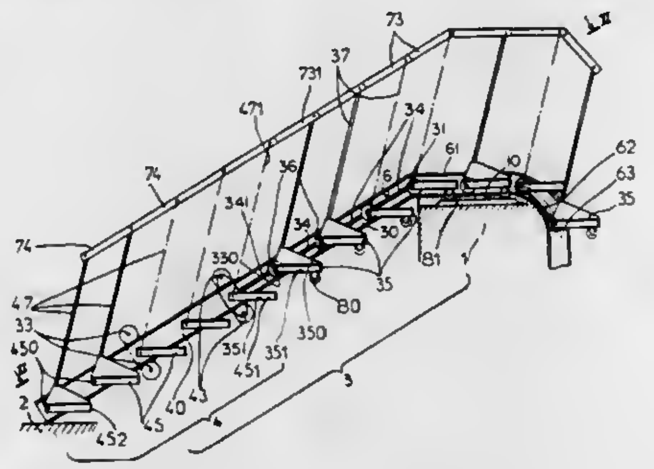
b. an inlet for receiving water from a body of water supporting said boat;

c. means for injecting said water from said inlet directly into said enlarged region of said exhaust passageway; and

d. means for dividing said injected water into particles and mixing said particles with exhaust gases in said enlarged region of said passageway for cooling and quieting said expanding exhaust gases from said engine before said exhaust gases are output along with said injected water from said output end of said passageway.

4,100,995
TELESCOPIC SET OF STEPS WITH VARIABLE SLOPE

Jacques Pradon, 19, avenue des Tourelles, 94100 Saint-Maur-des-Fosses, France
Filed Feb. 14, 1977, Ser. No. 768,430
Claims priority, application France, Feb. 17, 1976, 76 04332
Int. Cl.² B63B *29/20*
U.S. Cl. 182—1 **8 Claims**



1. A telescopic set of steps comprising:

at least two frames each comprising two parallel members forming stringboards;

means for pivotally connecting one end of one of said frames to a fixed support, for pivotal movement about a horizontal axis;

means mounting the other of said frames for sliding movement along said one frame;

means for varying the slope of said set of steps;

a plurality of individual steps comprising a first group of steps and a second group of steps;

means pivotally mounting the steps of said first group of steps directly on said other frame for pivotal movement about an axis parallel to said horizontal axis;

means mounting each step of said second group of steps on a respective axle for pivotal movement about an axis parallel to said axes of said first group of steps;

a pair of supports mounted on each end of each axle;

a pair of slideways formed on the said stringboards of said one frame and receiving respective said supports of said axles of said steps of said second group of steps and along which said supports are slidable;

slideway extensions extending said slideways by a distance at least equal to the length of said other frame and being adapted to be arranged on said fixed support;

means for maintaining a constant spacing between the pivot axes of said steps;

means for maintaining the steps parallel to one another; and means for setting the inclination of at least one said step.

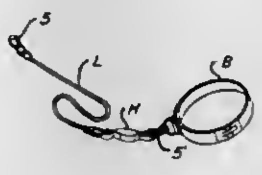
4,100,996
SHOCK ABSORBER FOR A SAFETY BELT LANYARD

Jonathan E. Sharp, 3999 Hillside Pl., Littleton, Colo. 80123
Filed Jun. 6, 1977, Ser. No. 803,551
Int. Cl.² E06C *7/18;* **A62B** *1/16*
U.S. Cl. 182—3 **6 Claims**

1. A web-type shock absorber for a safety belt-lanyard combination to decelerate to a stop the fall of a workman wearing the same, by pulling a selected length of a web through a resistance slide and comprising:

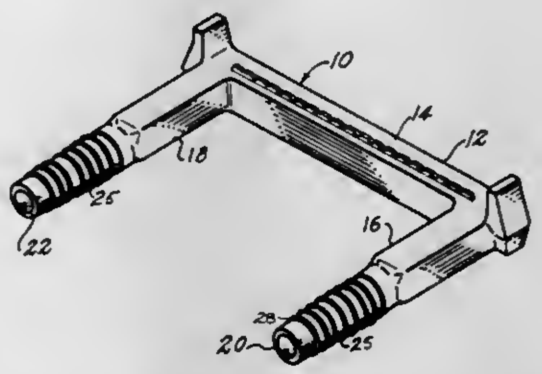
(a) a web of nylon or like material having a short base portion and a free reach in tandem, a first connector loop at the end of the base portion, a second connector loop between the base portion and the free reach and a third connector loop at the end of the free reach and wherein the length of the free reach corresponds to the aforesaid selected length to be pulled through a resistance slide;

(b) a resistance slide including a central bar and side bars in spaced parallelism proportioned to snugly receive the web with the said first loop being upon the central bar and with the end of the free reach adjacent to the said third loop being threaded upon the slide, about the said first loop between the adjacent side bars; and wherein said second loop and said third loop are connected to connector members of the safety belt-lanyard combination to be pulled by the combination in checking a fall with the free reach of the web moving through the resistance slide.



4,100,997
STEP CONSTRUCTION EMPLOYING INSERTABLE FASTENER HAVING DEFORMABLE PROJECTIONS

Bobbie D. Peacock, 702 Hippocket Rd., Peachtree City, Ga. 30269
Filed Jun. 21, 1976, Ser. No. 698,490
Int. Cl.² E04F *19/00*
U.S. Cl. 182—90 **1 Claim**

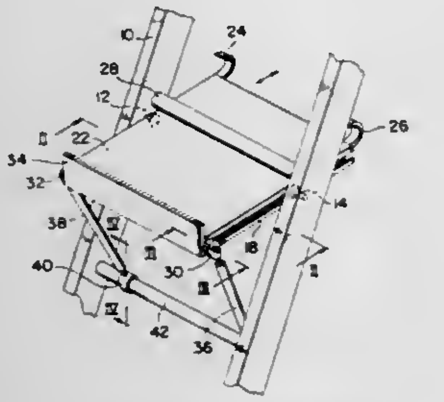


1. In an integrally molded prefabricated step for insertion in a pair of spaced tapered holes drilled or otherwise formed in a solid material such as concrete:

an elongated step member having a pair of outwardly projecting support members integrally molded thereon and rigidly attached substantially at right angles thereto, each of the ends of said support members being tapered for insertion into the corresponding tapered holes and having individual, substantially arcuate and continuous resilient projections integrally molded thereon from plastic material and the like and each of said projections having a slanted face inclined toward the step member and including a marginal edge which is deformable under pressure whereby when said end is driven into a respective opening of less distance than the overall distance between the marginal edges of the projections the projections are deformed and the step is held in place, said deformable members being substantially circular and being progressively larger in diameter from the external terminal end toward the step whereby said respective ends may be aligned with a respective spaced hole and driven into a tapered hole to support said step and to seal the respective holes.

4,100,998
LADDER STEP

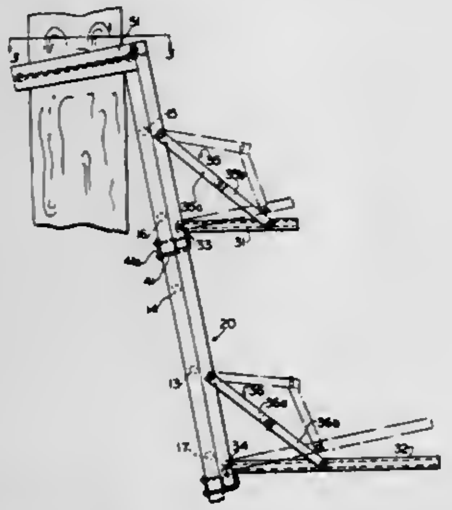
Manuel J. Marquez, Salem, Oreg., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Oct. 14, 1976, Ser. No. 732,306
Int. Cl.^{2} E06C *7/16*
U.S. Cl. 182—116 **4 Claims**



1. An improved ladder step, comprising:
a platform,
the platform attachable to a ladder,
a rugging material attached to an upper surface of the platform,
a front lip attached to a front edge of the platform,
a pivotable bearing attached to a front side of the front edge of the platform,
a support arm dependingly attached to the bearing,
a clamp attached to a lower end of the support arm and releaseably engageable with a lower rung of the ladder,
a rail attached to a lower side edge of the platform, &
a headed bolt attached to an inner side of a rail of the ladder and slidingly engageable by the rail.

4,100,999
DEER HUNTING STAND ATTACHMENT

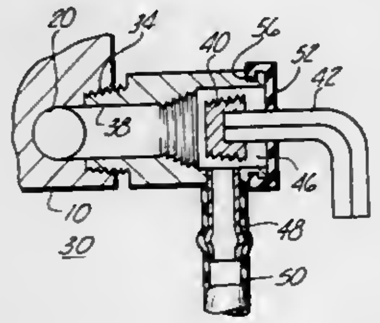
Joe Derrell Conner, 1265 New Hope Rd., Lawrenceville, Ga. 30245
Filed May 6, 1977, Ser. No. 794,685
Int. Cl.^{2} A47C *9/10;* **E06C** *7/16*
U.S. Cl. 182—122 **13 Claims**



1. An attachment for a ladder to provide a deer hunting stand comprising:
means defining a frame,
a first upper shelf and a second lower shelf,
means pivotally connecting each said shelf to said frame in spaced apart relationship, with the pivotal axes thereof substantially parallel and extending transversely of said first frame,
said shelves in one position thereof extending outwardly of said first frame, and
collapsible means connected to each said shelf and to a said frame for selectively supporting said shelves in said first position thereof,
said shelves being pivotal on said connecting means to a second position substantially parallel to said first frame by collapsing said collapsible supporting means, and
a second frame connected to said first mentioned frame, and means carried by said second frame for connecting said attachment to a tree.

4,101,000
EASY ACCESS OIL FILTER DRAIN SYSTEM

Andrew J. Scully, Mt. Clemens, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jul. 15, 1977, Ser. No. 815,882
Int. Cl.^{2} F01M *11/04*
U.S. Cl. 184—1.5 **5 Claims**

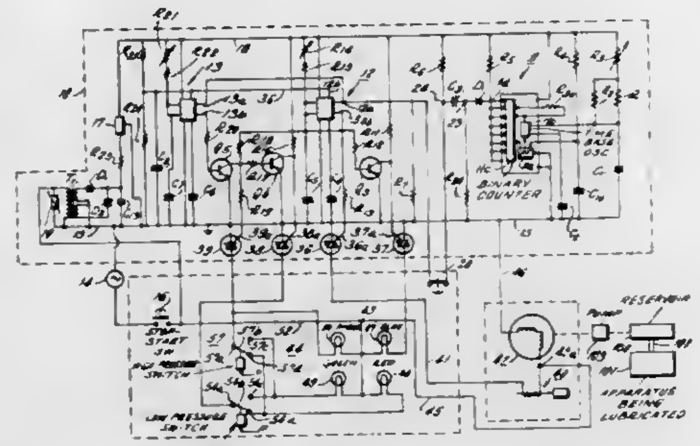


1. In an engine having an oil filter base bolted to an engine side surface such that the zone immediately beneath the base is obstructed: improved mechanism for draining oil from the base, comprising an auxiliary housing having a horizontal tubular extension threaded into an opening in the exposed side surface of the filter base so that oil within the base can drain outwardly through the horizontal passage formed by said extension; said horizontal passage being internally threaded in the end thereof leading into the housing; a threaded plug normally seated in the threaded portion of the passage to prevent flow of oil from the filter base through the passage; said housing including a frontal mouth opening larger than the diameter of the plug, whereby the plug can be inserted through the mouth opening and thence into the threaded portion of the passage; a flexible front cover connected to the housing for preventing escape of oil through the mouth opening when the plug is unthreaded from the passage; said front cover having a relatively small hole therethrough aligned with the passage axis, whereby a turning implement can be inserted through the hole to rotate the plug without removing the cover; said housing having an external tubular downspout for gravitational discharge of oil from the housing.

4,101,001
DUAL TIMER WITH DELAY

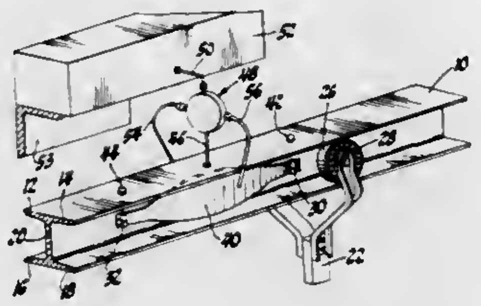
Carl H. Smith, Spring Valley, N.Y., assignor to Auto Research Corporation, Oakland, N.J.
Filed Jun. 1, 1976, Ser. No. 691,615
Int. Cl.^{2} F01M *1/18*
U.S. Cl. 184—6.4 **17 Claims**

1. System testing apparatus, comprising:
first adjustable time delay means for establishing the frequency at which a test condition is imposed on a system being tested, said first time delay means to generate a test initiating signal at adjustably preset first timing intervals;
second adjustable time delay means responsive to said test initiating signal for establishing a testing interval during which a test condition is imposed on said system being tested, said testing interval being of a significantly shorter duration than said first timing interval;
means controlled by said second adjustable time delay means for imposing a test condition on said system being tested during said testing intervals;
third adjustable time delay means responsive to said test initiating signal for establishing a third timing interval of a shorter duration than said testing interval, said third timing interval being of sufficient duration to permit said test condition imposed by said means for imposing a test condition to "settle";
means controlled by said second and third time delay means for coupling a condition sensing means, to said system being tested after the termination of said third timing interval but before the termination of said testing interval.



4,101,002
TRACK MOUNTED LUBRICATION APPARATUS

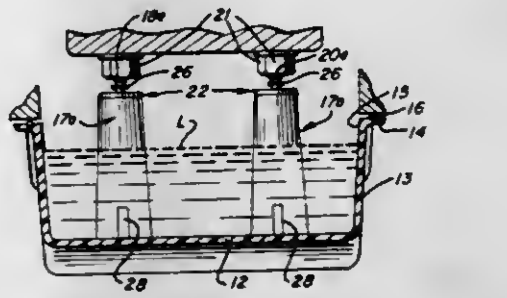
Ernest W. Almasy, 2416 Second St., Westland, Mich. 48184
Filed Apr. 18, 1977, Ser. No. 788,297
Int. Cl.^{2} F16N *7/24, 11/10*
U.S. Cl. 184—15 B **6 Claims**



1. A combination comprising:
an I-beam having a pair of upper flanges, a pair of lower flanges and a web between said flanges;
a pair of conveyor wheels supported on the lower flanges on opposite sides of the web so as to be movable along a path of motion, said conveyor wheels having bearings;
lubrication means mounted adjacent the I-beam including a lubricant reservoir;
nozzle means connected to the lubricant reservoir and operative to deliver lubricant therefrom to a position adjacent the path of motion of the conveyor wheels;
resilient bellows means disposed adjacent said web means and the path of motion of the conveyor wheels such that the volume of the bellows is reduced as the wheels pass the bellows, and means connecting the bellows means to the lubrication means, whereby lubricant is delivered to the wheel bearings as the volume of the bellows means is being reduced.

4,101,003
ISOLATED OIL PAN ASSEMBLY

Sune E. Timour, Columbus, and Thomas D. Littrell, Scipio, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.
Filed Jan. 12, 1977, Ser. No. 758,582
Int. Cl.^{2} F16N *31/00*
U.S. Cl. 184—106 **6 Claims**



1. An isolated oil pan assembly for mounting on the underside of an engine block wherein the interior of the latter is provided with rigid stationary means, said assembly comprising a pan for accumulating therein a predetermined amount of oil, said pan having a base, upstanding side walls connected to and delimiting said base, and a continuous ledge extending laterally from the upper edge of said side walls and delimiting an open top of said pan, said ledge being disposed above the level of the predetermined amount of accumulated oil, said open top being adapted to communicate with the interior of said engine block; a continuous seal of resilient vibration isolating, oil impervious material carried on said ledge for sealingly engaging the underside of said engine block; a plurality of elongated sleeve-like pockets formed in said base and extending upwardly therefrom and adapted to be in vertical alignment with the rigid stationary means, said pockets being disposed within an area delimited by said ledge; and a plurality of fastening means, one for each pocket, being disposed within said pockets and adapted to be secured to the rigid stationary means; each fastening means including an elongated element having the upper end thereof projecting through an opening formed in the upper end of the pocket and adapted to be secured to the rigid stationary means aligned therewith, an isolator formed of resilient vibration isolating, oil impervious material encompassing and being carried on and supported by a portion of said elongated element and sealingly engaging the portion of the pocket upper end cirumjacent the opening therein wherein said elongated element is isolated from said oil pan, said pan being adapted to be secured to the underside of the engine block by said elongated elements through the respective isolators.

4,101,004
DRIVE AND STEERING APPARATUS

Herbert D. Oltman, 605 Second St., Hampton, Ill. 61256
Filed Jan. 31, 1977, Ser. No. 764,050
Int. Cl.^{2} B62D *11/08*
U.S. Cl. 180—6.2 **5 Claims**

1. A drive and steering apparatus for a vehicle comprising:
a frame;
ground engaging means having a first side and a second side rotatably attached to said frame for moving said vehicle;
a shaft;
means for rotatably attaching said shaft to said frame;
means attached to said frame for rotating said shaft;
a first drive assembly, said first drive assembly having a first and a second frictional surface thereon, said first drive assembly including two drums rigidly connected together, said first and second frictional surfaces of said first drive assembly being located on an interior surface of the drums of said first drive assembly;

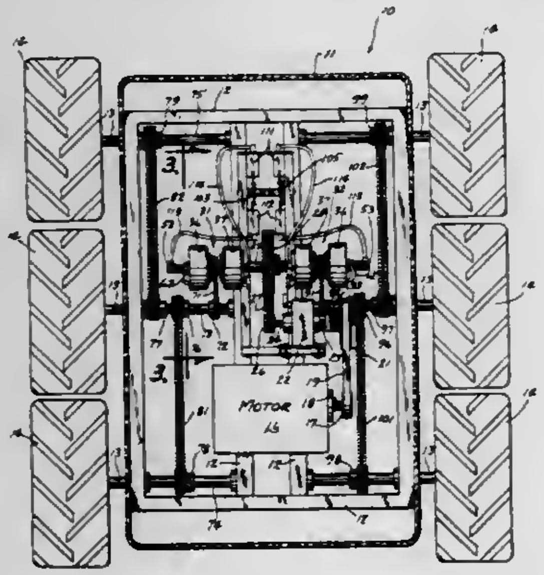
means for rotatably mounting said first drive assembly on said shaft;

means for transmitting rotary motion of said first drive assembly to the first side of said ground engaging means;

a first clutch means attached to said shaft, said first clutch means being movable between a first position in frictional contact with said first frictional surface of the first drive assembly whereby said first drive assembly rotates with said shaft, and a second position whereby said first clutch means is spaced from said first frictional surface of the first drive assembly whereby rotational movement of said shaft is not transmitted to said first drive assembly, said first clutch means comprising a hydraulically actuated shoe;

a first brake means attached to said frame, said first brake means being movable between a first position in frictional contact with said second frictional surface of the first drive assembly whereby said first drive assembly is prevented from rotating and a second position whereby said first brake means is spaced from said second frictional surface of the first drive assembly whereby said first drive assembly is allowed to rotate, said first brake means comprising a hydraulically actuated shoe;

first control means for simultaneously controlling said first clutch means and said first brake means, said first control means having a neutral position whereby the first clutch means and the first brake means are in the second positions thereof respectively, a driving position whereby said first clutch means is in the first position thereof and the first brake means is in the second position thereof, and a braking position whereby said first clutch means is in said second position thereof and said first brake means is in the first position thereof;



a second drive assembly, said second drive assembly having a first and a second frictional surface thereon;

means for rotatably mounting said second drive assembly on said shaft;

means for transmitting rotary motion of said second drive assembly to the second side of said ground engaging means;

a second clutch means attached to said shaft, said second clutch means being movable between a first position in frictional contact with said first frictional surface of the second drive assembly whereby said second drive assembly rotates with said shaft, and a second position whereby said second clutch means is spaced from said first frictional surface of the second drive assembly whereby rotational movement of said shaft is not transmitted to said second drive assembly;

a second brake means attached to said frame, said second brake means being movable between a first position in frictional contact with said second frictional surface of the second drive assembly whereby said second drive assembly is prevented from rotating and a second position whereby said second brake means is spaced from said second frictional surface of the second drive assembly whereby said second drive assembly is allowed to rotate; and

second control means for simultaneously controlling said second clutch means and said second brake means, said second control means having a neutral position whereby the second clutch means and the second brake means are in the second positions thereof respectively, a driving position whereby said second clutch means is in the first position thereof and the second brake means is in the second position thereof, and a braking position whereby said second clutch means is in said second position thereof and said second brake means is in the first position thereof.

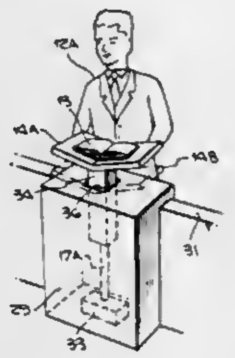
4,101,005
WATER POWERED LIFT FOR SPEAKERS APPARATUS

Harold L. Fewkes, Buena Park, Calif., assignor to Robert J. Little, Bountiful, Utah and Ronald E. Morris, Buena Park, Calif., part interest to each

Filed Oct. 26, 1976, Ser. No. 735,499

Int. Cl.² A47B *19/00*

U.S. Cl. 187—17 **6 Claims**



1. A lift for speaker's apparatus for use with a source of water under pressure and comprising

a hydraulic cylinder having a piston and a piston rod, said piston rod being attached to the speaker's apparatus,

a vertical guide for the apparatus;

a water supply line to the cylinder,

a water exhaust line to the cylinder;

a valve in each of the supply and exhaust lines, means for controlling each valve;

an oil column in the cylinder between the piston and the water supply line, said water and oil forming an intimate interface within the piston travel zone, and means for limiting the downward piston travel in the cylinder such that the interface stays above the supply line.

4,101,006
CARRIER TRAVERSE CONTROL FOR A SERIAL PRINTER

Donald F. Jensen, Endicott; Arnold B. Rosenthal, Vestal, and Charles O. Ross, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,647

Int. Cl.² B41J *19/30*

U.S. Cl. 400—144.3 **4 Claims**

1. The combination in a printer apparatus,

comprising a carrier movable along the print line of a document,

a print mechanism movable with said carrier including a type element having a plurality of type characters thereon movable on said carrier to present selected ones of said characters into position for printing at successive print locations of said print line,

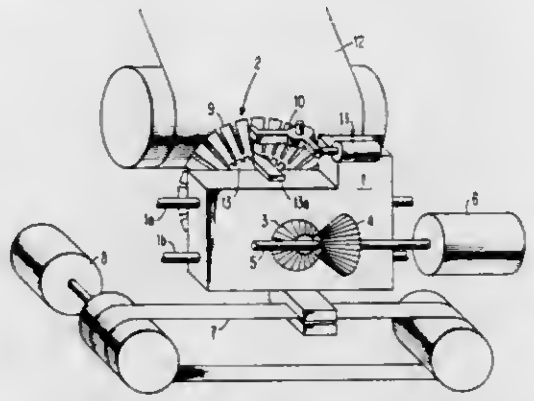
drive means for moving said carrier along said print line,

and means for controlling the motion of said carrier along said print line including

pulse means operable for providing pulses to operate said drive means,

means for determining the number of character positions said type element must move on said carrier to position the next type character for printing,

and means responsive to said determining means for operating said pulse means at selectively variable rates to provide different ones of a plurality of predetermined pulse sequences to said drive means,



whereby said drive means moves said carrier at a predetermined fixed velocity so long as said number of character positions does not exceed a predetermined number, at selectively variable velocities between print locations when said number of character positions exceeds said predetermined number, and at said fixed velocity during printing of said type characters on said document,

said control means further comprising a read only storage device having a plurality of stored programs each effective to apply different ones of said sequences of pulses from said pulse means to said drive means.

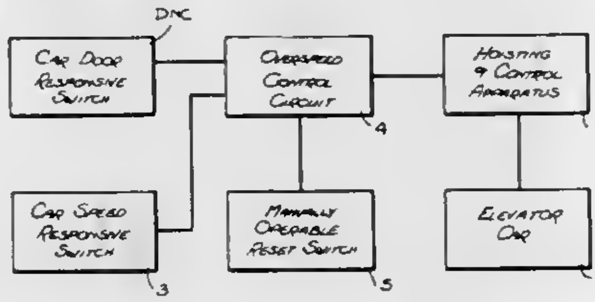
4,101,007
CONTROL SYSTEM FOR LIMITING ELEVATOR CAR MOVEMENT SPEED UNLESS CAR DOORS ARE FULLY CLOSED

John E. Magee, 191 Forest Blvd., Ardsley, N.Y. 10502

Filed Nov. 1, 1976, Ser. No. 737,471

Int. Cl.² B66B *5/06*

U.S. Cl. 187—29 R **6 Claims**


DRC
Car Door Responsive Switch
Overspeed Control Circuit
4
Hoisting & Control Apparatus
2
Car Speed Responsive Switch
3
Manually Operable Reset Switch
5
Elevator Car
1

1. In an elevator system having an elevator car with at least one door and means for moving said door to an open position and to a closed position and hoisting apparatus for raising and lowering said car, said hoisting apparatus including a drive motor for moving said car and speed control means for setting the speed at which said drive motor moves said car, the combination therewith of door responsive means responsive to the movement of said door to said closed position, speed control responsive means connected to said speed control means and responsive thereto when said control means sets the speed of movement of said car at a value above a predetermined value, and overspeed control means connected to said door responsive means, said speed control responsive means and said hoisting apparatus for stopping said hoisting apparatus when said door is away from said closed position thereof and said speed control means sets said speed of movement of said car at a value which exceeds said predetermined value.

4,101,008
ARRANGEMENT FOR ABSORBING VIBRATIONS

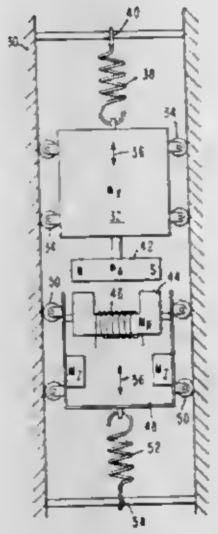
Albert Frosch, Herrenberg; Walter Mannsdöerfer, Aldlingen, and Claus Scheulog, Lorch, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,619

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603688

Int. Cl.² F16F *13/00*

U.S. Cl. 188—1 B **8 Claims**



1. In an arrangement for compensating oscillations of the mass forces of a driven oscillating spring-mass main system of a spring-mass auxiliary system, wherein the mass and spring rate of said auxiliary system are identical to the mass and spring rate of said main system, a magnetic means for coupling said systems, with said auxiliary system being operable by said magnetic means in a continuation of the same path of movement of said main system and oscillatable at the same frequency but out of phase with respect to said main system.

4,101,009
NON REACTIVE POSITIONING DEVICE

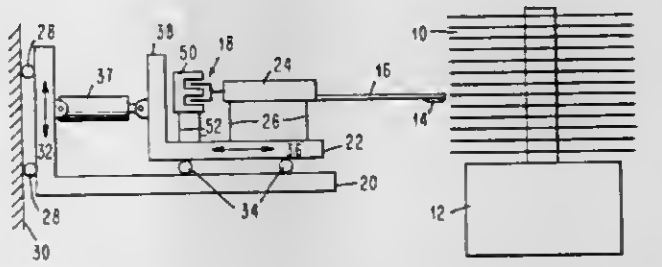
Walter Hehl, Steinenbronn, and Horst Matthaei, Waldenbuch, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,700

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603689

Int. Cl.² F16F *13/00*

U.S. Cl. 188—1 B **6 Claims**



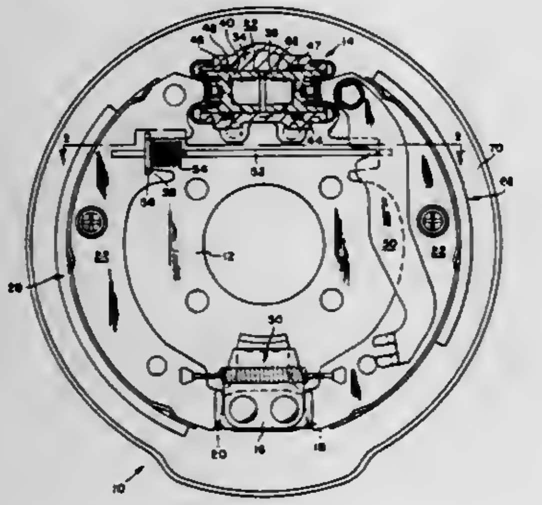
1. In an arrangement for compensating oscillations of the mass forces of a driven oscillating spring-mass main system by means of a spring-mass auxiliary system operably guided in a continuation of the same movement path as said main system in a manner that it oscillates at the same frequency as, but out of phase with, said main system, in which said auxiliary system has the same natural frequency as said main system, the im-

provement comprising a differential lever system for coupling the two said systems to compensate for external spurious forces.

4,101,010
DRUM BRAKE WITH AUTOMATIC ADJUSTMENT

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 5, 1977, Ser. No. 784,764
Int. Cl.^{2} F16D *51/20, 65/52*
U.S. Cl. 188—79.5 P **2 Claims**

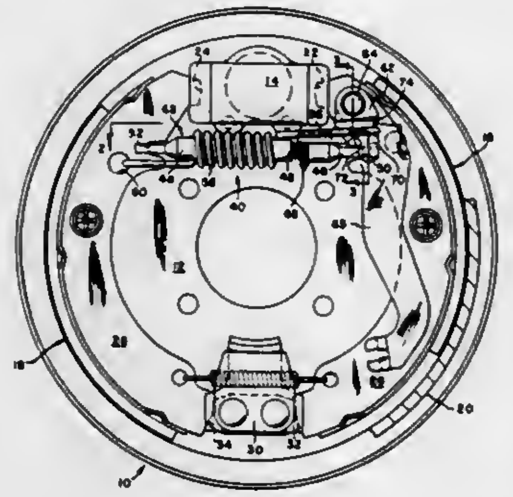


1. In a drum brake having a backing plate, a pair of brake shoes engageable with the drum, a hydraulic actuator cooperating with adjacent first ends of the pair of brake shoes to urge the pair of brake shoes into a braking position and a parking mechanism cooperating with the pair of brake shoes to also urge the pair of brake shoes into the braking position and an anchor attached to the backing plate and cooperating with adjacent second ends of the pair of brake shoes, the improvement wherein a first resilient member engages said pair of brake shoes opposite said hydraulic actuator and adjacent said anchor in order to urge said pair of brake shoes into engagement with said anchor, said hydraulic actuator including a pair of pistons engageable with said first ends of said brake shoes respectively and a pair of sealing rings cooperating with said pistons and being deformable when said pair of pistons move said pair of brake shoes to the braking position, and a second resilient member carried by said parking mechanism, said first resilient member and said second resilient member creating moments for said pair of brake shoes about said anchor, said moments being substantially equal and opposite to permit said pair of sealing rings to retract said pair of brake shoes from the braking position substantially independently of said first and second resilient members.

4,101,011
DRUM BRAKE ADJUSTER

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 28, 1977, Ser. No. 791,667
Int. Cl.^{2} F16D *65/56*
U.S. Cl. 188—79.5 GT **8 Claims**

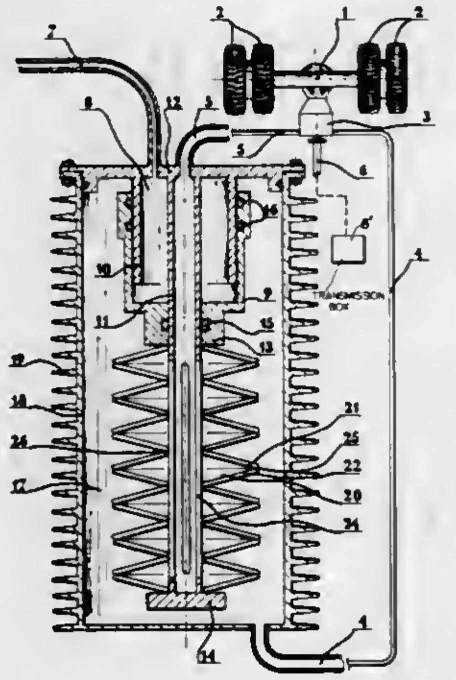


7. In a drum brake assembly having a hydraulic actuator for urging a pair of brake shoes into engagement with a rotatable member during braking and an extendible member for adjusting the clearance between the rotatable member and the pair of brake shoes, the improvement wherein a pawl pivots relative to one of said pair of brake shoes and engages the extendible member and a single resilient member cooperates with the pawl to provide for extension of the extendible member when the clearance between the pair of brake shoes and the rotatable member is above a predetermined value and said single resilient member also cooperates with said extendible member and said pawl to urge the pair of brake shoes into engagement with the hydraulic actuator.

4,101,012
HYDROSTATIC BRAKING DEVICE FOR VEHICLES RUNNING DOWNHILL

François Durand, 11 rue du Bateau, 06 Antibes, France

Filed Oct. 4, 1976, Ser. No. 729,364
Claims priority, application France, Oct. 2, 1975, 75 30286
Int. Cl.^{2} F16D *57/00*
U.S. Cl. 188—290 **5 Claims**

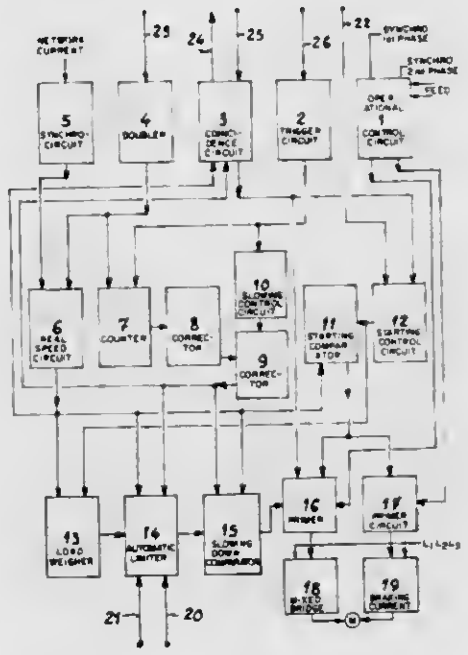


1. A hydrostatic braking device for vehicles having a transmission shaft, a transmission, a wheel axle, and an oil pump driven by the transmission shaft between the transmission and the axle, said braking device comprising a spill valve, the spill valve comprising a central tubular shaft and a pile of Belleville springs surrounding the tubular shaft, the Belleville springs being arranged on the shaft in alternately opposite orientation so that pairs of adjacent springs define spaces between them that are enclosed by a said pair of springs, said tubular shaft opening into said spaces between the Belleville springs, the pump having an outlet communicating with the interior of said tubular shaft whereby when a said vehicle rolls downhill, the pump is driven to force oil into the interior of the tubular shaft and thence into said spaces and between the margins of the pairs of Belleville springs in order to brake said downhill rolling.

4,101,013
PROCESS FOR THE CONTROL AND REGULATION OF THE SPEED OF A MOBILE

Jean Duriez, 119 rue J. Gielee 59000, Lille, and Jean Evin, Hameau de la Becque 59710, Avelin, both of France

Filed Jan. 12, 1977, Ser. No. 758,901
Claims priority, application France, Jan. 15, 1976, 76 01492
Int. Cl.^{2} B66B *1/30*
U.S. Cl. 187—29 R **9 Claims**

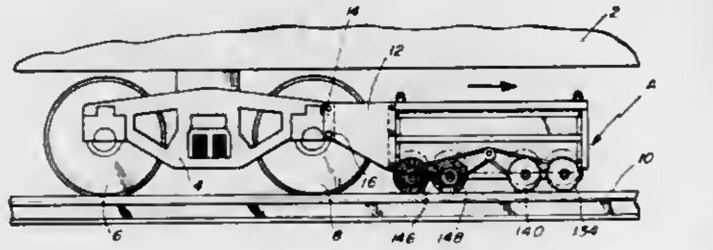


7. A device for controlling and regulating the speed of a mobile for monitoring means for controlling the speed variations by means of a differential voltage which is the result of a comparision of a voltage whose variation represents the evolution of the real speed of the mobile with a control voltage, said voltage tending to follow an ideal control curve of speed variation and comprising a succession of straight sections having lengths corresponding, at least in the case of a slowing down to complete stoppage order, to distances obtained by decoding certain positions of a counter counting the entire distance travelled after the order has been given at a fixed distance from the stopping point, the improvement comprising means for realigning the origin of each section with the reference curve.

4,101,014
APPARATUS FOR REMOVING ICE AND SLEET FROM A THIRD RAIL OF AN ELECTRIFIED RAILWAY VEHICLE

Stuart C. Matheson, 1366 Broadway, Apt. 9H, Somerville, Mass. 02144

Filed Sep. 9, 1977, Ser. No. 831,866
Int. Cl.^{2} B60L *5/02*
U.S. Cl. 191—62 **7 Claims**

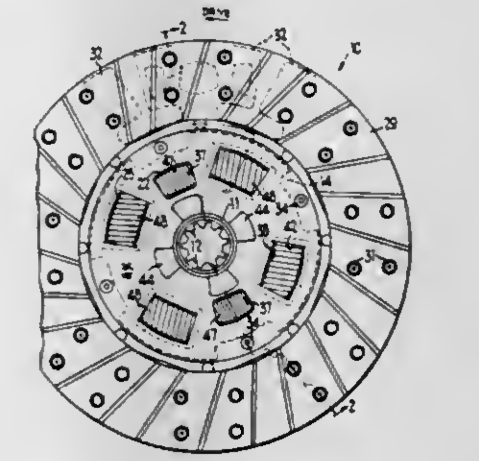


1. Cleaning apparatus for removing ice and sleet from a third rail of an electrified railway vehicle, said apparatus comprising a frame, means for rigidly securing the frame to a wheel truck portion of the vehicle, a vertically adjustable carriage slideably disposed in the frame, rotatable cleaner means arranged at one side of the carriage, means for vertically adjusting the carriage in the frame and moving the rotatable cleaner means into and out of contact with the said third rail of the railway vehicle, and means for actuating the rotatable cleaner means when moved into engagement with the third rail.

4,101,015
VIBRATION DAMPER WITH VARIABLE SPRING RATE AND DAMPING FRICTION

Edmund John Radke, Mount Clemens, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,530
Int. Cl.^{2} F16D *3/14, 47/02, 69/00*
U.S. Cl. 192—106.2 **11 Claims**



1. A vibration damper assembly for a vehicle friction clutch comprising a hub operatively connected to a driven shaft, a radial flange integral with said hub, a clutch plate rotatably mounted on said hub and terminating at its outer periphery in oppositely disposed friction facings secured thereto, a spring retainer plate rotatably mounted on said hub and secured to said clutch plate for rotation therewith, said clutch plate and said spring retainer plate sandwiching said hub flange, a plurality of circumferentially spaced first aligned openings in said plates and flange, a torsion spring for each set of said first openings providing a first stage of angular displacement, a plurality of circumferentially spaced second aligned openings in said plates and flange, at least one torsion spring for each set of said second openings, the second openings in said hub flange having a greater arcuate dimension than the second openings in the plates thereby providing a second stage of angular displacement, means to limit the extent of arcuate movement of said plates relative to said hub and flange, a plurality of circumferentially spaced raised cam areas on said flange adjacent said hub separated by depressed areas, and a plurality of depressed cam areas on said spring retainer plate adjacent the inner periphery thereof cooperating with the cam areas on the flange, wherein said plates move relative to said flange over said first stage at a low rate of angular displacement and over said second stage at a higher rate of angular displacement, and said cam areas providing a low friction rate and a high friction rate over said displacement stages, said friction rate shifting from one level to the other simultaneously with the change between stages of angular displacement.

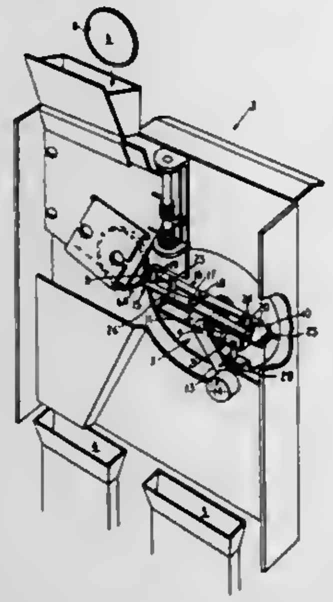
4,101,016
COIN TESTING APPARATUS

Basil James Richards, Vaucluse, Australia, assignor to New Century Novelty Company Pty. Limited, Mascot, Australia

Filed Apr. 18, 1977, Ser. No. 788,563
Claims priority, application Australia, Apr. 27, 1976, 5718/76
Int. Cl.^{2} G07F *3/02*
U.S. Cl. 194—97 A **9 Claims**

1. A device for providing a rim check of coins in coin selection apparatus which has discrete chutes within its body provided for the passage, respectively, of authentic and reject coins, said chutes having juxtaposed entrances, said device

comprising a cradle pivoted with respect to the body at a position above and adjacent to said entrances, and means for biasing said cradle to a rest position, said cradle including a frame, tongs having coin-gripping jaws at one end and being pivoted with respect to the frame, and a carriage displaceably mounted on the frame and responding to the weight of a coin to impose a closing force on said jaws of the tongs to clamp them upon said coin and to cause the cradle to pivot to a coin discharge position while said jaws continue to grip said coin.



4,101,017
MATRIX PRINT HEAD

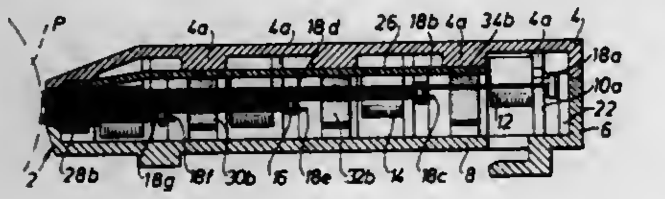
Gösta Roland Englund, Stockholm, and Karl Tommy Wincent, Upplands Väsby, both of Sweden, assignors to Svenska Dataregister Aktiebolag, Sweden

Filed Jun. 17, 1976, Ser. No. 697,299

Claims priority, application Sweden, Jun. 30, 1975, 7507469; Jan. 29, 1976, 7600963

Int. Cl.² B41J *3/04*

U.S. Cl. 400—124 **5 Claims**



1. A matrix print head comprising:
- a plurality of electromagnets each having an associated armature;
- each of said electromagnets including a pair of poles;
- a plurality of elongated print elements having ends adapted for printing markings on a data carrier;
- each of said print elements being associated with an armature;
- said armature comprising a bar including first and second portions;
- said armature being pivotable about said first pole at said first portion of said bar;
- each of said print elements including an armature-engaging portion for resiliently maintaining its associated armature against its associated electromagnet;
- said print element armature-engaging portion being in contact with each end of said bar;
- one end of said bar being provided with a groove and the other end of said bar is provided with a hole;
- said groove accommodating a first part of said armature-engaging portion and said hole accommodating a second part of said portion;
- each of said print elements including a straight-line portion substantially perpendicular to said data carrier;
- said print element straight line portions being parallel to each other and being disposed in the same plane;
- each of said print element armature-engaging portions permitting its associated armature to pivot about a first one of said poles whenever said electromagnet is energized; whereby
- the associated print element is thereby moved in a direction parallel to the straight-line portion thereof to thereby permit a marking on said data carrier to be printed.

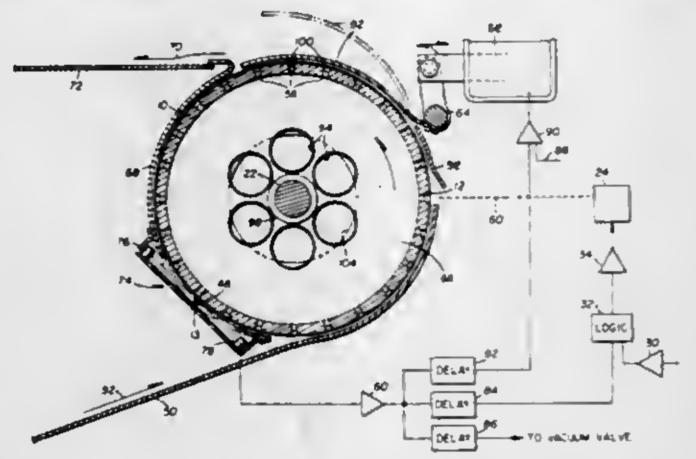
4,101,018
PAPER EDGE SENSOR

Eugene K. Sokolowski, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Continuation of Ser. No. 606,959, Aug. 22, 1975, abandoned. This application Mar. 1, 1977, Ser. No. 773,246

Int. Cl.² B41J *29/44;* B41F *13/00*

U.S. Cl. 400—582 **2 Claims**



1. In a printing apparatus, a rapidly-rotating drum for carrying a record medium having two edges repeatedly past a printing means which selectively prints indicia on the record medium, a system for initiating a cycle of operation of the printing apparatus at a consistent distance from a leading one of the two edges of the record medium, comprising:
- means for holding the record medium to the drum with a trailing one of the two edges and a length of the record medium attached thereto extending in a tangential direction away from the drum;
- means for sensing the passage of said trailing edge past a fixed position on the printing apparatus;
- means for sensing incremental rotation of the drum;
- delay means responsive to the sensing means for producing a signal a predetermined time interval after the sensing means senses the trailing edge of the record medium, the time interval related to the speed of rotation of the drum, the angular distance between the sensing means and the printing means, and the top margin of the record; and
- logic means responsive to the signal produced by the delay means for starting the outpulsing of indicium-forming signals to the printing means and responsive to sensing of subsequent incremental rotation of the drum for outpulsing successive indicium forming signals to the printing means.

4,101,019
AERIAL CONVEYOR SYSTEM

Charles R. Satterwhite, 15920 Coolwood, Dallas, Tex. 75218

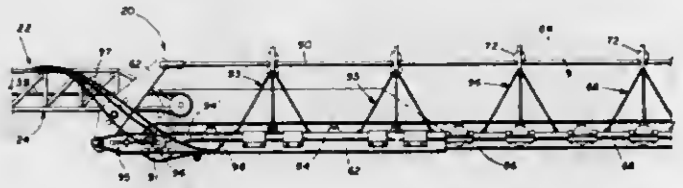
Continuation of Ser. No. 413,537, Nov. 7, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 620,929

Int. Cl.² B65G *63/00*

U.S. Cl. 198—300 **37 Claims**

1. An aerial conveyor system comprising:
- a cable extending from a material receiving zone over an open area to a material discharge zone;

- a plurality of conveyor support frames each comprising a pair of elongate members extending substantially parallel to the cable, hook roller means for supporting the elongate members on the cable, and roller means supported by and extending transversely between the elongate members;
- the conveyor support members engaging one another end to end to define a substantially continuous array extending from the receiving zone across the open area to the discharge zone;
- an endless conveyor belt supported on the conveyor support rollers for movement around a course extending from the receiving zone over the open area to the discharge zone;
- drive means mounted at the discharge zone end of the array of support members for driving the conveyor belt around the course;
- said elongate members of the support frames being tubular and having the adjacent ends thereof connected in communication with one another; and
- means extending through the tubular elongate members of the conveyor support frames from the receiving zone end of the array to the discharge zone end for supplying operating power to the drive means.



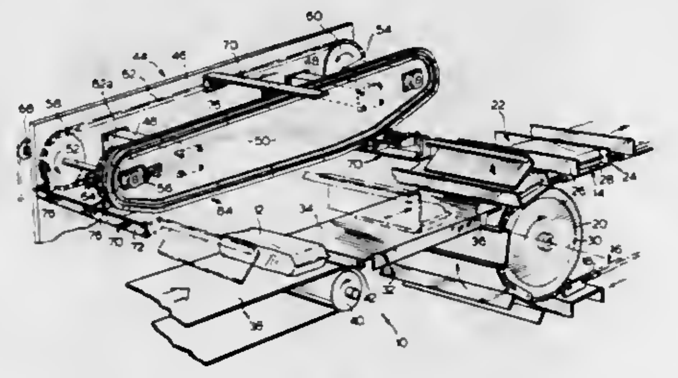
4,101,020
PACKAGING MACHINE TRANSFER MECHANISM

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed Mar. 1, 1977, Ser. No. 773,324

Int. Cl.² B65G *47/52*

U.S. Cl. 198—478 **6 Claims**



1. In a packaging machine having a load transfer station and a packaging station, the improvement of;
- (a) a main conveyor mounted for continuous longitudinal movement through said load transfer station and said packaging station,
- (b) a plurality of article receiving compartments carried by said main conveyor at longitudinally spaced intervals thereon, each of said compartments having a front wall and a back wall projecting outwardly from and longitudinally spaced with respect to said main conveyor, said compartments opening upwardly away from said main conveyor,
- (c) a loading platform in said load transfer station and disposed in a transfer plane, said loading platform having a discharge edge at one end thereof,
- (d) means for depositing articles onto said loading platform,
- (e) discharge means associated with said loading platform for moving articles along said loading platform to discharge them over said discharge edge,
- (f) means supporting said main conveyor to guide said article receiving compartments in a loading path which includes an arcuate section disposed adjacent to and below said loading platform and a straight section which extends forwardly from said arcuate section outwardly from said discharge edge such that the front wall of each compartment emerges from below said loading plane and projects upwardly in front of said discharge edge to form a stop against which articles are driven by said discharge means and thereafter said back wall emerges from below said loading plane to retain transferred articles in said article receiving compartment as the compartments are conveyed from said loading station along said straight section of said loading path for subsequent packaging,
- (g) said discharge means being adapted to move articles along said platform at a speed which is greater than the speed of forward movement of said article receiving compartments as they emerge from below said discharge edge of said platform whereby the articles discharged thereby are urged into engagement with the front wall of the article receiving compartment in which they are located,
- (h) said discharge means comprising a plurality of pusher blades mounted for movement along a path which includes a forward run which is disposed above said platform, said forward run including a transfer section projecting forwardly and inclined upwardly from adjacent said discharge edge of said platform whereby said pusher blades are elevated out of the path of the back wall of said compartments as the back wall emerges from below said platform,
- (i) said pusher blades being mounted to pivot about an axis extending transversely of the longitudinal extent of said main conveyor and guide rail means coextensive with at least said transfer section of said forward run of said guide rail means cooperating with said pusher blades to cause said pusher blades to pivot rearwardly and upwardly away from said loading plane as the pusber blades move forwardly along said transfer section to direct an article forwardly and downwardly into an article receiving compartment, the pusher blades moving forwardly relative to a compartment after loading thereof to be disposed in an overlying relationship thereto thus ensuring that the article located in the compartment does not project excessively upwardly from said compartment.

4,101,021
APPARATUS FOR CONVEYING BULK MATERIALS

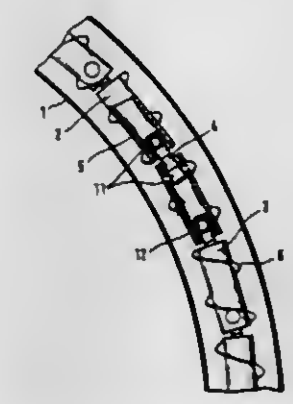
Walter Sauer, Aschaffenburg, Germany, assignor to Hans Giesbert KG, Mombris, Germany

Filed Jul. 23, 1976, Ser. No. 708,130

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1975, 7528530[U]

Int. Cl.² B65G *33/16, 33/32*

U.S. Cl. 198—668 **1 Claim**

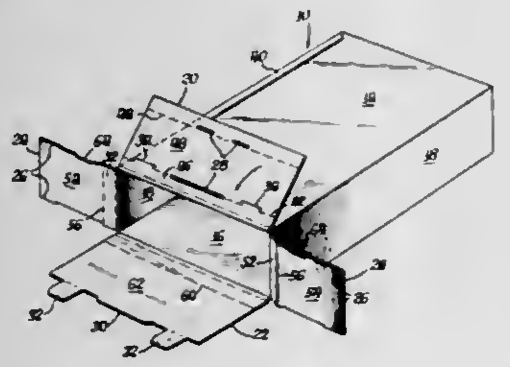


1. Apparatus for conveyance of feed for small animals comprising:
- conveying chute means having curved sections therein,
- motor-driven conveyor screw means disposed within said

conveying chute means, said conveyor screw means comprising within said curved sections thereof:
(a) a plurality of individual screw segments,
(b) said screw segments each comprising a tubular section,
(c) said tubular sections each having a screw part outwardly disposed and integrally formed thereon,
(d) said screw segments being joined by elongated swivel pins mounted therebetween,
(e) said swivel pins comprising tapered and non-tapered sections,
(f) said non-tapered sections being located towards the ends of said swivel pins with said tapered sections located therebetween and tapering towards each other,
(g) said non-tapered sections having bores therein,
(h) stud means for joining said swivel pins to said tubular sections,
(i) said bores receiving said stud means and
(j) said tubular sections receiving said non-tapered sections of said swivel pins.

4,101,022
RECESSED END CONTAINER

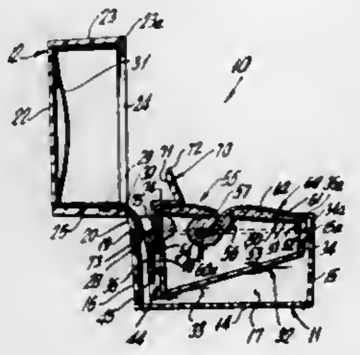
Caesar E. Watkins, Carrollton, Tex., assignor to Inland Container Corporation, Indianapolis, Ind.
Filed Mar. 28, 1977, Ser. No. 781,643
Int. Cl.² B65D *5/10, 5/50*
U.S. Cl. 206—45.14 **2 Claims**



1. A package which includes an article disposed within a recessed end container, said container including
top, bottom and side walls joined to form a generally rectangular tubular compartment wherein said article is contained and closure means at each end of said compartment,
said closure means at one end of said compartment including top, bottom and side flaps hinged respectively to said top, bottom and side walls, wherein the improvement comprises
one of said top and bottom flaps having a first minor panel which extends into said compartment and which is hinged to a major panel that extends between said top and bottom walls at a location spaced interiorly of the end edge of said compartment, said major panel being hinged in turn to a second minor panel that extends to said end edge, said one flap also having slotted opening means in each of said minor panels adjacent the hinge lines with said major panel and slit means in said major panel,
said side flaps each having a minor panel which is folded into said compartment, a major panel lying adjacent said one flap at said interior location and extending toward the opposite side wall and lock tabs on the upper and lower edges of said side flaps which are received in said slotted openings in said one flap to hold said side flaps in the folded position,
the other of said top and bottom flaps having a minor panel which is folded into said compartment over said second minor panel and a major panel which lies adjacent said side flap major panels and extends between said top and bottom walls, thereby sandwiching said side flaps between said one flap and said other flap, said other flap major panel having fold tab means and having a lock tab formed at its end edge, said lock tab being received in said slotted opening means in said first minor panel of said one flap and said fold tab means extending past said side flaps and being received in said slit means in said major panel of said one flap to thereby hold said four flaps in closed position.

4,101,023
RING BOX WITH REMOVABLE DISPLAY STAND

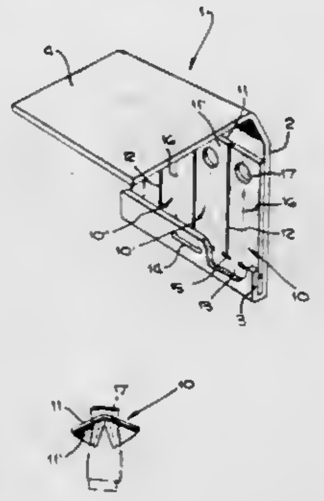
Eric Schuander, South Orange, N.J., assignor to The Alsten Company, Jersey City, N.J.
Continuation-in-part of Ser. No. 777,930, Mar. 15, 1977, abandoned. This application Oct. 20, 1977, Ser. No. 844,044
Int. Cl.² B65D *1/34, 5/50*
U.S. Cl. 206—45.19 **10 Claims**



1. A box comprising:
(A) a case section, said case section including
  (i) a bottom wall and
  (ii) a peripheral wall, said peripheral wall extending upwardly and terminating in an upwardly facing edge portion,
(B) a cover section, said cover section including
  (i) a top wall and
  (ii) a peripheral wall, said peripheral wall extending downwardly and terminating in a downwardly facing edge portion,
(C) said upwardly facing edge portion of the case section and said downwardly facing edge portion of the cover section being in alignment,
(D) spring hinge means rotatably joining the case section to the cover section,
(E) said case and cover sections and said hinge means being cooperatively constructed to hold said facing edge portions of said sections disposed in spaced relation to each other, one above the other, with the downwardly facing edge portion of said cover slanting downwardly and forwardly toward the upwardly facing edge portion of the case, so as to provide a substantial open space between said facing edge portions when said cover section is swung down over said case section, and
(F) a removable separately displayable display stand, said display stand including
  (i) a flange interposed between said case section and said cover section when the box is closed, said flange being of uniform height and being contacted by said facing edge portions and maintaining said edge portions in parallel spaced relation,
  (ii) the outer sides of said flange being exposed to view externally of the box when the box is closed.

4,101,024
INDIVIDUAL, DISPOSABLE HOLDERS FOR CIGARETTES AND DISPENSERS THEREOF

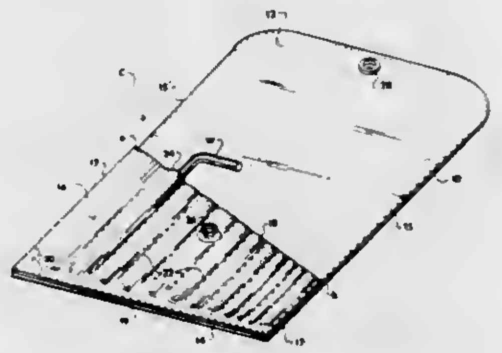
Seiji Furuya, 151 N. Alvarado Ave., Ojai, Calif. 93023, and Roger H. Smartt, 77 Hackberry Dr., Ventura, Calif. 93001
Filed Jul. 26, 1976, Ser. No. 708,582
Int. Cl.² A24F *13/08, 13/22*
U.S. Cl. 206—102 **1 Claim**



1. As an article of manufacture, an array of a plurality of individually separable disposable holder elements particularly adapted for smoking a short stub of a cigarette not provided with a mouthpiece and usually have an irregularly shaped, virtually conical end,
said array being formed from a body of planar sheet material provided with a plurality of transversely spaced, parallel, longitudinal slits separating individual holder elements extending from a transversely extending, unslit tab portion and a line of perforations adapted to facilitate separation of individual holder elements from said tab portion,
each of said individual holder elements having means, at a zone removed from said tab portion, integral with said sheet material for receiving, holding and embracing the stub end of a cigarette with its axis virtually at right angles to the holder element, each holder element of said array being provided with a longitudinally extending medial score line to facilitate folding therealong, and each of the holding means comprising an aperture intersecting said medial score line adjacent the end of the holder element removed from the tab portion, said aperture being adapted to receive, grasp and hold an irregularly shaped end of a cigarette guided to said aperture by a trough formed by portions of the holder element on opposite, lateral sides of the medial score line partly folded toward each other along such line.

4,101,025
CARRYING CASE FOR WRENCHES

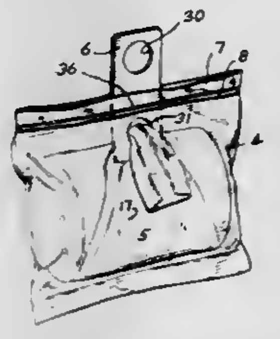
Ronald H. Jordan, 530 Hamilton St., Burlington, N.C. 27215
Filed Jul. 8, 1977, Ser. No. 813,875
Int. Cl.² B65D *85/20*
U.S. Cl. 206—377 **1 Claim**



1. A case for hexagonal bar wrenches comprising:
(a) a backing member formed of leather material and generally rectangular in shape, having a bottom edge, side edge, and an upper edge;
(b) a separate cover member also formed of leather material and in the shape of a right trapezoid, three sides of said cover member, when assembled, lying coextensively with three corresponding sides of backing member throughout a portion of the periphery of said backing member and the fourth side extending across the surface of said backing member between said side edges from a first point on one side edge spaced above said bottom edge a first distance to a second point on the other side edge spaced above said bottom edge a second, smaller distance;
(c) said cover member being stitched to said backing member with a sturdy thread around the coextensive sides and across the bottom, and a plurality of spaced parallel lines of stitches connecting said cover and said backing member, said lines of stitches extending from said fourth side downwardly toward said bottom edge forming a plurality of pockets therein; and
(d) a snap connecting means having a male member secured to said cover member at a point centrally located and slightly below said fourth edge, and a female member secured to said backing member at a point centrally located between said side edges and slightly below said upper edge whereby the top portion of said backing member may be folded over and releasably secured to said male member covering the wrenches inserted in said pockets.

4,101,026
PRE-MOISTENED TOWELETTE DISPENSER

Joseph P. Bonk, Des Plaines, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Division of Ser. No. 405,503, Oct. 11, 1973, Pat. No. 3,986,479. This application Apr. 26, 1976, Ser. No. 680,607
Int. Cl.² B65D *81/24*
U.S. Cl. 206—205 **1 Claim**



1. A pre-moistened towelette roll assembly comprising:
(a) a substantially water impervious sealed pouch,
(b) a roll of a web of absorbent material, disposed in said pouch, said web having lines of perforations disposed spaced apart longitudinally along said web to define individual towelettes when severed from said web,
(c) a leader of non-absorbent material attached at one end to said web within said pouch for withdrawing web from said roll and for threading said web in a dispenser adapted to receive said assembly, and said leader having a portion extending exteriorly of an outer margin of said pouch, a portion of said pouch margin being sealed to said leader to prevent vapor loss from said fluid yet said margin still being removable from said leader,
(d) a chemical-containing fluid impregnated in said absorbent material, and
(e) said fluid is an amount sufficient to be retained by said absorbent material and maintain said web in a premoistened state under normal use conditions without free fluid in said pouch.

4,101,027
MAGAZINE FOR A PLURALITY OF RECORDING MEDIA

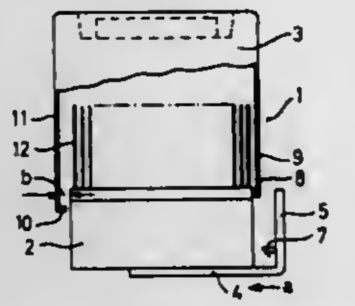
Lambert Kohl, Wachenheim; Richard Schneider, Heidelberg-Neuenheim, and Karl Uhl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,405

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612854

Int. Cl.^{2} G11B *5/48;* **B65D** *85/30*

U.S. Cl. 206—309 **5 Claims**



1. A storage magazine for use in a record-changing device for recording and/or playing back information on a selected one of a plurality of flexible magnetic recording disks individually housed in respective ones of a plurality of flat rectangular cartridges, said device having a carriage supported therein for movement between a loading position and an operative, cartridge withdrawal position;

said storage magazine comprising:

a substantially cuboid tray with compartments receiving said plurality of cartridges, a removable hood cooperating with said tray to protect the cartridges therein while in storage, and a releasable locking mechanism between said tray and said hood, said tray having guide means for loading said tray with said cartridges therein, and with said hood removed, onto said carriage preparatory to selective withdrawal of said cartridges in said operative position of the carriage, the bottom of said tray having externally attached thereto a substantially L-shaped member, the horizontal arm of said member forming said guide means while the verticle arm of said member extends in spaced relation to the corresponding side wall of the tray to form a handle for laterally moving said tray.

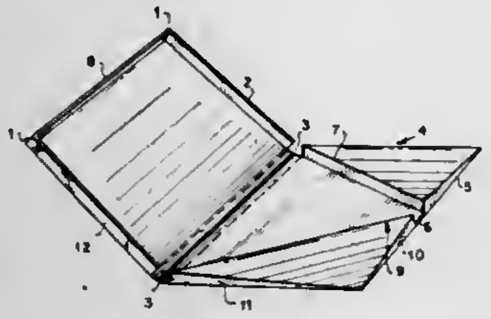
4,101,028
HERB CLEANER RECORD COVER

Marc Anthony Cantil Woolbright, 3927 Y St., Sacramento, Calif. 95817

Filed Nov. 1, 1976, Ser. No. 737,790

Int. Cl.^{2} B65D *85/30*

U.S. Cl. 206—311 **2 Claims**



1. In a double album record cover having two halves connected by a spine, the improvement comprising:

(a) one of said halves being formed with edge walls on the three edges of said half not adjacent said spine projecting normal to the plane of said one half and;

(b) the other of said halves having formed thereon a pair of converging walls forming a sorting device, said converging walls forming therebetween a converging sorting cavity having a wide end and a narrow end, the narrow end forming an exit opening, said wide end of said cavity being located at the edge of said other half adjacent said spine and the exit opening being located at the edge of said other half opposite said spine, said exit opening being less than 2¾ inches wide, whereby when said album is folded, said one half and said edge walls confine and enclose said sorting cavity, and said other half.

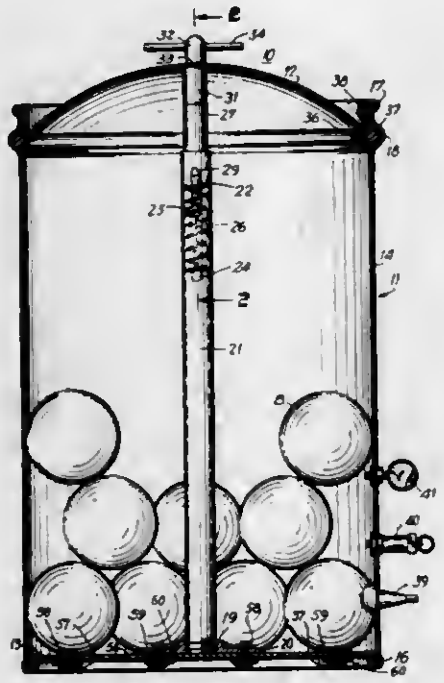
4,101,029
TENNIS BALL REJUVENATOR AND MAINTAINER

Robert S. Feinberg, 81 Edgemont Pl., Teaneck, N.J. 07066, and David A. Selick, 76 LeRoy St., Tenafly, N.J. 07670

Filed Sep. 29, 1977, Ser. No. 837,783

Int. Cl.^{2} B65D *85/16*

U.S. Cl. 206—315 B **12 Claims**



1. A pressure vessel comprising an open topped cylindrical receptacle including a bottom wall and an upstanding peripheral wall having a peripheral groove formed in the inside face of its upper border, a compressible annular gasket removably engaging said peripheral groove and projecting inwardly of the inside face of said peripheral wall, a circular cover member having a depending outwardly inclined peripheral border with an outer diameter less than the outside diameter of said gasket and not exceeding the inside diameter of said peripheral wall, said border including means to receive the gasket in sealing relationship guide means separably connected to said cover for supporting said cover for vertical movement in said receptacle between a raised closed position with said gasket embraced between said cover border and a face of said groove and a depressed position below and out of engagement with said gasket, and means for introducing a pressurized gas into the closed vessel.

4,101,030
CASSETTE

Wilhelm Kroeber, 3 Ellerbookwisch, Hamburg 2000, Fed. Rep. of Germany (65)

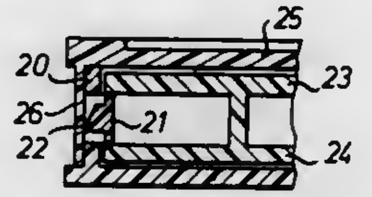
Filed Jun. 3, 1977, Ser. No. 803,066

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624880

Int. Cl.^{2} B65D *85/672*

U.S. Cl. 206—398 **5 Claims**

1. A cassette and associated spool for film, recording tape, and similar material and a means for supporting the outer areas of the spool flanges characterized in that areas (21,31, 41,42) of the side wall (20,30,40) of the base of the cassette corresponding in height substantially to the spacing between adjacent sides of the spool flanges (23,24) are arranged to be resiliently and radially displaceable in relation to the other wall areas and provided with projections (22,32,43) on their outer sides and including means responsive to the application of the cassette lid (25) to the base of the cassette so that said areas will be pressed into the inside of the cassette between the spool flanges.



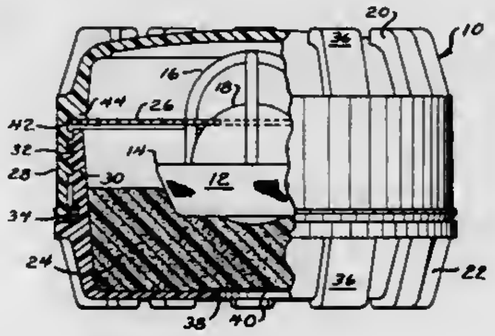
4,101,031
PACKAGE FOR PROSTHETIC HEART VALVE OR THE LIKE

Harry W. Cromie, Pittsburgh, Pa., assignor to Medical Engineering Corp., Racine, Wis.

Continuation of Ser. No. 620,238, Oct. 6, 1975, abandoned, which is a continuation of Ser. No. 464,021, Apr. 25, 1974, abandoned. This application Dec. 16, 1976, Ser. No. 751,614

Int. Cl.^{2} B65D *81/06, 85/30*

U.S. Cl. 206—438 **6 Claims**



1. In a package for prosthetic heart valve and the like comprising a pair of separable, mating package sections for receiving said heart valve, and retaining said valve in sterile manner in biased position against a resilient pad carried by one of said package sections, the improvement comprising:

(a) a separate retainer member positioned within said package for biasing said heart valve against the resilient pad, said retainer being a rigid sheet having an aperture shaped to receive a portion of said valve, and

(b) a shoulder defined in one of said mating package sections, said shoulder being adapted to urge the retainer member into a biased position against the heart valve so that the heart valve is in turn biased against the resilient pad, said shoulder being further adapted to slide easily along the surface of the retainer member so that torque is not transmitted to the heart valve when the mating package sections are rotated to open or close the package.

4,101,032
ORNAMENTAL ARTICLE FOR PACKAGES OR THE LIKE

Andy Obidniak, Ville la Salle, Canada, assignor to H & F Faller Sales Corp. Ltd., Montreal, Canada

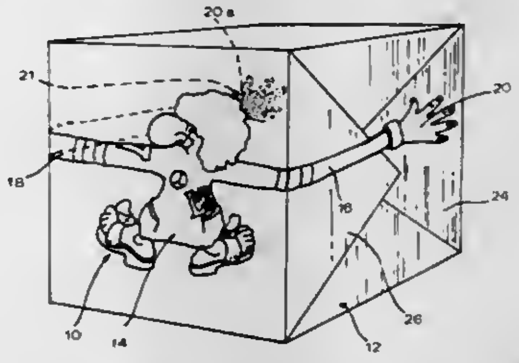
Filed Jan. 21, 1976, Ser. No. 651,198

Claims priority, application Canada, Jan. 22, 1975, 218456

Int. Cl.^{2} B65D *63/10*

U.S. Cl. 206—457 **3 Claims**

1. In combination with a three-dimensional package of predetermined size, an ornamental affixative article of size smaller than the package, said ornamental article comprising a blank of pliable sheet material a front and rear face and a shaped peripheral edge which outlines an animated character having a central body from each side of which extends a relatively narrow and elongated appendage of oversized arm length and terminating in enlarged hands, said blank having its front face provided with indicia representative of said animated character and its rear face at least in the region of said hands provided with the adhesive for affixing the animated character to said package, said blank being fitted snugly against said package with its rear face in contact with the surface thereof and with the body portion and the oversized arm lengths fully extended to envelope the package along at least two of its surfaces.



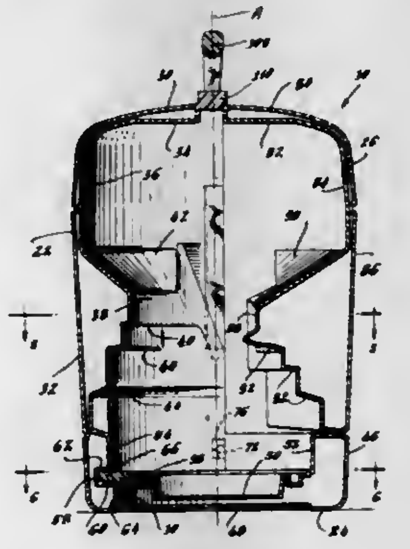
4,101,033
MOLDED CASE FOR SUPPORTING AND ENCLOSING AN ARTICLE

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Filed Jun. 8, 1977, Ser. No. 804,504

Int. Cl.^{2} B65D *85/30*

U.S. Cl. 206—521 **20 Claims**



1. A molded case, formed to support and enclose an article having a base, said case comprising:

A. a main body member having an interior wall shaped to generally conform to a portion of the article and having at least one inwardly projecting structure;

B. a base member formed with:

  1. an upstanding interior wall that complements said interior wall of said main body member and
  2. a floor recessed from said upstanding interior wall and shaped to receive the base of the article;

C. means for securing said base member to said main body member; and

D. a closure member, hinged to said main body member for movement between closed and open positions, formed with an interior wall which generally extends from said base member upstanding wall and complements said main body member interior wall when in the closed position.

4,101,034
PACKING BOX

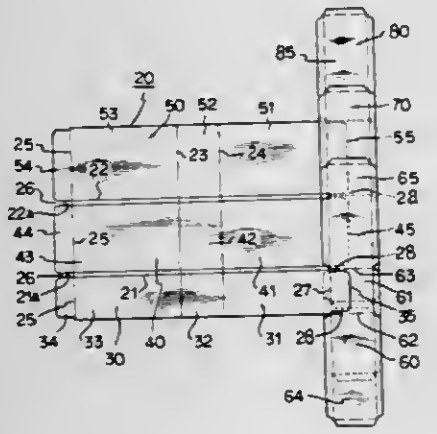
Akio Yamaguchi, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,823

Claims priority, application Japan, Sep. 13, 1976, 51-123096[U]

Int. Cl.² B65D *5/54, 17/24*

U.S. Cl. 206—612 12 Claims



1. A packing box, comprising:

a base board (20) made of corrugated cardboard on which a plurality of cut tapes (21, 22) are provided parallel at a predetermined spacing on the inside surface of said board to section said base board in its width direction into a number of sections;

two bending lines (23, 24) are provided in a direction rectangularly intersecting said tapes (21, 22) to form continued bottom plates (31, 41, 51), rear plates (32, 42, 52), and lid plates (33, 43, 53) sectioned by said tapes (21, 22);

auxiliary plates (60, 70, 80) equal in number to said number of sections are connected with said base board, are provided at least with a front plate (61, 71, 81) and right (65, 75, 85) and left side plates (64, 74, 84), are made bendable along bending lines (62, 63, 72, 73, 82, 83) on the boundaries of said front plate and right and left side plates, and are formed of the same material as of that of said base board (20);

whereby when said base board (20) is bent inside along said two bending lines (23, 24) and said front plates (61, 71, 81) of said respective auxiliary plates (60, 70, 80) are erected, and said right (65, 75, 85) and left side plates (64, 74, 84) are bent and are connected with the respective sections of the bottom plate, a plurality of sectioned box-shaped parts (36, 46, 56) are formed on a common bottom plate;

said box-shaped parts (36, 46, 56) are opened and closed with a common lid continued with the bottom plate and rear plate;

said lid is peeled off and broken in the forward and rearward direction for the respective sections by pulling grippable parts (21*a*, 22*a*) of said tapes (21, 22) in the end parts of said lids; and

lids (33, 43, 53) opening and closing independently for the respective sections are formed and said rear plates and bottom plates are peeled off and broken in the forward and rearward direction for said respective box-shaped parts (36, 46, 56) by selectively peeling off said tapes (21, 22) so that said respective box-shaped parts (36, 46, 56) may be divided into independent boxes (92, 93, 94) of smaller units.

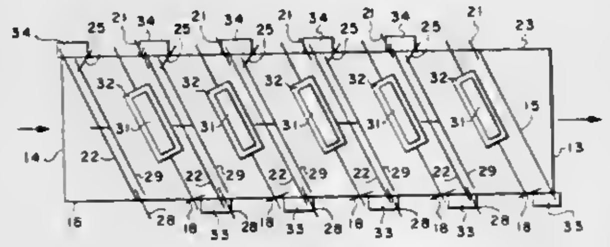
4,101,035
CONVEYOR BELT SOLIDS SEPARATOR WITH COMBINED SCRAPER AND GAS JET CONTROL

Edward D. Burger, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 749,587, Dec. 10, 1976. This application Dec. 13, 1976, Ser. No. 750,072

Int. Cl.² B07C *1/00*

U.S. Cl. 209—114 42 Claims



1. A system for separating spherically-shaped solids which tend to roll down an inclined surface from irregularly-shaped solids which tend to slide down an inclined surface comprising:

a. a conveyor belt-like member having an upper surface, an upper end and a lower end and adapted to rotate about said upper end and said lower end in a manner such that a point on said conveyor belt-like member cycles upward around said upper end, downward around said lower end, and then upward to the point of origination, said upper surface of said conveyor belt-like member being inclined from horizontal along its longitudinal axis at an angle at least as great as the static roll angle of the spherically-shaped solids and less than the static slide angle of the irregularly-shaped solids;

b. upper removal means adapted to deflect irregularly-shaped solids moving upward on said upper surface in an upward, sideways direction so that said irregularly-shaped solids move off a side of said conveyor belt-like member;

c. first receiving means adapted to receive irregularly-shaped solids deflected off said inclined conveyor belt-like member by said upper removal means;

d. lower removal means spaced along the longitudinal axis of said conveyor belt-like member from and below said upper removal means, said lower removal means having an upper side adapted to deflect spherically-shaped solids moving downward on said upper surface in a downward, sideways direction so that said spherically-shaped solids move off a side of said conveyor belt-like member;

e. second receiving means adapted to receive spherically-shaped solids deflected off said inclined conveyor belt-like member by said second removal means;

f. longitudinal gas control means adapted to emit jets of gas directed angularly and longitudinally to a target area extending over a major portion of the width of said upper surface, said target area being upward and ahead of said upper side of said lower removal means by a preselected distance, said preselected distance being such that at least one row of spherically-shaped solids adjacent said upper side of said lower removal means is outside said target area of said jets of gas, said jets of gas being of sufficient force to affect the downward movement of spherically-shaped solids in said target area on said upper surface; and

g. supply means adapted to feed a mixture of said spherically-shaped solids and said irregularly-shaped solids onto a portion of said upper surface between said upper removal means and said target area of said longitudinal gas control means.

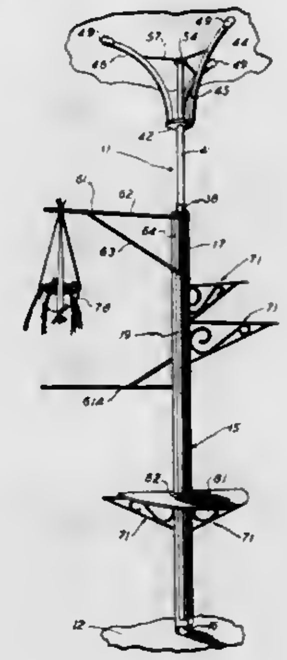
4,101,036
SUPPORT COLUMN WITH CEILING THRUSTERS

Paul M. Craig, 858 Lomita St., El Segundo, Calif. 90245

Filed Jan. 14, 1977, Ser. No. 759,253

Int. Cl.² A47F *5/00*

U.S. Cl. 211—86 1 Claim



1. A support pole for placement between floor and ceiling and comprising a hollow column, a floor pad at an end of the column, an adjustable shaft movable at the other end of the column, resilient means biasing the shaft relative to the column, a plurality of thrust arms adapted to thrust against said ceiling to secure said thrust arms with respect to said ceiling; articulated means securing the thrust arms to the outer end of said shaft to diverge therefrom uniformly, said articulated means including a support assembly at the end of the adjustable shaft remote from the column, a support post extending from the support assembly, a pivot securing each thrust arm for articulation to the support assembly, and a tie extending from the post to each thrust arm intermediate the length of the thrust arm; a plurality of independent fastening bands fixed to the exterior of the column, and at least one cantilever support adapted to engage a fastener band and extend away from the column.

4,101,037
FOLDABLE ROTARY CLOTHES HOIST

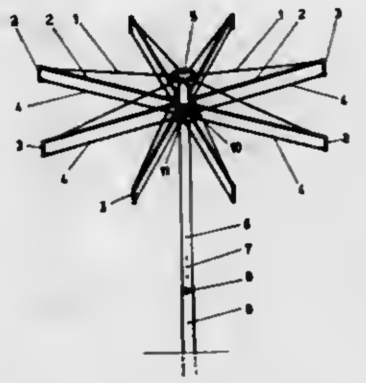
Ernst Allesch, 56 Port Arthur St., Lyons, Canberra, Australia 2606, and Nathan Bank, 18 McCormack St., Curtin, Canberra, Australia 2605

Filed Dec. 13, 1976, Ser. No. 751,063

Claims priority, application Australia, Oct. 19, 1976, 7785/76

Int. Cl.² A47F *5/02*

U.S. Cl. 211—167 8 Claims



1. A foldable rotary clothes hoist comprising:

(i) An upright support post rotatably mounted in a socket on a base member;

(ii) A plurality of arms, each connected at one end to said post and extending radially outwardly thereform; each of said plurality of arms being capable of upward and downward movement independently from the other arms;

(iii) A plurality of tension members, each associated with a respective arm and being connected at one end to said post above the connection point of its associated arm and at the other end detachably connected to the distal end of a respective arm;

(iv) A plurality of separate clothes line sections independent from said plurality of tension members, each connected at one end to said post and at the other end connected to a respective arm so as to extend radially beneath a respective arm;

(v) The connections of said tension members and said arms to said posts being pivotal and having pivot axes transverse to the longitudinal axis of said post whereby on detaching said tension members from said arms, said tension members, arms and clothes line sections are able to fold downwardly to lie alongside said post.

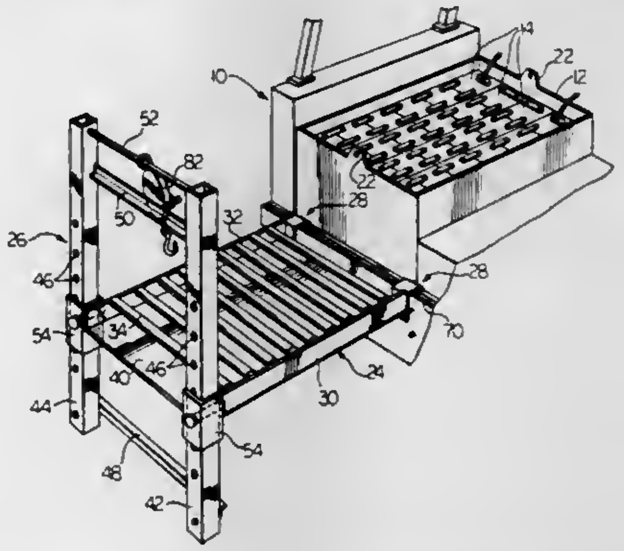
4,101,038
SERVICE RACK FOR LIFT TRUCKS

Milton J. Palma, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,613

Int. Cl.² B65G *67/24*

U.S. Cl. 214—44 R 8 Claims



1. A service rack for use in removing and thereafter supporting heavy objects from a place of installation to permit access to other, underlying objects at the place of installation, said rack comprising:

a support bed having opposed ends and including a pair of spaced apart side rails;

a plurality of rollers journalled between said rails along the length thereof and having peripheries extending past one edge of each of the rails on at least one side of said bed, the axes of rotation of said rollers being generally transverse to said side rails;

an elongated leg structure;

means for selectively securing an end of said support bed to said leg structure at a desired one of a plurality of positions along the length of said leg structure such that said leg structure will be generally transverse to said support bed;

gripper means at the other end of said support bed for securing said other end, in elevated relation, to structure at a place of installation; and

winch means mounted on said leg structure.

4,101,039

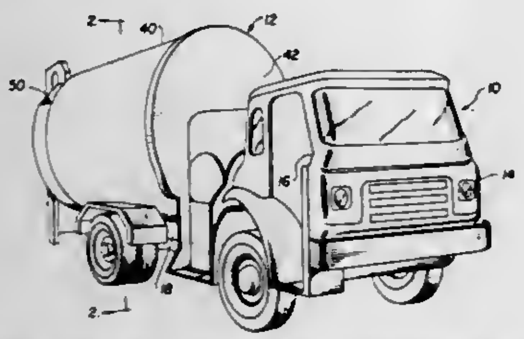
APPARATUS FOR COLLECTING AND COMPACTING WASTE MATERIAL

Pier F. Talenti, Washington, D.C., assignor to Orbital Collection Systems, Inc., Washington, D.C.

Filed Jan. 25, 1977, Ser. No. 762,601

Int. Cl.^{2} B60P *1/42*

U.S. Cl. 214—83.32 **6 Claims**



1. An apparatus for collecting and compacting waste material comprising:

a hollow cylindrical container operable to be mounted upon a truck chassis for selective rotation about the longitudinal axis of said cylindrical container;

first end wall means operable to be mounted upon the truck chassis and being positioned across one end of said cylindrical container;

second end wall means operable to be mounted upon the truck chassis and being positioned across the other end of said cylindrical container;

means mounted upon said truck chassis and connected to said cylindrical container for selectively rotating said cylindrical container about the central longitudinal axis thereof;

charging means fashioned within each of said first and second end wall means for receiving waste material deposited at either end of said cylindrical container;

packing vane means mounted upon the peripheral interior surface of each end of said cylindrical container for raising waste material deposited within said charging means into said cylindrical container upon rotation of said container about the longitudinal axis thereof;

means connected to said cylindrical container for translating waste material deposited within each end of said cylindrical container toward the longitudinal center of said container, said means for translating including

a first plurality of translating vanes mounted upon the interior surface of said cylindrical container and extending helically from one end of said container toward the center thereof;

a second plurality of translating vanes mounted upon the interior surface of said cylindrical container and extending helically from the other end of said container toward the center thereof;

first discoid means rotatively mounted upon one end wall of said cylindrical container and being directed generally inwardly and upwardly toward the central portion of said container,

said first discoid means having generally radially extending vanes thereon and being mounted adjacent the charging means of said one end wall for contacting waste material delivered into the interior of said container and for directing said waste material toward the central portion of said container;

second discoid means rotatively upon the other end wall of said cylindrical container and being directed generally inwardly and upwardly toward the central portion of said container;

said second discoid means having generally radially extending vanes thereon and being mounted adjacent the charging means of said othe end wall for contacting waste material delivered into the interior of said container and for directing said waste material toward the central portion of said container;

wherein waste material deposited within said charging means at either end of said cylindrical container will be directed generally toward the center of said container by said first and second discoid element to tightly compact waste material within said cylindrical container; and

first spring biased breaker means connected to said first end wall means and extending generally radially toward but spaced from the interior periphery of said one of said cylindrical container,

said first spring biased breaker means being operable to act in opposing cooperation with said packing vanes mounted upon the peripheral interior surface of said one end of said cylindrical container wherein oversized waste material deposited within said first end charging means will be first raised by said packing vane means and if said waste material is larger than the passage between the radial extent of said spring biased breaker means and said packing vane means said waste material will contact the extremity of said spring biased breaker means and be reduced by said breaker means before entering said container; and

second spring biased breaker means connected to said second end wall means and extending generally radially toward but spaced from the interior periphery of said other end of said cylindrical container,

said second spring biased breaker means being operable to act in opposing cooperation with said packing vanes mounted upon the peripheral interior surface of said other end of said cylindrical container wherein oversized waste material deposited within said second end charging means will be first raised by said packing vane means and if said waste material is larger than the passage between the radial extent of said spring biased breaker means and said packing vane means said waste material will contact the extremity of said spring biased breaker means and be reduced by said breaker means before entering said container.

4,101,040

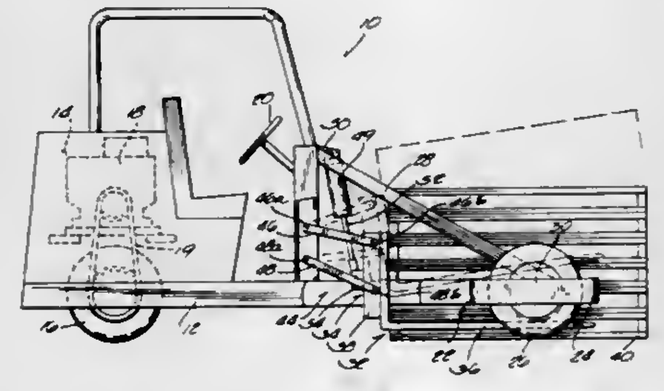
VEHICLE FOR TRANSPORTING PALLETIZED LOADS

Ronald M. Stolley, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 13, 1977, Ser. No. 796,804

Int. Cl.^{2} E02F *3/00*

U.S. Cl. 214—131 R **4 Claims**



1. A vehicle for transporting palletized loads comprising a chassis having a rear end portion and a forward end portion, a pair of laterally spaced, generally horizontal side frame members extending forwardly from said forward end portion of said chassis, said side frame members having a free forward end and being sufficiently spaced apart to straddle the load to be transported, a ground-engaging rear wheel mounted on said rear end portion of and partially supporting said chassis, a ground-engaging wheel mounted on each of said side frame members near said free end thereof and supporting said side frame members in spaced relationship to the ground, a load-lifting frame adapted to lift and carry a palletized load disposed between said side frame members, a linkage arrangement connecting said load-lifting frame to said chassis for movement of said load-lifting frame relative to said chassis between a lowered position for picking up the load and a raised position to lift the load for transporting to another location, said linkage arrangement being automatically operative to tilt said load-lifting frame rearwardly relative to said chassis as said load-lifting frame is moved from the lowered position toward the raised position and including a pair of vertically spaced upper and lower rigid links, said upper link having a first end pivotally connected to said chassis about a first axis fixed relative to said chassis and said upper link and having a second end pivotally connected to said load-lifting frame about a second axis fixed relative to said load-lifting frame and said upper link, said lower link having a first end pivotally connected to said chassis about an axis fixed relative to said chassis and said lower link and located directly vertically below said first axis, said lower link also having a second end pivotally connected to said load-lifting frame about an axis fixed relative to said load-lifting frame and said lower link and located directly vertically below said second axis when said load-lifting frame is in the lowered position, the distance between the pivotal connections of said upper link being less than the distance between the pivotal connections of said lower link, and lift means connected between said chassis and said load-lifting frame for moving said load-lifting frame between the lowered and raised positions.

4,101,041

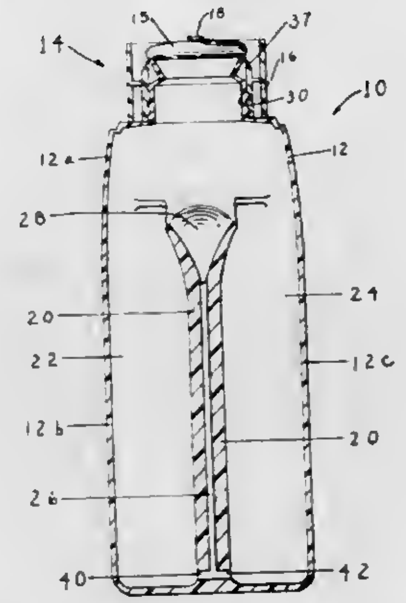
PREFILLABLE, HERMETICALLY SEALED CONTAINER ADAPTED FOR USE WITH A HUMIDIFIER OR NEBULIZER HEAD

Charles L. Mauro, Jr., New York, N.Y.; Theodore L. Siuta, Elizabeth, N.J., and Gordon Sylvester, Jamaica, N.Y., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Aug. 1, 1977, Ser. No. 820,641

Int. Cl.^{2} B65D *1/02*

U.S. Cl. 215—6 **6 Claims**



1. A unitary, prefillable, hermetically sealed, container adapted for use with a humidifier or nebulizer head, which comprises;

a thermoplastic body having a closed first end and a closed removable second end, said body defining an interior chamber for holding a fluid;

a conduit communicating between a point within said chamber adjacent said closed first end and a point within said chamber adjacent said closed second end, said conduit having a guide means for receiving a tube at the point adjacent said second end;

support means for said conduit connected to said body; and means for attaching a humidifier or nebulizer head to said body upon removal of said closed, removable second end.

4,101,042

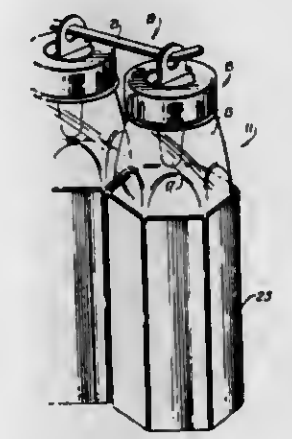
BOTTLE DISC

Lawrence M. Strong, Solon, and Chester H. Rilling, Ravenna, both of Ohio, assignors to Questor Corporation, Toledo, Ohio

Filed Jul. 5, 1977, Ser. No. 812,648

Int. Cl.^{2} A61J *9/06*

U.S. Cl. 215—11 R **3 Claims**



1. A disc for use with a baby bottle and a cap having an aperture therein, said disc comprising

a substantially planar base having a diameter smaller than the diameter of the interior of said cap;

a circular plate mounted on said planar base, said plate being of a dimension to mate within said aperture in said cap;

an elongated land mounted on said plate and extending outwardly therefrom, said land being tapered at each end and extending beyond said plate whereby said land removably maintains said plate within said aperture in said cap;

a tab having an aperture therethrough; and

a flexible hinge connecting said tab to said land.

4,101,043

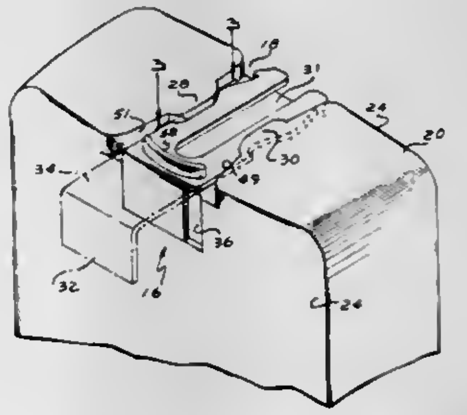
CONTAINER AND SUPPORT CLIP COMBINATION

Joseph E. Johnson, Jr., East Lyme, and Richard D. Warrell, Mystic, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 12, 1977, Ser. No. 832,255

Int. Cl.^{2} B65D *25/22*

U.S. Cl. 215—100 R **5 Claims**



1. In the combination of a container and an L-shaped support clip operable in a recess in the container base, the improvement wherein said clip comprises:

(a) an upright portion substantially parallel to the container axis; and

(b) a forked base portion slidable in the recess between first and second positions at which the upright member is respectively displaced outwardly of and substantially in surface engagement with a sidewall of such container, the bifurcations of said forked member and the walls of such recess having means to lock the clip in place in said first position.

4,101,044

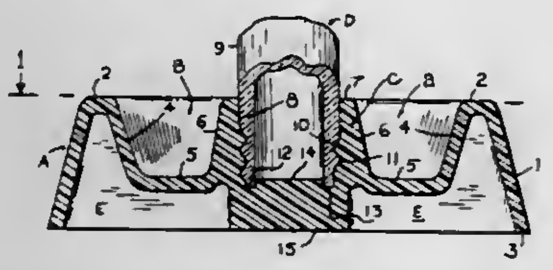
CLOSURE CAP AND SUPPORT FOR HOLDING A BOTTLE OF CARBONATED BEVERAGE IN INVERTED POSITION

Francis A. Paquette, 4308 Shamrock Way, and Richard H. Henze, 17647 Trenton Dr., both of Castro Valley, Calif. 94546

Filed Jul. 22, 1977, Ser. No. 818,001

Int. Cl.² B65D *47/40*

U.S. Cl. 215—228 **1 Claim**



1. A closure cap and support for holding a bottle of a carbonated beverage in an inverted position: comprising

(a) a single molded unit with a large area base substantially greater than the large diameter of the bottle, said base being defined by an outer annular wall extending upwardly and inclined inwardly from a planar surface and extending to a juncture with an inner annular wall that slopes downwardly and inwardly to form an inverted V cross sectional configuration;
(b) the lower end of said inner annular wall terminating and forming an integral connection with a horizontal bottom wall that is spaced above the aforementioned planar surface;
(c) said base having a center portion integral with said bottom wall and having a central cylindrical internally threaded cavity for receiving the exteriorily threaded neck of a bottle containing a carbonated beverage, the axis of said cylindrical cavity coinciding with the axis of said base and being normal to the planar surface, the bottom of the cylindrical cavity lying substantially in the same plane as that of said bottom wall and the top of said center portion lying substantially in the same plane as the plane coinciding with the junction of said inner and outer annular walls;
(d) said center portion having an integral extension extending from the bottom of the cylindrical cavity to the planar surface so that the lower edge of the outer annular wall will lie in the same plane as the bottom of said integral extension of said center portion; and
(e) a plurality of radially extending ribs whose inner ends are integral with the depending extension of said center portion and extend outwardly so that their outer ends are integral with the adjacent surfaces of said annular outer and inner inclined walls of said base, said ribs also adding weight to the base and being integral with the under surface of said bottom wall, the lower edges of said ribs lying in the same plane that coincides with the lower edge of said outer annular wall and with the bottom of said extension of said center portion;
(f) whereby the center of gravity for the uncapped inverted bottle supported by said base will lie at the center of said depending extension of said center portion and the center portion will cooperate with the annular inner wall and with the bottom wall to form a circular reservoir for receiving any leakage from the inverted bottle, the threaded cavity forming a liquid seal for the contents of the inverted uncapped bottle; said ribs adding weight and structural reinforcement for the various parts of said base.

4,101,045

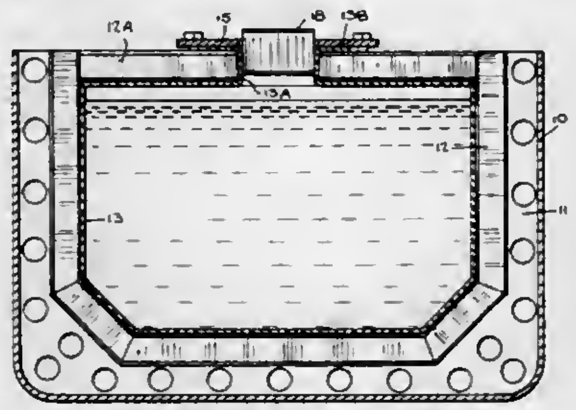
CRYOGENIC CONTAINER

William Melchior Roberts, Blauvelt, and Jean Kohn, New York, both of N.Y., assignors to Baltek Corporation, Northvale, N.J.

Filed Apr. 12, 1977, Ser. No. 786,878

Int. Cl.² B65D *87/24;* **B63B** *25/16*

U.S. Cl. 220—404 **13 Claims**



1. A cryogenic container for storing or shipping a liquified gas, such as LNG, at atmospheric pressure, in quantities comparable to those carried by LNG containers designed for transoceanic transport, said container comprising:

A. an enclosed rigid outer tank having structural walls which afford thermal insulation and incorporate a nonmetallic secondary liquid and gas-impervious barrier, the inner surface of the outer tank having a predetermined configuration, the top wall of said outer tank having an inlet port;
B. an independent tank for containing a load of liquified gas and constituted by a collapsible bladder of flexible material which may be lowered in the collapsed state into the rigid outer tank through said port and which includes a neck portion that lines said inlet port, said bladder when lowered into said outer tank being suspended from said neck portion, said bladder material being constituted by a fabric of synthetic plastic fibers coated with a compatible film having sufficient strength to support said liquified gas and operative as a primary barrier, said bladder having a geometry roughly conforming to said inner surface configuration whereby those areas of the bladder which fail to exactly conform to the inner surface and are therefore unsupported are not subject to rupture by forces imposed by said load, and
C. detachable means at selected positions to anchor said collapsible inner tank on the wall of the outer tank to maintain the normal shape of said collapsible tank when it is empty.

4,101,046

PAINT BRUSH HOLDER

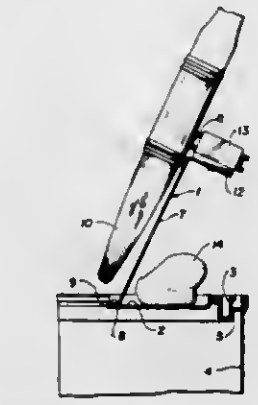
Theodore F. Puntillo, 5706 28th St., Sacramento, Calif. 95824

Filed Mar. 31, 1977, Ser. No. 783,512

Int. Cl.² A46B *17/02;* **B44D** *3/12*

U.S. Cl. 220—90 **4 Claims**

1. A paint brush holder comprising a wide base element provided with a dependent lip-shaped portion complemental to a chime of a paint can arranged for association therewith, said chime having a circumference, a wide upstanding cradle means including an upper terminal portion and a planar portion offset from a juncture with said base element at an acute angle with respect thereto, the juncture of said cradle means with said base element being provided with a flat edge portion against which a paint brush may be moved in an upward direction for removing excess pain therefrom, and retention means for releasably holding said paint brush spaced from said edge portion secured to said upper terminal portion of said cradle means, said dependent lip-shaped portion of said base element circumscribing an arc at the least of substantially one-third of the circumference of the chime of said paint can.



4,101,047

LAMINATED MATERIAL OF THERMOPLASTIC SYNTHETIC MATERIAL, PROCESS OF MAKING AND CONTAINER CLOSED THEREWITH

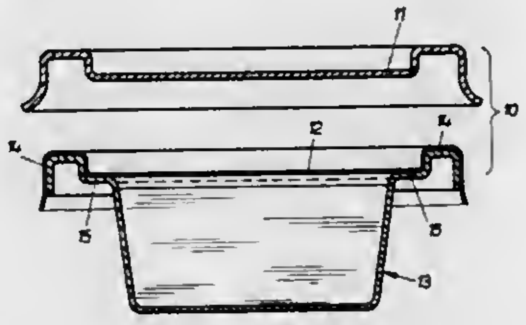
Barbara Geppert, and Kurt Huth, both of Wiesbaden, Fed. Rep. of Germany, assignors to Bellaplast GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 18, 1976, Ser. No. 715,219

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537435

Int. Cl.² B65D *5/64;* **B29F** *3/10;* **B29C** *19/00;* **B32B** *27/08*

U.S. Cl. 220—258 **6 Claims**



1. A container assembly comprising a cup-shaped body of synthetic thermoplastic material selected from the group consisting of polyethylene and polypropylene having a rim around its upper open end, and a cover fitted upon said rim, said cover comprising two adhesively bonded mutually detachable coextensive layers of different synthetic plastic materials, with the outer of said layers being an impact resistant polystyrene and the inner of said layers being of substantially the same material as said body and permanently bonded directly to said rim and containing a dispersal of adhesive material capable of bonding said layers together, said adhesive material being an ethylene vinyl acetate copolymer present in the amount of about 10 percent by weight of said inner layer.

2. Laminated material comprising two surface contacting coextensive layers of extruded heat bonded different synthetic thermoplastic materials that normally do not adhere to each other, one of said layers being a material selected from the group consisting of polyethylene and polypropylene, and the other of said layers being a material selected from the group consisting of polystyrene styrene-acrylonitrile copolymers and polycarbonates, at least one of said layers containing a dispersed predetermined quantity of adhesive material dispersed therein, said adhesive material being characterized in that it is capable of bonding said layers together and that it is present in such controlled quantity as to provide a bond of predetermined strength between said layers, the quantity of the adhesive material admixed to the material of at least one of the layers which are to be bonded together being within the range of between about 5 percent by weight and 50 percent by weight of the material of that one layer as a function of the desired adhesive bond strength between the layers.

5. A process for producing laminated material wherein two coextensive layers of different synthetic thermoplastic materials that normally do not adhere to each other are extruded in surface contact and heat bonded, characterized in that prior to extrusion a predetermined quantity of a selected adhesive material capable of bonding said materials together is dispersed within at least one of said layers, the quantity of the adhesive material dispersed in said one of the layers being within the range of about 5 to 50 percent by weight of that one layer as a function of the desired adhesive bond strength between the layers.

4,101,048

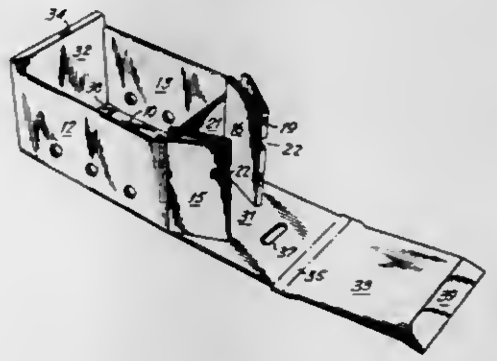
PRODUCE FIELD BOX AND FOLDABLE BLANK FOR MAKING IT

Horace Johnnie Rieben, Russellville, Ak., and Lawrence F. Taylor, Bay Minnette, Ala., assignors to International Paper Company, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,844

Int. Cl.² B65D *5/22, 21/02*

U.S. Cl. 229—34 R **20 Claims**



1. A cut and scored foldable blank for a produce field box, which comprises:

a bottom panel;
first and second outside end wall panels connected to opposite sides of the bottom panel;
a first inside end wall panel, said first inside end wall panel connected by a first end wall top deck panel to said first outside end wall panel;
a second inside end wall panel, said inside end wall panel connected by a second end wall top deck panel to said second outside end wall panel;
first and second outside side wall panels connected to opposite sides of the bottom panel, wherein the corners of the first and second outside side wall panels which are remote from the bottom panel project away from said bottom panel whereby said corners of the first and second outside side wall help to support the first and second end wall top deck panels when the blank is folded into a produce field box;
a first inside side wall panel, said first inside side wall panel connected to said first outside side wall panel opposite to said bottom panel;
a second inside side wall panel, said second inside side wall panel connected to said second outside side wall panel opposite to said bottom panel;
a first set of two first end wall stacking panels comprising a first, first end wall stacking panel and a second, first end wall stacking panel connected to opposite sides of the first outside side wall panel;
a second set of two first end wall stacking panels comprising a first, first end wall stacking panel and a second, first end wall stacking panel connected to opposite sides of the second outside side wall panel whereby, when the blank is folded into a produce field box, each of said first end wall stacking panels helps to support an end wall top deck

panel when a load is stacked on said end wall top deck panel;
four second end wall stacking panels, each of said second end wall stacking panels connected to a different first end wall stacking panel on the opposite side that the outside side wall panel is connected whereby, when the blank is folded into a produce field box, each of said second end wall stacking panels helps to support an end wall stacking panel when a load is stacked on said end wall top deck panel.

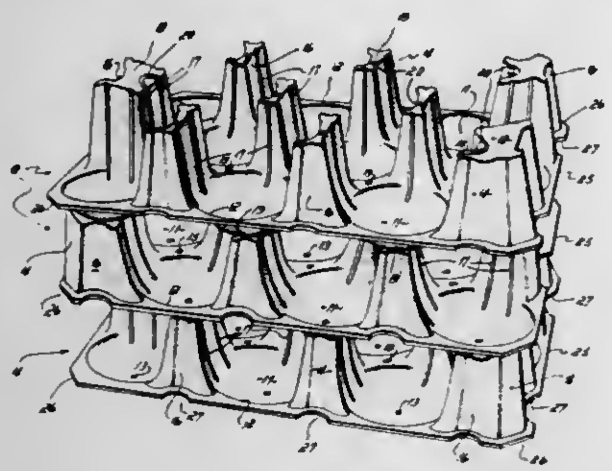
4,101,049
SHIPPING TRAY FOR FRUIT

Harry S. Wallace, Largo, Fla., and Robert C. Taylor, Florence, Ky., assignors to Hopple Plastics, Inc., Florence, Ky.

Filed Mar. 10, 1977, Ser. No. 776,216

Int. Cl.² B65D *81/16, 81/24, 81/26*

U.S. Cl. 229—2.5 R **4 Claims**



1. A stackable, nestable shipping tray for fruit comprising,
a single molded sheet having a generally planar peripheral border,
a plurality of fruit-receiving pockets formed in said sheets, the upper edges of said pockets lying in a plane,
a plurality of posts formed in said sheet and located adjacent said pockets, said posts projecting a uniform height above said plane a distance substantially greater than the depth of said pockets,
said pockets having a depth which is less than one-third the overall height of a tray,
said posts presenting generally vertical surfaces, said vertical surfaces having vertical grooves extending into said pockets,
said pockets having holes in the bottom thereof,
at least a portion of said pockets having an undersurface which is adapted to rest upon a respective post when a plurality of like trays, oppositely oriented, are in stacked relation,
said posts having upper surfaces which receive the undersurfaces of said pockets, said surfaces having grooves therein to facilitate air and liquid flow,
said posts, grooves and holes permitting air and liquid flow around the fruit between the top and bottom of a stacked group of filled trays.

4,101,050
FILLED-POLYSTYRENE LAMINATES

Ernest Jack Buckler, and Michael Hugh Richmond, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Sep. 14, 1976, Ser. No. 723,285

Claims priority, application Canada, Oct. 22, 1975, 238304

Int. Cl.² B65D *1/00;* **B32B** *27/08*

U.S. Cl. 229—3.5 R **6 Claims**

1. A thermoplastic polymeric laminate comprising at least one layer of polystyrene and at least one layer of filled styrene polymer composition containing from about 5 to about 50 parts by weight of filler, said filled styrene polymer composition being the product of mixing a styrene polymer masterbatch with polystyrene, said masterbatch comprising 100 parts by weight of impact polystyrene, from 1 to about 40 parts by weight of rubber selected from styrene-butadiene rubber, polybutadiene rubber, high cis-1,4-polyisoprene, thermoplastic rubber block copolymers comprising vinyl- or vinylidene-substituted aromatic hydrocarbon polymer blocks and conjugated diolefin polymer blocks, ethylene-pripylene-diene rubber and mixtures thereof, from 10 to 200 parts by weight of filler being an inorganic mineral filler selected from calcium carbonate, magnesium carbonate, calcium sulphate, aluminum oxide and hydrates thereof, clay, aluminum sulphate, silica, talc, mica, wollastonite, vermiculite, asbestos fibres and glass fibres, and from 1 to 40 parts by weight of mineral oil selected from a mixed naphthenic-aromatic oil and an aromatic oil.

4,101,051
PACKAGING MEANS

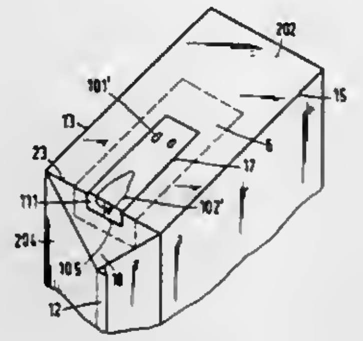
Wilhelm Rell, Im Tiefen Weg 8, Bensheim-Auerbach, Hessen, Germany

Filed May 10, 1976, Ser. No. 684,780

Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520569; Jun. 11, 1975, 2530945

Int. Cl.² B65D *5/70, 5/54*

U.S. Cl. 229—17 R **13 Claims**



1. Packaging means for liquids or the like, comprising a spout portion and a wall extending into said spout portion, a perforation line in said wall defining a tear-off strip, and a covering strip of liquid-impervious material being secured to the inner surface of said wall and positioned over said perforation line to close and seal it, a portion of said tear-off strip remote from said spout portion being unattached to said covering strip to facilitate gripping and removal of said tear-off strip and opening of said spout portion.

4,101,052
CONTAINERS FOR TRANSFERRING MERCHANDISE BETWEEN DISTRIBUTION SERVICE CENTERS AND RETAIL STORES, WHILE SECURITY SEALED IN EITHER AN EXPANDED OR A REDUCED VOLUME CONFIGURATION

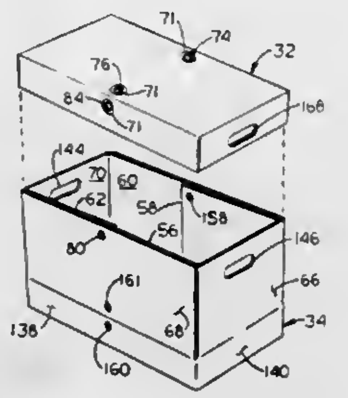
Douglas J. A. Dove, Edmonds, Wash., assignor to Interstore Transfer Specialists, Inc., Edmonds, Wash.

Filed Mar. 4, 1977, Ser. No. 774,323

Int. Cl.² B65D *5/35*

U.S. Cl. 229—23 R **20 Claims**

1. A container assembly reusable for many shipments and transfers, arrangeable either in an expanded volume configuration or alternately in a reduced volume configuration, comprising:
a. a cover subassembly having: a planar top surface structure and depending flaps forming a lid; and reinforcing antitear means for these depending flaps, thereby making this cover subassembly more resistant to rough handling; and
b. a bottom subassembly, having a planar, one piece bottom surface; four upstanding sides which pivot upwardly from the bottom surface along their respective common scores; each score being common to a side of the bottom and the bottom edge of an upstanding side; volume changing flaps which pivot along the upstanding sides along their common scores, each score being common to the top edge of an upstanding side and to the bottom of a volume changing flap; additional volume changing structure, pivoting and unfolding from two opposite volume changing flaps to supplement the strength of the container, the pivoting occurring along their common scores, each score being common to one eventually upright side of an additional volume changing flap and to an eventually upright side of an additional volume changing structure; and reinforcing antitear means for the volume changing flaps thereby making this bottom subassembly more resistant to rough handling.



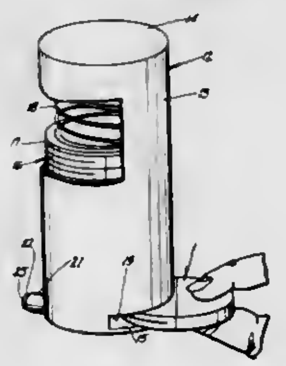
4,101,053
DISPOSABLE PRODUCT APPLICATOR AND DISPENSING PACKAGE THEREFOR

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 668,253, Mar. 18, 1976, Pat. No. 4,053,242. This application May 13, 1977, Ser. No. 796,691

Int. Cl.² B65H *1/12*

U.S. Cl. 221—232 **12 Claims**



1. In combination a plurality of hand-held, T-shaped disposable product applicators and a dispensing package therefor, each of said applicators comprising an applicator pad portion and an upstanding finger grip portion, said pad portion being normally substantially planar with a top surface and a bottom product-applying surface, said upstanding finger grip portion being normally substantially planar with opposite sides providing finger grip surfaces, said finger grip portion being normally substantially perpendicular to and extending transversely across said top surface of said pad portion bisecting said pad portion into two substantially equal parts, each said pad portion being folded along its juncture with said finger grip portion with said bottom product applying surface folded upon itself, said finger grip portion being of a thickness substantially twice the thickness of said pad portion whereby said finger grip portion and said folded pad portion are substantially coplanar and of substantially the same thickness, said folded applicators being arranged in a stack located in said package, said package having a dispensing opening through which the endmost applicator of said stack may be removed from said package sequentially, means within said package to advance said stack toward said opening and to maintain said pad portion of each applicator of said stack folded, said pad portion of each of said applicators being fabricated of a material of such nature that said pad portion will spring to said normal substantially planar configuration upon removal of said applicator from said package.

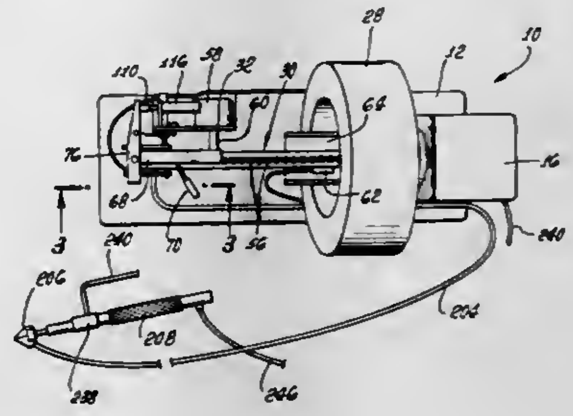
4,101,054
PNEUMATIC AUTOMATIC SCREWFEEDER

Francis Edmund Frost, 301 Foothill Ave., Sierra Madre, Calif. 91024, and Robert Mack, 507 S. Arturo St., West Covina, Calif. 91791

Filed Sep. 30, 1976, Ser. No. 728,250

Int. Cl.² B65H *3/08*

U.S. Cl. 221—278 **16 Claims**

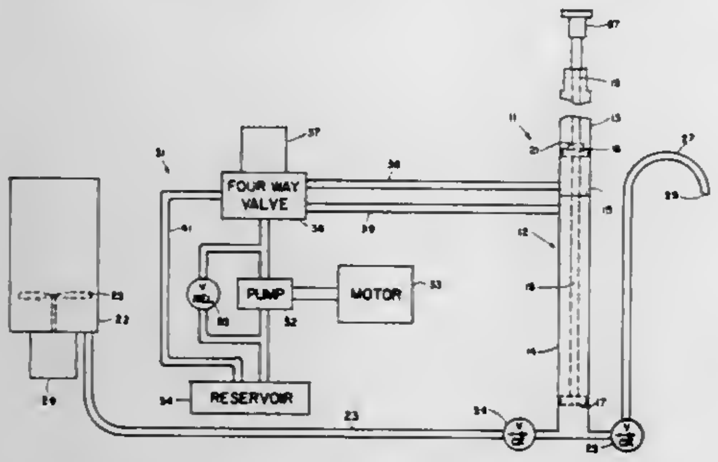


1. In an automatic screwfeeder,
screw carrying means having screw receiving means adjacent one end and having a screw discharge end adjacent its other end,
screw supplying means adjacent said carrying means for supplying screws to screw receiving means,
means associated with said carrying means to move said screws in said carrying means toward said discharge end for positioning for discharge,
first screw metering means associated with said carrying means at the discharge end to withhold and alternately discharge single screws from the carrying means at the discharge end,
the improvement comprising:
second screw metering means adjacent first metering means, said second metering means being associated with said carrying means and having means to receive and releasably hold a single discharge screw from said carrying means,
a feed tube connected at one end to said second metering means and connected at its other end to a screwdriver to supply screws thereto,
said means to releasably hold said single screw in said second metering means having actuating means to release said single screw to said feed tube to rest therein when said first metering means is withholding another single screw, and
means connected to said feed tube to move said single screw resting therein to said screwdriver when said first metering means discharges another single screw to said second metering means.

4,101,055

COLORANT DISPENSER HAVING TIME SEQUENCE DISPENSING CYCLE

Edward J. Poltras, 198 Highland St., Holliston, Mass. 01746
Filed Aug. 6, 1976, Ser. No. 712,328
Int. Cl.² B67D *5/30*
U.S. Cl. 222—17 **13 Claims**



4. A fluid mixing and dispensing apparatus comprising:

a plurality of containers for fluid mediums to be combined;

a plurality of measuring receptacles, each defining a variable effective volume and one connected for fluid communication with each of said containers;

tubulation means for conveying fluid medium retained in said effective volume of each of said receptacles to a discharge nozzle, all of said nozzles being disposed in a common discharge area;

cyclic pump means for pumping preselected volumes of fluid medium from said containers to said receptacles during sequential withdrawal cycles and from said receptacles to said discharge area during sequential dispensing cycles;

an adjustable selector means for selectively and independently varying the effective volume of each of said receptacles, and wherein said pump means completely fills said effective volume of each receptacle during said withdrawal cycles to establish the preselected volume of fluid medium pumped from each of said containers to said receptacles;

cycle timer means for controlling the periods of said sequential withdrawal and dispensing cycles; and

sequence control means adjustable to provide a predetermined number of said sequential withdrawal and dispensing cycles, said sequence control means comprising sequence timer means for deenergizing said cyclic pump means after a time period encompassing a predetermined number of said sequential withdrawal and dispensing cycles.

4,101,056

TEMPERATURE-COMPENSATING PETROLEUM PRODUCT DISPENSING UNIT

George E. Mattimoe, 953 Wainiha St., Honolulu, Hi. 96825, and Michael P. Gouveia, Honolulu, Hi., assignors to George E. Mattimoe, Hooolulu, Hi.
Continuation-in-part of Ser. No. 581,229, May 27, 1975, abandoned. This application Jul. 8, 1976, Ser. No. 703,465
Int. Cl.² G01F *1/00, 15/02*
U.S. Cl. 222—26 **43 Claims**

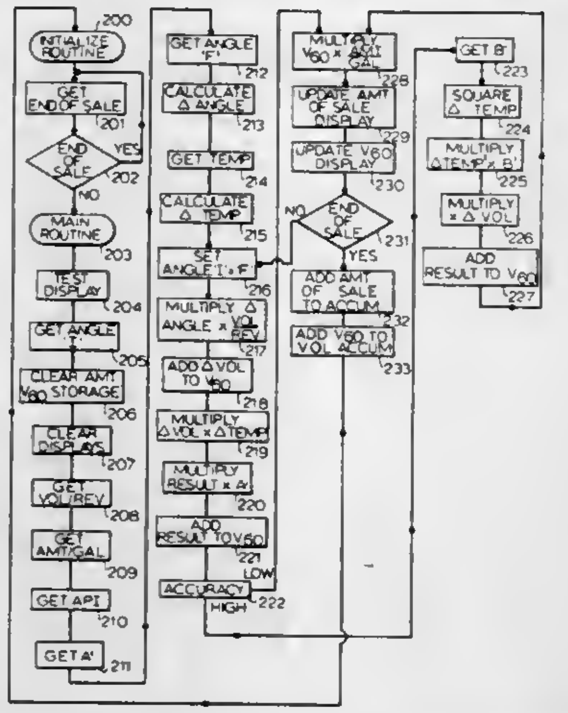
1. In apparatus for the transfer of liquid in terms of standard volume at a standard temperature, having a delivery conduit with an outlet delivery means, and means for moving the liquid through said outlet delivery means, the combination of:

thermometric means in said outlet delivery means for sensing continuously the instantaneous temperature of the liquid there and continuously deriving an analogous electrical signal therefrom,

signal transmitting means connected to said thermometric means for generating a thermal value electrical signal, corresponding to the sensed temperature, from said analogous electrical signal and for sending said thermal value electrical signal several times per second, upon command,

metering means at said outlet delivery means for generating and sending, upon command, at least as often as said signal transmitting means, volume electrical signals corresponding to volume of liquid transferred through said outlet delivery means,

rapid electronic computing means for repetitively commanding and receiving said volume signals and said thermal value signal, for incrementally calculating therefrom at intervals of several times per second during a delivery of liquid the volume delivered in each interval as corrected to said standard temperature, and for summing the total volume from initiation of each delivery through the latest calculated interval, and

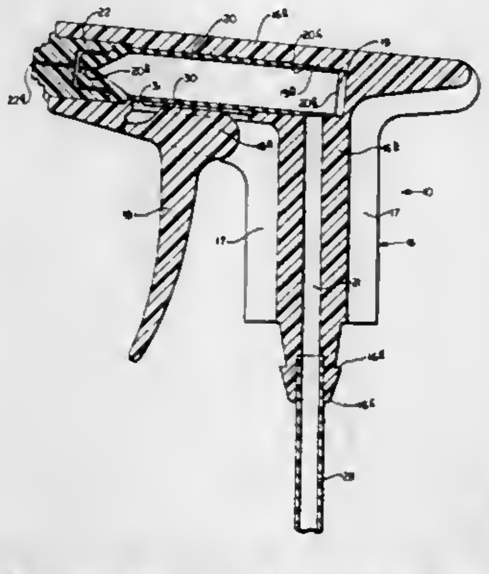


volume display means actuated by said computing means for continuously displaying the computed summed volume of dispensed liquid in terms of standard measure at said standard temperature.

4,101,057

TRIGGER ACTUATED PUMP

Lewis C. LoMaglio, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Dec. 2, 1976, Ser. No. 747,041
Int. Cl.² B65D *37/00*
U.S. Cl. 222—207 **14 Claims**



1. A manually operable liquid dispensing pump for use and incorporation on a container for a liquid to be dispensed comprising, in combination:

a. tubular bladder means having flexible walls which expand to their natural profile when depressed and relaxed, said bladder means having an upstream end and a downstream end, said downstream end having an integrally molded one-way valve means that permits fluid to flow outwardly from said bladder means, said upstream end of said bladder means being open to permit fluid to flow into said bladder means,

b. a one-piece, integrally molded housing means having:

  i. cavity means for receiving and containing said bladder means,

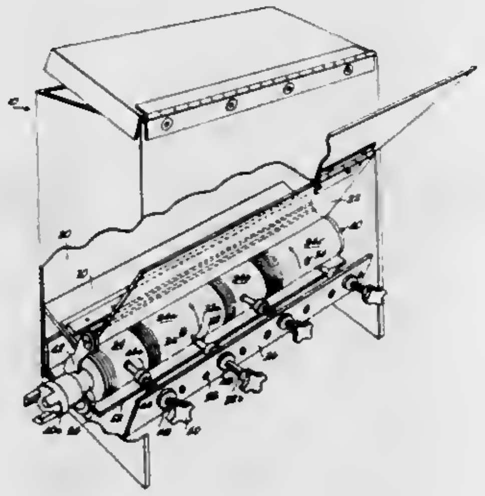
  ii. channel means communicating with said cavity means, said channel means being located substantially adjacent to said upstream end of said bladder means and between said upstream end and said downstream end of said bladder means when said bladder means is received in said cavity means, said upstream end of said bladder means sealing one end of said channel means to prevent fluids from entering said cavity means from said channel means when said bladder means is in a depressed position or in its natural profile, and permitting fluids to enter said bladder means while said bladder means is expanding to its natural profile, and

c. trigger means connected to said housing means for depressing said bladder means to pump fluids therefrom.

4,101,058

VARIABLE WIDTH GLASS SPHERE DISPENSER

Martin A. Smith, P.O. Box 708, Opa Locka, Fla. 33054
Filed Apr. 14, 1977, Ser. No. 787,692
Int. Cl.² G01F *11/20*
U.S. Cl. 222—274 **8 Claims**

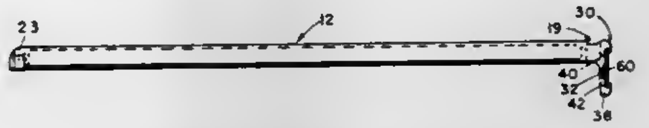


1. In apparatus for dispensing glass spheres or the like at prescribed adjustable widths by gravity feeding such spheres upon a roller, the improvement comprising, a common drive shaft, means for coupling said drive shaft to a rotative source for continuously rotating said drive shaft, a plurality of roller sections coaxially journalled on said drive shaft in substantially abutting end-to-end relation therealong, means for individually and selectively securing said roller sections to said drive shaft for rotation in unison therewith, a hopper above said roller sections for holding glass spheres to be dispensed, and an elongated discharge opening in the bottom of said hopper and substantially coextensive with the combined axial length of said roller sections for depositing glass spheres upon upper surface portions of said roller sections.

4,101,059

TALLY

John H. Batts; Judd F. Garrison, both of Grand Rapids, and Douglas F. Wolff, Marshall, all of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed May 25, 1977, Ser. No. 800,337
Int. Cl.² A47J *51/098*
U.S. Cl. 223—85 **20 Claims**



1. A device for displaying information on a garment hanger, comprising:

a flexible sheet member tally, said sheet member tally defining a locking detent notch intermediate the lateral edges thereof along a transverse edge, said sheet member tally also including a stop tab extending outwardly from the other transverse edge; and

a tally attaching means disposed on said hanger in plain view when a garment is suspended from said hanger for attaching said tally to said hanger, said attaching means including:

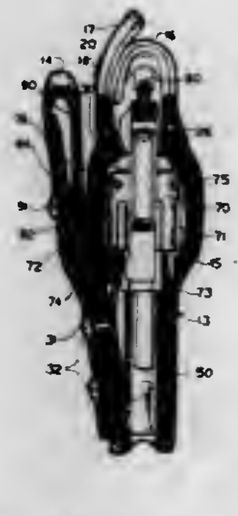
a first means defining a first groove and including a detent extending into said groove intermediate the ends thereof; and

a second means defining a second groove, said second groove positioned spaced from said first groove and including a stop, said tally being insertable into said grooves and dimensioned so that when said tab abuts said stop said detent is disposed within said notch.

4,101,060

HOLSTER WITH IMPROVED BELT LOOP LOCK

John E. Bianchi, 1601 Wilt Rd., and Richard D. E. Nichols, 813 Cozy Ct., both of Failbrook, Calif. 92028
Division of Ser. No. 492,757, Jul. 29, 1974, Pat. No. 3,977,583. This application Apr. 26, 1976, Ser. No. 680,215
Int. Cl.² F41C *33/02*
U.S. Cl. 224—2 B **3 Claims**



1. A holster including a body portion defining a handgun cavity and a belt loop portion secured thereto and defining a belt loop for receiving a belt;

said belt loop portion defining an elongated opening having a height approximating the width of the belt on which it is to be worn and a width approximating the thickness of the belt;

said belt loop portion comprising a bight of leather having an open end;

a body of expansible-compressible material positioned at the edge of the elongated opening and closing the open end of said bight and securing the end portions of said bight together;

means for selectively expanding said body of expansible-compressible material into engagement with the edge of a belt passing through said opening by variable compression of said body of expansible-compressible material in a direction parallel to the width of said elongated opening and variable expansion of said last body toward the edge of said belt to prevent relative movement of said belt loop assembly and belt.

4,101,061

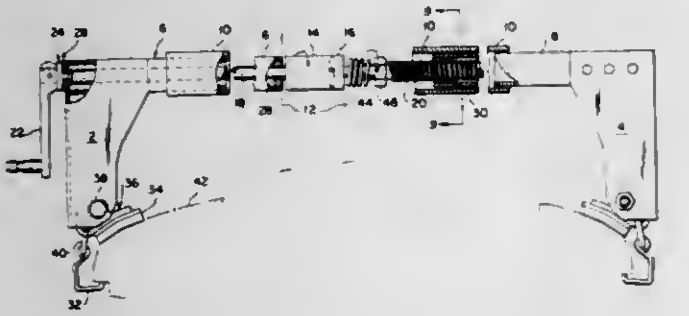
ADJUSTABLE CAR TOP CARRIER SUPPORT

Howard M. Sage, Phoenix, and John C. Abromavage, Tempe, both of Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

Filed May 9, 1977, Ser. No. 794,900

Int. Cl.^{2} B60R *9/04*

U.S. Cl. 224—42.1 F **31 Claims**



1. An adjustable car top carrier support, operable for use on a gutterless car top having ledges at opposite sides thereof, comprising:

a. a first horizontal support tube, having an outer and an inner end, and including a first vertical support leg means proximate said outer end;

b. a second horizontal support tube, having an outer and an inner end, and including a second vertical support leg means proximate said outer end;

c. crankshaft means interconnecting said support tubes for horizontally contracting and extending said respective support tubes;

d. clutch means within said crankshaft means for limiting the amount of torque which may be applied by said crankshaft in contracting said support tubes; and

e. car top engaging means, extending from the bottom of each of said vertical support leg means, and operable for engaging a car top proximate said ledges at opposite sides of said car top, whereby upon contraction of said support tubes engagement forces are transmitted to said car top only in the vicinity of said opposite car top ledges and said clutch means is operable to limit the amount of the engagement force which may be exerted between said car top carrier and a car top.

4,101,062

INFLATABLE CARTOP CARRIER AND SHELTER STRUCTURE

Benjamin E. Lazar, 5446 Cheena Dr., Houston, Tex. 77096

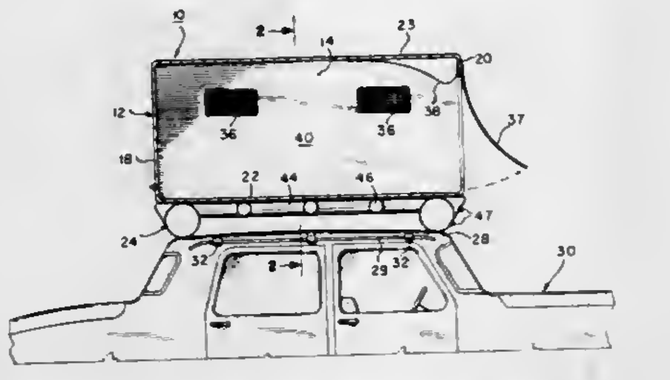
Filed Feb. 28, 1977, Ser. No. 772,809

Int. Cl.^{2} B62D *33/04*

U.S. Cl. 296—37.7 **6 Claims**

1. An inflatable structure having a cartop carrier case forming a chamber therein for securely and conveniently carrying, storing and sheltering objects when said structure is inflated, and to collapse into a small space when not in use,

wherein, said structure includes:



an inflatable horizontally-disposed bottom mattress, a roof, and front, rear and side walls extending between said mattress and said roof.

4,101,063

SURGICAL INSTRUMENT FOR LIGATING TUBULAR ORGANS IN DEEP CAVITIES

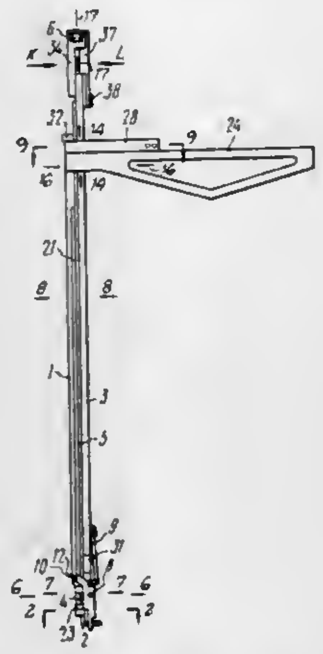
Nikolai Nikolaevich Kapitanov, 8 ulitsa Oktyabrskogo polya, 5, kv. 9, and Kim Nikolaevich Tsatsanidi, B. Cherkizovskaya ulitsa, 3, korpus 5, kv. 15, both of Moscow, U.S.S.R.

Continuation of Ser. No. 659,520, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,893, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 463,795, Apr. 24, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,365

Claims priority, application U.S.S.R., Oct. 30, 1973, 1974031

Int. Cl.^{2} B25C *1/00*

U.S. Cl. 227—19 **4 Claims**



1. A surgical instrument for ligating tubular organs in deep cavities of the human body, which comprises: in combination a first elongate element with opposite ends; a magazine containing a U-shaped staple mounted on said first element at one of the ends thereof; a second elongate element with opposite ends assembled next to and in parallelism with said first element, said second element comprising driving means for forcing said staple out of the magazine by longitudinal movement of said second element relative to said first element; a third elongate element assembled next to and in parallelism with said second element; a needle-shaped die secured to one of the ends of said third element and extending axially beyond said magazine for bending the staple forced out of the magazine by the driving means; said first and second elements being movable longitudinally in unison with respect to said third element; a spring-loaded mechanism movably mounted on said first element near said one of said ends thereof, said mechanism being operative to press and fix a portion of a tubular organ grasped by the die when the first and second elements are moved longitudinally with respect to the third element into an operative position with said mechanism adjacent said die; said needle-shaped die including a hook adapted to grasp the tubular organ while in tissue which the die pierces and while the first, second and third elements are manually rotated in said operative position about the longitudinal axis of the instrument, said second element in said operative position being longitudinally movable relative to said first and third elements to force the staple from the magazine, a movement-limiting means mounted on the opposite ends of the first and second elements for limiting the extent of movement of the second element relative to the first element: and cooperating groove means provided on said first element, the magazine, the third element and the die including portions permitting the legs of a staple to pass along the die as far as the hook on which the legs of the staple are bent when the staple is pushed out of the magazine by the driving means.

4,101,064

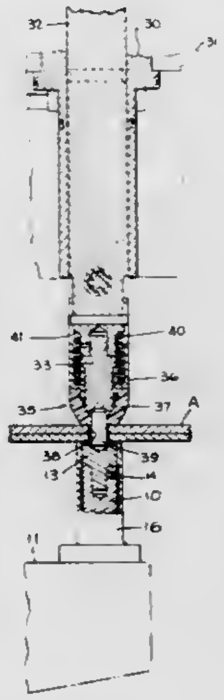
SLUG RIVETING APPARATUS

Joseph Vargo, Jr., West Seneca, and John W. Davern, North Tonawanda, both of N.Y., assignors to General-Electro Mechanical Corp., Buffalo, N.Y.

Division of Ser. No. 735,388, Oct. 26, 1976, Pat. No. 4,060,189. This application May 17, 1977, Ser. No. 797,682

Int. Cl.^{2} B21J *15/36*

U.S. Cl. 227—53 **4 Claims**



1. Apparatus for inserting a generally cylindrical rivet blank in workpieces and for forming heads at opposite ends thereof comprising a pair of coaxial head forming anvils at opposite sides of the workpieces and means for moving said anvils relatively toward each other to form said rivet heads, each of said anvils having a rivet head forming recess therein comprising a flat circular bottom wall of substantially the same diameter as the end of a rivet blank and a flaring side wall for guiding the associated end of said rivet blank into abutment with said bottom wall whereby the rivet blank is accurately positioned and held in coaxial alignment with said head forming anvils.

4,101,065

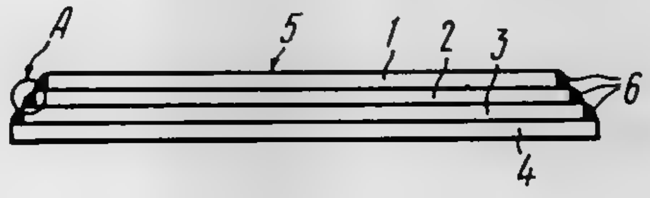
METHOD OF MANUFACTURING MULTILAYER CONVEX COLLARED COVERS AND BOTTOMS FOR PRESSURE VESSELS

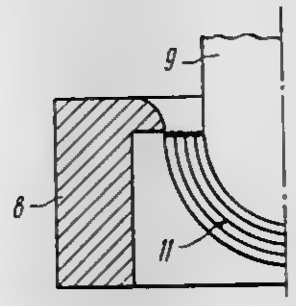
Alexandr Nikolaevich Novikov, ulitsa Kurchatova, 9, kv. 41; Evdokia Danilovna Kudrikova, ulitsa Sovetskaya, 160, kv. 7; Marat Moiseevich Shel, ulitsa Kievskaya, 4, kv. 15; Pavel Gdalievich Pimshtein, ulitsa Kurchatova, 9, kv. 45, all of Irkutsk; Nikolai Kirillovich Globin, ulitsa Griboedova, 20, kv. 64, Sverdlovsk; Boris Georgievich Ziselman, ulitsa Inzhenernaya, 71, kv. 45, Sverdlovsk; Vyacheslav Mikhailovich Potulov, ulitsa Griboedova, 19, kv. 14, Sverdlovsk; Alexei Mikhailovich Maletin, deceased, late of Irkutsk; by Ljubov Alexeevna Maletin, administrator, and by Tatyana Alexeevna Maletina, administrator, both of ulitsa Kurchatova, 56, kv. 41, Irkutsk, all of U.S.S.R.

Filed Nov. 18, 1976, Ser. No. 743,063

Int. Cl.^{2} B23K *31/02*

U.S. Cl. 228—155 **3 Claims**





1. A method of manufacturing multilayer convex collared covers and bottoms for pressure vessels including the steps of: assembling a pack of circular sheet blanks in the form of a truncated cone by placing one blank on another; forming said cone where the diameter of the upper smaller blank is equal to the developed length of the internal layer of the bottom; selecting the diameter of each subsequent blank so that the base angle of the truncated cone is equal to from 40°-65°; and welding said pack blanks one to another along their perimeter; stamping said blanks at a temperature of 800°-1100° C and preparing said blanks for further welding at surfaces to be subsequently welded.

4,101,066

SOLDERING METHOD AND APPARATUS UTILIZING DUAL SOLDER WAVES OF DIFFERENT VARIABLE VELOCITIES

Vincent A. Corsaro, Haverhill, and Ernst A. Gutbier, North Andover, both of Mass., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,559

Int. Cl.^{2} B23K *1/02*; H05K *3/34*

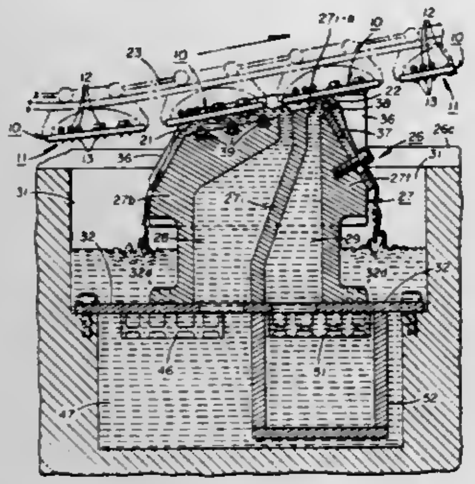
U.S. Cl. 228—180 R **10 Claims**

1. A method of soldering an electrical device which is movable along a predetermined path, which comprises:

producing a first solder wave which flows counter to the direction of movement of the electrical device along the predetermined path;

producing a second solder wave which flows in the direction of movement of the electrical device along the predetermined path;

moving the electrical device along the predetermined path so that the electrical device engages the first and second solder waves in succession; and

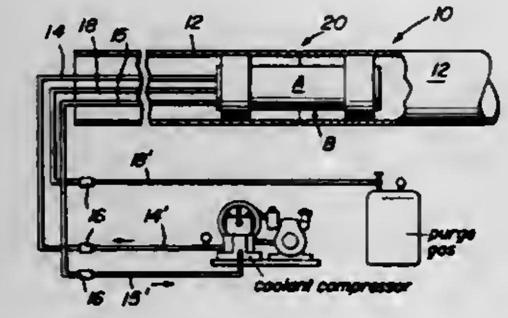


feeding solder to said first and second solder waves at different variable velocities indpendently of one another.

4,101,067
HEAT SINK WELDING AND PURGING APPARATUS

Marlo S. Sloan, and Arthur B. Renfro, Jr., both of Bakersfield, Calif., assignors to Sloan Purge Products Co., Inc., Bakersfield, Calif.

Filed Jul. 23, 1976, Ser. No. 708,224
Int. Cl.^{2} B23K *35/00*
U.S. Cl. 228—222 **22 Claims**



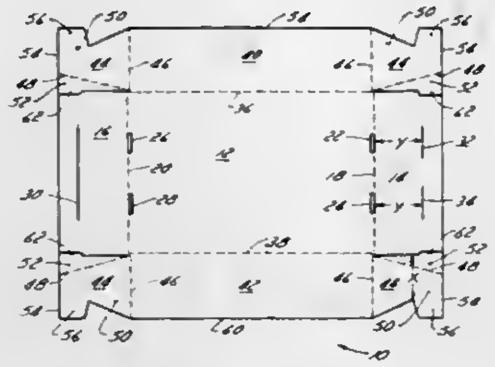
7. A purging and cooling apparatus for use with the welding of cylindrical members, comprising: inflatable means for expandable engagement with the cylindrical members to be welded adjacent the weld joint, and means for adding inflation and coolant medium to the inflatable means for inflating the inflatable means and cooling the area near the weld joint, the inflation and coolant medium being the same fluid material.

4,101,068
DIE CUT TRAY

Stanley Edward Buck, Montreal, Canada, assignor to Domtar Inc, Montreal, Canada

Filed Nov. 30, 1977, Ser. No. 856,011
Int. Cl.^{2} B65D *5/26*
U.S. Cl. 229—35 **7 Claims**

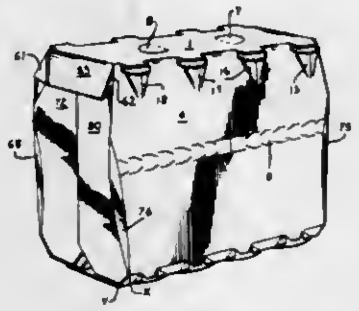
1. A blank forming a tray, comprising a bottom wall, end walls foldably connected one to each end of said bottom by a fold-line, at least one slit in each of said end wall, at least one slot in said bottom wall adjacent to each of said fold-lines, a pair of side walls one foldably connected to each side of said bottom wall by a fold-line substantially perpendicular to said fold-lines connecting said end walls to said bottom wall, end flaps foldably connected one to each end of each of said side walls by a fold-line substantially perpendicular to the fold-line connection between said side wall and said bottom wall, each of said end flaps terminating in a free end and being provided with an upper tab formed in said flap and a bottom tap projecting down from said flap and a diagonal fold line extending across said flap from said free edge toward the junction of the fold-line connection between said flap and said side wall to which it is attached and said fold-line connecting said side wall to which is attached to said bottom wall, said, at least one slit in each said end wall and said diagonal fold-line in each said flap being arranged so that each said end flap may be folded along said diagonal fold-line to permit movement of each said end flap into a position wherein the top edge and upper flap may be received in the adjacent of said slits in said end wall, when said end flap is in face to face relationship with its adjacent end wall, said lower tab being positioned to co-operate with the adjacent said slot in said bottom wall when said tray is erected.



4,101,069
ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 26, 1977, Ser. No. 845,471
Int. Cl.^{2} B65D *5/02*
U.S. Cl. 229—40 **5 Claims**

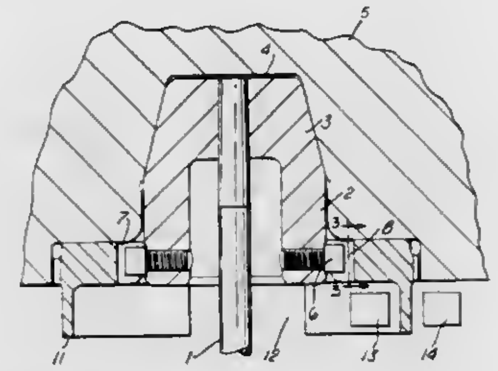


1. An article carrier comprising a top wall, a pair of side walls secured respectively to the side edges of said top wall, a bottom wall secured to the edges of said pair of side walls remote from said top wall, a connecting panel foldably joined to an end edge of one of said walls along a first arcuate fold line, an end panel foldably joined to said connecting panel remote from said one wall along a second arcuate fold line, said first and second arcuate fold lines being configured in a concave relationship with respect to said connecting panel, and said connecting panel being disposed inwardly with respect to the associated end of the carrier and at an acute angle to said one wall so as to impart inward bowing to said end panel.

4,101,070
CENTRIFUGE ROTOR COUPLING

Gordon Harold Hoare, Horsham, and Brian Walter Lovegrove, Crawley, both of England, assignors to Fisons Limited, London, England

Filed Jan. 24, 1977, Ser. No. 761,669
Claims priority, application United Kingdom, Feb. 7, 1976, 4848/76
Int. Cl.^{2} B04B *9/00*
U.S. Cl. 233—1 R **8 Claims**

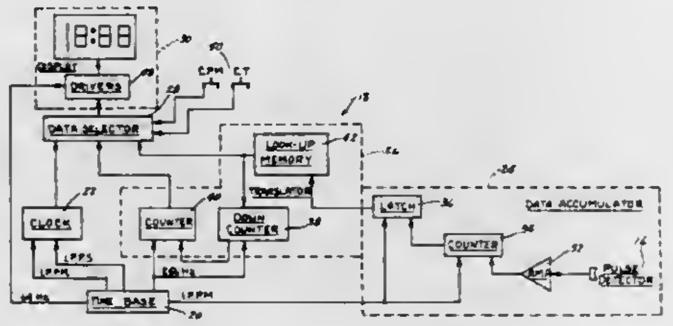


1. A centrifuge assembly comprising a rotor;
a rotatable drive shaft;
bayonet mounting means for removably engaging said rotor to said drive shaft,
said mounting means comprising a first member attached to one of said rotor and said drive shaft and a second member attached to the other of said rotor and said drive shaft,
said first member being provided with a central longitudinal recess and at least one peripheral socket communicating with said recess, said socket having at least two opposed side walls, at least one of which is inclined at an obtuse angle to a plane normal to the axis of rotation of said rotor;
said second member comprising a drive head adapted to be received in said recess of said first member, said drive head having at least one transverse pin extending radially outwardly therefrom and adapted to be received in said socket when said first and second members are engaged, whereby on relative rotation of said first and second members, said pin bears against said side wall to generate a longitudinal component of force tending to urge said first and second members together.

4,101,071
ELECTRONIC CALORIE COUNTER

Carl Brejnik, 1327 S. 79th, Omaha, Nebr. 68124, and William T. Whitlow, 217 W. Park La., Waterloo, Iowa 50701

Filed Apr. 4, 1977, Ser. No. 783,974
Int. Cl.^{2} G06M *3/06*
U.S. Cl. 235—92 MT **7 Claims**

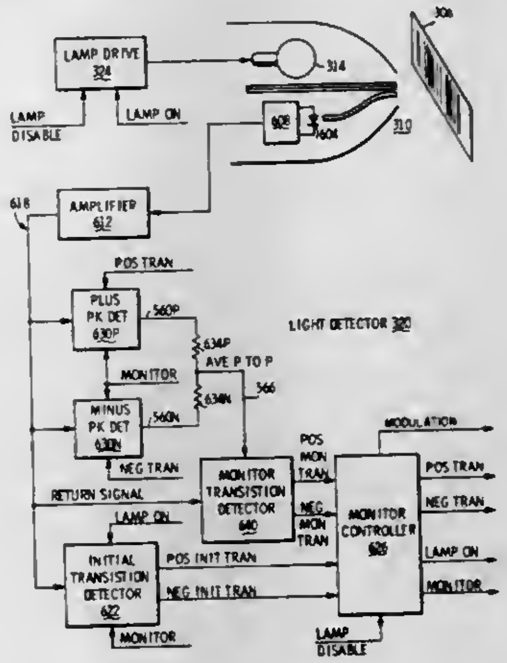


1. An electronic calorie counter comprising,
a portable pulse detector means adapted to be attached to a person's wrist and worn during daily activities for detecting the heart pulse of the person,
electronic circuit means including an electronic counter means operatively connected to said pulse detector means for totalizing the detected pulses for a predetermined time for determining the pulse rate,
electronic computer means operatively connected to said counter means for converting the detected pulse rate into the approximate calorie burn rate in response to programmed information in the computer means,
said electronic computer means including means for computing the calorie burn total, for a predetermined length of time, in response to the computed calorie burn rate,
and visual display means operatively connected to said means for computing the calorie burn total for displaying the computed calorie burn total.

4,101,072
DATA-GATHERING DEVICE FOR SCANNING DATA HAVING A VARIABLE AMPLITUDE MODULATION AND SIGNAL TO NOISE RATIO

Daniel J. Weaver, San Jose, Calif.; Robert Treiber, Centerport, N.Y., and Joseph Pernyeszi, Mountain View, Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,694
Int. Cl.^{2} G06K *7/10, 11/02*
U.S. Cl. 235—455 **7 Claims**



1. Apparatus having a standby mode for initially illuminating a data source in relative motion therewith with pulses of light and detecting initial transitions in the intensity of the light reflected from the data source, and having an operate mode thereafter for illuminating the data source with a continuous light and detecting subsequent transitions in the intensity of the light reflected from the data source, comprising:
a lamp driver means having a pulse output during the standby mode and a continuous output during the operate mode;
a lamp means responsive to the lamp driver for illuminating the data source with pulses of light during the standby mode and with continuous light during the operate mode;
a light sensitive means responsive to the transitions in the intensity of the light reflected from the data source for providing a return electric signal with corresponding transitions;
initial transition detecting means responsive to the return signal from the light sensitive means for detecting the transitions therein corresponding to the initial transitions in the reflected light;
mode control means responsive to the initial transition detecting means for temporarily establishing the continuous operate mode within the lamp driver;
resettable peak detector means for retaining the most recent plus and minus voltage peaks of the return signal from the

light sensing means for maintaining an average peak to peak signal; and

operate transition detector responsive to the average peak to peak signal from the peak detector means and to subsequent transitions in the return signal from the light sensing means for detecting transitions therein relative to the average peak to peak signal to provide transistion signals which reset the peak detector means to the most recent plus and minus voltage peaks.

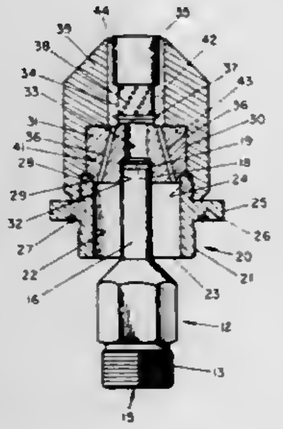
4,101,073
TWO-FLUID SPRAY NOZZLE PRODUCING FINE ATOMIZATION OF LIQUID

James Hall Curran, North Chelmsford, Mass., assignor to Spray Engineering Company, Nashua, N.H.

Filed Aug. 25, 1977, Ser. No. 827,701

Int. Cl.² F25C *3/04*

U.S. Cl. 239—14 **6 Claims**



1. A spray nozzle comprising:

(a) a base member having an inlet for air under pressure leading to an open-ended hollow post outstanding from the base member;

(b) a body member associated with the base member for the reception of water under pressure and for the flow of the water out of the body member;

(c) a distributor associated with the body member and having a closed-ended hollow post portion forming an axial continuation of the hollow post outstanding from the base member,

(i) the distributor also being provided with a base having an annular arrangement of water passages located exteriorly of the hollow post continuation portion to receive the water flowing out of the body member,

(ii) the distributor also being provided with a shoulder forming a knife-edged deflector in the paths of discharge of water from the distributor base passages,

(iii) the distributor hollow post continuation portion being provided with annular rows of passages leading from its interior and located downstream from the shoulder for the discharge of air outwardly into the water deflected by the knife-edged shoulder; and

(d) a cap associated with the body member substantially enclosing the distributor hollow post continuation portion in spaced relation thereto and provided with a discharge orifice, said cap and continuation portion forming a mixing chamber for the air and water prior to discharge from said orifice.

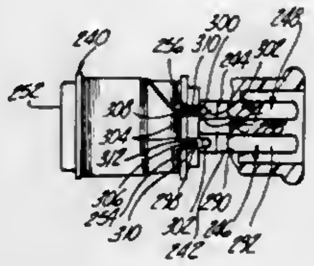
4,101,074
FUEL INLET ASSEMBLY FOR A FUEL INJECTION VALVE

Alexander Michael Kiwior, Warren, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 697,173, Jun. 17, 1976, Pat. No. 4,030,668. This application Mar. 25, 1977, Ser. No. 781,086

Int. Cl.² B05B *1/30*

U.S. Cl. 239—585 **1 Claim**



1. In a fuel inlet assembly for a fuel injection valve

(a) A fuel inlet connector comprising an inlet tube portion separated from an outlet tube portion by a radially extending flange portion, said flange portion having at least one terminal insulating post aperture therethrough between first and second flange sides; and

(b) a coil and terminal assembly comprising a coil bobbin and a thin terminal,

i. said coil bobbin having first and second radially extending flanges separated by an axially extending central portion positioned on said outlet tube portion, one of said bobbin flanges comprising a terminal insulating post extending axially therefrom through said aperture, said terminal insulating post having first and second ends separated by a thin slot extending the axial length of said post, said first end terminating at said one bobbin flange and said second end terminating outboard said second inlet connector flange side, said terminal post further comprising an oblong opening having a floor defined by said thin slot and a dimple locking wall extending radially outwards intermediate said first and second terminal post ends, and

ii. said thin terminal having a narrow length portion received in said thin slot, said narrow length portion having a dimple across substantially the entire width thereof, said dimple being engaged by said dimple locking wall to restrain said thin terminal from axial movement in said thin slot.

4,101,075
PULSATING FLUID SPRAY DEVICE

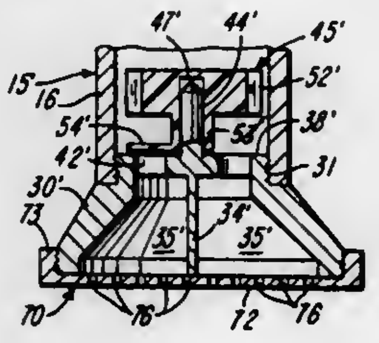
Charles J. Heitzman, 1024 Waieli St., Honolulu, Hi. 96821

Filed May 12, 1977, Ser. No. 796,190

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.² B05B *1/08*

U.S. Cl. 239—101 **7 Claims**



1. A pulsating fluid spray device adapted for use as a shower head, comprising a housing defining a fluid passage having an inlet adapted to be connected to a fluid supply, said housing including a discharge end portion having a plurality of angularly disposed partitions defining a corresponding plurality of fluid chambers therebetween, a discharge end wall connected to said housing and having means defining a plurality of nozzle discharge orifices for each of said fluid chambers, a generally flat stator wall connected to said housing and spaced upstream from said discharge end wall in generally parallel relation, said partitions extending from said stator wall to said discharge end wall, means defining a plurality of angularly spaced ports within said stator wall between said partitions and providing for a flow of fluid from said fluid passage directly into said fluid chambers, a turbine valve rotor including a projecting closure portion having a rotational path adjacent said ports for successively closing said ports momentarily restricting the flow of fluid from said fluid passage into said fluid chambers in response to rotation of said valve rotor, and means within said housing for directing the fluid along a path to produce rotation of said valve rotor for pulsating the fluid discharged from said orifices.

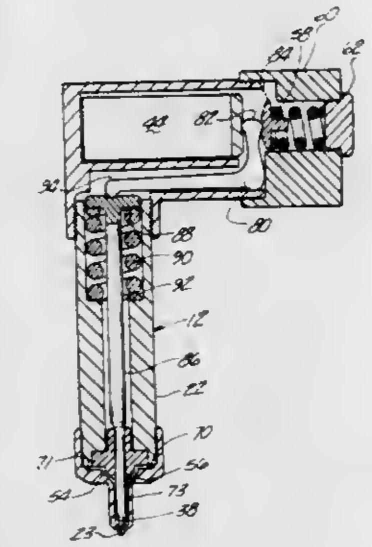
4,101,076
PIEZOELECTRIC FUEL INJECTOR VALVE

Hans U. Bart, Whitehall, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 509,892, Apr. 3, 1975, Pat. No. 4,022,166. This application Jan. 3, 1977, Ser. No. 756,201

Int. Cl.² B05B *1/30*

U.S. Cl. 239—584 **5 Claims**



1. A liquid fuel injector valve for an internal combustion engine said valve comprising:

a. a valve body adapted to contain liquid fuel therein under pressure, said valve body having a liquid fuel inlet port and a liquid fuel outlet port;

b. closure means movable between a first position where said closure means closes said outlet port to a second position where said outlet port is open;

c. a piezoelectric element cooperative with said closure means for effecting the movement of said closure means from said first position to said second position in response to an electrical potential imposed across said element;

d. biasing means for maintaining said closure means in said first position in the absence of said imposed potential;

e. a lever having a relatively short arm, a relatively long arm and a pivot point therebetween, means for biasing said short arm against said element so that said short arm follows the movements of said element, wherein said long arm is mechanically coupled to said closure means whereby said lever magnifies the stroke of said closure means relative to the stroke of said element; and

wherein the opening of said outlet port causes liquid fuel contained within said valve body under pressure to jet from said outlet port.

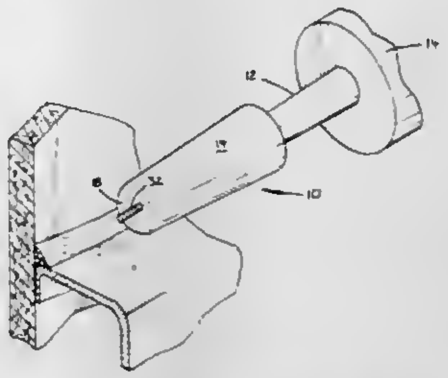
4,101,077
CAULKING SPOUT

Robert R. Gibson, Atlanta, Ga., assignor to William J. Van Horne, Atlanta, Ga.

Filed Apr. 4, 1977, Ser. No. 784,080

Int. Cl.² B05B *1/06*

U.S. Cl. 239—598 **10 Claims**



1. A caulking spout through which caulk may be dispensed from a dispenser into a corner joint at various angles of attack without an accompanying substantial change in the shape of the bead of caulk being dispensed and with the spout comprising a body elongated along a body axis merging with a rounded tip traversing said axis; an outlet orifice formed in said rounded tip to one side of and off said body axis; an inlet orifice formed in the end of said elongated body distal said rounded tip and a channel communicating between said inlet orifice and said outlet orifice with a first channel portion extending from said inlet orifice along said body axis and merging with a second channel portion diverging from said body axis and terminating at said outlet orifice.

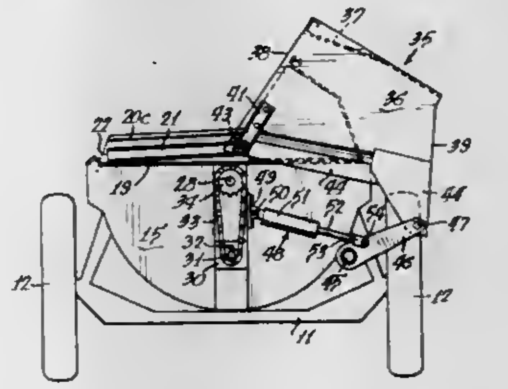
4,101,078
FLAIL TYPE MANURE SPREADER WITH ADJUSTABLE HOOD

James H. Hodgson, Vinton, Iowa, assignor to Chromalloy American Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 794,146

Int. Cl.² A01C *3/06*

U.S. Cl. 239—651 **17 Claims**



1. In a manure spreader of the type having a wheeled container which is substantially one-half a cylinder having upright, substantially semi-circular end walls, a driven shaft journalled on said end walls on the longitudinal axis of the cylinder, and flexible flails on the shaft to discharge manure over a discharge side of the container, and a fixed shield extending upwardly from a rear side of the container toward said discharge side, the improvement comprising, in combination:

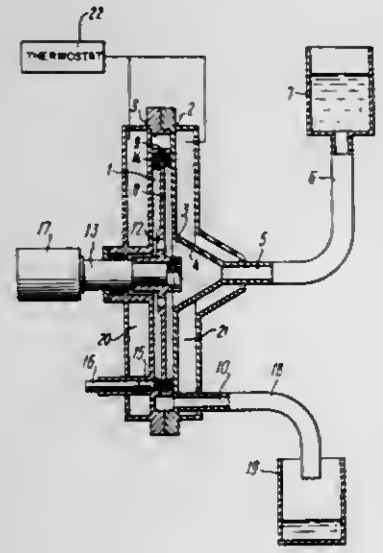
a hood having a top wall and upright end walls which are principally above said container end walls with lower portions overlapping the container end walls, said hood having a discharge side which is high above the discharge side of the container and having a rear side which is a short distance above the fixed shield;

- mounting means on the container operatively connected to said hood end walls and supporting the hood for fore-and-aft movement on the container between a first position with its discharge side contiguous to the discharge side of the container and a second position straddling said rear side of the container;
- and power operated means connected to said mounting means for moving the hood between said first and second positions.

4,101,079
BIOLOGICAL BALL MILL

Boris Abramovich Fikhte, Moscow; Grigory Aronovich Gurevich, Puschino Moskovskol oblasti; Vyacheslav Mitrofanovich Ushakov, Puschino Moskovskol oblasti, and Viktor Sergeevich Polpudnikov, Puschino Moskovskol oblasti, all of U.S.S.R., assignors to Institut Biokhimii I Fiziologii Mikroorganizmov, Puschino Moskovskol oblasti, U.S.S.R.

Continuation of Ser. No. 580,686, May 23, 1975, abandoned.
This application Sep. 3, 1976, Ser. No. 720,616
Int. Cl.² B02C *23/36*
U.S. Cl. 241—46.15 **6 Claims**

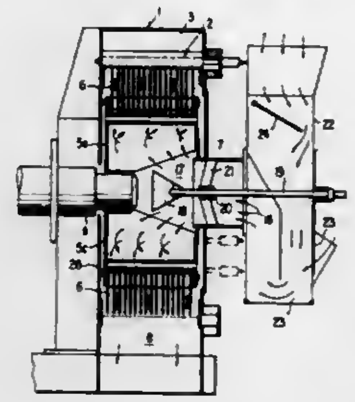


1. A disintegrator comprising a: cylindrical milling chamber having a width substantially smaller than the diameter thereof; said chamber having two end walls; an opening for feeding into said chamber a suspension of the material being disintegrated and located at the center of one of said end walls fo the milling chamber; openings for discharging from said chamber the suspension of disintegrated material in the cylindrical surface of said milling chamber; an agitator mounted at the center of said milling chamber and concentrically therewith; milling bodies made of a material having a density corresponding to the density of the suspension material being disintegrated, the space between said agitator and the inner walls of said chamber being constant and substantially equal to the thickness of 5 to 10 layers of said milling bodies.

4,101,080
BEATER MILL

Hartinus Thomsen Schmidt, Kolding, Denmark, assignor to Schmidt & Sonner Maskinfabrik A/S, Kolding, Denmark
Filed Jul. 7, 1976, Ser. No. 703,242
Claims priority, application Denmark, Jul. 11, 1975, 3176/75; Jan. 24, 1976, 2841/76
Int. Cl.² B02C *23/08*
U.S. Cl. 241—51 **3 Claims**

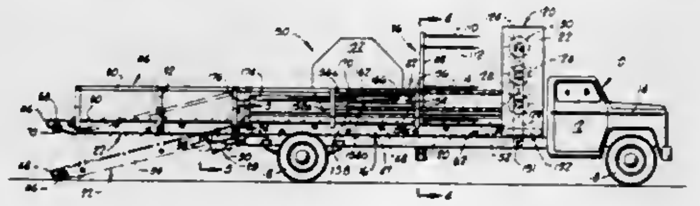
1. A beater mill comprising
- a cylindrical housing,
- a rotor mounted for rotation in said housing, said rotor including
- a hub and at least two fan blades arcuately spaced about the rotor axis, said fan blades each having
- a plurality of beaters thereon, the beaters of one of said fan blades being axially offset with respect to the beaters of another of said fan blades,
- said cylindrical housing including a peripheral screen area, the outer portions of said fan blades having an axial width corresponding to the width of said peripheral screen area, the inner portions of said fan blades having a reduced axial width and forming an axial recess in said rotor,



- inlet means for delivering both air and solids to said housing including an inlet duct terminating within said recess of said rotor coaxially therewith, a distributor mounted within said recess coaxially with said inlet duct and said rotor and for axial adjustment relative to said rotor, said peripheral screen area including a plurality of arcuate sections, each section being rigid and having axially-extending flanges, and mounting means on said housing including axial slots for carrying the flanges of said sections in sliding relationship.

4,101,081
HAY LOADING, TRANSPORTING AND FEEDING SYSTEM

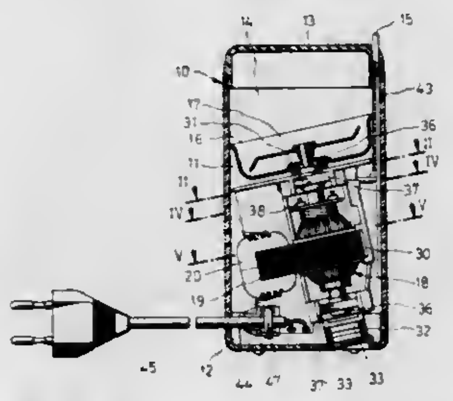
Orville A. Ritter, and Dale H. Ritter, both of Alva, Okla., assignors to Ritter Brothers Enterprises, Inc., Alva, Okla.
Filed Mar. 14, 1977, Ser. No. 777,566
Int. Cl.² B02C *13/286*
U.S. Cl. 241—101.7 **27 Claims**



1. A vehicular system for loading, transporting and feeding baled hay comprising:
- an elongated bed having a forward end and a rear end;
- ground-engaging wheels supporting the bed;
- a rearwardly extending bed extension pivotally connected to the rear end of said bed for pivotal movement about a horizontal axis into a ramp-forming position;
- a bale moving conveyor, having a pair of parallel transversely spaced endless chains each having an upper run and a lower run, supported on said bed and said bed extension and each of said chains extending from the forward end of said bed to the rear end of said bed extension and including a portion movable with said bed extension during the pivotal movement thereof;
- bale-retaining fences disposed on opposite sides of said bed and bed extension;
- a lateral bale pick-up cradle assembly pivotally mounted on one side of said bed for pivotal movement about a horizontal axis from a vertically extending position upwardly from said one side of the bed to a position extending downwardly and outwardly from said one side of said bed; and
- a bale cutting and disintegrating assembly mounted on said bed at the forward end thereof for receiving a bale of hay moved forwardly on said conveyor.

4,101,082
ELECTRIC MOTOR-DRIVEN COFFEE MILL

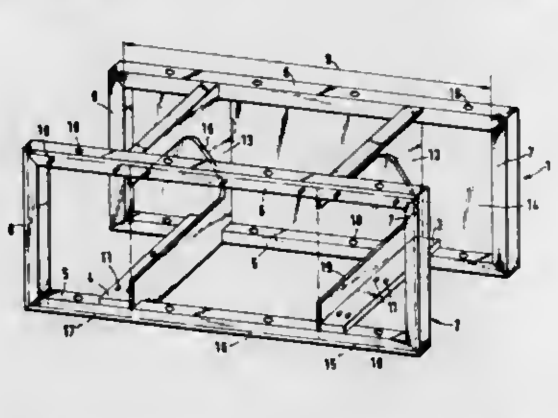
Rolf Mayer, and Max Speckhart, both of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany
Filed May 2, 1977, Ser. No. 792,864
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620800; May 15, 1976, 2621681
Int. Cl.² B02C *18/24*
U.S. Cl. 241—282.1 **12 Claims**



1. In an electric motor-driven coffee mill having a housing with a grinding cup disposed therein above the bottom of the housing, a drive motor in the housing disposed beneath the bottom of the grinding cup, and a rotatably supported comminuting tool disposed above the bottom of the grinding cup and driven by the drive motor, the improvement comprising said grinding cup being at least approximately circular and obliquely arranged in said housing, said drive motor being a salient-pole motor with an asymmetrically arranged field coil, the axis of said salient-pole motor being inclined such that the field coil extends on one side beyond a projection of the cup perpendicular to the oblique plane of the grinding cup, and the contours of said salient-pole motor lie inside a cylinder formed by a projection of the cup perpendicular to a horizontal plane.

4,101,083
HOUSING FOR ROLL STANDS FOR GRINDING CEREALS OR SIMILAR MATERIAL

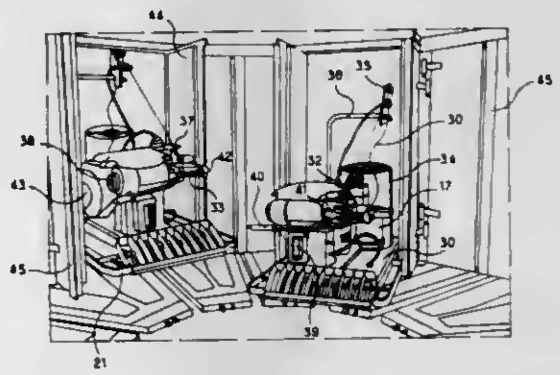
Walter Faist, Vechelde, Fed. Rep. of Germany, assignor to Buhler-Miag GmbH, Braunschweig, Fed. Rep. of Germany
Filed Mar. 9, 1977, Ser. No. 775,984
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610742
Int. Cl.² B02C *4/02, 23/00*
U.S. Cl. 241—285 R **4 Claims**



1. A housing for roll stands for grinding cereals or similar material comprising a support structure including rigid, vertical frames each having an internal length greater than a roll stand to be mounted in said housing; a pair of transverse bars connecting said frames in spaced relationship to each other; and cover means connected to said support structure for enclosing a space in which the grinding operation is to be performed, said cover means including a pair of vertical transverse walls extending spaced from each other and spaced from opposite ends of said frames between the latter for partly enclosing said space, each of said transverse walls being formed with a cutout permitting frontal insertion of a roll stand into the support structure and removing a roll stand therefrom.

4,101,084
WORK-POST CONSOLE FOR SEMI AUTOMATIC MACHINES

Pierre André; Robert Caretti; Michel Depoutot, and Gérard Mercet, all of Pontarlier, France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France
Filed May 5, 1977, Ser. No. 794,191
Claims priority, application France, May 31, 1976, 76 16381
Int. Cl.² H01F *41/02;* **B65H** *54/02, 54/72*
U.S. Cl. 242—7.11 **17 Claims**



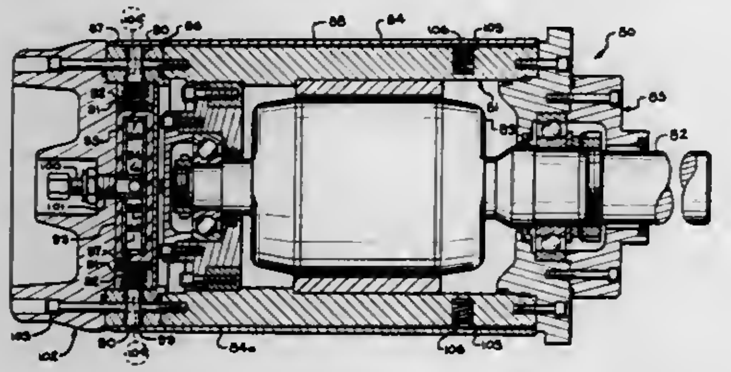
1. A work-post for semi-automatic machines comprising: multiple cabins, each accommodating one of said machines, and said work-post further including means for movement and guidance of the machines in advancement out of their cabins and return to them, means for opening and closing the cabins as the machines are respectively advanced and retracted, means for indicating that machines have completed their tasks, and means for control of the motion of said machines in and out of their cabins.

4,101,085
RADIALLY EXPANSIBLE COLLET FOR A TUBULAR SLEEVE

David Michael Arno, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.
Filed Jun. 28, 1976, Ser. No. 700,103
Int. Cl.² B65H *54/74, 75/30, 79/00*
U.S. Cl. 242—18 G **10 Claims**

1. A radially expansible supporting collet for a light-weight tubular sleeve, said collet comprising,
- (a) a tubular housing mounted for rotation,
- (b) a plurality of axially extending ribs on the exterior of said housing, each of said ribs having a cross-section of larger circumferential extent at its outer portion than at its inner portion,
- (c) axially elongated sleeve-contacting bars mounted on each of said ribs in rib-embracing relationship thereto for limited radial movement relative to the associated one of said ribs, and
- (d) a circular bladder at only one end of the housing for moving the corresponding ends of said bars radially outwardly for expanding the effective diameter of said collet

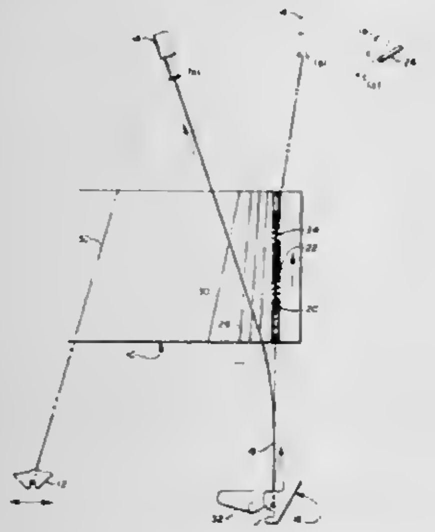
for engagement of said bars with the inner surface of said sleeve and resilient means carried by said housing for biasing the other ends of said bars in their radially outward position.



4,101,086

YARN TIE-UP AND TRANSFER TAIL METHOD, AND YARN PACKAGE TUBE AND APPARATUS FOR THE METHOD

William A. Thomas, Jr., Bristol, Va., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 20, 1977, Ser. No. 817,276
Int. Cl.² B65H *54/02, 54/34, 75/28*
U.S. Cl. 242—18 PW **31 Claims**



1. In a textile yarn package tube particularly adapted for use in high speed rotary winding operations of yarn, said tube comprising a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of said body and extending at least partly around said body in a plane substantially perpendicular to the rotation axis of the tube, the improvement comprising: a corner formed in one of the groove side walls intersecting at an angle with said one side wall of the groove and pointing generally in the direction of intended rotation of the tube and adapted in rotary winding of yarn operations, as a yarn enters the groove in one direction of movement, for snagging yarn exiting from the groove and deflecting said yarn around said corner for changing the direction of movement of the exiting yarn to thereby trap and sever the yarn for winding.

22. Apparatus for forming a yarn transfer tail on a yarn package tube that is supported on a rotating mandrel of a yarn winder, the yarn moving continuously from a source of supply to the yarn package tube for engagement with a portion of the surface thereof and away from the yarn package tube, the portion of said surface to be engaged rotating in the same direction as the direction of yarn movement, the yarn winder having a self-threading yarn traverse guide reciprocating along a path parallelly spaced from the package portion of the yarn package tube, the supported yarn package tube comprising:

a. a substantially cylindrical body having formed in its external surface adjacent one end thereof a groove defined by a pair of side walls extending into the surface of the cylindrical body and extending at least partly around said cylindrical body in a plane substantially perpendicular to the rotation axis of the tube, and

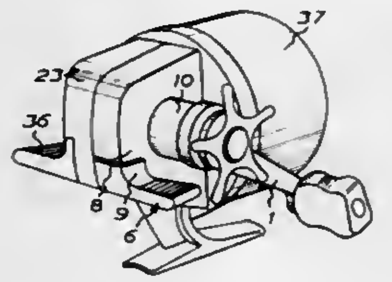
(b) the cylindrical body also having a corner formed in one of the groove side walls intersecting at an angle with said one side wall of the groove and pointing generally in the direction of intended rotation of the tube and adapted in rotary winding operations, as a yarn enters the groove in one direction of movement, for snagging a portion of the yarn exiting from the groove and deflecting said yarn around said corner for changing the direction of movement of the exiting yarn portion as said corner rotates with said tube away from where the yarn approaches said surface portion of the tube; the apparatus comprising:

means for positioning the continuously moving yarn in engagement with said surface portion of the yarn package tube in a partial arch at an initial location that is away from and out of contact with the groove and said corner; said positioning means including means for guiding the yarn sideways along the surface of the rotating yarn package tube toward the groove and said corner until the yarn drops into the groove and the exiting portion of the yarn engages said corner and becomes snagged and deflected therearound, thereby changing the direction of movement of the exiting yarn portion as said corner rotates with the tube away from where the yarn approaches said surface portion of the tube, and consequently tying-up the yarn to the tube, and subsequently snapping and severing the yarn from the yarn moving away from the tube; and said positioning means also including means guiding the continuously moving yarn, as consequently tied-up to the rotating supported tube, to form a waste bunch of a predetermined number of wraps and a transfer tail of a predetermined number of spaced helical wraps adjacent to the waste bunch, with subsequent release of the guided yarn to be picked-up by said yarn traverse guide for guiding the yarn as the yarn package is wound.

4,101,087

BRAKING DEVICE IN A NON-ROTARY TYPE FISHING REEL

Kurt Johan Stausgaard Harre, Karlshamn, and Kenth Anker Thufvesson, Asarum, both of Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden
Filed Jul. 1, 1976, Ser. No. 701,962
Claims priority, application Sweden, Jul. 7, 1975, 7507747
Int. Cl.² A01K *89/01, 89/02*
U.S. Cl. 242—84.2 A **10 Claims**



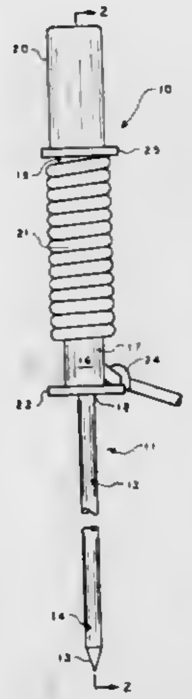
1. A braking device in a non-rotary type fishing reel having a transmission and comprising
a hand crank and a line winding member,
gear means located between said hand crank and said line winding member and including
a face gear drivable by said hand crank having a substantially smooth peripheral friction surface of revolution and teeth on a side face,
a pinion gear connected to said line winding member and positioned to engage said teeth of said face gear

a gear housing supporting said gear means,
a reel frame supporting said gear housing,
a lever thumb-operated friction braking knob of the type of lever formed by a bar with its fulcrum between an area of thumb applied power on one side of said fulcrum and a frictional braking area on the other side of said fulcrum, pivotally mounted at the rear of said gear housing, and having an operating position including said area of thumb applied power extending exteriorly of said housing, and a braking portion including said frictional braking area extending into said housing, and located for moving said frictional braking area into contact with said peripheral friction surface of revolution to exert a braking moment on said peripheral surface of revolution proportional to the pressure exerted on said operating portion.

4,101,088

MANUAL IMPACT STAKE DRIVING APPARATUS

Tommy E. Stauth, 110 Plaza Ave., Dodge City, Kans. 67801
Filed Sep. 27, 1976, Ser. No. 726,527
Int. Cl.² B65H *75/34, 75/28;* **B25D** *1/04*
U.S. Cl. 242—85 **1 Claim**

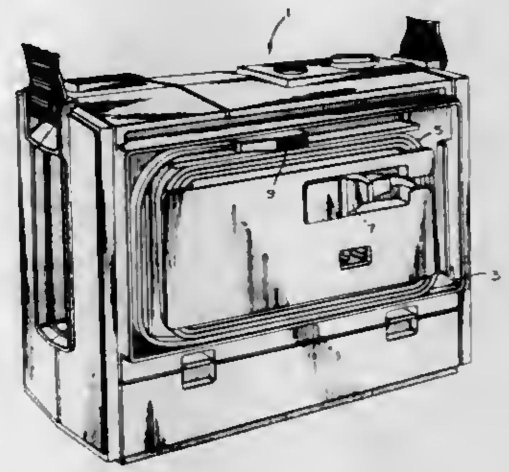


1. A manually driven, removable stake apparatus for anchoring and securing watercraft at an adjustable distance therefrom, said stake apparatus comprising in combination:
a stake having a piercing point at one end thereof and a driving and pulling stake head at the opposite end thereof, said stake head having upper and lower impact surfaces thereon;
sleeve means having upper and lower impact stops at opposite ends thereof for slidably confining said stake head therebetween, whereby said stake may be manually driven into a surface in response to impact between the upper impact surface of said stake head and the upper impact stop of said sleeve means, and may be manually pulled from such surface in response to impact between the lower impact surface of said stake and the lower impact stop of said sleeve means;
flange means disposed radially on said sleeve means for restricting the depth to which said stake may be driven in such surface;
a quantity of line storable on said sleeve means;
means on said sleeve means defining spool means for rotationally receiving and storing said line thereon; and
line hook means secured to and carried by said sleeve means for hooking about said line to prevent, during periods of pulling force against said line, rotation of said sleeve means and thereby to prevent paying out of said hooked line.

4,101,089

INTEGRAL STORAGE ASSEMBLY FOR DETACHABLE POWER CORDS

Richard Culbertson, and Paul J. Klucznik, both of Manlius, N.Y., assignors to General Electric Company, Syracuse, N.Y.
Filed May 23, 1977, Ser. No. 799,459
Int. Cl.² B65H *75/36*
U.S. Cl. 242—85.1 **10 Claims**

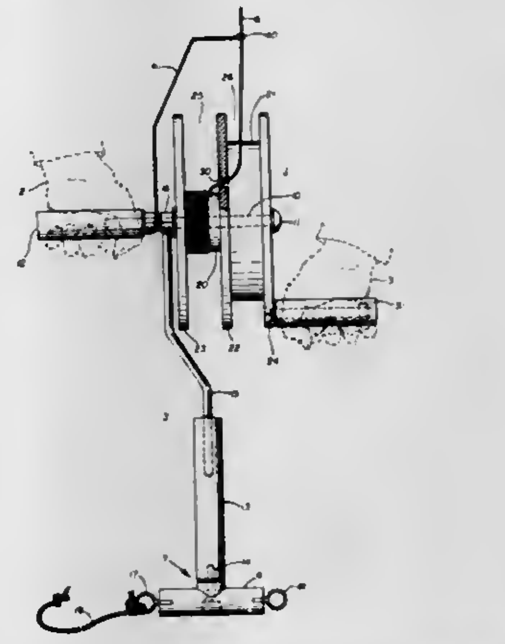


1. A storage assembly for storing on an external surface of a portable electrical device a detachable power cord having male and female ends, comprising:
a. a wrapping surface extending at approximately right angles to said external surface and arranged to provide a closed path on said surface,
b. at least a portion of said wrapping surface having an outwardly projecting overhanging extension disposed approximately parallel to said external surface,
c. first means joined to said external surface for securing the female end of the power cord, and
d. second means joined to said external surface for securing the male end of the power cord, whereby said power cord can be wrapped around said wrapping surface and held in place between said external surface and overhanging extension with its male and female ends secured.

4,101,090

REEL STRUCTURE

Albert L. Walt, Jr., 406 S. Peoria, Tulsa, Okla. 74101
Filed Jul. 21, 1977, Ser. No. 817,562
Int. Cl.² B65H *75/40*
U.S. Cl. 242—96 **6 Claims**



1. A reel structure with which line is retrieved and discharged, including,

an axle,

a first hub with a finite diameter mounted on the axle for rotating about the axle,

a second hub with the diameter different from that of the first hub and concentrically mounted on the axle for rotation with the first hub,

a first plate captured between the two hubs and mounted to rotate with the hubs as a unit on the axle,

second and third plates, each mounted on the outside ends of the assembly of two hubs with diameters greater than the hubs to form contiguous grooves with the first plate upon which line may be wound and unwound,

retaining structure mounted at the outer edge of the first plate in a position to be actuated to engage and direct a line being wound and unwound on the first of the hubs that the line may be wound and unwound on the second of the hubs,

and means for rotating the assembly of plates and hubs about the axis of the axle as the line is wound and unwound from either of the hubs.

4,101,091

VEHICLE SAFETY BELT APPARATUS

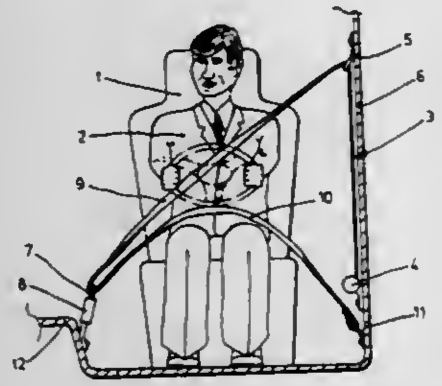
Günter Breitfeld, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed May 20, 1976, Ser. No. 688,487

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2525035

Int. Cl.² A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **4 Claims**



1. In a vehicle safety belt apparatus, including a safety belt winding device, having a spring activated roller for retracting a safety belt, and a safety belt, mounted on said roller and having a first belt portion comprising at least the portion of said safety belt remaining on said roller wheo said safety belt is applied to a vehicle occupant and a second belt portion comprising the remainder of said belt, said first belt portion having a greater longitudinal rigidity than said second belt portion, the improvement wherein the belt material forming said first belt portion is itself substantially non-resilent and more rigid than the belt material forming said second belt portion.

4,101,092

UNIVERSAL EMERGENCY LOCKING RETRACTOR

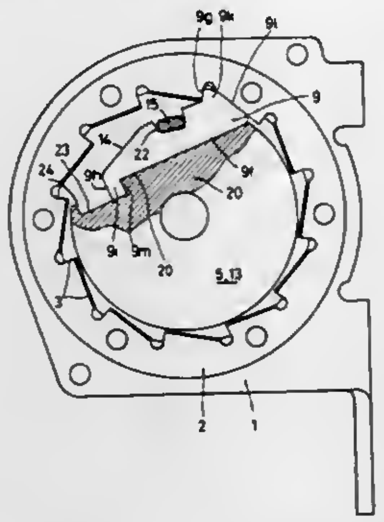
Harald Martin Schmelow, Ellerau/Krs. Segeberg; Per Olof Weman, Hasloh, and Heino Arff, Henstedt-Ulzburg, all of Fed. Rep. of Germany, assignors to N.V. Klippan S.A., Haasrode, Belgium, a part interest

Filed Apr. 9, 1976, Ser. No. 675,406

Int. Cl.² B65H *75/48;* A62B *35/02*

U.S. Cl. 242—107.4 B **8 Claims**

1. A retractor for safety belts, having a housing, a locking ring containing internal teeth and being fixed relative to said housing, a shaft rotatably mounted about an axis for retracting an extensible belt, an inertia element rotatably mounted on said shaft and adapted to lag in rotation relative to said shaft upon a predetermined acceleration thereof, a locking element slidably movable in a plane perpendicular to said axis of said shaft, said inertia element having means for moving said locking element relative to said axis in response to said predetermined angular acceleration of said shaft to effect locking engagement between said locking element and said locking ring, said shaft being provided with a partly circular disc having a chord that comprises a linear cam surface, and said locking element comprising an internal linear cam-follower surface in sliding engagement with said linear cam surface, said inertia element being in engagement with said locking element to hold said locking element at a constant distance from said axis, whereby said locking element moves in a direction opposite to the direction of rotation of said shaft upon predetermined shaft acceleration to produce locked engagement with said locking ring.



4,101,093

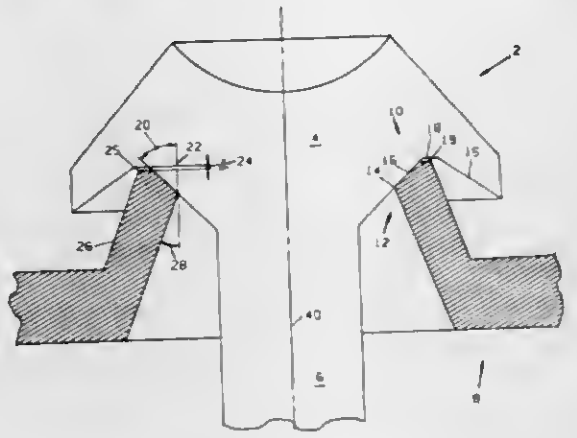
FRICTION DAMPENED PENDULUM SENSOR

Arduino Colasanti, East Detroit, Mich.; Josef M. Cachla, Louvain, Belgium, and Heino Arff, Henstedt-Ulzburg, Fed. Rep. of Germany, assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 11, 1976, Ser. No. 740,909

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **4 Claims**



1. In a safety belt retractor having a pendulum for sensing a change in acceleration, deceleration or orientation of a vehicle in which said retractor is mounted, said pendulum including a substantially circular pendulum head, a pendulum stem connected to a pendulum weight and a substantially circular support for said pendulum head, said pendulum head having an overhang around an outer circumference of said pendulum head, an improvement for avoiding undesired actuation of said pendulum comprising:

a first circumferential contact surface on a portion of an underside of said pendulum head, said first contact surface extending circumferentially around an inner circumference of at least part of said underside of said pendulum head and extending radially from a point adjacent to said pendulum stem to said overhang;

a second circumferential contact surface on said support; at least part of said first contact surface of said pendulum head resting on at least part of said second contact surface of said support, at least part of said second contact surface supporting said pendulum head;

said first contact surface and said second contact surface each having a circumferential substantially linear inclined portion and a circumferential horizontal portion, said inclined portions disposed at an angle with reference to a vertical line, said horizontal portion of said first contact surface extending outward radially from said inclined portion of said first contact surface to said overhang of said pendulum head, and said horizontal portion of said second contact surface extending outward radially from said inclined portion of said second contact surface to an outer circumference of said second contact surface;

said horizontal portions extending outward radially from an outer circumference of said inclined portions, at least part of said inclined portion of said first contact surface resting on at least part of said inclined portion of said second contact surface, said contact surfaces having a gap between said horizontal portion of said first contact surface and said horizontal portion of said second contact surface; and

said pendulum support comprising an upwardly extending circumferential projection upon which said pendulum head pivots during actuation.

4,101,094

DEVICE FOR USE IN EMERGENCY LOCKING MECHANISM FOR WEBBING-TYPE SAFETY BELTS

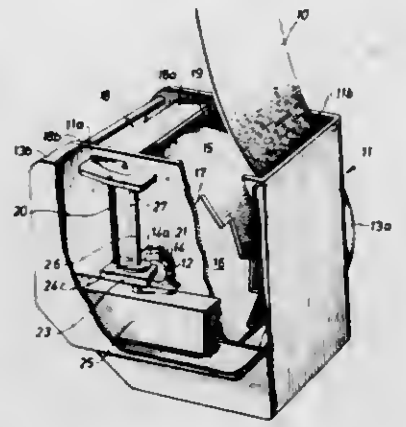
Jan-Olof Wallin, Ellerau, Fed. Rep. of Germany, assignor to Irvin Industries, Inc., Greenwich, Conn.

Filed Nov. 26, 1976, Ser. No. 745,217

Claims priority, application Sweden, Dec. 3, 1975, 7513642; Dec. 3, 1975, 7513643

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **12 Claims**



1. A device for use in emergency locking of webbing-type vehicle safety belts, comprising

a frame adapted to be mounted on a vehicle,

a spindle rotatable on said frame and having a webbing-type belt wound thereon,

a locking mechanism on said frame operable to stop rotation of said spindle in a belt-withdrawing direction,

a tension sensing element on said frame movable in response to a predetermined increase in the tension of said belt from a sensing position to a lock operating position where it causes said locking mechanism to operate,

a vehicle-triggered member on said frame responsive to sudden changes in the speed or direction of said vehicle to move from a neutral position to an operative position in which it operates during withdrawal of said belt to effect said predetermined increase in the tension in said belt and to cause said tension sensing element to be moved to its lock operating position,

a spring urging said vehicle-triggered member from its neutral position toward its operative position, and

means including an inertia element releasably holding said vehicle-triggered member in its neutral position, and responsive to sudden changes in the speed or direction of said vehicle to release said member,

said tension sensing element being operative, when moved to its lock operating position by release of said vehicle-triggered member from its neutral position, automatically to return said vehicle-triggered member to its neutral position.

4,101,095

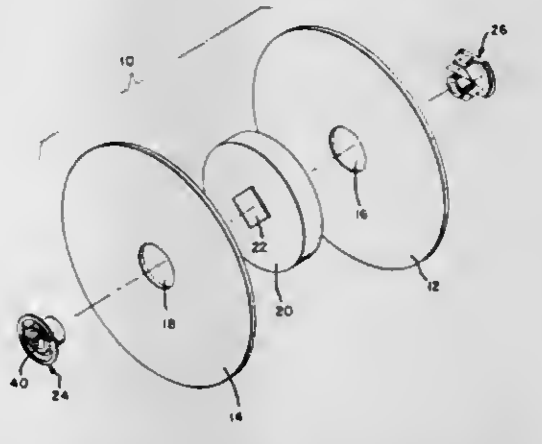
ADJUSTABLE AND EXPANDABLE SPOOL OR REEL ASSEMBLY

Clyde Thomas Carter, Shermans Dale, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 24, 1977, Ser. No. 809,741

Int. Cl.² B65H *75/22, 75/14*

U.S. Cl. 242—115 **8 Claims**



1. An expandable spool or reel assembly comprising:

a pair of rigid sidewall members each having a central aperture;

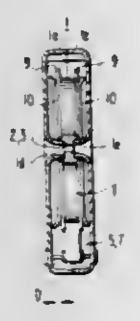
a spacer member having a profiled central aperture; and

a mating pair of inner and outer hub members, each said hub member having a base portion receivable in a respective one of said apertures of said sidewalls and a radial flange adapted to engage the surrounding sidewall member, said outer hub member having a substantially cylindrical portion extending coaxially from said base portion, a bore through said cylinder, at least one inwardly directed arcuate flange at the free end thereof, and an abutment extending the length of said bore from one edge of said flange, said inner hub member having a substantially centrally located locking portion extending from said base with a plurality of interrupted rings on the outer surface thereof, each ring comprising at least one radially extending arcuate flange, and at least one keying member extending from said base portion and profiled for engagement in the central aperture of said spacer member, whereby said arcuate flanges of said inner member are passed between the arcuate flanges of the outer member and the hub members rotated relatively to bring said arcuate flanges into locking engagement.

4,101,096
MAGNETIC TAPE CASSETTE

Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Sep. 15, 1976, Ser. No. 723,369
Claims priority, application Japan, Sep. 17, 1975, 50-112451
Int. Cl.^{2} G03B *1/04;* **G11B** *15/32, 23/04*
U.S. Cl. 242—199 **7 Claims**

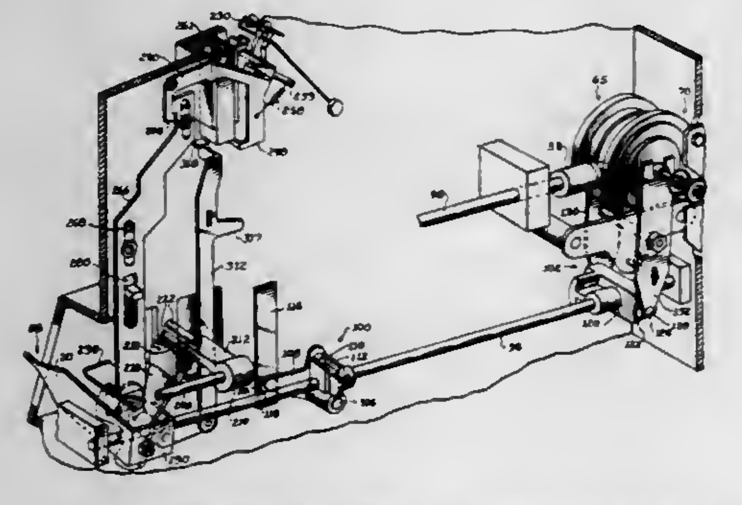


1. In a magnetic tape cassette unit of the type having at least one reel therein for reeling and unreeling a magnetic tape thereon, said reel being disposed in a housing having an upper wall and a lower wall confining said tape, the improvement comprising a plurality of elastically tensioned sheets, each having embossed projections projecting from a surface thereof, said projections positioned on said surface to press the tape edges along an axis parallel to the axis of said reel to maintain said tape in preferred position in the width direction thereof, said sheets being curved at a radius of curvature to elastically urge said projections against said tape edges, and wherein: said sheets each having a thickness in the range of 50 μ to 150 μ and said embossed projections have an overall diameter in the range of 1mm to 10mm, a projection height in the range of 5 μ to 20 μ and a pitch in the range of 1mm to 10mm.

4,101,097
DRIVE CONTROL APPARATUS FOR MOTION PICTURE PROJECTOR

Raymond W. H. Kim, Skokie; Edward H. Lodge, Wilmette, and Arthur L. Loeders, Mundelein, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,249
Int. Cl.^{2} G03B *1/04;* **G11B** *15/32*
U.S. Cl. 242—205 **20 Claims**



1. A drive control mechanism for selectively actuating a motion picture projector to several operational modes to transport film between a supply device and a take-up device, the drive control mechanism comprising:

means positionable in a plurality of positions for selecting projector operating modes including means for translating said plurality of positions into corresponding predetermined axial and rotational positions and movements;

means having a unidirectional input and being coupled to said supply device and said take-up device for selectively driving said supply device and said take-up device, said selective driving means including a dual clutch assembly arranged for continuous engagement with said unidirectional input and means provided for each of said clutch assemblies of said dual clutch assembly for actuating a respective one of said clutch assemblies of said dual clutch assembly, each of said clutch actuating means being positionable in at least a first position corresponding to said respective clutch assembly being in a free, non-actuated drive condition and a second position corresponding to said respective clutch assembly being in an engaged drive condition;

means selectively and simultaneously engaging each of said clutch assemblies for braking operation of said supply and take-up devices;

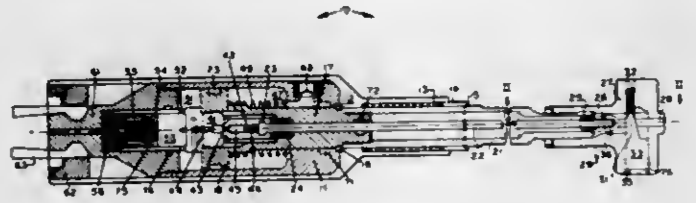
means coupled to said position translating means for controlling each of said clutch actuating means; and

means coupled to said position translating means for controlling said braking operation means to be simultaneously applied to each of said clutch assemblies during predetermined operating modes for stabilizing the film transport between the supply and take-up devices.

4,101,098
STRAIN ACTUATED HYDRAULIC HOLDBACK BAR

William H. Hickle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,414
Int. Cl.^{2} B64F *1/06, 1/12*
U.S. Cl. 244—63 **8 Claims**



1. In a hydraulic holdback bar of the type used for temporarily restraining an aircraft against the combined forces of engine thrust and catapult force prior to a catapult assisted launch of said aircraft, wherein said holdback bar has means for attachment to a runway surface and means for releasable attachment to said aircraft, and has a housing and a central plunger operative within said housing to pressurize a fluid in a pressure chamber in response to said combined forces, and has means for venting said fluid from said pressure chamber into a separate receiving chamber in response to a predetermined combined force enabling relative motion between said plunger and housing for triggering release of said aircraft, and has means for returning said fluid from said receiving chamber to said pressure chamber to reset said holdback bar for additional launches, the improvement comprising:

said plunger defining a resilient hollow shank and having a longitudinal axis;

said venting means comprising a valve having a body and a head, said valve body being attached to said plunger and defining a first passageway communicating between said pressure chamber and said receiving chamber, said valve head being movable along said longitudinal axis between open and closed positions, and operative in said closed position with said valve body to close said first passageway, said valve head being resiliently biased toward said closed position;

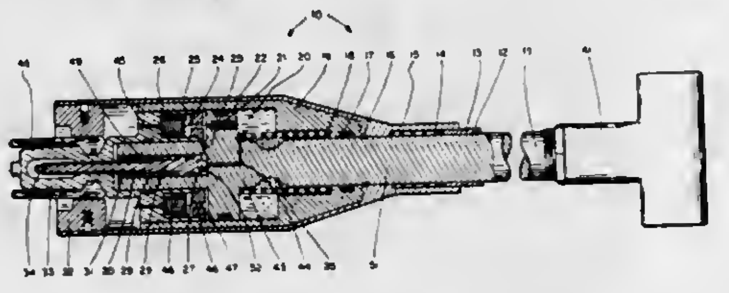
an elongated triggering rod having first and second ends, said first rod end engaging said valve head and operative to move said valve head from said closed position to said open position in response to tensile force within said rod, and said rod extending within said hollow shank to said second rod end at a location spaced from said valve head; and

means for applying tensile force to said triggering rod in reponse to said predetermined combined force.

4,101,099
REPEATABLE RELEASE HOLDBACK BAR

William H. Hickle, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 15, 1977, Ser. No. 833,425
Int. Cl.^{2} B64F *1/06, 1/12*
U.S. Cl. 244—63 **5 Claims**



1. In a repeatable release holdback bar of the type used for temporarily restraining an aircraft against the combined forces of engine thrust and catapult force prior to a catapult assisted launch of said aircraft, wherein said holdback bar has means for attachment to a runway surface and means for releasable attachment to said aircraft, and has a housing and a central plunger operative within said housing to pressurize a fluid in a pressure chamber in response to said combined forces, and has means for venting said fluid from said pressure chamber into a separate receiving chamber in response to a predetermined combined force level to enable relative motion between said plunger and housing for triggering release of said aircraft, and has means for returning said fluid from said receiving chamber to said pressure chamber to reset said holdback bar for additional launches, the improvement comprising:

said plunger defining a bore separate from said pressure chamber and said receiving chamber;

a piston sealingly slidable within said bore between closed and open positions, and resiliently biased toward said closed position;

said piston and bore defining an unloading chamber; said venting means comprising said plunger defining a first passageway communicating between said pressure chamber and said unloading chamber, and a second passageway communicating betwen said unloading chamber and said receiving chamber; and

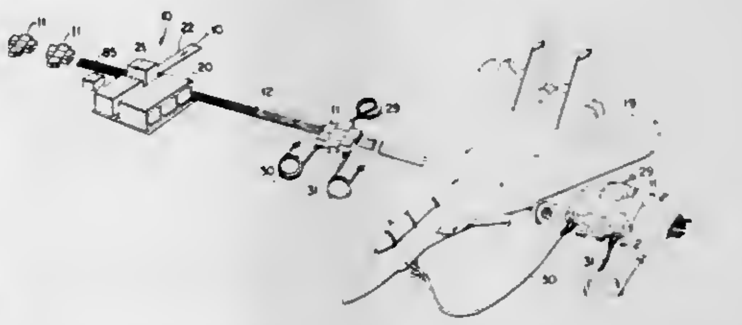
a sphere contained within said unloading chamber and cooperating with said piston in said closed postion to seal said first passageway.

4,101,100
AIRCRAFT FLIGHT LINE SERVICING SYSTEM

David W. Smith, Alexandria, Va.; Raymond C. LeBlanc, Potomac, and J. Allen Oliver, Silver Spring, both of Md., assignors to Value Engineering Company, Alexandria, Va.

Filed Jul. 28, 1976, Ser. No. 709,318
Int. Cl.^{2} B64F *1/28, 1/34*
U.S. Cl. 244—114 R **6 Claims**

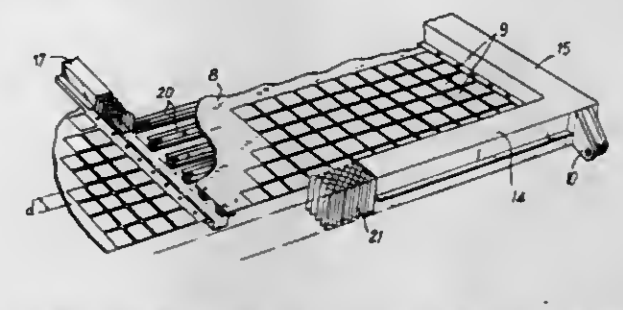
1. An aircraft flight line servicing system comprising a source of electrical energy having an electrical output at a predetermined voltage and frequency, an air compressor unit having an air output, a plurality of air and electrical distribution lines connected to said air and electrical outputs and positioned upon the flight line surface, a ramp having sloping longitudinal edges disposed over said air and electrical distribution lines and having a height of about 3.5 inches to enable aircraft tires to pass thereover, a plurality of service islands disposed on the flight line surface serially connected to all of said air and distribution lines and to said ramp and spaced apart a distance sufficient to accommodate two aircraft between successive islands, each island having a maximum height of about 4.5 inches and a tapering configuration so that an aircraft can taxi over the island, each island having air and electrical connections thereon to service aircraft.



4,101,101
SOLAR GENERATOR

Gérard Barkats, Mandelieu-la-Napoule; Claude Chenin, Cannes-la-Bocca; Jean Foucras, Mougins, and Louis Marnay, Mouans Sartous, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 28, 1977, Ser. No. 791,932
Claims priority, application France, May 3, 1976, 76 13098
Int. Cl.^{2} B64G *1/10*
U.S. Cl. 244—173 **14 Claims**



1. A solar generator capable of producing electrical energy from solar energy including at least one panel, said panel comprising:

an open frame having a pair of opposed sides and a pair of opposed ends;

a plurality of spaced, generally parallel intermediate stiffeners, each of which extends between and is connected to said sides;

a plurality of spaced, generally parallel auxiliary stiffeners transverse to and extending between adjacent intermediate stiffeners and between a stiffener and an adjacent one of said ends;

said frame and said intermediate stiffeners each comprising two mirror image sub-assemblies fastened together, each sub-assembly having a cross-section including a central cavity and a flange adjacent each edge thereof, said subassemblies being positioned with their flanges in contact;

a thin flexible sheet-like support disposed within said frame and at least partially fixed to said auxiliary stiffeners; and

a plurality of solar cells carried on said flexible support.

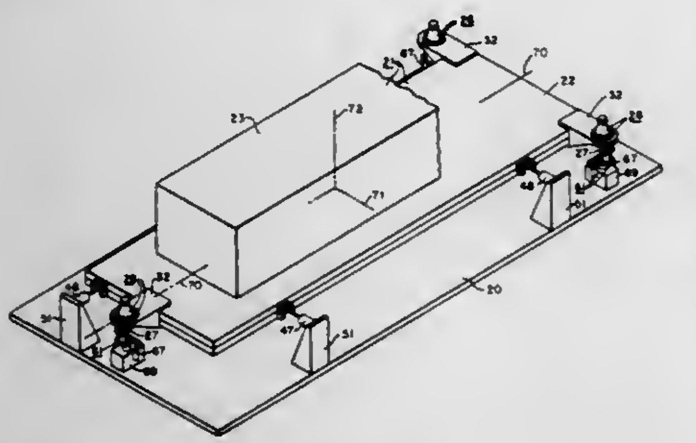
4,101,102
VIBRATION ISOLATION LOAD SUPPORT APPARATUS

Wayne B. Lloyd, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 680,255
Int. Cl.^{2} F16F *15/04, 11/00*
U.S. Cl. 248—20 **4 Claims**

1. Load support apparatus comprising a vibration-prone mounting member and a load-bearing mounted member,

a plurality of vertically-movable four-axis joint means carried by said mounting member and supporting said mounted member at horizontally spaced apart locations with freedom for relative movement between the two members in the vertical, longitudinal, lateral, roll, pitch, and yaw modes, and

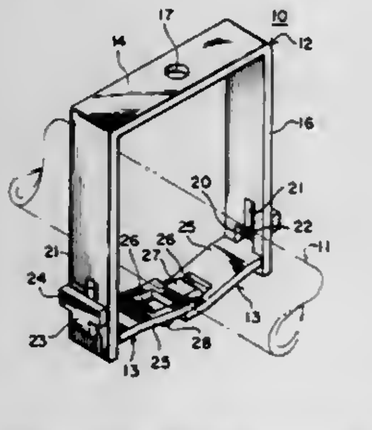


actuator means for effecting active vibration isolation in each of the aforesaid modes.

4,101,103
CRADLE TYPE CONDUIT HANGERS

Thomas Mooney, Mt. Sinai, and Sami Shemtov, Central Islip, both of N.Y., assignors to I.T.E. Imperial Corporation, East Farmingdale, N.Y.

Continuation of Ser. No. 591,408, Jun. 30, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,011
Int. Cl.² F16L *3/12*
U.S. Cl. 248—58 8 Claims

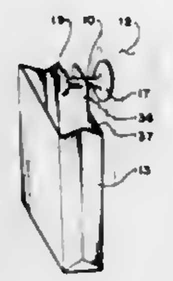


1. A conduit hanger comprising an overhead bracket including a pair of laterally spaced depending legs delineating an access opening between their lower portions, and gate means supported by said bracket, and movable between a depressed closed position restricting said access opening and a raised open position providing access through said opening, said gate means being normally urged toward its closed position and being movable to its open position in response to an upward pressure thereon, said bracket legs being substantially coextensive and having pivot openings formed proximate their lower ends, said gate means comprising a closure arm extending from each of said legs toward the other leg and including a reduced width shank proximate its outer end rockably engaging a respective pivot opening and provided with an upwardly directed lug terminating in a stop section defining a transverse stop member engaging the outer face of the corresponding bracket leg when said closure arm is in said depressed closed position.

6. A conduit hanger comprising an overhead bracket including a pair of laterally spaced depending legs delineating an access opening between their lower portions, gate means supported by said bracket and movable between a depressed closed position restricting said access opening and a raised open position providing access through said opening, said gate means being normally urged toward its closed position and being movable to its open position in response to an upward pressure thereon, and comprising a closure arm swingably supported by and extending from each of said bracket legs toward the other said bracket legs and disposed across said access opening in overlapping relation when said gate means is in its closed position and each being upwardly swingable in response to an upward pressure thereon to receive a conduit, and means for restricting the downward swinging of each of said closure arms including stop sections located on each closure arm and its corresponding bracket leg and movable into mutual abutting engagement when said closure arms swing to their closed overlapping position to prevent further depression thereof and support the conduit, at least one of said closure arms having an opening therein proximate its inner end and the other arm terminating in a depending lug engaging said opening when said closure arms are in registry with said access opening.

4,101,104
UTILITY KNOB

Marguerite F. Minard, Wenatchee, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Dec. 14, 1976, Ser. No. 750,470
Int. Cl.² A47F *5/00*
U.S. Cl. 248—95 1 Claim



1. A knob for mounting to a flat surface which serves as a hanger for a litter bag, said knob formed of a shaft joined at one shaft end to a first disc and to the opposed shaft end to a second circular disc, with

the external surface of the first circular disc coated with a self-adhering plastic material, and with

the external surfaces of the second circular disc formed as a continuous convex surface,

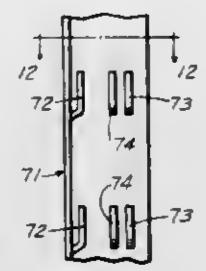
said disc generally oriented along parallel planes together with

a litter bag formed with a tab section, said tab section shaped with a circular hole of substantially the diameter of the diameter of the knob shaft, said hole intersected by a pair of opposed slots that extend a total distance of the general diameter of the second circular knob disc, with the width of each slot being substantially the maximum thickness of the said second circular knob disc, to permit the tab section of the litter bag to be readily detachably mounted to the knob.

4,101,105
SHELVING STRUCTURE

Guy J. DiCenzo, 5650-C Via Romano, Charlotte, N.C. 28211
Division of Ser. No. 599,767, Jul. 28, 1975. This application Dec. 27, 1976, Ser. No. 754,331
Int. Cl.² F16M *13/00*
U.S. Cl. 248—158 1 Claim

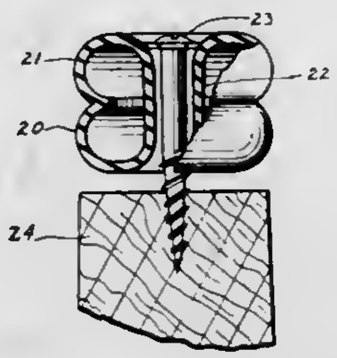
1. A supporting post for shelving structure, which is right angular in cross-section, both of the legs thereof having upwardly pointing prongs on their inner sides and one of the legs also having an upwardly pointing prong on its outer side, all of



the prongs being at the same relative distance along the length of the post so that they are aside of each other.

4,101,106
CUSHION LEVELER FOR TABLES AND CHAIRS

Marian C. Denkinger, 88-35 Elmhurst Ave., Elmhurst, N.Y. 11373, and Kemal Batova, 1607 N. Belmore Ave., Staunton, Va. 24401
Filed Apr. 27, 1976, Ser. No. 680,881
Int. Cl.² F16M *11/20*
U.S. Cl. 248—188.9 1 Claim



1. A device for levelling a piece of furniture, such as a table or chair, on a floor, so that the piece of furniture will maintain a stable equilibrium relative to unevenness in the piece of furniture or the floor comprising;

a double torus-shaped closed blister being filled with air, said blister being formed of deformable plastic material having an elastic lag with a memory of its formed shape, said blister having upper and lower faces;

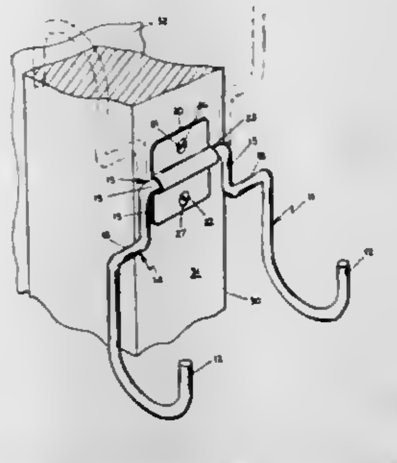
means for attaching said blister to a foot of a piece of furniture with one of its faces in abutment therewith; and

said blister having a central diametrical opening extending therethrough and said device additionally including a screw receivable and mountable within said opening for attaching said blister to a foot of a piece of furniture.

4,101,107
FOLDING WALL BRACKET

Alex Joseph Antoszewski, Michigan City, Ind., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed Sep. 13, 1976, Ser. No. 722,810
Int. Cl.² F16M *13/02*
U.S. Cl. 248—218.4 6 Claims

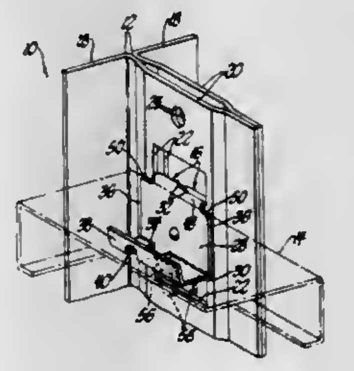
1. A bracket adapted to be mounted on the narrow face of a stud-like support, said bracket having a plate-like base piece adapted to seat against and be secured to the narrow face of said support, the improvement in said bracket comprising: a one-piece article engaging member having an arm, a base element extending from said arm, said base element having a first portion and a second portion generally normal to said first portion and when said member is in extended position extending generally parallel to the plane of the base piece and a third element extending from the end of the second element generally parallel to said first portion and joined to the arm, said first portion pivotally secured to said base piece, the second portion of the base element being adjacent the base piece and the base element being dimensioned to space the arm away from the base piece whereby if said base is dimensioned narrower than the face of the stud-like support and if said second portion of said base element is dimensioned to space the arm to one side of the stud-like support said second portion of said base element is adapted to rest against the face of the support when the



member is in extended operating position and the arm will be above the base piece with the arm seated on one side of the support when the member is in retracted storage position, the center of gravity of the member in extended position biasing if forwardly and downwardly and the center of gravity of the member biasing it rearwardly when the member is in retracted position.

4,101,108
SHELF CLIP

Thomas A. Klein, Plainwell, Mich., assignor to Lear Siegler, Inc., Kalamazoo, Mich.
Filed Jun. 6, 1977, Ser. No. 803,711
Int. Cl.² A47G *29/02*
U.S. Cl. 248—243 5 Claims



1. A shelf clip comprising a clip body having a vertically extending attachment flange with opposite lateral sides and upper and lower ends, a support flange extending horizontally from the lower end of the attachment flange to support a shelf thereon, a lower positioning tang at the lower end of the attachment flange to one side or the other of the center between the lateral sides thereof, said positioning tang being struck from the support flange so as to extend downwardly from the attachment flange and horizontally therefrom in the opposite direction as the shelf support flange, and an upper support hook at the upper end of the attachment flange located to one side or the other of the center between the opposite lateral sides of the attachment flange.

4,101,109

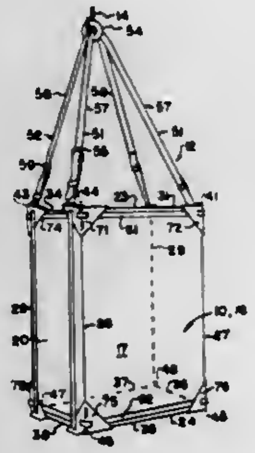
LOUDSPEAKER HARNESS

Aubrey John Edwards, 7987 Gilley Ave., Burnaby, British Columbia, Canada

Filed Dec. 14, 1976, Ser. No. 750,522

Int. Cl.² B65C *1/12*

U.S. Cl. 248—317 **5 Claims**



1. A loudspeaker harness for supporting a loudspeaker, the loudspeaker including a housing having: at least four generally vertical walls, namely front and rear walls and a pair of spaced side walls, and two horizontal walls, namely top and bottom walls, the walls intersecting at four generally vertical edges and eight generally horizontal edges; the housing also having at least eight corners, each corner being positioned at an intersection between two horizontal edges and one vertical edge; the harness being characterized by:

(a) first and second longitudinal links passing under the bottom wall of the housing and extending upwardly adjacent opposed vertical walls, at least one link extending to an upper link portion adapted to cooperate with a support to hang the loudspeaker therefrom,

(b) upper and lower circumferential links passing around the four vertical walls to form two loops enclosing the housing and being disposed within spaced generally horizontal planes positioned generally adjacent the top and bottom walls respectively,

(c) eight corner pocket members, one member being fitted at each corner of the housing to engage the corner of the housing and to cooperate with, and to restrict relative movement between, one longitudinal link and one circumferential link adjacent the particular corner, and in which each corner pocket member includes:

(i) first and second vertical portions to fit against the two vertical walls intersecting at the corner, each vertical portion having an opening having a size sufficient to accept the circumferential link threaded therethrough so as to form circumferential link engaging means,

(ii) a horizontal portion to fit against the horizontal wall intersecting the two vertical walls at the particular corner, the three portions intersecting each other along sides thereof to form a pocket generally complementary to the corner of the housing to restrict movement of the housing relative to the links,

(iii) a tang extending outwardly from an intersection of the horizontal portion with one vertical portion, the tang having an opening therein to form a longitudinal link engaging means to accept the longitudinal link threaded therethrough, so as to maintain the links in a desired position relative to the housing.

4,101,110

MOUNTING ARRANGEMENT FOR AN ADJUSTABLE VEHICULAR SEAT

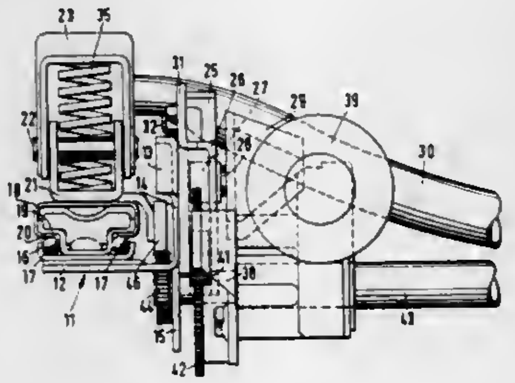
Hans Werner Voss, Wuppertal, and Bernd Klüting, Radevormwald, both of Fed. Rep. of Germany, assignors to Keiper Antomobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Jul. 28, 1977, Ser. No. 819,828

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634529

Int. Cl.² A45D *19/04*

U.S. Cl. 248—395 **12 Claims**



1. In an adjustable seat, particularly a motor vehicle seat, a combination comprising a seat element having front, rear and lateral regions; and means for mounting said seat element for adjustment of the position thereof, including two mounting arrangements each arranged at one of said lateral regions of said seat element and each including first support means associated with said front region and second support means associated with said rear region of said seat element, said first support means including an elongated first guide track extending substantially horizontally, a support rail telescopically guided on said first guide track and having a free front end, and a pivot connecting said front region of said seat element to said front end of said support rail for pivoting relative thereto, said second support means including an elongated second guide track which is inclined upwardly in the forward direction, and a support member connected to said rear region of said seat element and supporting the latter on said second guide track, said second support means being arranged laterally adjacent said first support means.

4,101,111

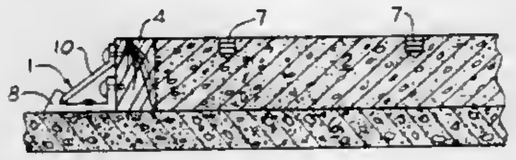
BLOCK AND BRACE ASSEMBLY

Byron Norman Bishop, 4121 Casa Loma, Yorba Linda, Calif. 92686

Continuation-in-part of Ser. No. 747,157, Dec. 3, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,648

Int. Cl.² B28B *17/00*

U.S. Cl. 249—205 **20 Claims**



1. A block and brace member assembly to support a mold form during the formation of a present panel within said mold form, said block and brace member assembly including:

a block member comprising a plate means and first and second arms connected to respective first and second ends of said plate means, each of said arms being angled with respect to said plate means,

the first angled arm of said block member adapted to be connected to said mold form, and

a brace member comprising a plate means and at least a first arm connected to one of first and second ends of said brace member plate means, the first arm of said brace member being angled with respect to said brace member plate means,

the first angled arm of said brace member adapted to be connected to said mold form at a point above the corresponding connection of the first angled arm of said block member to said mold form,

the second end of said brace member plate means received by the second angled arm of said block member plate means.

4,101,112

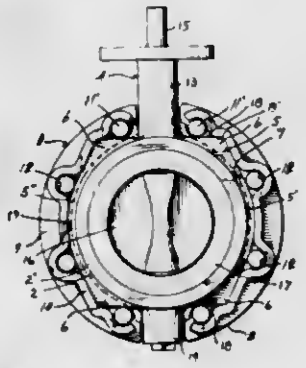
PIPE LINE COUPLING SYSTEM

John A. Conners, 510 Main St., Bridgeport, Conn. 06604, and Hyman Posner, 61-16th St., Roxboro, Canada

Division of Ser. No. 744,704, Nov. 24, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,146

Int. Cl.² F16K *1/22*

U.S. Cl. 251—148 **2 Claims**



1. A clamp for securing in fluid-proof manner a wafer type butterfly valve to the radially outwardly extending annular coupling flange at the end of a pipe, said coupling flange having a series of equally spaced bolt receiving apertures arranged in a circle around the pipe, said wafer type butterfly valve being of the type including a generally circular flat valve body having opposite flat end faces, a radially projecting bonnet and a diametrically opposite boss aligned along a common axis, said valve body further including an apertureless wafer flange projecting from the middle plane of said body and having opposite flat faces parallel to and recessed from the respective flat end faces of said valve body, said wafer flange forming two diametrically opposite flange portions each having two straight end edges and an intermediate arcuate edge, said straight end edges making an angle with said arcuate edge, each of the two straight end edges of one flange portion being aligned with a corresponding straight end edge of the other flange portion and extending along a line substantially perpendicular to said common axis, said two flange portions adapted to clear said bolt receiving apertures, said clamp including two separate clamp members each engageable with a flange portion of said valve body on one side of said bonnet and said boss, each clamp member being a mirror image of the other and including a flange section and a collar section rigid with said flange section and substantially perpendicular thereto, said flange section being flat and of arcuate shape and adapted to overlap a flange portion of said valve body and to extend around said valve body, said flange section having a thickness smaller than the axial distance between a flat end face of said valve body and the corresponding recessed flat face of said valve body flange portion, each flange section having a series of equally spaced bolt receiving holes adapted to register with half the number of bolt receiving apertures of said coupling flange, said collar section forming an inner arcuate surface complementary with and adapted to closely surround said arcuate edge of said flange portion and, at both ends of said inner arcuate surface and making an angle therewith, a straight surface adapted to closely extend along the corresponding straight end edges of said flange portions, said collar section clearing the bolt receiving holes of said flange section.

4,101,113

STOPCOCK WITH ROTARY AND ADJUSTABLE PLUG IN THE STOPCOCK HOUSING

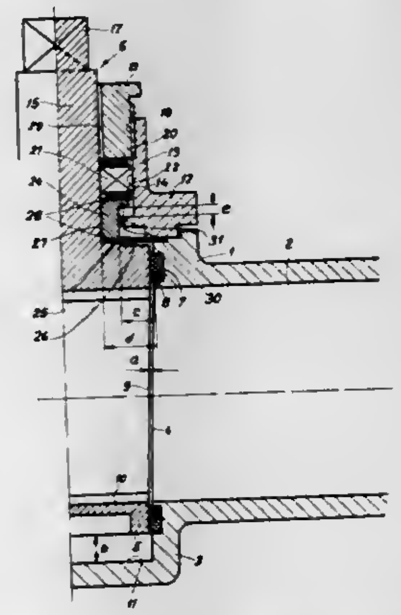
Kurt Plessing, Lindau, Fed. Rep. of Germany, assignor to Fördertechnik Streicher GmbH, Bad Schussenried, Fed. Rep. of Germany

Filed Jul. 6, 1976, Ser. No. 702,724

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1975, 2529641

Int. Cl.² F16K *5/00*

U.S. Cl. 251—214 **9 Claims**



1. A stopcock comprising in combination, a housing; a rotary and adjustable plug in said housing; a fixedly mounted liner of flexible material with a substantially smooth sliding surface at a bottom part of said housing; a shaft member displaceable for controlling the flow through said stopcock; a packing disk clamped at its outer edge to said housing and pressed tightly at its inner periphery to an upper surface of the said plug; a gasket located in a cylindrical annular space formed between said shaft member and a wall of said housing; a reset member projecting into the annular space, said reset member being reciprocably received in said annular space for resetting the stopcock, a reset force of said reset member acting via said gasket and packing disk on the stopcock bottom part for resetting in a conical seat,in said liner; a fixed stop on said housing, a substantially rigid ring-shaped member movable reciprocably in said annular space in response to reciprocable movement of said reset member, said fixed stop limiting the reciprocable movement, said gasket being enclosed on all sides and acting onto said packing disk through said ring-shaped member; said ring-shaped member having a reciprocable path between said reset member and said plug limited in the reset direction by said fixed stop, said ring-shaped member transmitting reset forces to said plug, said ring-shaped member being stopped by said fixed stop when said liner has received a predetermined amount of wear, further reciprocation by said reset member compressing further said gasket.

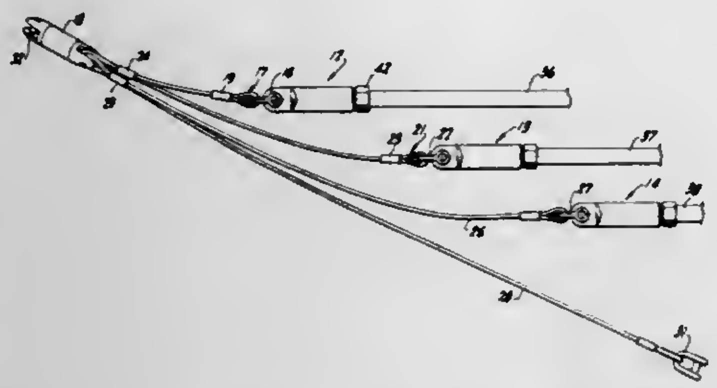
4,101,114
CABLE PULLING SYSTEM

Bernard L. Martin, San Rafael, and Bruce N. Vogel, South San Francisco, both of Calif., assignors to Carpenter Rigging and Supply Company, Inc., San Francisco, Calif.

Filed Oct. 12, 1977, Ser. No. 841,306

Int. Cl.^{2} E21C *29/16*

U.S. Cl. 254—134.3 FT **6 Claims**



1. A system for pulling electrical cables through a conduit comprising

a plurality of gripping means adapted to positively engage the ends of electrical cables in axial extension therefrom,

a swivel connector adapted to engage a line for drawing the system through a conduit, and

flexible connecting means having looped ends connected to said swivel means and said gripping means with lengths intermediate said looped ends being different to dispose said gripping means apart, at least the length of a gripping means.

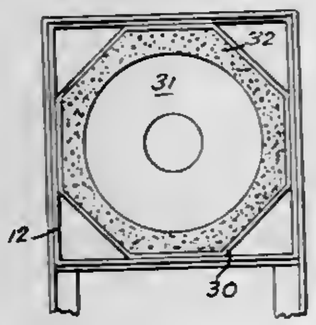
4,101,115
CRASH CUSHION

Lester N. Meinzer, 4331 Sierra Madre Dr., Sacramento, Calif. 95825

Filed Feb. 3, 1977, Ser. No. 765,290

Int. Cl.^{2} A01F *3/00*

U.S. Cl. 256—13.1 **6 Claims**



1. A crash cushion barrier comprising a plurality of cushions aligned in a linear series, one behind the other, means for securing said cushions to a concrete base, a frame disposed within each of said cushions, a tapering conical void within said frame oriented so that its open largest end is at the forward end of the cushion, a compressible material between said conical void and said frame formed from aerated vermiculite plaster of paris and portland cement wherein the frame is octagonal and strengthened by fiberglas threads wrapped around the outside so as to retain the compressible material.

4,101,116
APPARATUS FOR MIXING GRANULATED AND/OR PULVEROUS MATERIALS

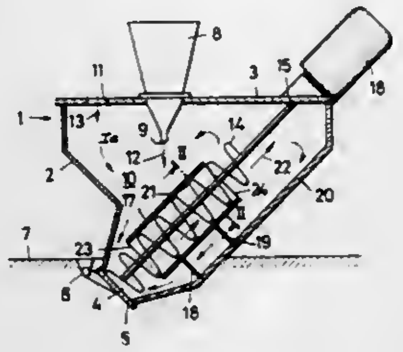
Franz Haag, Isny, and Paul Bougartz, Isny-Kleinhaslach, both of Fed. Rep. of Germany, assignors to MOTAN Gesellschaft mit beschränkter Haftung, Isny, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,620

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545078

Int. Cl.^{2} B01F *7/00, 15/02*

U.S. Cl. 366—142 **12 Claims**



1. An apparatus for mixing granulated and pulverous materials including synthetic materials and dye stuff which comprises: a housing defining a mixing chamber for receiving material to be mixed, said housing comprising wall means inclined in normal position of said apparatus relative to a horizontal plane, said housing also having means for introducing said material to be mixed into said mixing chamber, and also having outlet means for releasing intermixed materials from said mixing chamber, mixing means rotatably arranged within said housing for cooperation with at least a portion of said wall means so as to form a gap therewith for conveying said material to be mixed along said gap against the force of gravity in response to the rotation of said mixing means in the desired mixing direction, said inclined wall means including a hollow cylindrical body arranged within said housing and at least partially surrounding the operative portion of said mixing means, a portion of said inner surface of said hollow cylindrical body defining a portion of said gap.

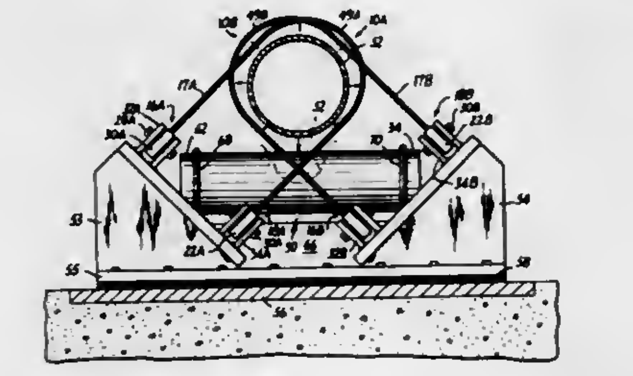
4,101,117
IMPACT ENERGY ABSORBING PIPE RESTRAINTS

George H. East, Jr., Randolph; Norman A. Goldstein, Framingham; John M. Peech, Cambridge; Shelden D. Pirotin, Melrose; Robert E. Roemer, Brighton, and Albert J. Spada, Wilmington, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 7, 1976, Ser. No. 703,229

Int. Cl.^{2} F16F *7/12;* F16L *3/00*

U.S. Cl. 267—136 **6 Claims**



1. A pipe restraint for absorbing the impact energy of a ruptured high energy pipe and restraining movement thereof in at least one direction, comprising:

a restraining pipe of a short length positioned adjacent the high energy pipe and arranged transversely to the longitudinal axis of the high energy pipe to absorb the impact energy of the ruptured high energy pipe and restrain its movement upon encountering and crushing said restraining pipe, said restraining pipe having ends which are free to move upward from the longitudinal axis of the restraining pipe so that as the restraining pipe is being crushed under the impact energy of the ruptured high energy pipe, a well is formed in the restraining pipe which aids in preventing lateral movement of the high energy pipe relative to the restraining pipe;

support means for supporting said restraining pipe adjacent the high energy pipe; and

coupling means for coupling said restraining pipe to said support means.

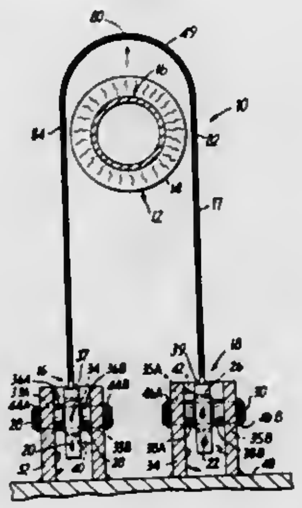
4,101,118
IMPACT ENERGY ABSORBING PIPE RESTRAINTS

Elia A. Mottola, North Andover; George H. East, Jr., Randolph; Norman A. Goldstein, Framinghan; Wu-Cheng Huang, North Reading; Robert E. Roemer, Brighton, and Albert J. Spada, Wilmington, all of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jul. 7, 1976, Ser. No. 703,230

Int. Cl.^{2} F16F *7/12;* F16L *3/00*

U.S. Cl. 267—136 **12 Claims**



1. A pipe restraint for absorbing the impact energy of a ruptured high energy pipe and restraining movement thereof in at least one direction, comprising:

a laminated strap formed of a plurality of strips which are unattached to one another and are secured only at their respective ends, with each strip being substantially of the same longitudinal length and each comprising a material having the property of substantial elongation in the plastic state for absorbing the impact energy of a ruptured high energy pipe in at least one direction, said laminated strap being shaped to extend circumferentially around at least a portion of the high energy pipe with an arcuate portion formed therein positioned adjacent the high energy pipe and spaced therefrom to restrain movement of the ruptured high energy pipe in the direction of said arcuate portion; and

anchoring means coupled to the ends of said laminated strap for anchoring said laminated strap to supporting structure.

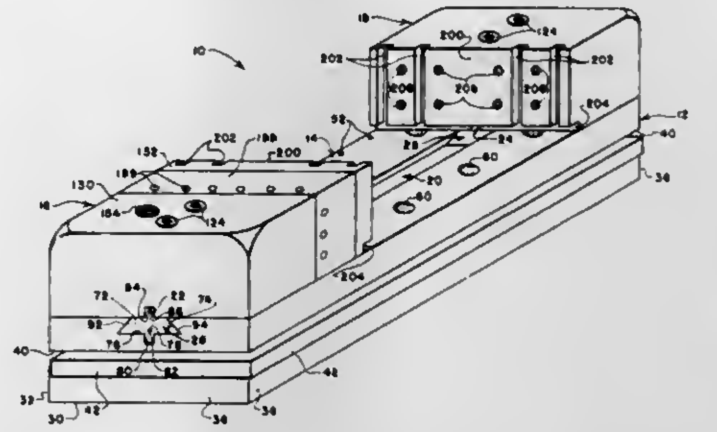
4,101,119
FLUID-OPERATED VISE

Arthur S. Speiser, 4400 Clarkwood Pkwy., Warrensville Hts., Ohio 44128, and Samuel G. Sheterom, Jr., 25 Wintergreen Hill, Painesville, Ohio 44077

Filed Nov. 16, 1977, Ser. No. 851,839

Int. Cl.^{2} B25B *1/02*

U.S. Cl. 269—203 **10 Claims**



1. A fluid-operated vise, comprising:

(a) an elongate base structure having a top surface and an undercut groove including inclined surface portions, the undercut extending substantially the full length of and opening through the top surface;

(b) first and second jaw means supported on the top surface and being movably positionable therealong for gripping a workpiece therebetween;

(c) first and second downwardly facing elongate grooves provided, respectively, in bottom portions of the first and second jaw means, the first and second downwardly facing grooves being of substantially identical cross-section and communicating along their lengths with the undercut groove as the first and second jaw means are positioned along the length of the top surface;

(d) first and second elongate key members each having lower cross-sectional portions configured to correspond to the undercut cross-section of the undercut groove and being positioned therein, and each having upper cross-sectional portions configured to correspond to the cross-section of the downwardly facing grooves and being positioned therein, whereby the key members maintain alignment of the first and second jaw means and the base structure as the jaw means are positioned along the length of the top surface;

(e) first and second clamping means for clamping the first and second key members into engagement with the inclined surface portions to releasably retain the first and second jaw means in place at selected positions along the length of the top surface; and,

(f) one of the jaw means including:

  (i) a first component operably engaged by the first clamping means and adapted to be secured by the first clamping means at a first selected position along the length of the top surface;

  (ii) a second component movably connected to the first component for relative movement in directions toward and away from the other jaw means;

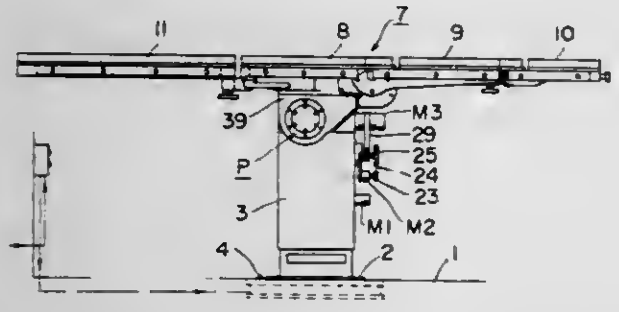
  (iii) fluid-operated actuator means interposed between the first and second components for moving the second component relative to the first component in a direction toward said other jaw means; and,

  (iv) biasing means interposed between the first and second components for biasing the second component toward the first component in a direction away from said other jaw means.

4,101,120

ELECTRICALLY DRIVEN, SEPARATE TYPE, SURGICAL OPERATION TABLE

Kensuke Seshima, Tokyo, Japan, assignor to Mizuho Ika Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 4, 1977, Ser. No. 793,911
Claims priority, application Japan, Aug. 10, 1976, 51-94538
Int. Cl.² A61G *13/00*
U.S. Cl. 269—323 **9 Claims**



1. In an electrically driven, separate type, surgical operating table comprising an upper structure for supporting the body of a patient, a lower structure including support means for supporting the upper structure in a detachable manner, first drive means for moving said support means vertically relative to other parts of the lower structure, second drive means for rotating said support means about longitudinal and transverse axes of the operating table, guiding means for bringing the upper structure and said support means of the lower structure into predetermined relative positions, said guiding means comprising at least one combination of a first guide member carried by said support means and a second guide member carried by said upper structure, one of said guide members being a guide pin and the other guide member being a guide bush, and the operating table also comprising locking means for locking the upper structure onto said support means of the lower structure,

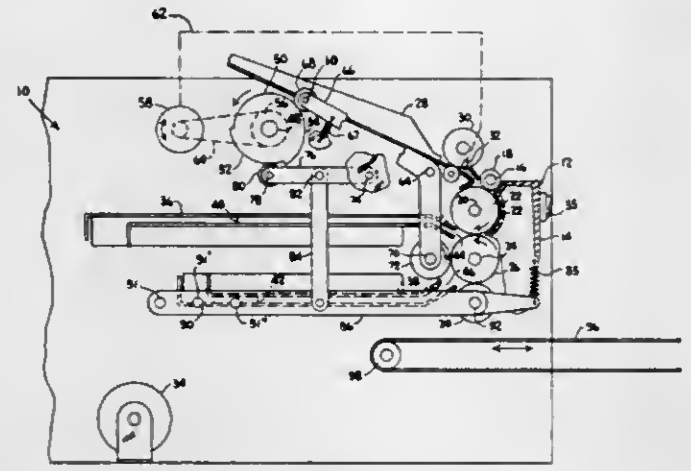
the improvement wherein

- (a) said first and second guide members are respectively combined with first and second mating parts of an electric connector which establishes electric connection between said mating parts when said first and second guide members are fully engaged, the first part of the connector being connected to an electric power source,
- (b) said locking means comprises at least one combination of a first threaded member provided in said support means and a second threaded member provided in said upper structure, one of said threaded members being a locking screw and the other threaded member being a nut which is threadedly engageable with said locking screw,
- (c) said upper structure supports therein third drive means for driving said second threaded member relative to said first threaded member for locking and unlocking operation between said support means of the lower structure and said upper structure
- (d) said upper structure supports therein fourth drive means for adjusting the upper structure itself independently of the lower structure, said third and fourth drive means being electrically operable and being connected to the second part of the electric connector whereby, when said first and second guide members are fully engaged, said third and fourth drive means are connected to the power source through said connector, and
- (e) circuit means are provided to cause said third drive means to become operative for the locking and unlocking operation at a predetermined vertical position of said support means of the lower structure, while causing said first drive means to become inoperative.

4,101,121

DOCUMENT FOLDING APPARATUS

Andrew Wladimir Rastorguyeff, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Feb. 9, 1977, Ser. No. 766,899
Int. Cl.² B65H *45/14*
U.S. Cl. 270—68 A **8 Claims**



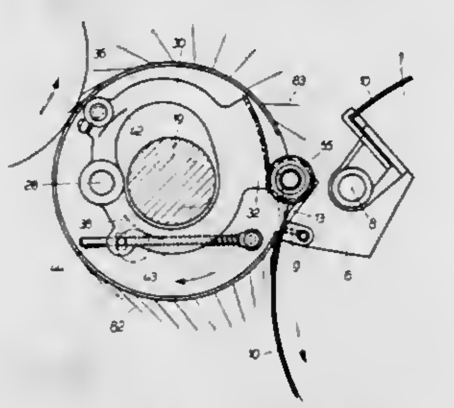
1. A document folding apparatus comprising:
- a. a longitudinal extending housing;
- b. a pair of drive rollers disposed within said housing adjacent one another to form a nip therebetween, the axis of said drive rollers being parallel to one another and disposed one above the other;
- c. means for providing drive to at least one of said drive rollers;
- d. a first idler roller supported by said housing above the upper roller of said pair of drive rollers to form a nip therebetween;
- e. a first buckle chute having an adjustable stop supported within said housing and having an opening adjacent the nip between said drive rollers;
- f. means for delivering a document between said first idler roller and said upper drive roller;
- g. a second laterally extending idler roller disposed within said housing below said first buckle chute and in horizontal alignment with the lower drive roller of said pair of driver rollers to form a nip therebetween;
- h. a second longitudinally extending buckle chute having an adjustable stop therein supported within said housing below said first buckle chute and said second idler roller and having an opening adjacent the nip of said lower drive roller and said second idler roller;
- i. a third laterally extending idler roller located below and ajacent said lower drive roller; and
- j. means responsive to the thickness of a document for varying the distance between said second idler roller and said lower drive roller and said third idler roller and said roller lower drive roller prior to the delivery of a document to said second roller and said lower drive roller.

4,101,122

SHEET TURN-OVER DEVICE FOR A FIRST-FORM PRINTING AND PERFECTING PRESS WITH CLAMPING GRIPPERS

Willi Jeschke, Heidelberg, and Arno Wirz, Bannental, both of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany
Continuation of Ser. No. 562,824, Mar. 28, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 648,913
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1974, 2414998
Int. Cl.² B41F *21/04*
U.S. Cl. 271—277 **7 Claims**

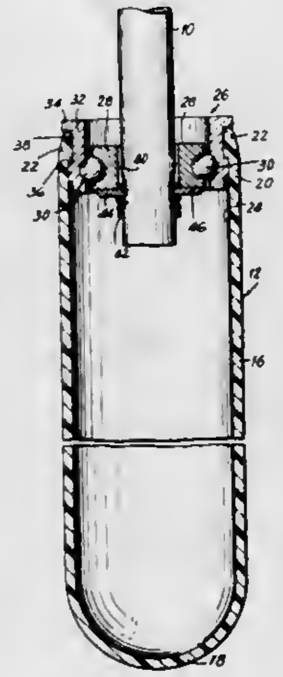
1. Sheet-turn over device for a one-side printing and perfecting press with clamping grippers pivotable about a rotary axis and mounted in a sheet turn-over cylinder so as to be adjustable from single-side printing to one-side printing and perfecting comprising a gripper shaft coextensive with the rotary axis about which the clamping grippers are pivotable, a gripper tube coaxially disposed on said gripper shaft, and separate control means for respectively driving said gripper shaft and said gripper tube, the rotary axis of said gripper shaft as well as of said gripper tube being disposed radially inwardly from a point on a tangent to the periphery of the sheet turn-over cylinder at the point of clamping contact of the grippers, and including respective gripper housings rotatably mounted on said gripper tube, said clamping grippers comprising respective first gripper members firmly secured to said gripper shaft, and respective second gripper members firmly secured to the respective gripper housing, a stop member firmly mounted on said gripper tube for each of said second gripper members, said first and second gripper members, in the single-side printing positions of the sheet turn-over device, being located at the outside and the inside respectively, of the periphery of the sheet turn-over cylinder, adjustable limit means spaced from said stop member, said gripper housing respectively being rotatable in direction toward said stop against the biasing action of a compressive spring for closing said clamping grippers and being rotatable in direction toward said adjustable limit means for opening said clamping grippers.



4,101,123

JUMP ROPE

Timothy M. Anthony, 143-40 Roosevelt Ave., New York, N.Y. 11354
Filed Mar. 14, 1977, Ser. No. 776,838
Int. Cl.² A63B *5/20*
U.S. Cl. 272—75 **1 Claim**

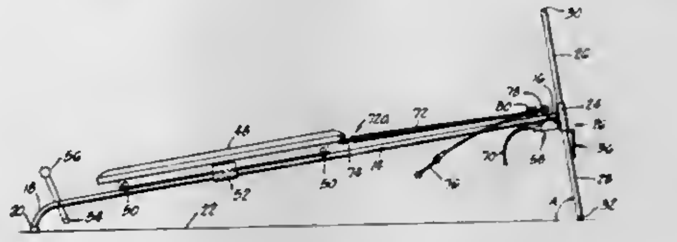


1. A jump rope construction comprising a one-piece hollow handle having an open end defining a handle connecting flange extending into the handle, a ball bearing assembly including balls, a race and a ball bearing housing including an outer flange and an inner shoulder defining therebetween a handle recess, said handle recess being constructed to mate with said handle connecting flange and said ball bearing assembly defining a ball bearing opening at its center for attachment of a rope therethrough, said handle being formed of a flexible resilient material to enable convenient detachment of said ball bearing assembly from said handle by compressing said handle at points proximate its open end thereby forming an oval configuration for said open end along one axis of which said handle recess is removed from said connecting flange.

4,101,124

PULL TYPE EXERCISING APPARATUS

Parker E. Mahnke, 3055 Hollywell Pl., Glendale, Calif. 91206
Filed Jan. 18, 1977, Ser. No. 760,388
Int. Cl.² A63B *21/00*
U.S. Cl. 272—134 **5 Claims**

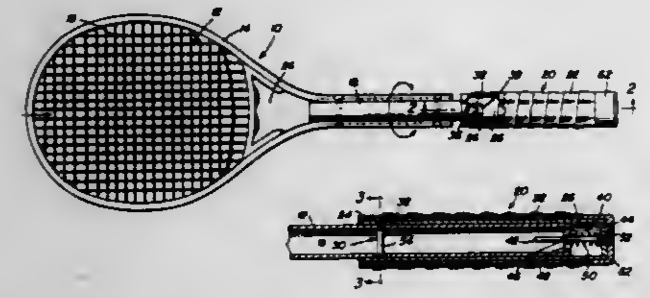


1. An improved exercising apparatus comprising:
- a. a pair of spaced, substantially parallel, generally cylindrically-shaped track members each having a first and second end, said second ends being supportable on a supporting surface;
- b. a substantially cylindrically-shaped guide sleeve affixed to each of said track members proximate the first ends thereof, said guide sleeves extending substantially perpendicular to said track members;
- c. a generally U-shaped tubular track elevating member having substantially parallel legs interconnected by an upper bight portion, said legs being telescopically receivable within said guide sleeves and having a plurality of longitudinally spaced apart apertures formed therein;
- d. a pivotally movable, generally U-shaped member formed of a yieldably resilient material having spaced, substantially parallel sides interconnected by bight portion, said sides having generally L-shaped free end portions spaced apart a distance substantially equal to the distance between said legs of said track elevating member, said end portions being partially receivable within the apertures formed in said legs of said track elevating members and pivotally movable relative thereto from a first interengaging position into a second locking position said end portions being adapted to supportably engage said guide sleeves when said end portions are pivoted into said second locking position;
- e. carriage means movably mounted on said track members for supporting a user of the apparatus, said carriage means being reciprocally movable along the length of said track members; and
- f. foot engaging means pivotally connected to said track members proximate the first ends thereof for engaging the feet of the user when the user is lying flat on said carriage means, said foot engaging means including handle means for grasping by the user to slidably move said guide sleeves relative to said track elevating member whereby said first ends of said track members can be positioned at selected distances above the supporting surface;
- g. operating means for causing reciprocal movement of said carriage means along said tracks comprising:
  - 1. a length of cord affixable to said carriage means;
  - 2. a pair of handles affixed to a corresponding one end of the length of cord for grasping by the user; and

3. cord guide means mounted on said track members proximate the first end thereof, for guiding the length of cord along intermediate portions thereof.

4,101,125
ADJUSTABLE TENNIS RACKET

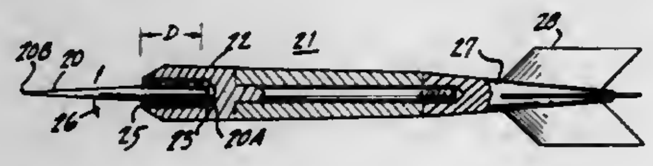
George Heath, 2449 Fairway Dr., Vero Beach, Fla. 32960
Continuation-in-part of Ser. No. 631,310, Nov. 12, 1975, abandoned. This application Jun. 23, 1976, Ser. No. 699,810
Int. Cl.² A63B *49/08*
U.S. Cl. 273—75 **6 Claims**



1. A game racket comprising a racket head adapted for striking a game projectile such as a tennis ball and having substantially planar, generally parallel opposite side striking faces, an elongated handle projecting from said head, hand grip means rotatably mounted on the outer end of said handle for limited angular displacement relative to said head and handle about an axis extending longitudinally of said handle between two predetermined angularly displaced positions, said first position being such as to present said racket head at an appropriate vertical angle relative to said projectile and the ground for forehand striking of said projectile and, without changing the grip on said grip means, said second position being such as to present said racket head at an appropriate vertical angle relative to said projectile and the ground for backhand striking of said projectile, and means interconnecting the handle and hand grip means to positively lock the hand grip means and handle in said adjusted angularly displaced positions, said interconnecting means being releasable during play of a point in response to longitudinal movement of the racket head toward the hand grip means in a manner similar to forces exerted on the head when shifting between a forehand and backhand stroke when using a racket with a rigidly interconnected head, handle and hand grip means to enable angular adjustment of the racket head and handle relative to the hand grip means without moving or releasing any part of the hand in gripping engagement with the hand grip means, and a spring assembly interconnecting the handle and hand grip means to releasably retain the handle and grip means in locked position.

4,101,126
GAME DARTS AND DARTBOARDS EMPLOYING ANTI-BOUNCE-OFF APPARATUS

Ronald A. Kurtz, Englewood, and Henry P. Utzinger, Ridgewood, both of N.J., assignors to Kulite Tungsten Corporation, Ridgefield, N.J.
Filed Nov. 9, 1976, Ser. No. 740,211
Int. Cl.² F41J *3/00*
U.S. Cl. 273—95 R **7 Claims**



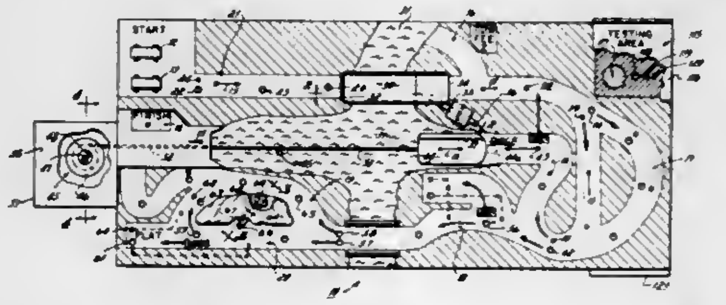
5. A game dart of the type adapted to be thrown at a target of the type including a plurality of grid wires which are relatively impenentrable by a point portion associated with a game dart, the improvement therewith of apparatus for coupling said point portion to said barrel portion, comprising:

a. a cylindrical barrel portion having a point accommodating end and a flight accommodating end, with a coaxial aperture beginning at said point accommodating end and of a given length and diameter,

b. a point portion having a tip end which tapers into a second end of a relatively fixed diameter, said diameter being relatively less than the diameter of said aperture, means coupling said second end to said barrel within said aperture whereby said surface of said point portion as extending within the length of said aperture is separated perpendicular to the axis from said barrel portion by a given distance to thereby permit said tip to pivot or flex according to said separation, said separation selected in accordance with the width of said grid wires to enable said point and therefore said dart to be directed from a wire towards said target when pivoted by said wire, with said separation as provided enabling said point tip to move a distance at least half the width of one of said grid wires.

4,101,127
TARGET AMUSEMENT DEVICE

Glenn W. Isgrig, 7735 Tecumseh Trail, Cincinnati, Ohio 45243
Filed May 23, 1977, Ser. No. 799,383
Int. Cl.² A63F *9/14;* F41J *3/02*
U.S. Cl. 273—95 B **13 Claims**



1. Amusement apparatus of the type including a target board having a plurality of targets thereon and a projectile aiming and releasing means for holding a projectile above said target board and for releasing an aimed projectile, said apparatus further comprising:

indicia on said target board defining a first primary path, a portion of said targets disposed proximate portions of said first primary path and adapted to receive released projectiles;

indicia on said target board defining a plurality of alternate paths intersecting said first primary path at respective positions, another portion of said targets disposed proximate portions of said alternate paths;

position indicating means intermittently movable along said paths;

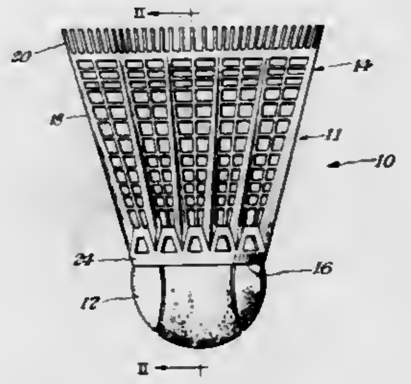
each of said first and said alternate paths ending at a common destination point, each of said alternate paths comprising a further effective distance thereto than said first primary path; and

at least two targets of varying size disposed proximate a single intersection between said first path and an alternate path;

said position indicating means being movable along said first path, from said intersection, in response to a projectile hit on a smaller one of said targets at said intersection, and along the alternate path, from said intersection, in response to a projectile hit on a larger one of said targets at said intersection.

4,101,128
PRACTICE TENNIS DEVICE

Robert Yellen, 2201-B NE. 39th St., Lighthouse Point, Fla. 33064
Filed Feb. 22, 1977, Ser. No. 770,382
Int. Cl.² A63B *67/18*
U.S. Cl. 273—106 A **9 Claims**



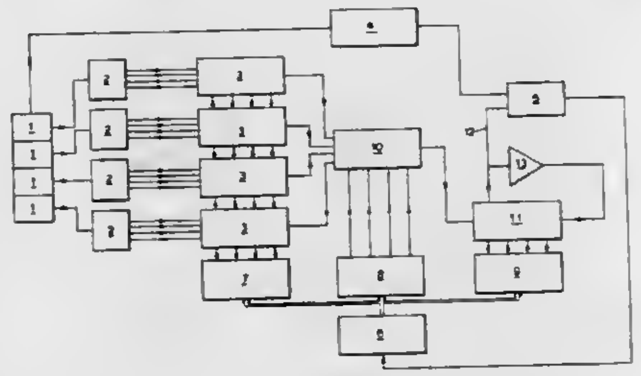
1. A practice tennis device comprising:

a first portion of a regulation spherical tennis ball of at least one-half of the spherical tennis ball, and

a cone means generally equal to the weight of the other portion of the tennis ball severed from said first portion, said cone means connected to said first portion of said spherical tennis ball providing a tennis practice device with a weight generally equal to the weight of a regulation spherical tennis ball providing a player with the same feel when a tennis racquet hits the device as when the tennis racquet hits a regulation tennis ball and said cone means including a winged means for stabilizing said device in flight.

4,101,129
GAMING MACHINES

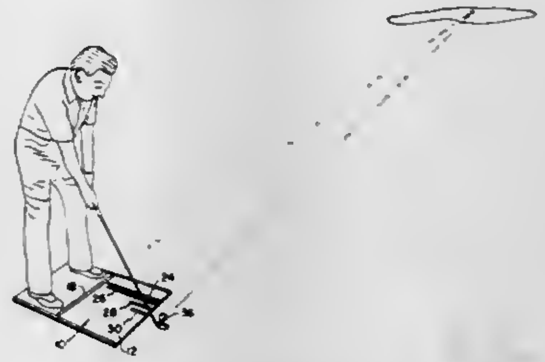
Calvin Howard Cox, Cotgrave, England, assignor to Bell-Fruit Manufacturing Company Limited, Nottingham, England
Filed Apr. 15, 1976, Ser. No. 677,291
Claims priority, application United Kingdom, Apr. 17, 1975, 15780/75
Int. Cl.² A63F *9/00*
U.S. Cl. 273—143 R **22 Claims**



1. Means for detecting prize-winning combinations of symbols in a gaming machine of the kind which selects a combination of symbols at random during each game and awards prizes when predetermined prize-winning combinations occur, said means comprising first memory means for storing information of each of a number of predetermined symbols that can occur in said selected combinations; first comparison means for carrying out succesive first comparison operations in each of which it compares all of the symbols in a selected combination with a respective one of said predetermined symbols stored in said first memory means so as to determine an occurrence pattern for that particular predetermined symbol in said selected combination; second memory means for storing information of each of a number of predetermined symbol occurrence patterns that can occur in said selected combinations; and second comparison means for carrying out successive second comparison operations in each of which it compares one of said occurrence patterns determined by said first comparison means with a respective one of said predetermined occurrence paterns stored in said second memory means that is associated with the predetermined symbol used in the first comparison operation to determine said occurrence pattern and that corresponds to a prize-winning combination, said second comparison means producing a coincidence signal to indicate a win when said determined occurrence pattern corresponds to said predetermined occurrence pattern.

4,101,130
GOLF MAT

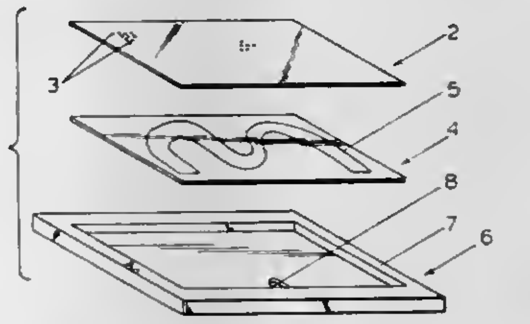
Earl Richards, 310 N. Lake Ave., Leesburg, Fla. 32748
Filed Jan. 10, 1977, Ser. No. 757,965
Int. Cl.² A63B *69/36*
U.S. Cl. 273—187 A **7 Claims**



1. A mat for use by a golfer comprising a substantially rectangular sheet of pliable material, a pair of cut-out sections for placement therethrough of the feet of said golfer with the feet resting on the ground, a plurality of parallely disposed separate length and axis indicating straightline markings on said mat substantially perpendicular to the intended line of flight of a golf ball hit by said golfer, each of said markings corresponding to at least one particular golf club type and having an outer end even with the outer end of each other marking, and each of said markings having a length substantially equal to the distance of placement of the golf ball from the outer end of said marking in alignment therewith and outside of the periphery of said rectangular sheet.

4,101,131
COMPETITIVE GAME APPARATUS

Donald W. Barnby, 1111 Army Navy Dr., Apt. C 1004, Arlington, Va. 22202
Filed Aug. 3, 1976, Ser. No. 711,226
Int. Cl.² A63F *9/14*
U.S. Cl. 273—239 **6 Claims**



1. Competitive game apparatus comprising:

a plurality of sets of playing pieces, each one of said plurality of set of playing pieces having a plurality of playing pieces which have a common characteristic which distinguishes them from the plurality of playing pieces of every other set of said plurality of sets of playing pieces;

stacking means included by at least some of said playing pieces whereby said stacking means permits one of said playing pieces to be stacked upon another and said stacking means also tends to prevent lateral movement of such stacked playing pieces relative to one another thereby tending to prevent an upper playing piece from falling off of the playing piece upon which it is stacked;

a multiple layer game board, having a top layer which is essentially a flat sheet made of transparent material, at least one second layer which is essentially a flat sheet located beneath said top layer, and a third layer which is essentially a flat surface located beneath said second layer, said top layer and said at least one second layer being separable;

a first indicia, which designates the playing positions, carried by said transparent top layer;

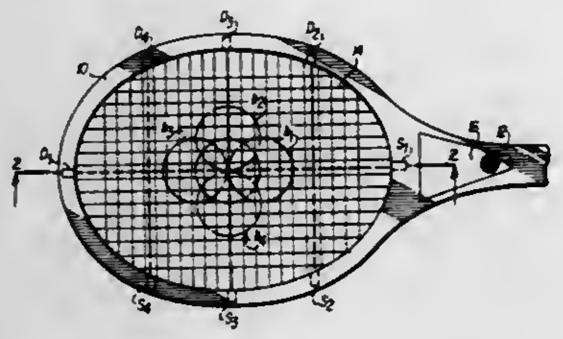
a second indicia carried on at least one surface of said at least one second layer, said first indicia being different from any part of said second indicia and said second indicia being visible through said transparent top layer and influencing the placing of said playing pieces on said multiple layer playing board in accordance with the rules of the game being played;

magnetic means which provides magnetic attraction between said playing pieces and said third layer.

4,101,132
ELECTRONIC ATHLETIC EQUIPMENT

Richard N. Conrey, 3138 Normandy Dr. - Apt. E, Ellicott City, Md. 21043; Phillip T. McQuaid, 7017 Lochlan Cir., Towson, Md. 21239, and Paul J. Yursis, Timonium, Md., assignors to Richard N. Conrey, Ellicott City and Phillip T. McQuaid, Towson, both of, Md.

Filed Dec. 5, 1975, Ser. No. 638,224
Int. Cl.² A63B *69/38*
U.S. Cl. 273—29 A **22 Claims**



1. In combination,

a racquet for striking a moveable game element to impart motion thereto, said racquet comprising an area in which contact with said game element is intended to be made;

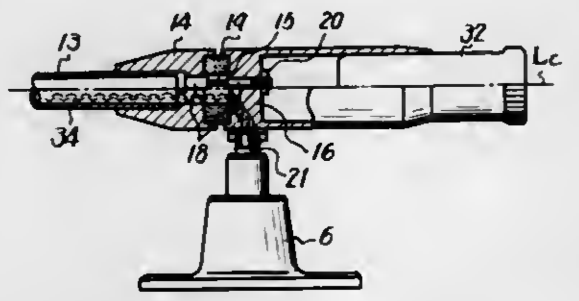
first means mounted on said racquet for detecting the presence of said game element relative to said racquet at preselected locations on said area wherein said preselected locations are less than said area, and wherein said first means detects the presence of said game element on either side of said racquet;

second means responsive to said first means for providing an indication of one of said preselected locations at which the presence of said game element has been detected, and for resetting said first means following each detection of said game element, whereby repeated detections of said game element may be indicated without requiring intervention by a player using said racquet or by any other person, and said first and second means does not substantially interfere with normal play of said racquet.

4,101,133
PICKUP TONE ARM

Naohisa Aoki; Hitoshi Matsuda, and Hideaki Hayashi, all of Mitaka, Japan, assignors to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 731,666
Claims priority, application Japan, Oct. 16, 1975, 50-141086; Feb. 24, 1976, 51-20708
Int. Cl.² G11B *3/18*
U.S. Cl. 274—23 R **10 Claims**

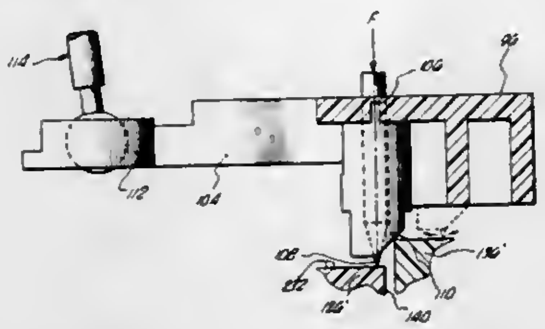


1. A tone pickup arm comprising a main holder portion formed with a central opening, a hollow member with a stylus supported on one end, a hollow member holder into which the second end of said hollow member extends and said hollow member holder formed with a central opening, a damper member of visco-elastic material of generally cylindrical shape and formed with an opening mounted between said main holder portion and said hollow member holder in said central openings, and a suspension wire attached to said hollow member holder and to said main holder portion and said suspension wire mounted so as to pass through said opening in said damper member and so as to be vertically offset above the center line of said hollow member, said hollow member holder and said main holder portion.

4,101,134
SOUND REPRODUCING UNIT TONE ARM

Jay Smith, III, Pacific Palisades, and Richard F. M. Conroy, Woodland Hills, both of Calif., assignors to Hasbro Development Corp., Pawtucket, R.I.

Division of Ser. No. 471,351, May 20, 1974, Pat. No. 4,010,959
Filed Jan. 17, 1977, Ser. No. 760,231
Int. Cl.² G11B *3/10*
U.S. Cl. 274—23 R **1 Claim**

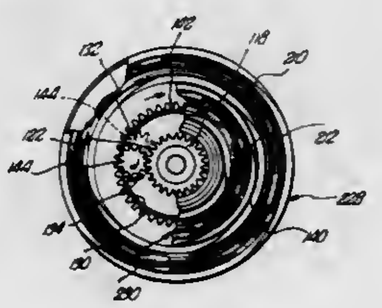


1. A sound unit tone arm for picking up and transmitting sound indicia from a recording medium, comprising a tone arm body member mounted adjacent to a recording medium, said tone arm body member including a mounting post positioned on an end thereof for pivotally locating said tone arm body member relative to said recording medium, a hinge member spaced from said mounting post for hingedly connecting said tone arm body member relative to said mounting post, a stylus mounting arm, a stylus located in said stylus mounting arm and engaging said recording medium, hinge means hingedly connecting said stylus mounting arm to said tone arm body member and providing for relative movement between said stylus mounting arm and said tone arm body member, and spring means secured to said mounting post of said tone arm body member for urging said tone arm body member downwardly, thereby insuring a downward force on said stylus mounting arm to locate said stylus in positive engagement with said recording medium, said recording medium including a first record and a second record located adjacent thereto, said stylus mounting arm having a camming surface formed thereon that is engageable with an adjacent surface for moving said stylus mounting arm and stylus therein from a first record to a second record.

4,101,135
SOUND REPRODUCING UNIT

Jay Smith, III, Pacific Palisades, and Richard F. M. Conroy, Woodland Hills, both of Calif., assignors to Hasbro Development Corp., Pawtucket, R.I.

Division of Ser. No. 471,351, May 20, 1974, Pat. No. 4,010,959.
This application Jan. 17, 1977, Ser. No. 760,237
Int. Cl.² G11B *3/78*
U.S. Cl. 274—39 A **17 Claims**



9. A sound unit for producing a plurality of combined sound sequences comprising:

a first record member having a plurality of separate sound sequences on a respective plurality of individual sound tracks;

a second record member having a plurality of separate sound sequences on a respective plurality of individual sound tracks, the second record member mounted relative to the first record member to permit relative movement for varying the relative position of the respective sound tracks;

sound pickup means for contacting the first and second member to transmit a combination of the sound sequences;

drive means for driving the first and second record members relative to the pickup means when energized; and

means for transmitting energizing power to the drive means including means for moving one record member relative to the other record member at least during a portion of the power transmission to the drive means, wherein a plurality of different combined sound sequences can be produced when the drive means rotates the first and second record means, said power transmitting means including a carrier member that is connected to said second record member and that is operative to provide for relative movement of said record members in one direction and for locking said record members for concurrent movement together in the other direction.

4,101,136
EXERCISING APPARATUS

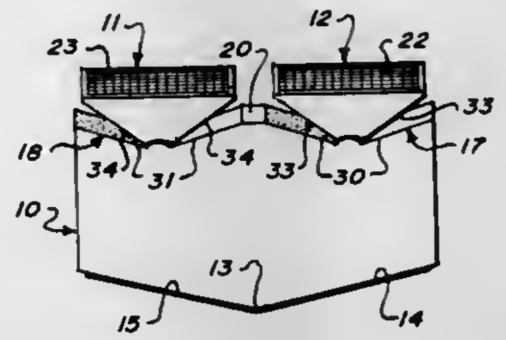
James A. Corll, #1 Westlake Dr. N.E., Albuquerque, N. Mex. 87112

Filed Jan. 17, 1977, Ser. No. 759,755
Int. Cl.² A63B *69/18*
U.S. Cl. 272—97 **16 Claims**

8. A device, comprising:

two foot pedals of generally triangular cross-sectional shape, an apex of said shape being oriented downwardly,

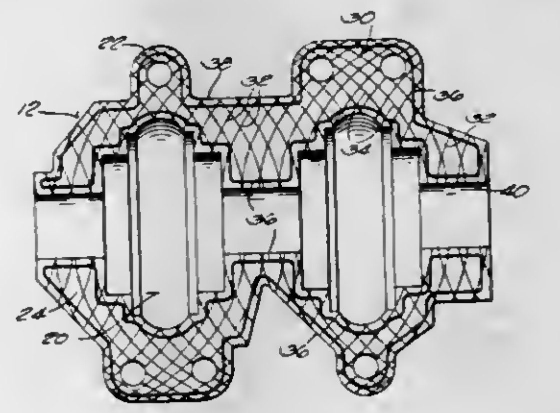
a block moveable between semi-stable side-to-side positions, having two parallel V-shaped grooves along a top surface to receive said foot plates, the angle between the walls of said V-shaped grooves being larger than the angle between the walls of said downwardly oriented apex of said foot pedals, whereby the foot pedals are rotatable from side-to-side about said apex within said grooves.



4,101,137
PRESSURE SEAL AND METHOD FOR PRODUCING SAME

Robert R. Travis, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 27, 1976, Ser. No. 726,996
Int. Cl.² F16J *15/14*
U.S. Cl. 277—1 **5 Claims**



1. A method for forming a pressure seal between two metallic structural members comprising the steps of forming flat surfaces on each of the two members, texturing at least one of the flat surfaces by providing a plurality of interconnecting grooves thereon in the general region where the pressure seal is desired, the grooves interconnecting in a manner to provide at least one continuous grooved recess through the region where the pressure seal is desired, applying an extrudable sealant on one of the flat surfaces in the general region where the seal is desired, the amount of the sealant being sufficient to fill at least the continuous grooved recess, moving the structural members together with the flat surfaces in facing relation, and clamping the structural members together in a manner to apply sufficient compression between the flat surfaces to establish face-to-face contact between the flat surfaces and to extrude substantially all of the sealant into the grooves, so as to fill the continuous grooves recess with the sealant to provide a pressure seal between the flat surfaces.

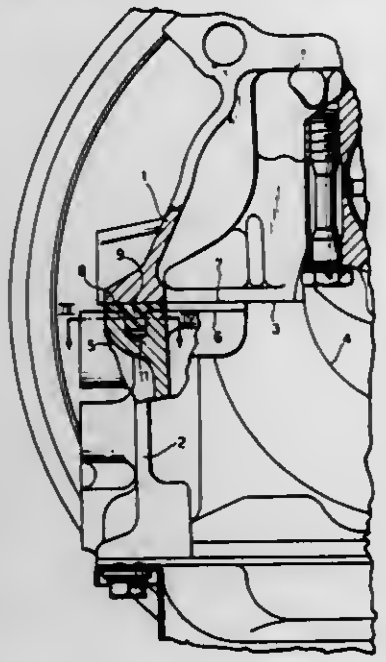
4,101,138
GASKET FOR INTERNAL COMBUSTION ENGINES, INCORPORATING LOCATING PINS

Nicola Gaggiano, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Nov. 21, 1977, Ser. No. 853,793
Claims priority, application Italy, Nov. 25, 1976, 53664/74[U]
Int. Cl.² F16J *15/02*
U.S. Cl. 277—11 **3 Claims**

1. In an internal combustion compression-ignition engine having upper and lower engine blocks, a vibration-damping gasket of elastic material for interposition between said engine

blocks, wherein the gasket is formed In a single piece with a shape corresponding to that of the mating profile of the lower engine block, and wherein the gasket embodies locating pins, made of the same material as the gasket, for engagement in corresponding holes in the lower engine block.



4,101,139
BEARING BRACKET ASSEMBLY FOR A SUBMERSIBLE MOTOR DRIVEN PUMP

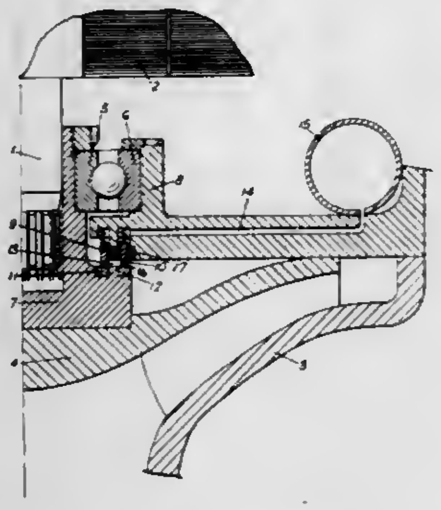
Dag Nordin, Taby, Sweden, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,223

Claims priority, application Sweden, May 10, 1976, 7605256

Int. Cl.² F16J *15/40*

U.S. Cl. 277—22 **8 Claims**



1. A bearing and seal assembly, comprising:
a non-rotating bearing bracket;
a ball bearing having an outer non-rotating ring mounted in the bearing bracket;
a shaft;
a socket fixedly attached to the shaft, said socket and shaft being rotatably supported by the inner rotating ring of the ball bearing;
a pair of radially spaced concentric seal means on said socket;
a pair of radially spaced concentric seal means on said bearing bracket for sealingly engaging the pair of spaced concentric seal means on said socket;
a reservoir; and
conduit means connecting said reservoir to the space between said seal means whereby lubricating and cooling medium may be provided from the reservoir to the space for lubricating and cooling the seals.

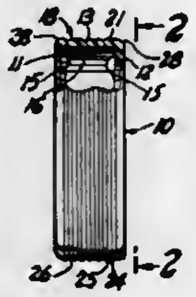
4,101,140
PERIPHERALLY GROOVED SEAL

William P. Reld, Long Beach, Calif., assignor to Tetrafluor, Inc., El Segundo, Calif.

Continuation of Ser. No. 237,443, Mar. 23, 1972, abandoned, which is a continuation of Ser. No. 13,630, Feb. 24, 1970, abandoned. This application Nov. 12, 1974, Ser. No. 523,164

Int. Cl.² F16J *9/06*

U.S. Cl. 277—165 **10 Claims**



1. As an article of manufacture, a bi-directional sealing ring for use with a cooperative elastomer loading ring for special utility in continuous dynamic operation in opposing fluctuating or pulsating fluid pressure from a low pressure to a relatively high pressure, for example, in a pump or a hydraulic cylinder,
said sealing ring being made of plastic material having the general characteristics of a fluorinated hydrocarbon and having inner and outer circumferentially extending sealing surfaces,
one of said circumferentially extending sealing surfaces being shaped and dimensioned for sealing contact with the cooperative loading ring for transmission of fluid pressure to the sealing ring through the loading ring,
the other of said circumferentially extending sealing surfaces serving to create a dynamic leakproof fluid seal against an adjacent confronting surface when relative axial movement occurs between the sealing ring and the confronting surface in response to said pressure changes applied thereto tending to establish a temporary fluid path between the confronting surface and said other sealing surface,
said other of the circumferentially extending sealing surfaces having a multiplicity of circumferentially extending very narrow and very shallow grooves with oppositely sloping outwardly divergent side walls forming circumferentially extending lands with sloping side walls, the degree of divergence of the opposite sloping walls being such that the walls defining the grooves flatten in transverse cross section in response to relatively high pressure pulsations from the loading ring without forming bulges overhanging the grooves whereby the volumes of the grooves contract in response to the high pressure pulsations and subsequently expand with suction effect as the pressure decreases in the time intervals between the high and reduced pressure pulsations with consequent tendency for the sealing ring to maintain effective sealing contact with the confronting surface in the time intervals thereby preventing leakage in the low pressure condition and blow-by when high pressure is again applied, and whereby the pressure pulsations increase the area of the lands that transmit pressure from the loading ring directly to said confronting surface until the lands support the load,
there being a plurality of the lands on each side of a median plane of the sealing ring so that bowing of the ring away from said confronting surface on the high pressure side of the median line in response to high pressure leaves a multiplicity of lands in effective sealing contact with said confronting surface on the other side of the median line.

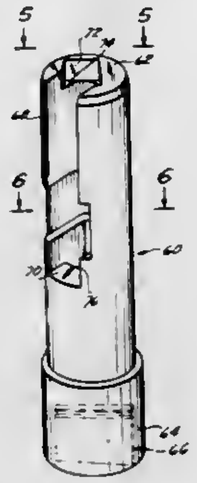
4,101,141
DRIVE CHUCK

Eugene W. Mattila, and Joseph M. Maher, both of White Pine, Mich., assignors to Copper Range Company, White Pine, Mich.

Filed Mar. 16, 1977, Ser. No. 778,093

Int. Cl.² B23B *31/06*

U.S. Cl. 279—19 **10 Claims**



1. A drive chuck for use with a plurality of driven elements comprising a chuck body having an upper surface and a longitudinally extending elongated slot formed therein, said slot opening along the side of the chuck and including a closed base portion located generally parallel to said upper surface, said upper surface having a first recess formed therein in general alignment with said slot, said recess including portions extending beyond the slot to define a base shoulder along the periphery of the recess below said upper surface, and said base portion having a second recess formed therein in general alignment with said slot and having a base shoulder extending across the slot below said base portion whereby said recesses define pockets adapted to receive the end of a tool to be driven through the chuck with the end of the tool received in the pocket supported on the respective base shoulder.

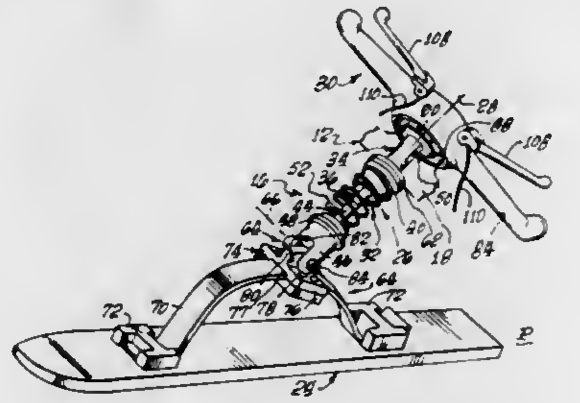
4,101,142
SNOW SLED TURNING MECHANISM

Richard W. Turner, 1786 Tubbs St., Thousand Oaks, Calif. 91360

Filed Mar. 22, 1976, Ser. No. 669,238

Int. Cl.² B62B *13/10*

U.S. Cl. 280—16 **2 Claims**



1. A snow sled comprising:
a sled body adapted to support a rider,
a pair of runners along opposite sides of said body adjacent the rear end thereof and having coplanar bottom snow engaging surfaces for slidably supporting said sled body on snow,
a steering ski at the front end of said body having a lower snow engaging surface,
means supporting said ski on said body for turning movement relative to said body comprising a steering shaft extending through the front end of said body with the longitudinal axis of the shaft disposed substantially in a plane normal to the common plane of said runner surfaces and aligned approximately with the longitudinal center line of said body, and with said axis sloping forwardly toward its lower end, bearing means on said body supporting said shaft for rotation on said axis, an arcuate stirrup extending lengthwise of and fixed at its ends to said ski and arching upwardly from said ski between said stirrup ends, a clamp adjustable along and adapted to be secured in adjusted position along said stirrup, and means pivotally connecting the lower end of said shaft to said clamp for turning of said ski with said shaft about said shaft axis and pivotal movement of said ski relative to said shaft about a pivot axis parallel to said ski surface and transverse to both said shaft axis and the longitudinal axis of said ski,
a steering member connected to the upper end of said shaft and operable by the rider for turning said ski,
said steering shaft comprising upper and lower telescoping sections, a cross pin extending through the upper end of said lower shaft section and into longitudinal slots in said upper shaft section so as to connect said shaft sections of rotation of the sections in unison and relative axial movement of the sections, a first compression spring surrounding the upper end of said lower shaft section and seating against said cross pin and a seat in said upper shaft section for urging said lower section upwardly relative to said upper shaft section, and a second compression spring surrounding the lower end of said lower shaft section and seating against shoulders on said shaft sections for urging said lower section downwardly relative to said upper section,
said bearing means comprising radial and thrust bearing means supporting said upper shaft section or rotation and against axial movement relative to said body, and
said ski and steering member being connected to the lower end of said lower shaft section and the upper end of said upper shaft section, respectively.

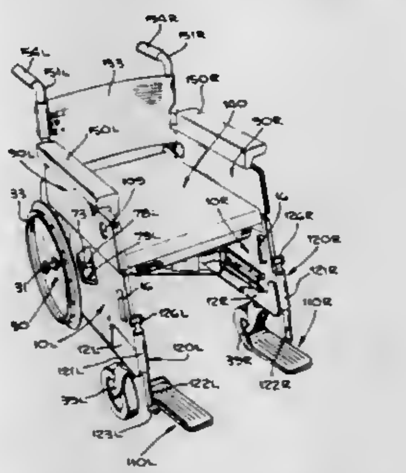
4,101,143
WHEELCHAIRS

William J. Sieber, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Jan. 3, 1977, Ser. No. 756,419

Int. Cl.² B62B *11/00*

U.S. Cl. 280—42 **56 Claims**

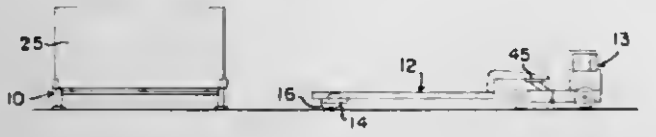


1. A wheelchair comprising a pair of frame members, each formed of one piece of material; a pair of wheels; well means indented into the frame members for accommodating a wheel therein and mounting means for mounting a wheel for rotation in each well means; brace means for supporting the frame members in a spaced apart, open position and allowing the frame members to be brought together to a collapsed position comprising a pair of brace members and vertical pivot means

for pivotally mounting the brace members with respect to each other at a central portion of each brace member about a vertical axis; anchoring means on each frame for anchoring one end of the brace members to a frame member for pivoting the brace member with respect to the frame member about a vertical axis; releasable anchoring means for releasably anchoring the second end of the brace members to the frame member opposite the one to which the one end of the brace member is anchored; brake means mounted on the frame members for movement against the wheels for preventing rotation of the wheels; hill holder means connected to the brake means for preventing movement of the wheels in one direction; a handle movable between at least two positions, wherein in the first position, the handle moves the brake means against the wheel to stop the wheelchair and in the second position moves the hill holder means against the wheel to prevent movement of the wheelchair in one direction; an indentation on each frame member adjacent the well means for mounting the handle in the indentation, slot means through the frame member for allowing the brake means to pass through the well means upon movement of the handle to the first position and for allowing the hill holder means to pass through the well means upon movement of the handle to the second position; side members; means for mounting the side members on the top of the frame members in a first position wherein the side members extend vertically from each frame member and in a second position wherein the side members extend horizontally from the frame members; footrest means; means for mounting the footrest means on the frame members including a housing, telescoping means extending downward from the housing and having a mounting bracket for mounting the footrest means thereon, a grip on the top part of the housing, the grip being connected to the telescoping means and being positioned within reach of the user whereby pulling the grip raises the footrest means; a seat between the frame member for supporting a user between the frame members comprising a platform mounted below the top of the frame members, a pit in the platform and a cushion on the platform extending into the pit and being generally flush with the top of the frame members.

4,101,144
TRAILER FOR HANDLING CONTAINER-CARRYING PALLET FRAMES

Douglas Ross, 3043 122nd Pl. NE., Bellevue, Wash. 98005, and Keith Blackburn, 1316 Florence St., Enumclaw, Wash. 98022
Division of Ser. No. 765,341, Jan. 21, 1977, Pat. No. 4,053,072. This application Oct. 11, 1977, Ser. No. 827,616
Int. Cl.² B62D *21/02*
U.S. Cl. 280—423 B **13 Claims**

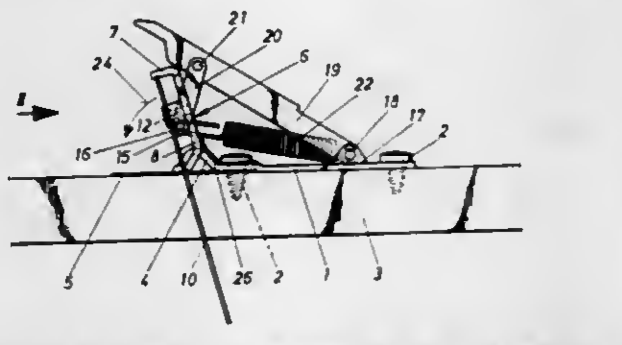


1. A trailer for use in a container transport system of the type having load carrying pallet frames mounted on legs to be loaded on the trailer by backing the trailer beneath a selected pallet frame and elevating the trailer to lift the pallet frame with its load out of ground contact for transport on the trailer, said trailer comprising,

a pallet support frame, coupling means on the front of the pallet support frame for connecting it to a towing vehicle,
primary wheel means and caster wheel means mounted on said pallet support frame near the rear thereof, and
level changing means connected to said pallet support frame for selectively raising and lowering the primary wheel means relative to the caster wheel means and pallet support frame to responsively move the rear of the pallet support frame between a lowered position for passage beneath a pallet frame whereat only the caster wheel means supports the rear of the pallet support frame, and a raised position for lifting the pallet frame whereat only the primary wheel means supports the rear of the pallet support frame.

4,101,145
SKI BRAKE

Heinz Korger, Munich, Fed. Rep. of Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany
Filed Jul. 15, 1976, Ser. No. 705,578
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533470
Int. Cl.² A63C *7/10*
U.S. Cl. 280—605 **9 Claims**



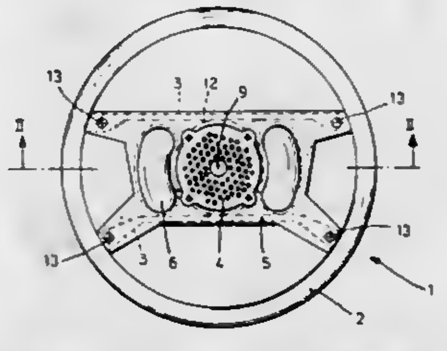
1. A ski brake having a lever assembly (6, 10, 11) adapted to be mounted on a top surface of a ski with a pivotal axis disposed in close proximity to the top surface of the ski at least approximately transversely to the length of the ski, said lever assembly including first arm means pivotally connected to said ski about said pivotal axis for carrying (6) second arm means (10, 11), said second arm means comprising two brake wings extending generally longitudinally and having end portions disposed beyond the sides of the ski when the brake is in a braking condition, a pedal adapted for pivotal connection to the ski and (19) operable by a ski boot for actuating and moving the ski brake from the braking condition to an inoperative condition, and spring bias means for moving the brake wings laterally with respect to the ski so that the ski brake automatically assumes its braking condition upon removal of a boot from the pedal, the ski brake being characterised in that pivot connection means pivotally connect each brake wing (10, 11) to the said first arm means (6), the pivot connection means including two pivot pins (12) positioned at right-angles to the said first arm means, and that connection means connect the pedal directly to the brake wings so that, when said first arm means is parallel to the ski surface, movement of the pedal (19) swings the wings relatively to said first arm means to the inoperative condition wherein the two brake wings are disposed above and parallel to the ski surface with their end portions forced towards each other.

4,101,146
GAS BAG SAFETY DEVICE FOR FLAT STEERING WHEEL

Klaus Oehm, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany
Filed May 20, 1976, Ser. No. 688,403
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524770
Int. Cl.² B60R *21/08*
U.S. Cl. 280—731 **2 Claims**

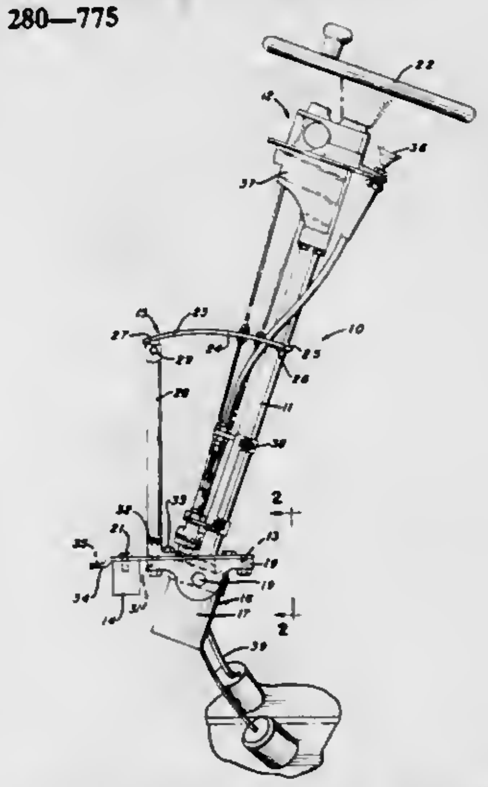
1. A safety device for mounting on a vehicle steering wheel, having a rim connected to a steering column by spokes, comprising:

a gas generator disposed over said column;
a gas bag container, mounted to said spokes and including compartments extending between said spokes and behind said steering wheel in the direction of said column for holding a folded gas bag; and
a gas bag, arranged in a folded configuration in said compartments and across said gas generator, said gas bag being inflatable in response to gas supplied by said gas generator.



4,101,147
STEERING COLUMN ADJUSTMENT MEANS

Richard M. Ederati, Oswego, and William J. Brown, Naperville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 11, 1977, Ser. No. 814,595
Int. Cl.² B62D *1/18*
U.S. Cl. 280—775 **11 Claims**



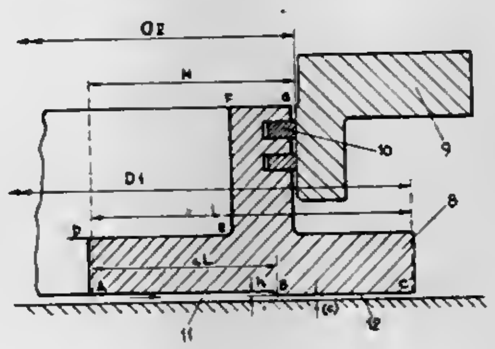
1. In a steering column assembly for use in steering a vehicle having a frame, improved means for temporarily mounting the steering column to the vehicle frame during assembly of the vehicle to permit steered driving of the vehicle during such assembly, said mounting means comprising:

a mounting plate;
means pivotally mounting the steering column to said mounting plate;
means for temporarily securing the mounting plate to the vehicle frame; and
bracket means removably secured to said mounting plate for holding the steering column in a preselected upwardly extending position.

4,101,148
PIPE JOINTS

Alan Stuart Lee, Leicester, England, assignor to The English Electric Company Limited, London, England
Filed Oct. 29, 1976, Ser. No. 736,819
Claims priority, application United Kingdom, Dec. 2, 1975, 49486/75
Int. Cl.² F16L *55/00*
U.S. Cl. 285—13 **12 Claims**

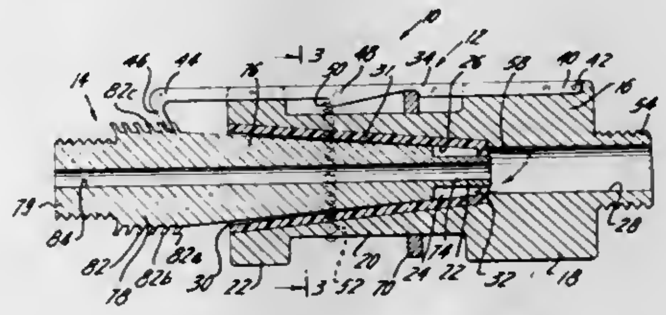
1. A joint between adjacent ends of a first and a second pipe for conveying liquid under pressure, comprising means to prevent separation of said adjacent ends of said first and second pipes, a first sealing member of annular form in sealing contact with the said end of the first pipe and having a radially extending first sealing surface facing a sealing assembly which incorporates a tubular support section secured to the second pipe at or near its said end, and a second sealing member having a substantially cylindrical surface in sliding and sealing abutment with a co-operating, substantially cylindrical surface of the tubular support section, thereby to permit axial movement of the second sealing member relative to the support section, said second sealing member having an annular, radially extending,



second sealing surface facing said first sealing surface and being urgeable away therefrom by the pressure of the liquid within the pipes against a restraining force, provided at least partly by the pressure of the liquid acting upon at least one further surface of said second sealing member, to provide a clearance between said sealing surfaces which is adequate to permit relative transverse movement of the sealing surfaces to take place without sliding contact but at the same time provides high resistance to the radial flow of liquid between them, thus forming a substantially sealing joint between said adjacent pipe ends.

4,101,149
COUPLING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424
Continuation-in-part of Ser. No. 479,667, Jun. 17, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,581
Int. Cl.² F16L *21/00*
U.S. Cl. 285—55 **14 Claims**

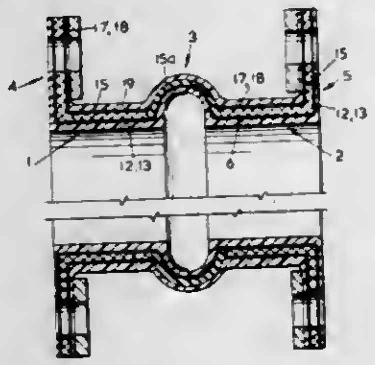


1. A hand adjustable substantially fluid-tight coupling device comprising, in combination, a socket member and a plug member adapted to be removably disposed in said socket member in a first position to form a substantially fluid-tight seal between said members, said plug member comprising a conical-like member including tapered outer walls, and inner walls, said inner walls defining a bore running through said plug member, and at least two securing means, one of said securing means being disposed closer to a narrow end of said tapered outer walls than the other of said securing means, said socket member comprising a body portion including solid rigid outer walls and tapered inner walls defining a tapered passageway running through said body portion, at least one wear resistant lining disposed between said tapered outer walls of said plug member

and said tapered passageway of said socket member, said tapered outer walls of said plug member being adapted to seat in in initial portion of said tapered passageway of said socket member, to define said first position and restricted to said initial position when so seated in that it cannot be moved deeper into the socket member, said plug member and socket member by means of said lining forming a substantially fluid-tight seal between said members, and only after portions of said lining have worn, said plug member being adapted to be repositioned by hand, without the need for use of a tool, with respect to said initial portion of said passageway of said socket member to a second portion of said passageway to define a second position and thereby form, by means of said lining, a substantially fluid-tight seal with said socket member, said socket member further including at least one securing means comprising at least one connecting rod, a portion of which is connected to said body portion of said socket member, said connecting rod being adapted to manually engage at least one of said securing means of said plug member when said plug and socket members are in their first position, and after a portion of said lining has worn and said plug member has been repositioned in said socket member to define said second position, a second of said securing means of said plug member and said connected rod of said socket member are adapted to be manually engaged in a second position relative to each other to retain said plug member in said socket member in substantially fluid-tight engagement, said at least two securing means of said plug member being axially spaced from the wide end of said tapered passageway of said socket member when said plug member and said socket member are in the assembled position.

4,101,150
EXPANSION JOINTS

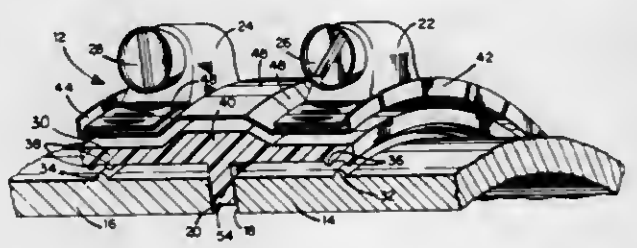
Clive Stafford Thawley, and Thomas Shepherd, both of Dumfries, Scotland, assignors to Uniroyal Limited, Newbridge, England
Filed Sep. 9, 1976, Ser. No. 721,925
Claims priority, application United Kingdom, Oct. 13, 1975, 41813/75
Int. Cl.² F16L *27/10, 51/02*
U.S. Cl. 285—226 **15 Claims**



1. An expansion joint or dredging sleeve comprising two annular end sections joined by an intermediate outwardly arched section, each end section terminating in a flange, the sleeve having a body built up from rubber and fabric ply construction throughout its length, a reinforcement in each end section comprising a ring of rubber having a Shore A hardness of not less than 70° sandwhiched between two rings of a fabric comprising cords which have a compression deflection characteristic not exceeding 1% under a load of 40 kg, said cords extending substantially circumferentially of the rings and the reinforcement extends into each flange, a reinforcement in the intermediate section including a ring of rubber of a hardness not more than 60° Shore A, said ring being of substantially the same thickness as the ring in the end section reinforcement.

4,101,151
CLAMP ASSEMBLY

Harry J. S. Ferguson, Winchester, Mass., assignor to Clamp-All Corp., Needham, Mass.
Filed May 19, 1977, Ser. No. 798,397
Int. Cl.² F16L *21/06*
U.S. Cl. 285—236 **8 Claims**

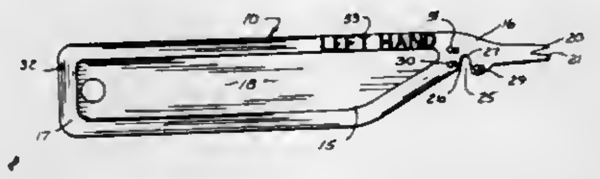


1. A clamping assembly such as for joining two pipes in an end-to-end relationship in a clamping position, which assembly comprises:

(a) a flexible, sheet-metal, clamping band of defined length and adapted to surrounding circumferentially the ends of the pipes to be joined with the opposite ends of the clamping band in an overlapping, slidably adjustable, nesting relationship, the clamping band having
  (i) a raised edge bead along each outer edge of the band and extending generally about the circumference of the clamping band in the clamping position;
  (ii) a preformed, raised, central section extending generally the defined length of the clamping band;
  (iii) band-strap-retaining areas extending on both sides of the raised central section, the raised edge beads on each side and the sides of the raised central section forming two generally parallel band-strap-retaining areas of sufficient width to accommodate a flat band-strap therein, and
  (iv) a plurality of slots extending inwardly from the outer edge of the clamping band and generally longitudinal to the ends to be joined, the slots extending generally throughout the defined length to permit the adjustment of the clamping band in each band-strap-retaining area;
(b) a compressible, circumferential, sealing gasket adapted to be disposed between the pipe ends and the overlapping clamping band and to overlap and bridge the entire junction between the pipe ends, the gasket characterized by an outwardly raised, peripheral, central section, which central section is contoured in form and fits snugly within the raised central section of the band clamp to prevent movement of the sealing gasket in the clamping position; and
(c) at least a pair of flat band straps, one strap disposed and positioned in each of the band-retaining areas of the band clamp, the band straps including a band-tensioning means, whereby the band straps may be tightened to compress the underlying sealing gasket into a fluid-tight sealing relationship.

4,101,152
FISHERMAN'S KNOT TYING JIG

Walter E. Gardipee, P.O. Box 2925, Missoula, Mont. 59801
Filed Dec. 23, 1976, Ser. No. 753,887
Int. Cl.² D03J *3/00*
U.S. Cl. 289—17 **9 Claims**

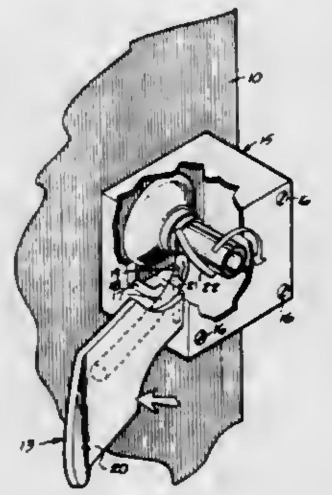


1. A hand held jig for tying fisherman's knots, comprising:

an elongated body having a forward end and a rearward end with side surfaces extending therebetween;
said forward end being tapered to a tip;
an open receiving cleft longitudinally formed in the tip to receive a first line bight of a fishing line and enable a free end of the fishing line to be wrapped about the tapered forward end;
two longitudinally spaced pegs projecting outward of the body from one side surface rearward of the cleft for enabling the free end of the fishing line to form a second line bight about the two pegs; and
an open notch formed transversely in the body between the two pegs for enabling the free end of the fishing line to be inserted into the notch and through the second line bight between the two pegs.

4,101,153
QUICK OPENING LOCK ASSEMBLY FOR DOORS AND METHOD

Donald P. Dozier, 2301 Crystal Ave., Concord, Calif. 94520
Continuation of Ser. No. 517,477, Oct. 24, 1974, abandoned.
This application Jul. 29, 1977, Ser. No. 820,021
Int. Cl.² E05C *15/02, 1/14*
U.S. Cl. 292—92 **13 Claims**

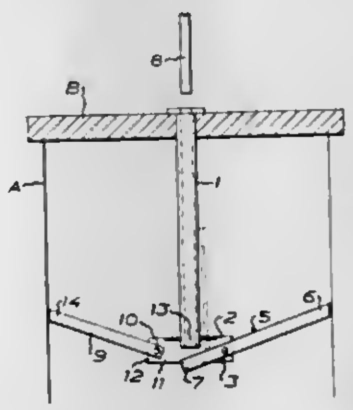


1. A lock assembly comprising
a rotary tubular spindle,
a latch unit including a latch movably mounted therein for movement between locked and unlocked positions,
an adapter, adapted to replace a door knob, including a tubular sleeve slidably mounted on said spindle and cam means disposed in spiralled relationship on said sleeve,
means detachably mounting said sleeve on said spindle for preventing both rotational and axial displacement of said sleeve relative to said spindle,
motion transmitting means mechanically interconnected between said latch and said spindle for moving said latch to its unlocked position upon rotation of said adapter,
handle means movably mounted adjacent to said adapter and operatively engaged directly with said cam means for rotating said adapter and said spindle upon movement of said handle means, and
a housing enclosing said adapter and said spindle and wherein said handle means comprises a single stem extending through a sidewall of said housing and pivotally mounted thereon, an inner end of said stem engaging said cam means in substantial line and sliding bearing contact therewith, said means detachably mounting said sleeve on said spindle being independent of said housing and maintaining said sleeve in a fixed axial position relative to said spindle so that the inner end of said stem will be continuously and precisely maintained in bearing contact with said cam means upon pivoting of said handle means on said housing to move said latch between its locked and unlocked positions.

11. A method for converting a lock assembly to panic hardware, said lock assembly mounted on a door and comprising a latch unit movable between normally locked and unlocked positions relative to a door frame having said door hingedly mounted thereon, a rotary spindle, a knob detachably mounted on said spindle and motion transmitting means mechanically and interconnected between said latch unit and said spindle for moving said latch unit to its unlocked position upon rotation of said adapter, said method comprising the steps of
detaching said knob from said spindle,
attaching a tubular adapter sleeve, having a spiralled cam secured thereto, directly to said spindle to prevent both rotational and axial movement therebetween,
securing a housing to said door to enclose said spindle, and said sleeve therein and simultaneously spacing an outer wall of said housing axially relative to an outer end of said sleeve to prevent contact therebetween;
pivotally mounting a handle on said housing and adjacent to said sleeve to engage an inner end of a single stem of said handle directly with said cam in bearing contact therewith whereby pivoting of said handle will rotate said sleeve and said spindle to move said latch unit to its unlocked position.

4,101,154
LOCKING DEVICE FOR WELL COVERS AND THE LIKE

Rune Kägström, 36a, Tunbyvägen, Vesteras, Sweden (S-722 23)
Filed Oct. 19, 1976, Ser. No. 733,939
Claims priority, application Sweden, Oct. 21, 1975, 7511782
Int. Cl.² E05C *3/06*
U.S. Cl. 292—237 **17 Claims**



1. A locking device for use in locking a removable lid such as a cover, a well grating or the like over an opening of a straight-walled hole such as a well, a manhole, a shaft or the like, said locking device comprising:
at least one locking member in the form of a lever pivotally mounted about a journal;
means, separate from a lid, for mounting said journal with respect to the lid such that said journal extends in a direction parallel to the plane of the lid and such that said journal is immovable in a direction away from the lid;
said lever having a first end and a second end, and said lever being automatically pivotable about said journal such that said first end automatically engages with a first straight wall surface of a hole to be covered by the lid;
at least one abutment means, mounted on said mounting means, for abutting against a second straight wall surface of the hole when said first end of said lever abuts against said first straight wall surface and for preventing lateral shifting of said first end of said lever out of engagement with said first straight wall surface, thereby locking the lid in the hole covering position thereof;
the sum of the distance between said first end of said lever and said journal and the distance between said journal and said abutment means being greater than the straight line distance between said first end and said abutment means;
said first end of said lever when engaging said first straight wall surface being closer to the lid than is said journal; and

operating means, operable from the outside of the lid and extendable through at least a portion of said mounting means, for engaging said second end of said lever and for pivoting said lever about said journal such that said first end of said lever is disengaged from said first straight wall surface, thereby unlocking the lid from the hole.

4,101,155

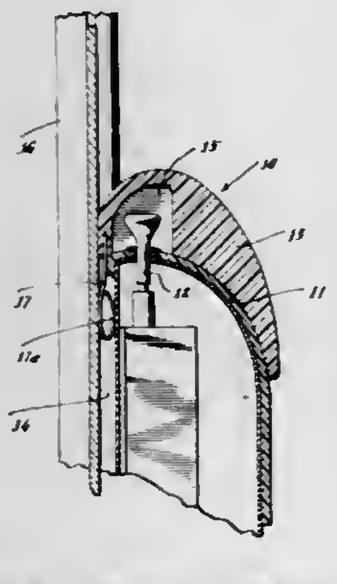
DEVICE FOR PREVENTING UNINTENDED UNLOCKING OF AUTOMOBILE CAR DOORS

Nathan Coben, 89 Bradly St., North Haven, Conn. 06473

Filed Mar. 18, 1977, Ser. No. 779,144

Int. Cl.² E05C *19/00*

U.S. Cl. 292—347 **4 Claims**



1. In an automobile door equipped with a door lock operating member protruding through the window ledge of the door, a device removably attachable to the window ledge on the inside of the door to prevent access to the door lock operating member comprising

(a) a hood removably disposed on the door at the window ledge to conceal the door lock operating member and prevent access thereto for purposes of locking or unlocking the automobile door;

(b) an elongated anchoring member fixedly mounted on the hood and extendable into the interior of the door to anchor the hood to the door; and

(c) the anchoring member provided with biasing means to press against an interior wall of the door with sufficient force to substantially retard ordinary removal of the hood from the window ledge.

4,101,156

CLAMPING RING FOR REMOVABLE COVERS OF DRUMS

Cesar Santoni, Hamilton, Canada, assignor to Greif Bros. Corporation, Delaware, Ohio

Filed May 28, 1976, Ser. No. 690,941

Int. Cl.² E05C *19/18*

U.S. Cl. 292—256.69 **7 Claims**

1. An improved clamp ring for use in releasably holding a cover in assembled relationship with a drum comprising:

a split ring having two ends positioned substantially adjacent to one another;

a locking lever pivotedly connected adjacent one of its ends with one of the ends of the split ring;

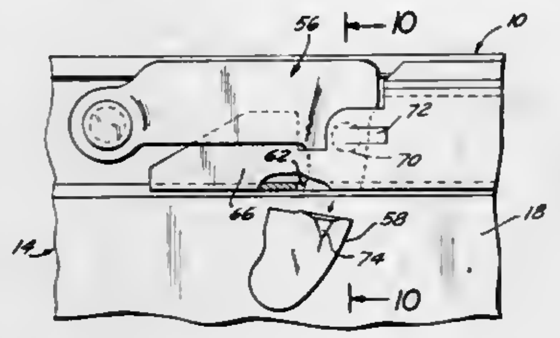
said lever having a slot therein;

linkage means for pivotally connecting the other end of the split ring with an intermediate portion of the locking lever;

the pivotal connections being so constructed and arranged that the locking lever is shiftable from an open position away from the split ring at which the split ring is in an expanded position to a locking position adjacent surfaces of the split ring at which the split ring is in a contracted position;

a latch pivotally mounted on said split ring being in the form of a base terminating in a finger whereby the latch is adapted to be pivoted downwardly until the finger extends through the slot in the lever and adapted to be shifted from an unlatched position away from the split ring to a latched position in interengagement with the lever when the lever is in its locked position;

removable sealing means including an arcuately shaped finger portion on the latch adapted to automatically engage with surfaces on the lever when the latch is shifted to seal the latch in latched position and positioned so that removal thereof will permit shifting of the latch between the latched and unlatched positions; and



said sealing means including the arcuately shaped portion of the finger terminating in a hook tang position to interengage with the under surface of the lever adjacent the slot through which the finger extends, and further including a second lock formed by an arcuate portion of the latch finger terminating in an inwardly laterally projecting tang adapted to interengage with the surfaces adjacent the slot of the lever when the finger extends therethrough.

4,101,157

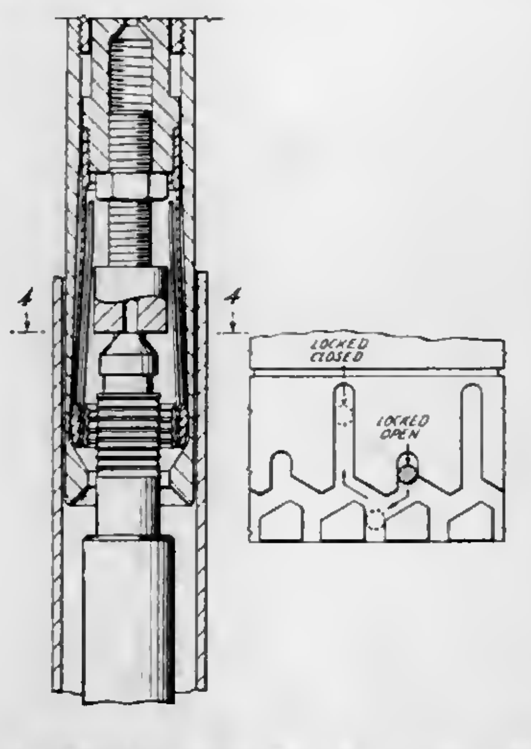
TOOL FOR FISHING AN OBJECT FROM A BORE HOLE

Vernon T. Richey, 1111 Blalock, Apt. 160, Houston, Tex. 77055

Filed Jul. 11, 1977, Ser. No. 814,197

Int. Cl.² E21B *31/02*

U.S. Cl. 294—86.21 **3 Claims**



1. A tool for fishing an object out of a bore hole, comprising:

(a) a tubular body having

(i) an upper end for connecting to apparatus extending from the surface to raise and lower the tool in and out of the bore hole,

(ii) a lower end for extending around and over a portion of the object, said lower end having a tapered surface located thereon;

(b) fingers mounted within said body for coacting with the tapered surface of said body to move between an opened position and a closed position;

(c) a spring mounted within said body for urging said fingers toward the lower end of said body for coaction with the tapered surface;

(d) camming means mounted within said body for controlling the movement of said fingers between the opened and closed positions having

(i) a sleeve rotatably mounted within said tubular body forming a cam face defining "J" slotted grooves with upwardly extending stems located at the closed and opened positions of said fingers and connecting grooves between "J" slotted grooves thereby forming a single cam groove which permits recycling of said fingers between the opened and closed position,

(ii) a pin extending from said tubular body into and coacting with the cam groove to cause the sleeve to rotate between the opened and closed positions by moving said body toward and away from the object after engagement with a portion of the object, the fingers moving into the closed position by the urging of the spring and by the movement of the pin upward into the closed position stem of the "J" slotted grooves and the fingers moving into the opened position by overcoming the urging of the spring and by movement of the pin upward into the opened position stem of the "J" slotted grooves; and

(e) lugs mounted with said sleeve for nesting within corresponding slots formed in said body which defines first shoulders between the slots and second shoulders at the bottom of the slots, said lugs having downwardly facing shoulders for abutting against the first shoulders to limit movement of the pin in the opened position stem of the "J" slotted grooves and for abutting against the second shoulders to limit movement of the pin in the closed position stem, the opening and closing of the fingers and movement of the lugs being provided by movement of said body toward and away from the object after engagement with a portion of the object, which causes the first and second shoulders to move downwardly relative to the lugs and the pin to move downwardly within and coact with the cam groove for rotating the sleeve and lugs into alignment such that the downward facing shoulders of the lugs will abuttingly engage with the respective first or second shoulders of said body.

4,101,158

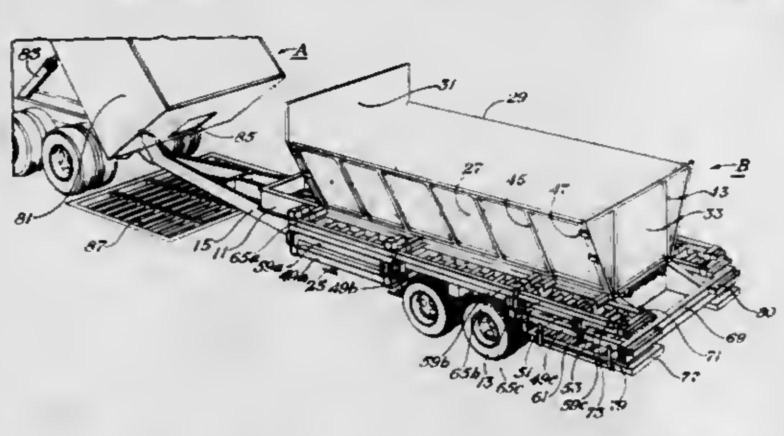
CONVERTIBLE TRAILER FOR HAULING GRAIN AND A HARVESTING MACHINE

James Thomas Jones, Rte. 5, Box 114, Waco, Tex. 76705

Filed Sep. 13, 1976, Ser. No. 722,516

Int. Cl.² B60P *3/42*

U.S. Cl. 296—10 **13 Claims**



10. A dual purpose trailer for selectively hauling grain in bulk and for hauling a combine, comprising:

a rectangular frame mounted on wheels and having a tongue and hitch means for being towed by a truck;

front, side, and rear panels, carried by the trailer, and means for selectively interconnecting them in a position defining a hopper for hauling granular material in bulk, and in a storage position for storing the panels to create a substantially flat bed;

dumping means carried along the bottom of the frame for releasing grain carried within the hopper; and

an extensible track hingedly carried by the frame along its sides so as to be foldable from a storage position wherein the trailer width is substantially equal to the distance between the outer edges of the wheels to an extended position located laterally of the outer edges of the wheels, thereby increasing the width for receiving a combine with an overall wheel width greater than the overall wheel width of the trailer.

4,101,159

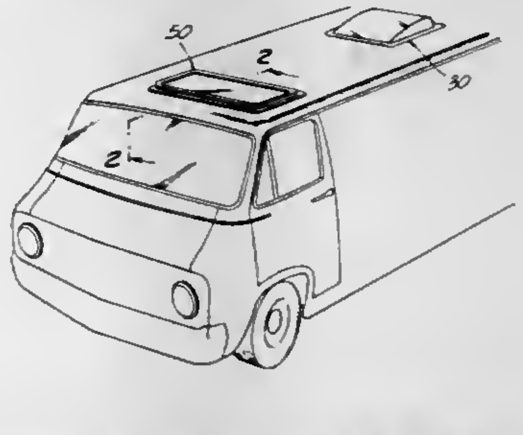
VAN OVERHEAD CONSOLE

Buster D. Stewart, 16123 Runnymede St., Van Nuys, Calif. 91406

Filed Jul. 12, 1977, Ser. No. 814,863

Int. Cl.² B60R *7/04*

U.S. Cl. 296—37.7 **7 Claims**



1. For installation in the interior of a standard American manufactured van,

an elongate molded overhead and rear corners console assembly selectively moldable in three different lengths to fit the three standard lengths of said American manufactured van;

said console assembly having front and rear raised overhead portions thereon to receive electronic accessory means;

a recessed cutout area in said front overhead portion to cooperate with and in which is mounted at least one sun roof assembly means;

a recessed cutout area in said rear overhead portion to contain and cooperate with and in which is mounted at least one rear roof vent means;

variable length recessed areas to contain mirror means in said rear overhead portion thereof;

spaced cutout means in said overhead console assembly in which are mounted light means and alarm means;

symmetrical raised means on each side of said front overhead portion of said console assembly for mounting speaker means;

raised portions in the upper portion of each of said rear corners console assembly into which are mounted speaker means;

the edges of said recessed cutout areas of said overhead molded console assembly overlap and interact with said sun roof assembly means to rigidly attach said front overhead portion to the roof of said standard American manufactured van;

a curtain track on which a curtain is hung separating the cab portion of said van from the rear portion of said van said track being mounted transversely across the width of said overhead console assembly;

- attachment and spacer means to which said console assembly is secured at a distance from the roof of said van;
- fastener means for engaging said console assembly with said attachment and spacer means;
- insulation means between said console assembly and said roof of said van;
- fastener means for attaching said rear corners assembly portions to the rear corners of said van. of said van.

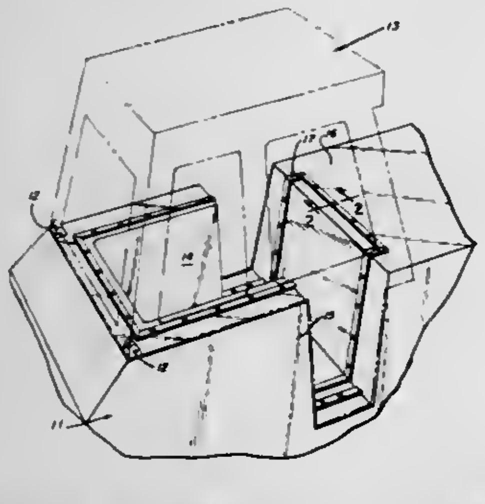
4,101,160
SEMI-MODULAR CAB JOINT LINE SEALING ARRANGEMENT

William T. Monnts, Chillicothe, and Joseph B. Stratton, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 11, 1977, Ser. No. 814,521

Int. Cl.^{2} B62D *23/00*

U.S. Cl. 296—35 R **14 Claims**



1. In a vehicle having a base portion and a cab defining with said base portion an operator's space, an improved joint line means for sealing the peripheral portion of the cab to the base portion comprising:

- channel means secured to said cab defining a projecting channel extending lengthwise along said cab peripheral portion, said channel means defining a web portion spaced from said peripheral portion and having spaced openings therein;
- cooperating threaded securing means having a first portion secured to said vehicle base portion and a second portion having a manipulating portion received in said channel permitting threading of said second securing means portion to said first securing means portion to secure said channel means to said vehicle base portion along the length of said channel web at said openings; and
- a compressible seal means adjacent said channel means extending lengthwise parallel thereto, said seal means having an uncompressed thickness greater than the projection of said channel means whereby said seal means is sealingly compressed between said cab peripheral portion and said vehicle base portion as an incident of the securing of the cab to said base portion by said threaded securing means.

4,101,161
OPENING ROOF ASSEMBLIES FOR VEHICLES

John Josiah Currall, Birmingham, England, assignor to Weathershields Limited, Birmingham, England

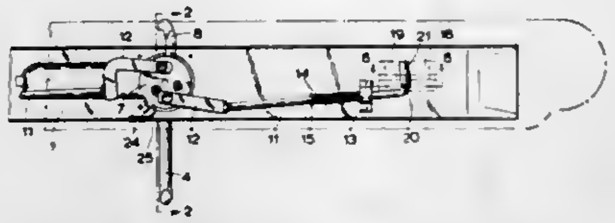
Filed Jun. 2, 1976, Ser. No. 691,984

Claims priority, application United Kingdom, Jun. 6, 1975, 24350/75

Int. Cl.^{2} B60J *7/18*

U.S. Cl. 296—137 H **9 Claims**

1. An opening roof assembly for a longitudinal opening in a roof of a vehicle, said assembly comprising a flexible fabric covering, cross-members supporting said covering and including a front cross-member, guides extending along each side of said opening on which said cross-members are adapted to slide, handle-operated means carried on front cross-member for drawing said covering forwardly to tighten it, a substantially rigid transverse flap to which the front end of said covering is attached, a pivotal connection between said transverse flap and said front cross-member, transmission means between said flap and said front cross-member for drawing down said flap into close sealing engagement with said roof around the front end of said opening, said transmission means being actuated by said handle operated means and comprising a pair of rods mounted in said front cross-member, means for moving said rods relatively towards and away from each other in response to rotation of said handle-operated means, and downwardly depending flanges mounted on said flap and provided with inclined slots in which free ends of said rods engage.



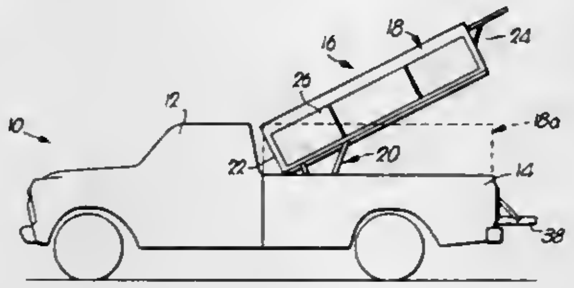
4,101,162
VERTICALLY SWINGABLE CAMPER SHELL

Leland Koehn, 211 E. Panta 7E, Halstead, Kans. 67056

Filed Jan. 6, 1977, Ser. No. 757,485

Int. Cl.^{2} B60P *3/42*

U.S. Cl. 296—137 B **10 Claims**



1. In combination with a light truck of the type having an open-topped body and a cab at one end of said body extending upwardly beyond said top, a cover for the top including:

- a hollow, open-bottomed, box-like shell on said body overlying said top in normally closing relationship to the latter,
- said shell including an upright end wall adjacent said cab and extending transversely of the truck; and
- hinge means mounting said shell on said body for swinging vertical movement of the shell about a fixed transversely extending axis adjacent the uppermost portion of said end wall whereby said shell may be selectively shifted from its closing relationship over said top to permit unobstructed access to the body of the truck.

4,101,163
COLLAPSIBLE CHAIR

Robert J. Morin, 4720 Preda Dr., Pontiac, Mich. 48054

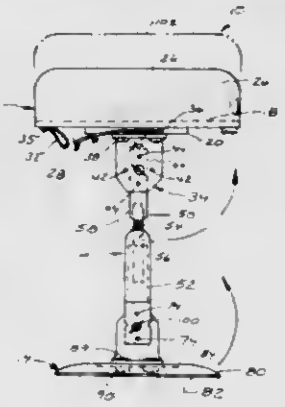
Filed Feb. 16, 1977, Ser. No. 769,239

Int. Cl.^{2} A45D *29/04*

U.S. Cl. 297—16 **1 Claim**

1. A collapsible chair adapted to be carried by a user, said chair comprising:

- a disk-shaped base for supporting said chair in an upright position, said base having an upright flange with a pair of laterally spaced, outwardly projecting, non-movable stop pins;
- a leg having first and second members telescopically attached for relative rotational movement, said first member having first and second laterally spaced bores disposed at 90° intervals for selectively and laterally receiving said stop pins to permit said disk-shaped base to be locked in a first position wherein said leg is disposed along an axis perpendicular to said base and a second position wherein said leg is inclined at 90° with respect to said first position;
- a first threaded fastener extending through said leg and said base flange;
- a nut engaged by said fastener to secure said leg to said base in either of said positions;
- said second member having a second pair of laterally spaced and outwardly projecting, non-movable stop pins;
- a seat having a downwardly projecting flange with first and second laterally spaced bores disposed at 90° intervals for selectively and laterally receiving said second stop pin to permit said seat to be locked in a first position wherein said seat is disposed in a plane perpendicular to said leg and a second position wherein said seat is inclined at 90° with respect to said seat first position;
- a second threaded fastener extending through said leg and said seat flange;
- a second nut engaged by said second fastener to secure said leg to said seat in either of said seat positions; and
- strap means connected to said seat to facilitate the carrying of said chair when the same is in its collapsed position.



4,101,164
FOLDING SEAT AND TABLE UNIT

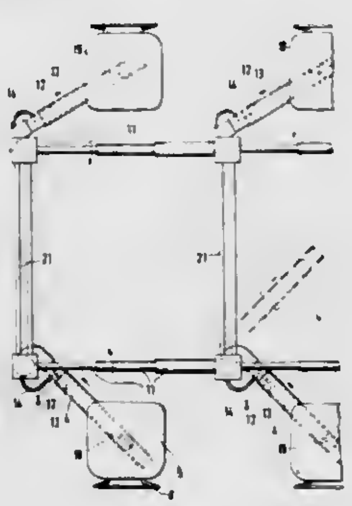
Luis Vega Urdanoz, Urnieta (Guipuzcoa), Spain, assignor to Manufacturas Vega S.A., Urnieta, Spain

Filed Dec. 22, 1976, Ser. No. 753,584

Claims priority, application Spain, Dec. 24, 1975, 443862; May 5, 1976, 447601; Mar. 29, 1976, 446460; Jan. 8, 1976, 217905

Int. Cl.^{2} A47B *1/08, 3/14*

U.S. Cl. 297—159 **14 Claims**



1. In a folding seat and table unit of the type having a plurality of seats and a table connected together into an articulated unit, said table being adapted to extending and retracting, the improvement comprising:

- (a) a plurality of substantially vertical legs on said table;
- (b) at least one seat;
- (c) connecting means for connecting said at least one seat to a corresponding one of said legs;
- (d) folding and unfolding means on said connecting means for pivoting said seat between an unfolded position and a folded position about the axis of said one of said legs;
- (e) pivot means on said means for connecting for rotating said seat from a substantially horizontal position to a substantially vertical position during motion by said folding and unfolding means from said first position to said second position; and
- (f) unfolding framework means on said table for moving at least some of said legs closer to some others thereof while maintaining all of said legs substantially vertical and parallel.

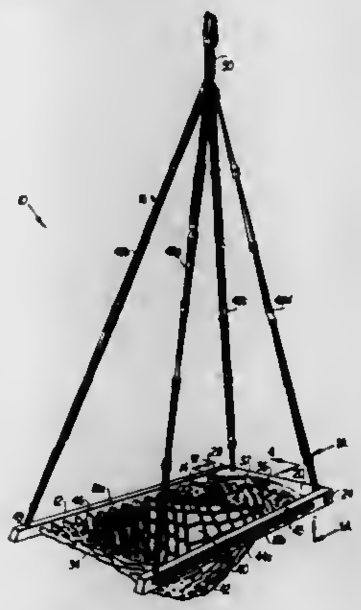
4,101,165
HAMMOCK CHAIR

Henry H. Hammer, Louisa, Va., assignor to Twin Oaks Community, Louisa, Va.

Filed Mar. 2, 1977, Ser. No. 773,736

Int. Cl.^{2} A47C *15/00*

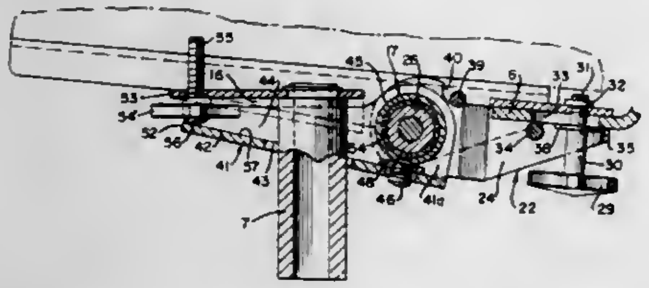
U.S. Cl. 297—273 **18 Claims**



1. In a hammock chair for supporting an occupant above a floor, said hammock chair including a rigid outer seat frame for supporting a seat fabric, a flexible seat fabric extending across the frame for holding said occupant, and a main support means for supporting said frame above said floor, the improvement wherein said rigid outer frame includes two independent side rigid members and an independent rear rigid member, said rear rigid member having mounted thereon an attaching means for mounting said side rigid members at opposite ends of said rear rigid member to form the shape of a quadrangle having one open side, said seat fabric extending between said rear and side rigid members to form a chair seat enclosed by said rear and side rigid members along three edges thereof but not along a fourth forward edge thereof, said side rigid members extending lengthwise along the ends of said rear rigid member and said attaching means including an elongated tension rod extending transversely through both of said side rigid members and longitudinally along said rear rigid member proximate a rear edge of said rear rigid member, such that when an occupant sits in the flexible seat fabric said side rigid members are held in position by tension forces acting on the tension rod and compression forces produced at forwardly positioned corners of the rear rigid member, said forward ends of the side rigid members tending to flex toward one another.

4,101,166
CHAIR CONTROL MECHANISM

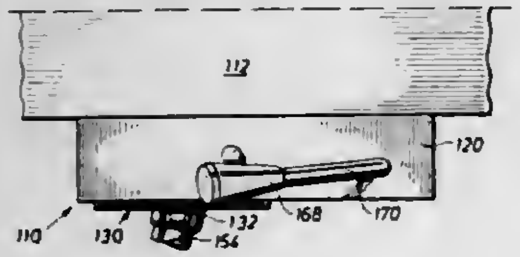
Richard A. Rauschenberg, N. Jackson; Melvin A. Textoris, Struthers, and Philip J. Williams, Poland, all of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio
Filed Jul. 7, 1977, Ser. No. 813,652
Int. Cl.^{2} A47C *3/00*
U.S. Cl. 297—304 **14 Claims**



1. A chair control mechanism including, a control body provided with a pair of spaced apart side flanges and having a medially disposed central web therebetween, a post member depending from said web, a tilt torsion unit transversely disposed between said side flanges, an axle pin spanning said side flanges and supporting said torsion unit rearwardly of said web and post member, a tilt bracket having a pair of side arms extending forwardly from a rear portion and affixed to said torsion unit, an inner sleeve freely mounted about said axle pin between said side arms and fixed to said side arms, an outer sleeve surrounding said inner sleeve and spaced therefrom, spring means joining the interior of said outer sleeve to the exterior of said inner sleeve and applying a torsional force therebetween, a tension lever including a bottom web joined to a pair of side walls, said bottom web having a forward edge disposed beneath and adjacent the forward edge of said control body web and including a rear portion disposed beneath said torsion unit, said torsion lever bottom web including an opening freely surrounding said post member, said tension lever side walls adjacent said rear portion surrounding said torsion unit outer sleeve, means affixing said tension lever to said outer sleeve whereby, said torsion unit spring means concurrently urges said tension lever forward portion upwardly toward said control body web and said tilt bracket rear portion upwardly toward said control body and adjustment means forward of said post member and intermediate said control body web and tension lever web manipulable to alter the angular disposition of said tension lever relative said control body and thus vary the torque acting upon said tilt bracket.

4,101,167
TILTING UNIT FOR FURNITURE SUBSTRUCTURES

Stellan Örnberg, Jönköping, Sweden, assignor to Kalmar Läns Landsting, Kalmar, Sweden
Filed May 24, 1976, Ser. No. 689,152
Claims priority, application Sweden, Feb. 6, 1976, 7601316
Int. Cl.^{2} A47C *3/026*
U.S. Cl. 297—328 **8 Claims**



1. A tilting unit for furniture such as an easy or office chair including a seat tiltably mounted on a base, the tilting unit comprising:

a retaining structure attached to the seat of the chair;

a carrying structure pivotally supporting the seat retaining structure on a tilt axis and in turn attached to the base of the chair; and

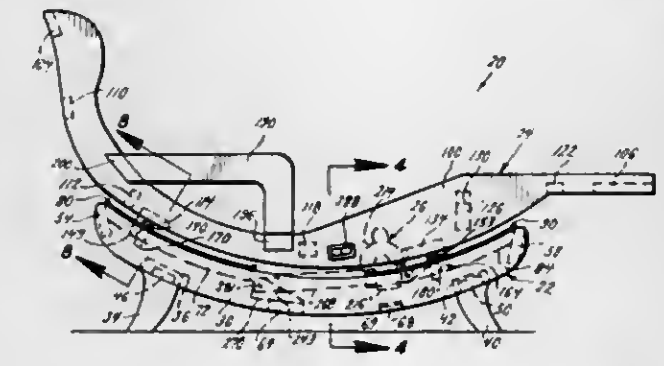
a prestressing means interposed between the retaining and carrying structures for resiliently urging the structures into an initial or rest position, said prestressing means comprising at least one solid block of elastomeric material located between said retaining and carrying structures and being confined on one side of the tilt axis, said block or blocks being exposed to elastic compression to oppose thereby the relative tilting movement of said retaining and carrying structures, means securing each elastomeric block to one and only one of said retaining and carrying structures, said securement being a releasable securement, and each said block being mounted in a position adjustable with respect to said tilt axis for thereby varying the resilient opposition to tilting;

said carrying structure comprising a generally U-shaped stirrup means having opposed legs connected by a bridge portion and pivotally connected to opposing sides of said retaining structure at such tilt axis, said securing means including an attaching screw for each block, said bridge portion including a pair of parallel elongated slots spaced side-by-side along said tilt axis and accommodating the block attaching screws of a pair of said blocks for adjustment of the distance of said blocks to the tilt axis of the stirrup means with respect to said retaining structure, said retaining structure having the form of a box, each said block being held in compression between said stirrup bridge portion and the bottom of said retaining box;

one leg of said stirrup means having a projecting arm having surfaces for locking engagement spaced from said tilt axis, said retaining box mounting a clamping means operable for gripping the locking surfaces of said arm therebetween and thereby locking the tilting unit in a desired tilted position.

4,101,168
ADJUSTABLE CHAIR

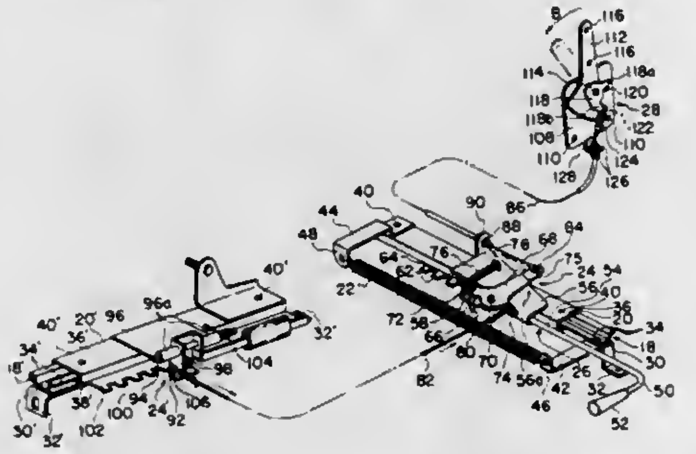
Arthur Charles Ferro, St. Louis, Mo., assignor to Contour Chair-Lounge Co., Inc., St. Louis, Mo.
Filed Dec. 15, 1976, Ser. No. 750,917
Int. Cl.^{2} A47C *1/024*
U.S. Cl. 297—329 **2 Claims**



1. A positionable chair comprising: a base having transverse support structure and curved, downwardly convex, longitudinally disposed support tracks; a top section having transverse support structure and having an upwardly concave top surface whereby parts of the body resting thereon may be higher than other points, the top section parts being in fixed relation to each other from end to end; means for movably supporting the top section upon the curved tracks so that the top section as a whole can move in a curved path relative to the base alternately to raise the foot or head portions of the chair; a power assembly comprising a motor and an extensible drive means connected together as a unit, the extensible drive means having a first portion operatively connected to and united with the motor and a second portion associated with the first portion and moved toward and away from the first portion upon operation of the motor; connecting means to pivotally connect one portion of the power assembly to the base transverse structure at a first point thereon; and other connecting means to pivotally connect the other portion of the power assembly to the top section transverse structure at a second point longitudinally separate from the first point, so that the power assembly can move the top section in the curved path relative to the base and the power assembly can pivot relative to the top section and to the base between the transverse support structure of the base and the top section during the curved movement; and said connecting means for the base and top section confining movement of the extensible means between the pivotal connections of the base and top section; the base section comprising side rails and the base transverse structure comprising transverse braces at intervals along the base side rails holding the side rails together; the top section being likewise formed of side rails and the top section transverse structure comprising transverse braces at intervals along the top section side rails holding those side rails together; the braces of the top section between the two points being above the bottom of the top section, and the braces of the base section being below the top thereof, to provide an open space in the sections between the first and second points; the motor portion of the power assembly being pivotally mounted on the underside of a brace of its section within said space and projecting therefrom toward the other section, and the second portion of the extensible drive means being pivotally connected to the upper side of a brace of the other section in the said space and projecting therefrom toward the first section, so that the power assembly can be extended and contracted, to move the top section in its curved path, without interference with the transverse braces; the connections on the base section being at least substantially wholly below the upper limits of the base section at the connections, and the connections on the top section being below the top thereof and depending below the top section, to dispose the extensible drive means at least largely below the top section.

4,101,169
ADJUSTABLE SEAT FOR A MOTOR VEHICLE

Masakazu Muraishi, Higashi-murayama, and Takao Sekino, Hiratsuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Feb. 25, 1977, Ser. No. 771,983
Claims priority, application Japan, Feb. 27, 1976, 51-20794
Int. Cl.^{2} B60N *1/04*
U.S. Cl. 297—341 **7 Claims**



1. A seat structure for a motor vehicle, having a stationary base member adapted to be fixed to said vehicle, a movable support member slidable on said stationary base member for carrying a seat cushion, and a tilting means for allowing a seat back to be tilted relative to said seat cushion, said seat structure comprising:

seat position memorizing means for memorizing the seat position which is initially set at will in fore-and-aft direction of said vehicle and including a plurality of detents fixed to said stationary base member, a control lever connected to said movable support member so as to be rotatable about the axis thereof and longitudinally movable relative to said movable support member, and a plate member firmly fixed to one end of said control lever and having an opening therein for engagement with one of said detents when said control lever is rotated about the axis thereof in one direction at a predetermined angle, said plate member being formed with a latch slot at its side portion;

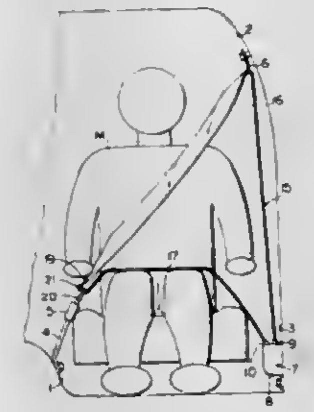
seat locking means for locking said movable support member to said stationary base member;

biasing means for moving said movable support member in the forward direction of said vehicle relative to said stationary base member when said locking means is disengaged; and

actuating means for actuating said seat locking means in association with said seat position memorizing means in response to the tilting movement of said seat back and including a lever member rotatably supported on said movable support member and biased one direction by a spring; a pin member firmly fixed to one end of said lever member, said pin member being engageable with said latch slot of said plate member of said seat position memorizing means to allow said lever member to rotate in said one direction at a predetermined angle by the assistance of said spring, first means for converting the tilting movement of said seat back to the rotational movement of said lever member so that when said seat back is tilted forwardly at a predetermined angle, said lever member is rotated in another direction against the force of said spring thus causing said pin member to disengage from said latch slot, and second means for transmitting the movement of said lever member to said locking means so that when said pin member is disengaged from said latch slot, said seat locking means is disengaged thus causing said movable support member to move in the forward direction by force of said biasing means.

4,101,170
SEAT BELT DEVICE FOR USE IN VEHICLE

Mamoru Mori, Okazaki, and Hiroshi Arai, Obbu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jan. 25, 1977, Ser. No. 762,337
Claims priority, application Japan, Feb. 19, 1976, 51-18752[U]
Int. Cl.^{2} A62B *35/00*
U.S. Cl. 297—389 **3 Claims**



1. A seat belt device for use in a vehicle comprising:

a single retractor for taking up both a shoulder belt and a lap belt, said belts restraining a shoulder portion and a waist portion of an occupant and being formed to be continuous, said retractor having a single take-up shaft for simultaneously taking up said two belts;

a sash guide above the occupant's shoulders having a slit through which the belt freely passes;

a tongue plate for engaging with a buckle means and having an opening through which said belt freely passes; and

stopper means on the belt between the tongue plate and the sash plate, said stopper means being separate from the tongue plate and linearly moveable along the belt by manual manipulation but not so moveable due to pressing force by the tongue plate, said stopper means being of such a configuration that it will not pass through the tongue plate opening, said stopper means being moveable to such a position along said belt that the shoulder portion thereof has sufficient length between the tongue plate and the retractor that the shoulders of the occupant are not unduly pressed by the belt upon attachment thereof.

4,101,171

TONGUE PLATE FOR SEAT BELT DEVICE

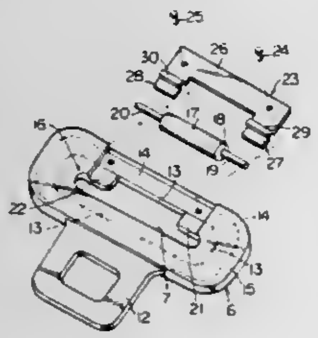
Shiro Sasaki, Toyota; Mitsuo Inukai, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Tokai Rika Denki Seisakusho K.K., both of Japan

Filed Jan. 27, 1977, Ser. No. 810,682

Claims priority, application Japan, Jul. 31, 1976, 51-103071[U]

Int. Cl.^{2} A62B *35/00*

U.S. Cl. 297—389 **10 Claims**



1. A tongue plate for a seat belt device comprising;

a base plate constructed of a metal plate in which a buckle insert portion is formed integrally with a main frame portion of said base plate having a slot for passing a seat belt webbing of the seat belt device, and

a rotatable roller having a supporting shaft disposed in the face of the slot in the main frame portion at a peripheral side of the slot opposite to the buckle insert, where said seat belt webbing is in contact;

an outer peripheral surface of the main frame portion and end portions of said supporting shaft coated with a layer of synthetic resin having suitable thickness, said supporting shaft of said rotatable roller being carried by said layer of synthetic resin.

4,101,172

IN-SITU METHODS OF EXTRACTING BITUMEN VALUES FROM OIL-SAND DEPOSITS

Leonard C. Rabbitts, Big Chief Rd. R.R. #3, Orillia, Ontario, Canada

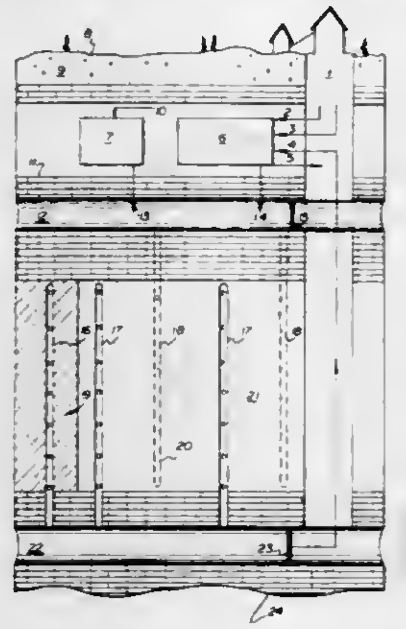
Filed Dec. 9, 1976, Ser. No. 748,822

Claims priority, application Canada, Dec. 22, 1975, 242305

Int. Cl.^{2} E21B *43/25;* **E21C** *41/10*

U.S. Cl. 299—2 **40 Claims**

1. A method of in situ extraction of bitumen from an oil sands body which comprises sinking an access shaft through the oil sands body, driving a plurality of access drifts in the rock strata adjacent said oil sands body at least one access drift being in the rock strata underlying the oil sands body, providing at each of a plurality of locations spaced longitudinally along each access drift a plurality of bores extending in a fan-shaped pattern transversely of said access drift into said oil sands body to provide transverse rows of bores spaced longitudinally along said body in the direction of the access drifts, alternate transverse rows of bores defining rows of inlets and outlets for passage of fluid through said body, said outlets being in access drifts underlying said body, providing perforated pipes in those portions of the bores defining the outlets in said body, the perforations in the pipes being dimensioned to prevent said particles from said body passing therethrough, increasing the permeability of the body by causing fracturing of the body through the inlet bores to provide a fractured block of oil sands in said body defining an enclosed mining room capable of retaining liquids and gases under pressure surrounded by undisturbed solid pillar walls on all four sides of said room, sealing the ends of the access drifts to provide a closed reservoir system capable of delivering and removing fluid through said inlets and outlets and associated access drifts, flooding the block at all elevations at substantially the same time via said inlets at a temperature and for a residence time sufficient to raise the temperature of the block by an amount to cause the bitumen to become flowable with said fluid and removing the fluid-bitumen mixture so formed from all desired levels in said block substantially at the same time through said outlets and associated access drift and separating said bitumen from said fluid.



4,101,173

ROOF PROP AND PLATFORM MOVABLY MOUNTED ON BOOM OF TUNNELLING MACHINE

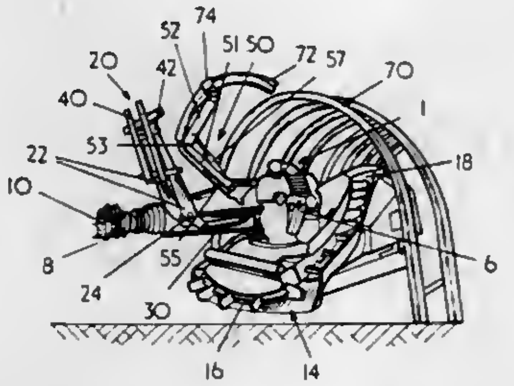
John Hedley Hodgkinson, Sutton-in-Ashfield, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Jan. 28, 1977, Ser. No. 763,708

Claims priority, application United Kingdom, Feb. 13, 1976, 5725/76

Int. Cl.^{2} E21D *9/04, 9/10*

U.S. Cl. 299—33 **11 Claims**



1. A mineral mining machine includes a mobile base unit, a forwardly extending cutter-carrying boom mounted on the base unit and adapted for vertical and horizontal movement, a conveyor assembly attached to the base unit and extending from the front of the unit to the rear thereof, the conveyor unit being adapted to collect and convey material at the front of the unit to the rear of the unit for discharge, and a face support structure pivotally attached to the boom and being adapted for movement independently of the movement of said boom between an inoperative position adjacent the boom and a face supporting position orthogonal or substantially orthogonal to the longitudinal axis of the boom.

4,101,174

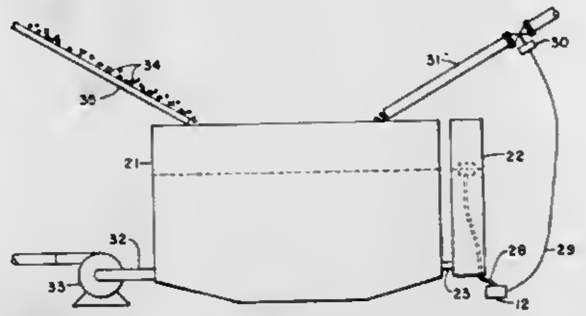
SLURRY CONTROL SYSTEM

Thomas R. Miller, Waynesburg, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 25, 1977, Ser. No. 781,079

Int. Cl.^{2} B65G *53/30, 53/66;* **F16K** *31/20*

U.S. Cl. 302—11 **4 Claims**



1. A slurry handling system for removing coal particles from the interior of a coal mine to the surface comprising:

(a) a slurry hopper located in the interior of a coal mine;
(b) a conveyor for feeding coal particles to said hopper;
(c) a controlled liquid inlet for feeding liquid to said hopper;
(d) a slurry pump connected to said hopper by a slurry outlet for discharging a slurry of said coal particles and said liquid from said hopper to a collecting point where coal particles may be separated from said liquid;
(e) a compartment in fluid communication with said hopper;
(f) a liquid-containing conduit having a first free end positioned in said compartment and adapted to float within said compartment at a level dependent on the level of fluid in said compartment; and
(g) a pressure transducer connected to said compartment and responsive to head pressure in said liquid-containing conduit, said pressure transducer being operatively connected to a control valve controlling said controlled liquid inlet to control the amount of said liquid being fed to said hopper in response to the liquid level in said hopper.

4,101,175

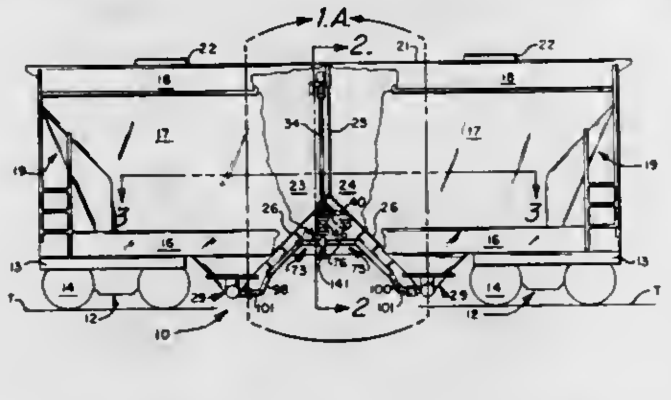
RAILWAY HOPPER CAR FOR UNLOADING LADINGS WHICH DO NOT READILY FLUIDIZE

George A. Kull, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 644,362, Dec. 24, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 815,887

Int. Cl.^{2} B65G *53/12*

U.S. Cl. 302—53 **2 Claims**



1. A railway hopper car for the transport of ladings which do not readily fluidize comprising:

a railway car having at least two longitudinally spaced hoppers, the upper portion of which are in fluid communication; each of said hoppers having longitudinally spaced, inclined hopper slope sheets extending downwardly toward a transversely extending pressure discharge outlet located in the lower portion of each hopper; each outlet including a lading control valve for metering the lading into a discharge tube extending transversely of the car below its respective hopper; said discharge tube at opposite ends having a connection to receive a lading transfer conduit to convey the lading to a container; conduit connecting means located adjacent the car below said hopper slope sheets for receiving a source of air pressure; a first conduit extending from said source at least partially internally within at least one of said hoppers and comprising a standpipe extending vertically to the upper portion of the hopper; a sleeve in the upper portion of said one hopper and said standpipe being movable vertically within said sleeve; a pair of second conduits extending in opposite directions from said source, generally longitudinally of the car and then transversely and downwardly from said source below said hopper slope sheets to about the transverse mid portion of the car into respective first end portions of each of said discharge tubes; a pair of third conduits each in communication respectively with an end portion of the adjacent second conduit and extending respectively to the opposite end portion of the adjacent discharge tube; a first air control valve located in said first conduit below said hopper slope sheets to control the air pressure applied to the upper portion of the hoppers; a pair of second air control valves located in each of said second conduits adjacent its respective outlet for controlling air pressure applied to respective end portions of each of said discharge tubes; a pair of third air control valves located in each of said third conduits to control air pressure applied to the respective opposite end portions of said discharge tubes; whereby said first, second and third conduits are in compliance with AAR clearance requirements without modifying the structure of the hoppers to reduce the carrying capacity of the car, and whereby when the first air control valve is opened, air pressure is applied to the upper portion of each of said hoppers through said first conduit, passing within one of said hoppers to urge the lading downwardly, the lading control valve in the first hopper outlet being unloaded metering lading into the discharge tube located below the first hopper being unloaded; the second conduit in the outlet being unloaded applying pressure to assist in transporting the lading from the discharge tube into the container essentially entirely by pressure without significant fluidization, whereby the third air control valve in the outlet being unloaded may be opened to apply pressure to further assist in transporting the lading through the transfer conduit to the container essentially entirely by pressure without significant fluidization, and whereby after unloading said first hopper outlet, said lading transfer conduit may be removed from the discharge tube of the first outlet unloaded, and quickly attached to the second outlet to be unloaded, to unload the second hopper.

4,101,176

BRAKING CORRECTION DEVICE

Jean-Jacques Carré, Montreuil, and Yves Meyer, Taverny, both of France, assignors to Societe Anonyme DBA, Paris, France

Continuation of Ser. No. 666,837, Mar. 15, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 792,437

Claims priority, application France, Apr. 1, 1975, 75 10131

Int. Cl.^{2} B60T *8/22*

U.S. Cl. 303—6 C **3 Claims**

1. A brake correction device comprising:

a housing defining first and second bores therewithin;

first and second inlet ports respectively communicating with said first and second bores;

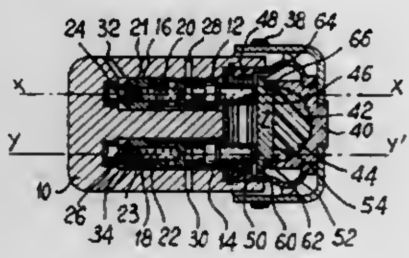
first and second outlet ports respectively communicating with said first and second bores;

a first correcting valve means mounted in said first bore between the first inlet and outlet ports;

a second correcting valve means mounted in said second bore between the second inlet and outlet ports;

each said first and second correcting valve means having a piston controlling communication between corresponding inlet and outlet ports, said piston having a projection movable therewith;

input lever means pivotally mounted with respect to said housing, said input lever means carrying a rigid element having a cavity and said rigid element being movable with said input lever means when the latter is pivoted relative to said housing;



a block of elastomeric material disposed within the rigid element cavity, said block being movable with said rigid element and rotatable nondeformably within the rigid element cavity; and

a rocker member engaging said block to retain the latter within the cavity and rotating with said block relative to the rigid element, said rocker member also engaging the projection of each piston to impart movement to each piston in one direction as said input lever means pivots relative to the housing.

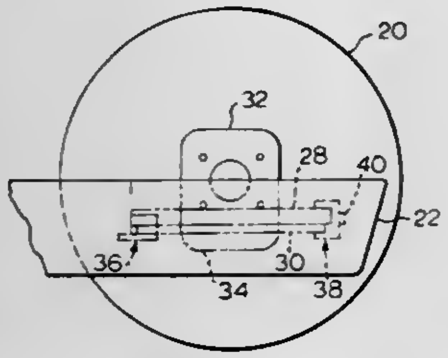
4,101,177
IDLER WEAR STRIP RETAINER FOR TRACK-TYPE VEHICLES

Raymond A. Bianchi, Pekin, and Harry E. Campen, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 2, 1977, Ser. No. 802,611

Int. Cl.² B62D ***55/10***

U.S. Cl. 305—31 **2 Claims**



1. An idler wear strip retainer for track-type vehicles comprising:

first and second retainer means secured to a frame portion of an associated vehicle for forming receptacles therewith and for engaging and retaining first and second ends, respectively, of the wear strip; and

at least one of the retainer means is releasably secured to the frame portion.

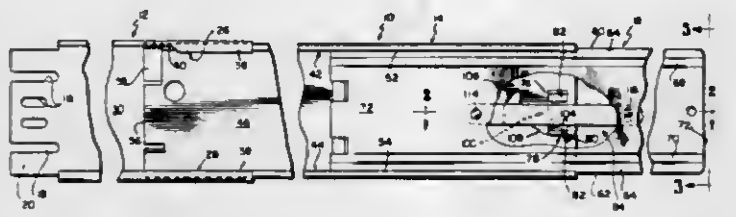
4,101,178
LOCKING LEVER SAFETY STOP

Steven M. Adams, Indianapolis, and Joseph C. Monroe, Beech Grove, both of Ind., assignors to Herbert S. Fall, Indianapolis, Ind.

Filed Sep. 28, 1977, Ser. No. 837,170

Int. Cl.² F16C ***29/00***

U.S. Cl. 308—3.6 **15 Claims**



1. A drawer slide mechanism including a slide member, another slide member slidably engaging the first-mentioned slide member, the first-mentioned slide member including means for providing a stop which projects outwardly from the first-mentioned slide member, and the other slide member including a lever movably mounted thereon and including a hook portion for engaging the stop to limit movement of the other slide member with respect to the first-mentioned slide member, the lever including first and second ends, the lever being provided with a slot adjacent the first end thereof, and means for movably attaching the slotted end of the lever to the other slide member to provide for limited movement of the lever to disengage the hook from the stop and allow the other slide member to be disengaged from the first-mentioned slide member.

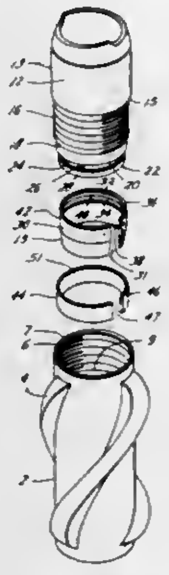
4,101,179
DRILLING STABILIZER INCLUDING MECHANICAL INTERLOCK DEVICE

Alvie Barron, Dallas, Tex., assignor to Royal Tool Company, Inc., Dallas, Tex.

Filed Oct. 3, 1977, Ser. No. 838,686

Int. Cl.² F16C ***1/26***

U.S. Cl. 308—4 A **5 Claims**



1. An improved drilling stabilizer having a substantially cylindrical rigid main sleeve, an axial passageway extending the entire length of the rigid main sleeve and including an inwardly extending fixed abutment means medially of the passageway, the innermost extent of which abutment means defines an opening of sufficient size to permit the sleeve to be slideably received over a drill collar, a flange extending radially outwardly of the rigid main sleeve, a clamping means positioned internally of the rigid main sleeve adjacent the fixed abutment means including first and second pairs of overlying inner and outer split rings each having a single opening, each pair of split rings positioned on opposite sides of the abutment means, one ring of each pair of split rings engaging the abutment means, each pair of rings of sufficient diameter to be slideably received over the drill collar and having abutting conical surfaces oriented so that the axial movement of one split ring of each pair relative to the other split ring of the same pair results in a clamping or unclamping of the inner ring to the rigid main sleeve and the outer ring to the drill collar, and an end cap slideably and threadedly received by the rigid main sleeve to activate the clamping means, wherein the improvement comprises:

a mechanical interlock means for engagement of the outer split ring of one pair of rings to the end cap whereby the outer ring is disengaged axially from the inner ring of the pair as the end cap is threadedly removed from the main sleeve, thereby unclamping the pair of rings from the rigid main sleeve and the drill collar.

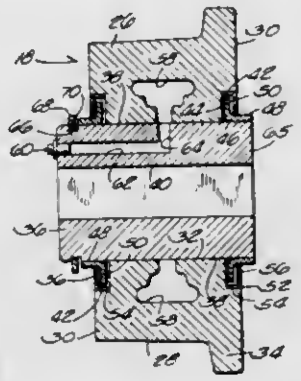
4,101,180
ROLLER ASSEMBLY

William B. Anderson, Oconomowoc, and Julius J. Yulga, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jun. 13, 1977, Ser. No. 806,028

Int. Cl.² F16C ***13/02***

U.S. Cl. 308—20 **10 Claims**



1. A roller assembly comprising:

(a) a roller member having an outer cylindrical rolling surface and substantially flat parallel end faces;

(b) a cylindrical bore extending through said roller member;

(c) a bushing journaled in said bore for relative rotational motion therein;

(d) a counterbore in each end face lying concentric with said bore and having an end wall parallel to the end face;

(e) a pair of inner sealing rings of L-shaped cross section, each having an axially extending leg and a radially extending leg and adapted to be pressed onto an end of said bushing and to be held thereon by an interference fit between the inside surface of said axially extending leg and the outer surface of said bushing;

(f) said inner sealing rings each being disposed within one of said counterbores with the radially extending leg thereof parallel to and closely spaced from the end wall of said counterbore to limit axial movement of the roller member on the bushing and to provide therebetween an axial thrust bearing surface;

(g) the outer edge of the radially extending leg of each inner sealing ring lying spaced from the surface of the counterbore;

(h) outer sealing ring mounted within each counterbore and having a radially extending leg lying axially spaced from the radially extending leg of said inner sealing ring and radially spaced from the axially extending leg of said inner sealing ring; and,

(i) the distance by which the radially extending legs of said inner sealing rings are spaced from the respective end walls of said counterbores is less than the distance by which the radially extending legs of said outer sealing rings are spaced from the respective radially extending legs of said inner sealing rings.

4,101,181
BEARING STRUCTURE FOR A ROTARY DISC

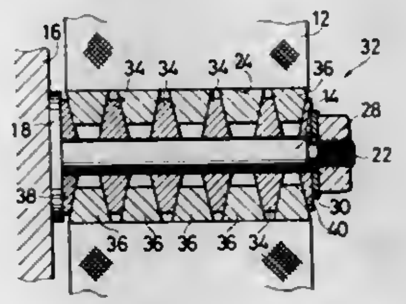
Keiichi Nakanishi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jan. 4, 1977, Ser. No. 756,602

Claims priority, application Japan, Jan. 8, 1976, 51-1040; Mar. 12, 1976, 51-29456

Int. Cl.² F16C ***13/02***

U.S. Cl. 308—36 **11 Claims**



1. A bearing structure for rotatably supporting a rotary disc on a stationary shaft, said rotary disc having a central bore through which said stationary shaft is inserted, said bearing structure comprising:

a plurality of spaced first ring members coaxially mounted on said stationary shaft, each of said first ring members having at its each radial side first means defining a first conical surface concentric with said stationary shaft;

a plurality of spaced second ring members coaxially mounted on the surface of said central bore of said disc and meshing with said first ring members, each of said second ring members having at its each radial side second means defining a second conical surface concentric with said stationary shaft;

said first conical surface and said second conical surface being contiguously engaged with each other at their substantially entire portions; and

holding means for providing a tight contact between said first and second ring members and said stationary shaft, said holding means including two third ring members coaxially mounted on said stationary shaft at positions respectively engageable with two of said second ring members which two are respectively arranged at the axially outermost end positions of said plurality of spaced second ring members, each of said third ring members having at its one radial side third means defining a third conical surface concentric with said stationary shaft, said third conical surface and the second conical surface which is formed on the axially outer side of the corresponding one of said two second ring members being contiguously engaged with each other at their substantially entire portions; and urging means for urging said third ring members into tight contact with said two second ring members and thus providing a tight connection between said first, second and third ring members and said stationary shaft.

4,101,182
HOODS FOR RECORD PLAYERS

Josef Vavřina, Steinhofstrasse 9, and Benedikt Strausak, Merianweg 19, both of CH-3400 Burgdorf, Switzerland

Filed Aug. 18, 1976, Ser. No. 715,390

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537085

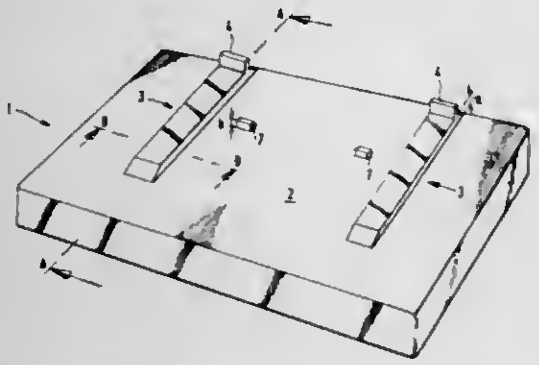
Int. Cl.² A47B ***81/06***

U.S. Cl. 312—8 **1 Claim**

1. A pivoted covering hood for a record player having an

upper surface and a rear side about which said hood pivots, the improvement comprising:

a pair of spaced apart strips extending forwardly from said rear side, said strips extending upwardly from the hood upper surface and being dimensioned to support a record sleeve and space the same from said hood upper surface,



said hood including openings in said hood upper surface,

said strips being recessed in said hood upper surface and snap fit in said openings, and

stops disposed respectively on said strips and extending upwardly therefrom, said stops being positioned near said rear side.

4,101,183

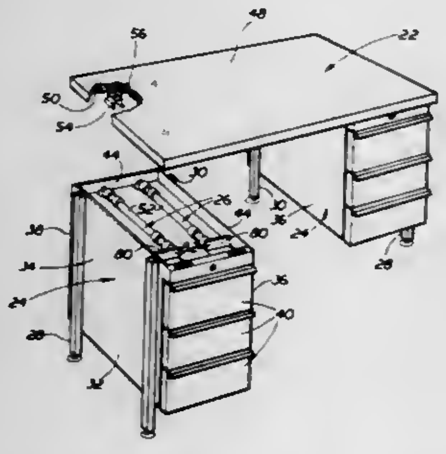
MODULAR OFFICE FURNITURE

Francis C. A. McManus, 5301 N. 13th St., Philadelphia, Pa. 19141

Filed Sep. 17, 1976, Ser. No. 724,201

Int. Cl.² A47B *27/00*

U.S. Cl. 312—195 **2 Claims**



1. Modular office furniture adapted for rapid and simple assembly and disassembly comprising a generally planar top module adapted for use as a table top and a desk surface, a pedestal module comprising a pedestal shell and a pedestal top for supporting said top module and quick-acting snap connecting means for securing said top module onto said pedestal module, said snap connecting means including a first component in the form of a pair of cylindrical locking rods and a second component in the form of at least two clips, each having a resilient mouth into which an associated rod is adapted to be snap-fit, said snap connecting means also comprising a respective pair of guide rings secured to each of said locking rods and spaced apart by the length of said clip to permit said clip to fit therebetween when said rod is within said clip mouth to prevent longitudinal relative movement between said rod and clip, one of said components being permanently secured to said top module and the other component being permanently secured to said pedestal module, with the module to which said locking rods are secured having two pairs of support members permanently secured thereto, each of said support members including a recess in which an end portion of a respective rod is disposed and permanently secured to fastening means, said support members serving to hold said rods parallel to but away from said module to facilitate the securement of said clips to said rods, said pedestal top including a flanged stop abutting an end of each of said rods to longitudinally position said rods with respect to said support members.

4,101,184

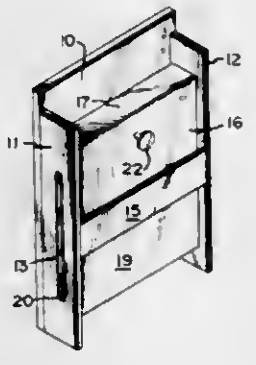
TELEPHONE BOOK HOLDER

Warren E. Barrett, 1198 Topeka St., Pasadena, Calif. 91104

Filed Aug. 13, 1976, Ser. No. 714,187

Int. Cl.² A47B *41/06*

U.S. Cl. 312—233 **3 Claims**



1. A holder for telephone book directories and the like comprising

a backing plate adapted to be mounted on a wall;

a pair of spaced apart side panels extending from one face of the backing plate;

a vertical extending elongate slot in each of the said panels, said slots being in opposed relationship;

a carrier support member spaced from the backing plate and interconnecting the side panels; and

a carrier member, adapted to hold a telephone directory, or the like, said carrier member fitting between the side panels and between the backing plate and carrier support member and having pins projecting from a lower end thereof and into the elongate slots of the side panels, a facing panel extending between the side panels and having a face adapted to extend sufficiently close to the carrier support member that said corner support member will act as a pivot for the facing panel, and top and bottom plates respectively extending from the facing panel and between the side panels, said top and bottom plates extending closely adjacent to the backing plate whereby said top plate will hold the directory on the facing panel when the directory is being displayed and the bottom plate will hold the directory on the facing panel when the directory is being stored.

4,101,185

METHOD FOR PRODUCING A LOW-PRESSURE GAS DISCHARGE LAMP

Johannes van Esdonk; Jan Hasker, and Johannes Cornelis Gerardus Vervest, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1977, Ser. No. 764,588

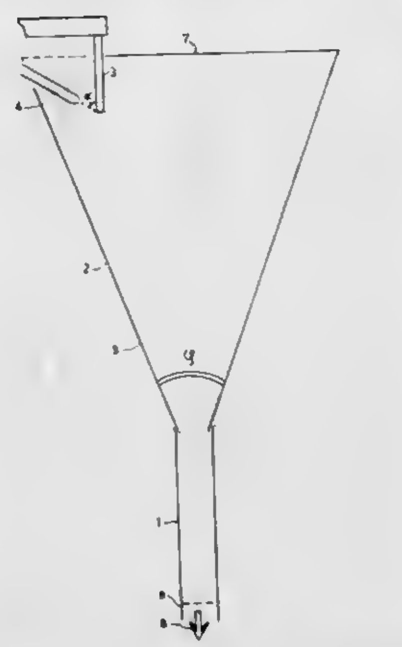
Claims priority, application Netherlands, Mar. 18, 1976, 7602824

Int. Cl.² H01J *9/18*

U.S. Cl. 316—19 **14 Claims**

1. A method for producing a low-pressure discharge lamp which comprises: providing a lamp envelope, said envelope including walls defining a tubular discharge space, providing a body comprising filaments of solid material elements, said body being permeable to a gas discharge, providing coherence to said filaments in a second space adjacent to said tubular

discharge space by subjecting said filaments to a gas current and by whirling said filaments, then sucking said filaments into



said discharge space, and completing the manufacture of said lamp.

4,101,186

CONTACT CLAMP FOR GRAPHITE ELECTRODES

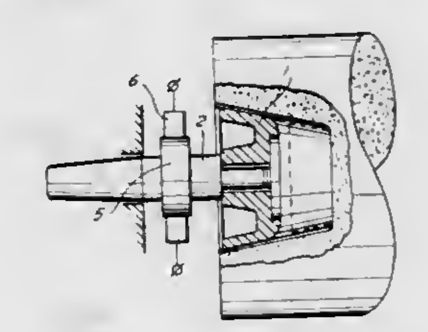
Georgi Metev Georgiev; Peter Lazarov Shivachev; Todor Yankov Koychev; Lyubeo Kostov Lazov, and Alexander Yordanov Valchev, all of Sofia, Bulgaria, assignors to DSO "Cherna Metalurgia", Sofia, Bulgaria

Filed Mar. 2, 1977, Ser. No. 773,754

Claims priority, application Bulgaria, Mar. 3, 1976, 32515

Int. Cl.² H01R *39/00*

U.S. Cl. 339—5 S **4 Claims**



1. A contact clamp for a graphite electrode comprising:

a shaft formed adjacent one end with a conical portion, and adjacent the other end with a neck portion;

a metal hub formed as a truncated cone and seated on said neck portion, said hub being receivable in a conical seat formed in said electrode;

a current-carrying disk on said shaft and in electrical connection with said electrode; and

current-supplying brushes in contact with said disk.

4,101,187

SOCKET FOR WEDGE BASE BULBS

Ben C. Collier, 6121 S. Monticello Dr., Montgomery, Ala. 36109

Filed Jun. 30, 1977, Ser. No. 811,871

Int. Cl.² H01R *33/06*

U.S. Cl. 339—59 L **2 Claims**

1. A socket for releasably receiving a wedge base bulb of the type having an envelope and a pair of exposed conductors on the exterior of the base thereof and for also releasably receiving preassembled conductive wire and clip means, said socket comprising

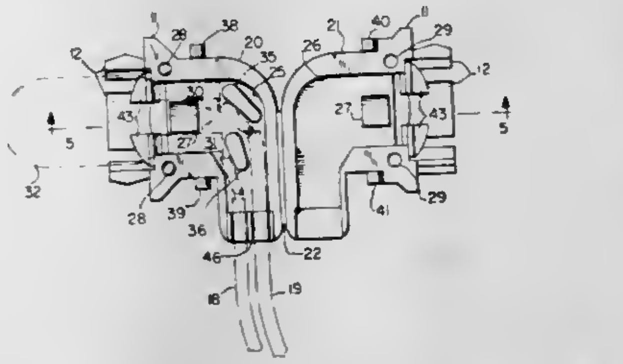
first and second socket halves molded from a rigid polymeric material;

a hinge member integrally formed with said socket halves and interconnecting said halves so that they can be relatively moved between an open position and a closed position;

each of said halves having means defining a recess extending between opposite ends thereof so that, when said halves are moved to said closed position, said recesses form a channel through the socket, one end of said channel being dimensioned to enclose said clip means and to receive the base of said bulb;

one of said halves having means at the other end of said channel for receiving a pair of wires and for maintaining said wires in spaced relationship;

said one of said halves having means in said recess intermediate the ends of said channel and extending toward the other one of said halves for maintaining said clip means in



spaced relationship and in proper position when a bulb is inserted into said one end of said channel to engage said clip means; and

latch means integrally formed on said halves for retaining said halves in said closed position;

and wherein said preassembled wire and clip means includes

a pair of wires each having an exposed end portion, the remainder thereof being covered with an insulating material;

a pair of identical, generally U-shaped metal clip members each dimensioned to engage a conductor on the base of said bulb;

each of said members having integrally formed thereon a connector for frictionally and securely engaging said exposed end portion.

4,101,188

FIBER OPTIC SYSTEM

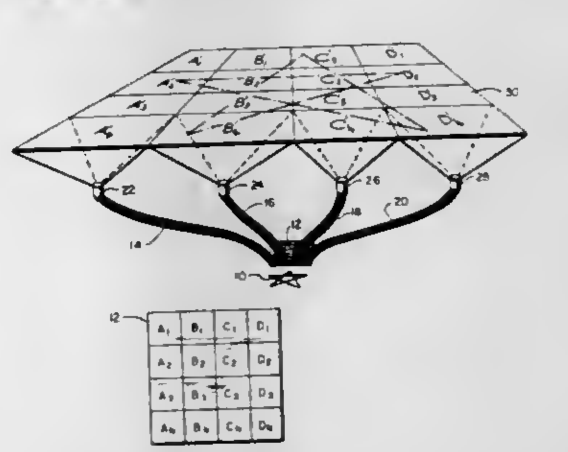
George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 223,612, Feb. 4, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,355

Claims priority, application Israel, Jan. 17, 1973, 41332

Int. Cl.² G02B *5/16*

U.S. Cl. 350—96.24 **13 Claims**



1. An optical system including:

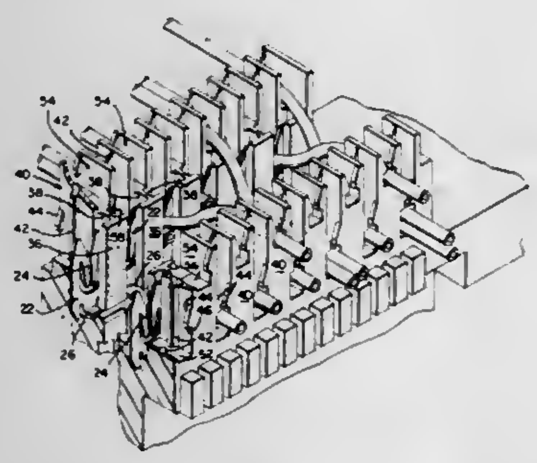
(a) A plurality of coherent light guides having their input termini positioned at and defining an object surface,

(b) said coherent light guides diverging from each other over at least a portion of their length,
(c) the distance between the output termini of said guides being greater than the distance between the input termini,
(d) the output termini of said coherent light guide being rigidly positioned relative to each other,
(e) a light receiving surface adjacent said output termini and adapted to receive output projected therefrom,
(f) the said output termini each provided with a projecting lens interposed between it and said light receiving surface,
(g) means for compensating for image inversion of the projected optical output of each coherent light guide on said light receiving surface,
(h) the output termini of said coherent light guides extending into and supported by a panel and wherein said projection lenses are Lister doublets, the optic axis of each Lister doublet coinciding with the center of its respective output terminus.

4,101,189
DISCRETE WIRE INTERCONNECTIONS FOR CONNECTOR BLOCKS

Jessie Lee Moser, Highpoint; John Robert Shoemaker, Walkertown, and Melvin Andrew Soderstrom, Advance, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 1, 1977, Ser. No. 802,326
Int. Cl.^{2} H01R *13/38*
U.S. Cl. 339—99 R **5 Claims**

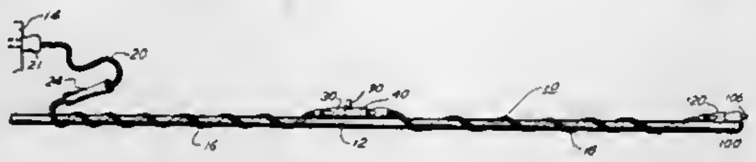


1. In a connector block capable of being interconnected by discrete wires, the improvement comprising:
first and second rows of electrical contacts along opposite sides of said block having resilient contacts on opposite sides of a central cavity of said block and tail portions in the form of slotted plates projecting outwardly of said block,
said block including two rows of supporting flanges provided with aligned grooves facing the spaces defined between adjacent flanges,
the slotted plates of said contacts bridging across the spaces between adjacent flanges and the side margins of said slotted plates being received in the aligned grooves,
said block further including first and second rows of columnar projections defining elongated wire aligning passageways in alignment with adjacent wire gripping jaws of said slotted plate contacts,
said projections further including wire gripping ribs in said passageways for gripping wires aligned along said passageways and terminated to said wire gripping jaws,
said projections further including keeper means preventing removal of wires inserted along said passageways,
said projections further including wire aligning elongated channels aligned with said wire receiving passageways of the opposite rows of projections, whereby wires aligned in said channels span transversely across said block and are terminated to wire receiving jaws of slotted plate contacts adjacent said opposed row of projections and are gripped by said ribs in said wire receiving passageways.

4,101,190
INDICATOR DEVICE FOR MODULAR HEATING CABLE

Dale H. Schoff, New Carlisle, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Filed Feb. 28, 1977, Ser. No. 772,731
Int. Cl.^{2} H01R *3/00*
U.S. Cl. 339—113 L **12 Claims**

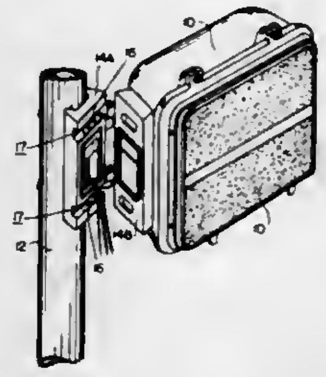


1. An indicator device for modular heating cables having male and female connectors for coupling two heating modules together, comprising a body with a plug having two terminals for connection with said female connector and forming a moisture proof connection with said female connector and a socket having two terminals for connection with said male connector and forming a moisture proof connection with said male connector, a pair of electrical conducting means connecting the terminals of said plug with the respective terminals of said socket, an indicator light means connected to said body in sealed relationship therewith and having a pair of leads, and means connecting said leads of said indicator light means to each of said electrical conducting means.

4,101,191
MOUNTING BRACKET ASSEMBLY FOR PEDESTRIAN TRAFFIC SIGNAL

James S. Gould, Los Alamitos, and Samuel Gould, San Pedro, both of Calif., assignors to Indicator Controls Corporation, Gardena, Calif.

Filed Mar. 16, 1977, Ser. No. 778,077
Int. Cl.^{2} E01F *9/01;* H02B *1/08*
U.S. Cl. 339—125 R **9 Claims**

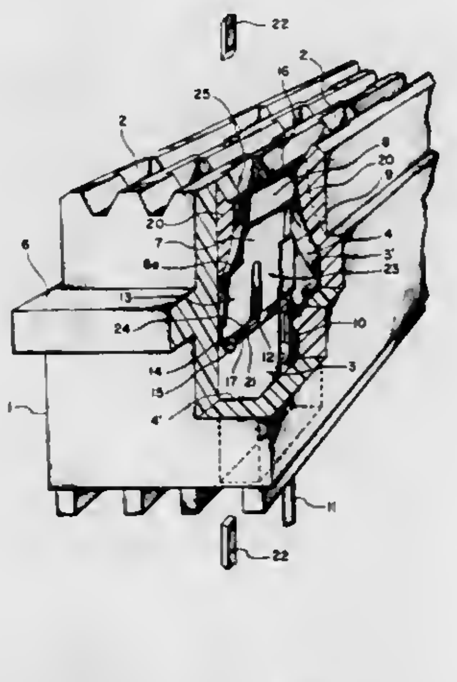


1. In combination: an upright pole; a rectangular-shaped pedestrian traffic signal unit; a two-piece bracket for removably mounting the signal unit on the pole, said bracket including a first cavity-defining piece mounted on the pole having an open front and including an opening in the back thereof for receiving electric wires from the interior of the pole, a second cavity defining piece mounted on one side of the pedestrian traffic signal unit having an open front and including an opening in the back thereof for receiving electric wires from the interior of the unit, hinge means mounted on the first and second pieces to permit the second piece to be removably hinged to the first piece, the first and second pieces being shaped to define an enclosure for the electric wires therebetween within the cavities defined thereby when the two pieces are turned about the axis of said hinge means into facing juxtaposed relationship.

4,101,192
ELECTRICAL CONNECTOR WITH RELEASABLE CONTACT MEMBERS

Gerhard Bäuerle, Willsbach, and Oswald Hüboer, Neuenstadt, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 631,282, Nov. 12, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,668
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1974, 2454317
Int. Cl.^{2} H01R *9/16*
U.S. Cl. 339—217 S **8 Claims**

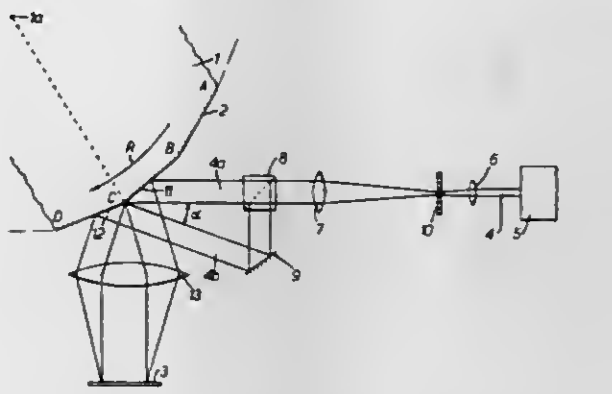


1. An electrical connector comprising:
an insulating body having opposite termination and mating contact faces and at least one contact receiving chamber extending through said body and opening at each of said faces, said termination face adapted to receive wires for connection to connector contact members;
said body including, in each chamber, a locking shoulder on one wall of said chamber and positioned to lock a contact member within the chamber and prevent removal through the opening in the termination face; and
at least one contact member disposed within each chamber, each said contact member including a locking tab engaging said locking shoulder to lock said contact member in a fixed position, said locking tab being releasable from engagement with said locking shoulder by the insertion of a releasing tool to move said locking tab away from said locking shoulder and permit removal of the contact through the opening at said termination face, the improvement comprising:
a releasing shoulder means for the outward release of the contact member through the termination face protruding laterally of said locking tab so as to be positioned laterally adjacent said locking shoulder when said contact member is locked in said fixed position;
means defining a first passageway leading from said termination face to said releasing shoulder means for insertion of a releasing tool to engage and displace said releasing shoulder means and thereby effectuate sufficient concurrent movement of said locking tab to release the latter from locking engagement with said locking shoulder and permit removal of the contact through the opening at said termination face without insertion of a releasing tool from said mating contact face; and
a second passageway leading from the mating contact face for insertion of a releasing tool to engage and displace said locking tab to release the latter from locking engagement with said locking shoulder.

4,101,193
SCANNING SYSTEM

Peter Waterworth, Towcester, and Douglas Charles John Reid, St. James, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Feb. 11, 1977, Ser. No. 767,822
Claims priority, application United Kingdom, Feb. 13, 1976, 05714/76
Int. Cl.^{2} G02B *27/17*
U.S. Cl. 350—6.8 **9 Claims**

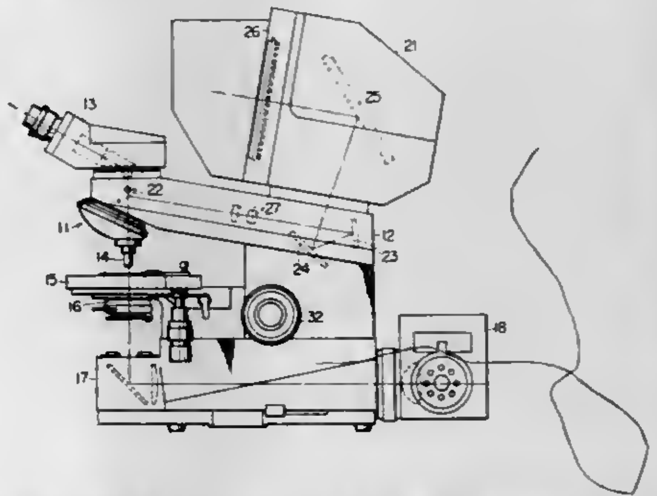


1. A scanning system which includes a rotatable multifaceted polygon having an angle ϕ between adjacent facet edges, the faceted surfaces of which are optically reflective; a recording means spaced-apart from the said polygon and adapted to move in a direction parallel to the rotational axis of the polygon; light generating means for generating at least 2 light beams, directing means for directing the 2 light beams at different angles onto the faceted surface and in contact with each other at said faceted surface in a non-overlapping relationship; modulating means for modulating the said at least two light beams; and first focussing means interposed between the said polygon and the said recording means for focussing said two light beams reflected from the said polygon onto the said recording means to produce two complete scans of the recording means for a single angle rotation ϕ of the polygon.

4,101,194
SCREEN MICROSCOPE WITH VARIABLE ILLUMINATION

Kensaku Miyazaki, Machida, and Toshio Shinohara, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

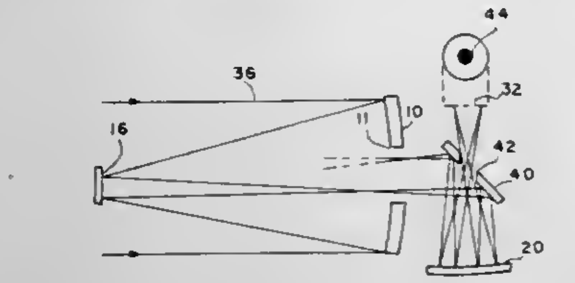
Filed Jul. 14, 1976, Ser. No. 705,172
Claims priority, application Japan, Aug. 27, 1975, 50-102886
Int. Cl.^{2} G02B *21/36, 21/56*
U.S. Cl. 350—9 **3 Claims**



1. A screen microscope comprising an arm mounted to a microscope body, an objective mounted to said arm, an eyepiece arranged on said arm, a projection screen means having a screen and arranged on said arm adjacent to said eyepiece, a movable reflecting mirror arranged in said arm so that said

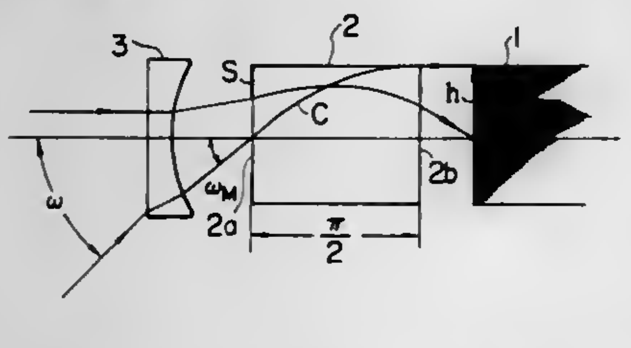
movable reflecting mirror can be aligned with and removed from the optical axis of said objective, other reflecting mirrors arranged in said arm and arranged to direct the light passed through said objective and reflected by said movable reflecting mirror toward said screen, an illuminating light source mounted to said microscope body, and a change-over switch provided in said arm and arranged so that said change-over switch is changed over in combined operation with movement of said movable reflecting mirror for aligning it with and removing it from the optical axis of said objective, said screen microscope being arranged to vary the intensity of light from said illuminating light source by change over of said change-over switch.

4,101,195
ANASTIGMATIC THREE-MIRROR TELESCOPE
Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Dietrich G. Korsch, Huntsville, Ala.
Filed Jul. 29, 1977, Ser. No. 820,498
Int. Cl.^{2} G02B *17/06, 23/06*
U.S. Cl. 350—55 **4 Claims**



1. A three-mirror telescope comprising:
a primary mirror of ellipsoidal configuration, and having an opening central about a central axis thereof;
a secondary mirror of hyperboloidal configuration facing said primary mirror, said secondary mirror being of a smaller diameter than the primary mirror and positioned symmetrically with the axis of the primary mirror, whereby light from a scene being viewed passes around and by the secondary mirror, and then is reflected through said opening in said primary mirror; and
imaging means, including a tertiary mirror of ellipsoidal configuration positioned to receive light from said secondary mirror, for reflecting an image of the scene being viewed to a plane for viewing.

4,101,196
OBJECTIVE OPTICAL SYSTEM FOR ENDOSCOPES
Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Aug. 23, 1976, Ser. No. 716,804
Claims priority, application Japan, Aug. 30, 1975, 50/104521
Int. Cl.^{2} G01B *5/16, 5/14*
U.S. Cl. 350—96.31 **3 Claims**

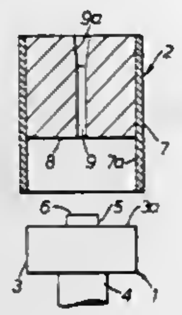


1. An objective optical system for endoscopes comprising an optical fiber bundle for transmitting an image of an object and a cylindrical light-focusing heterogeneous medium arranged near the end face of said optical fiber bundle on the object side and having refractive index distribution *n* given by the following formula:

$$n = n_0(1 - \tfrac{1}{2}\alpha R^2)$$

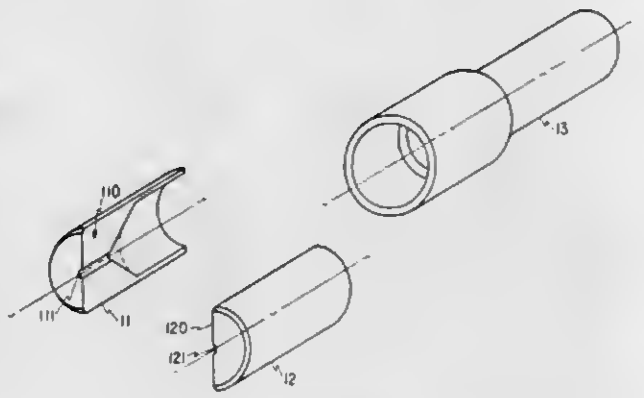
wherein reference symbol n_0 represents refractive index on the optical axis, reference symbol α represents the coefficient of refractive index distribution and reference symbol R represents the distance from the optical axis, said optical system further comprising a negative lens arranged on the object side of said light-focusing heterogeneous medium.

4,101,197
CONNECTORS FOR COAXIALLY COUPLING THE END OF A LINEAR OPTICAL WAVEGUIDE ELEMENT FOR A RECEIVING SURFACE
Alan Hugh Kent, Wokingham, and Peter Howard Fell, Maidenhead, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland
Filed Jun. 4, 1976, Ser. No. 692,782
Claims priority, application United Kingdom, Jun. 6, 1975, 24467/75
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.17 **4 Claims**



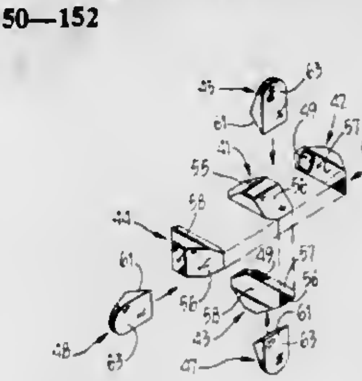
1. A connector for coupling the end of an optical waveguide element to a small-area light-receiving surface, which comprises a first connector member having a substantially rigid body and an end face on which the light-receiving surface is fixedly arranged, and a second connector member having a substantially rigid body formed with a coupling face at one end and with a cylindrical longitudinal through bore penetrating said coupling face at right angles to said face for closely surrounding the end of such waveguide element, said bore having a flared lead-in portion at its end remote from said coupling face, the body of the first connector member including a boss-like structure and the body of the second connector member including at its outer circumference a longitudinally projecting tubular part which presents an inner circumferential surface for slidingly receiving said boss-like body of said first connector member with such longitudinal penetration that said light-receiving surface is substantially in contact with said coupling face, said tubular part and said boss-like body being in such fixed relation to said cylindrical bore, and to said receiving surface respectively, as to each be parallel and substantially coaxial respectively with said bore and with an axis that extends through the centre of said light-receiving surface at right angles to the latter and in which the body of the second connector member has an end portion in which the end of the said waveguide element is centred and which, at least at that end which, in the coupled position of said first and second connector members, is nearest to the receiving surface, is enclosed in a cylindrical holder tube which extends beyond the end of the said end portion, to form a collar adapted to encircle the boss of the first connector member, and having a cylindrical bore for sliding cooperation with the cylindrical outer surface of the boss.

4,101,198
FIBER OPTIC CONNECTOR WITH SPLIT FERRULE ASSEMBLY
Earl R. Heldt, Monta Vista, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 21, 1976, Ser. No. 698,392
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 350—96.20 **7 Claims**



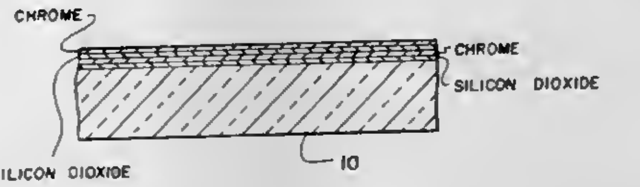
1. A connector for end-to-end coupling of an individual optical fiber cable to another, each cable having an optical fiber, a fiber jacket and a cover, said connector comprising:
a ferrule for retaining the optical fiber and fiber jacket;
boot means for maintaining the cover in gripping relationship with the ferrule; and
coupling means for coupling the ferrule to another ferrule;
said ferrule including a retainer sleeve and two half-shells, each of said half-shells having a flat face formed with a coaxially aligned groove to provide a bore of substantially uniform diameter for slidably retaining the optical fiber when mounted in the retainer sleeve.

4,101,199
RADIATION BEAM SPLITTER
Craig M. Christensen, Atherton, Calif., assignor to Noctua, Inc., Belmont, Calif.
Division of Ser. No. 621,709, Oct. 14, 1975, Pat. No. 4,036,557. This application Jan. 24, 1977, Ser. No. 761,833
Int. Cl.^{2} G02B *27/28, 27/10*
U.S. Cl. 350—152 **6 Claims**



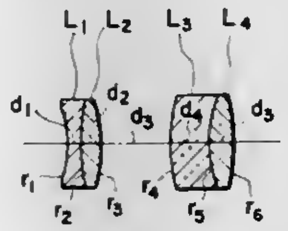
1. A radiation beam splitter for use in generating a pair of mutually parallel coherent radiation beams from a coherent radiation input beam having orthogonal polarization components, said radiation beam splitter comprising:
a plurality of Amici prisms each having opposing end faces and intermediate roof faces extending therebetween, said roof faces of different ones of said plurality of Amici prisms being arranged in facing relation, one of said roof faces of each of said Amici prisms including beam splitting means for reflecting a preselected fractional portion of at least one of said orthogonal polarization components of said input beam and for transmitting the remaining fractional portion of said at least one of said orthogonal polarization components to the interior of the associated Amici prism; and
a plurality of reflecting prisms each associated to a different one of said Amici prisms, each said reflecting prism having a radiation input face coupled to one of said end faces of the associated one of said Amici prisms, a radiation output face, and a reflecting surface having a relatively high coefficient of reflectivity, said reflecting prisms each being arranged so that radiation entering said input face from the associated one of said Amici prisms is totally internally reflected by said output face, reflected by said reflecting surface and emerges from said output face.

4,101,200
COATING COMPOSITION FOR A LIGHT TRANSMITTING ABSORBING COATING ON SUBSTRATES
Helmut Daxinger, Wangs, Switzerland, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein
Filed Mar. 8, 1976, Ser. No. 664,424
Claims priority, application Switzerland, Mar. 7, 1975, 3390/75
Int. Cl.^{2} G02B *5/23;* C23C *15/00;* G02B *5/28*
U.S. Cl. 350—166 **9 Claims**



1. A light transmitting filter having a blue-gray transmission color, in particular a sight glass, comprising a substrate of a transparent material and a coating on said substrate of alternate metal and non-metal layers, said metal layers consisting essentially of chromium and having a thickness of less than 10 nm, and said non-metal layers consisting essentially of silicon dioxide.

4,101,201
LOW MAGNIFICATION MICROSCOPE OBJECTIVE
Tsutomu Tojyo, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Dec. 27, 1976, Ser. No. 754,634
Claims priority, application Japan, Dec. 26, 1975, 51/157485
Int. Cl.^{2} G02B *9/02, 21/02*
U.S. Cl. 350—175 ML **1 Claim**



1. A low magnification objective comprising a first negative cemented lens component having a concave surface facing the object side and consisting of a biconcave lens element and a biconvex lens element, and a second positive cemented lens component consisting of a negative meniscus lens element and a biconvex lens element, and said objective having the following numerical data:

f = 1			
$r_1 = -0.2703$	$d_1 = 0.0492$	$n_1 = 1.51633$	$\nu_1 = 64.1$
$r_2 = 1.0278$	$d_2 = 0.0527$	$n_2 = 1.71285$	$\nu_2 = 43.4$
$r_3 = -0.5009$	$d_3 = 0.2530$		
$r_4 = 0.7140$	$d_4 = 0.1230$	$n_3 = 1.78472$	$\nu_3 = 25.7$
$r_5 = 0.3562$	$d_5 = 0.0735$	$n_4 = 1.50378$	$\nu_4 = 66.8$

-continued

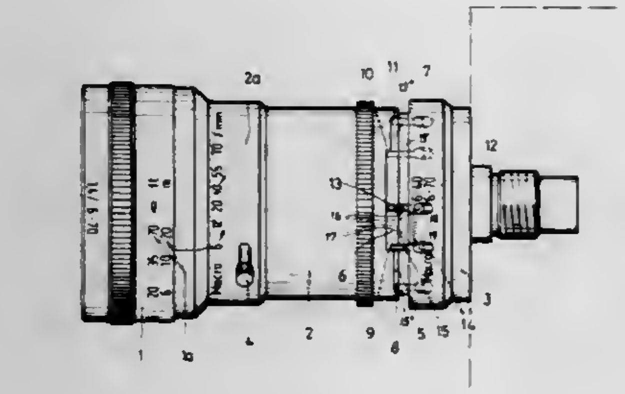
f = 1
$r_6 = 0.7532$

wherein the reference symbol f represent the overall focal length of the objective as a whole, the reference symbols r_1 through r_6 designate radii of curvature on respective lens surfaces, the reference symbols d_1 through d_5 denote thicknesses of respective lens elements and the airspace therebetween, the reference symbols n_1 through n_4 represent refractive indices of respective lens elements and the reference symbols ν_1 through ν_4 designate Abbe's numbers of respective lens elements.

4,101,202

VARIFOCAL CAMERA OBJECTIVE WITH ADJUSTMENT-RANGE SELECTION

Karl Tesch, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany
Filed Dec. 10, 1976, Ser. No. 749,332
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555953
Int. Cl.² G02B *15/18*
U.S. Cl. 350—187 **4 Claims**



1. In a camera having a varifocal objective provided with control means displaceable between a telephoto position and a wide-angle position for adjusting the focal length of the objective in a zoom range, said control means being further displaceable beyond said wide-angle position for focusing the objective upon nearby objects in a macro range, the combination therewith of:

- first stop means coupled with said objective and selectively settable to coact with said control means for blocking movement thereof from said wide-angle position toward said telephoto position beyond a predetermined intermediate position; and
- second stop means coupled with said objective and selectively settable independently of said first stop means to coact with said control means for blocking movement thereof away from said telephoto position past said wide-angle position.

4,101,203

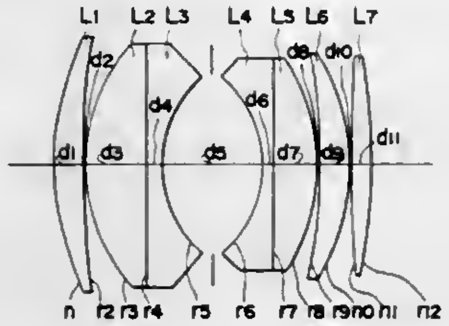
GAUSS TYPE LENS SYSTEM

Tamikazu Yamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 6, 1977, Ser. No. 757,213
Claims priority, application Japan, Jan. 12, 1976, 51/3001
Int. Cl.² G02B *9/60*
U.S. Cl. 350—217 **9 Claims**

1. A five group, seven element Gauss type lens system comprising, from the object side to the image side of the lens system;

- a first positive meniscus lens element convex to the object side, forming a first lens group;
- a second positive lens element;
- a third negative lens element cemented to the second lens element to form a meniscus-shaped doublet convex to the object side, forming a second lens group;
- a fourth negative lens element;
- a fifth positive lens element cemented to the fourth lens element to form a meniscus-shaped doublet concave to the object side, forming a third lens group;
- a sixth positive meniscus lens element concave to the object side, forming a fourth lens group; and
- a seventh positive lens element, forming a fifth lens group,

the lens system having design parameters within the following ranges:



$$1.7 < r8/r6 < 1.9,$$

$$0.9 < r10/r8 < 1.2,$$

$$0.67 < (d_6 + d_7)/(d_3 + d_4) < 0.87,$$

$$1.65 < n2 < 1.72,$$

$$n5 > 1.72;\ n6 > 1.72$$

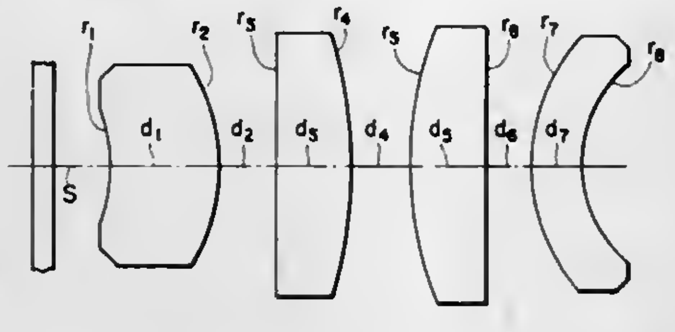
wherein,

- r represents the radius of curvature,
- d represents the value of the axial distance, and
- n represents refractive index,
- the sub-numbers correspond to the consecutive values from the object to image side of the lens system.

4,101,204

MEDIUM MAGNIFICATION OBJECTIVE FOR VIDEO DISKS

Toshimichi Koizumi, Sagamihara, and Miwako Unami, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Feb. 24, 1977, Ser. No. 771,801
Claims priority, application Japan, Feb. 27, 1976, 51-20147
Int. Cl.² G02B *9/34*
U.S. Cl. 350—224 **7 Claims**



1. A medium magnification objective for video disks comprising a first, second, third and fourth lenses, said first lens being a positive meniscus lens with its concave surface positioned toward the object side, said second lens being a positive meniscus lens with its concave surface positioned toward the object side, said third lens being a biconvex lens, said fourth lens being a negative meniscus lens with its convex surface positioned toward the object side, said medium magnification objective for video disks satisfying the following conditions:

$$0.3 \geqq d_6/f \geqq 0.06 \tag{1}$$

$$0.41 \geqq d_7/f \geqq 0.28 \tag{2}$$

$$2 \geqq |f_4|/f_1 \geqq 1 \tag{3}$$

$$0.45 \geqq d_4/f \geqq 0.25 \tag{4}$$

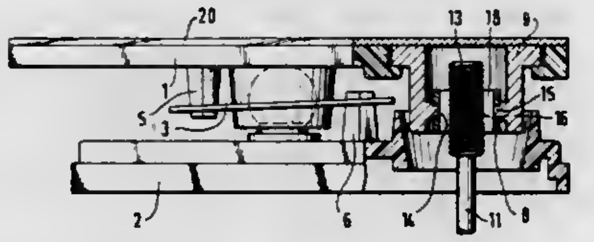
$$1.7 \geqq |r_2|/d_1 \geqq 1.5 \tag{5}$$

Wherein reference symbol r_2 represents the radius of curvature of the surface on the image side of the first lens, reference symbol d_1 represent the thickness of the first lens, reference symbol d_7 represents the thickness of the fourth lens, reference symbol d_4 represents the airspace between the second and third lenses, reference d_6 represents the airspace between the third and fourth lenses, reference symbol f_1 represents the focal length of the first lens, reference f_4 represents the focal length of the fourth lens and reference symbol f represents the focal length of the lens system as a whole.

4,101,205

DRIVING MIRROR ASSEMBLY

Horst Bös, Göppingen, Fed. Rep. of Germany, assignor to Gebr. Marklin & Cie. GmbH, Goppingen, Fed. Rep. of Germany
Filed Aug. 9, 1976, Ser. No. 713,061
Int. Cl.² G02B *5/08*
U.S. Cl. 350—289 **3 Claims**



1. A driving mirror assembly comprising:

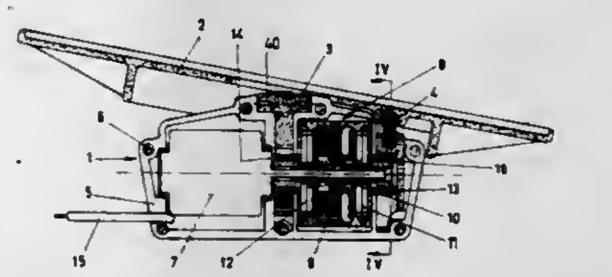
- a base;
- a carrier for a mirror glass the mirror glass, said carrier being supported on said base by means of a universal joint;
- first means for pivoting said carrier relative to said base about a first axis passing through said universal joint;
- second means for pivoting said carrier relative to said base about a second axis passing through said universal joint and perpendicular to said first axis;
- a plurality of first posts formed on said base and extending towards said carrier;
- a plurality of second posts formed on said carrier and extending towards said base;
- a sheet of spring metal positioned about said universal joint and supported by said first and second posts to prevent said carrier from rotating.

4,101,206

ADJUSTABLE MOTOR CAR MIRROR WITH COMPACT ELECTRICALLY DRIVEN ADJUSTING MEANS

Aane Adriaan Oskam, De Meern, and Hermanus Marinus Ignatius Koot, Linschoten, both of Netherlands, assignors to Industrie Koot B.V., Montfoort, Netherlands
Filed Dec. 17, 1976, Ser. No. 751,709
Claims priority, application Netherlands, Apr. 9, 1976, 7603821; Sep. 14, 1976, 7610173
Int. Cl.² G02B *5/08, 7/18*
U.S. Cl. 350—289 **12 Claims**

1. A device for adjusting a motor car mirror around two substantially perpendicular axes, comprising a housing, a reversible motor in said housing, an electromagnetically operated clutch in said housing and connected to said motor, two planetary transmission assemblies in said housing and to which said clutch is connected for operating one or the other of said transmission assemblies, each transmission assembly having a drive shaft, a projection member mounted on each drive shaft, and two mirror adjustment units, one having one end connected to said projection member on said drive shaft of one transmission assembly and having the other end adapted to be connected to a mirror structure for tilting said mirror structure around one of said axes, and the other having one end connected to said projection member on said drive shaft of the other transmission assembly and having the other end adapted to be connected to the mirror structure for tilting the mirror structure around the other of said axes, one of the connections between the drive shaft and the projection member and between the projection member and the mirror adjustment unit for each combination of drive shaft, projection member and mirror adjustment unit being a slip connection.



4,101,207

PREPARATION OF LIQUID CRYSTAL CONTAINING POLYMERIC STRUCTURE

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 331,445, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 121,156, Mar. 4, 1971, abandoned. This application Apr. 18, 1977, Ser. No. 788,577
Int. Cl.² G02F *1/13*
U.S. Cl. 350—344 **5 Claims**

1. As an article of manufacture, an electronic display device comprising:

- (a) at least one base member,
- (b) a thin, layer-like structure of controlled thickness supported on a surface of said base member,
- (c) said structure comprising poly(ethylene oxide) in matrix form and N,N'-bis(p-n-octyloxybenzylidene)-2-chloro-1,4-phenylenediamine nematic liquid-crystal material;
- (d) said nematic liquid-crystal material being dispersed in said poly(ethylene oxide) matrix in intimate contact therewith, and said poly(ethylene oxide) being chemically and physically inert relative to the contained liquid-crystal material, and
- (e) means for applying an electric field to selected areas of said structure to produce a dynamic scattering effect in said nematic liquid-crystal materail.

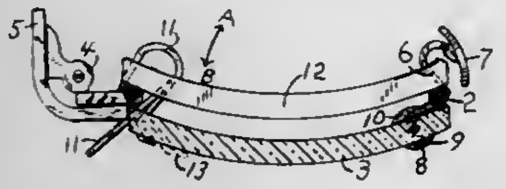
4,101,208

OPHTHALMIC DEVICE FOR TENSIONALLY SECURING LENSES THERETO

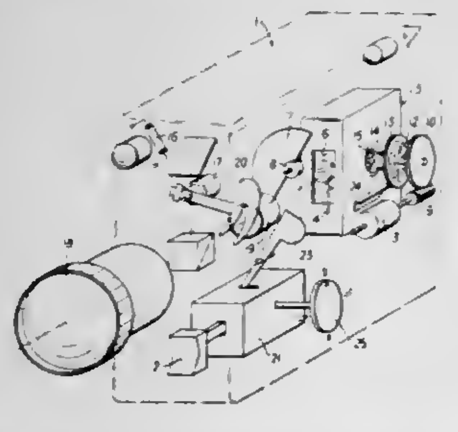
Louis J. Page, 191-21 Hillside Ave., Hollis, N.Y. 11423
Filed Jan. 17, 1977, Ser. No. 760,184
Int. Cl.² G02C *9/04*
U.S. Cl. 351—58 **10 Claims**

1. An ophthalmic device having a pair of spaced rim members connected by a bridge member, each of said rim members extending at least partially along the peripheral portion of a lens, the upper portion of said rim member being located substantially above eye level when worn, lens attaching means being attached to the nasal and temporal side portions of said rim member and having portions thereon extending rearwardly therefrom and having a spring relationship to each other so that the confronting surfaces of the attaching means

can be sprung apart relative to each other and having the distance between the attaching means less than the distance between the side portions of a lens inserted therein, lenses, at least one of said lenses being provided with at least one temporal and one nasal notch formed in the respective side edge portions thereof and at least one of said lenses being attached to each of said rim members, said lens being positioned so that one of said attaching means engages the corresponding side notch in the lens, the other side of said lens being positioned so that the notched portion therein is located over the rear of the corresponding side attaching means and is pressed against the attaching means whereby the attaching means yields relative to the other of said attaching means allowing the lens to enter therein, thereby tensionally and releasably securing the lens to said rim member.

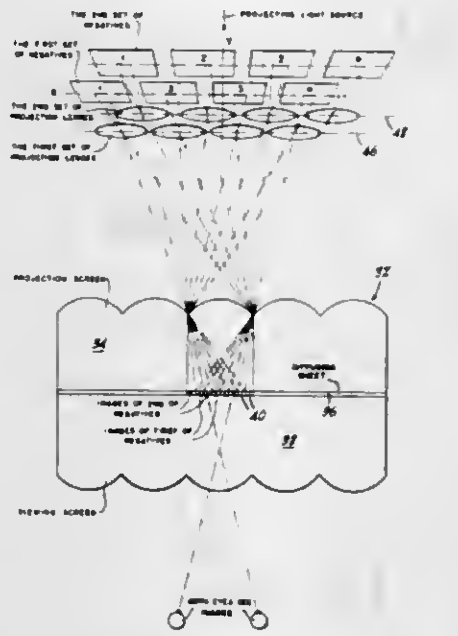


4,101,209
CINE CAMERA
Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria
Filed Sep. 8, 1976, Ser. No. 721,222
Claims priority, application Austria, Sep. 8, 1975, 6899/75
Int. Cl.^{2} G03B *21/36*
U.S. Cl. 352—91 C **22 Claims**



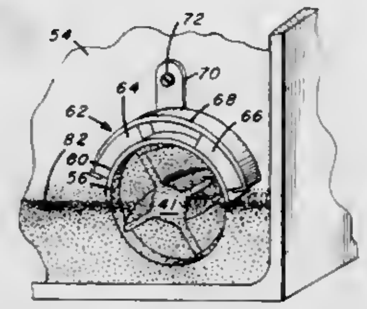
1. In a cine-camera for cinematographic film
optical means defining an optical axis;
means for guiding the film and for exposing successive image frames on said optical axis;
shutter means for intercepting said optical axis and being operable to alternately assume an intercepting condition and an open condition;
first drive means for said film and said shutter;
motor means for providing power for said first drive means;
fading means operable between an open condition and a fade-out condition for continuously altering the amount of light reaching the image frame on said optical axis;
release means for controlling the operation of said drive means and being movable from an inoperative position into a first operative position for rendering operative said drive means, and from the first into a second operative position to operate said fading means;
blocking means for preventing movement of said release means from the first into the second position, said blocking means having a blocking and an unblocking condition;
programming means being controlled by said release means and controlling said blocking means the blocking means after the movement of the release means from the inoperative into the first operative position remaining in blocking condition during a time interval determined by the programming means and then assuming the unblocking condition to allow the release means to be moved into the second operative position for operating the fading means.

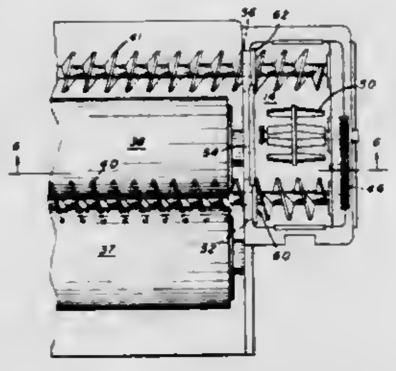
4,101,210
PROJECTION APPARATUS FOR STEREOSCOPIC PICTURES
Allen Kwok Wah Lo, and Jerry Curtis Nims, both of Dunwoody, Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.
Filed Jun. 21, 1976, Ser. No. 698,064
Int. Cl.^{2} G03B *21/00*
U.S. Cl. 353—7 **10 Claims**



1. Apparatus for forming stereoscopic pictures of the type including a multiplicity of lineiform image bands, each of said image bands comprising a plurality of condensed images from a corresponding plurality of two-dimensional views of an object field taken from spaced vantage points, and a lenticular screen having a corresponding multiplicity of lenticules aligned with the image bands, said apparatus comprising:
a lenticular screen having a plurality of cylindrical lenticules of width *w*;
means including a plurality M of projecting lenses for projecting a corresponding plurality M of two-dimensional views of an object field, a plurality N ≦ M of which were taken from different vantage points relative to the object field, onto said lenticular screen with the projected image of a selected common element of each view in substantial registry with a reference point located substantially at the position of said lenticular screen, the number M of projected two-dimensional views being equal to w/m, where m is the width of an individual condensed image formed at the rear surface of a lenticule;
a corresponding plurality M of photographic recordings, each arranged in optical alignment with a corresponding one of said projecting lenses and containing a photographic image of one of said two-dimensional views; and
means for supporting said plurality M of projecting lenses and said corresponding plurality M of photographic recordings in a plurality of rows, said rows of projecting lenses and photographic recordings being spaced apart in the direction of the lengthwise extent of the lenticules and being offset relative to one another in the direction of the widthwise extent of the lenticules of said lenticular screen such that the apertures of said M lenses, when viewed in the direction of the lengthwise extent of the lenticules, are arranged substantially in edge-to-edge contiguous relation,
whereby said M projected two-dimensional views form M condensed images at the rear surface of each lenticule which are substantially contiguous and non-overlapping.

4,101,211
MAGNETIC CURTAIN SEAL FOR DEVELOPMENT APPARATUS
Walter Kayson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 12, 1976, Ser. No. 704,215
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—3 DD **1 Claim**

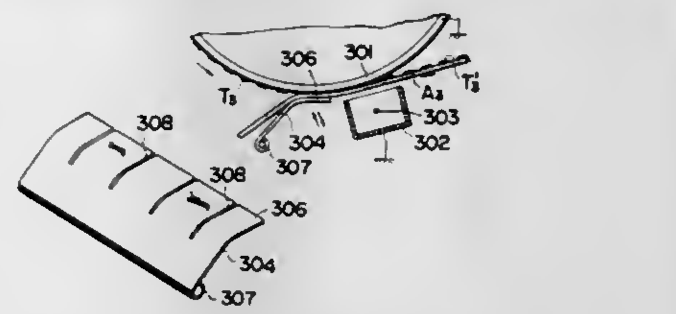




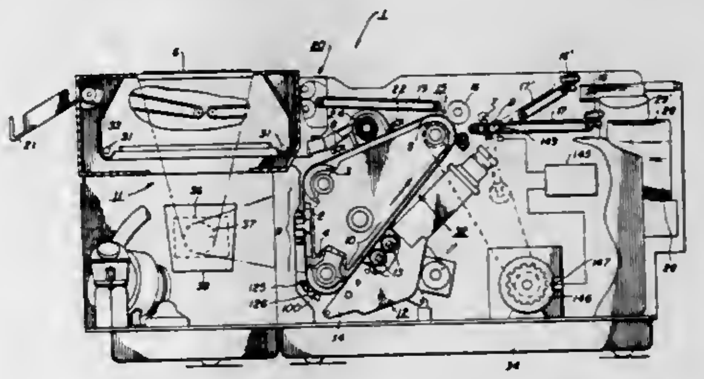
1. In an electrographic development apparatus including a sump for receiving developer having toner and magnetic particles, and a development station having means for applying toner to an electrostatic image carried on an insulating surface, and at least one rotatable auger disposed in a passageway formed between the sump and the development station, the improvement comprising:
magnetic curtain seal means having a magnetic shunt member and a plurality of magnets connected to said shunt member, said magnetic curtain seal means being disposed relative to said auger and said passageway for attracting a portion of the developer to block a part of said passageway, whereby toner dust is prevented from escaping from said sump through such blocked portion of said passageway into said development station.

4,101,212
IMAGE TRANSFER COMPLEMENTARY APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE
Keiji Sumiyoshi, Hino, and Tomio Saitoh, Iruma, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Jan. 14, 1977, Ser. No. 759,373
Claims priority, application Japan, Jan. 19, 1976, 51-4013
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—3 TR **5 Claims**

5. In an electrophotographic copying machine having means for providing a developed toner image on the surface of a recording element and means, having a discharge electrode, for electrostatically transferring, at a transfer zone, the developed toner image to a transfer sheet supplied to the transfer zone, the improvement comprising an image transfer complementary device including a depressing plate having an end portion extending adjacent the recording element, at least the end portion of said plate being adapted to press the transfer sheet, at a position upstream of the transfer zone, against the surface of the recording element and being deformable in response to movement of the transfer sheet.



4,101,213
ZOOM LENS COPIER
Kenneth W. Laskowski, Fairport, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 577,379, May 14, 1975, Pat. No. 4,046,467. This application Nov. 26, 1976, Ser. No. 745,254
Int. Cl.^{2} G03G *15/00*
U.S. Cl. 355—5 **5 Claims**



1. In the method of producing copies electrostatically using a movable photoreceptor, the steps comprising:
(a) flash illuminating an original to be reproduced to produce a light image representative of said original;
(b) projecting said light image by means of an infinitely variable lens means onto the photoreceptor whereby to form a latent electrostatic image of the original on said photoreceptor for development and transfer to copy substrate material;
(c) changing actuation of said illuminating flash to displace the light image produced on said photoreceptor and the position of the developed image on said copy substrate material; and
(d) operating said lens means to adjust the size of the light image projected by said lens means onto the photoreceptor so as to produce a copy of the entire original without deletion of any information due to displacement of said image.

4,101,214

TONER DISPENSING DEVICE WITH ELECTRICAL INTEGRATING CIRCUIT

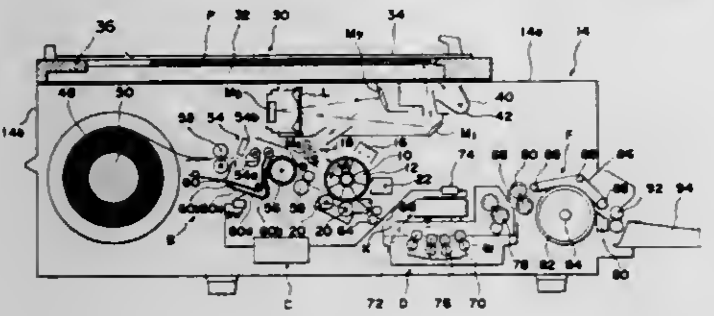
Yutaka Irie; Tomoji Murata, both of Toyokawa; Kenji Shibazaki, Aichi; Shigemitu Shimizu, Toyokawa; Yukio Tokura, Toyohashi, and Shunji Yamamoto, Shinshiro, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 31, 1975, Ser. No. 645,914

Claims priority, application Japan, Jan. 13, 1975, 50-7419[U]

Int. Cl.² G03G *15/10*

U.S. Cl. 355—10 **12 Claims**



1. A toner dispensing means for use in an electrophotographic copying apparatus having an optical system, means for forming an electrostatic latent image upon receipt of light rays projected through said optical system from an original to be copied, said electrostatic latent image corresponding to an image of the original which has been carried by said optical system, means for feeding copy material into contact with said latent image forming means, said toner dispensing means comprising:

- toner storing means;
- detecting means for detecting the length of copy material passing through the path means;
- circuit means for electrically integrating the length of the copy material detected by said detecting means and for memorizing the integrated length of the copy material until the amount of the integrated length has reached a predetermined level and for generating the electrical output in the form of electrical pulses when the amount of the integrated length has reached a predetermined level, the said circuit means including an integrating circuit element which accumulates energy in the forward current and discharges the accumulated energy in the reverse current, whereby the internal resistance of the integrating circuit means is lower in the period when the accumulated energy is existing in said integrating circuit means than in the period when the accumulated energy is not existing therein; and
- supply means for supplying an amount of toner corresponding to said output signal from said integrating circuit means to the developing means.

4,101,215

CLEANING DEVICE FOR AN ELECTROSTATIC COPIER

Günther Fottner, and Gottfried Waibel, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

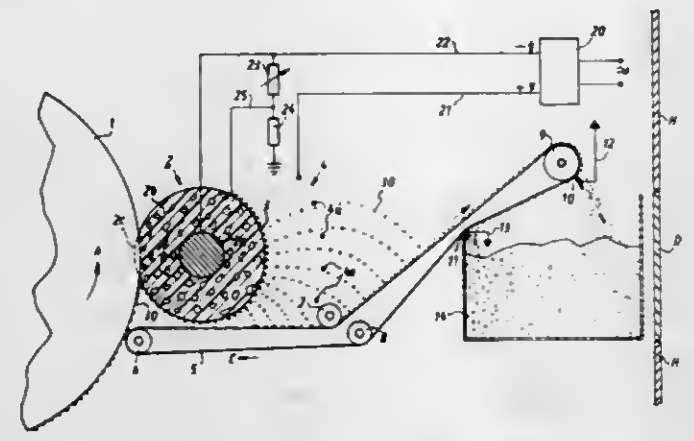
Filed Dec. 15, 1976, Ser. No. 750,804

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557758

Int. Cl.² G03G *21/00*

U.S. Cl. 355—15 **22 Claims**

1. In an electrostatic copier wherein an electrostatic image pattern is formed on the photoconductive surface of a travelling endless carrier, toner particles are electrostatically attracted to said pattern to form a visible image and are thereupon transferred to an image carrier, and cleaning means subsequently cleans incremental portions of the photoconductive surface to remove residual toner particles therefrom which then become lodged on said cleaning means, the improvement comprising means for dislodging toner particles from said cleaning means; a receptacle spaced from said dislodging means; a grid-electrode intermediate said receptacle and said dislodging means and spaced from the latter, said grid-electrode being provided with a plurality of interstices so as to be readily permeable to toner particles; and means connected to said grid-electrode for generating between the same and said dislodging means an electric field which impels dislodged particles from said dislodging means towards and through said grid-electrode for eventual deposition in said receptacle.



4,101,216

METHOD AND APPARATUS FOR PRINT EXPOSURE CONTROL

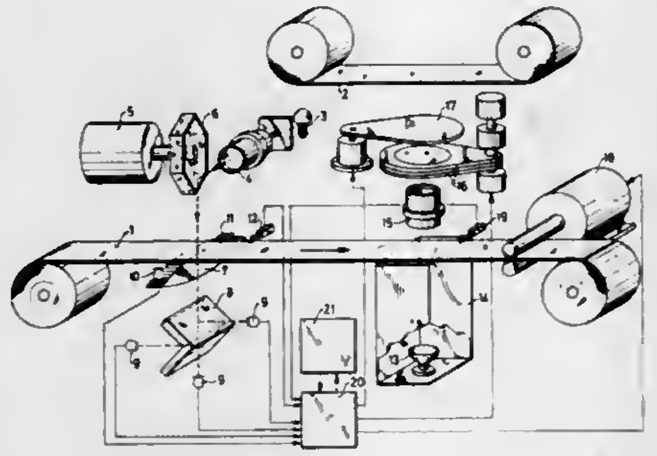
Walter Grossmann, Russikon, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Continuation-in-part of Ser. No. 637,103, Dec. 2, 1975, abandoned. This application Sep. 10, 1976, Ser. No. 722,115

Claims priority, application Switzerland, Dec. 13, 1974, 16612/74

Int. Cl.² G03B *27/76, 27/78*

U.S. Cl. 355—35 **18 Claims**



17. A photographic printer for producing photographic prints from an original, comprising

a means for scanning the density of the original point-by-point in three primary colours *i*, *j* and *k* and evaluating density values D_i, D_j, D_k of the three primary colours *i*, *j*, *k* in each point of scan of the original,

a process computer connected to said scanning means and programmed to

select from all density values evaluated in the scanning means only those which originate from points of scan the three density values of which satisfy at least two of the following three conditions:

$$D_i - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_i} - \frac{aD_{N_i}+bD_{N_j}+cD_{Nk}}{a+b+c} \pm d_1$$

-continued

$$D_j - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_j} - \frac{aD_{N_i}+bD_{N_j}+cD_{N_k}}{a+b+c} \pm d_2$$

$$D_k - \frac{aD_i+bD_j+cD_k}{a+b+c} \leqq D_{N_k} - \frac{aD_{N_i}+bD_{N_j}\pm cD_{N_k}}{a+b+c} \pm d_3$$

where D_i, D_j and D_k denote the densities of the scanned points for the primary colours *i*, *j* and *k*; *a*, *b* and *c* being constant factors, d_1, d_2 and d_3 being constant density values, and D_{N_i}, D_{N_j} and D_{N_k} denoting the densities of the primary colours *i*, *j*, and *k* of a reference original, and to determine area density values in the three primary colours *i*, *j*, *k* from the so selected density values; and

a means for exposing a light sensitive material to light from said original, said exposure means having a control means which controls exposure in accordance with said area density values.

4,101,217

AUTOMATIC COLOR PRINTING APPARATUS

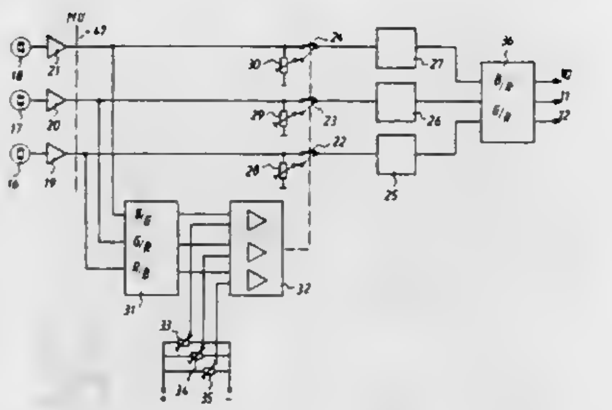
Berthold Fergg, Taufkirchen; Wolfgang Zahn, Munich, and Walter Knapp, Taufkirchen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,595

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1975, 2535034

Int. Cl.² G03B *27/78*

U.S. Cl. 355—38 **21 Claims**



1. In a photographic color printing apparatus wherein originals are imaged onto photosensitive receptors and at least some originals include areas of predominant color, an exposure control comprising signal transmitting photosensitive transducer means operative to scan the areas of an original in the primary colors; signal transmitting means for evaluating signals from said transducer means for the presence of areas of predominant color; signal transmitting means for integrating the signals from said transducer means in the primary colors; signal transmitting means for comparing signals from said evaluating means with reference signals; means for modifying the signals from said transducer means to said integerating means in response to signals transmitted by said comparing means and indicative of areas of predominant color, said modifying means comprising switching means operative to at least reduce the intensity of signals from said transducer means to said integrating means in response to signals transmitted by said comparing means on scanning of an area of predominant color; and means for regulating the exposure of a receptor in response to signals from said integrating means.

4,101,218

ELECTRONIC COPYING APPARATUS

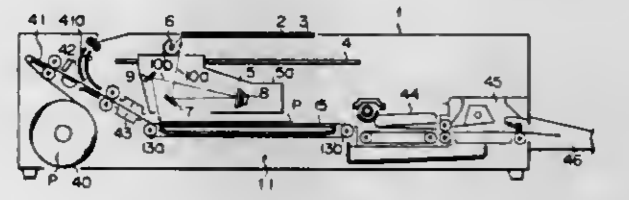
Ryoji Saruwatari, Niiza; Fumio Tamakawa, Yokohama; Takeo Ikeda, Yokohama, and Norio Misawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 23, 1977, Ser. No. 780,645

Claims priority, application Japan, Mar. 26, 1976, 51-33203

Int. Cl.² G03G *15/00;* G03B *27/34*

U.S. Cl. 355—57 **8 Claims**



1. An electronic copying apparatus comprising a copying machine body; original mount means for fixing an original to said body; support means for supporting a photosensitive body in parallel with said original; an optical unit provided in said machine body to move along said original and including a light source for irradiating said original and lens means defining a first light path between the original and the lens means and a second light path between the lens means and the photosensitive body, both said first and second light paths having a ratio of optical distances controlled according to the copying magnification; and driving means for stopping the photosensitive body to allow the optical unit to perform scanning in full-scale copying and in varied-scale copying, allowing the optical unit to perform scanning while moving the photosensitive body and the optical unit according to the correlation as follows

$$V_P = |V_L(1-\alpha)|$$

where V_P is a moving speed of the photosensitive body at time of exposure, V_L is a moving speed of optical unit at time of exposure, V_L is a moving speed of optical unit at time of exposure, and α is a copying magnification.

4,101,219

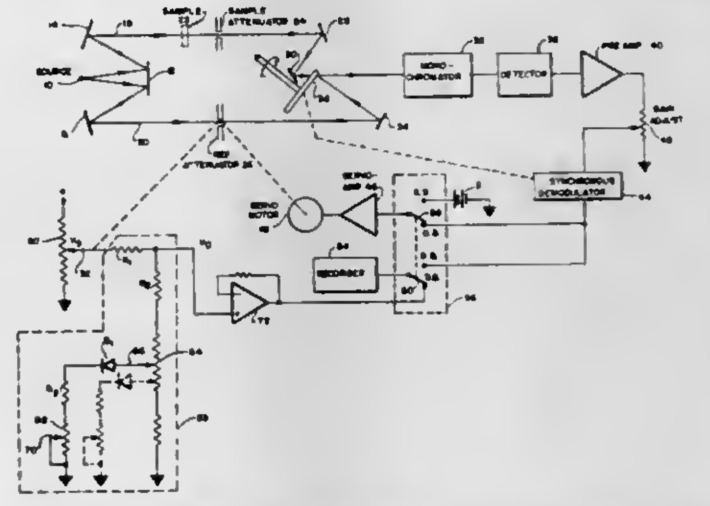
APPARATUS FOR CALIBRATING AN OPTICAL NULL SPECTROPHOTOMETER

Allan S. Way, Irvine, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 2, 1976, Ser. No. 702,252

Int. Cl.² G01J *3/42;* G01R *15/10*

U.S. Cl. 356—89 **2 Claims**



1. In a double beam optical null spectrophotometer including sample and reference optical beam paths, a radiation detector, an attenuator feedback loop connected to said detector for positioning an optical attenuator in the reference beam path in response to a detector signal indicative of an energy difference in the sample and reference beam paths to equalize the energy

in said beam paths, a transmitting potentiometer having a slider movable with said attenuator and providing a potentiometer output signal at said slider as a function of the position of said attenuator, a recorder, means for selectively connecting said slider to said recorder to record said potentiometer output signal and apparatus for calibrating said transmitting potentiometer including means for selectively disabling said attenuator feedback loop and means for coupling the output of said detector to said recorder while said attenuator feedback loop is disabled and while said slider is disconnected from said recorder and while blocking one of said beam paths to record a measure of single beam energy of said spectrophotometer for selected levels of attenuation in the other of said beam paths, said connecting means selectively connecting said slider to said recorder at said selected levels of attenuation to record said potentiometer output signal at each of said selected levels of attenuation in addition to said measure of single beam energy, the improvement comprising:

a signal level sensitive impedance network connected to said slider of said transmitting potentiometer for modifying said potentionmeter output signal to achieve a substantially linear relationship between said potentiometer output signal and said measure of said single beam energy over a range of levels of attenuation including said selected levels of attenuation, said signal level sensitive impedance network including a first electrical resistance network having a variable resistor, a second electrical resistance network, means coupling said second electrical resistance network between said slider of said transmitting potentiometer and a source of potential, switch means including a nonlinear circuit element, means connecting said nonlinear circuit element in series circuit with said variable resistor of said first electrical resistance network between an adjustable slider on said second electrical resistance network and a source of potential, said adjustable slider adjusting the switching characteristic of said nonlinear circuit element and said variable resistor cooperating with said nonlinear circuit element to establish the impedance of said series circuit for modifying said potentiometer output signal to achieve a substantially linear relationship between said potentiometer output signal and said measure of said single beam energy over said range of levels of attenuation.

4,101,220

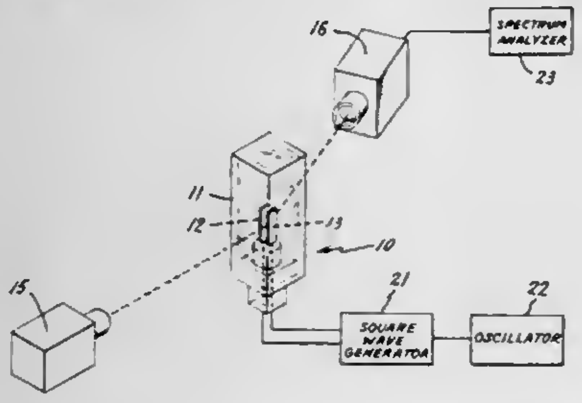
LASER DOPPLER SPECTROSCOPY WITH SMOOTHENED SPECTRA LINE SHAPES

Charles P. Bean, and Egidijus E. Uzgiris, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,186

Int. Cl.^{2} G01N *27/26*

U.S. Cl. 356—105 **10 Claims**



1. In the method of measuring electrophoretic mobility distribution of particles suspended in a fluid and situated in a square wave electric field by heterodyning laser light of a predetermined unshifted frequency with said laser light after undergoing a Doppler shift in frequency caused by said particles scattering laser light impinging thereon so as to produce a signal representative of said Doppler shift in frequency, the improvement comprising varying the electric field square wave frequency in a predetermined manner.

4,101,221

PROCESS FOR THE PHOTO-OPTICAL MEASUREMENT OF THE ABSORPTION BEHAVIOR OF SOLID, LIQUID AND GASEOUS MEDIA

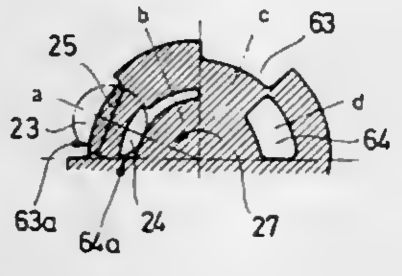
Gunter Schunck, and Albert Randwo, both of Bruchkobel, Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Mar. 23, 1977, Ser. No. 780,400

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614181

Int. Cl.^{2} G01N *21/22*

U.S. Cl. 356—205 **9 Claims**



2. In an apparatus for the photo-optical measurement of the absorption behavior of solid, liquid and gaseous media, of the type having an optical radiation source, a test cell, a standard absorption cell, chopper means for breaking up light beams passing through both cells into a periodic sequence of light pulses, at least one light receiver, and a circuit for the indication of the measured value and adjustable for compensating for changes in the radiating intensity of the optical radiation source and in the sensitivity of the light receiver, wherein the improvement comprises: the chopper means including at least one set of holes having alternatively different light admitting ability and disposed in the range of each cell to periodically pass through the light beams through the cells to define light pulses divided by defined variation of their intensity into two different pulse series of which one series comprises measuring light pulses and the other series comprises control pulses having a relatively short time duration, and the circuit comprises a comparison circuit connected to the output of the light receiver for comparing the actual value of the control pulses to a given standard value and a regulating amplifier controlled by the comparison circuit for effecting adjustment of the circuit to decrease the difference between the actual and standard values of the control pulses during the time duration, a phasing circuit synchronized by the control signals, and a plurality of circuits controlled by the phasing circuit for alternately periodically feeding the control pulses during each time duration to the comparison circuit and to the phasing circuit and feeding the measuring light pulses to be indicating after each time duration.

4,101,222

SPECTROPHOTOMETER SAMPLE HOLDER WITH IMPROVED SAMPLE VIEWING APPARATUS

Einar Skau Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

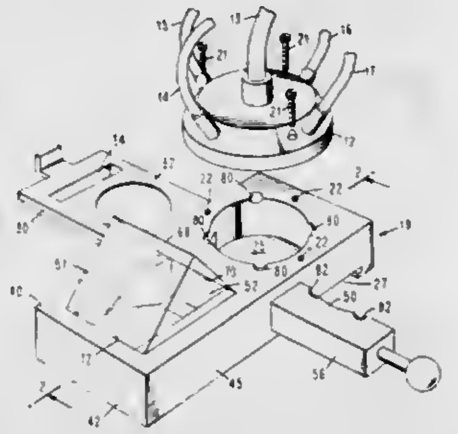
Filed Dec. 23, 1976, Ser. No. 753,769

Int. Cl.^{2} G01N *21/16;* G01J *3/42*

U.S. Cl. 356—244 **7 Claims**

1. In a color analyzer of the type having a probe head, a base forming a cavity for the probe head, means for positioning a subject such as a textile to be analyzed adjacent to the base at the end of the cavity opposite the probe head for a color analyzing operation on the subject, means for supporting the base for a sample to be at approximately hand level and slightly below eye level for a seated operator, improved apparatus for use by the operator for viewing the sample at the position at which the color analysis is to be made, comprising,

a shutter mechanism and means in said base for guiding said shutter mechanism along a path between an open position and a closed position, the path intersecting a portion of the cavity, said shutter having a surface conforming to the shape of the cavity when the shutter is in the closed position,



means in said base forming an optical pathway between said cavity and an upper surface of the base when the shutter is in its open position, and

a prism mounted on said base over said pathway to provide an image of the textile to be analyzed at a convenient viewing height when the shutter is open.

4,101,223

ATTACHMENT MEMBER FOR EXCHANGEABLE LENSES

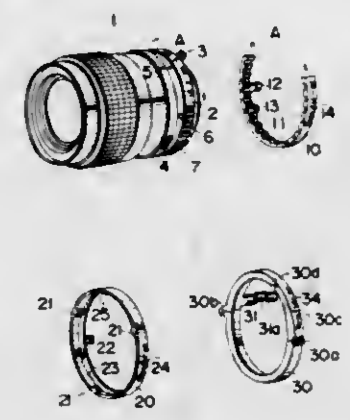
Shuzo Mutsusbita, Ikeda, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Jul. 7, 1977, Ser. No. 813,657

Claims priority, application Japan, Jul. 12, 1976, 51-91649[U]

Int. Cl.^{2} G03B *17/00*

U.S. Cl. 354—286 **34 Claims**



1. An attachment member adapted for use in conjunction with an exchangeable lens for a single lens reflex camera body where the exchangeable lens is of the type including a diaphragm setting ring manually rotatable for setting a desired diaphragm aperture and information transmitting means arranged on said diaphragm setting ring for transmitting to a camera body information as to the step-difference between a minimum *f*-number of the exchangeable lens and a set *f*-number corresponding to the diaphragm aperture set by said diaphragm setting ring when the exchangeable lens is mounted on a camera body.

said attachment member comprising:

a substantially circular body adapted to be releasably attached to the outer periphery of said exchangeable lens; and

an information transmitting means arranged on said substantially circular body at an angular position thereon dependent upon a maximum *f*-number of the particular exchangeable lens to be used therewith and adapted for transmitting to a camera body information as to be maximum *f*-number of the exchangeable lens when the substantially circular body is attached to the exchangeable lens at a predetermined angular position, and the exchangeable lens is in turn mounted on a camera body, whereby with the diaphragm setting ring of an exchangeable lens set to a minimum aperture corresponding to the maximum *f*-number, information as to the minimum *f*-number of the exchangeable lens may be obtained within a camera body when information thus transmitted by the information transmitting means of the lens and the attachment member to the camera body is combined.

4,101,224

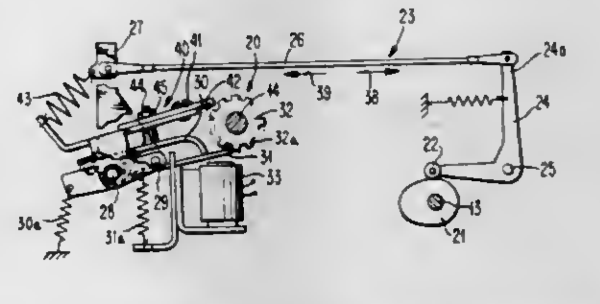
ESCAPEMENT MECHANISM FOR TYPEWRITERS

John Robert Litkenhus, Lawrenceburg, and Donald Wayne Stafford, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,129

Int. Cl.^{2} B41J *19/20*

U.S. Cl. 400—328 **12 Claims**



1. In a typewriter having a cyclicly rotatable print shaft, a driven leadscrew having a ratchet thereon, said leadscrew connected to a carrier containing a typing element thereon, and a pawl for engagement with said ratchet and normally biased to inhibit motion of said leadscrew;

a cam mounted for rotation with said print shaft, a cam follower engaging said cam and means interconnecting said cam follower and said pawl whereby on rotation of said print shaft said cam effects momentary disengagement of said pawl from said ratchet to permit rotation of said leadscrew and movement of said carrier, and means selectively operable for maintaining disengagement of said pawl from said ratchet a predetermined period of time; and

detent means carried by said interconnecting means for engagement with said ratchet inhibiting movement thereof during momentary disengagement of said pawl from said ratchet whereby escapement of said ratchet and leadscrew is prevented unless said selectively operable means maintains disengagement of said pawl.

4,101,225

APPLICATOR, ESPECIALLY FOR PIGMENTED LIQUIDS

Friedrich Linz, No. 97, D-8561 Hirschbach, and Lothar Sommer, Kurlandstrasse 24, D 8500 Nuremburg-Katzwang, both of Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,020

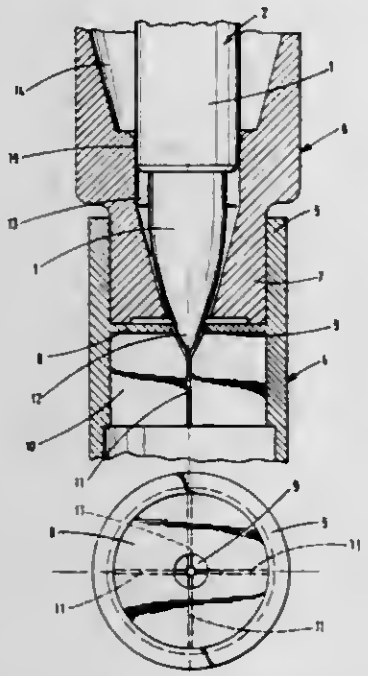
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 7540155[U]

Int. Cl.^{2} A46B *11/00*

U.S. Cl. 401—119 **8 Claims**

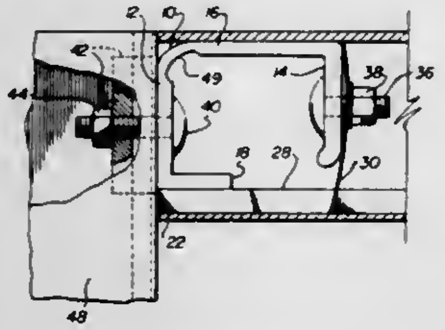
1. An applicator for a liquid product, including a container open at one end; a handle adapted to be fitted on said open end of the container to close it; a shaft connected to said handle, an applicator tip at that end of said shaft which in a closed position of the applicator faces the container and adapted to

project into the container; means defining capillary channels in said applicator tip; means mounting said applicator on said shaft to project from the free end of said shaft; an inset element in the container at said open end thereof, means on said inset element defining an approximately central recess for accommodating said applicator tip in the closed position; and transverse slot means on said inset element and extending in the axial direction and forming capillary channels which connect the interior of the container with said recess for the applicator tip, whereby a liquid product in the container will enter said capillary channels and be guided into communication with said applicator tip.



4,101,226
FENCE RAIL FASTENER

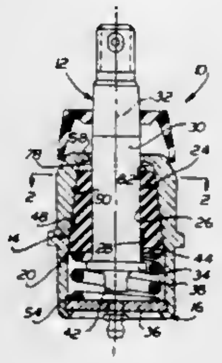
Rodolph E. Parisien, 891 Rainbow St., Ottawa, Canada
Filed May 24, 1977, Ser. No. 800,076
Claims priority, application Canada, May 31, 1976, 253756
Int. Cl.² F16B *2/02*
U.S. Cl. 403—4 **4 Claims**



1. A bracket for use in fastening a fence rail to a fence post so that the end of said rail abuts a side of said post, said rail and said post being in the form of channel members having spaced apart side walls and an interconnecting wall, said side walls being bent inwardly to define a slot therebetween, said bracket comprising a channel type member having two side walls and an interconnecting side wall, a first one of said side walls being bent toward a second one of said side walls so as to provide a partial wall substantially parallel to said connecting wall, adjustable attaching means on said first side wall for engaging said post and a curved sheet metal member, at least one major dimension of which is greater than an interior dimension of said rail, secured to said second side wall at an outer face thereof, whereby when said bracket is inserted into said rail so that said first wall thereof is adjacent but spaced from an end of said rail and said first wall is then secured to said post by said adjustable means in such a manner that movement of at least a cental portion of the sheet metal member causes said curved sheet metal member to flatten and consequently edges of said sheet metal member are wedged against inner walls of said rail.

4,101,227
PIVOT JOINT

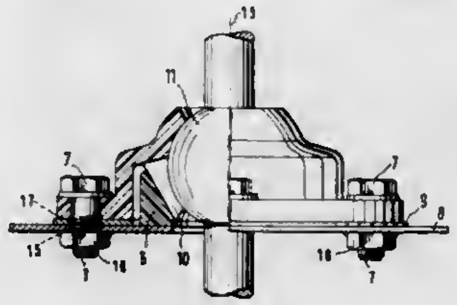
Edward J. Herbenar, Birmingham, and Albert W. Gair, Fraser, both of Mich., assignors to TRW Inc., Cleveland, Ohio
Filed Jan. 6, 1977, Ser. No. 757,342
Int. Cl.² B25G *3/00;* F16C *11/00*
U.S. Cl. 403—27 **12 Claims**



1. A pivot joint assembly comprising housing means for at least partially defining a cavity, said housing means having open and closed end portions, an axially movable and rotatable stud extending axially through said open end portion of said housing means into said cavity, said stud having a head end portion disposed in said cavity and a cylindrical shank portion extending outwardly from said head end portion of said stud through said open end portion of said housing means, said stud being movable between a retracted position in which said shank portion extends a relatively small distance outwardly from said housing means and an extended position in which said shank portion extends a relatively large distance outwardly from said housing means, bearing means disposed in said cavity for preventing sidewise movement of said stud relative to said housing means during axial and rotational movement of said stud relative to said housing means, said bearing means including a cylindrical bearing surface engaging the cylindrical shank portion of said stud and a circular end surface facing toward said closed end portion of said housing, said head end portion of said stud being disposed axially between said end surface of said bearing means and said closed end portion of said housing means, said head end portion of said stud having a first side surface which is disposed in abutting engagement with said circular end surface of said bearing means when said stud is in the extended position to limit axially outward movement of the shank portion of said stud, said head end portion of said stud having a second side surface which is disposed in abutting engagement with said closed end portion of said housing means when said stud is in the retracted position to limit axially inward movement of the shank portion of said stud, said first side surface being spaced apart from said bearing means when said stud is in the retracted position and said second side surface being spaced apart from said closed end portion of said housing means when said stud is in the extended position by a distance through which said stud is freely movable axially between the retracted and extended positions, and wear take-up means for pressing said cylindrical bearing surface firmly against the cylindrical shank portion of said stud during axial and rotational movement of said stud to enable said bearing means to hold said stud against sidewise movement after normal wear has occurred between said bearing surface means and the shank portion of said stud, said wear take-up means including spring means disposed between said bearing means and said closed end portion of said cavity for applying force to said bearing means to continuously urge said bearing surface into engagement with the shank portion of said stud during axial and rotational movement of said stud relative to said housing means prior to the occurrence of excessive wear between said bearing surface and the shank portion of said stud.

4,101,228
HOUSING FOR A FLEXIBLE COUPLING

Wolfgang Scheerer, Meerbusch, Germany, assignor to A. Ehrenreich GmbH & Co. KG., Dusseldorf, Germany
Filed Jul. 25, 1977, Ser. No. 818,613
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634938
Int. Cl.² F16C *11/00*
U.S. Cl. 403—137 **10 Claims**



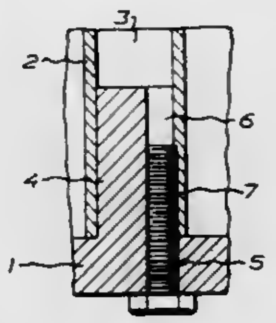
1. A housing for use in connection with a flexible, substantially spherically-shaped coupling having a ball, particularly for a gear-shift lever in automobiles,

comprising in combination:

- a hollow, generally spherically-shaped casing body adapted to engage the ball and having a central axis, a plurality of slits extending in a direction corresponding to longitudinal lines of a globe within a predetermined region of said casing body, and including an external portion in the shape of a truncated cone within the region of said slits,
- a frame connected to said casing body, and
- a cup-shaped body surrounding the cone-shaped portion of said casing body and being axially adjustable with respect to said casing body, whereby when a generally axial pressure is exerted between said bodies, the extent of engagement between said casing body and the ball is adjusted.

4,101,229
CONNECTION DEVICE

Torsten Waloddi Weibull, Torpamöllan, 270 44 Brösarp, Sweden
Claims priority, application Sweden, Feb. 19, 1976, 7601912
Int. Cl.² F16D *1/00*
U.S. Cl. 403—171 **5 Claims**

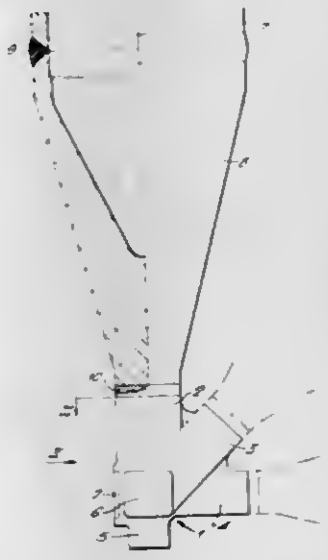


1. A connection device for connecting at least two frame members to each other, said connection device comprising:

- a connection member formed of at least two plates interconnected at an angle;
- a projection extending from at least one of said plates;
- each of said frame members having at least one recess adapted to accommodate said projection, each of said plates having a through hole, said projection having a groove disposed in and along the periphery thereof, said hole in said plate and said groove being in axial alignment; and
- a self-threading screw means extending freely through said hole in said plate and being adapted to partially reside in said groove, said groove being shaped and configured so that when said screw means is inserted through said hole and into said groove, said screw means, by rotation thereof, threads itself into the material of said frame member recess surrounding said projection adjacent said groove;
- whereby said connection member is securely connected to at least one of said frame members.

4,101,230
JOINT FOR TRUSSES

Per H. Moe, Kristian Brenners vei 56c, 3000 Drammen, Norway
Filed Mar. 18, 1976, Ser. No. 667,956
Claims priority, application Norway, Mar. 20, 1975, 750967
Int. Cl.² F16B *7/00*
U.S. Cl. 403—171 **5 Claims**



1. A joint structure for joining the ends of large-diameter tubular truss members, comprising:

- a unitary joining member of solid construction, having protruding stub arms each adapted to be connected to one end of one of said truss members and each of a circumference small compared with that of said corresponding truss end;
- said joining member being substantially homogeneous and having substantially isotropic ultimate strength characteristics, whereby the stress point at which it loses its integrity is substantially the same for all directions of applied stress; and
- transition pieces each welded at one end to one of said stub arms and each weldable at its other end to the corresponding one of said truss members, for supportively connecting said stub arms to said truss members;
- each of said transition pieces having a first portion of substantially solid construction in cross-section adjacent the stub arm to which it is welded, and each having a second portion toward its other remote end which is tubular to substantially match the said end of the corresponding truss member for easy welding thereto;
- each of said transition pieces having an outer circumference which increases along the direction from said solid first portion thereof toward said tubular second portion thereof, and having a wall thickness in said tubular second portion which gradually decreases by tapering downwardly from a position adjacent said first portion thereof toward said other remote end thereof;
- whereby there is provided a greater flexibility in and adjacent said stub arms than in said truss members, thereby providing a flexible connection for said truss members which is capable of relieving bending stresses in said truss members, while rendering more reliably calculable the

load-bearing characteristics of an assembly of truss members joined by said joint structure.

4,101,231
RELEASABLE ASSEMBLY OF STRUCTURAL MEMBERS

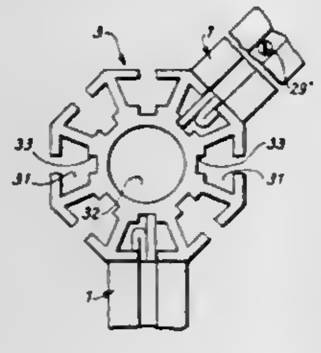
Albrecht Streib, Leinenweberstr. 67, 7000-Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1977, Ser. No. 786,466

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616440

Int. Cl.² F16B *9/02*

U.S. Cl. 403—252 **10 Claims**



1. In an assembly including a first structural member formed with an opening; a second structural member formed with a groove having a restricted orifice, said groove and said orifice being elongated; and a connector element having a body portion secured in said opening, catch means mounted on said body portion, and operating means on said body portion for moving said catch means through said orifice into and out of locking engagement with said second member, the improvement which comprises:

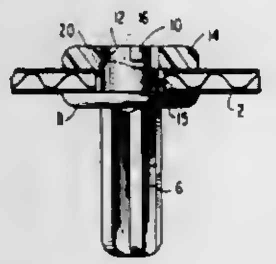
(a) said catch means including two catch members,
  (1) one of said catch members having an enlarged head portion leading during movement of said one catch member inward of said groove, and a reduced neck portion adjacent said head portion in trailing relationship; and
(b) said operating means including
  (1) a single, manually operable drive member, and
  (2) motion transmitting means connecting said drive member to said two catch members for moving the catch members inward and outward of said groove in timed sequence,
  (3) said one catch member leading the other catch member during said moving.

4,101,232
TIER SUPPORT SYSTEM FOR FANCY CAKES

Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325
Division of Ser. No. 725,579, Sep. 22, 1976. This application Jul. 22, 1977, Ser. No. 818,071

Int. Cl.² F16B *9/02*

U.S. Cl. 403—261 **1 Claim**



1. A post having its entire length cross-sectioned so as to facilitate insertion into and removal from a cake with minimal distortion thereof with means for mounting the same in a panel aperture of predetermined size comprising:

a removable head member including a sleeve adapted to engage through the panel aperture and a collar on one end thereof larger than the panel aperture and having an underside spaced from the other end of the sleeve and extending outwardly from the sleeve, said sleeve having therein an opposed pair of cam ramps with circumferentially spaced ends defining therebetween an opposed pair of slots, a stud member on one end of said post, said stud member having on an outer end thereof an opposed pair of lugs adapted to engage through the opposed pair of slots between the cam ramps, and a second collar larger than the panel aperture and spaced along the length of said stud from said lugs, the length of the sleeve between the underside of the first collar being such that the end of the sleeve engages against the second collar and said outer end of said stud, said lugs, and the exposed end of the sleeve collar all lie in a common plane with said lugs seated on the cam ramps and the opposite end of said post also terminating in a plane with portions, adequate to provide support for said post.

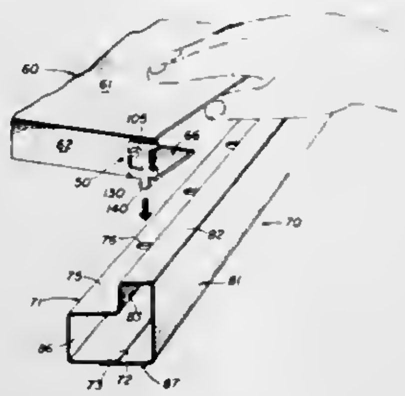
4,101,233
PANEL MOUNTING CLIP FOR STORAGE RACK

Kennedy McConnell, Homewood, Ill., assignor to Interlake, Inc., Oak Brook, Ill.

Filed Mar. 25, 1977, Ser. No. 781,168

Int. Cl.² B25G *3/36*

U.S. Cl. 403—397 **14 Claims**



1. A clip for securing a deck panel having openings therein adjacent to the ends thereof to an apertured beam in a storage rack to maintain the positional relationship of the panel and the beam during material loading and unloading, said clip comprising a generally flat body, a recurved flange carried by said body adjacent to the periphery thereof and extending therefrom in a first direction in overlapping spaced-apart relationship with a portion of said body, a tab extending from said body toward said flange and spaced therefrom in a direction perpendicular to said body a distance less than the thickness of an associated panel, said tab being deflectable away from said flange for cooperation therewith securely to hold the associated panel therebetween for mounting said body on the associated panel, and a finger extending from said body beyond the periphery thereof in a second direction substantially normal to said first direction, and having engagement means for insertion through an aperture in an associated beam to engage the beam thereby to maintain the positional relationship of the panel and the beam during material loading and unloading.

4,101,234
SHOPPING CART THEFT-CONTROL APPARATUS

Ernesto G. Castaneda, 7934 Lou Dillon, Los Angeles, Calif. 90001

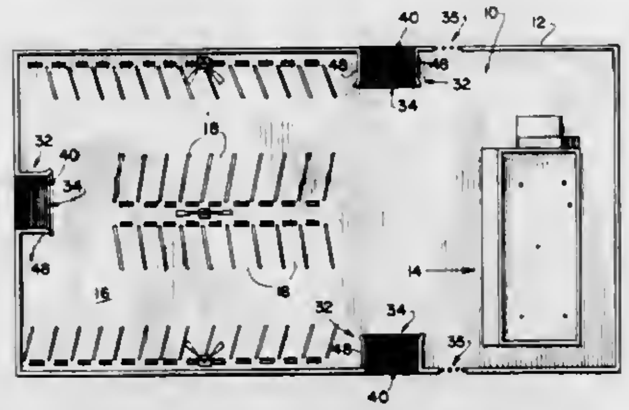
Filed Apr. 18, 1977, Ser. No. 788,618

Int. Cl.² E01F *13/00*

U.S. Cl. 404—6 **1 Claim**

1. A shopping cart theft-control apparatus wherein said cart is prevented from being removed from a restricted area surrounding a shopping facility, wherein said apparatus comprises:

a peripheral wall structure defining said restricted area;
a plurality of driveway entrances arranged to allow egress and ingress for various sizes of vehicles;
a plurality of pedestrian portals formed in said peripheral wall structure;
means provided within said pedestrian portal to prevent said cart from passing therethrough, said means comprising a plurality of vertical post members equally spaced apart wherein the width of the spaces therebetween prevents carts from passing therethrough, yet it is wide enough to allow pedestrian traffic therethrough;
means disposed in said driveway entrance for preventing said cart from traversing said driveway entrance, wherein said means comprises:
  a stationary base structure defining an apron,
  a plurality of bar members laterally disposed and affixed in said apron, said bar members being arranged in a juxtaposed, spaced, parallel relationship to one another,



  wherein said bar members comprise an elongated channel member affixed in said apron having a pair of side walls and a top surface wall substantially spaced above the surface of said apron.
  restraining wells defined by spaces formed between each of said bar members, said wells being adapted to receive various sizes of caster wheels associated with said carts, whereby said wheels are locked within said restraining wells by engaging respective bar members forming said wells, wherein the width of said wells is between 4 to 4½ inches and wherein the depth thereof is between 1 to ½ inch,
  a boundary barrier comprising a pair of oppositely disposed and inwardly extending wall structures formed from said peripheral wall structure, wherein each extending wall structure is disposed along the terminating ends of said bar members; and
wherein said resricted area thereof comprises a vehicle parking lot, whereby said shopping carts are freely movable therein to allow said carts to be transported without restriction to the parked vehicles.

4,101,235
PARKING LOT EXIT CONTROL MEANS

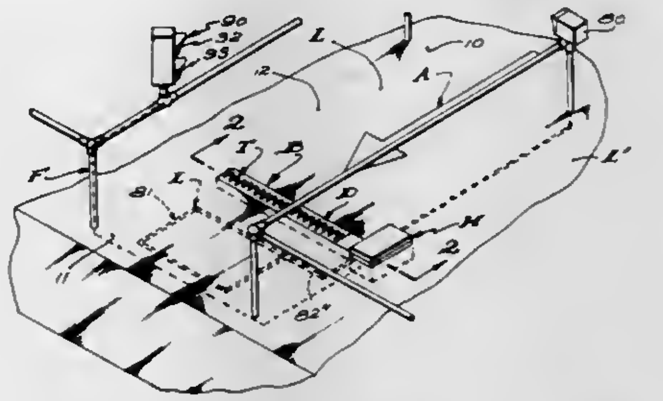
Donald F. Nelson, 14756 Burbank Blvd., Van Nuys, Calif. 91411

Filed Jun. 27, 1977, Ser. No. 810,174

Int. Cl.² E01F *13/00*

U.S. Cl. 404—6 **10 Claims**

1. Traffic control means to control the movement of automobiles into and out of defined areas, the traffic control means including an elongate lane with inlet and outlet ends and a top surface, said lane having one end opening into said area and its other end opening outside said area, an elongate barrier in and extending transverse the lane between the ends thereof, said barrier including an elongate rotatable shaft positioned below the surface of the lane, in a normal rotative position a plurality of tire piercing spikes secured to the shaft in longitudinally spaced relationship and normally projecting upwardly therefrom and upwardly from the surface of the lane; electric powered operating means at one end of the shaft to rotate the shaft to and from an actuated position where said spikes project horizontally therefrom and occur below said surface, and control means to cause the operating means to sequentially rotate the shaft from its normal to its actuated position and from its actuated position to its normal position and including a control circuit with a primary actuating switching means at the upstream end of the lane and connected in the circuit to cause the operating means to rotate the shaft from its normal to its actuated position and a secondary actuating switching means in the outlet end portion of the lane and connected in the circuit to cause the operating means to rotate the shaft from its actuated to its normal position.



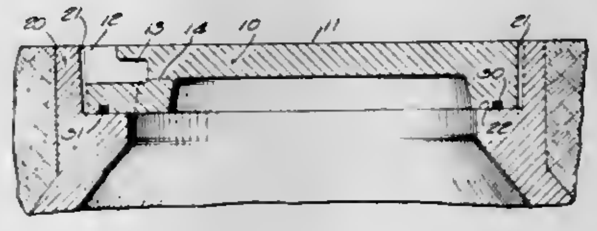
4,101,236
SEALING MANHOLE COVER FOR USE ON EXISTING UNSEALED SANITARY SEWER MANHOLE COVER FRAMES

Jack M. Meyer, Neenah, Wis., assignor to Neenah Foundry Company, Neenah, Wis.

Filed Jun. 29, 1977, Ser. No. 811,019

Int. Cl.² E02D *29/14*

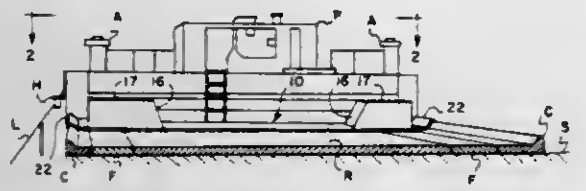
U.S. Cl. 404—25 **4 Claims**



1. A manhole cover for reception in a conventional manhole cover frame having a horizontal flange extending peripherally around an opening, said manhole cover having a horizontal peripheral portion adapted to rest on said ledge, the novelty comprising, an imperforate upper surface of said cover extending entirely across the cover broken only by a blind pocket to receive a manhole opening tool, and an O-ring groove extending around the lower surface of said horizontal peripheral portion of said cover at a location such that when the cover is installed in a standard manhole cover frame the O-ring groove will be located over the horizontal flange of a said frame, said groove being downward opening and rectangular in radial cross section, and spaced inwardly from the periphery of said cover, and an O-ring having a generally circular radial cross section with a diameter sufficiently greater than the radial width of said groove that said O-ring must be compressed slightly to place it in the groove, said groove having a vertical depth slightly more than half the diameter of the O-ring whereby the O-ring is retained in said groove by compression of its diameter and has a portion projecting downwardly from the groove whereby to engage the flange of a said manhole cover frame when said manhole cover is installed in a said frame.

4,101,237
METHOD OF SLIP-FORMING ROADBEDS AND APPARATUS THEREFOR

Gerald Anthony Catenacci, 44 Golfvalley La., Toronto, Canada
Filed Aug. 16, 1977, Ser. No. 825,129
Int. Cl.² E01C *11/28*
U.S. Cl. 404—98 **16 Claims**



1. A method of slip-forming a roadbed and at least one integral curb from fluid concrete material and which method comprises the steps of:

a. moving a roadbed slip-form along one side of a trackway and simultaneously moving a curb slip-form along an opposite side of said trackway, said roadbed slip-form and said curb slip-form being mutually spaced apart by a distance equalling at least the width of said trackway;

b. continuously depositing concrete material in front of both said roadbed slip-form and said curb slip-form whereby movement of said slip-forms over said concrete material will shape and form said concrete material into a roadbed and a curb, said roadbed and said curb so formed being mutually spaced apart by a predetermined gap;

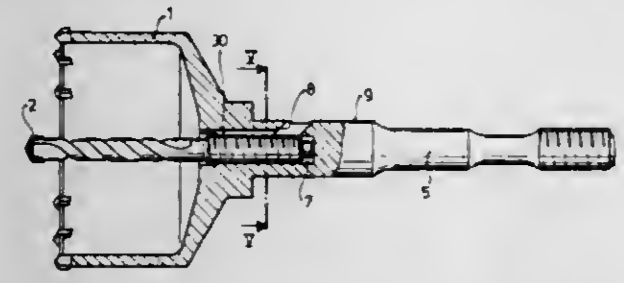
c. continuously passing a filler portion of concrete material through one of said roadbed slip-form and said curb slip-form, said filler portion of concrete material being disposed on the top surface of concrete material formed by a respective one of said slip-forms and being located generally along one edge of and on one of said roadbed and said curb adjacent said gap;

d. continuously transferring said filler portion of concrete material transversely into said gap thereby filling said gap to join said curb and said roadbed to form a single integral homogeneous concrete structure; and

e. continuously smoothing the top surface of said concrete material as transferred into said gap and the top surface of that one of said curb and said roadbed from which said filler portion was transferred.

4,101,238
HOLE SAW WITH PARTICLE-ASPIRATING ACCESSORY FOR HAND DRILL

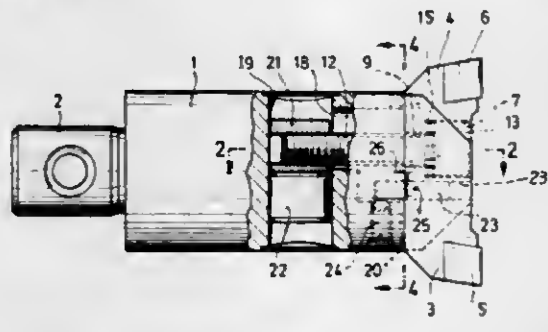
Wilbert Reibetanz, Leinfelden; Karl Wanner, Echterdingen, and Klaus Voss, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 10, 1977, Ser. No. 757,853
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2602238
Int. Cl.² B23B *27/10, 41/02*
U.S. Cl. 408—59 **10 Claims**



1. A drill accessory comprising a cup centered on a rotation axis and having a rim centered on said axis, said cup having a shaft adapted to be received in a drill chuck and extending along said axis from said cup away from said rim, said cup being formed with a bore lying on said axis and opening into said cup, said shaft being formed with a first passage extending non-axially from said bore to the outer surface of said shaft; a second passage communicating between the cup interior and said first passage; at least one tooth on said rim, whereby rotation of said cup and shaft about said axis with said rim pressed against a workpiece will cause said tooth to cut an annular groove centered on said axis in said workpiece; and a pilot bit lying on said axis and having a shank removably received in said bore and a tip projecting axially beyond said rim.

4,101,239
BORING TOOL PROVIDED WITH A PAIR OF SEPARATELY ADJUSTABLE CUTTERS

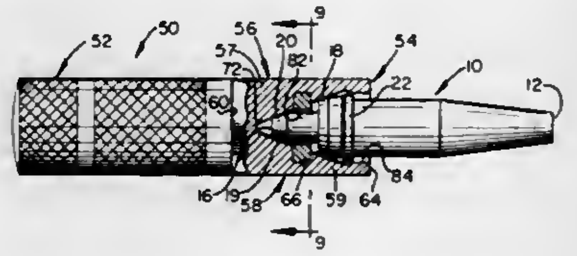
Gerhard Wohlhaupter, Frickenhausen, Fed. Rep. of Germany, assignor to Emil Wohlhaupter n. Co., Frickenhausen, Wurtt, Fed. Rep. of Germany
Filed Jun. 6, 1977, Ser. No. 803,427
Int. Cl.² B23B *29/034*
U.S. Cl. 408—182 **8 Claims**



1. In a boring tool having a pair of blade cutters diametrically and individually adjustable relative to the axis of the boring tool, wherein means are provided for slidably mounting said blade cutters on the end of the body of said boring tool and for guiding said blade cutters to permit displacement thereof along an appropriate diameter, the improvement comprising a recess formed in said body having an axis parallel to the direction of displacement of said blade cutters, a mounting screw for each blade cutter, slots in said body for accepting said mounting screws, each of said slots having an axis at an angle to the longitudinal axis of said body and the end of each of said mounting screws engaging a separate retainer slidably disposed in said recess.

4,101,240
NOZZLE REFACING TOOL

Ray D. Fox, 1912 W. 28th St., Odessa, Tex. 79763
Filed Apr. 4, 1977, Ser. No. 784,443
Int. Cl.² B23B *51/00, 3/22;* B27F *1/08*
U.S. Cl. 408—211 **14 Claims**



1. A refacing tool by which spaced seating surfaces of an oxygen-acetylene torch nozzle can be refaced, comprising:

a main body by which said tool can be manipulated;

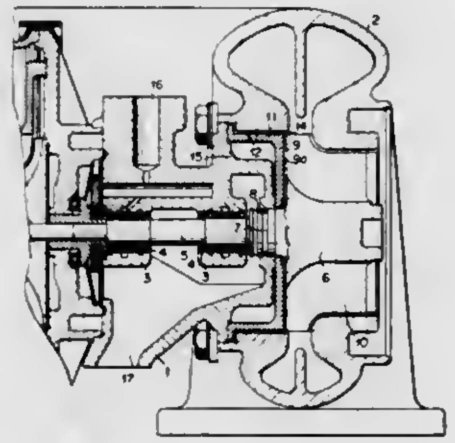
a plurality of support members having opposed ends with one of said opposed ends being affixed to said main body and the other of said opposed ends extending therefrom and in radially spaced relation to one another;

said radially spaced support members each having a cutting face formed thereon for simultaneously engaging the spaced seating surfaces of the nozzle;

a guide member affixed to the free ends of said support members for telescopingly receiving a marginal length of the torch nozzle therewithin with spaced marginal lengths of said cutting face being brought into engagement with the spaced seating surfaces of the nozzle, whereupon the refacing tool can be axially rotated respective to the longitudinal axis of the nozzle to cause the cutting face to remove material from and thus reface the spaced seating surfaces.

4,101,241
SUPER CHARGER WITH FLUID BIASED HEAT SHROUD

Tamotsu Kasuya, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed May 19, 1976, Ser. No. 687,905
Int. Cl.² F01D *5/08, 25/08*
U.S. Cl. 415—113 **3 Claims**



1. A supercharger, comprising:

a center housing having an inlet and an outlet for a lubricant;

a turbine casing mounted on said center housing;

a turbine shaft rotatably supported within said center housing, said turbine shaft having a turbine impeller at one end thereof within said turbine casing;

sealing means provided on said turbine shaft to prevent lubricant leakage from said center housing to said turbine casing;

a heat shroud mounted on said turbine shaft between said center housing and said turbine casing; and

pressure means provided on said heat shroud which permits communication of the inside and outside thereof thereby applying the pressure on the outside of said heat shroud to the inside of said heat shroud whereby the pressure on the inside of said heat shroud is greater than the pressure in said center housing thereby enhancing the sealing effect of said sealing means.

4,101,242
MATCHING THERMAL EXPANSION OF COMPONENTS OF TURBO-MACHINES

John Frederick Coplin, Duffield; Anthony Butler, Belper, and Peter Frederick Neal, Donington, all of England, assignors to Rolls-Royce Limited, Derby, England
Filed Jun. 2, 1976, Ser. No. 692,051
Claims priority, application United Kingdom, Jun. 20, 1975, 26427/75
Int. Cl.² F01D *1/04, 5/08, 25/08, 25/26*
U.S. Cl. 415—134 **8 Claims**

1. An axial flow compressor for a gas turbine engine comprising:

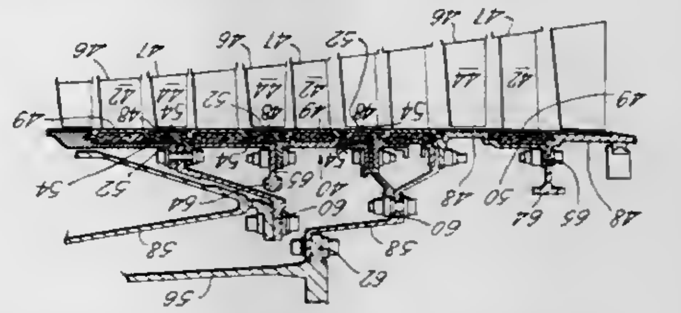
a bladed rotor including a plurality of axially spaced rows of rotor blades;

a casing surrounding said bladed rotor;

a plurality of axially spaced rows of stator vanes disposed between the rows of rotor blades, said rows of stator vanes having roots supported by said casing;

said casing having an inner wall and a radially spaced outer wall at locations surrounding the rows of stator vanes and surrounding at least one row of rotor blades; said inner wall including a first plurality of continuous and unsegmented platform rings with each one of said platform rings extending about and supporting a row of stator vanes and a second plurality of continuous and unsegmented rings disposed between said platform rings and extending about and spaced from each of said rows of rotor blades, said inner wall and said outer wall being spaced from each other by radially extending flanges defining spaces surrounding the roots of the rows of stator vanes and surrounding the rows of rotor blades;

a heating insulating medium in each of said spaces;



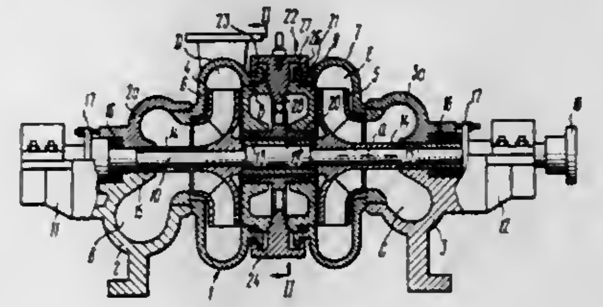
a lining of heating insulating material on a radially inner surface of each of said second plurality of rings at a location of said rows of rotor blades;

a rigid mass spaced radially outwardly of and extending around said casing, said mass being relatively cool with respect to said casing and having a lower rate of thermal expansion than a rate of thermal expansion of said casing; and

means rigidly connecting said mass to said casing whereby said inner wall of said casing as defined by said first and second plurality of rings are restrained in their expansion and prevented from getting out of round by said rigid mass so that at least said second plurality of rings have a rate of expansion substantially equal to a rate of expansion of said bladed rotor.

4,101,243
CENTRIFUGAL TWO-STAGE PUMP

Viktor Arsentievich Tatkov; Petr Ipatovich Jurin; Gennady Ivanovich Bondarev, and Mikhail Andreevich Koryagin, all of Novokuznetsk Kemerovskol oblasti, U.S.S.R., assignors to Vsesohuzny nauchno-issledovatelsku I Proktno-Konstruk torsky institut. Dobychi Uglya Grdravlicheskin Sposobom "Vnllgidrougal", Novokuznetsk Kemerovskol oblasti, U.S.S.R.
Filed Feb. 24, 1976, Ser. No. 661,047
Claims priority, application U.S.S.R., Feb. 28, 1975, 2106103
Int. Cl.² F01D *25/24*
U.S. Cl. 415—201 **6 Claims**



1. A two-stage centrifugal pump comprising:

(a) a hollow, elongated casing having a longitudinal axis and including a pair of axially spaced sections each of which comprises a plurality of releasably connected parts so that said casing is dismountable, said sections having confronting flanges provided with recesses;

(b) a pair of axially spaced partitions respectively cooperating with said sections in the regions of said flanges to define a pair of chambers interiorly of said casing;

(c) sealing members between said casing and said partitions for sealing said chambers;

(d) a shaft in said casing mounted for rotation on said axis;

(e) a pair of impellers mounted on said shaft for rotation therewith and each arranged in one of said chambers; and

(f) a clamp for connecting said sections arranged between the latter, said clamp including a pair of releasably connected portions joined along a plane which substantially passes through said axis so as to permit rapid disassembly of said pump, and said clamp being provided with collars which are received in said recesses, said clamp having an inwardly directed projection positioned between said partitions and operative for exerting pressure on the latter and thereby causing compression of said sealing members upon assembly of said clamp.

4,101,244

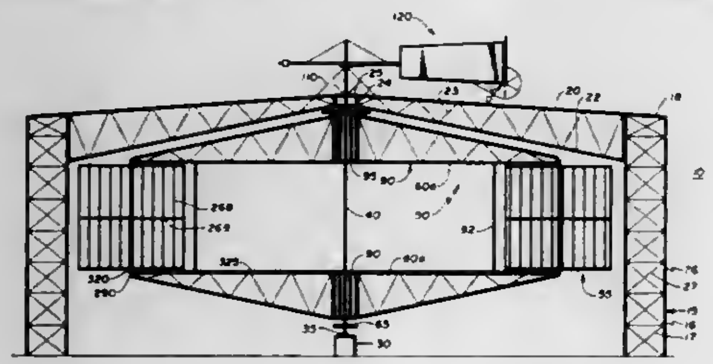
VERTICAL AXLE PADDLE MOTOR

Robert B. Grotberg, Kathryn, N. Dak. 58089

Filed Nov. 5, 1976, Ser. No. 739,263

Int. Cl.^{2} F03D *7/06*

U.S. Cl. 416—41 **23 Claims**



1. A vertical axis paddle motor comprising, an upstanding frame, a vertical axle supported by said frame, a rotor frame having a plurality of rotor arms journaled on said vertical axle for rotation on said axle and within said upstanding frame, a paddle pivotally mounted on the end of each rotor arm, each of said paddles being formed of a plurality of vanes pivotally mounted in a paddle frame and linked together to pivot from an open to a closed position with the frame, motor means mounted on each paddle to move the vanes therein from the open to the closed position, a wind direction indicator vane pivotally mounted on the top of the upstanding frame and coupled to a first shaft, a wind velocity sensor carried by the wind direction indicator and coupled to a second shaft, composite cam means mounted on the first and second shaft and separately adjustable upon rotation of said shafts, cam follower means mounted on each rotor arm and engaging the composite cam means, means connecting the cam follower means to the motor means mounted on the paddle for each arm to control the operation of the motor means in the opening and closing of the vanes, and means connected to the vertical axle and driven thereby.

4,101,245

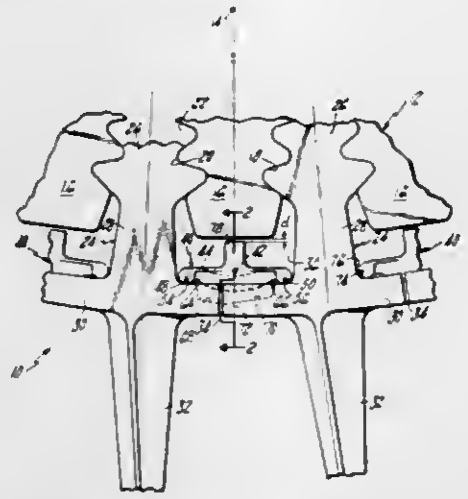
INTERBLADE DAMPER AND SEAL FOR TURBOMACHINERY ROTOR

John R. Hess, Westchester, Ohio, and Herbert Frederick Asplund, South Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,666

Int. Cl.^{2} F01D *5/26*

U.S. Cl. 416—190 **13 Claims**



1. A turbomachinery rotor comprising:

(A) a central disc adapted to be rotated about an axis of rotation extending axially of the rotor,

(B) a plurality of blades connected to the periphery of said disc to form a circumferential array of blades about the periphery of the disc and with each blade having,

(1) a platform extending generally circumferentially from opposite sides of each blade so that platforms of adjacent blades terminate in close circumferential proximity to define a circumferential gap of selected size between adjacent blade platforms and so that the disc and adjacent blades and their platforms cooperate to define a blade damper cavity therebetween communicating with said gap, and

(a) each platform including a flat surface adjacent the blade and generally facing the disc axis and extending for substantially the full axial dimension of the cavity to define a part of said cavity and positioned so that the blade platform flat surfaces of adjacent blades in each cavity are parallel and lie in the same plane, which plane is perpendicular to a radial line extending from said axis of rotation and passing midway between said flat surfaces in each cavity and

(b) a recessed portion extending for substantially the full axial dimension of the blade damper cavity and opening thereinto and into the platform circumferential gap so that said recessed portions of adjacent platforms cooperate to define a continuous recess extending substantially for the full axial dimension of the damper cavity and opening thereinto,

(C) a one-piece blade damper and seal located in said blade damper cavity and extending for substantially the full axial dimension thereof and overlapping said flat surfaces of adjacent blade platforms and having,

(1) rails of curved cross-section extending in parallel relationship for the full axial dimension of the damper on opposite lateral sides thereof so that said rails contact adjacent platform single plane, flat surfaces in line contact for substantially the full axial dimension of the cavity,

(2) a solid central portion of the blade damper extending between said rails and across said gap and outwardly into the blade platform recess so that the blade damper center of gravity is located on or near said platform flat surfaces so that, in response to centrifugal force, the blade damper rails bear in line contact against adjacent blade platform single plane, flat surfaces for substantially the full axial dimension of the blade damper cavity to cooperate with the central portion to seal said cavity from said gap to thereby prevent recirculation of hot gases through said gap and around said damper into said blade damper cavity, and so that as each blade platform moves circumferentially during rotor operation, the line contact between the damper rail and the platform flat surface will establish friction therebetween to dampen blade motion.

4,101,246

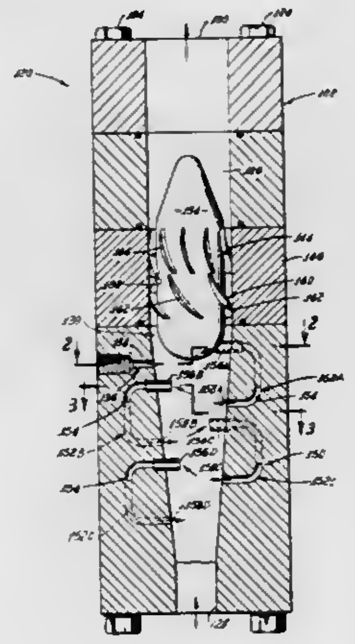
VORTEX JET PUMP

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.

Continuation-in-part of Ser. No. 527,219, Nov. 26, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,861

Int. Cl.^{2} F04F *5/10, 5/42, 5/46*

U.S. Cl. 417—171 **11 Claims**



1. A fluid jet pump comprising:

a pumped fluid suction inlet;

a fluid outlet downstream from the suction inlet;

a fluid flow passage between the suction inlet and the outlet;

a power liquid jet inlet for injecting power liquid into the fluid flow passage in a generally tangential direction;

a throat in the fluid flow passage downstream from the power liquid jet inlet having a flow cross section less than the flow cross section of the passage adjacent the power liquid jet inlet;

a diffuser section in the fluid flow passage downstream from the throat and including means for converting primarily circumferential fluid flow to primarily axial fluid flow in the passage;

means upstream from the power liquid jet inlet for initiating a component of circumferential flow in fluid in the passage in the same sense as the tangential direction of the power liquid jet inlet, comprising:

means for extracting a portion of fluid from the fluid flow passage downstream from the power liquid jet inlet; and

means for injecting the portion of fluid into the fluid flow passage, upstream from the power liquid jet inlet at least partly tangentially and with a lower velocity head than power liquid injected through the power fluid jet inlet; and

means upstream from the power liquid jet inlet for injecting fluid into the passage in a primarily tangential direction with the velocity head of the injected fluid being less than the velocity head of the power liquid injected through the jet inlet.

4,101,247

GETTER DEVICE WITH IMPROVED SUPPORT MEMBER

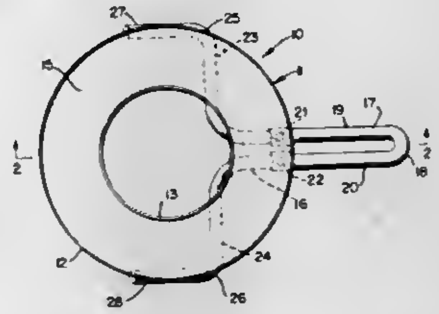
Franco Pirota; Nello Violini, and Mario Zucchinelli, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Apr. 20, 1977, Ser. No. 789,291

Claims priority, application Italy, May 12, 1976, 23184 A/76

Int. Cl.^{2} F04B *37/02*

U.S. Cl. 417—48 **6 Claims**



1. A getter assembly comprising a getter container having at least one side wall and a bottom wall connected to said side wall and having getter metal vapour relesing material supported by said bottom wall and side wall, and a wire support member comprising a substantially U-shaped tab portion in the form of an arcuate portion and two slightly distanced substantially parallel arms the arcuate portion of which extends radially outwards in a plane parallel to the plane of the bottom wall to a distance greater than the outer radius of the getter assembly, at least one arm of said tab portion being attached to said bottom wall the ends of each arm opposite the arcuate portion being joined to secondary support elements which secondary support elements increase their separation along their length until said separation is approximately equal to the outer diameter of the getter assembly, each support element terminating at the beginning of one of a pair of similar runners of arcuate configuration individually having a length approximately equal to the outer radius of the getter assembly and extending substantially parallel to one another and substantially parallel to the arms of the tab portion, the concave surface of the runners facing said bottom wall.

4,101,248

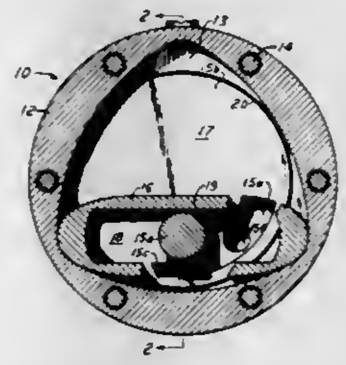
ROTARY GAS EXPANSION MOTOR

Earl William Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Filed Apr. 18, 1977, Ser. No. 788,516

Int. Cl.^{2} F04B *23/10;* **F01C** *1/02, 21/14*

U.S. Cl. 417—204 **6 Claims**



1. A rotary gas expansion motor comprising:

a generally triangular chamber,

an elongate rotor,

said rotor being rotatable end over end inside said chamber and serving to divide same into two compartments,

a shaft with crank,

said crank extending into a slot in said rotor and serving to divide said slot into two cells,

a disk,

said disk being coaxially affixed to said shaft adjacent said chamber and said rotor,

said disk including an inlet port and an outlet port,

said inlet port being shaped and positioned to begin communication with each said chamber compartment and each said slot cell when they begin to increase in size and to continue said communication for less than a full movement of said rotor in said chamber and said crank in said slot, so as to provide early cut off in inlet gas and thus require trapped gases to expand therein prior to departing said motor,

said outlet port being shaped and positioned to communicate with each said chamber compartment and each said slot cell at all times they are decreasing in size.

4,101,249

SWASH PLATE TYPE COMPRESSOR

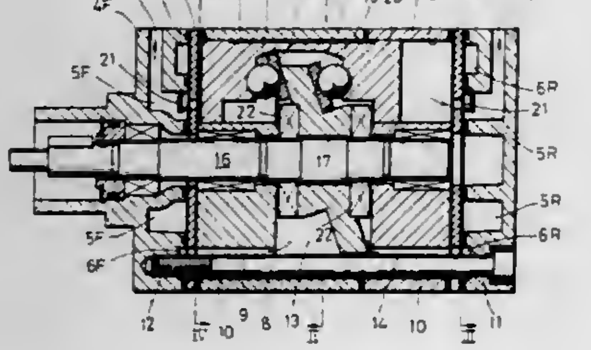
Shozo Nakayama, Kariya; Masayuki Kurahashi, Nagoya, and Mitsuhiro Hattori, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 29, 1976, Ser. No. 755,447

Claims priority, application Japan, Dec. 29, 1975, 50/155992

Int. Cl.^{2} F04B *1/12, 27/08*

U.S. Cl. 417—269 **5 Claims**



1. A substantially circular cylindrical swash plate type compressor comprising a cylinder block consisting of a front portion and a rear portion, each of said cylinder block portions being provided with a plurality of bores arranged at equal distances along its circumference; a swash plate chamber formed in said cylinder block in which a swash plate is rotatably fixed to a shaft, said swash plate chamber being connected to a refrigerant gas suction port provided at the middle portion of said cylinder block; a plurality of duplex head pistons which axially reciprocate in engagement with said swash plate in said swash plate chamber, said duplex head pistons being fitted in said bores of said cylinder block; and a front and a rear housing respectively attached to the front and rear ends of said cylinder block through a front and a rear valve plate, respectively, each of said front and rear housings having a low pressure gas chamber as well as a high pressure gas chamber which may communicate with said bores of said cylinder block; wherein between each two adjacent bores of said cylinder block there is provided a through hole into which a clamping bolt is inserted, each through hole, for the length thereof, being greater in size than the diameter of said clamping bolt and providing a full length space which serves as a low pressure refrigerant gas passage parallel to said bores and in communication with the low pressure gas chamber of each of the front and rear housing; said refrigerant gas suction port, each refrigerant gas passage and said low pressure gas chambers of both housings being communicated with one another via said centrally located swash plate chamber.

4,101,250

SWASH PLATE TYPE COMPRESSOR

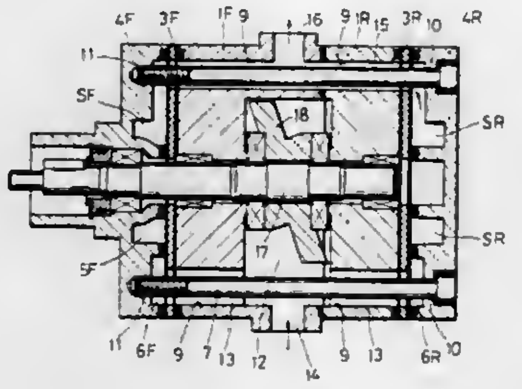
Shozo Nakayama, Kariya; Masayuki Kurahashi, Nagoya, and Nobuyuki Araki, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 29, 1976, Ser. No. 755,480

Claims priority, application Japan, Dec. 29, 1975, 50-176446[U]

Int. Cl.^{2} F04B *1/12, 27/08*

U.S. Cl. 417—269 **5 Claims**



1. A substantially circular cylindrical swash plate type compressor comprising a cylinder block consisting of a front portion and a rear portion, each of said cylinder block portions being provided with a plurality of bores arranged at equal distances along its circumference; a swash plate chamber formed in said cylinder block in which a swash plate is rotatably fixed to a shaft, said swash plate chamber being connected to a refrigerant gas suction port provided at the middle portion of said cylinder block; a plurality of duplex head pistons which axially reciprocate in engagement with said swash plate in said swash plate chamber, said duplex head pistons being fitted in said cylinder block; and a front and a rear housing respectively attached to the front and rear ends of said cylinder block through a front and rear valve plate, respectively, each of said front and rear housings having a low pressure gas chamber as well as a high pressure gas chamber which may communicate with said bores of said cylinder block; wherein between each two circumferentially adjacent bores of said cylinder block there is provided a through hole into which a clamping bolt is inserted, each through hole, for the length thereof, being greater in size than the diameter of said clamping bolt and providing a full length space which serves as a refrigerant gas passage parallel to said bores, a refrigerant gas outlet port provided at the middle portion of said cylinder block, at least one of said through holes being fluidly connected with said front and rear high pressure gas chambers formed in said front and rear housings and the refrigerant gas outlet port, and the other through holes being fluidly connected with said centrally located swash plate chamber and said low pressure gas chambers of both housings.

4,101,251

HYDRAULIC CONDUIT HAVING PIVOTING AND TELESCOPING CAPABILITY

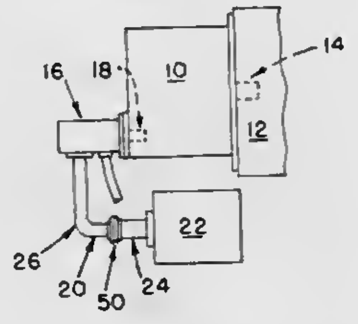
Arthur D. Gay, Decatur; Derald L. Hartley, Mount Zion, and William H. Klekamp, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 29, 1976, Ser. No. 671,651

Int. Cl.^{2} F04B *39/14*

U.S. Cl. 417—313 **7 Claims**

4. Coupling apparatus comprising: a first conduit defining an inner cylindrical surface; a second conduit extending within the first conduit and defining a protruding surface portion thereabout in close proximity to the inner cylindrical surface of the first conduit; the first and second conduits being in telescoping inward and outward relation, with the protruding surface portion in close proximity to the inner cylindrical surface of the first conduit; and the protuding surface portion being shaped to allow for a degree of misalignment of the second conduit relative to the first conduit; wherein the second conduit is pivotable relative to the first conduit generally about the longitudinal axis of a portion of the first conduit surrounding the second conduit; and further comprising a hydraulic tank secured to the first conduit, and a hydraulic pump secured to the second conduit, the first and second conduits providing communication between the tank and pump; the apparatus further comprising transmission means, the pump being releasably securable to the transmission means, and drivingly connected thereto through spline means when so secured to the transmission means, the pump and first and second conduits being relatively positioned so that the spline means are substantially parallel to the telescoping movement allowed between the first and second conduits, so that outward telescoping movement of the second conduit relative to the first conduit provides for disengagement of the spline means, the second conduit being configured so that upon pivoting of the second conduit relative to the first conduit generally about the longitudinal axis of the portion of the first conduit surrounding the second conduit, the pump secured to the second conduit is moved laterally of the transmission means.



4,101,252

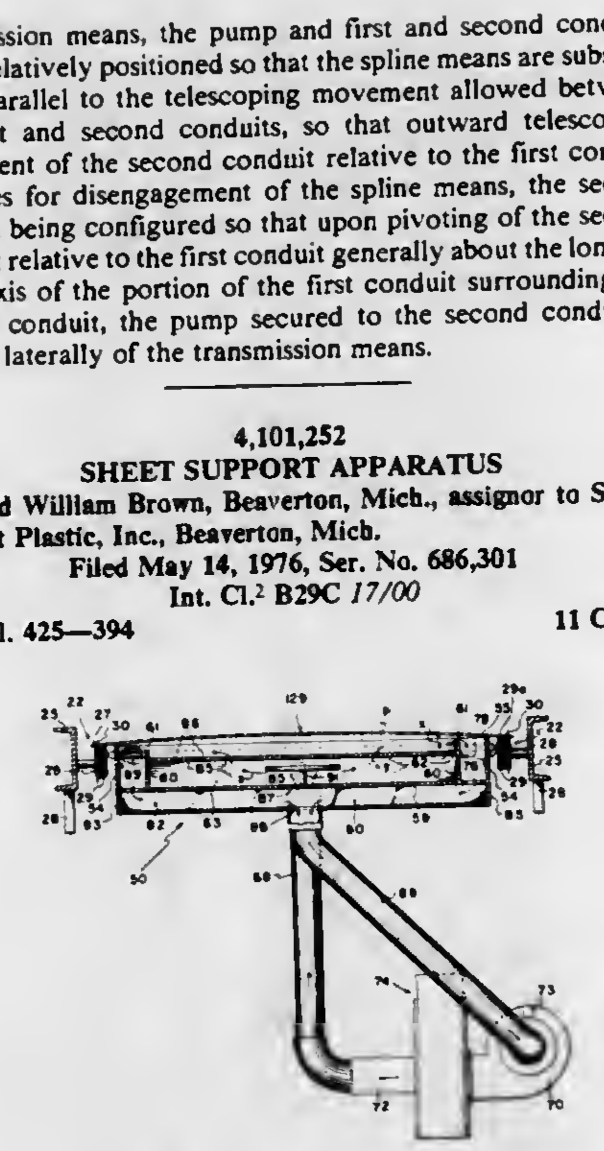
SHEET SUPPORT APPARATUS

Gaylord William Brown, Beaverton, Mich., assignor to Sweetheart Plastic, Inc., Beaverton, Mich.

Filed May 14, 1976, Ser. No. 686,301

Int. Cl.^{2} B29C *17/00*

U.S. Cl. 425—394 **11 Claims**



1. Differential pressure thermoforming apparatus for forming articles in a continuous sheet of thermoplastic material comprising:

a frame having a longitudinally forward end and a rearward end;

laterally spaced apart sheet supporting means movably mounted on said frame for supporting the lateral edges of said sheet and for incrementally longitudinally forwardly indexing said continuous sheet of thermoplastic material relative to said frame in a forward, longitudinal path of travel;

mold means mounted on said frame (disposed) in juxtaposition with said sheet supporting means for forming articles in the sheet supported thereon;

said mold means being movable forward and away from said sheet between a retract position and a sheet engaging position;

heating means, disposed on said frame upstream of said mold means for heating said sheet to forming temperature; and

means, stationarily mounted on said frame upstream of said mold means, for upwardly directing pressurized fluid between said sheet supporting means to support the midportion of said heated sheet upstream of said mold means at a level spaced from the level of said mold means in said retract position and inhibit sagging of the midportion of said sheet under its own weight as said sheet moves relative thereto from said heating means to said mold means.

4,101,253

EXTRUSION

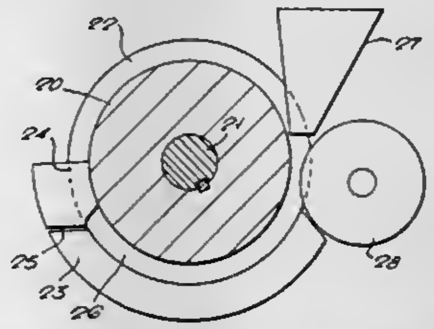
Clifford Etherington, Blackpool, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 671,031, Mar. 29, 1976, abandoned, which is a continuation of Ser. No. 541,089, Jan. 15, 1975, abandoned, which is a division of Ser. No. 388,139, Aug. 14, 1973, abandoned. This application Dec. 10, 1976, Ser. No. 749,444

Claims priority, application United Kingdom, Nov. 15, 1972, 52830/72; Jan. 9, 1973, 2968/73

Int. Cl.^{2} B22F *3/18*

U.S. Cl. 425—79 **4 Claims**



1. Extrusion apparatus comprising a wheel member having an endless groove therein, a shoe member covering part of the length of the groove and forming a passageway therewith, an abutment member projecting into the groove and blocking one end of the passageway, the wheel member being rotatable relative to the shoe member in the direction towards the abutment member, at least one die orifice at least near the abutment member, and means for feeding loose feed material to be extruded into the end of the passageway remote from the abutment member so that the material is carried along in the groove by frictional drag in the direction towards the abutment member and is thereby extruded through the die orifice, and in which a rotary driven compacting member is arranged closely adjacent said shoe at said end of the passageway remote from the abutment to cooperate with the groove in the wheel member to form a nip for compacting the loose feed material into a continuous strip prior to entering the passageway, and means for driving said driven member.

4,101,254

PREFORM MACHINE

Arthur J. Wiltshire, Richmond Heights, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio

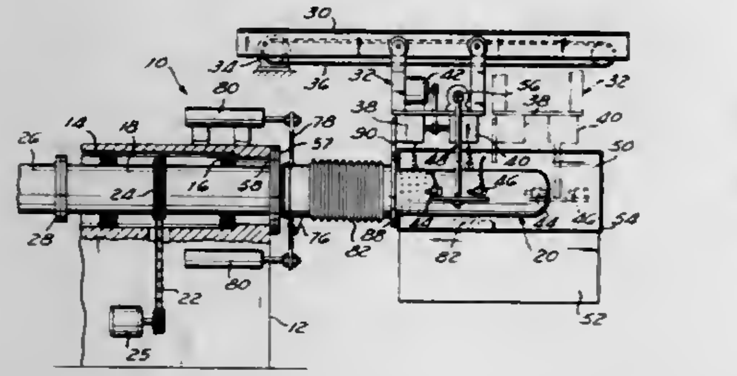
Filed May 27, 1977, Ser. No. 801,145

Int. Cl.^{2} B29J *5/00*

U.S. Cl. 425—82.1 **16 Claims**

1. A method of manufacturing a preform for fiber-reinforced, plastic articles, comprising the steps of rotating about its longitudinal axis an elongated, cylindrical, hollow tube having a cylindrical sidewall and a closed end and having perforations in its entire outer surface including said end,

blocking the perforations in at least a major portion of said cylindrical sidewall, applying vacuum to the inside of said form to draw air through unblocked perforations in said end, while said vacuum is applied, directing a large number of randomly oriented, short pieces of fiber against the outside surface of said end by a source of fibers, progressively unblocking the perforations and as the perforations are unblocked uniformly traversing the length of said form with said source, spraying said fibers with a thermosetting resin to bind said fibers together to form a preform without filling the voids between said fibers, and curing said resin while said preform remains on said form.



4,101,255

APPARATUS FOR MANUFACTURING WAVE-SHAPE BUILDING BLOCKS

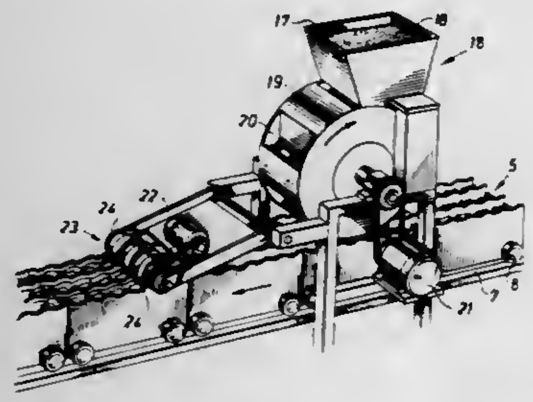
Sven Evert Fernaeus, Frejavägen 80, 191 46, Sollentuna, and Erik Anselm Jonsson, Box 3411, Yokelsbo, 820 40, Järvso, both of Sweden

Division of Ser. No. 605,314, Aug. 18, 1975, Pat. No. 4,040,226. This application Feb. 17, 1977, Ser. No. 769,430

Claims priority, appilcation Sweden, Aug. 23, 1974, 7410741; Sep. 3, 1974, 7411139

Int. Cl.^{2} B28B *3/12*

U.S. Cl. 425—219 **14 Claims**



1. Apparatus for manufacturing building blocks having a given wave-shape in two mutually transverse directions of the blocks, comprising:

at least one mold, the bottom surfaces of said mold having a shape corresponding to the wave-shape of the bottom of said blocks and the upper edge surfaces of the walls defining the longitudinal sidewalls of the mold having a wave-shaped upper edge profile corresponding to the wave-shape of the top of said blocks in the longitudinal direction of said blocks;

means located above said mold and operatively associated with said mold for supplying a casting mass to said at least one mold; and

a rotary and vertically movable roll above said mold and operatively associated with said mold for levelling out and smoothing the mass at the upper end of said at least one mold, said roll being movable relative to said at least one mold in the longitudinal direction of said mold and including means for cooperating with said wave-shaped upper edge profile of said longitudinal sidewalls of said at least one mold and being further vertically movable relative to said at least one mold in accordance with said wave-shaped upper edge profile, said roll having a profile corresponding to the desired wave-shape of said block in the transverse direction of said mold relative to the longitudinal direction thereof.

4,101,256

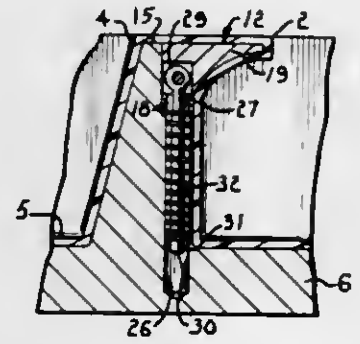
MOLD FOR FORMING A PLASTIC ARTICLE HAVING AN UNDERCUT OR NEGATIVE DRAFT PORTION

Roger L. White, Lawrence, and Richard K. Dalton, Garnett, both of Kans., assignors to E & E Specialties, Inc., Lawrence, Kans.

Filed Mar. 11, 1977, Ser. No. 776,701

Int. Cl.^{2} B29C *17/04*

U.S. Cl. 425—441 **2 Claims**



1. A mold for forming articles having undercut or negative draft portions and comprising:

(a) a vacuum forming mold having a base wall and an upstanding wall member including an abutment surface, a wall end surface, and a shoulder having an elongated recess therein, thereby defining a mold cavity;

(b) an undercut defining mold member positioned on and projecting outwardly from said upstanding wall member for forming a hollow projection in an article formed from a plastic sheet, said undercut defining mold member comprising:

  (1) a projecting flipper portion having an abutment engaging surface, a sill engaging surface, and a sheet engaging surface;

  (2) a sill portion mounted on said shoulder and underlying said flipper portion, said sill portion having an aperture extending therethrough and aligned with said recess;

  (3) an elongated pin extended through said aperture and having hinge means pivotally connecting said pin to said flipper portion, resilient means engaging said pin and urging said pin longitudinally through said aperture toward said base wall, said aperture being greater in dimension than said pin at least in a direction transverse to the axis of said hinge means thereby providing clearance for rocking with guidance of said pin during movement of said flipper portion toward and away from said sill portion, whereby said abutment engaging surface deflects from said wall end surface upon removal of a formed article, and automatically returns said flipper portion into engagement with said sill portion.

4,101,257

PILOT GAS CONSERVATION SYSTEM FOR FLARE STACKS

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Jun. 16, 1977, Ser. No. 807,198

Int. Cl.^{2} F23D *13/20*

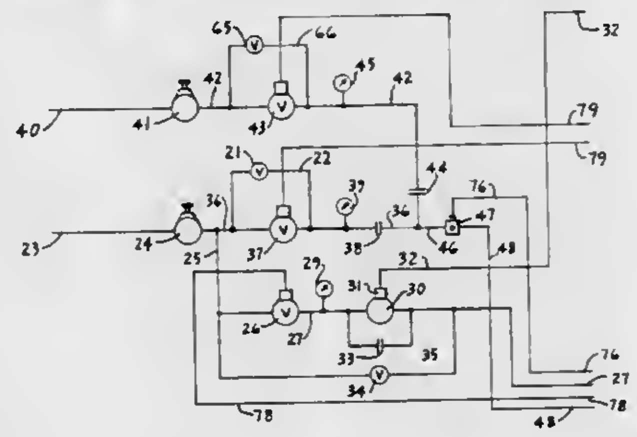
U.S. Cl. 431—15 **10 Claims**

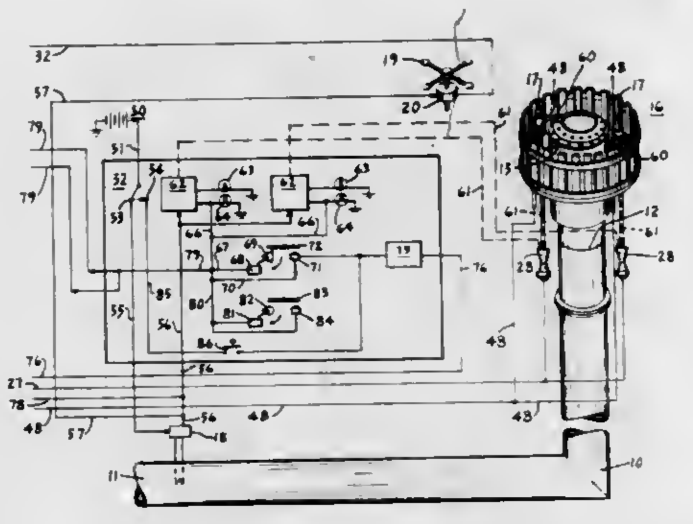
1. A control system for the pilot gas for a waste combustible gas flare burner having a pilot burner which comprises;

a waste combustible gas flare burner,

a connection to a supply of pilot gas,

a pilot burner for said flare burner connected to said supply connection igniting means for said pilot burner,





control means for controlling the supply of pilot gas to said pilot burner comprising a wind speed responsive member contiguous to the flare gas burner and a pilot gas control valve means,

control means for said igniting means comprising a member responsive to operation of said pilot burner.

4,101,258

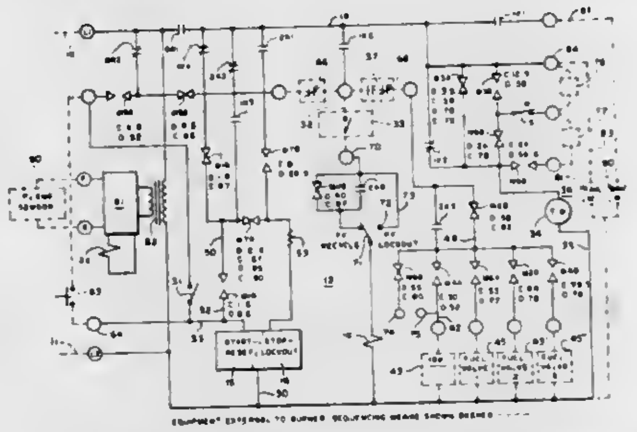
FUEL BURNER SEQUENCING DEVICE WITH SAFETY CHECKING MEANS

Roelof F. Jacobsz, Blaine, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 25, 1977, Ser. No. 800,244

Int. Cl.^{2} F23Q *23/00*

U.S. Cl. 431—26 **10 Claims**



1. A fuel burner sequencing means for controlling a fuel burner in response to a controller and which includes safety checking means, including: programmed switch means and relay operated switch means; flame sensor and amplifier means controlling a portion of said relay operated switch means in response to a flame at said burner; said burner sequencing means responsive to said controller to provide a normal fuel burner initiation and ignition cycle to establish a flame at said burner with said flame monitored by said flame sensor and amplifier means; and said sequencing means including alternate action safety checking means which includes contact means with a first contact open circuited when a second contact is close circuited; said contact means connected to supply power to said sequencing means in conjunction with said programmed switch means and said relay operated switch means; said safety checking means operating in response to the operation of said controller to power said sequencing means and at the termination of the operation of said sequencing means to reset itself for the next cycle of said sequencing means; said safety checking means operating after said normal burner initiation to immediately stop said sequencing means and turn off fuel to said burner in the event said flame sensor and amplifier means indicates the presence of flame when none should be present, or if flame sensor and amplifier means indicates the absence of flame when a flame should be present.

4,101,259

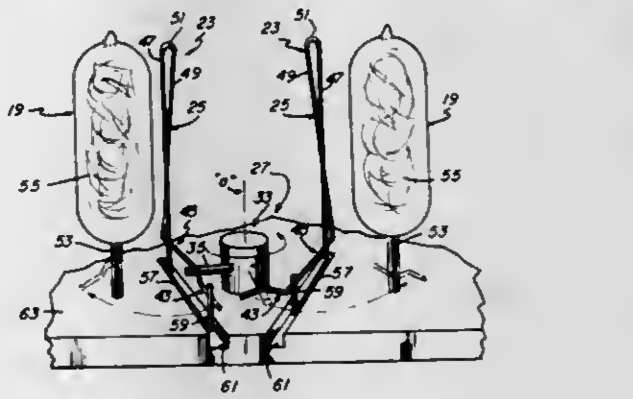
MULTILAMP PHOTOFLASH ASSEMBLY WITH ROTATABLE ACTUATOR

John W. Shaffer; David W. Mecone, and William T. Colville, all of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 9, 1976, Ser. No. 740,279

Int. Cl.^{2} F21K *5/02;* G03B *15/02*

U.S. Cl. 431—93 **26 Claims**



1. A multilamp photoflash assembly comprising:

an elongated housing defining first and second adjacently oriented regions therein;

a plurality of percussively ignitable flashlamps located within said first region of said housing;

a plurality of pre-energized striking mechanisms positioned within said first region of said housing, each of said striking mechanisms associated with one of said flashlamps for firing said flashlamps upon actuation thereof;

an elongated actuating member rotatably positioned within said housing, said actuating member having an end portion and a rodlike portion adjoining said end portion and passing through said first and second regions, said rodlike portion including a plurality of arm members spacedly positioned therealong and extending within said first region for actuating said pre-energized striking mechanisms in a sequential manner during rotation of said actuating member within said housing.

4,101,260
FLASH ARRAY

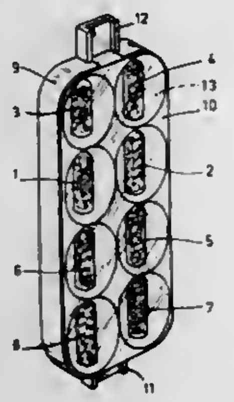
Markus Wilhelm Matthijs Wanninkhof; Johnny Wilhelmus van der Velden, and Pieter Hendrik Broerse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,721

Claims priority, application Netherlands, Sep. 15, 1975, 7510808

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 R **3 Claims**



1. A flash array which comprises: a housing, a plurality of combustion flash lamps carried by said housing, electrical terminals connected to said lamps, said housing including at least one wall which includes a transluscent electrically conductive layers substantially all light radiating from the flash array passing through said transluscent electrically conductive layer and wall, said translucent electrically conductive layer being electrically connected to one of said terminals of the lamps, each of said plurality of lamps being a high voltage combustion flash lamp and the transparent electrically conductive layer having a resistance per square which is smaller than 50 kOhm and said transparent electrically conductive layer mainly consisting of conductive indium oxide.

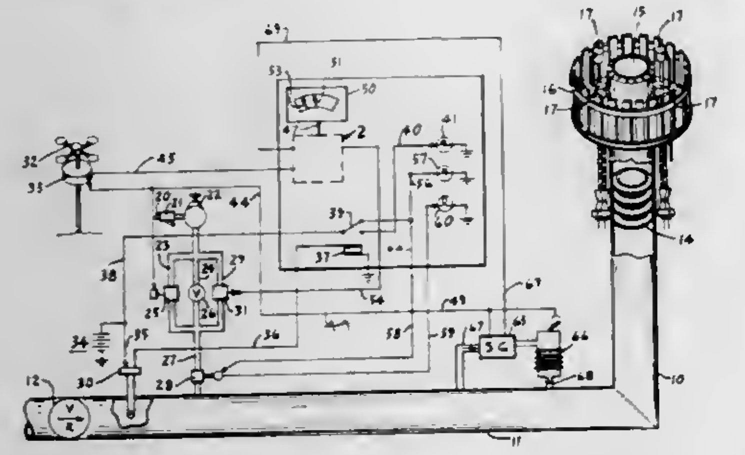
4,101,261
FLARE GAS STACK WITH PURGE GAS CONSERVATION SYSTEM

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustino Unlimited Incorporated, Elkins Park, Pa.

Continuation-in-part of Ser. No. 769,709, Feb. 17, 1977. This application Jun. 20, 1977, Ser. No. 808,287

Int. Cl.² F23D *13/20*

U.S. Cl. 431—202 **12 Claims**



1. Control apparatus for a flare gas stack which comprises, in combination with a flare gas stack

a connection to said stack from a supply of waste combustible gas for combustion at the discharge end of the stack,

a connection to said stack from a supply of purge gas, and

waste gas flow sensing and signaling members,

means for controlling the supply of purge gas to said stack, said means including

a valve member for controlling purge gas delivery from said supply,

members responsive to non-flow of waste gas for permitting purge gas flow,

windspeed sensing and signaling members,

control members for said valve members controlled by said windspeed sensing and signaling members for controlling said purge gas delivery valve members, and

indicating means for indicating waste gas flow and purge gas flow.

4,101,262
PRESSURE REGULATOR FOR GAS LIGHTER

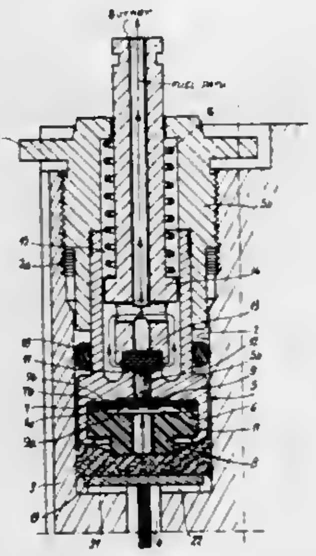
Guy Neyret, Francheville, France, assignor to Société Anonyme dite: Etablissements GENOUD & CIE, Venissieux, France

Filed Jun. 4, 1976, Ser. No. 692,729

Claims priority, application France, Jun. 5, 1975, 75 18161

Int. Cl.² F23D *13/04*

U.S. Cl. 431—344 **15 Claims**



1. A pressure regulator for a gas lighter containing a reservoir of a gasifiable liquid fuel, said pressure regulator comprising a porous membrane of constant natural porosity and good wettability for hydrocarbons constituting a filter for controlling the maximum flame height of said lighter, means defining on one side of said filter a wetting chamber communicating with said reservoir, means defining on the other side of said filter an evaporation chamber communicating with a burner outlet, said filter having porosity characteristics determined at the time of its manufacture to establish a maximum height for said flame, at least one fiber layer disposed along a side of said membrane, and means independent of said membrane and compressible to vary the flame height.

4,101,263
METHOD FOR HEATING NONGASEOUS CARBONACEOUS MATERIAL

Robert E. Lumpkin, Jr., Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

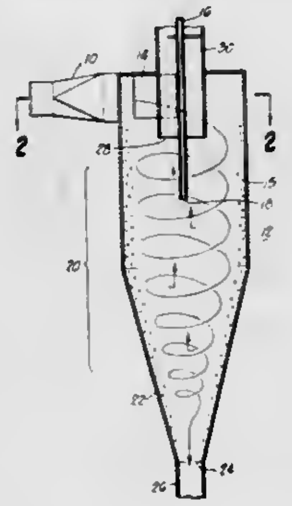
Filed Jun. 25, 1976, Ser. No. 700,006

Int. Cl.² F27D *13/00;* **C10B** *49/12*

U.S. Cl. 432—13 **23 Claims**

1. A process for heating nongaseous carbonaceous material comprising:

- a. introducing tangentially a first stream containing a nongaseous carbonaceous material and carbon monoxide into a reactor structure comprising:
  - i. a reactor having a covered cylindrical chamber,
  - ii. a conical portion attached to said covered cylindrical chamber opposite the covered end thereof and in communication therewith,
  - iii. a first inlet means for directing a first stream containing a nongaseous carbonaceous material tangentially into said covered cylindrical chamber and for causing nongaseous material to form an outer spiralling vortex which is urged towards said conical portion and for causing nongaseous material to be substantially separated from gases,
  - iv. a second inlet means for simultaneously and separately introducing a second stream containing gaseous oxygen into said reactor away from the walls thereof, said second inlet means communicating with said reactor at a point removed from the covered end thereof,
  - v. a first outlet means located in the covered end of said covered cylindrical chamber, and oriented along the axis thereof and in communication therewith, for removing gases substantially separated from nongaseous material, and for forming an inner spiralling gaseous vortex, and
  - vi. a second outlet means located at the smaller diameter end of said conical portion and in communication therewith for removing nongaseous material;



- b. forming an outer spiralling vortex within said reactor to cause substantial separation of gases from said nongaseous carbonaceous material;
- c. simultaneously and separately introducing a second stream containing oxygen into said reactor through said second inlet means and internally of said outer spiralling vortex, and reacting said oxygen with said first stream thereby producing a gaseous product comprising carbon dioxide and producing a heated nongaseous carbonaceous material;
- d. removing a third stream from said reactor, through said first outlet means, containing said gaseous product which is substantially free of said nongaseous carbonaceous material before a major portion of said gaseous product comprising carbon dioxide can react with said nongaseous carbonaceous material; and
- e. removing a fourth stream containing said heated nongaseous carbonaceous material which is a major portion of said nongaseous carbonaceous material introduced in step (a) from said reaction zone through said second outlet means.

4,101,264
DRYING APPARATUS AND METHOD

Derek Julian Barr, London, England, assignor to Barr & Murphy Limited, London, England

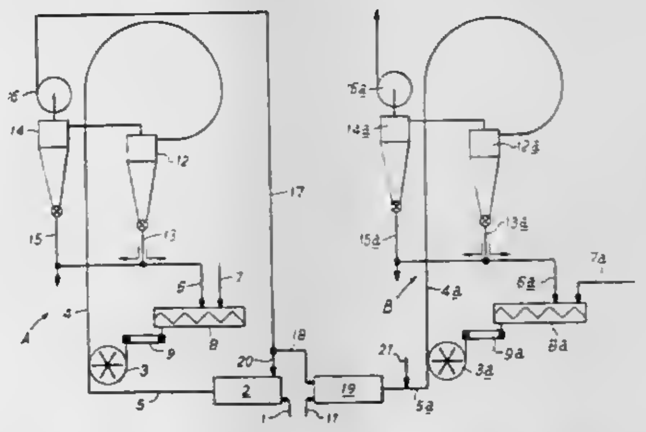
Filed Nov. 22, 1976, Ser. No. 744,041

Claims priority, application United Kingdom, Nov. 20, 1975, 47886/75

Int. Cl.² F27B *15/00;* **F26B** *3/10*

U.S. Cl. 432—14 **7 Claims**

1. A method of pneumatically drying two wet materials, the first of which produces an odorous exhaust during drying and the second of which products substantially no odorous exhaust during drying, using a first dryer section, a second dryer section, a furnace and an incinerator, which method comprises drying said first wet material in the first dryer section by means of a first stream of hot gas, re-cycling a portion of spent gas, including entrained moisture and odorous matter, from the first dryer section through the furnace and re-heating said portion of spent gas in the furnace by blowing into said portion of spent gas a flow of air in which fuel is burnt, thereby forming the first



stream of hot gas, passing the entire remaining portion of the spent gas, including entrained moisture and odorous matter, through the incinerator to pyrolyse the odorous matter in said remaining portion, and passing hot gaseous products from the incinerator through said second wet material in the second dryer section and then into the atmosphere.

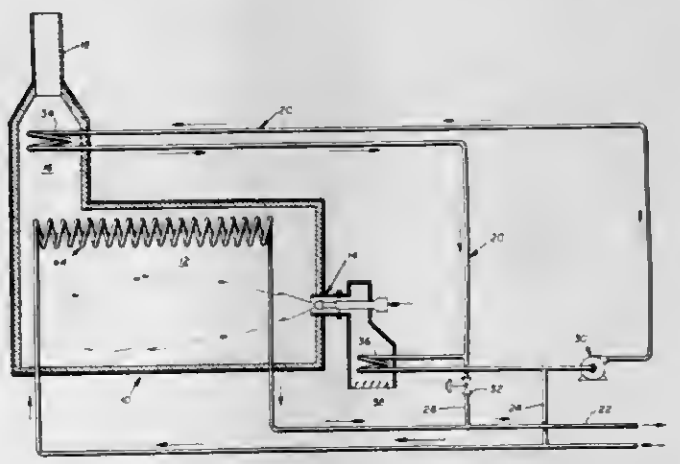
4,101,265
EQUIPMENT AND PROCESS INVOLVING COMBUSTION AND AIR

George C. Broach, and Donald W. Thurman, both of Tulsa, Okla., assignors to The G. C. Broach Company, Tulsa, Okla.

Filed Dec. 9, 1976, Ser. No. 748,885

Int. Cl.² F27B *5/16*

U.S. Cl. 432—29 **18 Claims**



1. In a system which includes a furnace for heating a fluid stream, the method of preheating combustion air being supplied to the system which comprises the steps of:

circulating a portion of fluid from said fluid stream first in non-contact heat exchange relationship with the products of combustion of said furnace, then

circulating said portion of fluid in non-contact heat exchange relationship with said combustion air.

4,101,266
FIRE PREVENTION DEVICE FOR THE FIXING STAGE OF AN ELECTROPHOTOGRAPHIC MACHINE

Keiichi Ishikawa, Urawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 14, 1977, Ser. No. 759,552

Int. Cl.² H05B *3/00;* **G03G** *8/00;* **F27B** *9/14*

U.S. Cl. 432—46 **11 Claims**

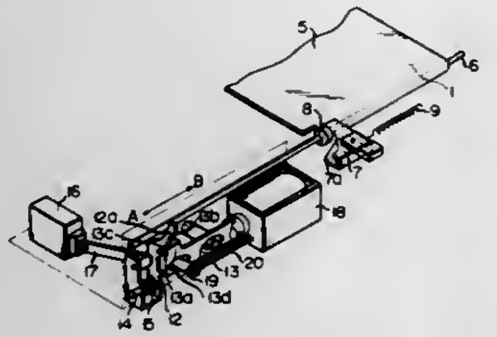
11. A fire prevention device for a fixing stage of an electro-

photographic copying machine, having an abnormality detection mechanism comprising:

a heat shield plate movable between a first position to close the front face of the fixing stage and a second position to open said front face;

heat shield plate transporting means to move said shield plate to said first position;

first locking means for holding said heat shield plate at said second position;



second locking means for holding said first locking means; and

a control means for operating said first and second locking means to bring the shield plate to the first position, when driving power for the copying machine is stopped during a copying operation, and to maintain the shield plate at the second position when driving power is stopped when the copying machine is in a ready condition but a copying operation has not been initiated.

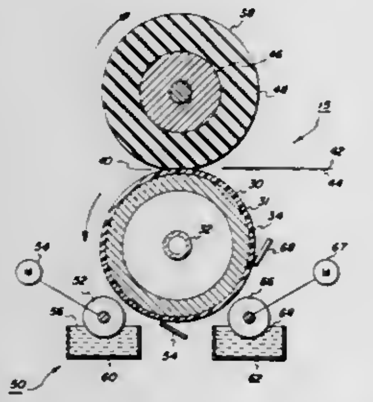
4,101,267
ROLL FUSER CLEANING SYSTEM

Karl J. Mueller, Fairport; Dewey H. Haumann, Jr., Palmyra, and Alvin D. Kromm, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 621,991

Int. Cl.² F27B *9/28*

U.S. Cl. 432—60 **12 Claims**



1. Roll fuser apparatus including a heated fuser roll cooperating with a resilient backup roll for forming a nip through which support material having toner images adhered thereto moves with said toner images contacting said heated fuser roll to thereby soften the toner forming said toner images, said apparatus comprising:

a first means containing a quantity of first release fluid;

an applicator member, said applicator member being spaced from said heated fuser roll whereby there is no contact between the surfaces of said cleaning member and said heated fuser roll;

means for effecting movement of said applicator member through said first release fluid, said movement being effective to coat the surface of said applicator member to a thickness sufficient to transfer release fluid from said applicator member to said heated fuser roll;

a doctor blade cleaning member engaging the surface of said heated fuser roll for removing substantially all the release fluid from the heated fuser roll and any contaminants deposited thereon;

second means containing a quantity of second release fluid;

means for applying a coat of said second release fluid to said heated fuser roll subsequent to the functioning of said cleaning member, said second release fluid applying means serving to apply said release fluid in a thickness substantially less than the thickness initially applied for cleaning of said heated fuser roll whereby said last mentioned coating enhances release of support material from said heated fuser roll.

4,101,268
ROTARY KILN WITH PLANETARY COOLER

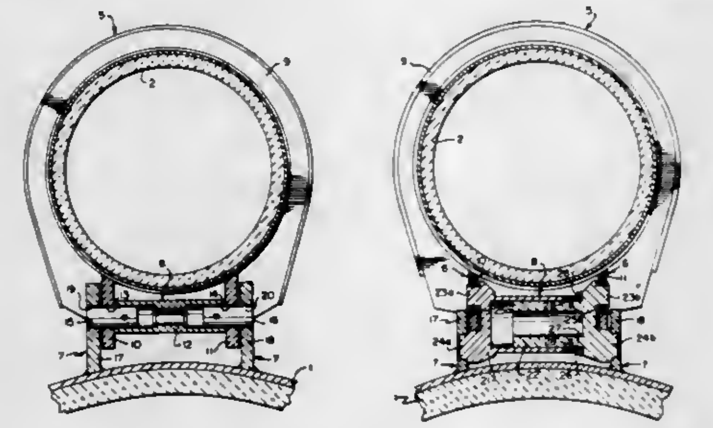
Karl Groiss, Linkoping, Sweden, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 16, 1976, Ser. No. 742,235

Claims priority, application United Kingdom, Nov. 17, 1975, 47244/75

Int. Cl.² F27B *7/02, 7/38*

U.S. Cl. 432—80 **28 Claims**



1. A rotary kiln having a planetary cooler system mounted for rotation therewith, said cooler system including at least one cooler tube having a forward portion and a rearward portion, said forward portion including an inlet end portion communicating with the rotary kiln for reception of material to be cooled, said rearward portion including an outlet end portion for exiting the cooled material, means to support each cooler tube in planetary fashion about said rotary kiln including first support means positioned adjacent said inlet end portion of said cooler tube and second support means positioned adjacent said outlet end portion of said cooler tube so as to retain the longitudinal axis of the cooler tube substantially parallel to the axis of rotation of the rotary kiln, at least said second support means comprising:

(a) an annular member disposed about said cooler tube;

(b) first mounting means having at least a first pair of generally parallel flanges mounted to said annular member, each flange defining at least one bore extending generally transverse to the axis of said cooler tube and disposed generally between said cooler tube and the rotary kiln;

(c) second mounting means having at least a second pair of generally parallel flanges secured to peripheral portions of the rotary kiln for rotation therewith, each flange of said second pair being disposed adjacent to an associated flange of said first pair of flanges and defining at least one bore spaced from the bores defined by said first pair of flanges;

(d) means positioned between said cooler tube and said rotary kiln pivotally connecting said first and second mounting means for rotation of the cooler tube about the axes of the bores defined by said first and second pairs of flanges, said pivot means including:

i. a first generally elongated member connected to at least one pair of adjacent associated flanges by means of pivot members journaled in a bore of each flange, said first elongated member having a generally cylindrical section extending generally transverse to the longitudinal axis of said cooler tube; and

ii. a second generally elongated member connected to at least one other pair of adjacent associated flanges by means of pivot members journaled in a bore of each flange, said second generally elongated member having a generally cylindrical section extending generally transverse to the longitudinal axis of said cooler tube and positioned for relative rotation within said generally cylindrical section of said first elongated member so as to permit relative axial movement between said cooler tube and said rotary kiln while permitting rotational movement of at least portions of said cooler tube about an axis extending generally radially of said rotary kiln.

4,101,269

DYED POLYMERS AND COPOLYMERS HAVING A CYANOVINYL-AZO DYE INCORPORATED IN THE STRUCTURE THEREOF

Michel Maurice Luce Champenois, Le Mesnil Esnard, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

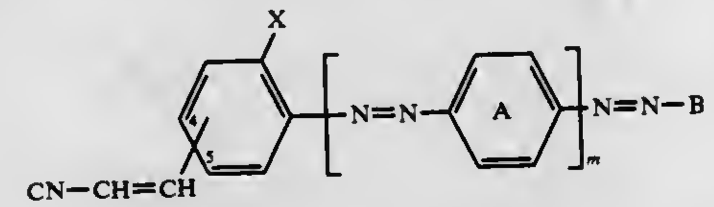
Filed Jan. 24, 1977, Ser. No. 761,570

Claims priority, application France, Aug. 2, 1974, 74 26847

Int. Cl.² D06P *3/00, 5/00*

U.S. Cl. 8—4 **17 Claims**

1. Structurally dyed random polymer or copolymer resulting from the radical polymerization of one or more colorless base monomers having a polymerizable olefinically unsaturated group and one or more dyes of the formula:



wherein —CH═CH—CN is fixed in position 4 or 5, X represents a hydrogen or halogen atom, the benzene ring A is unsubstituted or substituted by halogen atoms, alkyl, alkoxy or acylamino groups, m represents 0 or 1, and B represents the residue of a coupling component BH either substituted or unsubstituted, said coupling component being free of sulfonic and carboxylic acid groups, said polymerization taking place across the double bond of the cyanovinyl group of the dye and the double bond of the polymerizable olefinically unsaturated group of the base monomers.

4,101,270

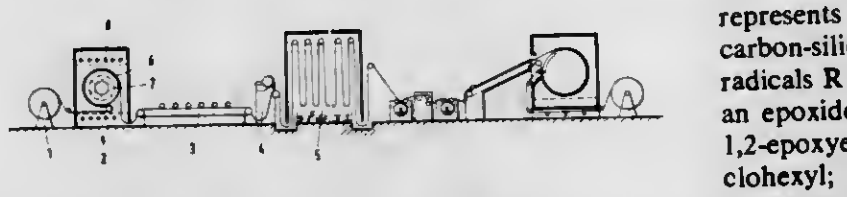
PROCESS AND APPARATUS FOR THE CONTINUOUS DYEING OR PRINTING OF ENDLESS LENGTHS OF MATERIALS

Hans Fleissner, Basel, Switzerland, assignor to Vepa Aktiengesellschaft, Switzerland

Filed Jun. 20, 1975, Ser. No. 588,834

Int. Cl.² D06P *7/00;* **D06B** *5/08;* **D06C** *7/02*

U.S. Cl. 8—17 **8 Claims**



1. A process for the continuous dyeing or printing of a length of textile material having pile fibers on one side and a backing material on the other side, said backing material being made of shrinkable fibers which will be subjected to a change in length during fixation of dye to the pile fibers under saturated steam conditions, which comprises, successively, passing the length of textile material through a setting zone under tension, treating the fibers making up the backing material with a gaseous medium heated to a setting temperature for the shrinkable fibers during passage of the length of textile material through said setting zone, said backing material being heat-set in said setting zone by passing the textile material over a perforated surface of a sieve drum means with the backing material resting on the surface of the sieve drum means and by drawing the heated gaseous medium by suction through said textile material on the perforated surface of said sieve drum means, then passing the heat-treated length of textile material into a dye application system to apply dye to said pile fibers, and thereafter fixing the dye to said pile fibers by passing the dye-containing length of textile material through a zone wherein the length of textile material is subjected to saturated steam conditions.

4,101,271

TANNING SKINS USING POLYCARBOXYLIC ACID PARTIAL ESTERS

Wolfgang Bockelman, Leverkusen, and Hans Niederprum, Monheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 31, 1977, Ser. No. 802,100

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626429

Int. Cl.² C14C *3/02, 3/06*

U.S. Cl. 8—94.26 **9 Claims**

1. In the chrome-tanning of skins with a chromium(III) salt and an acid-binding agent, the improvement which comprises effecting the chrome-tanning in the presence of a water-soluble partial ester of a polycarboxylic acid containing 4 to 11 carbon atoms which ester hydrolyzes into the free acid or its salt.

5. A tanning composition comprising a chromium(III) salt, an acid-neutralizing agent and a water-soluble partial ester of a polycarboxylic acid containing 4 to 11 carbon atoms which ester hydrolyzes into the free acid or its salt when the composition is employed in tanning.

4,101,272

PROCESS FOR THE TREATMENT OF WOOL WITH POLYORGANOSILOXANES

Geoffrey Bruce Guise, and Francis William Jones, both of Highton, Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Oct. 5, 1976, Ser. No. 729,715

Claims priority, application Australia, Oct. 13, 1975, 3561/75

Int. Cl.² D06M *3/10, 3/02, 15/66, 15/52*

U.S. Cl. 8—127.6 **11 Claims**

1. A process for the treatment of fibrous materials which comprises the steps of treating the fibrous materials with a composition containing:

a component A selected from the class consisting of polyorganosiloxanes of the general formula

$$R_nSiO_{\left(\frac{4-n}{2}\right)}$$

in which *n* has an average value in the range 1.8 to 2.2, and R represents organic radicals attached to the silicon atoms by carbon-silicon bonds; wherein between 1.0 and 50% of the radicals R consist of one or more organic radicals containing an epoxide group and selected from the class consisting of: 1,2-epoxyethyl; 3,4-epoxycyclohexyl; 6-methyl-3,4-epoxycyclohexyl; 3,4-epoxycyclohexyl-1-ethyl; 9,10-epoxystearyl; 3-(2,3-epoxypropoxyl)propyl; p-(2,3-epoxybutyl)-phenyl; and 3-(3,4-epoxybutyl)cyclohexyl, and the remainder of the radicals R consist of one or more organic radicals selected from the class consisting of alkyl and aryl radicals; selected from the group consisting of:

- (a) Diamines of the type $NH_2(CH_2)_nNH_2$, where *n* is 10 or greater;
- (b) Amines of the type $YNH(CH_2)_nNH_2$, where *n* is 2 or greater; and Y is an alkyl radical containing more than 10 carbons;
- (c) Linear or branched polymers of ethylene oxides or propylene oxides with terminal 2-aminoethyl or 2-aminopropyl either groups or mixtures of said polymers;
- (d) Di- and higher amines prepared by the reduction of the nitriles of the polymers of unsaturated fatty acids;
- (e) Products from the reaction of (d) with acrylonitrile which have been subsequently hydrogenated;

or an amine component C wherein C is an amine of the type $R'''NH_2$ or $R_2'''NH$ wherein R''' is an alkyl or alkenyl group containing twelve or more carbon atoms;

or a mixture of components B an C;

and allowing the components A and B to react chemically.

4,101,273

DISPERSE DYEING WITH POLYGLYCERINE ANIONIC EMULSIFIERS AND/OR POLYARYL POLYGLYCOL ETHERS

Takafumi Matsuba, Sakai; Ryozo Kuriyama, Ibaraki; Shin-Ichi Saitoh, Takarazuka, and Yoshio Ishitsuka, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

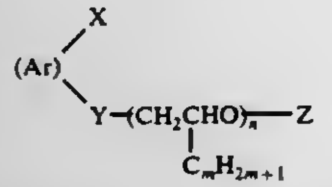
Filed Jun. 27, 1975, Ser. No. 590,947

Claims priority, application Japan, Oct. 24, 1974, 49 123245

Int. Cl.² D06P ***1/607***

U.S. Cl. 8—172 R **13 Claims**

1. A method for dyeing or printing polyester fiber materials, which comprises (1) contacting the fiber material with a dye bath comprising a water-insoluble dye and at least one member selected from the group consisting of a polyoxyethylene of formula (I), and a glycerin derivative, formula (I) being represented by



$$X-(Ar)-Y-(CH_2\underset{\displaystyle C_mH_{2m+1}}{\underset{|}{C}}HO)_n-Z \qquad (I)$$

wherein Ar is a naphthalene nucleus substituted by aryl-C_1-C_3 alkyl, or a benzene nucleus substituted by at least one aryl, aryloxy, aryl-C_1-C_3 alkyl or C_5-C_6 cycloalkyl, said aryl being hydrocarbyl unsubstituted or substituted by methyl or phenyl-C_1-C_3 alkyl;

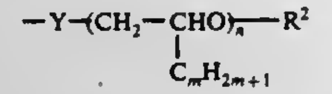
Y is —O—, —COO— or —CH_2O—;

m is a numeral 0 or 1;

n is an integer of 1 to 30;

Z is alkali metal sulfato or phosphato, ammonium sulfato or phosphato, or monoethanolamine-, diethanolamine-, triethanolamine-, methylamine-, ethylamine- or butylamine-sulfato or phosphato salt;

and X is hydrogen or



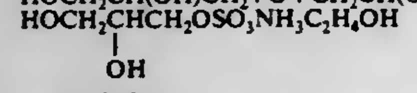
$$-Y-(CH_2-\underset{\displaystyle C_mH_{2m+1}}{\underset{|}{C}}HO)_n-R^2$$

in which Y, m and n are as defined above, and R^2 is alkali metal sulfato or phosphato, ammonium sulfato or phosphato, or monoethanolamine-, diethanolamine-, triethanolamine-, methylamine-, ethylamine- or butylamine-sulfato or phosphato; and the glycerine derivative being a compound selected from the group consisting of

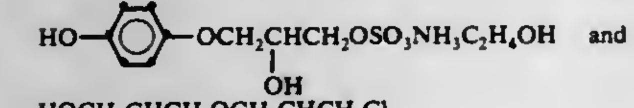
$HO\,.\,CH_2CH(OH)CH_2O\,.\,CH_2CH(OH)CH_2OC_2H_5$

$HO\,.\,CH_2CH(OH)CH_2OCH_2CH(OH)CH_2OCOCH_3$

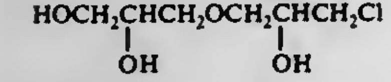
$HOCH_2CH(OH)CH_2\,.\,O\,.\,CH_2CH(OH)CH_2OH$



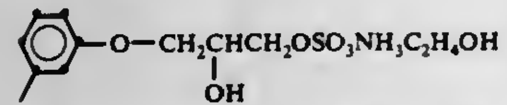
$$HOCH_2\underset{\displaystyle OH}{\underset{|}{C}}HCH_2OSO_3NH_3C_2H_4OH$$



and



$$HOCH_2\underset{\displaystyle OH}{\underset{|}{C}}HCH_2OCH_2\underset{\displaystyle OH}{\underset{|}{C}}HCH_2Cl$$



and

$HOCH_2CH(OH)CH_2OCH_2CH(OH)CH_2OSO_3NH_3C_2H_4OH$

and subjecting the resulting fiber material to a dry and/or wet heat treatment.

4,101,274

PROCESS FOR THE LEVEL DYEING OF SYNTHETIC FIBER MATERIALS

Helmut Beutler, Kerlkheim, Taunus; Friedrich Engelhardt, Frankfurt am Main; Karl Hintermeier, Frankfurt am Main, and Joachim Ribka, Offenbach am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

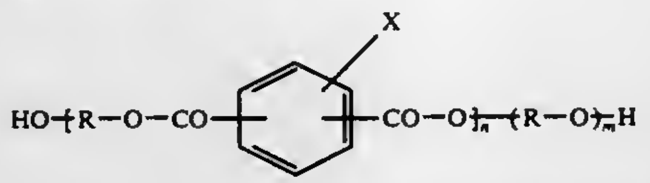
Filed Feb. 24, 1976, Ser. No. 660,831

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1975, 2508472

Int. Cl.² D06P ***5/04***

U.S. Cl. 8—173 **17 Claims**

1. A process for the level dyeing of fiber material made from linear polyesters and from mixtures thereof with natural fibers, with water insoluble disperse dyestuffs according to the exhaust method, which comprises adding to the aqueous dyebath, in addition to the said dyestuffs and pH regulating substances, as levelling agents in an amount of 0.1-5 grams per liter a water soluble or dispersible linear polyester which has the general formula



I

in which *m* is zero or 1, *n* is a number such that the average molecular weight of the polyester is 800-5,000, each X, which may be the same or different, is H, —O—CH_2—CH_2—CH_2—SO_3M or —SO_3M, in which M is hydrogen or alkali metal or ammonium or substituted ammonium, and each R, which is the same or different, is a diol radical of 2-10 carbons of a saturated or unsaturated aliphatic, cycloaliphatic or aromatic compound and in which the meaning of X is balanced such that 5-30 mole % of all phenylene nuclei in formula I carry a sulfato-containing radical.

4,101,275

AUTOMATIC PHOTOMETRIC ANALYZER

Isamu Taguchi, Tokyo; Akihiro Ono, Ichigao, and Ryutaro Matsumoto, Tokyo, all of Japan, assignors to Nippon Steel Corporation and Kokoshi Electric Co., both of Tokyo, Japan

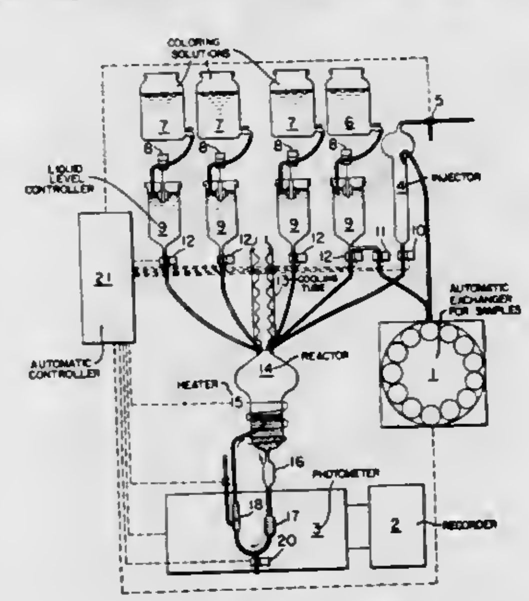
Division of Ser. No. 575,078, May 6, 1975, Pat. No. 4,003,708, which is a continuation of Ser. No. 511,205, Oct. 2, 1974, abandoned, which is a continuation of Ser. No. 283,851, Aug. 25, 1972, abandoned. This application Jul. 23, 1976, Ser. No. 707,993

Claims priority, application Japan, Aug. 26, 1971, 46-65729

Int. Cl.² G01N ***21/26***

U.S. Cl. 23—230 R **8 Claims**

1. A photometric batch type analysis method, comprising, feeding a sample solution and a coloring solution to a reactor form a reaction product, then feeding said reaction product to a recirculation system in which the reaction product is expanded to eliminate bubbles, measuring its absorbency and forcing the reaction product back into the reactor by air pressure, removing the reaction product from said recirculation system after its absorbency has been measured a selected number of times.



4,101,276

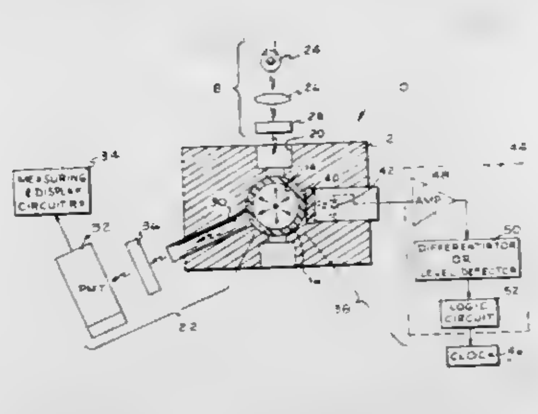
METHOD AND APPARATUS FOR SIGNALLING THE INTRODUCTION OF CHEMICAL REACTION COMPONENTS INTO A CHEMICAL ANALYZING SYSTEM

Robert J. Anderson, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 2, 1976, Ser. No. 692,159

Int. Cl.² G01N ***21/38, 33/16***

U.S. Cl. 23—230 B **16 Claims**



1. In a method of combining components of a chemical reaction which includes the steps of introducing the reaction components into a reaction zone to initiate the chemical reaction and measuring a characteristic of the reaction, the improved method of signalling the start of the chemical reaction comprising the steps of:

prior to initiating the chemical reaction adding a tagging substance to at least the reaction component last introduced into the reaction zone, the tagging substance remaining chemically isolated from the reaction; and

monitoring the reaction zone for the presence of the tagging substance and upon detecting the tagging substance generating a signal indicating the start of the chemical reaction.

4,101,277

DETECTION OF INCIPIENT FAULTS IN HYDROGEN-COOLED GENERATORS

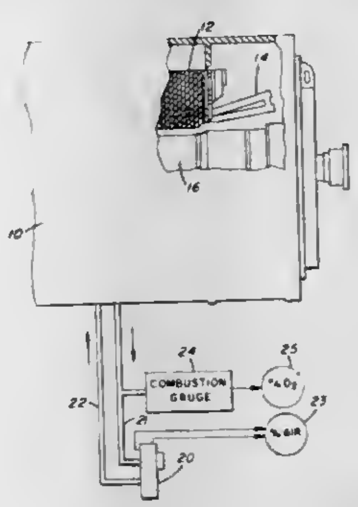
William M. Hickam, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 15, 1976, Ser. No. 732,631

Int. Cl.² G01N ***31/00***

U.S. Cl. 23—232 R **8 Claims**

1. A method for detecting incipient faults in a dynamoelectric machine having a housing filled with a coolant gas comprising hydrogen containing not more than 10% air, said method consisting of measuring the free oxygen concentration of said coolant gas under normal conditions, monitoring the free oxygen content of said coolant gas during operation of said dynamoelectric machine and detecting any substantial reaction of the free oxygen with hydrogen producing a concentration of free oxygen below that measured under said normal condition.



4,101,278

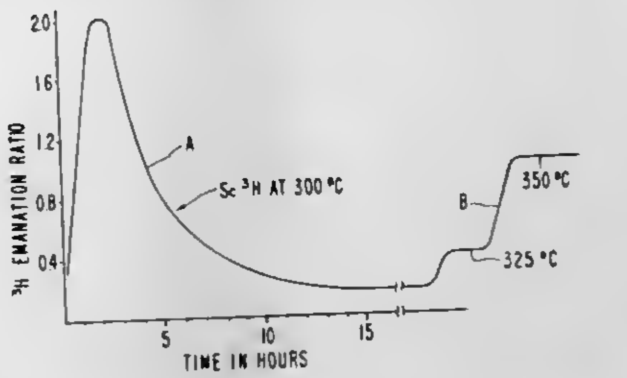
IONIZATION DETECTOR UTILIZING TRITIATED SCANDIUM WITH AN ACCEPTABLE TRITIUM EMANATION RATE AT HIGH TEMPERATURE

Charles Harold Hartmann, Moraga, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 232,016, Mar. 6, 1972, abandoned. This application Sep. 13, 1973, Ser. No. 396,921

Int. Cl.² G01N ***31/08***

U.S. Cl. 23—232 C **4 Claims**



1. A method for analyzing the effluent of a gas chromatograph at temperatures above 300° C without exceeding an acceptable tritium emanation level, said method comprising the steps of:

(a) heating a tritiated scandium β particle source in a heatable vessel at a treatment temperature in excess of 250° C, said source initially exhibiting an unacceptable tritium emanation ratio at temperatures above 250° C, until the tritium emanation ratio of said source has passed through a maximum value;

(b) heating the effluent of a chromatographic column to a temperature in excess of 300° C;

(c) conducting said heated effluent to a zone in proximity with electrode means for creating a difference of electrical potential, said effluent being maintained at a temperature greater than 300° C;

(d) removing said source from said vessel after the tritium emanation ratio of said source has passed through said maximum value, and disposing said source with respect to said zone in proximity with said electrode means so that β particle emissions from said source can ionize said effluent; and

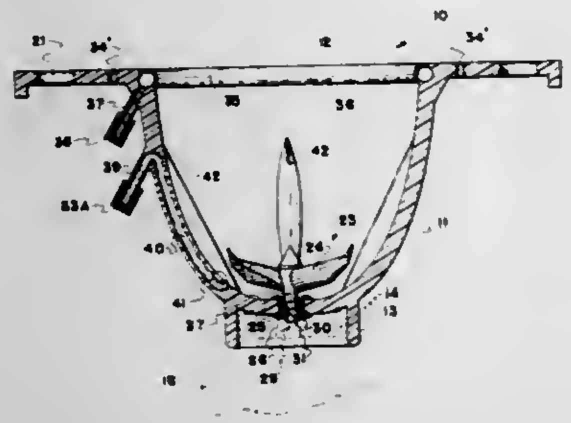
(e) measuring the fluctuation in electron current as a function of time as said effluent passes through said zone in proximity with said electrode means.

4,101,279

DEVICE FOR THE COLLECTION AND PROCESSING OF STOOL SPECIMENS

Muhammed Javed Aslam, 141 Linacre Rd., Winnipeg, Canada (R3T 3R5)

Filed Apr. 6, 1977, Ser. No. 785,035
Int. Cl.^{2} B01L *3/00;* G01N *33/16*
U.S. Cl. 23—259 17 Claims



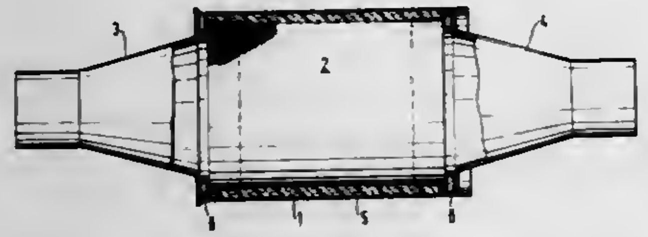
1. A disposable device for the collection and subsequent testing of formed stool samples, for use with a conventional toilet bowl and seat therefor and with a source of power operating a blender blade assembly; comprising in combination a bowl-shaped container having an open upper end and a base, means for detachably supporting said container upon a toilet bowl whereby the container is held in place by the seat of the toilet bowl, a separate cover for engaging the open upper end of the container in a sealing relationship after the stool sample is collected in said container, means to introduce fluid into the container when said cover is on said container, a blender blade assembly within the base of said container for blending the contents of said container when said cover is on said container, and means to extract a sample of the stool specimen from the interior of said container after said sample has been blended by said blender blade assembly and said cover is on said container.

4,101,280

APPARATUS FOR PURIFICATION OF WASTE FROM COMBUSTION ENGINES

Gunther Frietzsche, Edenkoben, Pflaz; Peter Krause, Hochstadt, and Christian Schulten, Didenhofen, all of Germany, assignors to Paul Gillet GmbH, Edenkoben, Pfalz, Germany

Filed Dec. 6, 1976, Ser. No. 748,047
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 7541252[U]
Int. Cl.^{2} B01J *8/02;* F01N *3/15*
U.S. Cl. 23—288 FC 5 Claims



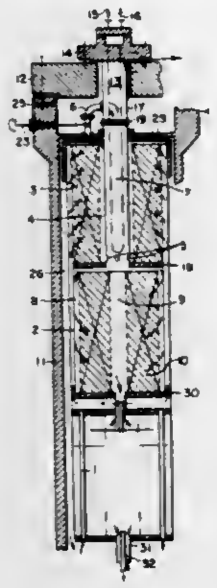
1. In an apparatus for the purification of exhaust gases from combusion engines which comprise at least one monolithic catalyzer block retained within a tubular metal housing, the improvement comprising jacketing means consisting essentially of compressed fibrous ceramic matt material completely surrounding the monolithic catalyzer whereby to take up radial as well as axial bearing forces acting on the monolithic catalyzer, said jacketing means being formed of a material having a residual expansionability that is at least equal to the difference between the thermal expansion coefficient of the monolith and that of the metal of the housing, a pair of end packing rings of refractory material, one at each end of said jacketing means, extending over the end area of the jacketing means and around a peripheral portion of the monolith, a pair of slitted rings of sheet metal, one supporting each packing ring, each of said slitted rings comprising a flange portion which surrounds an end portion of the monolith.

4,101,281

RADIAL-FLOW REACTOR FOR THE SYNTHESIS OF AMMONIA WITH PRODUCTION OF HIGH THERMAL-LEVEL STEAM

Giorgio Pagani, Milan, Italy, assignor to Snamprogetti S.p.A., Milan, Italy

Filed Jul. 14, 1976, Ser. No. 705,013
Claims priority, application Italy, Jul. 15, 1978, 25421 A/75
Int. Cl.^{2} B01J *8/04, 3/00;* C01C *1/04;* F22B *1/18*
U.S. Cl. 23—288 K 3 Claims



1. A radial-flow reactor for the synthesis of ammonia with the production of steam having a high thermal level, comprising

a generally vertically extending outer cylindrical shell of alloyed steel;
a lid having a central bore mounted on the top of said shell;
a top plate having a central bore fixed to the inner wall of said shell at a point spaced below said lid;
a first coaxial cylinder mounted in said shell below the top plate, adjacent the bottom surface of said top plate, said first cylinder having its outer wall spaced from the inner wall of the shell to provide a first duct of annular cross-section, said first duct being in flow communication with the space in said outer shell between said lid and said top plate through the outer circumferential portion of said top plate;
a boiler of the U or bayonet tube bundle type extending through said bores into the shell;
a flange having an annular groove in its lower face connecting the boiler to the lid;
an intake nozzle coupled, through said flange, to the inlet of said boiler for delivering water to the boiler;
a discharge nozzle coupled, through said flange, to the outlet of said boiler for discharging steam from the boiler;
a first annular plate fixed to the inner wall of said first coaxial cylinder;

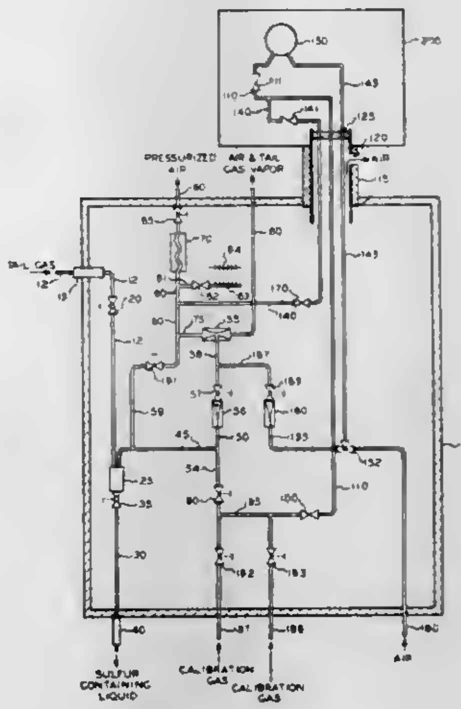
a cylindrical tube enclosing said boiler having its lower end fixed to said first annular plate and its upper end extending into and sealingly engaged within said groove in the flange;
a first catalyst bed of toroidal shape supported by said first annular plate;
a first pair of foraminous coaxial cylinders forming the side walls of said first catalyst bed, having their lower ends supported by said first annular plate and mounted in the shell to provide an internal duct of annular cross-section between the inner of said first pair of foraminous coaxial cylinders and said cylindrical tube, the top portion of said first catalyst bed being closed by an annular plate disposed between the inner of said first pair of foraminous cylinders and said first coaxial cylinder;
a second catalyst bed of toroidal shape;
a second annular plate fixed to the inner wall of said first coaxial cylinder and adapted to support the second catalyst bed below the first catalyst bed;
a second coaxial cylinder extending between said first and second annular plates;
a second pair of foraminous coaxial cylinders forming the side walls of the second catalyst bed, having their lower ends supported by said second annular plate and mounted in the shell to provide a second duct of annular cross-section between the outer of said second pair of foraminous cylinders and the inner surface of said second coaxial cylinder, said second duct being in flow communication with said boiler; the top of said second pair of foraminous cylinders being closed by a circular plate over the outer of said second foraminous cylinders;
a plurality of openings formed near the lower end of said boiler-enclosing tube to provide flow communication between said internal and second annular ducts;
a central cylindrical duct formed by the inner of said second pair of foraminous cylinders, said central cylindrical duct being in flow communication with a central bore in said second annular plate;
an additional duct of annular cross-section formed between the inner wall of said first coaxial cylinder and both the outer wall of the outer of said first pair of foraminous cylinders and the outer wall of the second coaxial cylinder;
a tube bundle heat exchanger supported in the shell below said second catalyst bed, the tubes of said heat exchanger providing flow communication between said first annular duct and said additional annular duct;
a tube extending through said top plate, said tube providing flow communication between said internal annular duct and the boiler;
valve means in said tube for controlling flow therethrough;
an inlet adapted to admit synthesis gas to the space between the lid and said top plate;
conduit means providing flow communication between the central cylindrical duct in the second catalyst bed, through said second annular plate and into said heat exchanger for introducing reacted gas from said second catalyst bed into said heat exchanger to sweep the outer surfaces of the heat exchanger tubes;
a generally cylindrical exit duct affixed to the bottom of said reactor for exhausting the reacted gas;
a second tube coaxial with said exit duct, said second tube extending through said heat exchanger and being in flow communication with said additional annular duct, through said conduit means, for supplying a starter gas to said reactor until said reactor has reached its steady state, such that cold gas admitted through said inlet to the space between said lid and said top plate flows into said first annular duct and passes through the tubes of said heat exchanger, through said additional annular duct and into said first catalyst bed, whereafter some reactant products of the first catalyst bed flow through said tube, from said internal annular duct, into said boiler-enclosing cylindrical tube and into said second annular duct while the remaining reactant products flow directly from said internal annular duct into said second annular duct which admits the reactant products of the first catalyst bed into said second catalyst bed to produce reacted gas flowing into said central cylindrical duct from which said conduit means introduces the resultant gas into said heat exchanger for sweeping the outer surfaces of the heat exchanger tubes and subsequent exiting through said exit duct.

4,101,282

SAMPLE CONDITIONER AND ANALYZER

Otis E. Ririe, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 18, 1977, Ser. No. 770,252
Int. Cl.^{2} G01N *1/22, 31/00*
U.S. Cl. 23—254 R 6 Claims



1. A device for the analysis of gases which contain reactive components comprising:

a gas analyzer having a detection chamber;
an enclosed heated conditioning cabinet having a heater within said cabinet to heat cabinet air;
a heated conduit connecting said analyzer and said cabinet in open communication with said cabinet and heated by warmed cabinet air flowing from the cabinet through said conduit and having an opening near the analyzer end to exhaust warmed air from said cabinet and said conduit to the atmosphere;
a plug at the analyzer end of said heated conduit adapted to prevent air flowing from said cabinet through said heated conduit and exiting through said opening from entering said analyzer;
means for introducing a gas sample into said cabinet;
bypass means for diverting a portion of said gaseous sample introduced into said cabinet and for exhausting it from said cabinet without analysis:
sample conveying means for transporting a predetermined portion of said gaseous sample through said heated cabinet and said heated conduit and into said detection chamber, said sample conveying means including a sample line for carrying of said gaseous sample, extending from the cabinet through the conduit to the detection chamber of said analyzer;
purging means for selectively purging said sample conveying means with air, said purging means including a purge line for carrying of air, leading from the cabinet through said heated conduit and said plug and into said analyzer, said purge line being in open communication with said sample line; and

means for withdrawing a portion of said gaseous sample from said detection chamber of the analyzer to the cabinet and for exhausting it from said cabinet, said sample withdrawing means including a line leading from the analyzer through said heated conduit into said cabinet.

4,101,283

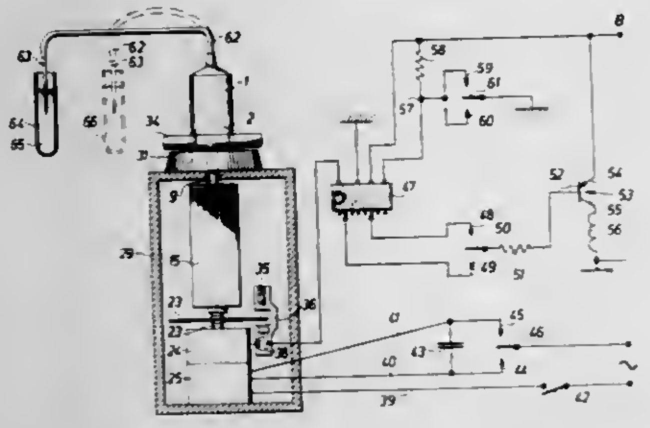
DISPOSABLE REAGENT CONTAINER AND ACTUATION MECHANISM

Karl Erik Sundstrom, 114, ch. de La Montagne, 1224 Chene-Bougeries, Geneva, Switzerland (1224)

Filed Jul. 13, 1976, Ser. No. 704,927

Int. Cl.^{2} G01N *1/14;* G01F *11/06*

U.S. Cl. 23—259 **19 Claims**



1. A volume portioning apparatus, comprising:
- (a) pipe means for sampling and delivery of volumetric material;
- (b) a cylindrical container having first and second ends with said first end connected to said pipe means;
- (c) plunger means cooperating with the inside of said cylindrical container for movement from said second end to said first end and return; and
- (d) means for performing movements of said plunger means into and out of said container with rotation of said plunger means.

4,101,284

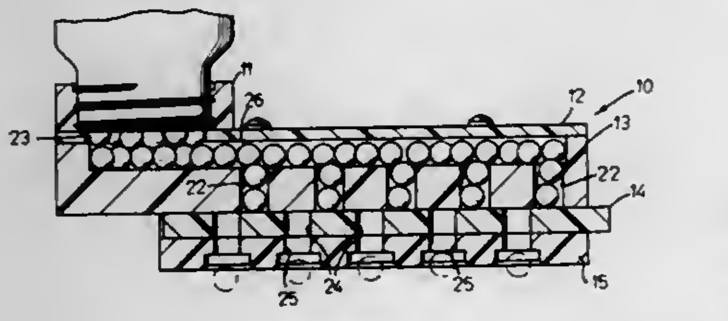
MULTIPLE BEAD DISPENSER FOR DIAGNOSTIC ASSAY

Joseph J. Difiglio, Vernon Hills, and Richard W. George, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 25, 1977, Ser. No. 844,667

Int. Cl.^{2} G01N *33/16;* B65G *65/60*

U.S. Cl. 23—259 **4 Claims**



1. An apparatus useful for simultaneously dispensing a plurality of beads to be used as solid supports in the performance of immunologic diagnostic assays which comprises:
- (a) a threaded container support having an opening for the delivery of beads from a container into the apparatus;
- (b) a block defining a reservoir having a bottom with a plurality of vertical apertures extending downwardly from the bottom and having a cover with a portal communicating with said opening in the threaded container support.
- (c) a base plate mounted beneath and peripherally on no more than three sides to said reservoir block, having a plurality of vertical apertures located in a position predetermined to be unaligned with the apertures in the bottom of the reservoir block and extending downwardly from the bottom through the base plate;
- (d) a sliding plate situated between the reservoir block and the base plate and within the peripheral attachment of said block and plate having a plurality of vertical apertures located in a predetermined position to be aligned with said apertures in the bottom of the reservoir plate and extending downwardly to the surface of said base plate; and
- (e) a biasing means constructed in a range to permit lateral movement of the sliding plate sufficient to align the vertical apertures in the sliding plate with those of the base plate and return the sliding plate so that its vertical apertures again align with those of said reservoir.

4,101,285

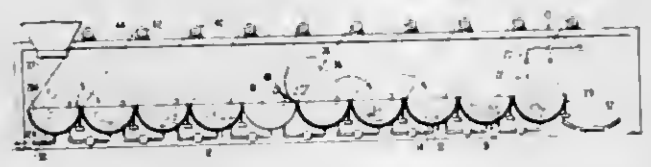
METHODS AND APPARATUS FOR EXTRACTING JUICES FROM JUICE-LADEN SOLID MATERIALS

Sydney E. Tilby, 716 E. Ridge Pl., Victoria, British Columbia, Canada

Filed Sep. 27, 1976, Ser. No. 726,752

Int. Cl. B01d *11/02*

U.S. Cl. 23—270 B **8 Claims**



1. Diffuser apparatus for extracting juice from juice-laden material comprising:
- tank means defining a row of successive material treatment stations;
- a perforated basket associated with each of said stations;
  - each basket being mounted for movement into and from its associated treatment station;
  - each basket including sections which are collapsible about a hinge axis disposed between said sections from an open condition defining an open chamber of given volume capacity to a collapsed chamber of reduced volume capacity;
  - each basket being operable to receive a charge of said material while in said open condition;
- means for conducting a flow of liquid through said tank means to extract juice from said material; and
- basket actuating means for applying a transfer force to each basket in a direction to sequentially:
  - collapse each basket to compress material contained therein so as to squeeze juice therefrom; and
  - transfer each basket means from its associated station to a generally inverted position over a succeeding station to discharge said charge of compressed material.

4,101,286

BUBBLE FORMING DEVICE HAVING NO MOVING PARTS

Jun-ichi Nagao; Hiroyuki Machiguchi, and Yoshikazu Yamamichi, all of Okayama, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

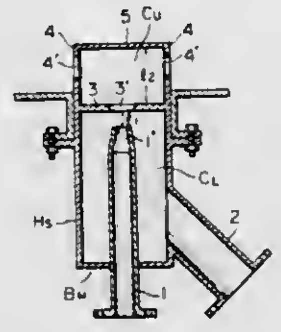
Filed Feb. 4, 1977, Ser. No. 765,588

Int. Cl.^{2} B01J *10/00;* C02D *1/00*

U.S. Cl. 23—283 **4 Claims**

1. A bubble-forming device having no moving parts which comprises:
- a housing (H_S) including a ceiling member (5), a side-wall (4), a bottom (B_M), and a horizontal partition (3) dividing the inside of said housing into upper and lower chambers (C_L and C_U), said horizontal partition (3) having an orifice (3') in the center thereof;

- the lower chamber (C_L) having:
  - a gas-introducing pipe (1) having a nozzle (1') on the top thereof aligned with and directed toward said orifice, said gas-introducing pipe being vertically fixed at the bottom (B_M) of said housing leaving a narrow space between the nozzle tip (1') and the orifice (3'); and
  - a liquid-introducing pipe (2) through which liquid is to be taken in; and the upper chamber (C_U) having:



  - said ceiling member (5) located at a short distance from the partition (3), against which a high velocity stream of the gas-liquid mixture passed through the orifice (3') is to be directed; and
  - at least one orifice (4') provided in the upper side wall (4) of said housing through which the fully mixed fluid containing an enormous number of very fine air bubbles is to be discharged.

4,101,287

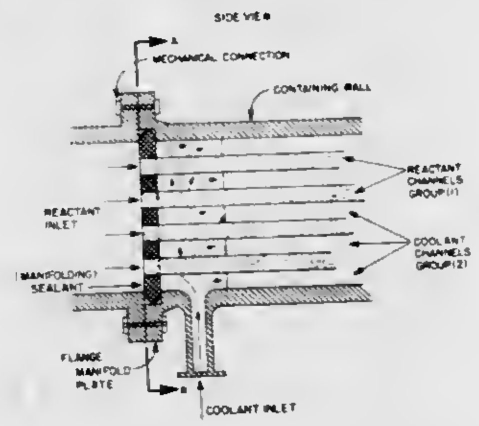
COMBINED HEAT EXCHANGER REACTOR

Norman H. Sweed, Princeton Jct.; John P. DeLuca, New Providence, and Kenneth Kambolz, Cherry Hill, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 21, 1977, Ser. No. 761,495

Int. Cl.^{2} B01J *8/00;* F28D *7/00;* F28F *1/04*

U.S. Cl. 23—288 K **12 Claims**



1. A one-piece integral, high strength combined heat exchanger reactor comprising a honeycomb possessing any regular repeating tesselation pattern of channels, wherein the channels are divided into a multiplicity of separate groups wherein one group of channels extends outward parallel to the direction of flow in the honeycomb, perpendicular to the cross-section of the honeycomb, each wall of this outwardly extending channel group being surrounded by and in contact through common walls with channels of a separate channel grouping, each channel of the outwardly extending group being separated from other channels of the same group by the presence of the intervening channels, which honeycomb system is manifolded and mechanically enclosed so as to form a separation of entrances of the extending channels as compared to the recessed channels of the separate group.

4,101,288

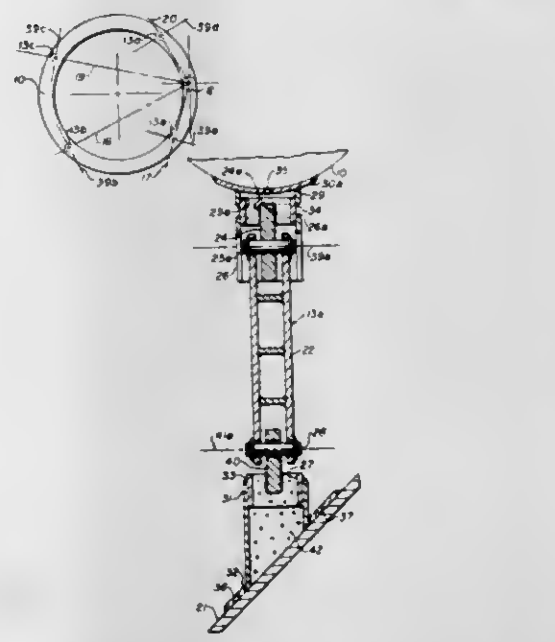
METHOD AND A SUPPORT ASSEMBLY FOR SUPPORTING AN AIR RING IN A REGENERATOR IN A FLUID CATALYTIC CRACKING UNIT

James A. Smith, Houston; John P. MacLean, Stafford, and Thomas W. DeBolse, Missouri City, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jul. 29, 1977, Ser. No. 820,189

Int. Cl.^{2} B01J *8/24;* F16M *13/02;* B23K *28/00*

U.S. Cl. 23—288 B **20 Claims**



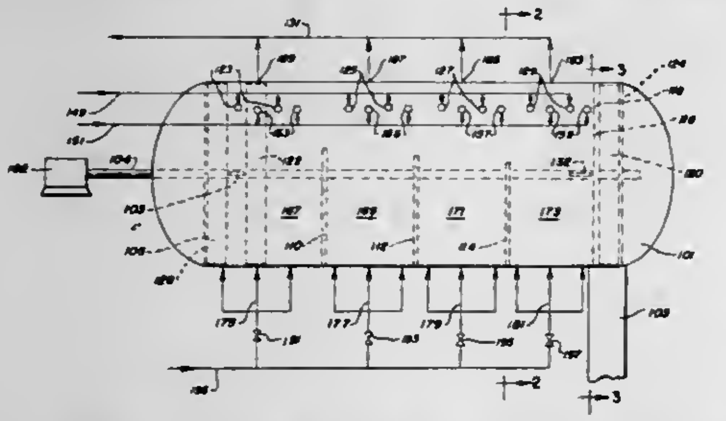
1. A method for forming a support assembly for supporting a mechanism on a supporting structure that may operate in the high temperature environment of at least 1,100°-1,400° F. wherein the support assembly comprises a primary support and a plurality of upright elongated secondary supports, each secondary support having first and second slip rings and pivot pins comprising the steps of,
- (a) fixedly securing a primary support between the mechanism at a predetermined first location point and the supporting structure,
- (b) pivotally mounting a first slip ring on a first pivot pin in one end of a first one of the plurality of elongated supports and pivotally mounting a second slip ring on a second pivot pin in the other end of the one elongated support,
- (c) extending an outer portion of the first slip ring into a first sleeve fixedly secured to the supported mechanism,
- (d) extending an outer portion of the second slip ring into a second sleeve fixedly secured to the supporting structure,
- (e) aligning the first pivot pin so that its longitudinal axis is normal to a line between the center of the first slip ring and the predetermined first location point,
- (f) fixedly securing the second slip ring to its supporting structure second sleeve with the first slip ring so aligned, and then,
- (g) fixedly securing the first slip ring to its supported mechanism first sleeve so that with any thermal expansion or contraction of the elongated supports, the supported mechanism, and the supporting structure due to operating in the high temperature environment causes pivotal movement of the first slip ring about its pivot pin and pivotal movement of the second slip ring about its pivot pin for preventing undue, intolerable, and unacceptable stresses in the fixed connections of the two slip rings, the two sleeves, and in portions of the supported mechanism and supporting structure adjacent the fixed connections, and whereby a simple and economical support assembly is formed because orientation and installation of the slip rings are easily and conveniently facilitated.

11. A method for forming a support assembly for supporting an air ring in a regenerator in a fluid catalytic cracking unit operating in the temperature range of at least 1,100°-1,400° F. comprising the steps of,

(a) welding an air inlet header between the air ring at a predetermined location point and the bottom of the regenerator,
(b) connecting other elongated supports under the air ring, said step of connecting said elongated supports comprising,
(c) pivotally mounting slip rings on pivot pins on opposite ends of each of the other supports, the two pins on each support being formed parallel to each other,
(d) inserting the pivotally mounted pair of slip rings of each support into the two corresponding sleeves mounted oppositely on the air ring and regenerator,
(e) aligning each support so that its corresponding pivot pin longitudinal axis is normal to a line between the center of the slip ring and the predetermined location point, and
(f) welding the slip rings in their respective sleeves with the supports so aligned to provide pivotal movement about the slip ring pins for elimination of any bending stresses due to thermal expansion or contraction.

4,101,289
HORIZONTAL REACTOR FOR THE VAPOR PHASE POLYMERIZATION OF MONOMERS

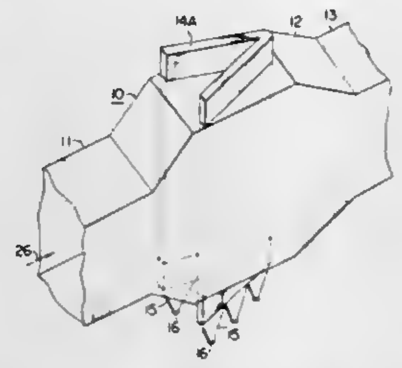
James L. Jezl, St. Charles, and Edwin F. Peters, Winfield, both of Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.
Division of Ser. No. 642,583, Dec. 19, 1975, which is a continuation of Ser. No. 533,020, Dec. 16, 1974, abandoned. This application Jan. 19, 1977, Ser. No. 760,639
Int. Cl.^{2} B01V *8/36*
U.S. Cl. 23—288 E **8 Claims**



1. Apparatus for the vapor phase polymerization of at least one polymerizable monomer comprising:
(a) a horizontal reactor of substantially circular cross-section containing a centrally-located drive shaft extending longitudinally through said reactor to which are attached a plurality of adjacently located paddles, which paddles cause essentially no forward or backward movement of the particulate matter contained in said reactor and extend transversely within and to a short distance from the internal surfaces of said reactor, said reactor being divided into two or more individually polymerization-temperature-controllable polymerization sections by one or more barriers so constructed to allow free reactor gas mixing in said reactor and to control movement of said particulate matter between said sections;
(b) driving means for said drive shaft;
(c) One or more reactor off-gas outlets spaced along the topward part of said reactor;
(d) one or more vapor recycle inlets spaced along the bottomward part of said reactor;
(e) one or more catalyst addition inlets spaced along said reactor;
(f) a plurality of quench liquid inlets spaced along the topward part of said reactor whereby quench liquid can be introduced into said two or more sections of said reactor; and
(g) take-off means for said particulate matter at one end of said reactor.

4,101,290
CATALYTIC REACTION APPARATUS

Norio Arashi; Yukio Hishinuma, and Tadayoshi Murakami, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of, Japan
Filed Mar. 23, 1976, Ser. No. 669,701
Claims priority, application Japan, Apr. 9, 1975, 50-42278
Int. Cl.^{2} B01J *8/02, 8/04;* F01N *3/15*
U.S. Cl. 23—288 R **8 Claims**



1. A catalytic reaction apparatus for removing a component from a gas by providing a catalyst-packed bed filled with catalysts therein in the gas, and making the gas pass through the catalyst-packed bed, which comprises the catalyst-packed bed being extended in a vertical direction with respect to gas flow and wherein said catalyst packed bed comprises wall surfaces extended in said vertical direction formed from flat plates, said wall surfaces forming an approximately V-shaped structure, with the open end of the approximately V-shaped structure facing an upstream side of the gas flow, wherein said approximately V-shaped structure is provided with a plurality of flow-rectifying guide plates having an equal length from wall surfaces of the catalyst-packed bed, wherein the flow-rectifying guide plates facing the upstream side of the gas flow are arranged perpendicularly to the general flow of gas through said apparatus and those facing the downstream side of the gas flow are arranged substantially in parallel to the gas flow.

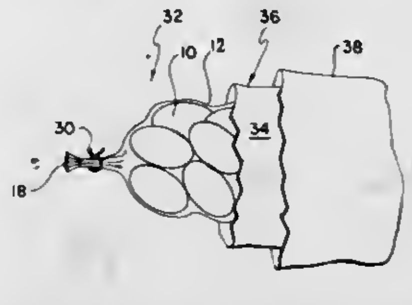
4,101,291
OXYGEN GAS GENERATOR AND METHOD OF MANUFACTURING THE GAS GENERATOR

Frank A. Marion, Riverside, Calif., assignor to Universal Propulsion Company, Inc., Mesa, Ariz.
Filed Aug. 6, 1976, Ser. No. 712,280
Int. Cl.^{2} C10L *5/02, 5/00*
U.S. Cl. 44—17 **19 Claims**

10. In combination in a generator for generating gases at a relatively high temperature,
a clay having a good green strength and having nonhydrophyllic properties and having a percentage by weight no greater than approximately 20% in the mixture,
coke particles serving as a fuel and having properties of being retained by the clay in dispersed form at individual positions in the clay and having a percentage by weight no greater than approximately 25% in the mixture, and
an oxidizer having properties of decomposing to provide oxygen for combustion of the oxygen with the coke at the localized positions and having a percentage by weight of at least 60% in the mixture,
the clay having a melting temperature above the temperature at which the oxidizer decomposes.

4,101,292
CHARCOAL BRIQUETTE PACKAGING TECHNIQUE

Robert Paul Hogan, II, P.O. Box 18285, Corpus Christi, Tex. 78418
Filed Aug. 10, 1977, Ser. No. 823,454
Int. Cl.^{2} C10L *11/00;* B65D *65/00*
U.S. Cl. 44—40 **11 Claims**



1. A charcoal briquette packaging comprising
a sealed gas impermeable organic polymeric inner bag having therein a multiplicity of abutted charcoal briquettes, the bag being collapsed about the briquettes to provide a compact unbendable unit having a substantially reduced gas volume therein;
a fiber covering, juxtaposed to the inner bag, impregnated with a flammable liquid; and
a sealed gas impermeable organic polymeric outer bag surrounding the fiber covering.
9. A method of packaging charcoal briquettes, comprising
placing a multiplicity of charcoal briquettes in a gas impermeable organic polymeric first bag;
steps for replacing the oxygen containing atmosphere in the first bag with an inert gas atmosphere and collapsing the first bag;
sealing the first bag;
juxtaposing a fiber material in intimate contact with the first bag;
impregnating the fiber material with a flammable liquid; and
steps for sealing the fiber material, first bag and briquettes in a partially evacuated gas impermeable organic polymeric second bag.

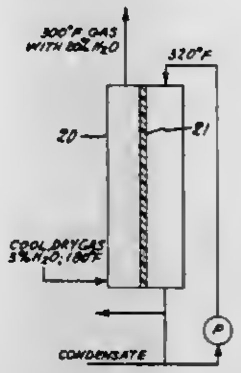
4,101,293
STABILIZING EMULSIFIERS

Arthur Waldemar Krause, and John Korose, both of Gulf Breeze, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.
Filed Mar. 30, 1977, Ser. No. 782,634
Int. Cl.^{2} C10L *1/18, 1/32*
U.S. Cl. 44—51 **23 Claims**

1. A storage stable coal and oil fuel mixture comprising (A) from about 0.1 part to about 10 parts of a stabilizing emulsifier comprising reacting at a temperature ranging from about 0° to about 160° C (I) at least one ethylenically unsaturated or ethylenically polyunsaturated aliphatic carboxylic acid or cycloaliphatic carboxylic acid containing from about 5 to about 36 carbon atoms and mixture thereof with (II) at least one member selected from a group consisting of the salt of an organic carboxylic acid, alkali metal hydroxides and alkanolamines with mixing until the reaction between (I) and (II) is complete and (B) from about 50 parts to about 1 part of pulverized coal and (C) from about 50 parts to about 99 parts of liquid petroleum hydrocarbon fuel oil.

4,101,294
PRODUCTION OF HOT, SATURATED FUEL GAS

Shiro G. Kimura, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Aug. 15, 1977, Ser. No. 824,335
Int. Cl.^{2} C10J *1/00*
U.S. Cl. 48—77 **11 Claims**



1. In apparatus for the production of a low BTU fuel gas stream comprising in combination a coal gasifier and, thereafter in sequential flow communication therewith, means for adding water to the product gas stream from said coal gasifier to reduce the temperature thereof; heat exchange means for further reducing the temperature of said product gas stream sufficient to condense water therefrom; means for reducing the hydrogen sulfide and ammonia content of said product stream; and means for reheating said product stream and increasing the water vapor content thereof by means of a hot liquid, the improvement in which the means for reheating the product stream and increasing water vapor content thereof comprises in combination:
an enclosure;
means disposed in said enclosure for defining two separate flow volumes therein;
means connected to said enclosure for admitting a first fluid flow into one of said flow volumes;
means connected to said enclosure for removing first fluid flow from said one flow volume;
means connected to said enclosure for admitting a second fluid flow into the other of said flow volumes; and
means connected to said enclosure for removing second fluid flow from said other flow volume;
said defining means being formed at least in part as a microporous barrier;
said microporous barrier being made of a material selected from the group consisting of hydrophobic polymer material and hydrophilic polymer material having a gel structure.

4,101,295
APPARATUS FOR CONVERTING COAL INTO GAS SUBSTITUTES

John H. Sadler, 16 Lakeside La., Bolton, Conn. 06040
Filed Aug. 16, 1976, Ser. No. 714,765
Int. Cl.^{2} C10J *3/58*
U.S. Cl. 48—99 **11 Claims**

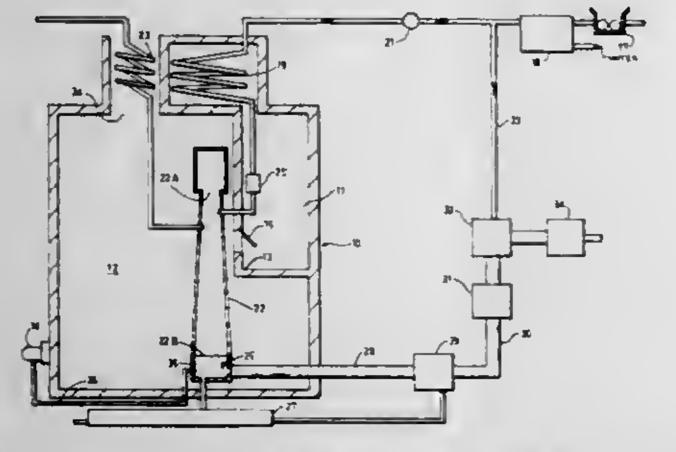
1. An apparatus for converting coal into a natural gas substitute comprising:
a furnace defining a first heating chamber and a second heating chamber,
a means connecting said first heating chamber in communication with said second heating chamber,
a burner disposed in said first heating chamber for generating heating products of combustion,
said connecting means including a temperature controlled damper to regulate the flow of said heating products of combustion between said first and second heating chambers,
a catalytic chamber containing a catalytic agent disposed in

said second heating chamber in heat transfer relationship to the heating products of combustion therein,

means for mixing pulverized coal with water to form a slurry mix,

means for conducting said slurry mix in heat transfer relationship to the heating gases in said second chamber for preheating said slurry mix, and said conducting means being connected to said catalytic chamber whereby said preheated slurry mix is brought into contact with the catalytic agent in said catalytic chamber to form a catalyzed heat emulsion,

a convertor chamber disposed in said first heating chamber,



means connecting said catalytic chamber to said convertor chamber whereby the heated catalyzed emulsion flows from said catalytic chamber to said convertor chamber,

a steam generator disposed in said first heating chamber in heat transfer relation to the heating combustion gases therein,

said steam generator being connected to said convertor for introducing steam in said convertor to mix with the catalyzed emulsion introduced thereinto,

said burner means heating said convertor chamber to coal distillation temperatures to produce the coal gas constituents,

and means for removing the coal gas constituents from said convertor chamber.

4,101,296

OZONE DECOMPOSITION AND ELECTRODESORPTION PROCESS

Frank Eugene Lowther, Severna Park, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 568,933, Apr. 17, 1975, abandoned, and a continuation-in-part of Ser. No. 694,017, Jun. 7, 1976, Pat. No. 4,038,050, and a continuation-in-part of Ser. No. 768,763, Feb. 15, 1977, which is a continuation-in-part of Ser. No. 625,237, Oct. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 527,832, Nov. 27, 1974, abandoned. This application Apr. 20, 1977, Ser. No. 789,307

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

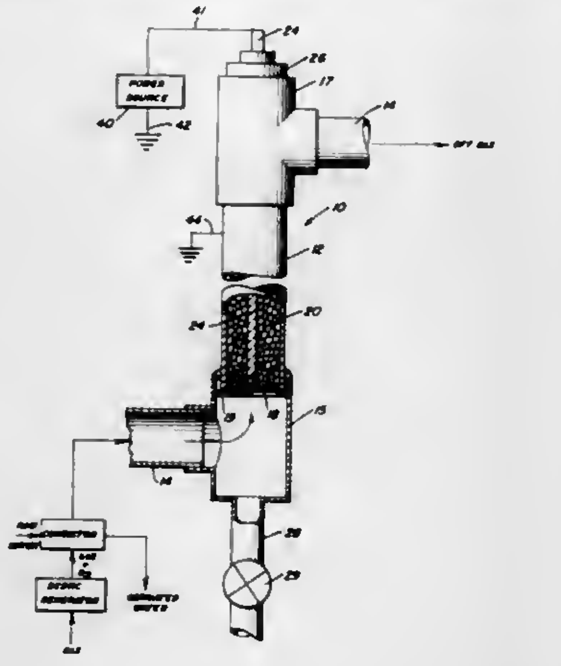
Int. Cl.² B01D *53/04*

U.S. Cl. 55—33 **12 Claims**

1. A method for decomposing ozone which comprises:

(a) contacting a gas mixture which includes ozone and water vapor with a bed of crystalline alumino-silicate zeolite, said zeolite being active for the decomposition of ozone; and

(b) maintaining the activity of said zeolite bed by the application of a 0–10^3 Hz electrical field of at least 0.2 Kv/cm across the bed to maintain a current density of about 0.01 to 100 microamps/cm² to remove water from said bed as molecular water.



4,101,297

PROCESS FOR RECOVERING A SOLVENT VAPOR

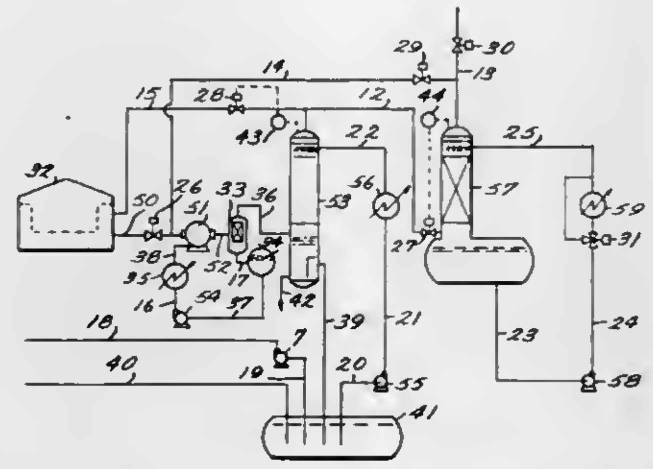
Kazumi Uda, Fukuyama; Motohiko Tamura, Mihara; Ichiro Nishiura, Takehara, and Hiroshi Fujiike, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 732,074, Oct. 13, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,263

Claims priority, application Japan, Oct. 15, 1975, 50-124061

Int. Cl.² B01D *19/00, 53/14*

U.S. Cl. 55—43 **13 Claims**



1. A process for recovering solvent vapor in an absorbing liquid and regenerating the absorbing liquid, comprising:

(a) absorbing a solvent vapor in a cooled absorbing liquid to form an enriched cooled absorbing liquid;

(b) desorbing a portion of solvent vapor from said enriched cooled absorbing liquid by warming said enriched cooled absorbing liquid, exposing said enriched absorbing liquid to a constant low vacuum regeneration stage and desorbing and recovering a portion of solvent vapor from said enriched absorbing liquid;

(c) re-exposing said enriched absorbing liquid to said constant low vacuum regeneration stage and desorbing and recovering another portion of solvent vapor from said enriched absorbing liquid; and

(d) repeatedly re-exposing said enriched absorbing liquid to said constant low vacuum regeneration stage and desorbing and recovering additional portions of solvent vapor from said enriched absorbing liquid thereby regenerating said absorbing liquid.

4,101,298

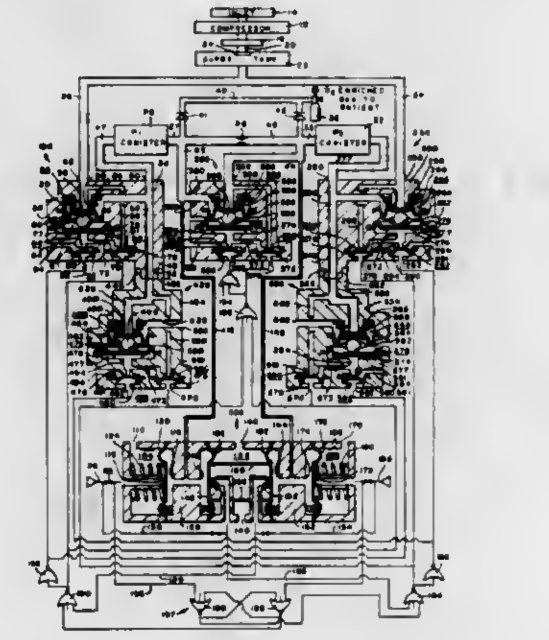
PRESSURE CYCLING CONTROL FOR FLUID SEPARATOR MECHANISM

William Perry Myers, and Terence August Torzala, both of Davenport, Iowa, assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 5, 1977, Ser. No. 784,901

Int. Cl.² B01D *53/00*

U.S. Cl. 55—163 **14 Claims**



1. In a breathing system wherein a breathable fluid is separated from a source of fluid mixture through retention of a component in the fluid mixture by an adsorption material located in first and second chambers, control means for regulating the communication of the source of fluid mixtures to the first and second chambers comprising:

first valve means for allowing said source of fluid mixture to freely flow to the first chamber while communicating the second chamber to the atmosphere in a first portion of a mode of operation;

second valve means for allowing said source of fluid mixture to freely flow to the second chamber while communicating the first chamber to the atmosphere in a second portion of the mode of operation;

first sensor means connected to said first chamber for developing a first sensor signal corresponding to the fluid pressure in said first chamber;

second sensor means connected to said second chamber for developing a second sensor signal corresponding to the fluid pressure in said second chamber; and

logic sequencer means responsive to said first and second sensor signals for pneumatically operating the first and second valve means during the first and second portions of the mode of operation.

4,101,299

APPARATUS FOR DISCHARGING SMOKES, FUMES AND GREASES FROM KITCHENS

Albert Flamidien Bertucci, Golbey, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Dec. 28, 1976, Ser. No. 755,002

Claims priority, application France, Dec. 31, 1975, 75 40315

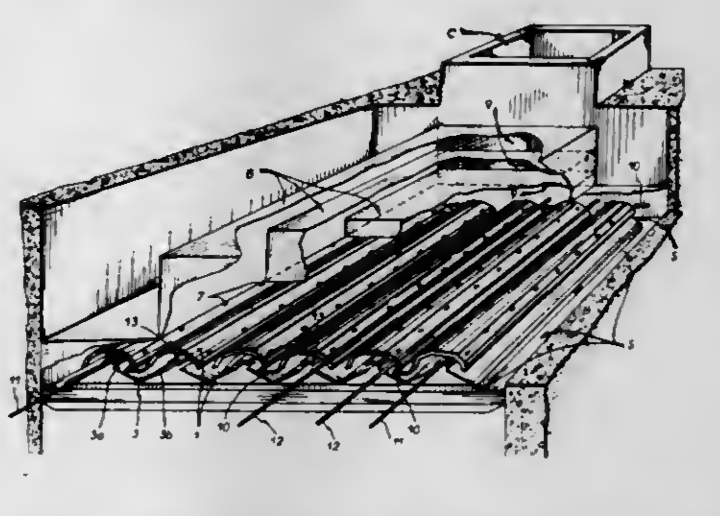
Int. Cl.² B01D *47/00*

U.S. Cl. 55—222 **7 Claims**

1. An installation for discharging smoke, fumes and greases from various premises, more particularly from restaurant or community kitchens comprising

a set of hollow ceiling elements each shaped as a long hollow gutter tile having its concave surface facing downwardly and having slits therebetween for discharging smoke and fumes,

a water circulation pipe system,



piping means connecting said hollow elements for passage of water between and through said elements, and connected to said water circulation pipe system,

drains extending beneath said hollow elements with slits between said drains for the passage of smoke and fumes therebetween, said drains connected to a sewer,

said hollow ceiling elements forming water-cooled condensers having heat-transfer surfaces for collecting the grease for discharge by said drains.

4,101,300

METHOD AND APPARATUS FOR DRAWING OPTICAL FIBER

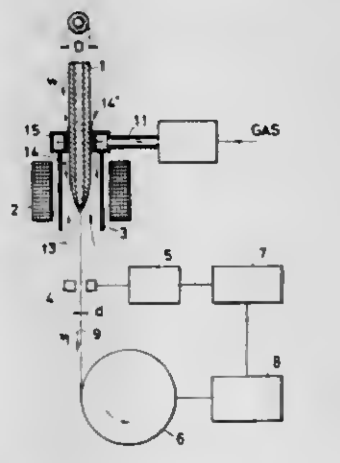
Katsuyuki Imoto, Sayama; Gyozo Toda, Hino, and Masao Sumi, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of, Japan

Filed Nov. 23, 1976, Ser. No. 744,454

Claims priority, application Japan, Nov. 27, 1975, 50-142055; Dec. 22, 1975, 50-151825; Mar. 22, 1976, 51-29960

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **30 Claims**



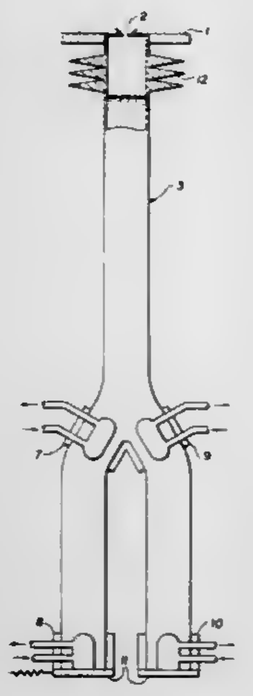
1. In an apparatus for drawing an optical fiber having a heater for heating an optical fiber preform and a pulling arrangement for drawing out an optical fiber from said preform, the forward end portion of which has been fused by said heater, the improvement comprising:

first means for detecting the diameter of said optical fiber, and

second means for controlling a predetermined amount of gas flow along the outer peripheral surface of the fused part of said preform in response to detected fluctuations of said optical fiber diameter.

4,101,301
FORMATION OF SPHERES OF THERMOPLASTIC MATERIALS, ESPECIALLY GLASS

Zvi Rigbl, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd., Haifa, Israel
Filed Oct. 28, 1976, Ser. No. 736,532
Claims priority, application United Kingdom, Oct. 28, 1975, 44456/75
Int. Cl.² C03B *19/10*
U.S. Cl. 65—21 10 Claims



1. A method for manufacturing hardened spheres from molten material, comprising:

filling a column with a liquid which either does not react chemically at all, or does so only to an insignificant extent, with said molten material and which has a specific density less than that of the material at the temperature in the column, said specific density difference being between 0.05–0.2;

causing a graduation of temperature of the liquid in the column such that the liquid at the top of the column is hotter than that at the bottom, the temperature at the top of the column being above the temperature at which the material passing through the column is sufficiently hard to be handled without deformation, and the temperature graduation within the column being such that a drop of said molten material passing through said column will have hardened sufficiently to be handled without danger of deformation by the time it reaches the bottom; and

allowing a drop of said molten material to enter the liquid at the top of the column and to pass through the liquid in the column, from the top to the bottom thereof.

4,101,302
PHOTOCHROMIC GRADIENT LENSES

David A. Krohn, Southbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.
Division of Ser. No. 668,175, Mar. 18, 1976, Pat. No. 4,036,624, which is a division of Ser. No. 624,688, Oct. 22, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,585
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.² C03C *15/00;* C03B *31/00*
U.S. Cl. 65—30 R 5 Claims

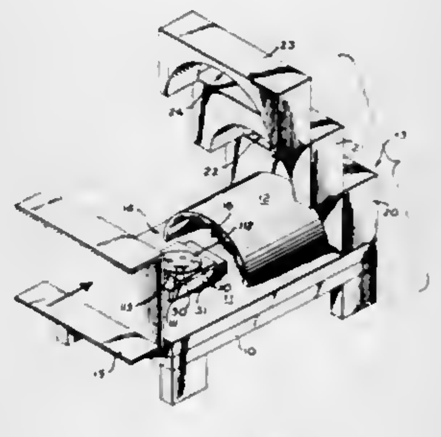
1. In a method of making ophthalmic quality lenses, or lens blanks, having a reversible, progressive, local variation in phototropic, or photochromic, behavior, said lens or lens blank including a portion ultimately to serve as a distance portion and another portion ultimately to serve as a near portion, the distance portion and near portion being contiguous with the near portion being below the distance portion when the lens is glazed in a frame, the reversible, progressive, local variation in phototropic or photochromic behavior being substantially more resistant to light transmission near the top which defines the upper limit of the distance portion thereof and substantially less resistant to light transmission in the near portion when said lens is glazed in a frame, the transition in light transmission from the top of the lens to the bottom being substantially uniform laterally of said lens when glazed,

comprised of an unnucleated oxide glass lens or lens blank, exhibiting no photochromic properties to the eye before nucleation, and being made of a glass consisting of ophthalmic quality glass, said lens, or lens blank, containing through its volume at least 0.005 volume percent of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide and mixtures thereof,

after nucleation in at least that portion of the lens, or lens blank, showing phototropic or photochromic behavior, said halide being in the form of particles, there being a progressive variation in the average linear dimension of said particles substantially corresponding to the variation in phototropic or photochromic behavior of the lens, or lens blank, the average linear dimensions of said silver halide particles being smaller than about 5 nanometers in the near portion and said particles substantially, progressively, increasing in size to about 50 nanometers in the distance portion, the improvement comprising the step of

subjecting said glass lens, or lens blank, to a heat treatment, said heat treatment consisting of subjecting the distance portion of such a lens, or lens blank, to a temperature above the strain point but below the softening point thereof for a time period sufficient to grow silver halide particles having an average linear dimension of about 50 nm, substantially progressively lessening the temperature of heat treatment across said lens from the top edge which defines the upper limit of the distance portion to that area spaced therefrom which constitutes the near portion in such a manner as to form silver halide particles of progressively smaller average linear dimension to thereby produce a lens characterized by a local variation in phototropic or photochromic behavior

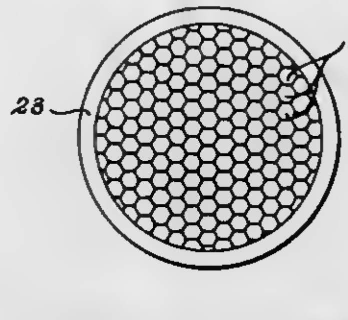
the greatest photochromic or phototropic behavior being exhibited in the distance portion.



SCHEMATIC OF GRADIENT FURNACE

4,101,303
PERFORATE GLASS STRUCTURES AND METHOD OF MAKING THE SAME

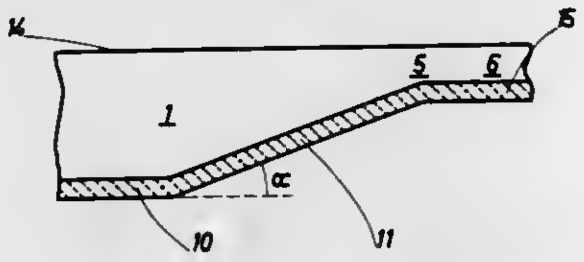
John Treagus Balkwill, Saugus, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Dec. 21, 1970, Ser. No. 128,598
Int. Cl.² C03C *15/00;* C03B *23/20*
U.S. Cl. 65—31 4 Claims



1. A method of making a perforate glass plate comprising the steps of: heating and drawing a first glass rod and a surrounding first glass tube to a smaller diameter, said first glass tube having a given thermal expansion coefficient; cutting said drawn first rod and tube into equal lengths; packing a hexagon mold full of said rod and tube lengths with said rod and tube lengths parallel; heating said mold to tack said tubes together; heating and drawing said tacked tubes and rods to a smaller size hexagon; cutting said smaller hexagon into equal lengths; placing said hexagon lengths in parallel positions inside a second glass tube; heating and evacuating said second glass tube to force it into contact with and fuse with said hexagon lengths to make a first boule; grinding off said second tube to make said first boule have a cylindrical surface; inserting said ground first boule into a third glass tube having a larger thermal expansion coefficient than said first tube; heating said ground first boule and said third tube and evacuating said third tube to force it into contact with said ground first boule and cause said ground first boule and said third glass tube to fuse together to make a second boule; slicing said second boule in a plane transverse to its axis to produce a thin wafer; removing said rod glass from said wafer by etching to form a plurality of holes therethrough; and heating said etched wafer in a hydrogen atmosphere so that said third glass tube remains fused to said wafer.

4,101,304
METHOD AND APPARATUS FOR FEEDING GLASS OUT OF A MELTING TANK TO A FLAT GLASS FORMING MEANS

Jean Marchand, Alsemberg, Belgium, assignor to BFG Glassgroup, Paris, France
Filed Mar. 28, 1977, Ser. No. 782,089
Claims priority, application United Kingdom, Apr. 12, 1976, 14844/76
Int. Cl.² C03B *5/04*
U.S. Cl. 65—135 19 Claims

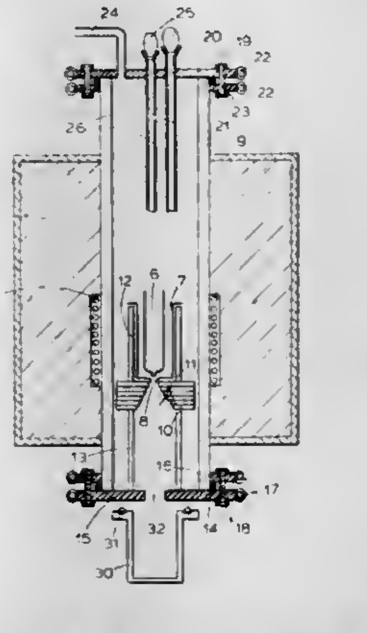


1. In apparatus for the manufacture of flat glass including a glass melting furnace having a sole and an outlet end from which molten glass flows out of the furnace, and means defining an exit channel having a sole and disposed adjacent the furnace to receive molten glass from the furnace outlet end and to deliver the molten glass to forming apparatus, the width of the exit channel being less than that of the furnace, the improvement wherein at least a portion of said sole of said furnace, adjacent the outlet and thereof and over substantially the full width thereof, is inclined upwardly at an angle of about 2° to b 5° from the bottom of said furnace continuously towards said sole of said exit channel.

16. In a method of manufacturing flat glass by feeding molten glass from the outlet end of a glass melting furnace via a forehearth to a narrower exit channel and conducting the glass to flat glass forming apparatus, the improvement wherein said step of feeding comprises causing glass to flow, in the forehearth, over a sole which is inclined upwardly at an angle of about 2° to 5° over substantially the full width of the forehearth toward the exit channel.

4,101,305
DRAWING DIELECTRIC OPTICAL WAVEGUIDES

John Edwin Midwinter, Suffolk, and Clive Richard Day, London, both of England, assignors to The Post Office, London, England
Division of Ser. No. 591,958, Jun. 30, 1975, Pat. No. 4,040,807. This application May 25, 1977, Ser. No. 800,429
Claims priority, application United Kingdom, Jul. 10, 1974, 30525/74
Int. Cl.² C03B *5/32, 5/20*
U.S. Cl. 65—145 6 Claims



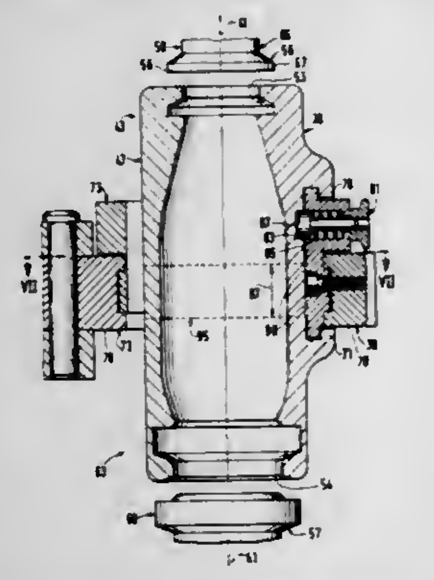
1. Apparatus for drawing dielectric optical waveguides comprising:
- a container;
- a double crucible assembly within said container, having inner and outer compartments;
- means for hermetically sealing said container;
- means for heating said double crucible;
- guide means comprising a pair of tubes extending vertically into said container for inhibiting lateral movement of glass rods to be loaded into the compartments of said double crucible, thereby insuring that rods are substantially at 90° to the melt surface in said compartments; and
- means defining a gas inlet into said container.

4,101,306
MOULDING TOOL

Lothar Schaar, Heuerssen, Fed. Rep. of Germany, assignor to Hermann Heye, Obernkirchen, Fed. Rep. of Germany
Filed Mar. 8, 1977, Ser. No. 775,603
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609651
Int. Cl.² C03B *9/40, 9/00*
U.S. Cl. 65—323 17 Claims

1. In a moulding tool for a machine for moulding plastic material, especially molten glass, a combination comprising at least one middle mould section having a longitudinal axis and

being divided into a plurality of cooperating middle mould section parts; a pair of axially spaced guide elements for each of said middle mould section parts, each of said pair of guide elements being connected to the respective middle mould section part and having a surface normal to said longitudinal axis and facing a corresponding surface of the other of said guide elements, at least one of said guide elements which is located above the other guide element of each pair being hook shaped; and operating means having means for supporting each of said middle section mould parts with radial clearance in said hook-shaped guide element and transmission means located between said surfaces of said guide elements for applying a force to the respective middle mould section part for holding the latter closed against forces tending to move said middle mould section part to an open position during operation of said moulding tool and insertion of molten material thereinto, the resultant holding closed force being located substantially in an application plane intermediate said surfaces of said guide elements and extending at right angles to said axis and the resultant of said opening forces lying also substantially in said plane.



4,101,307

METHIONAL DERIVATIVES AND COMPOSITIONS WITH A GROWTH-REGULATING EFFECT UPON PLANTS

Claude Clapot, Oullins; Louis Dumont, Chaponost, and Jean Vial, Tassin la Demi-Lune, all of France, assignors to Philagro S.A., Lyon, France

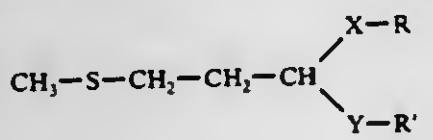
Filed Jul. 14, 1975, Ser. No. 595,723

Claims priority, application France, Jul. 15, 1974, 74 25781

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 71—88 **6 Claims**

1. A compound corresponding to the general formula

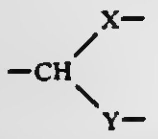


$$\mathrm{CH_3-S-CH_2-CH_2-CH}\begin{array}{l}\diagup X-R\\ \diagdown Y-R'\end{array}$$

in which

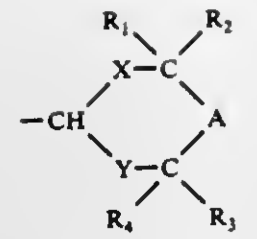
X and Y are oxygen,

R and R' form with



$$-\mathrm{CH}\begin{array}{l}\diagup X-\\ \diagdown Y-\end{array}$$

a cycle corresponding to to the formula

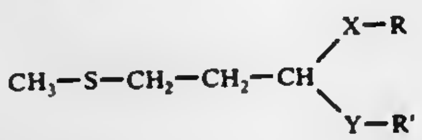


in which

R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an optionally halogen-substituted alkyl radical containing from 1 to 4 carbon atoms, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms, and

A represents a single bond with the proviso that R_1, R_2, R_3, R_4 do not represent hydrogen.

2. A growth-regulating composition for plants, comprising (1) an agricultural carrier, (2) a surfactant and (3) an amount sufficient to regulate the growth of plants of a compound corresponding to the general formula

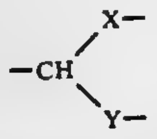


$$\mathrm{CH_3-S-CH_2-CH_2-CH}\begin{array}{l}\diagup X-R\\ \diagdown Y-R'\end{array}$$

in which

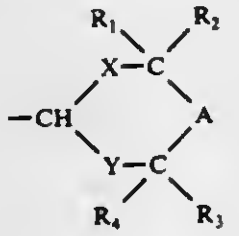
X and Y are oxygen,

R and R' form with



$$-\mathrm{CH}\begin{array}{l}\diagup X-\\ \diagdown Y-\end{array}$$

a cycle corresponding to the formula



in which

R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, an alkyl radical containing from 1 to 4 carbon atoms and optionally substituted by a halogen, the radicals NO_2, hydroxy and alkoxy containing from 1 to 4 carbon atoms,

is a single bond.

6. A process for modifying the growth of a plant comprising to said plant a growth modifying amount of a compound in accordance with claim 1.

4,101,308

SELECTIVE HERBICIDE

Oscar Rene Ochomogo, Baton Rouge, La., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 699,303, Jun. 24, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,750

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—93 **9 Claims**

1. Method for preventing and controlling undesired vegetation in the locus of oil palm, rubber, coffee and tea crops without causing significant injury to said crops comprising applying to the locus of said crops an effective amount of 1-methyl-3-cyclohexyl-6-dimethylamino-s-triazine-2,4(1H,3H)-dione.

4,101,309

METHOD FOR PREPARING TUNGSTEN MATERIALS

Isamu Koseki, Yokohama, and Motoo Seimiya, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 13, 1976, Ser. No. 732,073

Int. Cl.^{2} B22F *1/00;* C22B *34/36*

U.S. Cl. 75—0.5 AB **5 Claims**

1. In a method for preparing a tungsten material comprising the steps of reducing tungsten oxides having doping agents added thereto, washing the resulting tungsten powder with an acid, and thereafter drying the washed tungsten powder, the improvement comprising conducting said washing step separately with hydrochloric acid and then with hydrofluoric acid by first washing said tungsten powder with hydrochloric acid having a concentration of not less than 4% by weight and thereafter washing with hydrofluoric acid having a concentration of not less than 3% by weight.

4,101,310

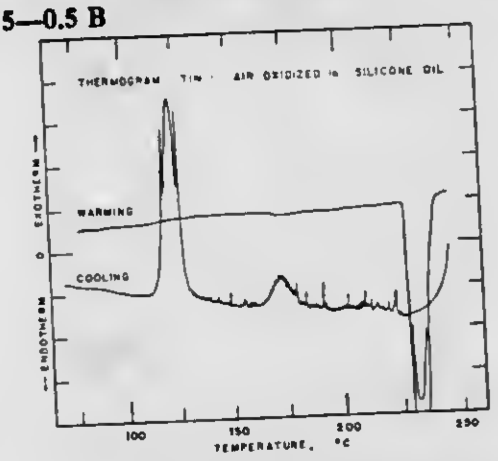
MICRON SIZED SPHERICAL DROPLETS OF METALS AND METHOD

Don H. Rasmussen, and Carl R. Loper, Jr., both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 560,478, Mar. 20, 1975, Pat. No. 4,042,374. This application Feb. 4, 1977, Ser. No. 765,538

Int. Cl.^{2} B22F *9/00*

U.S. Cl. 75—0.5 B **11 Claims**



Thermogram for pure tin. Emulsion formed by air oxidation in silicone oil. Melting point, 232°C. Thermogram peak crystallization temperature, 124°C. Peak supercooling, 108 degrees. Supercooling range, 90 degrees.

1. A method for processing a material formed of at least two components, at least one of which tends to cluster when the material is reduced to micron sized particles from a molten state, comprising heating the material to a molten state, reducing the molten material to micron sized particles in the presence of a reactant which forms a reaction product on the surfaces of the formed molten micron sized particles to inhibit their agglomeration whereby as a result of nonstatistical separation, some of the micron sized particles contain a concentration of one component which is higher than the concentration of that component in the original material, while other micron sized particles contain a concentration of the one component which is less than the concentration in the original material, solidifying at least a portion of the micron sized particles in response to decrease in temperature, and then separating the particles based upon differences in physical and chemical properties.

4,101,311

PROCESS FOR PRODUCING FERROMAGNETIC METAL POWDER

Masashi Aonuma; Yasuo Tamai, and Fumio Kodama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara

Filed Aug. 1, 1977, Ser. No. 820,951

Int. Cl.^{2} H01F *1/06*

U.S. Cl. 75—0.5 **17 Claims**

1. A process for producing a ferromagnetic metal powder comprising:

(a) adding a reducing agent to an aqueous solution of a salt of Fe, Co, Fe-Co, Fe-Ni, Co-Ni or Fe-Co-Ni at a rate of 0.1 to about 100 mole/sec. over an addition time of one minute or less, the temperature of said salt solution being −10° to 40° C at the start of said addition, and

(b) during the course of the reduction maintaining the temperature of said aqueous solution at a temperature not more than about 20° C higher than the temperature of said salt solution at the start of the addition.

4,101,312

METHOD FOR OPERATION OF A CONVERTER

Yozo Takemura, Chita; Shigeyoshi Fukuda, and Sadashi Ogino, both of Tokai, all of Demo. Peoples Rep. of Korea, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 1, 1976, Ser. No. 701,943

Claims priority, application Japan, Nov. 14, 1975, 50-137033

Int. Cl.^{2} C21C *7/00*

U.S. Cl. 75—52 **3 Claims**

1. In a method for operating a converter for the refining of steel under dynamic control wherein the steel is blown with oxygen and the oxygen blowing is accurately stopped at a predetermined temperature, and immediately thereafter, the molten steel and slag therein are poured out, the improvement which comprises adding from 8 to 25% based on the amount of slag of a cooling agent selected from the group consisting of burntlime, dolomite, lime stone, scrap bricks, converter slag, and baked dolomite, to the slag in the converter within 1 minute after the shutdown of the oxygen blowing and then starting the pouring-out of the steel from the converter within 2 minutes of the addition.

4,101,313

PROCESS AND APPARATUS FOR THE PRODUCTION OF STEEL

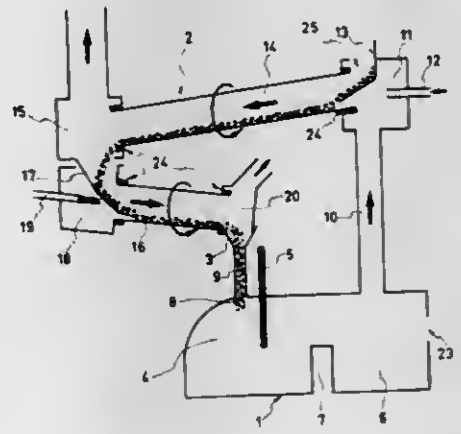
Pierre Vayssiere, and Aristide Berthet, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St. Germain-en-Laye, France

Filed Oct. 14, 1976, Ser. No. 732,362

Claims priority, application France, Oct. 14, 1975, 75 31335

Int. Cl.^{2} C21C *5/38, 5/40*

U.S. Cl. 75—60 **5 Claims**



1. A process for the production of steel from a carburized metallic charge comprising solid materials rich in iron, which comprises

(a) subjecting the charge to a two-phase preheating below the melting temperature of the solid materials,
  (1) the cold charge being received in a first preheating phase and
  (2) the charge whose temperature has been raised in the first preheating phase being received in a second, separate and succeeding preheating phase,
(b) introducing the preheated charge from the two-phase preheating into a melting and refining vessel,
(c) melting and refining the preheated charge in the vessel by subjecting the charge to a melting temperature and refining agents whereby hot gases develop in the vessel
(d) recovering the hot gases,
(e) delivering the recovered hot gases to the first preheating phase where the hot gases and the cold charges are in contact until the temperature of the charge has been raised, the hot gases and the charge being moved simultaneously in the first preheating phase, and
(f) supplying hot combustion gases from the outside to the second preheating phase while the charge is moved therethrough until the final temperature of the charge has been adjusted to a desired value, the charge having a temperature of the desired value being introduced from the second preheating phase into the vessel.

4,101,314

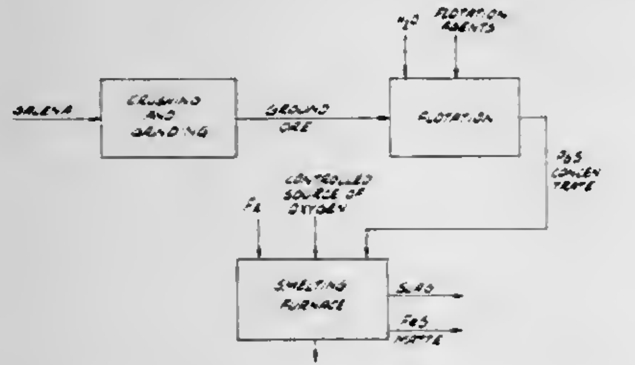
PROCESS FOR RECOVERY OF LEAD FROM LEAD SULFIDE CONCENTRATES

Arthur E. Morris, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 674,836, Apr. 8, 1976, abandoned, which is a continuation of Ser. No. 575,354, May 7, 1975, abandoned. This application May 18, 1977, Ser. No. 797,936

Int. Cl.² C22B *13/00*

U.S. Cl. 75—77 **6 Claims**



1. A process for recovery of lead from a lead sulfide concentrate comprising the steps of:
preparing a furnace charge comprising said concentrate, a source of elemental iron, and a source of available oxygen capable of reacting with the sulfur of the concentrate to form an oxysulfide matte, said concentrate, said source of elemental iron and said source of oxygen being present in such relative proportions that the sum of the elemental iron content and sulfur-reducible combined iron content of the charge is at least about 1.1 pound atoms per pound atom of sulfur based on the total sulfur content of the charge, and the oxygen source provides between about 0.25 and 0.5 pound atom available oxygen per pound atom of sulfur based on the total sulfur content of the charge;
heating the charge to a temperature of at least about 1050° C.;
maintaining said charge at a temperature of at least about 1050° C. to effect reduction of lead sulfide with elemental iron while limiting access of air to said charge to substantially prevent formation of sulfur dioxide therein, thereby causing formation of elemental lead and a matte containing partially oxygenated iron sulfide without substantial evolution of sulfur dioxide; and
separating said elemental lead from said matte.

4,101,315

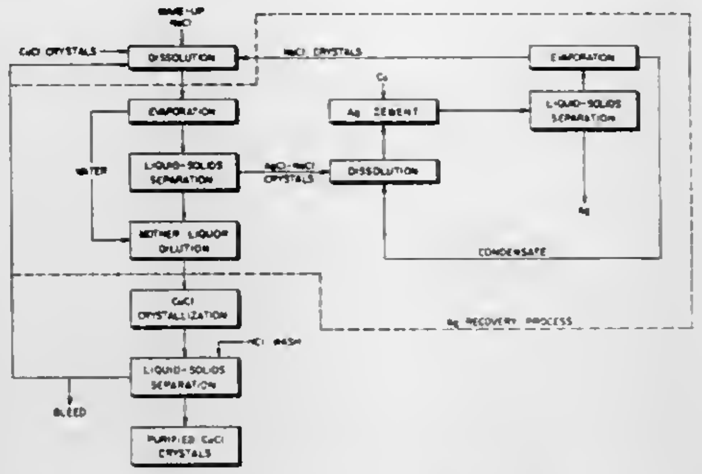
RECOVERY OF SILVER FROM CUPROUS CHLORIDE SOLUTIONS BY CO-CRYSTALLIZATION WITH SODIUM CHLORIDE

Mark A. Peters, Arvada, and Robert K. Johnson, Lakewood, both of Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Jan. 17, 1977, Ser. No. 759,846

Int. Cl.² C22B *15/12, 11/04;* **C01G** *5/00*

U.S. Cl. 75—104 **13 Claims**



10. A process for recovering substantially silver and iron free copper from copper ores containing silver and iron which comprises:
(a) reducing the copper in the ore to the cuprous form by leaching the ore with ferric chloride and cupric chloride to form a leach liquor containing the cuprous chloride;
(b) crystallizing the cuprous chloride from the leach liquor and recovering the formed crystals of cuprous chloride;
(c) reducing the cuprous chloride crystals to solution;
(d) adding sodium chloride to the cuprous chloride solution;
(e) evaporating the cuprous chloride solution to co-crystallize the silver and sodium chlorides;
(f) separating the solution from the precipitated chlorides;
(g) adding water to the cuprous chloride solution to change the concentration of the solution from a region of sodium chloride solid phase to a region of cuprous chloride solid phase accompanied by cooling said cuprous chloride solution to crystallize said cuprous chloride, and
(h) recovering copper from said cuprous chloride crystals.

11. The process of claim 10 in which silver is recovered from the recovered silver chloride.

4,101,316

CONVERSION OF MOLYBDENITE CONCENTRATE TO FERRO-MOLYBDENUM AND SIMULTANEOUS REMOVAL OF IMPURITIES BY DIRECT REDUCTION WITH SULFIDE FORMING REDUCING AGENTS

Jan Wallén, Trollhattan, Sweden, assignor to Ferrolegeringar Trollhatteverken AB, Trollhattan, Sweden

Filed Apr. 8, 1977, Ser. No. 786,013

Claims priority, application Sweden, Apr. 14, 1976, 76044437

Int. Cl.² C22C *1/02*

U.S. Cl. 75—129 **8 Claims**

1. A process for reducing copper-containing molybdenite concentrates comprising effecting the reduction of the molybdenite concentrate in one of a ferro-manganese melt and a melt of ferro-manganese and iron thereby to form a manganese - sulfur - and copper bearing slag phase and a metal phase containing molybdenum and iron.

4,101,317

COPPER ALLOYS WITH IMPROVED CORROSION RESISTANCE AND MACHINABILITY

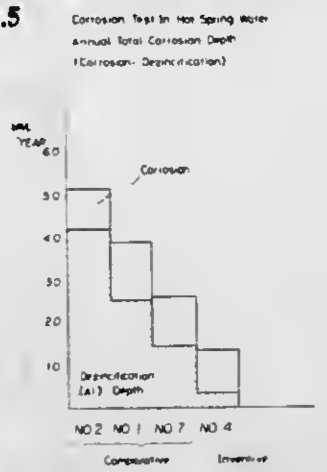
Masao Okano, Suwa, Japan, assignor to Toyo Valve Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 399,603, Sep. 21, 1973, abandoned. This application Jan. 24, 1977, Ser. No. 761,890

Claims priority, application Japan, Oct. 3, 1972, 47-99408

Int. Cl.² C22C *9/04*

U.S. Cl. 75—156.5 **6 Claims**



1. Copper-base alloy having improved corrosion resistance and machinability, consisting essentially of

63.0–66.0 wt. % copper,
1.2–2.0 wt. % tin,
1.0–2.0 wt. % lead,
0.1–1.0 wt. % iron,
2.0 wt. % or less nickel,
0.1 wt. % or less beryllium,

with the balance being zinc and unavoidable impurities, said alloy having been subjected to conventional hot and cold working and thereafter subjected to a heat treatment in the range from about 350 to 550° C for about 1 to 10 hours.

4,101,318

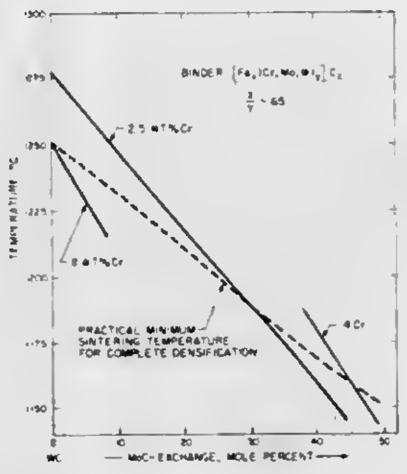
CEMENTED CARBIDE-STEEL COMPOSITES FOR EARTHMOVING AND MINING APPLICATIONS

Erwin Rudy, 1575 NW. Oakhill Dr., Beaverton, Oreg. 97005

Filed Dec. 10, 1976, Ser. No. 749,343

Int. Cl.² C22C *29/00;* **B22F** *3/00*

U.S. Cl. 75—240 **13 Claims**



1. A heat treatable composite structure comprising a heat treatable cemented carbide component and a heat treatable steel component;
the cemented carbide component comprising a sintered component including grains of monocarbide based substantially on the hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy, the binder being from 30 to 80 percent by volume of the cemented carbide component;
the steel component being formed from a castable low alloy steel;
the cemented carbide component being joined to the steel component by being integrally cast into the steel component, the cemented carbide component thereby being diffusion bonded to the steel component and being prestressed in compression.

6. A composition of material comprising sintered carbide-binder metal alloys in which the carbide comprises grains of monocarbide based substantially on the hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy which contains between 0.40 and 8.0 percent by weight chromium, between 0.40 and 8.0 percent by weight of a metal selected from the group consisting of molybdenum and tungsten, less than 1.5 percent by weight vanadium and between 0.15 and 1.20 percent by weight carbon, with the binder metal being from 30 to 80 percent by volume of the composition of material.

13. The method of making a heat treatable composite structure comprising a heat treatable cemented carbide component and a heat treatable steel component in which the cemented carbide component comprises grains of monocarbide based substantially on a preselected hexagonal solid solution (Mo,W)C embedded in a binder of heat treatable steel alloy which contains between 0.40 and 8.0 percent by weight chromium between 0.40 and 8.0 percent by weight of a metal selected from the group consisting of molybdenum and tungsten less than 1.5 percent by weight vanadium and between 0.15 and 1.20 percent by weight carbon, with the binder metal being from 30 to 80 percent by volume of the composition of material, and in which the steel component is formed from a castable low alloy steel, which method comprises the steps of:
preparing a powder mixture of binder and carbides having the desired gross composition of the cemented carbide component in which the binder portion of the powder mixture comprises iron powder whose average diameter is less than 40 micrometers alloyed with up to 10 percent by weight other iron group elements and not more than 0.2 percent by weight vanadium and 1.5 percent by weight chromium, with any additional chromium and vanadium being added to the powder mixture as carbides and with molybdenum and tungsten components of the binder being added as elemental powders or carbides,
wet milling the powder mixture to increase the sintering activity of the iron powder,
drying and homogenizing the powder mixture,
pressing the powder mixture into a compact having a predetermined shape,
sintering the compact to substantially full density at sintering temperatures not higher than the temperature at which η-carbides are formed for the preselected solid solution (Mo,W)C,
placing the sintered compact in a predetermined location of a casting mold,
pouring molten low alloy steel into the mold, and
allowing the molten steel to solidify, whereby a composite structure is formed in which the cemented carbide component is integrally bonded to the steel component and the cemented carbide component is prestressed in compression.

4,101,319

PLASMA DEPOSITION WELDING POWDER FOR PRODUCING WEAR RESISTANT LAYERS

Horst Beyer, and Ulrich Buran, both of Burscheid, Fed. Rep. of Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 687,661

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522690

Int. Cl.² B32B *15/16;* **B22F** *1/00*

U.S. Cl. 75—252 **16 Claims**

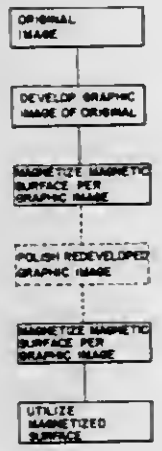
1. Plasma deposition welding powder for the production of

wear-resistant layers or machine parts subject to friction, consists essentially of a powder mixture of two components A and B, of which component A is present at about 70 to 99.5 weight percent of the total of A and B, component A comprising at least one metal selected from the group consisting of molybdenum and tungsten, component B being present at about 0.5 to 30 weight percent of the total of A and B, and consisting essentially of at least one alloy or compound of at least one of the metals selected from the group consisting of cobalt, chromium, iron, nickel, copper and manganese, with at least phosphorus.

4,101,320
MAGNETIC IMAGING METHOD

Edward C. Seliers, Buffalo, and Chandler Malkani, Tonawanda, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1974, Ser. No. 537,230
Int. Cl.^{2} G03G *13/22, 19/00, 13/26*
U.S. Cl. 96—1.4 **10 Claims**

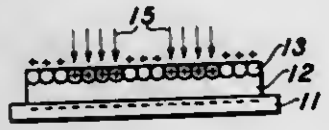

ORIGINAL IMAGE
DEVELOP GRAPHIC IMAGE OF ORIGINAL
MAGNETIZE MAGNETIC SURFACE PER GRAPHIC IMAGE
POLISH REDEVELOPED GRAPHIC IMAGE
MAGNETIZE MAGNETIC SURFACE PER GRAPHIC IMAGE
UTILIZE MAGNETIZED SURFACE

1. An imaging method which comprises the steps of:
(a) forming a grahic image with magnetizable marking materials;
(b) magnetizing said graphic image;
(c) further developing said graphic image by depositing magnetically attractable marking material on said magnetized image, without having previously fused said graphic image;
(d) fixing said redeveloped image to a substrate; and,
(e) subsequently polishing said fixed, redeveloped image and utilizing said redeveloped image to provide a latent magnetic image in a magnetic surface without transferring said redeveloped image to said magnetic surface.

4,101,321
IMAGING SYSTEM

Mortimer Levy, Rochester, and William L. Goffe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 612,122, Jan. 27, 1967, abandoned. This application Sep. 14, 1970, Ser. No. 71,781
Int. Cl.^{2} G03G *5/04*
U.S. Cl. 96—1.5 R **62 Claims**



1. An imaging method comprising:
providing a member comprising a layer of softenable material and agglomerable material both of which are capable of being softened by at least one of contact by solvent vapors below, heating below or combinations thereof, said agglomerable material distributed in depth in said softenable material in a first image configuration and comprising in addition to said first image pattern of agglomerable material, a complementary background pattern comprising agglomerable material in said softenable material, at least in part spaced apart in depth in said softenable material from said first image pattern, and
heating said member simultaneously with or after contacting said member with solvent vapors sufficiently to substantially reduce the effective optical cross-sectional area of the agglomerable material selectively in either said image or said background areas.

49. The method of claim 1 wherein an imaged migration-type imaging member has either the image or background areas selectively reduced by the method of claim 1, and
said imaging member is split in a plane substantially parallel and between the surface of said softenable layer whereby a portion of said softenable layer containing either said image or said background configuration is split from the remainder of said imaging member.

4,101,322
LITHOGRAPHIC PLATE INK RECEPTIVITY IMPROVING COMPOSITION AND METHOD

Leslie Edward Lawson, Orpington, England, assignor to Vickers Limited, London, England

Filed Jan. 24, 1977, Ser. No. 761,997
Claims priority, application United Kingdom, Jan. 26, 1976, 2951/76
Int. Cl.^{2} G03F *7/02*
U.S. Cl. 96—33 **12 Claims**

1. A composition for improving the ink receptivity of a lithographic printing plate having a printing image formed by alkali-development of an image-wise exposed radiation sensitive layer which composition comprises
(i) an organic solvent liquid capable of softening the surface of the printing image, said solvent being selected from the group consisting of alcohols, esters and ketones and comprising from about 2% to 20% by weight of the composition and
(ii) a film forming alkali-resistant oleophilic material which is a liquid hydrocarbon solution of a normally solid material selected from the group consisting of hydrocarbons, fats and mixtures of hydrocarbons and fats, said liquid hydrocarbon comprising from about 45% to 85% by weight of the composition and said normally solid material comprising from about 5% to 25% by weight of the composition.

6. A method of processing a radiation sensitive plate comprising a layer of radiation sensitive material which is developable by an alkaline developer after image-wise exposure, which method comprises:
(a) image-wise exposing the radiation sensitive layer,
(b) treating the image-wise exposed layer with a composition as claimed in claim 1 and
(c) developing the treated layer with an alkaline developer to leave an image on the plate.

4,101,323
RADIATION-SENSITIVE COPYING COMPOSITION

Gerhard Buhr, Königstein; Hans Ruckert, and Hans Werner Frass, both of Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

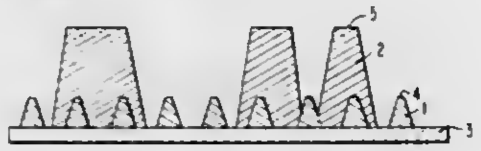
Filed Mar. 24, 1976, Ser. No. 669,892
Claims priority, application Switzerland, Mar. 27, 1975, 3953/75
Int. Cl.^{2} G03C *5/00, 1/52, 1/00*
U.S. Cl. 96—35 **16 Claims**

16. In the process for recording high-energy radiation which comprises
(a) imagewise irradiating a radiation-sensitive recording material composed of a support and a radiation-sensitive layer in such doses that the solubility of the layer, especially in water and aqueous solution, increases in the irradiated areas, and
(b) removing the irradiated areas with a liquid developer,
the improvement wherein said layer comprises a compound (1) which splits-off acid during irradiation, and a compound (2) which contains at least one group selected from the group consisting of a carboxylic ortho acid ester group and a carboxylic acid amide acetal group.

4,101,324
PRINTING PLATE AND METHOD FOR FORMING THE SAME HAVING SMALL PROJECTIONS IN NON-IMAGE AREAS

Masayoshi Mizuno; Tadashi Kawamoto, and Kiichi Iida, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 617,131, Sep. 26, 1975, Pat. No. 4,046,071. This application Nov. 17, 1976, Ser. No. 742,477
Claims priority, application Japan, Sep. 26, 1974, 49-110001; Mar. 31, 1975, 50-37775; Apr. 28, 1975, 50-50775; May 22, 1975, 50-60167
Int. Cl.^{2} G03C *1/68*
U.S. Cl. 96—36.3 **9 Claims**



1. A method for making a printing plate precursor which comprises.
(a) superimposing a photosensitive resin layer having thickness of transparent or 0.06 mm on a support, which is at least semitransparent to actinic light, in intimate contact therewith;
(b) exposing the resulting assembly to actinic light through an image-bearing transparency from the side of the photosensitive resin layer opposite the support;
(c) exposing the assembly to actinic light through a dot-image-bearing transparency having a transparent halftone dot area in a proportion of 1 to 40% from the side of the support to thereby form reliefs on the support as image areas and a number of small projections having a height of at least 0.01 mm., and being lower than the height of reliefs, in non-image areas, wherein steps (b) and (c) may be conducted in the order: (b) and then (c); or (c) and then (b); or simultaneously.

8. A method for preparing a novel printing plate precursor which comprises:
(a) superimposing a photosensitive resin layer having a thickness of transparent or 0.06 mm on a support at least semi-transparent to actinic light in intimate contact therewith;
(b) exposing the entire surface of the support to an extent that does not cure the photosensitive resin layer;
(c) exposing the resulting assembly to actinic light through an image-bearing transparency from the side of the photosensitive resin layer opposite the support;
(d) exposing the resulting assembly to actinic light through a dot-image-bearing transparency having a transparent halftone dot area in a proportion of 1 to 40% from the side of the support to thereby form on the base plate reliefs as an image area and a number of minute points having a height of at least 0.01 mm, and being lower than the height of the reliefs, in a non-image area, wherein steps (c) and (d) may be conducted in the order; (c) and then (d); or (d) and then (c); or simultaneously.

4,101,325
CONDUIT AND METHOD FOR PROCESSING WEBS WITH A LIQUID SOLUTION

Robert F. Allen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 490,155, Jul. 19, 1974, Pat. No. 3,968,510, which is a continuation of Ser. No. 375,576, Jul. 2, 1973, abandoned. This application Apr. 16, 1976, Ser. No. 677,633
Int. Cl.^{2} G03C *5/24, 5/26*
U.S. Cl. 96—48 R **5 Claims**

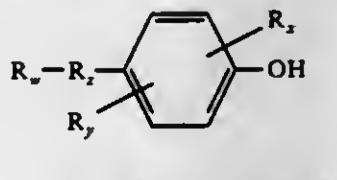
1. A method for processing an imagewise exposed photographic web with a liquid processing solution supplied through a processing conduit having pores between the inner and outer surfaces of the conduit at least along a helical path; said method comprising the steps of:
flowing processing liquid into the conduit and at least a portion thereof through said pores;
forming an elongate cushion of the liquid processing solution on the outer surface of the conduit at least along said helical path for supporting a section of the web along said helical path and;
guiding a web around said conduit in the helical path with one surface of said web in engagement with said liquid cushion for processing said web.

4,101,326
PROCESS FOR MAKING STABILIZED POLYESTERS USED IN RADIATION-SENSITIVE COMPOSITIONS FOR LITHOGRAPHIC PLATES HAVING IMPROVED WEAR LIFE INCLUDING HINDERED PHENOLS AND PHOSPHORIC ACID ESTERS

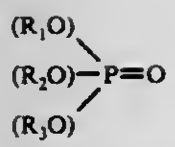
Kenneth T. Barkey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 656,508, Feb.), 1976, abandoned. This application Feb. 2, 1977, Ser. No. 764,942
Int. Cl.^{2} G03C *1/68*
U.S. Cl. 96—67 **18 Claims**

1. A radiation-sensitive element comprising a support having thereon a coating which comprises:
a radiation-sensitive condensation polyester formed from
1) at least one diol; and
2) at least one diacid or a functional derivative thereof containing at least one non-aromatic ethylenic-bond-containing group which is capable of crosslinking upon exposure to actinic radiation and has the formula
wherein R_1 is an unsubstituted or substituted aliphatic or cycloaliphatic hydrocarbon group having 2 to 7 carbon atoms and a crosslinkable ethylenic bond; said condensation polyester being formed in the presence of a combination of:
(a) at least one hindered phenol having the formula:

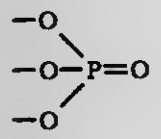


wherein R_w is a functional group capable of participating in ester interchange and polycodensation reactions that occur during formation of said condensation polyester, R_x and R_y are alpha-branched alkyl radicals containing 3–20 carbon atoms, alpha-branched aralkyl radicals containing 7–20 carbon atoms, or cycloalkyl radicals containing 6–20 carbon atoms and R_z is a divalent hydrocarbon radical containing from 1 to 3 carbon atoms; and
(b) at least one phosphoric acid ester having the formula



wherein each of R_1, R_2 and R_3 is a hydrocarbon radical having from 6 to 8 carbon atoms, said R_1O, R_2O and R_3O groups being capable of participating in ester interchange and polycondensation reactions that occur during the formation of said condensation polyester,

said phosphoric acid ester (b) and hindered phenol (a) being present in said combination in a molar ratio which provides



and phenolic hydroxy groups in a ratio in the range of from 1:1 to 1:6, respectively, said (a) and (b) compounds being thermally stable and substantially non-volatile at temperatures in the range of from about 250° to about 300° C; and

said radiation-sensitive condensation polyester having an inherent viscosity of from about 0.2 to about 1.0 and a polydispersity ratio of from about 1.8 to 3.4.

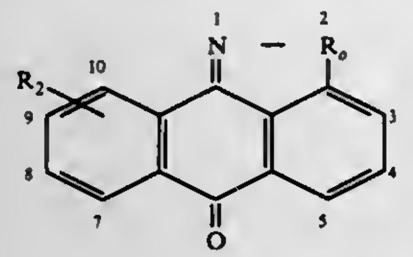
4,101,327

LIGHT-SENSITIVE COPYING COMPOSITIONS AND PHOTOINITIATORS CONTAINED THEREIN

Werner Frass, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 23, 1976, Ser. No. 753,875
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558812
Int. Cl.^{2} G03C *1/68*
U.S. Cl. 96—115 P 13 Claims

1. A light-sensitive copying composition which contains about 15 to 98.4% by weight of at least one polymeric binder, about 1 to 75% by weight of at least one ethylenically-unsaturated polymerizable compound, and about 0.1 to 10% by weight of at least one polynuclear heterocyclic nitrogen compound as a photoinitiator having the general formula II

II



wherein R_o is O, S, or NR_1 and R_1 is hydrogen, a saturated or unsaturated unsubstituted alkyl group with 1 - 6 carbon atoms, a saturated or unsaturated alkyl group with 1 - 6 carbon atoms which is substituted by hydroxyl, alkoxy, alkoxycarbonyl, acyl, acyloxy and/or halogen, an aralkyl group with 7 - 10 carbon atoms, an acyl group with 2 - 18 carbon atoms or a polyalkyleneoxide group of the general formulae $—(C_a—H_{2a}—O)_n—C_a—H_{2a}—OH$ or $—(C_aH_{2a}—O)_n—C_aH_{2a}—OCH_3$ wherein $a = 2$ to 4 and $n = 1$ to 10, and R_2 is hydrogen, an alkoxy group, an alkyl group with 1 - 6 carbon atoms or halogen.

4,101,328

WHITE RUST INHIBITOR

Arthur H. Fieser, Wexford, and Donald C. Finney, Bellevue, both of Pa., assignors to A. F. Industries, Inc., Pittsburgh, Pa.
Filed Jul. 9, 1976, Ser. No. 703,848
Int. Cl.^{2} C09D *5/08*
U.S. Cl. 428—624 4 Claims

1. In a combination including a zinc surfaced steel substrate susceptible to white rust and an amine-acid salt corrosion inhibiting composition in contact with the substrate, the improvement comprising:

an effective amount of a pH adjusting amine, having a pK of less than 5, to adjust the effective pH of said corrosion inhibiting composition at 8 to 12.5

4,101,329

AQUEOUS INK FOR AN INK EJECTION PROCESS

Ehrenfried Loock, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany
Filed Mar. 16, 1976, Ser. No. 667,378
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2511902
Int. Cl.^{2} C09D *11/00, 11/02*
U.S. Cl. 106—22 7 Claims

1. An aqueous ink for an ink ejection process comprises: (a) a water soluble triphenyl methane dye and (b) a buffer mixture of 5 to 200 g/l of ink of at least one organic hydroxy-containing carboxylic acid selected from the group consisting of citric acid, malic acid, gluconic acid and tartaric acid and 5 to 200 g/l of ink of at least one water soluble amine selected from the group consisting of diethanolamine, ethanolamine, ethylenediamine and triethanolamine.

4,101,330

LEUCITE-CONTAINING PORCELAINS AND METHOD OF MAKING SAME

Bruce Burk, Windsor, Conn., and Arthur P. Burnett, Milford, Del., assignors to The J. M. Ney Company, Bloomfield, Conn.
Filed Sep. 1, 1976, Ser. No. 719,380
Int. Cl.^{2} C04B *35/14, 33/00, 33/24*
U.S. Cl. 106—45 25 Claims

1. A ceramic raw material consisting essentially of at least about 78.1 percent by weight nepheline syenite, about 3 to 7 percent by weight of pre-formed leucite particles and about 0 to 15.5 percent by weight of at least one modifier selected from the class consisting of oxides and oxide precursors of potassium, sodium and lithium.

4,101,331

HALIDE OPTICAL ELEMENTS

Rogers H. Anderson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Division of Ser. No. 671,192, Mar. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,290, Feb. 28, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,869
Int. Cl.^{2} C04B *35/00, 11/22*
U.S. Cl. 106—73.1 6 Claims

1. An infrared transparent optical element comprising a crack-free, fully-dense alkaline earth fluoride body having a fine-grained crystalline structure throughout and having a grain size range of less than about 20μm.

4,101,332

STABILIZED MIXTURE

John Patrick Nicholson, Toledo, Ohio, assignor to Nicholson Realty Ltd., Sylvania, Ohio
Division of Ser. No. 654,211, Feb. 2, 1976, Pat. No. 4,018,617. This application Feb. 4, 1977, Ser. No. 765,837
Int. Cl.^{2} C04B *7/26*
U.S. Cl. 106—85 8 Claims

1. A mixture consisting essentially of fly ash and cement kiln dust.

4,101,333

METHOD OF MINE BACKFILLING AND MATERIAL THEREFOR

William Ross Wayment, Kitchener, Canada, assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Division of Ser. No. 716,617, Aug. 19, 1976, Pat. No. 4,059,963. This application May 23, 1977, Ser. No. 799,422
Int. Cl.^{2} C04B *7/00, 7/02*
U.S. Cl. 106—85 2 Claims

1. A structural material derived from a slurry of mill tailings and water with the water content being in the range of 35 to 70 percent by weight consisting of centrifugally dewatered, unclassified mill tailings of substantially uniform composition having a water content no greater than 25 percent by weight and preferably no more than 20 percent, which can be used directly for backfilling in underground operations.

4,101,334

COATED GLASS FIBERS

Homer G. Hill, Newark, and William G. Pansius, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Dec. 23, 1976, Ser. No. 753,746
Int. Cl.^{2} C04B *7/02*
U.S. Cl. 106—99 23 Claims

1. A cementitious product comprising a composite of reinforcing materials and a cementitious matrix wherein one of the reinforcing materials comprising bundles formed of a plurality of alkali resistant glass fibers, said bundles including an alkali impervious impregnant which coats the glass fibers and penetrates the bundles to fill the interstices between the glass fibers separating each from the other.

4,101,335

BUILDING BOARD

Victor Ernest Barrable, Gerrards Cross, England, assignor to Cape Boards & Panels Ltd., Uxbridge, England
Continuation-in-part of Ser. No. 738,688, Nov. 4, 1976, which is a continuation of Ser. No. 538,197, Jan. 2, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,676
Int. Cl.^{2} C04B *7/02*
U.S. Cl. 106—99 38 Claims

1. A shaped article having low shrinkage characteristics when subjected to high temperatures in the order of at least 900° C, which comprises:

a binder which has been caused to set by the action thereon of H_2O and reinforcing fibers, said binder being present in amount of 50-99% by weight of binder and reinforcing fibers, and said reinforcing fibers including organic fibers and excluding asbestos fibers; and

a component, selected from the group consisting of mica and a mixture of mica and vermiculite, in amount of not more than 60% by weight of binder plus reinforcing fibers and component and sufficient to restrict the linear shrinkage of the article when the article is subjected to a temperature at least in the order of 900° C to a value which is significantly less than the linear shrinkage of the article in the absence of said component.

4,101,336

METHOD OF BURNING PULVEROUS ALKALI-CONTAINING RAW MATERIALS AND KILN PLANT THEREFOR

Jørn Touborg, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.
Filed Jan. 11, 1977, Ser. No. 758,428
Claims priority, application United Kingdom, Jan. 12, 1976, 962/76
Int. Cl.^{2} C04B *7/02*
U.S. Cl. 106—106 8 Claims

1. A method of burning alkali-containing raw materials in a plant having a multi-string cyclone preheater, each string containing at least two cyclone preheater stages, a kiln, and a cooler unit for cooling the burnt material from the kiln by means of air which is subsequently divided into two streams, one stream being passed through the kiln and a kiln string of said preheater, the other stream being passed through a calciner and up through the calciner cyclone string of said preheater, comprising feeding raw material to each preheater string, passing the flow of material from the penultimate preheater cyclone stage of said kiln string to said calciner, passing a portion of the material from the penultimate cyclone stage of said calciner string to the lowermost cyclone stage of said kiln string, passing at least a remaining portion of the material from said penultimate cyclone stage of said calciner string to said calciner, passing material from the lowermost cyclone stage of said kiln string to said calciner, passing the at least partially calcined material from said calciner to the lowermost cyclone stage of said calciner string, and passing the material from the lowermost cyclone stage of said calciner string into said kiln for burning.

4,101,337

CEMENT MANUFACTURE

Tage Halfdan Danø, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.
Division of Ser. No. 618,819, Oct. 2, 1975, Pat. No. 4,059,396. This application Aug. 26, 1977, Ser. No. 828,192
Claims priority, application United Kingdom, Oct. 3, 1974, 42989/74
Int. Cl.^{2} C04B *7/50*
U.S. Cl. 106—101 31 Claims

1. A method of manufacturing cement comprising:
(a) burning cement clinker in a kiln;
(b) contacting the hot cement clinker with a reducing agent prior to discharging said clinker from a discharge portion of the kiln;
(c) discharging the hot cement clinker from the discharge portion of the kiln to a movable clinker supporting means;
(d) quenching said cement clinker substantially simultaneously with the discharge thereof from the kiln by subjecting said clinker to a spray of cooling liquid in a manner such that a major portion of said quenching liquid evaporates substantially immediately following said quenching;
(e) transferring said cement clinker to a clinker transporting means;
(f) subjecting said cement clinker to further cooling while evaporating substantially all of the remaining cooling liquid; and
(g) producing and maintaining sub-atmospheric pressure at the location of discharge of the hot cement clinker from the kiln to thereby prevent evaporating liquid from entering the kiln.

4,101,338

PROCESS FOR RECOVERING USEFUL PRODUCTS FROM CARBOHYDRATE-CONTAINING MATERIALS

Robert M. Rapaport, New Rochelle; Anthony Monti, Irvington; Raymond D. Moroz, Staten Island, all of N.Y., and Charles B. Broeg, Short Hills, N.J., assignors to Sucrest Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 582,809, Jun. 2, 1975, abandoned. This application Apr. 27, 1976, Ser. No. 680,721
Int. Cl.^{2} C13D *3/14, 3/00, 3/16*

U.S. Cl. 127—46 B **38 Claims**

1. In a method for treating carbohydrate-containing materials to separate carbohydrate therefrom, wherein said material is flowed through and contacted with an ion exclusion resin, the improvement comprising the steps of:

a. contacting said resin with a first portion of said carbohydrate-containing material;
b. thereafter sequentially contacting said resin with a second portion of said carbohydrate-containing material, said second portion having a density lower than that of said first portion;
c. thereafter sequentially contacting said resin with dilute aqueous medium capable of eluting material adsorbed by said resin; and
d. collecting from said resin an eluted solution, the solids of which are comprised predominantly of carbohydrate.

4,101,339

TREATMENT OF ZINC SURFACES

Hideaki Kaneko, Tokyo; Yasushi Miyazaki, Ichikawa, and Masanori Suzuki, Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Aug. 25, 1977, Ser. No. 827,660
Claims priority, application Japan, Sep. 2, 1976, 51-104249
Int. Cl.^{2} C03C *23/00*

U.S. Cl. 134—2 **6 Claims**

1. A process for improving the corrosion resistance and paint receptivity of a zinc or zinc alloy surface comprising contacting the surface with an aqueous composition containing a thiourea compound and a vegetable tannin and exhibiting a pH value of from 2 to 6.5.

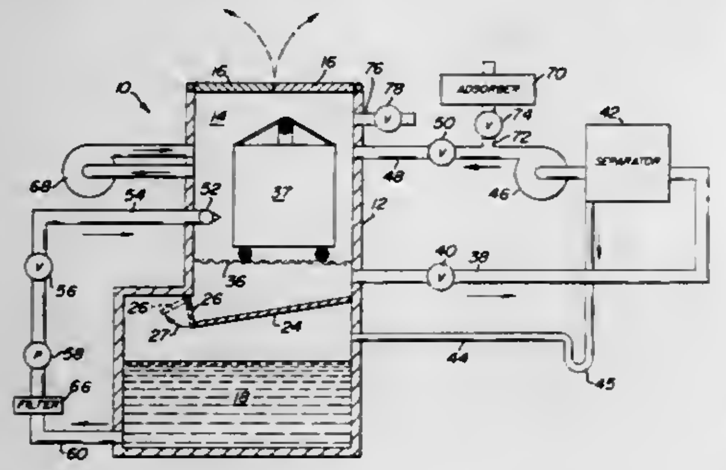
4,101,340

SOLVENT SPRAY CLEANING SYSTEM FOR MINIMIZING SOLVENT LOSSES

Burton Rand, Center Square, Pa., assignor to Autosonics, Inc., Norristown, Pa.

Continuation-in-part of Ser. No. 662,750, Mar. 1, 1976, Pat. No. 4,029,517. This application Mar. 15, 1977, Ser. No. 777,820
Int. Cl.^{2} B08B *3/08*

U.S. Cl. 134—11 **10 Claims**



8. A method of cleaning work comprising:

(a) introducing work to be cleaned into a treating chamber of a vessel, said vessel having an unheated sump selectively communicating with the bottom of said chamber by way of a flow passage, closing the upper end of said chamber, closing said flow passage,
(b) introducing liquid solvent into said chamber by way of at least one nozzle in said chamber, said step of introducing solvent into said chamber including pumping unheated solvent from said sump to said nozzle, cleaning said work by contact with said solvent and any vapors of the solvent generated in said chamber,
(c) opening said flow passage and discharging liquid solvent from said chamber into said sump,
(d) isolating said chamber from fluid communication with said sump after said discharging step and then removing residual solvent vapors from said chamber and said work while maintaining the upper end of the chamber closed, said removing step including liquifying said vapors while creating turbulence in said chamber,
(e) opening the upper end of said chamber and then removing said work from said chamber.

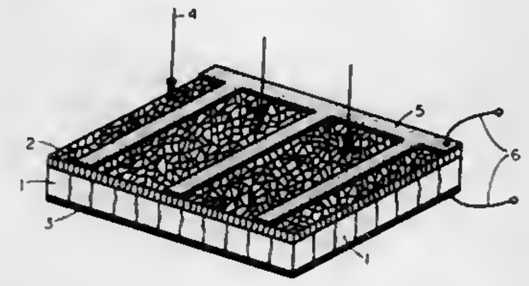
4,101,341

CDSE-SNSE PHOTOVOLTAIC CELL

Matthias Peter Selders, Kronberg, Fed. Rep. of Germany, assignor to Battelle Development Corporation, Columbus, Ohio

Filed May 4, 1977, Ser. No. 793,626
Int. Cl.^{2} H01L *31/06;* B05D *5/12*

U.S. Cl. 136—89 TF **7 Claims**



1. A photovoltaic cell comprising a photosensitive semiconductor junction and electrode means for withdrawing electrical energy from the semiconductor junction, wherein the semiconductor junction comprises regions of n-type cadmium selenide and p-type tin selenide.

2. The photovoltaic cell of claim 1 wherein the regions are polycrystalline.

7. A method for production of a photovoltaic cell comprising:

(a) applying to a conductive substrate a first layer of a semiconductor material selected from n-type cadmium selenide and p-type tin selenide.
(b) ion exchanging the cadmium for tin or the tin for cadmium, respectively, in an exposed surface region opposite the substrate, such that layered regions of both p-type tin selenide and n-type cadmium selenide are present, and
(c) applying an upper electrode on the exposed surface opposite the substrate.

4,101,342

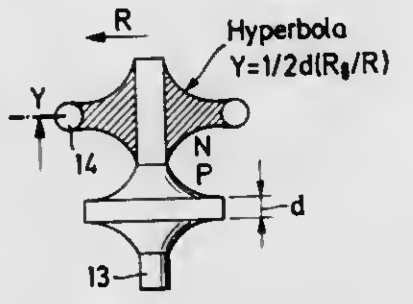
THERMOELECTRIC ELEMENT

Kurt Landecker, 157 Marsh St., Armidale, New South Wales, Australia (2351)

Filed Sep. 16, 1976, Ser. No. 723,890
Claims priority, application Australia, Oct. 7, 1975, 3466/75
Int. Cl.^{2} H01V *1/02*

U.S. Cl. 136—228 **6 Claims**

4. A thermo-electric element of the kind comprising two annular dissimilar components, inner and outer electrode means constituting a working junction and permitting current flow radially in the dissimilar components wherein at least one lateral face of each of the dissimilar components is non-planar and approximates a hyperboloid of revolution.



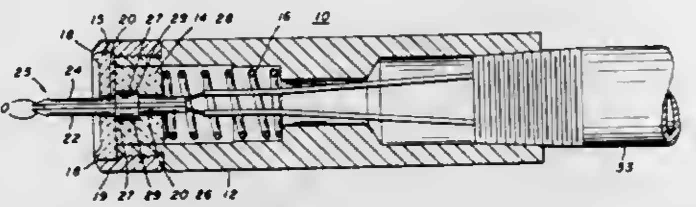
4,101,343

THERMOCOUPLE DEVICE

Lowell H. Felchter, Pittsburgh, and Albert R. Anderson, Export, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 2, 1976, Ser. No. 719,906
Int. Cl.^{2} H01V *1/02*

U.S. Cl. 136—230 **3 Claims**



1. A two-element thermocouple device having a unitary pointed end for contacting and penetrating the surface of a metal object to be examined for its temperature, the device comprising

two, closely spaced, relatively short, dissimilar metal elements each having a narrow cross section and low mass along the length thereof, and pointed at at least one end, the two metal elements being disposed together in a manner that their pointed ends taper toward each other to form a unitary pointed end,
a relatively thin layer of heat resistant, insulating material located between the metal elements to insulate the elements from each other,
a housing, and
an insulating refractory member located within said housing, with a portion of said metal elements and insulating layer extending into and secured in said refractory member.

4,101,344

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

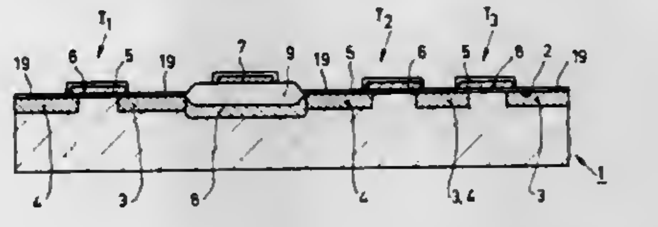
Else Kool; Pieter Johannes Wilhelmus Jochems, and Adrianus Teunis Van Zanten, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,896
Claims priority, application Netherlands, Oct. 25, 1976, 7611773
Int. Cl.^{2} H01L *21/26*

U.S. Cl. 148—1.5 **6 Claims**

1. A method of manufacturing a semiconductor device having a semiconductor body comprising a surface and a surface-adjoining region of p-type silicon in which there are present at least two insulated gate field effect transistors whose source and drain zones are formed by n-type conductivity surface-adjoining zones, said body comprising at least a n-type conductivity further surface zone which forms a conductive connection between one of the source and drain zones of one field effect transistor and one of the source and drain zones of the other field effect transistor, said further surface zone being formed in said p-type surface region, said method comprising the steps of:

(a) positioning on said surface a doping mask which has an aperture at a predetermined area of said surface at which the surface zone is to be provided, said surface comprising a certain other area at which said the field effect transistors are to be provided, said doping mask comprising at at least said certain other area layer portions of a material masking said body against oxidation,
(b) providing atoms selected from the group As and Sb, in the semiconductor body via said aperture in the doping mask,
(c) after such provision of said atoms, removing partly said doping mask so as to obtain an oxidation mask which comprises said layer portions,
(d) then subjecting said body to an oxidation treatment so as to obtain an oxide pattern which is at least partly sunk in the semiconductor body and which extends beside the layer portions masking against oxidation and above said predetermined area intended for the surface zone, during such oxidation treatment said atoms provided in the body at said predetermined area for the surface zone being caused to diffuse deeper into said semiconductor body and form there said n-type surface zone located below and adjoining the sunken oxide,



(e) after such oxidation treatment, providing insulated gate electrodes of said transistors at said predetermined area, where said field effect transistors are to be formed, which electrodes, viewed on the surface, are situated on either side of and at a distance from said surface zone, and
(f) providing the source and drain zones of the field effect transistors adjoining the sunken oxide pattern by doping exposed parts of said region with an impurity selected from the group P, As and Sb in a self-registering manner down to a depth at which the said zones of the field effect transistors that are to be connected together adjoin said surface zone below said sunken oxide pattern.

4,101,345

GALVANIZING STEEL STRIP IN SELECTED AREAS THEREOF

Robert F. Hunter; Stephen R. Koprich; Richard G. Baird-Kerr, all of Burlington, and Daniel S. Sakai, Toronto, all of Canada, assignors to The Steel Company of Canada, Limited, Hamilton, Canada

Filed Nov. 26, 1976, Ser. No. 745,000
Claims priority, application Canada, Nov. 5, 1976, 264969
Int. Cl.^{2} C23C *1/02*

U.S. Cl. 148—6.15 R **6 Claims**

1. In a method of galvanizing only selected areas of a ferrous metal strip, the improvement which comprises contacting surface areas of said strip not to be galvanized with a phosphoric acid solution to cause a spontaneous reaction to form a readily chemically strippable coating of a composite comprising iron hydroxides and hydrated iron phosphates non-wetting in molten zinc on said surface areas not to be galvanized, and passing the so-treated strip through said molten zinc with the coating in contact with said molten zinc.

4,101,346

PROTECTIVE HYDROPHOBIC AND OLEOPHILIC COATING FOR ALUMINUM PRODUCTS

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 610,966, Sep. 8, 1975, Pat. No. 4,004,951, which is a continuation-in-part of Ser. No. 593,092, Jul. 3, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,026

Int. Cl.^{2} C23F *7/00*

U.S. Cl. 148—6.27 **19 Claims**

1. A method of preparing a hydrophobic and oleophilic protective coating on an aluminum workpiece consisting essentially of developing a fresh aluminum surface on said workpiece and then treating the fresh aluminum surface under alkaline conditions with a liquid selected from the group consisting of nonaqueous liquids and aqueous liquids with a pH less than 10, said liquids containing an effective amount of a branched chain aliphatic carboxylic acid or an equivalent carboxylate compound having from 12 to 22 carbon atoms.

4,101,347

FERRITE-AUSTENITE STAINLESS STEEL CASTINGS HAVING AN IMPROVED EROSION-CORROSION RESISTANCE

Masakuni Fujikura; Tomio Kono; Kazuto Terai, all of Nagoya; Naohiro Abe, and Kiyohito Ishida, both of Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed May 6, 1977, Ser. No. 794,334

Int. Cl.^{2} C22C *38/42*

U.S. Cl. 148—38 **1 Claim**

1. A ferrite-austenite stainless steel casting having an improved erosion-corrosion resistance, consisting by weight percentage of not more than 0.1% of carbon, 0.2–3% of silicon, not more than 2% of manganese, 2.2–4% of copper, 3–9% of nickel, 20–30% of chromium, 2–6% of molybdenum, 0.08–0.25% of nitrogen, 0.12–0.3% of tin, 0–2% of niobium, 0–1% of titanium, 0–2% of tantalum, 0–1% of zirconium, 0–5% of vanadium and remainder of iron; said stainless steel casting being obtained by solution heat treatment at a temperature of 1,000–1,150° C in such a manner that chromium-and nickel-equivalents lie within an area represented by the area ABCD shown in FIG. 1 of the accompanying drawings.

4,101,348

PROCESS FOR PREPARING HOT-PRESSED SINTERED ALLOYS

Jean Berchtold, La Jolla, Calif., assignor to Spin Physics, San Diego, Calif.

Division of Ser. No. 59,512, Jul. 30, 1970, Pat. No. 3,999,216. This application Dec. 29, 1975, Ser. No. 645,177

Int. Cl.^{2} H01F *1/02*

U.S. Cl. 148—105 **11 Claims**

1. A process for preparing an aluminum-silicon-iron alloy compact exhibiting an improved combination of electrical and physical properties which process comprises:

(1) providing an aluminum-silicon-iron alloy powder having a grain size in the range of about 10 to 500 microns and an aluminum content of about 4 to about 9%, by weight, a silicon content of about 8 to about 11%, by weight, and the remainder essentially iron,

(2) nitriding said powder,

(3) sintering said nitrided powder at a temperature of at least 1200° C, and

(4) hot-pressing said powder simultaneously with or after said sintering by exerting mechanical pressure of at least 1000 psi. on said powder, said sintering and hot-pressing being continued until said powder is formed into a compact having a porosity of less than 0.1%, a Vickers hardness greater than 600 (measured at a 300 gram load) and a resistivity of at least 100 micro-Ohm-cms.

4,101,349

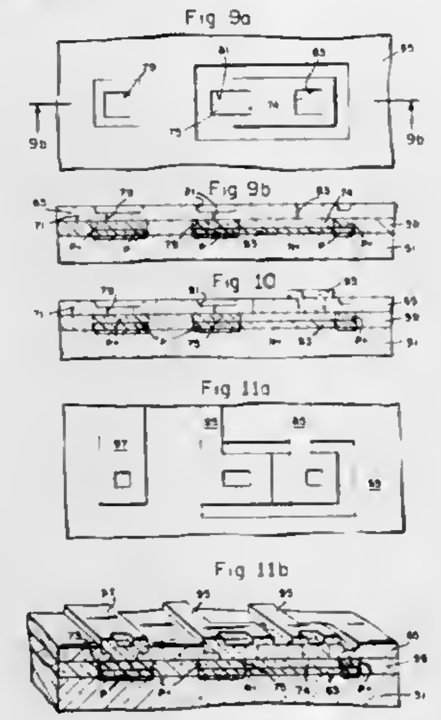
INTEGRATED INJECTION LOGIC STRUCTURE FABRICATED BY OUTDIFFUSION AND EPITAXIAL DEPOSITION

Bruce B. Roesner, Tustin, and Denis J. McGreivy, Laguna Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1976, Ser. No. 736,976

Int. Cl.^{2} H01L *21/22, 27/04*

U.S. Cl. 148—175 **3 Claims**



1. A method of fabricating an integrated circuit comprising the steps of

(a) driving, into first and second spaced-apart regions in the surface of a first conductivity type semiconductor body, a second conductivity type dopant;

(b) growing a first conductivity type epitaxial layer on said surface and auto-doping dopant from said spaced-apart regions in said semiconductor body to form corresponding first and second spaced-apart buried, second conductivity type regions in said epitaxial layer;

(c) driving a second conductivity type dopant into the surface of said epitaxial layer to form first and second conductive regions extending from said last recited surface to said first and second buried regions, said second conductive region having an annular configuration and, together with said second buried region, forming a bucket-shaped region in said epitaxial layer; and

(d) depositing electrical contacts on said epitaxial layer over said first and second conductive regions and over that portion of said epitaxial layer which is within said annular region.

4,101,350

SELF-ALIGNED EPITAXIAL METHOD FOR THE FABRICATION OF SEMICONDUCTOR DEVICES

Glen G. Possley, Sugarland; Robert G. Massey, Sherman, and Billy B. Williams, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 556,037, Mar. 6, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,725

Int. Cl.^{2} H01L *21/20, 21/76*

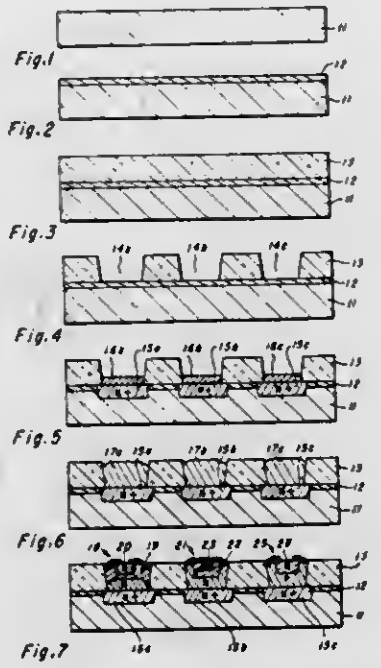
U.S. Cl. 148—175 **5 Claims**

1. A method for the fabrication of a semiconductor device comprising the steps of:

preparing a moncrystalline silicon substrate of one conductivity type having a crystallographic surface orientation of (100), a resistivity of 10 to 15 ohm-centimeters, and a thin surface layer thereon of the same conductivity type, said surface layer extending across the entire substrate surface and having a resistivity of about 0.1 ohm-centimeter or less;

forming an apertured diffusion or implantation mask on said substrate;

selectively placing impurities of the opposite conductivity type in said substrate through at least one aperture in said mask to a depth greater than the thickness of said surface layer, and with a dosage sufficient to convert the affected portion of said surface layer to said opposite conductivity type; and



thereafter, using the same mask and the same aperture, selectively growing epitaxial monocrystalline silicon in said aperture, to a thickness substantially the same as the thickness of said mask, whereby the resulting epitaxial region is inherently aligned with the region in said substrate formed by said step of selectively placing impurities in said substrate through said aperture, and whereby the mask and the epitaxial layer exhibit a substantially coplanar surface for subsequent processing.

4,101,351

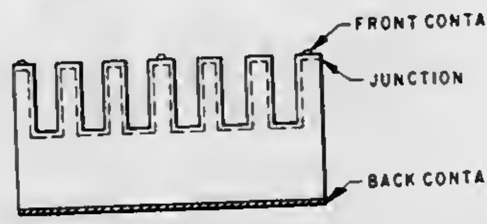
PROCESS FOR FABRICATING INEXPENSIVE HIGH PERFORMANCE SOLAR CELLS USING DOPED OXIDE JUNCTION AND INSITU ANTI-REFLECTION COATINGS

Pradeep L. Shah, Dallas, and Clyde R. Fuller, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 15, 1976, Ser. No. 742,027

Int. Cl.^{2} H01L *21/225*

U.S. Cl. 148—188 **1 Claim**



VERTICAL MULTIJUNCTION SOLAR CELL

1. A process for the fabrication of a solar cell comprising the steps of:

(a) applying a silicon oxide-forming, arsenic-comprising, dopant source composition to a monocrystalline silicon body of p-type conductivity, said dopant source comprising a solution of an arsenic-doped reaction product obtained by refluxing tetraethylorthosilicate with acetic anhydride or acetic acid;

(b) heating the resulting composite to a diffusion temperature for a time sufficient to diffuse said arsenic dopant into the silicon body, thereby forming a p-n junction,

(c) selectively patterning the remaining doped silicon oxide source layer to provide apertures therein for metallization of the diffused region;

(d) depositing and patterning a metal film on said patterned dopant source layer, whereby said dopant source layer is retained as an anti-reflection coating.

4,101,352

DEFLAGRATIVE ELECTRONIC COMPONENT POTTING COMPOUND

Clyde J. Poulin, Phoenix, Ariz., and Theodore N. Bryla, Glendora, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 8, 1971, Ser. No. 113,705

Int. Cl.^{2} C06B *45/10*

U.S. Cl. 149—19.2 **3 Claims**

1. A deflagrative potting material for electronic assemblies which upon ignition serves as a discrete heat source for the destruction of said assemblies consisting of a mixture of:

6% by weight of 1 to 3 micron particle size boron

15% by weight of 18 micron particle size magnesium

39% by weight of 8 micron particle size potassium perchlorate, and

40% by weight of low viscosity, low temperature curing silicone resin.

4,101,353

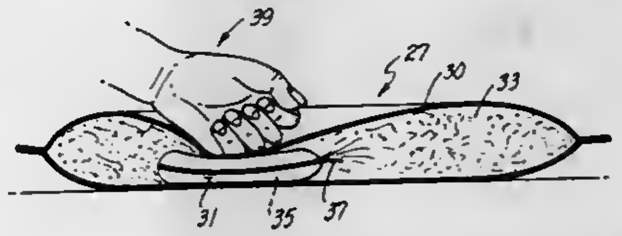
METHOD FOR SPLICING CABLES AND HOT PACK FOR USE THEREIN

Susan Steves Watson, Mountain View, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 479,844, Jun. 17, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 767,898

Int. Cl.^{2} H01R *5/02*

U.S. Cl. 156—49 **21 Claims**



1. A method of splicing a first cable end to a second cable end, including the steps of:

connecting the first cable end to the second cable end to form a conductor junction:

providing a sleeve formed from a material having dielectric properties and having a circumferential dimension greater than the individual circumferential dimensions of the first cable end and the second cable end, the material of the sleeve having properties responsive to temperatures in excess of a first particular temperature for shrinking the sleeve to provide the sleeve with a circumferential dimension less than the individual circumferential dimensions of the first cable end and the second cable end;

providing, in isolated relationship in a pack, first and second chemicals having properties of reacting chemically and exothermically at ambient temperatures to produce, in the peripheral and interior regions of the pack, first by-products and first increases of temperature involving the production of a second particular temperature above ambient temperature but less than the first particular temperature and the first by-products having properties of reacting chemically and exothermically at the second particular temperature with the first particular chemicals and with each other to produce, in the interior regions of the pack, second by-products and second increases of temperature involving the production of a third particular temperature greater than the first particular temperature, thereby producing, at the peripheral regions of the pack, temperatures above the first particular temperature for the extended period of time, the first chemical constituting a metal salt selected from a group consisting of calcium chloride, calcium oxide and magnesium chloride and the second chemical constituting a polyalcohol selected from a group consisting of ethylene glycol, 1, 4-butanediol and glycerol;

providing for a controlled accession of the first and second chemicals in the pack from their isolated relationship to obtain a controlled mixing of the first and second chemicals; and

disposing the pack around the sleeve in abutting and conformed relationship to the sleeve and with the first and second chemicals in isolated relationship to each other to provide for a controlled accession of the first and second chemicals and a shrinking of the sleeve around the conductor junction upon the controlled accession of the first and second chemicals.

4,101,354

COATING FOR FIBROUS CARBON MATERIAL IN BORON CONTAINING COMPOSITES

Robert C. Shaffer, Playa del Rey, Calif., assignor to Hitco, Irvine, Calif.

Filed Jul. 1, 1976, Ser. No. 701,597

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 156—60 **13 Claims**

1. A method of making a carbon-carbon composite comprising the steps of:

providing a fabric of carbon material which is free of boron;

applying a coating of a flexible thermosetting resin which is free of boron and which remains flexible upon curing to the fabric;

curing the flexible thermosetting resin;

impregnating the fabric with a second thermosetting resin;

adding a selected amount of boron to the second thermosetting resin in conjunction with impregnation of the fabric with the second thermosetting resin;

at least partially curing and second thermosetting resin;

assembling a plurality of layers of the fabric to form a laminate;

treating the laminate to further cure the second thermosetting resin; and

heating the laminate to at least about 4000° F. in an inert atmosphere while simultaneously applying pressure to the laminate to carbonize and at least partially graphitize the flexible thermosetting resin and the second thermosetting resin.

4,101,355

METHOD OF AND MEANS FOR MAKING VARIABLE WIDTH ZIPPER PROFILE FILM

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021

Filed Jan. 21, 1977, Ser. No. 761,670

Int. Cl.^{2} B29C *27/00*

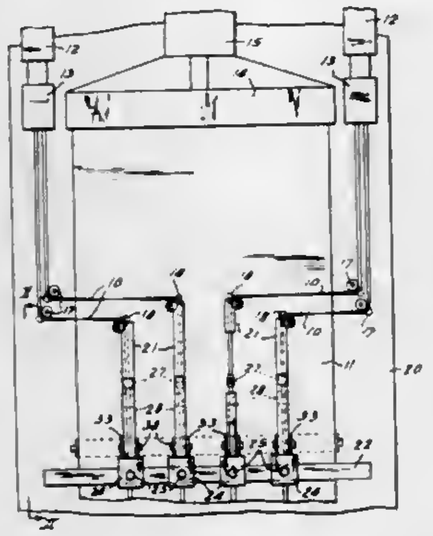
U.S. Cl. 156—66 **28 Claims**

1. A method of making variable width profile film web whereby a substantially continuous prefabricated resiliently flexible extruded profiled plastic fastener strip is joined to a prefabricated substantially continuous film web, compromising the steps of:

effecting continuous running travel of the web and the fastener strip in the same longitudinal direction and at the same speed;

adjusting the position of the fastener strip transversely relative to the web while the web and the fastener strip are travelling without interruption;

guiding the fastener strip into convergence with the web;



and then permanently securing the travelling fastener strip to the travelling web.

4,101,356

METAL COATING PROCESS

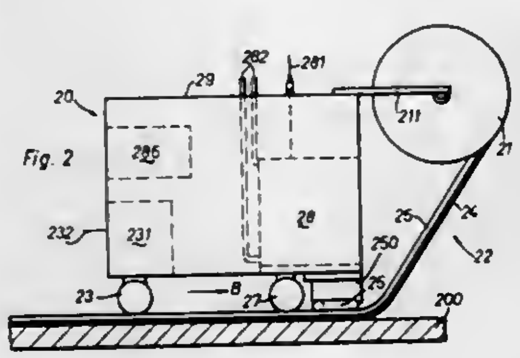
Leonardus Joseph Savelkouls, Bergschenhoek, Netherlands, assignor to Progress Processing Limited, Vaduz, Liechtenstein

Filed Oct. 25, 1977, Ser. No. 844,525

Claims priority, application Netherlands, Nov. 5, 1976, 7612325

Int. Cl.^{2} E04B *2/00;* B29C *19/02*

U.S. Cl. 156—71 **13 Claims**



1. In the process of coating a metal substrate with a substantially uniform layer of an organic polymer composition by providing a polymer stratum including a heat or melt bonding polymer composition in a contacting relation with said metal substrate, subjecting said metal substrate to electromagnetic radiation capable of heating said substrate for activation of said melt bonding composition, and allowing said metal substrate to cool so as to form a strong interbonding connection between said heat or melt bonding composition and said metal substrate; the improvement consisting of moving a source of electromagnetic radiation having a frequency in the radio frequency range relative to and over said polymer stratum near a surface thereof that is not in contact with said metal substrate for directing said radiation through said polymer stratum without heating thereof and onto said metal substrate in an area where said metal substrate is in said contacting relation with said polymer stratum and for briefly heating a surface portion of said metal substrate in said area by said radiation to a temperature at which said heat or melt bonding composition is capable of forming said interbonding connection, and continuously displacing said area by said movement of said source of said electromagnetic radiation relative to said substrate.

4,101,357

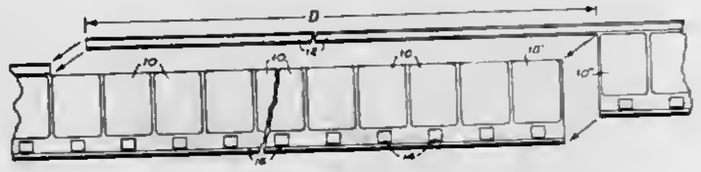
METHOD OF SPLICING MOTION PICTURE SOUND FILM

Arthur A. Rothrock, 8112 N. Druid St., Portland, Oreg. 97203

Division of Ser. No. 749,746, Dec. 13, 1976, Pat. No. 4,052,247. This application May 6, 1977, Ser. No. 794,656

Int. Cl.^{2} B31F *5/06*

U.S. Cl. 156—159 **5 Claims**



1. The method of splicing motion picture sound film wherein the sound recorded on the sound stripe is displaced longitudinally of the related picture frame by several frames, the method comprising:

(a) cutting the film transversely between adjacent picture frames but not across the sound stripe, thence longitudinally from said transverse cut between the picture frames and the sound stripe to a point at which the sound relates to the first picture frame adjacent said transverse cut, thence transversely across said sound stripe,

(b) repeating said cutting operation at another location on the film for removing a portion of the film, whereby one of the mating ends of the film to be joined has a length of sound stripe extending longitudinally from an end picture frame and the other of the mating ends of the film to be joined has a length of several picture frames extending longitudinally from the sound stripe the same distance as the longitudinally extending sound stripe on the said one end of film,

(c) placing the edges of said mating ends of film in mutual abutment, and

(d) securing said abutment mating ends together.

4,101,358

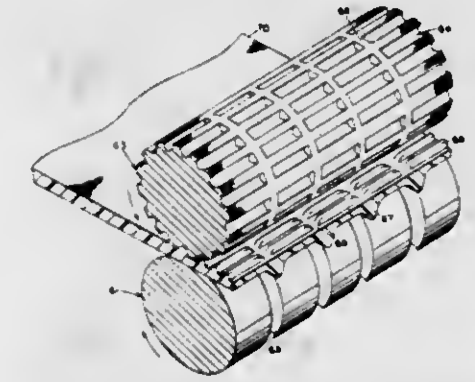
METHOD OF MAKING NETWORK STRUCTURES

Charles W. Kim, Wilmington; Chia-Seng Liu, and Richard MacDuff, both of Newark, all of Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 590,664, Jun. 26, 1975, abandoned, which is a division of Ser. No. 324,028, Jan. 16, 1973, Pat. No. 3,922,329. This application Dec. 15, 1976, Ser. No. 750,982

Int. Cl.^{2} D02J *1/22*

U.S. Cl. 156—167 **6 Claims**



1. A method of making a nonwoven fabric comprising:

forming a first sheet having a plurality of parallel continuous main ribs interconnected by webs of reduced thickness extending in a first direction on one side thereof and a plurality of parallel discontinuous tie ribs on the other side thereof extending in a second direction other than said first direction, said tie ribs being formed opposite the webs interconnecting said main ribs and having no substantial portion thereof crossing over a main rib;

drawing said sheet in at least one direction to separate the main ribs into oriented continuous main filaments having a substantially uniform cross-section and to separate the tie ribs into tie filaments uniformly interconnecting the main filaments, thereby forming a first uniform network structure;

forming a second sheet having a plurality of parallel continuous main ribs interconnected by webs of reduced thickness extending in a third direction other than said first direction on one side thereof and a plurality of parallel discontinuous tie ribs on the other side of said sheet extending in a direction other than said third direction, said tie ribs being formed opposite the webs interconnecting said main ribs and having no substantial portion thereof crossing over a main rib;

drawing said second sheet in at least one direction to separate the main ribs into oriented continuous main filaments having a substantially uniform cross-section and to separate the tie ribs into tie filaments uniformly interconnecting the main filaments thereby forming a second uniform network structure; and

bonding said first network structure to said second network structure to provide a fabric having substantially uniform and continuously oriented main filaments formed in both said first and said third directions.

4,101,359

COMPOSITE MATERIAL FOR USE IN COVERING WALLS, AND A METHOD OF MANUFACTURING SAME

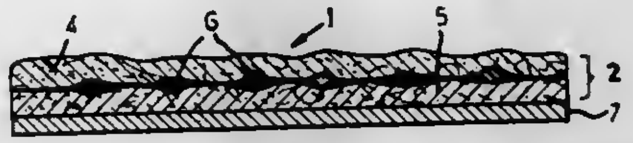
Olivier Failliot, Rochefort en Yvelines, France, assignor to Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer, Paris, France

Filed Sep. 14, 1976, Ser. No. 723,181

Claims priority, application France, Sep. 24, 1975, 75 29222; Jul. 7, 1976, 76 20714

Int. Cl.^{2} B32B *29/02*

U.S. Cl. 156—179 **6 Claims**



1. A method of manufacturing composite sheet material for use as wall coverings, which comprises providing a composite layer constituted by a net material forming a grid each face of which is covered by a layer of cellulosic wadding bonded along the threads forming said grid, bonding a carrier sheet of paper to the composite layer, applying colours in the entire thickness of said composite layer, and then bonding together the layers of cellulosic wadding over their entire surface facing one another through the mesh openings in the grid.

4,101,360

METHOD AND APPARATUS FOR FOLDING AND FUSING THE ELEMENTS OF A SLIDE FASTENER STRING

Lawrence S. Monroe, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 699,210, Jun. 23, 1976, Pat. No. 4,025,277. This application Mar. 22, 1977, Ser. No. 780,214

Int. Cl.^{2} B29C *19/04*

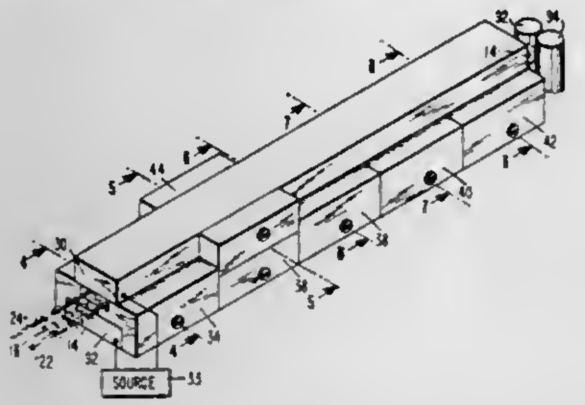
U.S. Cl. 156—200 **2 Claims**

1. A method of folding the thermoplastic coupling elements of a slide fastener string comprising the steps of

generating a high frequency electromagnetic field between a pair of spaced electrodes,

pulling the slide fastener string through the field between the electrodes to heat and soften the coupling elements,

initially concentrating the electromagnetic field at the point on each of the coupling elements at which the folding is to take place guiding the coupling elements to a folded position by drawing the coupling elements through a plurality of guide sections, each of the guide sections progressively folding each of the coupling elements, and



drawing the string through a set stage in which the folded coupling elements are cured in their folded position.

4,101,361
METHOD OF MANUFACTURING LAMINATED BUSES

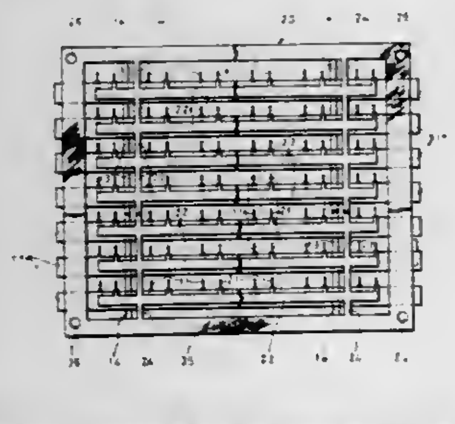
Shunichi Fukuda, Inashiki; Masaaki Muto, and Syoichi Iwabuchi, both of Tuchiura, all of Japan, assignors to Nippon Mektron Kabushiki Kaisha, Japan

Filed Mar. 10, 1977, Ser. No. 776,303

Claims priority, application Japan, Oct. 9, 1976, 51-121463

Int. Cl.² B32B *31/00;* B23P *17/00;* H01B *13/00*

U.S. Cl. 156—250 **19 Claims**



1. A method of manufacturing laminated buses comprising:

(a) stacking and temporarily bonding a plurality of electrically conductive perforated sheets and a plurality of insulating tapes in alternating relation to form a temporarily bonded laminate,

the perforated sheets comprising a plurality of parallel elongated conductor elements each having sides and ends, formed with terminals, spaced from each other, and spaced from an outer frame surrounding the conductor elements, said perforated sheets having means for connecting the sides of the conductor elements with said frame,

the insulating tapes being aligned with each of the conductor elements, extending from said ends of said conductor elements to said outer frame and being bonded temporarily to said outer frame;

(b) removing said means for connecting the sides of the conductor elements with said frames and allowing said conductor elements to be supported to said frame by said insulating tapes; and

(c) laminating said temporarily bonded laminate to form a bonded laminate including the laminated buses.

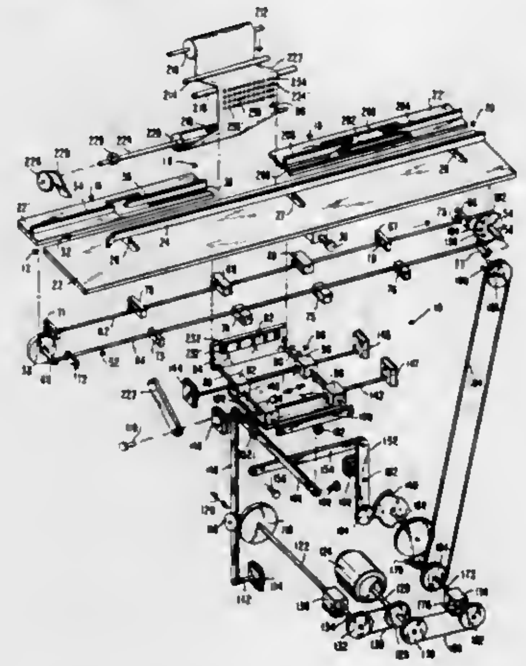
4,101,362
METHOD FOR APPLYING TRANSFERS

Max Norris Baker, Rural Hall, and Julian Richard Martin, Winston Salem, both of N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Apr. 19, 1976, Ser. No. 678,263

Int. Cl.² B44C *1/16;* B32B *1/10*

U.S. Cl. 156—235 **13 Claims**



1. A method for applying transfers to a plurality of packages, comprising:

advancing a first plurality of packages into a transfer station having a movable platen, means for supporting the packages, and a transfer sheet carrying rows and columns of tranfers, said transfer sheet being interposed between said platen and said packages with at least one row of transfers aligned with said packages;

positioning said first packages at a first position in said transfer station with each of said first packages aligned with a corresponding one of a first set of transfers in said at least one row of transfers;

aligning said platen with said first set of transfers;

moving said platen into engagement with said first set of transfers and said first packages to place one transfer from said first set on each of said first packages;

withdrawing said platen after completion of said transfer;

removing said first packages from said transfer station and advancing a second plurality of packages into said transfer station;

positioning said second packages at a second position in said transfer station with each of said second packages aligned with a corresponding one of a second set of transfers in said at least one row of transfers;

shifting said platen laterally to align it with said second set of transfers, said transfer sheet remaining stationary;

moving said platen into engagement with said second set of transfers and said second packages to place one transfer from said second set on each of said second packages; and

withdrawing said platen after completion of said transfer.

6. In a method of applying tax stamps to cigarette packages of non-standard dimensions which are packaged in cartons, said tax stamps being mounted on conventional transfer sheets in rows and columns which are, spaced for application to packages of standard dimensions, loading cartons of cigarette packages to be stamped for advancement by a conveyor, advancing each carton in turn through an opening station, a transfer station and a closing station, stopping each opened carton in said transfer station, and applying tax stamps to each package in said carton, the improvement comprising: ;p1 positioning a first carton at a first location in said transfer station with each package in said carton disposed on its side and the ends of each of said packages aligned with a corresponding one of a first set of tax stamps on said sheet;

aligning a platen with said first set of tax stamps;

reciprocating said platen to drive said set of tax stamps against the ends of corresponding packages to transfer said stamps from said sheet to said packages;

advancing said first carton out of said transfer station and advancing a second carton into said transfer station;

positioning said second carton at a second location in said transfer station with each package in said second carton aligned with a corresponding one of a second set of tax stamps on said sheet, said sheet remaining stationary;

shifting said platen laterally into alignment with said second set of tax stamps; and

reciprocating said platen to drive said second set of tax stamps against corresponding packages to transfer said stamps from said sheet to said packages.

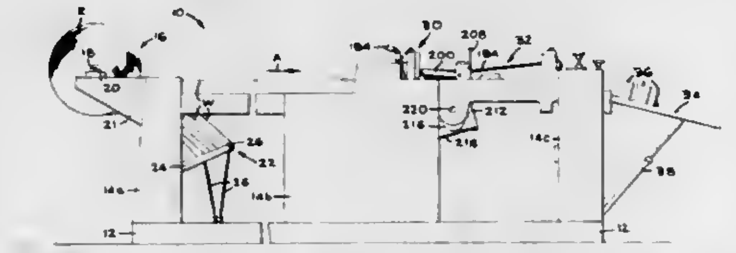
4,101,363
METHOD OF MAKING BOTTOM SEAL THERMOPLASTIC BAGS

Ronald L. Lotto, Bonduel, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 198,282, Nov. 12, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,700

Int. Cl.² B32B *31/00*

U.S. Cl. 156—250 **5 Claims**



1. In a method making bottom weld bags from a supply of elongate thin, flexible multi-layer web of thermoplastic material, which comprises the steps of converting normally continuously rotary motion to oscillatory motion for providing an oscillating drive having a web feed stroke in one direction and a reverse stroke in the opposite direction with said strokes progressively increasing and then decreasing in velocity from zero velocity to a maximum velocity and back to zero velocity between reversals of stroke direction, gripping the web between rotatable draw rolls and maintaining the grip of said rolls on the web during both of said strokes, separating transversely disposed seal bars and clutching a draw roll to the oscillating drive during the latter's feed stroke for drawing a trailing length of the web from the supply while advancing a leading edge of the web for motion between and past the seal bars, declutching said draw roll from the drive and preventing web motion at the end of the feed stroke, severing the web downstream of the seal bars and bringing the seal bars together for making a weld at the leading edge of the severed web, separating the seal bars and feeding a new length of web between the separated seal bars; the improvement comprising the steps of freeing said web for motion and clutching the draw roll to the oscillating drive during the final portion of the drive reverse stroke for rotating the draw rolls in a reverse direction sufficiently to strip the weld from the seal bars and maintaining the clutching of the draw roll to the drive after termination of said final portion of the drive reverse stroke and throughout the succeeding drive feed stroke for restoring the weld to its previous position between the seal bars and feeding a new length of the web past the seal bars while the seal bars remain separated.

4,101,364
METHOD OF AN APPARATUS FOR PRODUCING FILM-LAMINATED BASE PLATES

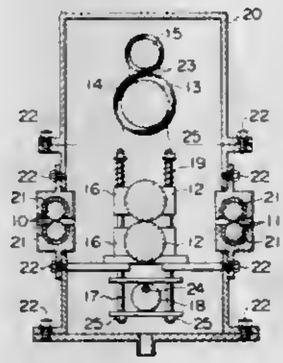
Katsushige Tsukada; Nobuyuki Hayashi; Hideo Yamada; Toshiaki Ishimaru; Asao Isobe, and Tadazi Sato, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,400

Claims priority, application Japan, Jul. 30, 1975, 50-92963

Int. Cl.² B29C *17/00*

U.S. Cl. 156—286 **14 Claims**



1. A method of laminating a film onto a base plate comprising:

evacuating a lamination chamber to at least 200 mm Hg;

feeding a base plate into said lamination chamber through air tight feed-in rolls;

supplying a film, from a film supply within the lamination chamber, onto the base plate within said lamination chamber;

pressing said film onto said base plate within said lamination chamber for laminating the film onto the base plate; and

feeding the laminated plate from within the lamination chamber through air tight feed-out rolls.

4,101,365
PROCESS OF MAKING HIGH SPEED MULTIFACETED POLYGONAL SCANNERS

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1976, Ser. No. 687,963

Int. Cl.² B29C *27/16;* G02B *5/08.*

U.S. Cl. 156—294 **8 Claims**

1. A process of making a high speed multifaceted polygonal scanner comprising providing a die cavity having a geometry which includes a plurality of facet shaped surfaces, placing an aluminum member into said cavity, said aluminum member being sized so as to provide a gap for a suitably dimensioned injected material having suitable mechanical and optical properties for high speed scanning applications, and injection molding acrylic into the gap between the aluminum member and the die cavity, an injected molded acrylic scanner comprising the injected molded acrylic having a plurality of facets on one surface thereof and an aluminum member thereby being formed, removing said injected molded acrylic scanner from said die cavity, coating the facets of said acrylic scanner with magnesium fluoride, and then applying a mirrorlike finish of aluminum to the surface of said magnesium fluoride coated acrylic scanner to provide a high speed multifaceted polygonal scanner, said magnesium fluoride enhancing the adherence of said aluminum finish to said acrylic scanner.

5. A process of making a high speed, multifaceted polygonal scanner comprising providing an aluminum member which is capable of accepting an acrylic material on its periphery, providing an injection molded acrylic material having a first surface which comprises a plurality of facets and a second surface sized so as to conform to the periphery of said aluminum member, cementing said acrylic material to the periphery of said aluminum member, coating the facets of said acrylic material with magnesium fluoride and then applying a mirrorlike finish

of aluminum to the surface of said magnesium fluoride coated facets to provide the high speed multifaceted polygonal scanner, said magnesium fluoride enhancing the adherence of said aluminum finish to said acrylic material.

4,101,366
ELECTRONIC DIGITAL DISPLAY SCALE WITH LABEL PRINTER

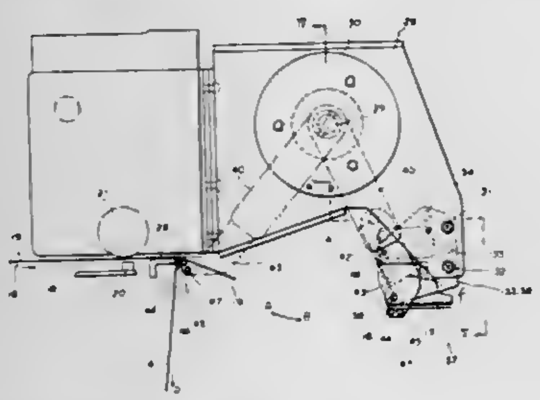
Kazuharu Teraoka, and Kazuo Nishimura, both of Tokyo, Japan, assignors to Teraoka Seikosho Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,931

Claims priority, application Japan, Sep. 4, 1975, 50-107207; Dec. 23, 1975, 50-153782

Int. Cl.^{2} G01G *19/413*

U.S. Cl. 156—378 **3 Claims**



1. An electronic digital display scale with a label printer having a printing mechanism adapted to print a weight and other information of an article which is weighed and adhere said label to said weighed article, wherein a printed label is held and transferred to a label applying position above a scale plate located outside a frame by adhering a label transfer device to an adhesive surface of the label and is applied onto said weighed article by depressing the weighed article against the label adhered to said label transfer device comprising:

a driving mechanism fixed at the center of a side plate which is fixed to a label printer frame;

a first setting plate fixed to the lower part of said side plate through two connecting rods;

a second setting plate opposed to said first setting plate through two connecting rods;

a receiving plate rotatably fixed to the lower end part of both said setting plates through a shaft;

a switching mechanism fixed to one of said setting plates with a small distance from said receiving plate above thereof, and connected with said printing mechanism;

a first swing plate secured at a shaft of said driving mechanism;

a second swing plate secured through two connecting rods to said first swing plate; and

two label transfer bars including coil springs rotatably mounted to the peripheries of said transfer bars secured at the lower end part of said other swing plate.

4,101,367
SINGLE FACE CORRUGATING MACHINE

Johann Maier, Welden, Opf., Fed. Rep. of Germany, assignor to BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft, Fed. Rep. of Germany

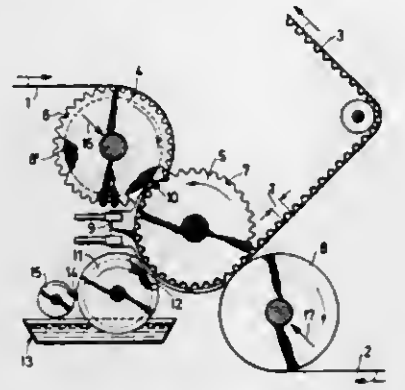
Filed Mar. 16, 1977, Ser. No. 778,106

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611325

Int. Cl.^{2} B31F *1/28*

U.S. Cl. 156—471 **17 Claims**

1. A machine for corrugating a single face of a paper web, said machine comprising, a first serrated roller and a second serrated roller positioned for cooperative engagement therebetween, a pressure roller positioned for cooperation with said second serrated roller, each said serrated roller having serration-type teeth with tooth tips and tooth roots, a paper web to be corrugated adapted to be fed between said serrated rollers under mutual pressure exerted upon said web, a cover paper web adapted to be supplied and glued to the corrugated paper web between said second serrated roller and said pressure roller, the tooth root contour of said second serrated roller being of generally concave curve configuration and formed by rolling the tooth tip of the first serrated roller against the second serrated roller with said paper web between said rollers, said serrated rollers being rotatable in opposite directions and having constant axial spacing, said pressure roller having longitudinal serrations formed parallel to the axis of said pressure roller, the contours of said longitudinal serrations being rolling curves and formed by rolling the tooth tip of said second serrated roller against the pressure roller with said corrugated paper web and cover web between said last named rollers.



4,101,368
INNER TUBE SPLICING MACHINES

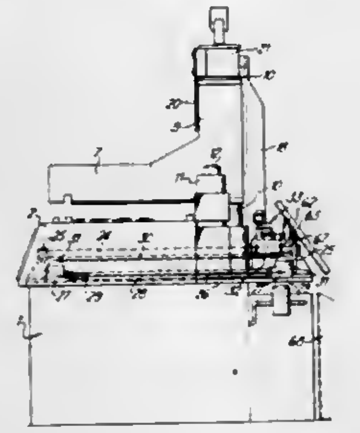
Roy Arthur Page, Wolverhampton, England, assignor to The Midland Designing & Manufacturing Co. Ltd., Wolverhampton, England

Filed Dec. 15, 1976, Ser. No. 750,582

Claims priority, application United Kingdom, Jan. 8, 1976, 630/76

Int. Cl.^{2} B29H *15/04;* G03D *15/04*

U.S. Cl. 156—503 **10 Claims**



1. An inner tube splicing machine having a pair of spaced apart tube end supporting tables, each of said tables having in operative association therewith a tube end clamping arm, one of said tables and its coacting arm being movable towards the other of said tables and its coacting arm to effect splicing of the tube ends, support means positioned above said supporting tables to support the bulk of said tube to be spliced, a cutting assembly arranged to be reciprocated relative to said supporting tables and their said coacting clamping arms to cut said tube ends prior to said splicing operation, said tube end cutting assembly being mounted on a pair of horizontally disposed spaced parallel guide shafts, and hydraulically powered piston/cylinder means operatively connected to said cutting assembly to cause reciprocal movement of said cutting assembly on said guide shafts relative to said tube end supporting tables and said coacting clamping arms of the machine to effect a cutting operation, said tube end cutting assembly comprising a supporting carriage having a knife table slidably mounted on said guide shafts, a bearing block supported on said knife table, first and second vertically disposed spindles turnably mounted in said bearing block, a cutting device secured to one end of each of said first and second spindles, each of said cutting device having a pair of spaced knife holders and a cutting blade extending therebetween, an actuator block fixed to the other end of each of said first and second spindles, and an electrically operated solenoid the actuator arm of which solenoid is arranged to impart angular turning movement to said actuator blocks which in turn impart angular turning movement to said cutting devices to move said cutting devices between cutting and non-cutting positions.

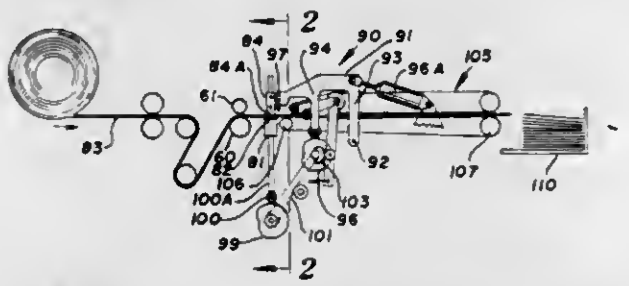
4,101,369
BOTTOM SEAL CUT-OFF

Richard C. Adams, West Barrington, R.I., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed Mar. 31, 1972, Ser. No. 240,075

Int. Cl.^{2} B32B *31/00;* B30B *15/34*

U.S. Cl. 156—510 **2 Claims**



1. Thermoplastic web treating apparatus comprising, in combination, drive means for intermittently advancing superimposed webs of thermoplastic sheet film material along a certain predetermined plane of travel and for stopping said superimposed webs for a predetermined period of dwell, hot knife means for thermally welding said superimposed webs together at predetermined spaced intervals therealong, and blade means for severing said superimposed webs at predetermined spaced intervals therealong; said apparatus comprising:

(a) drive means including draw roll means in driving contact with said webs for imparting repeating cycles of intermittent motion and dwell to said web with the motion being reversible between motion in the forward web direction and motion in the reverse web direction;

(b) said severing blade means including a knife having a cutting blade secured thereto and knife actuating means for reciprocatorily moving said cutting blade through the plane of travel of said web to sever said web;

(c) hot knife means including a heated welding bar and a back-up pad therefor, actuating means for reciprocatorily moving said heated welding bar to bring said welding bar into contact with said superimposed webs against said back-up pad for a predetermined period of time for welding portions of said superimposed webs together;

(d) control means for determining the draw and dwell cycles of said drive means and for controlling the period of operation of said severing blade means and said welding bar;

(e) said severing blade means and welding bar means being arranged to cut and weld said film during web dwell with the cutting operation of said blade preceding the welding operation for severing said film prior to welding, said control means being arranged to actuate said draw rolls in a draw cycle which includes two directions of motion of web draw with an initial period of motion in the draw rolls being in the reverse web direction to release said web from the surface of said back-up pad, and a second period of motion in the forward web direction to advance said superimposed webs preparatory to the next succeeding period of dwell; and

(f) means are provided for biasing said cutting blade toward said film in a first operational mode and for retracting said cutting blade away from said film in a second operational mode.

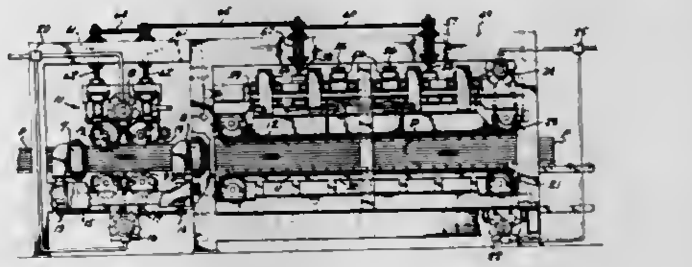
4,101,370
LAMINATING TRAVELLING PRESS

George F. Russell, 8513 - 42nd Ave. W., Tacoma, Wash. 98466

Division of Ser. No. 357,960, May 7, 1973, Pat. No. 3,943,025. This application Feb. 5, 1976, Ser. No. 655,619

Int. Cl.^{2} B30B *5/06*

U.S. Cl. 156—555 **18 Claims**



15. A laminating travelling press for laminating a pack of boards comprising elongated first moving means engageable with one side of the pack of boards, elongated second moving means engageable with the other side of the pack of boards, said first moving means and said second moving means cooperating for moving the pack of boards lengthwise, first motor means for driving said first moving means, second motor means for driving said second moving means, means for synchronizing operation of said first motor means and said second motor means for synchronizing movement of said first moving means and said second moving means, hold-down means spaced lengthwise of the pack of boards from said first moving means, first adjusting means for adjusting the position of said first moving means transversely of its length, hold-down-adjusting means for adjusting the position of said hold-down means transversely of the length of said first moving means, and coordinating means connecting said first adjusting means and said hold-down-adjusting means for effecting simultaneous and equal adjustment of said first moving means and of said hold-down means.

4,101,371
APPARATUS FOR FASTENING CERAMIC MAGNETS TO A FLYWHEEL USING CENTRIFUGAL FORCE

Glenroy Newcomb Aggen, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

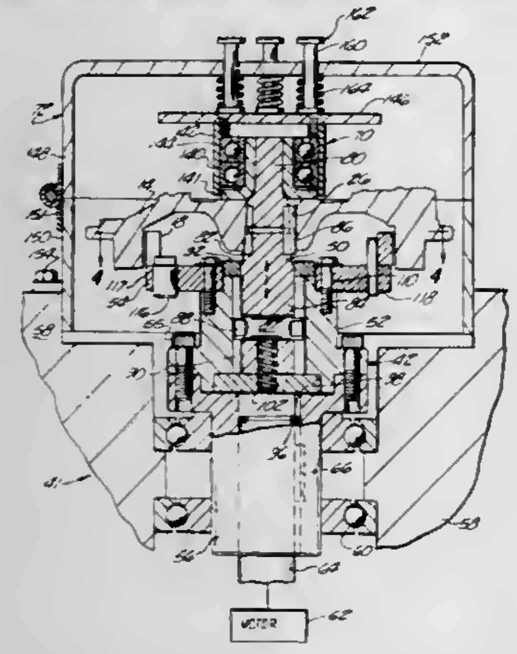
Division of Ser. No. 573,929, May 2, 1975, Pat. No. 4,011,120. This application Dec. 2, 1976, Ser. No. 746,953

Int. Cl.^{2} H02K *15/02*

U.S. Cl. 156—560 **8 Claims**

1. An apparatus for use in attaching a magnet to a radially inner surface of a rotor for use in a dynamo-electric system and the like with said magnet being located at a predetermined position circumferentially of said rotor comprising a vertically disposed rotatable spindle adapted to be driven by a motor or the like, a disc fastened to said spindle and extending radially outwardly of said spindle in a horizontal direction, means for fastening said rotor on said spindle for corotation therewith with said inner surface of said rotor being concentric with the rotational axis of said spindle and located at a predetermined radial distance from and at a predetermined position axially of said spindle such that at least a portion of said inner rotor surface is disposed above a top surface of said disc, magnet positioning means on said disc at an upper surface thereof so as to be located radially inwardly of said rotor surface when said rotor is assembled on said spindle, said magnet positioning

means being arranged to locate said magnet radially inwardly of said rotor surface in general alignment with said predetermined circumferential position on said rotor, said magnet positioning means being further arranged and disposed so as to guide said magnet radially outwardly into engagement with said rotor at said predetermined circumferential position when said magnet is located in said positioning means, said rotor is assembled on said spindle and said spindle is rotated to cause said magnet to move radially outwardly due to centrifugal forces.



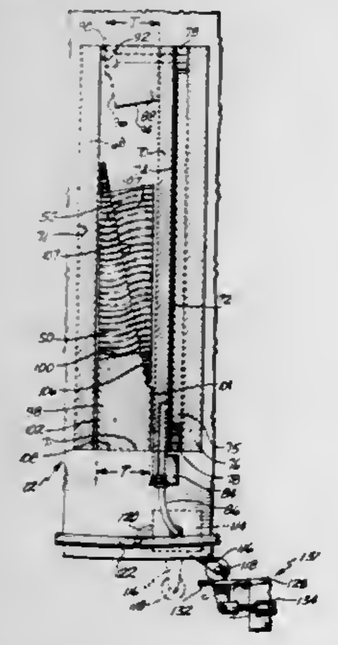
4,101,372
WIDTH ADJUSTING THICKNESS SETTING CLAMPING SYSTEM

Earl Dean Hansenwinkle; Clement Kuanoni, and Frank Wislocker, all of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 13, 1977, Ser. No. 759,167

Int. Cl.^{2} B23K *27/00*

U.S. Cl. 156—580 **9 Claims**



1. A width adjusting thickness setting clamping apparatus for clamping together at least one pair of elongated substantially triangular-shaped solid pieces with the thin edge of one approximately adjacent the thick edge of the other, an individual clamping mechanism comprising:

a first edge platen having a predetermined thickness dimension positioned between a pair of face platens,

said pair of face platens being substantially parallel to each other with at least one of said face platens being movable relative to the other between a clamped position and a retracted position,

a second edge platen slidable between said pair of face platens and having a predetermined thickness dimension substantially similar to said first edge platen,

means for moving said second edge platen toward said first edge platen when said face platens are substantially in their retracted positions allowing a pair of said pieces positioned within a clamping mechanism to slide relative to one another, thereby adjusting the width of said pair, and

means for moving at least one of said face platens toward the other and into said clamped position abutting said first and second edge platens and said pair of said pieces, thereby setting the thickness dimension of said pair.

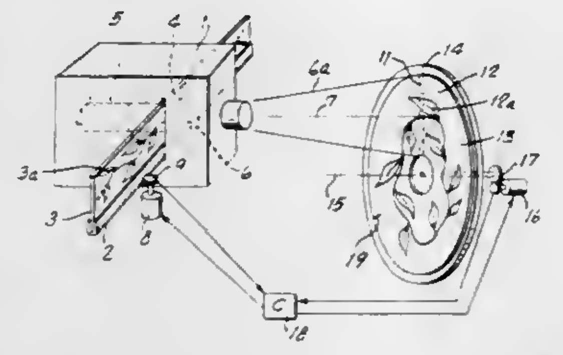
4,101,373
METHOD AND APPARATUS FOR PRODUCING A DESIGN ON A FLAT SURFACE ADAPTED TO BE FORMED INTO AN ARCUATE SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Westport, Conn.

Filed Oct. 18, 1976, Ser. No. 733,711

Int. Cl.^{2} G03B *27/32, 21/00*

U.S. Cl. 156—659 **14 Claims**



1. A method of transferring a design from a flat rectangular-coordinate form to a flat polar-coordinate form, comprising progressively projecting successive narrow transverse images of the design from a flat rectangular transparency and progressively rotating a flat surface spaced from the transparency about an axis such that the narrow transverse images of the design are successively projected upon and received in polar-coordinate form by narrow radial segments of the flat surface maintained substantially perpendicular to the direction of projection.

7. A method of producing a polar-coordinate design on a flat image surface from a rectangular-coordinate design, comprising:

(a) forming the design in rectangular-coordinate form upon a relatively flat transparency;

(b) progressively and sequentially exposing narrow transverse areas of the transparency to a directional light source whereby images of the design are progressively and sequentially projected in the direction of the light;

(c) providing the flat image surface with a photosensitive coating;

(d) disposing the flat image surface spaced from the transparency such that narrow radial segments thereof are progressively and sequentially maintained substantially perpendicular to the direction of the light and substantially parallel with the projected images;

(e) rotating the flat image surface about an axis in synchronization with the progressive projection of the transparency such that the projected narrow transverse images of the design are progressively and sequentially received by said narrow radial segments of the flat image surface and the design in polar-coordinate form is exposed upon the photosensitive coating of the image surface; and

(f) processing the exposed coating on the flat image surface to selectively produce the design upon the surface.

4,101,374
DEWATERING DEVICE INCLUDING A DRUM WITH RADIALLY SLANTED CELLS

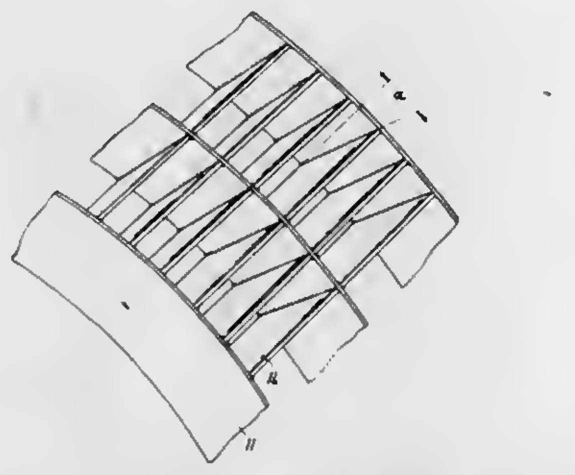
Dietrich Nebel, Engelsweidchen 11, Stockheim-Kreuzau, and Hans Reicherter, Oberhaldenweg 35, 7417 Pfullingen, both of Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 729,970

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544750

Int. Cl.^{2} D21F *1/04*

U.S. Cl. 162—306 **19 Claims**



1. A device to de-water fiber suspensions to form a de-watered fiber sheet comprising:

(a) a perforated drum

(b) drive means to rotate said drum in a given direction of rotation about a horizontal axis of rotation;

(c) said drum having a drum wall for supporting a mesh sieve and containing a plurality of radially disposed open ended cells, said cells being formed in part by bridges which extend axially relative to said drum wall and are radially slanted forward relative to the direction of rotation of said drum at least at their outer ends to define an acute angle of at least 10 degrees with a radial plane passed through the respective bridge;

(d) a material feeder to feed fiber suspension onto said drum, said material feeder terminating at a point which lies adjacent said drum wall and approximately at the beginning of a first quadrant of said drum to feed said fiber suspension thereat, and the cross-section of said drum being considered to have a first quadrant defined by the portion of said drum rising in the direction of rotation from the horizontal plane in which the axis of rotation of said drum lies, and second, third and fourth quadrants consecutively numbered in the direction of rotation; and

(e) take off means disposed adjacent said drum wall at the beginning of said second quadrant to remove de-watered fibersheet tangentially from said drum wall.

4,101,375
ISOTOPICALLY ENRICHED HELIUM-4

Leo Garwin, 326 Oklahoma Mortgage Bldg., Oklahoma City, Okla. 73102

Continuation-in-part of Ser. No. 307,405, Nov. 17, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,218

Int. Cl.^{2} F25J *3/08;* C01B *23/00;* G21C *15/28;* C09K *5/00*

U.S. Cl. 176—37 **6 Claims**

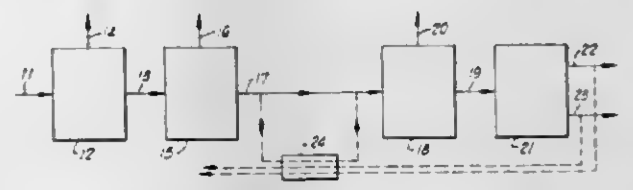
1. A method of producing isotopically enriched helium-4 which comprises removing by distillation helium-3 from liquefied natural gas source helium, said removal being accomplished at a temperature between about 4.2° K and about 5.1° K, and at a pressure equal to the equilibrium pressure of the system.

3. A method for more safely and efficiently cooling a high-temperature, gas-cooled nuclear reactor comprising:

liquefying natural gas source helium;

subjecting the liquefied natural gas source helium to distillation carried out at a temperature of between about 4.2° K and about 5.1° K, and at a pressure equal to the equilibrium pressure of the system, to separate, by such distillation, and through the removal of the helium-3 isotope in the course of the distillation, the liquefied natural gas source helium into an isotopically enriched helium-4 fraction containing less than about 0.17 ppm of helium-3, and an isotopically denuded helium-4 fraction; and

circulating at least a portion of the isotopically enriched helium-4 fraction through the high-temperature, gas-cooled nuclear reactor to provide at least a portion of the coolant gas therefor.



4,101,376
TUBULAR HEATER FOR CRACKING HYDROCARBONS

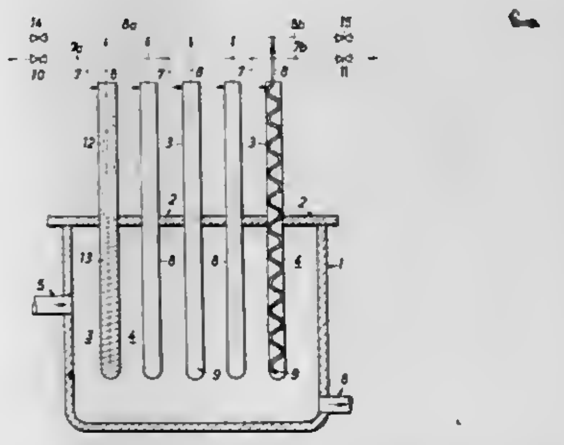
Gerhard Cornelius, Bergen-Enkheim; Heinz Jockel, Klein-Gerau, and Hans Küpfer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 552,507, Feb. 24, 1975, abandoned. This application Sep. 17, 1976, Ser. No. 724,125

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1974, 2412840

Int. Cl.^{2} G21C *1/00*

U.S. Cl. 176—39 **8 Claims**



1. Reactor for reacting a gaseous mixture of gaseous or vaporized hydrocarbons with water vapor to produce a product gas of carbon monoxide and hydrogen-containing gases at temperatures above 700° C and under pressure of 5–80 kg/cm^2 comprising a heating zone and reaction tube means receptive of a heating fluid which consists of a gas at a temperature above 800° C for indirectly heating same in the heating zone comprising a plurality of tubes each having a first portion extending into the heating zone and surrounded by the heating fluid in a heating zone, a second portion positioned outside the heating zone, feed conduit means for feeding the gaseous mixture therein and discharge conduit means for discharging product gas, each reaction tube having a closed end within said heating zone, each discharge conduit means extending longitudinally through the first and second portions of its respective reaction tube almost to the tube end and being open at its end within said reaction tube, a gas permeable material disposed in the second portion of each tube in the annular space around the discharge conduit means to promote heat transfer and catalyst

material disposed in the first portion of each tube in the annular space around the discharge conduit means whereby the gaseous mixture to be reacted is fed to each reaction tube, flowing therethrough, through the gas permeable material, undergoing reaction therein to form the product gas which then flows through the discharge conduct means contercurrent to the direction of flow through the gas permeable material.

4,101,377
FAST NEUTRON REACTOR

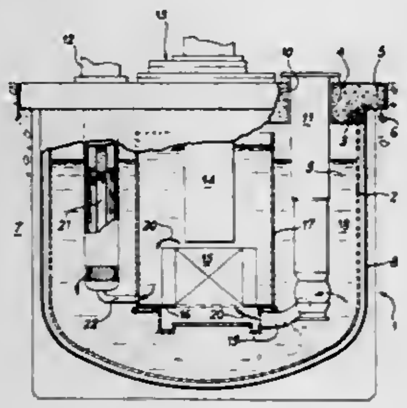
Jean-Marie Berniolles, Pierrevert, and Patrick Jogand, Aix en Provence, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 25, 1977, Ser. No. 781,428

Claims priority, application France, Mar. 29, 1976, 76 09082; May 4, 1976, 76 13275

Int. Cl.^{2} G21C *15/00*

U.S. Cl. 176—40 **10 Claims**



1. A fast neutron reactor in which a volume of liquid coolant metal is contained within a metallic main vessel having a vertical axis and an open-topped end suspended from a shield roof of substantial thickness forming a closure for a containment vault which surrounds said vessel, there being also placed within said main vessel an inner vessel having a cylindrical wall for containing the reactor core which is immersed beneath the level of the liquid metal, provision being made within the intermediate space between the main vessel and the inner vessel for heat exchangers and pumps immersed beneath the level of the liquid metal, each heat exchanger being such as to have an annular shape defined by an inner shell and an outer shell in parallel relation and provided with plurality of heat-transfer tubes extending vertically over the greater part of their length, said tubes being in contact externally with the liquid metal which passes through the heat exchanger and arranged in concentric rings between the two shells, said tubes being such as to have their openings in two end tube-plates which delimit with the two shells of the heat exchanger two manifolds consisting respectively of an inlet manifold at the lower end of the heat exchanger and an outlet manifold at the upper end for a heat-transfer fluid which serves to collect the heat gained by the liquid metal as it passes through the reactor core, wherein the inner shell surrounds a central feed duct having a vertical axis and joined to the inner vessel and wherein the annular space between the two shells communicates at the upper end thereof with a flared portion of the central duct through a first circular window formed in the inner shell and at the lower end thereof with the region located between the inner vessel and the main vessel through a second circular window formed in the outer shell.

4,101,378
PROCESS FOR THE MICROBIOLOGICAL OXIDATION OF STEROIDS

Daikichiro Nishikawa, Tokyo; Yukio Imada; Masayuki Kinoshita, both of Yokohama; Katsuhiko Takahashi, Kawasaki; Hajime Machida, Tokyo, and Michitaro Nagasawa, Noda, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Noda Institute for Scientific Research, Chiba, both of, Japan

Division of Ser. No. 693,685, Jun. 7, 1976, Pat. No. 4,057,469. This application Aug. 15, 1977, Ser. No. 824,902

Claims priority, application Japan, Jun. 6, 1975, 50-68379; Sep. 22, 1975, 50-114431

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.^{2} C07B *29/02*

U.S. Cl. 195—51 G **19 Claims**

1. In a process for the production of 17-hydroxyandrosta-1, 4-dien-3-one and/or androsta-1,4-diene-3,17-dione by fermenting a sterol, its 4-en-3-one sterol derivative or its 1,4-dien-3-one sterol derivative in a culture medium with a microorganism capable of microbiologically oxidizing said sterol or its derivatives to produce 17-hydroxyandrosta-1, 4-dien-3-one and/or androsta-1,4-dien-3,17-dione, the improvement which comprises adding to the culture medium at least one glyceride-containing substance selected from the group consisting of glycerides, fats, oil seeds and oil fruits in an amount sufficient that the culture medium contains at least 0.3 percent by weight of glycerides.

4,101,379
ENZYME COMPLEX HYDROLYZING BACTERIAL MUCUS

Philippe Gerard Marie-Joseph Boidin, Phalempin; Raoul Louis Andre Cassaigne, Cappelle-en-Pevele; Bernard Albert Victor Colein, Houplin-Ancoisne, and Robert Louis Felix Delecourt, Seclin, all of France, assignors to GB Fermentation Industries, Inc., Kingstree, S.C.

Filed Jan. 4, 1977, Ser. No. 756,669

Claims priority, application France, Jan. 22, 1976, 76 01729

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—62 **6 Claims**

1. A process for preparing complex enzymes capable of hydrolyzing bacterial mucus, comprising the following steps: inoculating a fermenatation medium with a Bacillus subtilis ATCC No. 31,182, causing fermentation of said medium while monitoring development of said complex enzymes in the fermentation medium, and suddenly stopping fermentation when the activity of complex enzymes in the medium reaches its maximum.

5. An enzyme complex capable of hydrolyzing bacterial mucus and containing a high endo-N-acetylhexosaminidase activity and produced by the process of claim 1.

4,101,380
PROCESS FOR THE CROSS-LINKING OF PROTEINS

Menachem Rubinstein, Kiryat Ono; Shulamit Simon, Ramat-Gan, both of Israel, and Rene Bloch, deceased, late of Savion, Israel (by Rachel Bloch, administratrix), assignors to Research Products Rehovot Ltd., Rehovot, Israel

Filed Jun. 11, 1976, Ser. No. 695,030

Claims priority, application Israel, Jun. 12, 1975, 47468

Int. Cl.^{2} C07G *7/02, 7/00*

U.S. Cl. 195—63 **31 Claims**

1. A process for the cross-linking of proteins wherein the proteins to be cross-linked are reacted with a cross-linking agent selected from the group consisting of:

(a) water soluble poly(ethylene oxide) derivatives of the general formula I

$$(Z)_m—Y—(CH_2CH_2O)_nCH_2CH_2—Y—(Z)_m \qquad (I)$$

wherein both n and m are at least 1; Y is a covalent bond or is an —R— or —RO— radical in which the oxygen is bound to the poly(ethylene oxide) and R is selected from the group consisting of methylene, ethylene, propylene, o—, m— and p-phenylene, o—, m— and p-phenylene carbamate optionally substituted by one or more alkyl, aryl, halo, nitro, oxo, carboxy, hydroxy, thio, sulfonate and phosphate groups; and Z is a reactive group selected from the groups consisting of haloisocyanato-, isothiocyanato-, tosylate, acyl halides, acyl azides, aryl diazonium salts, acyl imidoester salts, activated esters of acyl residues and 2,4-dichlorotriazines; and

(b) activated esters of di- and poly-carboxylic acids wherein the acids and the alcohol moieties thereof are water soluble, and wherein the alcohols forming the activated esters are selected from the group consisting of N-hydroxysuccinimide, 1-hydroxy benzotriazole, 8-hydroxyquinoline and 2- and 4-thiopyridine.

4,101,381
METHOD AND REAGENT FOR THE DETERMINATION OF SUBSTANCES FORMING HYDROGEN PEROXIDE

Sigmar Klose, Berg; Ulfert Deneke, Peissenberg; Erich Haid, Weilheim, and Gunter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Dec. 27, 1976, Ser. No. 754,878

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1976, 2600526

Int. Cl.^{2} G01N *33/00, 31/14*

U.S. Cl. 195—99 **14 Claims**

1. Method for the quantitative determination of a substance which forms H_2O_2 with oxygen under the action of an oxidase, which comprises treating the H_2O_2 formed with methanol and catalase to yield formaldehyde, reacting the formaldehyde with 3-methyl-2-(sulfonyl)-benzothiazolone-hydrazone in the presence of an oxidizer, and photometrically determining the dye formed thereby as a measure of the said substance initially present.

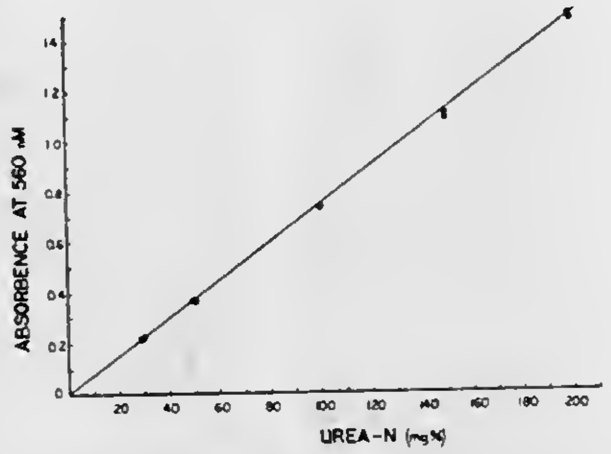
4,101,382
NOVEL REAGENT AND METHOD FOR THE DETERMINATION OF UREA IN BIOLOGICAL FLUIDS

Moon Ki Chang, 1262 Barrington Ave., Apt. 105, Los Angeles, Calif. 90025

Division of Ser. No. 519,600, Oct. 31, 1974, Pat. No. 3,950,226. This application Dec. 5, 1975, Ser. No. 638,272

Int. Cl.^{2} G01N *31/14*

U.S. Cl. 195—103.5 UR **6 Claims**



1. The method of determining the urea level in urea-containing fluids which comprises:

1. adding in one step a specimen of said fluid to an aqueous solution of a buffer, a pH indicator dye, a stabilizer of the solution, and measuring the absorbence of the resulting solution,
2. adding urease to the above resultant solution and measuring the absorbence of the final solution after the hydrolysis of urea by urease has gone to completion, and
3. calculating the amount of urea in the unknown sample by comparing the change in absorbance of the specimen with the change in absorbance obtained from subjecting specimens containing known amounts of urea to steps 1 and 2.

4,101,383
PROCESS FOR TESTING MICROPARTICLE RESPONSE TO ITS ENVIRONMENT

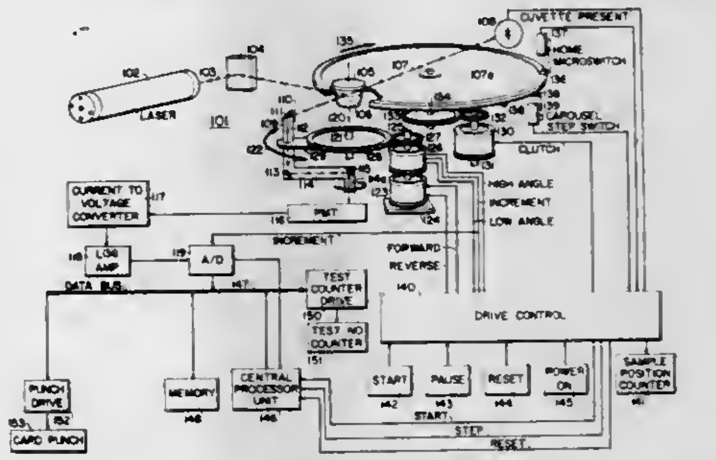
Philip J. Wyatt; Vincent R. Stull, both of Santa Barbara; William L. Proctor, Goleta, all of Calif., and Irving L. Miller, New Haven, Conn., assignors to Science Spectrum, Inc., Santa Barbara, Calif.

Division of Ser. No. 468,992, May 10, 1974, Pat. No. 3,928,140. This application Dec. 12, 1975, Ser. No. 640,195

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—103.5 R **26 Claims**



1. A process for determining the minimal inhibitory concentration (MIC) of a given bacterial sample to a selected chemical agent comprising the steps of:

A. preparing from said given bacterial sample a bacterial control sample in a medium promoting growth of bacteria;
B. incubating said bacterial control sample for a period of time sufficient for metabolism to occur;
C. inserting said sample into the path of an incident narrow, substantially monochromatic beam of radiant energy;
D. measuring the intensity of radiant energy scattered by said sample at plurality of angular locations about said sample relative to the direction of said incident beam sufficient to derive a control differential scattering pattern produced by said sample;
E. preparing from said given bacterial sample a bacterial test sample including a predetermined concentration, X, of a selected chemical agent in a medium promoting growth of bacteria;
F. incubating said bacterial test sample for substantially the same period of time and under substantially the same conditions as the bacterial control sample;
G. inserting said test sample into said beam path;
H. measuring the intensity of radiant energy scattered by said test sample at substantially the same angular locations about said test sample to derive a test differential scattering pattern produced by said test sample;
I. comparing said test and control patterns to yield a score, S, indicative of the effects of the chemical agent upon bacterial growth and upon bacterial morphology; and,
J. determining the MIC value, V (S, X), from the score, S, and the predetermined concentration, X, of the selected chemical agent.

4,101,384

APPARATUS FOR THE FERMENTATIVE CONVERSION OF A NUTRIENT MIXTURE BY MEANS OF MICROORGANISMS

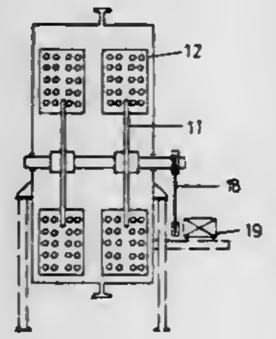
Uwe Faust, Fischbach; Rudolf Knecht, Dortmund-Aplerbeck; Wolfgang Lautenschlager, Wersau, and Wilhelm Wengeler, Bochum-Stiepel, all of Fed. Rep. of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 629,098, Nov. 5, 1975, abandoned. This application Jan. 26, 1976, Ser. No. 652,534

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1974, 2454443

Int. Cl.² C12B *1/16*

U.S. Cl. 195—142 **1 Claim**



1. Apparatus for carrying out a fermentative conversion of a nutrient mixture by means of microorganisms in the presence of an oxygen bearing gas consisting of:

(a) a closed reaction vessel provided with six inlet and outlet nozzles for the nutrient mixture, its components and the product,

(b) input and output pipes for said vessel for an oxygen-bearing gas,

(c) a horizontally disposed shaft within said vessel,

(d) motors means to drive said shaft, and

(e) a distributing device in the form of 2 paddle wheels each consisting of a circular disc and 8 flat paddles each of which has five rows of four holes evenly spaced thereon with each paddle equally spaced from each other and arranged radially on the disc and perpendicular to the axis of the disc, arranged on said shaft

so that each disc is perpendicular to the axis of said shaft and the axis of the said shaft passes through the center of each disc and the discs are so spaced that the paddles attached to the outer periphery of one disc do not touch the paddles attached to the outer periphery of another disc and

wherein the paddle wheels are so arranged that a small gap is provided between the outer end of each paddle wheel and the wall of the reactor vessel.

4,101,385

PROCESS FOR MAKING A METAL PLASTIC STRUCTURE

Daniel Luch, Warwick, N.Y., assignor to International Nickel Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,512

Int. Cl.² C25D *5/54, 5/56, 5/34*

U.S. Cl. 204—20 **3 Claims**

1. A process for electroplating at least part of the surface of a formed body comprising roughening said at least part of said surface, mechanically conforming and adhering a sheet of plateable plastic containing a polymer, carbon black and sulfur to said roughened surface and electroplating said adhered, conformed and plateable plastic sheet.

4,101,386

METHODS OF COATING AND SURFACE FINISHING ARTICLES MADE OF METALS AND THEIR ALLOYS

Richard Dötzer, and Klaus Stöger, both of Nüremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 300,906, Oct. 26, 1972, Pat. No. 3,969,195, which is a continuation-in-part of Ser. No. 249,279, May 1, 1972, abandoned. This application Jun. 1, 1976, Ser. No. 691,707

Claims priority, application Fed. Rep. of Germany, May 7, 1971, 2122610; Oct. 28, 1971, 2153831

Int. Cl.² C25D *5/34, 5/42, 5/44*

U.S. Cl. 204—32 R **1 Claim**

1. In a process of electroplating a metal article, the improvement of pre-treating the surface of said article by impinging an anhydrous, aprotic liquid against the surface of said article by falling drops for the purpose of removing scale and exposing bright metal, and subsequently electroplating said article in an aprotic organo-metal liquid electroplating electrolyte essentially devoid of water and molecular oxygen.

4,101,387

COMPOSITION FOR ELECTRODEPOSITION OF METAL DEPOSITS, ITS METHOD OF PREPARATION AND USES THEREOF

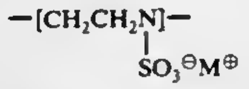
Hans-Gerhard Creutz, Yale; Roy Wilbur Herr, Troy, and Richard Marshall Stevenson, Grosse Point Woods, all of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 462,683, Apr. 22, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,563

Int. Cl.² C25D *3/56, 3/12, 3/22, 3/20*

U.S. Cl. 204—43 T **5 Claims**

4. A process for electrodepositing a bright metallic finish selected from the group consisting of nickel, nickel-iron and zinc upon a substrate, comprising passing a current through an aqueous acidic bath including a polyelectrolyte, in which the polyelectrolyte is a reaction product of a polyethylenimine and a sulfonating agent which contains nitrogen substituted sulfamate groups as a integral part of the polymer chain, said nitrogen substituted sulfamate unit of the reaction product is represented by the formula:



$$-[CH_2CH_2\underset{SO_3^{\ominus}M^{\oplus}}{\underset{|}{N}}]-$$

where M=H, Li, Na, K, or NH_4, the ratio of said nitrogen substituted sulfamate units to amino units —$[CH_2CH_2NH]$— in the reaction product being determined by the molar ratio of the polymer repeat unit —$[C_2H_5N]$— to sulfonating agent in the reaction.

4,101,388

PREVENTION OF ANODE BAG CLOGGING IN NICKEL IRON PLATING

Hyman Chessin, West Bloomfield, and Edgar J. Seyb, Jr., Berkley, both of Mich., assignors to M & T Chemicals Inc., Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,898

Int. Cl.² C25D *3/12, 3/20, 3/56*

U.S. Cl. 204—43 T **12 Claims**

7. In an aqueous plating solution containing nickel compounds and at least one member selected from the group consisting of cobalt compounds and ferrous compounds, providing ions for electrodepositing nickel, cobalt, nickel-cobalt alloy, nickel-iron alloy, or nickel-cobalt-iron alloy, and containing an amount of oxalic acid break-down product the improvement comprising the presence of at least one cation selected from the group consisting of cations of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium in single or combined concentration of 1.0 gram per liter to 10 grams per liter.

4,101,389

METHOD OF MANUFACTURING AMORPHOUS ALLOY

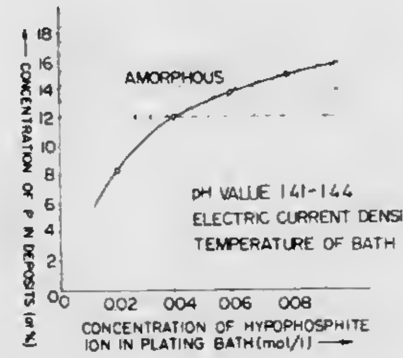
Satoru Uedaira, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,241

Claims priority, application Japan, May 20, 1976, 51-58305; Feb. 5, 1977, 52-11876

Int. Cl.² C25D *3/56*

U.S. Cl. 204—44 **13 Claims**



1. A method of manufacturing an amorphous plated layer alloy consisting essentially of from 60 to 88 atomic percent iron and from 12 to 30 atomic percent phosphorous and up to 10 atomic percent nickel and/or cobalt comprising providing an acidic aqueous plating bath containing:

1/3 to 5/3 mole/l divalent iron ions

0.07 to 0.42 mole/l hypophosphite ions

and effecting the electroplating through the use of said bath under the following conditions:

pH	1.0 to 2.2
Current density	3 to 20A/dm²
Temperature	30 to 50° C

8. A method of manufacturing an amorphous plated layer alloy consisting predominantly of iron and phosphorous comprising providing an acidic aqueous plating bath containing:

1/3 to 5/3 mole/l divalent iron ions

0.07 to 0.42 mole/l hypophosphite ions

4×10^{-5} to 8×10^{-3} mole/l cupric ions

and effecting the electroplating through the use of said plating bath under the following conditions:

pH	1.0 to 2.2
Current density	3 to 20A/dm²
Temperature	30 to 50° C

4,101,390

PROCESS FOR PRODUCING A LEAD DIOXIDE COATED ANODE FROM A LEAD ELECTROLYTE WHICH CONTAINS DISSOLVED BISMUTH

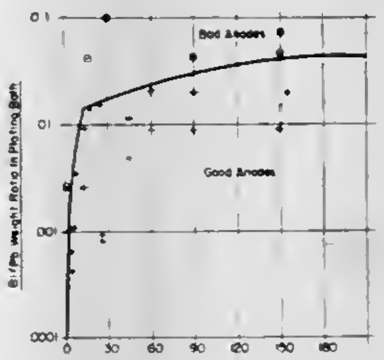
Raymond C. Rhees, Henderson, and Bruce B. Halker, Boulder City, both of Nev., assignors to Pacific Engineering & Production Company of Nevada, Henderson, Nev.

Division of Ser. No. 662,632, Mar. 1, 1976, Pat. No. 4,038,170. This application Jun. 3, 1977, Ser. No. 803,105

Int. Cl.² C25D *9/06*

U.S. Cl. 204—57 **14 Claims**

1. In a process for forming a coated anode containing lead dioxide, the process comprising electrodepositing a coating containing lead dioxide in a substrate anode, the electrolyte being acidic and containing an aqueous acid solution of a lead compound in a concentration and of the type capable of depositing lead dioxide on the substrate anode, the improvement comprising including in said electrolyte during coating of the lead dioxide on the substrate anode, bismuth in an amount to provide a ratio of bismuth to lead in said electrolyte of at least $1{:}10^3$ and being sufficient to increase the current efficiency of the anode, or to decrease lead loss from the anode surface at temperatures of use below 25° C.



4,101,391

ELECTROLYTIC OXIDATIVE METHYL-METHYL COUPLING OF CRESOL SALTS

Richard C. Hallcher, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 5, 1976, Ser. No. 646,725

Int. Cl.² C25B *3/10;* **C07C** *69/16*

U.S. Cl. 204—59 R **20 Claims**

1. The process of electrolytic oxidative methyl-methyl coupling of cresol salts substituted with non-interfering, blocking substituents at least at the 2,4,6-positions relative to the phenolic oxyanion where at least one of the substituents is the cresolic methyl, which process comprises electrolytic oxidation at the anode by electrolysis at no more than about 0.5 volts (versus the saturated calomel electrode) in a liquid electrolysis medium comprising such cresol salt and a substantially non-nucleophilic solvent, and thereafter recovering a methyl-methyl coupled dehydrodimeric cresol.

4,101,392

PROCESS FOR ELECTROLYTIC OXIDATIVE METHYL-METHYL COUPLING OF CRESOL SALTS

Richard C. Hallcher, Maryland Heights, and Manuel M. Baizer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,652

Int. Cl.² C25B *3/10*

U.S. Cl. 204—59 R **21 Claims**

1. An improved process for electrolytic oxidative methyl-methyl coupling of cresol salts substituted with non-interfering, blocking substituents at least at the 2, 4, 6-positions relative to the phenolic oxyanion where at least one of the substituents is the cresolic methyl, which process comprises electrolytic oxidation at the anode by electrolysis at no more than about 0.5 volts (versus the saturated calomel electrode) in a liquid electrolysis medium comprising the cresol salt, the corresponding free cresol, and a substantially non-nucleophilic solvent, wherein the molar equivalent ratio of cresol salt to free cresol is no more than about 1.0 molar equivalent of cresol salt to about 5.0 molar equivalents of free cresol, and thereafter recovering a methyl-methyl coupled dehydrodimeric cresol.

4,101,393

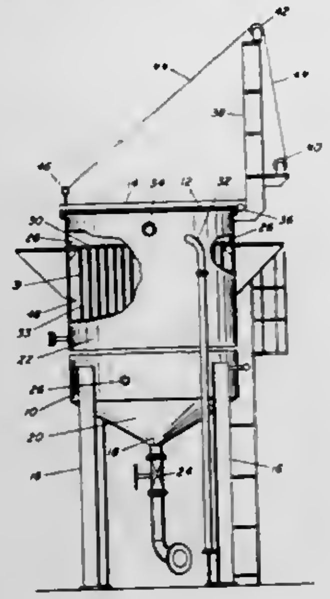
METHOD OF CLEANING FILTER BAGS IN A SYSTEM FOR EFFLUENT GAS RECYCLING AND RECOVERY FROM ELECTROLYTIC CELLS FOR PRODUCTION OF ALUMINUM FROM ALUMINUM CHLORIDE

Robert L. Hargis, Palestine, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 22, 1977, Ser. No. 808,780

Int. Cl.^{2} C25C *3/06*

U.S. Cl. 204—67 **2 Claims**



1. In a process for electrolysis of aluminum chloride wherein effluent gases contain particles of aluminum chloride and aluminum chloride combinations, said particles are separated from the effluents and accumulate in a filtering means of a separating means, the improvement comprising:

transferring said filtering means having the particles thereon as an assembled unit from said separating means to a vessel for cleaning;

placing said filtering means inside the vessel and sealing the vessel from the environment;

flowing water at a temperature of from 5° to less than 100° C into the lower portion of the vessel until said filtering means is completely immersed therein;

permitting the water to react with the particles on said filtering means; and

exhausting gaseous products of reaction from the upper portion of the vessel and exhausting water and products of reaction contained in the water from the lower portion of the vessel thereby cleaning said filtering means.

4,101,394

ELECTROLYTIC METHOD

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 575,915, May 9, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,308

Int. Cl.^{2} C25B *1/26, 1/02, 3/04*

U.S. Cl. 204—77 **18 Claims**

14. A method of producing chlorine and alcohol comprising the steps of:

feeding hydrochloric acid to an anolyte chamber of an electrolytic cell;

feeding a water soluble organic oxidant having a reducible peroxy bond to a catholyte chamber of said cell at a rate sufficient to suppress hydrogen evolution at the cathode;

passing an electrical current from an anode of said cell to a cathode of said cell whereby chlorine is evolved at the anode and the organic oxidant is reduced in the catholyte; and

recovering chlorine from the anolyte chamber and the reduction products of the organic oxidant from the catholyte chamber.

4,101,395

CATHODE-STRUCTURE FOR ELECTROLYSIS

Kensuke Motani; Toshikatsu Sata, and Masakatsu Nishimura, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Filed Aug. 30, 1976, Ser. No. 718,769

Int. Cl.^{2} C25B *1/46, 11/03, 13/08*

U.S. Cl. 204—98 **9 Claims**

1. A cathode-structure for liquid-phase electrolysis of an aqueous solution of an alkali metal salt comprising a perforated cathode and a polymer containing cation exchange groups in its molecule, said cathode being electrochemically inactivated on one surface, thereof said polymer being laminated in the form of a film on said electrochemically inactivated surface of said cathode.

8. A process for electrolysis of an aqueous solution of an alkali metal salt using the cathode structure of claim 1.

4,101,396

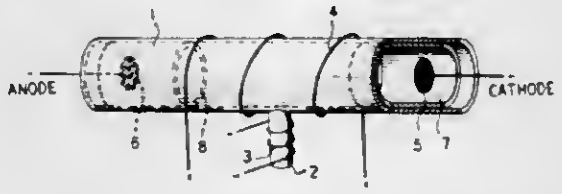
ISOTOPE ENRICHMENT BY RESONANCE TRAPPING

William Thomas Silfvast, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1976, Ser. No. 753,707

Int. Cl.^{2} B01J *1/10;* **B01D** *53/00*

U.S. Cl. 204—157.1 R **20 Claims**



1. A method of altering the isotopic composition of a quantity of an element comprising the steps of:

producing a quantity of elemental vapor from a feedstock quantity of the element in such a manner that the partial pressure of the vapor generated is substantially equal to a predetermined value, whereby the trapping factor of a less-abundant isotope is greater than the trapping factor of a more-abundant isotope;

mixing said vapor with a buffer gas having an ionization potential greater than the ionization potential of said element;

passing a direct current electric discharge through the mixture of said vapor and said buffer gas, which electric discharge excites resonant states of said vapor, whereby the phenomenon of resonance trapping produces a higher proportion of excited atoms in the more-abundant isotope than in the less-abundant isotope;

ionizing preferentially those atoms which have been excited to said resonant states, and

removing the ions so produced from said mixture, whereby the material removed contains an enhanced proportion of the more-abundant isotope relative to the proportion in the feedstock and the residue contains an enhanced proportion of the less-abundant isotope relative to the proportion in the feedstock.

4,101,397

PROCESS FOR THE PREPARATION OF ALPHA-CHLOROMETHYLSILANES

Hans-Joachim Kötzsch; Gerhard Müller, both of Rheinfelden, and Hans-Joachim Vahlensleck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,372

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614197

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—158 HA **9 Claims**

1. In a process for the preparation of an α-chloromethylsilane of the general formula

$$ClCH_2(CH_3)_{3-n}SiCl_n \; (n = 0 \text{ to } 3) \qquad II$$

by contacting a methylsilane of the formula

$$(CH_3)_{4-n}SiCl_n \qquad I$$

with elemental chlorine under illumination, the improvement which comprises introducing chlorine into a reaction zone at a constant rate, maintaining said reaction zone in the vicinity of the boiling point of the methylsilane to be chlorinated, introducing methylsilane to be chlorinated into said reaction zone at such a rate so as to maintain the temperature of the reaction mixture in the vicinity of the boiling point of the methylsilane to be chlorinated and continuously withdrawing reaction product at such a rate that the concentration of chloromethylsilane in the reaction product amounts to up to 18 percent by weight.

4,101,398

PROCESS FOR HARDENING A RESIN WHICH IS THE REACTION PRODUCT OF AN EPOXY RESIN, AN OLEFINICALLY UNSATURATED MONOCARBOXYLIC ACID AND A POLYCARBOXYLIC ACID ANHYDRIDE UNIT

Wolfgang Hesse, Wiesbaden, and Paul Jacobi, Wiesbaden-Biebrich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 487,983, Jul. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 239,332, Mar. 29, 1972, abandoned. This application Jul. 2, 1976, Ser. No. 702,352

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1971, 2115918

Int. Cl.^{2} C08F *8/00*

U.S. Cl. 204—159.16 **16 Claims**

1. A process for hardening (I) a resin which is the reaction product of a first reaction of a) an epoxy resin which contains at least two epoxy groups, with b) an olefinically unsaturated monocarboxylic acid followed by a reaction of free hydroxyl groups formed from the epoxidecarboxylic acid reaction with c) a polycarboxylic acid anhydride unit, by copolymerising said resin (I) with (II) a copolymerisable olefinically unsaturated monomer under the action of irradiation of an electron beam of a minimum radiation dose of 0.25 Mrad/g of reaction product, one polycarboxylic acid anhydride unit being attached to at least two molecules of the epoxy resin, the number of epoxy groups being approximately equal to the sum of the number of free carboxyl groups and the number of anhydride groups of the polycarboxylic acid anhydride units, the epoxide being in the proportion of about 1.25 to 1.5 equivalents of epoxide per equivalent of unsaturated monocarboxylic acid and about 0.25 to 0.5 mol of polycarboxylic acid anhydride units.

4,101,399

PRODUCTION OF SOLVENT RESISTANT BROMINATED AND/OR CHLORINATED AROMATIC POLYESTER FIBROUS MATERIALS

John R. Costanza, North Plainfield, and George L. Collins, New Providence, both of N.J., assignors to Celanese Corporation, New York, N.Y.

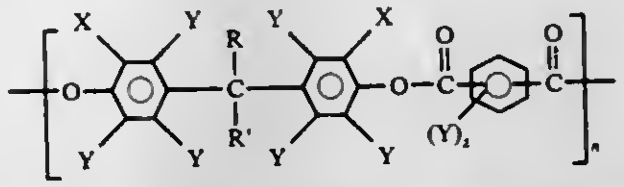
Filed Mar. 8, 1976, Ser. No. 664,461

Int. Cl.^{2} C08G *18/00*

U.S. Cl. 204—159.19 **19 Claims**

1. A process for enhancing the solvent resistance of a halogenated fibrous material which consists essentially of

irradiating an aromatic polyester of the recurring structural formula



where X which may be the same or different is chlorine or bromine, Y which may be the same or different is hydrogen, chlorine or bromine, z is 4 and R and R' may be the same or different and represent lower alkyl groups, hydrogen, or together constitute a cyclic hydrocarbon group, n = at least 10, by exposing said halogenated fibrous material to low intensity low energy ultraviolet light radiation of a wavelength which consists essentially of 1000 A to 3900 A, and a source intensity of from 100 to 400 watts per linear inch for a period of time not to exceed 10 seconds, said source intensity and duration of exposure being selected to achieve enhanced solvent resistance.

4,101,400

METHOD FOR DEWATERING SLUDGE

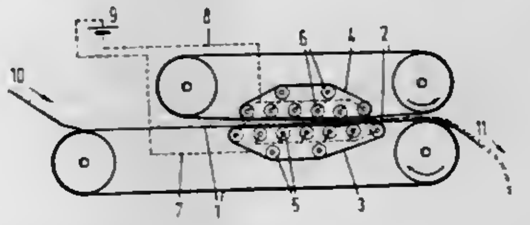
Roelf Pepping, Sneek, Netherlands, assignor to Machinefabriek W. Hubert & Co. B.V., Sneek, Netherlands

Continuation of Ser. No. 474,092, May 28, 1974, abandoned. This application May 20, 1977, Ser. No. 798,940

Claims priority, application United Kingdom, May 29, 1973, 25458/73

Int. Cl.^{2} B01D *13/02*

U.S. Cl. 204—180 R **4 Claims**



1. In a method of dewatering sludge having a dry content of less than 30% comprising continuously passing the sludge, on an endless belt member permeable to liquid, between electro-endosmosis electrodes and applying an electrical direct current through the sludge between the electrodes in a direction transverse to the direction of movement of the sludge, the improvement comprising:

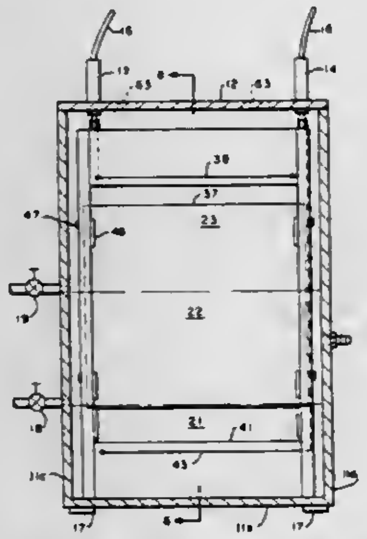
preconditioning the sludge by flocculation with polymeric flocculants;

while the sludge is on the endless belt member and before the sludge is passed between the electro-endosmosis electrodes, pre-dewatering the sludge to shovel consistency; and

while the sludge is on the endless belt member, subjecting the sludge to mechanical pressure at least at locations during and after the passage of the sludge between the electro-endosmosis electrodes to a sufficient extent at each location to provide an amount of dewatering greater than the amount achieved when the dewatering is accomplished with pressure applied only during passage of the sludge between the electrodes.

4,101,401
FLUID ISOLATION ELECTROPHORESIS APPARATUS AND METHOD

Stanton A. Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.
Filed Mar. 11, 1977, Ser. No. 776,639
Int. Cl.² G01N *27/26*
U.S. Cl. 204—180 G **16 Claims**



1. Apparatus for electrophoretic separation of samples within a running gel, comprising

an outer container forming therein an upper buffer space, an intermediate space adjacent to said upper buffer space and a lower buffer space adjacent to said intermediate space, each of said spaces being in fluid communication with the adjacent space,

means for holding the running gel in vertical disposition within said outer container so that the running gel extends from said upper buffer, through said intermediate, to said lower buffer spaces,

an upper electrode disposed in said upper buffer space,

a lower electrode disposed in said lower buffer space,

and means for removing heat energy from said intermediate space,

whereby a sample placed atop the running gel is separated electrophorectially therein when an electrical potential is applied between said upper and lower electrodes, and said upper buffer, intermediate, and lower buffer spaces are filled with upper buffer, electrically insulating, and lower buffer solutions respectively having increasing relative specific gravity in the order named.

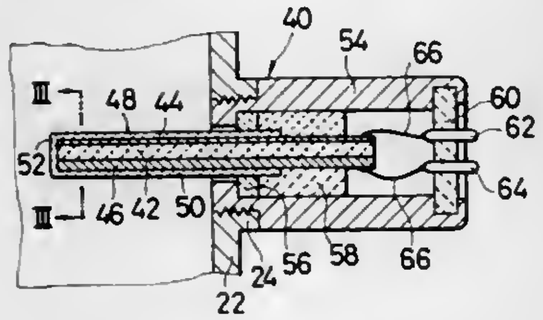
4,101,402
ADHERENCE OF METAL FILMS TO POLYMERIC MATERIALS

John Louis Vossen, Jr., Bridgewater, N.J.; Frederick Russell Nyman, Carmel, and George Frederick Nichols, Oaklandon, both of Ind., assignors to RCA Corporation, New York, N.Y.
Division of Ser. No. 599,130, Jul. 25, 1975, Pat. No. 3,984,907. This application Apr. 23, 1976, Ser. No. 679,842
Int. Cl.² C23C *15/00, 13/02*
U.S. Cl. 204—192 C **8 Claims**

1. A method for improving the adhesion of nickel-chromium alloy films to polymeric materials wherein said alloy contains from about 65 to about 80 percent by weight of nickel, from about 10 to about 30 percent by weight of chromium and from 0 to about 10 percent by weight of iron which comprises sputtering a first thin layer of copper onto said polymeric material and sputtering a layer of said alloy onto said copper layer.

4,101,403
SENSOR FOR DETECTING VARIATION IN OXYGEN CONCENTRATION IN GAS

Toru Kita, and Takeshi Fujishiro, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Dec. 13, 1976, Ser. No. 749,899
Claims priority, application Japan, Dec. 18, 1975, 50/150129
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **10 Claims**



1. A sensor for detecting the occurrence of a fluctuation in the air/fuel ratio of an air-fuel mixture fed to an internal combustion engine across the stoichiometric air/fuel ratio by disposing the sensor in a stream of the exhaust gas of the engine, the sensor comprising:

a layer of an oxygen ion conductive solid electrolyte;

a support means for supporting the solid electrolyte layer such that at least a portion of said solid electrolyte layer can be exposed on both sides thereof to a stream of the exhaust gas;

porous and electron conductive first and second electrode layers of a metal having catalytic ability on oxidation reactions of carbon monoxide and hydrocarbons contained in the exhaust gas formed respectively on first and second sides of said solid electrolyte layer at least in regions exposable to the exhaust gas stream; and

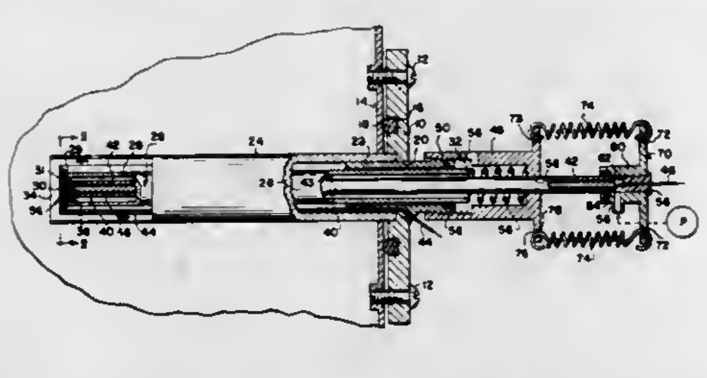
porous first and second protective coatings of a refractory material formed respectively on said first and second electrode layers at least in regions exposable to the exhaust gas stream;

said first and second electrode layers and said first and second protective coatings being formed such that the total resistance offered by said first protective coating and said first electrode layer to the permeation of the exhaust gas therethrough is different from the total resistance offered by said second protective coating and said second electrode layer to the permeation of the exhaust gas therethrough, so that the exhaust gas comes into contact with said second side of said solid electrolyte layer with a time lag behind the contact of the exhaust gas stream with said first side of said solid electrolyte layer whereby establishing an electromotive force when a fluctuation occurs in the oxygen partial pressure of the exhaust gas resulting from a fluctuation in said air/fuel ratio, across said stoichiometric ratio, with the polarity of said electromotive force indicating whether the air/fuel ratio is increasing or decreasing.

4,101,404
HOT GAS MEASURING DEVICE

Robert N. Blumenthal, 17470 Bard Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Wauwatosa, Wis. 53226
Filed Jun. 28, 1976, Ser. No. 700,659
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **11 Claims**

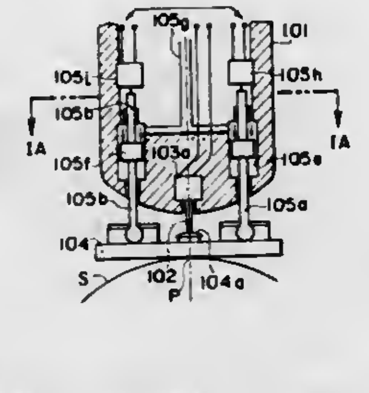
10. In a gas measuring device for measuring a characteristic of high temperature gases, and having a solid electrolyte and means for mounting said electrolyte with a portion of its surface exposed to the gas which is to be measured, and having an electrode in contact with said exposed electrolyte surface and spring means pressing said electrode and electrolyte together, the improvement wherein said electrode comprises at least two



open mesh screens made of electrically conductive material, said screens being mounted in face-to-face contact with each other transverse to the direction of action of said spring means.

4,101,405
SHAPING APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research (IJR) Inc., Yokohama, Japan
Division of Ser. No. 228,155, Feb. 22, 1972, abandoned. This application Nov. 19, 1976, Ser. No. 743,519
Claims priority, application Japan, Feb. 19, 1971, 46-8312; Feb. 22, 1971, 46-8305; Feb. 22, 1971, 46-8306; Mar. 26, 1971, 46-18265; May 21, 1971, 46-34536; May 28, 1971, 46-36270
Int. Cl.² B23P *1/02, 1/12;* B24B *17/00;* B23D *5/04*
U.S. Cl. 204—224 M **15 Claims**



1. An apparatus for shaping a workpiece comprising:

a sensor adapted to scan a model and generating a plurality of signals defining a plane tangent to the surface of said model and the direction of curvature of said surface at a sensed point;

a workpiece support adapted to receive said workpiece;

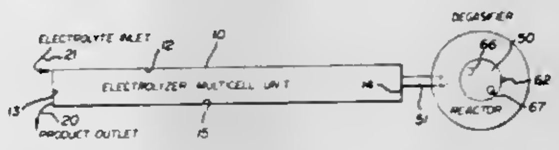
a tool having an axis and juxtaposed with said workpiece;

a tool support carrying said tool; and

means connected with at least one of said supports and operatively connected with said sensor for relatively displacing said workpiece and said tool with respect to a multiplicity of axes for maintaining the tool axis normal to a contour generated in said workpiece by said tool, said sensor comprising a plurality of fingers biased in the direction of said model, respective mechanical/electrical transducers for converting the positions of each of said fingers into an electrical analog signal representing said position, said means connected to at least one of said supports including respective servomotors responsive to said signals.

4,101,406
SIMPLIFIED ELECTROLYTIC SYSTEM

G. Oscar Westerlund, Vancouver, Canada, assignor to Gow Enterprises Limited, Vancouver, Canada
Continuation-in-part of Ser. No. 693,888, Jun. 8, 1976, Pat. No. 4,052,287. This application Jun. 29, 1977, Ser. No. 811,238
Claims priority, application Canada, Apr. 1, 1976, 249382
Int. Cl.² C25B *15/08, 9/00*
U.S. Cl. 204—239 **17 Claims**



1. A closed loop system for effecting an electrolysis reaction and for subsequently removing reacted products of electrolysis, including: (1) a multicell electrolyzer in the form of a generally rectangular parallelepiped vessel and comprising: (A) inlet means for fresh electrolyte thereto, and outlet means for electrolyte soluble ion and gaseous products of electrolysis therefrom, inlet means for recycled electrolyte and electrolyte soluble ion products of electrolysis thereto and outlet means for electrolyte soluble ion products of electrolysis therefrom; (B) a plurality of interconnected electrolytic cells provided with bipolar metal electrodes disposed in the path of the electrolyte flow between the fresh electrolyte inlet means and the electrolyte soluble ion and gaseous electrolysis products outlet means, one end wall providing an anodic terminal connection, the other end wall providing a cathodic terminal connection, with an anode bus bar connected to the anode terminal connection and a cathodic bus bar connected to the cathodic terminal connection, wherein the electrolyte soluble ion and gaseous electrolysis products outlet means are from an electrolytic cell whose electrical potential is about the same as that of an electrolytic cell to which the recycled electrolyte and electrolyte soluble ion products of electrolysis return, the cover of said electrolyzer sloping to provide increasing cross-sectional area in the direction from the fresh electrolyte inlet means to the electrolyte soluble ion and gaseous electrolysis products outlet means, the floor of said electrolyzer sloping to provide decreasing cross-sectional area in the direction from recycled electrolyte and electrolyte soluble ion products of electrolysis inlet means to the electrolyte soluble ion products of electrolysis outlet means; (C) a downwardly sloping front wall; (D) wedge means disposed between the electrodes and the front wall, thereby to hold the electrodes in place, and when thus assembled, to simplify installation and to minimize internal liquor spacing between electrodes; (E) removable cover means to provide said sloping cover; (F) a lower liquor distributing trough connected to the recycled electrolyte and electrolyte soluble ion products of electrolysis inlet means and disposed below the assembled bipolar electrode modules for distributing liquor to the interelectrode zones between said electrodes; (G) a top liquor distributing channel disposed above the assembled electrode modules and leading directly to the electrolyte soluble ion and gaseous electrolysis products outlet means; and (H) circulation means provided by internal pumping action due to the construction and arrangement of the electrodes and the rising gaseous products of the electrolysis; and (2) a reactor/degasifier in the form of a generally upright cylindrical vessel and including (A) inlet means for electrolyte soluble ion and gaseous electrolysis products from said electrolyzer and outlet means near the bottom of said reactor for recycled electrolyte and electrolyte soluble ion products of electrolysis to said electrolyzer; (B) a pipe riser connected directly to said inlet means and discharging near the top thereof; (C) degasifier means disposed atop the reactor means, the degasifier means including an upper liquor-free zone having outlet means for the separated gaseous products of electrolysis and having an open bottom communicating with, or being, an opening at the top of said reactor for the introduction of electrolyte soluble ion and

gaseous electrolysis products into said degasifier means and for the recirculating of largely degasified electrolyte and electrolyte soluble ion products of electrolysis into said reactor; and (D) indirect cooling means for said reactor.

4,101,407

HORIZONTAL ELECTROLYZERS WITH MERCURY CATHODE

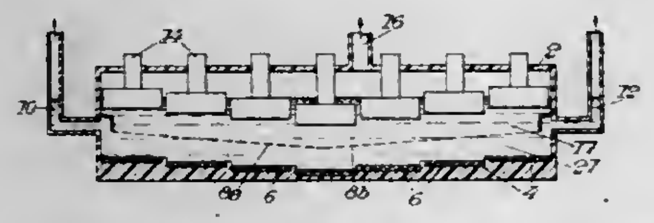
Pierre Hilaire, Grenoble, and Georges Lonchampt, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 28, 1977, Ser. No. 763,614

Claims priority, application France, Jan. 30, 1976, 76 03015

Int. Cl.^{2} C25B *1/46, 1/40*

U.S. Cl. 204—251 **15 Claims**



1. A horizontal mercury cathode electrolyzer comprising:
a housing,
diaphragm means separating a lower cathode compartment and an upper anode compartment in said housing,
a plurality of parallel channels located in said cathode compartment and inclined at a slight longitudinal angle to the horizontal, said channels being vertically staggered with respect to each other,
means for delivering mercury to the upper end of each of said channels and for collecting and evacuating said mercury at the lower end of each said channel,
and anode means in said anode compartment,
said diaphragm means being approximately parallel to a plane passing through the longitudinal midlines of said channels and to said anode means.

4,101,408

COUNTERCURRENT EXTRACTION COLUMN FOR LIQUID-LIQUID EXTRACTION

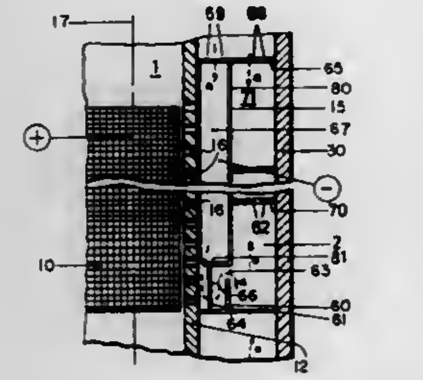
Helmut Schmieder, Karlsruhe; Hubert Goldacker, Hochstetten, and Werner Roos, Leimersheim, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Dec. 30, 1976, Ser. No. 757,062

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559337

Int. Cl.^{2} C25C *7/00*

U.S. Cl. 204—272 **7 Claims**



1. In a countercurrent extraction column for a liquid-liquid extraction of two phases which are insoluble in each other, with simultaneous electrolysis, including: an outer tube, an inner tube within said outer tube, said inner tube dividing said column into an inner anode chamber and an outer cathode chamber which encloses the anode chamber without the use of a diaphragm, a plurality of bores establishing communication between said anode chamber and cathode chamber, an anode in said anode chamber, a cathode in said cathode chamber; the improvement comprising a hollow sheet metal cylinder around the inner tube in the area of the bores between the cathode chamber and the anode chamber, said cylinder acting as a cathode cylinder member and being chargeable in its interior by one of the phases through bores located at the top of the cylinder, and a plurality of radially inwardly extending sheet metal strips which are attached to the interior surface of said cylinder and which are distributed over the circumference of the cylinder.

4,101,409

ELECTROLYTIC FLOTATION APPARATUS

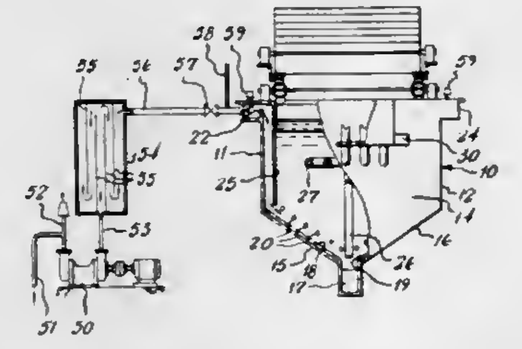
Eric Pani Austin, Sandbach, England, assignor to Simon-Hartley Limited, Staffordshire, England

Filed Apr. 25, 1977, Ser. No. 790,807

Claims priority, application United Kingdom, May 12, 1976, 19515/76

Int. Cl.^{2} C02B *1/82, 1/20*

U.S. Cl. 204—277 **2 Claims**



1. Apparatus for the treatment of a liquid comprising a tank equipped with at least one electrode assembly in the base thereof for the generation of gas bubbles by electrolytic action, means for supplying the liquid to be treated to the tank for flow therethrough, means for collecting the treated liquid from the tank and means for gathering thickened material which collects on the surface of the liquid within the tank, characterised in that the means for supplying the liquid to be treated to the tank includes a line having a high pressure section and a low pressure section separated by a pressure reducing valve located immediately prior to the connection between said line and the tank, means for pumping the liquid through the line and means for bleeding air into the high pressure section of the line.

4,101,410

ELECTRODE ASSEMBLY WITH FLEXIBLE GAS BAFFLE CONDUCTOR

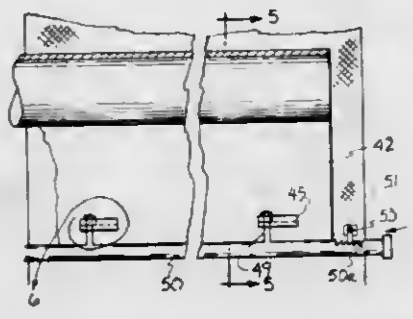
Morton S. Kircher, Eaton, N.Y., and Maynard F. Engler, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 26, 1977, Ser. No. 836,458

Int. Cl.^{2} C25B *13/00, 11/03, 9/00*

U.S. Cl. 204—282 **22 Claims**

1. An electrode assembly which comprises:
a. a vertically inclined common electrode conductor bar;
b. at least two opposed electrode working faces; and
c. movable, electrically-conductive, downwardly opening, gas baffle means for connecting said faces to said conductor bar, for biasing said working faces away from one another and for redirecting flow of gases between said working faces from an upward to a primarily sideways direction parallel to said faces.



4,101,411

PLASMA ETCHING APPARATUS

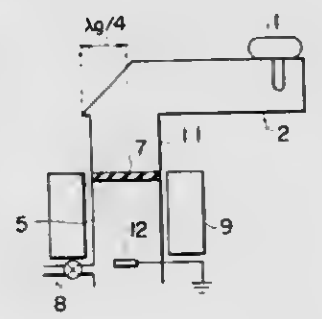
Keizo Suzuki; Sadayuki Okudaira, both of Kokubunji; Ichiro Kanomata, Fuchu, and Noriyuki Sakudo, Ohme, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 15, 1977, Ser. No. 787,878

Claims priority, application Japan, Apr. 15, 1976, 51-42787; Apr. 15, 1976, 51-42788

Int. Cl.^{2} C23C *15/00;* **B01K** *1/00*

U.S. Cl. 204—298 **7 Claims**



1. In a plasma etching apparatus comprising:
microwave generator means;
waveguide means coupled to said generator for propagating microwaves therefrom;
a discharge area;
coupling means for introducing the microwave power from said waveguide into said discharge area;
magnetic field supplying means for applying an external magnetic field to said discharge area; and
gas supply conduit means to introduce a discharge gas into said discharge area;
whereby the surface of a substrate disposed in said discharge area is processed by ions, radical atoms and radical molecules in a plasma produced within said discharge area;
the improvement wherein said coupling means comprises a round waveguide means to introduce the microwave power and wherein said discharge area is provided within said round waveguide.

4,101,412

PROCESS AND APPARATUS FOR RAPID PYROLYSIS OF CARBONACEOUS MATERIALS

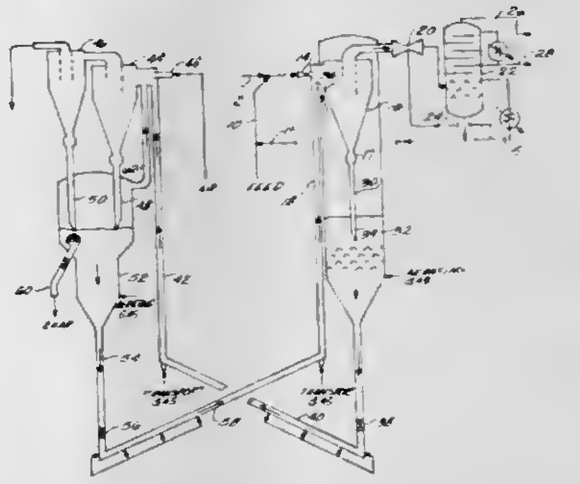
Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,049

Int. Cl.^{2} B01D *45/12;* **C10B** *49/16, 55/08;* **C10G** *1/00*

U.S. Cl. 208—8 **30 Claims**

1. In a process for the pyrolysis of carbonaceous materials wherein the carbonaceous material is primarily pyrolyzed by heat transferred thereto from a high temperature, particulate solid source of heat to yield as products of pyrolysis, a pyrolytic vapor including condensible and noncondensible hydrocarbons and a particulate carbon containing solid residue, the improved method of achieving rapid pyrolysis which comprises:
(a) tangentially introducing to and passing along the path formed by the curved inner surface of a cyclone reaction separation zone having a vapor outlet at one end and a solids outlet at the base thereof, a high velocity stream of carbonaceous material, while;
(b) introducing into the high velocity stream of carbonaceous material at about the entrance of said cyclone reaction separation zone a high velocity, high temperature stream of the particulate solid source of heat contained in a carrier gas which is nondeleteriously reactive with respect to the products of pyrolysis at an angle inclined to the path of travel of said carbonaceous material to penetrate and initiate pyrolysis of said carbonaceous material, the introduced quantity of particulate source of heat being sufficient to raise the carbonaceous material to a pyrolysis temperature of at least about 600° F while simultaneously;
(c) separating a gaseous mixture of the carrier gas and pyrolytic vapor from a solids mixture including the particulate solid source of heat and the carbon containing solids residue by the formation of a separate flow pattern of each mixture, the formed flow patterns being created by centrifugal forces induced at least in part by the high introduction velocities of each feed stream.



4,101,413

EXTRACTION OF COAL

William Derek Jones, Bredon, Nr. Tewkesbury; Geoffrey Michael Kimber, Cheltenham; James McLaren, Gotherington, and David Watkin Price, Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation-in-part of Ser. No. 626,845, Oct. 29, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,314

Claims priority, application United Kingdom, Nov. 8, 1974, 48448/74

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—8 **8 Claims**

1. A high boiling aromatic solvent oil for the solvent extraction of coal, produced by extracting a heavy petroleum material with a solvent which selectively removes the aromatic components which are suitable for use as a solvent for coal from the material, admixing the extract with an aromatic solvent selected from benzene, toluene and xylene, washing out with water the selective solvent from the admixture and recovering said aromatic components to form said solvent oil.

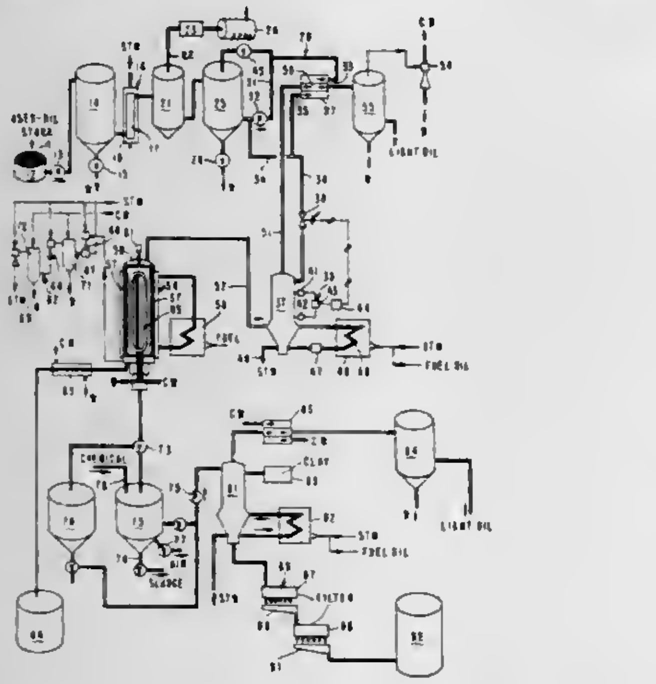
4,101,414
REREFINING OF USED MOTOR OILS

Yang J. Kim, Villa Park, and Belton R. Williams, Naperville, both of Ill., assignors to Unitech Chemical Inc., Chicago, Ill.

Filed Sep. 2, 1975, Ser. No. 609,183

Int. Cl.² C10G *7/00;* C10M *11/00*

U.S. Cl. 208—18 **13 Claims**



1. A method for rerefining used lubricating oils, comprising the steps of: predistilling a used oil stock by steam stripping said stock within the range of between about 480° F. and about 650° F. and below the cracking temperature thereof for at least 4 hours, said predistilling step removing NO_x gases, a light oil component and residual water from the stock to leave a predistilled stock; thereafter vacuum distilling the predistilled stock at below the cracking temperature thereof in a high vacuum environment, said vacuum distilling step including forming a thin film of the predistilled stock on a heated surface and wiping said film to assist in evaporating the stock and to avoid coking, fouling and buildup of impurities, and said vacuum distilling step including vaporizing a vacuum distilled stock to separate it from a viscous concentrate.

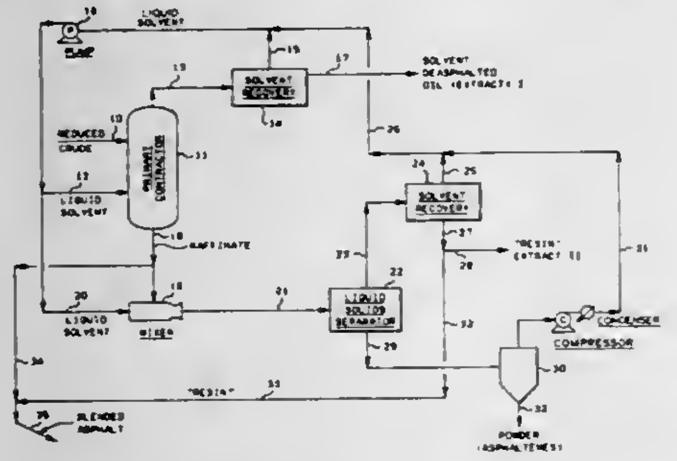
4,101,415
SOLVENT DEASPHALTING

Ralph P. Crowley, Woods Cross, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 14, 1977, Ser. No. 777,217

Int. Cl.² C10C *1/18, 3/08*

U.S. Cl. 208—45 **6 Claims**



1. A process for producing a paraffinic-waxy fraction, a resin-naphthenic fraction, and a solids-asphaltene fraction from an asphalt-containing heavy hydrocarbon material which comprises the steps of:

(a) contacting a hydrocarbon charge stock containing asphaltic materials and resins with a first portion of a selective solvent comprising light paraffins and mixtures thereof at a relatively low solvent-to-hydrocarbon volumetric ratio in the range of 2:1 to 10:1 and under extraction conditions of temperature and pressure sufficient to separate a first solvent-rich extract fraction containing paraffins and waxy materials and a first solvent-lean raffinate fraction containing resins, naphthenes, and asphaltene,

(b) separating paraffinic waxy materials from said first solvent-rich extract phase and recovering a paraffinic waxy phase and solvent,

(c) contacting said first solvent-lean raffinate fraction with a second portion of said selective solvent at a solvent-to-hydrocarbon volumetric ratio higher than said ratio in (a) and at a temperature and pressure lower than in (a) such that asphaltic solids are formed in the presence of a large excess of solvent and that substantially all soluble materials are dissolved in a second solvent-rich extract phase,

(d) passing the admixture formed in (c) to a liquid-solids phase separation zone and allowing the admixture to phase separate into a heavy solids-containing phase and a solvent-hydrocarbon phase relatively free from asphaltenes,

(e) separating a resin extract fraction from said solvent-hydrocarbon phase of (d) and recovering a resin fraction and solvent, and

(f) passing said heavy solids-containing phase to a flashing zone and therein subjecting same to flashing conditions of temperature and pressure sufficient to separate residual solvent therefrom and yield a powdered asphaltic product comprising asphaltenes.

4,101,416
PROCESS FOR HYDROGENATION OF HYDROCARBON TARS

Geoffrey E. Dolbear, Diamond Bar, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,002

Int. Cl.² C10G *13/06;* C07C *15/02*

U.S. Cl. 208—108 **18 Claims**

1. A process for hydrogenation of hydrocarbon tars of high asphaltene content which comprises:

(a) forming a fluid solution of a hydrocarbon tar having an asphaltene content at least about 50% by weight in an aromatic hydrocarbon solvent for the hydrocarbon tar, said aromatic hydrocarbon solvent having a boiling point of from about 300° to about 750° F and formed as a product during the hydrogenation of the hydrocarbon tar to a hydrogen content of from about 1.2 to about 1.5 atoms of hydrogen per atom of carbon;

(b) hydrogenating the tars while maintaining a substantial portion of the solution in the liquid state in the presence of a hydrogenation catalyst and externally supplied hydrogen in an amount of at least about 3 times the amount of hydrogen consumed during hydrogenation at a temperature above about 500° F and a pressure from about 1500 to about 5000 psig for a time sufficient to react hydrogen with the tars and reduce the molecular weight of the tar constituents to form additional aromatic hydrocarbon solvent for the tars; and

(c) recovering at least a portion of the aromatic hydrocarbon solvent formed during the hydrogenation from the effluent of the hydrogenation zone and using the recovered aromatic hydrocarbon solvent in preparing the solution of hydrocarbon tar for feed to the hydrogenation zone.

4,101,417
METHOD OF NEGATING THE EFFECTS OF METALS POISONING ON ZEOLITIC CRACKING CATALYSTS

Bruce Richard Mitchell, Sarver, and Harold Eugene Swift, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 4, 1976, Ser. No. 729,183

Int. Cl.² C10G *11/04;* B01J *8/24*

U.S. Cl. 208—120 **6 Claims**

1. In a process which comprises contacting a hydrocarbon feed with a zeolite-containing cracking catalyst containing at least 1,500 ppm nickel equivalents as metal contaminants in a cracking zone under cracking conditions without added hydrogen to produce a gasoline fraction; the improvement which comprises contacting said catalyst with a tin compound so as to deposit at least 2,000 ppm tin on said catalyst.

4,101,418
CATALYTIC REFORMING OF A NAPHTHA FRACTION

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 699,748, Jun. 24, 1976, Pat. No. 4,046,711. This application Jun. 6, 1977, Ser. No. 803,693

Int. Cl.² C10G *35/08*

U.S. Cl. 208—139 **11 Claims**

1. A process for the catalytic reforming of a naphtha fraction which comprises passing said naphtha fraction and hydrogen in contact with a germanium-promoted platinum group metal catalyst at reforming conditions, said catalyst having been prepared by impregnating a porous high surface area carrier material with a non-aqueous solution of a platinum group metal compound and a halo-substituted germane containing less than four halo substituents in an amount to provide a final catalyst containing from about 0.05 to about 1.0 wt. % platinum group metal and from about 0.05 to about 1.0 wt. % germanium, and drying and calcining the thus impregnated carrier materials, said platinum group metal compound being selected from the group consisting of chloroplatinic acid, platinum chloride, ammonium chloroplatinate, dinitrodiaminoplatinum, palladium chloride, chloropalladic acid, rhodium chloride, ruthenium chloride, ruthenium oxide, osmium chloride and iridium chloride.

4,101,419
SEPARATOR FOR SEPARATING HIGHER DENSITY METAL VALUES FROM EARTHEN MATERIAL

Thomas W. Bergman, R.F.D. Rte. 1, Morgan, Utah 84050

Continuation-in-part of Ser. No. 576,734, May 12, 1975, abandoned. This application Jun. 11, 1976, Ser. No. 695,238

Int. Cl.² B03B *5/62*

U.S. Cl. 209—13 **10 Claims**

9. A method for separating higher density metal values from lower density earthen materials comprising the steps of:

preparing a separator cone as a right conical surface and orienting the axis of the cone vertically with the cone being divergent upwardly;

attaching a transparent, hollow, cylindrical column to the apex of the cone so that the column is in fluid communication with the interior of the cone;

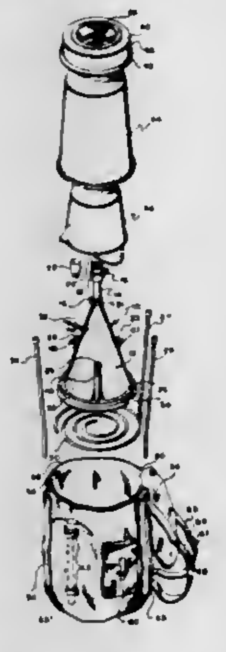
introducing water into the column and cone by diffusing at least a portion of the water into the column adjacent the lower end of the column;

screening a quantity of earthen material containing higher density metal values into the cone, the screen admitting only particles of a predetermined size into the cone;

visually observing the flow of particles into the column while regulating the flow of water diffusing into the column thereby separating higher density metal values from lower density earthen materials by forcing the lower density earthen materials upwardly in the cone with the water while allowing higher density metal values to fall downwardly into the column;

attaching a water-filled collection reservoir to the lower end of the transparent column in fluid communication with the column;

interposing a valve means between the column and the collection reservoir; and



removing metal values from the column without disturbing the operation of the column by visually observing when the metal values have accumulated in the bottom of the column and opening the valve means thereby permitting the metal values to fall into the collection reservoir upwardly displacing water therein.

4,101,420
APPARATUS FOR ORIENTING AND SORTING ELONGATED ARTICLES

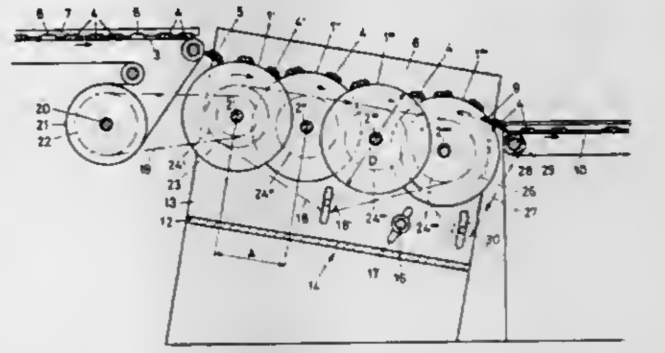
Pierre Luginbühl, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 31, 1977, Ser. No. 783,452

Claims priority, application Switzerland, Apr. 1, 1976, 4091/76

Int. Cl.² B07B *13/04*

U.S. Cl. 209—104 **5 Claims**



1. An apparatus for sorting and orienting elongated articles of predetermined length, comprising:

(a) at least two substantially horizontal shafts supported in a parallel-spaced relationship;

(b) a pair of axially spaced discs mounted on each shaft; the axial distance between the discs of any disc pair being less than said predetermined length; any successive two discs mounted on different shafts being in an overlapping relationship as viewed in a direction parallel to said shafts; each disc having a non-overlapping upper circumferential portion; the orientation of the circumferential portions of successive discs determining the direction of article feed;

(c) means for successively positioning articles on the first disc pair as viewed in said direction of article feed, in a generally transverse orientation with respect to said direction of article feed; and

(d) means for driving said discs unidirectionally for effecting movement of each said circumferential portion in said direction of article feed for advancing each article successively on the circumferential portions of successive discs in said direction of article feed, effecting alignment of articles into an orientation perpendicular to said direction of article feed and effecting, between the discs of one of said disc pairs, dropout of articles shorter than said predetermined length.

4,101,421
CENTRIFUGE DRUM WITH LATERAL FILTRATION

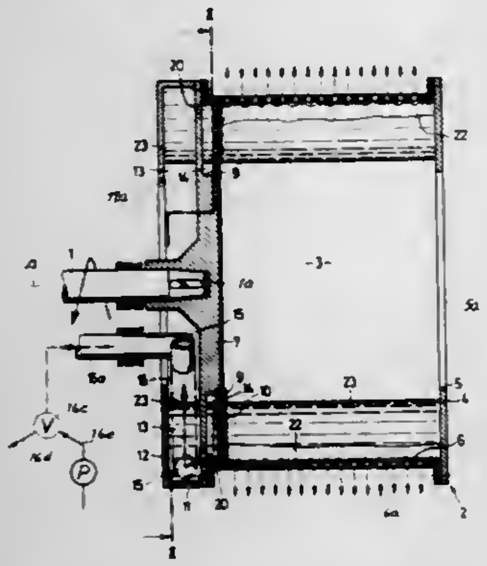
Günther Hultsch, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,171

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603610

Int. Cl.^{2} B01D *21/26, 33/02*

U.S. Cl. 210—78 **8 Claims**



1. A suspension-separating centrifuge comprising:
a support;
a drum mounted for rotation on said support;
a driving shaft rotatable on said support and keyed to said drum for rotating said drum about an axis, said drum including
a perforated shell forming a body of revolution surrounding said axis and adapted to centrifugally discharge liquid from a suspension and collect a filter cake on the interior of said shell upon rotation of said drum,
a filter ring lying transversely of said shell at one axial end thereof, said ring lying in a plane substantially perpendicular to said axis and being formed with perforations, wall means lying transversely of said shell at the other axial end thereof, and
means on said drum forming an annular chamber of a radius at least equal to that of said ring and communicating with the interior of said drum through perforations formed in said ring; and
means for withdrawing liquid from said annular chamber, said annular chamber being formed as an inwardly open trough, said means for withdrawing liquid being a scoop tube displaceable on said support to extend to an adjustable depth into said trough and forming a liquid outlet for withdrawing liquid from said trough.

4,101,422
COPOLYESTERS USEFUL IN BLOOD SEPARATION ASSEMBLIES

James Lamont, and Robert J. Braun, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed May 11, 1977, Ser. No. 795,992

Int. Cl.^{2} B01D *21/26*

U.S. Cl. 210—84 **4 Claims**

1. A method of separating the serum and clot portions of a blood sample which comprises centrifuging the blood in a blood separation assembly with a small but effective amount of an inert, homogeneous, hydrophobic copolyester having a 210° F viscosity of 2,000 to 8,000 centistokes, density in the range 1.015 to 1.060 g/cm^3 and obtained by the reaction of essentially stoichiometric amounts of

(a) a saturated aliphatic dicarboxylic acid having 4 to 12 carbon atoms,

(b) a polymeric fatty acid containing 75% by weight or more C_{36} dibasic acid, and

(c) a branched-chain aliphatic dihydric alcohol having 3 to 8 carbon atoms, a mixture of said branched-chain dihydric alcohols, or a mixture containing at least 50% by weight said branched-chain aliphatic dihydric alcohols and a straight-chain aliphatic dihydric alcohol having 2 to 8 carbon atoms, the equivalents ratio of (a) to (b) ranging from 0.80:0.20 to 0.97:0.03, until the copolyester locates at the interface between the serum and clot portions and forms a continuous integral barrier therebetween.

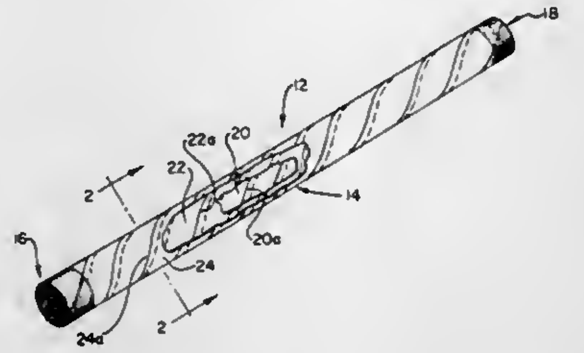
4,101,423
TUBULAR FILTRATION ELEMENT AND METHOD OF MAKING IT

Wayne S. Merrill, Nashua, N.H.; James H. Edwards, Winchester, and Bernard R. Danti, Lexington, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 565,094, Apr. 4, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,763

Int. Cl.^{2} B01D *27/00, 29/06*

U.S. Cl. 210—494 M **8 Claims**



7. A fragile tubular filter element having the low resistance to liquid flow characteristic of a microporous membrane, that retains its tubular shape when not under load, for use for inside-to-outside liquid flow, that requires supportive engagement within a rigid, liquid-permeable, encasing support member for downstream hydraulic support when in use, said filter element comprising three substantially coextensive layers nested one within the other, said layers being disposed as an inner layer, an intermediate microporous layer, and an outer layer, each layer being formed from a separate, helically wound, thin web of liquid-permeable material, each layer having marginal edges that are disposed in overlapping relation, the confronting surfaces of the overlapped edges of the inner layer and of the intermediate microporous layer respectively being bonded to each other, said inner layer being formed from high wet strength paper that has sufficient rigidity to provide mechanical support for the element and being highly porous with a bubble point that is or approaches zero and being more permeable to liquid flow that the intermediate microporous layer, the intermediate microporous layer being formed from a fragile,

sterilizing grade, sterilizable, hydrophilic microporous membrane, the outer layer being formed from a finely porous plastic sheet material that has a low bubble point relative to that of the microporous membrane and that has a structure that permits lateral flow, the porosity of the inner and outermost layers being sufficiently great that the bubble point of the microporous membrane is not significantly affected, and two terminal rings of cured synthetic polymeric material, one at each of the ends of the tubular element respectively, said polymeric material being hydrophilic and impregnating the three layers at each of the ends of the element respectively and uniting them in a 3-dimensional monolithic polymeric ring structure that is reinforced by the impregnated end portions of the layers, without substantially affecting the bubble point of the microporous membrane, each of said rings sealing its respective end of the element against leakage when the element is in use, and each imparting mechanical strength to the element.

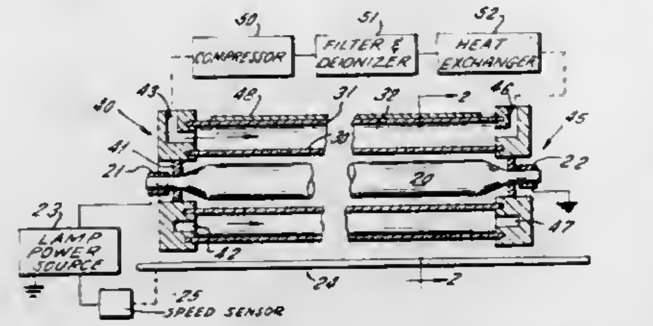
4,101,424
WATER JACKET FOR ULTRAVIOLET LAMP

Willard A. Schooley, Denville, N.J., and Robert E. Browne, E. Northport, N.Y., assignors to Sun Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 579,834, May 22, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,427

Int. Cl.^{2} G01J *1/00*

U.S. Cl. 250—504 **18 Claims**



1. An ultraviolet lamp assembly for producing a generally focused band of ultraviolet radiation comprising, in combination:

an elongated ultraviolet radiation producing lamp having spaced terminals;

electrical power source means connected to said spaced terminals for energizing said lamp;

an elongated liquid-conducting jacket surrounding said lamp and being substantially coextensive with said lamp; said jacket being of a material which is substantially transparent to ultraviolet radiation;

a source of cooling liquid connected to said liquid-conducting jacket and circulating cooling liquid down the length of said jacket; said lamp being thermally coupled to said cooling liquid, whereby a portion of the heat produced by said lamp is transferred to said cooling liquid and is removed from the vicinity of said lamp;

means for deionizing said cooling liquid;

and elongated curved reflector means at least partly surrounding said lamp and intercepting at least a part of the radiation of said lamp and reflecting and generally focusing a part of said radiation into said generally focused band.

4,101,425
NON-AQUEOUS ACID EMULSION COMPOSITION AND METHOD FOR ACID-TREATING SILICEOUS GEOLOGICAL FORMATIONS

Donald C. Young, Fullerton, and George P. Maly, Newport Beach, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Apr. 21, 1975, Ser. No. 569,890

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—8.55 C **18 Claims**

1. A substantially anhydrous emulsion comprising: (1) about 5 to 95 weight percent of an acid component comprising (a) about 50 to 99 weight percent of polyphosphoric acid having about 5 to 86 weight percent of the total P_2O_5 present as polymeric P_2O_5, and (b) about 2 to 8 weight percent of hydrofluoric acid; (2) about 5 to 95 weight percent of an organic solvent component; (3) about 0.01 to 3.0 weight percent of an anionic or nonionic surfactant component; and wherein the H_2O/P_2O_5 mole ratio of the overall emulsion is less than 3.4.

4,101,426
ACID COMPOSITION AND METHOD FOR ACID TREATING GEOLOGICAL FORMATIONS

George P. Maly, Newport Beach, and Donald C. Young, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 496,144, Aug. 9, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,562

Int. Cl.^{2} E21B *43/27*

U.S. Cl. 252—8.55 C **18 Claims**

1. An acid composition comprising a substantially anhydrous liquid mixture containing about 60 to 95 weight percent of polyphosphoric acid having about 40 to 86 percent of the total P_2O_5 present as polymeric P_2O_5, about 2 to 8 weight percent of hydrofluoric acid, and wherein the H_2O/P_2O_5 mole ratio of the overall acid mixture is less than 3.4.

4,101,427
LUBRICANT COMPOSITION

Harold Shaub, New Providence, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 9, 1977, Ser. No. 766,917

Int. Cl.^{2} C10M *1/48, 3/42, 5/24, 0/46*

U.S. Cl. 252—32.7 E **9 Claims**

1. A lubricating composition having improved antifriction properties comprising a base oil and an additive mixture of from about 0.1 to about 1.5 grams of t-alkyl primary amine salt of dialkyldithiophosphate per 100 grams of base oil and from about 0.1 to about 5.0 grams, per 100 grams of base oil, of a metal dialkyldithiophosphate wherein said metal is a transition metal and the oxide of said metal exhibits a Mohs hardness of about 3 or more.

4,101,428
COMPOSITION COMPRISING A MIXTURE OF THE ZINC SALTS OF O,O-DI(PRIMARY AND SECONDARY) ALKYLDITHIOPHOSPHORIC ACIDS

John Crawford, Hornsea, England, assignor to Chevron Research Company, San Francisco, Calif.

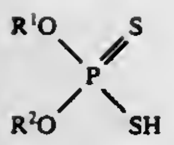
Filed Feb. 22, 1977, Ser. No. 770,866

Claims priority, application United Kingdom, Feb. 25, 1976, 7402/76

Int. Cl.^{2} C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **8 Claims**

1. A lubricant composition comprising a major amount of a lubricating base oil and from 0.001 to 15% by weight of a mixture of zinc salts of 0,0′-dialkyldithiophosphoric acids having the structural formula:



wherein R^1 and R^2 are the same or different and are either C_1 to C_{30} primary alkyl groups or C_4 to C_{20} secondary alkyl groups, and wherein said mixture is prepared by contacting a feedstock comprising a mixture of one or more C_1 to C_{30} primary alcohol(s) and one or more C_4 to C_{20} secondary alcohol(s) with phosphorus pentasulphide to form a mixture of 0,0′-dialkyldithiophosphoric acids and thereafter neutralising the mixture of acids by contact with zinc oxide, the secondary alcohol(s) forming not less than 25 mole percent of the feedstock mixture.

4,101,429
LUBRICANT COMPOSITIONS

August H. Birke, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 21, 1977, Ser. No. 817,875

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **6 Claims**

1. A lubricating oil composition comprising:

a major amount of an oil of lubricating viscosity and containing dissolved therein (1) from about 0.25 to about 1.75 weight percent of a zinc dialkyl dithiophosphate; from about 0.07 to about 0.5 parts per part by weight of said zinc dithiophosphate of a mixture of (a) a dimeric acid produced by the condensation of unsaturated aliphatic monocarboxylic acids having between about 16 and 18 carbon atoms per molecule, and (b) the reaction product obtained by reacting a monocarboxylic acid, a polyalkylene polyamine having more than one nitrogen atom per molecule, and an alkenyl succinic anhydride in a weight ratio of (a) to (b) from about 0.001 to 50 to about 15:0.001; and from 0.035 to about 0.25 parts of a substantially neutral zinc salt of a dialkylated aromatic sulfonic acid per part by weight of said zinc dithiophosphate.

4,101,430
LUBRICANT COMPOSITIONS

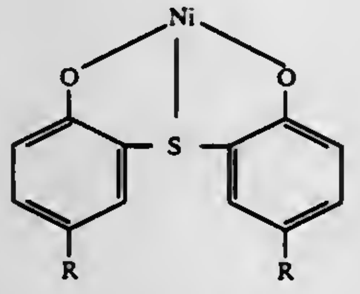
Milton Braid, Westmont, and Samuel J. Leonardi, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 15, 1977, Ser. No. 768,925

Int. Cl.² C10M *1/54, 3/48, 5/28, 7/52*

U.S. Cl. 252—42.7 **14 Claims**

1. A lubricant composition comprising a major amount of a lubricant base and a minor amount effective for stabilizing said composition against oxidative degradation of an organo-nickel complex having the structure



in which R is either hydrogen or an alkyl group having up to 30 carbon atoms.

4,101,431
TURBINE LUBRICANT

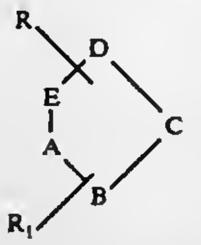
Lawrence F. Kuntschik, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 12, 1977, Ser. No. 796,104

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 **10 Claims**

1. A vapor phase rust inhibited, oxidation stable, lubricating composition having improved air release properties and comprising in combination, a major amount of a mineral lubricating oil; a minor effective oxidation stabilizing amount of a heterocyclic antioxidant compound of the formula:



wherein R and R_1 are alkyl or aryl, straight or branched chain, or form a six membered ring and have one to 30 carbon atoms each; or can be absent and at least one member of the group ABCDE is carbon and at least three other members are selected from the group of nitrogen, oxygen and sulfur, a minor effective antifoaming amount of a polyacrylate anti-foaming agent, a minor effective vapor phase rust inhibiting amount of a C_8 to C_{10} monocarboxylic fatty acid, a minor work load improving amount of a mixture of synthetic tri(isopropylated phenol) phosphates, a minor effective antioxidant amount of a 2,6-ditertiary alkyl phenol antioxidant and a minor effective antirust amount of a phenol-free antirust concentrate consisting of oil-soluble polycarboxylic acids having alkyl groups of 6 to 30 carbon atoms and alkylacid orthophosphates.

4,101,432
LUBRICANT COMPOSITIONS CONTAINING ORGANOPHOSPHORUS DERIVATIVES OF HYDROXYCARBOXYLIC ACIDS

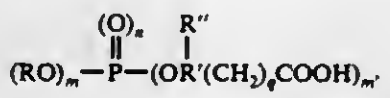
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,630

Int. Cl.² C10M *1/10*

U.S. Cl. 252—49.8 **28 Claims**

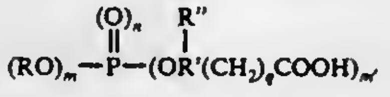
1. A lubricant composition comprising a major amount of an oil of lubricanting viscosity or grease prepared therefrom and a minor load-carrying amount of a compound of the formula:



$$(RO)_m-\overset{\overset{(O)_n}{\|}}{P}-(O\overset{\overset{R''}{|}}{R'}(CH_2)_qCOOH)_{m'}$$

where R is alkyl of 1 to 32 carbon atoms, aryl or alkaryl and R′ is alkylene or arylene and R″ is H, alkyl of 1 to 30 carbon atoms, aryl or alkaryl and where *n* is zero or 1 and *q* is zero or 1 to 30 and *m* and *m′* are 1 or 2 with the proviso that the sum of *m* and *m′* is 3.

17. A compound having the following general formula:



$$(RO)_m-\overset{\overset{(O)_n}{\|}}{P}-(O\overset{\overset{R''}{|}}{R'}(CH_2)_qCOOH)_{m'}$$

where R is alkyl of 1 to 32 carbon atoms, aryl or alkaryl and R′ is alkylene or arylene and R″ is H, alkyl of 1 to 30 carbon atoms, aryl or alkaryl and where *n* is zero or 1 and *q* is zero or 1 to 30 and *m* and *m′* are 1 or 2 and the sum of *m* and *m′* equals 3.

4,101,433
COMPOSITION

Robert F. Purcell, and James R. Selleck, Jr., both of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Mar. 25, 1977, Ser. No. 781,250

Int. Cl.² C10M *3/04*

U.S. Cl. 252—49.5 **4 Claims**

1. A composition consisting essentially of tris(hydroxymethyl)nitromethane and P-1487 in a weight ratio of from about 0.7:1.3 of tris(hydroxymethyl)nitromethane to about 1.3:0.7 of P-1487, the latter consisting essentially of 4-(2-nitrobutyl)morpholine and 4,4′-(2-ethyl-2-nitrotrimethylene)dimorpholine in a ratio of 3.5:1, respectively.

4. A method of controlling the growth of bacteria and fungi in a petroleum-based cutting oil emulsion comprising the step of incorporating in the emulsion an amount of the composition of claim 1 sufficient to provide a concentration of from about 500 to 1500 ppm.

4,101,434
MINERAL OIL COMPOSITIONS WITH AN ISOBUTYLENE POLYMER CONTAINING BOUND 2,6-DI-t-BUTYL PHENOL GROUPS

Douglas Cameron Edwards, and John Walker, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 20, 1977, Ser. No. 789,236

Claims priority, application Canada, May 25, 1976, 253253

Int. Cl.² C10M *1/28*

U.S. Cl. 252—52 R **3 Claims**

1. Improved mineral oil compositions comprising a major proportion of a mineral oil and from about 1 to about 20 weight percent of the total mineral oil composition of an isobutylene polymer containing bound at a terminal position from about 1 to about 20 weight percent of 2,6-di-t-butyl phenol groups attached to the isobutylene polymer at the 4-position of the aromatic phenol ring, the isobutylene polymer having an intrinsic viscosity as determined in toluene at 30° C of from 0.05 to 0.5 dl/g.

4,101,435
MAGNETIC IRON OXIDE-DEXTRAN COMPLEX AND PROCESS FOR ITS PRODUCTION

Masakatsu Hasegawa, Nagoya, and Syusaburo Hokkoku, Kani, both of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 14, 1976, Ser. No. 695,925

Claims priority, application Japan, Jun. 19, 1975, 50-73754

Int. Cl.² H01F *1/00;* **A61K** *29/02, 33/26*

U.S. Cl. 252—62.53 **14 Claims**

1. A water dispersable magnetic iron oxide-dextran complex wherein the proportion of the dextran, calculated as its anhydrous glucose unit, is about 0.1 to about 1 mole per mole of iron oxide, calculated as an iron atom.

4,101,436
CONSTANT BOILING MIXTURES OF 1-CHLORO-2,2,2-TRIFLUOROETHANE AND HYDROCARBONS

Kevin P. Murphy, Orchard Park; Richard F. Stahl, Hamburg, and Sabatino R. Orfeo, Orchard Park, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 21, 1976, Ser. No. 753,054

Int. Cl.² C09K *5/04*

U.S. Cl. 252—67 **12 Claims**

1. Constant boiling mixtures consisting essentially of 1-chloro-2,2,2-trifluoroethane and a hydrocarbon selected from the group consisting of isopentane, n-pentane, n-butane, 2,2-dimethylpropane and isobutane.

7. The process of producing refrigeration which comprises condensing a constant boiling mixture as described in claim 1 and thereafter evaporating said mixture in the vicinity of a body to be cooled.

4,101,437
INHIBITOR FOR AQUEOUS ACID SOLUTIONS

Josef Rones, and Joachim Geldner, both of Detusch, Fed. Rep. of Germany, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 29, 1977, Ser. No. 782,582

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616144

Int. Cl.² C11D *7/32, 7/60*

U.S. Cl. 252—149 **6 Claims**

1. An inhibitor for an aqueous acid solution consisting essentially of the condensation product of a mixture of diethyl- and dibutyl-thiourea with hexamethylenetetramine wherein the weight ratio of diethyl- to dibutyl-thiourea is from 1:5 to 5:1 and wherein the mole ratio of hexamethylenetetramine to thiourea mixture is from 0.1 to 1.1.

5. An inhibited aqueous acidic solution comprising the product of claim 1 and at least one acid selected from the group consisting of hydrofluoric, hydrochloric, sulphuric, amidosulphonic, citric, tartaric and oxalic acids.

4,101,438
SULFONIUM COMPOUNDS AS CORROSION INHIBITORS IN AQUEOUS ACIDIC CLEANING SOLUTIONS

Wayne W. Frenier, and William J. Settineri, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 350,295, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 118,175, Feb. 23, 1971, Pat. No. 3,764,543. This application Mar. 22, 1976, Ser. No. 669,116

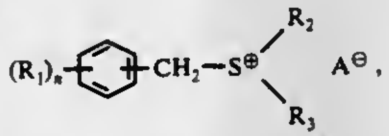
The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl.² C11D *7/34;* **C23G** *1/06*

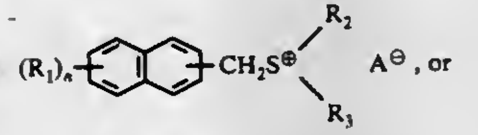
U.S. Cl. 252—151 **20 Claims**

1. An aqueous acidic cleaning solution of at least one organic acid having dissolved or dispersed therein a sulfonium salt corresponding to the formula

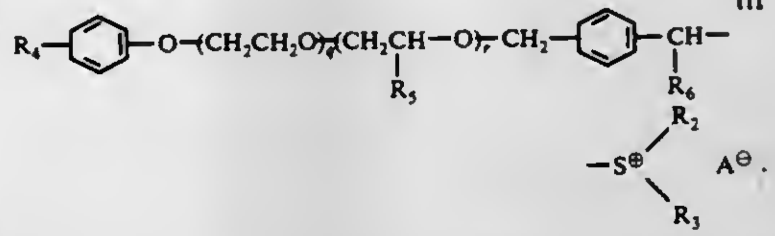
I



II



III



wherein *n* is 1 or 2; each R_1 independently is hydrogen or a hydrocarbyl, a hydrocarbyl whose chain length is interrupted by an atom of oxygen or sulfur, a hydrocarbyloxy or a hydrocarbylthio radical of from 1 to about 24 carbon atoms; R_2 is a hydrocarbyl or inertly-substituted hydrocarbyl radical of from 1 to about 24 carbon atoms, with the proviso that the total aggregate carbon content of R_1 and R_2 is from 7 to about 25; R_3 is an alkyl radical of from 1 to 4 carbon atoms or an inertly-substituted alkyl radical of from 2 to 4 carbon atoms, allyl, phenyl or an inertly-substituted phenyl radical; or R_2 and R_3 are joined to form a 5- or 6-membered heterocyclic ring, with the proviso that the total aggregate carbon content of R_1, R_2

and R_3 is from 10 to about 25; R_4 is alkyl of 4 to about 20 carbon atoms; R_5 is methyl or ethyl; R_6 is hydrogen, methyl or ethyl; *q* is an integer of from 0 to 8; *r* is an integer of from 0 to 10, with the proviso that the sum of *q* plus *r* is equal to or less than 10; and $A^{\ominus}$ is an anion; said sulfonium salt being present in an amount at least sufficient to inhibit the acid-induced corrosion of ferrous metals in contact with said solution and ferric ions.

4,101,439

POLYOL BLENDS AND POLYURETHANE PREPARED THEREFROM

David D. Russell, Atwater, and George Shkapenko, Akron, both of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

Division of Ser. No. 617,655, Sep. 29, 1975, Pat. No. 4,010,146. This application Jul. 6, 1976, Ser. No. 702,936

Int. Cl.² C08G *18/32*

U.S. Cl. 252—182 **1 Claim**

1. A blend of a block copolymer of ethyleneoxide and 1,2-propylene oxide having the formula

$$HO[(C_2H_5—O)_x(C_3H_6—O)_y(C_2H_5—O)_z]H$$

wherein *x* and *z* are integers of from 0 to 22 and *y* is an integer of from 1 to 20 and the molecular weight of the copolymer is between 500 and 3000 and poly(tetramethylene ether)glycol having a molecular weight of from about 500 to about 3000, in a ratio of from about 5 to about 95 parts by weight of the copolymer per 100 parts of poly(tetramethylene ether)glycol, said block copolymer containing from about 60 to about 100 percent primary hydroxyl groups.

4,101,440

CHEMICALLY DIGESTIVE AGENTS

Motoo Akagi; Hazime Morishita; Saburo Nonogaki, all of Tokyo; Makoto Tanaka, Koganel, and Tadao Kaneko, Tokyo all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 15, 1976, Ser. No. 705,529

Claims priority, application Japan, Jul. 23, 1975, 50-89248; Nov. 25, 1975, 50-140215

Int. Cl.² C01B *15/02;* **H04N** *9/60*

U.S. Cl. 252—186 **19 Claims**

1. A chemically digestive agent for releasing photoresist films, said agent comprising hydrogen peroxide and sulfamic acid, wherein the amounts of said hydrogen peroxide and sulfamic acid contained are 0.5 to 10% by weight and 0.001 to 5% by weight, respectively, and a ratio of the amount of the hydrogen peroxide contained to the amount of the sulfamic acid contained is 1:0.001 to 1:2.

4,101,441

COMPOSITION AND METHOD OF INHIBITING CORROSION

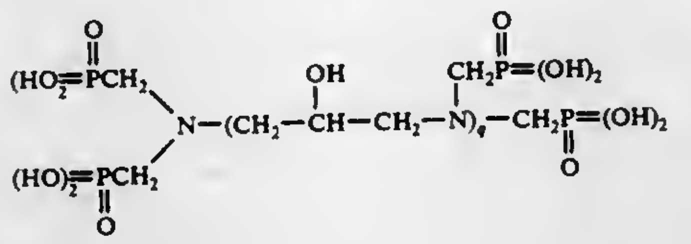
Chih Ming Hwa, Palatine, and Jose T. Jacob, Lake Zurich, both of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 644,654, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 529,175, Dec. 3, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,717

Int. Cl.² C23F *11/16, 11/14, 11/18*

U.S. Cl. 252—389 A **4 Claims**

1. A non-chromate-containing corrosion inhibiting composition which consists essentially of 1 to 80 weight percent azole, 0.1 to 98 weight percent water-soluble phosphate and 1 to 85 weight percent of water-soluble organophosphonic acid, water-soluble salts and esters thereof, said azole being a member of the group consisting of triazoles, pyrazoles, imidazoles, isoxazoles, oxazoles, isothiazoles, thiazoles, and mixtures thereof, said water soluble phosphate being selected from the group consisting of phosphoric acid, disodium phosphate, dipotassium phosphate, sodium tripolyphosphate, tetrapotassium pyrophosphate and tetrasodium pyrophosphate, and said organophosphonic acid having the formula



in which $q = 1 - 10$.

4,101,442

NON-AQUEOUS ANTIFOAM COMPOSITIONS

Meyer Robert Rosen, Spring Valley, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 1, 1976, Ser. No. 691,393

Int. Cl.² B01D *17/00*

U.S. Cl. 252—358 **10 Claims**

1. A non-aqueous antifoam composition consisting essentially of a lipophilic nonionic surface active agent having a hydrophilic-lipophilic balance value of less than 9 homogeneously dispersed in a transient siloxanate antifoam agent, wherein said siloxanate antifoam agent consists essentially of the product resulting from heating, in the absence of water, a mixture consisting essentially of a finely divided silica filler and a condensation product of a partially hydrolyzed trifunctional silane, said condensation product having a residual alkoxy content of at least about 9 percent by weight, said silane being selected from the group consisting of $RSiX_3$ and $RSi(OR')_3$ wherein R is an alkyl radical having 1 to 5 carbon atoms, R' is an alkyl radical having 1 to 4 carbon atoms and X is a halogen atom, wherein the amount ratio of said silica filler to said condensation product ranges from about 1 to about 33 parts by weight of the silica filler per 100 parts by weight of the condensation product, and wherein the amount ratio of said surface active agent to said antifoam agent ranges from about 3 to about 33 parts by weight of the surface active agent per 100 parts by weight of the antifoam agent.

4,101,443

TRANSIENT ANTIFOAM COMPOSITIONS

Meyer Robert Rosen, Spring Valley, and Samuel Sterman, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 1, 1976, Ser. No. 691,394

Int. Cl.² B01D *17/00*

U.S. Cl. 252—358 **8 Claims**

1. A transient non-aqueous antifoam composition, said composition consisting essentially of the product resulting from heating, in the absence of water, a mixture consisting essentially of a finely divided silica filler and a condensation product of a partially hydrolyzed trifunctional silane, said condensation product having a residual alkoxy content of at least about 9 percent by weight, said silane being selected from the group consisting of $RSiX_3$ and $RSi(OR')_3$ wherein R is an alkyl radical having 1 to 5 carbon atoms, R' is an alkyl radical having 1 to 4 carbon atoms and X is a halogen atom, and wherein the amount ratio of said silica filler to said condensation product ranges from about 1 to about 33 parts by weight of the silica filler per 100 parts by weight of the condensation product.

4,101,444

CATALYST DEMETALLIZATION UTILIZING A COMBINATION OF REDUCTIVE AND OXIDATIVE WASHES

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jun. 14, 1976, Ser. No. 695,662

Int. Cl.² B01J *29/38, 8/24;* **C10G** *11/18*

U.S. Cl. 252—411 R **16 Claims**

1. In a process for treating a metal contaminated catalyst which has been poisoned in a hydrocarbon conversion process by a feedstock containing metal poisons to remove at least a portion of the metal contaminants and to produce a catalyst with improved catalytic activity, the improvement which comprises:

(i) removing at least a portion of the metal poison from said catalyst by (a) contacting said catalyst with a liquid reductive wash medium; and (b) subsequently contacting the reductively washed catalyst with a liquid oxidative wash medium; and

(ii) recovering a catalyst of reduced metal poison content and improved catalytic activity.

4,101,445

PREPARATION OF MODIFIED AND ACTIVATED CHROMOCENE CATALYSTS FOR ETHYLENE POLYMERIZATION

Isaac Jacob Levine, Somerville, and Frederick John Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 22, 1976, Ser. No. 725,542

Int. Cl.² C08F *4/76, 4/78*

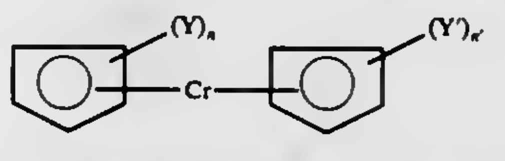
U.S. Cl. 252—429 R **9 Claims**

1. A method for preparing a catalyst for the consistent polymerization of ethylene which comprises the steps of:

(1) drying an inorganic oxide catalyst support, having a high surface area, selected from the group consisting of a alumina, thoria, silica, zirconia, and mixtures thereof at a temperature of about 100° C. to about 800° C.;

(2) slurrying the dried support obtained in step (1) with a substantially anhydrous normally liquid hydrocarbon;

(3) blending the slurry obtained in step (2) with a solution of a chromocene compound having the formula:



wherein each of Y and Y' is a hydrocarbon radical having 1 to about 20 carbon atoms and each *n* and *n'* has a value of 0 to 5, in a normally liquid hydrocarbon and a titanium compound which is soluble in said hydrocarbon and is calcinable to TiO_2 whereby the resultant blend, exclusive of hydrocarbon, contains about 0.02 to about 3.0 weight % of elemental chromium and about 1.0 to about 10 weight % of elemental titanium;

(4) removing the hydrocarbon leaving a solid residue;

(5) adding to the residue from step (4) from 0 to about 2.5 weight % of a fluoridation agent calculated as F; and

(6) heating the product from step (5) in a substantially anhydrous oxygen-containing atmosphere at a temperature of about 300° C. to about 1000° C. until an active ethylene polymerization catalyst is obtained.

4,101,446

LEAD ACETATE IMPREGNATED MAGNESIUM SILICATE FOR THE PRODUCTION OF PERCHLOROMETHYL MERCAPTAN

Milton L. Honig, Bronx, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,120

Int. Cl.² B01J *21/14, 31/04;* **C07C** *145/00*

U.S. Cl. 252—430 **6 Claims**

1. A catalyst composition suitable for the production of perchloromethyl mercaptan consisting essentially of lead acetate, impregnated magnesium silicate, wherein the ratio of lead acetate to magnesium silicate varies from about 3:1 to about 1:3.

3. A method for preparing a catalyst suitable for the production of perchloromethyl mercaptan which comprises contacting lead acetate with a solvent selected from the group consisting of methanol, ethanol, glycerol, ethylene glycol, and water, to form a solution; contacting said solution with magnesium silicate and removing said solvent to produce a dry, powdery product, whereby the ratio of lead acetate to magnesium silicate of said dry, powdery product varies from about 3:1 to about 1:3.

4,101,447

PYRROLIDONE POLYMERIZATION CATALYST SYSTEM

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 20, 1976, Ser. No. 724,801

Int. Cl.² B01J *31/12;* **C08G** *73/16*

U.S. Cl. 252—431 C **8 Claims**

1. A process for making catalysts for the polymerization of 2-pyrrolidone which comprises contacting an alkali metal pyrrolidonate, a tetraalkyl ammonium alkanoate and carbon dioxide in mol ratios of about 1:1.1-2:0.1-0.5.

4,101,448

CATALYST COMPOSITIONS ESPECIALLY USEFUL FOR PREPARATION OF UNSATURATED ACIDS

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 14, 1976, Ser. No. 686,352

Int. Cl.² B01J *27/14, 23/10, 23/14, 23/16*

U.S. Cl. 252—437 **8 Claims**

1. A catalyst having the empirical formula:

$$Mo_aV_bGe_cX_dY_eO_f$$

wherein

X is one or more of the elements selected from the group consisting of iron, nickel, thallium, phosphorus, indium, bismuth, and the rare earths; and

Y is one or more of the elements of the group consisting of copper, tin, chromium, manganese, magnesium, aluminum, titanium, arsenic, niobium, tantalum, potassium, rubidium, cesium, tungsten, uranium, cobalt, silver, gallium, antimony, and zinc; and

wherein the number of atoms of each element present is represented by *a* through *f*,

wherein

a is a number from 6 to 18;
b is a number from 0.1 to 10;
c is a number from 0.1 to 6;
d is a number from 0.01 to 5;
e is a number from 0 to 5;
f is a number that satisfies the valence requirements of the other elements present.

4,101,449

CATALYST AND ITS METHOD OF PREPARATION

Mikio Noda, Nagoya; Yoshinobu Yamaguchi, Seto; Ken-ichiro Uwano, Kariya; Nobuhiro Sato, Nagoya; Tadayoshi Tomita, and Koji Otsuka, both of Yokohama, all of Japan, assignors to Fujimi Kenmazai Kogyo Co., Ltd., Aichi and Toyo Engineering Corporation, Tokyo, both of, Japan

Filed May 9, 1977, Ser. No. 795,417

Claims priority, application Japan, Jul. 20, 1976, 51-86272

Int. Cl.^{2} B01J *21/04, 21/08, 23/78*

U.S. Cl. 252—457 **9 Claims**

1. The method of preparing a sintered shaped catalyst object which comprises the steps of:

forming a moldable mixture by mixing and kneading with water

(a) fine particles of essentially pure nickel oxide having a maximum particle size of less than about 10 microns,

(b) particles of calcium oxide or particles of a calcium compound or a mixture of calcium compounds which compounds can be converted to pure calcium oxide free of impurities by heating same at the below-mentioned sintering temperature, and

(c) an alumina hydraulic cement consisting essentially of calcium aluminates, the amount of said cement (c) being at least 8 weight percent based on the sum of the weights of ingredients (a), (b) and (c), wherein the ingredients (a), (b) and (c) are present in amounts effective to provide a sintered shaped catalyst object having the composition set forth hereinbelow;

molding the moldable mixture into a shaped object;

hardening the shaped object, at a temperature of from 5° to 35° C, in an ambient atmosphere having a relative humidity of higher than 60%, for longer than one day to hydrate and harden the cement;

drying the shaped object at a temperature below 350° C; and sintering the dried shaped object at a temperature in the range of from 550° to 1200° C, the thus sintered catalyst object consisting essentially of 10 to 30 weight percent of nickel oxide, 20 to 60 weight percent of calcium oxide and 10 to 70 weight percent of aluminum oxide and containing less than 1 weight percent of silicon dioxide.

4,101,450

CATALYST FOR PRODUCTION OF ACETIC ACID

H. Shinn Hwang, Livingston, and Paul D. Taylor, Clinton, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,260

Int. Cl.^{2} B01J *29/12, 29/22, 23/40*

U.S. Cl. 252—460 **5 Claims**

1. A method for the preparation and pretreatment of a catalyst composition which is highly selective for the production of oxygenated C_2-hydrocarbon derivatives from synthesis gas which comprises (1) co-impregnating a carrier substrate with an aqueous solution of soluble rhodium and ruthenium compounds, and subjecting the co-impregnated carrier substrate to drying conditions to remove substantially all of the water content, wherein the resultant catalyst composition consists essentially of between about 0.1 and 10 weight percent rhodium metal and between about 0.01 and 2 weight percent ruthenium metal, based on the total catalyst composition weight; (2) calcining and reducing the catalyst composition by contacting said catalyst composition with hydrogen at a temperature between about 200° C and 500° C; and (3) subsequently heating the catalyst composition in a static atmosphere of carbon monoxide and hydrogen at a temperature between about 150° C and 350° C for a time period between about 0.2 and 20 hours.

4,101,451

ENHANCEMENT OF PROMOTED COPPER CATALYST

Ludo K. Frevel, Midland, and Leonard J. Kressley, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1977, Ser. No. 760,775

Int. Cl.^{2} B01J *21/04, 23/72, 23/56, 23/74*

U.S. Cl. 252—465 **6 Claims**

1. A process for improving an active catalyst consisting essentially of a mixture of finely divided copper metal and a minor proportion of at least one activator metal of the group consisting of silver, platinum, palladium, manganese, cobalt, nickel, chromium, and molybdenum supported on gamma-alumina having a surface area of at least about 10 sq meters per gram, which process consists essentially of impregnating said catalyst with about 0.01–0.3 gram mole of alkali metal hydroxide solution per 100 grams of catalyst, roasting the impregnated catalyst at a temperature up to about 650° C sufficient to cause a reaction between the alkali metal hydroxide and the alumina surface, and contacting the roasted alkali-impregnated catalyst with hydrogen at about 100° C–400° C for a time sufficient to convert essentially all copper and activator metal present to the metallic state.

4,101,452

LEAD SULFIDE ACTIVATION PROCESS

Ronald G. Newburgh, Brookline, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Continuation-in-part of Ser. No. 311,949, Sep. 27, 1952, which is a continuation-in-part of Ser. No. 223,435, Apr. 27, 1951. This application Oct. 25, 1954, Ser. No. 464,603

Int. Cl.^{2} H01B *1/00*

U.S. Cl. 252—501 **16 Claims**

1. The process of photosensitizing lead sulfide comprising adding a persulfate solution to intermixed solutions of thiourea, lead acetate and sodium hydroxide whereby activated lead sulfide is precipitated therefrom.

4,101,453

SINTERED COMPOSITION

Raymond Leslie Orford, Solihull, and Dexter William Smith, Hall Green, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 14, 1977, Ser. No. 777,535

Claims priority, application United Kingdom, Mar. 20, 1976, 11317/76; Aug. 18, 1976, 34373/76

Int. Cl.^{2} H01B *1/02, 1/04*

U.S. Cl. 252—503 **10 Claims**

1. A brush for a dynamo electric machine comprising a sintered composition substantially composed of the following ingredients by weight:

Carbon	1 -8%
Silicon Carbide	0.85–5.1%
Tin	0 - 4%
Lead	7.5 - 15.3%,
Copper	and remainder

4,101,454

CERAMIC SEMICONDUCTORS

Bernard M. Kulwicki, Foxboro, and Norman P. St.Martin, Taunton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 536,502

Int. Cl.^{2} H01B *1/02*

U.S. Cl. 252—514 **1 Claim**

1. A ceramic semiconductor material of positive temperature co-efficient of resistivity adapted to display a sharp increase in resistivity when heated to a selected temperature comprising a base ceramic composition selected from the group consisting of titanates, stannates, and zirconates of barium, strontium, calcium, and lead having a selected addition thereto of silicon in the range from 2.0 to 4.0 mol percent, a dopant selected from the group consisting of yttrium, niobium, and rare earths heavier than dysprosium, characterized in that the material further includes ruthenium in the range of 0.001 to 0.020 mol percent as an activator to reduce the voltage sensitivity of the material at said selected temperature.

4,101,455

LOW PHOSPHATE CONTENT GLASSY PHOSPHATE DETERGENT COMPOSITIONS HAVING OPTIMUM DETERGENCY

Edward Francis, Midland, Mich.; Craig Ronald Carson, and Michael Lance McKay, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 587,451, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 551,476, Feb. 20, 1975, abandoned. This application Apr. 29, 1976, Ser. No. 681,320

Int. Cl.^{2} C11D *3/06, 3/065*

U.S. Cl. 252—531 **3 Claims**

1. A granular detergent composition consisting essentially of:

(A) from about 0.5% to about 2.5% of a glassy phosphate having the general formula

$$M_{2y+2}P_{2y}O_{6y+1}$$

wherein M is an alkali metal and y has a value in the range of from about 7 to about 12;

(B) from about 22 to about 28% by weight of the composition of an alkali metal of a phosphate builder mixture comprising:

(i) from about 10 to 15% by weight of the composition of a pyrophosphate-orthophosphate mixture wherein the ratio of pyrophosphate to orthophosphate is in the range of 10:1 to 3:1 by weight, the cations of said salts being selected from the group consisting of hydrogen, alkali metal, ammonium and substituted ammonium cations with at least one of the cations being something other than hydrogen; and

(ii) from about 7 to about 18% by weight of the composition of a tripolyphosphate;

(C) from about 15 to about 25% by weight of the composition of an organic surfactant selected from the group consisting of water-soluble C_{10}–C_{20} alkyl ether sulfates containing an average of from 1 to 4 ethylene oxide groups, water-soluble C_{12}–C_{20} linear alkyl sulfates, and water-soluble C_{10}–C_{14} linear alkyl benzene sulfonates and mixtures thereof;

(D) from about 1 to about 15% of sodium silicate having an SiO_2:Na_2O ratio of from about 4:1 to about 1.5:1; and

(E) from about 5 to about 40% sodium sulfate.

4,101,456

LIGHT DUTY LIQUID DETERGENT

Jean Renaud, Bougival; Gilles Noiriel, Rueil-Malmaison, and Georges Chazard, Bezons, all of France, assignors to Colgate-Palmolive Company, New York, N.Y.

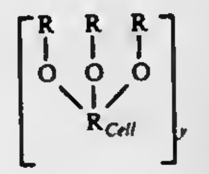
Filed Apr. 8, 1976, Ser. No. 674,788

Claims priority, application United Kingdom, Apr. 18, 1975, 16108/75

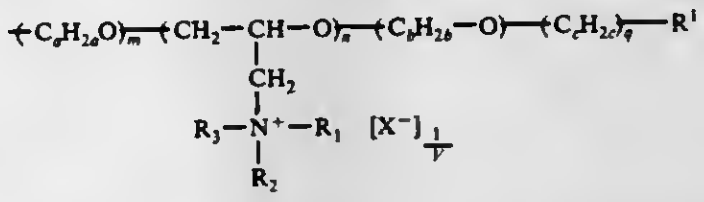
Int. Cl.^{2} C11D *1/37, 1/62, 3/26*

U.S. Cl. 252—551 **12 Claims**

7. A liquid detergent composition adapted for washing articles having soiled glazed surfaces which are thereafter dried by draining which consists essentially of 15% to 45% by weight of a water-soluble surface active agent mixture of an anionic sulfonated detergent salt selected from the group consisting of C_{10}–C_{16} alkyl benzene sulfonate, C_{12}–C_{18} α olefin sulfonate and C_{10}–C_{20} alkyl sulfonate and a second detergent which is a C_{12}–C_{15} alkyl polyethenoxy ether sulfate containing 1 to 5 ethylene oxide groups, the weight ratio of sulfonate detergent to said second detergent being in the range of 1:4 to 4:1; about 0.05% to 5% by weight of a water-soluble non-proteinaceous, cationic polymer having the following structural formula



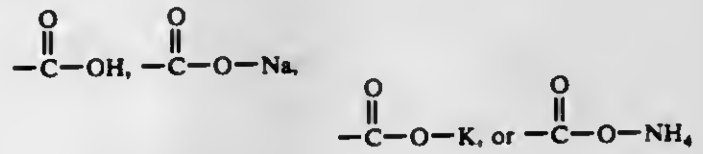
wherein R_{Cell} is the residue of an anhydroglucose unit, y is an integer having a value of from 50 to 20,000 and each R individually represents a substituent group of the general formula:



$$-(C_aH_{2a}O)_m-(CH_2-\underset{\begin{array}{c}|\\ CH_2\\ |\\ R_3-N^+-R_1\quad [X^-]_{\frac{1}{V}}\\ |\\ R_2\end{array}}{CH}-O)_n-(C_bH_{2b}-O)-(C_cH_{2c})_q-R^1$$

wherein a is 2 or 3; b is 2 or 3; c is 1, 2 or 3; m is 0 or an integer from 1 to 10; n is 0, 1, 2 or 3; p is 0 or an integer from 1 to 10; q is 0 or 1;

R′ is -H,



$$-\overset{\overset{O}{\|}}{C}-OH,\ -\overset{\overset{O}{\|}}{C}-O-Na,\ -\overset{\overset{O}{\|}}{C}-O-K,\text{ or }-\overset{\overset{O}{\|}}{C}-O-NH_4$$

with the proviso that when q is 0 or R′ is -H;

R_1, R_2 and R_3 taken individually represent alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxyalkyl or alkoxyaryl radicals containing up to 10 carbon atoms, with the proviso that when any one of them is an alkoxyalkyl radical there are at least 2 carbon atoms separating the oxygen atom from the nitrogen atom, with the further proviso that the total number of carbon atoms is R_1, R_2 and R_3 is from 3 to 12 and with the further proviso that when R_1, R_2, and R_3 are taken together, the nitrogen atom to which R_1, R_2 and R_3 are attached can be a component of a hetercyclic ring selected from pyridine, α-methylpyridine, 2,5-dimethylpyridine, 2,4,6-trimethylpyridine, N-methylpiperidine, N-ethylpiperidine, N-methylmorpholine and N-ethylmorpholine;

X is an anion;

V is an integer which is equal to the valence of X; the average value of n per anhydroglucose unit of said cellulose ether is from 0.01 to 1; **and the average** of $m+p+q$ per anhydroglucose unit of said cellulose ether is from 0.01 to 4, the weight ratio of said surface-active agent mixture to polymer being from about 2:1 to about 1000:1; and an aqueous medium containing from 0% to 12% by weight of a C_2–C_3 alkanol.

4,101,457

ENZYME-CONTAINING AUTOMATIC DISHWASHING COMPOSITION

Geoffrey Place, and Edward John Maguire, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 635,830, Nov. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 479,952, Jun. 17, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,415

Int. Cl.^{2} C11D *1/12*

U.S. Cl. 252—559 **9 Claims**

1. A cleaning composition, particularly suitable for use in

automatic dishwashers and having improved anti-redeposition properties, consisting essentially of:

- (a) from about 0.5 to about 20% by weight of an alkoxylated nonionic surface-active agent selected from the group consisting of:
  - (i) the condensation product of one mole of a carboxylic acid having from about 10 to about 18 carbon atoms with from about 5 to about 50 moles of ethylene oxide;
  - (ii) the condensation point of an alcohol having from about 10 to about 24 carbon atoms with from about 5 to about 50 moles of ethylene oxide;
  - (iii) polyethylene glycol having a molecular weight of from about 1400 to about 30,000;
  - (iv) the condensation product of one mole of alkyl phenol wherein the alkyl chain contains from about 8 to about 18 carbon atoms with from about 4 to about 50 moles of ethylene oxide;
  - (v) the condensation product of benzyl chloride and an ethoxylated alkyl phenol wherein the alkyl group has from about 6 to about 12 carbon atoms and wherein from about 12 to about 20 moles of ethylene oxide have been condensed per mole of alkyl phenol;
  - (vi) polyetheresters of the formula

$$(ClC_6H_4)_2CHCO_2(CH_2.CH_2.O)_xR$$

wherein x is from 4 to 20 and R is an alkyl group with from 1 to 4 carbon atoms;

  - (vii) polyoxyalkylene compounds of the formula

$$Y[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein Y is an organic radical having from 1 to about 18 carbon atoms and containing x reactive hydrogen atoms and the values of n and m are such that the (C_2H_4O) content is from about 10 to about 90% by weight;

  - (viii) the alkoxylated nonionic surface-active agents having the formula of (i) through (vii) in which the terminal hydroxyl of the alkoxy group is acylated with a monobasic acid; and
  - (ix) mixtures thereof;
- (b) from about 0.001 to about 5% by weight of a proteolytic enzyme which exhibits a proteolytic activity of 80 to 100% of maximum activity when measured at pH 12 by the Anson hemoglobin method carried out in the presence of urea, said enzyme being present in an amount such that the detergent composition has a proteolytic activity of at least 6.0 Anson units/kg.;
- (c) from 0 to about 60% by weight of detergent builder ingredients selected from the group consisting of the alkali metal salts of polyphosphates, carbonates bicarbonates, silicates, polyacetates, carboxylates, polycarboxylates, polyhydroxy sulfonates and mixtures thereof;
- (d) from 0 to about 20% water;
- (e) from 0 to about 75% of china protecting agents selected from the group consisting of silicates, water-soluble aluminosilicates, aluminates and mixtures thereof;
- (f) from 0 to about 75% of fillers selected from the group consisting of sodium sulfate, sucrose, sucrose esters and mixtures thereof;
- (g) from 0 to about 20% by weight of a sulfonated aromatic compatibilizing agent having a critical micelle concentration greater than 1% by weight at 25° C, wherein the weight ratio of said alkoxylated nonionic surface-active agent to said sulfonated compatibilizing agent is in the range from about 2:5 to about 5:3;

which is substantially free of bleach and brightener components.

4,101,458
ELECTROLYTE FOR ELECTROLYTIC CAPACITORS

Yntaka Taketani, and Shinichi Niwa, both of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 554,011, Feb. 28, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,975

Claims priority, application Japan, Nov. 16, 1973, 48-129869; Fed. Rep. of Germany, Feb. 28, 1975, 2508904

Int. Cl.² H01G *9/02*

U.S. Cl. 252—62.2 **4 Claims**

1. An electrolyte for electrolytic capacitors consisting essentially of a solvent, a solute dissolved therein, and an amount of water sufficient to form a dielectric layer on a capacitor anode, wherein said solvent consists essentially of an amide solvent containing at least 10% by weight of N-ethylformamide and said solute is an acid salt of maleic acid with ammonia or an amine, the amide solvent other than N-ethylformamide when present being selected from the group consisting of N-methylformamide, dimethylformamide, diethylformamide and dimethylacetamide.

4,101,459
COMPOSITIONS FOR CURING EPOXIDE RESINS

Christopher Michael Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,072

Claims priority, application United Kingdom, Oct. 23, 1975, 43497/75

Int. Cl.² C08G *59/56, 59/68*

U.S. Cl. 260—18 EP **9 Claims**

1. A composition comprising

- (i) an epoxide resin,
- (ii) from 0.75 to 1.25 amino hydrogen equivalents of an aromatic, heterocyclic, or cycloaliphatic polyamine per 1,2-epoxide equivalent of the epoxide resin (i), and
- (iii) a metal salt of trifluoromethanesulfonic acid, said metal selected from the group consisting of lithium, calcium, zinc, cadmium, cobalt, nickel, manganese, and magnesium.

4,101,460
HIGH PERFORMANCE ION EXCHANGE COMPOSITION

Hamish Small, and Timothy S. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 402,669, Oct. 2, 1973, abandoned. This application Jul. 7, 1975, Ser. No. 593,345

Int. Cl.² C08J *5/20*

U.S. Cl. 521—28 **25 Claims**

1. A composition of matter for exchanging ions comprising:

Component A, an insoluble substrate which consists essentially of synthetic resin, having ion exchanging sites at least on its available surface; and

Component B, a finely divided, insoluble material comprising synthetic resin particles of from about 0.1 micron to about 5 microns median diameter having, at least on their outer surfaces, ion exchanging sites which attract available sites of Component A; wherein the particles of Component B are irreversibly attached as a monolayer to the available surface of Component A.

4,101,461
METHOD FOR PREPARATION OF ANION EXCHANGERS BY SUBSTITUTION OF HYDROPHILIC POLYMERIC GELS

Petr Strop; Jiri Coupek; Otakar Mikes, and Jiri Hradil, all of Prague, Czechoslovakia, assignors to Czechoslovenska akademie ved, Prague, Czechoslovakia

Filed Feb. 7, 1975, Ser. No. 548,094

Claims priority, application Czechoslovakia, Feb. 8, 1974, 896-74

Int. Cl.² B01D *15/04;* **C08J** *5/20;* **B01D** *15/08*

U.S. Cl. 521—32 **17 Claims**

1. Method for the preparation of hydrophilic anion exchangers from polymeric gels containing hydroxyl groups in their structure wherein a crosslinked copolymer of hydroxyl group containing acrylate, methacrylate, acrylamide and methacrylamide monomers is modified by reaction of said copolymer with an amino compound selected from the group consisting of halogenoalkylamines, halogenoalkylamonium compounds, epoxyalkylamines and epoxyalkylammonium compounds, said reaction being effected after activation of said copolymer by treatment thereof under basic conditions.

4,101,462
URETHANE CATALYST

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

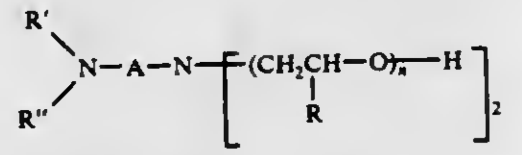
Filed Apr. 7, 1977, Ser. No. 785,388

Int. Cl.² C08G *18/18, 18/20*

U.S. Cl. 521—115 **7 Claims**

4. A method for producing a polyurethane foam which comprises:

reacting, in the presence of a blowing agent, an organic polyisocyanate with an organic polyhydroxyl compound in the presence of a catalytic amount of an amine catalyst of the formula:



$$\begin{matrix} R' \\ R'' \end{matrix}\!\!>N{-}A{-}N{-}\left[{-}\left(CH_2\underset{\underset{R}{|}}{CH}{-}O\right)_n{-}H\right]_2$$

where R is independently hydrogen or a methyl radical provided the terminal hydroxyl group is secondary; R' and R" are, independently, lower alkyl radicals or, taken together with the nitrogen atom to which they are attached form a morpholine ring; A is a straight or branched chain alkylene radical having two to four carbon atoms; and n has an average value of from one to about three;

said organic polyhydroxyl compound being either a polyhydric polyether or a polyester having terminal hydroxyl groups, which polyesters are obtained from the reaction of a polycarboxylic acid with a polyhydric alcohol.

4,101,463
MOLDED COMPOSITION AND ARTICLE MOLDED THEREFROM

Donald F. Morgan, Bloomingdale, and Irwin S. Wolosky, Parsippany, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 546,875, Feb. 4, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,471

Int. Cl.² C08J *11/04;* **B29H** *19/00*

U.S. Cl. 260—2.3 **25 Claims**

1. A vulcanizing molding composition processable into a solid rubber tire, said composition consisting essentially of:

- a. a previously vulcanized non-devulcanized hydrocarbon rubber polymer in an amount ranging from about 94% to about 99% by weight of the total composition;
- b. a vulcanizing agent in an amount ranging from about 1 to about 4% by weight of the total composition; and
- c. an accelerator comprising a mixture of at least two compounds present in an amount of from about 0.13% to about 2% by weight of the total composition, said at least two compounds being selected from the group consisting of quanidines, thiazoles, dithiocarbamates and thiurams.

4,101,464
PROCESS FOR PREPARING FOAMED SOLIDS USING TWO OR MORE AZO COMPOUNDS

Ernest Rudolph Kamens, Tonawanda, N.Y.; Donald Milton Kressin, Glen Burnie, Md.; Harold Carl Lange, Grand Island, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Phialdelphia, Pa.

Continuation-in-part of Ser. No. 548,946, Feb. 11, 1975, Pat. No. 3,993,609, which is a continuation-in-part of Ser. No. 453,446, Mar. 21, 1974, abandoned. This application Sep. 16, 1976, Ser. No. 723,679

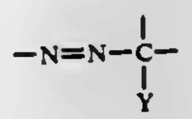
The portion of the term of this patent snbsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.² C08J *9/02*

U.S. Cl. 521—88 **23 Claims**

1. A process for preparing cellular polymeric structures which comprises mixing an acidulous or acidic polymerizable medium that is polymerizable and/or cross-linkable by a free radical mechanism with an effective amount of two or more acid sensitive mono- or poly-azo compounds containing the group:

FORMULA I



$$-N{=}N{-}\underset{\underset{Y}{|}}{\overset{|}{C}}{-}$$

wherein in Y is an acid sensitive group which in the presence of an acidulous or acidic polymerizable medium causes sufficient decompositon of tbe azo compound that gas is released in said medium and during said decomposition said mono- or poly-azo compound promotes polymerization and/or corsslinking of said medium to provide a matrix that is sufficiently polymerized and/or cross-linked that the generated gases cause the matrix to expand, each of the remaining valences being satisfied by an organic radical; provided that any carbon atom that is directly linked to an azo nitrogen, except that of a carbonyl group, has at least two of its remaining three valences satisfied by a carbon to carbon bond or a carbon to hydrogen bond.

4,101,465
A COCATALYST SYSTEM FOR TRIMERIZING ISOCYANATES

Robert J. Lockwood, East Haven; Alexander McLaughlin, Meriden, and Harold E. Reymore, Jr., Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

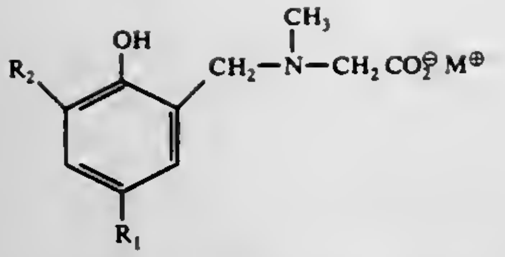
Filed Oct. 6, 1976, Ser. No. 729,899

Int. Cl.² C08G *18/14*

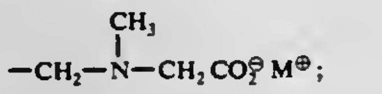
U.S. Cl. 521—118 **26 Claims**

1. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is isocyanurate which process comprises bringing together in the presence of a blowing agent, an organic polyisocyanate, a trimerization catalyst, and a minor amount of a polyol, the improvement which comprises employing as the catalyst, a combination consisting essentially of:

(a) a glycine salt having the formula

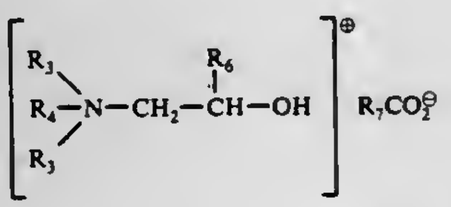


wherein M is an alkali metal, R_1 is selected from the class consisting of hydrogen and alkyl having from 1 to 12 carbon atoms, and R_2 is selected from the class consisting of hydrogen and the group



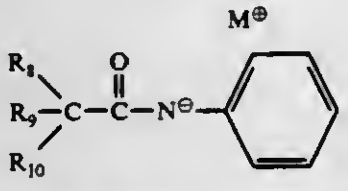
$$-CH_2-\overset{\overset{CH_3}{|}}{N}-CH_2CO_2^{\ominus}M^{\oplus};$$

(b) a hydroxyalkyltrialkylammonium carboxylate salt having the formula

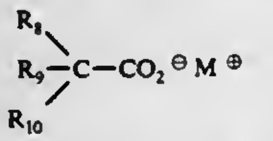


wherein R_3, R_4, R_5 can be the same or different and represent alkyl having from 1 to 4 carbon atoms, inclusive, R_6 is selected from the group consisting of hydrogen and alkyl having from 1 to 4 carbon atoms, inclusive, and R_7 is selected from the class consisting of hydrogen and alkyl having from 1 to 8 carbon atoms, inclusive; and

(c) an alkali metal salt selected from the group consisting of
(i) an amide salt having the formula



wherein M is as defined hereinbefore, R_8, R_9, and R_{10} can be the same or different and are selected from the group consisting of hydrogen and alkyl from 1 to 4 carbon atoms, inclusive; and
(ii) a carboxylic acid salt having the formula



wherein R_8, R_9, R_{10} and M are as defined hereinbefore.

4,101,466
BIS (DIMETHYLAMINOPROPYL)-AMINE DERIVATIVES AS POLYURETHANE CATALYSTS

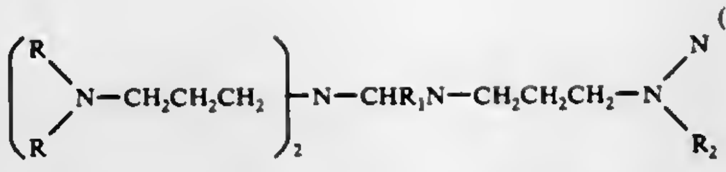
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,577

Int. Cl.² C08G *18/18*

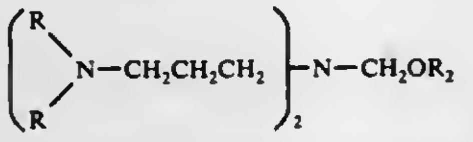
U.S. Cl. 521—115 **8 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having a structure selected from the group consisting of



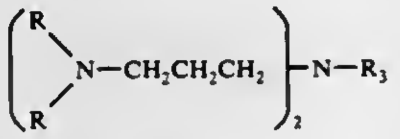
(A)

where R is lower alkyl and R_1 is hydrogen, alkyl phenyl or substituted phenyl and



(B)

where R is lower alkyl and R_2 is hydrogen or alkyl; and



(C)

where R and R_3 are lower alkyl.

2. The method of claim 1 wherein said organic polyisocyanate has a functionality of from 2 to 4, and said organic polyester or polyether polyol has a hydroxyl number of from about 25 to 700.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to about 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,101,467
SOFT ETHYLENIC POLYMER FOAMS

Chung Poo Park, Pickerington, Ohio; Warren H. Griffin, and John M. Corbett, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 661,911, Feb. 27, 1976, abandoned. This application Jan. 27, 1977, Ser. No. 763,374

Int. Cl.² C08J *9/14*

U.S. Cl. 521—79 **21 Claims**

1. A method for making soft ethylenic polymer resin foams having substantially closed cell structure, dimensional stability, and thickness greater than about 0.5 inch from starting ethylenic polymer resins which have low stiffness less than about 20,000 psi and which comprise low stiffness copolymers of ethylene which copolymers consist essentially of ethylene and monoethylenically unsaturated non-ionic comonomers, by forming under heat and pressure a flowable gel composition of the starting polymer resin and a volatile blowing agent and releasing the resulting flowable gel to ambient air atmosphere whereby the blowing agent separates from the gel and forms gas bubbles in the polymer resin, particularly characterized in that the volatile blowing agent is composed of a mixture of an essential constituent I which is at least one fluorocarbon which has normal boiling point between −25° and 20° C, from 2 to 4 carbon atoms in its molecular structure, and a value for the critical quantity $T_b-0.5V_c$ of not less than 125 where T_b is the normal boiling point temperature of the fluorocarbon in degrees Kelvin and V_c is its critical volume in cubic centimeters per gram-mole, and an essential constituent II which is at least one fluorocarbon which has normal boiling point between −40° and 5° C and a value for its critical quantity $T_b-0.5V_c$ as

above defined of not greater than 110, the mixed blowing agent containing, per 100 parts by weight, from about 10 to about 50 parts of fluorocarbon constituent II and at least about 75 parts of total fluorocarbon constituents I and II, and there being up to about 0.18 gram-mole of such mixed blowing agent per 100 grams of polymer resin in the flowable gel.

4,101,468
PROCESS FOR COLD-HARDENING POLYURETHANE FOAMS USING SULFONAMIDE EMULSIFIERS

Hermann Perrey, Krefeld; Hans-Joachim Meiners, Leverkusen, both of Fed. Rep. of Germany, and Jürgen Ick, Coraopolis, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

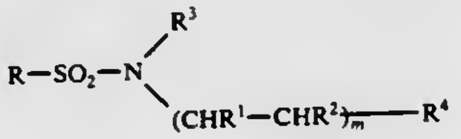
Filed Feb. 10, 1977, Ser. No. 767,608

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607998

Int. Cl.² C08G *18/14;* **C07C** *143/72*

U.S. Cl. 521—115 **7 Claims**

1. In a process for the production of cold-hardening foams containing urethane groups by foaming a mixture of polyethers containing at least two hydroxyl groups and having a molecular weight of from about 750 to 100,000, polyisocyanates, water and/or organic blowing agents, emulsifiers and catalysts the improvement wherein, said emulsifier comprises sulphonamide compounds corresponding to the following general formula:



wherein
R represents an alkyl, chloroalkyl, cycloalkyl radical having from 8 to 30 carbon atoms, or an alkaryl radical having from 10 to 30 carbon atoms,
R^1 and R^2, which may be the same or different, each represent a hydrogen atom, a chloromethyl, methyl, ethyl or phenyl radical,
m is an integer of from 0 to 50,
R^3 represents a hydrogen atom, an alkyl, aralkyl, alkaryl, aryl radical or a $-(CHR^1-CHR^2-O-)_{\overline{m}}R^4$-group and
R^4 represents a hydrogen atom, an alkyl, aralkyl, acyl, carbamoyl or cyanoalkyl radical having from 1 to 30 carbon atoms.

4,101,469
FOAMABLE RESINOUS POLYMER COMPOSITIONS CONTAINING ACID MIXTURES

J. Gustav Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 16, 1976, Ser. No. 696,743

Int. Cl.² C08J *9/00*

U.S. Cl. 521—83 **12 Claims**

1. A foamable polymer composition comprising a resinous polymer selected from the group consisting of thermoplastic and thermosetting resins that melt at a temperature up to about 300° C. and a mixture of polycyclic aromatic polycarboxylic acids carrying nuclear nitro groups that is soluble in acetone but insoluble in water, wherein the average number of benzene rings in the individual acid molecules ranges from two to about ten, the average number of carboxyl groups carried by the individual acid molecules ranges from about four to about ten, the average number of nitro groups carried by the individual acid molecules ranges from about one to about four, the average molecular weight of the acid mixture ranges from about 600 to about 1500 and the average nuclear equivalent of the acid mixture ranges from about 80 to about 200, said acid mixture having been prepared by reacting coal with aqueous nitric acid having a concentration of about five to about 90 percent at a temperature in the range of about 15° to about 200° C. for about 0.5 to about 15 hours at a pressure of about atmospheric to about 1000 pounds per square inch gauge, mechanically separating the solids in the resulting reaction mixture, extracting the resulting solids with a polar solvent and then separating the polar solvent from the extract to recover said acid mixture.

4,101,470
URETHANE CATALYSTS

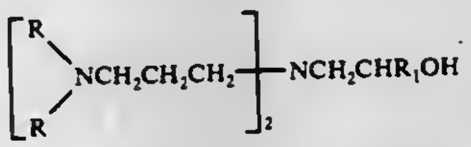
Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,991

Int. Cl.² C08G *18/18*

U.S. Cl. 521—118 **8 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having the following structural formula:



where R is lower alkyl and R_1 is a radical selected from the group consisting of hydrogen, alkyl, cycloalkyl, or an aromatic hydrocarbon radical; the R_1 radical can also bear an alkyl, cyano, nitro, or halo substituent.

2. A method of claim 5 wherein said organic polyisocyanate has a functionality of from 2 to 4, and said organic polyester or polyether polyol has a hydroxyl number of from about 25 to 700.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,101,471
HIGH RESILIENCY FOAM WITH IMPROVED LOAD BEARING ABILITY BY USE OF ORGANOTIN MERCAPTIDES

Robert V. Russo, Brooklyn, N.Y., assignor to M & T Chemicals Inc., Stamford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,964

Int. Cl.² C08G *18/22, 18/63, 18/66*

U.S. Cl. 521—121 **8 Claims**

1. A method for preparing a high resiliency polyurethane foam characterized by a value for the indentation load deflection, measured at 65% deflection, greater than one pound per square inch, said method comprising reacting at least one polyol selected from the group consisting of
1. polyols exhibiting a molecular weight of between 4,500 and 6,000 and a hydroxyl number from 25 to 45,
2. polyols exhibiting a molecular weight between 4,500 and 6,000 and a hydroxyl number from 25 to 45, wherein said polyol contains between 5 and 25%, based on the weight of said polyol, of side chains derived from the graft polymerization of acrylonitrile or a mixture of acrylonitrile and styrene,
3. mixtures of polyols exhibiting a molecular weight from 4,000 to 8,000 and a diamine as a cross-linking agent, said diamine being present in an amount from about 0.5 to 6%,

based on the weight of said polyol, with a polyfunctional isocyanate, a blowing agent comprising water and from 0 to 10%, based on the weight of said blowing agent, of a volatile fluorinated hydrocarbon that boils from −40° to +70° C., a silicone-base surfactant and as the polymerization catalyst, from 0.001 to 0.1%, based on the weight of said polyol, of an organotin compound of the formula $R_2^1Sn(SR^2COOR^3)$ wherein R^1 and R^3 are individually selected from the group consisting of alkyl radicals containing from 1 to 20 carbon atoms and R^2 is a methylene or ethylene radical.

4,101,472

FLAME RESISTANCE OF FOAMS USING DIETHYL HYDROXYMETHYLPHOSPHONATE ESTERS

Jean-Marie J. Biehler, Brunstatt; Serge L. Lecolier, Janville sur Juine, and Patrice M. Le Roy, Ballancourt, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

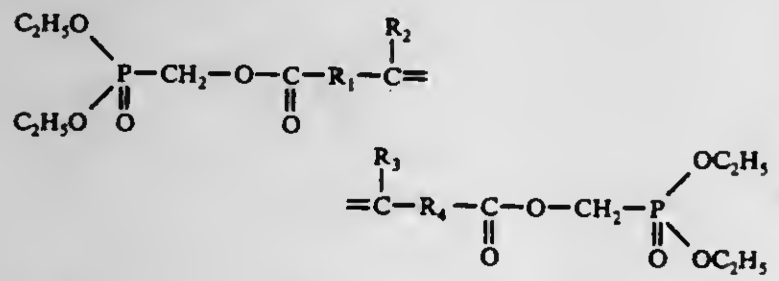
Division of Ser. No. 590,124, Jun. 25, 1975, Pat. No. 4,024,207. This application Nov. 1, 1976, Ser. No. 737,214

Claims priority, application France, Jul. 4, 1974, 74 23261

Int. Cl.² C08G *18/14*

U.S. Cl. 521—85 **2 Claims**

1. The method of improving the flame resistance of a rigid or a flexible polyurethane foam or a thermoplastic polyolefin or polyester foam which comprises adding to said foam a compound which is a diester of diethyl hydroxymethylphosphonate of the formula:



wherein R_1 and R_4 are alkylene chains of formula $-(CH_2)_m-$, in which m is 0 or an integer, R_2 and R_3 are hydrogen or alkyl radicals, and the total number of carbon atoms in the radicals R_1, R_2, R_3 and R_4 is not more than 10.

4,101,473

SOLID PARTICLE-FORM POLYMERIZABLE POLYMERIC MATERIAL AND COMPOSITIONS, STRUCTURES AND METHODS OF EMPLOYING AND PRODUCING THE SAME

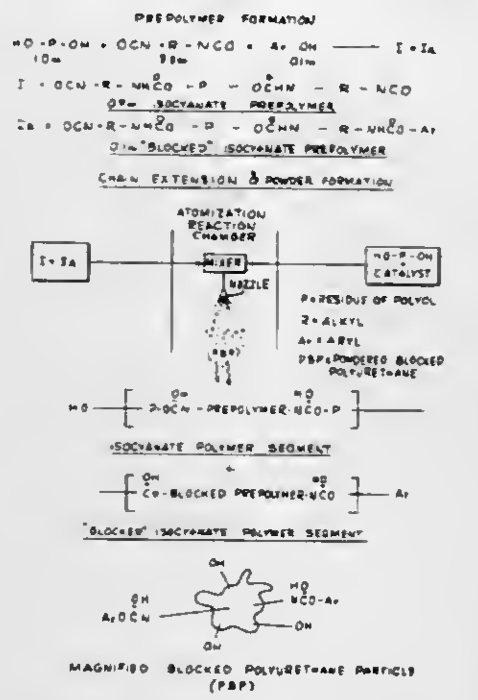
Harry L. Lander, Muskegon, Mich., assignor to Story Chemical Corporation, Muskegon, Mich.

Division of Ser. No. 460,482, Apr. 12, 1974, Pat. No. 3,947,426. This application Jan. 15, 1976, Ser. No. 649,352

Int. Cl.² C08G *18/80*

U.S. Cl. 260—13 **7 Claims**

1. A composition comprising solid particle-form thermoplastic, polymerizable or cross-linkable, multi-functional polymeric material containing blocked isocyanate groups together with urea and/or urethane linkages and wherein the blocked isocyanate groups making up said polymeric material comprise only a portion of the total isocyanate groups employed to produce said polymeric material, said polymeric material upon increase in temperature sufficient to unblock said blocked isocyanate groups being capable of undergoing polymerization or cross-linking, substantially uniformly dispersed in, distributed on or admixed with a particle-form thermoplastic resin selected from from the group consisting of polyethylene, polyvinyl chloride and polystyrene.


PREPOLYMER FORMATION
OP= ISOCYANATE PREPOLYMER
"BLOCKED" ISOCYANATE PREPOLYMER
CHAIN EXTENSION & POWDER FORMATION
ATOMIZATION REACTION CHAMBER
MIXER
NOZZLE
CATALYST
P=RESIDUE OF POLYOL
R=ALKYL
Ar=ARYL
PBP=POWDERED BLOCKED POLYURETHANE
ISOCYANATE POLYMER SEGMENT
"BLOCKED" ISOCYANATE POLYMER SEGMENT
MAGNIFIED BLOCKED POLYURETHANE PARTICLE (PBP)

4,101,474

AQUEOUS BASED EPOXY SLURRY FOR FORMING A CONSOLIDATED GRAVEL PACK

Claude T. Copeland, Tulsa, and Vernon G. Constien, Owasso, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 737,813, Nov. 1, 1976, Pat. No. 4,074,760. This application Jun. 16, 1977, Ser. No. 807,094

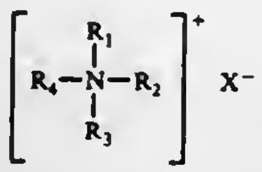
Int. Cl.² E21B *43/04*

U.S. Cl. 260—13 **42 Claims**

1. In a slurry suitable for use in emplacing a permeably consolidated particulate mass in communication with a permeable subterranean formation, of the type containing an epoxy resin-solvent mixture, a curing agent for the epoxy resin, a particulate material, and a coupling agent, the improvement which comprises:

(a) an aqueous based carrying fluid for the slurry, and

(b) a surfactant in the slurry, selected from the group consisting of quaternary ammonium salts corresponding to the formula



$$\left[\begin{array}{c} R_1 \\ | \\ R_4-N-R_2 \\ | \\ R_3 \end{array} \right]^+ X^-$$

wherein: R_1 and R_3 are each independently lower alkyl, hydroxy substituted lower alkyl, or polyoxyethylene alkyl of the formula $-(CH_2CH_2O)_nH$ wherein n is 2 or 3; R_2 is an 8- through 18-carbon hydrocarbon chain; R_4 is an aliphatic hydrocarbon chain or an alkyl aryl group, containing 7 to 18 carbon atoms; and X is fluorine, chlorine, bromine, or iodine;

the components of said slurry being provided in amounts and admixed in a sequence such that a pumpable slurry is obtained from which a permeable, consolidated mass can be formed after a suitable curing time.

4,101,475

FLAME RESISTANT MATERIALS AND METHOD OF MAKING SAME

Joseph P. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 17, 1976, Ser. No. 754,926

Int. Cl.² C08G *12/32*

U.S. Cl. 260—21 **15 Claims**

1. A hardenable mixture for forming a flame retarding surfacing material consisting essentially of the following ingredients in the following approximate parts by weight:

Aluminium trihydrate	from 15 to 80
Other inorganic fillers	from 0 to 50
Aldehyde condensate resole [prepolymer]	from 15 to 45
Fatty acid salt	from 0 to 4.0
Ammonium hydroxide	from 0.1 to 3.0
Acid salt catalyst	from 0.05 to 0.5

said mixture being wetted out with sufficient water to form a handleable gel that becomes flowable at elevated temperatures before being thermoset.

4,101,476

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE, CROSSLINKED, ELASTOMERIC EPOXIDE RESINS

Rolf Schmid, Gelterkinden, and Ursula Kreibich, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 680,265, Apr. 26, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,441

Claims priority, application Switzerland, Apr. 28, 1975, 5443/75

Int. Cl.² C08L *91/00, 63/00*

U.S. Cl. 260—22 EP **20 Claims**

1. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins, characterised in that epoxide compounds, containing two or more epoxide groups, are reacted

a. with polyester-polycarboxylic acids A which essentially contain segments of the formula I

$$-[O-(CH_2)_n-O.CO-(CH_2)_m-CO]_p- \qquad (I)$$

in which n and m are identical or different and denote 2 or a higher number than 2, and to which the condition $n + m = 6$ to 30 applies, and in which p denotes a number from 2 to 40 which, however, is sufficiently large that the segment contains at least 30 $-CH_2-$ groups, and

b. with polyester-polycarboxylic acids B which essentially contain segments of the formula II

$$-[O-R^1-O.CO-R^2-CO]_q- \qquad (II)$$

in which R^1 denotes an alkylene radical with at least 2 C atoms in the chain, in which R^2 denotes a radical which is derived from a dimerised mono- unsaturated or di- unsaturated fatty acid, and in which, per O bridge, an average of at least 3.5 and at most 30 C atoms, without taking into account the C atoms of the $-CO.O-$ radicals, are present in the chain, and in which q denotes a number from 2 to 40, which, however, is sufficiently large that the segment contains at least 30 C atoms, without taking into account the C atoms of the $-CO.O-$ radicals, in the chain, and

c. if appropriate, with curing agents C, and, if appropriate, in the presence of accelerators,

in a ratio such that 0.5 to 1.2 equivalents of polyester-polycarboxylic acid are present per equivalent of epoxide compound, that 1/10 to 9/10 of these 0.5 to 1.2 equivalents are attributable to the polyester-polycarboxylic acid A and the remaining 9/10 to 1/10 to the polyester-polycarboxylic acid B, and that up to 0.6 equivalent of curing agent C is present per equivalent of epoxide compound, with the proviso that, in the cases in which only difunctional epoxide compounds and difunctional polyester-polycarboxylic acids A and B are employed, the epoxide groups must be present in excess and the reaction with a curing agent C is essential.

4,101,477

RADIATION CURABLE ACRYLIC RESIN COMPOSITIONS

Nelson E. Lawson, Trenton, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Division of Ser. No. 604,488, Aug. 14, 1975, Pat. No. 4,035,320, and a continuation-in-part of Ser. No. 274,409, Jul. 24, 1972, abandoned, and Ser. No. 434,440, Jan. 18, 1974, abandooed. This application Dec. 22, 1976, Ser. No. 753,579

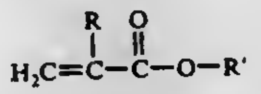
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.² C09D *3/66, 3/81, 11/10*

U.S. Cl. 260—22 CB **6 Claims**

1. The polyacrylate reaction product of,

(a) an equivalent excess of an acrylic compound of the formula:



$$H_2C=\overset{\overset{\displaystyle R}{|}}{C}-\overset{\overset{\displaystyle O}{\|}}{C}-O-R'$$

wherein R is selected from hydrogen and methyl; R' is selected from hydrogen, methyl and ethyl; and

(b) a polyester polyol obtained by the condensation of

(i) an aliphatic polycarboxylic acid having a molecular weight of at least 325 and at least 19 carbon atoms, inclusive, said acid being a maleated fatty acid; with

(ii) an equivalent excess of an aliphatic polyol having at least two hydroxyl groups and a molecular weight of between about 60 to about 250;

said reaction of (a) and (b) being under conditions wherein said acrylic compound does not polymerize.

4,101,478

SYNTHETIC RUBBER MIX

Vladimir Mitrofanovich Kostjuchenko, ulitsa Komsomolskaya, 10, kv. 188; Evgeny Petrovich Panov, ulitsa Fadeeva, 41"a", kv. 34, both of, Volgograd; Arkady Grigorievich Shvarts, ulitsa Abelmanovskaya, 7, kv. 20, Moscow; Nadezhda Arkadievna Pruzhanskaya, Bolshaya Cherkizovskaya ulitsa, 9, korpus 1, kv. 105, Moscow; Natalya Yakovlevna Vasilievykh, ulitsa Malaya Gruzinskaya, 38, kv. 29, Moscow, and Galina Vasilievna Fateeva, ulitsa Karla-Marxa, 13, kv. 47, Volgograd, all of U.S.S.R.

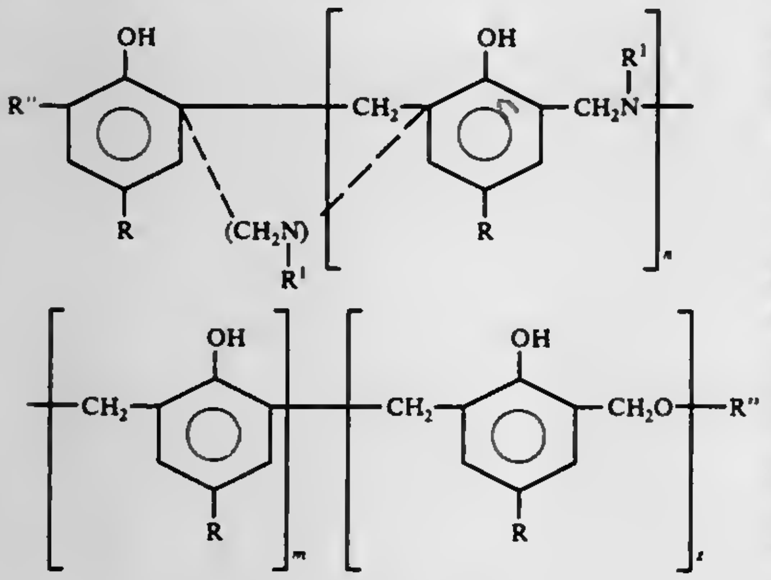
Flied Apr. 12, 1976, Ser. No. 675,941

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 S **7 Claims**

1. A rubber mix comprising synthetic rubbers selected from the group consisting of cis-isoprene rubber, cis-divinyl rubber, butadiene-styrene rubber, ethylene-propylene rubber and butyl rubber, and mixtures thereof; sulfur as a vulcanizing agent; organic accelerators selected from the group consisting of di-(2-benzothiazolyl)-disulphide, 2-mercaptobenzothiazole, N-furfurolidene-benzothiazolyl-2-sulphenamide, diphenylguanidine, N-cyclohexyl-2-benzothiazolyl-sulphenamide, and tetramethylthiuramidisulphide; zinc oxide as a vulcanization promoter, fillers selected from the group consisting of carbon black, and a mixture of carbon black and a silicic-acid based filler; stearin as a dispersing agent, plasticizers selected from the group consisting of an aromatic oil with a viscosity of 35 to 40 cSt at 100° C, paraffin-naphthenic oil with a viscosity of 8.5 to 10 cSt at 100° C, petroleum bitumen, and indene-coumarone resin; and alkylphenolamine resin obtained by condensation of aminomethylating agents with a mixture comprising 70 to 97 weight percent of monoalkylphenols, with alkyls containing from 4 to 12 carbon atoms, and 3 to 30 weight percent of 2,4- and 2,6-dialkylphenols, with alkyls containing 4 to 12 carbon

atoms, at a temperature of 120 to 180° C, said alkylphenolamine resin being described by the general formula:



where:

R is alkyl having 4 to 12 carbon atoms;
R′ is hydrogen or substituted hydroxybenzyl;
R″ is hydrogen, or alkyl having 4 to 12 carbon atoms, or N(dimethyl)methylene amine;
n is equal to 0.1 to 5.0;
m is equal to 0–4; and
z is equal to 0 to 0.5, and having a molecular weight of 500 to 2,000, a softening point of 50° to 130° C, and a nitrogen content of 0.4 to 5 percent, said components of the rubber mix being taken in the following proportions, in parts by weight:

synthetic rubbers: 100
vulcanizing agent: 1.5–3
organic accelerators: 1–2.5
vulcanization promoter: 3–5
fillers: 40–70
dispersing agent: 1–2
plasticizers: 5–20, and
alkylphenolamine resin: 0.5–10.

4,101,479
POLYOLEFIN PHOTOSTABILIZER COMPOSITION

Carroll J. Wedel, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 614,388, Sep. 18, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,201
Int. Cl.^{2} C08K *5/36, 5/09*
U.S. Cl. 260—23 H **11 Claims**

1. A composition providing resistance to the photodegradation of a polyolefin produced from C_2–C_6 monomers comprising a nickel salt of a C_3–C_{30} nonaromatic monocarboxylic acid and a thiodiester of the formula $R^1OOCR^2—S—R^3COOR^4$ in mol ratio of about 1:0.25–2, wherein R^1 and R^4, and R^2 and R^3, are bydrocarbyl groups which may be the same or different and each contains from 1 to about 20 carbon atoms.

4,101,480
PIGMENTARY PRINTING PASTE ADDITIVE

Roland Ruf, Chantilly, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Nov. 28, 1975, Ser. No. 636,271
Claims priority, application France, Nov. 15, 1974, 74 37651
Int. Cl.^{2} C09D *5/02, 11/02, 11/10*
U.S. Cl. 260—23 AR **30 Claims**

1. In a pigmentary printing paste for textile fibers wherein said paste is in the form of an oil-in-water emulsion or semi-emulsion containing a water-soluble synthetic thickening agent which comprises at least 20% of dry material and which is swollen in an aqueous medium by alkaline agents and which results from the polymerization or copolymerization of at least 20% of at least one unsaturated carboxylic acid having 3 or 4 carbon atoms or an anhydride thereof, wherein said paste also contains finely dispersed pigment, binding agent in the form of a copolymer of unsaturated monomers, and an emulsifying agent; the improvement whereby said printing paste contains from 1 to 10% by weight of a liquid additive which is substantially insoluble in water, said additive comprising a nonionic surface-active liquid product which is substantially insoluble in water, and which has a molecular weight of from 1,000 to 20,000 and is the condensation product of propylene oxide or of a mixture of propylene oxide and ethylene oxide containing a greater amount of propylene oxide with a compound having at least one atom of active hydrogen which is selected from the group consisting of monoalcohols comprising methanol, ethanol, propanols, butanols and homologues thereof having less than 20 carbon atoms, polyalcohols comprising glycol, glycerol, pentacrythritol, oses having 5 to 12 carbon atoms, aliphatic mono-acids having 12 to 40 carbon atoms, aliphatic polyacids having 2 to 20 carbon atoms, their esters and ethers, aliphatic monoamines having 1 to 6 carbon atoms, aliphatic polyamines having 1 to 6 carbon atoms and at most 4 amine functions, aminoalcohols, and water.

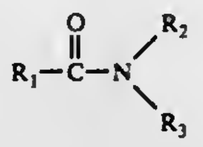
4,101,481
PROCESS FOR THE MANUFACTURE OF STABLE POLYCHLOROPRENE LATEX

Paul Branlard, Grenoble, and Jean Pierre Merle, Echirolles, both of France, assignors to Societe Distugil, Paris, France

Filed Jun. 27, 1977, Ser. No. 810,388
Claims priority, application France, Jul. 2, 1976, 76 20292
Int. Cl.^{2} C08L *11/02*
U.S. Cl. 260—23.7 A **10 Claims**

1. In a process for the preparation of a chloroprene polymer latex by polymerizing chlorophene in an alkaline aqueous emulsion in the presence of an emulsifying agent and of a catalyst which provides free radicals, the improvement comprising

adding to said emulsion, per 100 parts of starting monomer, from 0.2 to 4 parts by weight of an amide of the formula



in which R_1 is $C_3 - C_{18}$ alkyl or alkenyl or aryl or arylalkyl, or arylalkyl with the aryl and alkyl linked by a hetero-atom; and R_2 and R_3 are identical or different and are each hydrogen, a linear or branched $C_1 - C_{12}$ alkyl or alkenyl or an aryl or an arylalkyl, or arylalkyl with the aryl and alkyl linked by a hetero-atom or R_1 and R_3 taken together form a heterocyclic ring with nitrogen as the hetero-atom with the proviso that, if $R_2 = R_3 = H$, the carbon in the α-position relative to the group $C = O$ must be substituted by at least one group having a positive inductive effect and, if $R_2 = H$ and R_3 is an alkyl group, said R_3 must possess at least two carbon atoms when R_1 does not possess a group having a positive inductive effect on the carbon in that α-position relative to the group $C = O$ of the amide, said amide being substantially insoluble in water at the concentration used, soluble in chloroprene and non-hydrolyzable by NaOH.

4,101,482
SEALANT BASED ON MIXTURE OF UNSATURATED AND HYDROGENATED BLOCK COPOLYMERS

Richard C. Doss, and Edward L. Walton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1976, Ser. No. 729,549
Int. Cl.^{2} C08K *5/01;* **C08L** *93/00*
U.S. Cl. 260—27 BB **10 Claims**

1. A sealant composition comprising:

5-50 parts by weight of an unsaturated block copolymer of a conjugated diene and a monovinyl-substituted aromatic compound;

50–95 parts by weight of a teleblock copolymer of a formula selected from ABA and $(AB)_nY$ wherein A represents a block of a polymerized monovinyl-substituted aromatic component, B represents a block of a polymerized conjugated diene before hydrogenation, said teleblock copolymer being hydrogenated to the extent that only 5 percent or less of the original olefinic unsaturation remains, and 5 percent or less of the monovinyl-substituted aromatic component unsaturation has been removed, Y represents a residue of a polyfunctional coupling agent or a polyfunctional initiator, and *n* is an integer having a value of from 2 to 4;

10–300 parts by weight of a modifyiog resin; and

25–250 parts by weight of a filler.

4,101,483
NON-AQUEOUS WATER-DISPLACING SEALANT COMPOSITION FOR VEHICLE GLASS JOINTS

John J. Moskal, Garfield Heights, Ohio, assignor to Premier Industrial Corporation, Cleveland, Ohio

Filed May 2, 1977, Ser. No. 792,932
Int. Cl.^{2} C08K *5/34*
U.S. Cl. 260—27 BB **21 Claims**

1. A non-aqueous, water-displacing sealant composition for application to vehicle glass joints and the like, comprising a homogeneous mixture of:

(A) from 5% to 20% by weight of a thermoplastic rubber base, and
(B) from 0.5% to 12% by weight of a liquid plasticizer selected from the group consisting of oxidation-resistant balsamic resins and aromatic hydrocarbons, and
(C) from 1% to 20% by weight of a tackifying resin, and
(D) from 0.1% to 3% by weight of an anti-oxidant for rubber, and
(E) from 0.25% to 0.70% by weight of a cationic surfactant selected from the group consisting of imidazoline derivatives, and
(F) from zero to 48% by weight of inert inorganic solids as fillers, and
(G) from zero to 5% by weight of a bodying agent, and
(H) from 20% to 70% by weight of a liquid solvent selected from the group consisting of aliphatic and aromatic hydrocarbons, and said composition being essentially free of water and being characterized by its ability to displace water, without absorption thereof into the composition, from a water-wetted substrate to which said sealant is applied.

4,101,484
SEALANT BASED ON THERMOPLASTIC ELASTOMER AND MIXED MODIFYING RESINS

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 4, 1976, Ser. No. 729,432
Int. Cl.^{2} C08L *53/02, 83/10, 93/00*
U.S. Cl. 260—27 BB **8 Claims**

1. A sealant composition which exhibits low surface tack after application comprising

(1) a thermoplastic elastomer having the structure ABA or $(AB)_nY$, wherein A represents a block of a polymerized monovinyl-substituted aromatic compound, B represents a block of a polymerized conjugated diene, Y represents a residue of a polyfunctional coupling agent or a polyfunctional initiator, and n is an integer having a value of 2 to 4, said thermoplastic elastomer having a weight ratio of said monovinyl-substituted aromatic compound to said conjugated diene within the range of 50:50 to 5:95, said elastomer having the unsaturation normally associated with such polymers;
(2) 10–15 parts by weight per 100 parts by weight of said thermoplastic elastomer of a poly(vinyl aromatic)-compatible modifying resin component which is an aromatic hydrocarbon;
(3) 10–150 parts by weight per 100 parts by weight of said thermoplastic elastomer of a poly(conjugated diene)-compatible modifying resin component which is nonaromatic selected from normally solid modified and unmodified rosin and rosin esters of polyhydric alcohols, normally solid esters of polymerized rosin, polyterpene resins, and resinous polyolefins derived from aliphatic and cycloaliphatic olefins; and
(4) 25–250 parts by weight per 100 parts by weight of said thermoplastic elastomer of a filler.

4,101,485
DURABLE FIRE RETARDANT FOR FOREST AND RANGELANDS

Donald L. Brooks, Manchester; Michael L. Losee, Webster Groves; Harry Teicher, and Charles R. Williams, both of St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 28, 1976, Ser. No. 691,179
Int. Cl.^{2} C08L *61/28*
U.S. Cl. 260—29.4 UA **6 Claims**

4. A weather-durable fire retardant composition which comprises an aqueous dispersion of

(a) An ammonium salt selected from the group consisting of monoammonium orthophosphate, diammonium orthophosphate, monoammonium-alkali metal mixed orthophosphates, diammonium-alkali metal mixed orthophosphates, ammonium-alkaline earth metal mixed orthophosphates, ammonium sulfate, substantially water-insoluble ammonium polyphosphates, and mixtures thereof, wherein said ammonium polyphosphates are represented by the formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

wherein *n* is an integer having an average value from 20 to about 400, *m/n* has an average value between about 0.7 and about 1.1, and *m* has a maximum value equal to *n*+2.
(b) a reactive, water-soluble binder which insolubilizes upon drying; and
(c) a water-dispersible, viscosity control agent which imparts thixotropic flow properties to an aqueous dispersion,

wherein (a), (b) and (c) together comprise from about 5 to 40 percent by weight of said aqueous dispersion.

4,101,486
CATIONIC ELECTRODEPOSITABLE COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Lance C. Sturni, McKeesport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1975, Ser. No. 562,086
Int. Cl.^{2} C08G *18/80;* **C08J** *3/06;* **C08L** *63/00*
U.S. Cl. 260—29.2 TN **12 Claims**

1. An aqueous based resinous dispersion suitable for use as a coating composition comprising as the resinous phase:

(A) a quaternary ammonium salt group solubilized synthetic organic resin containing active hydrogens formed from reacting:
(1) a tertiary amine-acid salt with

(2) a polyepoxide which contains glycidyl groups; said oganic resin containing from 0.05 to 16 percent by weight nitrogen based on total weight of (1) and (2);

(B) a capped organic polyisocyanate stable at ordinary room temperature in the presence of said resin (A) and reactive with the active hydrogens of said resin (A) at elevated temperatures to form a cured product, cured through urethane crosslinks.

4,101,487
COATING MEDIUM

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Aug. 13, 1976, Ser. No. 714,167

Int. Cl.^{2} C08G *73/10*

U.S. Cl. 260—29.2 N **12 Claims**

1. A heat curable coating medium comprising an aromatic diamide diacid diamine formed as the reaction product of an aromatic diamine and an aromatic dianhydride, in the molar ratio of two-to-one respectively, at a temperature below that at which more than negligible imidization occurs, in an inert solvent for at least one of said reactants, a coating of said medium on a substrate being heat curable at imidization temperature to form a cured highly cross-linked polymeric coating thereon.

4,101,488
WATER-SOLUBLE HEAT-RESISTANT INSULATING VARNISH

Takashi Ishizuka, and Naoki Miwa, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Sep. 26, 1975, Ser. No. 617,135

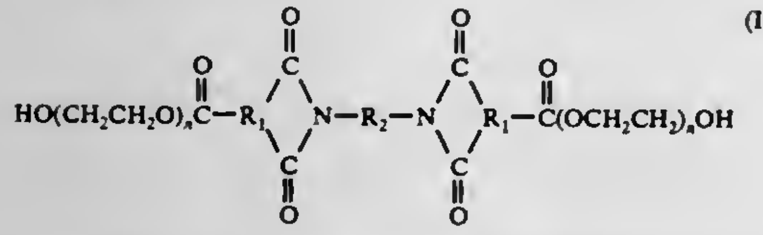
Claims priority, application Japan, Sep. 26, 1974, 49-111229

Int. Cl.^{2} C08J *3/08;* **C08L** *79/08*

U.S. Cl. 260—29.2 N **25 Claims**

1. A water-soluble, heat-resistant, insulating varnish comprising an aqueous solution of a resin containing ester groups and imide groups in the molecule, wherein said aqueous solution of said resin is obtained by adjusting the pH of said insulating varnish to between 5 and 9 by the addition of a volatilizable basic compound, said resin consisting of the reaction product of

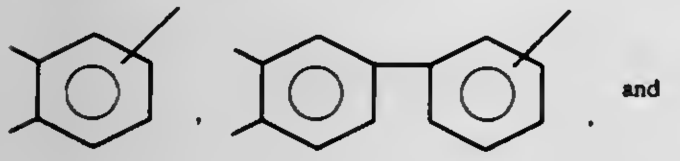
(A) a carboxyl-containing polyesterimide resin having an acid value of about 30 to 150 obtained by reacting (a) a polyhydric alcohol component comprising at least one organic polyhydric alcohol and further containing about 10 to 60 mol % of an imide ring-containing glycol of the general formula (I):



(I)

$$HO(CH_2CH_2O)_nC(=O)-R_1\langle(CO)_2\rangle N-R_2-N\langle(CO)_2\rangle R_1-C(=O)(OCH_2CH_2)_nOH \quad (I)$$

wherein R_1 is a trivalent aromatic group selected from the group consisting of



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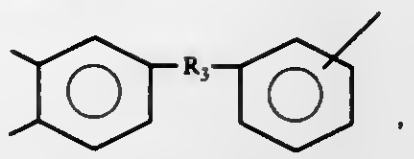
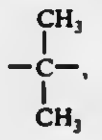


wherein R_3 is selected from the group consisting of

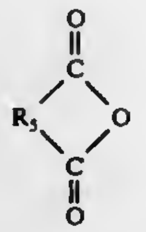


$$-C(CH_3)_2-,$$

R_2 is a divalent organic group, and *n* is an integer of 1 to 3, with (b) a polycarboxylic acid component comprising at least one trivalent or divalent organic carboxylic acid or the anhydride thereof

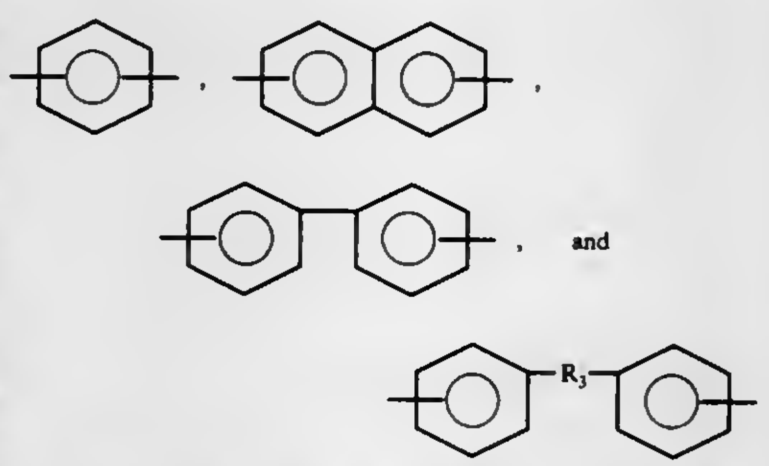
said divalent organic carboxylic acid or the anhydride thereof represented by the general formula (VI) or (VII), respectively

$$HOOC—R_5—COOH \quad (VI)$$

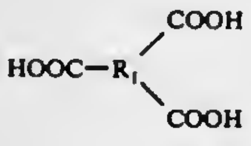


(VII)

in which R_5 is a divalent organic group selected from the group consisting of $-(CH_2)-n_2$ in which n_2 is an integer of 1 to 8,

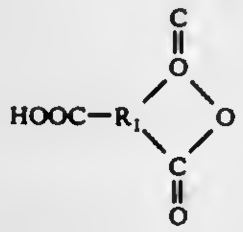


in which R_3 is as defined above, about 30 to 100 mol % of which comprises an aromatic tricarboxylic acid or the anhydride thereof represented by the formula (IV) or (V), respectively



(IV)

$$HOOC-R_1(COOH)_2 \quad (IV)$$



(V)

with R_1 as defined above so that the equivalent ratio (OH/-COOH) between the polyhydric alcohol component and the polycarboxylic acid component is about 1.0 to 2.0 and wherein the amount of the imide ring-containing glycol of the general formula (I) among the total amount of the (A) component is about 20 to 70% by weight;

(B) 1,2,3,4-butanetetracarboxylic acid or an imide-forming derivative thereof capable of forming an imide ring by reaction with an organic diamine; and

(C) an organic diamine, wherein the total amount of (B) and (C) is about 20 to 200 parts by weight per 100 parts by weight of said polyesterimide resin (A).

4,101,489
WATER-SOLUBLE PHENOL/FORMALDEHYDE CONDENSATION PRODUCTS

Gunther Reitz, Cologne, and Günther Boehmke, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1977, Ser. No. 774,455

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609531

Int. Cl.^{2} C08L *61/08*

U.S. Cl. 260—29.3 **7 Claims**

1. Dispersing agent which is the reaction product of

1. a mononuclear phenol/formaldehyde/bisulfite condensation product resulting from the condensation of 0.9–1.1 mols of each of formaldehyde and bisulfite per mol of phenol in an aqueous medium in the presence of a basic catalyst, and
2. per mol of phenol in said condensation product
   a. 0.8–1.1 mols of formaldehyde or
   b. 0.8–4.0 mols of formaldehyde and 0.1–2.0 mols of a nitrogen-containing compound capable of reacting with at lease two equivalents of formaldehyde.

4,101,490
PROCESS FOR PREPARING AQUEOUS EMULSIONS OF ADDITION POLYMERS WITH BUILT-IN EMULSIFIER

Dick A. Pons, Maassluis, and Anno Bijker, Spijkenisse, both of Netherlands, assignors to Synres International B.V., Hoek van Holland, Netherlands

Filed Sep. 20, 1976, Ser. No. 725,119

Claims priority, application Netherlands, Sep. 25, 1975, 7511275

Int. Cl.^{2} C08L *33/08*

U.S. Cl. 260—29.6 MP **9 Claims**

1. A process for preparing emulsions of addition polymers in water by polymerizing one or more olefinically unsaturated monomers in aqueous emulsion in the presence of a suitable catalyst system and one or more emulsifiers and various other conventional additives, wherein the emulsifier is at least one compound of the formula

$$(RO)\,(TO)PO(OH)$$

where RO represents the residue remaining after the removal of the hydroxyl hydrogen from an unsaturated polymerizable alcohol of 2 to 12 carbon atoms, or an ABO group, wherein

A represents the residue remaining after the removal of the acid hydrogen from an olefinically-unsaturated carboxylic acid of from 3 to 25 carbon atoms, and

B is a aliphatic or cyclo-aliphatic radical of from 2 to 20 carbon atoms, or a polyoxyalkylene radical of from 2 to 100 units, or an oxyalkylene polylactone radical of a molecular weight between 200 and 1000,

and wherein the bonding between A and B is carbon bonded to oxygen bonded to carbon,

and wherein TO is

(a) an aliphatic - oxy radical of from 6 to 22 carbon atoms or

(b) a polyoxyalkylated alkylphenoxy radical of from 7 to 30 carbon atoms containing from 1 to 40 polyoxyalkylene units, or

(c) a polyoxyalkylated higher alkoxy radical of from 6 to 22 carbon atoms and containing from 1 to 40 oxyalkylene units, or

(d) a monoalkylether of an ethylene oxide/propylene oxide block copolymer, wherein the alkyl group contains from 1 to 15 carbon atoms, or

(e) a monoalkylether of polypropylene oxide wherein the alkyl group contains from 1 to 15 carbon atoms.

4,101,491
ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES AND POLYMERS THEREOF

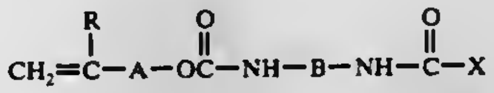
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 734,916

Int. Cl.^{2} C08L *35/02*

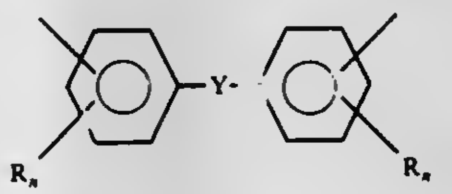
U.S. Cl. 260—29.6 T **11 Claims**

1. A latex comprising (A) water and (B) a polymer comprising from about 0.1 percent to 100 percent by weight of polymerized units of an ethylenically unsaturated blocked aromatic diisocyanate of the formula



$$CH_2=C(R)-A-OC(=O)-NH-B-NH-C(=O)-X$$

wherein R is hydrogen or a methyl or ethyl radical; A is a carbonyloxyalkylene radical containing 2 to about 8 carbon atoms or an aralkylene radical containing 7 to about 12 carbon atoms; B is a bivalent aromatic radical selected from the group consisting or arylene, naphthalene, and the structure



where R is defined as above; Y is O, S, or $—CH_2)_n$; $n = 0$ to 3; and X is the radical fragment remaining after a hydrogen atom is removed from the nitrogen atom of an oxime, benzimidazole, pyrazole, benzotriazole, caprolactam, thiocaprolactam, or p-nitroaniline, and up to 99.9 percent by weight of polymerized units of a copolymerizable vinylidene monomer.

4,101,492
AQUEOUS EMULSION COPOLYMERS CONTAINING LOWER ALKYL HYDROGEN POLYSILOXANE

Martin K. Lindemann, Greenville, and Donald M. Wacome, Greer, both of S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.

Filed Mar. 3, 1977, Ser. No. 772,961

Int. Cl.^{2} C08F *283/12*

U.S. Cl. 260—29.6 NR **19 Claims**

1. An aqueous emulsion comprising water having emulsified therein particles of copolymer produced by copolymerization in aqueous emulsion of nonreactive polymerizable monoethylenically unsaturated monomers providing a Tg below about 20° C. with from 0.5% to 20% of reactive monoethylenically unsaturated monomer providing active hydrogen and from 1 to 40% of a terminal-blocked lower alkyl hydrogen polysiloxane having a viscosity in the range from 20 to 1,000 cP at 20° C., the ratio of alkyl groups to Si-H groups in said siloxane being in the range of from 13:1 to about 1:1, the terminal groups not being included in said ratio.

4,101,493
CROSSLINKING EMULSION

Teruo Nakagawa; Takahisa Ogasawara, and Hidemaro Tatemichi, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1976, Ser. No. 704,819

Claims priority, application Japan, Jul. 17, 1975, 50-86717

Int. Cl.^{2} C08L *33/08*

U.S. Cl. 260—29.6 R **10 Claims**

1. An emulsion of a crosslinking type which comprises an oligoester-(meth)acrylate having at least two (meth)acryloyl groups per molecule, a molecular weight of not more than 1000 per one (meth)acryloyl group, and a boiling point at normal atmospheric pressure of at least 200° C, and

a polymer emulsion of an oil-in-water type.

4,101,494
TIRE SEALING AND BALANCING AGENT

Jerry B. Kent, and Peter P. Augostini, both of Arlington, Tex., assignors to Wobaco Trust, Ltd. Trustee, Nassau, The Bahamas

Filed Aug. 9, 1976, Ser. No. 712,516

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—29.6 B **13 Claims**

1. A tire sealing and balancing composition having a viscosity of from about 1000 to about 2200 cps at 100° F., said composition comprising from about 2% to about 8% by weight of a fibrous component containing asbestos fibers of from about 0.01 to about 3.0 inches in length and fiberglass fibers of about 0.25 inches to 0.125 inches in length the ratio of asbestos fibers to fiberglass fibers being from about 20:1 to about 100:1 and an aqueous solution of a water soluble polyvinyl alcohol wherein the ratio by weight of polyvinyl alcohol to water is from about 0.5:100 to about 5.0:100.

4,101,495
MODIFIED WATER-DILUTABLE DIOLEFIN POLYMER OILS CONTAINING CARBOXYL GROUPS

Hans-Peter Patzschke, and Armin Göbel, both of Wuppertal, Fed. Rep. of Germany, assignors to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts, Wuppertal, Fed. Rep. of Germany

Filed Dec. 1, 1975, Ser. No. 636,369

Claims priority, application Austria, Dec. 2, 1974, 129609/74

Int. Cl.^{2} C08L *47/00*

U.S. Cl. 260—29.7 NR **17 Claims**

1. A modified, water-dilutable conjugated diolefin polymer oil containing carboxyl groups, obtained by the steps including reacting an α, β-unsaturated compound selected from a monocarboxylic acid, a dicarboxylic acid, a dicarboxylic anhydride, a dicarboxylic acid (semi) ester, a dicarboxylic acid (semi) amide, a dicarboxylic acid imide, and mixtures thereof, with an diolefin polymer oil component substantially free from carboxyl groups, wherein the modified polymer oil is prepared by reacting

A. the reaction product of at least one of said α,β-unsaturated compounds with a mixture containing
  a. from about 80 to 99 parts by weight, of a conjugated diolefin polymer oil substantially free from carboxyl groups with an average molecular weight of from about 500 to 2500, and
  b. from about 1 to 20 parts by weight, of an olefin polymer oil substantially free from carboxyl groups, selected from degraded rubber, liquid butadiene copolymer and a readily soluble diolefin block copolymer, having an average molecular weight of from about 4500 to 20,000, with

B. from about 3 to 15 parts by weight, based on 100 parts by weight of component A of a liquid conjugated diolefin polymer oil substantially free from carboxyl groups which has not been reacted with said α,β-unsaturated compound and the average molecular weight of which is between the average molecular weights of components (Aa) and (Ab).

4,101,496
HIGHLY PIGMENTABLE, LIQUID COATING COMPOSITIONS

Jörg Dörffel, Marl; Werner Andrejewski, Gahlen, and Uwe Blethan, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 2, 1975, Ser. No. 637,017

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1974, 2457775

Int. Cl.^{2} C08L *61/24, 61/28, 67/02*

U.S. Cl. 260—31.2 R **9 Claims**

1. In a liquid coating composition containing 0–25% solvent and a binder consisting essentially of

A. 45–10% by weight of an aminoplast, a low-molecular weight precursor thereof, or a mixture thereof; and

B. 55–90% by weight of a polyester, or mixture thereof, whose end groups are predominantly hydroxy prepared by condensing an alcohol component consisting of:
  I.1 0–30 molar percent of one or more aliphatic polyols having 3 or 4 hydroxy groups and 3–6 carbon atoms, and
  I.2 100–70 molar percent of a mixture of ethylene glycol and 1,2-propanediol,

with an acid component whose predominant acid is hexahydroterephthalic acid; or a binder which is the condensation product of said aminoplast component, or the starting materials for the production thereof, with said polyester component, the improvement wherein
  (i) the polyester or mixture of polyesters of component (B) have a degree of condensation of between 2.5 and 10.5 and an average molecular weight of up to 1,000, and the
  (ii) the mixture of ethylene glycol and 1,2-propanediol consists of 33–90 molar percent of ethylene glycol and 67–10 molar percent of 1,2-propanediol, and
  (iii) the acid component mixture consists essentially of at least 80 molar percent of hexahydroterephthalic acid, one or more derivatives thereof, or a mixture thereof.

4,101,497
SEALANT-PRIMER COATING

Everett Charves, Holland; David F. Pulley, Warrington, and Arthur O. Stander, Jenkintown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1976, Ser. No. 747,461

Int. Cl.^{2} C08K *5/10*

U.S. Cl. 260—31.2 N **1 Claim**

1. A method for preparing a protective coating composition, comprising:

forming a first component by mixing, in parts by weight,

epoxy resin having an epoxide equivalent between 185 and 196, viscosity between 110 and 160 poises, and density between 9.6 and 9.8 lbs./gal. at 68° F	291
strontium chromate	1701
titanium dioxide	319
magnesium silicate	788
diatomaceous silica	414
leveling agent	135
methyl n-butyl ketone, urethane grade	3386

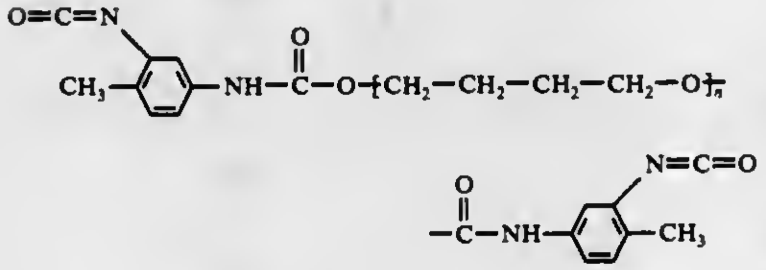
forming a second component by mixing, in parts by weight,

ketimine curing agent	1680
methyl ethyl ketone, urethane grade	2754

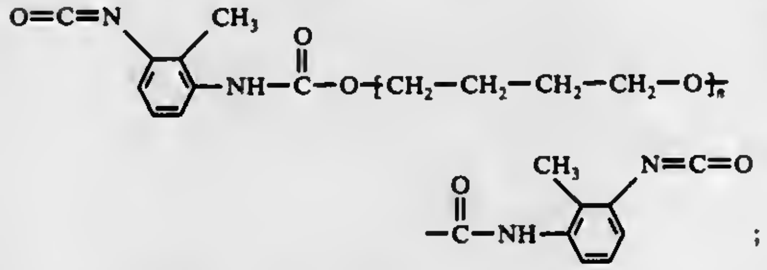
forming a third component by mixing, in parts by weight,

aromatic polyurethane resin having a 100% modulus of 400 psi at 100° C and an available isocyanate content of 2.8%	1740
polyurethane resin having a 100% modulus of 1100 psi at 100° C and an available isocyanate content of 4.1%	873
xylene, urethane grade	1214
butyl acetate, urethane grade	699
toluene, urethane grade	634

wherein said polyurethane resins are selected from the group consisting of a compound having the formula



and a compound having the formula



and combining said first, second and third components in equal parts by volume.

4,101,498
FIRE-RESISTANT COMPOSITION

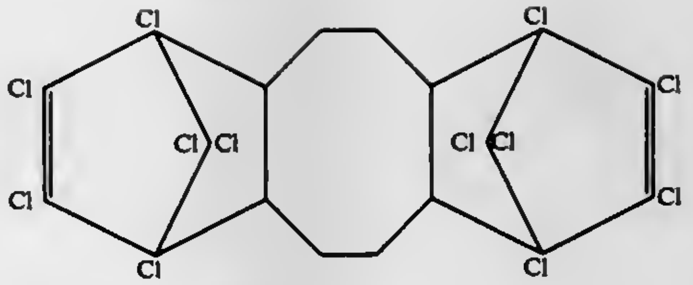
John L. Snyder, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1976, Ser. No. 690,762

Int. Cl.^{2} C08K *5/01;* **C08L** *51/00*

U.S. Cl. 260—33.6 AQ **10 Claims**

1. An oil-resistant, fire-resistant polymer composition comprising:
  (a) 100 parts by weight of a block copolymer having at least two polymer end blocks A and at least one polymer mid block B, each block A being a non-elastomeric polymer block of a monoalkenyl arene having an average molecular weight of between about 2,000 and about 125,000 and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight between about 10,000 and about 250,000;
  (b) 0–200 parts by weight of an extending oil;
  (c) 10–300 parts by weight of a polymeric alpha-olefin;
  (d) 0–200 parts by weight of an inorganic filler;
  (e) 5–100 parts by weight of antimony trioxide;
  (f) 5–100 parts by weight of a zinc borate; and
  (g) 20–300 parts by weight of a flame retardant selected from the group consisting of a perchloropentacyclodecane, the adduct



and mixtures thereof.

4,101,499
POLYORGANOSILOXANES CONTAINING HOMOGENEOUSLY DISTRIBUTED FILLERS

Joachim Herzig, Leichlingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 30, 1976, Ser. No. 709,978

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1975, 2535334

Int. Cl.^{2} C08L *83/04*

U.S. Cl. 260—37 SB **11 Claims**

1. A process for the preparation of a storage-stable homogeneously filled polyorganosiloxane comprising forming a mixture of polyorganosiloxane, water and a modifying agent of the formula

$$(R_3Si)_nX$$

in which
  R is an optionally substituted hydrocarbon radical with up to 10 C atoms,
  X is a halogen, OH, OR, N, S, OOCR or NY,
  Y is hydrogen or any of the definitions of R, and
  n is 1, 2 or 3,

adding thereto silica having a specific surface area of at least $50m^2/g$, and subsequently cold curing the filled polyorganosiloxane.

4,101,500
BRAKE LINING COMPOSITIONS HAVING FRICTION PARTICLES OF AN AROMATIC AMINE MODIFIED NOVOLAC RESIN AND AN AROMATIC CARBOXYLIC COMPOUND

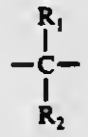
Philip H. Brodsky, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 26, 1976, Ser. No. 735,710

Int. Cl.^{2} C08L *61/10, 61/14*

U.S. Cl. 260—38 **14 Claims**

1. In a brake lining composition comprising friction particles and a resin binder therefor, wherein said improvement comprises, said friction particles comprising a thermoset reaction product of
  (A) an aromatic amine modified novolac resin characterized by having:
    (1) a number average molecular weight of from about 200 to 1000,
    (2) at least two aryl moieties per molecule, the aryl nucleus of each aryl moiety containing from 6 through 10 carbon atoms each,
    (3) at least one divalent bridging moiety of the formula:



$$-\overset{\displaystyle R_1}{\underset{\displaystyle R_2}{\overset{|}{\underset{|}{C}}}}-$$

wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, lower alkyl, lower alkalene, lower haloalkyl aryl of from 6 through 12 carbon atoms and haloaryl of 6 through 12 carbon atoms, said bridging moiety having the unsatisfied valences of its carbon atom each bonded to a different one of said aryl moieties,

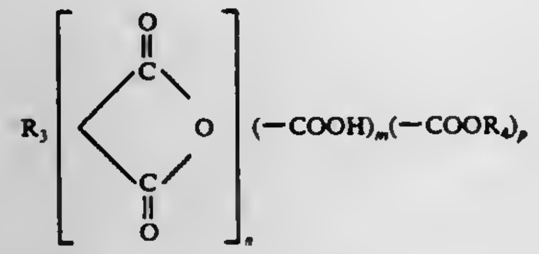
(4) at least one >NH group per molecule, one bond of which is directly attached to one of said aryl nuclei and the other bond of which is attached to another of said aryl nuclei or to a radical R_1 as defined above,

(5) at least one OH group per molecule each such group being directly attached to a different one of said two aryl nuclei,

(6) a percent oxygen acetyl of from about 3 to 26, and

(7) a percent nitrogen acetyl of from about 3 to 26, and

(B) an aromatic polycarboxylic compound of the formula:



in which R_3 is an aromatic radical of three, four, five or six valences and containing from 6 to 24 carbon atoms, R_4 is a monovalent hydrocarbon radical containing less than 19 carbon atoms; *n* is an integer of from 0 through 3; *m* is an integer of from 0 through 6; *p* is an integer of from 0 through 6; when *n* is 0, the sum of $m+p$ is an integer of from 3 through 6; when *n* is 1, the sum of $m+p$ is an integer of from 1 through 4; when *n* is 2, the sum of $m+p$ is an integer of from 0 through 2; and the sum of *n* and *p* is always at least 1,

(C) the relative proportions of said amine modified resin and said aromatic polycarboxylic compound being such that said composition is thermoset by heat said thermoset friction particles being infusible at temperatures above 700° F., being dispersed in and held in place by said binder resin.

4,101,501
HARDENABLE ONE-COMPONENT SUBSTANCE, METHOD OF PRODUCING AND HARDENING SAME AND ITS APPLICATION

Rudolf Hinterwaldner, Kastanienstrasse 13, D 8-Munich 90, Germany

Filed Aug. 13, 1976, Ser. No. 714,331

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1975, 2536319

Int. Cl.² C08K ***9/10***

U.S. Cl. 260—40 R **16 Claims**

1. In a hardenable composition of the type composed of a mixture of a first component of a monomeric, oligomeric or polymeric compound and a hardening promoting agent wherein one or both of the first component and the hardening agent is encased in a protective casing which prevents the reaction and subsequent hardening of the composition until rupture of the casing and which further contains a casing rupturing agent, the improvement which comprises said rupturing agent being microspheres which break under the pressure applied in the normal use of the composition into fragments possessing angular edges or which are acutely tapered.

4,101,502
INTERPOLYMERS OF POLY (BUTYLENE TEREPHTHALATE)

Ghazi Khattab, Succasunna, and Gerard P. Naviello, Jersey City, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,796

Int. Cl.² C08K ***7/14***

U.S. Cl. 260—40 R **7 Claims**

1. A composition of matter comprising a blend of:

a. between about 2 and about 60 wt% glass fibers, and

b. between about 40 and 98 wt% of a graft copolymer of poly(butylene terephthalate) containing between about 0.1 wt% and about 3 wt% based on poly(butylene terephthalate) of 1,4-butenediol or 3-hexene-2,5-diol with polyethylene or polypropylene.

4,101,503
COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND HIGH MOLECULAR WEIGHT ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,249

Int. Cl.² C08L ***71/04, 23/16***

U.S. Cl. 260—42.18 **29 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about 2 microns,

wherein the improvement comprises the modified alkenyl aromatic resin having an intrinsic viscosity of at least 0.50 dl/g.

4,101,504
HIGH IMPACT COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,251

Int. Cl.² C08L ***71/04, 23/16***

U.S. Cl. 260—42.18 **30 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about two microns,

wherein the improvement comprises the modified alkenyl aromatic resin containing at least 8% by weight of rubbery interpolymer.

4,101,505
COMPOSITIONS OF A POLYPHENYLENE ETHER RESIN AND EPDM RUBBER-MODIFIED ALKENYL AROMATIC RESINS HAVING SPECIFIED GEL CONTENT

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,252

Int. Cl.² C08L ***71/04, 23/16***

U.S. Cl. 260—42.18 **30 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about 2 microns,

wherein the improvement comprises the modified alkenyl aromatic resin containing at least 2% by weight of toluene-insoluble gel.

4,101,506
CYANAMIDE STABILIZERS

Paul Uhrhan; Reinhard Lantzsch, both of Cologne; Harald Oertel; Ernst Roos, both of Odenthal, and Dieter Arlt, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

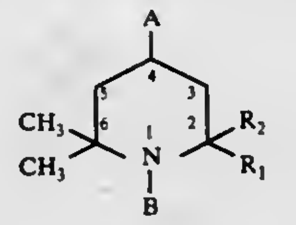
Filed Oct. 6, 1976, Ser. No. 730,202

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545646

Int. Cl.² C08K ***5/34;*** **C07D** ***211/06***

U.S. Cl. 260—45.8 N **7 Claims**

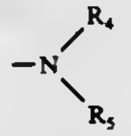
1. Cyanamides corresponding to the general formula (I):



(I)

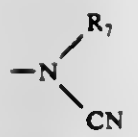
in which

(a) where B is a cyano group, A represents an O—R_3 group, where R_3 represents a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms, an aromatic hydrocarbyl having 7 to 12 carbon atoms, or hydrogen, an



group, where R_4 and R_5 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 20 carbon atoms, a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms or an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, in addition to which R_5 may also represent H, or A may, together with the carbon atom in the 4 position of the piperidine ring represent a >C=O group, or

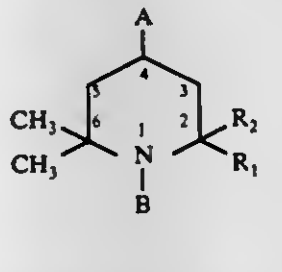
(b) where B is H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, an alkenyl or alkynyl having 3 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms or the group—CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl, A represents a group



R_7 represents H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, a cycloalkyl having 5 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms, a β-cyanoethyl, a β-alkoxy carbonyl ethyl having 1 to 3 carbon atoms in the alkoxy moiety, an aryl having 6 to 14 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl,

and R_1 and R_2 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 12 carbon atoms or, together with the ring carbon atom to which they are attached, form a cycloalkyl ring having 5 to 12 carbon atoms.

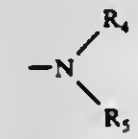
4. A process for stabilising synthetic polymers, wherein the polymers have added to them active quantities of cyanamides corresponding to the general formula:



(I)

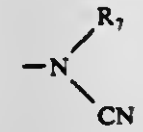
in which

(a) where B is a cyano group, A represents an O — R_3 group, where R_3 represents a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms, an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, or hydrogen, an



group, where R_4 and R_5 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 20 carbon atoms, a straight-chain or branched aliphatic hydrocarbyl carbonyl having 2 to 20 carbon atoms or an aromatic hydrocarbyl carbonyl having 7 to 12 carbon atoms, in addition to which R_5 may also represent H, or A may, together with the carbon atom in the 4 position of the piperidine ring represent a >C=O group, or

(b) where B is H, a straight-chain or branched alkyl radical having 1 to 20 carbon atoms, an alkenyl or alkynyl having 3 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl, A represents a group



where R_7 represents H, a straight-chain or branched alkyl having 1 to 20 carbon atoms, a cycloalkyl having 5 to 12 carbon atoms, an aralkyl having 7 to 12 carbon atoms, a β-cyanoethyl, a β-alkoxy carbonyl ethyl having 1 to 3 carbon atoms in the alkoxy moiety, an aryl having 6 to 14 carbon atoms or the group —CH_2—CHR_6—OH, where R_6 represents H, methyl or phenyl,

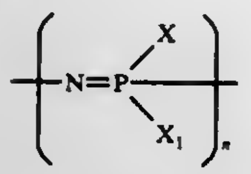
and R_1 and R_2 may be the same or different and each represents a straight-chain or branched alkyl having 1 to 12 carbon atoms or, together with the ring carbon atom to which they are attached, form a cycloalkyl ring having 5 to 12 carbon atoms.

4,101,507
STABILIZATION OF POLYPHOSPHAZENES

Delmar Frederick Lohr, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 21, 1977, Ser. No. 779,390
Int. Cl.^{2} C08K *5/34*
U.S. Cl. 260—45.8 N **15 Claims**

1. A poly(phosphazene) composition stabilized against thermal aging comprising (1) a poly(phosphazene) represented by the general formula:



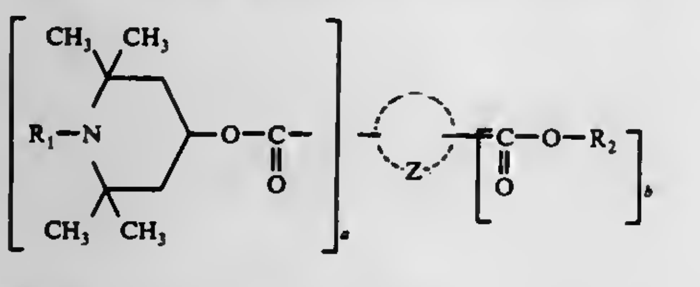
wherein *n* represents an integer from 20 up to about 50,000 and X and X_1 each represent a monovalent substituent selected from the group consisting of alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, hydroxy, and amino, and X and X_1 are randomly distributed along the —P═N— backbone, and (2) a stabilizer consisting of an organic compound compatible with said poly(phosphazene) and present in an amount sufficient to stabilize said poly(phosphazene) against thermal degradation, said organic compound being selected from the group consisting of substituted picolinamides and substituted thiopicolinamides wherein the substituents are selected from the group consisting of hydroxy, alkyl, aryl, alkoxy and halogen and an amount of a basic oxide sufficient to render said picolinamide effective as a stabilizer, and said basic oxide is selected from the group consisting of MgO and ZnO.

4,101,508
2,2,6,6-TETRAMETHYL-4-PIPERIDYL BICYCLIC HEPTANE AND OCTANE CARBOXYLIC ACID ESTERS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,561
Int. Cl.^{2} C08K *5/34;* **C07D** *211/46, 211/94*
U.S. Cl. 260—45.8 N **26 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidyl ester of bicyclic heptane and octane carboxylic acids useful as a stabilizer for organic polymeric materials, and having the general formula:



I

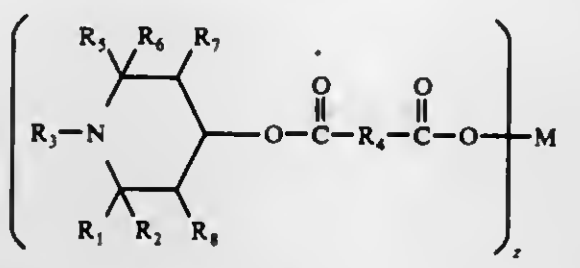
wherein:
- R_1 is selected from the group consisting of hydrogen and O.
- R_2 is selected from the group consisting of alkyl; alkenyl; cycloalkyl; aryl; alkaryl; aralkyl;
- *a* is selected from the group consisting of 1, 2, 3 and 4;
- *b* is selected from the group consisting of 0, 1, 2 and 3; and
- *a* + *b* is 1, 2, 3 or 4; and
- Z is a bicyclic heptane or octane ring having from seven to eight ring carbon atoms, and having from zero to four substituents selected from the group consisting of halogen, alkyl, cycloalkyl and aryl; the alkyl having from one to about six carbon atoms; the cycloalkyl having from three to about eight carbon atoms, and the aryl having from six to fourteen carbon atoms.

4,101,509
HINDERED PIPERIDINE CARBOXYLIC ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,910
The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.
Int. Cl.^{2} C08K *5/17;* **C07D** *211/46*
U.S. Cl. 260—45.75 N **24 Claims**

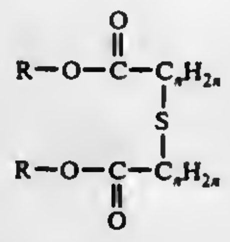
1. A compound of the formula



I

wherein
- R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group,
- R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl, or acyl,
- R_4 is straight-chain alkenylene of 2 to 4 carbon atoms, 1,2-cycloalkylene or 1,2-cycloalkenylene having 4 to 6 carbon atoms, 2,3-bicycloalkylene or 2,3-bicycloalkenylene having 7 to 8 carbon atoms or 1,2-, 1,3- or 1,4-phenylene, or a straight-chain alkylene of 1 to 4 carbon atoms substituted by alkyl or alkenyl of 1 to 18 carbon atoms, provided that the straight-chain alkylene substituted by alkyl has in total more than 8 carbon atoms,
- M is a metal selected from the group consisting of, nickel, manganese, copper, zinc, cobalt, tin and dialkyl tin,
- *z* has a value of from 1 to 4, the value of *z* being the same as the available valence of M, and either
- (a) R_5 is alkyl of 2 to 6 carbon atoms, R_6 is alkyl of 1 to 6 carbon atoms, and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms, provided that R_7 and R_8 are not both hydrogen, or
- (b) R_5 and R_6 together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted with a methyl group and R_7 and R_8 are independently hydrogen or alkyl of 1 to 5 carbon atoms.

15. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing
- (a) 0.005% to 5% of a stabilizing compound according to claim 1,
- (b) 0 to 5% of a hindered phenolic antioxidant,
- (c) 0 to 5% of a thio co-stabilizer



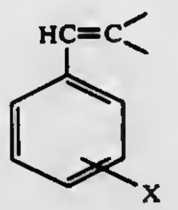
wherein R is an alkyl group having from 6 to 24 carbon atoms, and *n* is an integer from 1 to 6, and
- (d) 0 to 5% of a U.V. absorber.

4,101,510
FIRE RETARDANT POLYMER

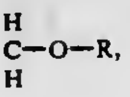
James Spanswick, Wheaton, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Continuation-in-part of Ser. No. 635,169, Nov. 25, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,933
Int. Cl.^{2} C08K *3/38*
U.S. Cl. 260—45.75 B **14 Claims**

1. A flame retardant thermoplastic composition comprising:
- (a) a thermoplastic resin comprising an effective amount of at least one substituted vinyl aromatic monomer and at least one monomer selected from the group consisting of ethylene, propylene, and styrene, whereinsaid substituted vinyl aromatic monomer has the structure:



where X is $-CH_2Cl$, $-CH_2Br$, $-CH_2OH$, $-SO_3H$,



$$-\underset{H}{\overset{H}{C}}-O-R,$$

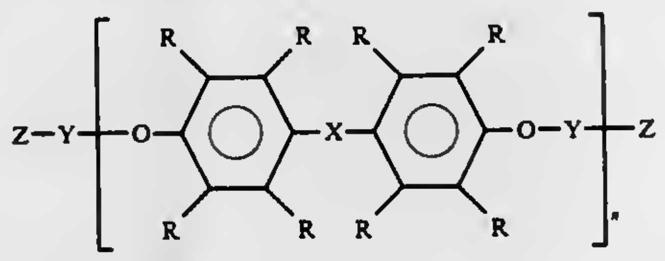
$-CHO$, $-CO_2R$, $-CH(CH_3)_2$ or $-C(O)CH_3$ and R is an alkyl group containing 1 to 6 carbon atoms; and
- (b) an effective amount of a Lewis acid or Lewis acid precursor, which forms a char that inhibits flame propagation.

4,101,511
NOVEL BISPHENOL DERIVATIVES AND USES THEREOF

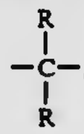
Joseph C. Floyd, Baytown, Tex., and Don A. Plank, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 711,705, Aug. 5, 1976, Pat. No. 4,032,510, which is a continuation-in-part of Ser. No. 597,245, Jul. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 441,457, Feb. 11, 1974, abandoned. This application Mar. 21, 1977, Ser. No. 779,903
Int. Cl.^{2} C08K *5/37*
U.S. Cl. 260—45.85 T **19 Claims**

13. A composition of matter comprising an oxidatively degradable hydrocarbon and an effective amount of a stabilizer having the following structural formula:

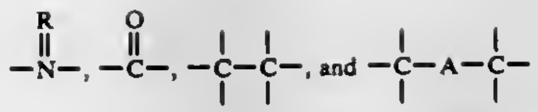


wherein:
- (1) R is selected from the group consisting of —H, C_1–C_{18} alkyl groups, and an aryl group;
- (2) X is selected from the group consisting of —S—,



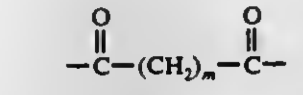
$$-\underset{R}{\overset{R}{C}}-,$$

$-SO-$, $-SO_2-$, —



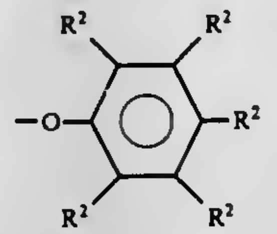
$$-\overset{R}{\overset{\|}{N}}-,\ -\overset{O}{\overset{\|}{C}}-,\ -\underset{|}{\overset{|}{C}}-\underset{|}{\overset{|}{C}}-,\ \text{and}\ -\underset{|}{\overset{|}{C}}-A-\underset{|}{\overset{|}{C}}-$$

wherein A is a C_1–C_{16} alkylene or an arylene group;
- (3) Y is



$$-\overset{O}{\overset{\|}{C}}-(CH_2)_m-\overset{O}{\overset{\|}{C}}-$$

wherein *m* is 0 or an integer ranging from 1 to 10
- (4) Z is selected from the group consisting of

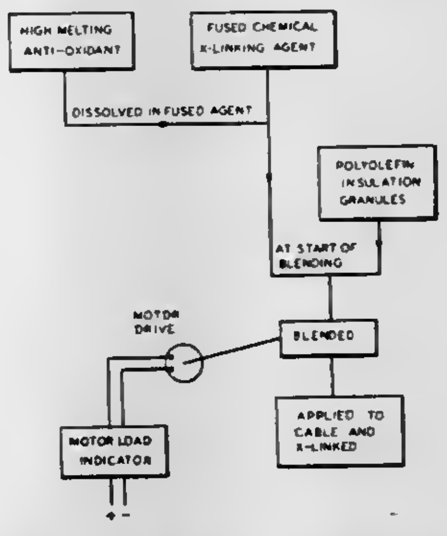


and $-O-R^3$ wherein R^2 is —H or a C_1–C_{18} alkyl group or —OH, and R^3 is a C_1–C_{18} alkyl group; and
- (5) *n* is a value ranging from 1 to about 15.

4,101,512
DISPERSION OF ANTIOXIDANT IN CROSS-LINKABLE POLYETHYLENE

Gertraud A. Schmidt, Long Branch, and Louis A. Bopp, Fair Haven, both of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Aug. 23, 1976, Ser. No. 716,688
Int. Cl.^{2} C08K *3/24*
U.S. Cl. 260—45.95 C **8 Claims**


HIGH MELTING ANTI-OXIDANT
FUSED CHEMICAL X-LINKING AGENT
DISSOLVED IN FUSED AGENT
POLYOLEFIN INSULATION GRANULES
AT START OF BLENDING
MOTOR DRIVE
BLENDED
MOTOR LOAD INDICATOR
APPLIED TO CABLE AND X-LINKED
+ -

1. The method of dispersion of an antioxidant, that has a melting point higher than the softening point of pellets of an electric cable polyolefin insulation into which a quantity of the antioxidant must be dispensed, which method comprises dissolving the antioxidant in a fused cross-linking agent which must be dispensed throughout the insulation for subsequent cross-linking of the polyolefin, said cross-linking agent having a substantially lower melting point than the antioxidant and the solution having a melting point substantially lower than the softening point of the pellets of insulation, dissolving the antioxidant, while in solid phase, in the cross-linking agent before bringing either of the ingredients of the solution into contact with the pellets of insulation, using an antioxidant and cross-linking agent that make a solution which is absorbed into the pellets to distribute the antioxidant and cross-linking agent into the pellets of the polyolefin, adding the solution, in the molten

condition to the pellets of the polyolefin and tumbling the pellets and solution in a ribbon blender, at temperatures above the melting point of the solution but below the softening temperatures of the pellets, until the solution is uniformly distributed over the surfaces of the pellets, and continuing the tumbling in the ribbon blender until the uniformly distributed solution is absorbed by the pellets through the surfaces thereof and throughout the mass of each of the polyolefin pellets.

4,101,513

CATALYST FOR CONDENSATION OF HYDROLYZABLE SILANES AND STORAGE STABLE COMPOSITIONS THEREOF

Frederick J. Fox, Woodbury; Richard W. Noren, St. Paul, both of Minn., and George E. Krankkala, North Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

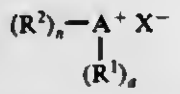
Filed Feb. 2, 1977, Ser. No. 764,817
Int. Cl.^{2} C08G *77/04*

U.S. Cl. 526—193 **44 Claims**

1. An anhydrous, storage-stable, polymerizable composition comprising at least one hydrolyzable silane represented by the formula:

X_mSiR_{4-m}

wherein
X is a hydrolyzable group or hydrogen,
R is a hydrocarbyl group, and
m is 2, 3, or 4,
and an organic aromatic onium ctalyst comprising an aromatic adduct of (1) a diaromatic, triaromatic, or tetraaromatic organoatomic cation of a Group Va, VIa, or VIIa atom and (2) an anion, said onium catalyst being represented by the formula:



$$(R^2)_n-\underset{(R^1)_a}{\underset{|}{A^+}}\ X^-$$

wherein R^2 is an aromatic group at least as electron withdrawing as benzene,
R^1 is an alkyl or alkenyl group,
A is a Group Va, VIa, or VIIa atom,
X is an anion,
n is a positive whole integer of at least 2 up to the valence of A plus one,
a is 0 or a positive whole integer up to thé valence of A minus one, and
n plus a is equal to the valence of A plus one
and wherein at least two of said R^2 groups are bonded to A.

4,101,514

IMIDAZOLE TYPE CURING AGENTS AND LATENT SYSTEMS CONTAINING THEM

Karl Friedrich Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 55,981, Jul. 17, 1970, abandoned. This application Sep. 15, 1976, Ser. No. 723,601
Int. Cl.^{2} C08G *59/68, 59/56*

U.S. Cl. 528—109 **6 Claims**

1. A latent reactive system which reacts at temperatures above 50° C. comprising a first compound containing the 1,2 epoxy group and a second compound of the formula

$ML_n(O-SO_2-R_f)_m$

wherein
L is selected from the group consisting of imidazole and halogen or hydrocarbon derivatives thereof,
M is a metal selected from Groups VIII, IB, and IIB, of the Periodic Table,
n is a coordination number of M,
R_f is a fluorinated alkyl group of 1–18 carbon atoms, and
m is the valence of M.

4,101,515

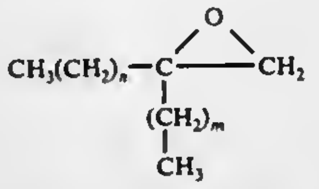
2,2-DIALKYLEPOXIDES

Robert Malone Gipson; Ernest Leon Yeakey, and William Jennings Peppel, all of Austin, Tex., assignors to Texaco Development Corp., New York, N.Y.

Division of Ser. No. 560,531, Mar. 20, 1975, abandoned, which is a division of Ser. No. 461,550, Apr. 17, 1974, Pat. No. 3,897,383, which is a division of Ser. No. 263,678, Jun. 16, 1972, Pat. No. 3,835,166. This application Sep. 27, 1976, Ser. No. 726,859
Int. Cl.^{2} C08L *63/00;* C08G *57/14*

U.S. Cl. 252—182 **2 Claims**

1. A process for reducing the viscosity of epoxy resins comprising admixing therewith an epoxide compound of the following formula:



wherein *n* and *m*, individually, are integers in the range of 3 to 7 and the sum of *n* and *m* is an integer in the range of 8 to 10; and wherein from about 1 to 25 parts by weight of said epoxide is employed per 100 parts by weight of said epoxy resin.

4,101,516

CLEAR AND COLORLESS EPOXIDE DIANHYDRIDE CURED RESINS

Walter P. Barie, Jr., Shaler Township, Allegheny County, and James T. Eurich, Winfield Township, Butler County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 10, 1976, Ser. No. 749,251
Int. Cl.^{2} C08G *59/42*

U.S. Cl. 528—112 **11 Claims**

1. A powdered resin mixture which will cure to a clear, substantially colorless hard resin comprising 5-phenyl-5-methylhexane-1,2,3,4-tetracarboxylic acid dianhydride and an epoxy resin having an epoxy equivalent value greater than one and an epoxy equivalent weight between about 400 and about 4,000, and a ratio of anhydride equivalents to epoxy equivalents of between 1.0 and about 1.5.

4,101,517

PREPARATION OF POLYESTERS OF 1,2-BIS(HYDROXYPHENYL)ETHANES AND AROMATIC DICARBOXYLIC ACIDS

Morris R. Ort, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 22, 1977, Ser. No. 770,955
Int. Cl.^{2} C08G *63/18*

U.S. Cl. 528—271 **7 Claims**

1. In a process for preparation of a polyarylene ester condensate of an aromatic dicarboxylic acid and a diphenol admixture comprising at least 75 mol percent 1,2-bis(4-hydroxyphenyl)ethane by melt condensation of the aromatic dicarboxylic acid and the 1–7 carbon aliphatic carboxylic acid diester of the diphenol admixture in substantially stoichiometric proportions up to 10 molar percent excess of the diacid or the diester, at a temperature in the range of from 240° to 350° C. to yield a condensate of inherent viscosity of at least about 0.3 determined at 25° C. in a 60/40 weight mixture of phenol and sym-tetrachloroethane at a concentration of 0.5 g. per deciliter, the improvement which comprises carrying out the melt condensation in the presence of a catalytic amount of a potassium compound selected from the group consisting of potassium

hydroxide, potassium carbonate and the potassium salts of lower fatty acids containing from 1 to 7 carbon atoms.

4,101,518

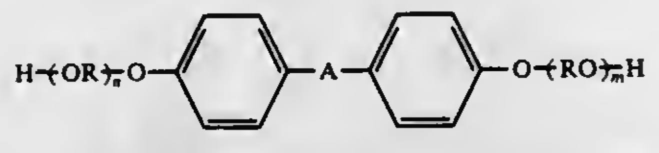
RESIN COMPOSITION FOR POWDER COATINGS

Shigeru Takamori, Osaka; Kazutaka Yamashita, and Yoshinao Kono, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 781,772
Claims priority, application Japan, Apr. 16, 1976, 51-43187
Int. Cl.^{2} C08L *63/00*

U.S. Cl. 528—100 **11 Claims**

1. A resin composition for powder coating compositions consisting essentially of
(A) a polycarboxylic acid obtained by reacting
(1) a polycarboxylic acid formed by reacting
(i) a polyoxyalkylene ether of a dihydric phenol having the formula:



wherein A is alkylene having 1 to 4 carbon atoms or carbonyl, R is alkylene having 2 to 4 carbon atoms. and each of *m* and *n* is a number of at least 1 and the sum of *m* and *n* is in the range of from 2 to 14, with
(ii) trimellitic acid or trimellitic anhydride in an amount of 1 to 4 moles of said trimellitic acid or trimellitic anhydride per one mole of said polyoxyalkylene ether, with
(2) a diepoxy compound in an amount of 0.1 to 0.5 mole of said diepoxy compound per one mole of said polycarboxylic acid (1) to effect a chain-extending reaction, and
(B) a polyepoxy compound.

4,101,519

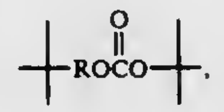
POLYCARBONATE EQUILIBRATION METHOD

John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,793
Int. Cl.^{2} C08G *63/62*

U.S. Cl. 528—197 **8 Claims**

1. A method for reducng the molecular weight of aromatic polycarbonate consisting essentially of chemically combined units of the formula,



$$\left[RO\overset{O}{\overset{\|}{C}}O \right],$$

which comprises,
(A) agitating a mixture of the polycarbonate, a phenol of the formula,

QOH,

a substantially inert organic solvent and an effective amount of a tertiary amine catalyst,
(B) effecting the separation of polycarbonate from the mixture of (A) and
(C) recovering the polycarbonate from the mixture of (B), where Q is selected from R^1—, HOR— and ZR^2—, R is a $C_{(6-30)}$ divalent aromatic organic radical, R^1 is a $C_{(6-13)}$ monovalent aromatic organic radical, R^2 is a $C_{(6-13)}$ divalent aromatic organic radical, and Z is a monovalent radical selected from carboxy, a $C_{(2-8)}$ olefinic hydrocarbon radical and an MSO_3 radical, where M is an alkali metal, halogen, phosphate, or amino.

4,101,520

METHYLATED, METHYLOLATED MELAMINE COMPOSITION

Leslie Boldizar, Wallingford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 19, 1976, Ser. No. 706,344
Int. Cl.^{2} C08G *9/24*

U.S. Cl. 528—248 **1 Claim**

1. A methylated, methylolated melamine composition having a combined formaldehyde content of about 4.0 to 4.2 moles per mole of melamine; a combined methanol content in the form of methoxymethyl groups of about 3.7 to 3.8 moles per mole of melamine; an —NH content of about 1.1 to 1.25 moles per mole of melamine and a content of free methylol groups of about 0.12–0.4 mole per mole of melamine.

4,101,521

PROCESS FOR THE MANUFACTURE OF HIGHLY DISPERSE SOLIDS CONSISTING OF CROSSLINKED UREA-FORMALDEHYDE POLYCONDENSATION PRODUCTS

Alfred Renner, Muenchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 609,144, Aug. 29, 1975, Pat. No. 4,018,741, which is a continuation of Ser. No. 439,243, Feb. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 378,898, Jul. 13, 1973, abandoned, which is a continuation of Ser. No. 299,479, Oct. 20, 1972, abandoned, which is a continuation of Ser. No. 65,330, Aug. 19, 1970, abandoned. This application Jun. 3, 1976, Ser. No. 692,580

Claims priority, application Switzerland, Sep. 12, 1969, 13829/69

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.^{2} C08G *2/28*

U.S. Cl. 528—242 **8 Claims**

1. A process for the manufacture of highly disperse insoluble and infusible solids of crosslinked urea-formaldehyde polycondensation products consisting of primary particles having an average diameter of not greater than 1 micron which consists essentially of
(A) forming an aqueous solution consisting essentially of water and a precondensate of urea and formaldehyde
(B) mixing said aqueous solution with a sufficient amount of sulphamic acid to achieve gel formation at a temperature of from 30° to 70° C to form a crosslinked gel, the molar ratio of formaldehyde to urea being from greater than 1.2 to 2.0 not later than at the time of gel formation, and
(C) comminuting drying and deagglomerating the resulting gel.

4,101,522

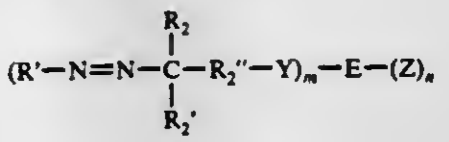
AZO COMPOUNDS CONTAINING ACYLATING FUNCTION AND AZO CONTAINING POLYMERS

Chester Stephen Sheppard, Tonawanda, and Ronald Edward MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 471,115, May 17, 1974, abandoned, which is a division of Ser. No. 386,661, Aug. 8, 1973, Pat. No. 3,890,294, which is a division of Ser. No. 37,311, May 14, 1970, Pat. No. 3,752,802, which is a continuation-in-part of Ser. No. 667,352, Sep. 3, 1967, abandoned. This application Feb. 25, 1976, Ser. No. 661,458
Int. Cl.^{2} C08G *63/68*

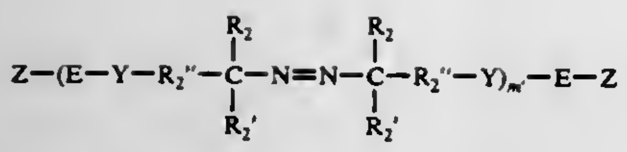
U.S. Cl. 528—292 **10 Claims**

1. A polymer having the formula:



$$(R'-N{=}N-\underset{R_2'}{\underset{|}{\overset{R_2}{\overset{|}{C}}}}-R_2''-Y)_m-E-(Z)_n$$

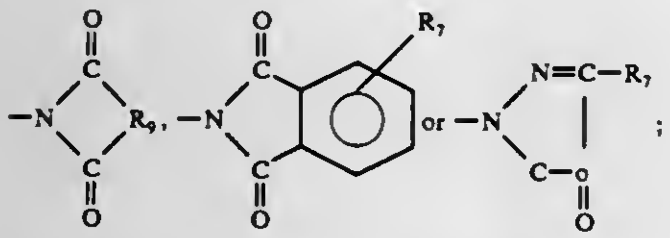
or



$$Z-(E-Y-R_2''-\underset{R_2'}{\overset{R_2}{C}}-N{=}N-\underset{R_2'}{\overset{R_2}{C}}-R_2''-Y)_{m'}-E-Z$$

wherein:

(a) R' is t-aliphatic having 4-10 carbon atoms;
(b) R_2 is lower alkyl of 1 to 8 carbons;
(c) R'_2 is —CN, —C(=O)OR_6, —OC(=O)R_6, —CL, —Br, —OC(=O)H, —GC(=G)R_5, —GC(=G)GR_5, —GR_5, —N_3, —SCN, —NCS, —OCN, —OOR_8, —R_5,



(d) R_2'' is aliphatic of 1 to 10 carbons, aromatic of 6 to 12 carbons, aromatic-aliphatic of 7 to 20 carbons, or cycloaliphatic of 3 to 10 carbons;
(e) R_2 and R_2'', when taken together with the tertiary carbon atom connected to the azo nitrogen atom, form a cycloaliphatic triradical of 3-10 carbons.
(f) Y is a divalent radical selected from —C(=O)O—, —OC(=O)O—, and, —OC(=O)R_3(COOH)C(=O)O—,
(g) R_3 is an aromatic of 6 to 12 carbons, aliphatic of 1 to 10 carbons, or cycloaliphatic of 3 to 10 carbons;
(h) R_5 is an alkyl or cycloalkyl radical of 1–12 carbons or an aromatic radical of 6–12 carbons;
(i) R_6 is alkyl of 1 to 6 carbons;
(j) R_7 is H, alkyl or cycloalkyl of 1–10 carbons, or aromatic of 6–12 carbons;
(k) R_8 is tertiary aliphatic of 4 to 10 carbons;
(l) R_9 is lower alkylene of 1 to 6 carbons;
(m) G is oxygen or sulfur;
(n) E is a divalent residue of a polyester;
(o) *m* is 1 to 2; *n* is 0 to 1 and *m* plus *n* is 2;
(p) *m'* is 1 to 100; and
(q) Z is selected from -OH, and —H.

4,101,523
POLYESTER FILMS

Masamichi Watanabe, Yokohama; Takuo Nakahara; Seiji Sakamoto, both of Machida; Kunio Bizen, Yokohama; Akikazu Yano, Yokohama, and Yuzo Otani, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 16, 1976, Ser. No. 705,936

Claims priority, application Japan, Jul. 17, 1975, 50/87480; Jul. 18, 1975, 50/87937; Jul. 18, 1975, 50/87935

Int. Cl.² C08G *63/22*

U.S. Cl. 528—309 **2 Claims**

1. A polyester film comprising a polyester mainly consisting of polyethylene terephthalate and 0.02 to 0.4% by weight of calcium terephthalate anhydride particles incorporated into the polyester by addition to the reaction medium in which the polyester is formed, said calcium terephthalate anhydride particles having an average particle diameter of 0.2 to 4.5 microns and a volume shape factor, $\phi\nu$, in the range of 0.08 to 0.4, said $\phi\nu$ being calculated by the formula:

$$\phi\nu = V/D^3$$

wherein D is the maximum diameter of a particle in the projection plane and V is the volume of the particle, said particulate calcium terephthalate anhydride being formed by reacting a dialkali metal terephthalate with a water-soluble calcium compound and heating the resultant calcium terephthalate to a temperature above 100° C to convert it into its anhydride.

4,101,524
METHOD FOR THE PRODUCTION OF COLORLESS POLYESTER AMIDES

Klaus Burzin, and Rainer Feldmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,358

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1975, 2542467

Int. Cl.² C08G *63/22, 63/68*

U.S. Cl. 528—288 **6 Claims**

1. A method for the production of colorless polyester amides from monomer starting materials selected from the group consisting of dicarboxylic acids, esters of dicarboxylic acids, primary diamines, polyhydric alcohols and aminocarboxylic acids; esters of dicarboxylic acids, primary diamines and aminocarboxylic acids; dicarboxylic acids, esters of dicarboxylic acids, primary diamines and lactams; esters of dicarboxylic acids, primary diamines and lactams; dicarboxylic acids, esters of dicarboxylic acids, primary diamines and aminocarboxylic acids; or esters of dicarboxylic acids, primary diamines, polyhydric alcohols and aminocarboxylic acids comprising:

(a) condensing said starting materials in a first condensing stage in the presence of about 3 to 20 percent by weight of added water based on the total weight of polyamide forming starting materials under a pressure of about 14 to 25 bar and at a temperature of about 220°-300° C:
(b) removing said water from said first condensing stage; and
(c) in a second condensing stage completely condensing said starting materials at a reduced pressure of about 0.91 to 100 mbar and at a temperature of about 230° to 300° C.

4,101,525
POLYESTER YARN OF HIGH STRENGTH POSSESSING AN UNUSUALLY STABLE INTERNAL STRUCTURE

Herbert L. Davis, Convent Station; Michael L. Jaffe, Summit, both of N.J.; Herman L. LaNieve, III, and Edward J. Powers, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,850

Int. Cl.² C08G *63/18, 63/70*

U.S. Cl. 528—309 **16 Claims**

1. An improved high performance polyester multifilament yarn comprising at least 85 mol percent polyethylene terephthalate and having a denier per filament of 1 to 20 exhibiting no substantial tendency to undergo self-crimping upon the application of heat which is particularly suited for use in industrial applications at elevated temperatures and which possesses an unusually stable internal structure as evidenced by the following novel combination of characteristics:

(a) a birefringence value of +0.160 to +0.189,
(b) a stability index value of 6 to 45 obtained by taking the reciprocal of the product resulting from multiplying the shrinkage at 175° C. in air measured in percent times the work loss at 150° C. when cycled between a stress of 0.6 gram per denier and 0.05 gram per denier measured at a constant strain rate of 0.5 inch per minute in inch-pounds on a 10 inch length of yarn normalized to that of a multifilament yarn of 1000 total denier, and
(c) a tensile index value greater than 825 measured at 25° C. obtained by multiplying the tenacity expressed in grams per denier times the initial modulus expressed in grams per denier.

4,101,526
PROCESS FOR THE MANUFACTURE OF LINEAR POLYESTERS WHICH CONTAIN PHOSPHITES AND/OR PHOSPHATES

Lothar Buxbaum, Lindenfels, Odenwald, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,620

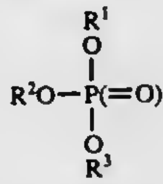
Claims priority, application Switzerland, Feb. 2, 1976, 1263/76

Int. Cl.² C08G *63/18, 63/68*

U.S. Cl. 528—179 **20 Claima**

1. An improved process for the manufacture of high molecular weight linear homo- or copolyesters, which contain moieties selected from the group consisting of phosphites and phosphates, and which are derived from aromatic and/or cycloaliphatic, unsaturated aliphatic and optionally in addition aliphatic, dicarboxylic acids, hydroxycarboxylic acids and diols, and which are formed first by transesterification process in the presence of a catalyst followed by a preliminary precondensation to give a precondensate containing hydroxy groups and with an average minimum degree of polycondensation Pn of 50, wherein the improvement comprises

adding from 1 to 25% by weight, based on the polyester precondensate, of a reaction catalyst of the general formula I, or mixtures thereof,



$$R^2O-\underset{\substack{|\\O\\R^3}}{\overset{\substack{R^1\\O\\|}}{P}}(=O)_x \qquad (I)$$

wherein R^1, R^2 and R^3 are the same or different, and represent linear or branched alkyl groups, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; or said aryl, aralkyl, cycloalkyl or cycloalkylalkyl groups substituted by alkyl, cyclohexyl, phenyl or phenylalkyl, and *x* is 0 or 1, and

completing the polycondensation in the melt or solid phase at a temperature between 170° C and 320° C until a minimum degree of polymerisation Pn of 100 is attained.

20. A polyester composition prepared by the process according to claim 1.

4,101,527
MOISTURE CURING POLYMERS PREPARED FROM POLYFUNCTIONAL ISOCYANATES AND A DIOXAZABICYCLO OCTANE

Arthur L. Cunningham, Park Forest, and John Mathai, Chicago, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Feb. 18, 1977, Ser. No. 770,245

Int. Cl.² C08G *18/00*

U.S. Cl. 528—73 **10 Claims**

1. A composition polymerizable to a cured film in the presence of moisture which comprises a polyfunctional isocyanate and a dioxazabicyclooctane.

4,101,528
COPOLYESTERS OF ETHYLENE 2,6-NAPHTHALENE DICARBOXYLATE AND HALOGENATED COMONOMERS

William N. Knopka, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Division of Ser. No. 385,572, Aug. 3, 1973, Pat. No. 3,874,573, and a continuation-in-part of Ser. No. 328,043, Jan. 30, 1973, Pat. No. 3,874,155, Ser. No. 328,044, Jan. 30, 1973, abandoned, Ser. No. 328,045, Jan. 30, 1973, Pat. No. 4,043,513. This application Jun. 16, 1977, Ser. No. 806,979

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.² C08G *63/12*

U.S. Cl. 260—45.75 R **9 Claims**

1. A linear, filament-forming, random copolyester resin of at least 75 mol % of ethylene-2,6-naphthalene dicarboxylate units and at least 3 mol % up to 25 mol % of a copolymerized halogenated ester unit having bromine or chlorine chemically united with either the dicarboxylic acid residue of said ester unit or both the diacid residue and the diol residue of said ester unit in an amount sufficient to provide at least 3.5% of the halogen, based on the weight of the copolyester.

4,101,529
HARD, OPTICALLY CLEAR POLYURETHANE ARTICLES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 4, 1976, Ser. No. 655,184

Int. Cl.² C08G *18/28*

U.S. Cl. 528—67 **21 Claims**

1. A polyurethane composition substantially free of ether linkages characterized by being heat curable to yield hard, impact-resistant articles having a Shore D hardness at room temperature of at least 75, said articles having a heat distortion temperature as determined according to ASTM D-648 of at least 190° F. (88° C.) and showing no visual change when exposed to ultraviolet light in accordance with ASTM G-25-70, Method A, comprising the reaction product of:

(A) a cycloaliphatic polyisocyanate,
(B) a low molecular weight active hydrogen-containing material containing only two active hydrogens per molecule,
(C) a low molecular weight active hydrogen-containing material having at least three active hydrogens per molecule, and optionally,
(D) a polymeric polycarbonate diol; the equivalent ratio of (B)/(C) being within the range of 0.5 to 10/1, said reaction product having a calculated weight percentage of urethane linkages of at least 20 percent, a calculated molecular weight between branch points of 600–4,000 and the percentage by weight of cycloaliphatic structural units being within the range of 45 to 50.

4,101,530
PROCESS FOR THE PRODUCTION OF POLYISOCYANATE MIXTURES CONTAINING BLOCKED ISOCYANATE GROUPS

Tlio Burkhardt, and Manfred Schönfelder, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 22, 1976, Ser. No. 734,832

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550156

Int. Cl.² C08G *18/81*

U.S. Cl. 528—45 **23 Claims**

1. A process for the production of polyisocyanate mixtures containing blocked isocyanate groups which are readily soluble in lacquer solvents, wherein polyhydroxyl compounds having a molecular weight in the range of from about 62 to 300 or mixtures of polyhydroxyl compounds having an average

molecular weight of from about 62 to 300 are reacted with 3-isocyanato methyl-3,5,5-trimethyl cyclohexyl isocyanate to form a reaction mixture containing urethane groups and free isocyanate groups, the quantitative ratios between the reactants being selected in such a way that the reaction mixture contains from about 2 to 12 isocyanate groups per hydroxyl group, and the free isocyanate groups in the reaction mixture are blocked by reaction with blocking agents containing isocyanate-reactive methylene groups,

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4,101,531

ANIONIC COPOLYMERIZATION OF 2-PYRROLIDONE WITH CAPROLACTAM OR PIPERIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 687,968, May 19, 1976, Ser. No. 724,801, Sep. 20, 1976, and Ser. No. 724,802, Sep. 20, 1976. This application Apr. 25, 1977, Ser. No. 790,776

Int. Cl.^{2} C08G *69/24*

U.S. Cl. 528—315 **25 Claims**

1. A process for the production of a solid copolymer of 2-pyrrolidone and a lactam having five or six carbon atoms in its ring, which comprises polymerizing a mixture of 2-pyrrolidone and said lactam by contacting the mixture with a catalyst system consisting essentially of an alkaline polymerization catalyst, and an auxiliary catalyst which is a quaternary Group VA onium salt, carbon dioxide and a copolymerization promoter.

4,101,532

PROCESS FOR THE PRODUCTION OF HIGH VISCOSITY POLYAMIDE BY ADDING ALKYLENE CARBONATE TO MOLTEN POLYAMIDE

Vincenzo Ruoti, Varese, and Felice Farioli, Fagnano Olona, both of Italy, assignors to SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Jan. 10, 1977, Ser. No. 757,934

Claims priority, application Italy, Jan. 22, 1976, 19471 A/76

Int. Cl.^{2} C08G *69/48*

U.S. Cl. 528—311 **6 Claims**

1. Process for the production of polyamide composition having a high viscosity in the molten state which comprises preparing an original polyamide, adding to said polyamide in the molten state an alkylene carbonate in an amount from 0.1 to 2% by weight of the polyamide, and extruding the resulting alkylene carbonate containing polyamide composition, thereafter subjecting said composition to heat treatment under a vacuum at residual pressure below 5 mmHg, at a temperature between about 110° C and 210° C, whereupon the relative viscosity of said composition is markedly raised relative to the original and extruded polyamide.

4,101,533

CYCLIC CARBONIC ACID ESTERS AS SOLVENTS FOR POLY-(β-HYDROXYBUTYRIC ACID

Robert M. Lafferty, and Elmar Heinzle, both of Graz, Austria, assignors to Agroferm AG, Chur, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,647

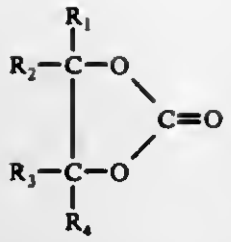
Claims priority, application Switzerland, Jan. 14, 1976, 403/76

Int. Cl.^{2} C08G *63/06*

U.S. Cl. 528—491 **14 Claims**

1. A process for the extraction of racemic or optically active poly-(β-hydroxybutyric acid) from a fermentaton mass which comprises:

contacting a fermentation mass containing poly-(β-hydroxybutyric acid) with a liquid cyclic carbonic acid ester of the formula:



wherein R_1, R_2, R_3 and R_4, which are the same or different, are hydrogen or alkyl with 1 to 6 carbon atoms, as a solvent for the poly-(β-hydroxybutyric acid.

4,101,534

METAL-BONDING ADHESIVE COMPOSITIONS

Hiroshi Ueno, Kawasaki; Shinya Otsuka, Tokyo; Tetsuo Tsukamoto, Tokyo, and Akira Kishimoto, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Limited, Japan

Filed Jul. 13, 1972, Ser. No. 271,409

Claims priority, application Japan, Aug. 4, 1971, 46-58362

Int. Cl.^{2} C08L *77/00*

U.S. Cl. 260—857 TW **16 Claims**

1. A metal-bonding adhesive composition consisting essentially of 89 - 60% by weight, based on the total composition, of an aliphatic homopolyamide and 11 - 40% by weight, based on the total composition, of an aliphatic copolyamide, said homopolyamide being a crystalline homopolyamide having 7 - 13 amide groups per 100 carbon atoms in the polymer backbone, said copolyamide consisting of 90 - 70% by weight of (i) recurring units such that a homopolyamide thereof has 7 - 13 amide groups per 100 carbon atoms in the polymer backbone and (ii) 10 - 30% by weight of (ii) recurring units which are different from the recurring units (i), and said copolyamide being the same as the recurring units of said crystalline homopolyamide.

16. A polyamide powder composition comprising,

A. 60 - 89 percent by weight, based on the total composition, of an aliphatic homopolyamide and

B. about 40 - 11 percent by weight, based on the weight of the total composition, of an aliphatic copolyamide, said homopolyamide having 7 - 13 amide groups per hundred carbon atoms in the polymer backbone, said copolyamide consisting of 70 - 90% by weight of

(i) recurring units having 7 - 13 amide groups per 100 carbon atoms in the polymer backbone, wherein said recurring units are the same as the recurring units of said homopolyamide and 30 - 10% by weight of (ii) recurring units which are different from the recurring units in (i).

4,101,535

METHOD AND APPARATUS FOR RECOVERING SAPONIFIED TALL OIL

Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,836

Int. Cl.^{2} C09F *1/00*

U.S. Cl. 260—97.7 **8 Claims**

1. The method of removing tall oil soap from black liquor in a storage pond, which method comprises, the steps of, storing the liquor with its surface exposed to the atmosphere for a sufficient period of time to permit particles of soap and lignin in said black liquor to accumulate in a layer at the bottom of the pond, creating a whipping action in the black liquor and disturbing said layer on the bottom of the pond with said whipping action to cause the particles of soap in said layer to agglomerate and release said lignin and also to agglomerate residual soap contained within the liquor above said layer, whereby the differences in specific gravity causes the agglomerated soap to float toward the top of the body of liquor in the

pond, and thereafter skimming the agglomerated soap from the surface of the black liquor in the pond.

4,101,536

MURAMYLDIPEPTIDE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Yuichi Yamamura, Hyogo; Tetsuo Shiba, Osaka; Ichiro Azuma, Osaka; Shoichi Kusumoto, Osaka; Tadamasa Hirayama, Tokyo, and Tsuneo Kusama, Tokyo, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

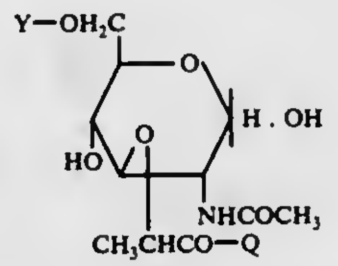
Filed Jun. 23, 1977, Ser. No. 809,245

Claims priority, application Japan, Jun. 23, 1976, 51-74072; Dec. 16, 1976, 51-150328; Feb. 3, 1977, 52-11122

Int. Cl.^{2} C07G *103/52, 7/00;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **9 Claims**

1. Muramyldipeptide derivatives represented by the general formula



wherein Y represents a mycoloyl group or a synthetic higher acyl group having a total carbon number of C_{30}–C_{90} and having at least a branched chain of long alkyl group on the α-position thereof; Q represents an -L-alanyl-D-isoglutamine group,

a -glycyl-D-isoglutamine group, or
an -L-seryl-D-isoglutamine group.

4,101,537

OCTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Ernest D. Nicolaides, and Francis John Tinney, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Apr. 7, 1977, Ser. No. 785,393

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **11 Claims**

1. A octapeptide having the name N^{α}-t-butoxycarbonyl-L-tryptophyl-O-benzyl-L-seryl-O-benzyl-L-tyrosyl-D-phenylalanyl-L-leucyl-N^{G}-nitro-L-arginyl-L-prolylglycine methyl ester.

4,101,538

NONAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Alfred Campbell, Ann Arbor, Mich., assignor to Warner-Lambert, Morris Plains, N.J.

Filed Jun. 13, 1977, Ser. No. 805,764

Int. Cl.^{2} C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **2 Claims**

1. A nonapeptide of the formula

benzyloxycarbonyl-Gln-Trp-Ser-Tyr-Trp-Pro-Pro-Tyr(benzyl)-Ser(benzyl)-Y

where Y is amino, lower alkylamino or di(lower alkyl)amino.

4,101,539

BACITRACIN RECOVERY PROCESS

James Alexander Kindraka, Terre Haute, Ind., and John Bernard Gallagher, Paris, Ill., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 17, 1977, Ser. No. 844,092

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **10 Claims**

1. A process for the recovery of bacitracin from a fermented beer containing it comprising the steps of:

a. screening the fermented beer through a 100–150 mesh screen,

b. adjusting the pH of the fermented beer to about 7.5 to about 8.7,

c. ultrafiltering the fermented beer in an ultrafilter having a molecular weight cut off of from 30,000 to 80,000, and

d. collecting and holding the bacitracin containing permeste at a temperature of less than 30° C.

4,101,540

3-TRIFLUOROMETHYL-4-PHENYL-PYRAZOLIUM AZO DYESTUFFS

Gerard Emile Edgard Coispeau, Soisy-sous-Montmorency, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

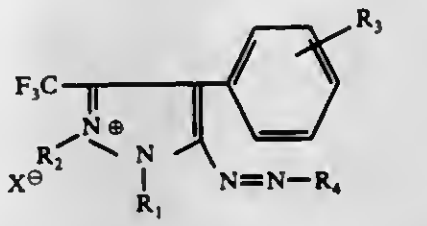
Filed Sep. 20, 1976, Ser. No. 724,488

Claims priority, application France, Sep. 30, 1975, 75 29873; Sep. 30, 1975, 75 29874

Int. Cl.^{2} C09B *29/00, 29/36, 29/38;* **D06B** *3/76*

U.S. Cl. 260—147 **7 Claims**

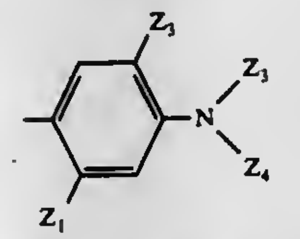
1. A dyestuff of the formula:



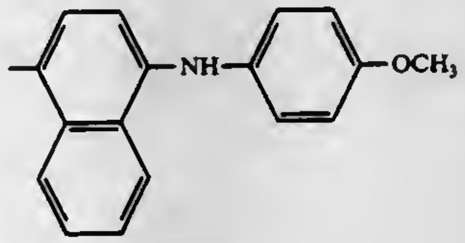
in which R_1 is alkyl containing 1 to 4 carbon atoms, phenyl, chlorophenyl, bromophenyl, nitrophenyl, alkoxy (C_1–C_2)-phenyl or alkyl (C_1–C_4)-phenyl;

R_2 is alkyl containing 1 to 4 carbon atoms;
R_3 is hydrogen, chlorine or bromine;
R_4 is a radical of the formula:

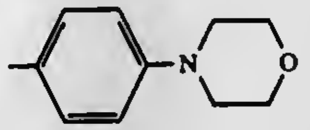
(a)

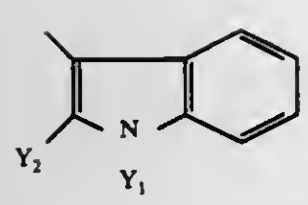


(b)

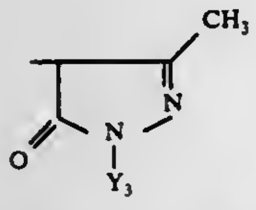


(c)




(d)

or


(e)

Y_1 is hydrogen, methyl, ethyl, cyanoethyl or 2-hydroxypropyl;
Y_2 is hydrogen, methyl, isopropyl or phenyl;
Y_3 is hydrogen, phenyl, tolyl, nitrophenyl, chlorophenyl or methoxyphenyl;
Z_1 is hydrogen, chlorine, methyl, methoxy, ethoxy or acetylamino;
Z_2 is hydrogen, methyl or ethoxy;
Z_3 is methyl or ethyl;
Z_4 is methyl, ethyl, cyanoethyl, trifluoroethyl, diethylaminoethyl, succinimidoethyl or phenyl; and
$X^{\ominus}$ is a monovalent anion.

4,101,541
3-CYANO-1,2,4-THIADIAZOLYL-5-CZO DYESTUFFS

Jean Claude Petitplerre, Kaiseraugst, and Visvanathan Ramanathan, Basel, both of Switzerland, assignors to Ciba-Gelgy Corporation, Ardsley, N.Y.

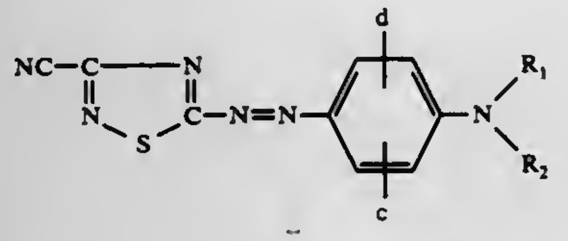
Continuation of Ser. No. 532,331, Dec. 12, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,067

Claims priority, application Switzerland, Dec. 21, 1973, 18040/73

Int. Cl.² C09B *29/06, 29/10, 29/24, 29/38*

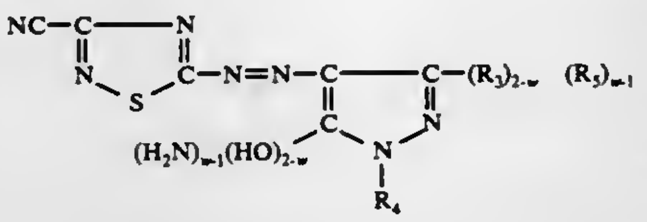
U.S. Cl. 260—158 **5 Claims**

1. An azo dyestuff, free from sulphonic acid groups, of the formula



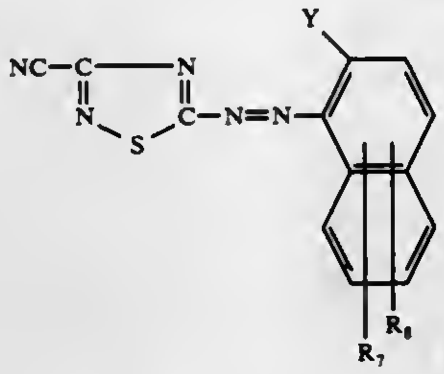
wherein
d and *c* are independently hydrogen, chloro, bromo, lower alkyl, lower alkoxy, lower alkylmercapto, phenyl, phenoxy, phenylmercapto, cyclohexyl, cyclohexylmethyl, benzyl, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl;
and
c is additionally trifluoromethyl or acylamino wherein the amino group is otherwise unsubstituted or substituted by methyl, and acyl is alkanoyl of up to 5 carbon atoms, alkylcarbamyl of up to 5 carbon atoms, alkoxycarbonyl of up to 5 carbon atoms, phenylcarbamyl, phenoxycarbonyl, benzoyl, phenoxyacetyl, chloroacetyl or phenylacetyl;
and
R_1 and R_2 are independently hydrogen or lower alkyl which is unsubstituted or substituted by: fluoro, chloro, bromo, phenyl, lower alkoxy, lower alkylcarbonyloxy, lower alkylcarbonylamino, benzoyloxy, benzoylamino (chloro-, bromo-, methyl-, ethyl-, methoxy- or ethoxy-) benzoylamino, cyano, hydroxy, phenoxy, phenylcarbonyl, phenylsulphonyloxy, phenoxycarbonyl, phenylthio, (chloro-, bromo-, methyl-, ethyl-, methoxy- or ethoxy) phenoxy, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylcarbonyl, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylsulphonyloxy, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenoxycarbonyl, (chloro-, bromo-, methyl-, ethyl-, methoxy-, or ethoxy-) phenylthio, lower alkylsulphonyl, lower alkoxycarbonyloxy, phenoxycarbonyloxy, phenylaminocarbonyloxy, aminocarbonyl, mono-lower alkylaminocarbonyl di-lower alkylaminocarbonyl, lower alkylcarbonyl, succinimido, phthalimido, lower alkoxycarbonyl cinnamoyl, thiophenecarbonyl, pyridinecarbonyl, phenoxyalkylcarbonyloxy, phenylaminoalkylcarbonyloxy or (lower alkoxy- or phenoxy-) carbonylalkylcarbonyl (-oxy or -amino).

3. An azo dyestuff, free from sulfonic acid groups, of the formula



wherein
R_3 is lower alkyl, lower alkoxy, phenyl, lower alkoxycarbonyl, aminocarbonyl or lower alkyl aminocarbonyl;
R_4 is hydrogen, lower alkyl, hydroxyethyl, phenyl or phenyl substituted by chloro, bromo, hydroxy, lower alkylcarbonylamino, benzoylamino, methyl, ethyl, propyl or butyl, or is sulpholanyl;
R_5 is hydrogen, lower alkyl, lower alkoxy, cyano, lower alkoxycarbonyl, carbamoyl, loweralkoxy-loweralkoxycarbonyl, phenoxy or phenyl; and
w is 1 or 2.

4. An azo dyestuff, free from sulfonic acid groups of the formula



wherein
Y is —OH or —NHR_6,
R_6 is hydrogen, lower alkyl, benzyl or phenylethyl; and
R_7 and R_8 independently are hydrogen, halo, lower alkyl, lower alkoxy, nitro, sulphonylamino, N-lower alkyl sulphonylamino or N,N-dilower alkylsulphonylamino.

4,101,542
PROCESS FOR THE SELECTIVE DESTRUCTION, BY REDUCTION, OF P-COUPLED PRODUCTS OF THE 1-NAPHTHOL SERIES

Erich Krämer, Bergisch-Gladbach, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1976, Ser. No. 745,400

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553443; Oct. 1, 1976, 2644433

Int. Cl.² C09B *29/00, 41/00, 46/00*

U.S. Cl. 260—158 **4 Claims**

1. Process for the selective destruction of p-coupled product of a 1-naphthol coupler and a diazo compound in the presence of o-coupled products thereof which comprises treating said coupled products with hydrazine, hydrazine and a redox catalyst, a salt of dithionous acid or a salt of hydroxymethanesulphinic acid at a pH > 4 and a temperature of 10°-100° C to reduce said p-coupled product, and then separating the o-coupled products.

4,101,543
BENZENE-AZO-HETEROCYCLIC DYESTUFFS DERIVED FROM ALKYL AMINOCINNAMATES OR AMINOCINNAMIDE

Jean-Pierre Henri Stiot, Saint Pierre les Elbeuf; Claude Marie Henri Emile Brouard, Sotteville les Rouen, and Jean Marie Louis Leroy, Saint Etienne du Rouvray, all of, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

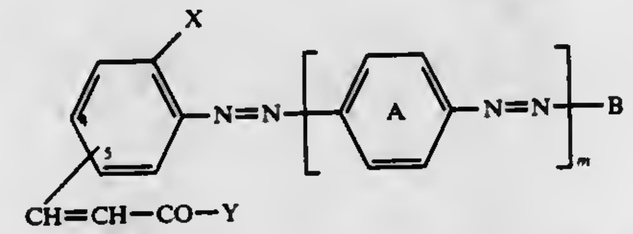
Filed Feb. 12, 1974, Ser. No. 441,791

Claims priority, application France, Feb. 16, 1973, 73.05503

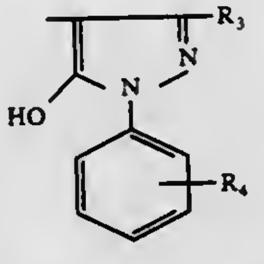
Int. Cl.² C09B *29/36, 29/38, 31/14, 33/02*

U.S. Cl. 260—162 **8 Claims**

1. A dyestuff of the formula:



in which -CO=CH-CO-Y is fixed in the 4 or 5 position, X is hydrogen or chlorine, Y is amino or alkoxy containing 1 to 4 carbon atoms, the p-phenylene nucleus A is unsubstituted or substituted by chlorine, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, formylamino, acetylamino, propanoylamino, benzoylamino or cinnamoylamino, m is zero or one, and B represents the radical N-methyl (or ethyl)-4-hydroxy-2-oxo-quinolyl, 2-hydroxy-carbazolyl, 3-hydroxy-dibenzofuranyl, 2-phenyl-indolyl, N-methyl (or ethyl)-2-hydroxy-3-cyano-4-methyl-6-oxo-pyridyl, 3,6-dimethyl-4-hydroxy-1-phenyl-(4,5-b)pyrazolopyridyl or the radical of formula:



wherein R_3 is hydrogen, methyl, alkoxycarbonyl, carbonamido or alkyl-substituted carbonamido and R_4 is hydrogen, chlorine, nitro, methyl, cyano or, but only in the 3 or 4 position of the phenyl nucleus, sulphonamido, carbonamido, alkyl-substituted sulphonamido or alkyl-substituted carbonamido, the alkyl and alkoxy groups of R_3 and R_4 containing 1 to 4 carbon atoms.

4,101,544
WATER SOLUBLE MONOAZO DYES FOR POLYAMIDE MATERIAL

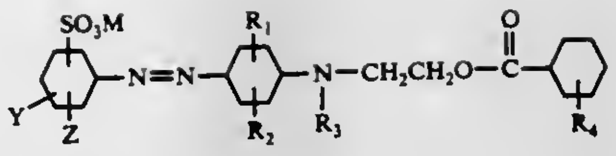
Allan M. Huffman, Lock Haven; Paul R. Horinka, West Lawn, and Dominic A. Zanella, Lock Haven, all of Pa., assignors to American Color & Chemical Corporation, Charlotte, N.C.

Filed Sep. 26, 1975, Ser. No. 617,149

Int. Cl.² C09B *29/08, 29/26*

U.S. Cl. 260—207.1 **3 Claims**

1. A dye of the formula:



wherein:
(a) M is hydrogen or a member selected from the group consisting of alkali metal ions, the ammonium ion and hydroxylalkyl ammonium ions, the alkyl portion of which has from 3 to 12 carbon atoms;
(b) Y and Z are members independently selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl;
(c) R_1 and R_2 are members independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, chlorine and bromine;
(d) R_3 is a member selected from the group consisting of lower alkyl and lower alkyl cyano; and
(e) R_4 is a member selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl.

4,101,545
DIAMINO-ANDROSTANES AND A PROCESS FOR THE PREPARATION OF THE SAID COMPOUNDS

Zoltan Tuba; Maria Marsai; Katalin Biro; Laszlo Szporny; Egon Karpati, and Szaboles Szeberenyi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 28, 1976, Ser. No. 709,325

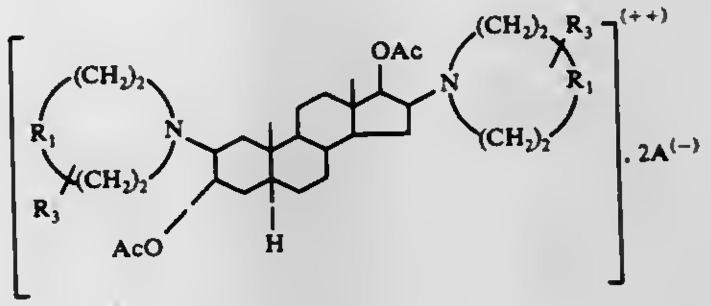
Claims priority, application Hungary, Aug. 1, 1975, RI 575

Int. Cl.² C07J *43/00*

U.S. Cl. 260—239.5 **4 Claims**

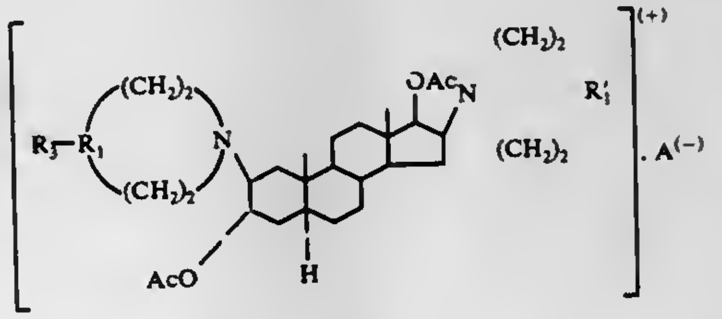
1. A compound of the formulae

(1a)



or

(1b)



wherein
Ac is an alkyl carbonyl group containing 1 to 4 carbon atoms in the alkyl moiety and one of
R_1 and R_1' is a methylene group and the other is a group of the formula >N-R_2 wherein R_2 is an alkyl group containing 1 to 3 carbon atoms,
A is halogen and
R_3 is an alkyl group containing 1 to 4 carbon atoms, or an allyl group

4,101,546

CYANATOTHIOMETHYLTHIO PYRAZINES

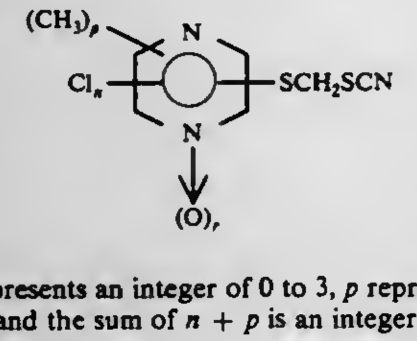
Craig E. Mixan, and Christian T. Goralski, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 759,944, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 588,757, Jun. 29, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,473

Int. Cl.^{2} C07D *241/04*

U.S. Cl. 544—408 **14 Claims**

1. A compound corresponding to the formula



wherein *n* represents an integer of 0 to 3, *p* represents an integer of 0 to 2 and the sum of $n + p$ is an integer of 0 to 3; and *r* is 0 or 1.

4,101,547

1,4-DIAMINOANTHRAQUINONES

Roland Mislin, Saint-Louis, France; Wolfgang Schoenauer, Riehen, and Karl Ulrich Steiner, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

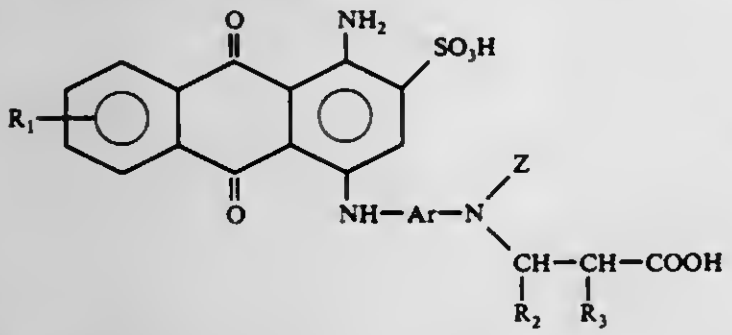
Filed Jun. 25, 1976, Ser. No. 700,064

Claims priority, application Switzerland, Jul. 2, 1975, 8596/75

Int. Cl.^{2} C09B *62/20, 62/28, 1/22*

U.S. Cl. 544—294 **11 Claims**

1. A compound of formula



in which

R_1 is a hydrogen atom or a sulpho group attached at the 5-, 6-, 7- or 8-position of the anthraquinone nucleus,

each of

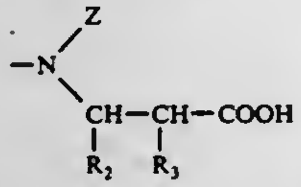
R_2 and R_3 is a hydrogen atom or one is a hydrogen atom and the other is a methyl group,

Z is a 2,5,6-trihalopyrimidinyl-4 or 2-methylsulphonyl-5-halo-6-methylpyrimidinyl-4 group,

and

Ar is a 1,3- or 1,4-phenylene or a 1,5-naphthylene group, unsubstituted or substituted with one or two substituents selected from (C_{1-4}) alkyl, (C_{1-4}) alkoxy, sulpho and carboxyl groups and halogen atoms,

with the provisos (i) that the group



is not attached at an adjacent position on the phenylene or naphthylene nucleus to any sulpho substituent on that nucleus, and (ii) two sulpho or two carboxyl groups, or one sulpho and one carboxyl group cannot simultaneously be present on the phenylene nucleus, or a water soluble salt thereof.

4,101,548

1,2,3-THIADIAZOLE AMIDES

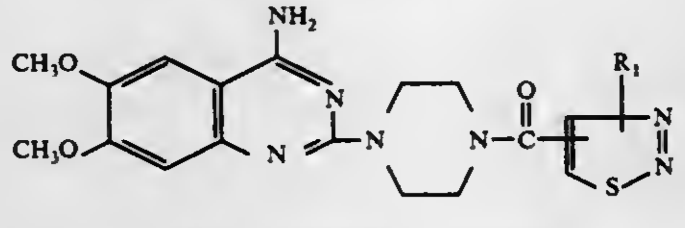
Ronnie R. Crenshaw, Dewitt, and Richard A. Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,966

Int. Cl.^{2} C07D *239/84*

U.S. Cl. 544—284 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein

R_1 is hydrogen, amino, lower alkyl of 1 to 4 carbon atoms inclusive or $NHCO_2R_2$ in which R_2 is lower alkyl of 1 to 4 carbon atoms inclusive.

4,101,549

AMINOPHENYL ESTERS OF 5-CARBOXYALKYL BARBITURIC ACIDS

Antonino Focella, Clifton; John Edward Heveran, Fairfield; Sidney Teitel, Clifton, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 26, 1976, Ser. No. 690,123

Int. Cl.^{2} C07D *239/62*

U.S. Cl. 544—301 **3 Claims**

1. A primary aminophenyl ester of a 5-lower alkyl of 2 to 8 carbon atoms -5-(1-carboxy-lower alkyl of 2 to 8 carbon atoms) barbituric acid.

4,101,550

BIS-PIPERAZIDES OF TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACIDS

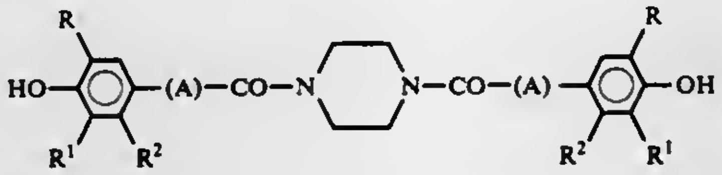
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 682,237, May 3, 1976, Pat. No. 4,049,713, which is a division of Ser. No. 490,835, Jul. 23, 1974, Pat. No. 3,984,460, which is a continuation-in-part of Ser. No. 400,745, Sep. 25, 1973, abandoned. This application Apr. 22, 1977, Ser. No. 789,897

Int. Cl.^{2} C07D *295/18*

U.S. Cl. 544—387 **4 Claims**

1. A compound having the formula



wherein

R is branched alkyl of 3 to 8 carbon atoms,

R^1 and R^2 are alkyl of 1 to 3 carbon atoms, and

A is straight chain alkylene of 1 to 3 carbon atoms.

4,101,551

QUINOPHTHALONE DYESTUFFS

Manfred Groll, Cologne, Fed. Rep. of Germany, and Hans-Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, administrator), assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

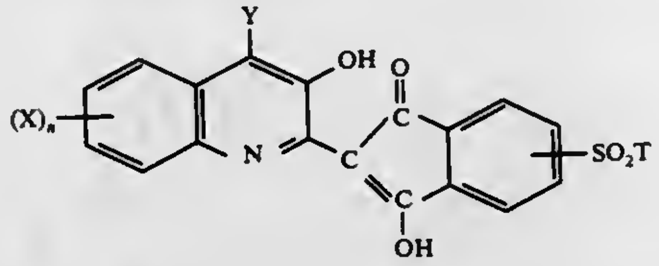
Filed Jul. 2, 1976, Ser. No. 702,045

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530123; Jul. 5, 1975, 2530124

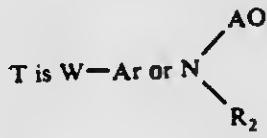
Int. Cl.^{2} C07D *215/22;* **C09B** *25/00*

U.S. Cl. 260—283 SA **9 Claims**

1. Water-insoluble quinophthalone dyestuff of the formula



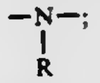
wherein



$$T \text{ is } W{-}Ar \text{ or } N{<}^{AOR_1}_{R_2}$$

Ar is phenyl, naphthyl, mono-, di-, or tri-substituted phenyl, or mono-, di- or tri-substituted naphthyl where the substituents are chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, phenyl, phenoxy, cyano, nitro, methylmercapto, methoxycarbonyl, or hydroxy;

W is oxygen, sulfur, or



$$-\underset{\underset{R}{|}}{N}-;$$

R is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkyl substituted by cyano, hydroxy, methoxy, or chloro;

A is straight-chain or branched-chain C_2-C_6-alkylene or C_2–C_6-alkylene interrupted in its chain by oxygen;

R_1 is C_1-C_4-alkyl, cyano-C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, methoxy-C_1-C_4-alkyl, chloro-C_1–C_4-alkyl, phenyl, naphthyl, mono-, di-, or tri-substituted phenyl, or mono-, di-, or tri-substituted naphthyl where the substituents are chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, phenoxy, cyano, nitro, methylmercapto, methoxycarbonyl, or hydroxy;

R_2 is hydrogen, C_1–C_4-alkyl or C_1–C_4 -alkyl substituted by cyano, hydroxy, methoxy, or chloro;

X is chlorine, bromine, C_1–C_4-alkyl, methoxy-C_1–C_4-alkyl, chloro-C_1-C_4 alkyl, C_1-C_4-alkoxy, nitro, or C_1–C_4-alkylcarbonylamino;

Y is halogen, chlorine, or bromine; and

n is a number from 0 to 3.

4,101,552

NOVEL LYSERGIC ACID AMIDES AND PROCESS FOR PREPARING SAME

Erzsébet Magó née Karácsony; József Borsi; Lászlo Tardos; Ildikó Király; Sandor Elek, and István Elekes, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 23, 1976, Ser. No. 679,866

Claims priority, application Hungary, Apr. 24, 1975, GO 1309

Int. Cl.^{2} C07D *457/06;* **A61K** *31/48*

U.S. Cl. 260—285.5 **2 Claims**

1. 9,10-dihydrolysergic acid-(3'-/pyrrolid-2''-on-1'-yl/-propyl)-amide.

2. 1-methyl-9,10-dihydrolysergic acid-(thiazoline-2'-yl)-amide.

4,101,553

IMIDAZO[2,1-a]ISOQUINOLINES

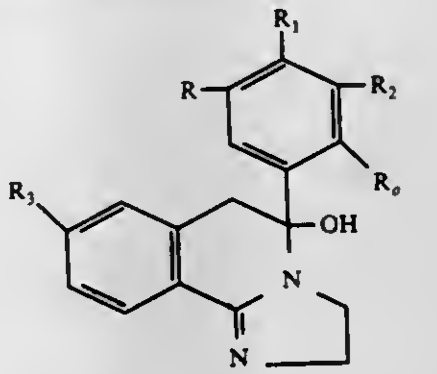
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 429,526, Jan. 2, 1974, abandoned. This application Nov. 4, 1974, Ser. No. 520,537

Int. Cl.^{2} C07D *471/04;* **A61K** *31/47*

U.S. Cl. 260—288 CF **16 Claims**

1. A compound of the formula



where

R_0 represents H or halo of atomic weight 19–36,

each of R, R_1 and R_2 represents, independently, H, halo having an atomic weight of 19-36, methyl, methoxy, trifluoromethyl, or

R and R_1 or R_1 and R_2 taken together represent methylenedioxy, R_2 and R_0 and R and R_0 respectively then being H, and

R_3 represents H, halo having an atomic weight of 19–36, or methyl,

provided that (1) when R or R_2 is trifluoromethyl, R_1 is H or said halo, and (2) no more than two of R, R_1, R_2 and R_0 represent other than H, or a pharmaceutically acceptable acid addition salt thereof.

4,101,554

CATALYTIC PROCESS FOR THE PREPARATION OF PERFLUOROALKYL-SUBSTITUTED HETEROCYCLIC COMPOUNDS

John H. Tobin, Winsted, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 643,227, Dec. 22, 1975, Pat. No. 4,038,331, which is a continuation-in-part of Ser. No. 549,589, Feb. 13, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,362

Int. Cl.^{2} C07D *213/26*

U.S. Cl. 260—290 HL **9 Claims**

1. A process for preparing perfluoroalkylsubstituted pyridines which comprises

a. heating together in the vapor phase under anhydrous conditions at temperatures from about 300° C to about 800° C

(1) a pyridine compound containing at least one hydrogen atom attached to a ring carbon atom and further substituted with from 0 to about 3 inert substituents;

(2) a perfluoroalkyl bromide having from about 1 to about 4 carbon atoms; and

(3) a catalytic amount of a catalyst selected from the group consisting of iodine and an iodine generating compound selected from the group consisting of perhaloalkyl iodine having 1 to 4 carbon atoms, IBr, and 1Cl.

4,101,555

PROCESS FOR INCREASING THE CIS CONTENT OF A MIXTURE OF CIS AND TRANS ISOMERS OF S-ISOPROPYL-1-(5-ETHYL-2-METHYL-PIPERIDINECARBOTHIOATE)

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 617,908, Sep. 29, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,501

Int. Cl.² C07D *211/32*

U.S. Cl. 260—293.85 **2 Claims**

1. In a process for the production of S-isopropyl-1-(5-ethyl-2-methylpiperidine carbothioate) by reaction of isomeric mixtures of cis- and trans-2-methyl-5-ethylpiperidinedine with isopropyl chlorothiolformate, the improvement comprising increasing the cis isomer content of the carbothioate product with respect to the cis isomer content of the starting piperidine comprising conducting the reaction utilizing a stoichiometric excess of from about 50% to about 300% of 2-methyl-5-ethylpiperidine with respect to isopropyl chlorothiolformate at a temperature below room temperature and in the presence of an inert diluent.

4,101,556

TOTAL SYNTHESIS OF 2,5-DIDEOXYSTREPTAMINES

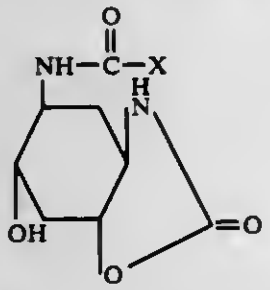
Gerry Kavadias, St-Lambert, and Bernard R. Belleau, Westmount, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 634,396, Nov. 24, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,482

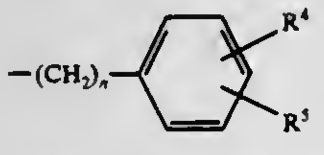
Int. Cl.² C07D *263/58*

U.S. Cl. 260—307 C **7 Claims**

1. The compound having the formula



in which X is —OR or R wherein R is (lower)alkyl, CF_3 or a group having the formula



in which *n* is an integer of 0 to 4 inclusive and R^4 and R^5 are alike or different and each is H, Cl, Br, I, F, (lower)alkyl, (lower)alkoxy or nitro; or an acid addition salt thereof.

4,101,557

SELECTIVE SYNTHESIS OF 2-HALOALKANETHIOLS AND EPISULFIDES THEREFROM

Wolfgang H. Mueller, Neuallschwil, Switzerland; Alexis A. Oswald, Mountainside, N.J., and Peter J. Kozak, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

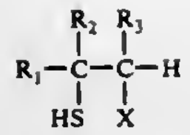
Continuation-in-part of Ser. No. 581,441, Sep. 23, 1966, Pat. No. 3,994,889. This application Apr. 27, 1970, Ser. No. 32,457

The portion of the term of this patent subsequent to Mar. 4, 1993, has been disclaimed.

Int. Cl.² C07D *331/02*

U.S. Cl. 260—327 E **10 Claims**

1. A process for preparing monomeric episulfides which comprises reacting a haloalkanethiol of the general formula



$$\begin{array}{ccccccc} & & R_2 & & R_3 & & \\ & & | & & | & & \\ R_1 & - & C & - & C & - & H \\ & & | & & | & & \\ & & HS & & X & & \end{array}$$

wherein R_1, R_2 and R_3 are hydrogen and C_1 to C_{20} nonsubstituted or monosubstituted monovalent hydrocarbon radicals and X is halogen, with a substantially equal molar amount of anhydrous ammonia at a temperature varying from about −50° to +50° and at a pressure of 0.5 to 3 atmospheres.

4,101,558

PROCESS FOR PREPARING THIOXANTHONES

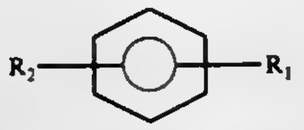
Lubomir Vacek, Toledo, and Harold M. Foster, Sylvania, both of Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Apr. 21, 1977, Ser. No. 789,465

Int. Cl.² C07D *335/16*

U.S. Cl. 260—328 **20 Claims**

1. A process of preparing thioxanthones which comprises reacting in the presence of effective amounts of a Friedel-Crafts catalyst approximately equal molar amounts of an ortho-chlorosulfenylbenzoyl chloride and at least one aromatic compound having the formula:



wherein R_1 and R_2 are either the same or different and selected from the class consisting of hydrogen, chlorine, bromine, hydroxyl, aryl, lower alkyl and lower alkoxy radicals having 1 to 8 carbon atoms.

4,101,559

PRECURSORS OF HETEROFURANOBENZOXEPIN ACETIC ACIDS

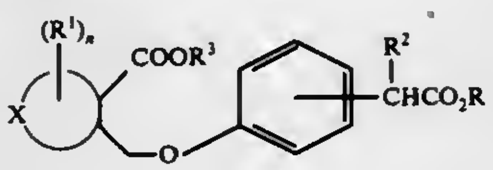
Arthur Raymond McFadden, East Brunswick, and Daniel Eugene Aultz, Middlesex, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 607,926, Aug. 26, 1975, Pat. No. 4,025,640. This application Apr. 19, 1977, Ser. No. 788,788

Int. Cl.² C07D *307/68*

U.S. Cl. 260—347.3 **4 Claims**

1. A compound of the formula



wherein X together with the carbon atoms to which it is attached is a furano ring structure; R is hydrogen or straight or branched chain alkyl of from 1 to 5 carbon atoms; R^1 is alkyl of 1 to 4 carbon atoms; R^2 is hydrogen or methyl; R^3 is hydrogen or alkyl of 1 to 4 carbon atoms; *n* is the integer 0, 1 or 2; and salts thereof prepared from pharmaceutically acceptable bases.

4,101,560

SHAPED, BONDED BORIDE CATALYSTS

Ernest P. Buinicky, Newburgh; Joseph A. Durkin, Fishkill, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 656,048, Feb. 6, 1976, Pat. No. 4,033,901. This application Jan. 19, 1977, Ser. No. 760,779

Int. Cl.² C07D *301/20*

U.S. Cl. 260—348.29 **3 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the steps of: reacting said olefin in a tubular reaction zone with said organic hydroperoxide at temperatures of about 90° C to about 130° C and pressures sufficient to maintain the product and reactants substantially in liquid phase; the molar ratio of olefin to hydroperoxide ranging from about 1:10 to 100:1; in the presence of a shaped catalyst consisting essentially of 80 to 95 percent by weight of finely divided particles of tungsten boride intimately bonded by 5 to 20 percent by weight of lightly preoxidized aluminum powder having an oxide coating constituting from 5 to 10 percent by volume of said powder, the molar ratios of hydroperoxide to catalyst ranging from about 1:1 to 10,000:1 and recovering the corresponding epoxy compound.

4,101,561

OXIDATIVE COUPLING OF ALKYLPHENOLS CATALYZED BY METAL COMPLEXES OF IMINO ACID COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

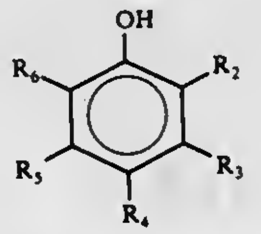
Filed Nov. 26, 1976, Ser. No. 745,209

The portion of the term of this patent subsequent to Nov. 14, 1994, has been disclaimed.

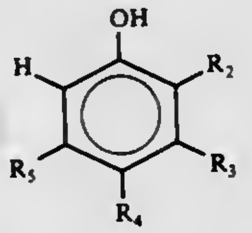
Int. Cl.² C07C *37/00, 39/12, 39/16, 45/16, 49/62, 49/72*

U.S. Cl. 260—396 N **12 Claims**

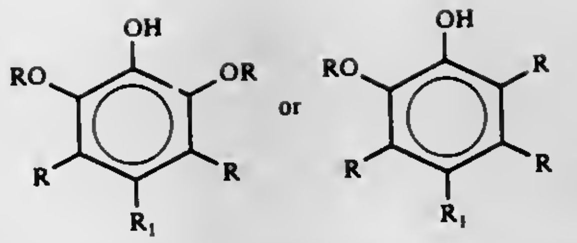
1. A method of preparing by an oxidation coupling reaction a carbon-carbon coupled condensation product of an alkyl phenol, an alkoxy phenol, or a 1-naphthol having one of the following formulas:



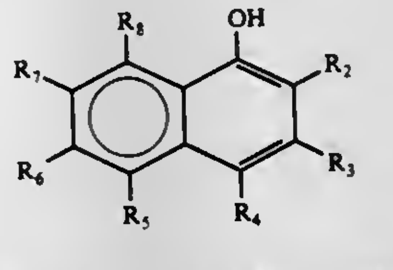
wherein R_2 and R_6 are alkyl, R_3 and R_5 are hydrogen or alkyl, and R_4 is hydrogen or methyl with the proviso that R_3 and R_5 cannot both be tertiary alkyl,



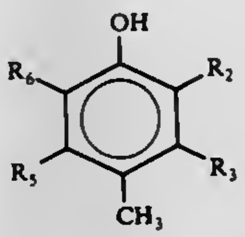
wherein R_2 and R_4 are alkyl provided that at least one of said alkyl groups is a tertiary alkyl and R_3 and R_5 are hydrogen or alkyl,



wherein each R is any alkyl group as defined above for the alkylphenols or OR, OR being alkoxy of 1–6 carbon atoms, and R_1 is either hydrogen or methyl, provided that the substituents adjacent to R_1 cannot both be tertiary alkyl or tertiary alkoxy,



wherein R_2, R_3 and R_4 are hydrogen, alkyl containing from 1 to 5 carbon atoms, or alkoxy containing from 1 to 6 carbon atoms, provided that either or both R_2 and R_4 are hydrogen and R_5, R_6, R_7, and R_8 are hydrogen, alkyl containing from 1 to 5 carbon atoms or alkoxy containing from 1 to 6 carbon atoms provided that tertiary alkyl or tertiary alkoxy groups may not be attached to adjacent carbon atoms of the naphthalene molecule,



wherein R_3 is hydrogen, a primary, secondary or tertiary alkyl or an alkoxy group, R_5 is a primary or secondary alkyl group containing from 1–5 carbon atoms and R_2 and R_6 are a primary, secondary or tertiary alkyl or an alkoxy group, said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of a catalyst system consisting essentially of an imino acetic acid metal complex wherein the metal source is selected from the class consisting of divalent copper, divalent nickel, divalent cobalt, divalent manganese, trivalent cerium, trivalent chromium, and trivalent iron and wherein the imino acid has the formula

$$R\text{-}N[(CH_2)_nCO_2H]_2$$

wherein *n* is 1 or 2 and R is hydrogen, alkyl, oxaalkyl, hydroxyalkyl, cycloalkyl, aryl, pyridyl or $—(CH_2)_nCO_2H$ wherein *n* is 1 or 2 and a sufficient amount of an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates and alkali metal bicarbonates to maintain the pH in the range of about 8.5–9.5 during the oxidative coupling reaction.

4,101,562

TREATMENT OF SAPONIFIED SYNTHETIC FATTY ACIDS

Ashok Kumar Bhandari, and Shrinath Sheshgiri Kalbag, both of Bombay, India, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 2, 1977, Ser. No. 764,970

Claims priority, application United Kingdom, Feb. 10, 1976, 5123/76

Int. Cl.² C11C *1/08*

U.S. Cl. 260—419 7 Claims

1. A method of extracting unsaponifiable material from saponified synthetic fatty acids by

(1) contacting an aqueous solution of the saponified synthetic fatty acids with a chlorinated hydrocarbon containing from 2 to 4 carbon atoms, said hydrocarbon being free of water miscible solvent and having a boiling point above about 70° C, in amounts of from about 10:1 to about 1:10 by weight, at a temperature above the normal boiling point of the chlorinated hydrocarbon to about 200° C and under a pressure sufficient to retain the chlorinated hydrocarbon below its boiling point;

(ii) settling the total reactants into two layers while retaining said sufficient pressure;

(iii) separating the lower chlorinated hydrocarbon layer which contains the unsaponifiable material; and

(iv) recovering said saponified synthetic fatty acids from the upper layer.

4,101,563

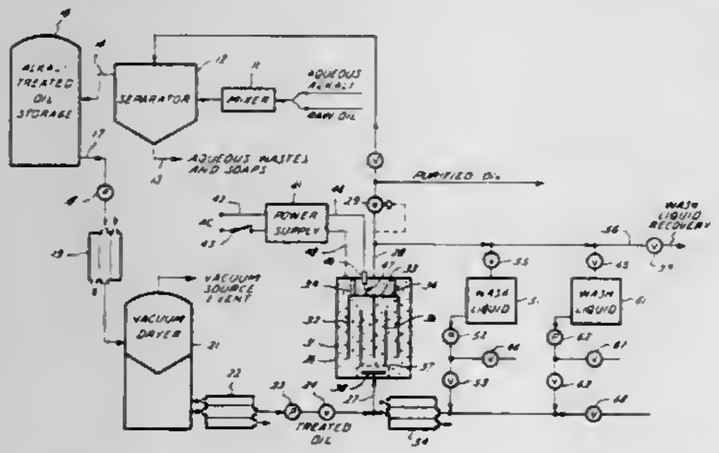
PROCESS FOR REFINING CRUDE OIL

Joel Victor Landis, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 24, 1977, Ser. No. 761,753

Int. Cl.² C11B *3/06*

U.S. Cl. 260—425 23 Claims



1. A process for refining crude oil selected from the group consisting of fats and animal and vegetable oils, comprising the steps of:

(a) treating said crude oil with aqueous alkali to produce a treated oil with reduced acidic content but containing finely dispersed liquid-state alkali metal soaps and a bulk aqueous alkali phase;

(b) separating the bulk aqueous phase from the treated oil;

(c) subjecting the treated oil to electrofiltration by passing it through a bed of dielectric particulate solids having open but tortuous flow paths interposed within a d.c. electric field, whereby the finely dispersed alkali metal soaps adhere in their liquid state to the particulate solids in the bed and provide a purified oil with a substantially reduced solids content; and

(d) withdrawing said purified oil.

4,101,564

PLATINUM-TIN HYDROFORMYLATION CATALYST

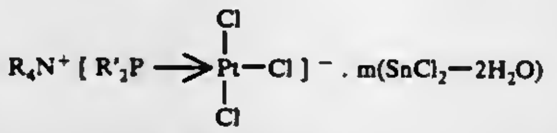
John E. Poist, High Bridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,781

Int. Cl.² C07C *7/22;* **B01J** *31/24, 31/18;* **C07C** *45/08*

U.S. Cl. 260—429.7 5 Claims

1. A platinum-tin hydroformylation catalyst corresponding to the formula:



$$R_4N^+ [\, R'_2P \longrightarrow \overset{\displaystyle Cl}{\underset{\displaystyle Cl}{Pt}}-Cl\,]^- \,.\, m(SnCl_2-2H_2O)$$

wherein R is a radical selected from hydrogen and alkyl and aryl groups containing between one and about 20 carbon atoms; R' is an organic radical selected from alkyl, alkoxy, aryl and aryloxy groups containing between one and about 20 carbon atoms; and *m* is an integer between one and about 10.

4,101,565

HYDROFORMYLATION CATALYST

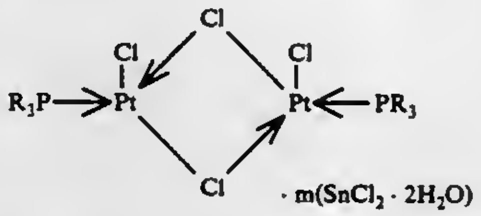
John E. Poist, High Bridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,780

Int. Cl.² C07F *7/22;* **B01J** *31/24, 31/18;* **C07C** *45/08*

U.S. Cl. 260—429.7 3 Claims

1. A platinum dimer complex hydroformylation catalyst corresponding to the formula:



wherein R is an organic radical selected from alkyl, alkoxyl, aryl and aryloxy groups containing between one and about twenty carbon atoms; and *m* is an integer between two and about twenty.

2. A hydroformylation catalyst in accordance with claim 1 wherein the R radical is phenyl.

3. A hydroformylation catalyst in accordance with claim 1 wherein the R radical is butyl.

4,101,566

OXIDATIVE ADDITION PRODUCTION OF TRANS-HALO-2(1,3-ALKADIENYL)BIS(TRIETHYLPHOSPHINE) COMPLEXES OF NICKEL(II), PALLADIUM(II), AND PLATINUM(II)

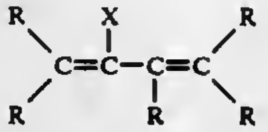
Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,762

Int. Cl.² C07F *15/00, 15/04*

U.S. Cl. 260—439 R 15 Claims

1. A process comprising contacting in solution a haloprene of the formula



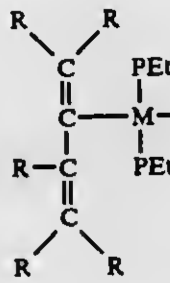
wherein X is chlorine, bromine, or iodine, four R groups are hydrogen and the remaining R group is hydrogen or methyl, and a zero valent complex having the formula

$M(PEt_3)_n$

wherein M is nickel, palladium, or platinum, PEt_3 represents triethylphosphine, *n* is 3 or 4, or

$M(1,5\text{-}COD)(PEt_3)_2$

wherein M and PEt_3 are as defined above and 1,5-COD represents 1,5-cyclooctadiene, under conditions suitable for producing the corresponding trans-halo-2(1,3-alkadienyl)bis(triethylphosphine) metal(II) complex of the formula



wherein M, X, R, and PEt_3 are as defined above.

4,101,567

METHOD OF PREPARING CHROMIUM ALKANOATES

Colin Fitzmaurice, and Norman William Fletcher Webster, both of Clwyd, Wales, assignors to Graesser Salicylates Limited, Clwyd, Wales

Filed Feb. 9, 1977, Ser. No. 766,976

Claims priority, application United Kingdom, Feb. 13, 1976, 5812/76

Int. Cl.² C07F *11/00*

U.S. Cl. 260—438.5 R 7 Claims

1. A method of preparing a chromic alkanoate having up to 6 carbon atoms which comprises heating an admixture of chromic anhydride, an alkanol having up to 6 carbon atoms, an alkanoic acid having up to 6 carbon atoms and water.

4,101,568

PRODUCTION OF DIALKYLALUMINUM HYDRIDES

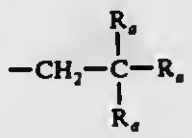
Dennis B. Malpass, LaPorte, Tex., and Spencer C. Watson, Wilmington, Del., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Feb. 27, 1976, Ser. No. 661,913

Int. Cl.² C07F *5/06*

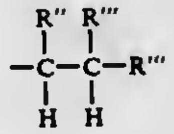
U.S. Cl. 260—448 A 19 Claims

1. A non-catalytic process for the production of dialkylaluminum hydrides having the formula R_2AlH in which R is an n-alkyl group having from 1 to 15 carbon atoms or a tri-substituted alkyl group having the formula



$$-CH_2-\overset{\displaystyle R_a}{\underset{\displaystyle R_a}{C}}-R_a$$

in which R_a is an alkyl group, comprising heating a compound having the formula R_2AlR' in which R is an α- or β- monosubstituted alkyl group of the type



$$-\overset{\displaystyle R''}{\underset{\displaystyle H}{C}}-\overset{\displaystyle R'''}{\underset{\displaystyle H}{C}}-R'''$$

in which one R'' is hydrogen and the other is alkyl and R''' is alkyl, at a temperature between about 50° and about 220° C.

4,101,569

PROCESS FOR THE PREPARATION OF 4,4'-DINITRODIPHENYL CARBONATE

Jan Mazanek; Johannes Blahak, and Dieter Arlt, all of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1976, Ser. No. 735,715

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549036

Int. Cl.² C07C *68/06*

U.S. Cl. 260—463 8 Claims

1. A process for the preparation of 4,4'-dinitro-diphenyl carbonate which comprises adding to a sulfuric acid solution of diphenyl carbonate maintained at a temperature between −40 and +40° C a stoichiometric or slightly stoichiometric excess of nitric acid relative to said diphenyl carbonate, the sulfuric acid having a strength of 80–100 percent and the concentration of diphenyl carbonate in the sulfuric acid being between 2 and 40 percent by weight based upon the volume of sulfuric acid.

4,101,570

PROCESS FOR THE PRODUCTION OF PERCARBOXYLIC ACID SOLUTIONS IN ORGANIC SOLVENTS

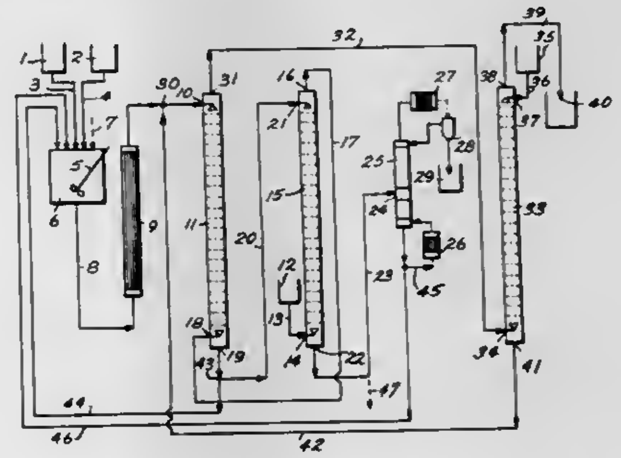
Manfred Krüger; Gerd Schreyer, both of Grossauheim, and Otto Weiberg, Neu-Isenburg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Dec. 17, 1973, Ser. No. 425,290

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1972, 2262970

Int. Cl.² C07C *179/10*

U.S. Cl. 260—502 R 18 Claims



1. In a continuous process for the production of substantially water free peralkanoic acid having 2 to 4 carbon atoms, said process comprising reacting in a reactor aqueous hydrogen peroxide with an alkanoic acid having 2 to 4 carbon atoms in the presence of an acidic catalyst at an addition mole ratio of hydrogen peroxide to alkanoic acid of 0.5 to 30:1 to form peralkanoic acid and water, counter-currently extracting the aqueous reaction solution with a water immiscible organic solvent, recovering a substantially water free solution of peralkanoic acid in said solvent, and dehydrating the extract by azeotropic distillation the improvement comprising taking at least a portion of the hydrogen peroxide containing aqueous raffinate from said extraction, and feeding it to an evaporating unit, distilling off at least a portion of the water from said raffinate under reduced pressure to form a hydrogen peroxide containing concentrated raffinate and returning the concentrated raffinate to the reactor together with sufficient fresh aqueous hydrogen peroxide and alkanoic acid to restore the starting conditions.

4,101,571

MANUFACTURE OF SULFAMIC ACID HALIDES

Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

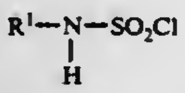
Filed Mar. 10, 1976, Ser. No. 665,684

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2513997; Apr. 3, 1975, 2514646

Int. Cl.² C07C *143/70, 143/21, 143/15*

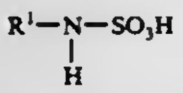
U.S. Cl. 260—543 R **13 Claims**

1. A process for the manufacture of sulfamic acid chlorides of the formula



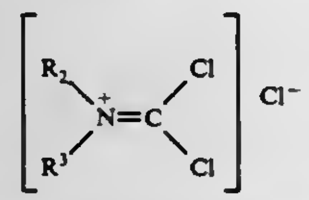
$$R^1—\underset{\displaystyle H}{\underset{|}{N}}—SO_2Cl \qquad I$$

where R^1 is an aliphatic or cycloaliphatic radical which comprises: reacting sulfamic acids of the formula



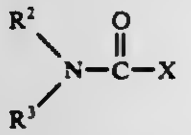
$$R^1—\underset{\displaystyle H}{\underset{|}{N}}—SO_3H \qquad II$$

where R^1 has the above meanings, or their metal salts, with phosgene in the presence of dichloromethyleneammonium chlorides of the formula



III

or in the presence of carbamic acid halides of the formula



IIIa

where R^2 and R^3 may be identical or different and each is an aliphatic radical, or R^2 and R^3 together with the adjacent nitrogen are members of a heterocyclic ring, and X is halogen.

4,101,572

USE OF PHOSPHORUS DERIVATIVES AS STABILIZING AGENTS FOR PERCHLOROMETHYL MERCAPTAN

Vincent C. Martines, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 22, 1976, Ser. No. 753,121

Int. Cl.² C07C *148/04*

U.S. Cl. 260—543 H **7 Claims**

1. A method of stabilizing crude perchloromethyl mercaptan produced by the iodine catalyzed chlorination of carbon disulfide which comprises adding an amount of dimethyl methylphosphonate effective to stabilize said crude perchloromethyl mercaptan.

6. A stabilized perchloromethyl mercaptan composition consisting essentially of: (1) crude perchloromethyl mercaptan produced by the iodine catalyzed chlorination of carbon disulfide, and (2) an amount of dimethyl methylphosphonate effective to stabilize said crude perchloromethyl mercaptan.

4,101,573

PRODUCTION OF METHYLDICHLOROPHOSPHANE

Klaus Gehrmann; Alexander Ohorodnik, both of Erftstadt; Karl-Heinz Stell, Hürth, and Stefan Schäufer, Brühl, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,619

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629299; Jan. 14, 1977, 2701389

Int. Cl.² C07F *9/02, 9/52*

U.S. Cl. 260—543 P **3 Claims**

1. A process for making methyldichlorophosphane by reacting methane with phosphorus trichloride in contact with carbon tetrachloride at temperatures higher than 500° C which comprises: admixing the starting reactant mixture with 2 to 7 mol % of reaction-initiating carbon tetrachloride, based on phosphorus trichloride; reacting the carbon tetrachloride to an extent of 50 to 80% by varying the reaction temperature within the range 550° to 650° C for constant residence times of 0.1 to 0.9 second; and condensing out the resulting reaction mixture containing a residual analytically detectable 20 to 50% proportion of the carbon tetrachloride used.

4,101,574

CYCLOPROPANECARBOXYLIC ACID CHLORIDES

Jacques Martel, Bondy; Chanh Huynh, Villemomble, and Jean Buendia, Fontenay sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

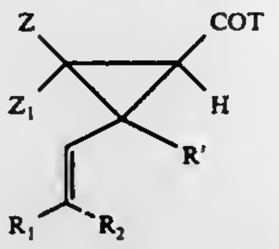
Division of Ser. No. 395,146, Sep. 7, 1973, Pat. No. 3,997,586, which is a division of Ser. No. 168,441, Aug. 2, 1971, Pat. No. 3,786,052, which is a continuation-in-part of Ser. No. 662,278, Aug. 22, 1967, abandoned, and Ser. No. 879,942, Nov. 25, 1969, abandoned. This application Dec. 10, 1976, Ser. No. 749,402

Claims priority, application France, Aug. 26, 1966, 66.74404; Aug. 26, 1966, 66.74405; Feb. 24, 1967, 67.96425; Jan. 16, 1967, 67.11071; Jul. 19, 1967, 67.114833; Nov. 26, 1968, 68.175375

Int. Cl.² C07C *61/18*

U.S. Cl. 260—544 L **2 Claims**

1. A compound selected from the group consisting of a racemic or optically-active cyclo-propane carboxylic derivative having the formula



wherein Z and Z_1 are selected from the group consisting of lower alkyl having from 1 to 7 carbon atoms and phenyl and Z and Z_1 together represent an alkylene residue having 4 to 5 carbon atoms, T is chlorine, R_1 and R_2 are selected from the group consisting of lower alkyl and phenyl, R′ is selected from the group consisting of hydrogen and lower alkyl, with the proviso that when Z and Z_1 are methyl and R′ is hydrogen, R_2 is other than methyl.

4,101,575

N-ARYL-N′-(2,3-DIHALOGENO-ALKANOYL)-UREAS

Edgar Enders, Cologne; Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Cologne, all al Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1976, Ser. No. 668,165

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1975, 2512171

Int. Cl.² C07C *127/22;* **A01N** *9/20*

U.S. Cl. 260—553 E **7 Claims**

1. An N-aryl-N -(2,3-dihalogeno-alkanoyl)-urea selected from the group consisting of

N-anthracen-1-yl-N′-(2,3-dichloropropionyl)-urea,
N-anthracen-1-yl-N′-(2,3-dibromopropionyl)-urea,
N-anthracen-2-yl-N′-(2,3-dichloropropionyl)-urea,
N-anthracen-2-yl-N′-(2,3-dibromopropionyl)-urea,
N-anthracen-10-yl-N′-(2,3-dichloropropionyl)-urea, and
N-anthracen-10-yl-N′-(2,3-dibromopropionyl)-urea.

4,101,576

2-CARBAMYLMETHYL-OR (DIETHYLCARBAMYL)METHYL-AMINO-4-HYDROXY TOLUENE AND PROCESS FOR PREPARING THE SAME

Gregoire Kalopissis, Neuilly-sur-Seine, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 619,478, Oct. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 263,625, Jun. 16, 1972, abandoned, which is a continuation of Ser. No. 848,342, Aug. 7, 1969, abandoned, which is a division of Ser. No. 525,291, Feb. 7, 1966, Pat. No. 3,591,323. This application Jan. 25, 1977, Ser. No. 762,329

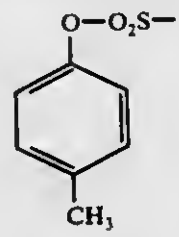
Claims priority, application France, May 6, 1965, 65.16140

Int. Cl.² C07C *103/29, 103/76*

U.S. Cl. 260—559 A **5 Claims**

1. A process for preparing 2-amino-4-hydroxy toluene comprising:

(1) reacting paracresol in the presence of pyridine with methane sulfochloride at a temperature of about −2° to 5° C to produce a compound having the formula

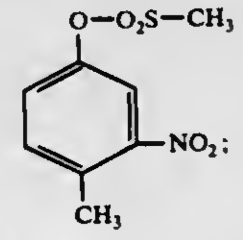


the molar ratio of said cresol to said sulfochloride being 2.0:2.4;

(2) cooling the compound from step (1) in the presence of a mixture of sufficient ice and chlorohydric acid present in a molar ratio of 14.2 moles per 2 moles of cresol;

(3) recovering the product of step (2) from the reaction mass and dissolving said separated product at a temperature of 0° - 5° C in concentrated sulfuric acid;

(4) nitrating the dissolved product of step (3) with a nitrating agent comprising a mixture of nitric acid and sulfuric acid in a ratio of 4.7 cm^3:3.8 cm^3, respectively, at a temperature of 0° - 5° C to produce a product having the formula



(5) pouring the reaction mixture from step (4) over ice to recover the nitrated product of step (4);

(6) reducing the $—NO_2$ substituent on the nitrated product recovered from step (5) to $—NH_2$ with a reducing agent comprising a mixture of tin and hydrochloric acid;

(7) cooling the reaction mixture from step (6) thereby precipitating 2-amino-4-mesyloxy toluene as the chlorostannate thereof;

(8) drying the precipitate from step (7) and dissolving said dried precipitate in water;

(9) subjecting the dissolved precipitate from step (8) to a current of hydrogen sulfide whereby tin sulfide is formed and thereafter removed by filtration;

(10) vacuum concentrating the filtrate from step (9) and cooling said concentrated filtrate thereby precipitating the hydrochloride of 2-amino-4-mesyloxy toluene;

(11) reacting the hydrochloride of 2-amino-4-mesyloxy toluene from step (10) in an inert nitrogen atmosphere with NaOH in amounts of 125 cc per 0.5 mole of said hydrochloride of 2-amino-4-mesyloxy toluene under reflux for about 2 hours; and

(12) cooling the reaction mixture from step (11) and neutralizing the same with HCl thereby producing 2-amino-4-hydroxy toluene.

4. 2-carbamylmethylamino-4-hydroxy toluene.

5. 2-(diethylcarbamyl) methylamino-4-hydroxy toluene.

4,101,577

PROCESS FOR MAKING LOWER ALKYL FORMAMIDES

Donald Lee Smathers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1977, Ser. No. 772,860

Int. Cl.² C07C *97/16*

U.S. Cl. 260—561 R **16 Claims**

1. A process for making formamides comprising contacting and reacting an intimate admixture of (a) gaseous CO, and (b) a nontertiary amine in the presence of a C_{1-4} alkanol and a strongly basic anion exchange resin by which a reaction mixture is formed containing a formamide.

4,101,578

CYCLOALIPHATIC TRIAMINES

Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Rudolf Braden, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

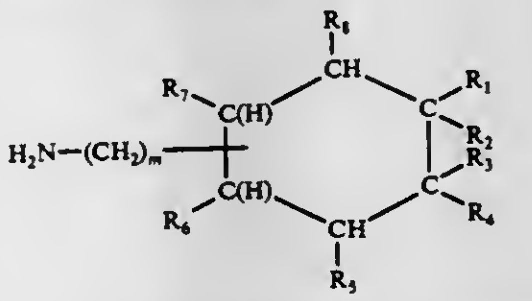
Filed Mar. 17, 1977, Ser. No. 778,632

Claims priority, application Fed.-Rep. of Germany, Apr. 2, 1976, 2614244

Int. Cl.² C07C *87/02*

U.S. Cl. 260—563 R **1 Claim**

1. Triamines of the formula (I)



(I)

in which R_1, R_2, R_3 and R_4 are the same or different and represent hydrogen, a methyl group or the group $—(CH_2)_n—NH_2$ where *n* represents an integer of from 1 to 3 and two of the groups represented by R_1, R_2, R_3 and R_4 are $—(CH_2)_n—NH_2$ groups; *m* represents 0, 1 or 2; and R_5, R_6, R_7 and R_8 are the same or different and represent hydrogen or a methyl group, the total number of methyl groups represented by R_5, R_6, R_7 and R_8 being limited to a maximum of 2.

4,101,579
PHENETHANOLAMINE ETHERS

David Hartley; Lawrence Henry Charles Lunts, and David Trevor Collin, all of London, England, assignors to Allen & Hanburys Limited, London, United Kingdom

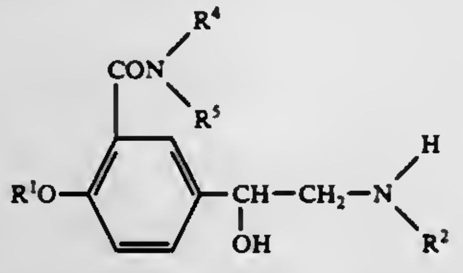
Continuation of Ser. No. 527,306, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 307,623, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 6,591, Jan. 28, 1970, abandoned. This application Jul. 19, 1976, Ser. No. 706,619

Claims priority, application United Kingdom, Feb. 6, 1969, 6379/69

Int. Cl.² C07C *103/29*

U.S. Cl. 260—559 R **4 Claims**

1. A compound of the formula:



in which R^1 is a lower alkenyl or alkoxy lower alkyl radical; R^2 is 1-methyl-3-phenylpropyl or 1,1-dimethyl-3-phenylpropyl and R^4 and R^5 are each a hydrogen atom or a lower alkyl radical; or a physiologically acceptable acid addition salt thereof.

4,101,580
3-AMINO-4-HOMOISOTWISTANE AND AN ACID ADDITION SALT THEREOF AND A PROCESS FOR PRODUCING THE SAME

Yoshiaki Inamoto; Hiroshi Ikeda; Yoshiaki Fujikura, all of Wakayama, and Naotake Takaishi, Iwade, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,983

Claims priority, application Japan, Jun. 27, 1975, 50-79437

Int. Cl.² C07C *87/32*

U.S. Cl. 260—563 P **4 Claims**

1. 3-Aminotricyclo $[5.3.1.0^{3,8}]$ undecane and acid addition salts thereof.

4,101,581
PREPARATION OF AZINES BY A CASCADE SYSTEM

Brian John Needham, Newton, and Michael Arthur Smith, Harton, both of England, assignors to Fisons Limited, London, England

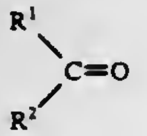
Continuation-in-part of Ser. No. 87,616, Nov. 6, 1970, abandoned, which is a continuation of Ser. No. 576,060, Aug. 30, 1966, abandoned. This application Feb. 16, 1971, Ser. No. 115,663

Claims priority, application United Kingdom, Sep. 11, 1965, 38884/65; Apr. 23, 1966, 17873/66

Int. Cl.² C07C *119/00*

U.S. Cl. 260—566 B **27 Claims**

1. In a process for the production of azines which comprises reacting, in the presence of a strong base, chloramine with aqueous ammonia and a carbonyl compound of the formula:



wherein R^1 is selected from the group consisting of hydrogen or 1 - 4 carbon alkyl and R^2 is selected from the group consisting of 1 - 4 carbon alkyl and phenyl, and R^1 and R^2 taken together is cyclohexanone to provide an azine-containing reaction product; the improvement comprising carrying out the reaction in a series of at least two reactors arranged in a concurrent cascade system, the total carbonyl compound being added to the first reactor only, and wherein the pH of the reaction is maintained within the range of 12.8 to 13.5.

4,101,582
2,6-DINITROANILINE HERBICIDES

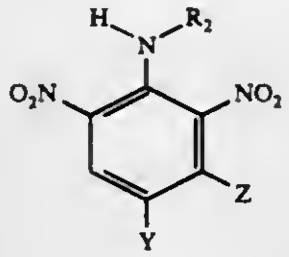
Albert William Lutz, Princeton, and Robert Eugene Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 643,226, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 599,223, Jul. 25, 1975, abandoned, which is a division of Ser. No. 323,000, Jan. 12, 1973, Pat. No. 3,920,742, said Ser. No. 323,000, which is a continuation-in-part of Ser. No. 262,807, Jun. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,938, Aug. 25, 1971, abandoned. This application Dec. 20, 1976, Ser. No. 752,357

Int. Cl.² C07C *87/62, 93/14*

U.S. Cl. 260—574 **24 Claims**

1. A compound of the formula:



wherein;

R_2 is C_3–C_7 secondary alkyl free from quaternary carbon atoms or R_2 is monochloro C_3–C_4 alkyl;

Y is CH_3, C_2H_5, C_3H_7 - *n*, C_3H_7 - *i*, C_4H_9 - *i*, sec - C_4H_9, Cl or CF_3; and

Z is CH_3, — CH_2OCH_3 or —$CH(CH_3)OCH_3$,

with the proviso that when Y and Z are methyl, R_2 cannot be 1-ethylbutyl, 1-ethylpropyl, 1-methylpropyl or 1 - methylbutyl.

4,101,583
ALPHA-METHYLTHIO-ALPHA-(2-AMINOPHENYL) ACETALDEHYDE DILOWERALKYL ACETALS

Paul G. Gassman, Columbus, Ohio, assignor to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 573,069, Apr. 30, 1975, Pat. No. 3,992,392, which is a division of Ser. No. 355,198, Apr. 27, 1973, Pat. No. 3,901,899. This application Aug. 9, 1976, Ser. No. 712,755

Int. Cl.² C07C *91/40*

U.S. Cl. 260—575 **2 Claims**

1. Alpha-methylthio-alpha-(2-aminophenyl) acetaldehyde diloweralkyl acetal.

4,101,584
BISBENZOIN ETHERS AND METHOD OF PRODUCING BENZOIN ETHERS

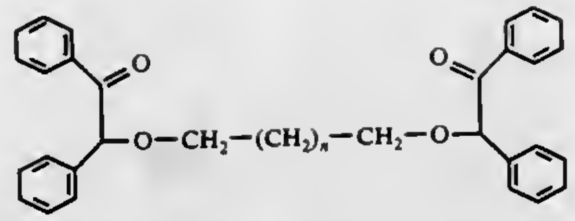
Walter J. Ranus, Jr., Midland Park, and Lester Dennis McClure, Oakland, both of N.J., assignors to Napp Chemicals Inc., Lodi, N.J.

Filed Dec. 10, 1976, Ser. No. 749,523

Int. Cl.² C07C *49/84;* **C08F** *2/46;* **B29C** *19/02*

U.S. Cl. 260—590 D **8 Claims**

1. Alkyl glycol bisbenzoin ethers of the formula:



wherein *n* equals 0,1 or 2.

4,101,585
PROCESS FOR THE PRODUCTION OF DEOXY-ALPHA-ACIDS

Urs Burckhardt, Basel; Lucius Werthemann, Rieben, and Richard Josef Troxler, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

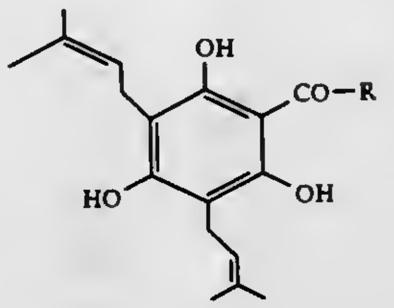
Filed Aug. 30, 1976, Ser. No. 718,710

Int. Cl.² C07C *49/82*

U.S. Cl. 260—592 **8 Claims**

1. Process for the production of deoxy-α-acids of formula I

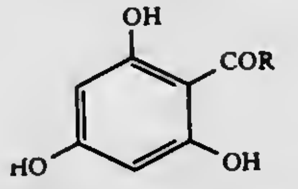
(I)



wherein

R represents a straight-chain or branched-chain alkyl group having 1 to 5 carbon atoms, by prenylation of acylphloroglucinols of formula II

(II)



wherein R has the meaning given under formula I, under alkaline conditions with a prenyl halide, in which process prenylation is performed in a mixture of water and an organic solvent immiscible with water, in the presence of a phase-transfer catalyst selected from the group consisting of tetraalkylammonium salts, tetraalkylphosphonium salts and crown ethers.

4,101,586
ALDOL REACTIONS WITH BIFUNCTIONAL CO-CATALYSTS

Mary Lease Deem, Bernardsville, and Kenneth Charles Stueben, Bridgewater, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,715

Int. Cl.² C07C *45/08, 49/04*

U.S. Cl. 260—593 R **9 Claims**

1. In the method of converting organic carbonyl compounds selected from the group consisting of aliphatic aldehydes having 1 to about 18 carbon atoms and ketones having from 3 to about 22 carbon atoms to condensation products by a base catalyzed aldol reaction, the improvement which comprises incorporating into the reaction mixture a bifunctional cocatalyst containing both imidazolyl and carboxyl functionalities selected from the group consisting of N^{α}-acyl substituted histidines and copolymers of a 4-vinylimidazole and an α, β-ethylenically unsaturated carboxylic acid having 3 to about 6 carbon atoms, at a molar concentration of at least about 10^{-4} based on the total amount of organic reactants whereby aldol condensation products of said organic carbonyl compounds are produced.

4,101,587
METHOD FOR THE MANUFACTURE OF ORGANO SUBSTITUTED PHOSPHONIUM SALTS

Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,380

Int. Cl.² C07F *9/54*

U.S. Cl. 260—606.5 F **9 Claims**

1. A process for preparing the compound $P[(CH(OH)R]_4X$ in which R is H or an alkyl or alkylaryl group of from 1 to 11 carbon atoms, and X is the anion of a mineral acid, HX, which comprises reacting a metal phosphide selected from the group consisting of lithium phosphide, sodium phosphide, potassium phosphide, beryllium phosphide, magnesium phosphide, calcium phosphide, strontium phosphide, barium phosphide, boron phosphide, aluminum phosphide, gallium phosphide, and zinc phosphide, with at least 4 moles of an aldehyde having the formula RCHO, per gram atom of the phosphorus, and at least 1 mole of the said mineral acid, per gram atom of the phosphorus, at a temperature of from −10° C to 100° C in the presence of an inert gas atmosphere, and with at least one and a half moles of water being present per gram atom of the phosphorus of the said metal phosphide.

4,101,588
PRODUCTION OF BIS-(DIMETHYL) ACETALS OF HEXANE DIALDEHYDES

Hans Juergen Nienburg, Heidelberg, and Rudolf Kummer, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 457,577, Apr. 3, 1974, abandoned. This application May 7, 1976, Ser. No. 684,401

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1973, 2317625

Int. Cl.² C07C *41/00*

U.S. Cl. 260—615 A **3 Claims**

1. A process for production of bis-(dimethyl) acetals of hexane dialdehydes with formation of monoaldehydes and residues being substantially suppressed which comprises hydroformylation butadiene with hydrogen and carbon monoxide at a temperature of 100°-140° C and a pressure of 200–400 atmospheres in the presence of a catalytic amount in the range of 10 to 1000 ppm, calculated as rhodium metal and based on the reaction mixture, of a catalyst of the formula

$$X\,Rh\,(CO)\,L_2$$

in which X is chlorine, bromine, or iodine and L is triphenylphosphine or triphenylphosphite, the ratio of Rh to P in said catalyst being in the range of 1:2 to 1:100 in methanol as the solvent, the amount of said methanol being in molar excess in the range of 100% to 1000% mol percent for each formyl group to be formed in the hydroformylation reaction.

4,101,589

1,3,4-TRIOLS AND DERIVATIVES THEREOF

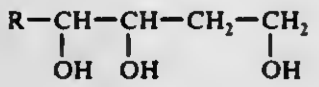
John J. Morrisroe, Whittier, and Thomas F. Banigan, Arcadia, both of Calif., assignors to Pilot Chemical Company, Santa Fe Springs, Calif.

Division of Ser. No. 135,427, Apr. 19, 1971, Pat. No. 3,778,482, which is a continuation-in-part of Ser. No. 687,137, Dec. 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 618,824, Feb. 27, 1967, Pat. No. 3,544,603. This application Dec. 3, 1973, Ser. No. 421,427

Int. Cl.² C07C *43/11, 41/02*

U.S. Cl. 260—615 B **7 Claims**

1. A 2 to about a 20 mole ethoxylate of a compound of structure:



$$\mathrm{R-\underset{\displaystyle OH}{\underset{|}{CH}}-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-\underset{\displaystyle OH}{\underset{|}{CH_2}}}$$

wherein R is a linear alkyl group of from about 5 to 9 carbon atoms, ethoxyl groups stemming from plural carbons of said compound.

4,101,590

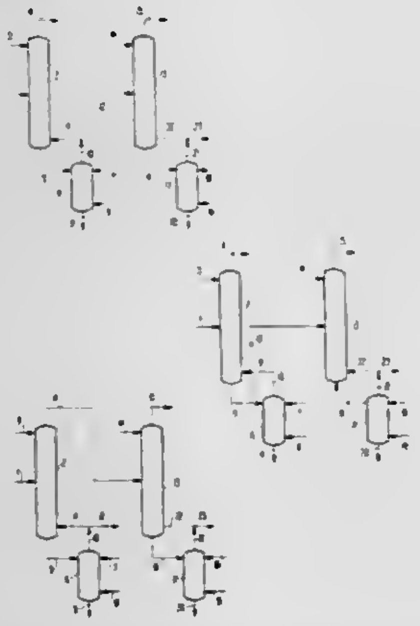
PROCESS FOR SEPARATION AND PURIFICATION OF VINYLPHENOL

Mikio Sato, Chiba; Kinya Tawara, Sohka; Shinpachiro Iwaki, Kobe; Kohji Matsumoto, Saitama, and Kenichi Sekine, Kuki, all of Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Aug. 23, 1976, Ser. No. 716,731

Int. Cl.² C07C *39/18, 37/28*

U.S. Cl. 568—750 **21 Claims**



1. A process for purifying crude vinylphenol containing

(a) vinylphenol,

(b) impurities more acidic than vinylphenol comprising phenol and carboxylic acids, and/or

(c) impurities less acidic than vinylphenol comprising alkylphenols having 1 to 4 carbon atoms in the alkyl group thereof, which comprises subject said crude vinylphenol at least once to an alkali extraction comprising countercurrently contacting at a temperature of from −10° to +40° C the crude vinylphenol with an aqueous alkali solution having a concentration of about 0.05 to 3 normal in an amount sufficient for extraction of only vinylphenol and/or impurities more acidic than vinylphenol together with an organic solvent having solubility in water of below 8g/100g H_2O at 20° C and capable of dissolving the individual components of the crude vinylphenol and selected from the group consisting of benzene, toluene, xylene, ethylbenzene, tetralin, diethyl ether, dipropyl ether, di-sec butyl ether, dibenzyl ether, benzyl ethyl ether, amyl alcohol, hexanol, heptanol, cyclohexanol, benzyl alcohol, nitromethane, cournarone, nitropropane, nitrobenzene, o-nitrotoluene, chlorobenzene, bromobenzene, (o—, m—, p—)chlorotoluene, chloronaphthalene, tetrachloroethane, tirchloropropane, trichlorotrifluoroethane, benzontrile, tolunitrile, 2,4-dimethylbenzonitrile, 4-isopropyl benzonitrile, butyronitrile, capronitrile, dibutyl sulfoxide, methyl phenyl sulfoxide, ethyl tolyl sulfone, butyl tolyl sulfone, dibutyl sulfone, ethyl isobutyl sulfone and a mixture containing at least one of these solvents, the amount of said organic solvent being from 1 to 100 times by weight based on the weight of the crude vinylphenol, whereby in each one of the at least one alkali extraction steps vinylphenol is separated from at least some of the impurities.

4,101,591

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

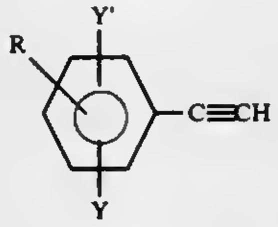
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910. This application Nov. 23, 1976, Ser. No. 744,332

Int. Cl.² C07C *25/18, 25/26*

U.S. Cl. 260—649 F **8 Claims**

1. A compound of the formula



where

R is hydrogen, alkyl, cycloalkyl, alkylcycloalkyl, cycloalkenyl, aryl or substituted aryl where the substituent is Y",

Y and Y' are each selected from the group consisting of hydrogen and haloloweralkyl,

Y" is selected from the group consisting of Y, lower alkyl and halo

with the proviso that at least one of Y and Y' is other than hydrogen.

4,101,592

CATALYTIC HYDROGENATION

Mark R. Rycheck, and Filippo Pennella, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 4, 1977, Ser. No. 765,515

Int. Cl.² C07C *13/00, 5/02*

U.S. Cl. 260—666 P **10 Claims**

1. A process for hydrogenation of monoolefins which comprises:

contacting in a reaction zone at least one monoolefinic hydrocarbon with hydrogen in the presence of a catalyst consisting essentially of at least one of carbides, nitrides, and silicides of Group VIII, Group VIB, and Group VIIB metals, at such conditions, including temperature and pressure, and for such period of time as to allow conversion of at least some of the monoolefins to corresponding paraffins, said catalyst having been activated prior to said contacting by heating with hydrogen at an elevated temperature and for a period of time sufficient to activate said catalyst for hydrogenation of monoolefins to paraffins.

4,101,593

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 687,135, May 17, 1976, Pat. No. 4,018,669, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Mar. 25, 1977, Ser. No. 781,389

Int. Cl.² C07C *5/36, 13/00, 15/00*

U.S. Cl. 260—666 A **16 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, and about 0.05 to about 5 wt. % cobalt; wherein the platinum or palladium, rhodium and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,101,594

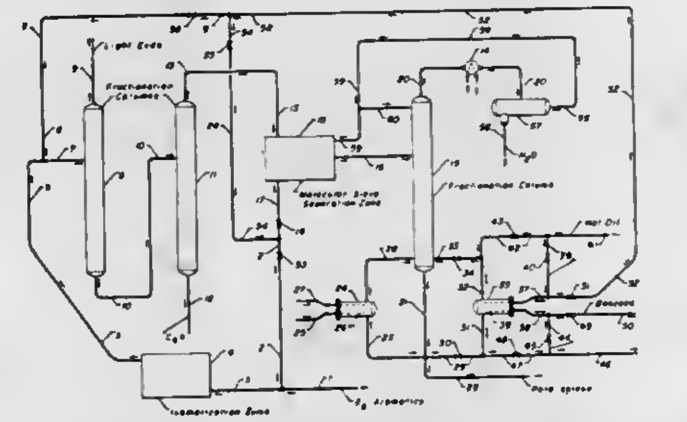
METHOD FOR DRYING A HYDROCARBON CONVERSION APPARATUS

Leroy J. Howard, Jr., Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 19, 1976, Ser. No. 755,373

Int. Cl.² C07C *7/12, 5/00*

U.S. Cl. 260—668 A **11 Claims**



1. A method of drying a hydrocarbon treating apparatus comprising a fractionation column, a process vessel and liquid transfer lines and which is used to perform a hydrocarbon treating process in which a product stream comprising a hydrocarbon having from 7 to 12 carbon atoms per molecule is fractionated which comprises the steps of:

(a) passing a startup stream comprising a preselected hydrocarbon having from 5 to 7 carbon atoms per molecule into the fractionation column used in the hydrocarbon treating process, there being a first and a second reboiler operatively associated with the fractionation column;

(b) isolating the first reboiler from the fractionation column by sealing a liquid and a vapor transfer line connecting the first reboiler to the fractionation column;

(c) vaporizing a portion of the startup stream in the second reboiler to form a first vapor stream which is passed into the fractionation column;

(d) passing a high temperature heat transfer fluid stream through the first reboiler and effecting the vaporization of a liquid stream comprising the preselected hydrocarbon which is simultaneously passed into the first reboiler to form a second vapor stream, superheating the second vapor stream and passing the second vapor stream through a process vessel other than the fractionation column to effect the drying of the process vessel;

(e) terminating the vaporization of the liquid stream and the formation of the second vapor stream when the process vessel has been adequately dried, terminating the passage of the liquid stream into the first reboiler, unsealing the liquid and the vapor transfer lines connecting the first reboiler to the fractionation column, and terminating the passage of the startup stream into the fractionation column; and,

(f) initiating the flow of the product stream into the fractionation column and the use of the first reboiler to generate a third vapor stream which is passed into the fractionation column.

4,101,595

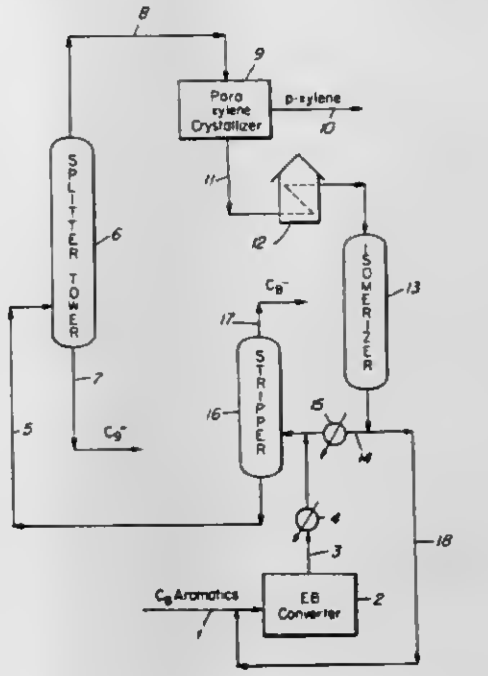
CONVERSION OF ETHYL BENZENE TO PARA XYLENE

Nai Y. Chen, Titusville, N.J., and William J. Reagan, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 793,017

Int. Cl.² C07C *5/24, 3/62, 7/01*

U.S. Cl. 260—668 A **18 Claims**



1. In a process for recovering para-xylene from a source mixture of eight carbon atom aromatics which contains ethyl benzene and each of the xylene isomers by extracting para xylene from a mixture of xylene isomers, isomerizing the resultant mixture lean in para xylene to convert ortho- or metaxylene to para-xylene, recycling the resultant isomerizate to the said extraction and adding to the loop of extraction and isomerization fresh charge containing each of the xylene isomers; the improvement whereby to provide said fresh charge reduced in ethyl benzene content and enhanced in para-xylene content above the thermodynamic equilibrium value which comprises converting said source mixture at conversion conditions of temperature between about 650° F. and 1000° F., pressure of 50 to 500 pounds per square inch, in admixture with 0.1 to 15 mols of hydrogen per mol of hydrocarbon and a space velocity of 1 to 100 volumes of hydrocarbon per volume of the hereinafter recited zeolite with a catalyst composite of a strong hydrogenation/dehydrogenation metal of Group VIII of the Periodic Table and a shape selective moderate acid zeolite characterized by a silicate/alumina ratio greater than 12, a constraint index of 1 to 12, a xylene sorption capacity greater than 1 gram per 100 grams of zeolite and an ortho-xylene sorption time for 30 percent of said capacity greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury.

7. A process for converting a monoalkyl benzene having an alkyl substituent of 2 to 4 carbon atoms to a dialkyl benzene mixture in which para isomer is present in a proportion greater than the thermodynamic equilibrium value which comprises converting said monoalkyl benzene at conversion conditions of temperature between about 650° F. and 1000° F., pressure of 50 to 500 pounds per square inch, in admixture with 0.1 to 15 mols of hydrogen per mol of monoalkyl benzene and a space velocity of 1 to 100 volumes of dialkyl benzene per volume of the hereinafter recited zeolite with a catalyst composite of a strong hydrogenation/dehydrogenation metal of Group VIII of the Periodic Table and a shape selective moderate acid zeolite characterized by a silica/alumina ratio greater than 12, a constraint index of 1 to 12, a xylene sorption capacity greater than 1 gram per 100 grams of zeolite and an ortho-xylene sorption time for 30 percent of said capacity greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury.

4,101,596

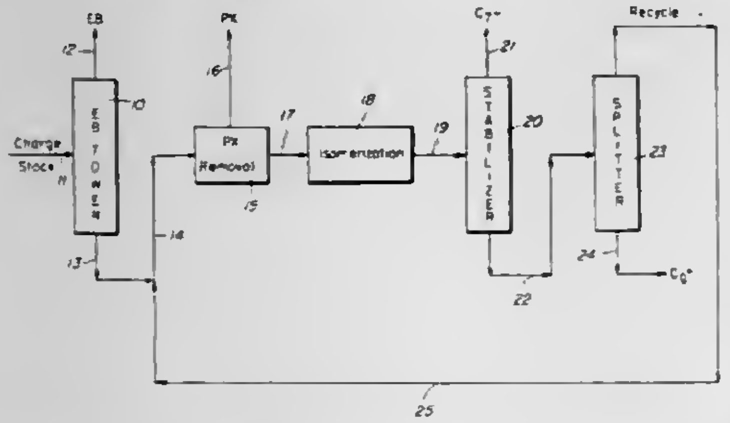
LOW PRESSURE XYLENE ISOMERIZATION

Kenneth M. Mitchell, Mount Laurel, N.J., and John J. Wise, Media, Pa., assignors to Mobli Oil Company, New York, N.Y.

Flied Jan. 10, 1977, Ser. No. 758,214

Int. Cl.² C07C *15/08*

U.S. Cl. 260—668 A **8 Claims**



1. In a process for manufacture of p-xylene from a mixture of eight carbon atom aromatic hydrocarbons containing ethyl benzene and the three xylene isomers by adding said mixture to a cyclic stream of hydrocarbons in a processing loop which includes a recovery stage for removal of p-xylene from the stream followed in turn by an isomerization stage for low pressure catalytic isomerization of xylenes, a distillation stage for removal of compounds boiling above and below the boiling range of eight carbon atom aromatic compounds and return of the eight carbon atom hydrocarbon stream derived from said distillation to said recovery stage;

the improvement resulting in prolonged on-stream periods of the process between catalyst regenerations which comprises adding said mixture to said loop substantially free of peroxide, conducting the said isomerization stage in the presence of a catalyst having activity for isomerization of xylenes and for conversion of ethyl benzene to higher and/or lower boiling hydrocarbons consisting essentially of an aluminosilicate crystalline zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12 at a partial pressure of said eight carbon atom alkyl aromatic compounds below about 100 pounds per square inch, a temperature range between about 500° F. and about 800° F. and a space velocity of 3 to 13 pounds of said eight carbon atom aromatic compounds per pound of said zeolite per hour, initiating the isomerization at a temperature in the lower portion of said range at conditions of temperature, pressure and space velocity to convert ethyl benzene at a rate to maintain ethyl benzene concentration in the loop approximately equal to that in said mixture, observing ethyl benzene in said loop and increasing temperature in said isomerization stage within said range during the process to maintain ethyl benzene conversion at a rate to maintain ethyl benzene concentration in the loop approximately equal to that in said mixture.

4,101,597

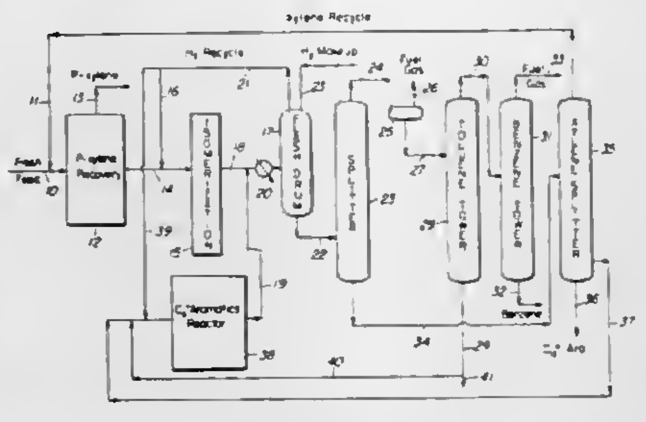
RECOVERY OF P-XYLENE AND BENZENE FROM EIGHT CARBON ATOM AROMATIC FRACTIONS

Lloyd L. Breckenridge, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,231

Int. Cl.² C07C *5/24, 3/62, 7/01*

U.S. Cl. 260—668 A **5 Claims**



1. In a process for recovery of p-xylene from a fresh feed of eight carbon atom alkyl aromatic compounds including ethyl benzene and the three xylene isomers by separating p-xylene from a mixture of said fresh feed with xylene recycle as hereinafter defined, subjecting the mixture depleted of p-xylene to isomerization by contact with hydrogen in the presence of a catalyst consisting essentially of a metal having hydrogenation/dehydrogenation catalyst properties and a crystalline aluminosilicate zeolite having a silica/alumina ratio of at least 12 and a constraint index of about 1 to about 12, separating hydrogen from the isomerate so produced, recycling separated hydrogen to the feed to the isomerization step, separating C_9^+ and C_7^- hydrocarbons from the hydrogen free isomerate and adding the remaining C_8 hydrocarbons to said fresh feed as said xylene recycle;

the improvement which comprises conducting said isomerization at a temperature of about 550° to 700° F., admixing the separated C_9^+ hydrocarbons with hydrogen, contacting the hydrogen/C_9^+ mixture with a porous acidic solid catalyst at a temperature of about 750° to 900° F., blending the product of such contacting with said isomerate, and recycling a portion of said separated hydrogen to admixture with said C_9^+ hydrocarbons.

4,101,598

ISOMERIZATION OF ALKYL BENZENES USING A NU-1 ZEOLITE CATALYST

Thomas Vincent Whittam, Stockton-on-Tees, and Barry Youll, Middlesbrough, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 727,773, Sep. 29, 1976, Pat. No. 4,060,590. This application Aug. 29, 1977, Ser. No. 828,827

Claims priority, application United Kingdom, Oct. 3, 1975, 40631/75; Feb. 9, 1976, 4957/76; Jul. 29, 1976, 31641/76

Int. Cl.² C07C *15/08*

U.S. Cl. 260—668 A **3 Claims**

1. A process for the isomerisation of alkyl benzenes which comprises contacting a feed of an alkyl benzene or a mixture of alkyl benzenes under isomerisation conditions in the liquid or vapour phase with a catalyst comprising zeolite nu-1 having a composition expressed by the formula

$$0.9 \text{ to } 1.3\ R_2O\ .\ Al_2O_3\ .\ 20 \text{ to } 150\ SiO_2\ .\ 0 \text{ to } 40\ H_2O$$

where R is one or more of hydrogen, ammonium, phosphonium or 1/*n* of a cation having a valency *n* and having a X-ray diffraction pattern when R is H substantially as shown in Table 1.

4,101,599

HYDROGENATION PROCESS OF OLEFIN POLYMERS FOR PRODUCING WHITE OILS

Guy F. S. Debande, Watermael; Raymond N. M. Cahen, Etterbeek, and Jacques F. J. Grootjans, Leefdael, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Mar. 15, 1977, Ser. No. 777,907

Claims priority, application Luxembourg, Mar. 16, 1976, 74570

Int. Cl.² C07C *5/14*

U.S. Cl. 260—683.9 **12 Claims**

1. A process for hydrogenating a liquid polymer derived from olefin units containing 4 carbon atoms, which comprises the step of hydrogenating said polymer at a hydrogen pressure of between about 20 and about 120 kg/cm^2, a liquid hourly space velocity of between about 0.25 and 4 hr^{-1}, a hydrogen:-polymer ratio of between about 250 and 6,000 Nl/l, and at a temperature of between about 130° and about 250° C in the presence of a catalyst comprising palladium on an alumina support, said support exhibiting a total pore volume of from about 0.25 ml/g to about 2.5 ml/g, wherein about 35 to about 50% of said pore volume is provided by small size pores having a pore size distribution lower than about 300A and about 25 to about 35% of said pore volume is provided by large size pores having a pore size distribution higher than about 300A and wherein the pore size distribution of the large size pores is at least 1.5 times that of the small size pores, whereby a white oil having an iodine number of less than about 0.26 is obtained.

4,101,600

METHOD OF DIMERIZATION OF ALPHA-OLEFINS

Viktor Ivanovich Zhukov, ulitsa Neftezavodskaya, 4, kv. 1; Nikolai Petrovich Shestak, Pyatigorsky pereulok, 3, kv. 5, both of Grozny; Gennady Petrovich Belov, Noginsky raion, Chernogolovka, Shkolny bulvar, 5, kv. 53, Moskovskaya oblast; Maria Nikolaevna Dyadjunova, ulitsa Mozdokskaya, 1, kv. 2, Grozny; Leonid Alexandrovich Shilov, ulitsa Polezhaeva, 7, kv. 27, Grozny; Ivan Davydovich Shevlyakov, ulitsa Nakhimova, 162, kv. 19, Grozny; Fridrikh Stepanovich Dyachkovsky, Vorobievskoe shosse, $2^{б}$, kv. 9, Moscow; Alexandr Grigorievich Liakumovich, ulitsa Galeeva, 10, kv. 8, Kazan; Pavel Alexandrovich Vernov, Nizhnekamsk, ploschad 50 let Oktyabrya, 6, kv. 87, Tatarskaya ASSR, and Jury Mikhailovich Sivakov, ulitsa Dybenko, 22, kv. 385, Moscow, all of U.S.S.R.

Filed Feb. 17, 1977, Ser. No. 769,426

Claims priority, application U.S.S.R., Feb. 23, 1976, 2320351

Int. Cl.² C07C *3/10*

U.S. Cl. 260—683.15 D **3 Claims**

1. In a method for the dimerization of alpha-olefins, wherein at least one alpha-olefin is mixed with a two component catalyst consisting of organic compounds of titanium, having the general formula $Ti(OR)_4$, and of aluminum, having the general formula AlR_3, where R is an alkyl having from 1 to 6 carbon atoms, or an aryl, in a medium of a hydrocarbon solvent, at a temperature from 0° to 100° C, and a pressure of alpha-olefins from 1 to 30 atm., the improvement which comprises the pretreatment of said constituents with an ethylene-hydrogen mixture containing from 5 to 95 percent by volume of hydrogen, said pretreatment being effected at a temperature of about 0° to 100° C, and a pressure of the ethylene-hydrogen mixture of about 0.2 to 15 atm., for about 1 to 120 minutes.

4,101,601

EPOXY-CATALYST ADDITIVE SYSTEM TO PRODUCE HIGHER I.V. POLYBUTYLENE TEREPHTHALATE FROM LOW I.V. POLYMER

Norman W. Thomas, Warren, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,276

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **13 Claims**

1. A process for preparing branched chain polybutylene terephthalate having increased melt strength and useful in extrusion applications, which process comprises reacting polybutylene terephthalate in the molten state with at least one epoxy branching agent containing at least two epoxy groups per molecule of epoxy branching agent, in the presence of a catalytic amount of at least one catalyst selected from the group consisting of alkyl triphenyl phosphonium halide and alkenyl triphenyl phosphonium halide wherein the alkyl groups contain from 1 to 10 carbon atoms, the alkenyl groups contain from 2 to 6 carbon atoms, and the halide anion is selected from the group consisting of chloride and bromide, to produce said branched chain polybutylene terephthalate having increased melt strength.

4,101,602

REACTION PRODUCTS OF HYDRAZIDES AND CERTAIN UNSATURATED ESTERS

Hubert J. Fabris, Akron; David P. Gruber, Cuyahoga Falls; David R. Sponseller, Akron, and Heinz Uelzmann, Tallmadge, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 738,775, Nov. 4, 1976, Pat. No. 4,061,845. This application May 23, 1977, Ser. No. 799,814

Int. Cl.² C08F *299/04;* C08G *2/18, 12/22, 81/02*

U.S. Cl. 260—839 **11 Claims**

1. A reactive composition useful in forming polymeric coatings and adhesives and comprising a mixture of (I.) a copolymer of

(a) a hydrazide having the formula $R(C(O)—NH—NHR')_a$ where *a* is a number from 1 to 10, each (O) is a carbonyl oxygen atom, *R* is selected from the group consisting of $—R'$, $—OR'$, $—NR_2'$, $—NHNHR'$, $—C(O)NHNHR'$ and polyvalent organic radicals having molecular weights of from 14 to 15,000, and each R′ is a hydrogen atom or a monovalent organic radical having a molecular weight of from 14 to 450 and being free of functions which react with methyl acrylate at 80° C., and

(b) an unsaturated organic ester having from 1 to 5 aliphatic double bonds activated by a carbonyl group, the average number of said carbonyl-activated double bonds being greater than one, and having a molecular weight of from about 71 to 12,000, and containing (II.) up to about 70 percent by weight of said mixture of a reactive resin selected from the group consisting of reactive melamine, urea and phenol-aldehyde resins, their alkylated derivatives and mixtures thereof.

4,101,603

HIGH SOLIDS COATING COMPOSITIONS

Oliver Wendell Smith, South Charleston, and Joseph Victor Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,185

Int. Cl.² C08L *61/32, 67/04*

U.S. Cl. 260—850 **11 Claims**

1. A high solids composition comprising from (I) 20 to 80 weight percent of a polycaprolactone derivative and (II) from 80 to 20 weight percent of a combined mix; wherein said combined mix (II) is a mixture of a methylolated melamine and a non-volatile low molecular weight polyol having a molecular weight of from 62 to about 1000 and from 2 to 6 hydroxyl groups wherein the methylolated melamine comprises from 40

to 90 weight percent of said combined mix; and wherein said polycaprolactone derivative (I) is a carboxyl modified polycaprolactone adduct reaction product mixture of (i) a polycaprolactone polyol and (ii) from 0.1 to 1 carboxylic acid anhydride equivalent for each hydroxyl equivalent present in the polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid produced by reacting (i) and (ii) at from about 75° C. to 200° C.

4,101,604
UNSATURATED POLYESTER MOLDING COMPOSITIONS

Eugene Hugh Rowe, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 18, 1977, Ser. No. 816,230

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—862 **33 Claims**

1. An unsaturated polyester molding composition comprising:

(a) an unsaturated polyester resin,

(b) a polymerizable monomer,

(c) from about 1 to about 30 parts by weight of an epihalohydrin polymer per 100 parts by weight of the combined weight of said unsaturated polyester resin and polymerizable monomer.

4,101,605
THERMOPLASTICPOLYESTER/BLOCK COPOLYMER BLEND

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application May 5, 1977, Ser. No. 794,156

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—873 **18 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 96 parts by weight of a block copolymer and about 96 to about 4 parts by weight of a saturated thermoplastic polyester so as to form at least partial continuous interlocking networks wherein:

a. said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

b. said saturated thermoplastic polyester has a generally crystalline structure, a molecular weight in excess of about 20,000, and a melting point over about 120° C and is selected from the group consisting of:

(i) the condensation product of a dicarboxylic acid and a glycol;

(ii) polypivalolacetone;

(iii) polycaprolactone.

4,101,606
METHOD FOR CURING POLYMERS CONTAINING ONE OR MORE CARBOXY OR ANHYDRIDE FUNCTIONS BY MEANS OF POLYMERS HAVING HYDROXYAMIDE GROUPS, AND COMPOSITIONS

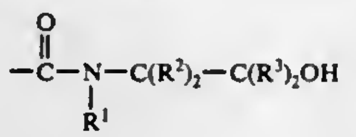
Harry J. Cenci, Warminster, and Graham Swift, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 454,645, Mar. 25, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,553

Int. Cl.^{2} C08G *69/48, 81/00*

U.S. Cl. 260—857 UN **25 Claims**

1. A method of curing addition polymers having carboxy groups, carboxylic anhydrides or salts of said carboxy groups which comprises the steps of (1) mixing said polymer with a different addition polymer containing two or more pendant β-hydroxyalkyl amide groups of the formula:



$$-\overset{O}{\overset{\|}{C}}-\underset{R^1}{\underset{|}{N}}-C(R^2)_2-C(R^3)_2OH \qquad \text{IV}$$

wherein R^1 is hydrogen, alkyl having 1 to 5 carbon atoms, or hydroxyalkyl having from 1 to 5 carbon atoms; R^2 and R^3 are the same or different radicals selected from hydrogen, straight or branched chain alkyl having from 1 to 5 carbon atoms, or one of the R^2 and one of the R^3 radicals joined together with the carbon atoms to which they are attached form cycloalkyl and (2) heating the mixture at a temperature of from about 125° to 400° C. until a cured polymer is obtained.

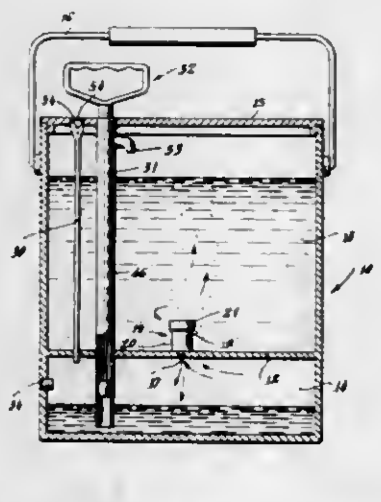
4,101,607
APPARATUS FOR AERATING A LIQUID

Philip D. Bart, Tamarac, Fla., assignor to PBI, Inc., Fort Lauderdale, Fla.

Filed Jul. 1, 1976, Ser. No. 701,643

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—36 R **24 Claims**



1. Apparatus for aerating a liquid comprising a single vessel including a substantially continuous partition dividing said vessel into an upper chamber for containing an initial quantity of liquid and a quantity of unpressurized gas and positionable below said upper chamber when said apparatus is oriented in an upright manner, and first vent means for conducting said liquid from said upper chamber to said lower chamber to increase the pressure of said gas in said lower chamber and for conducting said gas from said lower chamber to said upper chamber including a passageway having a first end communicating with said upper chamber and a second end communicating with said lower chamber, whereby liquid in said upper chamber can flow by gravity slowly through said passageway into said lower chamber, thereby causing increased pressure upon gas in said lower chamber, and said gas intermittently flows upward through said passageway into said upper chamber where it forms bubbles which rise through and aerate said liquid in said upper chamber.

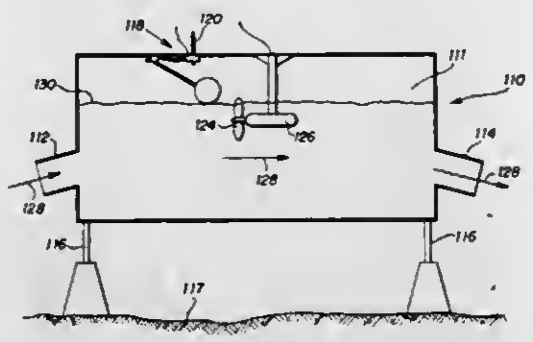
4,101,608
OXYGEN IMPREGNATION METHOD

Jep T. Bracey, Shepherd, Tex., assignor to Martin L. Towler, Galveston and Jack M. Langdon, Granbury, both of Tex., part interest to each

Continuation of Ser. No. 611,906, Sep. 10, 1975, abandoned, which is a division of Ser. No. 420,214, Nov. 29, 1973, abandoned, Continuation-in-part of Ser. No. 385,056, Aug. 2, 1973, Pat. No. 3,903,636, which is a continuation of Ser. No. 202,839, Nov. 29, 1971, abandoned. This application Dec. 17, 1976, Ser. No. 751,840

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—36 R **3 Claims**



1. A method for dissolving oxygen in the thermocline region of a stratified body of water comprising the steps of:

immersing receptacle means in said body of water at a depth below the thermocline, said receptacle means comprising a top wall and a side wall extending downwardly from the periphery of said top wall,

introducing a flow of oxygen into said receptacle means to establish a volume of oxygen in a region bounded by said top wall, said side wall, and the surface of said body of water underlying said volume of oxygen, and thereby maintaining a quiescent water-oxygen interface,

exhausting oxygen from said receptacle means by absorption into said body of water through the surface contact of the water with the oxygen, and

replenishing said volume of oxygen in said receptacle means by supplying oxygen directely to said volume of oxygen at a rate not greater than the rate oxygen is absorbed by said body of water from said volume of oxygen in said receptacle means so that gases are not allowed to escape and flow in an upward direction to disturb the thermocline and destratify the body of water.

4,101,609
COVER HOLDER FOR EVAPORATIVE COOLER

Paul E. Sumrow, 45115 N. Redwood Ave., Lancaster, Calif. 93534

Filed Oct. 5, 1976, Ser. No. 730,273

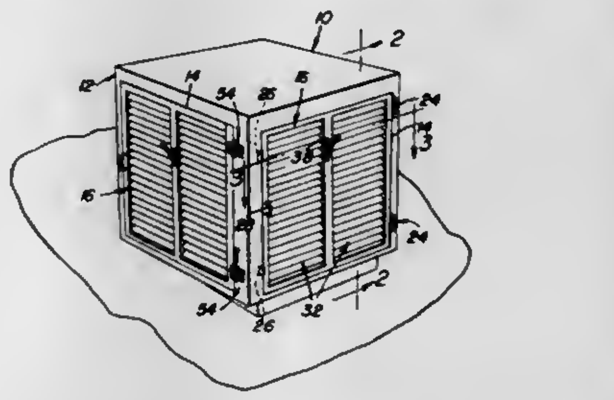
Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—105 **1 Claim**

1. A cover for an evaporative cooler, comprising, in combination:

(a) a cover member hingedly mounted on an open side of an evaporative cooler; and

(b) holder means associated with the evaporative cooler and with the cover member for hingedly mounted the cover member on the cooler for swinging movement with respect to the cooler, the holder means including a pad frame hingedly mounted on the cover member, an evaporative cooler pad arranged between the pad frame and the door, the cover member forming a swinging door panel for a main frame of the evaporative cooler, the pad frame and door panel being hingedly mounted adjacent one another for swinging movement away from one another about separate, but adjacent, parallel axes, the pad frame including a spring latch mounted on the pad frame at a point spaced from the axis of hingedly mounting of the pad frame the extent of the pad frame, and keeper means being provided on the holding means for engaging with the latch retaining the pad frame substantially parallel to the door panel, the cover member including a support element, a louver mounted on the support element and arranged for movement between an open position permitting fluid to flow through the cover member and a closed position blocking fluid flow through the cover member.



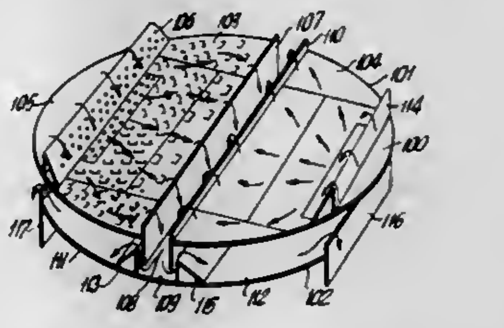
4,101,610
LIQUID-GAS CONTACTING TRAY

Robert Duncan Kirkpatrick, Tonawanda, and David William Weiler, Burt, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,941

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—110 **22 Claims**



1. In a circular-edged liquid-gas contacting tray of the slotted sieve-type for effecting intimate contact between rising vapor and liquid flowing across a member of the tray having main flat top and bottom surfaces from a liquid inlet at one edge of said tray member along a liquid flow path on said main top surface including a diverging flow section adjacent said inlet to a liquid discharge at an opposite edge of said tray member, with a plurality of fixed sized openings distributed across said member and extending therethrough with walls normal to said main flat top and bottom surfaces for gas flow, and a plurality of elevated portions formed from said member across said surfaces each with an upper surface raised from said main flat top surface having a front leading edge separated from said main flat top surface to form an elongated slot opening therewith of greater width than height, the raised upper surface being inclined to said main flat top surface and having a back edge integral with such surface and each elevated portion being spaced from adjacent elevated portions by said main flat top surface entirely surrounding such elevated portion, the improvement comprising: a first band portion of said tray member adjacent to said liquid inlet and extending therefrom downstream for distance at least 20% of the length of the tray diametral streamline from said liquid inlet to the tray transverse centerline and extending traversely outwardly from vicinity of the tray diametral streamline for distance at least 25% of the transverse length of said liquid inlet, with angular orientation of slot openings in said tray member first band portion with respect to and away from the tray diametral

streamline such that the slot angle of individual slots is greater than the angle formed by the diametral streamline and a tangent line at the tray member outer edge at the point of intersection with said liquid inlet, and with the density of slotting in said first band portion such that the ratio of the total area of the slot openings therein to the total active area of said first band portion is between 0.0001 and 0.30.

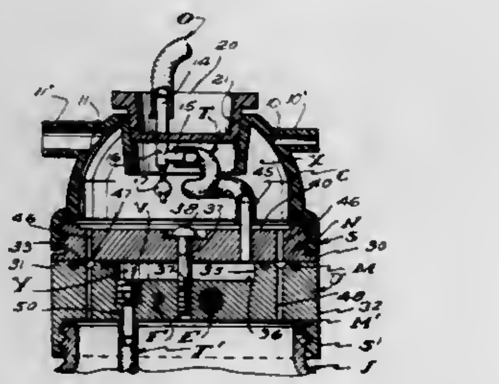
4,101,611
NEBULIZER

David E. Williams, Hemet, Calif., assignor to Amark Industries, Inc., San Jacinto, Calif.

Filed Feb. 7, 1977, Ser. No. 766,263

Int. Cl.^{2} B01F *3/04;* A61M *15/00*

U.S. Cl. 261—142 **17 Claims**



1. An elongate vertical water heating unit of heat conducting and storing material in combination with a fluid container having an upper open end and a supply of water within and with a container cap with an air supply means, air delivery means and aspirator means to draw water from said supply and connected with a supply of oxygen under pressure; said unit having upper and lower ends and a water heating chamber in spaced relationship between said upper and lower ends, coupling means at the lower end of the unit coupling the upper end of the container with said unit, coupling means at the upper end of the unit coupling said cap with said unit, said unit and cap cooperating to define a mixing chamber in which said aspirator means is positioned and with which said air supply and delivery means communicate, a water inlet means between the heating chamber and the water supply, water outlet means between the heating chamber and said aspirator means, a heater opening entering one side of and extending into the unit between the upper and lower ends thereof and in spaced relationship from said heating chamber and from said water inlet and outlet means and a resistance heater positioned in said opening, said heater having means at the exterior of the unit connected with the power supply, said heater heating said unit to heat the water in the heating chamber and to temper the atmosphere in said mixing chamber.

4,101,612
OPTICAL METHOD AND APPARATUS FOR DETERMINING STRESS RELAXATION

Robert I. Barker, Cuyahoga Falls, and David P. King, Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 642,705, Dec. 22, 1975, Pat. No. 4,037,968. This application Sep. 10, 1976, Ser. No. 721,152

Int. Cl.^{2} G01B *5/08*

U.S. Cl. 264—22 **10 Claims**

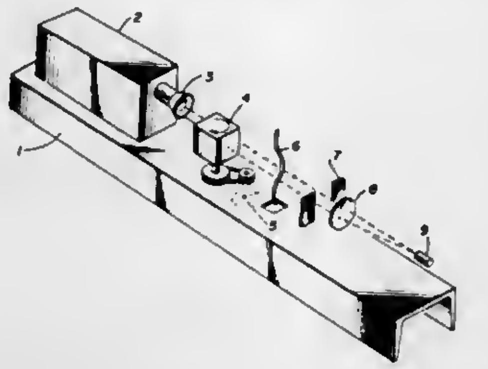
1. A method of measuring stress relaxation of extruded material which comprises extruding a continuous strand of the material from an orifice while optically monitoring the dimension across the material, then discontinuing the extrusion while continuing to monitor the dimension across the material, and calculating the time rate of change of the dimension.

8. Apparatus for measuring stress relaxation of extrudated material comprising,

extrusion means for extruding a strand of material between the edges of an aperture,

control means to provide extrusion during a preselected time of extrusion and to discontinue extrusion during a preselected time of resting,

optical means for scanning the extrudate in the aperture,



measuring the dimensions across the material during said preselected time intervals and generating signals proportional to the dimensions,

and means for integrating the values of the dimension during the interval of resting comprising an integrator circuit adapted to integrate the signal generated during the interval of resting.

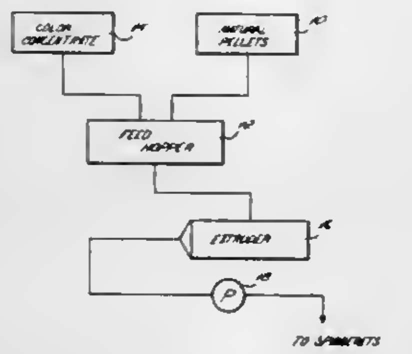
4,101,613
PRODUCTION OF SHAPED, HIGH POLYMERIC ARTICLES

David Norwood, Baltimore, Md., assignor to Concorde Fibers, Inc., Columbia, Md.

Filed Oct. 15, 1975, Ser. No. 622,555

Int. Cl.^{2} B29B *3/02*

U.S. Cl. 264—40.3 **2 Claims**



1. In a method of mixing natural thermoplastic, high polymer material and a coloring agent in yarn producing equipment, in which are provided hopper means for receiving the material and the agent and in which is formed a mixture thereof, feed means for continuously delivering the agent to the hopper means and including means for measuring doses of the agent for delivery thereof to the hopper at intervals, means for extruding the mixture and a spinneret, means for drawing the mixture from the hopper through the extruder, and metering pump means for delivering the throughput of the extruder to the spinneret to form yarns; the improvement comprising applying a first control signal to the metering pump means, deriving a second control signal from the first signal, which is proportional to the first signal, applying the second control signal to the means for measuring the doses of the agent for delivery thereof at intervals to the hopper to thereby regulate the interval between delivery of measured doses of the coloring agent to maintain predetermined portions of said material and coloring agent in the mixture in proportion to the output of the extruder.

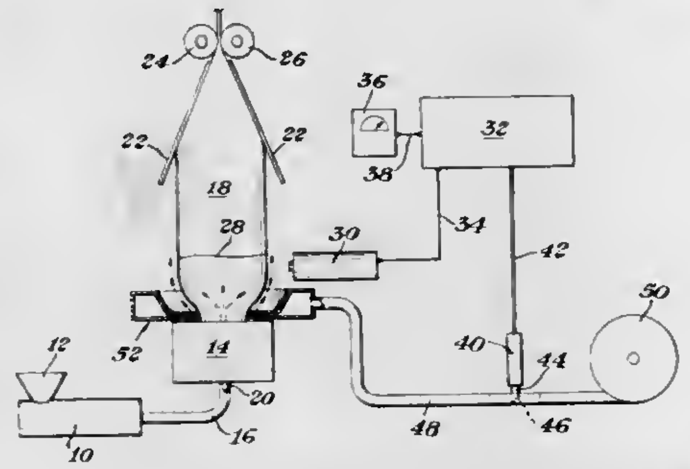
4,101,614
BLOWN FILM PROCESS

Carl B. Havens, Fresno, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 554,951, Mar. 3, 1975, abandoned, which is a continuation of Ser. No. 376,834, Jul. 5, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,984

Int. Cl.^{2} B29F *3/08*

U.S. Cl. 264—40.6 **2 Claims**



1. In a blown film process wherein film is produced through extruding a continuous molten tube of a film forming heat plastified synthetic resinous material, stretching or drawing the tube about a trapped air or gas bubble, and simultaneously cooling the tube, the steps comprising: monitoring the temperature of the film in a controlled area that is positioned between the frost line and extrusion die head, the control area being remote from and spaced sufficiently downwardly from the frost line so as to be less influenced by crystallization effects, cooling the film about its circumference between the control area and extrusion die head, setting a control temperature for the control area, comparing the monitored temperature with the control temperature, increasing or decreasing the rate of said cooling step responsive to the conditions of upward or downward drift, respectively, of the monitored temperature from the control temperature, whereby the process is characterized by an essentially constant temperature in the control area irrespective of cyclic variations in the operating parameters of the process.

4,101,615
PROCESS FOR PRODUCING ALUMINA FIBER OR ALUMINA-SILICA FIBER

Shozo Horikiri, Amagasaki; Kozo Tsuji, Ibaraki; Yasuaki Abe, Toyonaka; Akio Fukui, Ibaraki, and Eiichi Ichiki, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

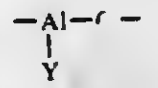
Continuation-in-part of Ser. No. 443,245, Feb. 19, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,023

Claims priority, application Japan, Feb. 20, 1973, 48-20568; Jun. 5, 1973, 48-64231

Int. Cl.^{2} C01F *7/02;* C04B *35/64*

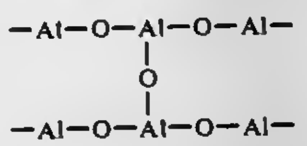
U.S. Cl. 264—63 **18 Claims**

1. A process for producing alumina fiber or alumina-silica fiber, which consists essentially of (i) spinning a solution of at least one polyaluminoxane or of a mixture of at least one polyaluminoxane and one or more kinds of silicon-containing compounds in an organic solvent to give a precursor fiber, (ii) hydrolyzing the resulting precursor fiber, and then (iii) calcining the hydrolyzed fiber, said polyaluminoxane being one or more kinds of polymers or copolymers which mainly consist of the structural units of the formula:



$$\begin{array}{c}-\mathrm{Al}-\mathrm{O}-\\ |\phantom{-\mathrm{O}-}\\ \mathrm{Y}\phantom{-\mathrm{O}-}\end{array}$$

wherein the pendant members Y are one or more kinds of groups selected from the group consisting of alkyl having 1 to 18 carbon atoms, alkoxy having 1 to 18 carbon atoms, acyloxy having 1 to 18 carbon atoms phenyl and phenoxy, and may be partially a halogen or hydroxy, and which may also contain cross-linkages of the formula:



$$\begin{array}{c}-\mathrm{Al}-\mathrm{O}-\mathrm{Al}-\mathrm{O}-\mathrm{Al}-\\ |\\ \mathrm{O}\\ |\\ -\mathrm{Al}-\mathrm{O}-\mathrm{Al}-\mathrm{O}-\mathrm{Al}-\end{array}$$

the amount of which in the polymer molecule is within the range that the polymer is soluble in the organic solvent, and said pendant groups Y of the polyaluminoxane satisfying the conditions:

$$f(\mathrm{HCOO}) + f(\mathrm{CH_3COO}) + f(\mathrm{F}) + f(\mathrm{Cl}) + f(\mathrm{Br}) + f(\mathrm{I}) + f(\mathrm{OH}) \leqq 0.2$$

wherein f(R) means the mole fraction for a particular group: R as defined for the pendant group Y, or

$$f(R) = \frac{\text{Number of group: } R \text{ in the polyaluminoxanes}}{\text{Number of aluminum atoms in the polyaluminoxanes}}$$

being in the range of from 0.0 to 1.0, and

$${}_{n=1}(n-1)f(C_nH_{2n+1}) + {}_{n=1}nf(C_nH_{2n+1}O) + {}_{n=3}(n+1)f(C_{n-1}H_{2n-1}COO) + 4.5\,f(\text{phenyl}) + 5.5f(\text{phenoxy}) \leqq 8$$

wherein n is an integer, and further the average degree of polymerization of the polyaluminoxanes being in the range of 5 to 1,000, and the amount of the silicon-containing compounds to be mixed into the solution being not greater than an amount such that the silica content in the alumina-silica fiber obtained after the calcination is not greater than 60% by weight.

4,101,616
PROCESS FOR PRODUCING Si_3N_4 ARTICLE

Sergei-Tomislav Buljan, Towanda, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 627,362, Oct. 30, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,516

Int. Cl.^{2} C01B *21/06*

U.S. Cl. 264—65 **2 Claims**

1. Process for producing self-supporting fibrous articles consisting essentially of alpha Si_3N_4 comprising:

(a) forming a green body of low bulk density within the range of about 0.1 g/cm^3 to 0.8 g/cm^3 of substantially amorphous Si_3N_4 powder, and

(b) heat treating the body at a temperature within the range of about 1550° C to 1750° C for from about 0.25 to 5 hours in a non-oxidizing atmosphere to promote in situ formation of fibrous crystalline alpha Si_3N_4 from the amorphous Si_3N_4 particles.

4,101,617
METHOD FOR INJECTION MOLDING OF HOLLOW SHAPED BODIES FROM THERMOPLASTIC RESINS

Ernst Friederich, Darmstadt, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 9, 1976, Ser. No. 647,793

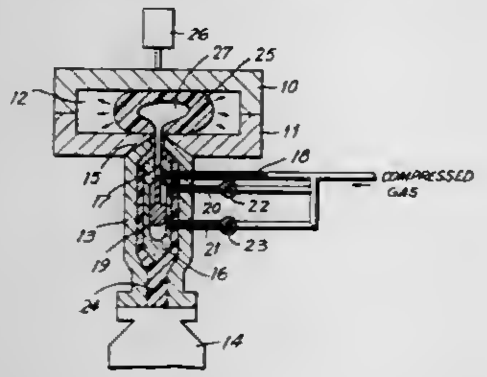
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1975, 2501314

Int. Cl.^{2} B29C *5/06*

U.S. Cl. 264—93 **8 Claims**

1. A method for making a hollow shaped body from a thermoplastic resin by injection molding, which method comprises injecting an amount of molten resin sufficient for the preparation of the hollow shaped body from an injection nozzle into a

mold through an injection aperture in said mold, injecting gas under pressure through said injection nozzle and aperture to expand and distribute the molten resin over the interior surfaces of the mold, whereby said hollow shaped body is formed within said mold with a gas entry opening in said hollow shaped body, cooling the hollow shaped resin body so formed



to a temperature beneath the softening point of the resin, separating said mold and said injection nozzle after said resin has cooled beneath its softening point, whereby the interior of said hollow shaped body is opened to the atmosphere through said injection aperture and gas-entry opening to equalize the pressure within said body with ambient pressure, and then opening said mold to remove said hollow shaped body.

4,101,618

INJECTION BLOW MOLDING METHOD FOR HOLLOW ARTICLE HAVING OPENINGS AT BOTH ENDS

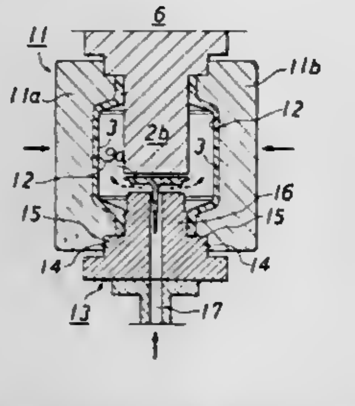
Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Filed Nov. 29, 1973, Ser. No. 420,231

Claims priority, application Japan, Dec. 4, 1972, 47-121385

Int. Cl.² B29C *17/07*

U.S. Cl. 264—97 **1 Claim**



1. An injection blow molding method for making a hollow article being open from end-to-end, by means of a molding machine having at least two laterally displaceable injection mold members, a stationary core member and a movable core member, at least two laterally displaceable blow mold members and a closing core member, said movable core being longitudinally displaceable and movable between said injection mold and said blow mold, said method comprising the steps of:

axially aligning said movable core to a position in closely adjacent relationship with said stationary core;

forming an injection mold cavity by laterally moving said injection mold members into engagement with said movable and stationary core members;

injecting plasticized material into said cavity to form a parison, said parison including runners between the internal wall surfaces thereof;

laterally displacing said injection mold members from the parison thus formed;

axially withdrawing said movable core member and said parison thereon from the vicinity of said stationary core member, a first end of said parison being sealed by said movable core;

displacing said movable core and parison to said blow mold;

axially aligning said movable core member with said closing core member;

sealing the second end of said parison by means of said closing core member;

laterally displacing said blow mold members toward said parison to form a blow mold cavity, the ends of said parison being hermetically sealed by being tightly engaged between the inner surfaces of said blow mold members and said movable core and said closing core member;

centrally holding said runners; while

blowing said parison within said blow mold cavity to laterally separate said parison walls from said runners thereby forming said hollow article; and

removing said completed article from said molding machine.

4,101,619

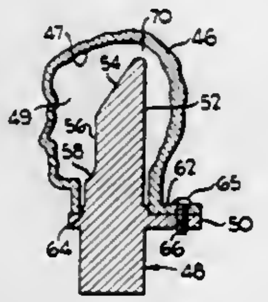
METHOD OF MAKING A DOLL HEAD

Lyle A. Conway; Rouben T. Terzian, both of Chicago, and Donald K. Fletchic, Cicero, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Division of Ser. No. 500,676, Aug. 26, 1974, Pat. No. 3,990,175. This application Jun. 10, 1976, Ser. No. 694,560

Int. Cl.² B29C *5/04, 5/12*

U.S. Cl. 264—156 **8 Claims**



1. A method of making a doll head for the excretion of liquid from the interior of the head, comprising the following steps:

providing a hollow mold shell defining the exterior contours of the doll head;

introducing an amount of heat curable plastic through an opening in said hollow mold shell;

closing said mold shell by means of a mold cap over said opening, said mold cap including an elongated plug portion extending across the interior of said mold shell to form an interior mold partition;

rotating and heating the assembled mold shell and mold cap to cause the plastic to blanket the interior surfaces of the mold shell and plug portion and to cure the plastic onto said surfaces to maintain the shape of the mold and forming two closed cavities between the mold shell and plug portion; and

forming apertures in the head to provide fluid communication between said reservoir and the exterior of the head.

4,101,620

PROCESS FOR PRODUCING A PLASTIC SHEET HAVING PARALLEL RIBS EXTRUDING FROM BOTH SURFACES

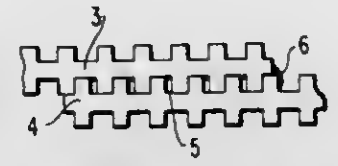
Friedrich Kops, Cologne; Helmut Kaufmann, Troisdorf, and Karl-Heinz Schymetzko, Luisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,487, Oct. 28, 1971, abandoned. This application Aug. 7, 1974, Ser. No. 495,432

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1970, 2054029

Int. Cl.² B29F *3/08*

U.S. Cl. 264—177 R **45 Claims**



1. A process for producing an unstretched bilaterally corrugated plastic sheet having a plurality of longitudinally extending parallel ribs on both sides thereof comprising extruding in a horizontal plane a plastic synthetic resin composition from a slotted nozzle which is fashioned to be comb-like on both sides thereof to form an extruded sheet having longitudinally extending parallel ribs on both sides thereof heated to an extrusion temperature, drawing off the extruded heated sheet in the longitudinal direction of the ribs from said slotted nozzle by conducting the sheet through a cooled smoothing calender, and cooling the extruded sheet within said calender to a temperature below the extrusion temperature to thereby form said unstretched bilaterally corrugated plastic sheet, said extruded sheet being drawn off from said nozzle at a fixed rate which is the same as or slightly more than the extrusion rate from said nozzle so that the ribs on said unstretched bilaterally corrugated plastic sheet exiting from said smoothing calender are uniform in size and shape, the height and width of the ribs being from about 1/15 to about equal to the thickness of a basic, non-ribbed, portion of the sheet and the basic, non-ribbed, portion of the sheet having a thickness of about 0.5 to 3 mm.

4,101,621

METHOD FOR PRODUCING FLAME RESISTANT ACRYLIC FIBERS

Toshihiro Yamamoto; Yoshioki Okubo, both of Hofu; Kenichi Toyoda, Ube, and Ryuji Yamamoto, Hofu, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed May 20, 1976, Ser. No. 688,259

Claims priority, application Japan, May 31, 1975, 50/65873; Feb. 28, 1976, 51/21662

Int. Cl.² D01F *6/38;* **C08F** *259/04, 259/06, 265/08*

U.S. Cl. 264—182 **14 Claims**

1. A method for producing flame-resistant acrylic fibers, which comprises the steps of:

1. prior to starting solution polymerization, adding to
   - (a) a solution of monomers dissolved in dimethylformamide, wherein said monomers consist essentially of from 30 to 80% by weight of acrylonitrile, from 20 to 70% by weight of vinyl chloride or vinylidene chloride and from 0 to 15% by weight of other unsaturated monomer,
   - (b) from 0.1 to 10% by weight, based on the weight of (a), of a polymer consisting essentially of from 10 to 85% by weight of acrylonitrile, from 10 to 50% by weight of vinyl chloride or vinylidene chloride and from 5 to 40% by weight of an anionic monomer, and
   - (c) from 0.005 to 5.0% by weight, based on the weight of (a), of zinc salt of an aromatic sulfonic acid, whereby to form a polymerization mixture,
2. then polymerizing said polymerization mixture under solution polymerization conditions to polymerize the monomers of component (a),
3. then removing unreacted monomers from the product of step 2 to obtain a polymer solution,
4. then adding from 0.005 to 3.0% by weight, based on the weight of said polymer solution, of sulfur dioxide, and adding water so that the water content of said polymer solution is from 3.0 to 15% by weight whereby to form a spinning solution, and
5. then spinning said spinning solution into an aqueous solution of dimethylformamide to form fibers.

4,101,622

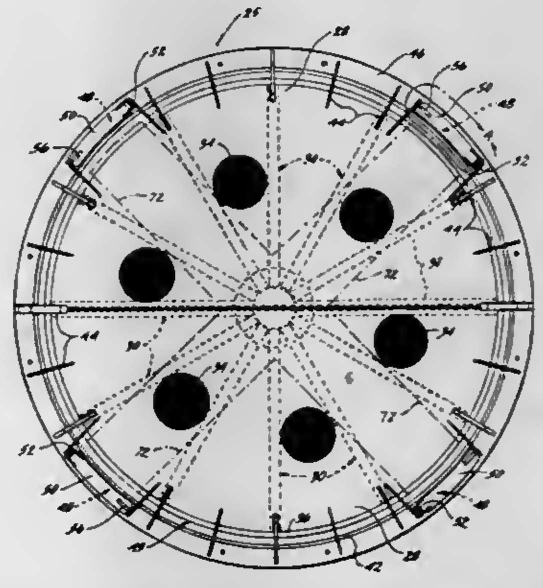
METHOD OF CASTING BEVELED PIPE

Frank M. Wells, Aztec, N. Mex., and Gordon J. Black, Nuevo, Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation of Ser. No. 488,545, Jul. 15, 1974, abandoned, which is a division of Ser. No. 385,189, Aug. 2, 1973, Pat. No. 3,856,453. This application Dec. 30, 1975, Ser. No. 645,382

Int. Cl.² B28B *1/14*

U.S. Cl. 264—251 **13 Claims**



1. A method of casting a beveled concrete pipe in a pipe mold which includes a cylindrical outer mold case, and an inner cylinder disposed concentrically inside the outer mold case to form an annular mold cavity into which concrete is to be poured, the method comprising the steps of:

(a) mounting the pipe mold so its axis is in an upright position;

(b) mounting above the annular mold cavity a facing ring having a generally flat bottom surface and a plurality of spaced apart openings which together occupy a minor portion of the facing ring area, the facing ring being mounted in a plane inclined from normal to the upright axis of the pipe mold, the openings in the facing ring being located at least on low, intermediate, and high points of said inclined plane, the facing ring having a plurality of spaced apart doors for opening and closing respective openings in the facing ring;

(c) mounting above the facing ring a plurality of pouring chutes each extending to a corresponding opening in the facing ring;

(d) pouring concrete through the pouring chutes and the openings in the facing ring and into the annular mold cavity and distributing the concrete in the mold cavity until the level of the concrete reaches the vicinity of the facing ring bottom surface;

(e) thereafter sequentially blocking further passage of concrete from the pouring chutes to the mold cavity to progressively block the rise of concrete in the mold cavity from the low side to the high side of the facing ring, and sequentially closing the doors in the facing ring, from the low side to the high side thereof, as the passage of concrete to the mold cavity is being progressively blocked, the bottom surface of each door being substantially flush with the flat bottom surface of the facing ring when each door is closed, the bottom surfaces of the closed doors cooperating with the facing ring bottom surface so that the rising concrete distributed in the pipe mold will come into contact substantially with the entire bottom surface of the facing ring and the bottom surfaces of the closed doors and form a smooth beveled end surface of the cast pipe; and

(f) removing the pouring chutes and the facing ring from the pipe mold.

4,101,623
METHOD OF LINING PIPES

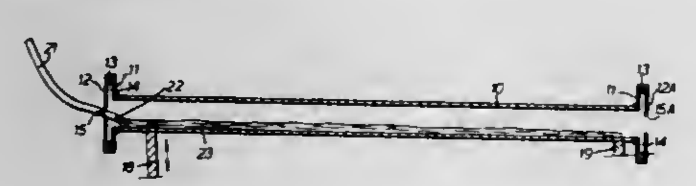
John David Webster; Anthony Austin Wilkinson, both of St. Austell, England, and Frederick George Tucker, Tennille, Ga., assignors to English Clays Lovering Pochin & Co. Ltd., England

Filed Nov. 11, 1975, Ser. No. 631,095

Claims priority, application United Kingdom, Nov. 21, 1974, 50586/74

Int. Cl.^{2} B29D *9/00;* **B29G** *7/00*

U.S. Cl. 264—270 **9 Claims**



1. A method of lining a pipe, or other tubular or hollow cylindrical article, herein referred to as a pipe, with a permanent lining of thermosetting synthetic plastics material which can be introduced into a pipe in the form of a liquid mixture of prepolymer and curing agent, which mixture is capable of setting to a resilient solid material, the method comprising arranging the pipe with its longitudinal axis inclined at a predetermined acute angle to the horizontal, introducing the liquid mixture at a predetermined rate into an upper part of the pipe whereby the liquid mixture which is first introduced into the pipe flows along the inside wall of the pipe and the mixture is distributed along a length of pipe, the liquid mixture being introduced into the pipe for a predetermined time, shifting the pipe to a horizontal position, and spinning the pipe about its longitudinal axis to distribute the liquid mixture around the inside of the wall of the pipe, spinning being continued until the plastics material has set, and wherein, after spinning has started thereby to obtain an initial distribution of the material around the inside of the pipe, gas at a temperature higher than the prevailing temperature of the lining material is blown axially through the pipe for a relatively short period of time to cause entrained air bubbles in the liquid material to be removed, said pipe being fitted with a flange at each end and covers being fitted to the flanges, each said cover having a hole centrally located therein and the hole in the cover at the downstream end of the pipe, relative to the blowing direction of the hot gas, being larger than the hole in the cover at the end through which the gas blast is introduced, said pipe being shifted to its horizontal position after approximately 4/5th to 9/10th has elapsed of the predetermined time for introducing the liquid mixture into the pipe at the predetermined rate.

4,101,624
METHOD OF CASTING SILICON

Harlan B. Johnson, Rittman; Aleksandrs Martinsons, Wadswoth, and Cletus N. Welch, Clinton, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1974, Ser. No. 448,589

Int. Cl.^{2} C04B *35/60*

U.S. Cl. 264—273 **4 Claims**

1. A method of casting a metal selected from the group consisting of silicon and silicon alloys containing in excess of 95 percent silicon, said metal having volumetric expansion upon solidification, comprising:

placing a hollow body containing one or more voids in a mold, said body being spaced from the interior surfaces of said mold and having a void volume of from about 1.0 to about 10.0 volume percent of the casting, basis the molten silicon;

pouring said metal in a molten state into said mold and around said hollow body disposed in said mold; and

cooling said molten metal in said mold below the melting point thereof, until pressure exerted by expansion of the cooling solid metal on the molten metal in the interior of said casting forces said molten metal into the voids of said hollow body until the voids of said hollow body are substantially filled with silicon.

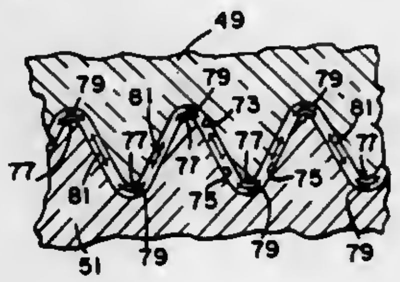
4,101,625
METHOD FOR MAKING CORRUGATED MOLECULARLY ORIENTED PLASTIC STRAPPING

Harold A. Haley, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 10, 1977, Ser. No. 758,211

Int. Cl.^{2} B29C *24/00*

U.S. Cl. 264—287 **15 Claims**



1. A method of making a molecularly oriented thermoplastic strapping including the steps of providing successive longitudinal portions of a band formed of essentially unoriented thermoplastic polymeric material with a like transverse cross-section which is of corrugated configuration and is of generally uniform thickness, in which polymer molecules thereof are oriented transversely of such band, and thereafter elongating said band without destroying the corrugated configuration thereof to also orient polymer molecules longitudinally of said band whereby the longitudinal orientation of polymer molecules in the resulting strapping imparts high tensile strength thereto and the transverse orientation of polymer molecules provides the said strapping with good resistance to longitudinal splitting.

4,101,626
METHOD FOR MOLDING AN ARTICLE EXPANDED AT THE CENTER PORTION AND HAVING THE MAXIMUM INNER DIAMETER AT SAID PORTION FOR A LIQUID ELASTOMER

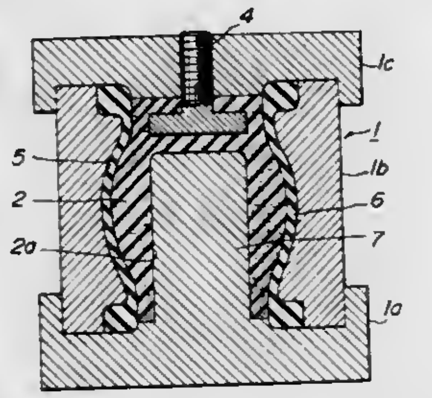
Takuya Takahashi, Odawara, and Masashi Ishigami, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 603,981, Aug. 12, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 770,175

Claims priority, application Japan, Aug. 24, 1974, 49-96639

Int. Cl.^{2} B29C *1/12*

U.S. Cl. 264—313 **6 Claims**



1. A method for molding an article expanded at the center portion and having the maximum inner diameter from a liquid elastomer, comprising; constituting a mold having a cover mold threadedly engaged with an upwardly tapered female screw member, a screw rod provided in the bottom end of an elastic core having the same outer shape as the inner shape of the article with the maximum diameter of the core at the expanded portion of the article provided with a hollow portion extending to at least the position of the article which has the maximum diameter, from the top end of the core, a main mold having the same shaped inner surface as the outer shape of the article expanded at the center portion and a bottom mold provided with a projection detachably fitting in the above described hollow portion in the core; assembling of the cover mold, the elastic core, the main mold and the bottom mold including inserting the porjection into the hollow portion of the core constituting a cavity corresponding to the shape of the article to be shaped, before setting the cover mold; pouring a liquid elastomer into the constituted cavity to fully fill the cavity; setting the cover mold on the main mold; hardening the poured elastomer; pulling out the bottom mold together with the projection fitted in the hollow portion in the core; removing the cover mold from the core; pulling out the core from the main mold by elastic deformation of the elastic core so as to be deformed into the hollow portion in the core and, pulling out the shaped article having the maximum diameter at the center portion.

4,101,627
METHOD OF FORMING PAPER PRODUCTS

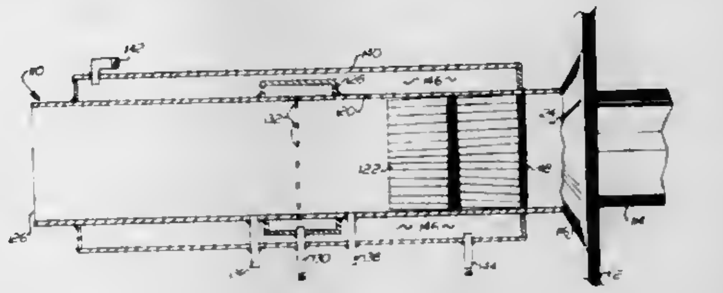
Vincent J. Menier, Pepper Pike, Ohio, assignor to North American Systems, Inc., Bedford Heights, Ohio

Filed Aug. 2, 1976, Ser. No. 710,400

Int. Cl.^{2} B31D *5/02*

U.S. Cl. 264—323 **3 Claims**

1. In a method of continuously producing a dish-shaped filter by forming multi-layered paper sheet stock into nested groups of the desired dish-shaped filter, forcing the nested groups of the dish-shaped filter through a heat-setting tube in sequential fashion so that a plurality of nested groups of the dish-shaped filter are simultaneously present in said heat-setting tube, and simultaneously heating the plurality of nested groups of the dish-shaped filter being forced through said heat-setting tube sufficiently to maintain its shape upon removal from the heatsetting tube, the improvement whereby the heating is performed with minimized burning or scorching of the nested groups of the dish-shaped filter by supplying steam into the interior of the heat-setting tube to act as a lubricant and protector of the nested groups of the dish-shaped filter and into a steam tube surrounding the heat-setting tube, said steam tube surrounding said heat-setting tube extending for substantially the whole length of the heat-setting tube and containing supply and return lines for circulation of the steam through the steam tube.



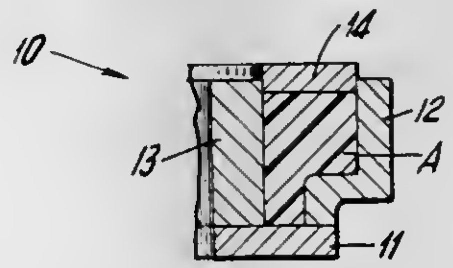
4,101,628
METHOD FOR MANUFACTURING THERMOPLASTIC ARTICLES

Tor Wiik, Vestervik Stromsvik, 65290 Vaasa 29, Finland

Continuation of Ser. No. 515,816, Oct. 18, 1974, abandoned. This application Aug. 27, 1976, Ser. No. 718,159

Int. Cl.^{2} B29F *5/00*

U.S. Cl. 264—325 **1 Claim**



1. A method for manufacturing objects of thermoplastic material comprising the steps of providing an extruded blank of thermoplastic material from which an object is to be formed, placing said extruded blank while still in a substantially molten state within a mold cavity defined on all sides thereof by a plurality of rigid walls totally enclosing said mold cavity, with at least one of said walls being movable relative to the other of said walls, said at least one movable wall extending substantially completely over the entire area of the side of said mold cavity defined by said at least one movable wall, displacing said at least one movable wall inwardly of said mold cavity to apply pressure to said blank along the side thereof contiguous with the side of said mold cavity defined by said at least one movable wall, said pressure being thereby applied over substantially the entire area of said contiguous side of said blank, applying heat directly to said at least one movable wall simultaneously with said displacing thereof thereby to simultaneously apply to said contiguous side of said blank heat together with the pressure resulting from said displacing of said at least one movable wall, and cooling the other sides of said blank at the same time that said pressure and said heat are being simultaneously applied to said contiguous side.

4,101,629

PURIFICATION OF SOLUTIONS CIRCULATING IN THE BAYER CYCLE

Henri Mercier; Robert Magrone, both of Gardanne, and Jean Deabriges, Aix-en-Provence, all of France, assignors to Aluminium Pechiney, Lyon, France

Filed Oct. 20, 1976, Ser. No. 734,188

Claims priority, application France, Oct. 21, 1975, 75 32169

Int. Cl.² C01F *7/06*

U.S. Cl. 423—121 **3 Claims**

1. Process of purifying a red mud-free alkaline solution of sodium aluminate obtained from the Bayer cycle process of treating bauxite with alkali to produce hydrated alumina, for the purpose of holding down the sodium carbonate content of solution in circulation in the Bayer cycle by removing impurities in the form of barium carbonate and barium oxalate comprising withdrawing at any point in the Bayer cycle, alkaline sodium aluminate solution containing an amount of sodium carbonate at least equal to the amount which was in solution during the Bayer cycle, adding a recycled quantity of a barium aluminate compound which is less than the quantity corresponding to the complete precipitation of the sodium carbonate in the form of barium carbonate, separating the precipitated barium carbonate from the sodium aluminate solution, now of reduced sodium carbonate concentration, reintroducing the latter sodium aluminate solution into the Bayer cycle, calcining the barium carbonate precipitate in the presence of added alumina, thereby removing carbon dioxide and obtaining a calcined material of essentially barium aluminate, separating the calcinate of barium aluminate into two fractions, mixing a first fraction with a solution of sodium aluminate containing sodium oxalate, being hydrate wash water previously served to scrub the aluminum hydrate of the Bayer cycle and taken therefrom, this fraction containing an amount of barium greater than the amount corresponding to the carbonate and oxalate to be removed, thus forming a precipitate and a solution with the excess barium dissolved therein, separating the precipitate and adding the same to the barium carbonate being calcined, mixing the separated solution having excess barium therein with the other fraction and recycling the compound resulting from the calcination mixture in the Bayer cycle in order to treat the alkaline sodium aluminate solution which is removed at any point in the Bayer cycle, whereby consumption of the barium aluminate compound reactant is avoided.

4,101,630

CONTINUOUS CALCINING OF GYPSUM

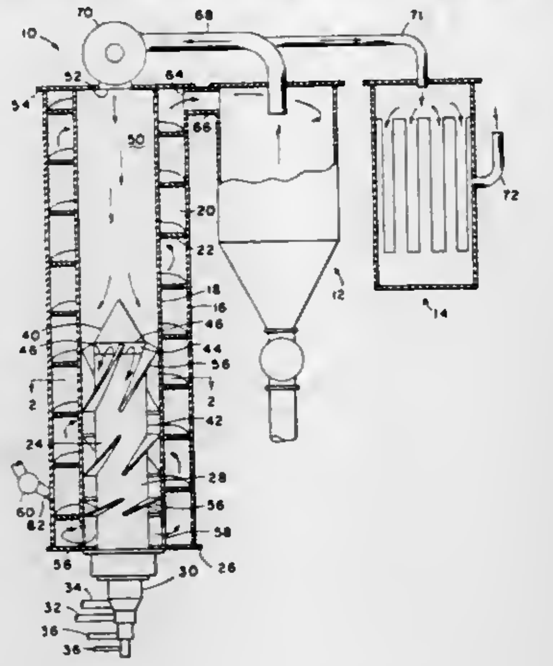
Rodney A. Stiling, Snyder, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Division of Ser. No. 719,935, Sep. 2, 1976, Pat. No. 4,052,149. This application Jul. 14, 1977, Ser. No. 815,707

Int. Cl.² C04B *11/02*

U.S. Cl. 423—171 **5 Claims**

1. The method of calcining calcium sulfate dihydrate of a fineness of about 90% through 100 mesh to form a calcium sulfate hemihydrate comprising the steps of conducting recycled gases downwardly around the outer surface of a combustion chamber, heating additional gases within said combustion chamber, combining said additional gases with said recycled gases, guiding said combination of gases to a spiral calcination zone which is disposed radially outward of said combustion chamber, combining and uniformly mixing said calcium sulfate dihydrate with said combination of gases as said combination of gases starts to flow spirally upwardly through said calcination zone, maintaining said uniform mixture in combination as said combination flows through said calcination zone, uniformly transferring heat from said heated gases to all of said calcium sulfate dihydrate, removing said combination of gases and solids therein at the top of said calcination zone, separating the calcined solids from said gases, and recycling said gases to the outer surface of said combustion chamber for use in another calcining cycle.



4,101,631

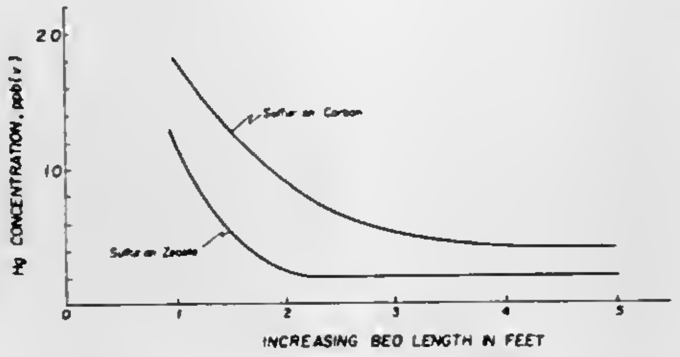
SELECTIVE ADSORPTION OF MERCURY FROM GAS STREAMS

Ronald Frank Ambrosini, Scarsdale; Richard Alan Anderson, Katonah, both of N.Y.; Louis Leonard Fornoff, Cedar Grove, N.J., and Krishan Dayal Manchanda, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 3, 1976, Ser. No. 738,529

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **8 Claims**



1. Process for removing mercury vapor from gas streams which comprises providing a gas stream containing water vapor and at least 0.02 micrograms of mercury vapor per normal cubic meter, passing said gas stream at a temperature of from −40° to 100° C. through a sorption zone containing a crystalline zeolitic molecular sieve having a SiO_2/Al_2O_3 molar ratio of from 2 to 20, and having elemental sulfur loaded thereon in an amount of at least 0.5 weight percent, based on the anhydrous weight of the molecular sieve, whereby mercury is adsorbed from said gas stream, and recovering the mercury-depleted effluent gas stream from said sorption zone.

4,101,632

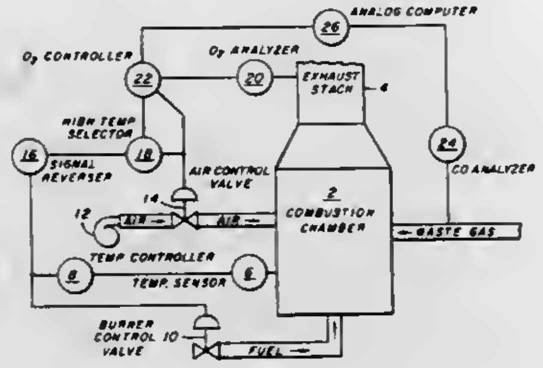
WASTE GAS INCINERATION CONTROL

Thomas G. Lamberti, and Harry B. Rowe, both of Palestine, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 28, 1976, Ser. No. 736,480

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **5 Claims**



1. A process for controlling the amount of air to be mixed with waste gas containing combustibles being fed into a combustion chamber comprising:

- maintaining a chamber temperature greater than the combustion temperature of the combustible in the waste gas;
- introducing a continuously fluctuating volume of waste gas containing a continuously fluctuating percentage concentration of combustibles into the combustion chamber;
- measuring the percentage of combustibles in the waste gas;
- computing the optimum percentage of free oxygen in the gas exhausting the chamber based on the percentage of combustibles in the waste gas;
- measuring the actual percentage of free oxygen in the exhaust gas directly exhausted from the combustion chamber; and
- adjusting the volume of air flow into the chamber so as to produce the optimum percentage of free oxygen in the exhaust gas.

4,101,633

PROCESS AND COMPOSITION FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 14, 1977, Ser. No. 768,421

Int. Cl.² B01D *53/34*

U.S. Cl. 423—228 **16 Claims**

1. A process for the removal of carbon dioxide containing acidic gases from a normally gaseous mixture, which comprises:

- (a) contacting said normally gaseous mixture with an aqueous amine solution comprising at least about 50 mol % of a sterically hindered amino alcohol and at least about 10 mol % of a tertiary amino alcohol, wherein said sterically hindered amino alcohol contains at least one secondary amino group which is part of a ring and is attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom; and
- (b) desorbing at least a portion of the absorbed carbon dioxide containing acidic gases from said solution.

4,101,634

PROCESS FOR THE SIMULTANEOUS REMOVAL OF NITROGEN AND SULFUR OXIDES FROM A GAS STREAM

Johannes E. G. Ploeg, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 4, 1977, Ser. No. 765,709

Claims priority, application Netherlands, Feb. 11, 1976, 7601371

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **5 Claims**

1. In a process for the simultaneous removal of nitrogen oxides and sulfur oxides from a gas stream containing oxygen, in addition to said oxides, in which process a metal-containing acceptor is used for the acceptance of sulfur oxides in the form of a metal sulfate and ammonia precursor is added to the gas stream for the reduction of the nitrogen oxides to nitrogen, and the metal sulfate-containing acceptor is regenerated at regular intervals by stopping the flow of the gas stream and introducing a reducing gas, the improvement comprising regenerating the acceptor by contacting the acceptor with the reducing gas in a flow counter-current to the direction in which the gas stream to be purified contacts the acceptor, the regeneration being terminated when at least part of the acceptor is still in the metal sulfate form, after which the flow of the oxygen-containing gas stream to be purified is continued.

4,101,635

METHOD FOR REGENERATING AND RECYCLING CATALYST FOR OXIDATION OF SULFUR DIOXIDE

Masao Nambu; Synnichi Yamamoto, both of Kawasaki, and Yoshihisa Kolwai, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Continuation of Ser. No. 504,746, Sep. 10, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 772,951

Claims priority, application Japan, Sep. 14, 1973, 48-103242; Oct. 5, 1973, 48-111538; Aug. 27, 1974, 49-97487

Int. Cl.² C01B *17/00;* **C01F** *11/46*

U.S. Cl. 423—242 **10 Claims**

1. A process for removing sulfur dioxide from a gas stream containing the same prior to passing said gas stream to the ambient atmosphere comprising oxidizing the sulfur dioxide with an oxygen-containing gas in a low temperature, liquid phase catalytic reaction to produce sulfuric acid wherein said reaction between sulfur dioxide and oxygen is carried out in the presence of an acidic aqueous solution containing, as oxidation catalyst, at least 3ppm each of pentavalent vanadium ion and divalent manganese ion and regenerating and recycling the oxidation catalyst by the steps of:

- adding at least one calcium compound selected from the group consisting of calcium oxide, calcium hydroxide and calcium carbonate and an oxygen-containing gas as an oxidizing agent to at least a part of the aqueous catalyst solution used in the oxidation reaction and containing sulfuric acid to thereby oxidize tetravalent vanadium contained therein to pentavalent vanadium and convert sulfuric acid to gypsum, by first adding the calcium compound to the aqueous catalyst solution and thereafter adding the oxygen-containing gas to the aqueous catalyst solution wherein the amount of calcium compound added is sufficient to maintain the pH of the aqueous catalyst solution at at least 7.0,
- separating the resulting gypsum, and
- recycling the recovered aqueous solution catalyst for use in the oxidation of sulfur dioxide.

4,101,636
DEFLUORINATED PHOSPHATE ROCK PROCESS USING LIME

Harold V. Larson, and Morris E. Clark, both of Pasadena, Tex., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 21, 1977, Ser. No. 761,049

Int. Cl.^{2} C01B *15/16, 25/26;* **C05B** *13/00*

U.S. Cl. 423—305 **17 Claims**

1. A process for preparing defluorinated phosphate rock from a fluorine-containing phosphate rock having an acid insoluble content in the range from in excess of 6 to about 10 percent by weight, which comprises:
   (a) admixing lime with phosphoric acid in a proportion to provide a CaO to P_2O_5 weight ratio in the range from about 0.01:1 to about 0.2:1 in the resulting acid slurry,
   (b) admixing said acid slurry with said phosphate rock, soda ash and water to form a mixture containing a CaO to P_2O_5 weight ratio in the range from about 1.010:1 to about 1.058:1,
   (c) granulating the resulting mixture to form granules,
   (d) heating said granules to dryness,
   (e) heating the resulting dried granules without fusion to a temperature sufficient to defluorinate said phosphate rock,

whereby sufficient fluorine is evolved to produce defluorinated phosphate rock granules.

4,101,637
DIRECT GRANULATION PROCESS FOR TRIPLE SUPERPHOSPHATE

Laurence William Bierman, and Gary Lynn Long, both of Pocatello, Id., assignors to J. R. Simplot Company, Boise, Id.

Filed Oct. 29, 1975, Ser. No. 626,772

Int. Cl.^{2} C01B *15/16, 25/26*

U.S. Cl. 423—309 **4 Claims**

1. In a process for the production of monocalcium phosphate by reaction of phosphoric acid and a material selected from the group consisting of lime, limestone and dolomite, the improvement which comprises: (1) adding said material to a dilute dispersed solution of phosphoric acid containing 22–38% P_2O_5 by weight with vigorous agitation while maintaining a temperature of 100°–180° F for a minimum of 3–5 minutes to produce a directly granulatable slurry; (2) granulating the resulting slurry; (3) drying the resultant granulated slurry at a temperature not exceeding 200° F; and (4) recovering the resultant dried and granulated monocalcium phosphate.

4,101,638
PROCESS FOR THE MANUFACTURE OF A SLURRY CONTAINING HIGHLY CONCENTRATED PHOSPHORIC ACID AND CALCIUM SULFATE HEMIHYDRATE IN A READILY FILTERABLE FORM

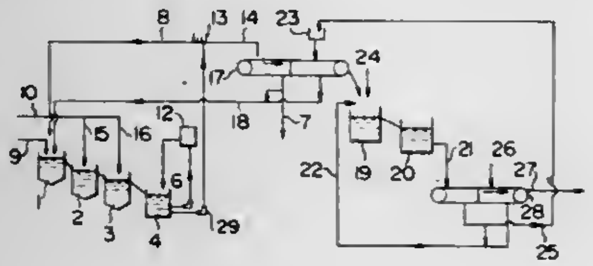
Takasuke Inone; Yuzo Itoh; Sataro Nakajima; Shin-Ichi Tajika, and Yoshio Saiki, all of Fuchu, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,741

Claims priority, application Japan, Aug. 13, 1975, 50-098305

Int. Cl.^{2} C01B *25/16*

U.S. Cl. 423—320 **6 Claims**



1. In a wet process for the manufacture of highly concentrated phosphoric acid, which process comprises a digestion step in which phosphate rock is digested by phosphoric acid and sulphuric acid to produce a slurry containing phosphoric acid having a P_2O_5 concentration in excess of 40%, together with calcium sulfate hemihydrate and a separation step in which the slurry is filtered to separate said calcium sulfate hemihydrate from said highly concentrated phosphoric acid, the improvement which comprises the step of introducing active silica during the digestion step.

4,101,639
PROCESS FOR PRODUCTION OF CARBON BLACK

Vitaly Fedorovich Surovikin, ulitsa Lermontova, 20, kv. 80; Gennady Vasilievich Sazhin, ulitsa 50let VLKSM, 8, kv. 33; Mikhail Ivanovich Romanov, ulitsa 3 Molodezhnaya, 56, kv. 34, and Nikolai Kalistratovich Korenyak, Kamerny pereulok, 52, kv. 39, all of Omsk, U.S.S.R.

Filed Jan. 23, 1976, Ser. No. 698,911

Claims priority, application U.S.S.R., Jun. 30, 1975, 2150406

Int. Cl.^{2} C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—449 **3 Claims**

1. A plasmatron process for the production of carbon black comprising:
   (a) introducing a gaseous heat carrier in the form of a plasma stream into a reaction chamber at a temperature of 2000° to 5000° K;
   (b) contacting the plasma stream with water vapor prior to contacting with a feedstock, said water vapor being introduced radially and tangentially with respect to the walls of the reaction chamber wherein the radial and tangential amounts of water vapor vary in a ratio of at least 3:1 respectively;
   (c) contacting the plasma stream in the reaction chamber with a hydrocarbon feedstock saturated with water vapor, introduced at a distance of not less than 5 diameters of the reaction chamber from the point of introduction of the water vapor into said plasma stream;
   (d) cooling the reaction products resulting from the thermal decomposition of the feedstock to a temperature of about 200° to 700° C; and
   (e) recovering the product.

4,101,640
PRODUCTION OF OH_3^+ SALTS

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 767,010, Feb. 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,398, Oct. 24, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,786

Int. Cl.^{2} C01B *7/00*

U.S. Cl. 423—462 **3 Claims**

1. A composition of matter consisting of an OH_3^+ cation, and an anion consisting of the hexafluoride of a material selected from the group consisting of antimony and arsenic.

4,101,641
PROCESS FOR THE REMOVAL OF SULPHUR OXIDES FROM GASES

Ian Poll, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 27, 1977, Ser. No. 801,262

Claims priority, application Netherlands, May 28, 1976, 7605736

Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—567 R **5 Claims**

1. In a process for the removal of sulphur oxides from a gas with the aid of a solid acceptor which accepts the sulphur oxides, the loaded acceptor subsequently being regenerated with reducing gas, and in which elemental sulphur is prepared from the regeneration offgas containing sulphur compounds, the improvement comprising preparing the elemental sulphur by feeding the regeneration offgas to a generator for the reducing gas in which a fuel is partially combusted with the sulphur compounds and oxygen to form a reducing gas containing hydrogen, carbon monoxide, and elemental sulphur, after which the sulphur is recovered from the reducing gas, and the reducing gas is used for the regeneration of the loaded acceptor.

4,101,642
METHOD FOR CONVERTING THE AMMONIA AND HYDROGEN SULFIDE CONTAINED IN COKE-OVEN GASES INTO NITROGEN AND WATER AND SULFUR RESPECTIVELY

Kurt Tippmer, Recklinghausen, Germany, assignor to Firma Carl Still, Germany

Filed Aug. 11, 1976, Ser. No. 713,494

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537451

Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—573 G **4 Claims**

1. A method for converting the ammonia and hydrogen sulfide in coke oven gases into water, nitrogen and sulfur using waste gases from which ammonia and hydrogen sulfide have been removed, comprising mixing said coke oven gases with oxygen enriched gas and a first portion of 80 to 90% of the waste gases, burning said mixture and passing the resulting gaseous products over a catalyst to convert the ammonia into water and nitrogen, mixing these gases which have passed over the catalyst with oxygen enriched gas and a second portion of the waste gases, cooling the mixture and removing some of the condensed sulfur, further processing the gases which have some of the sulfur removed to remove additional sulfur to form a remaining product gas, condensing the water from said remaining product gas, and using a portion of the resulting gaseous products to form a part of the waste gases, 80 to 90% of said oxygen enriched gas being added in said first mentioned mixture and 10 to 20% is added in said second mentioned mixture.

4,101,643
PROCESS FOR RECOVERING SULFUR BY REMOVAL OF SULFUR DIOXIDE FROM GASEOUS MIXTURES

Shao E. Tung, 91 Blake Rd., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 499,582, Apr. 21, 1974, Pat. No. 3,984,529. This application Sep. 30, 1976, Ser. No. 728,174

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.^{2} C01B *17/04*

U.S. Cl. 423—575 **27 Claims**

1. A process for removing sulfur dioxide from gaseous mixtures comprising:
   contacting the gaseous mixture in a scrubbing zone with a removal reactant consisting essentially of an aqueous solution of an alkali metal sulfite to form an aqueous solution of an alkali metal hydrosulfite salt;
   contacting, in a transfer reaction zone, the aqueous solution of said hydrosulfite salt with an organic liquid phase which includes at least one nitrogen-containing organic compound which does not form a stable emulsion with water, and which is selected from the group consisting of aliphatic amines containing from about 8 to about 45 carbon atoms, and having a solubility in water of less than 0.2 gm/100 gms water at 25° C, to yield, by a transfer reaction, an organic liquid phase containing at least one sulfur-containing salt of said nitrogen compound, and to concurrently regenerate said removal reactant;
   separating the organic liquid phase containing said sulfur-containing nitrogen compound from the aqueous solution; then
   heating the organic liquid phase to a temperature of at least 70° C to decompose the sulfur-containing salts to yield sulfur dioxide and regenerate said nitrogen-containing compound.

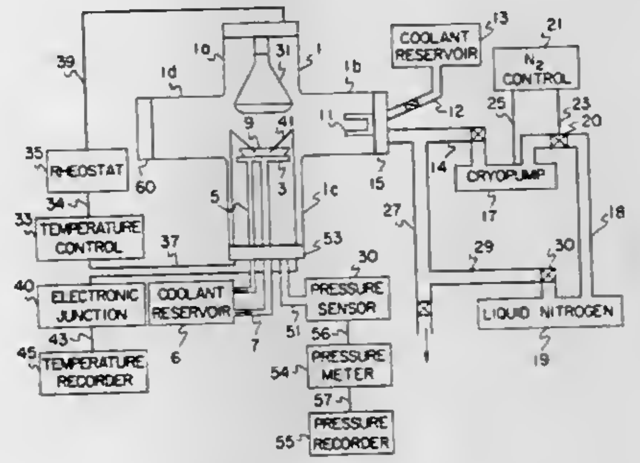
4,101,644
PROCESS FOR THE PREPARATION OF CALCIUM SUPEROXIDE

Robert A. Frosch, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of; E. Vernon Ballou, Santa Clara, Calif.; Peter C. Wood, San Jose, Calif.; Theordore J. Wydeven, Jr., Sunnyvale, Calif., and LeRoy A. Spitze, Morgan Hill, Calif.

Filed Jul. 11, 1977, Ser. No. 814,378

Int. Cl.^{2} C01B *15/043*

U.S. Cl. 423—581 **11 Claims**



1. A process for converting calcium peroxide diperoxyhydrate to calcium superoxide which comprises:
   (a) washing the calcium peroxide diperoxyhydrate with a dry polar solvent to obtain finely divided diperoxyhydrate;
   (b) spreading a thin layer of the finely divided washed diperoxyhydrate on the surface of a flat container over an area within the range of about 18 to about 300 cm^2 per gram;
   (c) positioning said container on a support structure in a reaction chamber;
   (d) partially evacuating said chamber to a pressure not greater than about 500 μm Hg;
   (e) allowing said diperoxyhydrate to reach a temperature not greater than about 40° C;
   (f) while maintaining said temperature, rapidly and systematically removing from the diperoxyhydrate zone the heat and water vapor released by the conversion of said compound;
   (g) backfilling the chamber with a dry inert gas; and
   (h) recovering the calcium superoxide produced.

10. A process for converting calcium peroxide diperoxyhydrate to a calcium superoxide which comprises:
   (a) spreading a thin layer of finely divided calcium peroxide diperoxyhydrate on a flat porous support in a chamber over an area within the range of 145 to 300 cm^2 per gram;
   (b) partially evacuating said chamber to a background pressure lower than 20 μm Hg;
   (c) allowing said diperoxyhydrate to reach a temperature not greater than 40° C;
   (d) while maintaining said temperature and keeping the chamber pressure at a level not greater than about 90 μm, passing a flow of cool dry inert gas through said porous support and diperoxyhydrate layer to sweep away evolved water and heat towards a liquid nitrogen cooled surface;
   (e) backfilling said chamber with nitrogen gas, after completion of the reaction; and
   (f) recovering the calcium superoxide produced.

4,101,645

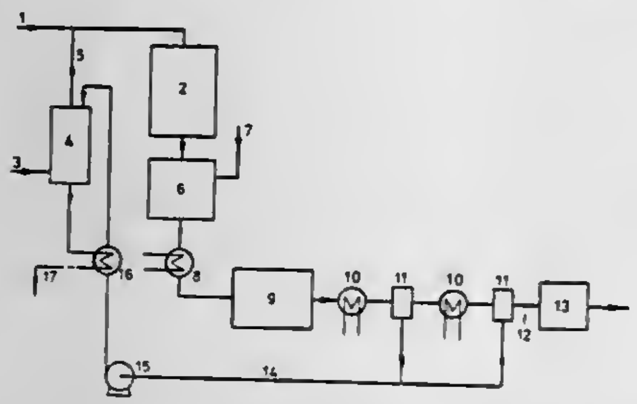
PROCESS FOR THE PRODUCTION OF HYDROGEN/DEUTERIUM-CONTAINING GAS

Eberhard Nitschke, Do-Barop; Arvind Desai, Dortmund-Aplerbeck, and Hartmut Ilgner, Dortmund, all of Fed. Rep. of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Fed. Rep. of Germany

Division of Ser. No. 611,611, Sep. 9, 1977, abandoned, which is a division of Ser. No. 352,606, Apr. 19, 1973, Pat. No. 3,957,961. This application Nov. 8, 1976, Ser. No. 739,638

Int. Cl.² C01B *4/00, 1/16, 5/02, 31/20*

U.S. Cl. 423—648 A **3 Claims**



1. A process for increasing the deuterium content of manufactured hydrogen gas which contains naturally occurring deuterium by a method comprising in sequence the steps of:

I. reacting naphtha with steam in a first cracking furnace to produce a partially cracked process gas which consists of carbon monoxide, water vapor, hydrogen and lower hydrocarbons and insuring that enough steam is introduced to have water vapor which is 0.6 kg/m^3 of the process gas;
II. introducing the partially cracked process gas into a second cracking furnace;
III. introducing air into the second cracking furnace;
IV. cracking the lower hydrocarbons of the partially cracked process gas to produce a fully cracked process gas;
V. cooling the fully cracked process gas which consists of carbon monoxide, water vapor and hydrogen in a heat exchanger;
VI. passing the fully cracked process gas into a carbon monoxide converter;
VII. introducing steam into a carbon monoxide converter to convert the carbon monoxide to carbon dioxide and thereby having a modified process gas consisting of carbon dioxide, water vapor and hydrogen;
VIII. cooling the modified process gas in a heat exchanger;
IX. passing the modified gas through a separator to divide the phases, the condensate which is liquid water with some carbon dioxide and impurities dissolved in it from the less humid gas which is carbon dioxide, hydrogen and traces of water vapor;
X. conducting the liquid condensate via a booster pump through a heat exchanger for cooling;
XI. introducing the liquid condensate into the top of an exchange column;
XII. introducing steam into the bottom of the exchange column;
XIII. contacting the liquid condensate with the steam in the exchange column to achieve an equilibrium of concentration of deuterium, the deuterium in the liquid water transfers to the steam which enriches the steam in deuterium and depletes the water;
XIV. conveying the steam rich in deuterium to Step I;
XV. conducting the less humid gas from Step IX to a carbon dioxide scrubbing unit;
XVI. removing the carbon dioxide in the scrubbing unit from the less humid gas leaving manufactured hydrogen gas rich in naturally occurring deuterium.

4,101,646

FERRITE VASCULAR CONTRAST MEDIA

Mitsuo Sugimoto, Tokyo, Japan, assignor to Rikagaku Kenkyusho, Japan

Continuation-in-part of Ser. No. 46,913, Jun. 17, 1970, abandoned. This application May 10, 1972, Ser. No. 252,519

Claims priority, application Japan, May 13, 1970, 45-40656

Int. Cl.² A61K *29/02*

U.S. Cl. 424—4 **4 Claims**

1. A water dispersible composition for the preparation of a vascular radiographic contrast media, said composition comprising 20 to 50 parts by weight of at least one magnetic ferrite having a particle size of from about 0.05 to about 1 μ coated with from 80 to 50 parts by weight of a negatively charged colloid selected from the group consisting of colloidal gold, colloidal silver iodide, colloidal platinum and colloidal silicate.

4,101,647

ORAL DOSAGE FORM FOR X-RAY CONTRAST MEDIA CONTAINING A PHARMACEUTICALLY ACCEPTABLE BASE AND METHOD OF USE THEREOF

Wolfram Clauss; Ulrich Speck, and Dietmar Jentsch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,333

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1975, 2505218

Int. Cl.² A61K *29/02*

U.S. Cl. 424—5 **17 Claims**

1. In a pharmaceutical composition adapted for oral administration, comprising in unit dosage form, an X-ray contrast agent for cholecystocholangiography in admixture with a pharmaceutically-acceptable carrier, the improvement wherein the composition comprises an amount per unit dosage of a pharmaceutically-acceptable base effective to neutralize the stomach acid content of a human when the composition is ingested.

4,101,648

COMPOSITION FOR CARRYING OUT A URIC ACID LOAD TEST

Horst Ulbrich, Merenberg, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG, Bad Homburg, Fed. Rep. of Germany

Filed Aug. 23, 1976, Ser. No. 716,549

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537488

Int. Cl.² A61K *29/00, 31/52;* **G01N** *33/16*

U.S. Cl. 424—9 **2 Claims**

1. A composition for carrying out a uric acid load test comprising a mixture consisting essentially of adenine and guanine in about equal quantities by weight incorporated in amorphous silicic acid as a carrier therefor.

4,101,649

HYDROSOLUBLE AGENTS HAVING NON SPECIFIC IMMUNODEPRESSIVE PROPERTIES

Arlette Adam, nee Chosson, Palaiseau; Pierre LeFrancier, Bures-sur-Yvette, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 8, 1976, Ser. No. 730,839

Claims priority, application France, Oct. 9, 1975, 75 30948

Int. Cl.² A61K *39/00, 37/00;* **C07C** *103/52*

U.S. Cl. 424—12 **26 Claims**

1. N-acetylmuramyl-D-alanyl-D-isoglutamine which possesses immunosuppressive or immunodepressive properties.

15. A diagnostic composition for diagnosis and inhibition of the action of an adjuvant comprising a compound selected from the group consisting of: N-acetylmuramyl-D-alanyl-D-isoglutamine and N-acetylmuramyl-L-alanyl-L-isoglutamine and a compatible carrier.

4,101,650

PEPSTATIN FLOATING MINICAPSULES

Hamao Umezawa, Tokyo, Japan, assignor to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 6, 1977, Ser. No. 785,268

Int. Cl.² A61K *9/46, 9/50, 37/64*

U.S. Cl. 424—44 **15 Claims**

1. A composition in oral dosage form comprising minicapsules having a diameter in the range of 0.1 to 2 mm. in which the center comprises a granule of sodium bicarbonate, said granule being coated with a conventional water-soluble, film-coating agent and said center being coated with pepstatin.

4,101,651

PROCESS FOR PREPARING PREPARATIONS FOR ORAL ADMINISTRATION

Toshiyuki Kobayashi, Yokohama; Akio Okada, Kawasaki; Takeshi Mayama, Chigasaki, and Akira Okada, Zushi, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 655,026

Claims priority, application Japan, Sep. 29, 1975, 50-117513

Int. Cl.² A61K *9/16, 31/74, 31/78*

U.S. Cl. 424—35 **4 Claims**

1. A process for preparing granular preparations for oral administration having no bitter taste which comprises dissolving a pharmaceutically acceptable water insoluble ethyl cellulose as a bitter taste-masking substance having a molecular weight higher than about 2,000 in high concentration in a volatile solvent to be used for dissolving or suspending midecamycin as a bitter pharmaceutical ingredient, adding the midecamycin to the resulting solution followed by kneading, adding silicic acid anhydride to the resulting kneaded substance to form a powder and granulating said powder using a solution of the ethyl cellulose in a fluidized bed granulator, said volatile solvent not exerting a degrading effect upon said ethyl cellulose or upon said midecamycin, the amount of said ethyl cellulose to be dissolved in said solvent being about 0.5 to about three times the amount of said midecamycin and the amount of said ethyl cellulose used for said granulation being about 1/10 to about 1/5 the amount thereof used for said dissolving.

4,101,652

PHARMACEUTICALLY ACTIVE COMPLEXES AND PHARMACEUTICAL COMPOSITIONS CONTAINING EASCIN AND STEROLS

Attilio Boonati, Milan, Italy, assignor to Inverni Della Beffa S.p.A., Milan, Italy

Filed Jun. 14, 1976, Ser. No. 695,752

Claims priority, application United Kingdom, Jul. 1, 1975, 27707/75

Int. Cl.² A61K *31/705;* **C07J** *17/00*

U.S. Cl. 424—49 **19 Claims**

1. A pharmaceutical composition comprising a pharmaceutically acceptable diluent or carrier and as active ingredient an effective amount of a complex formed between aescin and a sterol selected from the group consisting of cholesterol, β-sitosterol, stigmasterol, campesterol and mixtures thereof, the aescin being in free acid form or in the form of a pharmaceutically acceptable salt, with the proviso that where the composition is an unpurified aqueous suspension of a complex formed between cholesterol and the impure sodium or potassium forms of aescin, the composition contains an ingredient selected from the group consisting of preservatives and buffering, thickening, suspending, stabilizing, wetting, emulsifying, coloring and flavoring agents.

11. A composition according to claim 1 in the form of a dentifrice.

4,101,653

N²-ARYLSULFONYL-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Tokyo; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Tokyo; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

Continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, and Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, and Ser. No. 703,704, Jul. 8, 1976, said Ser. No. 671, 436, and said Ser. No. 671,568, each is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,929

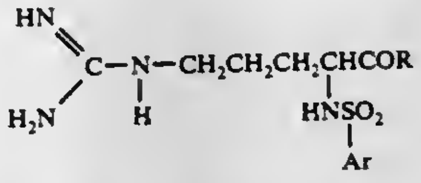
Claims priority, application Japan, Nov. 8, 1974, 49/128774; Nov. 8, 1974, 49/128775; Nov. 29, 1974, 49/136695; Nov. 29, 1974, 49/136697; Feb. 25, 1975, 50/023268; Feb. 26, 1975, 50/023635; Mar. 5, 1975, 50/026768; Mar. 11, 1975, 50/029357; Mar. 11, 1975, 50/029358

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.² A61K *37/00;* **C07C** *103/52*

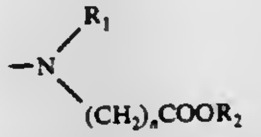
U.S. Cl. 424—177 **13 Claims**

1. An N²-arylsulfonyl-L-argininamide having the formula (I):



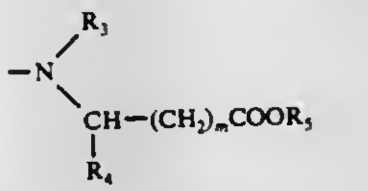
$$(H_2N)(HN{=})C{-}NH{-}CH_2CH_2CH_2CH(NHSO_2Ar)COR \qquad (I)$$

or a pharmaceutically acceptable salt thereof, wherein R is



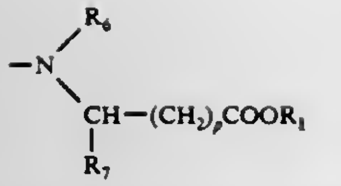
$$-N(R_1)(CH_2)_nCOOR_2 \qquad (1)$$

wherein R_1 is C_3–C_{10} alkylcarbonylalkyl, ring substituted aralkyl wherein said substituent is C_1–C_5 alkoxy or C_1–C_5 alkyl, 2-thenyl, 3-thenyl, or a tetrahydrofurfuryl or tetrahydro-3furylmethyl group either of which is substituted with one or more C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, or tetrahydro-2-thenyl, tetrahydro-3-thenyl, tetrahydro-2(3 or 4)-pyranylmethyl or 1,4-dioxa-2-cyclohexylmethyl which is unsubstituted or substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof; R_2 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *n* is 1, 2, or 3;



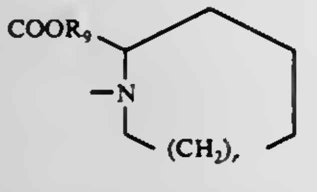
$$-N(R_3)CH(R_4){-}(CH_2)_mCOOR_5 \qquad (2)$$

wherein R_3 is C_3–C_{10} alkylcarbonylalkyl, 2-thenyl, 3-thenyl, or a tetrahydrofurfuryl or tetrahydro-3-furylmethyl group either of which is substituted with one or more C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, a tetrahydro-2-thenyl, tetrahydro-3-thenyl, tetrahydro-2(3 or 4)-nyranylmethyl or 1,4-dioxa-2-cyclohexylmethyl group which is unsubstituted or substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof; R_4 is C_1–C_{10} alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl optionally substituted with one or more C_1–C_5 alkyl or C_1–C_5 alkoxy groups, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_5 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and m is 0, 1 or 2;



(3)

wherein R_6 is furfuryl, 3-furylmethyl, tetrahydrofurfuryl or tetrahydro-3-furylmethyl; R_7 is carboxy, C_2–C_{10} alkoxycarbonyl, phenyl optionally substituted with one or more C_1–C_5 alkyl or C_1–C_5 alkoxy groups, C_7–C_{12} aralkyl or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_8 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and *p* is 0, 1 or 2; or



(4)

optionally substituted with one or more C_1–C_5 alkyl, alkoxy or mixtures thereof, wherein R_9 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and r is 1, 2, 3 or 4; Ar is phenyl, which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof.

4,101,654

MICROBIOCIDAL PROCESS EMPLOYING FULL QUATERNARY NITROGEN-HETEROCYCLIC PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 380,606, Jul. 19, 1973, abandoned, which is a division of Ser. No. 117,082, Feb. 19, 1971, Pat. No. 3,770,750. This application Apr. 4, 1977, Ser. No. 784,385

Int. Cl.² A01N *9/36*

U.S. Cl. 424—200 **9 Claims**

1. A process of inhibiting the growth of bacteria from the group consisting of (1) aerobic bacteria and (2) sulfate reducing bacteria of the Desulfovibrio genus in aqueous, hydrocarbon, or aqueous hydrocarbon system characterized by adding thereto a growth inhibiting amount of a quaternary full nitrogen-heterocyclic phosphonate wherein the nitrogen-heterocyclic group is selected from the group consisting of pyridine, the picolines, the lutidines, the collidines, cyano-pyridine, quinoline and isoquinoline, each having an unsaturated bond between the nitrogen atom and one adjacent carbon atom and a saturated bond between the nitrogen atom and the other adjacent carbon atom, the phosphorus atom of the phosphonate group being bonded directly to a carbon atom of said nitrogen-heterocyclic group, said phosphonate group being ortho or para to the nitrogen atom in said nitrogen-heterocyclic group and the quaternary group is an alkyl or phenyl halide, sulfate or alkyl sulfate with the proviso that the said alkyl moiety in both occurrences contains 1–12 carbon atoms.

4,101,655

INSECTICIDAL AND OVICIDAL METHOD

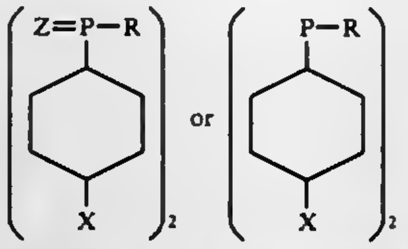
Edwin L. Sukman, Montclair, N.J., assignor to M & T Chemicals Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 555,884, Mar. 6, 1975, Pat. No. 3,989,824. This application Oct. 4, 1976, Ser. No. 729,029

Int. Cl.² A01N *9/36*

U.S. Cl. 424—204 **7 Claims**

1. A method for killing insects and sterilizing their eggs by applying to said insects, eggs or to substrates susceptible to infestation with said insects an insecticidally and ovicidally effective amount of a phosphorus compound exhibiting the formula:



wherein R is selected from the group consisting of alkyl and haloalkyl radicals containing between 1 and 12 carbon atoms, X represents a halogen atom selected from the group consisting of fluorine, chlorine, bromine and iodine and Z represents oxygen or sulfur.

4,101,656

7β-ACYLAMINO-3-(ALKANESULFONAMIDOALKYL SUBSTITUTED TETRAZOLYLTHIOMETHYL) CEPHALOSPORINS, ANTIBACTERIAL COMPOSITIONS CONTAINING THEM AND METHODS OF TREATING BACTERIAL INFECTIONS WITH THEM

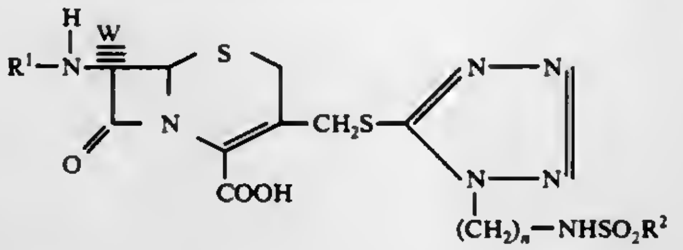
David A. Berges, Wayne, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Filed Jul. 12, 1976, Ser. No. 704,141

Int. Cl.² A61K *31/545;* **C07D** *501/54, 501/56*

U.S. Cl. 424—246 **30 Claims**

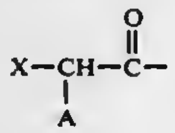
1. A compound of the formula:



in which:

W is hydrogen or methoxy;

R^1 is an acyl group of the formula:



$$X-\underset{\displaystyle A}{\underset{|}{C}H}-\overset{\displaystyle O}{\overset{\|}{C}}-$$

where:

X is thienyl, phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido or ureido;

A is NH_2, OH, COOH, SO_3H or formyloxy;

n is two to five; and

R^2 is alkyl of from one to four carbon atoms, or a non-toxic pharmaceutically acceptable salt thereof.

23. An antibacterial pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

26. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an antibacterially effective but non-toxic dose of a compound as claimed in claim 1.

4,101,657

CEPHAMYCINS AS ANTIBACTERIAL AGENTS

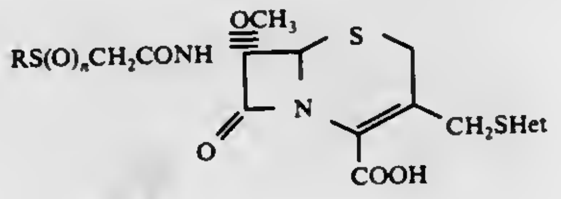
Robert M. DeMarinis, King of Prussia, Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 540,482, Jan. 13, 1975, Pat. No. 4,059,578, which is a continuation-in-part of Ser. No. 504,619, Sep. 9, 1974, abandoned. This application Jul. 1, 1977, Ser. No. 812,012

Int. Cl.² A61K *31/545*

U.S. Cl. 424—246 **14 Claims**

1. A method of treating bacterial infections comprising administering to a warm-blooded animal an antibacterially effective but non-toxic dose of 250–1000 mg of a compound of the formula



wherein

R is CF_3 or CF_3CH_2;

n is 0, 1 or 2; and

Het is tetrazolyl, triazolyl, thiadiazolyl or oxadiazolyl, each unsubstituted or substituted with one or two alkyl groups of 1–4 carbon atoms or a pharmaceutically acceptable salt thereof and a pharmaceutical carrier therefor.

4,101,658

ANTIBACTERIAL HYDRAZONO CEPHALOSPORINS

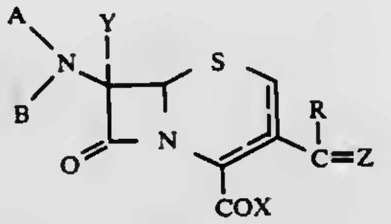
Mitsuru Yoshioka, Toyonaka; Yuji Sendo, Nishinomiya; Koji Ishikura, Amagasaki; Masayuki Murakami, Itami, and Sadao Miyazaki, Toyonaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jun. 4, 1975, Ser. No. 583,696

Int. Cl.² A61K *31/545;* **C07D** *501/20*

U.S. Cl. 424—246 **7 Claims**

1. A compound of the following formula:



wherein A is hydrogen;

B is thienylacetyl;

R is hydrogen;

X is hydroxy;

Y is hydrogen or methoxy; and

Z is a hydrazion moiety selected from the group consisting of:

(1) hydrazono;

(2) 2-(o- or p-carboxyphenyl)hydrazono, 2-(p-alkylsulfonylphenyl)hydrazono in which said alkyl contains 1 to 3 carbon atoms,

2-(p-sulfophenyl)hydrazono which can form a slat with an alkali metal ion;

(3) 2-phenyl-2-alkylhydrazono in which the alkyl contains 1 to 3 carbon atoms;

(4) 2-(2-pyridyl)hydrazono, 2-(thiazol-2-yl)hydrazono, 2-(1-amino-5-mercapto-1,3,5-triazol-2-yl)hydrazono, 2-(purin-6-yl)-hydrazono, 2-(4-oxoimidazolin-2-yl)hydrazono;

(5) 2-(sulfolan-3-yl)hydrazono, 2-(carbalkoxymethyl)hydrazono in which the carbalkoxy contains 2 to 5 carbon atoms;

(6) (4-methylpyrazin-1-yl)imino, (2-pyridon-1-yl)imino;

(7) 2-(alkanoyl)hydrazono in which the alkanoyl contains 1 to 4 carbon atoms, 2-glycylhydrazono, 2-(n-tertiary butoxycarbonyl-glycyl)hydrazono, 2-(trimethylammoniumacetyl)hydrazono, 2-(pyridiniumacetyl)hydrazono, 2-oxalylhydrazono, 2-(alkoxalyl)hydrazono in which the alkoxalyl contains 3 to 6 carbon atoms, 2-(amidoxalyl)hydrazono, 2-(hydrazinyldicarbonyl)hydrazono, 2-(cyaboacetyl)hydrazono, 2-(gluconoyl)hydrazono, 2-(benzoyl)hydrazono, 2-(furoyl)hydrazono, 2-(isoxazol-3-yl)carbonylhydrazono, 2-(5-methyl-isoxazol-3-yl)carbonylhydrazono, 2-(1,2,5-thiadiazol-3-yl)-carbonylhydrazono, 2-(5-methyl-1,2,3-thiadiazol-4-yl)carbonylhydrazono;

(8) 2-(carbalkoxy)hydrazono in which the carbalkoxy contains 2 to 5 carbon atoms, 2-(dithiocarbalkoxy)hydrazono in which the dithiocaralkoxy contains 2 to 5 carbon atoms, 2-(methylthiothiocarbonyl) hydrazono and 2-(4-hydroxyimidazol-2-yl)hydrazono; and wherein the broken line shows the presence of a double bond at the 3-position, or an alkali metal salt thereof.

4. An antibacterial pharmaceutical composition comprising an effective antibacterial amount of the compond of claim 1, and a pharmaceutically acceptable carrier.

4,101,659

BENZHYDRYL GUANIDINES

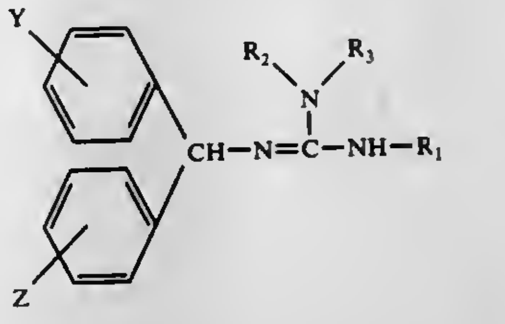
Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Aug. 29, 1977, Ser. No. 828,694

Int. Cl.² C07D *295/12;* **A61K** *31/535*

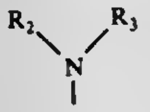
U.S. Cl. 424—248.56 **23 Claims**

1. A pharmaceutical composition in dosage unit form comprising an effective hypoglycemic amount of a member selected from the group consisting of a benzhydryl guanidine derivative having the formula:

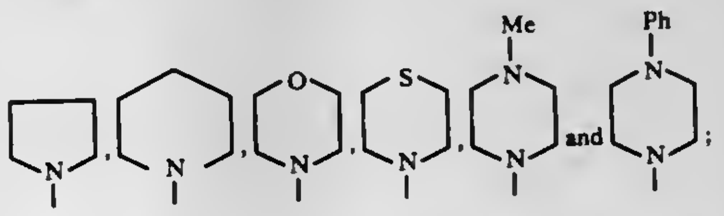


wherein:

R_1 is a member selected from the group consisting of hydrogen and loweralkyl;



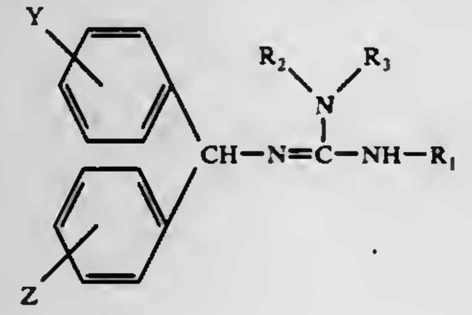
taken together represents a member selected from the group consisting of



and Y and Z are each a member selected from the group consisting of hydrogen, halo, loweralkyl, and loweralkyloxy;

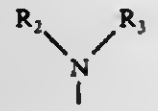
and the pharmaceutically acceptable acid salts thereof in admixture with a pharmaceutical carrier.

15. A compound selected from the group consisting of a benzhydryl guanidine derivative having the formula:

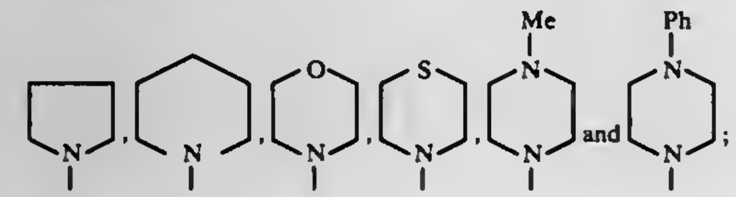


wherein:

R_1 is a member selected from the group consisting of hydrogen and loweralkyl;



taken together represents a member selected from the group consisting of



and Y and Z are each a member selected from the group consisting of hydrogen, halo, loweralkyl, and loweralkyloxy;

and the pharmaceutically acceptable acid addition salts thereof.

4,101,660

2-AMINOMETHYL-5-PHENYLOXAZOLES AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Sho Inoue; Katsuya Ohata, both of Kyoto; Satoshi Tsutsui, Yokohama, and Tatsuo Nomura, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Nippon Shinyaku Company, Limited, Kyoto, both of, Japan

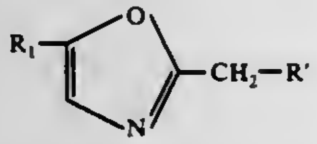
Filed Feb. 9, 1977, Ser. No. 766,975

Claims priority, application Japan, Feb. 12, 1976, 51-14194; Feb. 26, 1976, 51-20328

Int. Cl.² A61K *31/495;* C07D *413/06*

U.S. Cl. 424—250 **5 Claims**

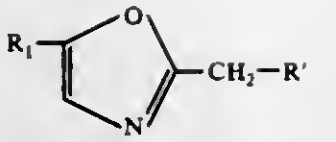
1. A 2-aminomethyl-5-phenyloxazole having the formula (I):



(I)

wherein R_1 is phenyl or halophenyl; R' is 4-(2-hydroxyethyl)-1-piperazinyl or the pharmaceutically acceptable acid addition salts thereof.

4. A method of meliorating inflammation in warm blooded animals, which comprises administering to said animal an anti-inflammatory effective amount of a compound having the formula (I):



(I)

wherein R_1 is phenyl or halophenyl; R' is 4-(2-hydroxyethyl)-1-piperazinyl.

4,101,661

NOVEL ANTIBACTERIAL AMIDE COMPOUNDS AND PROCESS MEANS FOR PRODUCING THE SAME

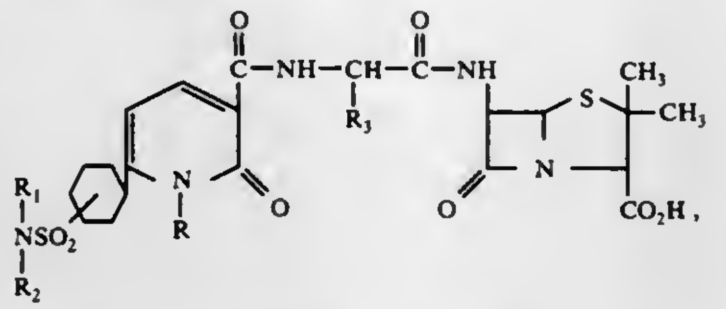
James S. Kaltenbronn; Theodore H. Haskell, and Leonard Doub, all of Ann Arbor, Mich., assignors to Warner-Lambert, Morris Plains, N.J.

Filed Jun. 3, 1977, Ser. No. 803,004

Int. Cl.² C07D *499/68;* A61K *31/43, 31/455*

U.S. Cl. 424—266 **13 Claims**

1. A compound of the formula



and pharmaceutically-acceptable salts thereof; wherein R is hydrogen or methyl; R_1 is hydrogen, lower alkyl or hydroxy(-lower alkyl), R_2 is hydrogen, lower alkyl, hydroxy(lower alkyl), pyridyl or di(lower alkyl)amino(lower alkyl); R_1R_2N taken together is 1-pyrrolidinyl, 1-piperidinyl or hydroxymethyl-1-piperidinyl, R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl.

4,101,662

METHOD FOR INHIBITING EMESIS AND COMPOSITIONS THEREFOR

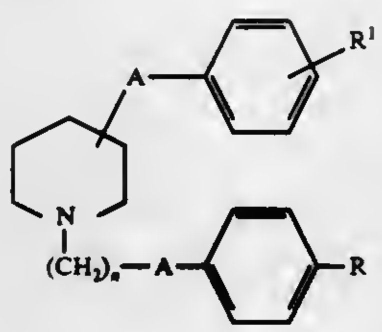
John Wesley Ward, and Charles Arthur Leonard, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed May 3, 1973, Ser. No. 356,975

Int. Cl.² A61K *31/445*

U.S. Cl. 424—267 **8 Claims**

1. A method of inhibiting emesis and nausea in an animal or human in need of said treatment which comprises internally administering to said animal or human from about one half milligram to about five milligrams of a compound selected from 1,4-(3-)-disubstituted piperidines of the formula:



wherein;

R is halogen having an atomic weight less than 80,

R^1 is selected from the group consisting of hydrogen and halogen having an atomic weight less than 80,

n is a positive integer from 2–4 inclusive,

A is selected from the group consisting of —C(O)— and —CHOH—, and

pharmaceutically acceptable acid addition salts thereof.

4,101,663

BENZOYLPIPERIDYLALKYLINDOLES

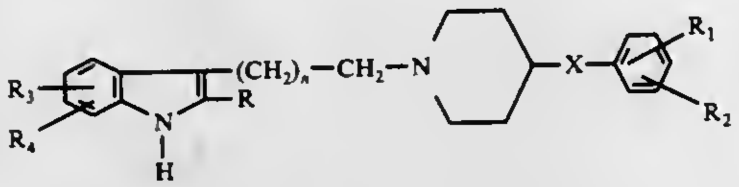
Grover C. Helsley, Pottersville; Joseph T. Strupczewski, Flemington, and Beth Ann Gardner, Stanhope, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 663,820, Mar. 4, 1976, Pat. No. 4,046,900, which is a continuation-in-part of Ser. No. 594,042, Jul. 8, 1975, abandoned. This application Jun. 21, 1977, Ser. No. 808,451

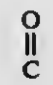
Int. Cl.² C07D *401/06*

U.S. Cl. 424—267 **1 Claim**

1. A method of treating hypertension which comprises administering to a patient a pharmaceutically effective amount of a compound of the formula



wherein X is



$$\overset{O}{\overset{\|}{C}}$$

or CHOH; R is hydrogen or methyl; R_1 and R_2 are the same or different and stand for hydrogen, halogen, straight or branched chain alkyl of up to 5 carbon atoms, alkoxy of up to 5 carbon atoms, trifluoromethyl, hydroxy, phenoxy or phenyl; R_3 and R_4 are hydrogen or methoxy; *n* is the integer 1 or 2; or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

4,101,664

1-(2-AR-4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YLMETHYL)-IMIDAZOLES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

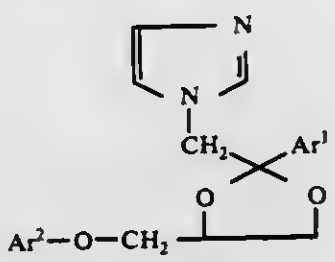
Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,828

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.² A61K *31/33;* C07D *405/06*

U.S. Cl. 424—273 R **4 Claims**

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:

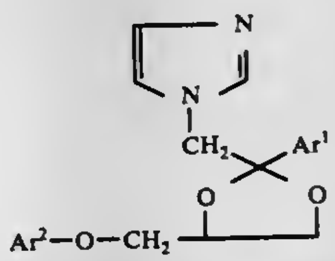


and the therapeutically acceptable acid addition salts thereof, wherein:

Ar^1 is a member selected from the group consisting of naphthalenyl, thienyl, halothienyl, nitrophenyl, cyanophenyl, lower alkyl-halophenyl and lower alkyloxy-halophenyl; and

Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, phenyl and phenylmethyl.

4. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof, wherein:

Ar^1 is a member selected from the group consisting of naphthalenyl, thienyl, halothienyl, nitrophenyl, cyanophenyl, lower alkylhalophenyl and lower alkyloxy-halophenyl; and

Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, phenyl and phenylmethyl.

4,101,665

1-(2-AR-4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YLMETHYL)IMIDAZOLES

Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

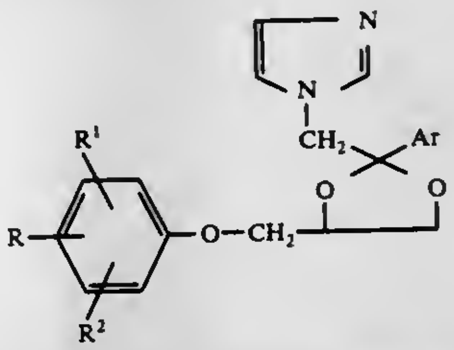
Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,827

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.² A61K *31/33;* C07D *405/06*

U.S. Cl. 424—273 R **6 Claims**

1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:



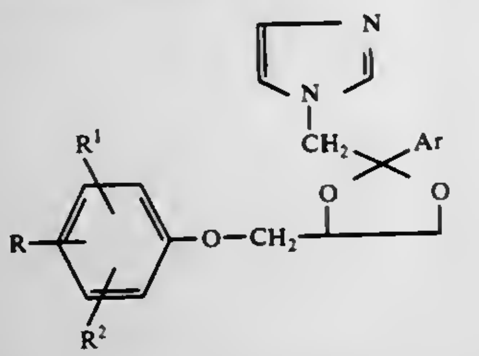
and the therapeutically acceptable acid addition salts thereof, wherein:

Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano;

R is a member selected from the group consisting of nitro, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl; and

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and lower alkyloxy.

6. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically active acid addition salts and stereochemical optical isomers thereof, wherein;

- Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano;
- R is a member selected from the group consisting of nitro, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl; and
- R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and lower alkyloxy.

4,101,666

1-(2-AR-4-R-1,3-DIOXOLAN-2-YLMETHYL)IMIDAZOLES

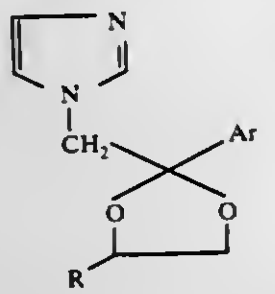
Jan Heeres, Vosselaar, Belgium, assignor to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 619,863, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,157, Jan. 27, 1975, Pat. No. 3,936,470. This application Oct. 15, 1976, Ser. No. 732,826

Int. Cl.^{2} C07D *405/06;* **A61K** *31/33*

U.S. Cl. 424—273 R **12 Claims**

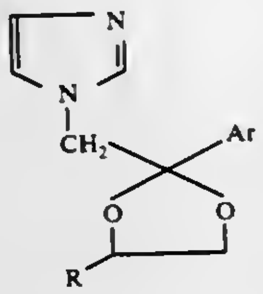
1. A chemical compound selected from the group consisting of an imidazole derivative having the formula:



and the therapeutically acceptable acid addition salts and stereochemical optical isomeric forms thereof, wherein:

- Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano; and
- R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

7. A composition for combatting the growth of a microorganism selected from the group consisting of fungus and bacterium comprising an inert carrier material and as an active ingredient an effective antifungal or antibacterial amount of a compound selected from the group consisting of an amidazole derivative having the formula



and the therapeutically active acid addition salts and stereochemical optical isomeric forms thereof, wherein:

- Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothienyl and naphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro and cyano; and
- R is a member selected from the group consisting of alkyloxymethyl wherein the alkylgroup has from 1 to 10 carbon atoms, alkenyl, alkenyloxymethyl, wherein said alkenyl has from 2 to 10 carbon atoms, hydroxymethyl, 2-propynyloxymethyl, halomethyl, arylmethyl and arylmethoxymethyl, wherein said aryl is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl and mono- and di-halonaphthalenyl, and wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, cyano, nitro, phenyl, phenylmethyl, benzoyl, halobenzoyl, lower alkylcarbonyl, lower alkyloxycarbonyl and trifluoromethyl, provided that when more than 1 substituents are present only 1 thereof may be selected from the group consisting of phenyl, phenylmethyl, benzoyl and halobenzoyl.

4,101,667

BENZO[B,F]THIEPIN DERIVATIVES

Shigeru Yamabe, Kobe; Yasuo Fujimoto, Tokyo; Shoji Ryu, Noda; Yoshio Suzuki, Misato; Yoshihiro Tanaka, Soka; Toru Yamanaka, and Kiyosato Nyu, both of Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

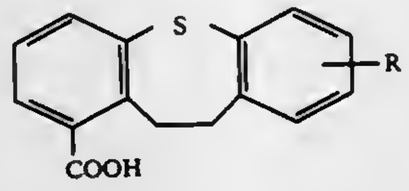
Filed May 25, 1976, Ser. No. 689,908

Claims priority, application United Kingdom, May 30, 1975, 23703/75; Japan, Oct. 28, 1975, 50-129490

Int. Cl.^{2} A61K *31/38, 31/495;* **C07D** *337/14, 409/10*

U.S. Cl. 424—275 **16 Claims**

1. A compound of the following formula:



wherein R represents a hydrogen or fluorine atom, a trifluoromethyl, 1-5C lower alkoxy, hydroxy, hydroxyethoxy or aminoethoxy group, or the group of the formula $—OCH_2CH_2OCH_2CH_2OH$.

4,101,668

ANTIOSTEOPOROTIC AGENTS

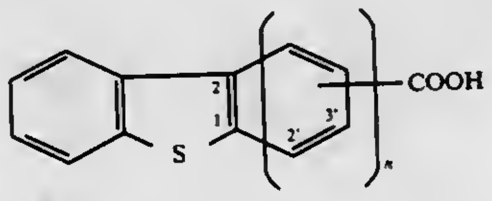
Carlos M. Samour, Wellesley, Mass., and Julius A. Vida, Greenwich, Conn., assignors to Bristol-Myera Company, New York, N.Y.

Filed May 10, 1977, Ser. No. 795,570

Int. Cl.^{2} A61K *31/38*

U.S. Cl. 424—275 **10 Claims**

1. A process for the treatment of a host animal in order to modify the balance between the rate of bone resorption and the rate of bone deposition in said host animal whereby the ratio of said rate of bone resorption to said rate of bone deposition is reduced comprising administering to said host animal an amount sufficient to modify said balance and reduce said ratio, of a compound of the formula:



wherein *n* has a value of 0 or 1; provided that there is a COOH substituent at the 1, 2, 2' or 3' position relative to the S group; and further provided that when *n* is 0, the carboxyl group is attached to the ring containing the S group; or a nontoxic, pharmaceutically acceptable salt thereof.

4,101,669

STABILIZED FORMULATIONS OF 2-ALKOXYIMINO-N-CARBAMOYL-2-CYANOACETAMIDES

Frederic John Baude, and Willis Eli Cupery, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

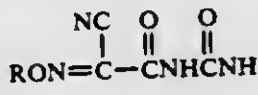
Division of Ser. No. 639,581, Dec. 12, 1975, Pat. No. 4,053,612, which is a continuation-in-part of Ser. No. 545,605, Jan. 30, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,595

Int. Cl.^{2} A01N *9/02, 9/12, 9/20*

U.S. Cl. 424—286 **3 Claims**

1. A fungicidal composition consisting essentially of

(a) 10 parts of a compound of the formula



$$RON{=}\overset{\overset{NC}{|}}{C}-\overset{\overset{O}{\|}}{C}NH\overset{\overset{O}{\|}}{C}NHR_1$$

wherein

- R is methyl or ethyl, and
- R_1 is hydrogen, alkyl of 1–4 carbon atoms or allyl;

(b) a fungicidally effective amount of zineb; and

(c) from 1 to 100 parts of an acidulent having a pH of 2 to 5.7 in a 1% distilled water mixture and a free acidity of from 2.5 millimoles per gram to 22 millimoles per gram of acidulent when titrated in a 1% distilled water mixture to a pH of 7.

4,101,670

GERMICIDAL AND ACARICIDAL COMPOSITIONS

Kunihiko Fujimori; Kuniaki Shimizu, both of Shimizu, and Haruki Ogawa, Fujieda, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

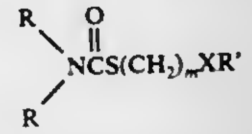
Filed Aug. 16, 1976, Ser. No. 714,861

Claims priority, application Japan, Aug. 15, 1975, 50-99144

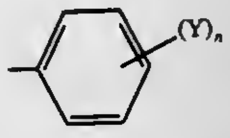
Int. Cl.^{2} C07C *153/09;* **A01N** *9/12*

U.S. Cl. 424—300 **10 Claims**

7. A method for controlling fungi, or mites which comprises applying germicidally or acaricidally effective amount of the thiolcarbamate derivative having the general formula



wherein R represents a lower alkyl group; R' represents a group shown by the formula



wherein Y represents a halogen atom, an alkyl group having 1–4 carbon atoms, an alkoxy group having 1–4 carbon atoms, a nitro group, a methylthio group, or a trifluoromethyl group, and n is an integer of 0 to 3, a benzyl group, a methylbenzyl group, or a naphthyl group; X represents an oxygen atom or a sulfur atom; and m is an integer of 3 to 6.

4,101,671

AMINOBENZYL-AMINES AND SALTS THEREOF

Johannes Keck, Biberach, Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen; Helmut Pieper, Biberach, Riss; Gerd Krüger, Biberach, Riss, and Sigfrid Püschmann, Biberach, Riss, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

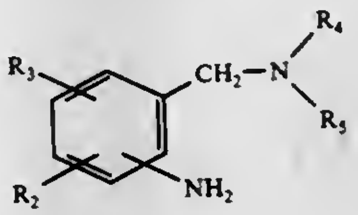
Continuation-in-part of Ser. No. 649,482, Jan. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 458,099, Apr. 5, 1974, Pat. No. 3,950,393. This application Mar. 24, 1977, Ser. No. 780,903

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1973, 2318636; Jan. 23, 1974, 2402989

Int. Cl.^{2} C07C *87/28*

U.S. Cl. 424—330 **7 Claims**

1. A compound of the formula



wherein

- R_2 is hydrogen, chlorine or bromine;
- R_3 is alkyl of 1 to 4 carbon atoms; and
- R_4 and R_5 are each alkyl of 1 to 5 carbon atoms or cycloalkyl of 5 to 7 carbon atoms;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. The method of preventing ulcers in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anti-ulcerogenic amount of a compound of claim 1.

4,101,672
MICROBICIDAL ALANINE THIOESTERS

Adolf Hubele, Magden; Walter Kunz, Oberwil, both of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

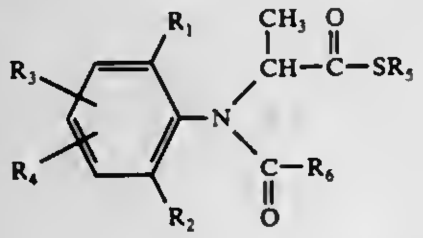
Filed Sep. 22, 1976, Ser. No. 725,203

Claims priority, application Switzerland, Sep. 30, 1975, 12647/75

Int. Cl.² A01N *9/12;* **C07C** *153/11, 161/02*

U.S. Cl. 424—301 **20 Claims**

11. A method for protecting plants from phytopathogenic fungi which comprises applying to growing plants, to soil in which plants are to be grown or to seeds of the plants, in an amount sufficient to protect the plants from fungi, a compound of the formula



wherein

- R_1 represents methyl or methoxy,
- R_2 represents methyl, ethyl, chlorine or bromine,
- R_3 represents hydrogen, methyl or halogen,
- R_4 represents hydrogen or methyl,
- R_5 represents methyl or ethyl, and
- R_6 represents hydrogen, C_2 or C_3 alkyl, C_1–C_3 alkyl substituted by cyano or thiocyano, C_2 or C_3 alkyl substituted by halogen, C_2–C_4 alkenyl, C_2–C_4 alkenyl substituted by halogen, C_2–C_4 alkynyl or C_3–C_7 cycloalkyl.

4,101,673
PURIFICATION OF NUTRITIVE OILS

Stephen S. Chang, East Brunswick, N.J., assignor to Vitrum AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 498,568, Aug. 19, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 74[illegible],069

Int. Cl.² A01N *9/24*

U.S. Cl. 424—312 **7 Claims**

1. A nutritive oil-in-water emulsion suitable for parenteral administration, comprising an oil selected from the group consisting of soybean oil and sunflower oil, an emulsifier for said oil, and water wherein the improvement comprises:

contacting said nutritive oil with an adsorbant selected from the group consisting of silicic acid and silica gel, to substantially remove non-urea-adduct forming esters and unsaponifiable matter from said nutritive oil, recovering said oil from the adsorbant, and subsequently combining the recovered nutritive oil with sterile water and an emulsifier to produce an improved oil-in-water emulsion.

4,101,674
HALOGEN DERIVATIVES OF ALKYNOXYMETHYL AMINES AS MICROBIOCIDES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 556,332, Mar. 7, 1975, Pat. No. 4,026,946. This application Jan. 3, 1977, Ser. No. 756,217

Int. Cl.² A01N *9/20, 9/24*

U.S. Cl. 424—325 **9 Claims**

1. A process of inhibiting or preventing the growth of microorganisms in aqueous or hydrocarbon systems which comprises treating said aqueous or hydrocarbon system with about 5 to 500 p.p.m. of a compound which is a halogenated alkynoxymethyl amine having the formula

$$RN(CH_2OR'C\equiv CX)_2$$

where R is alkyl, aryl or cycloalkyl, R' is an alkylene group having up to 8 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine.

4,101,675
NOVEL 2,6-DI-SUBSTITUTED PHENYL-AMINOQUANIDINE CONTAINING COMPOSITIONS AND METHODS OF USING SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME AND THERAPEUTIC METHOD

Harm Jan Panneman, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

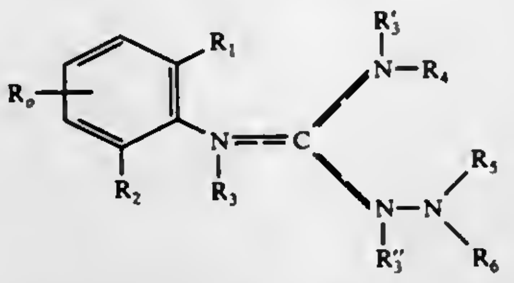
Continuation-in-part of Ser. No. 517,554, Oct. 24, 1974, Pat. No. 3,972,932. This application Jan. 29, 1976, Ser. No. 653,318

Claims priority, application Netherlands, Nov. 9, 1973, 7315350

Int. Cl.² A61K *31/155;* **C07C** *129/08*

U.S. Cl. 424—326 **2 Claims**

1. Method for the treatment of hypertension in hypertensive humans and warm blooded animals comprising administering to said human or animal a daily dosage of from 0.001 to 50 mg per kg body weight of a compound selected from the group consisting of a compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, in which one double bond is present between the carbon atom of the guanidino moiety and one of the adjacent nitrogen atoms, and in which

- R_o is selected from the group consisting of hydrogen, halogen, hydroxy, alkoxy containing from 1 to 6 carbon atoms, and alkyl containing from 1 to 6 carbon atoms;
- R_1 and R_2 are selected from the group consisting of halogen, hydroxy, alkyl containing from 1 to 4 carbon atoms, and alkoxy containing from 1 to 4 carbon atoms;
- R_3, R_3' and R_3'' are selected from the group consisting of hydrogen and alkyl containing from 1 to 4 carbon atoms, with the proviso that one of the substituents R_3, R_3', or R_3'' is absent because of the presence of the double bond;
- R_4 is selected from the group consisting of hydrogen, alkyl containing from 1 to 4 carbon atoms, and amino optionally substituted with one or two alkyl groups containing from 1 to 4 carbon atoms; and
- R_5 and R_6 are selected from the group consisting of hydrogen, alkyl containing from 1 to 6 carbon atoms, and acyl, with the proviso that if R_4 is methyl and R_0, R_3, R_3'', R_5 and R_6 are hydrogen, R_1 and R_2 may not represent methyl simultaneously.

4,101,676
DIPHENYLPROPYLAMINES TO TREAT DEPRESSION

Judith Ann Clark, Barrington, England, assignor to Beecham Group Limited, United Kingdom

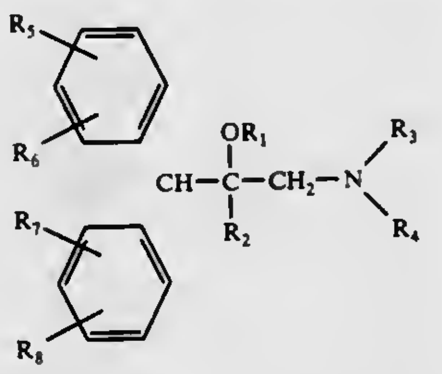
Division of Ser. No. 443,021, Feb. 15, 1974, Pat. No. 4,028,415. This application Jun. 21, 1976, Ser. No. 698,131

Claims priority, application United Kingdom, Feb. 24, 1973, 9183/73; Oct. 13, 1973, 47928/73

Int. Cl.² A61V *31/135;* **C07C** *93/20*

U.S. Cl. 424—330 **43 Claims**

22. A method of treating depression in humans which comprises administering to a human in need thereof an anti-depressantly effective amount of a pharmaceutical composition which comprises an anti-depressantly effective amount of a compound of the formula



or a pharmaceutically acceptable salt or hydrate thereof, wherein R_1 is $CO.R_9$ wherein R_9 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl; R_2 is hydrogen; R_3 is hydrogen or methyl; R_4 is methyl; R_5 is hydrogen, fluorine, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, trifluoromethyl, acetoxy, nitro, amino, methylamino or dimethylamino; and R_6, R_7 and R_8 are each hydrogen, fluorine, chlorine, bromine, methyl, methoxy or trifluoromethyl; in combination with a pharmaceutically acceptable carrier.

4,101,677
AMINOTETRALINS AND USE IN INDUCING ANESTHESIA

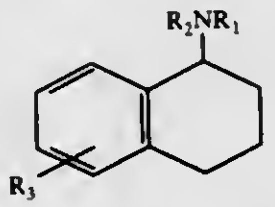
Daniel Ambrose Dunnigan, Winthrop Harbor; Adolph Oscar Geiszler, Mundelein, and James Brooks Holland, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 401,018, Sep. 26, 1973. This application Jun. 15, 1977, Ser. No. 806,790

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **3 Claims**

1. A method for inducing local anesthesia in animals which comprises locally administering to an animal to be anesthetized an anesthetically effective amount of a compound selected from the group consisting of a member of the formula:



where R_1 is selected from the group consisting of branched or straight chain alkyl of 6–9 carbon atoms and cyclohexyl, R_2 is selected from the group consisting of hydrogen, loweralkyl and loweralkanol, wherein said R_2 contains 1–3 carbon atoms, and R_3 is 5 or 6 methoxy; and nontoxic pharmaceutically acceptable acid addition salts thereof.

4,101,678
CLARIFICATION OF CITRUS JUICES

Robert A. Baker, Winter Haven, and Joseph H. Bruemmer, Tampa, both of Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 6, 1977, Ser. No. 794,597

Int. Cl.² A23L *2/30*

U.S. Cl. 426—50 **10 Claims**

1. A process for the clarification of citrus juices by the removal of cloud, comprising in combination the following:

(a) adding a sufficient amount of polygalacturonic acid (PGA) to citrus juice;
(b) allowing said solution to stand and cloud material to coagulate;
(c) removing the resultant coagulated cloud material thereby leaving a clear solution.

4,101,679
CELLULOSE FERMENTATION PROCESS

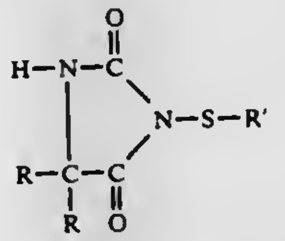
Donald L. MacFadden, Bristol, Tenn., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 31, 1977, Ser. No. 801,933

Int. Cl.² A23K *1/12*

U.S. Cl. 426—53 **8 Claims**

1. A method for accelerating the rate of cellulose fermentation by cellulose-digesting rumen bacterial and cecum microorganisms which comprises conducting said fermentation in the presence of a rateaccelerating amount of a compound of the formula



wherein R' is haloalkyl of 1 to 2 carbon atoms and 1 to 5 chloro or bromo groups and R individually is hydrogen or lower alkyl of 1 to 6 carbon atoms.

4,101,680
CO-CRYSTALLIZATION OF DEXTROSE AND SUCROSE ON CEREAL PRODUCTS

Larry W. Edwards, Hillsdale, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jan. 5, 1977, Ser. No. 756,931

Int. Cl.² A23L *1/164*

U.S. Cl. 426—96 **7 Claims**

1. A process for the co-crystallization of dextrose and sucrose onto the surface of a breakfast cereal product comprising the steps of:

(a) preparing an aqueous solution of dextrose and sucrose having a predermined ratio of dextrose to sucrose and having total sugar content of at least about 75%, by weight;
(b) coating the surface of said cereal product with a powdered seed material selected from the group consisting of anhydrous dextrose, dextrose monohydrate and sucrose;
(c) applying a thin film of said aqueous solution onto the surface of the dusted cereal product;
(d) reducing the moisture content of said thin film to not less than about 3%; and,
(e) allowing the sugars in said thin film to crystallize.

4,101,681
DEAROMATIZATION OF COFFEE OIL

Gerald S. Hurlow, Toronto; Jean R. Blain, Montreal; Michael Coombes, Pointe Claire; Jean-Claude Richard, Chateauguay, and Patrick W. Hitchinson, Dorval, all of Canada, assignors to General Foods Limited, Toronto, Canada

Filed Jan. 6, 1977, Ser. No. 757,167

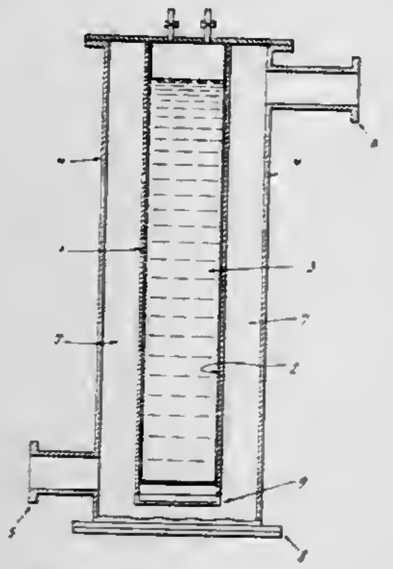
Int. Cl.² A23F *1/08*

U.S. Cl. 426—387 **15 Claims**

1. A process of obtaining coffee aroma constituents useful in the aromatization of a foodstuff which comprises:

(a) subjecting coffee oil in a distillation chamber to distillation at sub-atmospheric pressures and mild temperatures to obtain aroma constituents therefrom;
(b) condensing said aroma constituents onto the outer surface of a heat-conductive sleeve removably and snugly surrounding a heat-conductive container, said container having a coolant therein and said sleeve being enclosed by a condensing chamber, said condensing chamber having ports for the passage of said aroma constituents within the space between the sleeve and the condensing chamber, and said condensing chamber having a removable cover

which seals an opening through which the sleeve is passed when removed from the container;



(c) removing said cover and taking out said sleeve with the condensed aroma constituents thereon; and

(d) recovering said condensed aroma constituents.

4,101,682
METHOD AND APPARATUS FOR STEAM PEELING PRODUCE

Paul Kunz, Deishardtstr. 3, Dottesfeld, Fed. Rep. of Germany (541)

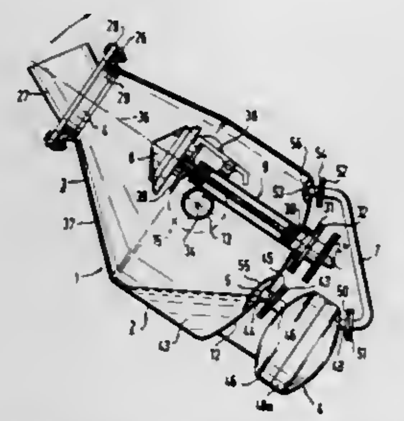
Division of Ser. No. 674,553, Apr. 7, 1976. This application Oct. 15, 1976, Ser. No. 732,820

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1975, 7511878[U]

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² A23N *7/00*

U.S. Cl. 426—482 **1 Claim**



1. In a method for steam peeling produce in a pivotally mounted pressure vessel into which the produce is to be fed and subsequently peeled by steam, the improvement comprising:

(a) providing a bath of water at the bottom portion of said vessel;

(b) feeding the produce by gravity into said vessel by locating said vessel in a first loading position substantially incline to the vertical for receiving said produce;

(c) temporarily maintaining said bath of water in said vessel during feeding of the produce for receiving the fed produce in a relatively impact-free manner;

(d) after feeding the produce into said vessel, withdrawing at least a substantial portion of said water bath by gravity into a separate reservoir attached to said vessel for establishing an overall suitable steam peeling environment thereby by pivoting said vessel to a second operative position;

(e) closing said vessel and thereafter steaming the produce to peel the produce;

(f) opening said vessel and thereafter simultaneously discharging the peeled produce by gravity from said vessel and returning the withdrawn water by gravity to said vessel for assisting in the discharge of the peeled produce by pivoting said vessel to a third emptying position.

4,101,683
PROCESS FOR MANUFACTURE OF FAST COOKING RICE

Hidemoto Kamada, Tokyo; Chiaki Miura, Kawasaki, and Makoto Utena, Niiza, all of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,578

Claims priority, application Japan, Jul. 16, 1975, 50/86156

Int. Cl.² A23L *1/182*

U.S. Cl. 426—618 **4 Claims**

1. A process for the manufacture of fast cooking rice, consisting essentially of puffing a raw rice into a puffed rice having a volume of 6 to 16 times as large, contacting this puffed rice with a solution of a thickener in a concentration in the range from about 0.1 to about 1.0 weight percent sufficiently to penetrate to the inside center of the puffed rice, and thereafter drying the treated puffed rice to reduce the volume thereof, said thickener being selected from the group consisting of agar, carrageenin, alginate, alginic acid, locust bean gum, guar gum, tamarind gum, psyllium seed gum, quince seed gum, gaz, pectin, glucomannan, propylene glycol alginate, low methyl ester pectin, sodium polyacrylate, carboxymethylcellulose salt, methylcellulose, hydroxymethylcellulose, methylethylcellulose, hydroxypropylceilulose, xanthan gum, cardrun, scleroglucan, succinoglucan and pullulan.

4,101,684
EXTRUSION PROCESS FOR THE TREATMENT OF CEREALS

John Richard Masson, Brigstock, and Joseph Dooley, Bugbrook, both of England, assignors to Golden Wonder Limited, England

Filed Jan. 24, 1977, Ser. No. 762,438

Int. Cl.² A23L *1/164*

U.S. Cl. 426—625 **8 Claims**

1. An extrusion process for a raw cereal comprising the steps of:

(a) subjecting a raw cereal to heat and pressure in an extrusion chamber of a cooker extruder having a sleeve and a co-operating screw,. which sleeve during operation is subject to wear which affects the density of the extrudate;

(b) adding to the raw cereal upstream of the cooker extruder an additive comprising particles of cereal which have already been expanded and milled;

(c) monitoring the density of the extrudate;

(d) utilizing the results of the monitoring to determine the amount of said additive to be added to the raw cereal upstream of extrusion so as to keep the density of the subsequent extrudate within a predetermined range; and

(e) adding the determined amount of said additive to the raw cereal to keep the density of the extrudate within said range.

4,101,685
SYSTEM FOR CONTROLLING THE MOISTURE CONTENT OF FLOCK IN A FLOCKING MACHINE

Joseph E. Geary, Rochester; Joseph Pelensky, Perry, and John Peter Hart, Leicester, all of N.Y., assignors to Champion Products Inc., Rochester, N.Y.

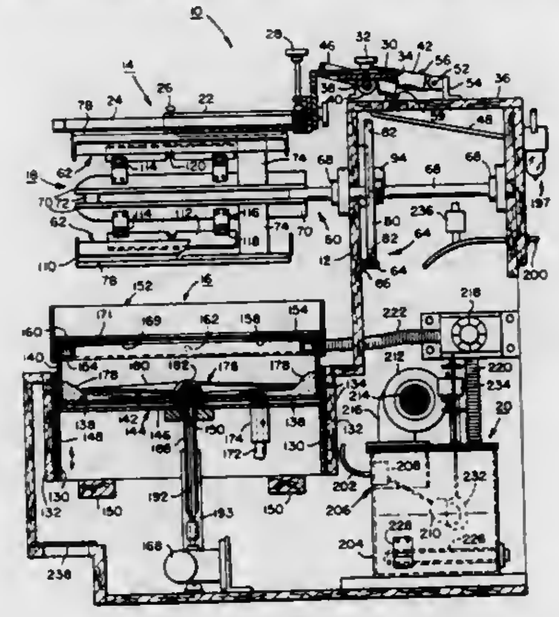
Filed Aug. 16, 1976, Ser. No. 714,800

Int. Cl.² B44C *1/00*

U.S. Cl. 427—8 **23 Claims**

16. An open top flock tray for holding a quantity of flock for use in applying flock to a substrate, said flock tray comprising

a floor and contiguous sidewalls, and an air duct located along the entire upper periphery of said sidewalls and defined by top, bottom and side walls, at least one inlet opening extending into said duct and a plurality of discharge openings in the bottom wall of said duct extending from said duct into said tray for feeding a uniform flow of air of controlled humidity into said tray.



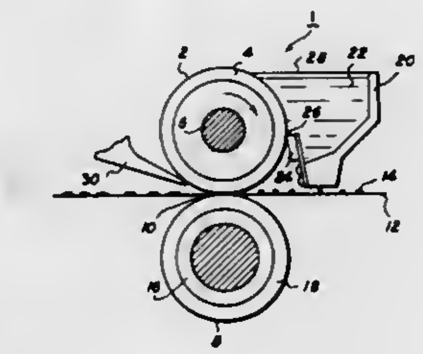
4,101,686
METHOD OF FUSING TONER IMAGES USING FUNCTIONALIZED POLYMERIC RELEASE AGENTS

Stephen Strella; Donald A. Seanor, both of Pittsford; George R. Imperial, and Thomas R. Hoffend, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 24, 1974, Ser. No. 491,415

Int. Cl.² G03G *13/20*

U.S. Cl. 427—22 **5 Claims**



1. The method of fusing non-reactive electroscopic thermoplastic resin toner images to a substrate including the steps of:

(a) forming a film on a heated, metal fuser member in an electrostatic reproducing apparatus, said film being a barrier to non-reactive electroscopic thermoplastic resin toner and comprising the product resulting from the interaction of the metal fuser member and a polydialkyl siloxane having built-in reactive functional groups selected from the group consisting of hydroxy, epoxy, amino, isocyanate, and mercapto, thereon which interact with the fuser member, said polydialkyl siloxane being fluid at the temperature between about 250° F and 400° F of the metal fuser member and acting as a release fluid film for the non-reactive electroscopic thermoplastic resin toner, the polydialkyl siloxane fluid being one capable of displacing electroscopic thermoplastic resin toner;

(b) contacting the toner images on said substrate with the coated, heated, metal fuser member for a period of time sufficient to soften the electroscopic thermoplastic resin toner; and

(c) allowing the toner to cool.

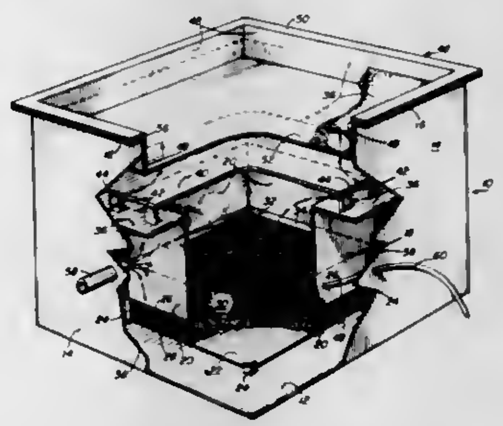
4,101,687
ELECTROSTATIC COATING METHOD

Walter Ganter Knudsen, Bethany, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Aug. 13, 1975, Ser. No. 604,323

Int. Cl.² B05D *1/04, 1/06;* B05B *5/00*

U.S. Cl. 427—25 **9 Claims**



1. An electrostatic coating method comprising the steps of: generating a stream of highly ionized gas at a location spaced by at least a minimum discharge distance of about 7.5 centimeters from a porous support member, said gas having an ionization value equivalent to air passed at about 3.0 to 15.0 standard cubic feet per minute through an electrode having a maximum resistance of about 0.05 ohm per centimeter and having applied to it a voltage of about 30 to 80 kilovolts; supplying to the upper surface of said support member particulate material that is capable of acquiring an electrostatic charge; passing said highly ionized gas along a flow path and thereafter upwardly through said support member, while substantially maintaining the ionization level thereof, to fluidize and efficiently electrostatically charge the particles of said material to produce a fluidized bed thereof; and placing in proximity to said fluidized bed a workpiece having a charge effectively opposite to said particles to thereby produce a coating thereof upon said workpiece, said minimum discharge distance being such as to prevent the passage of a substantial current from the source of said ionized gas to an electrically grounded member placed upon said upper surface of said support member.

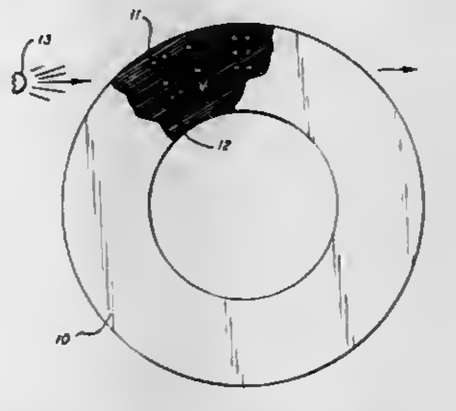
4,101,688
METHOD FOR PRINTING BRAILLE CHARACTERS BY LITHOGRAPHY

Martin E. Kurtzman, 154 Harrison Ave., Island Park, N.Y. 11558

Filed Jul. 22, 1976, Ser. No. 707,508

Int. Cl.² B41K *3/68;* B44F *1/10*

U.S. Cl. 427—56 **5 Claims**



1. A method for printing braille characters by means of a lithographic printing process, comprising the steps of:

exposing photosensitive sheet material to form a positive dot image of one or more braille characters on said sheet material;

developing the exposed photosensitive sheet material;

photographing said developed photosensitive sheet material and making a negative of said developed sheet material;

mounting said negative on an opaque sheet and cutting apertures in said sheet to permit light to pass through said negative;

exposing said mounted negative on a light-sensitive lithographic plate and developing said exposed plate;

mounting said developed plate on an offset printing press;

printing the dot image developed on said exposed lithographic plate in ink on sheet material stock by feeding said stock through said offset printing press;

depositing thermographic material on the image printed on said sheet material stock while the ink forming said image is still wet; and

heating said sheet material stock to melt, fuse and set said thermographic material and form raised braille characters on said sheet material stock.

4,101,689
ANTISTATIC AND/OR ELECTRICALLY CONDUCTIVE FLOOR COVERING, AS WELL AS PROCESS FOR THE PRODUCTION THEREOF

Michael Wienand, Siegburg, and Ernst Juch, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 22, 1973, Ser. No. 372,528

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1972, 2230578

Int. Cl.² B05D *5/12, 3/12*

U.S. Cl. 427—122 **10 Claims**

1. A process for the production of a floor covering of a thermoplastic synthetic resin having a paste containing conductive material incorporated therein in the form of a plurality of thread-like projections connected together, which comprises heating a thermoplastic resin sheet to a temperature of between 40° and 60° C; punching holes that penetrate completely through the heated sheet; applying a paste containing a conductive material and plasticized synthetic resin to one side of the heated sheet so that the paste penetrates into the holes; and then heating the sheet to above 60° C. from the side where the paste has been applied, whereby, due to the contraction of the holes in the hotter zone, the paste is forced through to the other side of the sheet to form said thread-like projections within said holes.

4,101,690
DESENSITIZING COMPOSITION

Akio Miyamoto, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

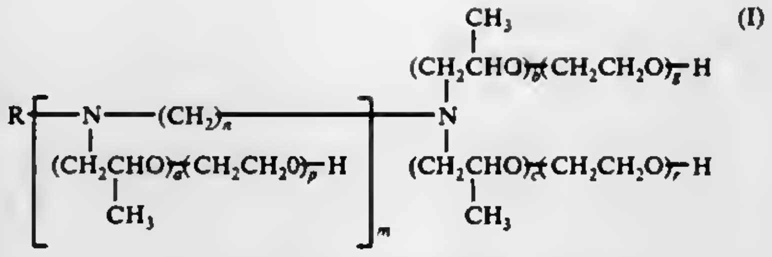
Filed Nov. 26, 1974, Ser. No. 527,383

Claims priority, application Japan, Nov. 26, 1973, 48-132331

Int. Cl.² B41M *5/12*

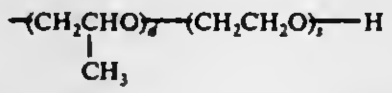
U.S. Cl. 427—150 **11 Claims**

1. In a desensitizing composition for a color developer capable of coloring a substantially colorless color former including a natural or synthetic high molecular weight compound and a pigment, the improvement which comprises said composition containing a compound obtained by reacting an amine with propylene oxide and ethylene oxide represented by the following general formula (I)



$$R\left[-\underset{(CH_2\underset{CH_3}{C}HO)_a(CH_2CH_2O)_p H}{N}-(CH_2)_n-\right]_m\underset{(CH_2\underset{CH_3}{C}HO)_c(CH_2CH_2O)_r H}{\overset{(CH_2\overset{CH_3}{C}HO)_b(CH_2CH_2O)_q H}{N}} \qquad (I)$$

wherein R has 2 to 20 carbon atoms and represents an alkyl group, an alkenyl group, an aryl group, an aralkyl group or a



$$-(CH_2\underset{CH_3}{C}HO)_d-(CH_2CH_2O)_s-H$$

group; *m* is 0 or an integer of 1 to 3; *n* is an integer of 2 to 6; the sum of *a, b* and *c* is an integer of 3 to 100; the sum of *a, b, c* and *d* is an integer of 4 to 100; the sum of *p, q* and *r* is an integer of 3 to 100; the sum of *p, q, r* and *s* is an integer of 4 to 100 and the molar ratio of propylene oxide moieties to ethylene oxide moities is 0.2 to 20.

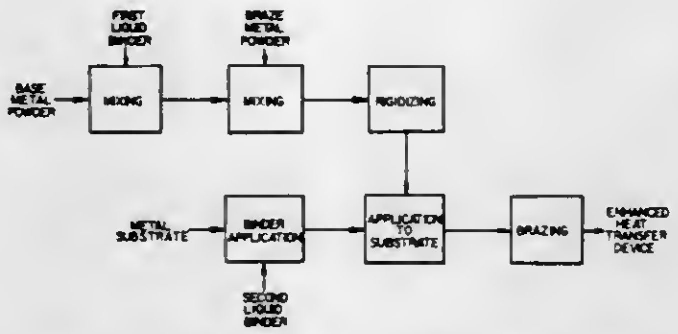
4,101,691
ENHANCED HEAT TRANSFER DEVICE MANUFACTURE

Robert Curtis Borchert, West Seneca, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,865

Int. Cl.² B05D *3/02*

U.S. Cl. 427—229 **13 Claims**



1. A method for manufacturing an enhanced heat transfer device consisting of a metal substrate and randomly distributed metal bodies bonded to said substrate comprising the steps of:

(a) providing base metal powder with particles of major dimensions less than 0.1 inch;

(b) mixing said base metal powder with first liquid binder and in proportion such that the weight ratio of base metal powder to first liquid binder is between 20:1 and 30:1, so as to form an adherent mass;

(c) providing braze metal powder having a melting point lower than said base metal powder and with particles of major dimensions such that the major dimension ratio of braze metal powder to base metal powder is between 1:60 and 1:3, and mixing said braze metal powder and said adherent mass in weight proportion such that said braze metal powder is between 10 and 30 percent of the braze metal powder plus the base metal powder, so as to form braze metal-coated mass;

(d) applying a second liquid binder on said metal substrate;

(e) applying said braze metal-coated mass on the second liquid binder coated metal substrate; and

(f) heating the braze metal coated mass-metal substrate sufficiently to remove said first and second binders, melt said braze metal and metal bond said base metal to said metal substrate thereby forming said metal bodies.

4,101,692
METHOD FOR RAPID CURING OF PARTIALLY HYDROLYZED SILICATE FILM

Henry L. Lomasney; William J. Lomasney, both of New Orleans, La.; Ignatius Metil, Buffalo, N.Y., and Dickens M. Lagos, Gretna, La., assignors to Southern Imperial Coatings Corporation, New Orleans, La.

Filed May 27, 1977, Ser. No. 801,307

Int. Cl.² B05D *3/10*

U.S. Cl. 427—333 **8 Claims**

1. A method for top coating a partially hydrolyzed silicate film with a protective coating that will accelerate the cure rate of said partially hydrolyzed silicate film which comprises applying a coating composition comprising an epoxy resin and a curing agent, one of which is in an emulsion, and a hydraulic cement to said partially hydrolyzed inorganic silicate film.

4,101,693
METHOD OF PREPARING EPOXY-GLASS PREPREGS

Lo Kwang Tsen, Coshocton, and John Louis Palkiewicz, Nashport, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 169,463, Aug. 5, 1971, abandoned. This application Nov. 20, 1974, Ser. No. 525,419

Int. Cl.² B05D *3/02;* B32B *17/10*

U.S. Cl. 427—386 **7 Claims**

1. A method for preparing prepregs for use in the manufacture of epoxy glass circuit board substrate laminates characterized by improved antimeasling, solvent resistance and antismearing upon drilling, which comprises a) impregnating a glass fabric with an epoxy resin composition comprising a first epoxy resin of diglycidy ether of bisphenol A having an epoxy equivalent weight of 170 to 200 and an average functionality of not more than 2, and a second epoxy resin comprising the reaction product of diglycidyl ether bisphenol A epoxy resin and a polyhydric phenol selected from the group consisting of bisphenol A and tetrabromobisphenol A, said resulting second epoxy resin having an epoxy equivalent weight of 900 to 1900 and an average functionality of not more than 2, the proportions of said first resin ranging from about 30 to 60% by weight of resin solids and of said second resin from about 70 to 40% by weight of resin solids, a curing system, and a suitable solvent, and b) passing the epoxy impregnated glass fabric through an oven maintained at an elevated temperature to partially advance said epoxy resin and to remove said solvent.

4,101,694
WOOD FINISHING PROCESS

Wayne A. Kraus, 2224 Ogden Ave., Cornwells Heights, Pa. 19020

Filed Jun. 20, 1977, Ser. No. 807,974

Int. Cl.² B05D *7/18, 1/36, 7/16*

U.S. Cl. 427—399 **7 Claims**

1. A process for finishing open-grain wood comprising the steps of: applying a paste filler to the wood; and thereafter applying at least one coat of lacquer, the lacquer, at least in the first coat thereof, comprising a quantity of film-forming solids dissolved in a thinner, and the filler being pervious to said thinner; characterized by the step of applying a washcoat in a substantially non-aqueous volatile solvent, preceding the application of filler, to form on the surface of the wood and within pores of the wood a film substantially insoluble in said thinner; whereby gas bubbles located within the pores are unable to rise to the surface of the wood and form blisters in the lacquer film.

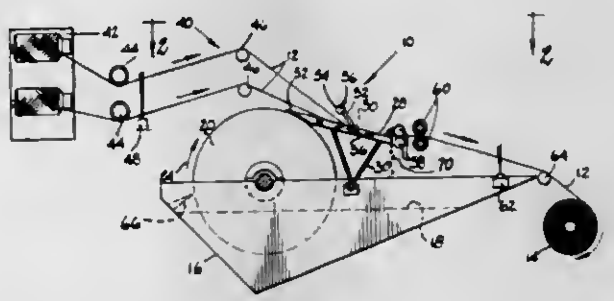
4,101,695
METHOD OF COATING STRAND MATERIAL

Robert Lee Batts, Denison, Tex., assignor to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 638,014, Dec. 5, 1975, Pat. No. 4,068,619. This application Feb. 28, 1977, Ser. No. 773,091

Int. Cl.² B05D *1/18*

U.S. Cl. 427—434 D **1 Claim**



1. A method of applying liquid resin to elongated strand material, said method comprising:

(a) maintaining a supply of said resin in a container;

(b) positioning a partially immersed roller in said resin supply;

(c) operatively contacting said roller on the downstream side thereof with an end of a stationary flat plate and extending said plate downwardly from the line of roll contact and at an angle of about 10° from the horizontal, the other end of said plate being disposed above said supply;

(d) rotating said roller whereby resin is transferred from said supply, onto said plate and at least in part recovered into said supply from the said other plate end;

(e) feeding at least one said strand in a path above but operatively associated with said plate;

(f) providing a horizontally disposed pressure arm above said path;

(g) providing a vertical component of motion to said arm whereby to selectively permit disposition of said strand above said plate or to press said strand into the resin transferred onto the plate by said roller.

4,101,696
THERMOGRAPHIC PLATE FOR MEASURING TEMPERATURE DISTRIBUTIONS

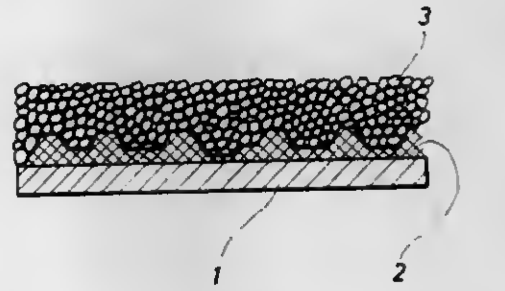
Friedrick Jennen, Bergisch-Gladbach, Germany, and Jean Tricoire, Paris, France, assignors to Troponwerke Dinklage & Co., Cologne, Germany

Filed Jul. 30, 1976, Ser. No. 709,991

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1975, 2536773

Int. Cl.² G01K *11/12*

U.S. Cl. 428—1 **8 Claims**



1. A thermographic plate with an overal thickness of less than 200 μm consisting of a transparent carrier film, an intermediate latex-based black layer on said film and a layer containing liquid crystals disposed on the intermediate layer, the improvement comprising the black layer having an average thickness in the range of 4–18 μm and comprising an irregular array of individual black islands produced by spray coating a plurality of successive spray coats of latex with intermediste

drying on the otherwise transparent carrier film, to provide a statistically fluctuating transparency.

4,101,697

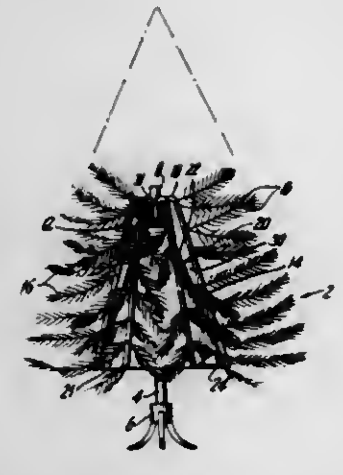
CONE LIKE SHEET FOR CHRISTMAS TREE

Percy Dieffenbach, Moscow, Pa., and Louis Zon, Clarence, N.Y., assignors to American Technical Industries, Inc., Mount Vernon, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,772

Int. Cl.² A47G *33/06*

U.S. Cl. 428—9 **2 Claims**



1. An artificial shrub comprising:
a cylindrical trunk member having a central axis oriented in a substantially vertical direction;
a plurality of limb assemblies, each of said limb assemblies including a main limb having a hooked end and a number of cross limbs, said cross limbs being attached to said main limb;
a bracket mounted circumferentially about said trunk member at a first predetermined height, said bracket including an outwardly extending flange having a plurality of circumferential apertures, the hooked ends of said main limbs of said limb assemblies being insertable into said apertures so that said limb assemblies are suspended from said flange in a substantially circumferential array to define a substantially conical space;
a frusto conical member of a flexible material having an apex end and a base end;
second bracket means for attaching the apex end of said frusto conical member to said trunk member at a second predetermined height which is less than said first predetermined height such that said frusto conical member hangs downwardly from said second bracket means within said substantially conical space; and
support means attached to said trunk member at a third predetermined height which is less than said second predetermined height, said support means including at least one support member having a first end which is attached to said trunk member and a second end which is radially spaced from said trunk member, and a ringlike member attached to the second end of said support member so that said ringlike member is mounted substantially coaxially with said trunk member to support the base end of said flexible frusto conical member a predetermined radial distance from said trunk member.

4,101,698

ELASTOMERIC REFLECTIVE METAL SURFACES

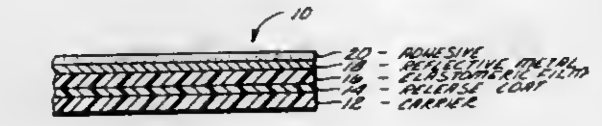
Richard E. Dunning, Munster, Ind., and Victor H. Rampelberg, Flossmoor, Ill., assignors to Avery International Corp., San Marino, Calif.

Filed Jul. 14, 1975, Ser. No. 595,547

Int. Cl.² B60R *13/00*

U.S. Cl. 428—31 **12 Claims**

1. A laminate for transferring a decorative metallized finish to a substrate comprising a substantially transparent, flexible and foldable, self-supporting elastomeric film of polyurethane material; a reflective metal layer bonded to a surface of the elastomeric film in microscopically discontinuous quantities in an amount which forms an apparent optically continuous reflective surface and which is elastically deformable in response to corresponding deformation of the elastomeric film; and an adherence layer on the side of the metal layer opposite the elastomeric film for adherently attaching the metal layer to a substrate so the elastomeric film provides a protective outer covering for the adherently attached reflective metal layer.



4,101,699

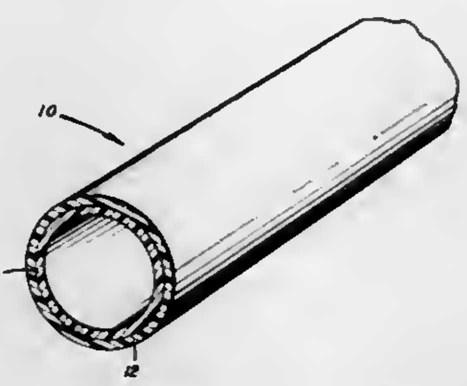
SYNTHETIC RESINOUS TUBE

Clifford R. Stine, Solon, and Jennings A. Boyce, Ravenna, both of Ohio, assignors to Samuel Moore & Company, Mantua, Ohio

Filed Nov. 23, 1973, Ser. No. 418,204

Int. Cl.² B29F *3/10;* B32B *31/30, 27/32*

U.S. Cl. 428—36 **1 Claim**



1. A dimensionally stable tube having a plurality of layers of different polymeric materials cohesively bonded together, said tube having been made by the method comprising simultaneously coaxially extruding a plurality of contiguous tubular layers of different fuse bondable thermoplastic polymeric materials, at least one of the layers being susceptible to cross-linking by electron irradiation and at least one layer being substantially nonsusceptible to cross-linking by electron irradiation, and irradiating the resulting tube until cross-linking of the susceptible thermoplastic layer has progressed to a point where the said susceptible layer is substantially non-thermoplastic, wherein the at least one layer which is susceptible to cross-linking is an ethylene-propylene-diene terpolymer composition and the at least one layer which is substantially nonsusceptible to cross-linking is a polyethylene composition.

4,101,700

THERMALLY INSULATING DUCT LINER

Richard James Ray, Jr., Toledo; Daniel Paul Kopy, Rossford, and Theodore Richard Rohweder, Toledo, all of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Mar. 12, 1976, Ser. No. 666,523

Int. Cl.² B32B *3/10*

U.S. Cl. 428—131 **13 Claims**

1. A flexible air duct liner comprising an outer thermal insulation layer of fibrous material and an inner working face layer of higher density than said insulation layer and having resistance to erosion from an adjacent gaseous stream; the improvement comprising:

said working face layer comprising a thin fibrous facing of rayon having a relatively open structure adhered to said thermal insulation layer and having been coated in place with a flame retardant coating containing polyvinyl acetate producing a duct liner having a flame spread classification of less than 25, a smoke developed classification of less than 50, and a surface roughness (e) of less than about 0.0025 feet.

4,101,701

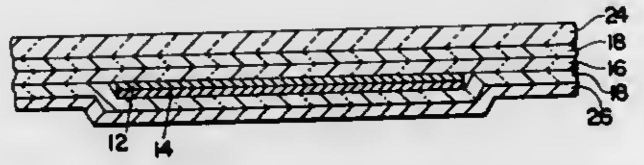
I.D. CARDS

Michael E. Gordon, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 361,232, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 148,768, Jun. 1, 1971, abandoned. This application Sep. 30, 1976, Ser. No. 728,311

Int. Cl.² B32B *3/00, 27/06*

U.S. Cl. 428—189 **2 Claims**



1. An I.D. card laminar structure including a transparent polyester front sheet the inner surface of which is provided with a first layer of a heat-activated adhesive comprising an ethylene acrylic acid copolymer or an ethylene ethyl acrylate copolymer or mixtures of these and a second layer comprising a mixture having a ratio of about 2:1 of polyvinyl alcohol and poly-4-vinylpyridine; a diffusion transfer photograph of smaller dimensions than said sheet material and having a dye image containing receiving layer comprising a mixture of polyvinyl alcohol and poly-4-vinylpyridine, said photograph being substantially centered on said front sheet, with the image receiving layer bonded to said front sheet through said two layers, leaving a peripheral area of said front sheet free from contact with said photograph, a back sheet of substantially the same dimensions as said front sheet having thereon a layer of a heat-activated adhesive comprising an ethylene acrylic acid copolymer or an ethylene ethyl acrylate copolymer or mixtures thereof and peripheral areas of said front and back sheets being sealed together to complete said lamination.

4,101,702

COMPOSITE SHEET MEMBER HAVING A PLURALITY OF COEXTRUDED LAMINAR LAYERS

Geoffrey B. Churchill, Wilbraham, and J. Craig White, Feeding Hills, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 18, 1977, Ser. No. 843,185

Int. Cl.² B32B *7/00*

U.S. Cl. 428—213 **21 Claims**

1. A composite sheet member having a plurality of coextruded laminar layers comprising:

A. a base layer formed from a first ABS polyblend having a thickness of about 55 to 99% of the thickness of said composite sheet member, said first polyblend having a grafted diene rubber content of 5 to 25% by weight of said polyblend and at least one,

B. external layer formed from a second ABS polyblend having a thickness of 1 to 45% of the thickness of said composite sheet member said second polyblend having a grafted diene rubber content of 7 to 35% by weight of said second polyblend, said external layer having present at least about 10% more grafted rubber than said base layer.

4,101,703

COATED CEMENTED CARBIDE ELEMENTS

Wilfried Schintlmeister, Reutte, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Continuation of Ser. No. 329,128, Feb. 2, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,695

Claims priority, application Austria, Feb. 4, 1972, 896/72; Jul. 21, 1972, 6317/72

Int. Cl.² B32B *15/04, 9/04*

U.S. Cl. 428—216 **19 Claims**

3. An article of manufacture comprising:
(a) a hard metal or sintered carbide substrate; and
(b) a composite coating on at least one surface of said substrate, said composite coating including a layer of titanium carbide and a layer of titanium nitride overlying and adjacent said layer of titanium carbide.

15. An article of manufacture comprising:
(a) a hard metal or sintered carbide substrate; and
(b) a composite coating on at least one surface of said substrate, said composite coating including a layer of titanium carbide, a transition layer containing titanium carbonitrides overlying said layer of titanium carbide and a layer of titanium nitride overlying said transition layer.

4,101,704

ENERGY ABSORBING MATERIALS

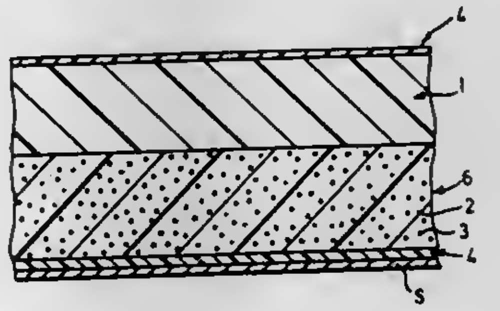
Maurice Arthur Frederick Hiles, Welwyn, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 681,528, Apr. 29, 1976, abandoned. This application Oct. 29, 1976, Ser. No. 736,936

Claims priority, application United Kingdom, Jul. 23, 1976, 30881/76

Int. Cl.² B32B *27/40, 27/08*

U.S. Cl. 428—218 **16 Claims**



1. An energy-absorbing material which comprises an elastomer layer of polymeric material having a low compression set and a delayed recovery from compression, in combination with a more difficultly compressible layer, said last mentioned layer comprising a tough flexible polymeric matrix having a plurality of substantially unbroken rigid hollow bodies embedded therein the arrangement being such that under the action of deforming forces deformation of the layers takes place sequentially.

4,101,705

NEUTRAL BRONZE GLAZINGS

Klaus Fischer, Porz, Fed. Rep. of Germany, and Robert Keul, Cormeilles-en-Parisis, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 2, 1975, Ser. No. 637,016

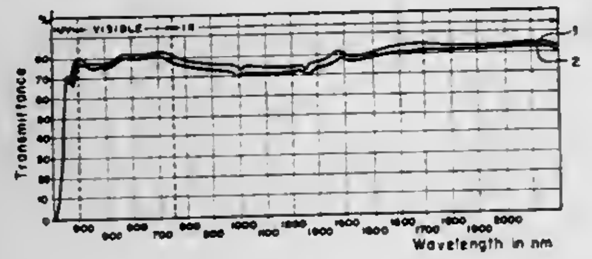
Claims priority, application France, Dec. 3, 1974, 74 39459

Int. Cl.² C23C *3/24, 3/30;* B32B *17/10*

U.S. Cl. 428—220 **20 Claims**

1. An article of manufacture comprising a glass sheet at a thickness suitable for glazing, used for windows and windshields of automotive vehicles, said glazing having a total

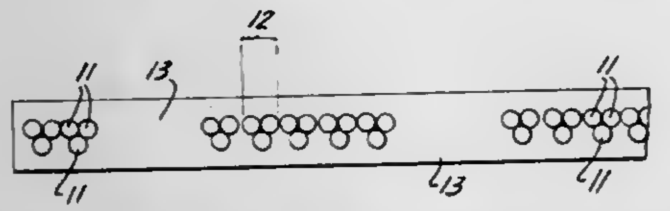
luminous transmittance above 70% and a monochromatic transmittance which on the average value decreases from the



long wavelengths to the short wavelengths in the visible spectrum from about 5 to 50%.

4,101,706
STRAPPING TAPES

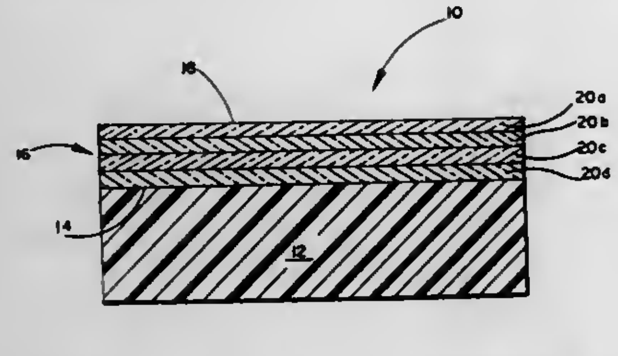
Richard I. Wolkowicz, Scotch Plains, N.J., assignor to Sun Chemical Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 672,027, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 503,330, Sep. 5, 1974, abandoned. This application Sep. 6, 1977, Ser. No. 830,788
Int. Cl.² D04H *3/02*
U.S. Cl. 428—294 **4 Claims**



1. A strapping tape having high tensile strength and low elongation comprising groups of plied twisted long-chain aromatic polyamide fibers arranged in a single layer in at least two spaced-apart compartments in a plastic jacket, each compartment containing at least one group of plied twisted fibers and each consecutive pair of compartments being separated by a portion of the plastic containing no fibers, said portion of separating plastic being of sufficient width to prevent roping and spreading when the tape is under stress.

4,101,707
HOMOGENEOUS MULTILAYER DIELECTRIC MIRROR AND METHOD OF MAKING SAME

Rodney D. Henry, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 4, 1977, Ser. No. 784,394
Int. Cl.² G02B *5/08, 1/02, 5/14;* **H01S** *3/00*
U.S. Cl. 428—409 **3 Claims**



1. A multilayer dielectric laser mirror comprising:
a garnet substrate having a substantially rectangular cross-section wherein at least one side of said substrate is a mirror surface chemical-mechanical polished to be relatively free of inhomogeneous strain and wherein said garnet is a metal oxide having the general formula $J_3Q_5O_{12}$ wherein O is oxygen, J is at least one element selected from the group consisting of the lanthanide series of the Periodic Table, lanthanum, yttrium, magnesium, calcium, strontium, barium, lead, cadmium, lithium, sodium, and potassium, and Q is at least one element selected from the group consisting of gallium, indium, scandium, titanium, vanadium, chromium, manganese, rhodium, zirconium, hafnium, molybdenum, niobium, tantalum, tungsten, and alluminum; and
a mirror coating deposited on said mirror surface of said substrate, said mirror coating consisting of a first plurality of layers of a first non-magnetic dielectric material having a relatively higher index of refraction and a second plurality of layers of a second non-magnetic dielectric material having a relatively lower index of refraction wherein said layers of said first dielectric material are interleaved alternately with said layers of said second dielectric material in a stacked relationship relative to each other and relative to said mirror, and wherein said first and second dielectric materials are selected from the group consisting of titanium dioxide, magnesium fluoride, and silicon dioxide.

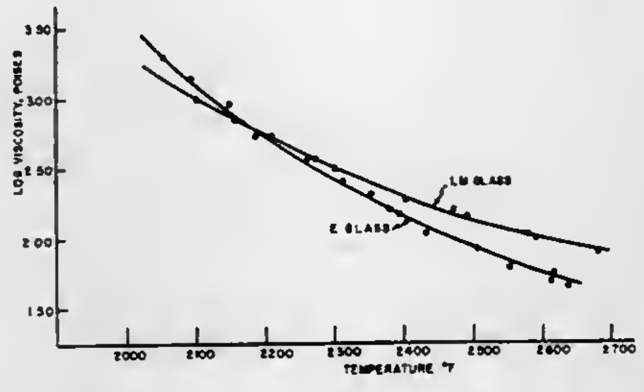
4,101,708
RESISTOR COMPOSITIONS

John Robert Larry, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 25, 1977, Ser. No. 781,310
Int. Cl.² H01B *1/08*
U.S. Cl. 428—432 **10 Claims**

1. Printable compositions of finely divided inorganic powder dispersed in an inert liquid vehicle for producing film resistors adherent to a dielectric substrate, the compositions consisting essentially of, by weight, a dispersion of
(1) 2–45% finely divided RuO_2 powder
(2) 40–70% glass comprising 30–55% PbO,
(3) 0.1–0.8% Nb_2O_5,
(4) 0–5% CaF_2, and
(5) 15–40% inert vehicle.

4,101,709
LOW MODULES GLASS FIBERS AND LAMINATE REINFORCED WITH SAME

Tack J. Whang, Berea, and Robert W. Pelz, West Richfield, both of Ohio, assignors to Reichhold Chemicals, Inc., White Plains, N.Y.
Continuation-in-part of Ser. No. 151,990, Jun. 10, 1971, abandoned, which is a continuation of Ser. No. 40,331, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 723,780, Apr. 24, 1968, abandoned. This application Apr. 25, 1973, Ser. No. 354,423
Int. Cl.² B32B *15/00*
U.S. Cl. 428—433 **17 Claims**



10. In combination, a layer of fiberglass reinforced thermoset resin laminate containing and reinforced with from about 40 to about 85 weight percent, based on the weight of the laminate, of a low modulus glass fiber reinforcement, said glass having the following composition:

	Wt.%
SiO_2	40–65
B_2O_3	24–38
$Na_2O + K_2O$	5–20
Li_2O	0–2
PbO	0–17
CaO	0–2
Al_2O_3	0–7
Fe_2O_3	0–2
TiO_2	0–3
F_2	0–2

said glass including at least one of the systems selected from the group consisting of SiO_2-B_2O_3-Na_2O/K_2O-PbO-Al_2O_3 and SiO_2-B_2O_3-Na_2O/K_2O, wherein, when Al_2O_3 is present, PbO is present, and the ratio of PbO:Al_2O_3 is from about 1:1 to about 3:1, and, when PbO is absent, so are all constituents other than SiO_2, B_2O_3 and Na_2O/K_2O, the parts by weight of the foregoing components totalling 100 as they vary within the indicated ranges respectively, said glass having a modulus of elasticity of from about 5.0 to about 6.5×10^6 psi, with a layer of fired ceramic, said glass present in said laminate substantially as chemically constituted when fiberized.

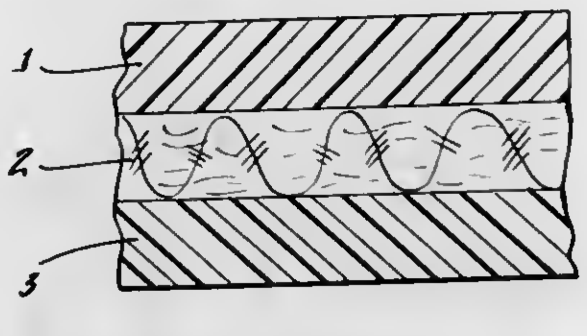
4,101,710
SILVER COMPOSITIONS

Sanford Morton Marcus, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 7, 1977, Ser. No. 775,274
Int. Cl.² H01B *1/08*
U.S. Cl. 428—472 **15 Claims**

1. A conductive silver composition useful for producing in a single application step solderable metal coatings on ceramic titanate bodies, said silver compositions being a mixture of finely divided inorganic particles dispersed in a vehicle, the inorganic particles consisting essentially of about, by weight,
(A) (1) 75–98% silver
  (2) 2–6% boron, and
  (3) 1–22% glass, PbF_2, or mixtures thereof, or
(B) (1) 40–70% silver,
  (2) 25–60% $Ni_3B_{1-x}P_x$ wherein x is in the approximate range 0–0.6, and
  (3) 3–22% glass, PbF_2, or mixtures thereof, or
(C) mixtures of (A) and (B).

4,101,711
BONE RESISTANT PACKAGING MATERIAL

Nathan Stillman, Walnut Creek, Calif., assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 18, 1977, Ser. No. 779,091
Int. Cl.² B32B *27/08, 27/32, 27/34;* **B23B** *27/36*
U.S. Cl. 428—474 **8 Claims**



1. A packaging laminate comprising:
a polyamide face film;
a filamentary non-woven synthetic-resin web bonded to said face film; and
a film of an olefinic acid or ester-type synthetic resin resistant to organic solvents affixed to said filamentary web.

4,101,712
METHOD OF PRODUCING A MATERIAL WITH LOCALLY DIFFERENT PROPERTIES AND APPLICATIONS OF THE METHOD

Michael J. Bomford, Clehonger, England, and Gernot Gessinger, Bublikoo, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Dec. 2, 1975, Ser. No. 637,060
Claims priority, application Switzerland, Dec. 23, 1974, 17239/74
Int. Cl.² B22F *1/00, 3/16, 5/04*
U.S. Cl. 428—547 **6 Claims**

1. A method of producing a turbine blade with locally different properties, comprising:
filling a form with two different component powders such that the ratio of contents of said powders in the mixture continuously varies over the spatial extent of the form; wherein each of the powdered components to be mixed together is introduced in the desired proportion by a conveyer proportioning screw into another mixing screw and therefrom is deposited in the mixed state into said form; and wherein one of said powders is a high strength super-alloy and is the predominant ingredient of said mixture in the portion of the workpiece intended for the blade foot, and the other powder is a non-corrosive Co- or Ni-base alloy and is the predominant ingredient of said mixture in the portion of the workpiece intended for the blade tip, and the transition from one powder to the other along the length of the workpiece is continuous;
compacting the mixed powders in the form; and
subsequently sintering the compacted powders.

4,101,713
FLAME SPRAY OXIDATION AND CORROSION RESISTANT SUPERALLOYS

Harold H. Hirsch, and John R. Rairden, III, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jan. 14, 1977, Ser. No. 759,440
Int. Cl.² B32B *15/20*
U.S. Cl. 428—554 **24 Claims**

Attrited Co-32Cr-3Al Flame Spray Powder Morphology

1. An article comprising a coated superalloy body, said body having been flame spray coated with high energy milled, mechanically alloyed powder particles having an average particle size of less than about 44 microns.

4,101,714
HIGH TEMPERATURE OXIDATION RESISTANT DISPERSION STRENGTHENED NICKEL-CHROMIUM ALLOYS

John R. Rairden, III, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 31, 1977, Ser. No. 783,187
Int. Cl.² B32B *15/20*
U.S. Cl. 428—639 **8 Claims**

1. An article of manufacture comprising a high temperature oxidation resistant dispersion strengthened nickelchromium alloy body comprising:
(a) said nickel-chromium alloy body;

(b) a first coating of cobalt having at least a portion thereof diffused therein, and

(c) an overcoating of aluminum, said second coating being substantially nonporous and adherent to the cobalt-coated nickel-chromium alloy body.

4,101,715

HIGH INTEGRITY CoCrAl(Y) COATED NICKEL-BASE SUPERALLOYS

John R. Rairden, III, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 9, 1977, Ser. No. 804,936

Int. Cl.² B32B *15/20*

U.S. Cl. 428—652 **6 Claims**

Co-22Cr-13Al-Y COATED IN-738 S.A.

1. A high temperature oxidation and corrosion resistant coated nickel-base superalloy article having a thermal expansion coefficient value in inches per inch per ° F. measured over a temperature range of

(i) 100°-1200° F. of from 8.45 to 9.05, and

(ii) 100°-1740° F. of from 9.45 to 10.05;

comprising:

(a) a nickel-base superalloy, and

(b) a first CoCrAl(Y) coating composition consisting essentially of, on a weight basis, approximately 26–32 percent chromium, 3–9 percent aluminum, and 0–1 percent yttrium, other rare earth elements, platinum or rhodium, and the balance cobalt.

4,101,716

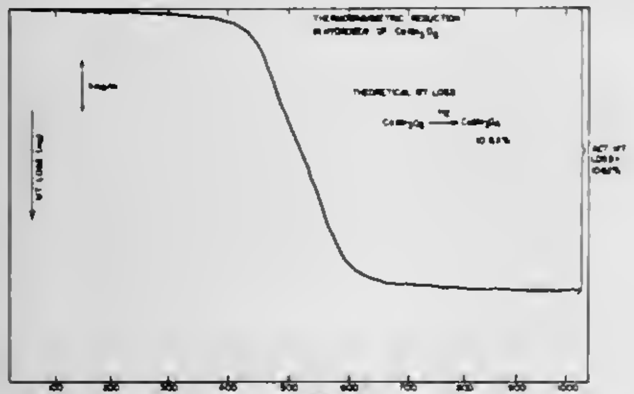
USE OF HIGH SURFACE AREA MIXED METAL OXIDES OF MANGANESE AND CALCIUM IN ELECTROCHEMICAL PROCESSES

Harold S. Horowitz, Clark, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 15, 1977, Ser. No. 824,630

Int. Cl.² H01M *4/86, 4/50*

U.S. Cl. 429—13 **14 Claims**



1. An electrical energy storage system comprising a cathode active material selected from the group consisting of $CaMn_3O_6$, $CaMn_4O_8$ and $CaMn_7O_{12}$ in combination with an anode and an electrolyte.

4,101,717

ELECTROCHEMICAL GENERATORS WITH A SEDIMENTATION BED AND DIVERGENT FEED

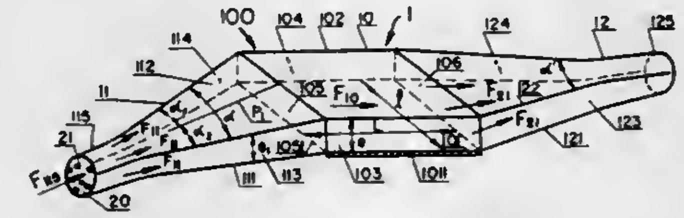
Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 4, 1977, Ser. No. 821,759

Claims priority, application France, Aug. 6, 1976, 76 24466

Int. Cl.² H01M *8/04*

U.S. Cl. 429—15 **30 Claims**



1. A process for the production of electric current utilizing electrochemical reactions in a generator comprising at least one cell having at least one compartment containing a liquid electrolyte and having an inlet, an outlet, an upper face and a lower face, the surface of the lower face being formed at least in part by all or part of the surface of at least one electron collector arranged on the electrolyte side, said process consisting in creating a flow through the compartment of the electrolyte containing solid particles which are at least partially active and/or solid particles transporting at least one active material, the density of the particles being greater than the density of the electrolyte, characterized by the fact that a divergence of the streamlines of the flow is brought about before the flow penetrates into the compartment so as to obtain a substantially homogeneous distribution of the particles at the inlet to the compartment over the entire width of the lower face, and characterized by the fact that, at least in a portion of the compartment, the particles move in the form of a sedimentation bed which is contiguous to the surface of the lower face and substantially homogeneous over the entire width of the lower face, the sedimentation bed being entrained by the electrolyte.

4,101,718

BATTERY OF LAMINATED STRUCTURE HAVING BATTERY FRAME OF NOVEL STRUCTURE

Kohki Tamura, and Kazuo Iwamoto, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of, Japan

Filed Apr. 1, 1977, Ser. No. 783,739

Claims priority, application Japan, Apr. 9, 1976, 51-39245

Int. Cl.² H01M *8/04*

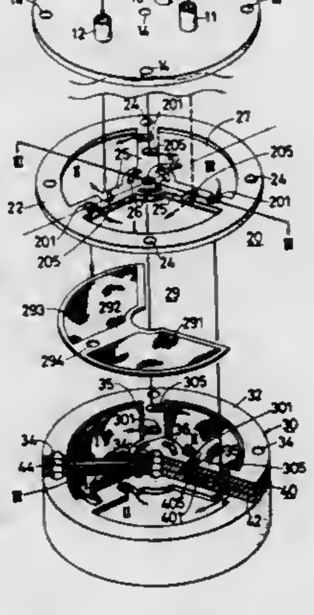
U.S. Cl. 429—26 **15 Claims**

1. A battery having a plurality of unit cells, each cell including a chamber for cathode active material, a chamber for electrolyte, and a chamber for anode active material, the chamber for the electrolyte constructed to be disposed between the other two chambers, and fluid path means for supplying the electrolyte and respective materials to the corresponding chambers, said battery further comprising:

a frame formed of insulating material and including three spaces divided by walls, the first of the spaces used as the chamber for the electrolyte, the second of the spaces used as the chamber for the anode active material, and the third of the spaces closed at one end thereof by insulating material and formed with the chamber for the cathode active material,

an electrode plate attached to one end of said first and second spaces in a manner the first space is formed with a chamber for the electrolyte and the second space is formed with a chamber of the anode active material, and

a plurality of said frames attached with said electrode plate, forming said unit cell in a manner that the frames are so positioned that the chamber for the electrolyte of the frame of one layer is disposed between the chambers for the anode and cathode active materials of the two adjacent frames of the two adjacent layers.



4,101,719

SILVER(II) OXIDE CELL AND ITS MANUFACTURE

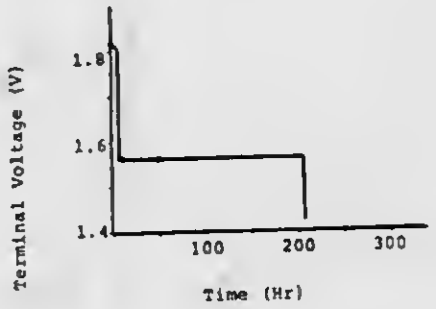
Yoshio Uetani; Akio Shimizu; Kozo Kajita; Hiroshi Ishiuchi; Tadashi Goryo, and Kazuo Ishida, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Jul. 18, 1977, Ser. No. 816,804

Claims priority, application Japan, Jul. 16, 1976, 51-85470; Jul. 16, 1976, 51-85471; Jul. 16, 1976, 51-85472

Int. Cl.² H01M *10/32*

U.S. Cl. 429—206 **22 Claims**



1. A silver(II) oxide cell which comprises a positive electrode comprising a shaped body of silver(II) oxide as a positive active material, a negative electrode comprising a negative active material and an alkaline electrolyte, characterized in that the shaped body is a molding product of a composition comprising particles of which each particle comprises a core part of silver(II) oxide and a surface part of silver(I) oxide integrally and continuously provided around the core part.

4,101,720

DEGRADABLE PLASTIC

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 230,969, Mar. 1, 1972. This application Jan. 2, 1976, Ser. No. 646,097

Int. Cl.² C08K *3/32, 3/38*

U.S. Cl. 526—3 **46 Claims**

1. As a composition of matter, a plastic composition which is degradable in the absence of electromagnetic radiation and consists essentially of an organic polymer having dispersed therein at least one transition-metal derivative and at least one readily autoxidizable organic material, said transition-metal derivative and readily autoxidizable organic material both being present in an amount sufficient to cause degradation of said polymer in the absence of electromagnetic radiation, and said readily autoxidizable organic material containing at least one carbon-hydrogen bond which is activated with respect to hydrogen-atom abstraction by an adjacent multiply bonded atom or an adjacent heteroatom and being a material which reacts with gaseous oxygen at a reaction rate more rapid than the corresponding reaction, under comparable conditions, of gaseous oxygen with an equal weight of said polymer in the absence of said readily autoxidizable material and being an acetal compound selected from the group consisting of α-amyl cinnamaldehyde dimethyl acetal; citral dimethyl acetal; hydratropic aldehyde dimethyl acetal; and phenylacetaldehyde diethyl acetal.

4,101,721

SOLID PHASE SYNTHESIS OF PROTECTED PEPTIDES

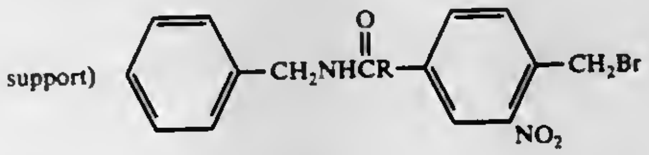
Daniel H. Rich, Madison, Wis., and Sweet K. Gurwara, Williamsville, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 9, 1976, Ser. No. 748,948

Int. Cl.² C08F *8/18*

U.S. Cl. 526—19 **15 Claims**

1. A supported 3-nitro-4-bromomethyl benzoyl amide having the general formula



in which R is 0-8 carbon atoms in an alkyl or substituted alkyl group.

4,101,722

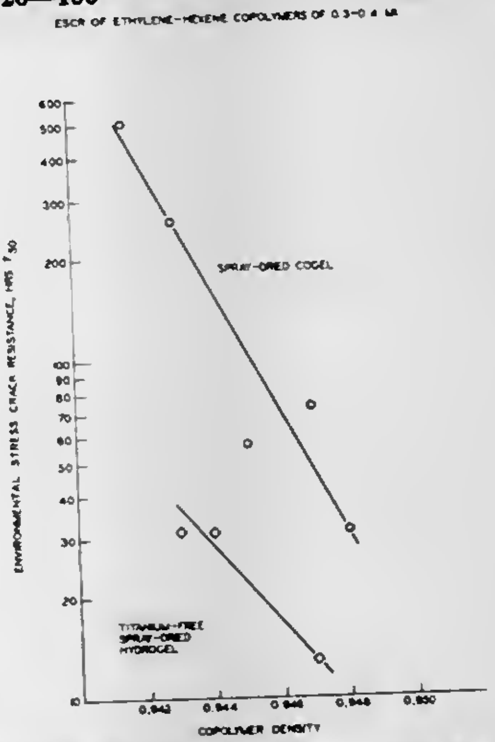
POLYMERIZATION PROCESS USING SPRAY DRIED TITANIUM-CONTAINING CATALYST

John P. Hogan, and Donald D. Norwood, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 607,977, Aug. 26, 1975, Pat. No. 4,053,436. This application Feb. 4, 1977, Ser. No. 765,471

Int. Cl.² C08F *4/78, 10/00, 10/14*

U.S. Cl. 526—106 **10 Claims**



1. A polymerization process which comprises contacting at least one monoolefin having 2–8 carbon atoms per molecule

under polymerization conditions with a catalyst produced by forming a hydrogel by contacting an alkali metal silicate with a material selected from the group consisting of acids, acidic salts, and carbon dioxide, said hydrogel having coprecipitated therewith a titanium compound, spray drying said thus-formed hydrogel to form a xerogel; thereafter calcining said xerogel to form a said catalyst, said xerogel before calcining containing in addition 0.1 to 20 weight percent chromium calculated as CrO_3 based on the total weight of said catalyst.

4,101,723

SUBSTITUTED PIPERAZINOPROPANOLS

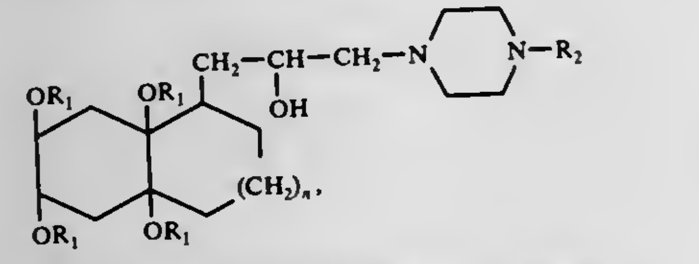
Frederic P. Hauck, Somerville; Rita T. Fox, Princeton, and John R. Watrous, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 5, 1977, Ser. No. 784,888

Int. Cl.² C07D *401/04, 295/08*

U.S. Cl. 544—360 **16 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

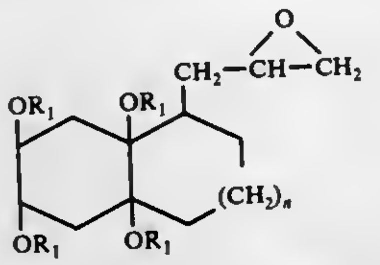
R_1 is alkanoyl;

R_2 is pyridinyl, phenyl, or phenyl substituted with 1 or 2 halogen, alkyl, trifluoromethyl, alkoxy or alkylthio groups; and

n is 0, 1 or 2;

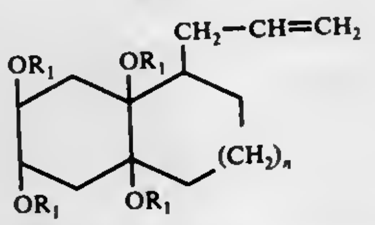
and wherein the terms alkyl, alkoxy and alkylthio refer to groups having 1 to 6 carbon atoms and the term alkanoyl refers to groups having 1 to 7 carbon atoms.

15. A compound having the formula



wherein R_1 is alkanoyl having 1 to 7 carbon atoms and *n* is 0, 1 or 2.

16. A compound having the formula



wherein R_1 is alkanoyl having 1 to 7 carbon atoms and *n* is 0, 1 or 2.

ELECTRICAL

4,101,724

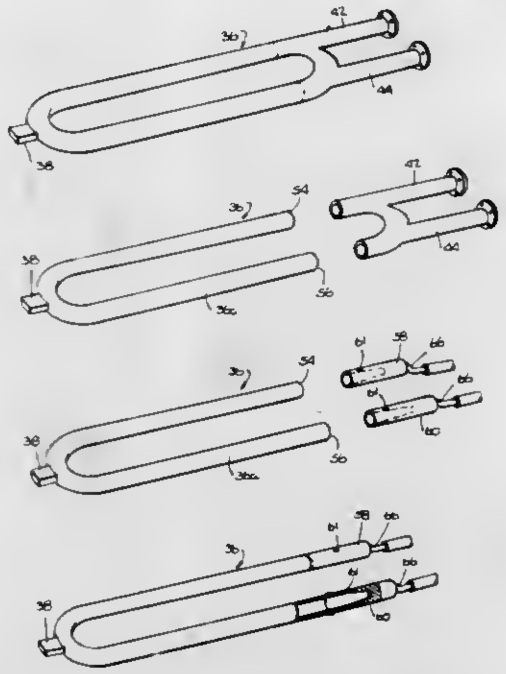
FURNACE CONVERSION METHOD AND APPARATUS

Hans Gunther Heine, Little Silver; Otto Hochstrasser, North Brunswick, both of N.J., and Fritz Hegewaldt, Herdecke, Fed. Rep. of Germany, assignors to Brown Boveri Corporation, North Brunswick, N.J.

Filed Jun. 30, 1976, Ser. No. 701,013

Int. Cl.² F27D *11/02;* H05B *3/06, 3/40*

U.S. Cl. 13—1 **4 Claims**



1. A method of converting a fuel-fired radiant tube type furnace to electrical operation, said method comprising the steps of disconnecting from the radiant tubes of said furnace, their fuel-fired source and their exhaust, and connecting electrical supply means to the tubes to drive electrical current longitudinally through the walls of said radiant tubes.

4,101,725

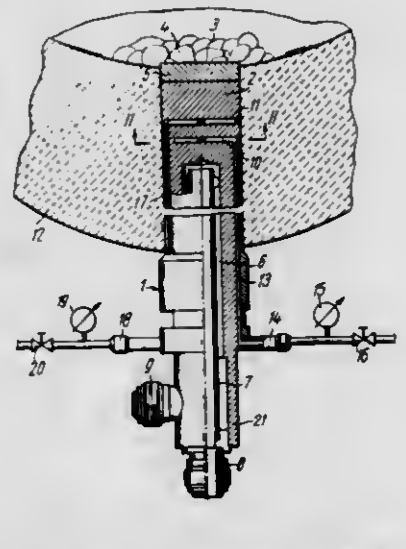
HEARTH ELECTRODE FOR MELTING FURNACES

Nikolai Semenovich Shelepov, ulitsa Geroev Kosmosa, 2a, kv. 96; Valery Alexeevich Kildjushev, ulitsa Kuibysheva, 23, kv. 18; Evgeny Mitrofanovich Kitaev, Ploschad Revoljutsii, 4, kv. 37; Vissarion Makarovich Dubodin, 2 Mokhovoi proezd, 24, kv. 7, and Vladimir Alexeevich Kochetkov, Bulvar Jubileiny, 29, kv. 15, all of Gorky, U.S.S.R.

Filed Aug. 16, 1976, Ser. No. 714,605

Int. Cl.² H05B *7/08*

U.S. Cl. 13—18 **7 Claims**



1. A hearth electrode for melting furnaces comprising a cylinder, one end of said cylinder having an outer surface thereof and being adapted for contacting a melt stock or melt within the melting furnace, an inner space of said cylinder being adapted for providing a coolant passageway; passage means for detecting local burnings-through or consumption by burning in said bottom being filled with gas under a pressure differential with respect to the static pressure within the melting furnace, said passage means being provided all along the electrode cross section and lying in a longitudinal plane of said bottom between said outer surface and said inner space of the electrode; and a sensor for pressure control in communication with said passage means for detecting a pressure change in said passage means.

4,101,726

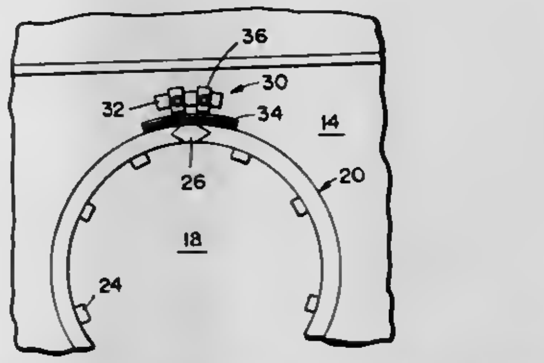
WATER COOLING JACKET FOR INDUCTION FURNACE WATER BUSHING

Bernard L. Griffiths, Susuin, Calif., assignor to Atlas Foundry & Mfg. Co., Richmond, Calif.

Filed Jan. 17, 1977, Ser. No. 760,185

Int. Cl.² H05B *5/14*

U.S. Cl. 13—29 **9 Claims**



1. In an induction melting furnace which includes a hearth, a passage through said hearth surrounded by refractory material, an induction transformer disposed in said passage, a bushing lining said passage, and having a longitudinally extending gap, a gasket element sealing the gap, and cooling liquid means associated with said bushing, the improvement comprising a water jacket overlying said gasket element, and means for circulating water through said jacket.

4,101,727

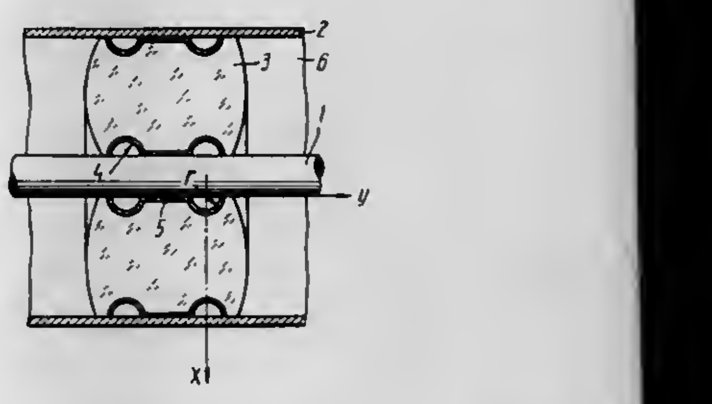
HIGH-TENSION ELECTRIC CABLE

Vladimir Ilich Levitov, ulitsa Vavileva 48, kv. 7; Andrei Grigorievich Lyapin, Vystavochny pereulek 5, kv. 39, and Oleg Vasilievich Scherbina, ulitsa Amundsena 16, kv. 76, all of Moscow, U.S.S.R.

Continuation of Ser. No. 531,814, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,653, Aug. 7, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,748

Int. Cl.² H01B *9/04*

U.S. Cl. 174—28 **1 Claim**

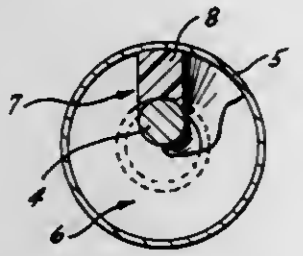


1. An improved high-tension cable employing an outer metal sheathing; a substantially coaxial inner current-conducting wire in the form of a core, running longitudinally inside said sheating, and having radially directed outer surfaces that are

substantially parallel with the longitudinal direction of the cable; a main insulation of compressed gas filling the space between said core and said sheathing; spaced-apart, partly toroidal insulator elements for supporting and coaxially securing said core relative to said sheathing, said insulator elements narrowing in at least their portions that face and contact said core, and having therein at least one pair of semicircular grooves in at least said contact portions of the insulator elements, said improvement comprising: said grooves being open towards said core; and at least one pair of shielding screen electrodes in electrical contact with at least said core, built into said grooves in the insulator elements, adjoining said contact portions of the latter; said screen electrodes having dimensions conforming to one-quarter of the distance between said screen electrodes; said insulator elements having side surfaces facing in the longitudinal direction, with a partly rectilinear and partly toroidal generatrix, the latter coinciding with the electrostatic line of force of the electric cable, at any point of which the gradient of electrostatic potential is lower than the gradient on said outer core surfaces in at least one of the spaces between successive ones of said insulator elements; said side surfaces being aligned with said current-conducting core; the line of force, coinciding with the generatrix of said insulator side surfaces, being so disposed in any longitudinal section of the electric cable that the line of force begins on said outer core surfaces at a distance $x = 1.1\ r$ from the center of the semicircular section of said grooves which have therein said shielding electrodes, r being the radius of the section of said grooves.

4,101,728
GAS INSULATED HIGH VOLTAGE CABLE

Jan Artbauer, Hanover, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Aug. 25, 1977, Ser. No. 827,615
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638610
Int. Cl.^{2} H01B *9/06*
U.S. Cl. 174—29 **11 Claims**



1. A gas insulated high voltage cable, comprising:

an outer tubular metal conductor having an inner surface and a tubular interior;

at least one conductor disposed in the outer conductor and having a surface which is asymmetrical with respect to the inner surface of the outer conductor so that the electric field strength in the tubular interior varies around the inner conductor; and

insulative spacer means supporting the inner conductor in the outer conductor and occupying zones of maximum electric field strength in the tubular interior of the outer conductor and in any cross-section of the cable.

4,101,729
APPLIANCE STRAIN RELIEF

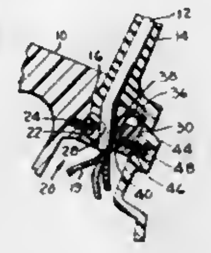
Charles A. Balchunas, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.
Filed Feb. 4, 1977, Ser. No. 765,664
Int. Cl.^{2} H01R *13/58;* **D06F** *75/28*
U.S. Cl. 174—65 R **7 Claims**

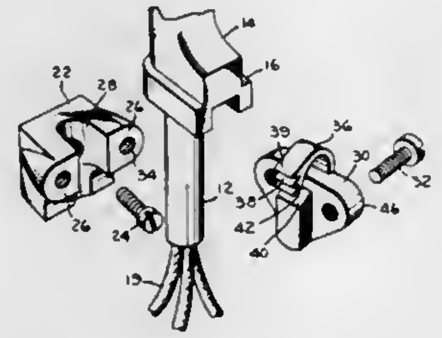
1. In a portable electric appliance cord-connected to internal electric terminals by multiple conductors, the improvement in a strain relief assembly between the cord and appliance comprising,

a housing chamber in the appliance at the cord entrance,

a formed saddle secured to the chamber and having spaced ears defining a passage therebetween aligned with the lay of the cord to contain the cord conductors,

a formed clamp fitting over said saddle and removably attached thereto,





said clamp having a toothed flexible extension disposed into said passage against the conductors therein,

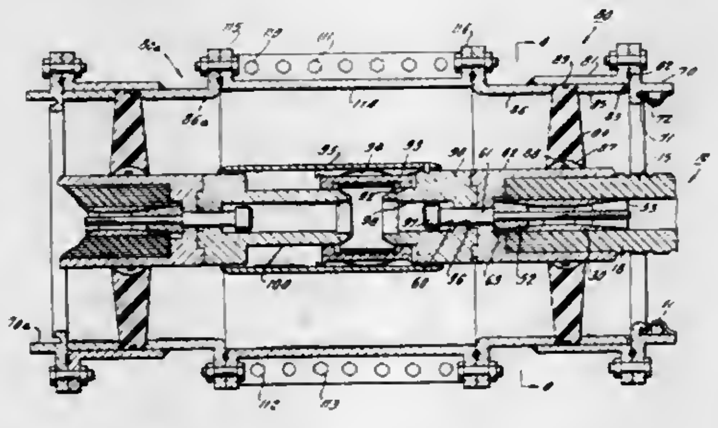
a wedge means on said clamp opposite said extension, and

a cover over said clamp and saddle,

whereby said flexible extension is forced by said wedge means into biting engagement with said conductors in said passage permitting said strain relief assembly to be used with different-sized conductors.

4,101,730
TERMINATION FOR STRANDED CABLE

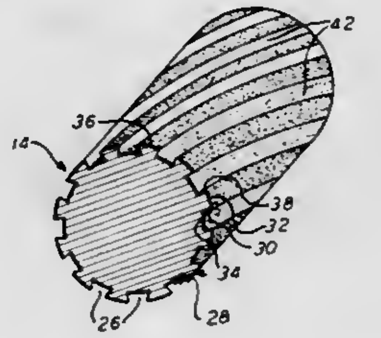
Philip C. Netzel, Milmont, Pa., assignor to Gould Inc., Rolling Meadows, Ill.
Filed Feb. 25, 1977, Ser. No. 771,943
Int. Cl.^{2} H02G *15/02*
U.S. Cl. 174—75 R **9 Claims**



1. An electrical terminal in combination with a stranded conductor; said stranded conductor comprising, at its terminal end, a generally hollow cylindrical form; said terminal comprising a rigid conductive outer sleeve closely surrounding the exterior of said generally hollow cylindrical form; a hollow elongated cylindrical conductive member disposed inside said cylindrical stranded conductor form; a pair of wedge-shaped nuts fitted into the opposite ends of said hollow elongated cylindrical conductive member; bolt means connected to said pair of wedge-shaped nuts and operable for drawing said wedge-shaped nuts toward one another to outwardly distort the respective ends of said hollow elongated cylindrical member and to press said strands of said generally hollow cylindrical form into high pressure engagement with said conductive outer sleeve; said bolt means being operable from a region external of said hollow cylindrical form.

4,101,731
COMPOSITE MULTIFILAMENT SUPERCONDUCTORS

William G. Marancik, Basking Ridge, N.J., assignor to Airco, Inc., Montvale, N.J.
Filed Aug. 20, 1976, Ser. No. 716,312
Int. Cl.^{2} H01L *39/02*
U.S. Cl. 174—126 S **16 Claims**



15. A composite superconductor comprising:

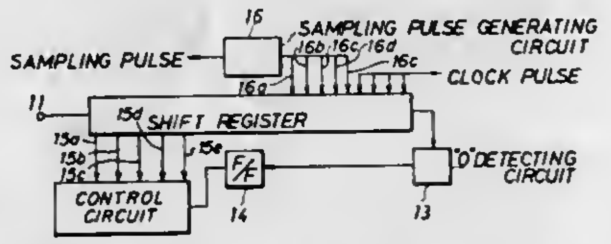
a plurality of unitary central metallic wires made of a normally conductive metal, each said wire having a plurality of spaced grooves extending longitudinally along each said wire, each said groove undercutting the surface of one said wire;

a thin film of substantially stoichiometric superconductive Nb_3Ge sputter-deposited on a portion of each said groove and also on the surface between adjacent grooves, at least part of each undercutting portion of each groove being deposit-free; and

said plurality of wires being consolidated into said composite structure by an enveloping metallic matrix of a normally conductive metal.

4,101,732
START AND STOP SYSTEM

Seigo Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan
Filed Oct. 19, 1976, Ser. No. 733,926
Claims priority, application Japan, Oct. 20, 1975, 50-126216
Int. Cl.^{2} H04L *5/24*
U.S. Cl. 178—53.1 R **4 Claims**



1. A start and stop control apparatus for successively transferring a plurality of data frames each including start, data and stop bit pulses, comprising:

a shift register having a plurality of stages for continuously storing binary first information items corresponding to the start bit pulse of each data frame in response to a series of clock pulses;

a detector circuit for generating an output in response to the binary first information item corresponding to the head of the continuous binary first information items stored in the shift register, which has been delivered from the output terminal of said shift register;

a control circuit for looping the shift register with a register length corresponding to the number N of the continuous binary first information items in response to the output from said detector circuit and for detecting the last stage of the looped shift register;

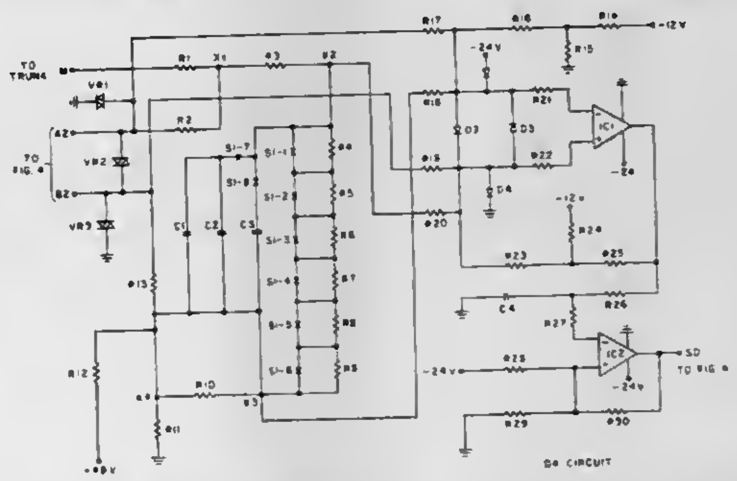
a sampling pulse output circuit for storing a binary second information item into the N/2th stage of the shift register in response to the detected last stage and for generating a sampling pulse in response to said binary second information item every time said shift register finishes one loop operation with said register length;

means for sampling data from the middle portion of each of said data bit pulses in response to said sampling pulse from said sampling pulse output circuit; and

means for storing binary second information items throughout the shift register in response to the stop bit pulse of each data frame.

4,101,733
ELECTRONIC DX SIGNALING CIRCUIT

Donald Edward Whitaker, Jackson, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed May 6, 1977, Ser. No. 794,335
Int. Cl.^{2} H04L *25/02*
U.S. Cl. 178—58 R **3 Claims**



1. A trunk signaling arrangement for a telephone system for signaling over two conductors between a first and a second office using E and M signaling techniques, a duplex trunk circuit in each office, each trunk circuit including means for transmitting the condition of its M lead over one said two conductors to the other office, a resistive balance network in each trunk circuit for sensing the condition of its M lead and the potential difference between its M lead and the M lead of the trunk circuit at the other office, an electronic comparator circuit in one trunk circuit responsive to certain predetermined combinations of conditions from said network for switching an output circuit from a quiescent to an active condition, said comparator circuit comprising an operational amplifier having two input terminals and an output terminal, and in which two substantially identical resistances of said network are coupled between the M lead of said one trunk circuit and one input terminal of said comparator circuit and in which two substantially identical resistances of said network are coupled to the other input terminal of said comparator circuit.

4,101,734
BINARY TO MULTISTATE BUS DRIVER, RECEIVER AND METHOD

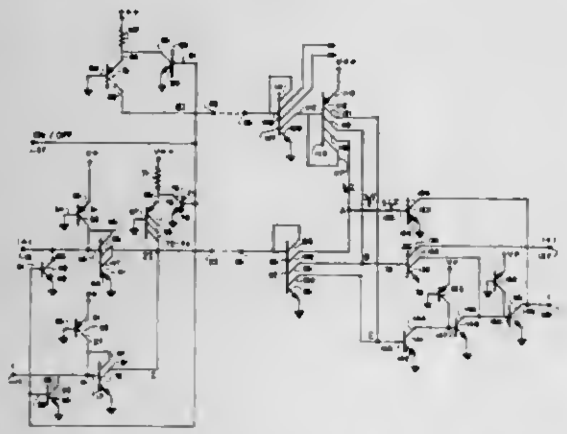
Tich T. Dao, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.
Filed Nov. 15, 1976, Ser. No. 741,874
Int. Cl.^{2} H04B *1/00*
U.S. Cl. 178—68 **9 Claims**

1. A binary to multistate line driver and remote receiver comprising,

a line driver including

first and second injection logic encoder circuits having current injectors connected to receive respective first and second binary input signals for providing analog outputs at a signal output terminal in response to said input signals, said first and second encoder circuits comprising first and second input devices capable of summing predetermined input levels at the output terminal together with a predetermined threshold level source connected to said output terminal, said circuits each having current injectors with substantially similar structural characteristics,

a reference channel circuit connected to a reference terminal for providing a reference to the encoded signals, said reference circuit having a current injector with structural characteristics substantially similar to said encoder circuit current injectors,



a remote receiver having reference and signal inputs connected to the corresponding driver outputs, including

a reference level circuit for generating plural predetermined threshold reference levels from said reference signal,

an input circuit for receiving said input signals and generating plural replicated outputs therefrom,

a threshold detector circuit having two binary outputs and having plural input nodes with said predetermined threshold signal levels connected respectively thereto, and one of each replicated outputs further connected respectively thereto, so that the inputs at said nodes are compared and the threshold detector circuit provides a binary output from the encoded input signal which is a replica of the binary signal inputs.

4,101,735
TWO-WAY LOUDSPEAKING DEVICE FOR TELEPHONE STATIONS

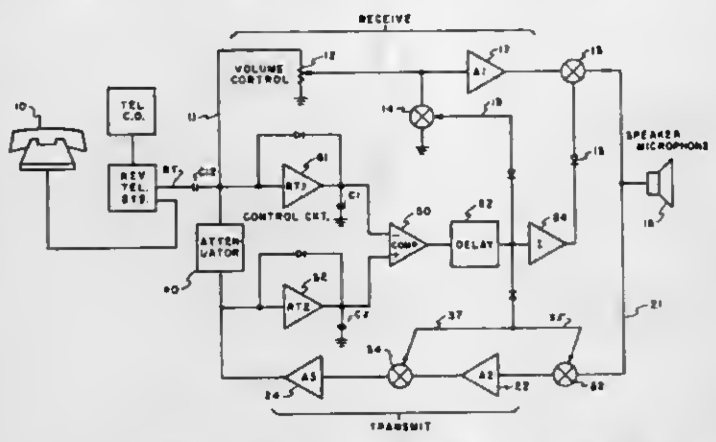
Edwin Redmond Bridenbaugh, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 591,455, Jun. 30, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,486

Int. Cl.^{2} H04M *9/08*

U.S. Cl. 179—1 HF **7 Claims**

1. An audio signal controlled switching circuit for interfacing between a telecommunications system and a bidirectional transducer, said circuit including a first unidirectional audio path coupled at its input to receive audio signals from said system and coupled at its output to said transducer to transmit signals to said transducer, a second unidirectional audio path coupled at its input to the transducer and at its output to the system , swithing means for enabling transmission of signals through one or the other of said paths on operation thereof, a comparator network having a first and a second input means for comparing signals in said audio paths for operating the switching means responsive to audio signal received from said paths to enable the audio path from which signals of greater amplitude have been received by comparator network and to disable the other audio path, said first input means coupled to said system to continuously receive signals directed to said first audio path, said second input means coupled to the output of said second audio path to receive signals therefrom only with said first audio path disabled by said switching means whereby to provide signals to said switching means to enable said first audio path on the occurrence of signals of greater amplitude from said system than those transmitted from said second audio path.



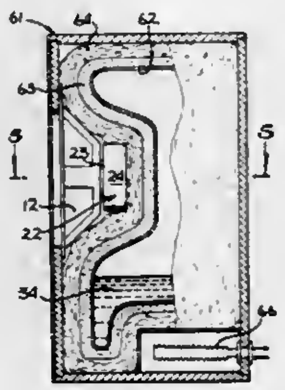
4,101,736
DEVICE FOR INCREASING THE COMPLIANCE OF A SPEAKER ENCLOSURE

Eugene J. Czerwinski, Studio City, Calif., assignor to Cerwin Vega, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 778,429, Mar. 17, 1977, abandoned. This application Oct. 25, 1977, Ser. No. 844,709

Int. Cl.^{2} H04R *1/28*

U.S. Cl. 179—1 E **6 Claims**



1. In a loudspeaker system an improvement for use in combination with a loudspeaker system which includes:

a. a vibratable cone having an open apex; and

b. a speaker enclosure having a top, a bottom, a back, a pair of sides and a front, the front having a speaker opening wherein the vibratable cone is mechanically coupled so that it may vibrate in response to an electrical signal, said improvement is a device for effectively enlarging the volume of the speaker enclosure in order to increase the compliance that the vibratable cone sees with said device comprising:

a. a gas having a gamma value less than 1.4 and the product of its density and the square of speed of sound therein less than the same product for air; and

b. a bag formed from a soft, pliable material for enclosing said gas within the speaker enclosure and adapted to seal said gas therein and to seal atmospheric gases and water thereout;

c. an acoustically transparent and porous cocoon disposed about said bag so that it surrounds completely said bag; and

d. an acoustical padding disposed adjacent to the top, the bottom, the back, the sides and the front of the enclosure and adapted to enclose said acoustically transparent and porous cocoon.

4,101,737
CONTROL ARRANGEMENT IN A TIME-SPACE-TIME (T-S-T) TIME DIVISION MULTIPLE (T.D.M.) TELECOMMUNICATION SWITCHING SYSTEM

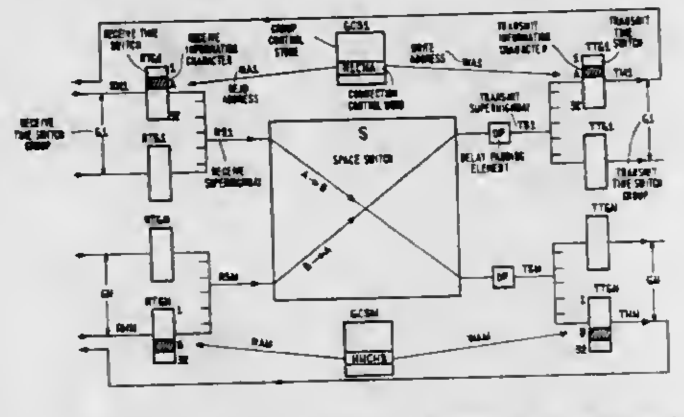
Alexander Schroder Philip, Liverpool, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jun. 24, 1976, Ser. No. 699,449

Claims priority, application United Kingdom, Jun. 26, 1975, 27075/75

Int. Cl.^{2} H04J *3/00*

U.S. Cl. 179—15 AT **8 Claims**



1. A digital switching system of a time division multiplex telecommunications system which includes; a plurality (n) of m-channel multiplex receive-highways; a plurality (n) of m-channel multiplex transmit-highways; each of the receive-highways and transmit-highways including

a separate time-switch for storing information characters; and,

the receive-highways and transmit-highways are arranged in groups with each group connected to an individual receive-superhighway and transmit-superhighway respectively;

said receive-superhighways being interconnectable with the transmit-superhighways by a space-switching network providing duplex connection paths for the conveyance of information characters; and

each said duplex connection path comprises two separate simplex connection paths which are separated by time-slots which are (F/2) apart, where F is the number of time-slots in each superhighway frame; and,

a control arrangement including a separate control-store for the time-switches of each pair of superhighways constituted by a receive-superhighway and a transmit-superhighway, and each control-store includes a plurality of connection control-words and a single connection control-word is employed twice in a superhighway frame, once for controlling the reading of an information character from a time switch in a receive highway for conveyance over one simplex path and once for controlling the writing of the information character being conveyed over another simplex path into a time-switch in a transmit highway; and,

each said control-store has $n \times m$ storage locations for storing connection control words and is divided into two separate sections and the connection control-words for time-slots of an odd nomenclature are stored in one of the sections and connection control words for time-slots of an even nomenclature are stored in the other of the sections, and each control store includes an addressing means including;

a first counting-device for selecting connection control-words from the control-store to effect reading of information characters from the receive time switches; and,

a second counting-device for selecting connection control-words from the control-store to effect writing of information characters into the transmit time switches; and,

the first and second counting devices are operated in such manner that a phase difference $F/2 + D$, where F is the number of time-slots in a superhighway frame, and D is the propagation delay in the transmission of an information character over a simplex path, between the first and second counting devices of an odd number of time-slots is maintained by ensuring that the propagation delay D is an odd number of time-slots, by the said addressing means always addressing the separate sections of the connections control store concurrently.

4,101,738
ARRANGEMENT FOR PROCESSING AUXILIARY SIGNALS IN A FREQUENCY MULTIPLEX TRANSMISSION SYSTEM

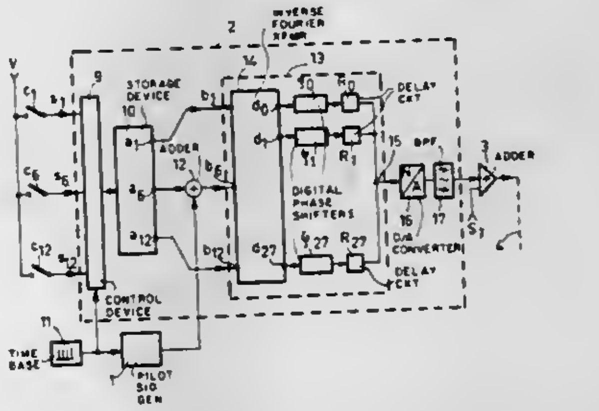
Maurice Georges Bellanger, Antony; Georges Bonnerot, Orsay, and Michel Coudreuse, Paris, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 18, 1976, Ser. No. 697,357

Claims priority, application France, Jun. 24, 1975, 75 19717

Int. Cl.^{2} H04J *1/14*

U.S. Cl. 179—15 FD **13 Claims**



1. An arrangement for processing spatially separated auxiliary signals for a given number of main information signals for transmitting these auxiliary signals together with the main information signals in an FDM format, said arrangement comprising a plurality of input circuit means for receiving said auxiliary signals, which plurality is equal to the number of main information signals, an output circuit, wherein the arrangement further comprises:

means coupled to said input means for digitizing the auxiliary signals, whereby said digital signals have a given bandwidth;

means which are coupled to said digitizing means for limiting the bandwidth of each of the auxiliary signals to less than said given bandwidth; and

a digital filter bank coupled to said limiting means and to said output means to which said digital auxiliary signals are applied and which has a passband characteristic which is characteristic for each of the auxiliary signals, the intermediate frequency of this characteristic coinciding with the intermediate frequency of the auxiliary channel for the relevant auxiliary signal.

4,101,739
DEMULTIPLEXER FOR ORIGINALLY SYNCHRONOUS DIGITAL SIGNALS INTERNESTED WORD-WISE

Horst Mueller, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 14, 1977, Ser. No. 759,351

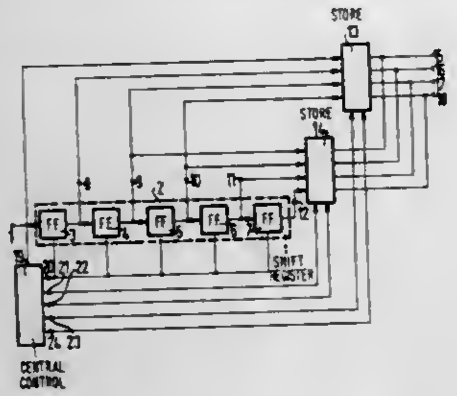
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602937

Int. Cl.^{2} H04J *3/04*

U.S. Cl. 179—15 A **5 Claims**

4. The method of demultiplexing a synchronous word interleaved signal composed of *m* input signals with *n* bits for each

interleaved word having as a first step storing the input signal into a shift register of capacity $(m + 1)$. n bits with a tap after each n bits; having as a second step reading the first q bits of each of m words using the shift register input and $m - 1$ succeeding consecutive taps, counting from the shift register input point, into a first m bit wide by q bits deep store; having as a third step shifting the contents of the shift register another



approximately $m \cdot n/2$ bits and reading the last r bits of each of m words from the shift register using the output of the shift register and $m - 1$ preceding consecutive taps counting from the shift register output point into a second m bits wide by r bits deep store; having as a fourth step reading out in parallel from the first store the first q bits of each word and from the second store the last r bits of each of the m words.

4,101,740

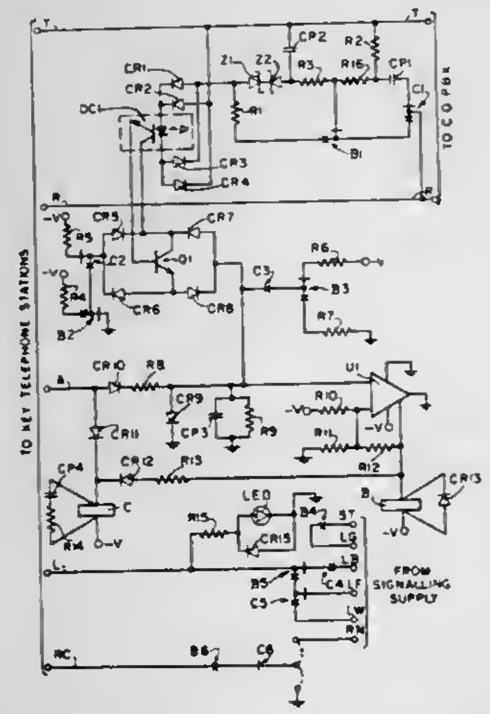
LINE CIRCUIT FOR KEY TELEPHONE SYSTEMS

John Anthony Barsellotti, Guelph, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,178

Iot. Cl.² H04M *1/00*

U.S. Cl. 179—99 **7 Claims**



1. A line circuit for a line of a key telephone system including means for sensing ringing current, means responsive to the sensing of the ringing current for operating a control member to cause operation of a first relay, said first relay on operation controlling signaling to stations of the line, a second relay responsive to *a* seize ground signal from one station of said line indicative of an off-hook condition of said one station to operate and signal the stations of said line accordingly, means for maintaining said second relay operated for a timed period after removal of said seize ground signal, said ring sensing means operative to sense the level of line voltage across the conductors of said line during said timed period of operation of said second relay, said ring sensing means operative when said line voltage exceeds a predetermined voltage indicative of release of the off-hook condition at said one station for causing restoration of said second relay.

4,101,741

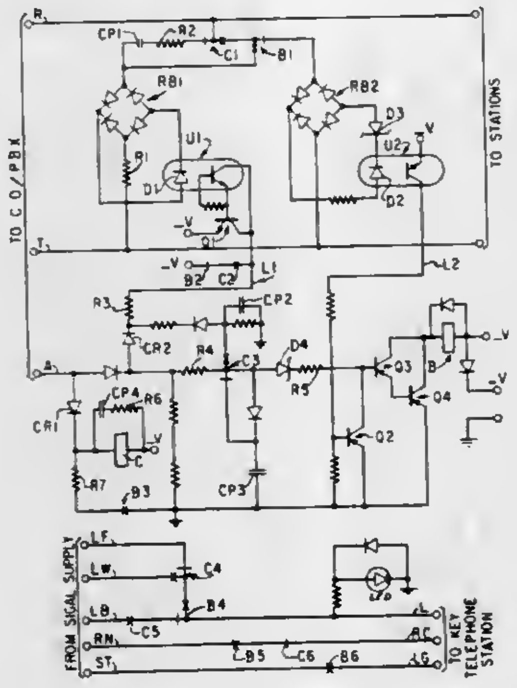
LINE CIRCUIT FOR KEY TELEPHONE SYSTEMS

George Kunstatter, Kitchener, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,041

Int. Cl.² H04M *1/00*

U.S. Cl. 179—99 **7 Claims**



1. A line circuit for a key telephone system which comprises a ring detecting means for causing operation of a first relay to initiate local signaling on occurence of ringing current applied to the line conductors, a second relay operated in response to an off-hook condition at a station of said line circuit, means for deenergizing said first relay in response to said off-hook signal, line voltage sensing means, means responsive to operation of said second relay for enabling said line voltage sensing means to determine the voltage across said line, said line voltage sensing means maintained in an off condition during off-hook and hold conditions, means for switching said voltage sensing means on in response to an open loop across said line conductors to prevent said first relay from operating and for preventing said line circuit from entering the hold condition.

4,101,742

AUDIO MESSAGE SYSTEM WITH PROGRAMMER

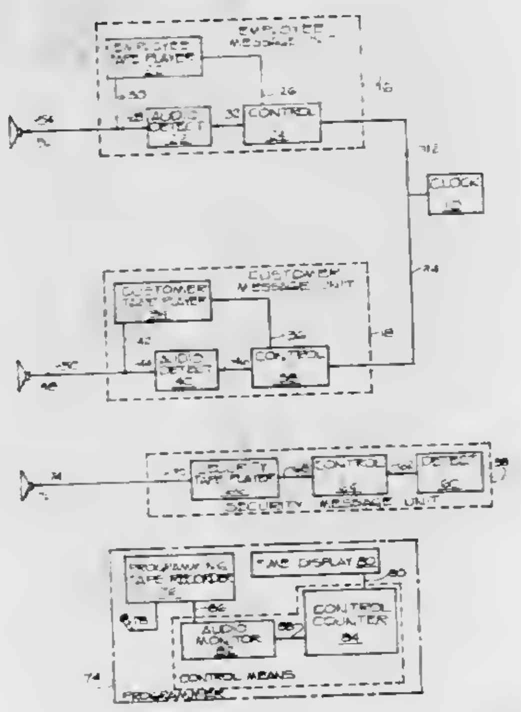
Edwin D. Craig, 3745 S. 250 West, P.O. Box 9255, Ogden, Utah 84409, and Ruel Ross Clark, Salt Lake City, Utah, assignors to Edwin D. Craig, Ogden, Utah

Filed Dec. 3, 1976, Ser. No. 747,070

Int. Cl.² G11B *15/18, 27/22, 31/00*

U.S. Cl. 179—100.1 C **15 Claims**

1. A programmable audio message system comprising:
a clock to generate intervaled timing pulses;
a plurality of audio message units, each of said units having:
  control circuit means conductively connected to receive said intervaled timing pulses and to generate a start control signal upon receipt thereof,
  tape player means conductively connected to receive said start control signal, said tape player having means to generate an audio signal and an audio output,
  an audio detect circuit conductively connected
    (1) to the audio output of said tape player to detect the presence of an audio signal and
    (2) to supply a run and stop signal to said tape player through said control circuit to cause said tape player to run as long as an audio signal is present at said audio output,
  tape means for positioning on said tape player, said tape being preprogrammed with a plurality of brief audio messages;
speaker means associated with each of said audio message units conductively connected to the audio output of its respective tape player to receive audio signals therefrom and generate corresponding audible signals;
wherein the intervaled timing pulses of said clock cause the control circuit of each message unit to start its respective tape player means in accordance with a time program to play the next brief audio message on said tape and the audio detect circuit of each respective message unit detects (1) the playing of the brief message at the audio output of its respective tape player to cause said tape player to run and (2) the absence of audio signals at the audio output to cause said tape player to stop; and
wherein said tapes are preprogrammed by a tape programmer comprised of:
  tape recorder means havng an input with a microphone connected thereto to receive an audible input;
  digital time display means;



  control means conductively connected to said tape recorder means and to said digital time display means, said control means having:
    a counter control circuit conductively connected to said time display means to supply signals thereto to cause said time display means to display a preselected time,
    an audio monitor circuit conductively connected to detect the presence and absence of audio input to said tape recorder means and to send a pulsing signal to said counter control to advance the displayed time a preselected increment of time after detection of the presence of an audio input of selected duration followed by the absence of said audio input, said audio monitor circuit having means to inhibit recording for a selected period after the detection of said absence of said audio input.

10. Apparatus for programming cassette tapes for use with an audio message system having cassette tape recorders, said apparatus being comprised of:
  a cassette tape recorder having an input with a microphone connected thereto to receive an audible input;
  digital time display means;
  control means conductively connected to said tape recorder means and to said digital time display means, said control means having:
  a counter control circuit conductively connected to said time display means to supply signals thereto to cause said time display means to display a preselected time,
an audio monitor circuit conductively connected to detect the presence and absence of audio input to said tape recorder means and to send a pulsing signal to said counter control to advance the displayed time a preselected increment of time after detection of the presence of an audio input of selected duration followed by the absence of said audio input, said audio monitor circuit having means to inhibit recording for a selected period after the detection of said absence of said audio input.

4,101,743

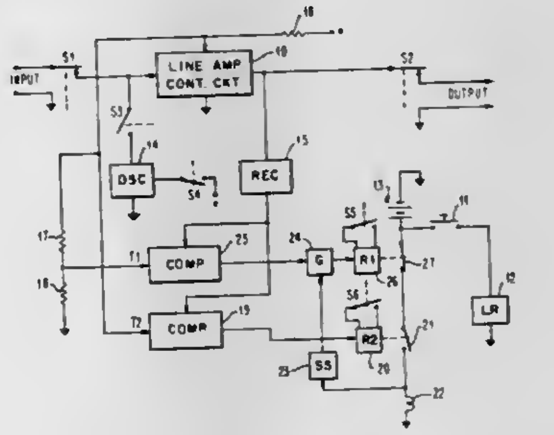
TEST CIRCUIT FOR A PROTECTIVE COUPLER

Michel Leon Costes, and James Franklin Hoyle, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1977, Ser. No. 803,837

Int. Cl.² H04M *3/26*

U.S. Cl. 179—175 **5 Claims**



1. A test circuit for use with a protective coupler used for coupling an output signal from a modem to a switched network and for limiting the maximum signal voltage applied to the network to a specified value comprising:
  first switch means for disconnecting the coupler from the modem output and the network and for applying a signal having a voltage substantially in excess of the allowable network voltage to the input of the coupler,
  circuit means for generating a first threshold voltage T1 corresponding to the maximum allowable signal voltage level permitted on the network and a second threshold voltage T2 corresponding to the signal voltage level applied by the first switching means to the coupler input,
  an electrically operated indicator,
  a first normally closed switch means and a second normally open switch means for connecting said indicator to an electric power source,
  first comparator means responsive to the second threshold T2 and to the protective coupler output for providing an output to said second normally open switch means for causing said switch means to close and energize said indicator when the coupler output equals or exceeds T2, and
  second comparator means responsive to the first threshold T1, the coupler output and the energization of said indicator for providing an output signal to said first normally closed switch means for causing said switch means to open and deenergize said indicator when said coupler output is equal to or less than T1 within a predetermined time period following the energization of the indicator.

4,101,744

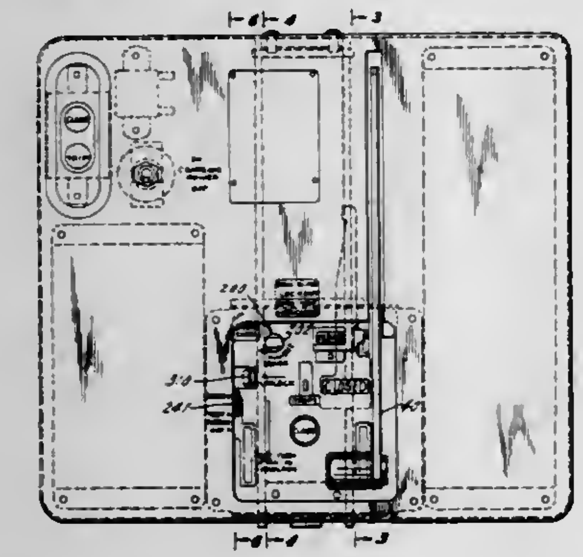
CIRCUIT BREAKER RACKING MECHANISM FOR DRAWOUT TYPE SWITCHGEAR

George A. Wilson, Pineville, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 22, 1976, Ser. No. 734,955

Int. Cl.^{2} H01H *9/20*

U.S. Cl. 200—50 AA **8 Claims**



1. In a circuit breaker for use in a cubicle;
a racking mechanism for moving the circuit breaker to connected, test, disconnect and draw out position, said racking mechanism comprising:
a lead screw mounted in the circuit breaker and extending from the front to the rear of said circuit breaker;
said lead screw having a threaded section at the end thereof adjacent the rear of the circuit breaker;
said lead screw having a driving section at the front of the circuit breaker and means for engaging said driving section to rotate said lead screw;
means for mounting said lead screw in said circuit breaker and retaining the same axially stationary therein;
said lead screw being angularly rotatable in said mounting;
a travelling nut on the threaded section of said lead screw;
guide means for the said travelling nut maintaining said travelling nut against rotation with said lead screw and causing said travelling nut to move longitudinally of said lead screw when said lead screw is rotated;
a cam roller carrying bracket pivotally mounted in said circuit breaker;
a link connecting said cam roller carrying bracket and said travelling nut;
said cam roller carrying bracket rotating in one direction when said travelling nut moves in one direction and in an opposite direction when said travelling nut moves in an opposite direction;
a cam roller mounted on said cam roller carrying bracket;
said cam roller being moved by said cam roller carrying bracket in a vertical direction between a rack out position wherein the cam roller is in a position to permit withdrawal of the circuit breaker from said cubicle and insertion thereof into said cubicle and a fully racked in position wherein said circuit breaker is fully inserted into said cubicle;
said cubicle having a back wall and a front;
the back wall of said cubicle having a plurality of stationary disconnect contacts;
the rear of said circuit breaker having corresponding circuit breaker disconnect contacts;
and means in said cubicle cooperating with said cam roller; engagement of said cam roller with said corresponding means and movement of said roller with respect to said cooperating means causing said circuit breaker to move between the drawout position and the connected position.

4,101,745

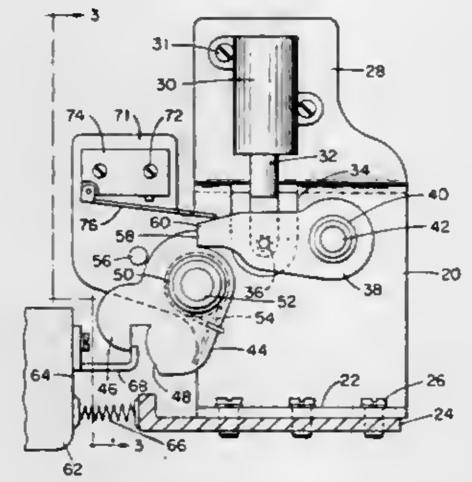
DRAWER OPERATED SWITCH ASSEMBLY

Gerald P. Smith, Dagsboro, Del., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 11, 1977, Ser. No. 786,696

Int. Cl.^{2} H01H *3/16*

U.S. Cl. 200—61.61 **16 Claims**



1. In combination with an enclosure structure including a slidably mounted drawer having an engaging member secured thereto, means for generating a signal upon latching of the drawer in a closed position within the enclosure structure comprising:
(a) latching means movably secured to said enclosure structure and positioned in the plane of movement of the drawer engaging member, said latching means being moved to a latching position by the engaging member upon movement of the drawer in a drawer closing position;
(b) signal generating means mounted on said enclosure for generating a signal when operated;
(c) and holding means operatively associated with said signal generating means and mounted for movement to a position holding said latching means in a latching position when so moved thereto by movement of said drawer to a closed position, said holding means operating said signal generating means upon movement thereof to the latching means holding position.

4,101,746

APPARATUS FOR CONTROLLING THE DRIVE FOR HYDRAULICALLY ACTUATED HIGH-VOLTAGE POWER CIRCUIT BREAKERS

Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

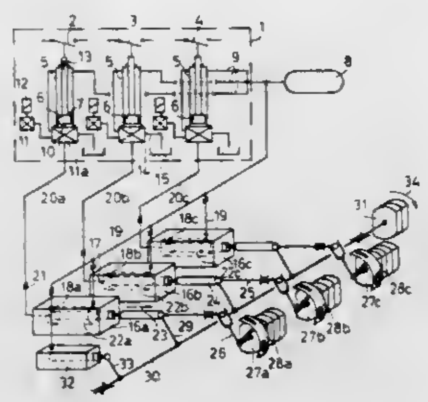
Filed Sep. 14, 1976, Ser. No. 723,204

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2543107

Int. Cl.^{2} H01H *35/38*

U.S. Cl. 200—82 B **6 Claims**

1. Control apparatus for controlling the drive of a high voltage circuit breaker including a number of hydraulically actuated circuit breaker units, said control apparatus comprising:
a number of hydraulically actuated position signal transmitter means each including means adapted to be connected to a different circuit breaker unit;
a number of freewheel clutches each connected to a different one of said signal transmitter means;
control switch means responsive to each said signal transmitter means for permitting transmission of an off command to a breaker unit only when all of said signal transmitter means are in an on position or an off position, said switch means being connected in series with each said transmitter means and including an actuating means connected to said clutches;



and accumulator means for continuously loading said switch means with a force which acts to bias said switch means in the off direction.

4,101,747

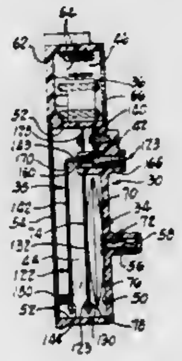
DIFFERENTIAL PRESSURE OPERATED SWITCH

William J. Houk, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Jan. 30, 1976, Ser. No. 653,899

Int. Cl.^{2} H01H *35/32*

U.S. Cl. 200—83 A **10 Claims**



1. A differential pressure responsive control device comprising:
(a) a support housing;
(b) a control switch member supported by said support housing and movable relative to said housing between first and second positions, said member defined by a thin sheet of electrically conductive material cantilevered to said housing and resiliently deflectable between said positions, said member biased toward said first position;
(c) a bladder operatively interposed between said member and said housing to effect movement of said member to said second position from said first position, said bladder formed at least in part by supple film material and constructed and arranged to be inflatable up to a predetermined volume without resiliently deforming the film material;
(d) conduit means for communicating the interior of said bladder to a source of fluid so that the bladder is inflated toward said predetermined volume when the fluid pressure level in said bladder exceeds the pressure ambient said bladder;
(e) said member defining a major face confronting said bladder and said supple film material of said bladder engaging and conforming to said member face so that differential pressure force is applied to said member for moving said member to said second position when the volume of said bladder is substantially less than said predetermined volume.

4,101,748

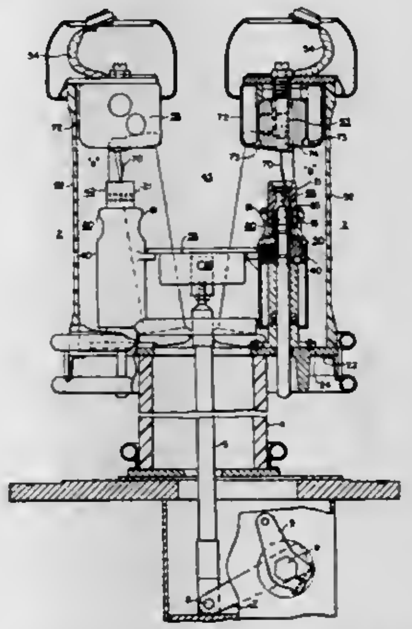
MODULAR PUFFER-TYPE CIRCUIT-INTERRUPTER UNIT ADAPTABLE FOR DIFFERENT VOLTAGE AND CURRENT RATINGS

Jeffry R. Meyer, Penn Hills Township, Allegheny County, and Robert L. Hess, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,466

Int. Cl.^{2} H01H *33/82, 9/30*

U.S. Cl. 200—148 A **6 Claims**



1. A gas-blast circuit-interrupter comprising, in combination, means defining a grounded metallic tank, a pair of terminal-bushings extending into said grounded metallic tank and carrying a pair of spaced interiorly-disposed line-terminal connections at the inner ends thereof, at least one modular-type puffer-interrupting unit disposed within said tank, a metallic supporting plate at high voltage (186) disposed within said grounded metallic tank for fixedly supporting said modular-type puffer-interrupting unit, insulating supporting means (95) for supporting said metallic support-plate (186) within said tank an adequate insulated distance from the inner walls of said grounded metallic tank, means defining a stationary contact structure (53) having a flexible line-connector (110), a side insulating bridging baffle-plate for solely fixedly supporting the stationary contact structure from said metallic supporting plate (186), means defining a fixed piston structure (50) supported from said metallic supporting plate (186), means defining a movable contact assemblage comprising an insulating hollow nozzle, a movable contact and a movable operating cylinder with the latter slidably moving over said relatively-fixed piston structure for the compression of gas therebetween, said movable contact being cooperable with said relatively-stationary contact structure (53) to establish an arc (70) through said insulating hollow nozzle (21), the gas compressed between the movable operating cylinder and the stationary piston structure passing through said hollow nozzle (21) adjacent the established arc (70) to effect the extinction thereof, operating-rod means for actuating the movable contact structure reciprocally operable through said metallic supporting plate (186) for effecting the opening and closing operations of said modular-type puffer-interrupting unit, means electrically connecting said flexible terminal-lead (110) with one of said two terminal-bushings, means electrically connecting the movable contact structure to the line-terminal connection of the other terminal-bushing, and said side insulating bridging baffle-plate not only serving as the sole supporting means for the relatively-stationary contact structure (53) but, additionally, preventing the lateral dispersion of the emanated hot arcing gases from reaching the inner side metallic tank wall which would tend to promote voltage flashover.

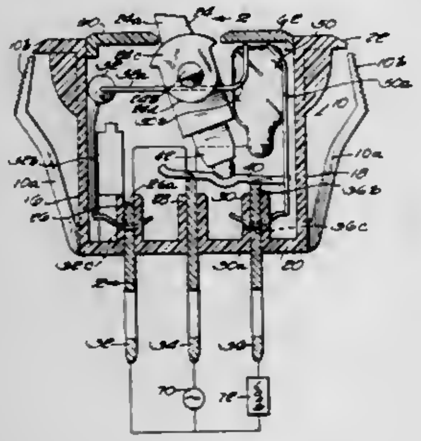
4,101,749
ELECTRICAL ATTACHMENT OF INDICATING LAMP TO TERMINALS IN ELECTRIC SWITCHES

Leonardus J. Josemans, Smithfield, N.C., and John A. Swessel, Jr., Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Dec. 15, 1976, Ser. No. 750,969

Int. Cl.^{2} H01H *9/00*

U.S. Cl. 200—317 **5 Claims**



1. In an electric switch, in combination:
(a) a switch housing,
(b) at least two spaced apart inwardly extending boss portions within said housing, each thereof having an aperture extending therethrough to an outer surface of the housing and a transversally extending notch formed at its inner end,
(c) terminal members secured in place within the apertures in said boss portions and extending outwardly of said housing, each of said terminals being provided with a transverse aperture which is partially aligned with the bottom end of said notch in its associated boss portion, and
(d) an electric indicating lamp mounted in said housing and having lead means extending through said notches in said boss portions and anchored in good electrical conducting relation with said terminal members between the bottom ends of said notches and the margins of the transverse terminal apertures.

4,101,750
DOOR INTERLOCK SYSTEM FOR MICROWAVE OVEN

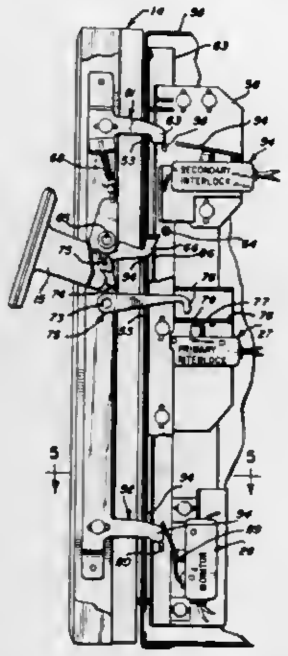
John T. Doner, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,832

Int. Cl.^{2} H05B *9/06*

U.S. Cl. 219—10.55 C **29 Claims**

1. In a microwave oven having a cabinet defining an oven cavity having a front opening, a door movably mounted to said cabinet for selectively closing said opening, electrically operable microwave energy generating means for supplying electromagnetic energy to said cavity, and an electrical circuit including switch means for providing electric power from an external source to said electrically operable means, improved means for selectively securing said door in a closed position wherein the door closes said opening, and selectively operating said switch means, said improved means comprising:
a slider member movably mounted to said cabinet for movement between released and interlocking positions;
catch means movable with said slider member; and
interlock means including an operator member for selectively moving said slider member to said interlocking position with said door disposed in said closed position, latch means carried by said door and engageable with said catch means with said door disposed in said closed position and as a result of said slider member being disposed in said interlocking position, and actuator means operable substantially concurrently with said latch means for operating said switch means to permit operation of said generating means only when said door is latched in said closed position.



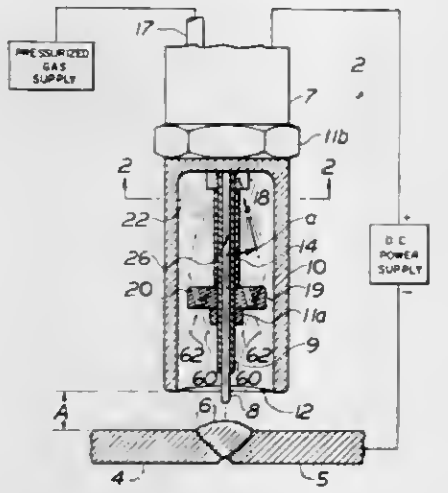
4,101,751
APPARATUS AND METHOD FOR INERT GAS ARC WELDING

John M. Urbanic, Pittsburgh, and Burney A. Major, Spring Church, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 3, 1977, Ser. No. 803,022

Int. Cl.^{2} B23K *9/16*

U.S. Cl. 219—74 **12 Claims**



1. An arc welding device including,
an elongated cup being substantially closed at its distal end and being substantially open at its proximal end,
inlet means adjacent the distal end of the cup for introducing gas into the cup,
electrode means disposed inside said cup and extending axially thereof,
diffuser means disposed partway along the axis of said cup between said inlet means and said open end of the cup,
said diffuser means having at least one set of passageways therein having their axes inclined away from the longitudinal central axis of the cup, and
at least one other set of passageways having their axes inclined toward said longitudinal central axis,
the two sets of passageways alternating with one another for creating two sets of gas columns passing by but not intersecting one another.

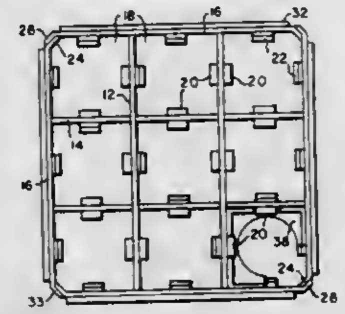
4,101,752
PROCESS FOR WELDING CORNER CELLS IN FUEL ASSEMBLY GRIDS

Robert Duncan, Fork, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1976, Ser. No. 723,271

Int. Cl.^{2} B23K *11/10*

U.S. Cl. 219—91.2 **4 Claims**



1. A process for welding framing members of a grid for a nuclear reactor fuel assembly comprising the steps of:
assembling a fuel assembly grid by interleaving straps having dimples and springs thereon to form a grid of egg crate configuration;
placing frame members peripherally around said interleaved grid so that the end of adjacent members overlap one another;
placing said grid in a fixture;
inserting in each of the grid corner cells a tool having outside dimensions equal to the inside dimensions of the corner cells and having an opening therein which is located in alignment with the overlapping frame member ends;
moving said fixture with its enclosed grid and tool onto a welding electrode so that the electrode tip extends through the tool opening and engages the overlapping frame ends;
moving an electrode of opposite polarity into contact with said overlapping ends and opposite said first electrode to thus spot weld said overlapping ends; and
removing said fixture from the welding apparatus.

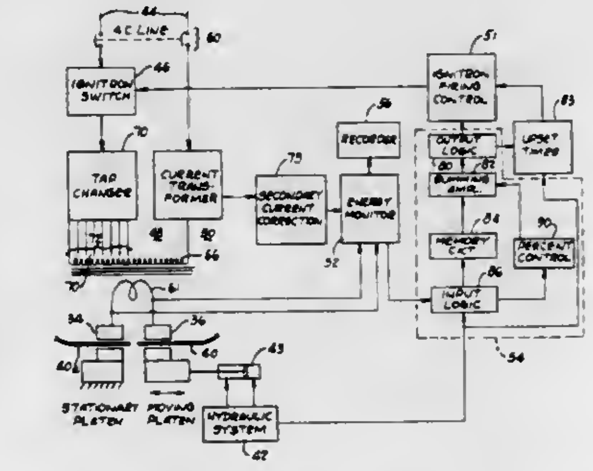
4,101,753
FLASH WELDING APPARATUS AND METHOD

Grier E. Buff, Gadsden, and Talmadge V. Phillips, Ragland, both of Ala., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 30, 1976, Ser. No. 653,837

Int. Cl.^{2} B23K *11/04*

U.S. Cl. 219—97 **7 Claims**



1. A system for executing a welding cycle including a flashing step and an upset step for flash welding together workpiece surfaces, the system comprising:
(a) apparatus for executing an initial flashing step comprising:
  (i) apparatus for moving the workpiece surfaces toward each other, and
  (ii) means for applying electrical energy between the workpiece surfaces during such motion to cause flash heating of the surfaces;
(b) apparatus for continuously monitoring the amount of electrical energy applied during the welding cycle, including during the flashing step, by producing a total energy output signal continuously representing the instantaneous time integrated electrical power applied during the welding cycle; and
(c) apparatus for subsequently executing an upsetting step, comprising:
  (i) apparatus for forcing the workpiece surfaces together subsequent to the flashing step; and
  (ii) control circuitry for continuing the application of electrical energy to the workpieces for a time during the upsetting step, said time being a function of the amount of electrical energy applied during the flashing step,
(d) said control circuitry comprising:
  (i) memory circuitry responsive to the energy monitor for storing a signal representing the amount of electrical energy applied during the flashing step;
  (ii) comparing circuitry connected to said energy monitor and said memory circuit for indicating the value of the stored signal relative to that of the total energy output signal, and
  (iii) output logic circuitry responsive to the comparing circuitry for terminating the electrical energy application when the comparing means indicates that the value represented by the energy monitor total energy output signal exceeds the value represented by the stored signal by a predetermined function of the stored signal value.

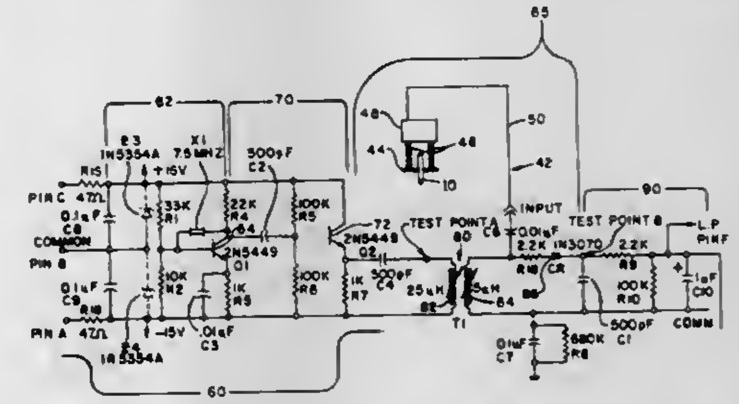
4,101,754
ADJUSTING CIRCUIT FOR USE IN PLASMA ARC CUTTING TORCH

Robert L. Fischer, Huntington, W. Va., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,605

Int. Cl.^{2} B23K *9/10*

U.S. Cl. 219—121 P **18 Claims**



1. In a plasma arc torch cutting assembly including a control circuit for automatically controlling the height of a plasma arc torch above a metal work piece to be cut; said cutting assembly including a water muffler assembly for reducing noise and fumes generated by the cutting torch; said control circuit including a reference voltage circuit having means for manually setting the desired height of the plasma torch above the work piece, and a detector circuit which senses the height of the plasma torch above the work piece based on the difference in control capacitance between the work piece and a sensor located adjacent said plasma torch; said reference voltage circuit and said detector circuit being fed into a differential amplifier; said differential amplifier connected to means for varying the height of said plasma arc torch; the improvement

wherein the reference voltage circuit includes an adjusting circuit which takes into account the effect of water on the work piece which caused a significant change in said control capacitance; said adjusting circuit including means for varying the reference voltage applied to said differential amplifier to compensate for the change in the detector circuit voltage caused by the change in said control capacitance caused by water on the work piece.

4,101,755
AUTOMATIC ARC WELDER

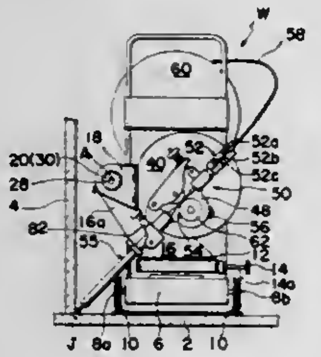
Takafumi Uratani, Osaka, Japan, assignor to Osaka Transformer Co., Ltd., Osaka, Japan

Filed Feb. 3, 1977, Ser. No. 765,406

Claims priority, application Japan, Feb. 13, 1976, 51-15015[U]; Feb. 13, 1976, 51-15016[U]; May 14, 1976, 51-60103[U]

Int. Cl.^{2} B23K *9/12*

U.S. Cl. 219—124.31 23 Claims



1. An automatic arc welder capable of performing various types of weldings such as non-positioned fillet welding, horizontal welding and flat positioned welding, through continuous feeding of electrode wire extracted from a wire drum onto a joint formed between two metal plates, said automatic arc welder comprising;

- a. a carrier member having means for traveling said carrier member along the joint;
- b. a first bracket mounted on said carrier member, said first bracket having formed therein a support at an end portion thereof;
- c. a second bracket having formed therein a coupling member for rotatably coupling said second bracket onto said support of said first bracket for rotating the second bracket on an imaginary plane perpendicular to the movement of the carrier member;
- d. a first clamping means for tightly clamping said second bracket with respect to said first bracket at a predetermined rotated position;
- e. a welding unit including an electrode wire feeding member for continuously feeding electrode wire extracted from the wire drum and a welding torch for guiding a tip end of said electrode wire towards an end of and further outside of said welding torch, said welding unit rotatably supported with respect to said second bracket on said imaginary plane for changing directing direction of said welding torch; and
- f. a second clamping means for tightly clamping said welding unit with respect to said second bracket at predetermined rotated position, whereby tip end of said welding torch, upon rotation of said second bracket into said first described predetermined position with respect to said first bracket and upon rotation of said welding unit into said latter described predetermined position with respect to said second bracket, can be positioned adjacent to said joint and can be directed towards the joint for effecting said various types of weldings.

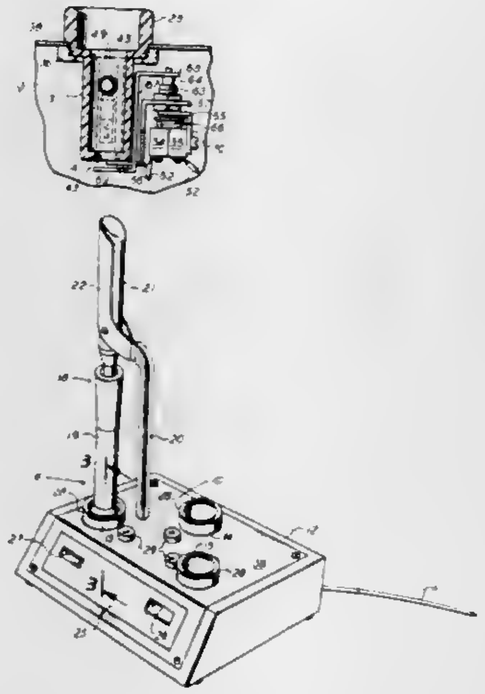
4,101,756
ELECTRICALLY HEATED CURLING IRON AND STAND THEREFOR

Jiichi Yamano, 288 2-chome Nishiokubo, Shinjuku-ku, Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 667,894

Int. Cl.^{2} H05B *1/00;* A45D *1/04*

U.S. Cl. 219—222 1 Claim



1. Hair curling apparatus comprising in combination at least one hair curling iron having a hair mandrel, a heat insulating handle, an electrically energized heating element enclosed in the curling iron and heat-conductively joined to the mandrel of the curling iron, electrically and spatially separated electrical contact zones on the curling iron handle remote from said mandrel electrically connected to the heating element, an electrically energizable stand, at least one receptacle on said stand, each adapted to receive the handle of one of said at least one curling iron for supporting the curling iron in the stand, electrically and spatially separated contact poles in each receptacle adapted to make electrical contact each with a separate contact zone on the curling iron handle received in the receptacle, a separate electrical line in the energizable stand electrically connected to each contact pole, a normally open switch having conventional spring-biased switch operators in each electrical line, a lesser beam fixed to each receptacle, said normally open switches being secured in pairs to said lesser beam, an actuating pin journalled in said lesser beam to engage the switch operators of said pair of normally open switches, a greater beam secured to the actuating pin to move therewith, a lower arm on the greater beam; a plug shank on the curling iron handle adapted to contact said lower arm of said greater beam when the handle is inserted into the receptacle, and a spring leaf integral with said actuating pin to transmit thrust between the pin, actuated by impingement of said plug shank on the lower arm of the greater beam, and the switch operators of said pair of switches to close the switches the greater beam being movable from the switch closing position upon removal of the curling iron handle from the receptacle, under the thrust of the spring-biased switch operators.

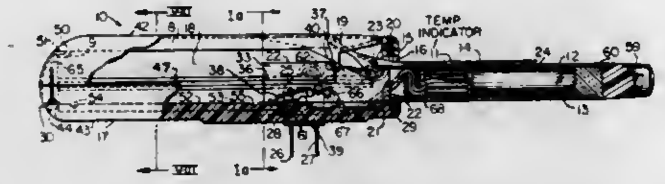
4,101,757
COLLAPSIBLE PORTABLE ELECTRIC HAIR CURLING IRON

Kenneth Arthur Van Dyck; James Bartlett Wyatt, both of Westport; Charles Francis Stephenson, Rowayton, and Scott William Miller, Stratford, all of Conn., assignors to The Gillette Company, Boston, Mass.

Filed Jul. 8, 1976, Ser. No. 703,581

Int. Cl.^{2} A45D *1/04;* H05B *3/06;* H01R *11/02*

U.S. Cl. 219—225 26 Claims



1. A curling iron comprising:
- a hollow handle having an open end;
- heat conducting means arranged in said handle for telescopic movement therein between a first position projecting from said handle and a second position substantially enclosed within said handle;
- an electric heat generating element associated with said heat conducting means for heating said heat conducting means; and
- electrical connector plug means electrically connected to said heat generating element and adapted to connect said heat generating element to an external source of power, said plug means being coupled to said heat conducting means for movement therewith and having bearing means projecting from said plug means for cooperating with means on said handle for moving said plug means between a first plug position projecting from said handle for conducting electrical energy to said heat generating element when said heat conducting means is in said first positon and a second plug position substantially entirely within said handle when said heat conducting means is in said second position in response to movement of said heat conducting means between said first and second positions.

4,101,758
ELECTRIC STEAM GENERATOR HAVING A MOVABLE DISTRIBUTION MEANS

Brinton Sprague, Bainbridge Is., Wash., assignor to Cam Industries, Inc., Kent, Wash.

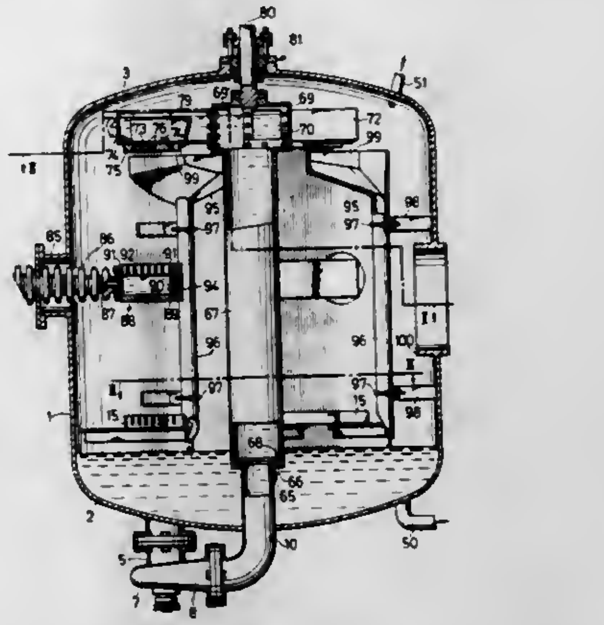
Filed Dec. 29, 1976, Ser. No. 755,200

Claims priority, application Switzerland, Jul. 13, 1976, 4989/76

Int. Cl.^{2} H05B *3/60;* F22B *1/30*

U.S. Cl. 219—285 8 Claims

1. In an electric steam generator, the combination comprising
- a vessel;
- at least one horizontally extending dish-shaped stationary electrode in said vessel for receiving and heating a supply of water and having openings therein forming outlets for the received water to form vertical water jets;
- a horizontally movable water distribution means located above each of said at least one electrode for movement relative to each of said at least one electrode in a range between a first position corresponding to a partial load on the generator and a second position corresponding to a full load on the generator, said distribution means having a chamber to receive water, said chamber including a horizontal bottom having a group of openings above each of said at least one electrode for directing vertical water jets against and into each of said at least one electrode; and,
- a water collecting means mounted in stationary manner in said vessel in a horizontal plane between said distribution means and each of said at least one electrode, said collecting means being vertically disposed below at least a portion of said distribution means when said distribution means is within said range and vertically out of alignment with each of said at least one electrode for collecting that portion of the water not directed at each of said at least one electrode.



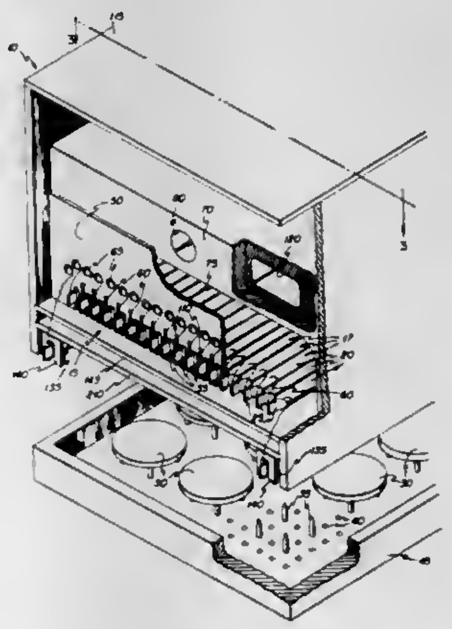
4,101,759
SEMICONDUCTOR BODY HEATER

Thomas R. Anthony; Harvey E. Cline, both of Schenectady; John O. Fielding, Ballston Lake, and Carl A. Erikson, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,512

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—343 17 Claims



1. A heater for processing one or more bodies of semiconductor material by temperature gradient zone melting, said heater comprising:
- a planar array of radiant heating elements, having two opposed sides and said array being oriented in a plane parallel to the one or more bodies of semiconductor material;
- means for mounting said radiant heating elements wherein each of said radiant heating elements is individually removable and replaceable without disengaging any other radiant heating element from said mounting means;
- said means for mounting said radiant heating elements comprises first and second terminal plates, each of said terminal plates being slotted in a plurality of locations along one

edge thereof, said slots accommodating the ends of said radiant heating elements and having cooling gas passages therethrough located between said ends of said radiant heating elements to provide a longitudinal means for cooling each of the elements, said terminal plates including a plurality of electrical terminals, each of said terminals being electrically connected to one of said radiant heating elements;

a reflector, disposed parallel to and spaced from one side of said planar array of radiant heating elements, said reflector being provided with internal cooling passages and a polished reflective surface and including first and second sides and first and second ends, and

said internal coolant passages within said reflector comprise a first coolant passage adapted to accommodate a flow of cooling gas and a second coolant passage adapted to accommodate a flow of liquid coolant.

4,101,760
REFRACTORY GRANULAR EMBEDDING COMPOSITION FOR ELECTRIC HEATING COILS

Hanno Roller, Kandel, Pfalz, Germany, assignor to Firma Fritz Eichenauer, Germany

Filed Apr. 5, 1976, Ser. No. 673,527

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1975, 2514578

Int. Cl.^{2} H01B *3/46, 3/12;* **H05B** *3/48, 3/18*

U.S. Cl. 219—544 **15 Claims**

1. A refractory, granular, electrically-insulative composition suitable for use as an embedding composition for electric heating coils, which composition comprises fused and granulated, high-melting, ceramic material having solid granulated polyalkylsiloxane or polyarylsiloxane admixed therewith in a proportion of from 0.5 to 5.0% by weight, expressed as an added weight, based on the weight of the ceramic material.

13. An electrical heating element comprising a housing and an electric heating coil which is embedded in a refractory, granular, electrically-insulative composition contained within said housing which composition comprises fused and granulated, high-melting, ceramic material having solid granulated polyalkylsiloxane or polyarylsiloxane admixed therewith in a proportion of from 0.5 to 5.0% by weight, expressed as an added weight, based on the total weight of the ceramic material.

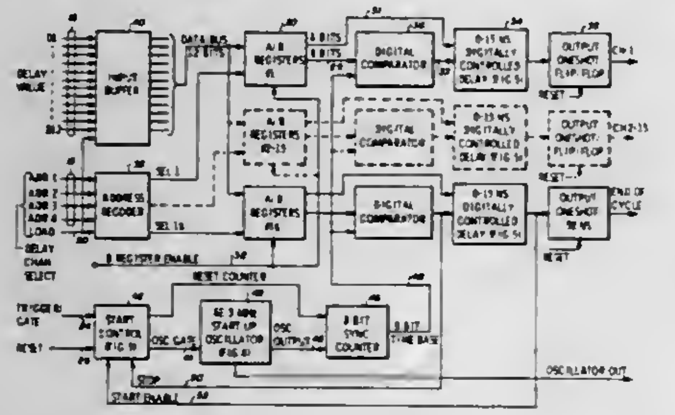
4,101,761
TIMING PULSE GENERATOR

Wayne R. Merryman, Lafayette, Calif., assignor to Pacific Western Systems, Mountain View, Calif.

Filed Nov. 26, 1976, Ser. No. 745,283

Int. Cl.^{2} G06M *3/02*

U.S. Cl. 235—92 CA **7 Claims**



1. In a timing circuit:

register means for registering a word having a first portion and a second portion and for providing said word at an output of said registering means;

a counter for providing an output;

clock means stepping said counter in predetermined increments of time through a plurality of states;

comparator means responsive to said counter output and to said first word portion of said output of said registering means for comparing said first portion of said word and the state of said counter and for generating a comparator output at an output of said comparator means when the two coincide; and

variable delay means having a plurality of predetermined selectable incremental delay values of time independent of said time increments of said clock means, said incremental delay values of time being of shorter duration than the time increments of said clock means and being responsive to the output of said comparator means and to said second portion of said output word of said register means for selecting the incremental value of said delay in accordance with information in said second portion of said word and for producing a timing pulse output at the end of said selected incremental amount of said delay

the starting time of said timing pulse output being thereby specified by information in said first portion of said word output of said register means and as further incrementally delayed in accordance with information in said second portion of said word.

4,101,762
RECORDING DISTANCE MEASURING INSTRUMENT AT VEHICLE WHEEL HUB

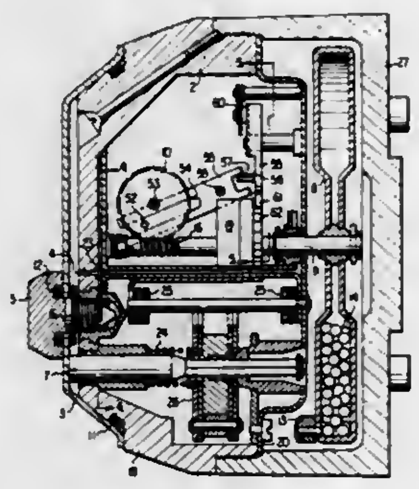
Carl Gote Lennart Borgstrom, Svangsta, Sweden, assignor to AB Record Taxameter AB, Halmstad, Sweden

Continuation-in-part of Ser. No. 549,702, Feb. 13, 1975, abandoned, and a continuation-in-part of Ser. No. 612,208, Sep. 10, 1975, Pat. No. 4,083,489. This application Jun. 14, 1976, Ser. No. 695,394

Claims priority, application Sweden, Feb. 27, 1974, 7402578; Australia, Feb. 21, 1975, 78449/75; Canada, Feb. 26, 1975, 220850; Denmark, Feb. 26, 1975, 766/75; United Kingdom, Feb. 27, 1975, 8197/75; Finland, Feb. 24, 1975, 750511

Int. Cl.^{2} G01C *27/00*

U.S. Cl. 235—95 C **4 Claims**



1. In a device attached to a vehicle hub for recording distances covered by the vehicle, wherein the device includes a counting mechanism having wheels that advance as the hub rotates, the improvement comprising:

a housing secured in fixed relation to said hub for containing said device and supporting said counting mechanism for rotation with said hub;

a shaft rotatably mounted in said housing for free rotation relative to each of said housing, said hub and said counting mechanism;

means for coupling said shaft to said counting mechanism to rotate the wheels of said counting mechanism, upon relative rotation between said shaft and said counting mechanism;

annular pendulum means non-rotatably secured to said shaft and tending to hold said shaft stationary with respect to said mechanism, said housing and said hub as said hub rotates;

an annular chamber within said pendulum means for holding a plurality of loose metal balls having a radial depth substantially less than the radial depth of said annular pendulum means, said loose metal balls moveable relative to said pendulum to change the center of gravity thereof, upon applying a vertical impact to the hub, so that the pendulum rotates; and

means fixed to said pendulum for returning said pendulum to essentially the same position, with respect to said hub, after the vertical impact has occurred, and to prevent the pendulum from slowly migrating, when subjected to vibration forces.

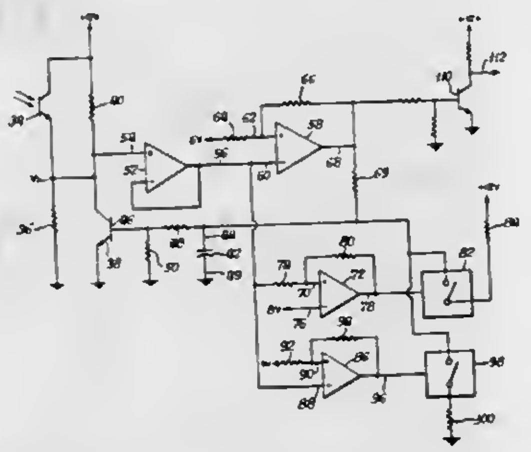
4,101,763
CONTROL SYSTEM FOR AN IMAGE DETECTOR

John R. Flint, Barrington, and K. George Rabindran, Lincolnwood, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jun. 3, 1977, Ser. No. 803,019

Int. Cl.^{2} H01J *39/12*

U.S. Cl. 250—214 R **14 Claims**



1. In an image detector having a light source, a light sensitive element disposed to receive light generated by the light source for generating a current proportional to the level of light incident thereon, and an image path along which an image bearing element is conveyed adjacent the light sensitive element for varying the light incident upon the light sensitive element in response to the presence and absence of an image, a control system for generating an image location voltage of a first predetermined level in the absence of an image and an image location voltage of a second predetermined level in the presence of an image, the control system comprising:

impedance means receiving the current from the photosensitive element for generating an image location voltage;

a variable current source having an output coupled to said impedance means and an input;

a charge storing element coupled to the input of said variable current source, said variable current source generating a current proportional to the level of charge on said charge storing element for varying its current output and thereby the level of said image location voltage;

first means responsive to the image location voltage exceeding a selected voltage level intermediate the intended first and second predetermined levels for discharging said charge storing element and raising the level of the image location voltage above the first predetermined level, and responsive to the image location voltage being below the selected voltage level for charging said charge storing element and lowering the level of the image location voltage below the second predetermined level;

second means responsive to the image location voltage exceeding the first predetermined level for charging said charge storing element and lowering the image location voltage below the first predetermined level;

third means responsive to the image location voltage being below the second predetermined level for discharging said charge storing element and raising the image location voltage above the second predetermined level,

whereby, when the image location voltage is intermediate the selected voltage level and the first predetermined level, said first means discharges said charge storing element and raises the image location voltage above said first predetermined level, whereupon said second means and said first means then alternately charge and discharge said charge storing element for alternately lowering and raising the image location voltage about the first predetermined level, and when the image location voltage is intermediate the selected voltage level and the second predetermined level, said first means charges the charge storing element to lower the level of the image location voltage below the second predetermined level, whereupon said third means and said first means alternately discharge and charge said charge storing element for alternately raising and lowering the image location voltage about the level of the second predetermined level to maintain the average level of the image location voltage substantially equal to the second predetermined level.

4,101,764
INCREMENTAL MEASURING SYSTEM

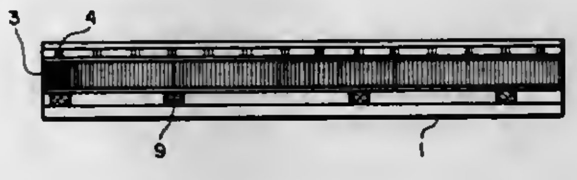
Günther Nelle, Siegsdorf, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 719,847

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540412

Int. Cl.^{2} H01J *3/14*

U.S. Cl. 250—237 G **7 Claims**



1. In an incremental measuring system, including a grid scale, an electronic counter, a plurality of fixed reference marks along the grid scale, and a movable sensor means for generating an electric impulse in conjunction with the reference marks for control purpose use by the electronic counter, the improvement comprising a series of movable selection indicators adjustable along the grid scale for association with each of the fixed reference marks needed for control purposes, and a switch means for cooperating with the adjustable selection indicators to prevent electric impulses generated by the sensor means, in conjunction with reference marks not associated with a selection indicator, from reaching the electronic counter.

4,101,765
MEANS FOR COUNTERACTING CHARGED PARTICLE BEAM DIVERGENCE

Edwin B. Hooper, Jr., Danville, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

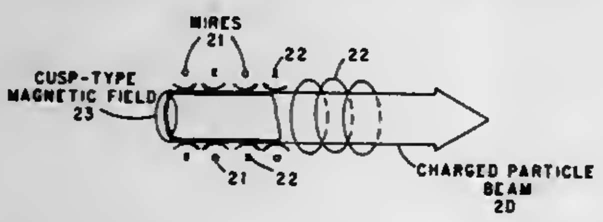
Filed Jul. 19, 1976, Ser. No. 706,402

Int. Cl.^{2} G01N *27/78*

U.S. Cl. 250—251 **7 Claims**

1. In combination with a neutral beam-generating system composed of a low energy beam section, an ion accelerator aligned to receive a beam from said low energy beam section, and a charge exchange cell aligned to receive the output from

said accelerator; apparatus for counteracting charged particle beam divergence comprising means for forming a cusp-type magnetic field positioned about an associated neutral beam, said magnetic field forming means being positioned in said low energy beam section of said neutral beam-generating system for deflecting and redirecting particles tending to diverge from a desired beam direction.



4,101,766

X-RAY IMAGE INTENSIFIER PHOTOFLUOROGRAPHY APPARATUS FOR CORRECTING THE BRIGHTNESS OF THE OUTPUT IMAGE

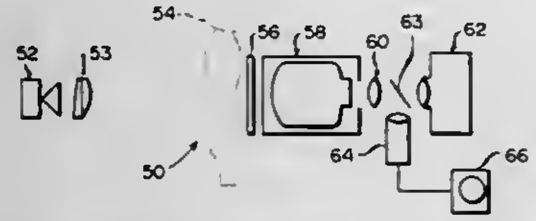
Hiroshi Minami, Yokohama; Norio Harao, Koza, and Takuji Tsuneoka, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 3, 1977, Ser. No. 756,003

Claims priority, application Japan, Jan. 10, 1976, 51-2191

Int. Cl.^{2} G03B *5/17*

U.S. Cl. 250—320 **8 Claims**



1. An X-ray image intensifier photofluorography apparatus for emitting X-rays from an X-ray source through a subject to an X-ray image intensifier, converting the X-rays into amplified light, photographing the light image through a lens system in an optical camera, and correcting the brightness of the output image, wherein X-ray distribution-correcting filter means whose X-ray permeability is represented by an axially asymmetric form relative to the horizontal axis is disposed between the X-ray source and X-ray image intensifier.

4,101,767

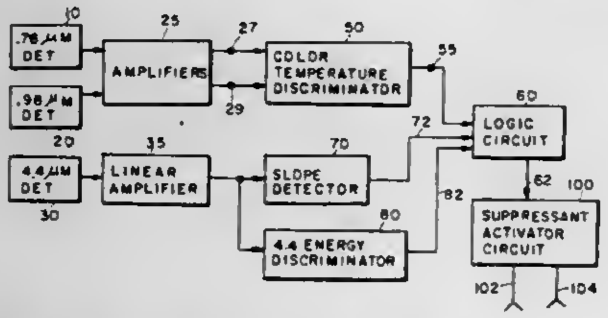
DISCRIMINATING FIRE SENSOR

John W. Lennington, Bellville, and Donald M. Szeles, Ann Arbor, both of Mich., assignors to Sensors, Inc., Ann Arbor, Mich.

Filed May 20, 1977, Ser. No. 798,801

Int. Cl.^{2} G01J *1/00*

U.S. Cl. 250—339 **20 Claims**



1. A discriminating fire sensor comprising:

first circuit means for detecting the color temperature of a fire and providing an output signal indicating that the color temperature of a fire is above or below a predetermined level;

second circuit means for detecting the energy level of a hydrocarbon fire and for providing a control output signal when the detected level is above a predetermined threshold and increasing at a predetermined rate; and

logic circuit means coupled to said first and second circuit means and responsive to signals therefrom for providing a suppressant activating signal only in response to a control signal from said second circuit means and when the signal from said first circuit means indicates the color temperature of the fire is below said predetermined level.

4,101,768

APPARATUS FOR COMPUTERIZED TOMOGRAPHY HAVING IMPROVED ANTI-SCATTER COLLIMATORS

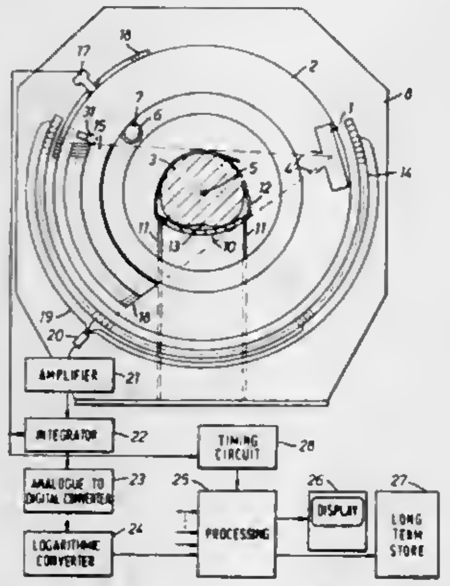
Brian Herbert Lill, Flackwell Heath, England, assignor to EMI Limited, Hayes, England

Filed Feb. 28, 1977, Ser. No. 772,688

Claims priority, application United Kingdom, Mar. 3, 1976, 8417/76

Int. Cl.^{2} A61B *6/00;* **G01N** *23/08*

U.S. Cl. 250—360 **8 Claims**



1. Radiographic apparatus including a source adapted to project a fan-shaped spread of penetrating radiation through a slice of the body of a patient, means for causing said source to effect at least an angular movement, relative to the body, about an axis intersecting the slice so as to project the radiation through the body from a plurality of directions, a plurality of detector devices disposed to receive the radiation after projection through the body and a plurality of plates disposed between the body and the detector devices to reduce the incidence, on detector devices being irradiated, of radiation transmitted from said source along indirect paths, wherein said source and said plates are arranged to move relative to said detector devices, the arrangement being such that said plates present substantially the same exit aperture to each detector device despite the relative movement.

4,101,769

METHOD FOR DIRECT MEASUREMENT OF BETA-RAY ABSORBED DOSE RATE AND AN INSTRUMENT THEREFOR

Kazuyoshi Bingo, and Katsuo Kawai, both of Tokai, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,082

Claims priority, application Japan, Oct. 6, 1975, 50-120531

Int. Cl.^{2} G01T *1/20*

U.S. Cl. 250—361 R **4 Claims**

1. A method of measuring the β-ray absorbed dose rate

corresponding to the epidermal thickness of tissue independently of β-ray energy by a β-ray detector including a thin scintillator, a photomultiplier, a preamplifier and an amplifier to obtain a desirable shape of pulse height distribution, said method comprising the steps of:

preparing said thin scintillator, the thickness of said scintillator being less than the range of high energy β-rays such as ^{32}P and ^{90}Y β-rays;

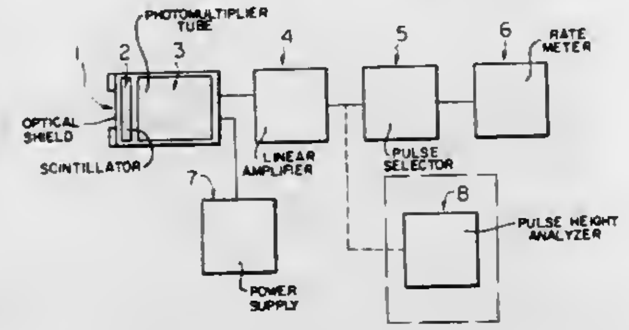
passing high energy particles from said β-rays through said scintillator;

releasing only part of the energy of said particles in said scintillator;

converting said energy into electric pulses by said β-ray detector, the height of said pulses being smaller than that of the pulses caused by said high energy particles the energy of which is fully released in said scintillator, and confirming that the absorbed dose rate can satisfy the following equation:

$$\overline{D}_t\ (E \max) = K_t,\ \overline{C}_t\ (E \max),$$

where D_t (E max), C_t (E max) and K_t are the absorbed dose rate per fluence rate for β-rays the maximum energy of which is E max, the counting rate per fluence rate, and the conversion constant of counting rate - dose rate, respectively, and the suffix "*t*" represents the epidermal thickness of tissue and Ct (E max) obtained in accordance with the steps above, by counting said pulses selected with a single channel analyzer, the lower discrimination level and window width of which are defined by the epidermal thickness of tissue.



4,101,770

CAMERA ARRANGEMENT FOR SCINTIGRAPHY

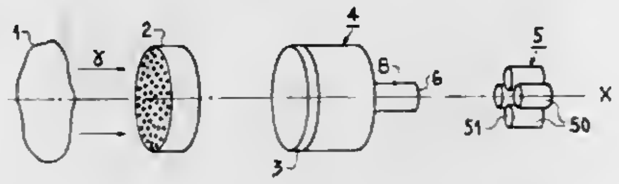
Henri Rougeot, and Guy Roziere, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 12, 1977, Ser. No. 796,342

Claims priority, application France, May 18, 1976, 76 14957

Int. Cl.^{2} G01T *1/20*

U.S. Cl. 250—363 S **2 Claims**



1. A camera assembly for use in scintigraphy in which the image of the subject, which is subjected to the circulation of a fluid containing an unstable isotope formed by the radiation emitted by the points of the subject under the effect of said isotope, is observed by elements in which each point of the image generates a signal, and in which a system ensures the treatment of the signals generated by each of said points in such a way as, on the one hand, to detect the energy of the radiation emitted by the corresponding point of the subject when it is struck by said isotope and, on the other hand, to define its position, wherein said treatment system is in two parts consisting of two delay devices imparting unequal delays to said signals, the first of said devices, which has the shorter delay, comprising means for roughly calculating the position of the point, means for correcting the inequalities of gain between the different points of the image and means for selecting the signals which have undergone said correction so as to exclude those signals which are not comprised between two limits, namely an upper limit and a lower limit, situated on either side of the energy level of the radiation normally emitted by the points of the subject reached by said flow, the second of the said devices comprising a calculator which receives, on the one hand, the said signals with a delay equal to that imparted to said signals by the first device and, on the other hand, the signals treated in said first device and which, during a second treatment and in a time appreciably greater than the preceding delay, computes the precise position of the point from which these signals have emanated, said treatment system finally comprising means for extracting the signals after treatment.

4,101,771

ION ELECTRON CONVERTER

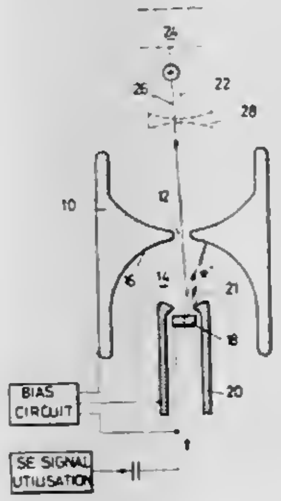
Wolfgang O. Hofer, Mühlgasse 16, Garching, and Jürgen Kirschner, Monheimsallee 62, Aachen, both of Fed. Rep. of Germany

Filed Jul. 30, 1976, Ser. No. 710,302

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1975, 2534796

Int. Cl.^{2} H01J *3/14*

U.S. Cl. 250—397 **13 Claims**



1. An ion electron converter comprising an electrode (10) having an aperture (12) adapted to be traversed by ions from an ion source (24), comprising a secondary electron emissive surface (16) on a first side which, in operation, is averted from said ion source and formed as a smoothly curved concave surface and defining a converter chamber (14);

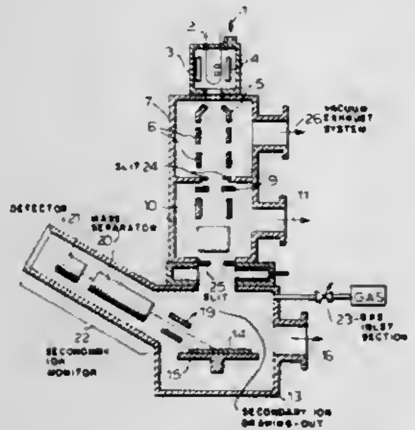
means for reflecting ions, that have passed through said aperture (12), onto said secondary electron emissive surface (16) including

electrode means (20) positioned within the converter chamber (14), and a bias voltage source means biassing the electrode means with respect to the secondary electron emissive surface to reflect ions unto said secondary electron emissive surface;

and a secondary electron detector (18) for detecting secondary electrons ejected from the secondary electron emissive surface (16) by said ions, located within the converter chamber and positioned with respect to the secondary electron emissive surface (16) to be essentially surrounded by at least a portion thereof.

4,101,772
ION-BEAM ETCHING METHOD AND AN APPARATUS THEREFOR

Fumiya Konishi, Toyonaka; Kenji Kusao, Osaka, and Yoshiaki Yoshioka, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 17, 1977, Ser. No. 759,870
Claims priority, application Japan, Jan. 19, 1976, 51-5242
Int. Cl.² A61K *27/02*
U.S. Cl. 250—399 **6 Claims**

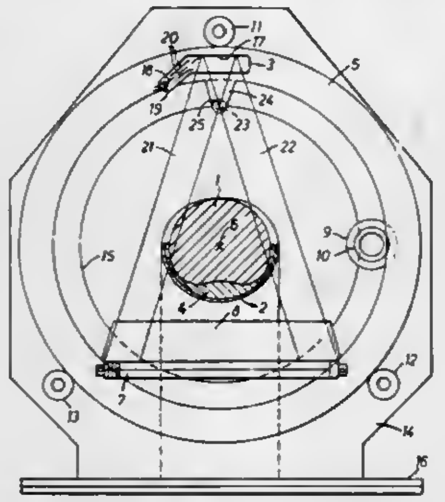


1. An ion-beam etching apparatus comprising:
an ion source for producing a beam of ions;
a beam focusing means aligned with the beam of ions from said ion source for focusing the beam from said ion source;
a beam source chamber enclosing said ion source and said beam focusing means for prevention of the introduction of unwanted gases into the path of the beam of ions;
a specimen chamber aligned with said beam focusing means and connected with said beam source chamber for prevention of the introduction of unwanted gases into the ion beam path and for holding a specimen to be etched by the beam from said beam focusing means;
a vacuum exhaust means connected to said beam source chamber and said specimen chamber for removing gas from the path of the beam of ions;
a gas introducing means connected to said specimen chamber for introducing gas into said specimen chamber; and
an additional vacuum exhaust means connected to said beam source chamber for removing gas from the path of the beam of ions.

4,101,773
RADIOGRAPHY

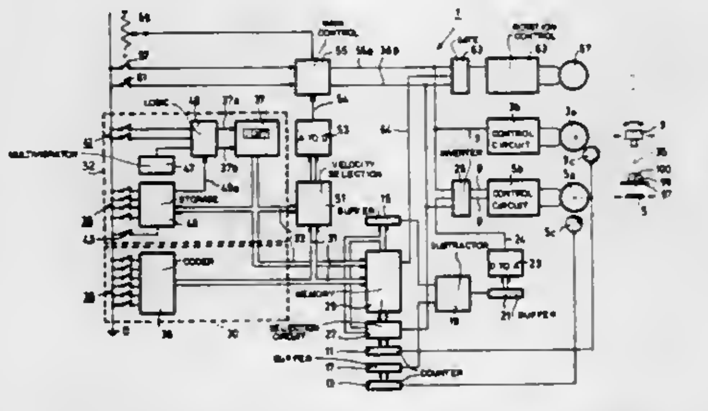
Christopher Archibald Gordon LeMay, Osterley, and Robert Paul Randall, Uxbridge, both of England, assignors to EMI Limited, Hayes, England
Filed Oct. 26, 1976, Ser. No. 735,012
Claims priority, application United Kingdom, Nov. 4, 1975, 45726/75
Int. Cl.² H05G *1/26*
U.S. Cl. 250—401 **7 Claims**

1. Radiographic apparatus including an x-ray tube arrangement having an electron emissive cathode, means for supplying energy to said cathode, during operation of said tube, to cause said cathode to emit electrons, means constraining said electrons to form a beam, an x-ray emissive target disposed to intercept said beam and adapted to emit x-radiation in response to the impingement thereof of said beam, support means supporting said tube, in spaced relationship with respect to a patient, so that said radiation travels towards the patient, detector means, disposed in the space between said tube and the patient, to detect radiation emitted by said tube, said detector means producing an output signal indicative of the amount of said radiation detected thereby, and regulating means utilising said output signal to regulate the supply of energy to said cathode, thus controlling the amount of x-radiation emitted by said tube.



4,101,774
X-RAY SYSTEM HAVING A DRIVING MECHANISM FOR AN X-RAY SOURCE AND AN X-RAY DETECTOR

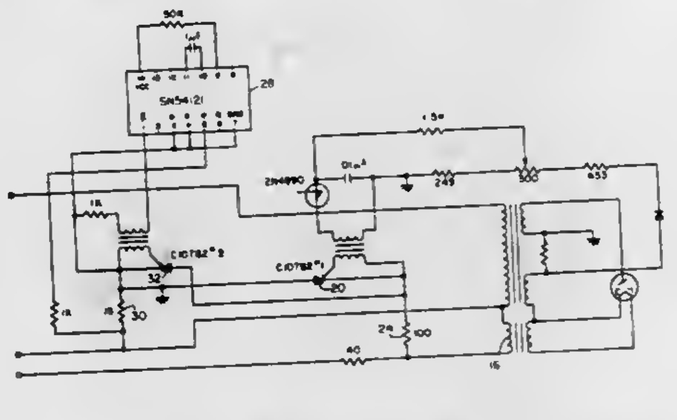
Johannes Mattheus Elzinga, and Albertus Derk Sondern, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 4, 1977, Ser. No. 765,525
Claims priority, application Netherlands, Feb. 6, 1976, 7601219
Int. Cl.² H05G *1/00*
U.S. Cl. 250—402 **9 Claims**



1. An X-ray system for making a shadow image of a layer of an object, which X-ray system comprises an X-ray source and an X-ray detector, as well as driving means which are designed to move the X-ray source and the X-ray detector with respect to each other in at least substantially parallel planes and with a constant velocity ratio in which the driving means comprise, in combination:
at least one electric motor driving the X-ray source;
at least one electric motor driving the X-ray detector, each electric motor being connected to an electronic control circuit to control the number of revolutions of said motor, an electric coupling existing between the electric motors; wherein the electric coupling comprises:
signal generators which are connected to the electric motor and/or to the X-ray radiator and detector driven by electric motors so as to obtain signals which are a measure of the instantaneous position of the X-ray source and detector;
at least one comparison circuit which is connected to the signal generators and functions to derive from the signals generated by the signal generators a correction signal for a control circuit of one of the said electric motors, whereby the movements of the X-ray source and detector are coordinated with each other; and
a controllable inverter circuit connected between the comparison circuit and the control circuit and selectably functioning in a first or in a second operating condition, as the need may be, a correction signal from the comparison circuit being inverted in the first operating condition and being not inverted in the second operating condition.

4,101,775
X-RAY TUBE CURRENT STABILIZING CIRCUIT

Frieder Hans Ensslin, Rochester, and Christopher Stevens Hazen, Fairport, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Mar. 17, 1977, Ser. No. 778,558
Int. Cl.² H05G *1/34*
U.S. Cl. 250—409 **1 Claim**

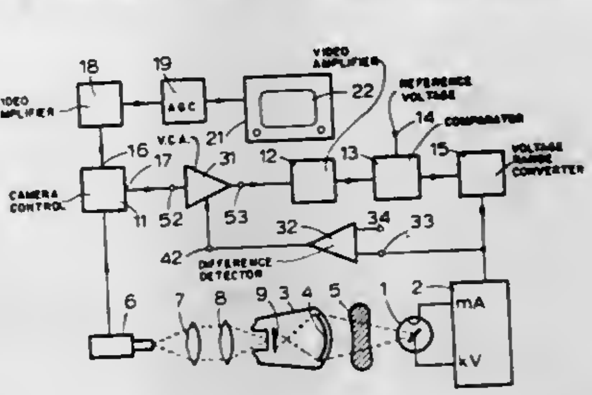


1. For use with a rectifying X-ray tube, a power supply providing stabilized tube current by controlling the current through a filament comprised of:
a high voltage source for providing tube voltage;
a resistor in series with said high voltage source and said tube for producing a current signal voltage corresponding to the tube current;
trigger means for providing a first trigger signal when the current signal voltage exceeds a predetermined value;
a current reducing circuit switchably connected to said filament;
first switching means for connecting said current reducing circuit to the filament upon receipt of said first trigger signal until the end of the then occurring half cycle,
timer means for providing a delayed second trigger signal delayed one half cycle after the trigger signal, and
second switching means for connecting said current reducing circuit to the filament upon the receipt to the second trigger signal until the end of the then occurring half cycle.

4,101,776
IMAGE INTENSIFIER T. V. FLUOROSCOPY SYSTEM

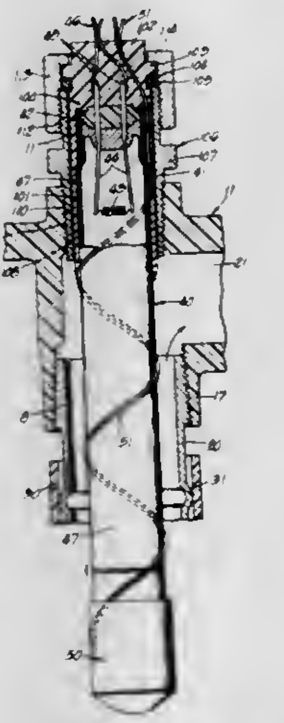
Brian A. Mansfield, London, and Royston K. Watkins, Surrey, both of England, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 22, 1976, Ser. No. 743,536
Claims priority, application United Kingdom, Nov. 25, 1975, 48361/75
Int. Cl.² G03B *41/16*
U.S. Cl. 250—416 TV **9 Claims**

1. An image intensifier TV system comprising:
an X-ray source for directing X-rays through a body;
television pickup means including an image intensifier which receives X-rays which pass through said body and which produces an image therefrom, and camera means which provide a video signal from said image;
display means which produce a display from said video signal and which include an automatic gain control function;
negative feedback means having a closed loop which adjust target anode voltage and current applied to said X-ray source in response to the level of said video signal; and
automatic control means which increases a loop gain of the closed loop if said target anode voltage exceeds a predetermined voltage.



4,101,777
FLUID PURIFICATION DEVICE AND ULTRAVIOLET LAMP THEREFOR

William P. Reid, 3200 E. 29th St., Long Beach, Calif. 90806
Continuation-in-part of Ser. No. 490,238, Jul. 22, 1974, Pat. No. 3,923,663. This application Sep. 8, 1975, Ser. No. 611,080
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.² G01N *21/26*
U.S. Cl. 250—436 **10 Claims**



1. An ultraviolet lamp for immersion in the fluid of a fluid purifying device, and the like, comprising: an elongate transparent envelope having sealed opposite ends, each mounting an ignition element located within said envelope; a continuous solid thin film of material having a non-stick characteristic with respect to a fluid being treated by the device, said film surrounding said envelope and being fixed to and in intimate contact with the outer surface of said envelope; base means at one end of said envelope including a base member hermetically sealing the adjacent end of said film with respect to said envelope; and a cap member for the opposite end of said envelope hermetically sealing the adjacent end of said film with respect to said envelope.

4,101,778

ROD-SHAPED SPECIMEN HOLDER FOR AN OPTICAL CORPUSCULAR-BEAM APPARATUS

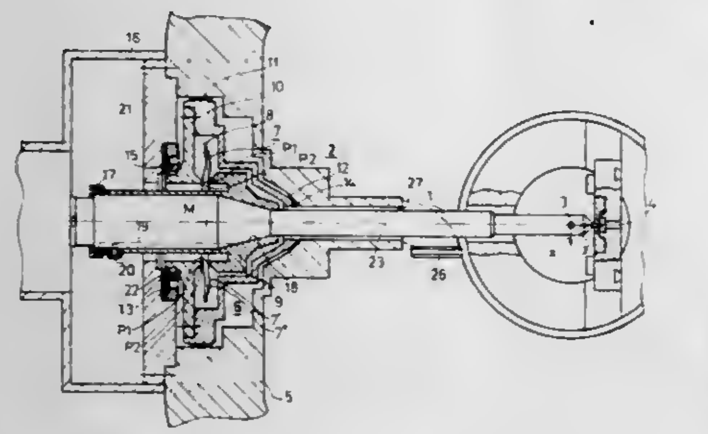
Moriz von Rauch, Berlin, Fed. Rep. of Germany, and Lee H. Veneklasen, San Leandro, Calif., assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,562

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2542351

Int. Cl.^{2} G21K *5/06*

U.S. Cl. 250—441 **2 Claims**



1. In an optical corpuscular-beam apparatus including a rod-shaped specimen holder passing through a wall of the apparatus, said holder being secured in the apparatus wall by a first bearing and engaging at one end an adjustable counterbearing in the interior of the apparatus, which apparatus interior is under a vacuum during operation of the apparatus; the improvement comprising:

- an outer housing, mounted on said apparatus wall and disposed about the other end of said specimen holder, which other end is located outside said apparatus interior, the interior of said outer housing being under vacuum during the operation of the apparatus; and
- said first bearing comprising a diaphragm disposed circumferentially about said rod-shaped specimen holder, said diaphragm being mounted in a second housing mounted within and rotatable with respect to said apparatus wall.

4,101,779

APPARATUS FOR MECHANICALLY SUPPORTING A MEDICAL DEVICE IN A PLANE

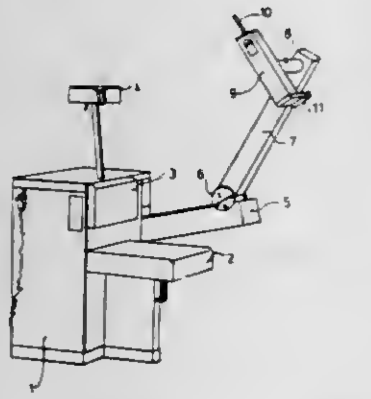
Walter Schmedemann, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,923

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536081

Int. Cl.^{2} H01J *35/16*

U.S. Cl. 250—445 R **3 Claims**



1. Apparatus for mechanically supporting a medical device at any position in a plane, comprising:

- a first supporting rod for pivotably supporting a medical device at a first pivot point along said rod;
- a first coupling rod pivotably connected to said first supporting rod at a second pivot point along said first supporting rod;
- A second coupling rod parallel to said first coupling rod and pivotably connected to said first supporting rod at a third pivot point between said first and second pivot points;
- a counterweight
- a second supporting rod supporting said counterweight at a fourth point along said second supporting rod, said second supporting rod being parallel to said first supporting rod and pivotably connected to said first and second coupling rods at fifth and sixth pivot points respectively, said fifth pivot point being between said fourth and sixth points, said second, third, fifth and sixth pivot points defining a parallelogram; and
- a pivot shaft perpendicular to the plane of the parallelogram and supporting one of said coupling rods at a balance point between the pivot connections thereof with said first and second supporting rods.

4,101,780

METHOD OF OBTAINING INTENSIFIED IMAGE FROM DEVELOPED PHOTOGRAPHIC FILMS AND PLATES

Barbara S. Askins, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 9, 1976, Ser. No. 694,406

Int. Cl.^{2} G03C *5/16, 1/04, 5/32;* **C09K** *3/00*

U.S. Cl. 250—475 **12 Claims**

1. A method of obtaining intensified images from silver images on developed films or plates comprising the steps of:

(a) converting silver of the developed film or plate to a radioactive compound by contacting said film or plate with an aqueous alkaline solution of an organo-S^{35} compound selected from the group consisting of thiourea-S^{35} and substituted thiourea-S^{35} compounds;

(b) placing said film or plate treated in step (a) in direct contact with a receiver film whereby said receiver film is exposed by radiation from said radioactive compound; and

(c) developing and fixing the resulting intensified receiver film.

4,101,781

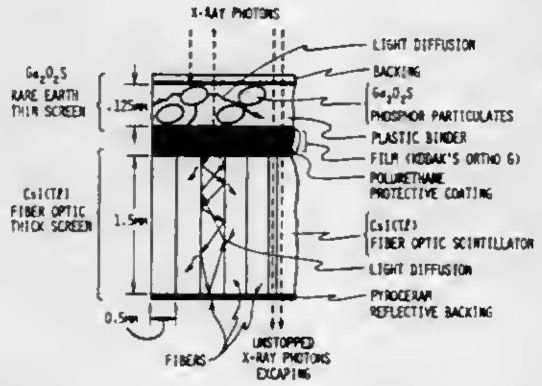
STABLE FIBER OPTIC SCINTILLATIVE X-RAY SCREEN AND METHOD OF PRODUCTION

Armand Paul Neukermans, Palo Alto, and William Paul Kruger, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 27, 1977, Ser. No. 806,966

Int. Cl.^{2} G01J *1/58*

U.S. Cl. 250—483 **16 Claims**


X-RAY PHOTONS
Gd₂O₂S RARE EARTH THIN SCREEN
.125mm
CsI(Tl) FIBER OPTIC THICK SCREEN
1.5mm
0.5mm
LIGHT DIFFUSION
BACKING
Gd₂O₂S PHOSPHOR PARTICULATES
PLASTIC BINDER
FILM (KODAK'S ORTHO G)
POLURETHANE PROTECTIVE COATING
CsI(Tl) FIBER OPTIC SCINTILLATOR
LIGHT DIFFUSION
PYROCERAM REFLECTIVE BACKING
FIBERS
UNSTOPPED X-RAY PHOTONS ESCAPING

1. A method of producing a fiber-optic scintillator that is stable under ambient conditions, the method comprising the steps of:

- evaporating a first material;
- evaporating a second material; and
- vacuum depositing the evaporated materials onto a selected backing material to produce a scintillator having uniformly shaped optical fibers that are stable under ambient conditions.

4,101,782

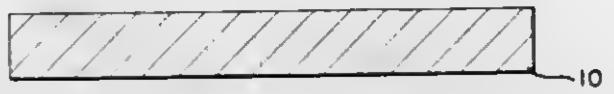
PROCESS FOR MAKING PATTERNS IN RESIST AND FOR MAKING ION ABSORPTION MASKS USEFUL THEREWITH

Robert L. Seliger, Agoura, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 626,425, Oct. 28, 1975, abandoned. This application May 5, 1977, Ser. No. 794,288

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 250—492 B **4 Claims**



1. A process for making a charged particle absorption mask including:

(a) providing an aluminum substrate,

(b) anodizing a surface of said substrate to thereby form an anodized Al_2O_3 coating thereon,

(c) depositing a gold mask on one surface of said anodized coating, and

(d) selectively removing a region of said aluminum substrate underlying said anodized coating and said gold mask to thereby expose said anodized coating and permit same to pass accelerated particles therethrough.

4,101,783

OZONE GENERATOR

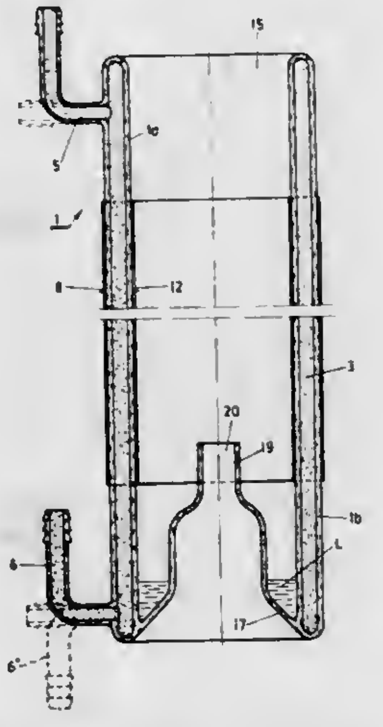
Felix Jakob Hutter, Altstätten, Switzerland, assignor to Hutter Apparatebau AG, Altstätten, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,766

Claims priority, application Switzerland, Jan. 20, 1976, 621/76; Jun. 14, 1976, 7550/76; Fed. Rep. of Germany, Dec. 10, 1976, 2656176

Int. Cl.^{2} C01B *13/11*

U.S. Cl. 250—540 **21 Claims**



1. Apparatus for enriching an oxygen-containing gas with ozone, comprising a one-piece twin-walled tube consisting of dielectric material and having an inner side and an outer side, said tube defining an annular chamber and further having an inlet for admission of oxygen-containing gas into and an outlet for evacuation of enriched gas from said chamber; a first electrode adjacent to said inner side; a second electrode adjacent to said outer side opposite said first electrode, at least one of said electrodes leaving exposed at least one substantially annular portion of the respective side; and means for confining a supply of liquid insulating medium in contact with said exposed portion of said last mentioned side to prevent the flow of creep currents between said electrodes during application of high voltage across said electrodes.

4,101,784

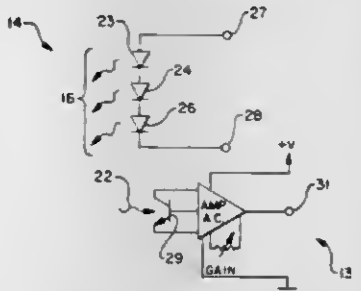
COLOR MARK DETECTOR

Paul Franklyn Key, San Martin, and Anthony Ross Lazzara, Portola Valley, both of Calif., assignors to Scientific Technology Incorporated, Mountain View, Calif.

Division of Ser. No. 712,607, Aug. 9, 1976, Pat. No. 4,047,023. This application Jun. 24, 1977, Ser. No. 809,542

Int. Cl.^{2} G06K *7/10*

U.S. Cl. 250—555 **3 Claims**



1. A method for detecting a mark on a surface having a contrasting background comprising the steps of projecting a pulsing multiwavelength component light beam toward the surface, sensing the intensity of light pulses reflected from the surface, producing sensing signals corresponding to the intensity of said light pulses, producing integrated signals from said sensing signals, producing time delayed reflected light pulse intensity signals from the integrated signals, comparing the sensed and time delayed signals, producing a dark mark output for sensed signals corresponding to lower intensity than those compared time delayed signals, and producing a light mark output for sensed signals corresponding to higher intensity than those compared time delayed signals.

4,101,785

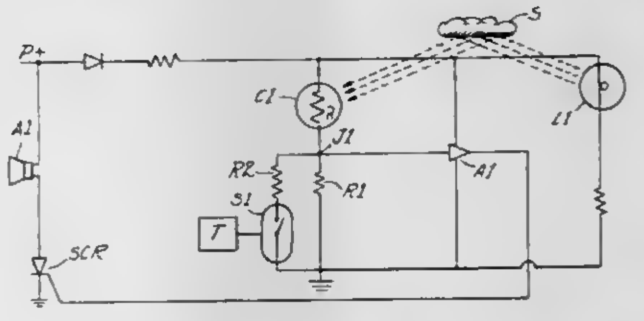
SMOKE DETECTOR WITH SWITCH MEANS FOR INCREASING THE SENSITIVITY

William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed May 19, 1977, Ser. No. 798,578

Int. Cl.^{2} G01N *21/26*

U.S. Cl. 250—574 **12 Claims**



1. A smoke detector comprising smoke responsive means and associated circuitry producing a signal output which is a function of smoke concentration and level detector means

responsive to said signal of a predetermined level to actuate alarm energizing means, and switch means so connected into said circuit that when the switch isin a first condition, the alarm is actuated at a lower smoke concentration than when the switch is in a second condition.

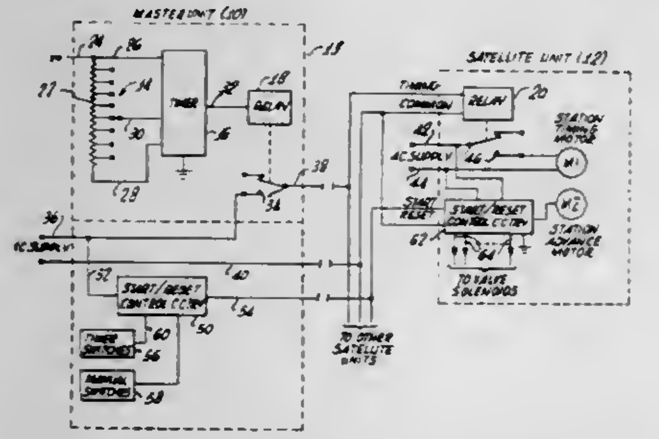
4,101,786
MASTER-SATELLITE IRRIGATION CONTROL SYSTEM WITH REMOTE PROPORTIONAL TIMING

Richard L. Ruggles, Mount Baldy, and Vinod Panday, Covina, both of Calif., assignors to Clemar Manufacturing Corporation, Glendora, Calif.

Filed Jun. 14, 1976, Ser. No. 695,908

Int. Cl.^{2} H02J *1/06*

U.S. Cl. 307—38 **16 Claims**



1. Remote proportional timing apparatus for controlling an irrigation system having master and satellite control units, said apparatus comprising:

timing signal source means located at a master control unit, for supplying timing signals which will in part determine the durations of energization of a plurality of valves;

timing signal utilization means at a satellite control unit, connected to operate in response to the timing signals transmitted from said timing signal source means and including means for controlling the durations of energization of the plurality of valves; and

timing signal conductor means connecting said timing signal source means to said timing signal utilization means; and

means for controlling said timing signal source means, thereby to vary the rate of operation of said timing signal utilization means, and to vary the durations of energization of the valves all to the same proportionate degree.

4,101,787
ELECTRICAL POWER SUPPLY

Ande R. Vail, Boise, Id., assignor to Meb, Ioc. and Au-Tom-A-Ton Research Company, both of Boise, Id.

Filed Sep. 15, 1976, Ser. No. 723,464

Int. Cl.^{2} H02J *7/00*

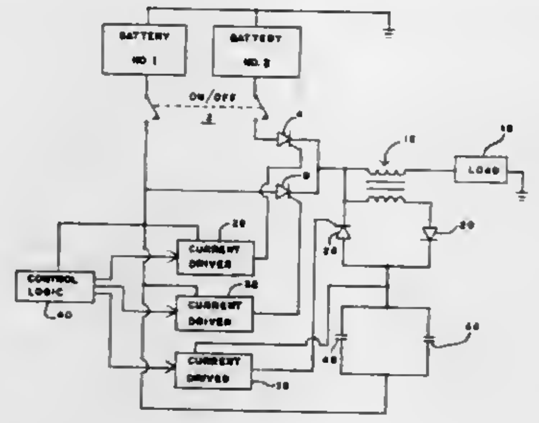
U.S. Cl. 307—81 **3 Claims**

1. In a power supply having a plurality of batteries for supplying direct current to a load, the respective batteries and load being coupled by switching means for alternately opening and closing the respective circuits between the load and each of the batteries to cause intermittent current flow between each of said batteries and said load serially, the improvement comprising a method for maximizing system efficiency including the steps of:

(a) determining the load current for operation of said load,

(b) selecting and providing batteries having an ampere/hour rating of at least ten times the value of the load current, and

(c) adjusting the switching means to alternately open and close the respective circuits at time intervals such that the closed circuit time duration for each of the circuits is between 2–6 seconds.



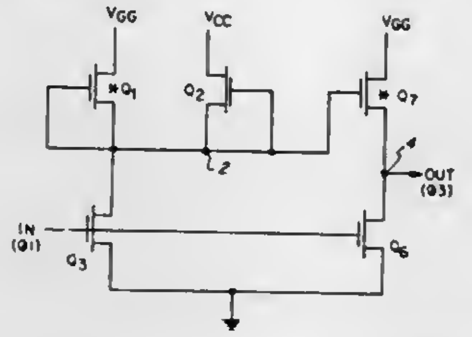
4,101,788
MOS BUFFER CIRCUIT

Lamar T. Baker, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,122

Int. Cl.^{2} H03K *19/08, 19/34, 19/36, 19/40*

U.S. Cl. 307—205 **19 Claims**



1. An MOS control circuit for controlling an output signal, said control circuit being coupled to first and second sources of potential comprising:

(a) a node;

(b) first circuit means for inverting an input signal and for producing an output potential at said node having a magnitude equal to the magnitude of said first source of potential;

(c) second circuit means coupled to said second source of potential for reducing said node potential by a desired amount;

(d) third circuit means coupled to said first cource of potential and driven by said reduced node potential for producing said control circuit output signal having a magnitude greater than the magnitude of said second source of potential but less than the magnitude of said first source of potential.

4,101,789
SIGNAL MULTIPLIER CIRCUIT FOR A VEHICLE ANTI-SKID WHEEL SENSOR

Gerhard Ruhnau, Hanover, Fed. Rep. of Germany, assignor to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 16, 1976, Ser. No. 714,294

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2549953

Int. Cl.^{2} H03K *21/00, 5/00;* B60T *8/00*

U.S. Cl. 307—220 R **10 Claims**

1. A frequency multiplier circuit having an output signal

whose alternation frequency is a multiple of the frequency of the sinusoidal input signal generated in accordance with the angular velocity of a rotating member, comprising:

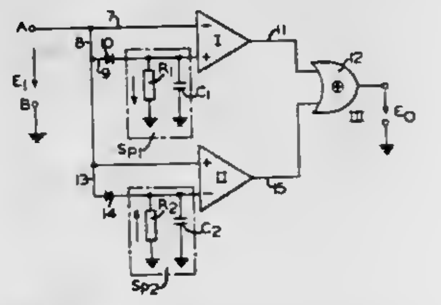
(a) an input terminal to which said sinusoidal input signal is connected;

(b) first and second comparators each having an output and a pair of inputs, one input of the first comparator and a different input of the second comparator being connected to said input terminal;

(c) first and second signal modifying circuit means connected to the other inputs of the respective comparators for providing a first and second modifying signal thereat with which said sinusoidal input signal is compared, each said first and second circuit means comprising:

(i) a capacitor connected between said input terminal and ground so as to be charged by said sinusoidal input signal; and

(ii) a resistor via which said capacitor of the same one of said circuit means is discharged in accordance with a certain chosen r-c time constant;



(d) first and second diodes, each disposed between said input terminal and the capacitor of a respective one of said first and second circuit means, whereby said one capacitor is charged to the peak value of the sinusoidal input signal during positive half-cycles and the other capacitor is charged to the peak value of the sinusoidal input signal during negative half-cycles thereof;

(e) said first and second comparators providing first and second difference signals at the respective outputs thereof in the absence of correspondence between the sinusoidal input signal and the modifying signal, said first and second difference signals having a 180° phase displacement therebetween; and

(f) logic means connected to the output of said first and second comparators for combining said first and second difference signals so as to provide a first multiple frequency output signal.

4,101,790
SHIFT REGISTER WITH REDUCED NUMBER OF COMPONENTS

Heichachiro Ebihara, Tokorozawa, and Takashi Yamada, Sayama, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 9, 1977, Ser. No. 776,018

Claims priority, application Japan, Mar. 10, 1976, 51-25042

Int. Cl.^{2} G11C *19/28;* H03K *17/60*

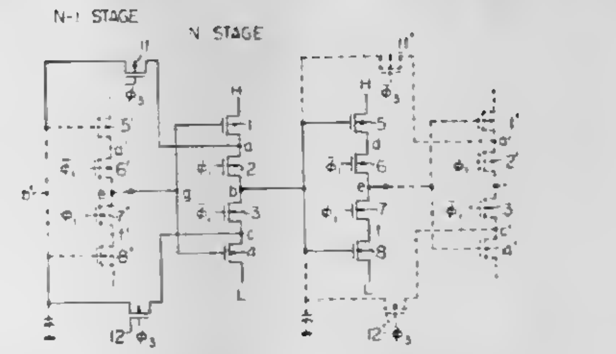
U.S. Cl. 307—221 C **5 Claims**

1. A shift register comprising:

a master section in which the drain electrode of a first P-channel MOS transistor having a source electrode connected to the high potential side of a power source is connected to the source electrode of a second P-channel MOS transistor at a first node, the drain electrode of said second P-channel MOS transistor is connected to the drain electrode of a first N-channel MOS transistor at a second node, the source electrode of said first N-channel MOS transistor is connected to the drain electrode of a second N-channel MOS transistor at a third node, and the source electrode of said second N-channel MOS transistor is connected to the low potential side of the power source; and

a slave section in which the drain electrode of a third P-channel MOS transistor having a source electrode connected to the high potential side of the power source is connected to the source electrode of a fourth P-channel MOS transistor at a fourth node, the drain electrode of said fourth P-channel MOS transistor is connected to the drain electrode of a third N-channel MOS transistor at a fifth node, the source electrode of said third N-channel MOS transistor is connected to the drain electrode of a fourth N-channel MOS transistor at a sixth node, and the source electrode of said fourth N-channel MOS transistor is connected to the low potential side of the power source;

wherein the respective gate electrodes of said first P-channel MOS transistor and said second N-channel MOS transistor are connected to each other at a seventh node, first and second clock pulses are applied to the respective gate electrodes of said second P-channel and first N-channel MOS transistors, the respective gate electrodes of said third P-channel MOS transistor and fourth N-channel MOS transistor are tied together and connected to said second node of the master section, and the second and first clock pulses are applied to respective gate electrodes of said fourth P-channel MOS transistor and third N-channel MOS transistor;



whereby the master section and slave section form a 1-bit stage which is thereafter connected to a plurality of similarly constructed cascades;

said first and third nodes of the master section, with the exception of the initial stage, being connected to a second node of the master section of the preceding stage through a fifth P-channel MOS transistor and fifth N-channel MOS transistor, respectively, with third and fourth clock pulses being applied to respective fifth P-channel MOS transistor and fifth N-channel MOS transistor thereby to produce an output at said fifth node.

4,101,791
DUAL CHANNEL WIDE-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFOR

Carl E. Atkins, Montclair, and Francis A. McGuirk, Jr., Chatham, both of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 660,116, Feb. 23, 1976, Pat. No. 4,045,778. This application Oct. 28, 1976, Ser. No. 736,374

Int. Cl.^{2} H03K *17/00*

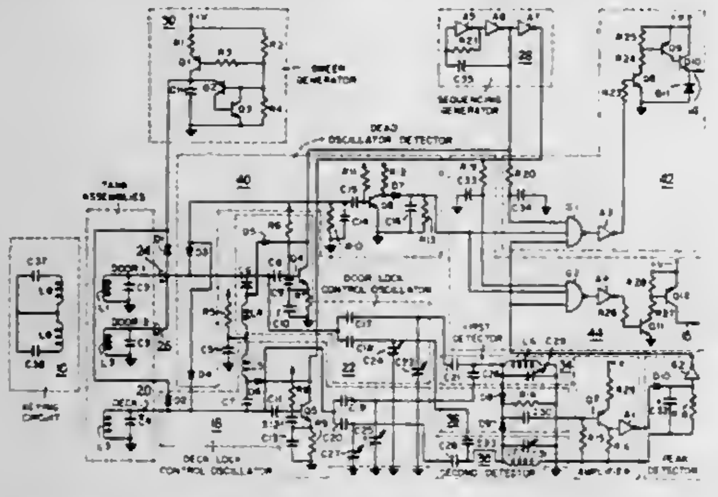
U.S. Cl. 307—308 **3 Claims**

1. In an electronically keyable control system of the type in which swept *rf* energy from a swept *rf* oscillator is connected to at least one sensing location and in which at least one keying signal is generated in response to a predetermined condition of physical proximity of a keying circuit to said sensing location, said keying circuit being resonant at at least one frequency within the sweep range of said swept *rf* oscillator, the improvement of a dead oscillator detector comprising:

(a) means for detecting a sample of the swept *rf* energy at at least one of said at least one sensing location;

(b) means for generating a constant enable signal when said sample of swept *rf* energy contains a predetermined modulation;

(c) said means for generating a constant enable signal being



operative to generate a constant inhibit signal during the absence of said modulation; and

(d) an AND gate receiving said enable and inhibit signals at one of its inputs and said keying signal at another of its inputs.

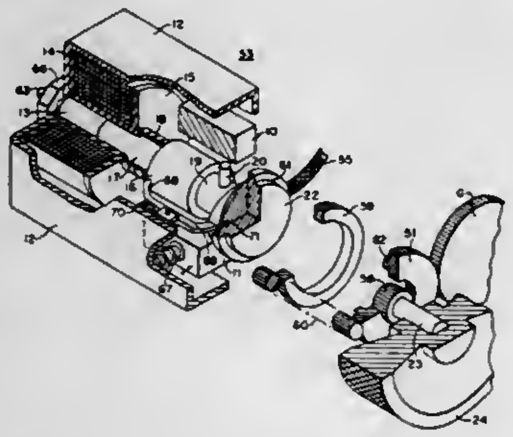
4,101,792
MECHANICALLY-POWERED ELECTRIC GENERATOR FOR INSTANT-PHOTOGRAPHIC CAMERA AND OTHER APPARATUS

William E. Shoupp, Pittsburgh, and Walter V. Bratkowski, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 380,179, Jul. 17, 1973, Pat. No. 3,840,297. This application Aug. 29, 1974, Ser. No. 501,560

Int. Cl.^{2} H02K ***35/00***

U.S. Cl. 310—15 **12 Claims**



1. A mechanically-powered generator for producing a pulse of electrical energy, said generator being of the recockable type and comprising the combination of;

a permanent magnet and a pole piece that are movable relative to one another and constitute parts of a magnetic circuit,

an armature that is movable toward and away from said pole piece and also constitutes part of said magnetic circuit, said armature being magnetically attracted to said pole piece and in magnetically captured relationship therewith when the electric generator is cocked and ready for use,

a winding of insulated wire disposed is inductive relationship with said magnetic circuit and oriented to generate a voltage pulse in response to a change in the flux density of the magnetic circuit produced by the movement of said armature relative to said pole piece,

means for tripping the cocked electric generator comprising means for displacing said permanent magnet and pole piece relative to one another a sufficient distance to effect a concomitant decrease in the field strength of the magnetic circuit, and

means for controllably storing mechanical energy and, in response to the actuation and operation of said tripping means, converting the stored mechanical energy into a force that acts on said armature and is so oriented and of such magnitude that the weakened magnetic attractive force on the armature is overcome and the position of said armature relative to the pole piece is thereby rapidly shifted and causes a voltage pulse to be generated by the wire winding.

4,101,793
ROTATING MACHINE USING A COOLING FLUID SUPPLIED BY A ROTATING SEAL

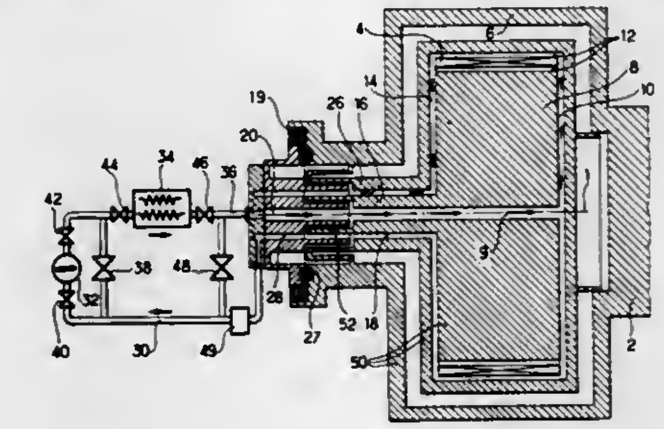
Michel Berthet, Gif aur Yvette; Roger Gillet, Belfort; Yves Laumond, Longjumeau; Christian Lehnen, Belfort, and André Marquet, Paris, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A. and Electricite de France, Service National, both of Paris, France

Filed Jul. 20, 1976, Ser. No. 707,138

Claims priority, application France, Jul. 22, 1975, 75 22865

Int. Cl.^{2} H02K ***9/00***

U.S. Cl. 310—52 **12 Claims**



1. An electric machine with a superconductive rotor provided with a cooling circuit having rotating seals, comprising:

a rotor mounted for rotation about its axis and having a peripheral zone of which heat is generated;

an internal cooling circuit in said rotor enabling the circulation of a cooling fluid subjected to centrifugal force resulting from the rotating of this rotor, said circuit comprising a rotary supply pipe within the axis of the rotor, first pipes extending radially outward from the rotary supply pipe and allowing the fluid to move away from said axis to reach the rotor peripheral zone, second pipes extending longitudinally within said rotor peripheral zone having a first end connected to respective first pipes and allowing the fluid coming from this descending pipe to circulate in the peripheral zone, collecting the heat generated in this zone; outlet means for the cooling fluid which has crossed through the second pipes;

a stationary external cooling circuit outside of said rotor comprising a stationary supply pipe, a rotating supply seal connecting said stationary supply pipe to said rotary supply pipe, and a stationary outlet pipe collecting the cooling fluid leaving the rotor;

a cooling device connected in series between the stationary supply and outlet pipes for cooling the cooling fluid;

means for circulating the cooling fluid through said cooling device, the stationary and rotary supply pipes, the first pipes, the second pipes, said outlet means and said stationary pipe;

said cooling fluid outlet means comprising third pipes connected to the second end of respective second pipes and extending radially to allow the cooling fluid to return towards the axis of the rotor and a rotary outlet pipe disposed along said axis and connected to the stationary outlet pipe by a rotary outlet seal coaxial with the supply seal, one of these two rotating seals forming an inner rotating seal limiting the communication between the supply and outlet pipes and the other of said rotating seals forming an outer rotating seal separating the space inside the cooling circuits from the space outside these circuits;

said rotating inner seal being of the "bayonet" type in which the two pipes connected by the seal comprise an outer pipe and an inner pipe, the outer pipe surrounding the inner pipe extending over an axial covering length forming a radial gap between the adjacent surfaces of these two pipes, the radial gap between these adjacent surfaces being greater than 0.6 mm at least when the rotor rotates at its highest speed, so as to enable the thermosiphon effect resulting from the rotating of the rotor and from the difference in temperature of the cooling fluid between the first pipes and the third pipes to make the cooling fluid circulate in a closed loop constituted by the inner circuit and by the leakage of the inner seal through said radial gap.

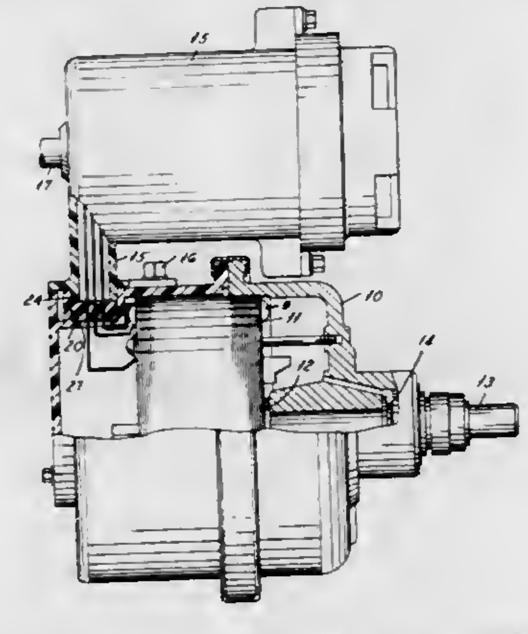
4,101,794
MOTOR SEALS

John E. Miller, Swartz Creek, and James R. Postema, Owosso, both of Mich., assignors to Universal Electric Company, Owosso, Mich.

Filed Dec. 3, 1976, Ser. No. 747,065

Int. Cl.^{2} H02K ***11/00***

U.S. Cl. 310—71 **3 Claims**



1. In a submersible motor or the like, the combination comprising

a first housing containing a motor field stator having a field winding,

a second plastic housing mounted on said first housing,

said field having unencased field winding wires,

said first housing having an open ended cylindrical cavity therein in the periphery thereof with the open end of said cavity extending outwardly of said housing,

said first housing having a opening in the base of said cavity of lesser diameter than said cavity,

a cylindrical body of compressible elastomeric material positioned in said cavity,

said body having an exterior configuration and dimensions which conform generally with the configuration and dimensions of the cavity so that said body can be readily inserted in said cavity without substantial compression,

said body having a plurality of generally axial passages therein,

said unencased wires from said field winding having a diameter such that they can be readily inserted through said passages when said body is radially uncompressed,

said second housing having a cylindrical tubular wall having a uniform thickness and extending axially into the open end of said cavity and has a radial end surface,

and mounting means for mounting said second housing on said first housing and drawing said housings toward one another to force said tubular wall axially against said body to compress said body when said second housing is in mounted position on said first housing thereby compressing said body radially outwardly into tight conformity with the periphery of the cavity and radially inwardly into tight conformity with the unencased wires from the motor,

the portion of said body radially inwardly of said tubular wall being unrestrained axially.

4,101,795
ULTRASONIC PROBE

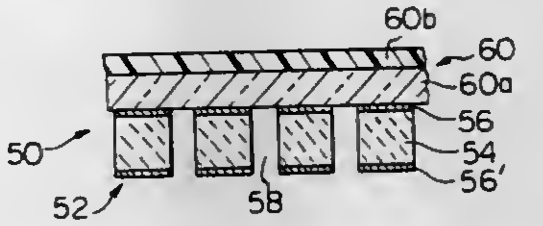
Akira Fukumoto; Masami Kawahuchi; Hiroshi Fukukita, and Jun-ichi Sato, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Japan

Filed Jun. 17, 1977, Ser. No. 807,600

Claims priority, application Japan, Oct. 25, 1976, 51 128472

Int. Cl.^{2} H01L ***41/10***

U.S. Cl. 310—336 **12 Claims**



1. An ultrasonic probe for ultrasonic inspection equipments, comprising:

a plurality of transducer elements, each being a rectangular plate of a piezoelectric material with front and back electrode films respectively coated on front and back surfaces thereof, said plate having a width-to-thickness ratio of not greater than 0.8, said transducer elements being arranged in a row at intervals with their longer sides opposite to each other so that said plate can make a width extensional vibration as a fundamental vibration mode; and

an acoustic impedance matching layer, consisting of a uniformly thick inner layer of a first material placed on said row of said transducer elements to intimately cover said front electrode films of all the transducer elements and a uniformly thick outer layer of a second material placed on said inner layer to intimately cover the outer surface of said inner layer,

the acoustic impedance of said first material being 2.5 to 9.5 times as large as the acoustic impedance of an object of ultrasonic inspection, the acoustic impedance of said second material being smaller than the acoustic impedance of said first material but is 1.6 to 2.7 times as large as the acoustic impedance of said object.

4,101,796
HIGH-PRESSURE DISCHARGE LAMP

Gijsbert Knus, and Peter Andreas, Waltherus Tielemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,952

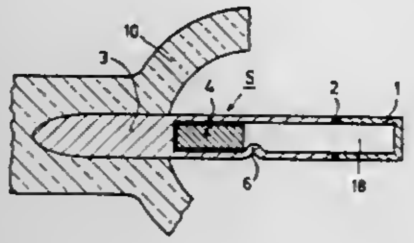
Claims priority, application Netherlands, Oct. 8, 1976, 7611135

Int. Cl.^{2} H01J ***61/24***

U.S. Cl. 313—178 **3 Claims**

1. A high-pressure discharge lamp having a discharge vessel comprising a gas filling, electrodes with electrode pins which are sealed into the wall of the discharge vessel and a hydrogen getter in a metal envelope, which is hydrogen permeable,

characterized in that the electrode pin of at least one electrode comprises a closed cavity extending in the longitudinal direction thereof in which cavity the hydrogen getter is present adjacent to the wall of the discharge vessel and at least mainly within the discharge vessel and that the electrode pin at its end within the lamp vessel consists of a metal part of a metal selected from the group formed by tantalum, niobium, alloys of tantalum and niobium and alloys of at least 5 atom % of at least one of the said materials with at least one of the metals tungsten and molybdenum, which metal part bounds the cavity in the electrode pin.



4,101,797
OFF CENTER ELECTRODE SPARK PLUG

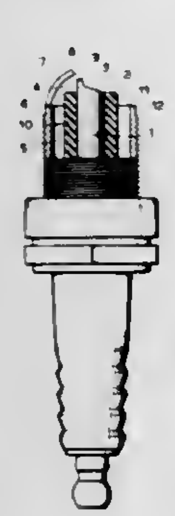
Iwao Yamamoto, No. 1-13, Shirasagi, 1-chome, Nakano-ku, and Morio Koga, both of Tokyo, Japan, assignors to said Iwan Yamamoto, by said Moriro Koga, Tokyo, Japan, a part interest

Filed Dec. 16, 1976, Ser. No. 751,530

Claims priority, application Japan, Dec. 18, 1975, 50-151402; Sep. 1, 1976, 51-104667

Int. Cl.^{2} H01T *13/20*

U.S. Cl. 313—141 **2 Claims**



1. A spark plug in which an arcuate projection is provided at the end face of a central electrode said arcuate projection comprised of an off-center extension of said central electrode, an insulator separating said central electrode from a main body having an end surface, said insulator interposed directly between said electrode and said body with only said arcuate projection exposed to said main body, and an arcuate earthing electrode is fixed by a projection weld to the end surface of said main body to form and maintain a small gap between an outer arcuate portion of said extension and an underside angular portion of the nose of said earthing electrode.

4,101,798
ELECTRIC LAMP WITH A TORPEDO SHAPED CONDUCTOR TIP

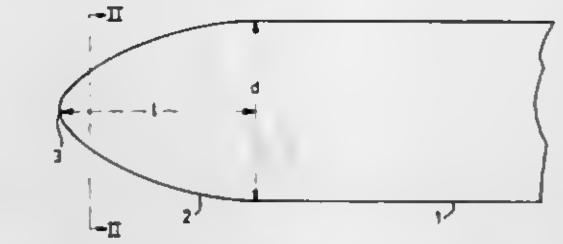
Victor Rosallie Netelteirs, and René Maria Vosters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,720

Claims priority, application Netherlands, Jun. 21, 1976, 7606691

Int. Cl.^{2} H01K *1/40*

U.S. Cl. 313—315 **2 Claims**



1. An electric lamp having a glass lamp vessel with at least one pinch seal, in which at least one metal foil is incorporated as a current leadthrough conductor to one end of which is connected an internal current conductor towards an electrically conductive member situated inside the lamp vessel and the opposite end of which is connected to an external current conductor comprising a cylindrical rod extending for the greater part outside the pinch seal, said rod having, at its end situated within the pinch seal, a non-cylindrical shape, characterized in that the external current conductor at its end situated in the pinch seal is in the form of a torpedo having a blunt or non-blunt tip, the length of the torpedo-like part being at least equal to the diameter of the cylindrical part, the diameter of the torpedo-shaped part at a distance from the cylindrical part of 0.9 times the cylinder diameter being at most equal to half the cylinder diameter.

4,101,799
HIGH-PRESSURE GAS DISCHARGE LAMP

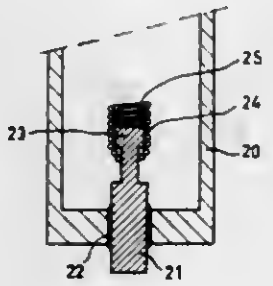
Piet Wledijk; Johannes Hubertus Antonius Schmitz, and Antonius Henricus Maria Van der Step, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1976, Ser. No. 721,288

Claims priority, application Netherlands, Sep. 11, 1975, 7510691

Int. Cl.^{2} H01J *5/50*

U.S. Cl. 313—331 **7 Claims**



1. A high-pressure gas discharge lamp which comprises a discharge vessel having a wall which consists mainly of at least one of the compounds selected from the group consisting of aluminium oxide and yttrium oxide, said vessel containing an ionizable gas filling, means for maintaining a gas discharge which includes at least one electrode and a current supply conductor connected thereto, said conductor being disposed within said discharge vessel and consisting mainly of at least one boride selected from the group of titanium boride and zirconium boride.

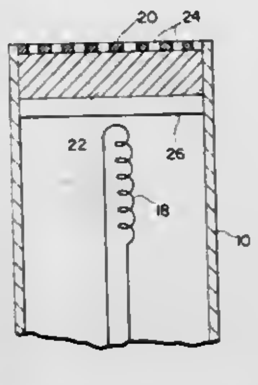
4,101,800
CONTROLLED-POROSITY DISPENSER CATHODE

Richard E. Thomas, Riverdale, Md., and Titus Pankey, Jr., Washington, D.C., asslgnors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1977, Ser. No. 813,389

Int. Cl.^{2} H01J *1/14, 19/06*

U.S. Cl. 313—346 DC **8 Claims**



1. A thermionic, dispenser-type cathode having an emissive member comprising:

a backing plug;

a "nonporous" reservoir of active cathode material, comprising a quantity of at least one alkaline earth material, adjacent said backing plug; and

a foil disposed on the free surface of said reservoir, said foil being formed from at least one refractory metal with a set of uniformly sized and spaced holes therein to permit the active electron-emitting material within said reservoir to migrate through said holes and to spread over the surface of said foil when the reservoir material is heated to the proper temperature.

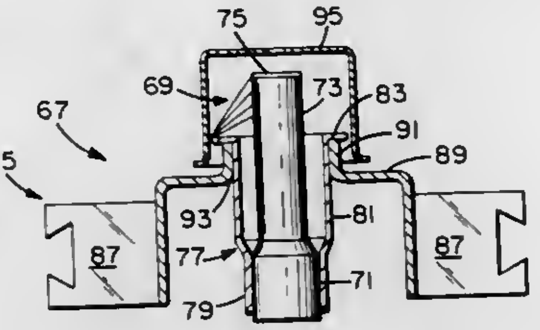
4,101,801
SHIELDED CATHODE SUPPORT STRUCTURE

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 28, 1977, Ser. No. 791,867

Int. Cl.^{2} H01J *29/02, 29/82*

U.S. Cl. 313—417 **8 Claims**



1. In a cathode ray tube having a control grid and an electron gun assembly with at least one insulator rod supporting a plurality of electrode elements, a shielded cathode support structure comprising:

a cup-shaped control grid electrode affixed to said insulator rod;

a cathode having an open end and a closed end with said closed end having a layer of electron emissive material thereon and located within said cup-shaped control grid electrode;

an eyelet member having upper and lower portions, said upper portion having a flared end within said cup-shaped control grid electrode and said lower portion having a diameter suitable for attachment to said cathode; and

a support member having a first section formed for attachment to said insulator rod and a second section in a plane substantially normal to said first section, said second section having a flared upstanding portion which surrounds a central aperture of a size to receive said eyelet member and provides a contacting surface for said flared portion of said eyelet member whereby said flared portion of said eyelet member and said cup-shaped control grid electrode serve to shield said insulator rod and electrode elements therein from cathode sublimation.

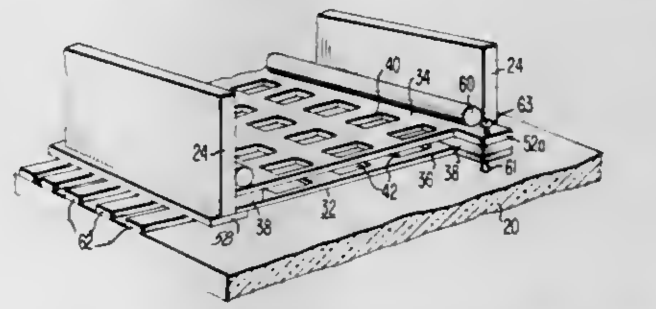
4,101,802
FLAT DISPLAY DEVICE WITH BEAM GUIDE

Zygmunt Marian Andrevski, Princeton, N.J., asslgnor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,300

Int. Cl.^{2} H01J *29/02, 29/82*

U.S. Cl. 313—422 **11 Claims**



1. In a display device which includes an evacuated envelope having spaced, substantially parallel front and back walls, spaced parallel support walls between the front and back walls forming a plurality of channels extending across the front and back wall and an electron beam guide assembly in each of said channels, the improvement comprising:

each of said electron beam guide assemblies including a pair of spaced, parallel grid plates each having a pair of spaced elongated substantially parallel edges, a separate spacer member between said grid plates at each of said edges, each of said grid plates being secured to said spacer members so that the plates are in a fixed relation to each other,

each of said guide assemblies extending across a separate channel adjacent to the back wall, and

means along the support walls for supporting said guide assemblies in a fixed spaced relation to said back wall.

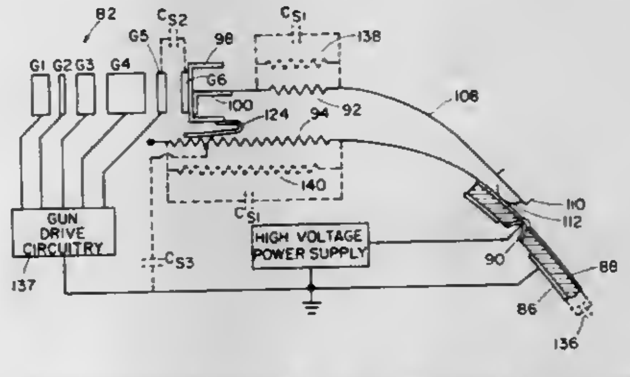
4,101,803
ARC SUPPRESSION AND STATIC ELIMINATION SYSTEM FOR A TELEVISION CRT

Michael Walter Retsky, Chicago, and James W. Schwartz, Deerfield, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 1, 1977, Ser. No. 802,223

Int. Cl.^{2} H01J *23/16, 29/96*

U.S. Cl. 315—3 **8 Claims**



1. In a television cathode ray tube including an evacuated glass envelope having on an external surface of a funnel portion thereof an outer conductive coating and on an internal surface thereof an inner conductive coating for receiving a

high voltage charge, said tube further comprising an electron gun located in a neck of the funnel, the tube being characterized by having an arc-suppression and static-elimination system comprising a discrete, non-distributed arc suppression resistor having a relatively low distributed capacitance and means for electrically and mechanically coupling said arc suppression resistor between said inner conductive coating and said electron gun, and in electrically parallel combination with said arc suppression resistor, an anti-static coating deposited on an inner surface of the neck around the beam egress from said gun.

4,101,804
TRAVELING WAVE TUBE WITH DEPRESSED COLLECTOR POWER SUPPLY

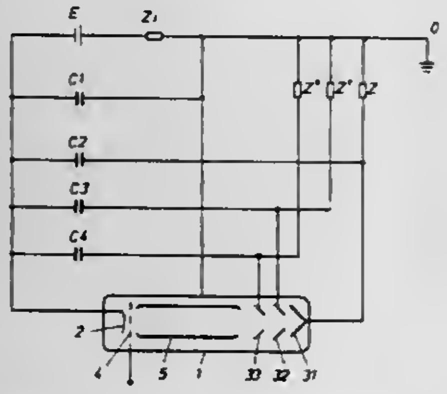
Leif Ronny Carlsson, Fjäras, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 23, 1977, Ser. No. 799,248

Claims priority, application Sweden, Jun. 23, 1976, 7607244

Int. Cl.² H01J *23/34*

U.S. Cl. 315—3.5 **3 Claims**



1. Power supply for a traveling wave tube with depressed collector which tube comprises a cathode, a grid, a collector and a wave structure arranged in the longitudinal direction of the tube, characterized in a voltage source (E, Zi) connected to the cathode (2) of the tube and to a reference potential (0), a first capacitive element (C1) connected to the voltage source for delivering a current to the wave structure (5) during the time interval the tube is conducting, a second capacitive element (C2) connected between the cathode of the tube and the collector (3) for delivering a current to the collector of the tube during the same time interval and an impedance (Z) connected between said capacitive elements (C1, C2) to prevent a current flow between the capacitive elements (C1, C2).

3. Traveling wave tube power supply according to claim 1, in the case that the traveling wave tube comprises a number of depressed collectors, characterized in that the same number of said second capacitive element (C2) as there are collectors are connected between the cathode (2) of the tube and each of the collectors (31, 32, 33) and that the same number of said impedances (Z) as there are collectors are connected between each of the capacitive elements (C2, C3, C4) and said first capacitive element (C1).

4,101,805
TOUCH-RESPONSIVE SOCKET

David E. Stone, Houston, Tex., assignor to Destron, Inc., Houston, Tex.

Filed Jan. 24, 1977, Ser. No. 761,569

Int. Cl.² H01J *7/44, 19/78, 29/96, 17/34*

U.S. Cl. 315—74 **30 Claims**

1. A touch-responsive socket for an electrical device comprising:

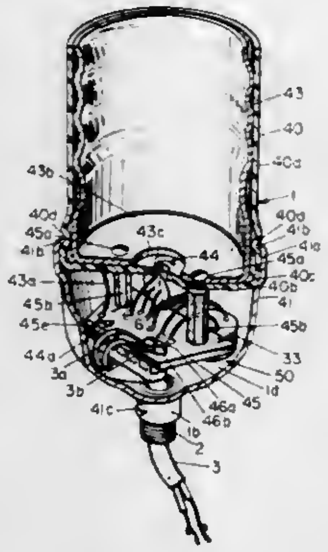
a first housing portion having an open first end and a substantially closed second end;

an electrically conductive socket member within said first housing portion and adapted to engage an electrical device through said first housing portion open first end to apply electrical power thereto;

a second housing portion formed of an electrically conductive material and having an open first end, engaging said first housing portion second end to form therewith a substantially enclosed chamber, and a second end adapted to mount said touch-sensitive socket on a base member;

a touch-responsive circuit within said chamber and electrically coupled to said socket member and to said second housing portion and, when coupled to a source of electrical power, responsive to touching of said second housing portion or an electrically conductive member electrically connected thereto to successively couple and de-couple said socket member to the source of electrical power, said touch-responsive circuit including timing means for inhibiting the responsiveness of said circuit for a preset time following termination of touching of said second housing portion and electrically conducting member; and

cable means for coupling said touch-sensitive circuit to a source of electrical power.



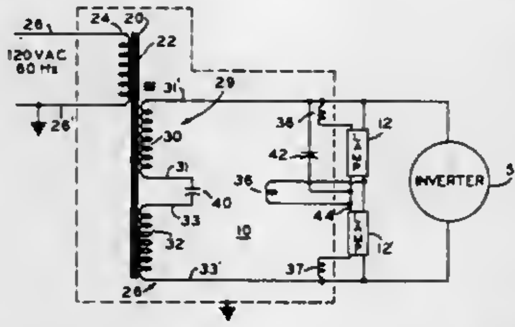
4,101,806
BALLAST EMI AND SHOCK HAZARD REDUCTION

Robert P. Alley, Manlius, N.Y., assignor to General Electric Company, Carmel, Ind.

Filed Aug. 26, 1976, Ser. No. 718,028

Int. Cl.² H05B *37/00, 41/14*

U.S. Cl. 315—86 **2 Claims**



1. In an electrical system for operating at least one gaseous discharge lamp from a line voltage AC source and upon failure of the AC source, from a DC energized, high frequency emergency circuit, the improvement comprising:

a ballast for operation from the AC source at high power factor, the ballast having means for reducing hazard associated with leakage current therein resulting from operation of the high frequency emergency circuit and for minimizing transference of EMI from the lamp side thereof to the AC source side thereof and to ground including an isolation transformer having at least a primary winding and a secondary winding; the secondary winding being divided into two portions; and a power capacitor connected serially in circuit between the two portions of the secondary winding.

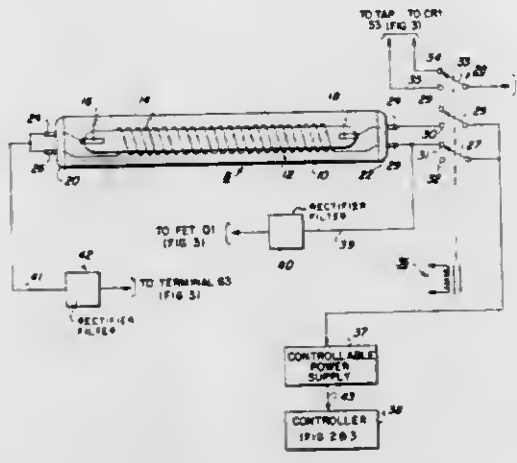
4,101,807
METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE OF LOW PRESSURE METAL OR METAL HALIDE LAMPS

Howard M. Hill, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 22, 1976, Ser. No. 669,079

Int. Cl.² H05B *41/36*

U.S. Cl. 315—116 **11 Claims**



1. Apparatus for forming a latent electrostatic charge pattern on a photoconductive insulating medium, said latent electrostatic charge pattern corresponding to the radiation pattern projected from an information bearing member comprising:

a charged photoconductive insulating member,

a low pressure metal vapor source for generating radiation of a predetermined spectral line, said information bearing member being interposed in the optical path between said metal vapor source and said charged photoconductive insulating member,

means for energizing said low pressure vapor source whereby radiation is emitted therefrom, said radiation exposing said information bearing member to selectively dissipate the charge on the surface of said photoconductive insulating member in accordance with the intensity of the radiation projected from said information bearing medium to form said latent electrostatic charge pattern,

means for heating said metal vapor source to a predetermined temperature, and

means coupled to said heating means for maintaining said temperature at said predetermined value.

4,101,808
LAMP CONTROL CIRCUIT

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 30, 1975, Ser. No. 617,270

Int. Cl.² H05B *39/04*

U.S. Cl. 315—151 **10 Claims**

1. A lamp control circuit for maintaining the light output intensity of an incandescent lamp to be controlled constant comprising:

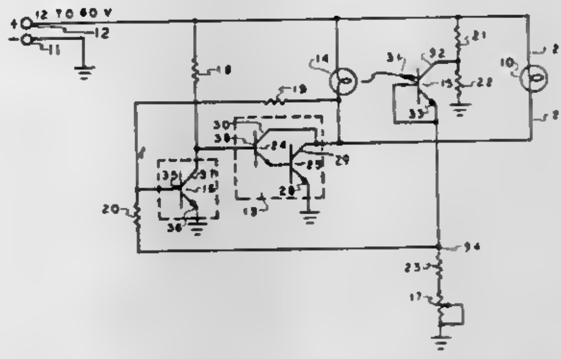
a pair of input terminals adapted for connection to an illuminating power source, one of said input terminals being coupled to one side of the incandescent lamp to be controlled;

switching means coupled to the other side of the controlled lamp and to the other input terminal so that when said switching means is closed the illuminating power from said power source is applied to the controlled lamp and when said switch is open the illuminating power to the controlled lamp is terminated;

illumination power sampling means comprising a second incandescent lamp coupled between said one input terminal and said switching means for sampling the illumination power and converting the sampled illumination power to light energy having an intensity related to the amount of illuminating power received by the controlled lamp;

a light sensitive detector operatively coupled to said second incandescent lamp for providing an intermediate control signal directly related to said second incandescent lamp light intensity;

reference voltage generating means for generating a reference voltage; and



control means coupled to said light sensitive detector, said reference voltage generating means and to said switching means for causing said switching means to close for an interval dependent on the magnitude of the illumination power source when said intermediate control voltage is less than said reference voltage and for causing said switching means to open for an interval dependent on the response time of the second lamp when said intermediate control voltage is greater than said reference voltage to thereby render the light output intensity of the controlled incandescent lamp substantially constant.

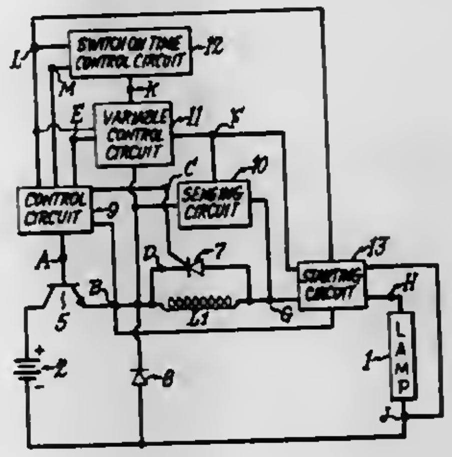
4,101,809
DISCHARGE LAMP OPERATING CIRCUIT

Don Morais, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed May 26, 1977, Ser. No. 800,983

Int. Cl.² H05B *37/02, 41/23*

U.S. Cl. 315—156 **13 Claims**



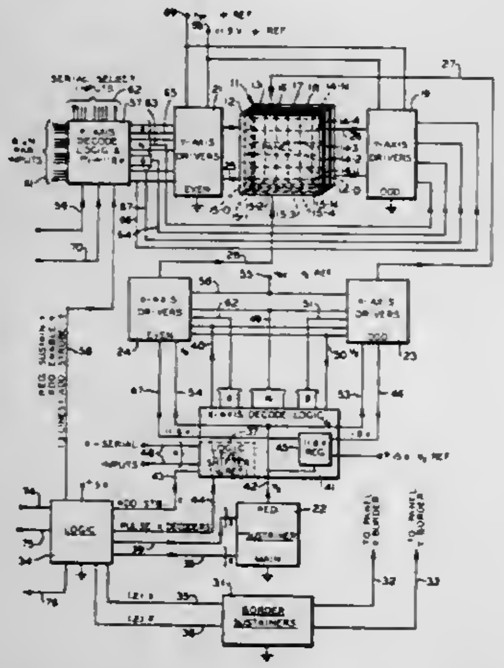
1. A lamp starting and operating circuit comprising, in combination, a direct current source, controlled switch means and inductance means connected in series across said power source, means for serially connecting a gaseous discharge lamp to said controlled switch means and said inductance means, means connected to said controlled switch means for limiting the peak current through said controlled switch means during the lamp starting interval, and control means coupled to said controlled switch means for repetitively and sequentially operating the same at predetermined intervals for applying DC

pulses to the gaseous discharge lamp for starting and operation thereof.

4,101,810
SYSTEM FOR AND METHOD OF OPERATING GAS DISCHARGE DISPLAY AND MEMORY

Jerry D. Schermerhorn, Swanton, and John W. V. Miller, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed May 19, 1976, Ser. No. 688,044
Int. Cl.² H05B *41/14*
U.S. Cl. 315—169 TV **39 Claims**

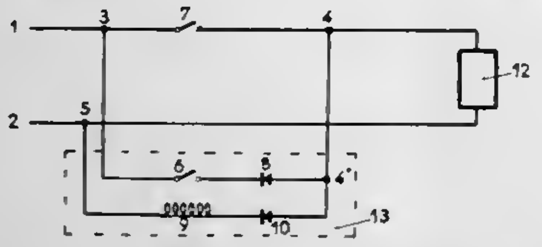


1. A method of manipulating the discharge condition of a gas discharge information storage panel device having a first array of dielectrically insulated electrodes transversely oriented with respect to a second array of dielectrically insulated electrodes, both of said arrays being proximate to gaseous discharge medium which comprises applying a periodically alternating pulse potential between electrodes of the first and second arrays through the gaseous discharge medium by applying a pulsating bulk sustainer voltage to the first array; selectively applying first voltage pulses referenced to the bulk sustainer voltage to electrodes of the first array; and selectively applying second voltage pulses referenced to a fixed voltage to electrodes of the second array.

4,101,811
DELAYED EXTINCTION CONTROL

Francois Dandrel, 12 Chemin Renaudin, 92260 Fontenay-aux-Roses, and Jean-Pierre Bouvier, Residence Bellevue, 91310 Nozay, both of France

Filed Jan. 16, 1976, Ser. No. 649,650
Claims priority, application France, Jan. 16, 1975, 75 01225
Int. Cl.² H05B *37/02, 39/06*
U.S. Cl. 315—200 R **10 Claims**



4. Apparatus for delaying the extinguishing of an alternating current energized source of illumination, the source of illumination including a primary control switch connected between a light emitter and current source, said delay apparatus comprising:

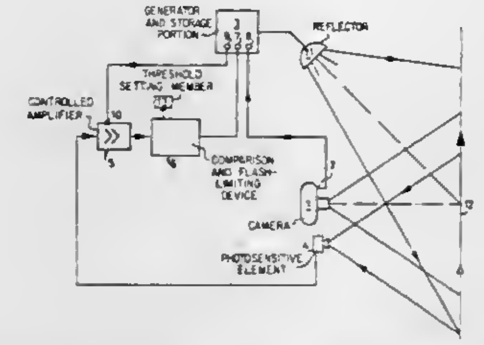
first circuit means connected in parallel with the light emitter, said first circuit means including electrically energized heating means and rectifier means connected in series between a first terminal of the current source and the load side of the primary control switch; and

second circuit means, said second circuit means connected in parallel with the primary control switch and including a normally open temperature responsive secondary switch and second rectifier means, said second rectifier means being connected in opposite polarity with respect to said first rectifier means said second switch being responsive to thermal energy produced by said first circuit means heating means.

4,101,812
PHOTOGRAPHIC FLASH UNIT

Ludwig Friedrich Müller; Adolf Schott, both of Fürth, and Wolfgang Pecher, Gremsdorf, all of Germany, assignors to Metz Apparatewerke, Fürth, Germany

Filed Dec. 30, 1968, Ser. No. 787,988
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1968, 1622230; Dec. 28, 1967, 1597325; Mar. 30, 1968, 1772104; Apr. 18, 1968, 1764175; May 11, 1968, 1772411; Jun. 11, 1968, 1772617
Int. Cl.² H05B *37/00*
U.S. Cl. 315—241 P **8 Claims**



1. In an automatic photographic flash apparatus for use with a camera and including a flash unit, a flash-limiting device having a photoelectric element arranged to respond to the light reaching the camera from the subject being photographed and connected to terminate the light emission by the unit in response to the light received by the photoelectric element, and power energy supply means connected to deliver flash-triggering energy to the flash unit, the improvement comprising:

said apparatus including means electrically connecting said flash-limiting device with said flash unit for rendering said flash-limiting device operative only upon initiation of a flash-triggering signal to said flash unit,

said flash-limiting device including control voltage producing means electrically connected to said photoelectric element and also including a component for producing a voltage proportional to the time integral of the intensity of the light received by said photoelectric element from the instant of commencement of the triggering of a flash by said unit, said component being electrically connected so that its voltage forms a control voltage which, upon reaching a predetermined value, actuates said flash-limiting device to terminate the light flash being produced by said flash unit,

said flash unit including a flash-triggering transformer arranged to produce a flash-triggering pulse when a flash is to be produced and also including a secondary winding across which a voltage pulse is induced by such flash-trigger pulse,

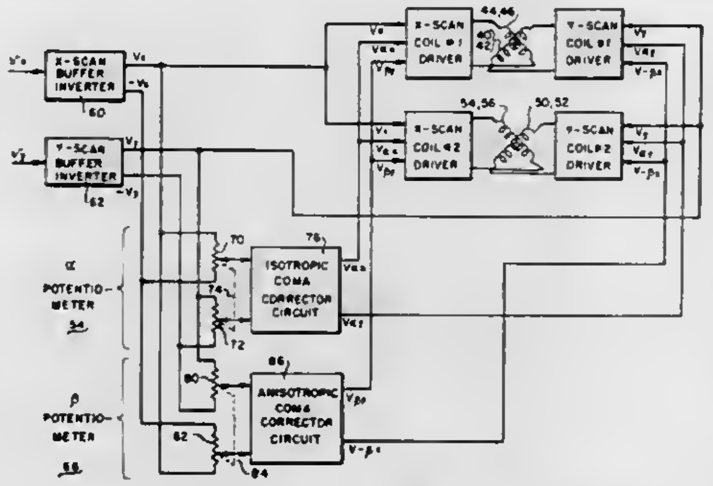
and said flash limiting device further including a storage capacitor connected to provide operating power for said flash-limiting device and a rectifier connected between said secondary winding of said flash-triggering transformer and said storage capacitor for causing the voltage induced in said secondary winding to charge said capacitor to the voltage required for rendering said flash-limiting device operative,

and setting means for adjusting the responsitivity of said device in accordance with the sensitivity of the film used and the camera lens aperture being employed.

4,101,813
DOUBLE DEFLECTION SYSTEM FOR AN ELECTRON BEAM DEVICE

Norman W. Parker; Steven D. Golladay, both of Chicago, and Albert V. Crewe, Palos Park, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,416
Int. Cl.² H01J *29/56*
U.S. Cl. 315—370 **7 Claims**



1. In an electron beam device having means for generating a beam of electrons, a magnetic lens for focusing the beam to a point in any image plane, and scanning means for scanning the focused point in the image plane, the coordinates of the center of the scanned point in the image plane being $(x_1 y_1)$, the beam normally being incident in the aperture plane of the lens at a location whose coordinates of the center of the beam are (x_o, y_o) and at a slope determined by the scanning means, the improvement in the instrument for simultaneously correcting isotropic coma and anisotropic coma aberrations, comprising:

deflection means positioned along the path of the beam prior to entry of the beam into the lens for displacing the intersection of the beam with the aperture plane so that the slope of intersection remains unchanged and so that the coordinates of the center of the beam at intersection (x_o and y_o) satisfy the relations

$$x_o = x_o + \alpha x_1 + \beta y_1$$

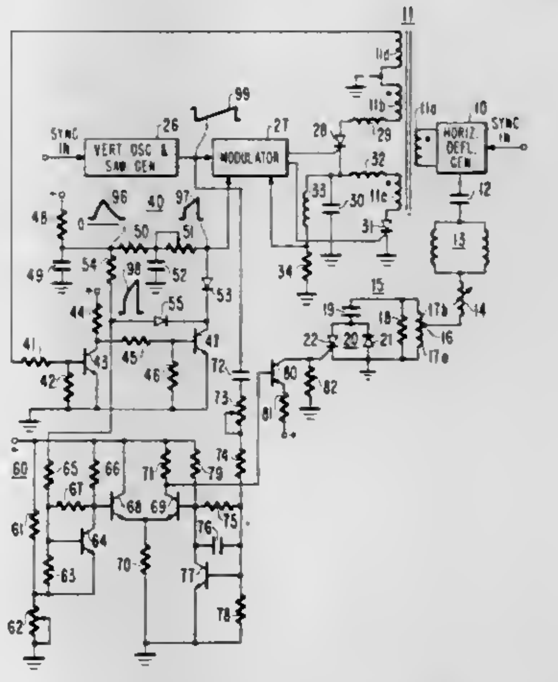
$$y_o = y_o + \alpha y_1 - \beta x_1$$

where $\alpha = S_6/S_8$ and $\beta = S_7/S_8$ wherein S_6, S_7, and S_8, are abberration coefficients.

4,101,814
SIDE PINCUSHION DISTORTION CORRECTION CIRCUIT

Peter Eduard Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,561
Claims priority, application United Kingdom, Mar. 19, 1976, 11271/76
Int. Cl.² H01J *29/56*
U.S. Cl. 315—371 **6 Claims**



1. A side pincushion distortion correction circuit, comprising:

a horizontal deflection winding;

a horizontal deflection generator coupled to said deflection winding for supplying scanning current thereto;

scanning current modulating means including a controllable switch coupled to said deflection winding;

a vertical deflection generator;

means coupling said vertical generator to said modulating means for controlling said switch for providing modulation of said scanning current at said vertical rate; and

means coupling said horizontal generator to said modulating means for producing nonlinear horizontal rate signals for controlling said switch for providing a combined nonlinear horizontal rate and a vertical rate modulation of said scanning current in a manner for reducing said side pincushion distortion.

4,101,815
HORIZONTAL DEFLECTION CIRCUIT WITH HIGH VOLTAGE SELECTION CAPABILITY

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1977, Ser. No. 796,671
Int. Cl.² H01J *29/80*
U.S. Cl. 315—411 **20 Claims**

19. A circuit comprising:

a voltage regulator responsive to a source of unregulated voltage for providing an operating voltage at an output terminal;

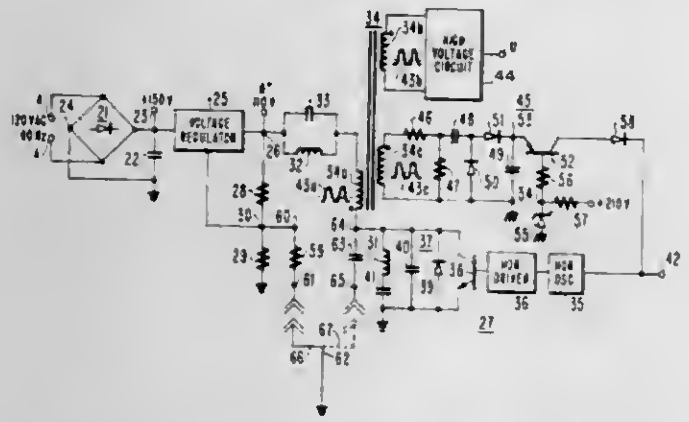
a deflection winding;

a deflection circuit coupled to said deflection winding for generating scanning current in said deflection winding for producing a raster, said deflection circuit including a capacitance coupled to said deflection winding for forming a resonant circuit therewith;

high voltage means coupled to said deflection circuit for providing a high voltage accelerating potential for beam current;

first means coupled to said voltage regulator for selectively changing the magnitude of said operating voltage; and

second means coupled to said resonant circuit for selectively changing the resonant frequency of said resonant circuit, said first and second means combined selectively for decreasing the magnitude of said high voltage accelerating potential while maintaining a constant raster width.



4,101,816

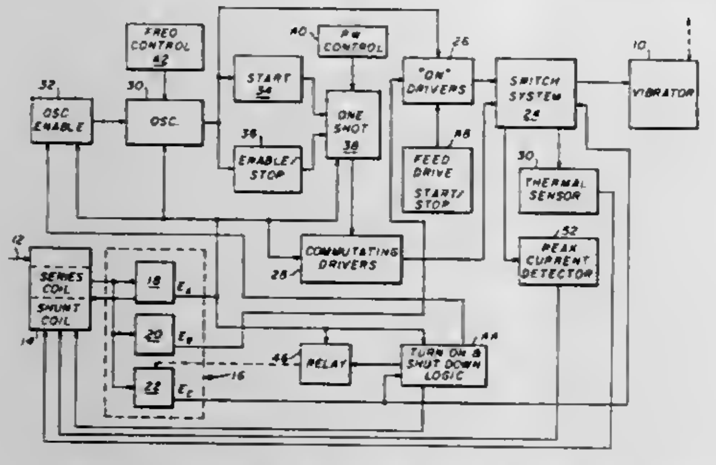
SWITCH CONTROL SYSTEM

Joseph J. Shepter, New Haven, Conn., assignor to Vibra-Metrics, Inc., East Haven, Conn.

Filed Nov. 3, 1976, Ser. No. 738,344

Int. Cl.^{2} H02K *33/00*

U.S. Cl. 318—130 **24 Claims**



1. Apparatus for periodically connecting a source of direct current to an inductive load,

said direct current source including a capacitance connected between the opposite polarity output terminals thereof,

said apparatus comprising:

first solid-state switch means, said first switch means comprising a first silicon controlled rectifier connected between a first polarity terminal of the current source and a first side of the load;

second solid-state switch means, said second switch means comprising a second silicon controlled rectifier connected between the second polarity terminal of the current source and the second side of the load, said first and second silicon controlled rectifiers and the load defining a series circuit through which current can flow in a first direction when said rectifiers are in the conductive state;

a first diode connected between the first polarity terminal of the current source and the second side of the load; and

a second diode connected between the second polarity terminal of the current source and the first side of the load, said first and second diodes and the load defining a series circuit through which current may flow in a second direction when said silicon controlled rectifiers are in the nonconductive state, said diodes, rectifier, load and power supply capacitance forming a resonant circuit whereby energy may be delivered to the load when the silicon controlled rectifiers are in the conductive state and returned from the load when the silicon controlled rectifiers are in the non-conductive state.

oscillator means, said oscillator means generating timing control signals;

drive control means, said drive control means being responsive to the timing control signals generated by said oscillator means for producing gating signals;

means for coupling said drive control means produced gating signals to said first and second solid-state switch means to periodically render said first and second silicon controlled rectifiers conductive;

commutation control means, said commutation control means being responsive to the timing control signals generated by said oscillator means for periodically producing turn-off signals, said turn-off signals alternating with said gating signals;

means connected to said first and second solid-state switch means for interrupting current flow through said first and second silicon controlled rectifiers to thereby return said rectifiers to the non-conductive condition; and

means for coupling said turn-off signals from said commutation control means to said current flow interrupting means.

4,101,817

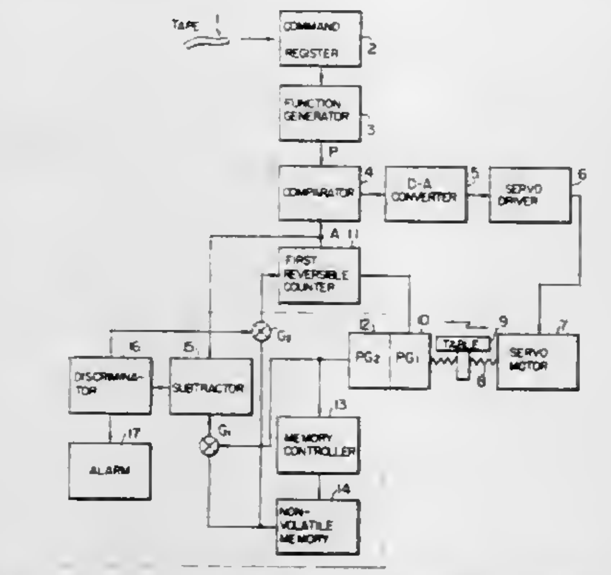
POSITION-CORRECTABLE NUMERICAL CONTROL SYSTEM

Yutaka Maeda, and Mitsuhiro Kawabe, both of Aichi, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Jul. 6, 1976, Ser. No. 702,950

Int. Cl.^{2} G05B *19/28*

U.S. Cl. 318—603 **4 Claims**



1. A position-correctable numerical control system for a machine wherein the position of an object along a path of travel is to be controlled without any device for detecting the absolute position of said object, said system comprising a reference mark detection pulse generator for determining a plurality of equidistantly-spaced reference marks providing standard ranges of control over the path of travel of said object, a non-volatile memory for storing in advance reference positions over the path of travel corresponding to said reference marks determined by said reference mark detection pulse generator, a comparator for comparing the actual position of said object on said path with a reference position stored in said non-volatile memory each time said object passes one of said reference marks, and means for correcting the position of said object on said path in accordance with a difference, if any, between said actual position and said reference position, so that the position of said object on said path is corrected each time it passes one of said reference marks.

4,101,818

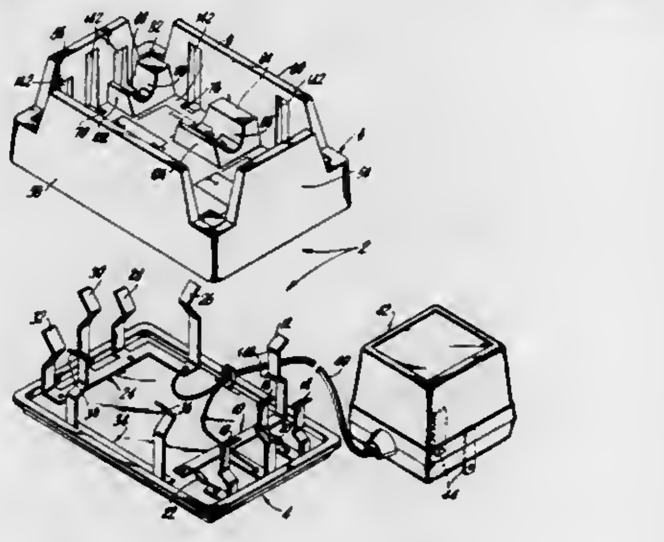
MULTI-CELL BATTERY CHARGER

William Tolson Kelly, III, Wilton, Conn., and Francis Stahl, Rocky River, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,995

Int. Cl.^{2} H01M *10/46*

U.S. Cl. 320—2 **11 Claims**



1. A battery charger comprising a holder having a generally rectangular base with a pair of upstanding first and second side walls, an upstanding front wall and an upstanding rear wall; a first conductive terminal contact means having a first flexible upstanding conductive terminal member disposed adjacent to and interior of the first side wall and a second flexible upstanding conductive terminal member disposed adjacent to and interior of the rear wall; a second conductive terminal contact means having a first flexible upstanding conductive terminal member disposed adjacent to and interior of the second side wall and a second flexible upstanding conductive terminal member disposed adjacent to and interior of the rear wall; a third conductive terminal contact means having a flexible upstanding conductive terminal member disposed adjacent to and interior of the front wall; said second conductive terminal member of the first conductive terminal contact means and said second terminal member of the second conductive terminal contact means aligned substantially in the same plane and spaced apart from the conductive terminal member of the third terminal contact means by a distance to accommodate lengthwise a "D" size [about 2.25 inches (5.7 cm)] rechargeable cell in pressure contact therebetween; said first conductive terminal member of the first conductive terminal contact means disposed and spaced apart from said first conductive terminal member of the second conductive terminal contact means by a distance to accommodate two tandem series-connected "AA" size or "C" size [about 1.8 inches (4.8 cm)] rechargeable cells in pressure contact therebetween; said first conductive terminal contact means and said second conductive terminal contact means connected across a transformer and current rectifier adapted for plugging into a conventional alternating-current power supply line.

4,101,819

THREE PHASE CONTROLLING SYSTEM

Yasuyuki Maeda; Nobuo Mitsui, both of Katsuta; Tadao Kameyama, Ibaraki; Akinori Watanabe, Katsuta; Katsu Komuro, Katsuta, and Sadao Hokari, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1975, Ser. No. 645,344

Claims priority, application Japan, Jan. 6, 1975, 50-65

Int. Cl.^{2} G05F *3/04*

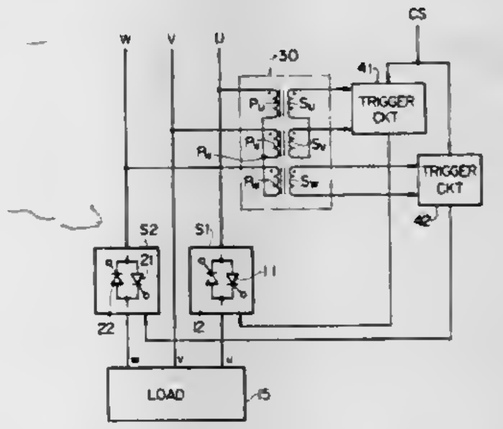
U.S. Cl. 323—24 **5 Claims**

1. In a three phase load control system including:

first and second bilateral switching circuits respectively connected in two of the three phase lines between a load and a power supply therefor,

trigger means for applying gating signals to said first and second bilateral switching circuits, and

a synchronizing circuit for providing electrical signals in synchronism with the frequency of the power supply voltage for said trigger means to provide a prescribed time base from which retard angles for the gating signals from said trigger circuit are referenced,



the improvement wherein said synchronizing circuit contains means for controlling said trigger means so that the gating signals, which are applied to the one of said bilateral switching circuits which is connected in the one of said two phase lines having the later phase, are advanced by a constant degree with respect to said later phase which constant degree is no greater than 120°, and the gating signals, which are applied to the other of said bilateral switching circuits, are synchronized to be in phase with the phase of the phase line in which said other bilateral switching circuit is connected.

4,101,820

FAIL-SAFE RESISTOR

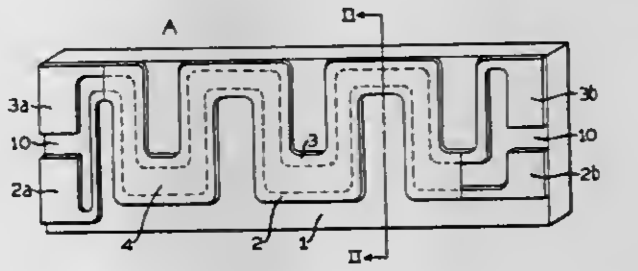
Piero Montanari, Turin, Italy, assignor to WABCO Westinghouse, Turin, Italy

Filed May 2, 1977, Ser. No. 792,639

Claims priority, application Italy, May 6, 1976, 68105 A/76

Int. Cl.^{2} H01C *7/12*

U.S. Cl. 323—94 R **12 Claims**



12. A fail-safe voltage divider network for supplying an output voltage which is a selected portion of an input voltage, comprising in combination,

(a) a first resistor having a preselected value,

(b) a second resistor comprising,

(1) a support element of fragile non-conducting material,

(2) two pair of terminals separately mounted on said support with one terminal and the other terminal of each pairs in associated relationships, each pair connected by a metallic strip deposited on said support element and whose continuity is interrupted by any breakage of said support element,

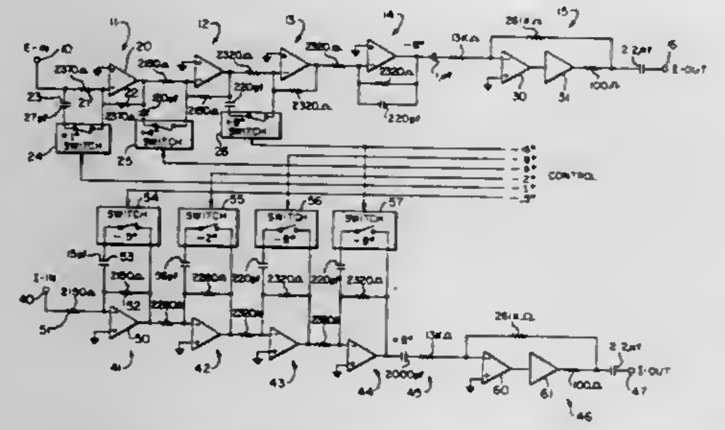
(3) resistance material coupled to form a resistor circuit of preselected value between the two metallic connector strips,

(c) said first resistor and said resistance material of said second resistor connected in a series circuit, including the one associated terminal of each pair of terminals of said second resistor, in which the preselected value of said resistance element represents a portion of the total series resistance equivalent to the desired portion of output voltage,

(d) an input voltage source connected to said series circuit, and

(e) an output voltage circuit connected across the other associated terminals of each pair of terminals for supplying the selected portion of output voltage only when the support element and the resistance element are unbroken.

4,101,821
VARIABLE PHASE SHIFTING APPARATUS
Thomas J. Kirby, Pelham, N.H., assignor to GTE Sylvania Incorporated, Stamford, Conn.
Filed May 2, 1977, Ser. No. 792,509
Int. Cl.^{2} G05F *1/68*
U.S. Cl. 323—119 **13 Claims**



1. Variable phase shifting apparatus including in combination

an input terminal for receiving an AC signal;

an output terminal;

a plurality of signal conducting means connected in series between the input terminal and the output terminal for conducting an AC signal received at the input terminal to the output terminal;

each of said signal conducting means including circuit means,

phase shifting means, and

switching means operable when in a first state to connect the phase shifting means to the circuit means and operable when in a second state to disconnect the phase shifting means from the circuit means,

the signal conducting means being operable to produce a predetermined phase shift in an AC signal conducted therethrough when the switching means is in said first state connecting the phase shifting means to the circuit means with respect to an AC signal conducted therethrough when the switching means is in said second state disconnecting the phase shifting means from the circuit means; and

switch control means coupled to each of the switching means for selectively switching each of the switching means to said first or said second state;

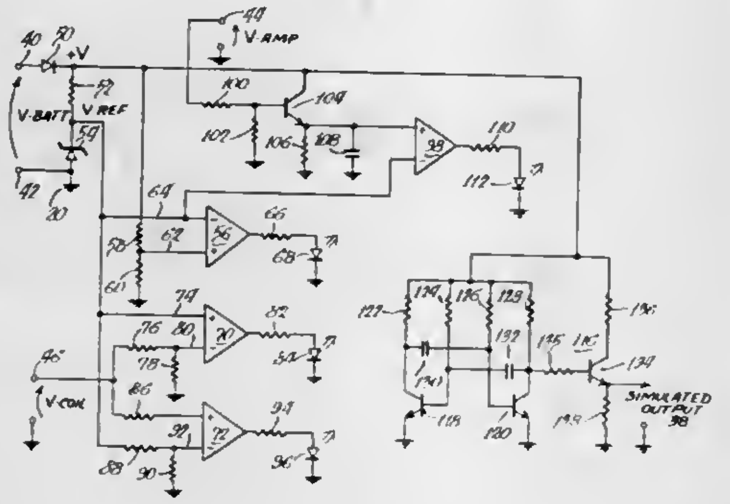
at least one of said signal conducting means including

a circuit means having an amplifier means and an input resistance connected thereto,

the phase shifting means being a reactance element, and

the switching means being operable when in said first state to connect the reactance element to the input resistance to provide a phase shifting network.

4,101,822
INSTRUMENT FOR TESTING A BREAKERLESS IGNITION SYSTEM
Daniel L. Doss, and Robert A. Melander, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.
Filed Mar. 25, 1977, Ser. No. 781,510
Int. Cl.^{2} F02P *17/00*
U.S. Cl. 324—16 R **16 Claims**



1. An instrument for testing a breakerless ignition system of an internal combustion engine having a battery, an ignition switch, an amplifier module, a coil, a distributor and spark plugs, the amplifier module providing a DC voltage to the coil and output pulses to the coil in response to rotation of a timing cam, the coil providing high voltage pulses to the distributor which distributes the high voltage pulses to the spark plugs comprising:

a first connecting means coupled to the battery;

means for establishing a reference voltage coupled to the first connecting means;

means coupled to said means for establishing a reference voltage and to the battery for comparing the reference voltage to the voltage provided by the battery;

means coupled to said means for comparing the reference voltage to the voltage provided by the battery for indicating whether the voltage provided by the battery exceeds the reference voltage;

a second connecting means coupled to the coil;

means coupled to said coil for comparing the DC voltage provided to the coil to a first and a second established voltage;

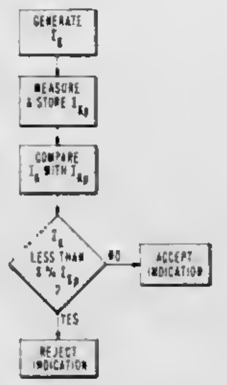
means coupled to said means for comparing the DC voltage provided to the coil to a first and a second established voltage for indicating whether the DC voltage provided to the coil is greater or less than the first established voltage;

means coupled to said means for comparing the DC voltage provided to the coil to a first and a second established voltage for indicating whether the DC voltage provided to the coil is greater or less than the second established voltage;

means coupled to said coil for determining the amplitude of the output pulses to the coil; and

means coupled to said means for determining the amplitude of the output pulses to the coil for indicating whether the amplitude of the output pulses exceeds an established voltage reference.

4,101,823
METHOD AND APPARATUS FOR MEASURING CATHODE EMISSION SLUMP
Felta Carl Farmer, Jr., Marion, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Mar. 28, 1977, Ser. No. 781,877
Int. Cl.^{2} G01R *31/024*
U.S. Cl. 324—20 CR **7 Claims**



1. A method of measuring an electron emission slump of a cathode in a vacuum tube, wherein said vacuum tube is a cathode ray tube having at least one cathode, one control grid G1 and one screen grid G2 said method comprising the steps of:

(a) heating said cathode;

(b) applying ground potential to said cathode and G1 grid;

(c) applying a positive potential, E_{G2} to said G2 grid;

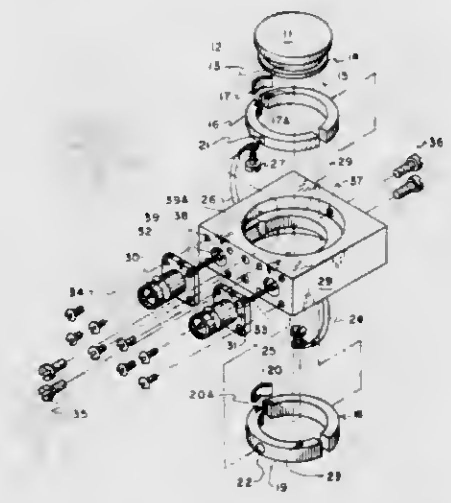
(d) increasing the magnitude of E_{G2} until a predetermined value of I_k is obtained;

(e) measuring a peak value, I_{kp}, of the cathode emission current I_k which is generated during a predetermined test period;

(f) comparing the magnitude of I_k with I_{kp} during said test period; and

(g) providing a failure indication if the magnitude of I_k becomes less than a predetermined percentage of I_{kp}.

4,101,824
TEST CELL HOLDER
Harold W. Breedlove, Woodbridge, and Walter L. Brown, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 12, 1976, Ser. No. 731,592
Int. Cl.^{2} G01R *31/024*
U.S. Cl. 324—20 R **8 Claims**



1. A test assembly for light detecting wafer test cell with circumferential electrodes comprising:

an optical bench means having an optical axis;

a standard cathode ray oscilloscope with scanned dot light source mounted on said bench means substantially centered on said optical axis;

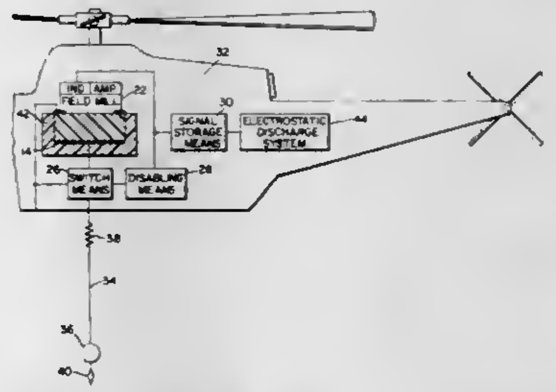
a holding jig mounted on said bench means defining a passageway of a first uniform cross-section extending therethrough normal to said optical axis and also defining an aperture of a second smaller uniform cross-section substantially centered on said axis extending from the jig surface nearest said source into said passageway; and

a holder for said test cell slideably mounted in said passageway, said holder including,

a frame member with parallel sides, an outer cross-section normal thereto substantially equal to the cross-section of said passageway and a socket defined therein larger than and facing said aperture, said socket having the same shape but dimensions slightly greater than said test cell,

a pair of electrical terminals mounted on an external surface of said frame insulated from one another; and fastening means attached to said frame member to secure said test cell in a fixed position within said socket and electrically attach each of said electrodes to a different one of said terminals.

4,101,825
ELECTRIC FIELD SENSOR
Robert L. Truax, 116 Fifth St., Fort Myers, Fla. 33901
Filed Jan. 21, 1977, Ser. No. 760,933
Int. Cl.^{2} G01R *5/28*
U.S. Cl. 324—32 **[illegible] Claims**



1. An electrostatic field measuring device for measuring the electric field outside a body comprising:

a. a sensor element comprising a plate of electrically conductive material electrically insulated from the body, the sensor plate being positioned wholly within the body,

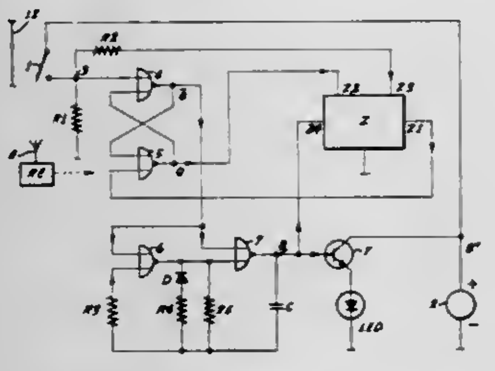
b. a segment of dielectric material having a pair of opposite surfaces, a first of the pair of surfaces being fixed to the plate,

c. an electrometer means positioned within the body adjacent to the second of the pair of surfaces of said segment of dielectric material and arranged for measuring the electric field within said segment of dielectric material, the electrometer being calibrated to indicate the electric field outside the body on the basis of the measured electric field within the segment of dielectric material, and

d. an elongated linear member of electrically conductive material extending outward from said body, the elongated linear member being electrically connected to said plate and electrically insulated from the body.

4,101,826
FAULT INDICATOR INCLUDING A REED RELAY RESPONSIVE TO ABOVE NORMAL CURRENT FLOW IN A CONDUCTOR

Hendrik Horsltmann, Nesenhaus 22, 403 Ratingen, Fed. Rep. of Germany
Filed Jun. 13, 1977, Ser. No. 805,694
Int. Cl.² G01R *31/02, 19/16*
U.S. Cl. 324—51 **10 Claims**



1. Fault circuit indicator, comprising:

a reed contact relay to be placed into the magnetic field surrounding a conductor to be supervised as to any excess electrical current;

an electronic latch connected to be operated by the reed contact to assume a first state upon closing of the reed contact;

a pulse generator connected to be operated by the latch when the latch is in the first state, the latch inhibiting the generator when the latch is in a second state;

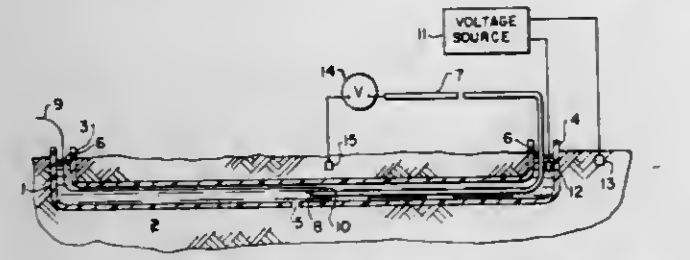
a visible signalling device connected to the pulse generator to emit blinking signals in response to pulses when generated by the generator;

an electronic counter also connected to the generator to count blinking pulses, and further connected to the latch to reset the latch to the second state after counting a particular number of pulses; and

a long life battery connected to operate the latch, the generator, the counter and the signalling device.

4,101,827
METHOD AND APPARATUS FOR DETERMINING THE LOCATION OF A LEAK IN A PIPE BURIED UNDERGROUND

Franklin F. Offner, 1890 Telegraph Rd., Bannockburn, Deerfield, Ill. 60015
Filed Dec. 17, 1976, Ser. No. 751,891
Int. Cl.² G01R *27/02*
U.S. Cl. 324—65 R **10 Claims**



1. The method for determining the location of a leak in a pipe made of an electrically insulating material which is buried in a medium that is electrically conductive which comprises the steps of:

at least partially filling the pipe with a fluid that is electrically conductive,

passing an electrical current through the fluid in said pipe;

measuring the electrical potential between said fluid and the medium in which said pipe is buried, and

ascertaining the location of the leak from the measured potential.

4,101,828
CORROSION DETECTOR

William H. Dehler, Wichita, Kans., assignor to The Boeing Company, Wichita, Kans.
Filed May 3, 1977, Ser. No. 793,403
Int. Cl.² G01R *27/02*
U.S. Cl. 324—65 R **8 Claims**

1. A corrosion detector for indicating chemical corrosion on a metal surface and when the surface should be washed, the detector comprising:

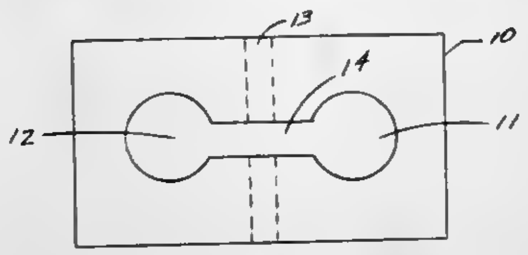
a filter paper for placing on the metal surface to be tested, said filter paper saturated with a solution of water, the water in said filter paper combining with the chemicals on the metal surface to form a chemical solution in said filter paper;

a probe disposed on top of said filter paper, said probe passing an electrical current through the chemical solution in said filter paper; and

a battery operated wash meter electrically connected to said probe, said wash meter including means for measuring the electrical resistance of the chemical solution and indicating whether the metal surface should be washed.

4,101,829
DIFFERENTIAL CURRENT DETECTOR

Robert J. Gomperts, Herentals, and Gerard M. V. Driesen, Borgerhout, both of Belgium, assignors to GTE International, Inc., Stamford, Conn.
Filed Apr. 13, 1977, Ser. No. 787,291
Claims priority, appilcation Belgium, Jul. 7, 1976, 843853
Int. Cl.² G01R *19/10, 33/00;* H01H *47/32*
U.S. Cl. 324—126 **5 Claims**



5. A method of measuring the differential current between two direct current carrying conductors, which comprises:

inserting first and second conductors, carrying direct current I_1 and I_2 respectively, into a bar of ferromagnetic material having first and second bores adapted to receive said conductors, such that I_1 and I_2 flow in the same direction, said holes being joined by a coplanar slot extending transversely therebetween said bar also having a third bore whose center line is orthogonal to a plane containing said first and second, said bore extending through said slot;

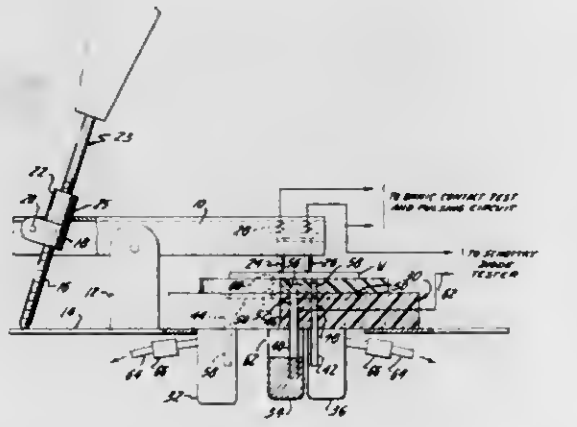
placing into said third bore a reed capsule switch having two mutually exclusive conductive states, said switch being responsive to the flux generated by I_1 and I_2 in said first and second conductors;

measuring the conductive state of said reed capsule switch; and

detecting a change in state in said switch at the instant $|I_1 - I_2|$ exceeds a predetermined current level.

4,101,830
MERCURY PROBE

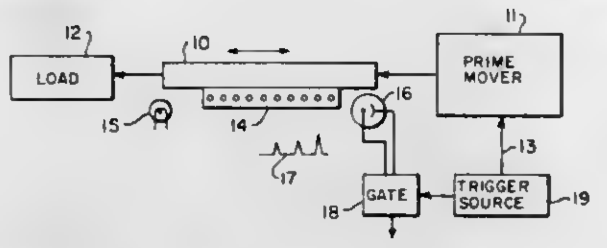
John H. Greig, Massapequa, N.Y., assignor to MSI Electronics Inc., Woodside, N.Y.
Filed Feb. 15, 1977, Ser. No. 768,824
Int. Cl.² G01R *1/06, 31/22;* H01R *3/04*
U.S. Cl. 324—158 F **11 Claims**



9. Electrical test apparatus including a support, an orifice plate on the support, said orifice plate having a flat surface for supporting a flat test wafer, said support and said orifice plate having aligned bores extending to an aperture in said flat surface, means for developing vacuum at the flat surface of the orifice plate at and near said aperture but only when a test wafer is disposed thereon for elevating mercury through said aligned bores to said aperture to form an electrode engaging a wafer on the orifice plate, said orifice plate being separably received on the support for providing a desired electrode area in the orifice plate.

4,101,831
LOAD MONITORING APPARATUS AND METHOD

Robert F. Dumbeck, Elgin, Tex., assignor to Rexnord Inc., Milwaukee, Wis.
Continuation-in-part of Ser. No. 675,780, Apr. 12, 1976, which is a continuation-in-part of Ser. No. 548,011, Feb. 7, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,736
Int. Cl.² G01P *3/48*
U.S. Cl. 324—166 **7 Claims**



1. Apparatus displaying changes in loading by observing variations of speed of a moving element, comprising in combination,

means deriving a sequence of timing pulses from movement of said element thereby identifying the speed of movement,

means sampling pulses from said sequence,

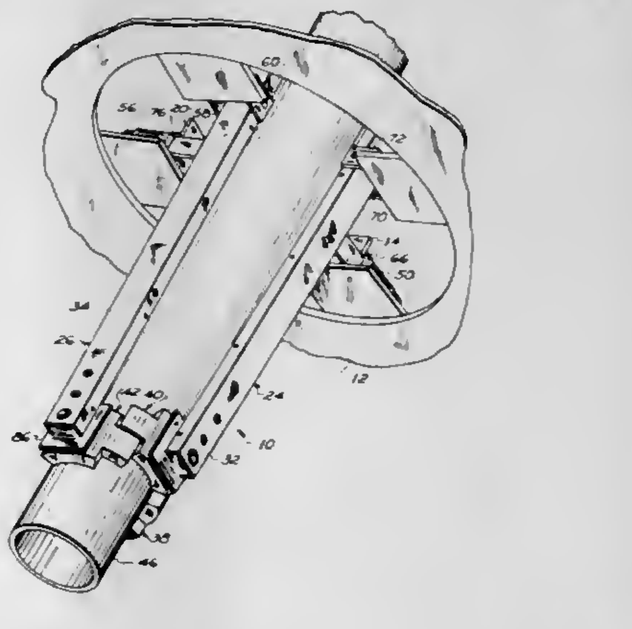
means responsive to sampled pulses to produce control pulses of predetermined duration,

means deriving a load indicia pulse of duration substantially equal to that between sampled speed pulses and successive pulses in said sequence,

means comparing the lengths of said control and load pulses, and load display means responsive to the comparison to provide an electrical indicia signal varying as a function of the load on said moving element.

4,101,832
MULTIPROBE EDDY CURRENT FLAW DETECTION DEVICE WITH MEANS TO RAISE AND LOWER THE INDIVIDUAL PROBES

Richard G. Baker, Cleveland Heights; Joseph P. Vild, Lyndhurst; Charles Griesfelder, and Donald P. Fox, both of Cleveland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio
Continuation of Ser. No. 82,051, Oct. 19, 1970, abandoned. This application Feb. 28, 1975, Ser. No. 554,167
Int. Cl.² G01R *33/12*
U.S. Cl. 324—227 **1 Claim**



1. In an eddy current flaw detection device for detecting defects in a workpiece as the workpiece travels along a work path;

(a) energizing means for causing a current to circulate in the workpiece in an inspection station along the path;

(b) a plurality of pickup arms each pivotally mounted for movement toward and away from the path between inspection and storage positions;

(c) a plurality of sets of individual sensing coils with each set of coils mounted on and supported by a corresponding and different one of said pickup arms;

(d) said sets of sensing coils substantially completely surround a circumference of a workpiece when the sets of sensing coils are in proximity with the workpiece and the arms are moved in their sensing positions;

(e) the individual sensing coils in each set being rigidly secured in spaced relationship with respect to each other for sensing changes in the current over a circumferential area of the workpiece;

(f) a plurality of actuators respectively coupled to a corresponding one of said plurality of pickup arms for moving the respective pickup arms to their storage positions for maintaining the sensing coils out of proximity with the workpiece path and to move the arms to their inspection positions for maintaining the sensing coils in proximity with the workpiece;

(g) each of the sets having an edge which is a leading edge with respect to the direction of workpiece travel along the path;

(h) resilient shield means projecting in front of the leading edge of at least one set;

(i) spring means for urging the at least one set away from the path until the shield means is between said leading edge and the path to protect the sensing set from collision with a workpiece advancing along the path into the station;

(j) a plurality of bridge circuit means coupled to a respective set of sensing coils, each bridge circuit means having an input circuit coupled to the corresponding set of sensing coils and an output circuit for developing a control signal having a value representative of a level of unbalance on the corresponding set of sensing coils; and,

(k) a like plurality of indicator circuit means each of which are coupled to the output circuit of a corresponding bridge circuit means for receiving the value of said control signal and developing an output signal indicative of both the occurrence and location of a flaw in the workpiece when the value of the control signal exceeds a predetermined value.

4,101,833

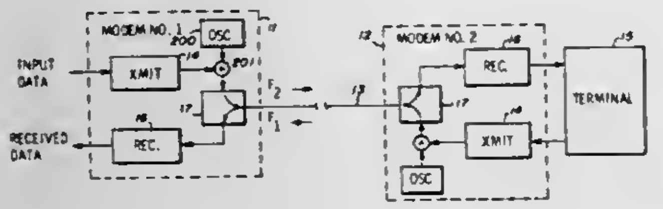
DUPLEX DATA TRANSMISSION MODEM UTILIZING AN INJECTED TONE FOR SHIFTING POWER WITHIN THE TRANSMIT SPECTRUM

John A. C. Bingham, and Ronald K. Maxwell, both of Palo Alto, Calif., assignors to The Vadic Corporation, Sunnyvale, Calif.

Filed Mar. 7, 1977, Ser. No. 775,104

Int. Cl.^{2} H04L *27/00*

U.S. Cl. 325—30 **5 Claims**



1. In a duplex data transmission modem having a first mode of operation in which outgoing data is transmitted by modulating a carrier frequency F1 and incoming data is received by a demodulation of a data modulated carrier frequency F2 which is greater than said frequency F1 and a second mode of operation in which data is received by demodulation of said carrier frequency F1 and is transmitted by modulation of said carrier frequency F2, a method of insuring that the power transmitted in a first band of frequencies extending from a frequency F3 to a frequency F4 does not exceed the power transmitted outside said first band of frequencies by a prescribed ratio in order to prevent interference with single frequency signaling systems operating at a frequency within said first band from F3 to F4, comprising the steps of:

operating said modem modulator in said second mode of operation; and

injecting a single-frequency tone F6 in the outgoing data transmission path, the power level of said injected tone being such that sufficient power is added to the band outside said first band so that the power in said first band does not exceed the power outside of said first band by said prescribed ratio for any transmittable data pattern.

4,101,834

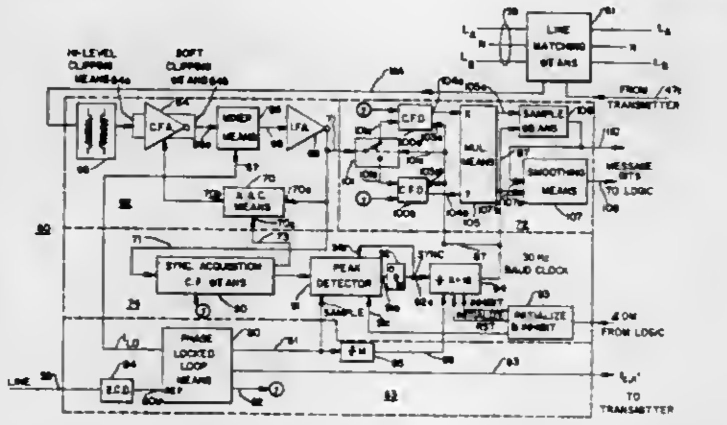
METHODS AND APPARATUS FOR REJECTION OF INTERFERENCE IN A DIGITAL COMMUNICATIONS SYSTEM

Charles A. Stutt, Rexford, and Richard W. Rankin, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,551

Int. Cl.^{2} H04L *1/00*

U.S. Cl. 325—42 **19 Claims**



1. A method for minimizing interference to a data carrier in a data communications system having a potentially-interfering signal system-wide signal at a known frequency (f_S) and harmonics of said system-wide signal, comprising the steps of:

(a) generating said data carrier at a frequency (f_C)substantially midway between an adjacent pair of the N-th and the N+1-st harmonics of said system-wide single signal; and

(b) locking the frequency (f_C) of said data carrier to an odd multiple (2N+1) of the first subharmonic $(f_{S/2})$ of the known frequency (f_S) of said single system-wide signal such that $f_C=(2N+1)(f_S/2)$, where N is an integer greater than zero, to maintain the frequency of said data carrier with essentially equal frequency seapration from each of said adjacent pair of harmonics even if said known frequency varies.

4,101,835

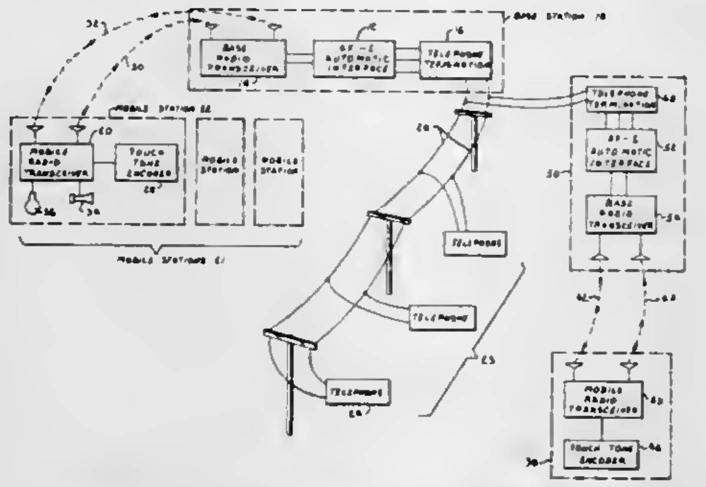
METHOD AND ELECTRONIC CONTROL DEVICE FOR RADIO TELEPHONE COMMUNICATION

Frank D. Taylor, and Ronald J. Novotny, both of Omaha, Nebr., assignors to General Communications Co., Inc., Omaha, Nebr.

Filed May 7, 1976, Ser. No. 684,304

Int. Cl.^{2} H04B *3/60, 5/04*

U.S. Cl. 325—55 **30 Claims**



1. Apparatus for communication between a half duplexed frequency radio system, and a plurality of telephone subscriber subsets operable to generate a plurality of tone signals for calling other subsets and for providing coded enabling and disabling signals, each said telephone subscriber subset having

an individual dial number and being interconnected with a telephone dial network, one of said subsets being connected to and having a dial number associated with said radio system, said apparatus comprising:

a plurality of mobile ratio units each equipped with a receiver having an operating frequency channel f_1, a transmitter having an operating frequency channel f_2, and pushbutton operated tone generating means connected to said mobile unit transmitter, said mobile unit transmitter operative in response to manual operation of said tone generating means to transmit tone signals;

a base station radio having the combination of a radio transmitter having said operating frequency channel f_1, and a radio receiver having said operating frequency channel f_2; and

interface means for interconnecting said base station transmitter and said base station receiver with said telephone dial network, said interface means being operable to couple a calling telephone subset with the base station radio receiver in response to ring pulse signals from said calling subset and further operable to couple said calling subset with the base station radio transmitter in response to a properly coded enabling tone signal from said calling subset.

4,101,836

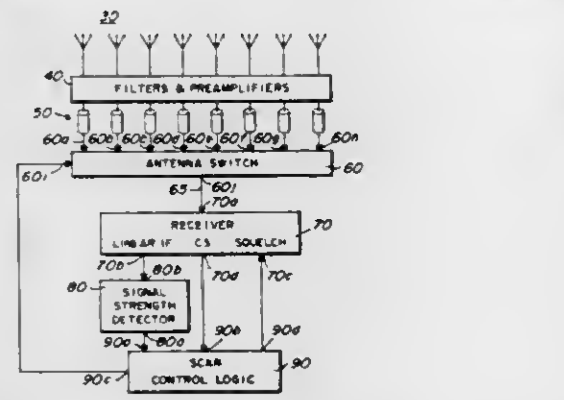
SECTORED ANTENNA RECEIVING SYSTEM

Timothy Philip Craig, Georgetown, Ky., and James Roy Stimple, Hoffman Estates, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,963

Int. Cl.^{2} H04B *7/08*

U.S. Cl. 325—302 **24 Claims**



15. The method of receiving a radio frequency broadcast signal comprising the steps of:

(a) providing a multisectored antenna array;

(b) orienting each sector in predetermined relationship with respect to the remaining sectors;

(c) scanning the array by sequentially switching the signal from each sector to a receiver means;

(d) detecting, via the receiver means, the strength of the signal from each sector;

(e) comparing said signal strengths to a reference level and determining the condition of the signal strength level of at least one sector exceeding said reference level;

(f) continuing scan for a predetermined interval subsequent to determination of a sector signal strength exceeding said reference level; and

(g) inhibiting scan following said predetermined interval and coupling the receiver to that sector which produced the greatest detected signal strength.

4,101,837

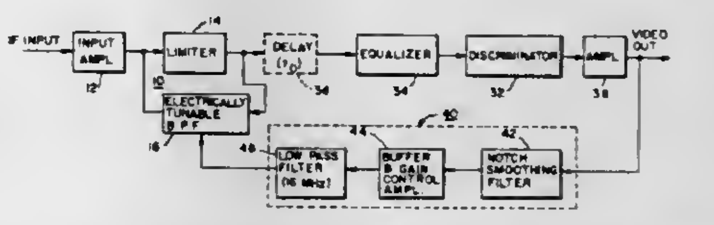
THRESHOLD EXTENSION FM DEMODULATOR APPARATUS FOR WIDE BAND WIDTH FM SIGNALS

Lorimer Clayton, Jr., Stone Mountain, and Elias J. Livaditis, Tucker, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed May 11, 1977, Ser. No. 795,991

Int. Cl.^{2} H04B *1/10;* H04N *5/44;* H03D *3/00*

U.S. Cl. 325—347 **11 Claims**



1. For use in apparatus for demodulating FM signals which carry wide band-width modulation, such as color televison signals, said apparatus having a discriminator circuit for providing output signals corresponding to the frequency of said FM signals, noise threshold extension circuitry which comprises

(a) an amplitude limiter, said limiter being connected to provide said FM signals to said discriminator,

(b) a tunable bandpass filter connected in regenerative feedback relationship across said limiter, and

(c) circuit means responsive to said discriminator circuit output signals for generating and applying to said tunable bandpass filter a steering signal for varying the tuning of said bandpass filter, said circuit means having an attenuation response characteristic across said bandwidth with a region of increased attenuation intermediate of said bandwidth and a phase response characteristic which provides about 360° total phase delay, including delays in the path of said FM signals between said limiter and said generating and applying means, at a frequency within said bandwidth higher than the highest frequency occupied by said region.

4,101,838

CLOCK PULSE GENERATING APPARATUS

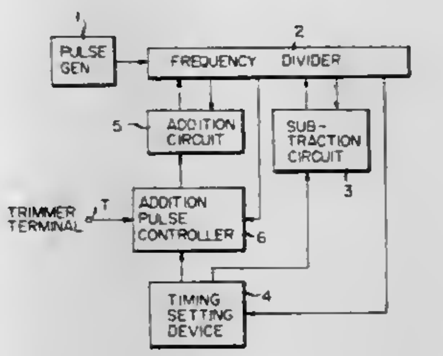
Mitsuo Aihara, Tokyo; Tsuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,714

Claims priority, application Japan, Jan. 28, 1976, 51-8135

Int. Cl.^{2} H03K *3/72, 1/16*

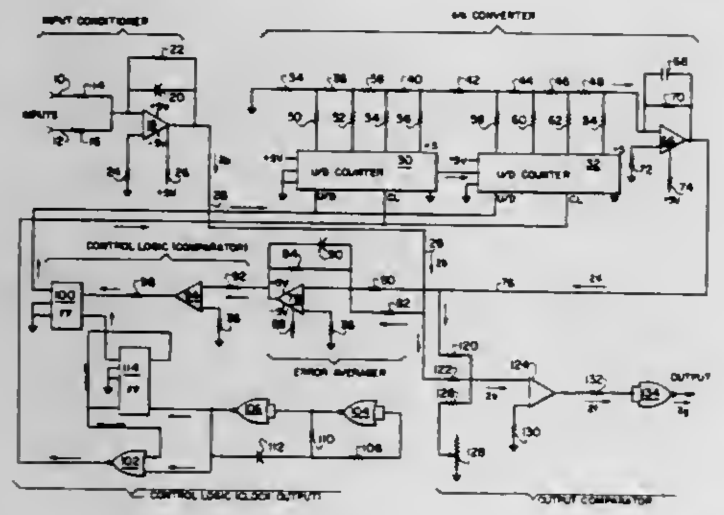
U.S. Cl. 328—63 **11 Claims**



1. A clock pulse generating apparatus comprising a pulse generator for generating a pulse signal of a predetermined cycle; a frequency divider including a plurality of frequency division stages so as to frequency divide an output pulse of the pulse generator; pulse subtracting means for subtracting at a predetermined ratio the number of pulses passing through one frequency division stage in the frequency divider; pulse adding means for adding at a predetermined ratio the number of pulses passing through another frequency division stage in the fre-

quency divider; timing setting means for imparting an operation timing to said pulse subtracting means and said pulse adding means and control means including at least an external operation terminal for variably controlling at least one of the adding ratio of said pulse adding means and the subtracting ratio of said pulse subtracting means.

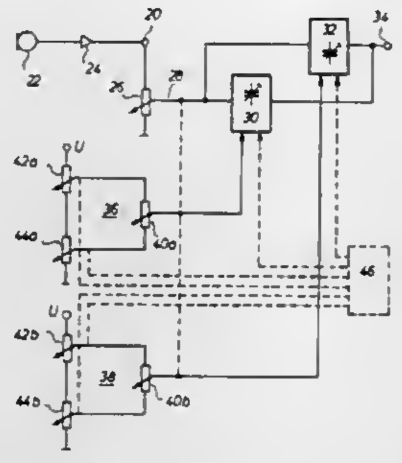
4,101,839
ANALOG-DIGITAL RATIO DETECTOR
Lynn A. Poole, and Harry M. Crain, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 27, 1974, Ser. No. 527,666
Int. Cl.^{2} H03B *1/00*
U.S. Cl. 328—165 **5 Claims**



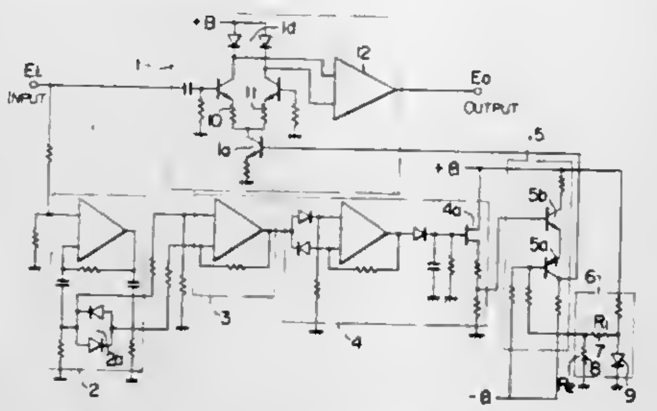
1. A ratio detector circuit for producing a gated output whenever the average amplitude of an information pulse exceeds a predetermined threshold in the presence of interfering background noise comprising:
- input conditioning means for inverting and smoothing an input signal to said detector;
- a feedback loop coupled to the output of said input conditioning means for establishing the average amplitude of said input signal and storing said average, said feedback loop comprising:
  - an error averager for determining the difference in amplitude between said conditioned input signal and said stored average;
  - control logic for determining the polarity of said amplitude difference and triggering an output indicative of said polarity, and for generating clocking signals to control the effective amplitude average of said detector;
  - a digital to analog converter for receiving said indicative output and said clocking signals for producing an analog output of said amplitude average; and
- output comparator means for detecting the amplitude relationship between said conditional input signal and said analog average and producing a digital output whenever said relationship exceeds a predetermined ratio threshold.

4,101,840
VOLUME CONTROL ARRANGEMENT FOR AN ELECTRO-ACOUSTIC SYSTEM
Jobst Fricke, Cologne, and Helmut Reuter, Euskirchen, both of Fed. Rep. of Germany, assignors to CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG, Cologne, Fed. Rep. of Germany
Filed Jun. 1, 1976, Ser. No. 691,639
Int. Cl.^{2} H03F *3/68;* H03G *3/00*
U.S. Cl. 330—127 **7 Claims**

1. In an electro-acoustic system, a volume control arrangement having an adjustable amplification factor and a frequency characteristic dependent thereon and comprising:
- an input terminal for receiving an input audio signal characterised by at least one formant region defined by a maximum in the amplitude/frequency characteristic curve of the signal;
- a volume control in the form of a signal magnitude adjuster connected on one side to the input terminal;
- a frequency selective amplifier circuit having its input connected to the other side of the volume control and its output connected to an output terminal, said circuit including elements which define a pass range in the audio frequency region, the frequency position of said pass range being variable by adjustment of a control voltage applied to said elements; and
- means for generating said adjustable control voltage, said means including a device which is adjustable by operation of the volume control in such a manner that the output signal at the output terminal has a formant region the frequency position and amplitude of which is shifted, relative to the position and amplitude of the formant in the input signal, in response to adjustment of the volume control.

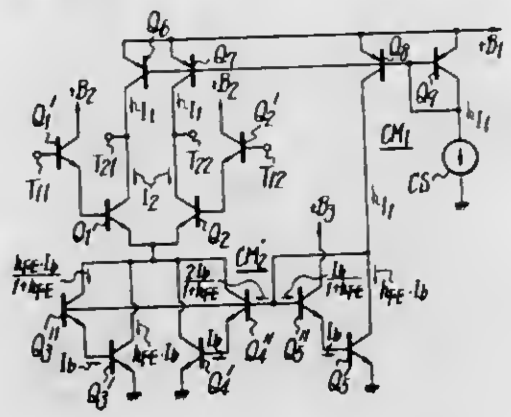


4,101,841
GAIN CONTROL CIRCUIT
Shigeru Okada; Takao Arai, both of Yokohama; Kouichi Tomatsuri, and Hiroshi Toeda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 30, 1977, Ser. No. 829,244
Claims priority, application Japan, Sep. 3, 1976, 51-104836
Int. Cl.^{2} H03G *3/30*
U.S. Cl. 330—254 **3 Claims**



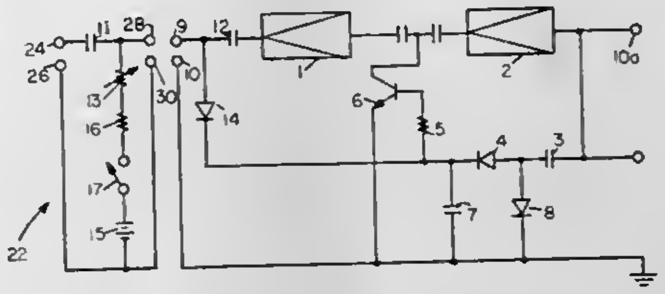
1. A gain control circuit comprising:
- a gain control section including at least a differential amplifier with which diodes or transistors arranged to act as diodes are connected as a load and the gain of which is controlled by a control signal;
- a control signal section including at least a logarithmic compression circuit and an exponential expansion circuit for the logarithmic compression and exponential expansion of an input signal applied to said differential amplifier, said control signal section applying its output signal to a control terminal of said gain control section as said control signal; and
- a temperature compensation circuit connected to a bias terminal of a transistor in the last stage of said control signal section to provide a temperature-dependent bias voltage which cancels the temperature dependence of said control signal section and that of said gain control section.

4,101,842
DIFFERENTIAL AMPLIFIER
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Sep. 1, 1977, Ser. No. 829,962
Claims priority, application Japan, Sep. 3, 1976, 51-105975
Int. Cl.^{2} H03F *3/45*
U.S. Cl. 330—257 **8 Claims**



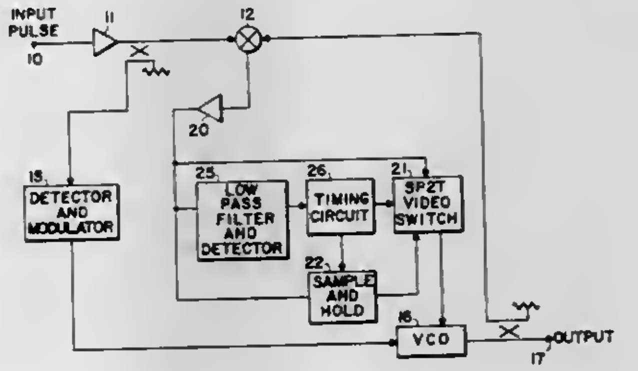
1. A differential amplifier comprising:
- first and second differentially connected transistors each having base, emitter and collector electrodes, at least one input terminal, means connecting each said input terminal with the base electrode of a respective one of said differentially connected transistors, at least one output terminal, and means connecting each said output terminal with the collector electrode of a respective one of said differentially connected transistors;
- first current mirror circuit means including third, fourth and fifth transistors and a P-N junction, each of said third, fourth and fifth transistors having base, emitter and collector electrodes, said P-N junction being connected in parallel with the base-emitter junctions of said third, fourth and fifth transistors and having the same polarity as said base-emitter junctions, a first reference DC terminal, means connecting said emitter electrode of each of said third, fourth and fifth transistors to said first reference DC terminal, and means connecting each said output terminal to the collector electrode of a respective one of said third and fourth transistors;
- second current mirror circuit means including first, second and third pairs of Darlington-connected transistors each having base, emitter and collector electrodes, said first and second pairs of Darlington-connected transistors having the collector electrodes thereof connected in common to the emitter electrodes of said first and second differentially connected transistors, each of said pairs of Darlington-connected transistors having the emitter electrode of one of the transistors thereof connected to the base electrode of the other transistor of the respective pair, a second reference DC terminal connected to the emitter electrodes of said other transistors of said pairs of Darlington-connected transistors, and means connecting together the base electrodes of said one transistors of said first, second and third pairs of Darlington-connected transistors;
- circuit means connecting said collector electrode of said other transistor of said third pair of Darlington-connected transistors to said base electrode of said one transistor of said third pair of Darlington-connected transistors and to the collector electrode of said fifth transistor; and
- current source means connected to said P-N junction at the side of the latter remote from said first reference DC terminal.

4,101,843
AUTOMATIC RECORDING LEVEL CONTROL CIRCUIT WITH MANUAL SENSITIVITY COMPENSATING CIRCUIT
Eiji Aoyama, Tokyo, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan
Filed Dec. 2, 1976, Ser. No. 746,780
Int. Cl.^{2} H03G *1/02*
U.S. Cl. 330—280 **10 Claims**



1. For use with a sound movie camera having an automatic sound level control circuit in which the gain of a pair of cascaded amplifiers is controlled by the conduction of an active control element having an input terminal receiving a conduction control signal representative of the amplitude of the output of the cascaded amplifiers, a variable sensitivity control circuit for remote control, comprising:
- a housing for the control circuit;
- a voltage source within said housing; and
- a variable impedance element in said housing and serially coupled between said voltage source and the input terminal of the active control element said coupling detachably associated with the camera for remote manual adjustment of the sensitivity control circuit,
- whereby a selectable amount of control current is provided through said voltage source and said variable impedance element for selectively controlling the conduction of the active control element for selectively varying the combined gain of the cascaded amplifiers.

4,101,844
OSCILLATOR APPARATUS ADAPTED TO LOCK ONTO A SINGLE PULSE OF RADIO FREQUENCY WAVES
Hugh Robert Malone, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 11, 1977, Ser. No. 814,511
Int. Cl.^{2} H03B *3/04*
U.S. Cl. 331—10 **3 Claims**

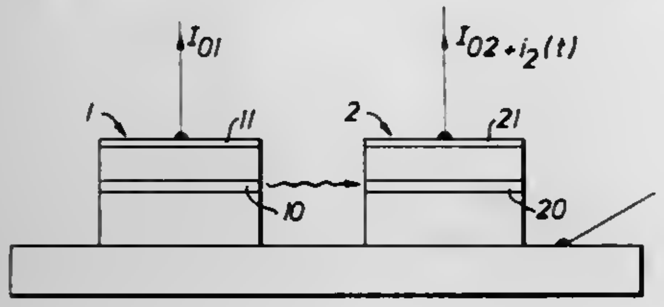


1. Oscillator apparatus adapted to lock onto a single pulse, or burst, of radio frequency waves comprising:

(a) an apparatus input adapted to receive the single pulse, or burst, of radio frequency waves;
(b) a variable oscillator having an output and a control input;
(c) switch means having an output connected to the control input of said variable oscillator and having first, second and control inputs, said switch means operating to connect the first input to the output thereof in a first mode and the second input to the output thereof in a second mode;
(d) a control loop connected to the control input of said variable oscillator through the first input of said switch means for providing a control signal to lock the output of said variable oscillator to the frequency of the radio frequency waves during the first mode of said switch means;
(e) timing means coupled to the control input of said switch means and further coupled to said control loop through a low pass filter designed to pass substantially only the control signal and operating, upon the reception of a pulse of radio frequency waves at said apparatus input, to activate said switch means to the first mode and a predetermined time later activate said switch means to the second mode; and
(f) sample and hold means coupled to said control loop and the second input of said switch means for sampling the control signals controlling said variable oscillator in the first mode, holding the sampled signals, and applying the sampled signals to the control input to control said variable oscillator when said switch means switches to the second mode.

4,101,845
METHOD OF AND ARRANGEMENT FOR PRODUCING COHERENT MODE RADIATION

Peter Russer, Ulm (Donau), Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Mar. 26, 1976, Ser. No. 670,824
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514140; Oct. 31, 1975, 2548796
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 M **17 Claims**



1. A method of producing coherent mode pure radiation modulated at a high bit rate, by means of two injection lasers which may be controlled separately but are optically coupled, comprising:

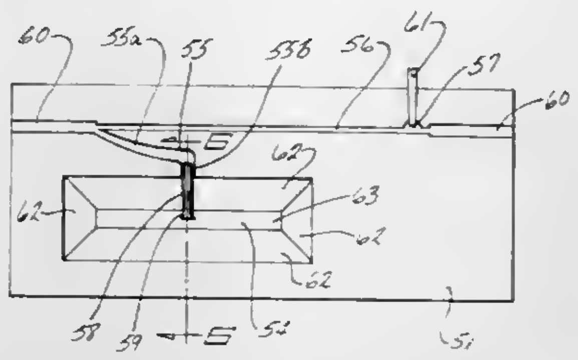
passing a direct current through a first injection laser having a good optical quality (Q-factor) and good spectral purity of its output radiation, with said direct current being such that said first injection laser is pumped above its threshold value,

coupling the output radiation of said first injection laser to a further injection laser having a low optical quality in comparison to that of the first injection laser, and

operating said further injection laser in an oscillating mode to provide the desired modulated coherent mode radiation by biasing the further injection laser by passing a direct current through it and controlling the output radiation of said further injection laser additionally by superimposing a modulation current on its direct current.

4,101,846
GAS LASER

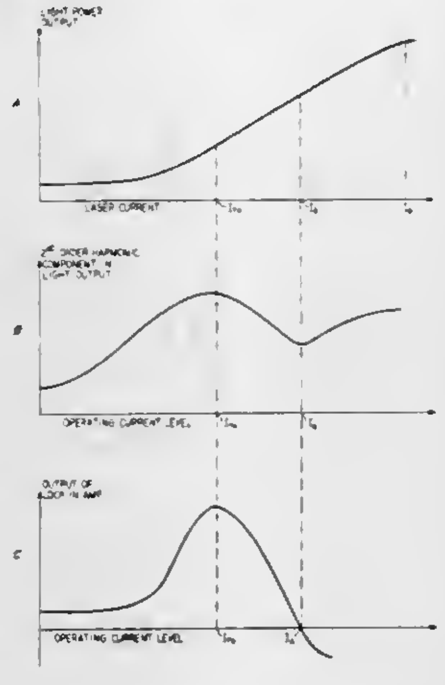
Michael E. Fein, Toledo, and Charles W. Salisbury, Rising Sun, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation-in-part of Ser. No. 546,240, Feb. 3, 1975, Pat. No. 3,991,385. This application Jul. 16, 1976, Ser. No. 705,854
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 D **3 Claims**



1. A combination with a laser having a cathode volume and a cathode within said cathode volume, a laser bore containing a lasing gaseous medium, and a connecting volume connecting the laser bore to said cathode volume, the improvement comprising a discharge insertion tube bent so as to release the discharge into the cathode volume at a predetermined distance from the nearest surface of said cathode.

4,101,847
LASER CONTROL CIRCUIT

Andres Albanese, Matawan, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 1, 1976, Ser. No. 737,846
Int. Cl.² H01S *3/13*
U.S. Cl. 331—94.5 S **11 Claims**



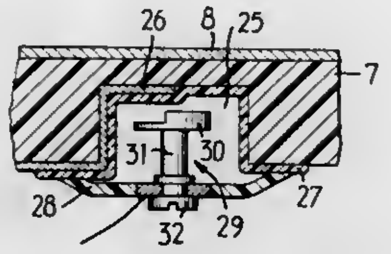
1. Apparatus for controlling the operating current level of an injection laser so that said injection laser operates at the point of maximum linearity comprising:

means for modulating the current through said injection laser with a test signal at a predetermined frequency; and

means for detecting the harmonic distortion component in the light output of said laser at twice said predetermined frequency and for automatically adjusting said operating current level for the minimum harmonic distortion component.

4,101,848
OSCILLATOR

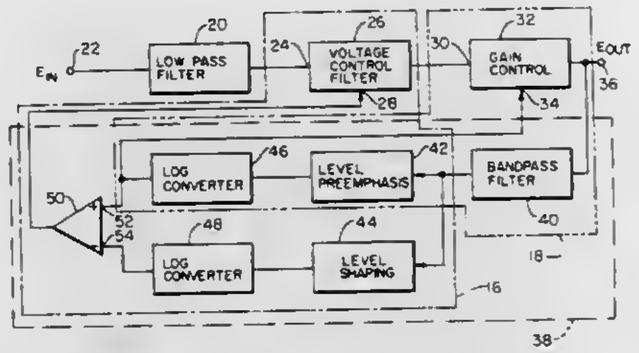
Shiro Yamashita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Oct. 21, 1976, Ser. No. 734,466
Claims priority, application Japan, Oct. 21, 1975, 50/126794
Int. Cl.² H03B *5/36*
U.S. Cl. 331—116 R **4 Claims**



1. An oscillator for developing an oscillatory output signal having a predetermined frequency, for use in an electronic timepiece, comprising: a miniature crystal vibrator element; a case housing said vibrator element with said vibrator element mounted for vibration in said case; an integrated circuit mounted on said case and comprising with said vibrator element an oscillator circuit having a frequency of oscillation determined by said vibrator element; a trimmer capacitor, said case having an exterior surface portion having a recess formed therein with said trimmer capacitor position within said recess; and means having low stray capacitances electrically connecting said vibrator element and said integrated circuit and said trimmer capacitor to define said oscillator circuit with said trimmer capacitor effective to alter the frequency of oscillation of said oscillator circuit, whereby said oscillator circuit is substantially insensitive to external electric fields.

4,101,849
ADAPTIVE FILTER

David E. Blackmer, Wilton, and C. Rene Jaeger, South Lyndeboro, both of N.H., assignors to DBX, Inc., Waltham, Mass.
Filed Nov. 8, 1976, Ser. No. 739,428
Int. Cl.² H04B *1/64*
U.S. Cl. 333—14 **13 Claims**



1. A companding system for use in signal transmission of an encoded signal derived from an electrical input signal, said system comprising, in combination:

an input terminal;

an output terminal;

means coupled between said input and output terminals for providing a pair of parallel transmission paths, the first of said paths having a substantially fixed transmission frequency range, the second of said paths providing transmission over a frequency range which is variable responsively to the amplitude of a first control signal, the frequency transmission characteristic of one of said two paths being within a relatively high range of frequencies and the frequency transmission characteristic of the other of said two paths being within a range of relatively low frequencies;

means for combining the output of said two paths to provide a combined signal along a single path;

means for sensing the amplitude of selected relatively low frequency components of said encoded signal and for providing a second variable control signal logarithmically related to the rms value of the amplitude of said relatively low frequency components;

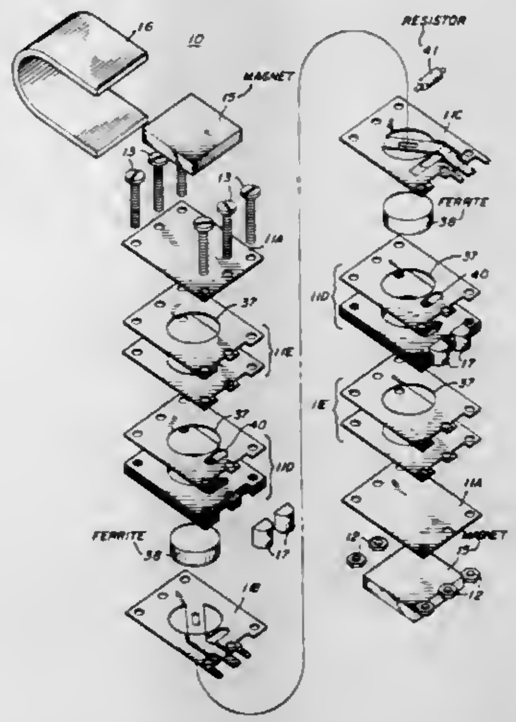
means for sensing the amplitude of selected relatively high frequency components of said encoded signal and for providing a third variable control signal logarithmically related to the RMS value of the amplitude of said relatively high frequency components;

means for comparing said second and third control signals so as to provide said first control signal related to the comparison of said second and third control signals; and

amplifying means coupled between said input and output terminals in series with said parallel transmission paths having a gain variable responsively to the one of said second and third control signals which is logarithmically related to the rms value of the amplitude of the frequency components which correspond to the transmission frequency range of the first of said paths.

4,101,850
UHF ISOLATOR USING STACKED CONDUCTOR SHEETS

Lawrence Noah Dworsky, Coral Springs, and Jeffery Alden Whalin, Hialeah, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 18, 1977, Ser. No. 788,398
Int. Cl.² H01P *1/36*
U.S. Cl. 333—24.2 **14 Claims**



1. An improved broadband two-port isolator for use in high frequency electronic apparatus and comprising in combination:

gyromagnetic members;

resistor means;

a plurality of substantially parallel, contiguous planar members, each member having essentially the same dimensions in the major plane, being formed of a conductive material, at least some of the members having apertures formed therein for receiving the gyromagnetic means and the resistor means;

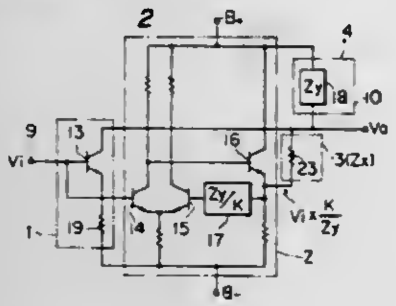
insulating means affixed to two of the planar members for insulating portions of each of the two members from adjacent planar members; and

magnetic means placed adjacent the planar members for producing a static magnetic field in a direction essentially perpendicular to the planes of the planar members, the magnetic field being essentially uniform in the gyromag-

netic means; a first end of the resistor means electrically contacting one of the said two planar members and a second end of the resistor means electrically contacting the other one of the said two planar members;
and wherein the two of the planar members comprise inductive lines between the gyromagnetic members, having the axis of one inductive line perpendicular to the axis of the other inductive line, and also wherein predetermined portions of the planar members comprise tuning elements for said inductive lines.

4,101,851
VARIABLE EQUALIZER

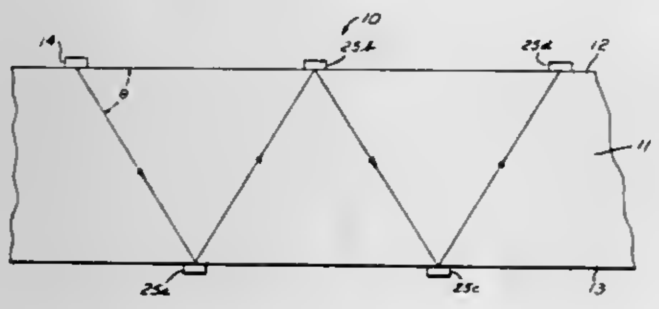
Kohei Ishizuka, and Yasuhiro Kita, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan
Filed Nov. 26, 1976, Ser. No. 745,057
Claims priority, application Japan, Dec. 1, 1975, 50/142246
Int. Cl.² H03H *5/00;* H03G *11/04*
U.S. Cl. 333—28 R **2 Claims**



1. A variable equalizer, comprising:
an a.c. current source which generates a current proportional to an input signal,
a series circuit which consists of an a.c. voltage source and a first impedance circuit and which is connected in parallel with said a.c. current source, and
a second impedance circuit which is connected in parallel with said a.c. current source,
a voltage from said a.c. voltage source being made equal to a value obtained by multiplying a magnitude of said input signal by an inverse number of an impedance value of said second impedance circuit,
at least one of said impedance circuits being endowed with a frequency characteristic.

4,101,852
MICROACOUSTIC SHEAR BULK WAVE DEVICE

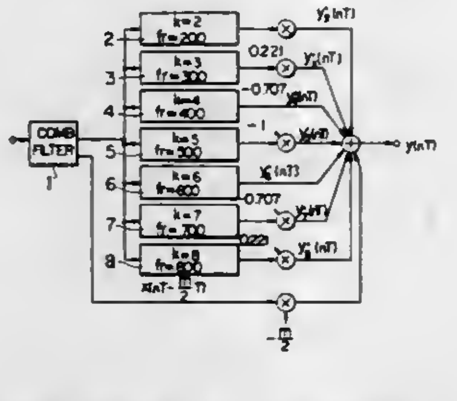
Max Epstein, Highland Park, and Ashok L. Nalamwar, Freeport, both of Ill., assignors to Northwestern University, Evanston, Ill.
Filed Sep. 21, 1976, Ser. No. 725,195
Int. Cl.² H03H *7/30, 7/10*
U.S. Cl. 333—30 R **8 Claims**



1. A microacoustic shear bulk wave device comprising
a substrate having a principal surface and a second surface opposed to said principal surface;
an input interdigital transducer supported on said principal surface and comprising a plurality of interdigital electrodes, a piezoelectric layer adjacent said electrodes, and a conductive film adjacent said piezoelectric layer, and
an output transducer adjacent said second surface of said substrate;
wherein ultrasonic wave energy is propagated by said input interdigital transducer at an angle ϕ which is not an angle substantially normal to said principal surface, said angle ϕ being a function of thickness of the piezoelectric layer and periodicity of the input interdigital transducers, and said output transducer is located laterally of a normal to said input interdigital transducer in a path of ultrasonic wave energy propagated by said input interdigital transducer.

4,101,853
FREQUENCY SAMPLING FILTER

Hiroshi Kosugi, Yokohama, Japan, assignor to Hitachi, Ltd., Japan
Filed Sep. 8, 1976, Ser. No. 721,408
Claims priority, application Japan, Sep. 12, 1975, 50-109989
Int. Cl.² H03H *7/08, 7/14, 7/30*
U.S. Cl. 333—70 R **8 Claims**



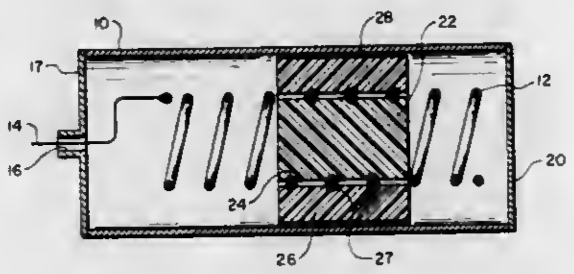
1. A frequency sampling filter comprising:
first filter means having an input for receiving an input signal and first and second outputs, the transfer function between said input and said first output having a plurality of periodically spaced zeros, said second output providing an output of the input signal delayed by a predetermined time;
second filter means coupled to said first output of said first filter means and including a plurality of resonator circuits providing outputs, each of said resonator circuits having a predetermined number of poles in the transfer characteristics thereof, the poles of each of said resonator circuits being coincident in frequency with a separate one of the periodically spaced zeros of said first filter means; and
summation means coupled to each of said resonator circuits and said second output of said first filter means for summing the outputs thereof to form a composite output signal.

4,101,854
TUNABLE HELICAL RESONATOR

Emanuel Gikow, deceased, late of Ocean, N.J. (by Ida M. Gikow, executrix), and Richard S. Tilton, Oceanport, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 28, 1977, Ser. No. 763,384
Int. Cl.² H01P *7/04*
U.S. Cl. 333—82 B **12 Claims**

1. A RF tuneable resonator comprising:
a metallic cylindrical shield;
a helical coil axially positioned within said metallic shield and including a RF coupling means at one end thereof;

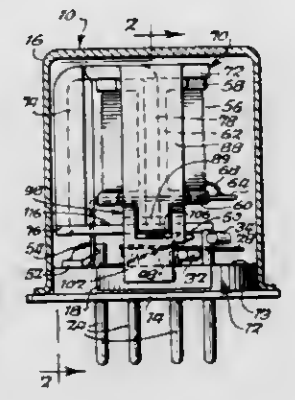
a first axially moveable dielectric means intermediate said metallic shield and said helical coil; and



a second axially moveable dielectric means positioned within said helical coil.

4,101,855
MINIATURE RELAY

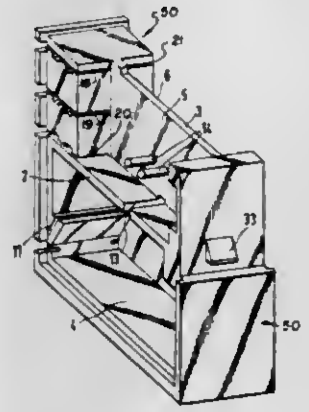
Donald R. Drapeau, Windsor, Conn., assignor to Hi-G Incorporated, Windsor Locks, Conn.
Filed Nov. 5, 1976, Ser. No. 739,210
Int. Cl.² H01H *50/02*
U.S. Cl. 335—106 **30 Claims**

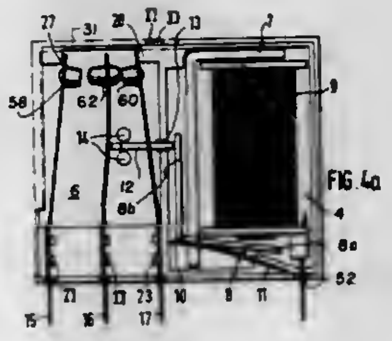


1. A miniature relay comprising:
(a) a support header having a plurality of terminal pins extending therethrough:
(b) a pair of fixed contact members each electrically coupled to a corresponding one of said terminal pins and positioned on one side of said header;
(c) a movable contact member carried by said header and electrically coupled to another of said pins, said contact member having a portion movable between said fixed contact members and normally engaging one of said members;
(d) an electromagnet assembly comprising a coil carried by a magnetic frame, said coil having a magnetic core and said frame having a portion operatively associated with said coil and defining a magnetic pole piece;
(e) holding means comprising a pair of spaced-apart holding elements extending in the same direction from said electromagnet assembly and defining an elongated open region therebetween;
(f) means for supporting said coil and magnetic frame on said header in spaced relation to said one side of said header with said holding means facing said header;
(g) an armature located in spaced relation to said header and having a first portion operatively engaging said movable contact, a second portion operatively associated with said pole piece and a third portion shaped and dimensioned to be received in said open region between said holding elements in a manner permitting limited angular movement of said armature relative to said open region along a plane disposed between said holding elements; and
(h) biasing means supported by said header and engaging said armature in a manner urging said armature third portion into said open region between said holding elements normally so that said armature first portion allows said movable contact to engage said one of said fixed contact members and said armature second portion is spaced from said pole piece;
(i) whereby in response to electrical energization of said coil said armature second portion is attracted to said pole piece thereby moving said armature against said biasing means causing said first portion to move said movable contact into engagement with the other of said fixed contact members.

4,101,856
ELECTRICAL SWITCHING RELAY CONSTRUCTION AND HOUSING THEREFOR

Ernst Dürr, Ebhausen, Germany, assignor to Fritz Kölle, Germany
Filed Mar. 30, 1977, Ser. No. 782,704
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614942
Int. Cl.² H01H *50/04*
U.S. Cl. 335—135 **7 Claims**

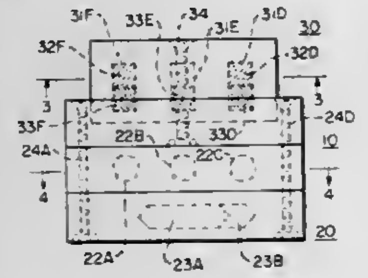




5. An electronic switching relay, comprising an integral single-part housing skeletal structure of insulating material having an interior space, first and second partition walls disposed substantially perpendicular to each other in said housing and dividing the interior of said housing into an armature chamber and first and second spring contact chambers, said housing including first and second sets of spring holder slots defined therein extending from the exterior of said housing into respective ones of said first and second spring contact chambers, respective spring contacts positioned in respective ones of said contact holder slots having exterior portions forming terminals extending to the exterior of said housing and having interior portions with contacts thereon, at least one of said spring contacts being movable relative to the others in order to position it into contact engagement or release from contact engagement therewith, said first partition wall separating said armature chamber from said first and second spring contact chambers having an actuator guide slot defined therethrough extending from said armature chamber to respective ones of said first and second spring contact chambers, an actuator extending through said actuator guide slot, an armature disposed in said armature chamber and engageable with said

actuator, electric coil means associated with said armature for moving said armature to move said actuator, said housing having a wall bounding an end of said armature chamber with an armature biasing spring retainer slot, and a retainer spring disposed in said armature biasing spring retainer slot and biased against said armature to move it to a return position.

4,101,857
EXTERNALLY-PROGRAMABLE SWITCH
Lawrence P. O'Toole, 80 Steiner Ave., Neptune City, N.J. 07753
Filed Sep. 30, 1976, Ser. No. 724,511
Int. Cl.^{2} H01H *9/00*
U.S. Cl. 335—206 **4 Claims**

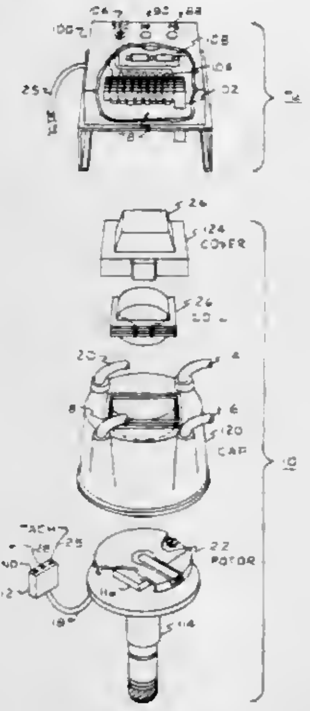


1. A programable, compound reed-type switch comprising a mounting base; a stationary portion secured beneath said mounting base; said stationary portion comprising at least one layer of reed-type switches positioned in a plane just below said mounting base; a moveable portion rotatably secured above said mounting base; said moveable portion comprising at least one layer of magnet holes forming a first series of magnet holes equispaced about said moveable portion, equidistant from the axis of rotation of said moveable portion, positioned in a plane just above said mounting base; at least one magnet in at least one of said magnet holes of said first series, to pass over and actuate certain of said reed-type switches in a prescribed sequence in the course of its rotation; a detent means for holding said moveable portion in at least one given position with relation to said mounting base and said stationary portion comprising a second series of magnet holes, spaced from said first series of magnet holes, about the periphery of said moveable portion; a third series of magnet holes is said mounting base, positioned to coincide with said second series of magnet holes at given intervals during the rotation of said moveable portion; at least one magnet in one of said second series of magnet holes, with one polarity directed toward said mounting base; and at least one magnet, in one of said third series of magnet holes, with its other polarity directed toward said moveable portion to arrest the motion of said moveable portion in at least one given position of said rotation of said moveable portion.

4,101,858
HIGH TORQUE ROTARY ELECTROMAGNETIC ACTUATOR
William H. Henninger, 702 Bancroft Pl., Paramus, N.J. 07652
Filed Dec. 20, 1976, Ser. No. 752,479
Int. Cl.^{2} H01F *7/14*
U.S. Cl. 335—272 **17 Claims**

1. A high torque rotary electromagnetic actuator comprising a generally U-shaped stator having two substantially parallel leg portions joined by a generally transverse connecting portion and defining an axis of symmetry and a pair of spaced stator pole pieces remote from said connecting portion, said stator being formed from a substantially planar sheet of magnetic iron; an elongate core joined at one end to said connecting portion and arranged along said axis; a rotor mounted on the other or free end of said core for rotation about said axis between said pole stator pieces; stop means for limiting rotation of said rotor between a first angular position wherein said rotor is substantially aligned with said stator pole pieces and a second angular position angularly displaced from said first angular position; biassing means for urging said rotor to said second angular position; and a coil coaxially mounted on said core for establishing a magnetic field in the actuator upon energization of said coil to urge said rotor to move from said second to said first angular positions against the action of said biassing means, said rotor being made from a magnetic material and having a predetermined axial thickness and provided with a coaxial counterbore for at least partially receiving said core, and further being provided with an axial hub portion extending beyond said other or free end of said core, said rotor hub portion being configurated to compensate for the reduced axial thickness of said rotor and provide a path of increased cross-sectional area for the magnetic flux associated with the axial components of the said magnetic field, whereby said axial hub portion and said path increased cross-sectional area decrease the magnetic reluctance in said path and increase the strength of said magnetic field.

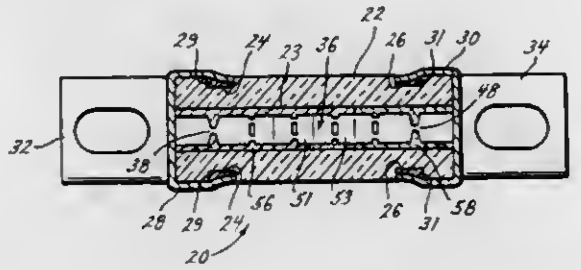
4,101,859
MAGNETIC PICK UP FOR USE WITH ELECTRONIC IGNITION SYSTEMS
George I. Reeves, and Jack J. Keegan, both of Fullerton, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Continuation of Ser. No. 635,742, Nov. 26, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 768,004
Int. Cl.^{2} H01F *27/02*
U.S. Cl. 336—90 **2 Claims**



1. Apparatus for coupling an internal combustion engine ignition analyzer to an electronic system of an internal combustion engine, said ignition system having a coil with primary and secondary circuits contained within the distributor producing a quadrature field in a substantially constant position relative to the distributor configuration, the interconnection of said coil secondary circuit and the distributor being generally inaccessible from outside the distributor, the apparatus comprising:

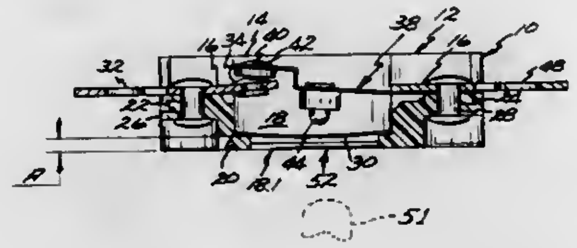
(a) a magnetic core;
(b) a winding on said core adapted to be connected to the analyzer for detecting ignition signals of said ignition system; and,
(c) a housing supporting said core and adapted to be mounted upon the distributor, said housing being configured such that when said housing is mounted upon the distributor said magnetic core is substantially positioned in the quadrature field with respect to the ignition coil of the particular distributor configuration whereby the signal induced by the quadrature field will be maximized and voltages induced by other magnetic fields from the engine will be minimized.

4,101,860
PROTECTOR FOR ELECTRIC CIRCUITS
Aloysius J. Fister, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed May 20, 1976, Ser. No. 688,552
Int. Cl.^{2} H01H *85/10*
U.S. Cl. 337—159 **15 Claims**



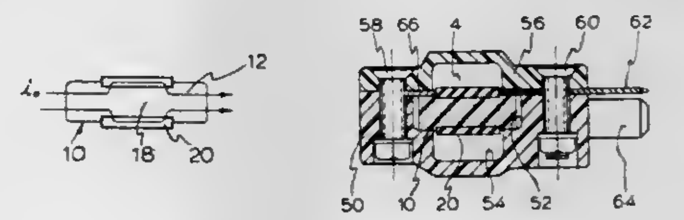
3. An electric fuse as claimed in claim 2 wherein at least one portion of said fusible element engages the surface of said passage to transfer heat from said fusible element to said housing of insulating material, said one portion of said fusible element not being said one or said other weak spot.

4,101,861
THERMOSTATIC SWITCH AND METHOD OF ASSEMBLY
Richard L. Jenne, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Mar. 15, 1976, Ser. No. 666,850
Int. Cl.^{2} H01H *37/12, 37/54*
U.S. Cl. 337—368 **9 Claims**



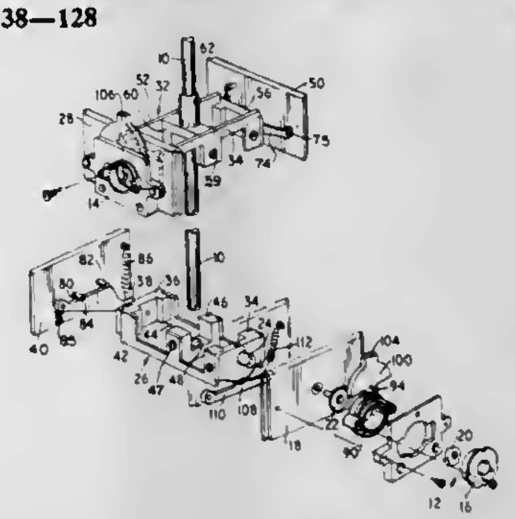
6. A thermostatic switch comprising a base member, an aperture defined by a side wall extending through the base from a first side to an opposed second side, a disc seating shoulder formed in the side wall, a thermostatic bimetallic disc having an outer peripheral margin disposed in the aperture with the outer peripheral margin supported on the disc seating shoulder, a first terminal element supported on the first side of the base extending over the aperture, a second terminal element supported on the first side of the base, a movable contact arm having a first end captured between the second terminal element and the base, the arm extending and terminating over the aperture in a free distal end adapted to move into and out of electrical engagement with a portion of the first terminal extending over the aperture; a motion transfer member disposed within the aperture between the movable contact arm and the disc to transfer motion from the disc to the movable contact arm and to prevent dislocation of the disc from the disc seating shoulder, the movable contact arm having an extended width section over a portion of its length intermediate the first end and the free distal end, the movable contact arm having two approximately right angle bends in the extended width section so that the free distal end of the movable arm lies in a plane spaced from and generally parallel to the remainder of the movable contact arm.

4,101,862
CURRENT LIMITING ELEMENT FOR PREVENTING ELECTRICAL OVERCURRENT
Katsuyuki Takagi, Ichinomiya, and Chihiro Asano, Kakamigahara, both of Japan, assignors to K.K. Tokai Rika Denki Seisakusho, Japan
Filed Nov. 19, 1976, Ser. No. 743,321
Int. Cl.^{2} H01C *7/13, 7/02*
U.S. Cl. 338—23 **14 Claims**



1. A current limiting element for preventing electrical overcurrent comprising:
- a generally elongate principle current conductor means of substantially circular cross-section, said conductor means being made from an elastic insulative material having a positive coefficient of thermal expansion mixed with conductive particles; and
- a heating/heat insulating member provided about the circumference of said conductor means.

4,101,863
ANGULAR MOVEMENT RESOLVERS
Edward Lewicki, Cheltenham, England, assignor to S.L.M. (Model) Engineers Limited, Cheltenham, England
Filed Dec. 23, 1976, Ser. No. 753,784
Claims priority, application United Kingdom, Apr. 8, 1976, 14227/76
Int. Cl.^{2} H01C *5/00;* G05G *9/02*
U.S. Cl. 338—128 **8 Claims**



1. A control device comprising a pair of pivoting members mounted in a housing for angular movement about mutually orthogonal axes, each pivoting member having a respective coupling member mounted thereon for angular movement relative thereto about an axis perpendicular to the axis of the corresponding pivoting member, and a common member connected to each of said coupling members so as to be restrained against relative translational movement in a plane containing

the axis of pivotal movement of the corresponding coupling member, said four axes having a common point of intersection.

4,101,864

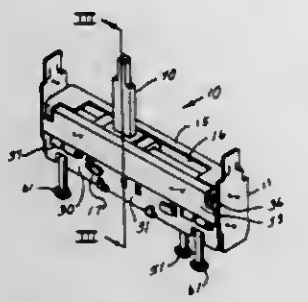
VARIABLE RESISTANCE SLIDE CONTROL

John D. Van Benthuysen, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Dec. 30, 1976, Ser. No. 755,850

Int. Cl.² H01C *10/44*

U.S. Cl. 338—183 **14 Claims**



1. A variable resistance slide control which comprises a first housing portion having elongated front and rear edges, having an elongated inner mounting surface that is longitudinally disposed intermediate of said edges, and having front and rear guide surfaces that are longitudinally disposed intermediate of said mounting surface and respective ones of said edges;

second housing portion means, having front and rear walls, having a side wall that is intermediate of said front and rear walls and that includes an elongated inner guide surface that is longitudinally disposed intermediate of said front and rear walls, and having a slot portion in said front wall that cooperates with said front edge of said first housing portion to form an elongated slot that is longitudinally disposed intermediate of said housing portions, for cooperating with said first housing portion to substantially enclose said mounting surface and all of said guide surfaces;

resistance and collector means, being longitudinally disposed proximal to said mounting surface and intermediate of said front and rear guide surfaces and being secured to the mounting surface, for providing longitudinally disposed resistance and collector surfaces that are distal from said mounting surface;

terminal means for connecting said resistance and collector means to an external circuit;

contactor means, being enclosed by said housing, for wipingly engaging said resistance and collector surfaces;

control operating means, comprising a slider block portion that is disposed intermediate of said inner guide surface and said contactor means, and comprising a handle portion that extends outwardly through said slot and that includes an outer end, for receiving planar guiding from all three of said guide surfaces, and for moving said contactor means longitudinally along said resistance and collector surfaces; and

guide means, comprising cooperating portions of both said slider block and one of said housings, for preventing longitudinal movement of said outer end of said handle portion without substantially corresponding longitudinal movement of said slider block;

said first housing portion including a rail that is longitudinally disposed intermediate of one of said edges and said mounting surface and that further including a longitudinally disposed side surface;

said guide means, and said cooperating portions thereof, comprising said side surface.

4,101,865

SONIC ECHO-SOUNDER FOR THE MEASUREMENT OF LEVELS OF SUBSTANCES

Peter Schurr, Maulburg, Fed. Rep. of Germany, assignor to Endress & Hauser GmbH & Co., Maulburg, Fed. Rep. of Germany

Filed Oct. 5, 1976, Ser. No. 729,638

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1975, 2547759

Int. Cl.² G01S *9/68;* G01F *23/28*

U.S. Cl. 340—1 L **9 Claims**

Fig 1

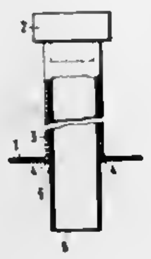


Fig 3a

1. An acoustic echo-sounder for determining the level of a substance in a container or channel, comprising

(a) an acoustic transducer;

(b) an acoustic wave-guided tube having said transducer fitted to one of its ends, the other of its ends being oriented towards the substance the level of which is to be determined;

(c) said oter end of said acoustic wave-guided tube being so constructed so that its solid cross-section diminishes progressively towards said other end of the wave-guide tube, whereby the acoustic impedance of the acoustic wave-guide tube is progressively matched to the acoustic impedance of the space containing the substance.

4,101,866

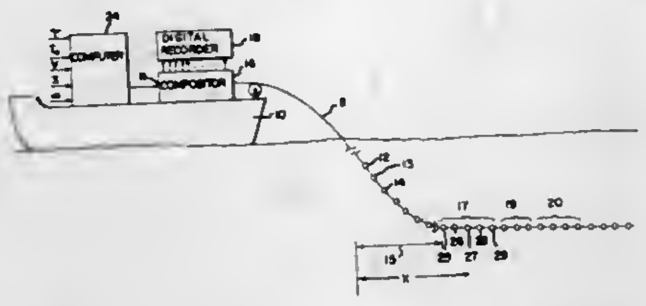
MARINE DETECTOR SPREAD HAVING ARRAYS OF DIFFERENT LENGTHS

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,762

Int. Cl.² G01V *1/38*

U.S. Cl. 340—7 R **4 Claims**



1. A method of seismic exploration utilizing at least one seismic energy source and a linear array of equally spaced seismic detectors, comprising the steps of:

(a) determining the acoustic velocity and dip of the subsurface formations and the seismic reflection times from said formations,

(b) combining the outputs of adjacent detectors in the linear array of equally spaced seismic detectors to form initial

arrays having lengths selected in accordance with said acoustic velocity, dip, and reflection times,

(c) periodically firing the seismic energy source to produce pulses of seismic energy,

(d) detecting the reflected seismic energy with said initial arrays of detectors,

(e) determining the period of said reflected seismic energy,

(f) determining the moveout per unit length along the detectors of said reflected seismic energy, and

(g) changing the lengths of said initial arrays in accordance with the ratio of said period to said moveout per unit length for said reflected seismic energy.

4,101,867

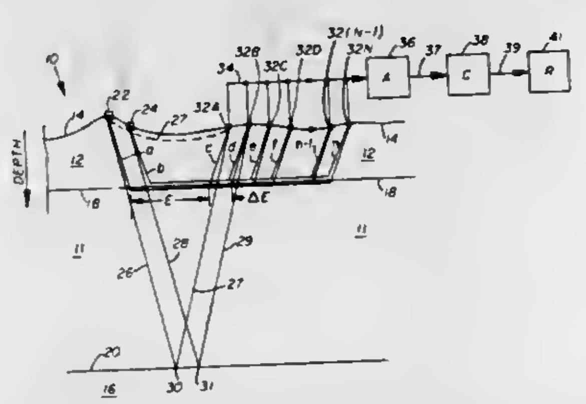
METHOD OF DETERMINING WEATHERING CORRECTIONS IN SEISMIC OPERATIONS

Lincoln A. Martin, Altadena, Calif., assignor to Geophysical Systems Corporation, Pasadena, Calif.

Filed Mar. 12, 1976, Ser. No. 666,360

Int. Cl.² G01V *1/36*

U.S. Cl. 340—15.5 TC **20 Claims**



1. In a seismic system having a linear array of source positions A, B, and receiver positions C, D, E, F down line from said source positions, the spacings AB, BC, CD, DE, EF, etc. being equal, the method of determining the differential static corrections by transmission two ways through the weathered layer between the records from adjacent closely-spaced source points A and B, comprising the steps of;

(a) recording a first record from a first source point A to receiver positions C, D, and E;

(b) recording a second record from a second source point B adjacent said first source point A to receiver positions D, E and F;

(c) correlating selected initial short portions of a first trace AC of said first record with the equal initial short portion of the corresponding first trace BD of said second record whereby only refracted seismic waves at the base of weathering are correlated, and reflected waves from deep interfaces are excluded from the correlations;

(d) determining the first timing difference K_1, in travel times through the weathered layer at source points A and B for said first pair of traces AC and BD;

(e) repeating steps (c) and (d) for at least a second pair of corresponding traces, such as AD and BE and determining a second timing difference K_2 in travel times through the weathered layer at source points A and B for said second pair of traces AD and BE; and

(f) determining the average value K_A of all of said plurality of timing differences K_1 and K_2.

4,101,868

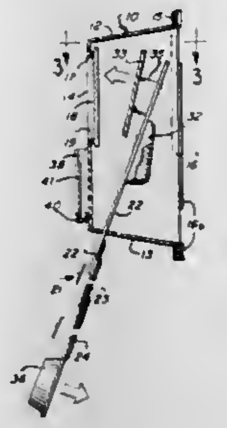
VEHICLE PARKING GUIDE AND SIGNALING DEVICE

Frank J. Bubnich, and Marketta A. Bubnich, both of 3224 Emmaus, Zion, Ill. 60099

Filed Sep. 26, 1977, Ser. No. 836,721

Int. Cl.² B60Q *9/00, 11/00, 5/00*

U.S. Cl. 340—51 **6 Claims**



1. A vehicle parking guide and signaling device comprising, a housing section adapted to be supported in a vertical position and having a front wall with an opening therein, said opening being substantially closed by a pane of material through which indicia become visible only when a flat plate having indicia on the front surface thereof is in direct contact with the rear surface of said pane, an actuating means supported by said housing section, said actuating means comprising an upper arm portion movable toward and away from said pane and normally maintained space rearwardly of said pane, a flat plate with warning indicia on the front surface thereof mounted on said upper arm portion and adapted to be moved forwardly into direct contact with the rear surface of said pane when said upper arm portion of said actuating lever is moved into a forwardly operating position, and said actuating means having a lower arm portion adapted to be engaged by a vehicle being parked and effect forward movement of the upper arm portion of said actuating means and move said plate into direct contact with the rear surface of said pane when said vehicle is in a designated parking position; thereby making said warning indicia visible to an observer viewing said pane from within the said vehicle.

4,101,869

VEHICLE WARNING DEVICES

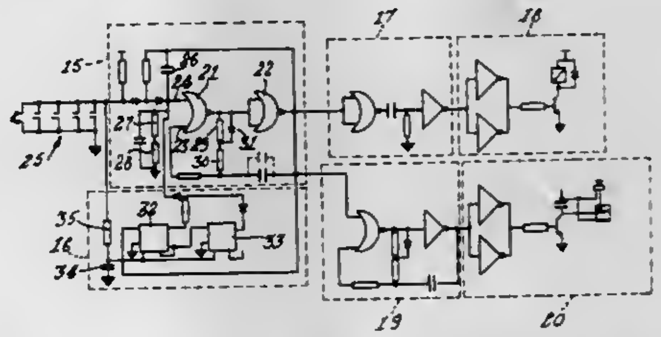
Henning M. Henderson, 21 Marina Vista, Corner Olympia Ave. and 8th St., Parkmore, Sandton, Transvaal Province, South Africa, assignor to Alert-O-Drive (Pty) Ltd., South Africa

Filed Jun. 2, 1976, Ser. No. 691,990

Claims priority, application South Africa, Jun. 4, 1975, 75/3614

Int. Cl.² B60Q *9/00;* G06F *13/00*

U.S. Cl. 340—52 R **30 Claims**



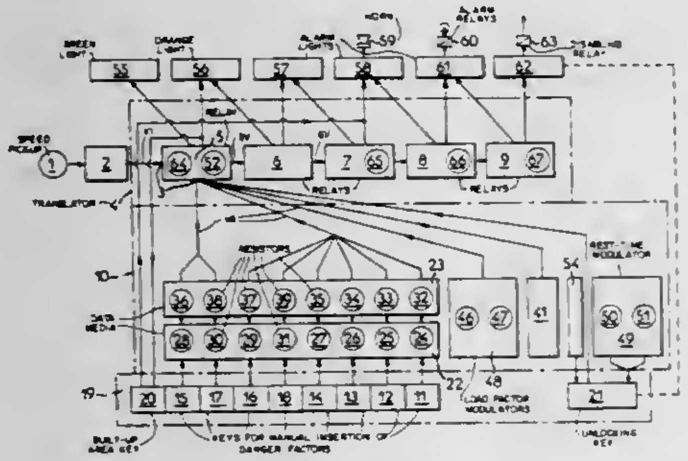
1. In a device for detecting and recording the occurrence of excessive inertial forces acting on a vehicle, said device having force detecting means actuated when excessive forces are

acting on said vehicle, indicator means responsive to said force detecting means for indicating "faults" when said detecting means is actuated, said indicator means including timing means for preventing said indicator means from indicating additional "faults" during a predetermined time interval following the indication of a "fault," the improvement comprising counting means responsive to said indicator means and said detecting means for counting "faults" and for disabling said indicator means from indicating "faults" when the number of "faults" counted during a single actuation of said detector means exceeds a predetermined number.

4,101,870

DEVICE FOR INDICATING SPEED LEVELS FOR MOTOR VEHICLES

Adolphe Ekman, 19 rue Gustave, Delory Lille (Nord), France
Filed Dec. 28, 1976, Ser. No. 755,070
Claims priority, application France, Jan. 21, 1976, 76.02073
Int. Cl.^{2} G08B *19/00*
U.S. Cl. 340—53 **46 Claims**



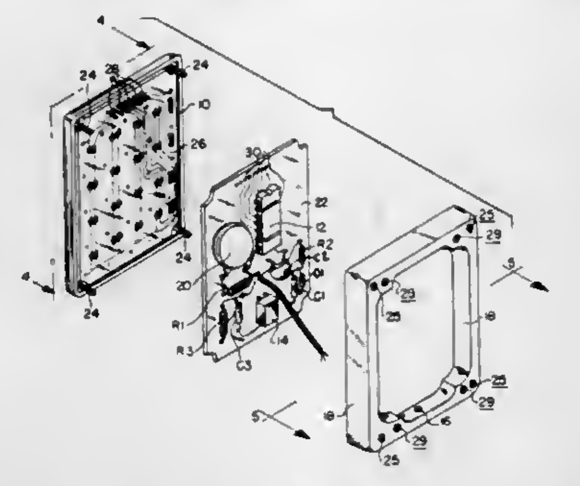
15. Device for indicating operational conditions, including speed levels, in a motor vehicle, comprising;
- a speed circuit for deriving from a vehicle's speed an electrical signal having a value corresponding to the speed of the vehicle;
- means for determining whether danger factors are present and for deriving from each determined danger factor an electrical danger signal of a predetermined value corresponding to the respective danger factor;
- means for modulating each derived danger signal in accordance with a safety factor dependent on characteristics of the vehicle and on characteristics of a driver for the vehicle;
- means for combining the modulated electrical danger signals with the electrical signal corresponding to the vehicle's speed into a resilient value;
- a comparing circuit including a flip-flop relay for comparing the resultant value with a pre-determined threshold; and
- a warning system actuatable by the relay upon the comparison, for indicating a danger existing at the danger existing at the detected speed.

4,101,871

TOUCH-TONE ENCODER UNIT FOR MOBILE RADIO TRANSMITTER

Joseph P. Oliveira, II, 8060 Willoughby Ave., Hollywood, Calif. 90046
Filed Dec. 20, 1976, Ser. No. 752,203
Int. Cl.^{2} H04M *1/50*
U.S. Cl. 340—171 R **4 Claims**

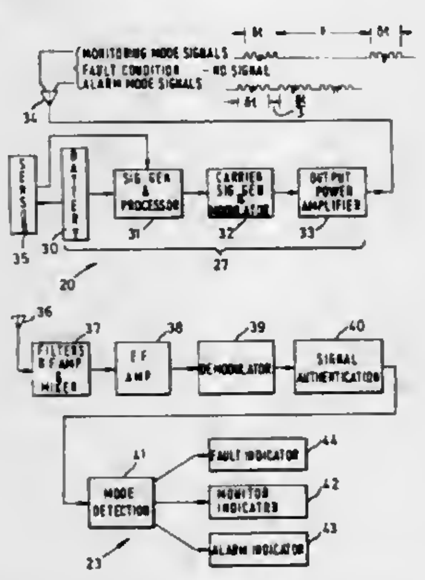
1. A Touch-Tone encoder unit comprising: an open frame; a keyboard mounted on said frame and providing a closure for the front thereof; a switching circuit board mounted on said frame adjacent to the rear face of said keyboard in parallel relationship with said keyboard; a plurality of pushbuttons mounted on said keyboard and connected to said switching circuit board; a further circuit board mounted on said frame adjacent to said switching circuit board in parallel relationship therewith, one of said circuit boards having a plurality of connecting pins thereon, and the other of said circuit boards having a plurality of connecting holes therein to establish electrical connections between said switching circuit board and said further circuit board; and electrical components and circuitry constituting a Touch-Tone encoder generator circuit mounted on said further circuit board and controlled by said switching circuit board to generate selected dual tones upon the selective operation of said pushbutton switches.



4,101,872

FIRE DETECTION SYSTEM

Dennis Gerasimos Pappas, New York, N.Y., assignor to Aboyne Pty. Limited, Sydney, Australia
Filed Jun. 10, 1975, Ser. No. 585,537
Claims priority, application Australia, Jun. 18, 1974, 7893/74
Int. Cl.^{2} G08B *1/08*
U.S. Cl. 340—539 **11 Claims**

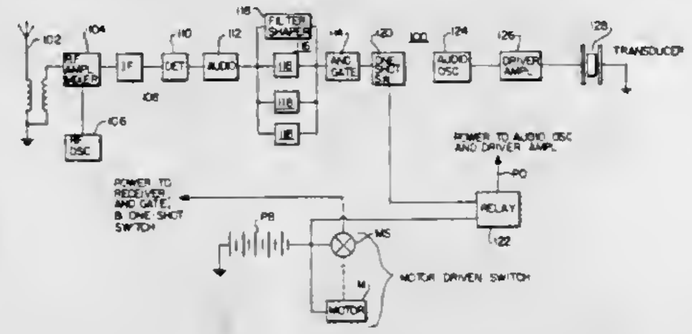


1. A wireless information system transmission system comprising at least two radio frequency signal transmitting means and at least one receiving means associated with the tranmsmitting means, each of the signal transmitting means being arranged to transmit in first and second modes, the first mode being a monitoring mode wherein monitoring mode signals which have a duration δt and a repetition rate such that said monitoring mode signals are spaced apart by intervals of time $t >> \delta t$ are employed to modulate a radio frequency carrier signal,
- the time interval t between successive monitoring mode signals being allowed to drift randomly between each of the transmitting means,
- the second mode being an alarm mode, which is established in response to an alarm inducing condition, wherein alarm mode signals having the same duration δt as the monitoring mode signals are employed to modulate the carrier signal, the alarm mode signals having a repetition rate greater than the repetition rate of the monitoring mode signals and being spaced apart by time intervals αt,
- each said monitoring and alarm mode signal associated with the respective transmitting means being composed of a coded pulse train,
- the receiving means being arranged to receive and detect signals from the transmitting means, the receiving means being arranged to provide an output responsive to a change occurring in the mode of transmission by the transmitting means and to provide an output if no signal having the duration δt is detected within each period of successive predetermined fault detecting periods of time $xt > t$, and
- the receiving means being arranged to provide an alarm indicating output if at least one signal of duration δt is received and detected within a receiver alarm detection period of time βt, where $\alpha t \leqq \beta t < t$, following receipt of a preceding such signal.

4,101,873

DEVICE TO LOCATE COMMONLY MISPLACED OBJECTS

Benjamin Ernest Anderson, 8313 Aqueduct Rd., Rockville, Md. 20854, and Louise Creegan McIntyre, 2713 Hermitage Dr., Montgomery, Ala. 36111
Filed Jan. 26, 1976, Ser. No. 652,157
Int. Cl.^{2} G08B *1/08*
U.S. Cl. 340—539 **2 Claims**

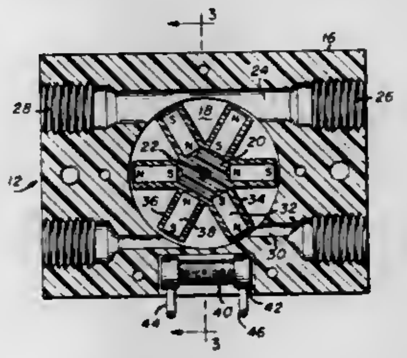


1. Audible communication means for selectively generating an audible signal at one of a plurality of random positions to be located within a general area comprising:
- transmitter means adapted to be utilized by an individual having a plurality of tone generator means selectively interconnected to provide a plurality of transmitted signals corresponding to a respective plurality of random positions;
- a plurality of receiver means being attached to corresponding ones of a respective plurality of objects at said random positions, one to locate each of said objects at said random positions, each of said receiver means comprising:
  - a power source means;
  - tuning means responsive to only a corresponding one of said transmitted signals and an audio generator means emitting an audible signal in response to said corresponding one of said transmitted signals to audibly identify the location of a corresponding one of said objects at said random positions to said individual;
  - detector circuit means cyclically energized by said power means and including AND gate means responsive to receipt of a predetermined transmitted signal to provide a control output;
  - one-shot switch means responsive to said control output to provide a power on signal;
  - audio generator means for providing an audible output signal; and
  - wherein said power means comprises:
    - a battery;
    - motor driven switch means powered by said battery and cyclically energizing said detector circuit means and said one-shot switch means; and
  - relay means responsive to said power on signal interconnecting said battery means to said audio generator means to energize the latter to provide said audible output signal.

4,101,874

FLUID FLOW INDICATOR AND FLOW SWITCH

Dean R. Denison, Los Gatos, and George J. Kren, Los Altos, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Jul. 29, 1976, Ser. No. 709,947
Int. Cl.^{2} G08B *21/00;* **G01F** *1/06*
U.S. Cl. 340—606 **5 Claims**



1. A fluid flow indicator comprising:
- a housing having at least one planar surface having a circular aperture therein, the plane of the circle of said aperture being coplanar with said planar surface; said housing containing a plurality of fluid channels entering and exiting said circular aperture, each of said plurality having a different fluid carrying capacity, said channels entering or exiting said circular aperture substantially along a tangent to the periphery of said aperture;
- an aperture cover plate having at least one planar surface adapted to cover and seal said circular aperture;
- a turbine mounted for rotation within said circular aperture, said turbine having an even number of radially positioned blades, each blade having a bar magnet embedded therein with one pole of said magnet being located adjacent the outer end of said blade, the polarity of said one pole being opposite to the polarity of the magnetic poles in the outer ends of the adjacent blades.

4,101,875

MULTI-SATELLITE INTRUSION ALARM CONTROL SYSTEM

Peter E. Humphries, King, Canada, assignor to Contronic Controls Limited, Mississauga, Canada
Filed Nov. 15, 1976, Ser. No. 742,047
Int. Cl.^{2} G08B *13/16, 25/00, 27/00*
U.S. Cl. 340—504 **9 Claims**

1. An intrusion alarm system comprising:
- (1) a master control unit having:
  - (a) two power supply terminals, and power supply means coupled thereto for supplying power to said power supply terminals,
  - (b) a master drive signal terminal, and a drive signal generator coupled thereto for applying a drive signal to said master drive signal terminal,
  - (c) a master alarm signal terminal, and a detector coupled thereto and responsive to receipt of a predetermined high level first alarm signal thereat for generating a second alarm signal,
- (2) a plurality of satellite units, each having:
  - (a) a satellite drive signal terminal, and a transmitter coupled thereto and responsive to receipt of said drive

signal thereat for transmitting a radiation field in a supervised area,
- (b) a receiver for receiving a portion of said radiation field which is reflected from objects in said area,
- (c) signal processing means coupled to said receiver for comparing the transmitted and received fields and responsive to disturbances in said received field caused by a moving intruder in the supervised area, for generating a third alarm signal upon occurence of such disturbance,
- (d) a satellite alarm signal terminal,
- (e) a control circuit coupled to said signal processing means and to said satellite alarm signal terminal and responsive to receipt of said third alarm signal for generating said high level first alarm signal at said satellite alarm signal terminal,
- (f) two satellite power receiving terminals for receiving power and coupled to said transmitter, to said receiver, said signal processing means, and to said control circuit for supplying power thereto,

(3) a cable having only four wires connecting each satellite unit to said master control unit, two of said wires being connected between said power supply terminals and said satellite power receiving terminals, a third of said wires being connected between said master drive signal terminal and said satellite drive signal terminal, and the fourth of said wires being connected to said master alarm signal terminal and said satellite alarm signal terminal.

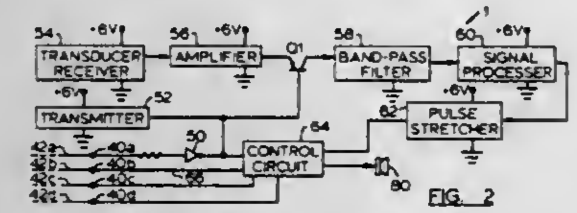


FIG. 2

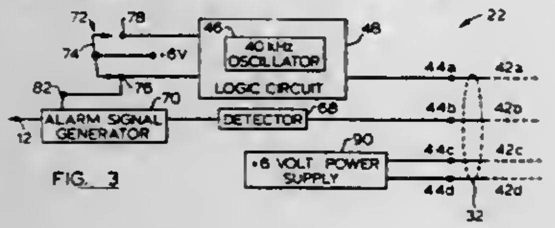
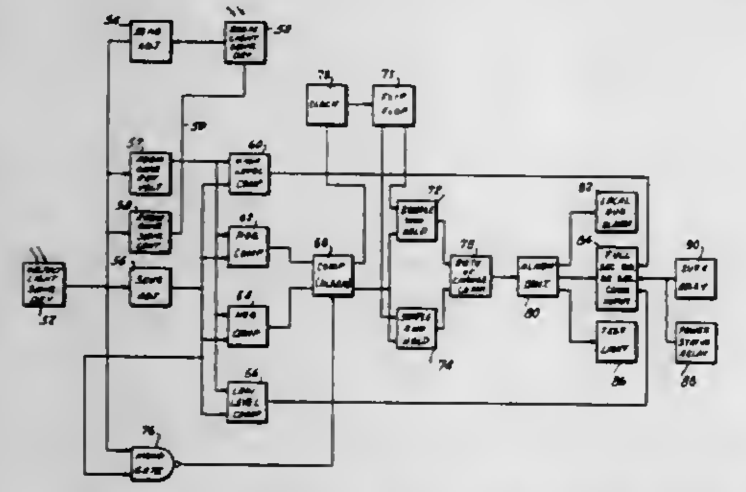


FIG. 3

4,101,876
PHOTO ELECTRIC SECURITY SYSTEM

Alexander Lurkis, Holliswood, and John I. Hill, Ronkonkoma, both of N.Y., assignors to Glimmer Security Systems Inc., Floral Park, N.Y.

Filed Jan. 24, 1977, Ser. No. 761,785
Int. Cl.^{2} G08B *13/18*
U.S. Cl. 340—555 **6 Claims**

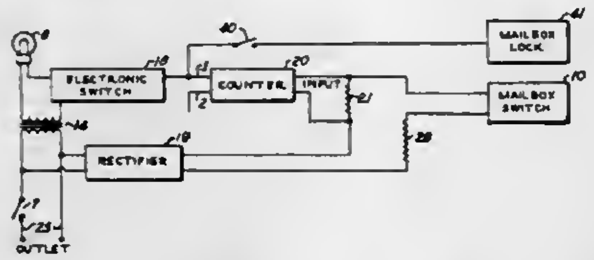


1. A security arrangement comprising an area having ambient radiation therein, an article requiring security monitoring in said area, a radiation sensor in said area for the formation of an electrical signal, sad article being located adjacent said sensor in intercepting relationship with said ambient radiation, and alarm means coupled to said sensor for responding to said electrical signal, said area including a wall and said article being mounted on said wall with the sensor being located between the article and wall, said arrangement further comprising means coupling said sensor to said alarm means and including a wire supporting said article on said wall and constituting at least part of the coupling between the sensor and alarm means.

4,101,877
MAIL DELIVERY ALARM SYSTEM

Donald W. Rush, 633 Myrtle Rd., North Brunswick, N.J. 08902

Filed Jun. 11, 1976, Ser. No. 695,506
Int. Cl.^{2} G08B *21/00*
U.S. Cl. 340—569 **1 Claim**



1. A system for activating at least one signal device located in a house when mail is deposited in a mailbox located outside the house and for deactivating the signal device when the mail is withdrawn from the mailbox, comprising:
- a house having a signal device or a plurality of signal devices therein;
- a mailbox located outside said house and having an openable and closeable door, switch means located in said mailbox behind said door, said switch means being closed when said door is closed and open when said door is open;
- means for activating said signal device or plurality of devices every other time said switch means is closed and for deactivating said signal device at each time said switch means is closed between said every other time; and
- an electrically engagable lock means located in said mailbox for locking the mailbox door shut, said lock being engaged at said every other time said switch means is closed, and manually operated switch means for disengaging said lock means.

4,101,878
SELF-CUT-OFF POWER SWITCH FOR A REMOTE CONTROLLED ELECTRONIC EQUIPMENT

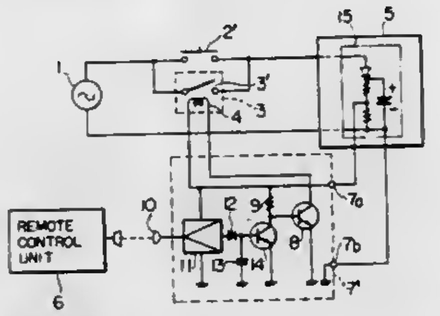
Keizo Shimizu; Takeshi Maruyama, both of Yokohama, and Toshio Fujimura, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 4, 1976, Ser. No. 729,263
Claims priority, application Japan, Oct. 6, 1975, 50-119731
Int. Cl.^{2} H04M *11/04*
U.S. Cl. 340—310 R **7 Claims**

1. A power switch for a remote controlled electronic equipment comprising;
- A. a switch element having on and off states,
- B. a control unit for controlling turn-on and turn-off of said switch element,
- C. a remote controlled load circuit,
- D. a power supply,
- E. a means for supplying a power from said power supply to said load circuit through said switch element,
- F. a means for supplying a power from said power supply to said control unit through said switch element,
- G. a remote control unit for generating a stop signal to turn off said switch element from its onstate, and

- H. a manual means for shortcircuiting said switch element when a manual operation is intervened,

said control unit including;
- a. a holding means which is operable only when the power is being fed to said control unit to turn on said switch element and which turns off said switch element during its non-operable condition, and

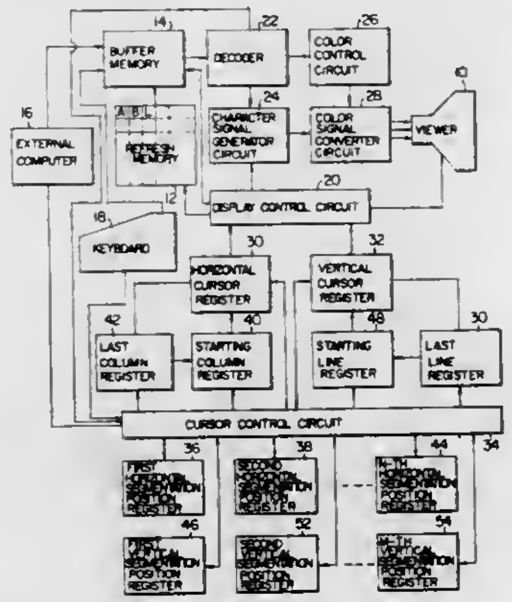


- b. a stop means which is operable only when the power is being fed to said control unit to maintain said holding means in its operating condition until the stop signal is received and which switches said holding means to its non-operating condition when the stop signal is received.

4,101,879
CURSOR MOVEMENT CONTROL DEVICE FOR SCREEN-SEGMENTED DISPLAY APPARATUSES

Mitsuo Kawaji; Toshio Usui, and Masaichiro Kawano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,973
Claims priority, application Japan, Dec. 26, 1975, 50-156413
Int. Cl.^{2} G06F *3/14*
U.S. Cl. 340—324 AD **6 Claims**


BUFFER MEMORY
DECODER
COLOR CONTROL CIRCUIT
EXTERNAL COMPUTER
REFRESH MEMORY
CHARACTER SIGNAL GENERATOR CIRCUIT
COLOR SIGNAL CONVERTER CIRCUIT
VIEWER
DISPLAY CONTROL CIRCUIT
KEYBOARD
HORIZONTAL CURSOR REGISTER
VERTICAL CURSOR REGISTER
LAST COLUMN REGISTER
STARTING COLUMN REGISTER
STARTING LINE REGISTER
LAST LINE REGISTER
CURSOR CONTROL CIRCUIT
FIRST HORIZONTAL SEGMENTATION POSITION REGISTER
SECOND HORIZONTAL SEGMENTATION POSITION REGISTER
N-TH HORIZONTAL SEGMENTATION POSITION REGISTER
FIRST VERTICAL SEGMENTATION POSITION REGISTER
SECOND VERTICAL SEGMENTATION POSITION REGISTER
N-TH VERTICAL SEGMENTATION POSITION REGISTER
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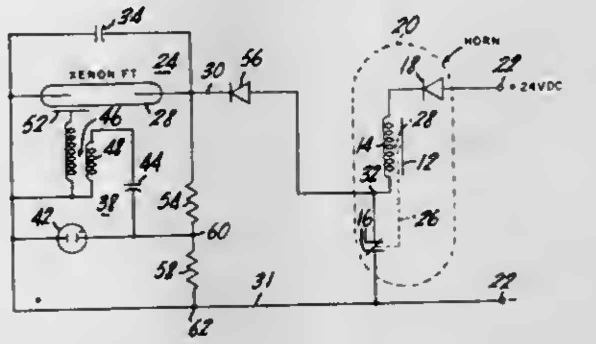
1. A cursor movement control device for a screen-segmented display apparatus, comprising at least one segmentation position register for storing a segmentation position of a display screen, a starting position register for storing the starting position of cursor display in each section, a last position register for storing the last position of cursor display in said section, a cursor register for storing the cursor position on display, and cursor control means for altering the data in said registers in response to a command from an external source, said cursor control means including means for causing said cursor register to store the data of said starting position register when the data in said cursor register coincides with that in said last position register and means responsive to completion of cursor movement required in one section for storing the starting position of another section associated with the next cursor display in said starting position register while at the same time storing the last position of said section associated with said next cursor display in said last position register.

4,101,880
AUDIOVISUAL SIGNALING DEVICE

Rein Haus, Long Branch, N.J., assignor to Wheelock Signals, Inc., Long Branch, N.J.

Filed Dec. 27, 1976, Ser. No. 754,740
Int. Cl.^{2} G08B *7/00*
U.S. Cl. 340—326 **11 Claims**

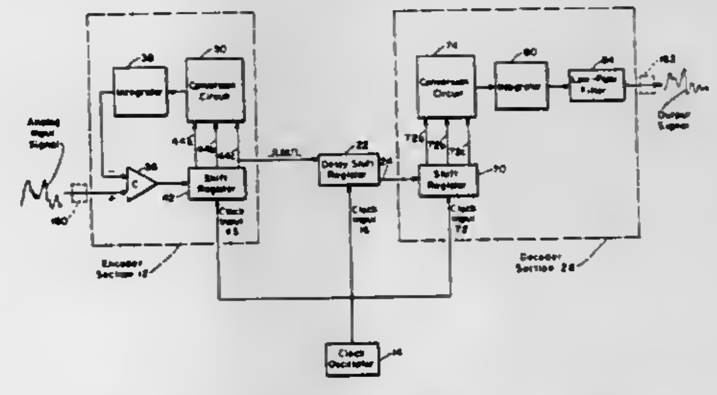


1. An audiovisual signaling device comprising auditory signaling means, induction means for energizing said signaling means, circuit-interruption means in series circuit with said induction means, and flashtube means electrically connected to said induction means and interruption means, said induction means acting as an electromagnet when a voltage is impressed across said induction means and interruption means, said series circuit being intermittently interrupted by said interruption means, and said flashtube means being actuated in response to the decaying magnetic field of said induction means when said circuit is thus interrupted.

4,101,881
MULTIPLE STATE RESPONSIVE DELTA-SIGMA CONVERTER AND DELAY LINE

Richard E. De Freitas, Westford, Mass., assignor to Hybrid Systems Corporation, Bedford, Mass.

Filed Mar. 15, 1976, Ser. No. 667,146
Int. Cl.^{2} H03K *13/02*
U.S. Cl. 340—347 R **8 Claims**



1. A delay line for producing a delay in an analog input signal comprising:
- comparator means for producing a digital output signal indicative of the level of the analog input signal with respect to a variable reference signal level;
- means for storing the digital values of said digital output signal at a plurality of successive time periods;
- conversion means for producing the reference signal as a function of a plurality of said stored digital values at said plurality of sequential time periods such that the reference signal is varied in a direction which lessens the difference

between it and the analog input signal applied to said comparator means;

said conversion means including:

means for producing an intermediate signal as a predetermined function of said plurality of stored digital values; and

an active integrator circuit providing true integration for integrating said intermediate signal to produce said variable reference signal such that the rate of change of said variable reference signal with respect to time is proportional to the amplitude of the intermediate signal throughout the dynamic range of said variable reference signal; and

decoder means responsive to the stored digital values of said output signal at the said plurality of successive time periods for producing a digital representation thereof after a predetermined time delay, including:

means for producing second intermediate signals having different analog values as a predetermined function of different combinations of plural digital values in the delayed digital representation; and

means for integrating said second intermediate signals to provide said analog output signal;

wherein the number of digital values used in providing said intermediate signals is three;

wherein the predetermined function for producing the first and second intermediate signals produces intermediate signals of a first polarity in response to digital values of **000, 001, 010,** and **011**, and produces intermediate signals of the opposite polarity in response to digital values of **100, 101, 110,** and **111**;

wherein the intermediate signals of the first polarity are further produced such that: in response to a digital value of **000**, the intermediate signal has a first magnitude; in response to a digital value of **001**, the intermediate signal has a second magnitude less than the first magnitude; in response to a digital value of **010**, the intermediate signal has a third magnitude less than the second magnitude; and in response to a digital value of **011**, the intermediate signal has a fourth magnitude intermediate the first and third magnitudes; all of said previous four intermediate signals being of the first polarity; and

wherein the intermediate signals of the opposite polarity are produced so that in response to digital values of **111, 110, 101,** and **100**, the magnitudes of the intermediate signal are substantially equal to said first, second, third and fourth values, respectively, all of said second four intermediate signals being of the opposite polarity.

4,101,882
DATA READ-OUT SYSTEM AND APPARATUS USEFUL FOR ANGULAR MEASUREMENTS

Melvin G. Kramer, Riverton, Wyo., assignor to The Brunton Company, Riverton, Wyo.

Filed May 28, 1976, Ser. No. 691,078
Int. Cl.² G08C *9/06;* H03K *13/18*

U.S. Cl. 340—347 P **19 Claims**

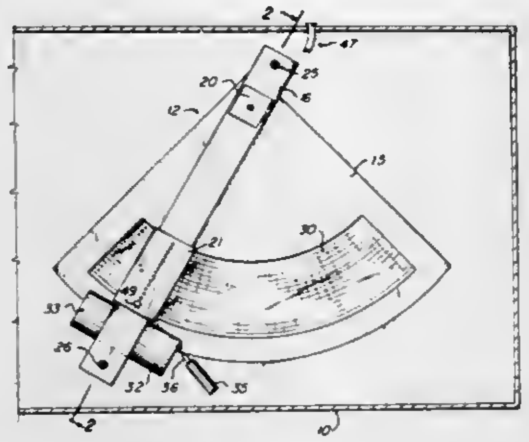
1. In a system having an input of a group of least significant bits and one or more groups of higher significant bits which change state at one transition point of one of the least significant bits, apparatus for producing output date correlated to the system input free of transition ambiguities comprising:

system output means;

means for coupling information correlated to the least significant bits to said system output means;

means for storing information correlated to the higher significant bits and for transferring said stored information to said system output means;

control circuit means responsive to the status of the least significant bits for controlling the information input into said storage means, said control circuit means generating a control signal in the presence of a first zone around the transition point and a transition reflecting signal in the presence of the transition point, said control circuit generating a load signal in the presence of a second zone removed from said first zone, said load signal operative to input higher significant bit correlated information into said storage means; and



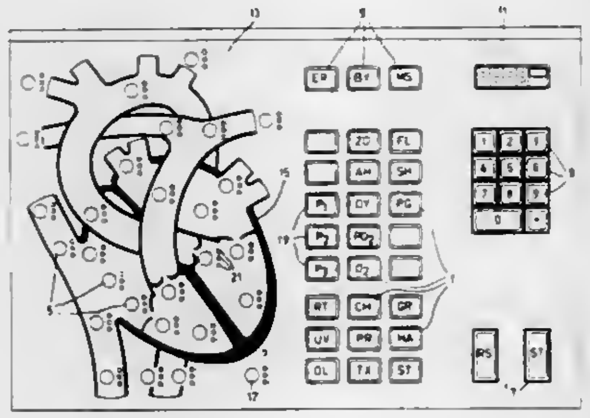
commutation circuit means associated with said control circuit means and responsive to said control signal for disabling said storage means from receiving said higher significant bit correlated information and responsive to said transition reflecting signal for altering the information in said storage means.

4,101,883
KEYBOARD

Klaas Hempenius; Jan Cornelis Van Mourik, and Petrus Franciscus Stevens, all of Eindhoven, Netherlands, assignora to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 590,438, Jun. 26, 1975, abandoned.
This application Apr. 20, 1977, Ser. No. 789,212
Claims priority, application Netherlands, Jul. 15, 1974, 7409515
Int. Cl.² G08C *11/00*

U.S. Cl. 340—365 R **2 Claims**



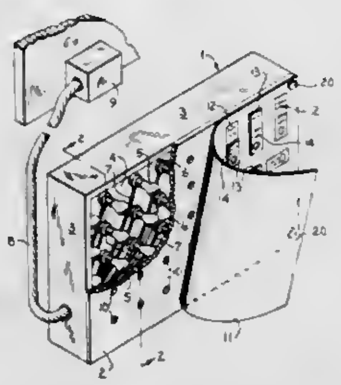
1. In computerized medical apparatus for diagnosing a physiological system said apparatus having on a keyboard a plurality of location command keys for operator communication to the apparatus of the location in the physiological system of an input element making a physiological measurement, improved means for identifying to the operator the physiological location associated with each of the location command keys, said improvement comprising: a diagramatic image representation of the physiological system on the keyboard background, the image representation including at least that portion of the physiological system at which input physiological measurements might be taken, each of the location command keys being physically located at the position on the image representation corresponding to the location in the physiological system communicated to the apparatus by actuation of that key.

4,101,884
VISUAL DISPLAY WITH MAGNETIC OVERLAY

Lawrence M. Benton, Jr., 1727 N. 34th St., Milwaukee, Wis. 53208

Filed Feb. 3, 1977, Ser. No. 765,354
Iot. Cl.² G09F *7/04*

U.S. Cl. 340—366 B **6 Claims**



1. A visual display device comprising, in combination:

(a) a planular support wall having a plurality of apertures therein,

(b) a light source disposed behind said support wall,

(c) a removable flexible light transmissive imperforate membrane disposed on the front of said support wall, and with said membrane having a plurality of discrete spaced display indicia portions thereon,

(d) said indicia portions being disposed over said apertures,

(e) at least one planular overlay member adapted to be removably disposed over one of said indicia portions and with said overlay member haviog a revised indicia thereon different from said first-named indicia,

(f) means for securing said overlay member in place so that said membrane is confined between said overlay member and said support wall,

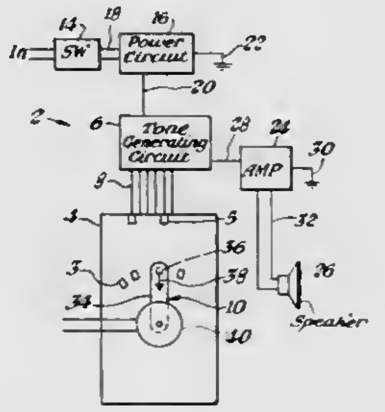
(g) and an opening in said overlay member and adapted to register with the respective aperture so that light passing through said aperture onto said membrane is visible through said overlay member.

4,101,885
MUSICAL CHIME DEVICE

Emil Blum, 4143 N. Ocean Blvd., Fort Lauderdale, Fla. 33308

Contiouation of Ser. No. 607,834, Aug. 26, 1975, abandoned.
This application Jun. 20, 1977, Ser. No. 807,922
Iot. Cl.² G08B *3/00*

U.S. Cl. 340—384 E **4 Claims**



1. A replaceable electric melody circuit board record for engagement with an electronic oscillator tone generating means for automatic play of a melody when continuously sweeped by electrical connecting means comprising:

a removable printed circuit board with a playing surface,

sequential and variable sized electrically conductive areas of melody control area means on said playing surface to provide a melody in conjunction with an electronic oscillator tone generating means,

said melody control area means sized to provide the time length of each tone when sweeped by connecting means,

said melody control area means spaced apart to provide the time length of the pause between each note, and

said melody control area means oriented in a single path pattern from start to finish for providing a complete melody,

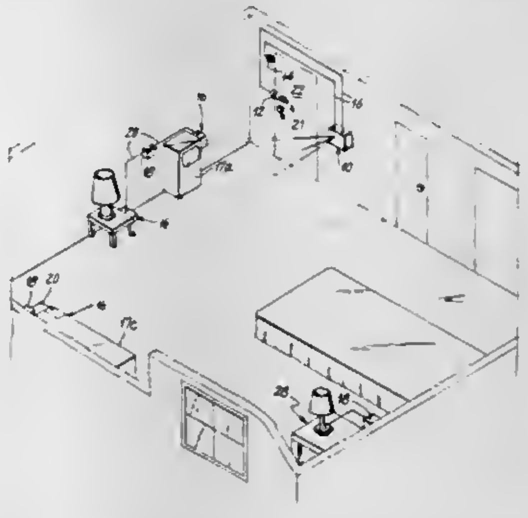
the edge of said melody circuit board including connector means interconnected with said melody control area means for sequentially picking up the proper tone when connected to an electronic oscillator tone generating means to provide various melodies from different printed circuit boards.

4,101,886
APPARATUS FOR CONSERVING ENERGY IN ELECTRICAL APPLIANCES

Johnny C. Grimes, 873 Grand Cir., Las Vegas, Nev. 89101; Richard L. Pierce, 6641 Sambar Cir., Cypress, Calif. 90630; Jimmy R. Payne, 3584 S. Bronco Rd., Las Vegas, Nev. 89102, and Nate Schlaifer, 1314 Sweeney Ave., Las Vegas, Nev. 89104

Filed May 16, 1977, Ser. No. 797,382
Int. Cl.² G08B *1/00*

U.S. Cl. 165—14 **10 Claims**



1. A device for conserving energy consumption by appliances within a room having a door when the room is unoccupied by an occupant, which device comprises:

(a) a source of energy;

(b) means for connecting the appliances to the source of energy;

(c) control means for causing the connecting means to connect or disconnect the appliances and the source of energy;

(d) sensing means responsive to the ingress to and egress from the room by the occupant, which sensing means includes:

1. first switch means responsive to activation by the occupant, and
2. second switch means responsive to the opening and closing of the door; and

(e) transmitting means activated and inhibited by the sensing means for transmitting control signals to the control means, thereby causing the appliances to be connected to or disconnected from the source of energy responsive to the ingress to or egress from the room by the occupant.

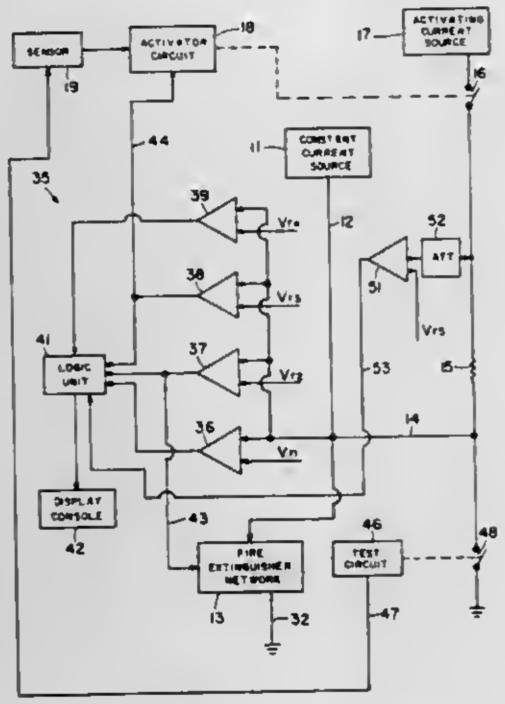
4,101,887
MONITORED FIRE PROTECTION SYSTEM

William B. Osborne, Marlboro, Mass., assignor to Walter Kidde and Co., Inc., Clifton, N.J.

Filed Sep. 24, 1976, Ser. No. 726,209

Int. Cl.^{2} G05B ***23/00***

U.S. Cl. 340—652 **15 Claims**



1. An electrical protection system comprising:
a plurality of suppressor units activatable to suppress an abnormal condition;
a plurality of electrical current responsive activators, one associated with each of said suppressor units and adapted to induce activation thereof;
an activator current supply means;
activator control circuit means comprising series circuit means connecting said activators in series, a sensor means for said abnormal condition, and initiator means responsive to said sensor means for initiating activating current flow from said activator supply means to said series connected activators so as to induce activation of said suppressor units;
a supervisory current supply means providing through said series connected activators a constant level of supervisory current flow insufficient to induce activation of said suppressor units;
fault voltage responsive means for detecting a given abnormally high voltage level across said series connected activators; and
switching circuit means for connecting said activators in parallel in response to detection of said abnormally high voltage across said series connected activators.

4,101,888
ANTICOLLISION CAR RADAR

Hans-Dieter Heller, Nurtingen; Wolfram Hertler, Kornwestheim, and Karl Petschauer, Karlsruhe, all of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

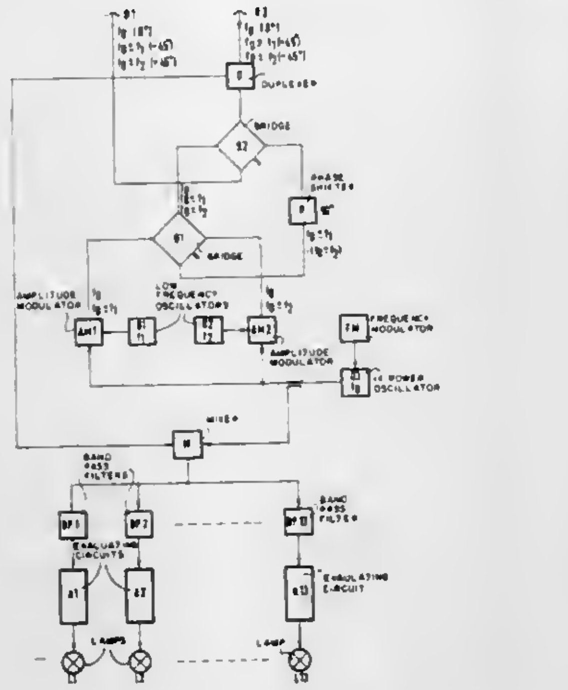
Filed Nov. 17, 1976, Ser. No. 742,406

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553302

Int. Cl.^{2} G01S ***9/02***

U.S. Cl. 343—7 VM **1 Claim**

1. An anticollision radar for motor vehicles comprising:
at least two antennas each radiating a radio frequency signal of different frequencies, said two antennas having overlapping radiation patterns;
a first means coupled to said two antennas to amplitude modulate a single radio frequency signal with two low frequencies to generate said radio frequency signals of different frequencies.
second means coupled to one of said two antennas to receive said radio frequency signals of different frequencies reflected from an object, to determine the difference between the amplitudes of said two radio frequency signals reflected from said object and to generate a direct current voltage proportional to said difference; and



third means having a threshold determined by a predetermined azimuth range coupled to said second means, said third means being responsive to said voltage to indicate whether said object is in the same road lane as a motor vehicle equipped with said radar.

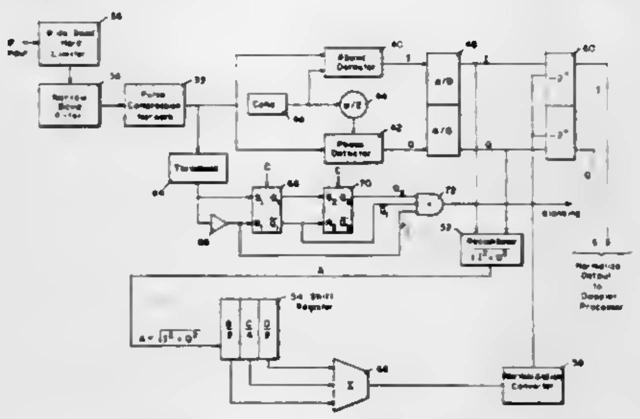
4,101,889
CONSTANT FALSE ALARM RATE DOPPLER RADAR SYSTEM

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 20, 1975, Ser. No. 588,576

Int. Cl.^{2} G01S ***9/42***

U.S. Cl. 343—7.7 **18 Claims**



1. A constant false alarm rate, doppler radar system comprising in combination:
a recombining network responsive to both in-phase and quadrature signal outputs from analog-to-digital converters and forming therefrom an output signal functionally related to said in-phase and quadrature signals;
a shift register responsive to output signal from the recombining network and forming functionally related output signals therefrom;
a summing circuit responsive to output signals developed in the shift register and forming a functionally related output signal therefrom:
a normalization converter responsive to output signal from said summing circuit and furnishing output signal functionally related thereto;
a divide-by-2^N circuit responsive to output signals from the normalization converter and the analog-to-digital converters and furnishing in-phase and quadrature signals to a doppler processor.

4,101,890
RADAR RECONNAISSANCE SYSTEM FOR TRACK VEHICLE RECOGNITION

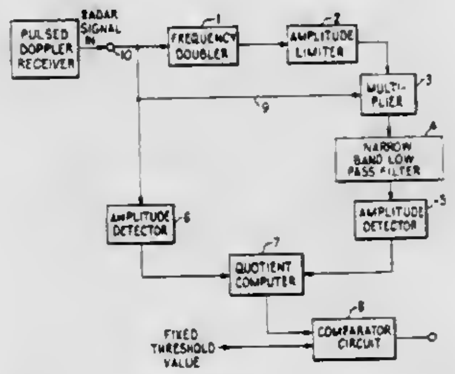
Pierre Jean-Marie Goyard, Fontenay le Fleury, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 766,935

Claims priority, application France, Mar. 10, 1976, 76 03563

Int. Cl.^{2} G01S ***9/44, 9/42, 9/02***

U.S. Cl. 343—8 **5 Claims**



1. In a pulsed Doppler radar system providing at least one received signal corresponding to a discrete range bin, the combination comprising:
first means responsive to said received signal to provide a second signal the components of which are of doubled frequency as compared to said received signal;
multiplier means responsive to said received signal and to said second signal to provide a third signal which is the product of said received and second signals;
filter means responsive to said third signal to produce a fourth signal which contains substantially only those spectral components corresponding to the tracks of a track vehicle;
first and second amplitude detectors responsive to said received and said fourth signal, respectively, to provide demodulated received and fourth signals;
second means responsive to the outputs of said amplitude detectors to produce a fifth signal which is the quotient of said demodulated fourth signal divided by said demodulated received signal;
and third means for comparing said fifth signal with a fixed threshold representative of the average ratio of the amplitudes of the signals reflected by the vehicle body to those refelected from a track of said vehicle, said third means providing an output indicative of the presence of said track vehicle at the range corresponding to said received signal range bin.

4,101,891
SURFACE ROUGHNESS MEASURING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Atul Jain, Altadena, Calif.

Filed Nov. 24, 1976, Ser. No. 744,577

Int. Cl.^{2} G01S ***9/02, 9/60***

U.S. Cl. 343—17.2 PC **5 Claims**

1. Apparatus for determining heights of ocean waves or terrain peaks utilizing synthetic-aperture radar to attain a return signal from said waves or peaks, said signal having a spectrum of bandwidth f_r, comprising
means for compressing said radar signal over different bandwidths, Δf_r, of said spectrum to obtain a plurality of intensity images $I_1(x), I_2(x), \ldots I_n(x)$, said bandwidths being centered at frequencies $f_{r01}, f_{r02}, \ldots f_{r0n}$, each spaced by a frequency difference of Δf_{r0} from the first f_{r01}, and

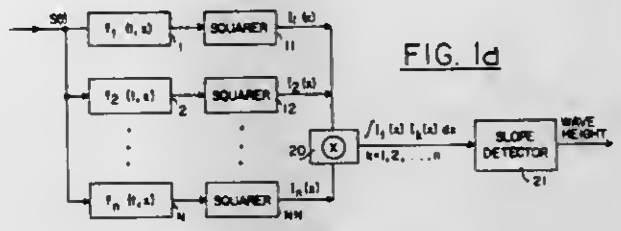


FIG. 1d

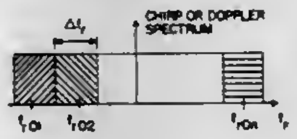


FIG. 1b

means for cross-correlating a selected area of one of said images with a corresponding area of at least one of the other of said images to determine a cross-correlation function value $R^E(\Delta f_{r0})$ for a given spacing Δf_{r0} which is a function of height of said waves or peaks.

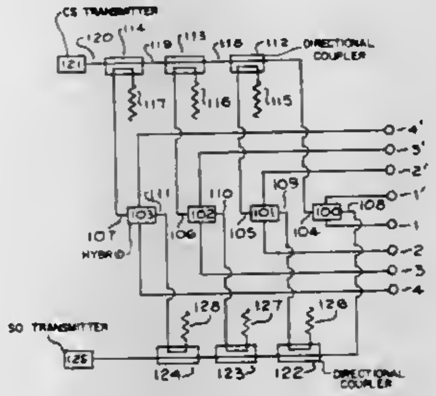
4,101,892
LOCALIZER ANTENNA ARRAY FOR USE WITH LOCALIZER TRANSMITTERS OPERATING AT ONE CARRIER FREQUENCY

Andrew Alford, 71 Bacon St., Winchester, Mass. 01890

Filed Nov. 19, 1975, Ser. No. 633,457

Int. Cl.^{2} G01S ***1/16***

U.S. Cl. 343—108 R **12 Claims**

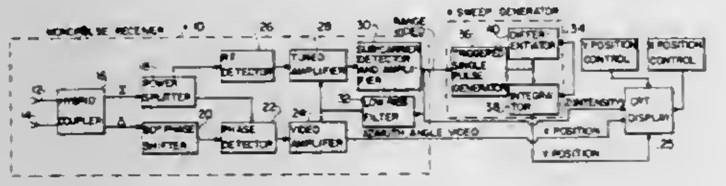


1. A localizer antenna array comprising:
(a) an even number of antenna elements,
(b) a transmitter of the carrier and sidebands,
(c) power supplied by said transmitter to a group of power dividers,
(d) a group of hybrids fed by said power dividers distributing the carrier and sidebands power among the antenna elements substantially in accordance with a geometrical progression.

4,101,893
AIRCRAFT LANDING AID FOR ZERO-ZERO VISIBILITY LANDINGS

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1977, Ser. No. 822,175
Int. Cl.² G01S *1/16*
U.S. Cl. 343—108 R **7 Claims**



1. An aircraft landing system for providing a perspective view of a runway to a pilot comprising:

a multiplicity of microwave transmitter means spaced at known intervals along both sides of said runway for transmitting pulses;

timing generator means for producing sequential signals which cause said microwave transmitters to transmit in sequence, the time spacing between each signal being related to the distance between the microwave transmitter to be triggered and the previous sequential microwave transmitter;

monopulse receiver means including a pair of spaced antennas mounted in a horizontal plane for receiving said transmitted pulses and for generating a range video signal and azimuth angle video signal for each pulse;

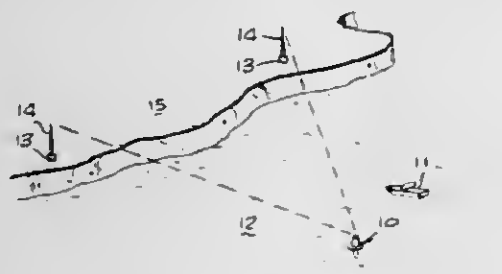
Y-sweep generator means for generating a sweep voltage in response to the sum video signal for the first transmitted pulse, said sweep voltage having a time length at least as long as the time required to receive all transmitted pulses;

CRT display means having X- and Y-position inputs and a Z intensity input, said X position input receiving said azimuth angle video signal for each received pulse to display the azimuth angle on the X axis for each microwave transmitter, said Y position input receiving said sweep voltage for generating a Y sweep of sufficient length to display all transmitted pulses in a sequence, and said Z position input receiving said sum signal to intensity-modulate said CRT display.

4,101,894
RADIO BEACON FOR A NAUTICAL EMERGENCY RESCUE SYSTEM

Melvin B. "Cy" Warner, 12144 Blix St., Los Angeles, Calif. 90068, and Dan H. Marshall, II, 873 Pecan Ct., Sunnyvale, Calif. 94087

Filed Sep. 17, 1976, Ser. No. 724,348
Int. Cl.² G01S *5/04;* H04B *1/034*
U.S. Cl. 343—112 R **20 Claims**



17. A nautical emergency rescue system comprising;

a plurality of beacons each having an antenna, a ground plane, a transmitter connected to said antenna and ground plane, and a modulator for said transmitter all contained in a flotation case,

said modulator providing frequency modulation of said transmitter with a repetitive, selectable pattern including a component at audio frequency, the pattern of each beacon being uniquely different from the pattern of the other beacons,

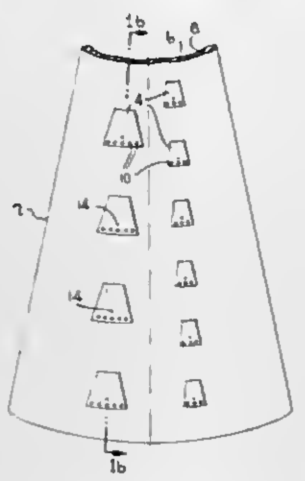
a duty cycle control circuit for said beacon, contained within said case, for alternately turning on said transmitter for a time duration sufficient to permit detection and direction finding of said beacon and for turning off said transmitter for a time duration sufficient to permit detection and direction find of other like beacons operating on the same frequency, and

a direction-finding receiver system for detecting and finding the direction of plural such beacons, the unique modulation pattern facilitating identification of each detected beacon.

4,101,895
MULTIFREQUENCY ANTENNA SYSTEM INTEGRATED INTO A RADOME

Howard S. Jones, Jr., Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 14, 1977, Ser. No. 768,126
Int. Cl.² H01Q *1/28*
U.S. Cl. 343—708 **9 Claims**



1. A multifrequency antenna system for integration into dielectric structures comprising:

A body whose structure is composed of a dielectric material;

Conductive plating on the inside surface of the body;

A plurality of conductive patches on the outside of the body forming one antenna array;

A second plurality of conductive patches on the outside of the body forming a second antenna array, wherein the first and second plurality of patches are wedge shaped and are each linearly aligned;

A means for shorting the bottom edge of the first and second plurality of conductive patches to the inside conductively plated surface; and

Coupling means for energizing the arrays whereby an efficient multifrequency antenna is constructed with a minimum of cross polarized components and coupling between the arrays.

4,101,896
CAMOUFLAGED DUAL-SLOT ANTENNA

Kurt Ikrath, deceased, late of Elberon, N.J. (by Gertrude Ikrath, executrix); Paul Sexton, Eatontown, N.J.; Peter Pingitore, Wayside, N.J., and William Kennebeck, Highlands, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,412
Int. Cl.² H01Q *1/32, 1/38, 9/00, 1/50*
U.S. Cl. 343—713 **5 Claims**

1. In combination with a vehicle having at least one body portion which is generally vertical and curved in its horizontal projection;

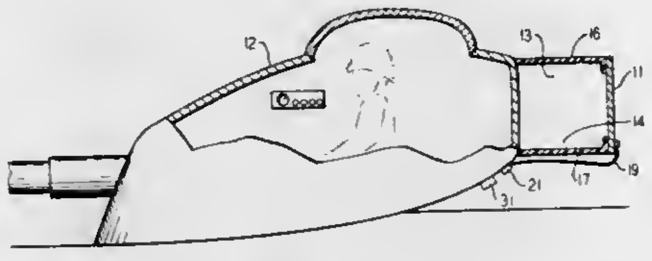
a source of a radio frequency signal; and

an antenna connected to said source of said radio frequency signal, said antenna being characterized by:

a metal plate which is generally vertical curved along the horizontal axis to at least partially conform to the curvative of said body portion, so that the plate has upper and lower edges;

nonconducting spacing means to maintain said plate spaced from and generally parallel to said body portion, to define a first slot between the upper edge of said plate and said body portion, and a second slot between the lower edge of said plate and said body portion;

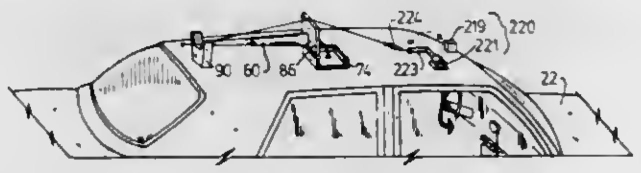
shorting means conductively connecting two grounding points of said plate to said body portion, and feed means connecting a feed point on said plate to said source of a radio frequency signal, said feed point being vertically spaced by a substantial distance from the line between said two ground points and being intermediate said two ground points.



4,101,897
C.B. RADIO ANTENNA UNIT SYSTEM AND PROCESS

Gary Eugene Morrison, Pampa, Tex., assignor to John M. Goldesberry, Houston, Tex., a part interest

Filed Sep. 7, 1976, Ser. No. 720,977
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—715 **5 Claims**



1. In the combination of a vehicle and a radio frequency communication means in said vehicle and an antenna connected thereto, said antenna on said vehicle, the improvement which comprises a rigid dimensionally stable antenna unit, a pivotal antenna unit support means, a dimensionally stable tension bearing support and an overload release means in operative combination;

(a) said rigid dimensionally stable antenna unit comprising a vertical rectilinear electrically conductive antenna element and a co-axially extending loading coil operatively connected thereto and having a physical height in range of 36 to 72 inches and an electrical characteristic of resonating as a ¼ wave length antenna to a radio broadcast wave length in the 11 meter band of class D citizens band frequencies, and cable connecting means connected to said coil, and

a rigid non-magnetic electrically non-conductive shell firmly attached to and surrounding said electrically conductive antenna element and loading coil, forming a rigid dimensionally stable support for said electrically conductive antenna element,

said shell extending from the bottom of said antenna unit for the major portion of said antenna unit, the rigidity of said antenna unit being such that said unit does not deflect at its top more than one inch in six feet of length in an air stream passing transverse thereto having a velocity of 40 miles per hour,

(b) said pivotal antenna unit support means comprising a rigid plate firmly attached to the bottom of said antenna unit support on said vehicle, a pivotal connection between said rigid plate and said antenna unit support on said vehicle, said pivotal connection extending along an axis transverse to said electrically conductive antenna element and located to the rear thereof;

(c) one, upper, end of a non-magnetic electrically non-conductive dimensionally stable tension bearing support attached to the antenna unit at a portion of the shell thereof near the top of said electrically conductive antenna element and the other, lower, end of said tension bearing support releasably attached to said overload release means, said tension bearing support means extending forward and downward from said one, upper, end to said other, lower, end and latch engaging means at said other, lower, end of said tension bearing means;

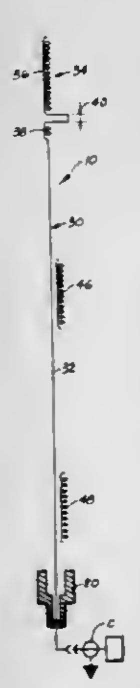
(d) said overload release means attached to said vehicle in front of said antenna unit support on said vehicle and comprising a latch means and a latch means support; said latch means support firmly attached to said vehicle and said latch means movably supported on said latch means support,

said latch means being movable between (i) one position wherein it engages said latch engaging means while said rectilinear electrically conductive element is vertical and (ii) another position wherein said latch means does not engage said latch engaging means while said rectilinear electrically conductive element is in a nonvertical position spring means attached to said latch means and holding said latch means into engagement with said latch engagement means when said latch means is at said position wherein it engages said latch engaging means.

4,101,898
BASE FED, TOP-LOADED VERTICAL WHIP ANTENNA

David Lee Ingram, E. 7316 Boone, Spokane, Wash. 99206

Filed Jul. 26, 1976, Ser. No. 709,007
Int. Cl.² H01Q *9/16*
U.S. Cl. 343—752 **6 Claims**



1. A base fed, top-loaded vertical whip antenna which is adapted to be connected to a radio frequency transmission line, comprising:

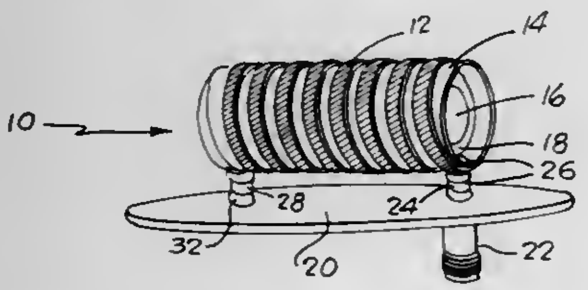
a vertical, elongated electrically non-conductive support core extending from a base end portion to an upper end portion with an intermediate central portion;

means for mounting the base end of the support core to a support with the upper end portion being freely unsupported;
an elongated electrically conductive wire having a dielectric coating thereon;
said electrically conductive wire having a lead section for operatively connecting to the radio frequency transmission line at the base end portion and extending from the base end portion along the central portion of the core to the upper portion of the core terminating in a closed, tightly-wound helical loading coil section wrapped about the upper end portion of the core;
said closed wound helical coil section having an upper main coil component with a majority of the closed, wound coil turns and a lower secondary coil component having a minority of the closed wound coil turns;
said secondary coil component being spaced immediately vertically below the main coil component a distance of between 0.187 and 0.313 inches with the secondary coil segment being electrically connected in series with the lead section and the main coil component and electromagnetically coupled to the main coil component.

4,101,899

COMPACT LOW-PROFILE ELECTRICALLY SMALL VHF ANTENNA

Howard S. Jones, Jr., Washington, D.C., and Frank Reggia, Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 8, 1976, Ser. No. 748,587
Int. Cl.^{2} H01E *7/08*
U.S. Cl. 343—788 **7 Claims**



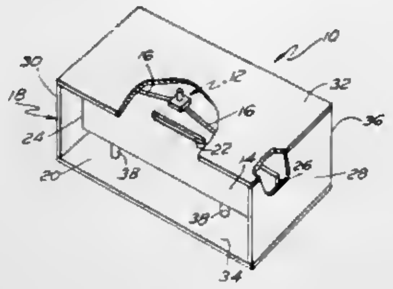
1. A compact low-profile electrically small antenna, which comprises:
a substantially cylindrical substrate, wherein said cylindrical substrate comprises a tubular member composed of a dielectric material;
multi-turn conductor means coiled about said cylindrical substrate, wherein said multi-turn conductor means comprises a conducting ribbon copperplated about the outer surface of said cylindrical substrate;
a ground plane over which said cylindrical substrate is mounted;
ferrite means for loading and tuning said multi-turn conductor means, wherein said ferrite means comprises a ferrite rod positioned coaxially within said tubular member; and
a tubular rod sleeve of a dielectric material means surrounding said ferrite rod for supporting same within said tubular member.

4,101,900

MODIFIED T-BAR FED SLOT ANTENNA

Michael R. Crews, Charlotte, N.C., and Gary A. Thiele, Columbus, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 28, 1977, Ser. No. 772,808
Int. Cl.^{2} H01Q *1/28*
U.S. Cl. 343—789 **4 Claims**

1. A T-bar fed slot antenna comprising:
a rectangular waveguide segment forming a cavity; and
a planar cross section T-bar having one side gradually sloping from its midpoint to its endpoints, said T-bar includes a slot centered between its ends said slot being generally parallel to a line joining said endpoints, the length of said slot is substantially one-half the wavelength of the upper endpoint of the frequency range.



4,101,901

INTERLEAVED ANTENNA ARRAY FOR USE IN A MULTIPLE INPUT ANTENNA SYSTEM

Richard Stephen Kommrusch, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 22, 1975, Ser. No. 642,829
Int. Cl.^{2} H01Q *21/06*
U.S. Cl. 343—853 **11 Claims**

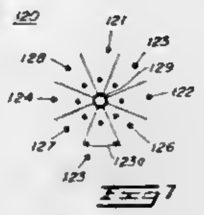
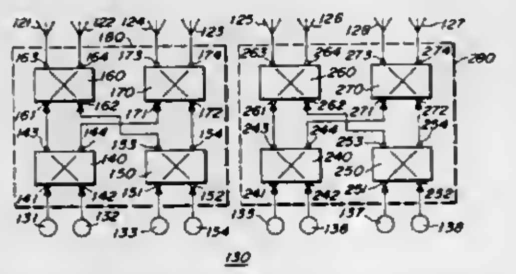


FIG. 7

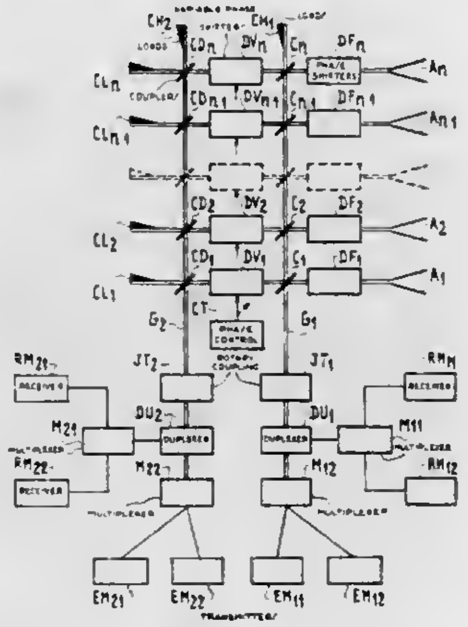


1. An interleaved antenna array for simultaneous use by two or more groups of independent transmitter/receivers, comprising:
a first plurality of antenna element means for generating a first composite radiation pattern for at least any one of a first plurality of independent electrical devices for processing radio frequency signals;
first coupling means for coupling each of said first plurality of devices to every one of said first plurity antenna element means;
a second plurality of antenna element means for simultaneously and independently generating a second composite radiation pattern for at least any one of a second plurality of independent electrical devices for processing radio frequency signals, said first and second pluralities of said antenna element means being independently operative; and
second coupling means, totally independent from said first coupling means, for coupling each of said second plurality of devices to every one of said second plurality antenna element means;
each antenna element means of said first plurality of antenna element means being disposed about a central axis and constructed for independently generating an associated radiation pattern directed substantially away from said central axis and each of said antenna element means of said second plurality of antenna element means; and
each antenna element means of said second plurality of antenna element means being alternately disposed circumferentially about said central axis with each of said first plurality antenna element means, and each of said second plurality antenna element means constructed for independently generating an associated radiation pattern directed substantially away from said central axis and each of said antenna element means of said first plurality of antenna element means, and
wherein said first coupling means includes first circuitry for providing a 90° electrical phase shift between the associated radiation patterns created by adjacent antenna element means in said first plurality of antenna element means and said second coupling means includes second circuitry for providing a 90° electrical phase shift between the associated radiation patterns created by adjacent antenna element means in said second plurality of antenna element means.

4,101,902

ELECTRONIC SCANNING ANTENNA

Roland Trigon, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Nov. 10, 1976, Ser. No. 740,834
Int. Cl.^{2} H01Q *3/26, 3/00, 13/00, 21/10*
U.S. Cl. 343—854 **6 Claims**

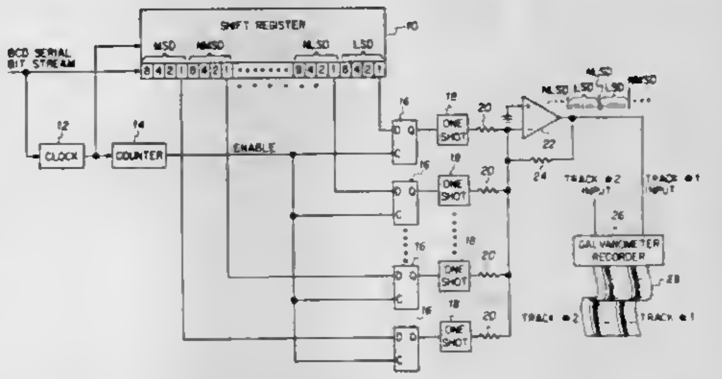


1. An electronically scanned antenna comprising:
a linear array of vertically stacked radiators capable of emitting and intercepting microwave energy;
a first and a second waveguide paralleling said array;
a set of first couplers communicating with said first waveguide at a number of spaced-apart locations corresponding to the number of said radiators;
a set of second couplers communicating with said second waveguide at a number of spaced-apart locations corresponding to the number of said radiators;
first transmitter means with at least one first operating frequency connected to said first waveguide;
a set of fixed phase shifters respectively inserted between said first couplers and said radiators for energizing same to emit at least one first beam of microwave energy at said first operating frequency, said first beam having a constant angle of elevation;
second transmitter means with at least one second operating frequency connected to said second waveguide;
a set of variable phase shifters respectively inserted between said first and second couplers in cascade with said fixed phase shifters for energizing said radiators to emit at least one second beam of microwave energy at said second operating frequency, said second beam having an angle of elevation depending on the setting of said variable phase shifters;
first receiver means connected to said first waveguide for detecting intercepted echoes at said first operating frequency; and
second receiver means connected to said second waveguide for detecting intercepted echoes at said second operating frequency.

4,101,903

METHOD AND APPARATUS FOR MONITORING BCD CONTINUOUSLY VARYING DATA

Larry G. Slay, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Aug. 2, 1976, Ser. No. 710,512
Int. Cl.^{2} G01D *5/14*
U.S. Cl. 346—33 R **12 Claims**

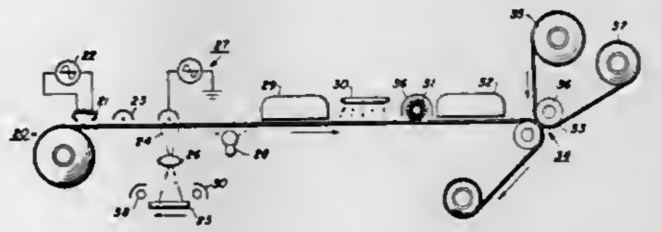


1. Apparatus responsive to value changes in binary coded decimal digital words representative of continuously varying data, comprising:
means for receiving each digital word;
a plurality of storage means connected to the output of said receiving means, there being a different one for each of the digits represented in each digital word, each having means for receiving and storing at its output the value of the least significant bit for its associated digit when enabled;
means for enabling said storage means upon receipt of a new digital word, and
a plurality of pulse generators, there being a different one for each of said storage means connected to its output for providing a pulse each time that its associated storage means output changes value irrespective of the direction of change.

4,101,904

MAGNETOGRAPHIC IMAGING MEMBER AND THE METHOD OF ITS USE

John Wolfgang Weigl, West Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 27, 1976, Ser. No. 690,453
Int. Cl.^{2} G03G *19/00*
U.S. Cl. 346—74.1 **3 Claims**



1. A method for forming a magnetic latent image which comprises the steps of:
(a) providing an imaging member comprising a photoconductive layer sandwiched between a transparent conductive substrate and an overcoating which comprises a di-

electric material having a pre-magnetized magnetically hard pigment dispersed therein;

(b) forming an electrostatic latent image on the overcoating,

(c) developing the electrostatic latent image with a radiant heat reflective toner; and

(d) exposing the imaging surface to radiant heat sufficient to elevate the temperature of the pigment above its Curie point in the portions of the overcoating where the radiant beat is not reflected by the toner, whereby a latent magnetic image remains in the overcoating corresponding to the developed electrostatic latent image.

4,101,905

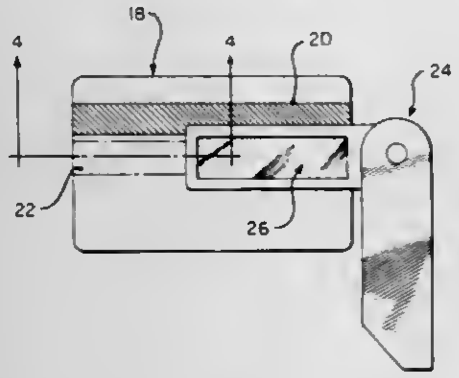
METHOD FOR WRITING AND VIEWING MAGNETIC HUMAN READABLE CHARACTERS AND VIEWING MEANS THEREFOR

William J. Hale, Kettering; William R. Horst, Dayton, and Donald A. Walker, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 10, 1976, Ser. No. 749,591

Int. Cl.² G03G *19/00;* G01R *33/00*

U.S. Cl. 346—74.1 **17 Claims**



1. A security system comprising:

a record medium having a recording track thereon;

means for magnetically recording data on said recording track in a humanly readable style which is normally invisible; and

a viewing means comprising:

a viewing window which when placed in operative proximity with said recording track responds to said data thereon to form an image on said viewing window corresponding to said data to enable a user of said viewing means to read said data;

magnet means; and

means for providing relative movement between said viewing window and said magnet means to erase said image upon said relative movement;

said magnet means being located on said providing means so as to enable the magnetic lines of flux of said magnet means to lie in the plane of said viewing window during said relative movement.

4,101,906

CHARGE ELECTRODE ASSEMBLY FOR INK JET PRINTER

Mark Sorensen Dahlstrom, San Juan Bautista, and Paul Simon, Palo Alto, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,205

Int. Cl.² G01D *15/18*

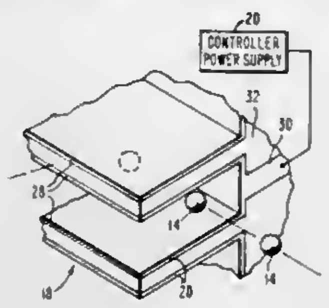
U.S. Cl. 346—75 **7 Claims**

1. A charge electrode assembly useful in an ink jet printer comprising:

a nonconductive ceramic housing;

a series of uniformly spaced grooves formed in said housing;

a layer of a corrosion-resistant non-oxidated noble metal applied directly in each of said grooves to said housing ceramic and insulated from each other, said non-oxidated metal being effectively resistant to dissolution that may be caused by anodic and cathodic current in the presence of pressure propelled ink droplets.



4,101,907

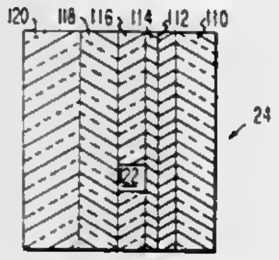
OVERCOAT STRUCTURE FOR OPTICAL VIDEO DISC

Alan Edward Bell, East Windsor; Robert Alfred Bartolini, Trenton, and Allen Bloom, East Windsor, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,847

Int. Cl.² G01D *15/34, 15/10*

U.S. Cl. 346—135 **10 Claims**



1. In a recording medium for use with a recording laser beam providing light of a given frequency, said recording medium having a light reflecting layer with a light absorbing layer thereon and an overcoat layer thereover, the improvement comprising a thermal and chemical barrier layer situate between the light absorbing layer and the overcoat layer,

wherein the thickness of said barrier layer is a function of the wavelength of the light from said recording laser and of the refractive index of said barrier layer at said wavelength.

4,101,908

ADJUSTABLE MOUNT FOR ELECTROSTATIC PRINTER STYLUS WITHIN CYLINDRICAL PRINTING ROLLER

Hans-Dieter Hinz, Tornesch; Ulf Rothgordt, Norderstedt, and Franz Schinke, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,613

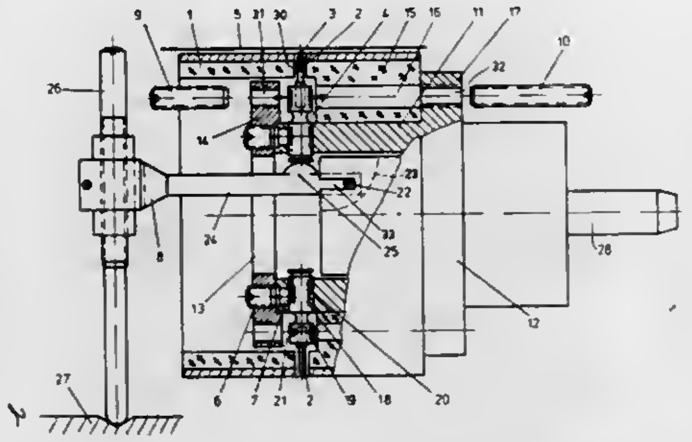
Claims priority, appilcation Fed. Rep. of Germany, Aug. 4, 1976, 2635052

Int. Cl.² G01D *15/16*

U.S. Cl. 346—139 C **4 Claims**

1. An electrostatic printer, comprising a rotatable, cylindrical printing roller, having an electrically non-conductive jacket which is provided with at least one aperture, a stylus electrode disposed in each aperture, a rod-shaped electrode holder carrying each said stylus electrode at one end thereof, each stylus electrode freely projecting through the aperture in which it is disposed, said jacket accommodating an insert of electrically conductive material in the form of a hollow cylinder comprising a bottom, each aperture which serves to accommodate a stylus electrode extending through the wall of said hollow cylinder being recessed in the wall of said hollow cylinder,

each electrode holder including (a) an adjusting portion which projects outside the wall of said cylinder and which supports the stylus electrode and (b) a fixing portion which is axially movable in the aperture in which the stylus electrode carried by the electrode holder is disposed and which is to be secured by means of a fixing device, said adjusting portion being displaceable transversely of the longitudinal direction of the electrode holder by means of a first adjusting device, each said electrode holder being entirely displaceable in the longitudinal direction thereof by means of a second adjusting device.



4,101,909

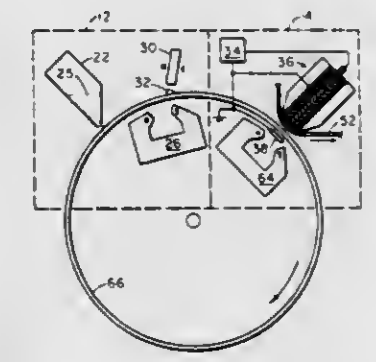
MAGNETIC INKING APPARATUS FOR PULSED ELECTRICAL PRINTING

Donald C. Solmon, Newburyport, and Donald J. J. Lennon, Acton, both of Mass., assignors to Epp Corp., Boston, Mass.

Filed Jul. 30, 1976, Ser. No. 710,280

Int. Cl.² G03G *15/16*

U.S. Cl. 346—153 **15 Claims**



1. Apparatus for coating an elongate sheet with ink comprising, in combination,

means for moving the sheet in a longitudinal direction,

means for depositing a quantity of ink particles loosely upon a surface of the sheet, the particles comprising a magnetizable material, and

means for establishing a stationary magnetic field having components extending from said surface through the deposited particles, said field being oriented and of sufficient magnitude to act in conjunction with the friction of the moving sheet to produce a bead of said particles at said surface rotating about an axis passing substantially through the bead and extending laterally of said direction, whereby a number of the particles in the bead are separated therefrom by said sheet and remain coated thereupon in the form of spaced aggregates of irregular height.

4,101,910

AUTOMATIC DIAPHRAGM CONTROL SYSTEM MEANS FOR PREVENTING ENERGIZATION OF THE DIAPHRAGM ADJUSTING MECHANISM WHEN THE ADJUSTING MECHANISM IS AT THE LIMIT OF ITS ADJUSTING RANGE

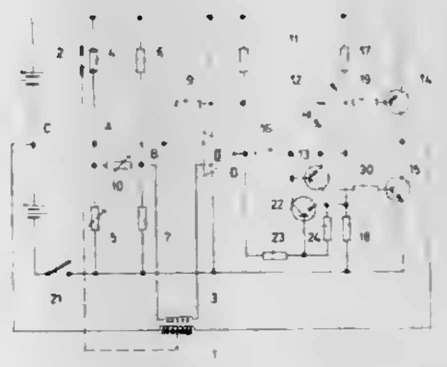
Hermann Mayer, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,694

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609618

Int. Cl.² G03B *7/10*

U.S. Cl. 354—42 **6 Claims**



1. In an automatic exposure control system of the type comprised of an adjustable diaphragm, an adjusting motor coupled to the diaphragm for varying the diaphragm setting, the adjusting motor having a limited adjustment range, negative-feedback control means, including photosensitive means exposed to scene light, operative for generating an error signal dependent upon the difference between the actual diaphragm setting and the setting required for the prevailing scene light and operative for energizing the adjusting motor to an extent dependent upon the value of the error signal, in combination therewith, an arrangement for preventing further energization of the adjusting motor when the adjusting motor reaches a limit of its adjustment range and can effect no further change of diaphragm setting but the error signal indicates that a further change of diaphragm setting is required, the arrangement comprising interrupter means activated when the error signal reaches a preselected value and operative when activated for preventing energization of the adjusting motor; and damping means for damping the operation of the adjusting motor and preventing the error signal from reaching the preselected value so long as a limit of the adjustment range has not yet been reached by lowering the value of the error signal to an extent dependent upon the rate at which the adjusting motor changes the diaphragm setting.

4,101,911

EXPOSURE INDICATOR FOR CAMERA HAVING ELECTRICAL SHUTTER

Yoshihisa Maitani, Hachioji, and Atsushi Kidawara, Tachikawa, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,566

Claims priority, application Japan, Nov. 6, 1975, 50/150867[U]

Int. Cl.² G03D *17/20*

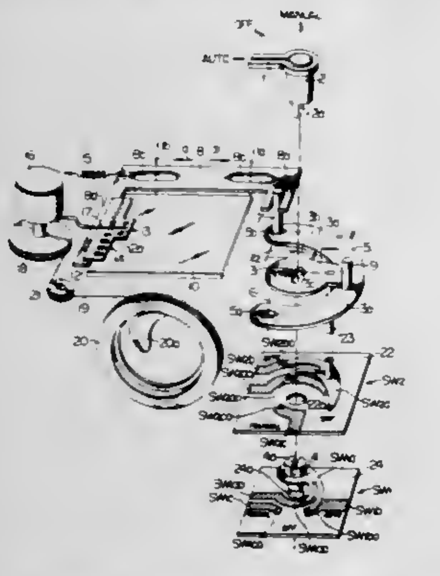
U.S. Cl. 354—53 **5 Claims**

1. A mode indicator apparatus for use in a camera of the type which is operable in an automatic, a manual and an off mode and which includes an optical viewfinder, said apparatus comprising:

brightness indicator means including a meter pointer extending into the field of view of said viewfinder, said brightness indicator means for adjusting the position of said meter pointer within said field of view of said viewfinder as a function of the brightness of an object being photographed;

a display panel comprising first and second scales; said first scale including a plurality of spaced numbers disposed along said panel, each said number representing a different exposure period; said second scale including a zero method index;

said display panel being movable between: a first position wherein said first and second scales are within the field of view of said viewfinder, said first and second scales cooperating with said meter pointer to provide photometric information relevant to an automatic mode of operation; a second position wherein only said second index is within the field of view of said viewfinder, said second index cooperating with said meter pointer to provide photometric information relevant to a manual mode of operation;



and a third position wherein neither said first nor said second scales are within the field of view of said viewfinder;

switch means movable between a first, a second and a third position for placing said camera in an automatic, a manual and an off mode, respectively; and

display panel locator means for placing said display panel in said first, said second and said third position responsive to movement of said switch means into said first, said second and said third positions, respectively, whereby the relative position of said display panel within the field of view of said viewfinder provides a visual indication of whether said camera is in said automatic, said manual, or said off mode.

4,101,912

DATA RECORDING DEVICE FOR CAMERA

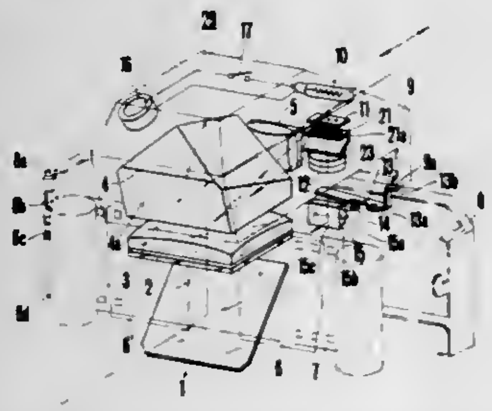
Yoshiaki Watanabe, Fujisawa; Akio Sunouchi, Tokyo, and Youichi Okuno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,492

Claims priority, application Japan, Aug. 20, 1975, 50/100722

Int. Cl.² G03B *13/02, 17/24*

U.S. Cl. 354—106 **3 Claims**



1. A data recording device for a camera having a body with a film plane and having an interchangeable finder with a body detachably mounted on the camera body, comprising:

a data illumination device in the finder body,

a data signal source provided in the finder body,

first optical path forming means forming a first optical path in the finder body, and

second optical path forming means forming a second optical path in the camera body,

said first and second optical path forming means are aligned to produce an optical path for passage of a signal light beam from the data signal source to the film plane in the camera when the finder body is mounted on the camera.

4,101,913

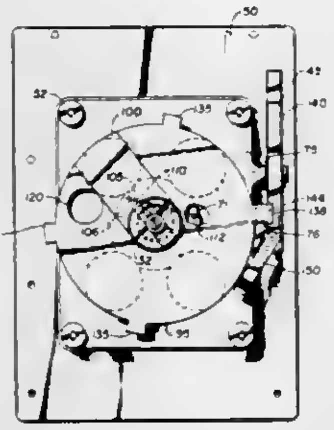
FOUR-UP POLAROID CAMERA

Albert F. Gallistel, Wayzata, and Jerome W. Lindenfelser, Minneapolis, both of Minn., assignors to Photo-Control Corporation, Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,248

Int. Cl.² G03B *35/00*

U.S. Cl. 354—122 **17 Claims**



1. A plural camera comprising, a film pack enclosure and a means for advancing the film therein for individual film frames, a camera frame mounted on the film pack enclosure, a plural camera lens structure positioned on the camera frame in front of the film frame to be exposed and including means for isolating a portion of the film frame for each of the lens of the plural lens structure, a single shutter mechanism positioned in front of the plural lens structure, said shutter mechanism being comprised of a disc with at least one aperture therein journaled on said frame for rotation relative to the plural lens structure so that at least one of said apertures in the disc aligns with a lens of the plural lens structure, spring means connected between said disc and said frame and biasing said disc for rotation in a predetermined direction, plural stop means formed on the periphery of said disc, one of said stop means being adapted to engage a fixed abutment mounted on the camera frame for defining limited rotation of the disc in said predetermined direction, a shutter release mechanism, each of said stop means being designed to engage said shutter release mechanism when positioned adjacent to the shutter release to restrict rotation of the disc, said disc when released from said stop means having limited rotation in said predetermined direction to bring at least one of said apertures in the disc into alignment with one of the lens of said plural lens structure, means for covering said aperture when said disc is rotated in a direction opposite to said predetermined direction, and means for manually rotating said disc in said opposite direction, said means for covering said aperture when said disc is rotated in a direction opposite the predetermined direction being a blade for covering the aperture which is journaled on the frame and movable relative to the disc a limited second rotation.

4,101,914

INDICATING DEVICES FOR USE IN CAMERAS

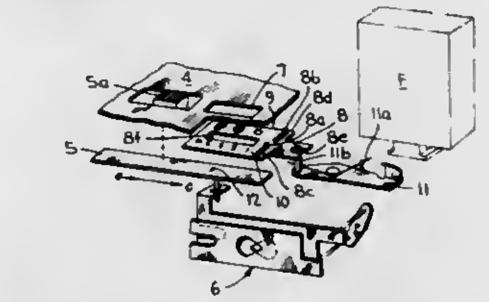
Maki Yamashita, Sakai, and Yasuzi Kogure, Kawanishi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Mar. 23, 1977, Ser. No. 782,298

Claims priority, application Japan, Mar. 31, 1976, 51-40040[U]

Int. Cl.² G03B *15/02*

U.S. Cl. 354—128 **19 Claims**



1. In a camera, wherein a flash means is removably mounted on the camera body and a diaphragm aperture is manually adjustable, apparatus comprising:

a diaphragm setting member movable for varying said diaphragm aperture and including an index;

first scale means including a plurality of symbols for indicating a set position of said diaphragm setting member for daylight photography;

second scale means including a plurality of symbols for indicating a set position of said diaphragm setting member for flash photography;

indicating means selectively movable between a first position to expose all the symbols of only said first scale means and said index and a second position to expose all the symbols of only said second scale means and said index; and

control means operated upon attachment and removal of said flash means to and from the camera body respectively, said indicating means being interlocked with said control means for movement to said first position with said flash means attached to said camera body, and for movement to said second position with said flash means removed from said camera body.

4,101,915

GEARING FOR CAMERA OPERATION

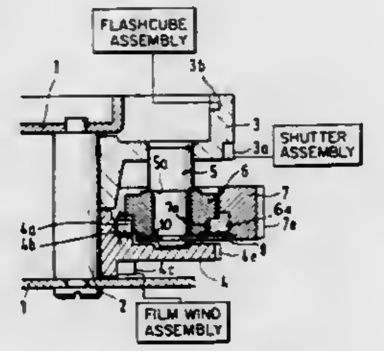
Karl Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke, Bunde, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 612,997, Sep. 1, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 832,302

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1974, 2446068

Int. Cl.² G03B *15/03, 17/42;* **F16H** *1/28*

U.S. Cl. 354—144 **10 Claims**



1. A gear assembly for a camera adapted to coordinately perform at least two functions in said camera comprising an internal gear, a plurality of planetary gears in mesh with said internal gear, a planetary gear carrier, said plurality of planetary gears being rotatably mounted on said planetary gear carrier, a sun wheel operatively connected to said plurality of planetary gears, a stationary shaft, said planetary gear carrier and said sun wheel being rotatably mounted on said stationary shaft, means for rotating said internal gear, said planetary gear carrier being rotated about said stationary shaft as said internal gear is rotated, a first set of gear teeth on said planetary carrier for performing a first function, and a second set of gear teeth on said planetary carrier for performing a second function.

4,101,916

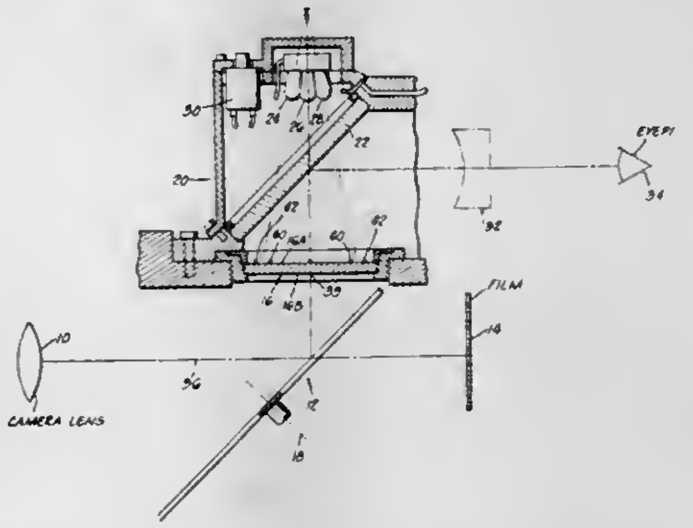
ILLUMINATED GROUND GLASS FOR CAMERA

Robert E. Gottschalk, Los Angeles, and Albert L. Mayer, Tarzana, both of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Filed Aug. 2, 1976, Ser. No. 711,062

Int. Cl.² G03B *13/02, 19/12*

U.S. Cl. 354—219 **7 Claims**



5. In a viewing system for cameras, a light transmitting plate having one side thereof formed with a matte surface comparable to a ground glass surface, light reflecting material fixed on the other side of said plate and positioned inwardly from the edges thereof so as to define boundary limits of a scene to be photographed.

4,101,917

EXCHANGEABLE LENSES FOR SINGLE LENS REFLEX CAMERAS

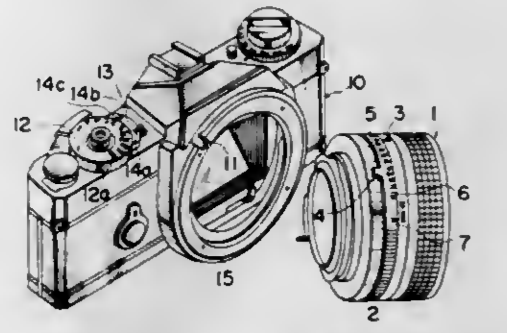
Hiroshi Ueda, Nara, and Shuzo Matsushita, Ikeda, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 26, 1977, Ser. No. 800,875

Claims priority, application Japan, Jun. 7, 1976, 51-65626

Int. Cl.² G03B *9/02*

U.S. Cl. 354—273 **6 Claims**



1. An exchangeable lens for use in a single lens reflex camera which includes a camera body and an information receiving member for receiving information from said exchangeable lens, said exchangeable lens comprising:

a lens barrel containing at least one optical lens and a controllable diaphragm aperture, a fixed index on the surface of said lens barrel,

a rotatable diaphragm setting member about the outer peripheral surface of said lens barrel, said diaphragm setting member having thereon an indicia for automatic aperture control and a graduated aperture scale for manual aperture setting, said aperture scale extending from a minimum to a maximum *f*-number of said exchangeable lens, said indicia being spaced a predetermined distance from a specific *f*-number position in the direction in which said aperture scale extends, said diaphragm setting member being settable to any one of the manual aperture setting positions in which any one of the *f*-numbers aligns with said index and to an automatic aperture control position in which said indicia aligns with said index,

a single information transmitting member integrally formed with said diaphragm setting member and spaced a predetermined distance from the minimum *f*-number position in the direction in which said scale extends, said information transmitting member being capable of being coupled with said information receiving member upon mounting of said exchangeable lens onto said camera body, whereby said information transmitting member transmits, to said camera through the coupling, information as to the step difference from the minimum to a set *f*-number when said diaphragm setting member is set to any one of the manual aperture setting positions and information as to the minimum *f*-number of said lens when said diaphragm setting member is set to the automatic aperture control position.

4,101,918
DEVELOPING APPARATUS FOR LIGHT-SENSITIVE MATERIALS COMPRISING AN EVAPORATOR FOR EVAPORATING A DEVELOPER MEDIUM FROM A SOLUTION

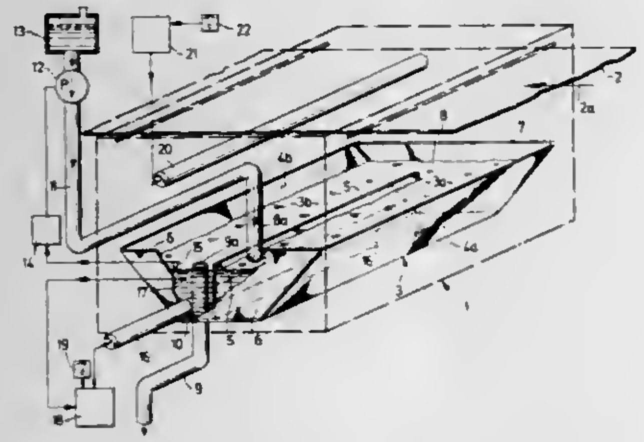
Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Nov. 29, 1976, Ser. No. 745,980

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553769

Int. Cl.^{2} G03D *13/00*

U.S. Cl. 354—299 **6 Claims**



1. A developing apparatus for light-sensitive material comprising elongated open trough means,

partition means in said trough means dividing said trough means into sections,

means providing communication between said sections,

inlet and outlet means for said trough means, said inlet means being adapted to introduce solution into one of said sections and said outlet means being adapted to remove solution from another of said sections,

heating means in said section containing said outlet means and being positioned below an opening of said outlet means in said trough means,

and temperature sensor means so positioned near said outlet means and within said trough means that, in operation, it is wholly immersed in the solution, said temperature sensor means being connected to said heating means via thermostat means.

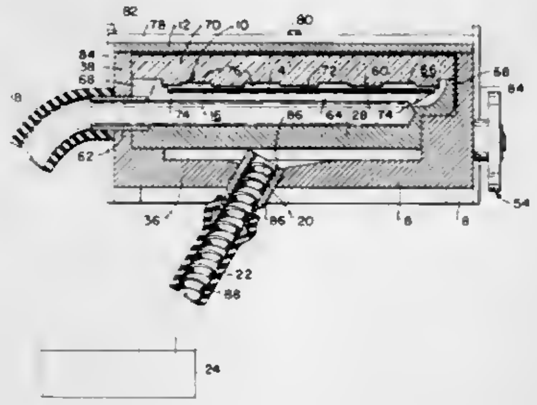
4,101,919
FILM PROCESSING APPARATUS

Steve Ammann, Cupertino, Calif., assignor to Quantor Corporation, Mountain View, Calif.

Filed Aug. 2, 1976, Ser. No. 710,838

Int. Cl.^{2} G03D *3/08*

U.S. Cl. 354—319 **12 Claims**



9. A film processor for developing exposed film by sequentially contacting an emulsion side of the film with a plurality of processing liquids, the processor comprising:

an elongate, substantially horizontal tank having a plurality of serially arranged compartments separated from each other by upright side walls to prevent the liquids from flowing between the compartments, the tank including a drainage opening for each compartment;

means for transporting the film in a substantially horizontal path past the side walls and the compartments;

nozzle means for each compartment disposed between an underside of the film and the drainage opening of that compartment, the nozzle means being constructed to contact every part of the film underside with processing liquid as the film moves past the corresponding compartment;

a cover plate disposed adjacent an upwardly facing side of the film and means for supporting the cover plate so that the film can move between the cover plate and the nozzle means, the cover plate including a plurality of depressions on its side facing the film to prevent film from adhering to the cover plate as it moves past it;

means for removing processing liquid from the film before the film enters the next adjacent compartment to prevent an intermixing of the liquids;

stationary means extending over substantially the full length of the tank and engaging lateral edges of the film as it moves through the processor for guiding the film along a straight, substantially horizontal path;

a closure member disposed over the cover plates and closing each compartment from the exterior, means for securing the closure member to the tank, and means for spacing the closure member from the cover plate so that the cover plate is movable relative to the closure member.

4,101,920
GREEN LIGHT EMITTING DIODE

Hiroyuki Nagasawa, and Kunio Kaneko, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 651,852, Jan. 23, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,230

Claims priority, application Japan, Jan. 29, 1975, 50-12228

Int. Cl.^{2} H01L *33/00*

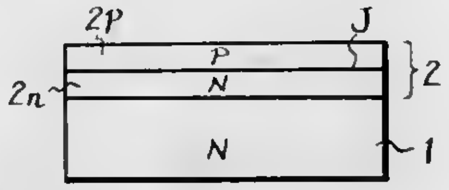
U.S. Cl. 357—17 **5 Claims**

1. A green light emitting diode comprising:

a semiconductor substrate of gallium phosphide; and

an epitaxial layer of gallium phosphide having nitrogen therein formed on said substrate;

said epitaxial layer having an N type layer portion directly formed on said substrate, a P type layer portion formed on and interfaced with said N type layer portion, a PN junction being formed therebetween, said N type layer portion being doped to have a donor concentration of between 1×10^{17} and $2 \times 10^{18}\ \mathrm{cm}^{-3}$, said P type layer portion being doped to have an acceptor concentration gradient adjacent said PN junction of between $7 \times 10^{20}\ \mathrm{cm}^{-4}$ and $1.5 \times 10^{21}\ \mathrm{cm}^{-4}$, the concentration of nitrogen in said gallium phosphide epitaxial layer being between $1 \times 10^{18}\ \mathrm{cm}^{-3}$ and $1 \times 10^{19}\ \mathrm{cm}^{-3}$ within a zone having a thickness less than 3 μm from the PN junction and less than said concentration of nitrogen out of said zone.



4,101,921
MEMORY TYPE INSULATING GATE FIELD EFFECT SEMICONDUCTOR DEVICE

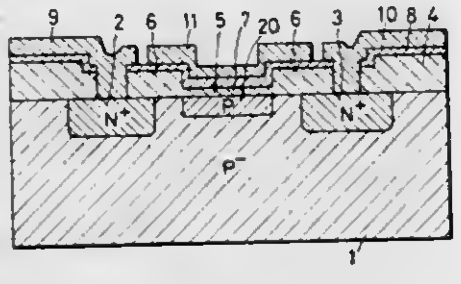
Takashi Shimada, Yamato; Kenichi Inoue, Kawasaki; Takaji Ohtsu, Hatano; Hidenobu Mochizuki, Atsugi, and Jiro Yamaguchi, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,099

Claims priority, application Japan, Mar. 1, 1976, 51-21998

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—23 **9 Claims**



1. In a memory type insulated gate field effect semiconductor device including

a semiconductor layer of one conductivity type having one surface,

a source region of the opposite conductivity type formed adjacent to said one surface of said semiconductor layer,

a drain region of the opposite conductivity type formed adjacent to said one surface of said semiconductor layer,

a gate insulating layer affixed to the surface of said semiconductor layer, comprising a first insulating layer having a pair of thick gate guarding portions adjacent said source and drain regions, and a thin memory portion intermediate between said thick gate guarding portions and second insulating layer covering, said thin memory portion being between said thick gate portions, and

a gate electrode deposited on the surface of said gate insulating layer,

the improvement comprising means for shifting a threshold voltage of said thin memory portion substantially closer to a threshold voltage of said thick guarding portions, said means including a doped region of P type conductivity adjacent to said one surface under said thin memory portion and having a different surface impurity concentration than a surface impurity concentration of said semiconductor layer under said thick guarding portions.

4,101,922
FIELD EFFECT TRANSISTOR WITH A SHORT CHANNEL LENGTH

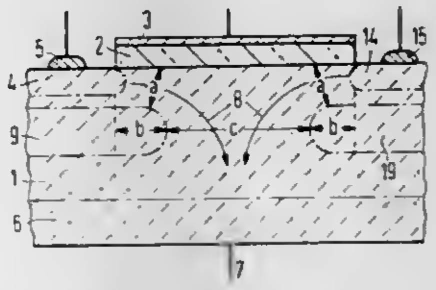
Jenoe Tihanyi, Munich, and Voachim Hoepfner, Planegg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 9, 1977, Ser. No. 775,978

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611338

Int. Cl.^{2} H01L *29/78*

U.S. Cl. 357—23 **10 Claims**



1. A field effect transistor with a MIS gate arrangement and with a source and drain regions in a semiconductor body, an electrically conductive zone additionally provided which lies in said semiconductor body beneath the source zone and which is of a conductivity type opposite to a portion of the semiconductor body surrounding it, wherein in the region of the controllable field effect by said gate arrangement (2) said additional zone (9) is spaced a distance (a) from said gate arrangement and from the boundary surface between the semiconductor body (1) and the gate insulation layer (2), and is bounded by an edge which forms a channel having a width "*c*" in said zone (9) and which projects laterally by a distance (b) beyond the edge of the source zone (4) into the path of charge carriers and where the distance (*b*) is approximately 1 to 10 times the thickness (*d*) of the gate insulation layer (2), and the distance (*a*) is approximately 1 to 5 times the thickness (*d*) of the gate insulation layer (2) and where the ratio of *b:a* is approximately equal to 1:1 to 10:1, the source zone (4) and the zone (9) are of opposite conductivity types and the degree of doping of the zone (9) is selected to be such that with the maximum provided electrical operating voltage between the drain electrode (6) and the source zone (4), the majority charge carriers of the zone (9) are not depleted.

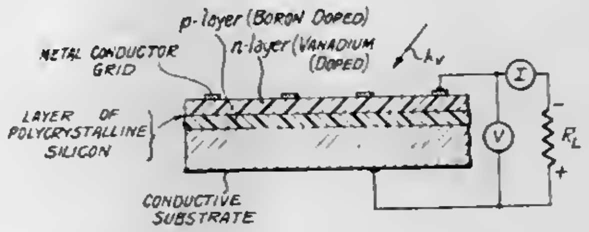
4,101,923
SOLAR CELLS

Arnold G. Gulko, and Jacob H. Steinberg, both of 2001 Jeff. Davis, #609, Arlington, Va. 22202

Filed Mar. 22, 1977, Ser. No. 780,287

Int. Cl.^{2} H01L *27/14*

U.S. Cl. 357—30 **8 Claims**



1. A solar cell comprising a layer of crystalline silicon doped with boron on at least one surface thereof, and having the other surface doped with vanadium wherein a p-n junction is formed therebetween.

4,101,924

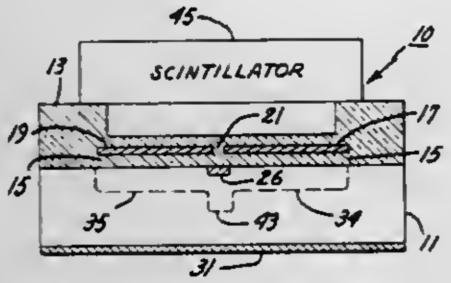
SEMICONDUCTOR RADIATION DETECTOR

Dale M. Brown, and Marvin Garfinkel, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,080

Int. Cl.² H01L *27/14;* G01T *1/22*

U.S. Cl. 357—30 **7 Claims**



1. A radiation sensing device comprising
a substrate of monocrystalline semiconductor material of one conductivity type,
a first layer of a transparent insulating material overlying a major surface of said substrate,
a second layer of a transparent conductive material overlying said first layer and forming a first capacitor with said substrate and said first layer,
a region of opposite conductivity type in said substrate adjacent said major surface forming a PN junction therewith, said PN junction having a first edge in said major surface and underlying said second layer of transparent conductive material, the area of said region of opposite conductivity type in said major surface being substantially smaller than the area of said second layer of transparent conductive material.

4,101,925

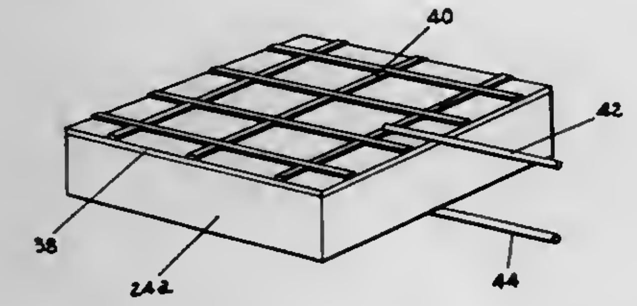
CENTRIFUGAL FORMING THIN FILMS AND SEMICONDUCTORS AND SEMICONDUCTOR DEVICES

Larry P. Kelley, 1024 State St., and Craig A. Hardy, Circle Dr., both of Hart, Mich. 49420

Continuation-in-part of Ser. No. 594,107, Jul. 8, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,750

Int. Cl.² H01L *23/48*

U.S. Cl. 357—68 **16 Claims**



1. A method of forming a semiconductor device having a thin crystalline layer on a substrate from single crystal forming semiconductor material consisting essentially of a material which can be grown in single crystalline form onto a seed crystal at the melting point of the material, the method comprising the steps of:
providing the single crystal forming semiconductor material in a molten state on a surface portion of the substrate, the substrate being of a conductive material other than the single crystal forming material;
heating the crystal forming material to maintain its molten state and while the crystal forming material is in the molten state, rotating the substrate about an axis substantially parallel to the surface thereof at a speed sufficient to overcome the surface tension of the molten material so as to spread by centrifugal force the molten material into a thin, substantially uniform, molten layer of the single crystal forming material, thinner than that obtainable under ordinary gravimetric conditions;
cooling the molten layer of the single crystal forming material while maintaining the speed of rotation of the substrate to solidify without epitaxial growth the entire thickness of the molten layer whereby a substantially monocrystalline thin semiconductive layer is formed on the substrate;
doping the surface of the semiconductor layer subsequent to the cooling step;
plating the doped semiconductor layer with a conductive grid; and
wherein the substrate forms a conductor as a part of the semiconductor device.

4,101,926

TELEVISION SYNCHRONIZING APPARATUS

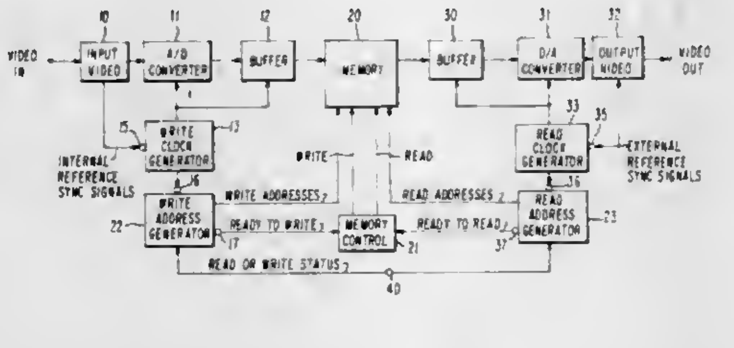
Robert Adams Dischert, Burlington; Arthur James Banks, Cherry Hill, and Robert Sherman Hopkins, Jr., Marlton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,944

Claims priority, application United Kingdom, Mar. 19, 1976, 11114/76

Int. Cl.² H04N *9/44, 9/46*

U.S. Cl. 358—17 **3 Claims**



1. A television signal synchronizer in which incoming video signals are written into memory storage means, said incoming video signals comprising one or more television fields, each of said television fields comprising horizontal line signals having a horizontal blanking interval containing horizontal and burst synchronizing signal components and an active image information portion, said burst signal component being opposite in phase from one of said television fields to another, comprising:
coherent memory storage means having preassigned fixed burst phasing for each line store of said memory storage means;
signal processing means for developing a composite horizontal sync and burst timing control signal indicative of the timing of said incoming video signal; and
delay means responsive to said control signal for delaying the writing into memory of only said active video image information portion(s) so as to write said video image information portion into said memory storage means consistent with said preassigned fixed burst phasing.

4,101,927

VIR CONTROL APPARATUS FOR COLOR TELEVISION RECEIVER

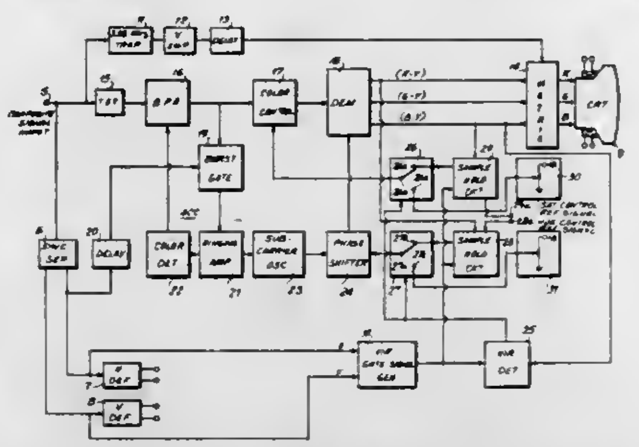
Katsuo Isono, Kawagoe, and Seiji Sanada, Yokosuka, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,869

Claims priority, application Japan, Dec. 27, 1975, 50-156974

Int. Cl.² H04N *9/535, 5/14*

U.S. Cl. 358—27 **21 Claims**



1. Color television receiving apparatus for receiving a composite color television signal including horizontal synchronizing signals, color burst signals and luminance and chrominance components, the composite color television signal being of the type which additionally may include a VIR signal provided in a predetermined line interval during the vertical retrace interval, said apparatus comprising signal processing means for processing said received composite color television signal to produce a video picture therefrom; signal generating means for generating sampling signals during the predetermined line intervals in which said VIR signal is provided; detecting means coupled to said signal processing means and responsive to said sampling signals to detect if said VIR signal is included in said received composite color television signal; sampling means responsive to said sampling signals for sampling at least one component produced by said signal processing means to produce sampled control signals; manually operable means for producing manually adjustable control signals; switch means coupled to said sampling means and to said manually operable means and having output means, said switch means being controlled by said detecting means to selectively supply said sampled control signals to its output means if the VIR signal is detected and to supply said manually adjustable control signals to its output means if the VIR signal is not detected; and control means responsive to the control signals selectively supplied to said output means of said switch means for controlling said signal processing means, thereby controlling predetermined characteristics of said video picture.

4,101,928

COLOR TELEVISION RECEIVER

Tadashi Sato, Yono; Masaru Ibuka; Yoshio Ishigaki, both of Tokyo, and Hiroshi Sahara, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

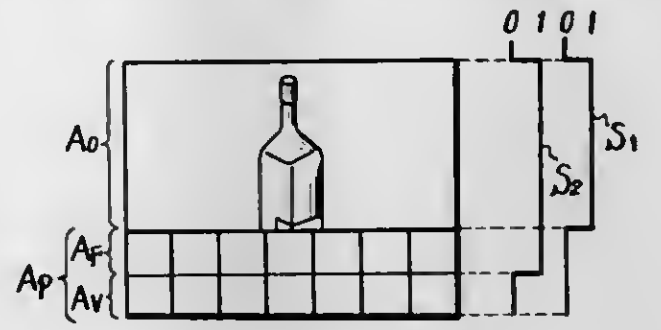
Filed Nov. 24, 1976, Ser. No. 744,757

Claims priority, application Japan, Dec. 3, 1975, 50-145402

Int. Cl.² H04N *9/535, 9/62*

U.S. Cl. 358—28 **7 Claims**

1. A color television receiver comprising:
a cathode ray tube including a screen emiting light in a plurality of colors;
circuit means responsive to received color television signals and connected to said tube to produce a color television picture on said screen;
first hue control means connected to said circuit means to vary the hue of said picture;
first generating means to generate reference signals of predetermined relationship, said first generating means being connected to said circuit means to cause a predetermined area of said screen to produce light of a predetermined hue; and
second generating means to generate signals of variable relationship, said second generating means being connected to said circuit means to cause a different predetermined area of said screen to produce light, said second



generating means including second hue control means to vary the hue of said light produced in said different area simultaneously with the control of the hue of said picture, said second hue control means having first and second gain controlled amplifiers the gains of which are controlled complementarily with respect to each other in response to variation of said first hue control means.

4,101,929

COLOR ENCODING VIDEO SYSTEM WITH OPTICAL LOW PASS FILTER

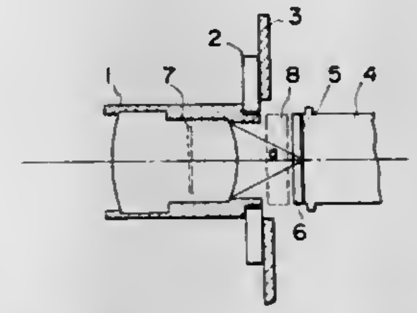
Shoichi Ohneda, Wakayama, and Yukio Okano, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 15, 1977, Ser. No. 768,869

Claims priority, application Japan, Feb. 20, 1976, 51-16977

Int. Cl.² H04N *9/07*

U.S. Cl. 358—44 **12 Claims**



1. In a color encoding video system having an image forming optical system, means for mounting the optical system, a color encoding filter operatively associated with the optical system for producing a representative color signal, a photosensitive element positioned approximately at the focal plane of the optical system and scanned for producing signals representative of both the luminous intensity and chromatic values of an object imaged thereon and scanning means for detecting and processing the luminous and chromatic signals, the improvement comprising:
an optical grating low pass filter positioned in a plane substantially adjacent the focal plane containing the photosensitive element, the grating pattern having a spatial frequency along the scanning direction limited to a value not greater than the highest spatial frequency available for detection of luminous signals of the object imaged on the photosensitive element by the means for detecting.

4,101,930
TELEVISION PICTURE WIPING

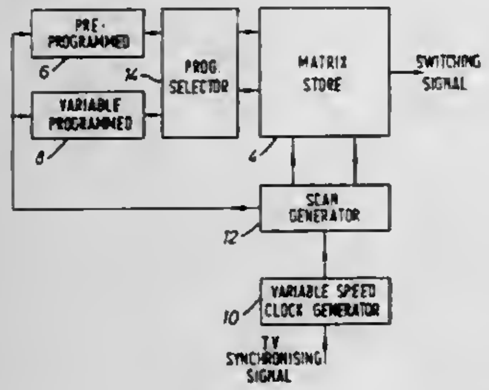
Richard Norman Sanders, Chesham, and William James Crossley, Maidenhead, both of England, assignors to Prowest Electronics Limited, Windsor, England

Filed Nov. 29, 1976, Ser. No. 745,687

Claims priority, application United Kingdom, Dec. 1, 1975, 49230/75

Int. Cl.^{2} H04N ***5/22***

U.S. Cl. 358—183 **11 Claims**



1. A television arrangement for receiving respective input television signals from each of a plurality of sources and providing output television signals, derived from at least one of said input signals, for display on a television picture area, said arrangement including storage means having a respective address for each of a plurality of substantially non-overlapping portions of said area, said storage means storing, at said addresses, switching information which indicates picture content replacement sequence in which the output television signals, previously derived from one of said sources and displayed on respective portions of said picture area, are to be derived from another of said sources, and scanning means for scanning said switching information to produce a switching signal adapted to selectively control, in accordance with said sequence, the derivation of said television output signals from said television input signals.

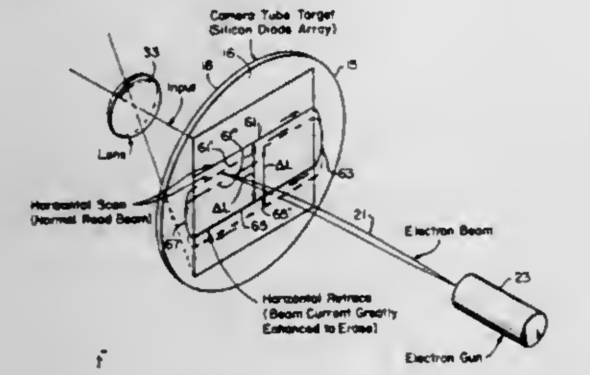
4,101,931
SILICON DIODE ARRAY VIDICON WITH ELECTRONICALLY CONTROLLED SENSITIVITY

Leon S. Yaggy, Oceanside, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1976, Ser. No. 736,790

Int. Cl.^{2} H04N ***5/36***

U.S. Cl. 358—217 **11 Claims**


Camera Tube Target (Silicon Diode Array)
33
16
18
15
Input
Lens
61
60
64
ΔL
63
Horizontal Scan (Normal Read Beam)
ΔL
65
66
67
21
Electron Beam
23
Horizontal Retrace (Beam Current Greatly Enhanced to Erase)
Electron Gun

1. A method of electronically selecting the sensitivity of an imaging device having a silicon diode array target comprising steps of:

(a) exposing the front of said target to an image;

(b) periodically scanning successive lines on the back of said target with an erasing electron beam;

(c) periodically scanning each of said successive target lines with a reading electron beam a uniform time after it has been scanned by said erasing electron beam; and

(d) selecting the time lag of said scanning electron beam relative to said erasing electron beam to attain a desired sensitivity for said imaging device.

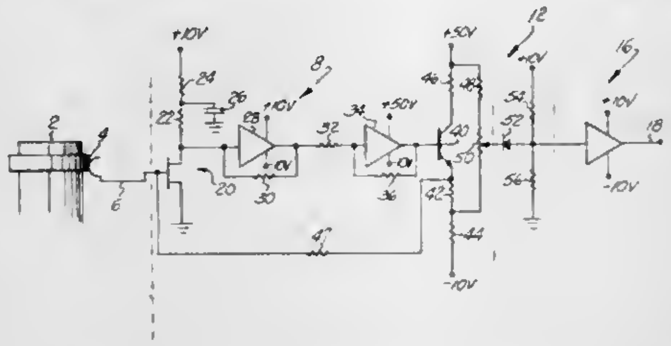
4,101,932
VIDEO PREAMPLIFIER FOR CAMERA OPERATED IN ACT MODE

Joseph F. Wiggin, Quincy, Ill., assignor to Harris Corporation Cleveland, Ohio

Continuation of Ser. No. 632,245, Nov. 17, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 839,980

Int. Cl.^{2} H04N ***5/14***

U.S. Cl. 358—223 **5 Claims**



1. An improved video preamplifier for use in a television camera having an imaging tube operated in an ACT mode for producing a video signal having large signal, unsuppressed white pulses interspersed periodically thereon due to said ACT operation, said imaging tube having a video output circuit, said improved video preamplifier comprising:

first amplifier means serially connected to said video output circuit for providing first amplification of said video signal, including said unsuppressed white pulses, without being overdriven thereby;

second amplifier means serially connected to said first amplifier means for second amplification of said video signal; and,

clipping circuit means interposed between said first amplifier means and said second amplifier means for clipping said large signal white pulses to prevent overdriving of said second amplifier means.

4,101,933
TELEVISION CAMERAS

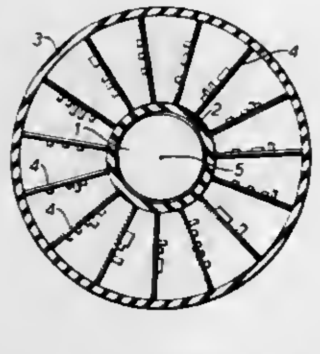
Michael Richmond, Witham, and Richard Michael Hesketh Prichard, Stock, both of England, assignors to Elliott Brothers (London) Limited, England

Filed Aug. 2, 1976, Ser. No. 710,668

Claims priority, application United Kingdom, Aug. 9, 1975, 33291/75

Int. Cl.^{2} H04N ***5/64***

U.S. Cl. 358—254 **11 Claims**



1. A television camera comprising a television camera tube and a yoke within which the camera tube is at least partially disposed, and a plurality of electronic sub-assembly units distributed around said tube and outside of said yoke, each sub-assembly unit comprising a circuit board substrate, carrying electronic components, each substrate extending in a plane which extends radially from the axis of said camera tube.

4,101,934
CODING SYSTEM

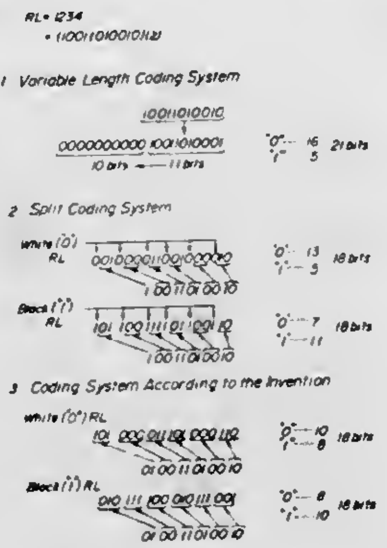
Kenji Fukuoka, Fussa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 741,994

Claims priority, application Japan, Nov. 17, 1975, 50-137215

Int. Cl.^{2} H04N ***1/40, 7/12;*** **G08B** ***1/08***

U.S. Cl. 358—261 **3 Claims**



1. A coding method comprising forming an assembly of code words prepared by converting a length composed of a train of "0" and a length composed of a train of "1" into a binary coded m-ary digit composed of *m* original elements each represented by a binary code including *n* bits, said "0" and "1" being a binary signal of facsimile to be coded, dividing said binary coded m-ary digit code into blocks each including *n* bits, said blocks each including an original unit, selecting *2m* code words without permitting any overlap thereof from an original set of binary code words having a given length of at least $n+1$ bits, dividing said *2m* code words into two groups each including *m* code words, bringing the number of "0" constituting all of the code words belonging to each group into agreement with the number of "1" thereof, and arranging in order each of the code words belonging to each group, said coding method further comprising converting each block of that binary coded m-ary digit which is associated with said length composed of a train of "0" of said binary signal into a code word having that order which corresponds to the original order of the m-ary digit which means said block in one of said groups and converting each block of that binary coded m-ary digit which is associated with said length composed of a train of "1" of said binary signal into a code word having that order which corresponds to said original order of the m-ary digit which means said block in another group.

4,101,935
ELECTRON BEAM READING ARRANGEMENTS

Robert Mark Quilliam, Chelmsford, England, assignor to The Marconi Company Limited, England

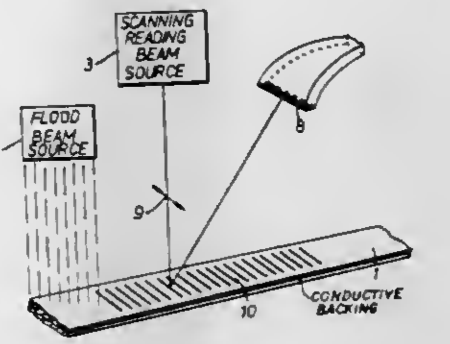
Filed Jul. 11, 1975, Ser. No. 595,106

Claims priority, application United Kingdom, Jul. 11, 1974, 30687/74

Int. Cl.^{2} H04N ***1/00, 1/28***

U.S. Cl. 358—293 **8 Claims**

1. A method of developing an electrical signal corresponding to surface modulations in a dielectric surface comprising the steps of charging said dielectric surface with electrons, scanning said charged dielectric surface with a reading electron beam and collecting predominantly electrons of said beam reflected by the surface charge of said dielectric surface at said modulations.



4,101,936
AUTOMATIC TAPE LOADING TYPE REPRODUCING APPARATUS HAVING INTERMITTENT TAPE SHIFTING CAPABILITY

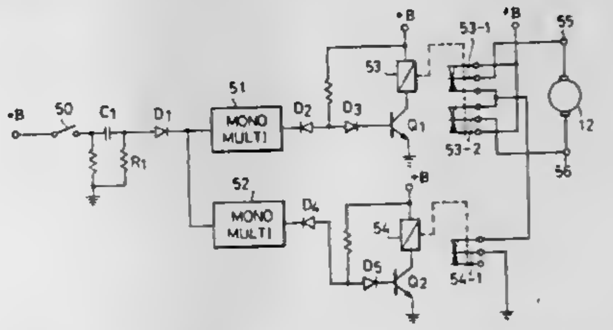
Kazue Shinbara, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 4, 1977, Ser. No. 756,907

Claims priority, application Japan, Jan. 7, 1976, 51-931

Int. Cl.^{2} G11B ***15/20***

U.S. Cl. 360—10 **6 Claims**



1. An automatic tape loading type reproducing apparatus comprising:

a guide drum having at least one rotating head;

loading means for operating with a cassette having a supply reel and a take-up reel with tape wound thereon, said loading means including means for drawing the tape from the cassette and loading the drawn out tape into a path in wrapping contact with the guide drum responsive to a loading operation in a forward direction, and for storing the tape in the cassette responsive to an operation in the reverse direction;

means comprising a driving motor selectively operating in a forward direction to drive the loading means in a forward direction and rotating in a reverse direction to drive the loading means in the reverse direction operation;

means for imparting a torque for urging the take-up reel to tension the tape in its taking up direction;

tape driving means for causing tape travel during normal reproduction and for terminating the tape travel during still picture reproduction;

a switch means for momentary actuation during the still picture reproduction; and

electrical circuit means operating in response to each of the momentary actuations of the switch to cause the driving motor to rotate briefly in a reverse direction for a specific interval of time and thereafter to rotate in a forward direction for at least said specific interval of time,

whereby actuation of the switch during still picture reproduction causes the tape driving means to cease normal operation, to take up a short section of the tape on the take-up reel in response to the reverse direction operation of the loading means and to pay out the tape from the supply reel so that the tape is shifted intermittently in response to the forward direction operation of the loading means.

4,101,937

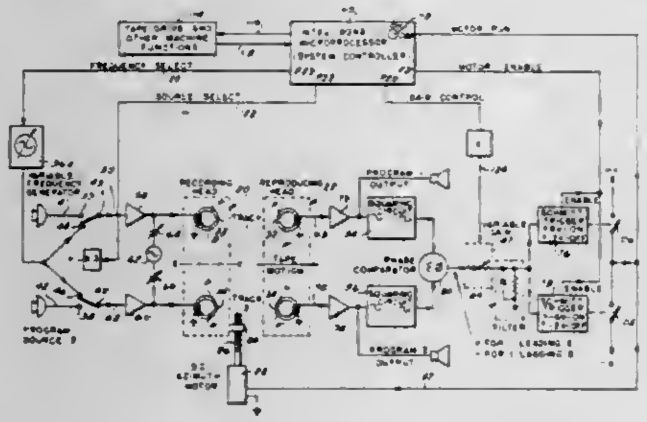
AUTOMATIC AZIMUTH CONTROL FOR MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Continuation-in-part of Ser. No. 740,958, Nov. 11, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,499

Int. Cl.² G11B *5/43*

U.S. Cl. 360—76 **16 Claims**



1. In apparatus for recording and reproducing signals along multiple tracks on a magnetic tape, tape driving means for moving the tape consecutively past a recording head and a reproducing head, each of the heads having at least two gaps defined between transducer pole piece portions for recording or reproducing along a corresponding number of tape tracks, automatic azimuth control means comprising:

signal generator means for generating variable frequency test signals:

means for recording said test signals simultaneously on said tracks through said gaps on the recording head at frequencies which vary from low to high frequency;

means for making productions of said test signals through said gaps on the reproducing head;

means for sensing time relationship of such test signal reproductions; and

skew means responsive to time differential of said test signal reproductions to skew the head-to-tape relation at one of said heads progressively in a direction to synchronize said test signal reproductions.

4,101,938

APPARATUS FOR REPRODUCING HIGH FIDELITY MAGNETIC TAPES FROM A MASTER TAPE

Ichiro Hanai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

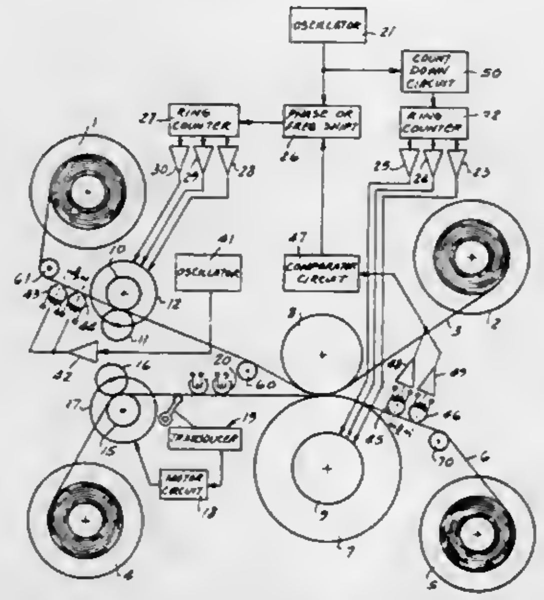
Filed Feb. 6, 1974, Ser. No. 440,263

Claims priority, application Japan, Feb. 9, 1973, 48-17437[U]

Int. Cl.² G11B *5/86, 15/43*

U.S. Cl. 360—16 **2 Claims**

1. A thermal printing apparatus comprising, a master tape driving means, a slave tape driving means, a pair of driven rollers contacting said master tape with said slave tape, heating means for heating said slave tape before it contacts said master tape, a motor control means connected to said master tape driving means, a first pair of magnetic heads mounted adjacent said master tape and spaced longitudinally a predetermined distance for recording the same signal on separate channels on said master tape before it reaches said master tape driving means, a second pair of magnetic heads mounted adjacent said slave tape after it has passed said rollers and has shrunk and spaced longitudinally said predetermined distance for reading signals from separate channels printed on said slave tape, a comparator circuit receiving the outputs of said second pair of magnetic heads and supplying a signal to said motor control means to control the tension on said master tape between said master tape driving means and said pair of rollers.



4,101,939

VIDEO SYNCHRONIZER WITH VELOCITY COMPENSATION

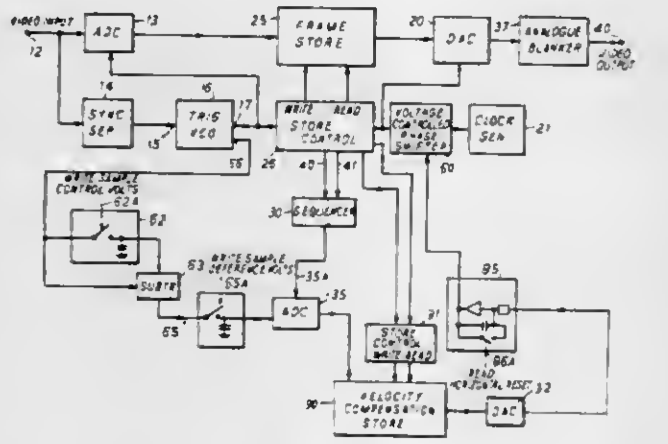
David Peter Owen, Newbury, and Barry Donald Ruberry Miles, Thatcham, both of England, assignors to Quantel Limited, England

Filed Feb. 17, 1977, Ser. No. 769,615

Claims priority, application United Kingdom, Feb. 19, 1976, 6588/76

Int. Cl.² H04N *5/78*

U.S. Cl. 360—36 **12 Claims**



1. A video synchroniser comprising:

(a) a first analogue-to-digital converter for converting an incoming analogue video signal to digital form;

(b) a video store for receiving successive lines of video information in digital form from said converter;

(c) a digital-to-analogue converter for converting a digital output signal from said store into analogue form;

(d) control means for writing-in and reading-out the digital information into and from said store;

(e) a triggered voltage controlled input oscillator for determining the rate of conversion of said analogue signal to digital form and the rate of writing into said store;

(f) an output oscillator for controlling the rate of reading out of the digital information form said store and the rate of conversion into analogue form;

(g) sampling means for sampling the input oscillator controlling voltage during one line;

(h) measuring means for detecting any voltage difference in the controlling voltage during successive lines;

(i) a second analogue-to-digital converter for converting the analogue voltage difference detected by said measuring means into digital form;

(j) digital storage means for retaining the digital voltage from said converter means, and

(k) phase shifter means for shifting the phase of the output oscillator in dependence on the voltage difference held by said digital storage means.

4,101,940

CIRCUIT FOR DELAYING A COMPOSITE VIDEO SIGNAL BY A LINE DURATION, PARTICULARLY FOR USE WITH A VIDEO RECORD PLAYER

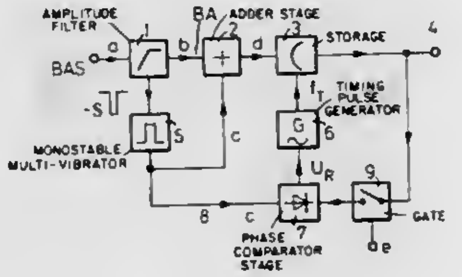
Werner Scholz, Gehrden, Germany, assignor to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Switzerland

Filed Dec. 23, 1976, Ser. No. 753,620

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558168

Int. Cl.² H04N *5/79*

U.S. Cl. 360—37 **11 Claims**



1. In a circuit for delaying a composite input video signal, having blanking intervals and including line sync pulses increasing the amplitude of the input signal, by the duration of at least one line, the circuit including a timed storage, having an input and an output, controlled by a timing pulse sequence from a generator, with a variable obtained, by phase comparison, from the input and output of the storage, and which controls the frequency of the timing pulse sequence in a manner such that the delay time is always equal to the actual duration of a line: the improvement comprising, in combination, means operable to separate the line sync pulses from the input signal and to feed the video signal, less the line sync pulses, to the input of said storage; means deriving, from the separated line sync pulses, pulses having an amplitude within the amplitude range of the video signal less the sync pulses and having a constant duration; and means adding the derived pulses, during the line blanking intervals, to the video signal fed to said storage.

4,101,941

AUTOMATIC TAPE RUN-REVERSING DEVICE

Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

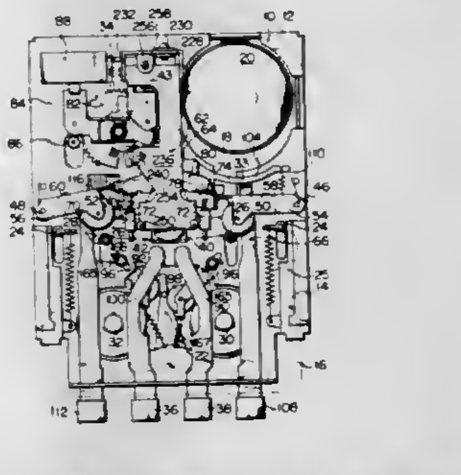
Filed Oct. 29, 1976, Ser. No. 736,825

Claims priority, application Japan, Nov. 6, 1975, 50-133407; Nov. 6, 1975, 50-133408; Nov. 6, 1975, 50-133409; Nov. 6, 1975, 50-133410; Nov. 6, 1975, 50-133411; Feb. 6, 1976, 51-12013; Feb. 6, 1976, 51-12581[U]; Feb. 6, 1976, 51-12582[U]

Int. Cl.² G11B *15/48, 21/02, 21/08*

U.S. Cl. 360—74 **11 Claims**

1. An automatic tape run-reversing device which comprises a one channel type magnetic head; tape-driving means for causing the magnetic tape to run alternately in opposite directions; said tape-driving means comprising a motor; a rotation-initiating member driven by the motor; first and second tape-driving unis formed of first and second capstans disposed on both sides of the magnetic head and designed to rotate by the motor in opposite directions and first and second pinch rollers for causing the magnetic tape to run in first and second opposite directions alternatively when pushed by the first and second capstans; first and second reel shafts coupled to the second or first capstans when the magnetic tape is run by the first or second driving unit and designed to rotate in the direction in which the magnetic tape is taken up; and an intermediate pulley means for rotating the first and second reel shafts in the direction in which the magnetic tape is taken up; detecting means for detecting the time at which the magnetic tape is substantially fully taken up; reversion means for reversing the run of the magnetic tape alternatively, a reversion control unit for said reversion interlockingly with the detecting means; said reversion control unit comprising a rotated member provided with an engagement shaft belonging to the reversion means and a plurality of projection-bearing cams belonging to the magnetic head-vertically moving means, and at least two concave stop portions spaced from each other at a distance corresponding to a specified circumferential angle and normally brought to rest with one of the concave stop portions caused to face the rotation-initiating member; and an auxiliary rotated member provided with rotation-induction portions designed to be coupled to the rotation-initiating member by being rotated up to one of said concave stop portions through operation of the detecting means and further push the rotated member for engagement with the rotation-initiating member; and magnetic headvertically moving means for changing the operative height of the magnetic head in a plurality of steps interlockingly with the detecting means, thereby effecting continuous multi-channel type recording and reproduction by automatically reversing the run of the magnetic tape, each time it is substantially fully taken up.



4,101,942

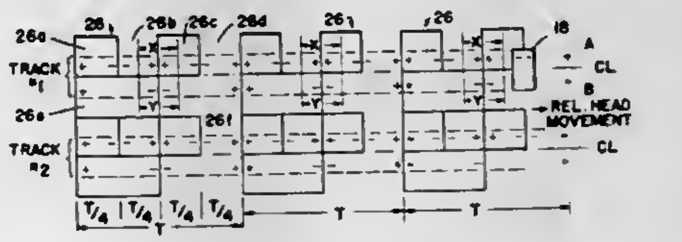
TRACK FOLLOWING SERVO SYSTEM AND TRACK FOLLOWING CODE

James O. Jacques, Tracy, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1976, Ser. No. 732,634

Int. Cl.² G11B *21/10*

U.S. Cl. 360—77 **24 Claims**



1. A data storage member comprising: a track; and a tracking code for positioning a transducer with respect to said track, said code including:

(a) a first path including a first region of magnetic flux of one polarity followed by a second region of magnetic flux of opposite polarity and preceded by a fifth region of magnetic flux of said opposite polarity; and

(b) a second path adjacent said first path and including a third region of magnetic flux of said opposite polarity followed by a fourth region of magnetic flux of said one polarity, wherein said second region follows said first region and said fourth region follows said third region at substantially the same positions on said storage member in their respective paths, and wherein the number of lines of flux in passing from said first region to said second region is equal to the number of lines of flux in passing from said third region to said fourth region, said third region and said fifth region commencing in their respective paths at substantially the same positions on the storage member.

4,101,943

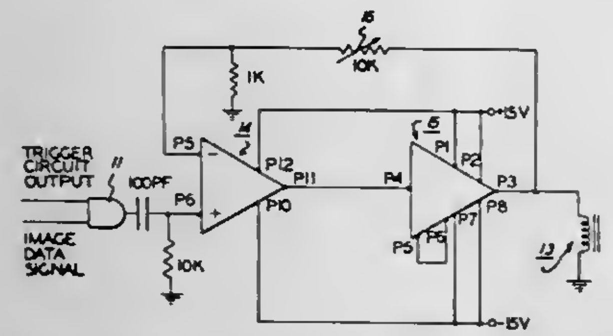
CONTROLLED-WIDTH-SYNCHRONIZATION OF RECORDED PIXELS

Thomas M. Frey, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,283

Int. Cl.^{2} G11B *5/52*

U.S. Cl. 360—84 **6 Claims**



1. Magnetic imaging apparatus for providing controlled-width-synchronization of recorded pixels, comprising:

(a) a rotational recording member having a record head mounted thereon;

(b) means for generating a first signal at a frequency which is a multiple of a predetermined recording frequency;

(c) means for generating a second signal indicative of the position of said record head during rotation of said rotational recording member;

(d) means for generating a third signal at the desired recording frequency, said means capable of initiating the generation of said third signal at the beginning of a time period division of a pixel recording time length upon receipt of said second signal and capable of terminating said generation of said third signal at a predetermined number of recorded pixels, the number of said time period divisions within a pixel recording time length being equal to the multiple of said first signal frequency with respect to said predetermined recording frequency; and

(e) means for driving said record head at the frequency of said third signal.

4,101,944

MAGAZINE LOADING DEVICE FOR MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS

Makoto Inoue; Toshiki Ikeda, and Koichiro Abe, all c/o Teac Video Corporation, 7-3, Nakacho 3-chome, Musashino-shi, Tokyo, Japan

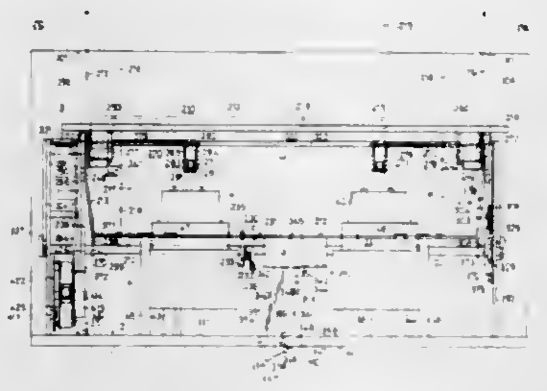
Continuation of Ser. No. 688,592, May 21, 1976, abandoned, which is a continuation of Ser. No. 525,754, Nov. 21, 1974, abandoned. This application Aug. 12, 1977, Ser. No. 824,164

Claims priority, application Japan, Nov. 24, 1973, 48-132392

Int. Cl.^{2} G11B *15/66, 23/04, 5/52*

U.S. Cl. 360—85 **4 Claims**

1. A magnetic video recording and reproducing apparatus comprising a magazine loading section disposed on the main surface of a main chassis of said apparatus, a rotary magnetic head assembly composed of a cylindrical magnetic tape guide surface and a rotary magnetic head and disposed on the main surface of the main chassis, a magazine loading device for loading a magazine formed with a casing containing a magnetic tape onto said magazine loading section and unloading said magazine therefrom, and magnetic tape threading means for drawing out said magnetic tape from said magazine to thread it on the magnetic tape guide surface of said rotary magnetic head assembly, in which said magazine loading device is composed of at least a magazine holder for housing the magazine inserted thereinto from the front of said magazine holder, a magazine holder support mechanism for supporting said magazine holder and bringing it from a magazine housing and unhousing position where the magazine is inserted into and removed from the magazine holder to a magazine loading position where the magazine is loaded on said magazine loading section and bringing the magazine holder from said magazine loading position to said magazine housing and unhousing position, and a buffer mechanism for providing a buffer effect when the magazine holder is brought from the magazine housing and unhousing position to the magazine loading position in the case of the main chassis being positioned vertical; said magazine holder support mechanism has left and right support plates planted on the main surface of the main chassis and first and second support arms pivoted to each of said left and right support plates, the free ends of said first support arms respectively pivoted to the left and right support plates being pivoted to the forward portions of said left and right side plates of the magazine holder on the outside thereof and the free ends of said second support arms pivoted to the left and right support plates being pivoted to the backward portions of the magazine holder on the outside thereof; and said buffer mechanism comprises a rotative lever pivotally mounted on the main chassis, a rotary member disposed to rotate with the rotation of the first support arm of said magazine holder support mechanism in the case of the main chassis being positioned with its main surface vertical, a brake ring mounted on the shaft of said rotative lever in a manner to be rotated through said rotary member and a uni-directional rotary coupling mecanism only when said first support arm rotates for bringing the magazine holder from the magazine loading position to the magazine housing and unhousing position, and a brake shoe mechanism for said brake ring.



4,101,945

DRIVE SPINDLE ASSEMBLY FOR DISC FILE

Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

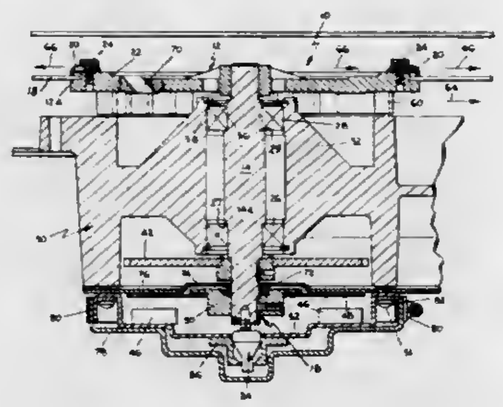
Filed Sep. 7, 1976, Ser. No. 721,042

Int. Cl.^{2} G11B *17/32, 25/04*

U.S. Cl. 360—102 **24 Claims**

1. A disc-drive spindle assembly and means for mounting the same in a disc recorder, comprising in combination: a disc recorder frame, including means defining a pair of spaced bearing supports; a direct-coupled spindle assembly, including a spindle shaft, a motor with its rotor coupled directly to said spindle shaft, a mounting platform means attached to said spindle shaft for mounting a disc and rotating the same with said shaft and air-moving means driven by the spindle for forcing air along at least part of the spindle shaft to help cool

the shaft; at least two bearings encircling said shaft at mutually spaced locations, said bearings supported in position by said spaced bearing supports of said recorder frame to thereby rotatably support the spindle assembly on said frame as a direct-coupled unit.



4,101,946

TAPE PLAYING MACHINE WITH MOVABLE HEAD MOUNT

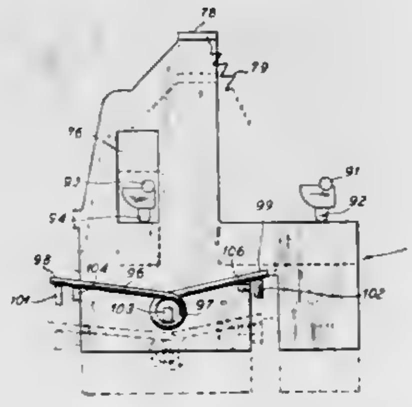
Ryoji Takamatsu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1976, Ser. No. 708,898

Claims priority, application Japan, Jul. 30, 1975, 50/106423[U]; Jul. 30, 1975, 50/106425[U]; Aug. 14, 1975, 50/112237[U]

Int. Cl.^{2} G11B *5/54, 21/16*

U.S. Cl. 360—105 **9 Claims**



2. In a tape recording/reproducing apparatus comprising a chassis, a first actuating push bar, a second actuating push bar, a head deck mounted on said chassis for back and forth movement in first and second directions, spring means attached to said head deck at a generally central position and having first and second extending portions, said first actuating push bar engageable with said first extending portion and said second actuating push bar engageable with said second extending portion to move said head deck in a first direction, return spring means connected between said chassis and said head deck to move it in a second direction, and stop means for limiting the motion of said head deck in said first direction but allowing said first and second actuating push bars to continue movement after said head deck has engaged said stop.

4,101,947

NARROW TRACK MAGNETIC-HEAD RECORDER

David Noel Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,553

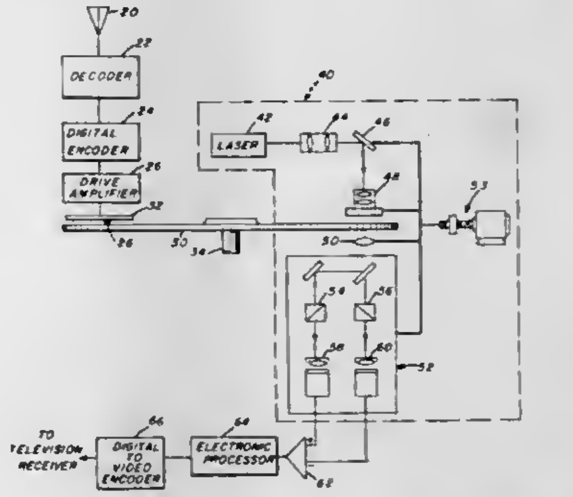
Int. Cl.^{2} G11B *5/32, 11/10*

U.S. Cl. 360—114 **14 Claims**

1. A process for magnetically recording an information signal on a planar magneto-optic medium of the type having a predominant proportion of magnetic domains in an orientation exhibiting a substantial magnetic component normal to a recording surface of said medium, the information signals being adapted to be reproduced by relatively high resolution optical playback apparatus employing a polarization detection beam oriented at a relatively steep angle to the recording surface, said process comprising:

moving a magnetic head, adapted to produce a magnetic field component normal to a recording surface, relative to the recording surface of such a medium along a predetermined track path, which, based on head width, incorporates a significant degree of track overlapping; and

applying the information signal to said magnetic head during such movement relative to the medium, such signal acting through said head to produce said magnetic field component normal to the surface in proportion to the signal to thereby induce domain orientation changes in the normal magnetic component of said medium, whereby the signal is recorded as orientations of magnetic domains in a narrow residual track portion and whereby the economy of magnetic recording is achieved in combination with the high information storage density of a magneto-optic storage medium.



4,101,948

METHOD FOR CLEANING FLEXIBLE MAGNETIC DISCS

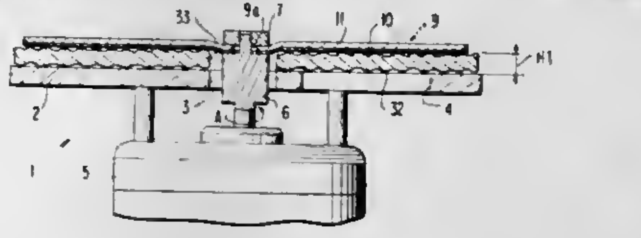
Eiichi Tadokoro, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 21, 1976, Ser. No. 753,165

Claims priority, application Japan, Dec. 29, 1975, 51-159260

Int. Cl.^{2} B21B *45/02;* G11B *25/04*

U.S. Cl. 360—137 **16 Claims**

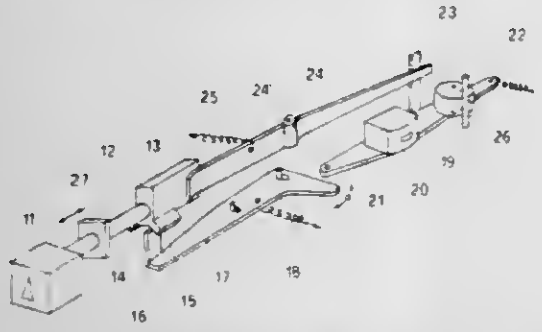


1. A cleaning method for a recording and reproducing apparatus of the type having a flat, horizontal base plate having a central aperture therein, a drive motor mounted beneath the base plate and having a rotary spindle extending up through the aperture, and a flexible record disc secured to the spindle for levitating rotation thereby parallel to and above the base plate, the record disc having a magnetic layer thereon on the side opposing the base plate, said method for cleaning the magnetic layer comprising:

(a) disposing a soft, coarse, and porous sheet member on the base plate below the record disc, the sheet member having

a central aperture therein corresponding to the base plate aperture
(b) adhering the sheet member to the base plate,
(c) rotating the record disc at a speed below its levitation speed, whereby the magnetic layer is slidingly contacted by the sheet member and cleaned thereby, dust particles adhering to the magnetic layer being scraped off by and transferred to the sheet member, and
(d) removing the sheet member prior to recording or reproducing information on or from said disc.

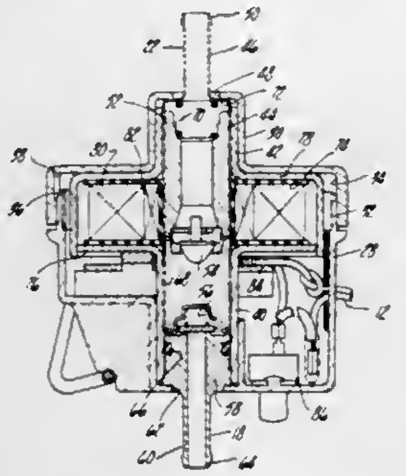
4,101,949
SINGLE CONTROL KEY FOR TAPE RECORDERS
Rodolfo Cicatelli, Lugano, Switzerland, assignor to Autovox S.p.A., Rome, Italy
Filed Feb. 14, 1977, Ser. No. 768,468
Claims priority, application Italy, Feb. 16, 1976, 48110 A/76
Int. Cl.² G11B *5/54, 21/22, 15/00*
U.S. Cl. 360—137 **10 Claims**



1. In tape recorders having a frame, a tape drive variator (controller), and a movable support mounting at least one of a pressure roller and magnetic head on the frame, a single control key comprising:
a shaft rotable about its axis;
an outer body fixed to said shaft for manually rotating said shaft;
a cam means fixed to said shaft, said cam means having a substantially rectangular cross section about said shaft axis in a plane perpendicular to said shaft axis;
projecting tabs connected to and rotatable with said shaft and spaced apart through a substantial angle of rotation of said shaft;
first cam follower means located adjacent to and coacting with said cam means for being positioned in response to the rotational position of said cam means; and
second follower means having a portion located radially between and coacting with said projecting tabs for being positioned in response to the rotational position of said tabs;
whereby the rotational position of said cam means controls one function of said tape player which is determined by the position of said first cam follower means and the rotational positions of said tabs control another function of said tape player which is determined by the position of said second follower means.

4,101,950
PORTABLE FLUID TRANSFER PUMP
Donald L. Hager, Elmira; Ralph V. Brown, Cayuta, and James A. Thomas, Corning, all of N.Y., assignors to Facet Enterprises, Inc., Tulsa, Okla.
Filed Nov. 8, 1976, Ser. No. 739,402
Int. Cl.² H01H *47/32*
U.S. Cl. 361—203 **16 Claims**

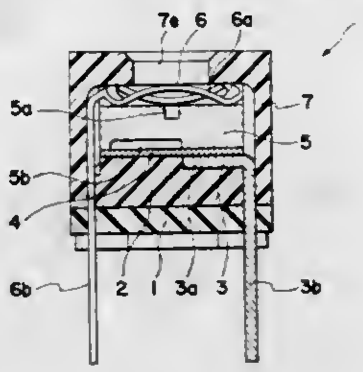
1. A portable fluid transfer pump comprising:
a cylindrical member having a guide portion at one end and a contiguous necked down portion at the other end, said necked down portion forming an outlet port;
solenoid coil means disposed concentrically about the outside of said guide portion for generating a magnetic field in response to a current flow;
detection coil means magnetically linked to said solenoid means for generating a first signal in response to said solenoid coil means generating an increasing magnetic field, and for generating a second signal in response to said solenoid coil generating a decreasing magnetic field;
resiliently biased piston means disposed in said guide portion adjacent to said solenoid coil means, said piston means reciprocally movable against said bias in response to the magnetic field generated by said solenoid coil means;
an inlet member having one end received in the end of said cylindrical member's guide portion opposite said necked down portion, said inlet member having a like necked down portion extending outwardly from said cylindrical member, and a fluid passageway passing through said inlet member concentric with said like necked down portion, said fluid passageway forming an inlet port;



valve means disposed in said cylindrical member for providing a unidirectional fluid flow from said inlet port to said outlet port;
an external housing enclosing said inlet member, said cylindrical member, said solenoid coil and said detection coil, said housing comprising an upper member having an aperture receiving therethrough the necked down portion of said cylindrical member, a lower member having an aperture therethrough the like necked down portion of said inlet member, and means for locking said upper member to said lower member, said upper and lower members in their locked state securing said inlet member in said cylindrical member; and
a blocking oscillator having an electronic switch member for controlling the current flow through said solenoid coil in response to said first and said second signals generated by said detection coil.

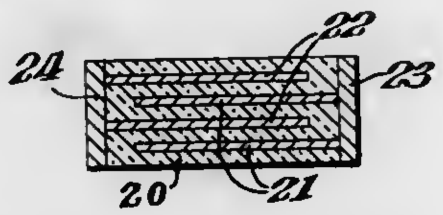
4,101,951
VARIABLE CAPACITOR
Saburo Kuze, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Jul. 28, 1976, Ser. No. 709,372
Claims priority, application Japan, Jul. 28, 1975, 50-104912[U]; Apr. 16, 1976, 51-48273[U]
Int. Cl.² H01G *5/04*
U.S. Cl. 361—293 **13 Claims**

1. A variable capacitor for use in electrical and electronic equipment comprising:
a substantially circular disc-like stator member of electrically insulating plastic material to which a stator electrode is secured thereto, said stator electrode including a stator terminal end and a stator terminal lead which form a single monolithic element;
a rotor member of electrically conductive material including one surface which mates with and is rotatably disposed on a dielectric member, said dielectric member being positioned adjacent to said stator member;
said one surface of said rotor member including a cut out portion acting as a rotor electrode for alteration of electrostatic capacity upon rotation of said rotor member through variation of confronting areas between said rotor member and said stator electrode;
said dielectric member being a plate member of dielectric ceramic material separately formed and disposed between said rotor member and said stator electrode;
a contact member including a rotor terminal end and a rotor terminal lead which form a single monolithic element, said contact member being positioned adjacent said rotor member and being adapted to urge said rotor member towards said dielectric member and said stator member;



said stator member, stator electrode, dielectric member, rotor member and contact member being housed in a substantially cylindrical casing of electrically insulating plastic material except for said stator terminal end and said rotor terminal end, said substantially cylindrical casing being firmly affixed to said stator member and including a through opening in a top thereof;
said substantially cylindrical casing being closed at a bottom thereof by an electrically insulating plastic base which includes openings therethrough to accommodate said stator terminal end and said rotor terminal end; and
said rotor member being adapted to be rotated by inserting an adjusting means through said through opening in the top of said casing to engage a groove in the rotor member which includes a marking for identification of directional property.

4,101,952
MONOLITHIC BASE-METAL GLASS-CERAMIC CAPACITOR
Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.
Filed Aug. 17, 1976, Ser. No. 715,036
Int. Cl.² H01G *1/01, 4/08*
U.S. Cl. 361—305 **21 Claims**



1. A monolithic ceramic capacitor comprising: a reduction resistant glass-ceramic body having at room temperature a dielectric constant greater than 1000 and having a characteristic sintering and full densification temperature of from 1080° C to 950° C, said body consisting of from 5 to 15% by weight of a non-crystalline glass phase and from 85 to 95 percent by weight of a crystalline ceramic phase having a characteristic sintering and densification temperature greater than about 1200° C, said glass phase consisting essentially of an alkaline earth aluminoborate glass wherein said alkaline earth is selected from barium, strontium and calcium, said crystalline phase being an alkaline earth metal titanate wherein at least 50 mole percent of said alkaline earth metal is barium; a base metal electrode being buried within said reduction resistant glass-ceramic body; and another metal electrode contacting said body and being in capacitive relationship with said buried electrode.

4,101,953
MULTIPLE FLASHLAMP ARRAY
Robert M. Anderson, Pepper Pike, and James M. Hanson, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 506,953, Sep. 18, 1974, abandoned. This application Feb. 3, 1977, Ser. No. 765,455
Int. Cl.² G03B *15/02*
U.S. Cl. 362—11 **4 Claims**

1. A multilamp photoflash array comprising a base, a reflector unit mounted on said base having a plurality of outwardly facing reflectors, a plurality of photoflash lamps mounted on said base, each one of said lamps being positioned within a respective one of said reflectors, and protective cover means over the said reflectors and secured to said base constituted of a light-transmitting polymodal resinous branched block butadiene styrene copolymer containing from about 70–95 weight percent styrene, wherein the copolymer has a Vicat softening of approximately 200° F, a 90–95% light-transmission, and Izod impact strength of about 0.4 foot-pounds/inch notch, a modulus of elasticity of 200,000 psi, and a 100% elongation at a tensile pull rate of approximately 0.2 inches/minute.

4,101,954
DEVICE FOR VARIABLY ILLUMINATING AN OBJECT
Karl Heinz, Rietmüller, Frankfurt, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany
Filed Jun. 3, 1977, Ser. No. 803,262
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 7618804[U]
Int. Cl.² G01D *11/28*
U.S. Cl. 362—26 **11 Claims**

1. A device for variably illuminating an object comprising a light source;
light conducting means adapted to transmit light to the object to be illuminated and having an end for receiving light from said light source;
light control means disposed between said light source and said end of said light conducting means including a movable member constructed of light conductive material receiving light from said light source and having a light transmitting surface of varying dimensions along the direction of movement of said member, said light transmitting surface being movably disposed adjacent said end of said light conducting means, the movement of said member relative to said end of said light conducting means varying the dimensions of the portion of said light transmitting surface adjacent said end of said light conducting means to control the amount of light supplied to said light conducting means.

4,101,955
ORNAMENTAL ARTICLE WITH ILLUMINATED DISPLAY
Richard E. DuNah, Mountain View, Calif., assignor to Precision Lamp, Mountain View, Calif.
Filed Oct. 12, 1976, Ser. No. 731,122
Int. Cl.² F21L *15/08*
U.S. Cl. 362—104 **11 Claims**

7. An illuminated ornamental article, comprising an outer case having a front and rear surface, said outer case section containing a lens chamber therein, an aperture in said front surface in communication with said lens chamber, a lens hav-

ing a front surface and a convex rear surface disposed in said chamber with the front surface in said aperture, a light source receiving well extending into said lens from the convex rear

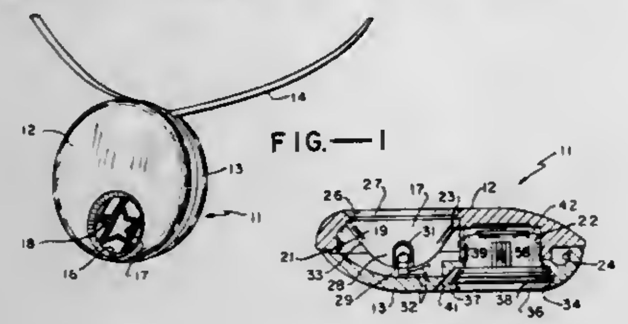


FIG.—1

FIG.—2

surface, a miniature light source in said well operating to emit light to be transmitted through said lens to the front surface when said miniature light source is energized to thereby illuminate the front surface.

4,101,956

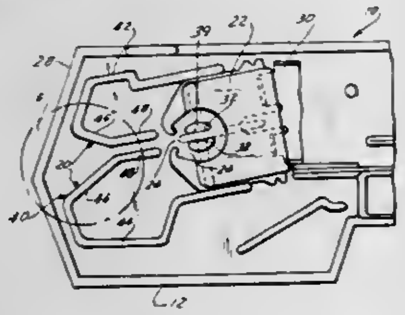
FLUORESCENT FIXTURE

Roy B. Crane, Wilmington, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,482

Int. Cl.² H05B *33/02;* H01R *33/08*

U.S. Cl. 362—217 **1 Claim**



1. In a fluorescent light fixture of the type including a housing having a pair of sockets positioned at opposite ends thereof for engagement with the pins of a fluorescent lamp, said sockets each having surfaces defining a cutout center portion, an opening extending through ends of said sockets communicating with said cutout for receiving said pins, contacts for electrical connection with said pins mounted in said cutout and surfaces of said socket for mechanical interengagement with said pins to secure said lamp in position, the improvement comprising: guide means affixed to said housing positioned in front of said socket opening to direct said lamp pins through said socket opening to siad cutout and into position to be rotated into electrical engagement with said contacts and mechanical interengagement with said surfaces; said guide means comprises a pair of members each including first portions thereof having surfaces spaced apart from each other and converging toward said socket opening and second portions thereof positioned between said first portions and socket opening and having surfaces parallel to each other and spaced apart a distance substantially equal to that of said opening; and. said sockets are mounted to end caps at opposite ends of said housing and said guide means are formed integrally with the internal surfaces of said end caps.

4,101,957

ZOOM OPERATING LIGHT

Bansun Chang, 12010 Susan Dr., Granada Hills, Calif. 91344

Filed Sep. 10, 1976, Ser. No. 722,220

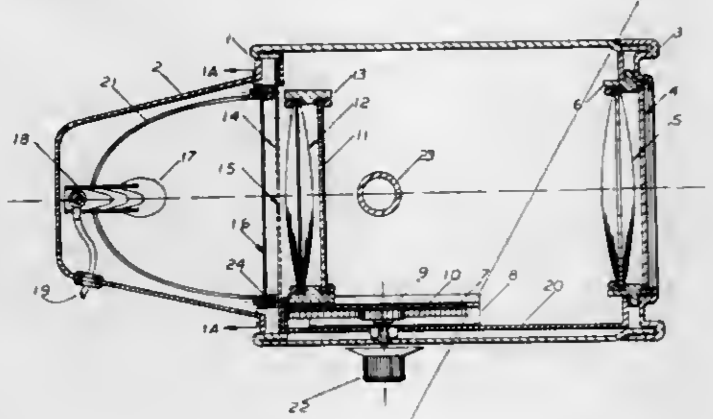
Int. Cl.² A61B *1/06*

U.S. Cl. 362—268 **4 Claims**

1. A zoom operating lamp useful for illuminating the oral cavity during dental and medical surgery, said lamp combination comprising:

a lamp providing a light source having a uniform beam of light;

an ellipsoidal reflector having an inner focus and an outer focus, wherein said lamp is positioned at said inner focus thereof;



an iris positioned at the outer focus of said ellipsoidal reflector;

a movable biconvex lens; and

a fixed biconvex lens, said lenses being positioned on the side of said iris opposite said lamp and said reflector which together form a zoom-lens system.

4,101,958

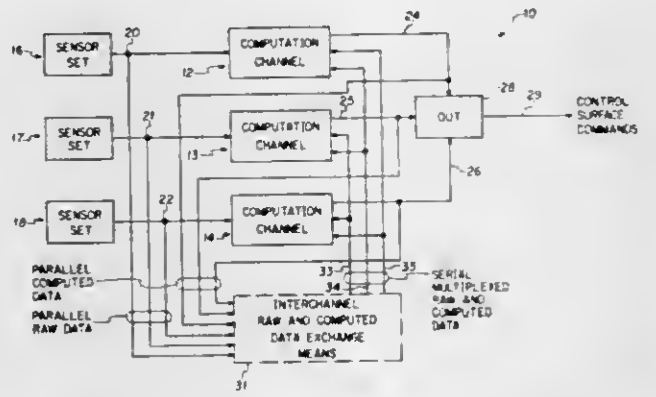
APPARATUS AND METHOD FOR EFFECTING REDUNDANT CONTROL DATA TRANSFER IN A DIGITAL FLIGHT CONTROL SYSTEM

Robert A. Patterson, Marion, and Larry D. Lacy, Cedar Rapids, botb of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 1, 1977, Ser. No. 829,757

Int. Cl.² G06F *15/50, 3/00, 11/08*

U.S. Cl. 364—200 **18 Claims**



1. A method for transferring selected data words from one computation channel to another, redundant channel, each of said computation channels having a data receiving main memory into which the data words are written under the control of a CPU, comprising:

(a) entering indicators into a first register as each of said selected data words is being written in the main memory, the location of each said indicators corresponding to the address in the main memory where a data word is being written;

(b) while said CPU is operating, scanning the first register until an indicator is found;

(c) stealing one memory cycle and transferring into a second register the data from the main memory location corresponding to the location of the indicator found;

(d) thereafter serially clocking the data from the second register to a data receiver associated with the other redundant channel;

(e) removing said indicator found from said first register; and

(f) repeating steps (a) through (e).

4,101,959

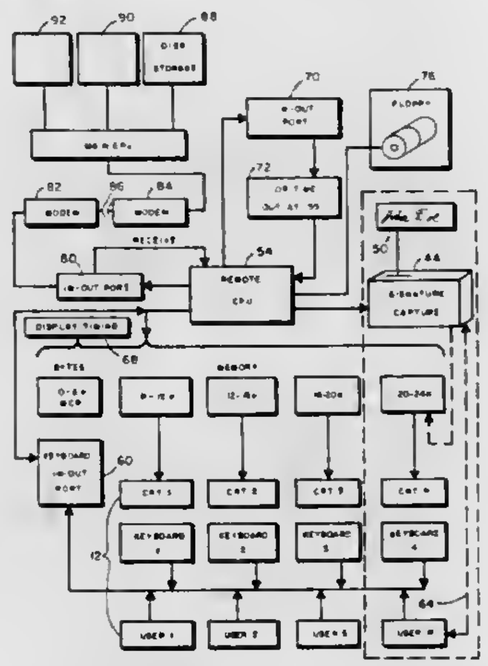
TERMINAL DISPLAY AND STORAGE SYSTEM

Donald A. Domike, Encino; Bryon M. Cole, Venice, and Richard A. Matthews, Los Angeles, all of Calif., assignors to Informer, Inc., Los Angeles, Calif.

Filed Oct. 22, 1976, Ser. No. 735,061

Int. Cl.² G06F *3/04, 3/14*

U.S. Cl. 364—200 **17 Claims**



1. A system for recording, storing and later displaying document information including means for capturing and recording a given document, storing the captured information and displaying the captured information at a CRT terminal in a remote location from said storage location comprising:

at least one television camera;

means for providing a document to be viewed by said television camera for capture and storage;

a CRT for later displaying the document captured by said television camera;

a processor connected to said television camera for controlling and activating said television camera and formatting the picture provided by said document into digital information;

means to activate said processor;

a main central processing unit (CPU) for connection to said processor; and,

storage means connected to said main CPU for storing the digitized video information corresponding to the document that has been captured by said television camera.

4,101,960

SCIENTIFIC PROCESSOR

Richard Arthur Stokes, West Chester; David Jerome Kuck, Seymour, and Carl Anton Jensen, Malvern, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 29, 1977, Ser. No. 782,374

Int. Cl.² G06F *15/16, 15/20*

U.S. Cl. 364—200 **9 Claims**

1. A single instruction multiple data processor comprising:

a large scale high level language programmable general purpose front end processor for user interfacing, archival storage and scalar task processing;

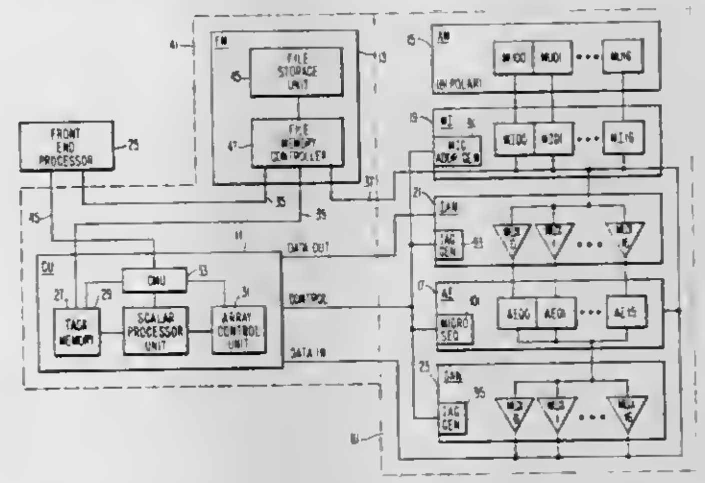
a parallel array processor having a parallel memory module array, a parallel array of arithmetic elements and an alignment network for aligning particular memory modules in said array thereof with particular arithmetic elements in said array thereof for parallel processing of linear vectors;

a large high speed secondary storage system having a high speed data channel connected to said front end processor and a high speed data channel connected to said parallel memory array; and

a control unit interconnected to said front end processor, said high speed secondary storage system and said parallel array processor for controlling said parallel array processor, said control unit comprising

a task memory for storing object program code for use in parallel processing;

a scalar processing unit for fetching object program code from said task memory and for issuing instructions in response thereto;



an array control unit for controlling said parallel task processor in response to instructions issued by said scalar processor; and

a control maintenance unit for providing communications between said front end processor and said control unit, for providing initialization and maintenance control for said control unit, and for gathering error and use data from said control unit, said secondary storage system, and said parallel array processor and for communicating gathered error and use data to said front end processor.

4,101,961

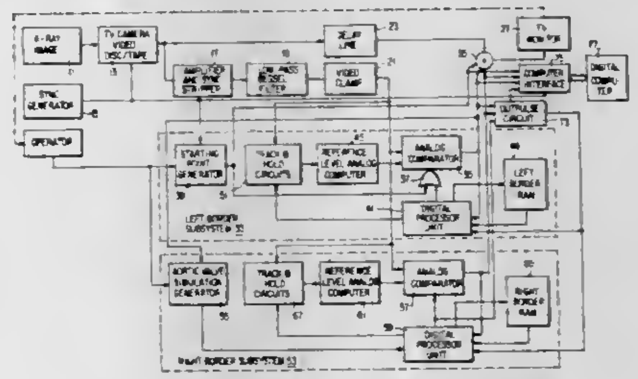
CONTOUR DETECTOR AND DATA ACQUISITION SYSTEM FOR THE LEFT VENTRICULAR OUTLINE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Johan H. C. Reiber, Papendrecht, Netherlands

Filed Feb. 16, 1977, Ser. No. 769,148

Int. Cl.² A61B *1/04;* H04N *7/02;* G06F *15/42*

U.S. Cl. 364—417 **8 Claims**



1. A real-time contour detector and data acquisition system for an angiographic apparatus having video scan means for converting X-ray images of a cardiac chamber characterized by a change in brightness level compared with its surrounding into video format and displaying the X-ray images in recurring video fields and comprising:

sampling means adapted to be coupled to the video scan means for sampling the brightness level of predetermined sample points of the current video field in the region of the last detected border point;

reference level means connected to the sampling means and responsive to the sampling of the brightness level of the predetermined sample points for generating a reference brightness level at which the next border point can be detected;

comparator means connected to the reference level means for comparing the brightness level along a video scan line in the current video field with that of the reference brightness level to detect the next border point;

field memory means for storing the coordinates of detected border points from two preceding video fields;

processor means connected to the comparator means, the field memory means, and the sampling means for enabling the comparator means only within a narrow expectation window on the next video scan line centered about the expected next border position and for determining the sample points to be sampled by the sampling means; and

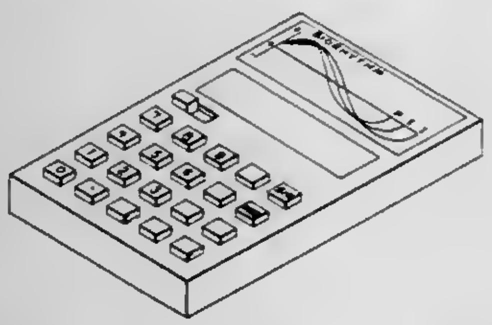
data acquisition means connected to the comparator means for acquiring the detected border points.

4,101,962

ELECTRONIC CALCULATOR FOR DETERMINING BIORHYTHM DATA

Masayuki Hakata, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1976, Ser. No. 698,507
Claims priority, application Japan, Jun. 24, 1975, 50-77866
Int. Cl.² G06F *15/02, 15/42*
U.S. Cl. 364—413 **20 Claims**



1. Non-programmable electronic calculator for determining biorhythm data, comprising:

an input section comprising a plurality of number keys for supplying data necessary to effect calculations based on the four fundamental rules of arithmetic and calendar data on the year, month and day; and function keys for instructing various arithmetic operations, including a specific key for instructing the determination of biorhythm;

cardinal number signal generating means for obtaining numerical data representing 23, 28 and 33 days respectively defining the cyclic periods of biorhythm;

a control section storing a series of microprograms based on which biorhythm data are to be obtained upon operation of said specific key and displayed, and microprograms based on which the arithmetic operations are to be controlled;

an arithmetic operation section coupled to said control section and to said cardinal number signal generating means and being controlled by a microprogram read out from said control section upon operation of said specific key, for obtaining a number of days of existence based on the calendar data on birthday and a specific date of biorhythm on which is to be determined, and for dividing said days of existence by the prescribed 23, 28 and 33 days so as to determine a number of residual days (including zero) which serves as biorhythm data, said calendar data having been supplied by operation of said number keys;

a memory for storing data items corresponding to the three factors of biorhythm, i.e., physique, sensitivity and intellect, in the form of numerical data showing the specific day in each cyclic period on which the three factors of biorhythm are applied;

code generating means for generating a code inherent to biorhythm, on the basis of a judgment made as to whether three biorhythm data factors stored in said memory exist on two regions, positive and negative, or on two points corresponding to two transition dates, one transition date from the positive region to the negative region and the other transition date from the negative region to the positive region, said code representing other than a numeral; and

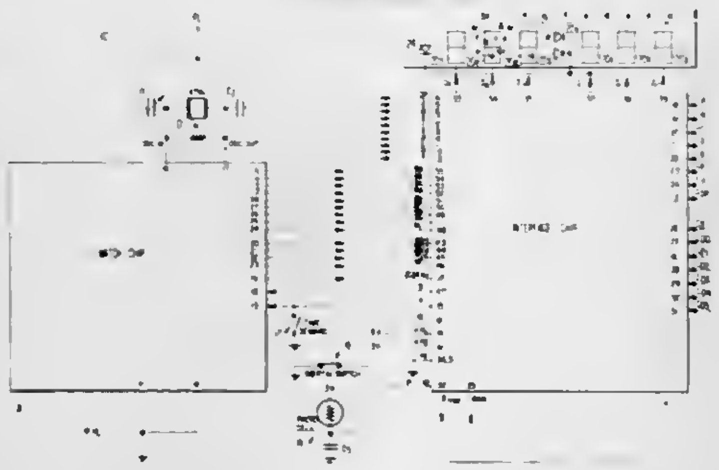
a display section coupled to said memory for displaying in a predetermined format said three biorhythm data items which are stored in said memory and for also displaying said non-numeral represented by said code generated by said code generating means to indicate that biorhythm data is being displayed.

4,101,963

WRISTWATCH CALCULATOR WITH INTERFACE CHIP

Robert O. Reese, and Donald W. Garrison, both of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa.

Filed May 25, 1977, Ser. No. 800,158
Int. Cl.² G06F *7/38;* **G04B** *37/12*
U.S. Cl. 364—705 **9 Claims**



1. A wristwatch having a case in which are mounted a clock chip, a calculator chip, a plurality of electro-optical display stations, a manually operated time display mode switch connected to said clock chip for coupling said clock chip to said display stations, a plurality of manually operated keyboard switches, including a calculator display mode switch, mounted in said case and connected to said calculator chip for alternatively coupling said calculator chip to said display stations, an interface chip having inputs connected to outputs of the clock and calculator chips and outputs connected to the display stations, said interface chip containing substantially all of the circuits necessary to multiplex the clock and calculator outputs to display the desired output as commanded by the time display mode and calculator mode switches, and an inertia switch in said case and connected to said interface chip, said interface chip having means for detecting a predetermined pattern of movement of said inertia switch and for generating a time demand signal upon detection of said predetermined pattern of movement to select the watch display mode, whereby time is displayed at said display stations.

4,101,964

DIGITAL FILTER FOR PULSE CODE MODULATION SIGNALS

William L. Betts, St. Petersburg, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

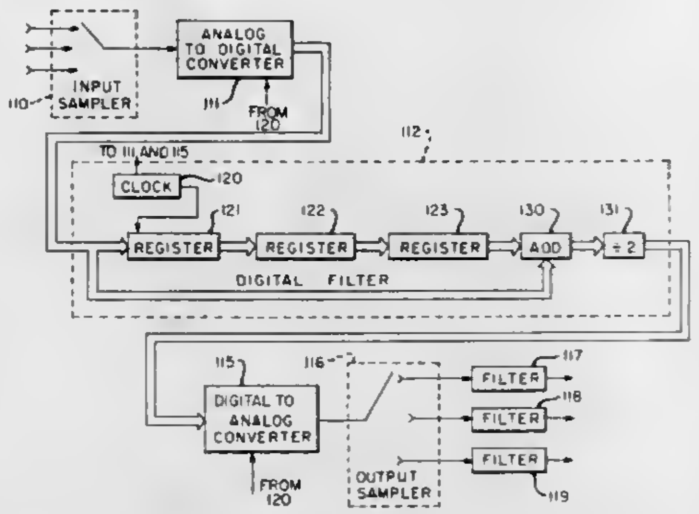
Filed Jan. 8, 1976, Ser. No. 647,537
Int. Cl.² G06F *7/38, 15/34*
U.S. Cl. 364—724 **1 Claim**

1. A digital filter for filtering a plurality of pulse code modulation signals appearing on separate input lines comprising:

sampling means for sampling each said input line in succession;

analog to digital means for sequentially converting the samples from said sampling means into digital form;

a plurality of serially connected single stage registers wherein the number of registers is equal to the number of said input lines, having the input to said plurality of serially connected registers connected to the output of said analog to digital means;



an adder means having one input connected to the output of said plurality of serially connected registers and a second input connected to the output of said analog to digital means for adding successive samples from a common one of said input lines and for adding samples from a different one of said input lines in succession;

a dividing means responsive to the output from said adder for averaging the output from said adder by dividing said adder output by two; and

digital to analog means for converting the averaged signal from said divider into analog form.

4,101,965

SURFACE ACOUSTIC WAVE DEVICES FOR PROCESSING AND STORING SIGNALS

Kjell A. Ingebrigtsen, Trondheim, Norway; Abraham Bers, Arlington, and John H. Cafarella, Swampscott, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 27, 1976, Ser. No. 690,601
Int. Cl.² G06G *7/19;* **H04R** *17/00*
U.S. Cl. 364—821 **14 Claims**

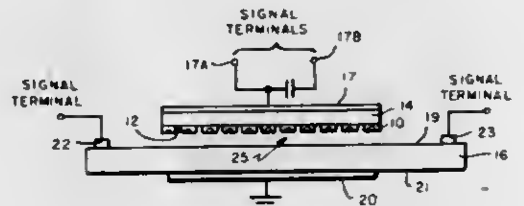


FIG. 1

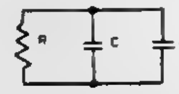


FIG.3

1. A device for processing and storing signals comprising

a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;

at least one transducer means formed on said selected surface for generating surface acoustic waves traveling on said surface along a selected direction thereof in response to electrical signals;

a semiconductor material positioned so as to have a first surface thereof, having a selected surface resistivity, adjacent and spaced from said selected surface of said first substrate to form an interaction region which includes the region at or near said surfaces and the spatial region therebetween;

an array of diode elements disposed at said first surface;

a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;

means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first subtrate;

means for applying a second signal uniformly over said interaction region to provide time-varying properties thereof for the interaction of said first and second signals thereby producing a spatial charge variation among said diodes, the semiconductor material responding to said spatial charge variation in a manner so as to provide an altered stationary conductivity pattern in said semiconductor material as said acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing said interacted first and second signals; and

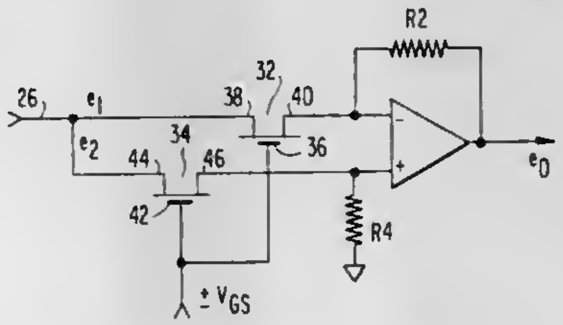
means capable of providing a third signal for interactionwith said altered stationary conductivity pattern, the selected surface resistivity of said semiconductor material being sufficiently high that such interaction can produce a usable interaction output signal.

4,101,966

4-QUADRANT MULTIPLIER

Vasil Uzunoglu, Ellicott City, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Mar. 28, 1977, Ser. No. 782,127
Int. Cl.² G06G *7/163*
U.S. Cl. 364—841 **6 Claims**



1. A high frequency 4-quadrant multiplier for receiving two input signals and providing an output proportional to the product of said input signals, and multiplier comprising:

an operational amplifier having first and second input terminals and an output terminal for providing the output of said 4-quadrant multiplier;

variable first and second resistance elements each having an input terminal, an output terminal and a control terminal, the input terminals of said resistance elements being coupled together for receiving a common input signal and the control terminals of each said resistance element being coupled together for receiving a common control signal, the resistance between the input and output terminals of each said resistance element varying in response to said common control signal, the output terminals of said variable first and second resistance elements being coupled to the first and second operational amplifier input terminals, respectively, said common input signal and said common control signal forming the input signals to said 4-quadrant multiplier.

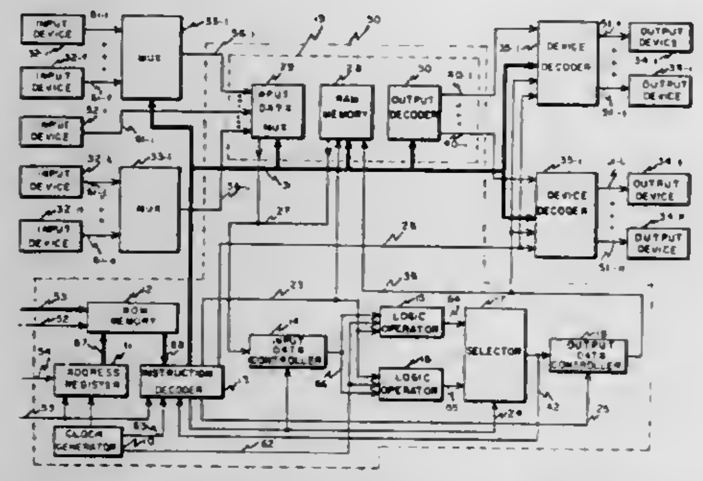
4,101,967
SINGLE BIT LOGIC MICROPROCESSOR

Marian Stanislaw Hajduk, Whitestone, N.Y., assignor to Tendy Electronics Co., New York, N.Y.

Filed May 19, 1976, Ser. No. 687,867

Int. Cl.^{2} G06F *7/00, 7/38*

U.S. Cl. 364—900 **9 Claims**



1. A logic microprocessor comprising in combination:

a single serially fed input data controller means having a data input, a control input, and a single data output;

first and second logic operator means each having a respective single data input commonly coupled to said single data output of said input data controller means and each being fed the same serial data thereby and a single data output;

data selector means having a pair of data inputs respectively coupled to the single data output of said first and second logic operator means, a control input and a data output;

an instruction word memory, means for accessing instruction words from said memory, and a decoder responsive to said instruction words for providing a control signal output comprised of at least first and second instruction bits, said first instruction bit being coupled to said first and second logic operator means for enabling said operator means, said second instruction bit being coupled to said input data controller means and said data selector means;

said input data controller means including means responsive to said second instruction bit to selectively provide a data output signal having either a first (true) or second (not) logic value of the input data applied to said data input thereof;

said first logic operator means including means set by one of said logic values to perform a predetermined first type of logic operation thereon,

said second logic operator means including means set by one of said logic values to perform a predetermined second type of logic operation thereon, and

said data selector means including means responsive to said second instruction bit to provide a data output signal at its data output selectively either the output of said first logic operator means or the output of said second logic operator means.

4,101,968
SORTER WITH OVERLAP OPERATION

Judit Katalin Florence, Menlo Park, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,221

Int. Cl.^{2} G06F *7/24*

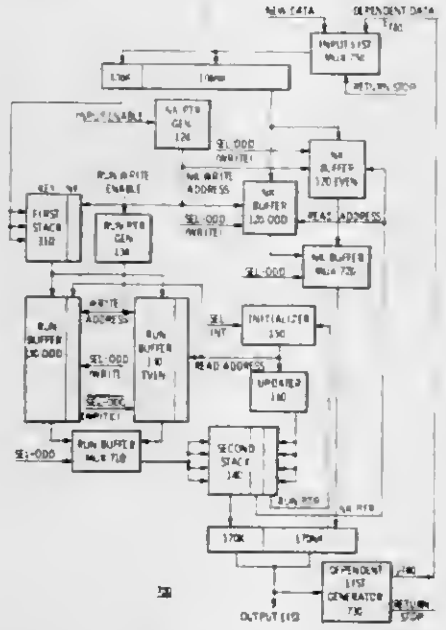
U.S. Cl. 364—900 **15 Claims**

1. A two stage sorter which receives dependent sequential scan line lists each having N or less initial data items, and sorts the data items according to one position coordinate thereof to form raster scan lines of ordered data for displaying edges of polygon faces on a raster scan display device in which thhe direction of scan is parallel to the one position coordinate, the two stage sorter comprising:

means for grouping the N or less data items of each scan line list into Q groups of data items;

a first stage sorter means for numerically ordering the data items within each of the Q groups according to the one position coordinate;

interstage storage means for holding the Q groups of ordered data items;



a second stage sorter means for forming a single ordered scan line list of all of the N or less data items, by receiving from the interstage storage means and sorting the first data item of each group, and then continuously outputting the first data item in the second sorter and receiving and sorting the next data item from the same group as the previously outputted data item; and

dependent item means responsive to the N or less data items in the single order scan line list from the second sorter means for providing dependent data items and forwarding the dependent data items to the means for grouping to be sorted into a subsequent scan line list.

4,101,969
SECONDARY STORAGE FACILITY WITH MEANS FOR MONITORING SECTOR PULSES

Roger E. Lawson, Northboro, and Maurice A. Richesson, Stow, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 6, 1977, Ser. No. 803,524

Int. Cl.^{2} G06F *11/06, 13/04*

U.S. Cl. 364—900 **4 Claims**

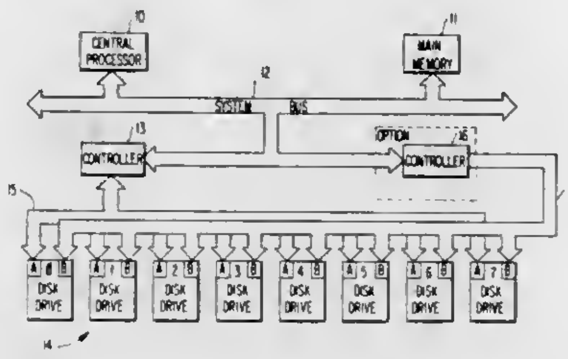
1. A drive for use in a secondary storage facility that includes a controller for controlling the operation of said drive and a drive bus for conveying signals between said drive and the controller, the controller including means for transferring digital data to an from said drive, said drive comprising:

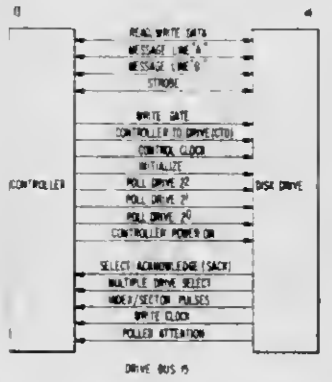
A. a storage medium having data and timing information stored thereon,

B. sector pulse means for generating a sector pulse corresponding to each sector in response to the timing information on said medium,

C. transmitter means responsive to said sector pulse means for transmitting onto a sector line of the drive bus a sector pulse signal that is conveyed over the drive bus to the controller,

D. testing means connected to said sector pulse means and to the drive bus for generating a MULTIPLE DRIVE SELECTED signal when a signal appears on the sector line of the drive bus that is transmitted at a time other than the transmission of a signal by said transmitter means.





4,101,970
MAGNETIC BUBBLE MODULE

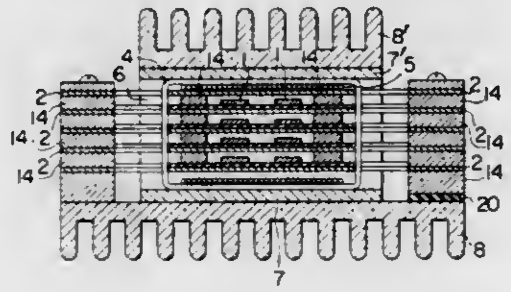
Nobuo Saito, Mitaka; Shigeru Yoshizawa, Tokorozawa, and Takashi Toyooka, Tokyo, all of Japan, assignors to President of Kogyo Gijutsuin, Japan

Filed Jul. 8, 1976, Ser. No. 703,604

Claims priority, application Japan, Jul. 8, 1975, 50-83092

Int. Cl.^{2} G11C *19/08*

U.S. Cl. 365—2 **7 Claims**



1. A magnetic bubble module comprising at least one substrate including therein at least one metal foil having a thickness smaller than a skin depth of said metal, said substrate serving also as a heat transfer plate; at least one magnetic bubble chip arranged on said substrate; and driving coils enclosing said chip therein for generating a rotsting magnetic field, wherein said substrate extends from the inside to the outside of said coils.

4,101,971
MAGNETIC BUBBLE INFORMATION WRITING DEVICE

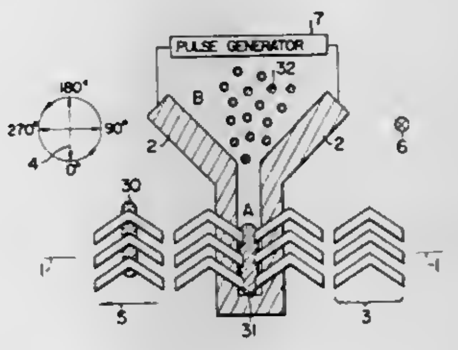
Minoru Hiroshima; Shigeru Yoshizawa; Nobuo Saito; Atsushi Asano, and Hirokazu Aoki, all of Kokubunji, Japan, assignors to President of Kogyo Gijutsuin, Japan

Filed Aug. 24, 1976, Ser. No. 717,377

Claims priority, application Japan, Aug. 28, 1975, 50/103498; Nov. 4, 1975, 50/131446

Int. Cl.^{2} G11C *19/08*

U.S. Cl. 365—11 **6 Claims**



5. In a magnetic bubble information writing device of the type including a thin film of magnetic substance having uniaxial anistropy; an insulating film disposed on said thin magnetic film; a magnetic bubble propagation circuit made of soft magnetic substance and disposed on said insulating film; a conductor loop so disposed between said thin magnetic film and said insulating film as to be opposite to a portion of said propagation circuit with said insulating film interposed therebetween; first means for applying to said thin film of magnetic substance having uniaxial anisotropy a dc bias magnetic field perpendicular to said thin film; second means for applying to said propagation circuit a rotating magnetic field parallel to said propagation circuit; and third means for applying to said conductor loop a magnetic bubble generating pulse current, wherein both information magnetic bubbles and unwanted stray magnetic bubbles may be generated, the improvement comprising said third means subsequently applying to said conductor loop a stray magnetic bubble annihilating pulse current having a polarity opposite to that of said bubble generating pulse current for annihilating said stray magnetic bubbles without affecting said information magnetic bubbles.

4,101,972
BUBBLE DOMAIN PROPAGATION USING OSCILLATING STRIPE DOMAINS

Stanley James Lins, Bloomington; Roger Edward Lund, Woodbury, and Marlin Marshall Hanson, Cologne, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 798,975

Int. Cl.^{2} G11C *19/08*

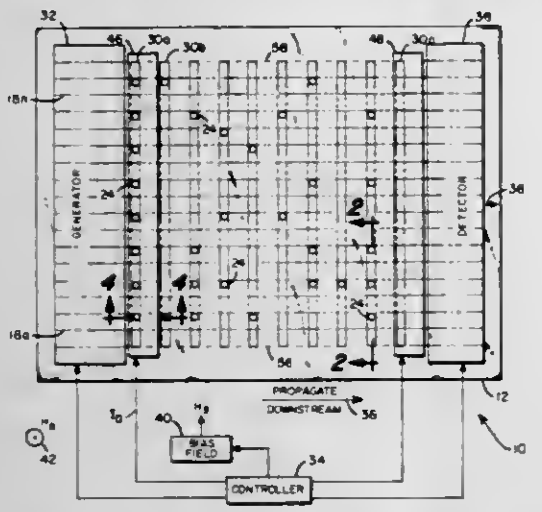
U.S. Cl. 365—29 **4 Claims**

1. A method of propagating stripe domains, comprising:

orienting in a stripe domain layer a set of parallel stripe domains that are orthogonal to a propagation direction;

coupling in the plane of said stripe domain layer and parallel to said propagation direction a normal field H_Z having temporally succeeding cycles of a relatively small normal field amplitude gradient across an energizing strip line followed by a relatively large normal field amplitude gradient across said energizing strip line; and

oscillating said stripe domains between a maximum downstream position under said stripe line and a maximum upstream position under said strip line when affected by said small normal field amplitude gradient across said energizing strip line and said large normal field amplitude gradient across said energizing strip line, respectively.



4,101,973

RANDOM ACCESS MEMORY WITH VOLATILE DATA STORAGE

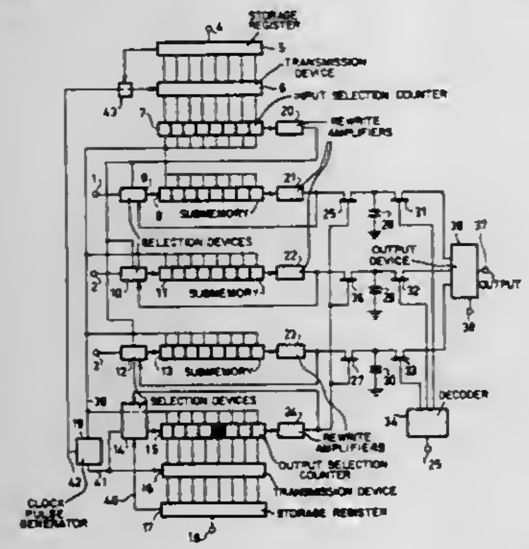
Hendrik Henricus Maria Tromp, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,856

Claims priority, application Netherlands, Nov. 3, 1975, 7512834

Int. Cl.² G11C *21/00*

U.S. Cl. 365—73 **5 Claims**



1. A random access memory, comprising a plurality of sub-memories, each having an input terminal, an output terminal and a plurality of cells for volatile information storage which are serially connected between said input and output terminals of each sub-memory, rewrite means connected to the output terminal of each sub-memory for recirculating and rewriting each said sub-memory output, output means coupled to each said sub-memory for receiving at least one rewritten information element per sub-memory when it appears on the output terminal of said sub-memery, selection means for producing a signal for selecting a predetermined sub-memory in order to supply an information element, from said sub-memory and through said output means, to an output of the random access memory, input means having an input which is connected to an input of the random access memory and an output which is connected to inputs of the sub-memories for storing modified information therein, clock pulse generator means for shifting the information elements serially and repeatedly through the sub-memory cells under the control of the clock pulses of the clock pulse generator means, a counter coupled to said clock pulse generator means, at least one further cell for volatile information storage coupled to the output of each sub-memory in order to receive rewritten information therefrom under the control of a counter position of the counter, said counter having a number of counting positions which at least equals the number of cells in each sub-memory, the counter passing through its counting positions under the control of the clock pulses in synchronism with the shifting of the information elements in the sub-memories, and said selection means being connectable to outputs of said further cells.

4,101,974

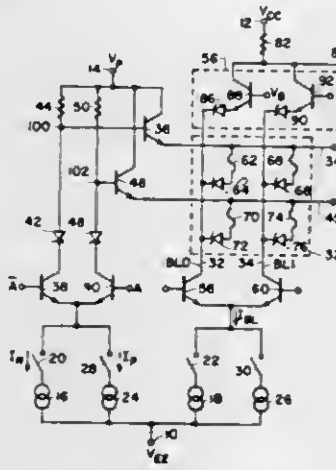
PERSONALIZABLE READ-ONLY MEMORY

Dennis L. Immer, Mesa; Michael S. Millhollan, Tempe, and Ronald L. Treadway, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 645,575, Dec. 31, 1975, abandoned. This application Sep. 30, 1977, Ser. No. 838,420

Int. Cl.² G11C *17/00*

U.S. Cl. 365—96 **4 Claims**



1. A personalizable read-only memory having a plurality of bit lines and word lines comprising:

(a) a plurality of interconnected cells, each cell comprising a fusible element and a unilaterally conducting device, each cell being coupled between an associated bit line and an associated word line, each of said unilaterally conducting devices being poled for conducting current between its associated word line and its associated bit line,

(b) a plurality of word line transistors, each having its emitter terminal coupled to a respective word line,

(c) word line decoder means coupled to the base terminals of said word line transistors,

(d) a bit line decoder means coupled to said plurality of bit lines, said word line decoder means and said bit line decoder means being responsive for reading information from said memory means during normal operation, and

(e) a first auxiliary current source coupled to said word line decoder means and being selectively disabled during normal operation, said first auxiliary current source being selectively coupled to said word line transistors during personalization for establishing a predetermined voltage differential between said plurality of word lines for selecting and isolating a predetermined fusible element prior to personalization thus eliminating the likelihood of erroneous personalization of other nonselected fusible elements.

4,101,975

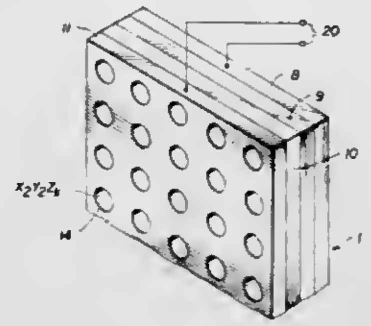
OPTICAL MEMORY WITH STORAGE IN THREE DIMENSIONS

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,051,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Aug. 15, 1977, Ser. No. 824,895

Int. Cl.² G11C *11/42*

U.S. Cl. 365—117 **12 Claims**



1. A three dimensional photovoltaic ferroelectric memory apparatus, comprising,

a plurality of electrically switchable stacked ferroelectric memory planes,

each memory plane including a layer of photovoltaic ferroelectric material and a layer of photoconductive material,

means for generating a light beam,

means for optically addressing selected storage *x-y* locations of the memory planes with said light beam, and

means for simultaneously electrically switching to a selected memory plane, whereby the selected *x-y* locations on the selected plane are accessed for writing and/or reading.

4,101,976

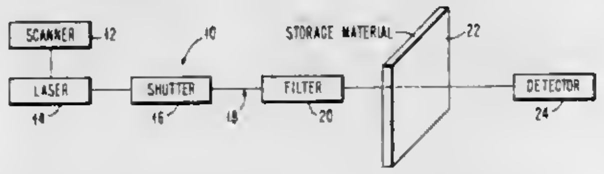
FREQUENCY SELECTIVE OPTICAL DATA STORAGE SYSTEM

George Castro; Dietrich Haarer, both of San Jose; Roger Morton MacFarlane, Palo Alto, all of Calif., and Hans Peter Trommsdorff, St. Martin d'Uriage, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,250

Int. Cl.² G11C *13/04*

U.S. Cl. 365—119 **13 Claims**



1. A frequency selective optical data storage system comprising:

a material, said material exhibiting inhomogeneous absorption line broadening and capable of storing at least two data bits in the frequency dimension, said material adapted to undergo a photo-induced reaction resulting in information stored in the non-volatile ground state of the material upon exposure to a light source having a wavelength bandwidth narrower than the inhomogeneous line width, and

a first laser adapted to write non-volatile information on said material with a wavelength narrower than and within the broad inhomogeneous absorption line.

4,101,977

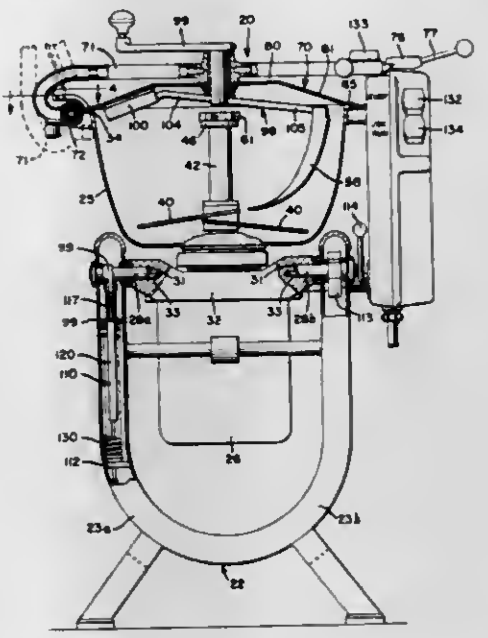
FOOD PROCESSING APPARATUS

Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jan. 6, 1977, Ser. No. 803,461

Int. Cl.² B01F *7/16*

U.S. Cl. 366—246 **3 Claims**



1. In an apparatus for processing foodstuffs, including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, a cover system including a lid for closing the top of the bowl, a mixing baffle blade and support mounted in the lid for rotation along and around the inside surface of the bowl for removing and returning foodstuffs from the side of the bowl to the vicinity of the food processing blades for further processing thereby, and a handle system including a handle outside the lid and means operatively connecting the handle to the mixing baffle blade support to rotate the support and mixing baffle blade, the improvement comprising balance means including the handle system being sized and positioned for counterbalancing the mixing baffle blade and the mixing baffle blade support when the axis of rotation thereof is not vertical.

4,101,978

FOOD PROCESSING APPARATUS

Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jun. 6, 1977, Ser. No. 803,457

Int. Cl.² B01F *7/16*

U.S. Cl. 366—314 **7 Claims**

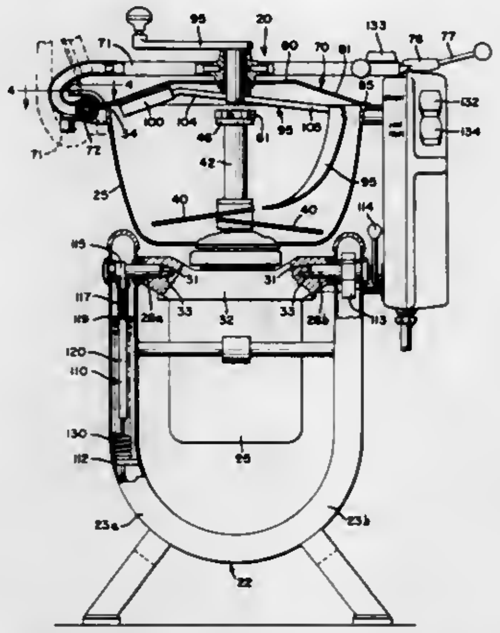
1. A quickly operable manual wedge lock for securing and releasing food processing blades on the drive shaft of an apparatus for processing foodstuffs, the apparatus including a mixing bowl having a drive shaft extending into the bowl through the bottom thereof, a motor mounted outside the bowl and connected to rotate the drive shaft, food processing blades mountable on the drive shaft within the bowl for processing foodstuffs therein when the motor is operated, and a cover system including a lid for closing the top of the bowl, the wedge lock comprising:

(a) a blade mount for driveably mounting the food processing blades on the drive shaft, said mount fitting over the drive shaft with a predetermined clearance between predetermined portions thereof and extending substantially to the upper end of the drive shaft within the bowl opposite the bottom of the bowl when located on the drive shaft,

(b) means on the upper ends of said blade mount and drive shaft opposite the bottom of the bowl defining a surface on each, said surfaces being spaced from one another, eccentric with regard to one another, and substantially vertical, one surface being inside the other and the eccentricity therebetween being greater than said predetermined clearance between said blade mount and drive shaft,

(c) a cap placeable on the upper ends of said blade mount and drive shaft, said cap including means thereon defining a pair of surfaces dimensioned for opposing and engaging said surfaces on the upper ends of said blade mount and drive shaft when said cap is placed thereon, said cap surfaces also being spaced from one another and eccentric with regard to one another and, due to the eccentricities thereof, being dimensioned to interfere with said blade mount and drive shaft surfaces when rotated with respect thereto, and

(d) manually engageable means on said cap for manually grasping said cap, positioning said surfaces thereon opposite the corresponding said surfaces on the upper ends of said blade mount and drive shaft, and manually rotating said cap and cap surfaces with respect to said blade mount and drive shaft surfaces to cause the opposed said surfaces to move relative to one another into a wedged interference which jams said blade mount and drive shaft into tight engagement with one another, thus securing said blade mount and the blades thereon onto the drive shaft.



DESIGNS

JULY 18, 1978

248,511

SHOE

Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima City, Japan

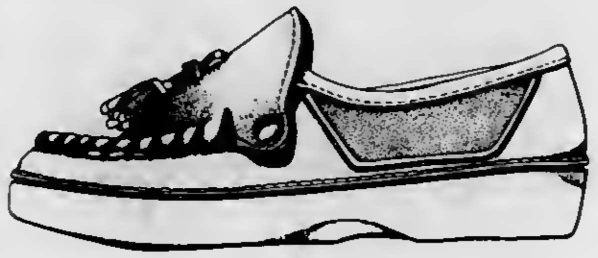
Continuation-in-part of Ser. No. 530,296, Dec. 6, 1974. This application Apr. 30, 1976, Ser. No. 681,912

Claims priority, application Japan, Nov. 1, 1974, 49-38440; Nov. 1, 1974, 49-38438; Nov. 8, 1974, 49-39273; Nov. 8, 1974, 49-39274

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—269



248,512

BOOT

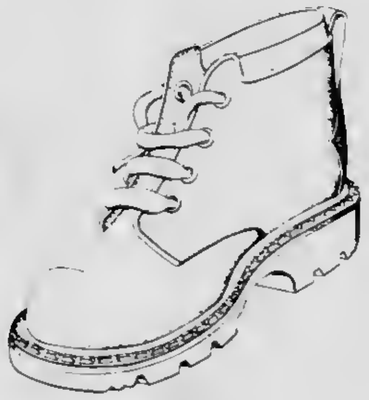
Oscar Nova, and Renzo Nova, both of Legnano, Italy, assignors to Antonio Nova S.r.l., Legnano, Italy

Filed Dec. 17, 1976, Ser. No. 751,927

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—272



248,513

SPORT SHOE

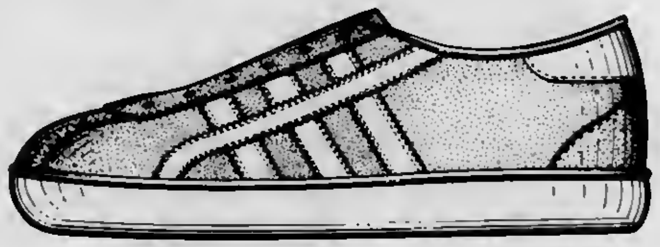
Andres Navarro Soler, Poligono Industrial de Altabix, Elche (Alicante), Spaio

Filed Jun. 23, 1976, Ser. No. 698,977

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—310



248,514

ATHLETIC SHOE

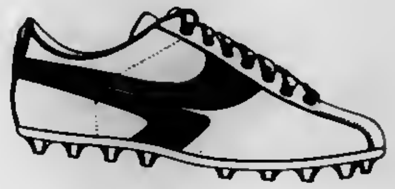
Wan Chan Lu, Miao Li Hslen, China, assignor to Jung Li Hsing Industry Co., Ltd., China

Filed Sep. 13, 1976, Ser. No. 722,372

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—311



248,515

KEY HANGER

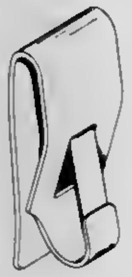
Robert T. Olson, Rt. #2, Box 452, Wisconsin Dells, Wis.

Filed Sep. 7, 1976, Ser. No. 720,956

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D2—400



248,516

INVERTIBLE CHAIR

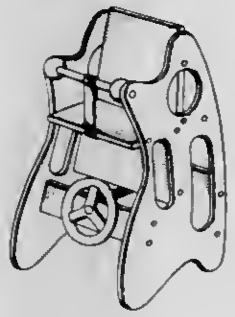
Karl Hugo Johansson, 17582 Manchester Ave., Irvine, Calif. 92714

Filed Sep. 23, 1976, Ser. No. 725,986

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—3



248,517

STAND FOR LETTER TRAYS

Ole Winther, Helsingör, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden

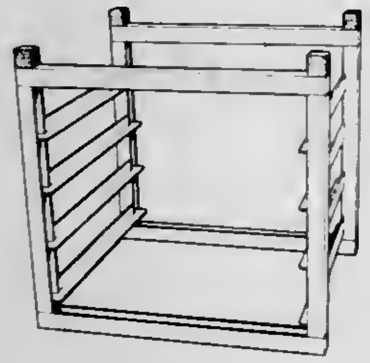
Filed Oct. 27, 1976, Ser. No. 736,052

Claims priority, application Sweden, May 5, 1976, 760991

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—3



248,518

CHILD'S SWING

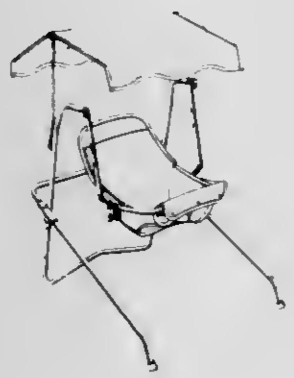
Edward F. Huff, 560 Trease Rd., Wadsworth, Ohio 44281

Filed Jan. 21, 1977, Ser. No. 761,400

Term of patent 7 years

Int. Cl. D6—*06*

U.S. Cl. D6—10



248,519

STOOL

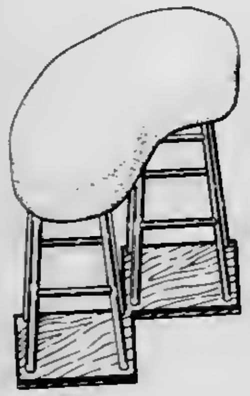
Lloyd J. Finch, 427 Fillmore, San Francisco, Calif. 94117

Filed Dec. 8, 1976, Ser. No. 748,799

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—32



248,520

SOFA

Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.

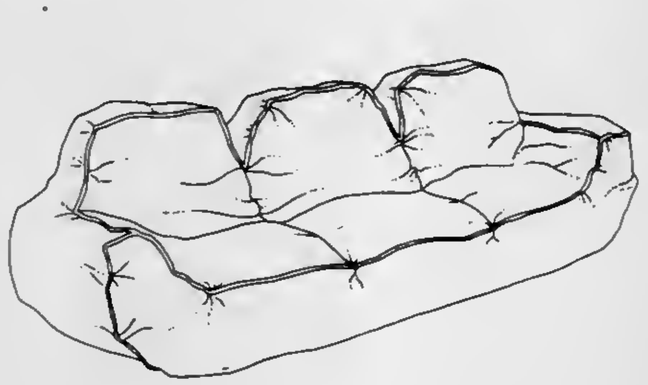
Filed Sep. 7, 1976, Ser. No. 720,547

The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—63



248,521

CURVED SOFA

Rodney R. Haynes, Sr., Richmond, Va., assignor to Dart Industries Inc., Los Angeles, Calif.

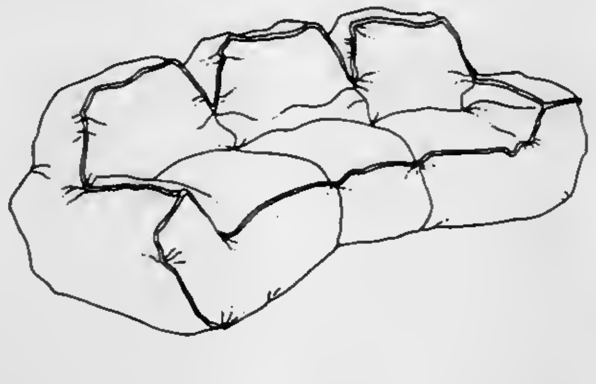
Filed Sep. 7, 1976, Ser. No. 720,709

The portion of the term of this patent subsequent to May 3, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—63



248,522

CHAIR

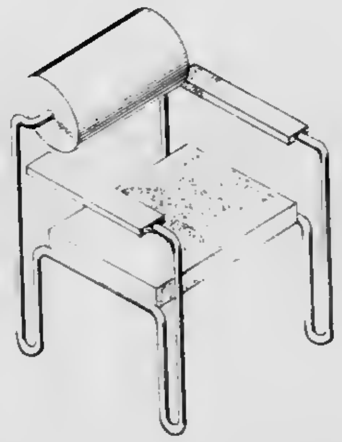
Charles Richard Corda, 2310 National Dr., Brooklyn, N.Y. 11234

Filed Nov. 1, 1976, Ser. No. 737,831

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—72



248,523

PORTABLE READING TABLE FOR BOOKS

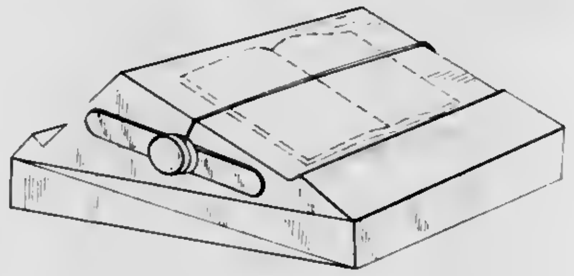
Morton I. Goldstein, 5671 Saranac Dr., Columbus, Ohio 43227

Filed Aug. 5, 1976, Ser. No. 712,891

Term of patent 14 years

Int. Cl. D6—*99*

U.S. Cl. D6—184



248,524

SEATING UNIT FOR A SWIVEL CHAIR

Gregory S. Gabourie, Ajax, Canada, assignor to Global Upholstery Company Limited

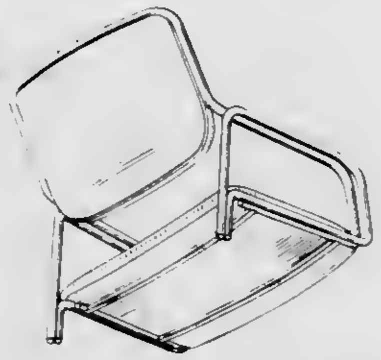
Filed Jun. 2, 1975, Ser. No. 582,875

The portion of the term of this patent subsequent to May 25, 1990, has been disclaimed.

Term of patent 14 years

Int. Cl. D6—*06*

U.S. Cl. D6—197



248,525

MIRROR

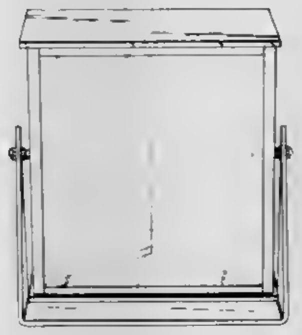
David S. Eckel, and George S. Lechter, both of 22 Thorndike St., Boston, Mass. 02141

Filed Dec. 6, 1976, Ser. No. 747,982

Term of patent 14 years

Int. Cl. D6—*07*

U.S. Cl. D6—237



248,526

SERVING DISH OR SIMILAR ARTICLE

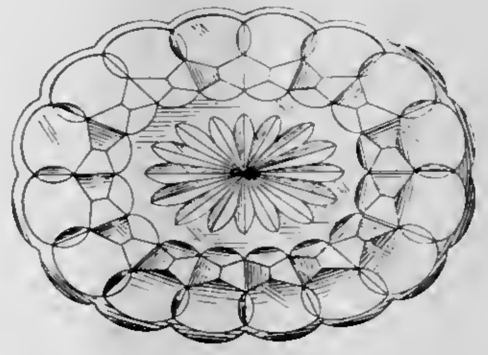
Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 545,621, Jan. 30, 1975, which is a division of Ser. No. 397,069, Sep. 13, 1973, Pat. No. D. 238,541. This application Aug. 26, 1976, Ser. No. 718,042

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—1



248,527

GLASS MUG

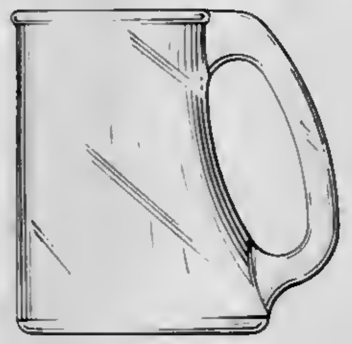
Charles S. Bryk, Tenafly, N.J., assignor to Texasgulf Inc., Stamford, Conn.

Filed Apr. 4, 1977, Ser. No. 784,428

Term of patent 14 years

Int. Cl. D7—*01*

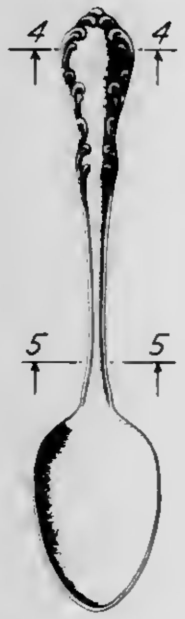
U.S. Cl. D7—9



248,528
SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 8, 1976, Ser. No. 703,443
Term of patent 14 years
Int. Cl. D7—*03*

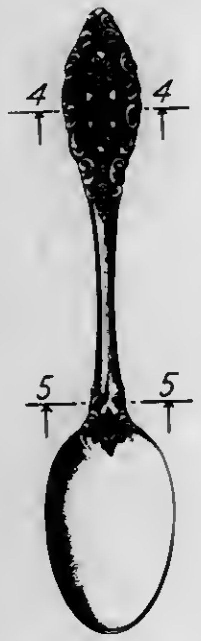
U.S. Cl. D7—137



248,529
SPOON OR SIMILAR ARTICLE

Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 8, 1976, Ser. No. 703,444
Term of patent 14 years
Int. Cl. D7—*03*

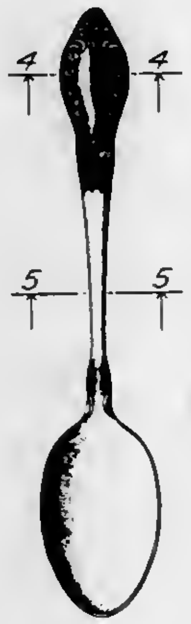
U.S. Cl. D7—137



248,530
SPOON OR SIMILAR ARTICLE

Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 23, 1976, Ser. No. 708,034
Term of patent 14 years
Int. Cl. D7—*03*

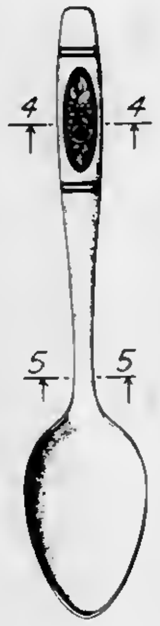
U.S. Cl. D7—137



248,531
SPOON OR SIMILAR ARTICLE

Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,474
Term of patent 14 years
Int. Cl. D7—*03*

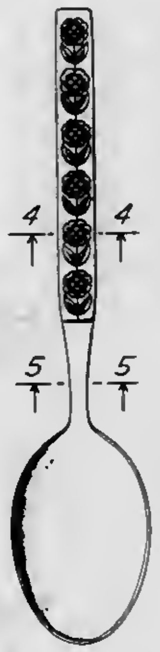
U.S. Cl. D7—137



248,532
SPOON OR SIMILAR ARTICLE

Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 11, 1977, Ser. No. 758,506
Term of patent 14 years
Int. Cl. D7—*03*

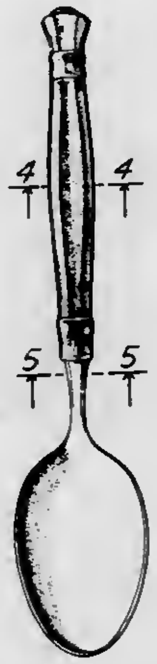
U.S. Cl. D7—137



248,533
SPOON OR SIMILAR ARTICLE

Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,126
Term of patent 14 years
Int. Cl. D7—*03*

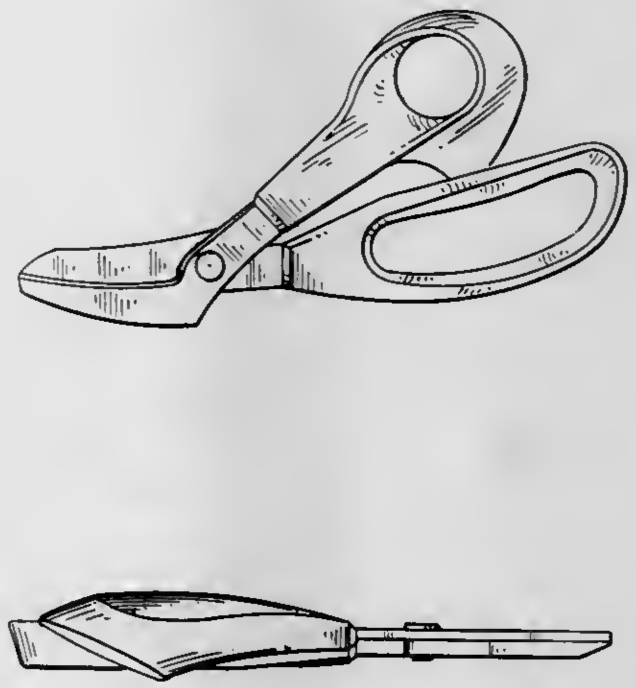
U.S. Cl. D7—151



248,534
PRUNING-SHEARS

Olof Fredrik Bäckström, Koivuniemenkatu 33 D 31, SF-10600 Tammisaari, and Erkki Olavi Linden, Björkkulla, SF-10330 Billnäs, both of Finald
Filed Apr. 6, 1976, Ser. No. 674,249
Claims priority, application Finland, Oct. 13, 1975, 535/75
Term of patent 14 years
Int. Cl. D8—*03*

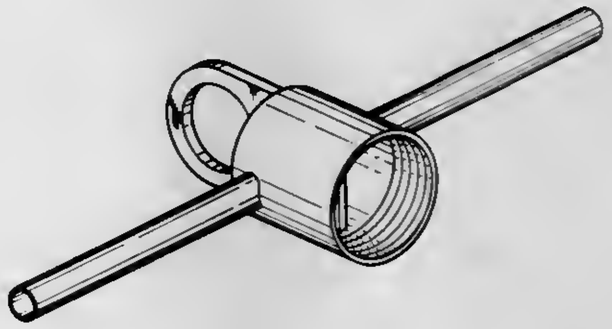
U.S. Cl. D8—5



248,535
LIFTING AND HANDLING TOOL FOR ROTARY ROLLER BITS

Arne Sjöström, and Alf Svanström, both of Fagersta, Sweden, assignors to Fagersta Secoroc AB, Fagersta, Sweden
Filed Oct. 19, 1976, Ser. No. 733,932
Claims priority, application Sweden, Apr. 20, 1976, 76-0873
Term of patent 14 years
Int. Cl. D8—*05*

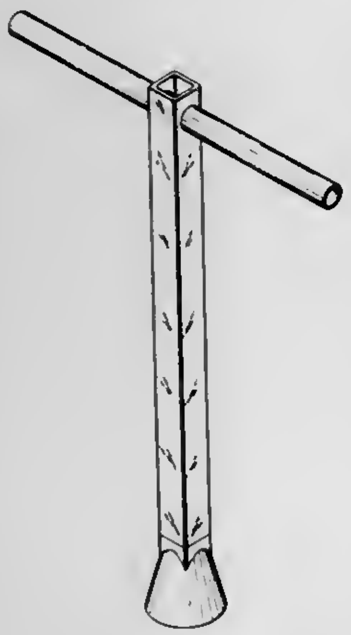
U.S. Cl. D8—14



248,536
PLUMBING AND LANDSCAPING TOOL FOR INSTALLING AND REMOVING SPRINKLER HEADS

Richard Domasin, 2501 Hill Dr., Los Angeles, Calif. 90041
Filed Dec. 20, 1976, Ser. No. 757,064
Term of patent 14 years
Int. Cl. D8—*05*

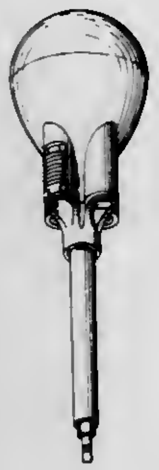
U.S. Cl. D8—21



248,537
SCREWDRIVER

Lloyd T. Smith, Newton, Kans., assignor to S/V Tool Company, Inc., Newton, Kans.
Filed Jan. 5, 1977, Ser. No. 757,048
Term of patent 14 years
Int. Cl. D8—*04*

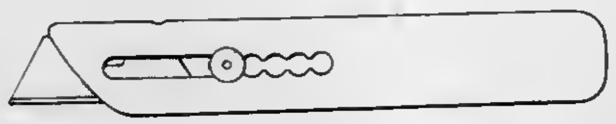
U.S. Cl. D8—82



248,538
ADJUSTABLE BLADE KNIFE

James L. Richards, Rosemead, Calif., assignor to Pacific Handy Cutter, Inc., Costa Mesa, Calif.
Filed Sep. 30, 1976, Ser. No. 728,397
Term of patent 14 years
Int. Cl. D8—*03*

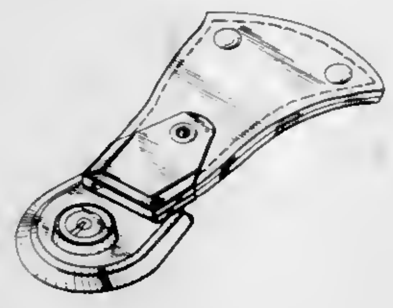
U.S. Cl. D8—99



248,539
COMBINED CLOSURE FLAP AND LOCK FOR LUGGAGE OR THE LIKE

Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Oct. 8, 1975, Ser. No. 621,366
The portion of the term of this patent subsequent to Jan. 4, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D8—*07*

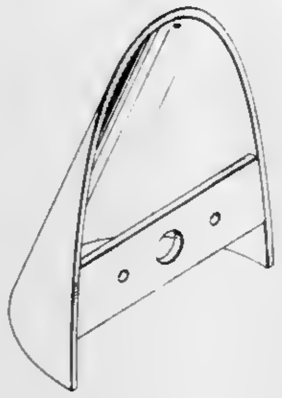
U.S. Cl. D8—336



248,540
PADLOCK PROTECTOR

Peter J. Linder, 3109 Ramblewood Rd., Ellicott City, Md. 21043
Filed Apr. 8, 1976, Ser. No. 674,946
Term of patent 14 years
Int. Cl. D8—*07*

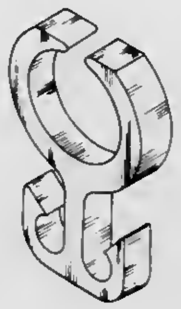
U.S. Cl. D8—346



248,541
HOOK FOR HANGING MEAT

Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed Jan. 12, 1976, Ser. No. 648,203
Term of patent 14 years
Int. Cl. D8—*08*

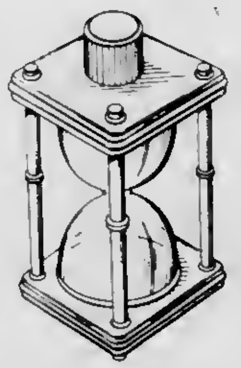
U.S. Cl. D8—372



248,542
BOTTLE DESIGN

Jack Z. Jacobs, 5833 N. 83rd St., Scottsdale, Ariz. 85253
Filed Oct. 26, 1976, Ser. No. 735,368
Term of patent 14 years
Int. Cl. D9—*01*

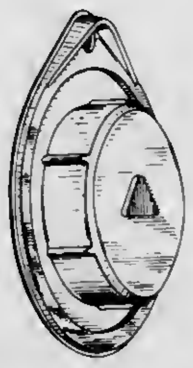
U.S. Cl. D9—23



248,543
PACKAGING CONTAINER FOR A TAPE OR THE LIKE

Steven G. Strelcheck, Edgerton, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Jul. 26, 1976, Ser. No. 708,704
Term of patent 14 years
Int. Cl. D9—*03*

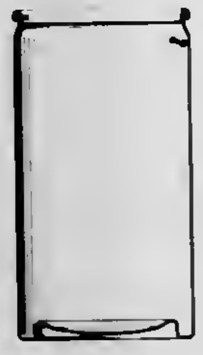
U.S. Cl. D9—171



248,544
SEAM-FREE CAN

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation
Filed Oct. 22, 1975, Ser. No. 624,947
Term of patent 14 years
Int. Cl. D9—*03*

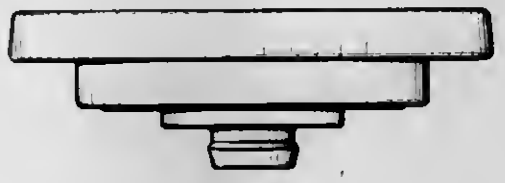
U.S. Cl. D9—216



248,545
DRUM CLOSURE

Kenneth L. Summers, Hudson, Ind., assignor to Rieke Corporation
Filed Jul. 28, 1976, Ser. No. 709,380
Term of patent 14 years
Int. Cl. D9—*07*

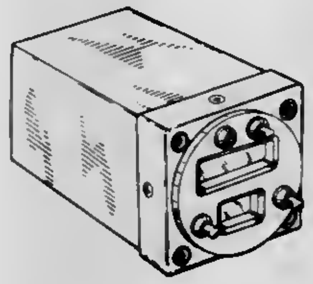
U.S. Cl. D9—254



248,546
AIRCRAFT CLOCK

Richard D. Snyder, 1136 Nottingham Way, Placentia, Calif. 92670
Filed Oct. 28, 1976, Ser. No. 736,431
Term of patent 14 years
Int. Cl. D10—*01*

U.S. Cl. D10—15



248,547
COMBINED WRIST WATCH CASE AND BAND

Fontana Fernando, Sesto Calende (Varese), Italy, assignor to Fontana Fernando S.p.A., Sesto Caleode (Varese), Italy

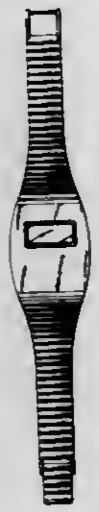
Filed Jul. 22, 1976, Ser. No. 707,661

Claims priority, application Italy, Mar. 29, 1976, 21061

Term of patent 14 years

Int. Cl. D10—*02*

U.S. Cl. D10—32



248,548
TENNIS PLAYER FIGURINE

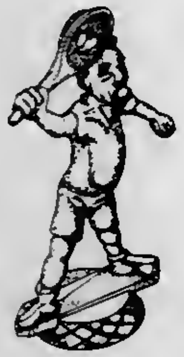
Owen R. Siegel, 1517 Basswood Dr., Chicago, Ill. 60025

Filed May 10, 1976, Ser. No. 684,577

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D11—160



248,549
MEDICAL INSTRUMENT BASKET APPARATUS

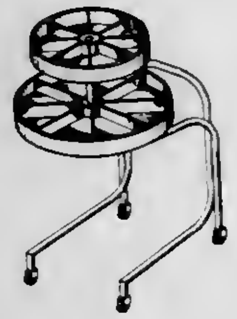
Vincent G. Lopez, 10717 Santa Clara, Lamont, Calif. 93241

Filed May 24, 1976, Ser. No. 688,960

Term of patent 14 years

Int. Cl. D24—*01;* D12—*02*

U.S. Cl. D12—29



248,550
VEHICLE WIND DEFLECTOR

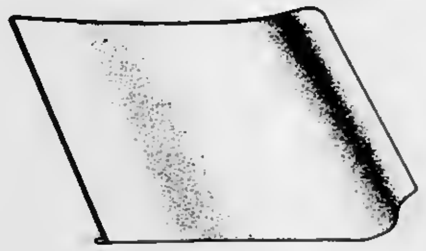
Boyd R. Woodard, 1085 NE. 89th St., Miami, Fla. 33138

Filed Feb. 11, 1977, Ser. No. 767,694

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—181



248,551
WHEEL

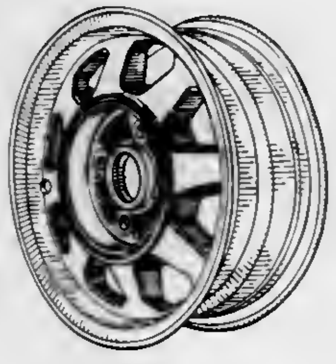
Iwae Sekido, and Sinichiro Doi, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha (Toyota Motor Co., Ltd.), Toyota, Japan

Filed Jun. 29, 1977, Ser. No. 811,365

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—211



248,552
MINIATURE DICTATING MACHINE

Werner Scbulze-Bahr, Kassel, and Karl Weis, Bad Homburg, both of Fed. Rep. of Germany, assignors to Assmann G.m.b.H., Bad Homburg, Fed. Rep. of Germany

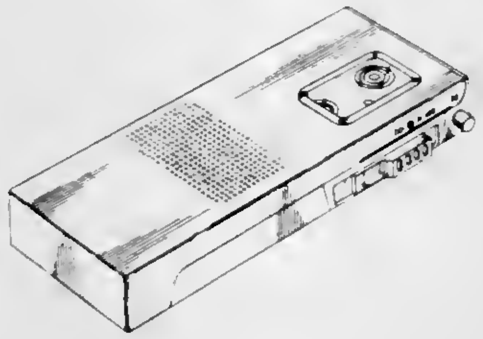
Filed Oct. 15, 1976, Ser. No. 732,811

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 1 MR 501

Term of patent 14 years

Int. Cl.[2] D14—*01*

U.S. Cl. D14—3



248,553
LOW CONSOLE TAPE DECK PLAYER

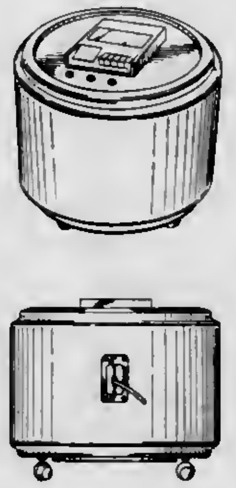
James F. Rebert, 3143 Pinehurst, and John W. Rebert, 1850 Burning Tree, both of Decatur, Ill. 62521

Filed Mar. 29, 1976, Ser. No. 671,167

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—5



248,554
DATA TERMINAL

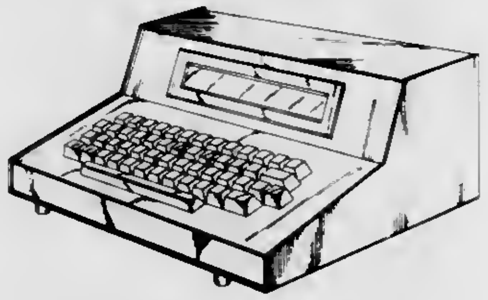
Richard T. Hawkins, 1310 Winchester, Grandview, Mo. 64030

Filed Oct. 12, 1977, Ser. No. 841,550

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—43



248,555
COMBINED SECURITY ACCESS GATE AND CONTROLLING CARD READER THEREFOR

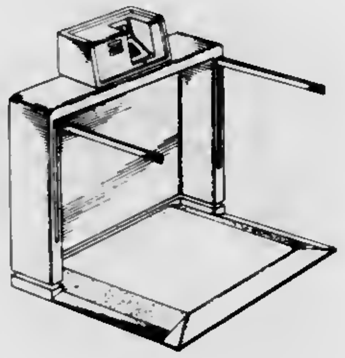
Luigi Dibeoedetto, El Segundo, Calif., assignor to TRW Data Systems, Hawthorne, Calif.

Filed Jun. 23, 1976, Ser. No. 699,151

Term of patent 14 years

Int. Cl. D14—*02;* D25—*99*

U.S. Cl. D14—49



248,556
TELEPHONE

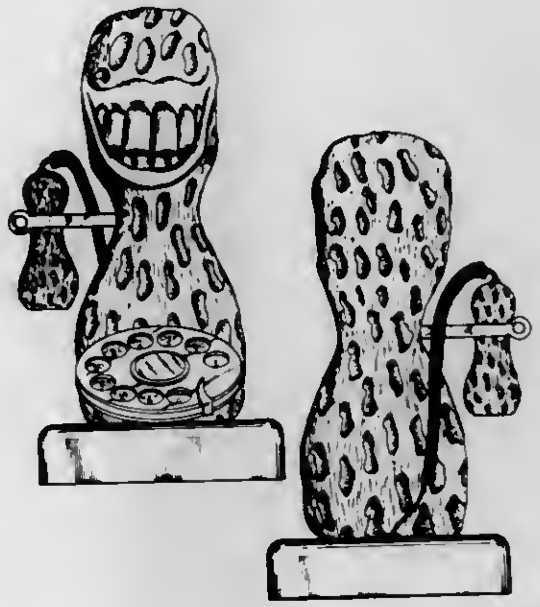
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004

Filed Mar. 15, 1977, Ser. No. 777,616

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53



248,557
CUTTER PIN FOR MOWER

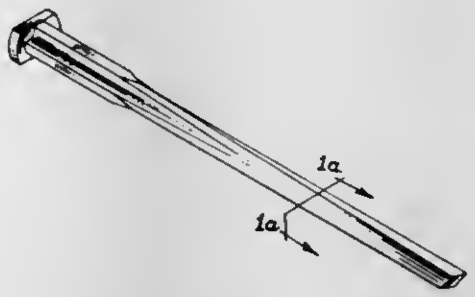
Donald L. Gobin, and Joseph E. Scanland, both of Savannah, Ga., assignors to Roper Corporation, Kankakee, Ill.

Filed Nov. 15, 1976, Ser. No. 741,992

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D15—17



248,558
TRACTOR PAN

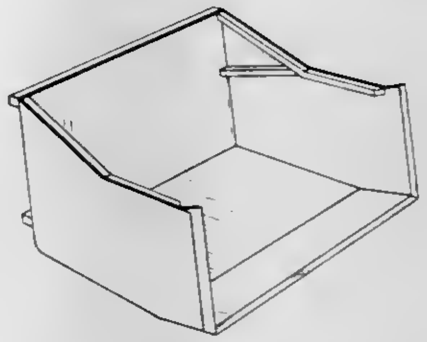
Charles A. Absher, Rte. 1, Box 210-B, Traphill, N.C. 28685

Filed Jan. 21, 1977, Ser. No. 760,874

Term of patent 14 years

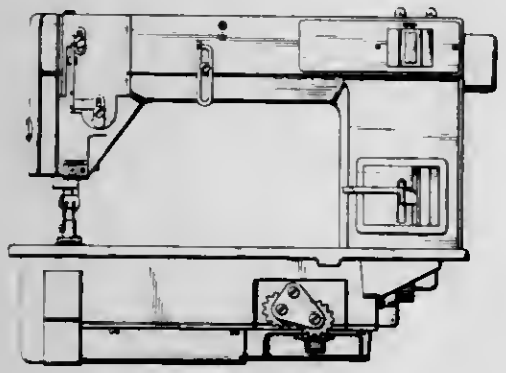
Int. Cl. D15—*03*

U.S. Cl. D15—32



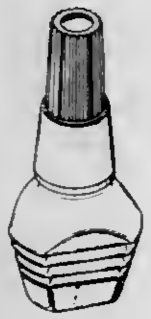
248,559
SEWING MACHINE

George Donald LaPolice, Somerville, N.J., assignor to The Singer Company
Filed Nov. 8, 1976, Ser. No. 739,752
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



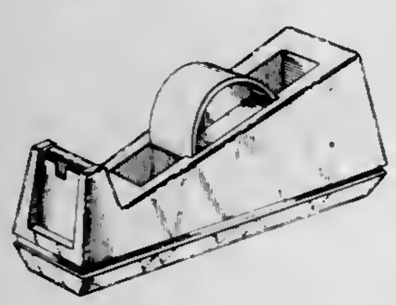
248,560
FELT PEN

Takaji Funahashi, No. 1, 2-chome, Kitatakasho-machi, Nishi-ku, Nagoya-shi, Aichi-ken, Japan
Filed Jan. 4, 1977, Ser. No. 756,697
Claims priority, application Japan, Jul. 21, 1976, 51-28265
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—43



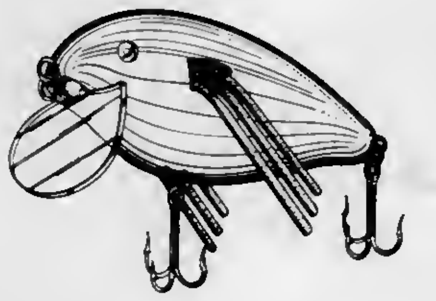
248,561
TAPE DISPENSER

Hartland W. Deering, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 10, 1977, Ser. No. 757,936
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69



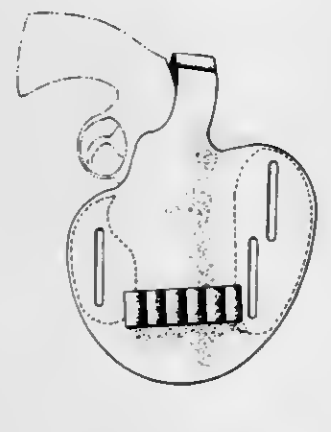
248,562
FISHING LURE

Cecil Lewis, P.O. Box 219, Smilax, Ky. 41764
Filed Aug. 1, 1975, Ser. No. 595,364
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



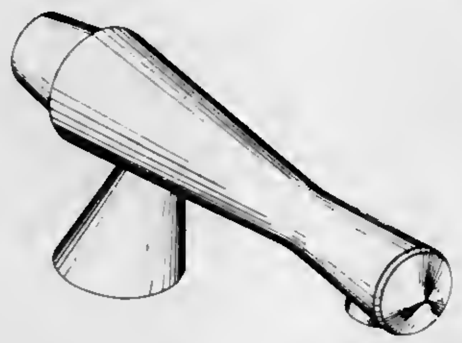
248,563
COMBINED GUN HOLSTER AND CARTRIDGE LOOPS

Roy L. Baker, Rte. #1, Box 245, Magnolia, Ark. 71753
Filed Sep. 15, 1976, Ser. No. 723,564
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



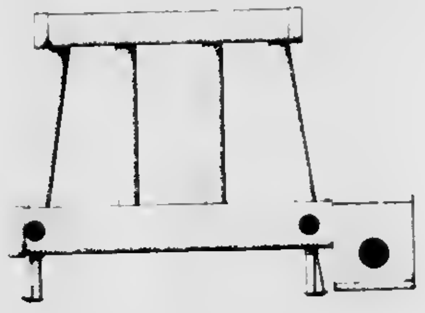
248,564
SPOUT

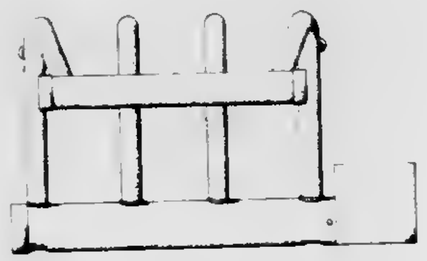
Donald W. Doman, Janesville, Wis., assignor to Kohler Co.
Filed Mar. 21, 1977, Ser. No. 779,926
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32



248,565
COMBINED HEAT EXCHANGER AND FIREPLACE GRATE OR THE LIKE

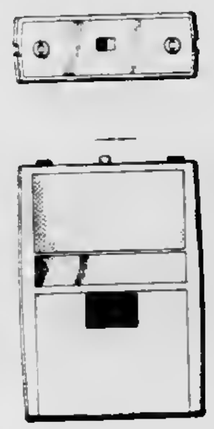
Covington B. Watson, 538 Wayne Dr., Wilmington, N.C. 24801
Filed Mar. 4, 1977, Ser. No. 774,413
Term of patent 14 years
Int. Cl. D23—*03;* D7—*08*
U.S. Cl. D23—94





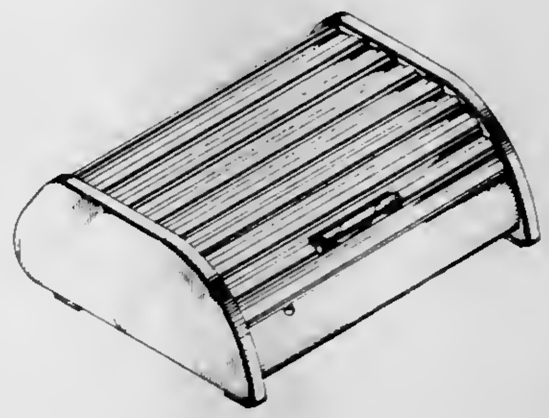
248,566
TELEPHONE ELECTROCARDIOGRAM TRANSMITTING EQUIPMENT CASE

Ronald R. Gorke, Maplewood, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Jul. 25, 1977, Ser. No. 818,641
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8



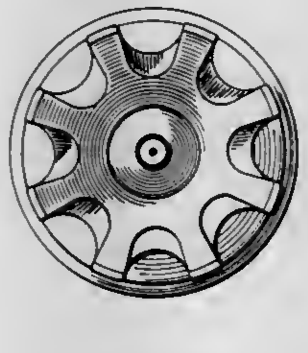
248,567
STERILIZER CABINET

James R. Ward, 1520 S. Oates St., Dothan, Ala. 36301
Filed Jul. 6, 1976, Ser. No. 703,069
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



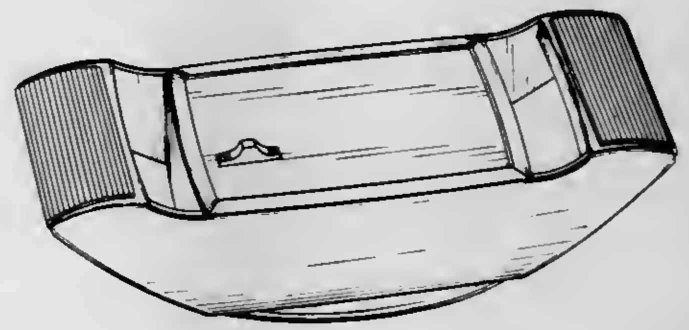
248,568
ANIMAL INTRADERMAL NOZZLE FOR JET INJECTION DEVICE

Aaron Ismach, 200 Upper College Ter., Frederick, Md. 21701
Filed Dec. 13, 1976, Ser. No. 750,138
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—25



248,569
MASSAGER

Alfred W. Madl, 615 W. Fairfield Ct., Glendale, Wis. 53209, assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 12, 1976, Ser. No. 704,422
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



248,570
CAR WASH BUILDING

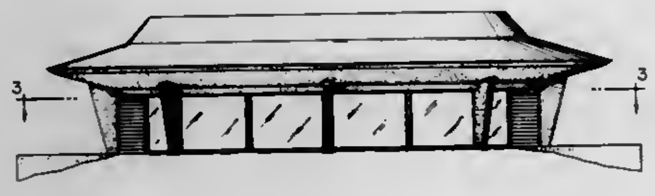
Judson L. Smith, and Bernard Stuart Siefer, both of Tempe, Ariz., assignors to Judson L. Smith

Filed Jun. 1, 1976, Ser. No. 691,525

Term of patent 14 years

Int. Cl. D25—*03*

U.S. Cl. D25—31



248,571
PREFABRICATED SOUND BARRIER WALL

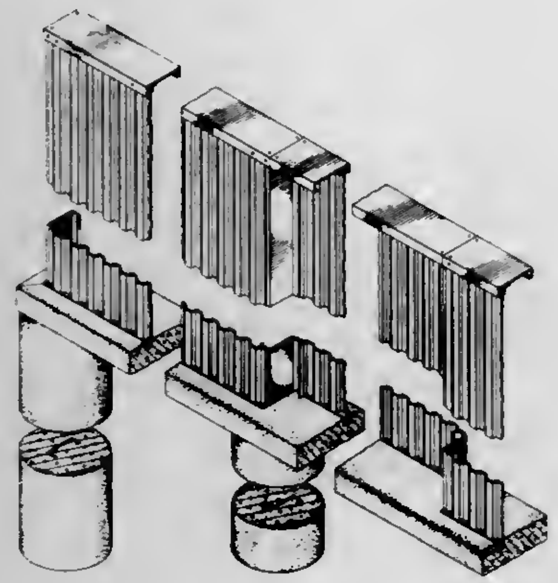
Lewis R. Herbst, 1036 Liberty La., Anaheim, Calif. 92805

Filed Feb. 19, 1976, Ser. No. 659,296

Term of patent 14 years

Int. Cl. D25—*02*

U.S. Cl. D25—38



248,572
SMOKING DEVICE

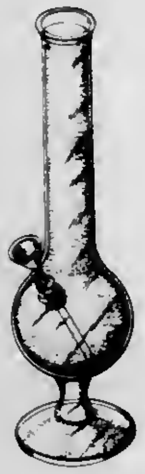
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910

Filed Jan. 16, 1976, Ser. No. 649,700

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—03



248,573
SMOKING DEVICE

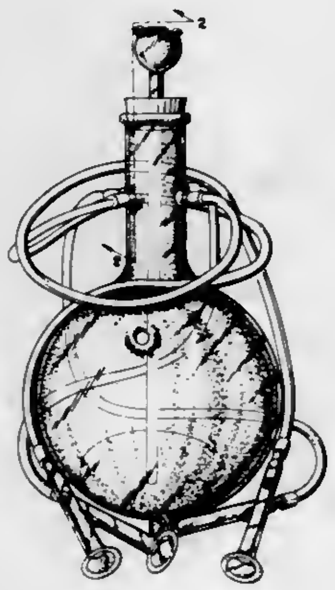
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910

Filed Jan. 16, 1976, Ser. No. 649,813

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—03



248,574
BOWL FOR A SMOKING DEVICE

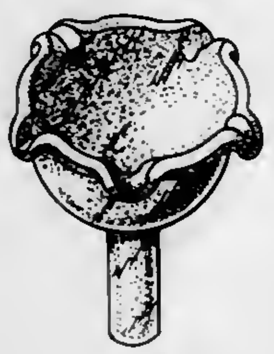
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910

Filed Jan. 16, 1976, Ser. No. 649,721

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—05



248,575
HAIR DRYER

Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

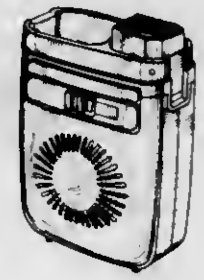
Filed Apr. 26, 1976, Ser. No. 680,455

Claims priority, application Netherlands, Nov. 14, 1975, 7550673

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—12



248,576
HAIR DRYER CASING

Wilhelmus Gerardus Elisabeth Janssens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

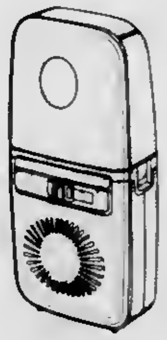
Filed Apr. 26, 1976, Ser. No. 680,456

Claims priority, application Netherlands, Nov. 14, 1975, 7550673

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—12



248,577
RAZOR HANDLE

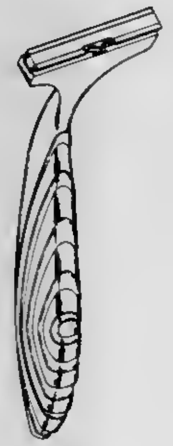
David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 3, 1976, Ser. No. 720,335

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—48



248,578
RAZOR HANDLE

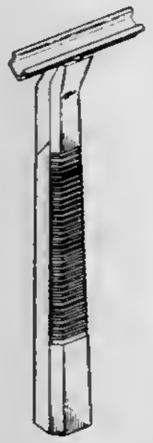
David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 3, 1976, Ser. No. 720,336

Term of patent 14 years

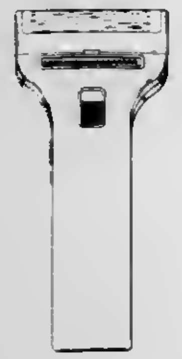
Int. Cl. D28—*03*

U.S. Cl. D28—48



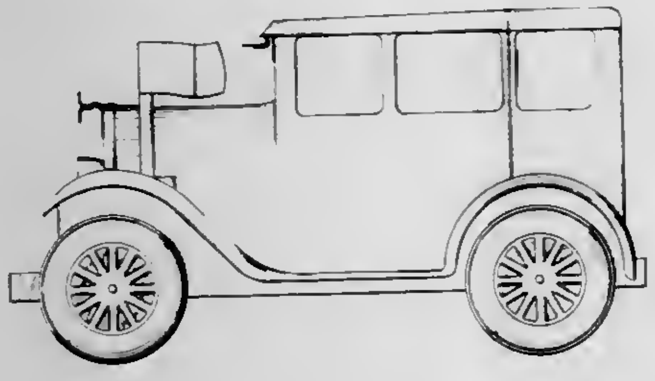
248,579
ELECTRIC SHAVER
Akio Gotoh; Takeshi Takagi; Kuniharu Ichikawa, and Shinji Yamamoto, all of Oaza-Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Dec. 28, 1976, Ser. No. 755,096
Claims priority, application Japan, Jan. 28, 1976, 51/24903
Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D28—49



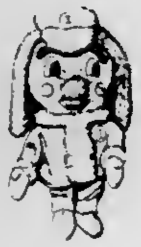
248,580
MAILBOX
Jabe Roy Luttrell, Webster La., Rocky Hill, Conn. 06067, and Edward Vincent Rhine, R.D. 1 Aumick Rd., Wallkill, N.Y. 12589
Filed Jan. 28, 1976, Ser. No. 653,276
Term of patent 14 years
Int. Cl. D31—*00*

U.S. Cl. D31—24



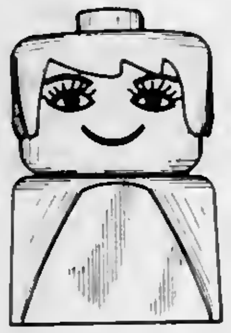
248,581
TOY ANIMAL FIGURE
Ronald Powell, Marlston Heyes Farm, Wrexham Road, Chester, CH4 9DE, Cheshire, England
Filed Aug. 10, 1976, Ser. No. 713,316
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—2 R



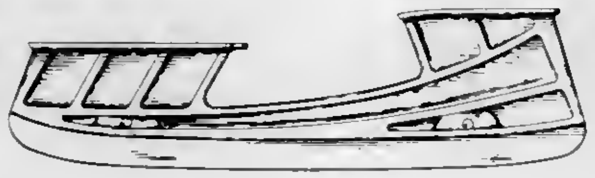
248,582
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,852
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—4 R



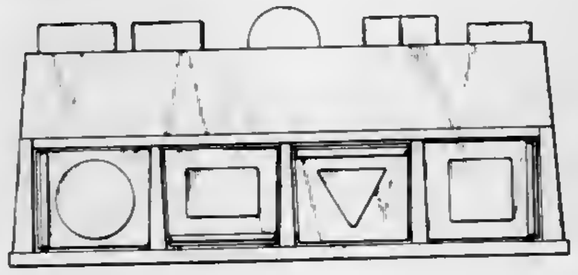
248,583
ICE-SKATE
Peter F. Zuuring, 100B des Prairies Boulevard - Apt. 501, Laval des Rapides, Quebec, Canada
Filed Jan. 4, 1977, Ser. No. 757,311
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—14 B



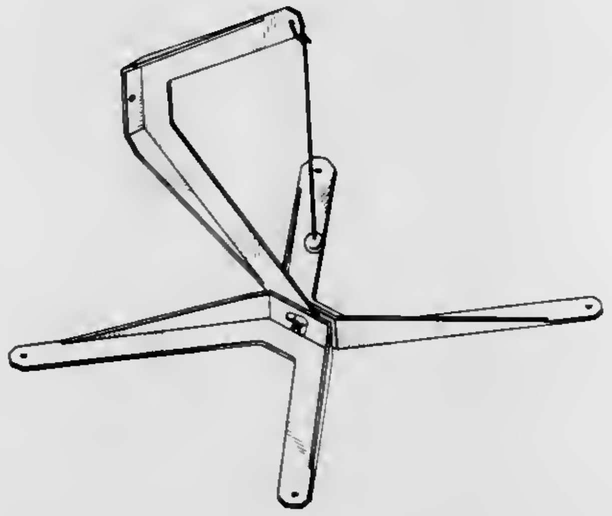
248,584
EDUCATIONAL BLOCK TOY
Paul D. Snyder, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Nov. 28, 1975, Ser. No. 635,588
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 R



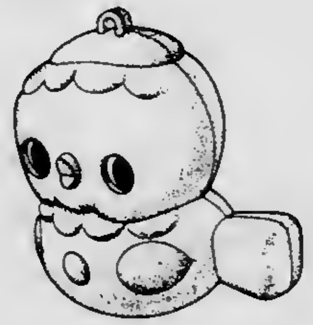
248,585
PENDULUM GAME DEVICE
Launa J. Lincoln, 3 Green Acres Rd., St. Louis, Mo. 63137
Filed Sep. 29, 1976, Ser. No. 727,974
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 P



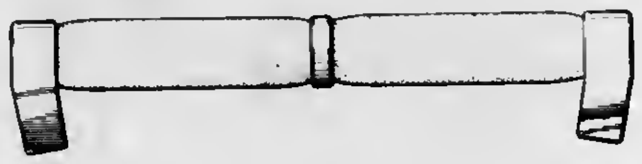
248,586
TOY MUSIC BOX
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co. Ltd., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,852
Claims priority, application Japan, Jul. 29, 1976, 51/29703
Term of patent 14 years
Int. Cl. D21—*01*

U.S. Cl. D34—15 C



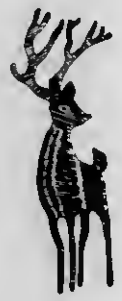
248,587
WATER SKI ROPE HANDLE
James T. Rumbaugh, 5660 Center Lake Dr., Spirit Lake, Iowa 51360
Filed Oct. 18, 1976, Ser. No. 733,427
Term of patent 14 years
Int. Cl. D21—*02*

U.S. Cl. D34—41



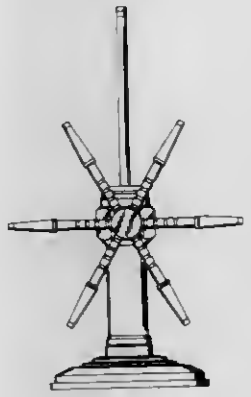
248,588
APPLIQUE OR THE LIKE
Archer Allen Montague, Jr., 115 N. King Charles Rd., Raleigh, N.C. 27591
Filed Oct. 29, 1976, Ser. No. 736,697
Term of patent 14 years
Int. Cl. D2—*99*

U.S. Cl. D33—9 C



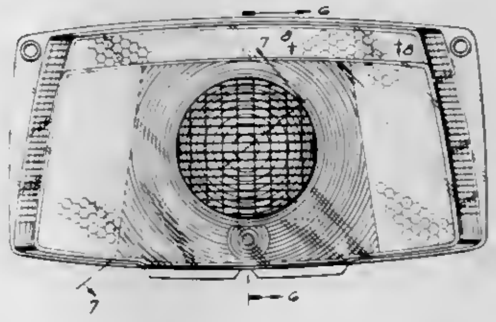
248,589
LAMP BASE
Clarence Williams, 2660 Dwight Rd., Memphis, Tenn. 38114
Filed Mar. 18, 1977, Ser. No. 779,132
Term of patent 14 years
Int. Cl. D26—*05*

U.S. Cl. D48—20 R

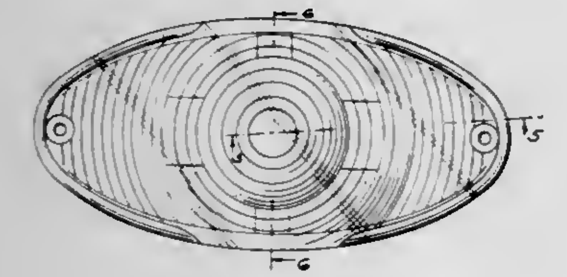


248,590
MULTI-FUNCTION LENS
Arthur A. Bleiweiss, and Richard Ball, both of Toronto, Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada
Filed Feb. 23, 1977, Ser. No. 771,540
Term of patent 14 years
Int. Cl. D26—*06*

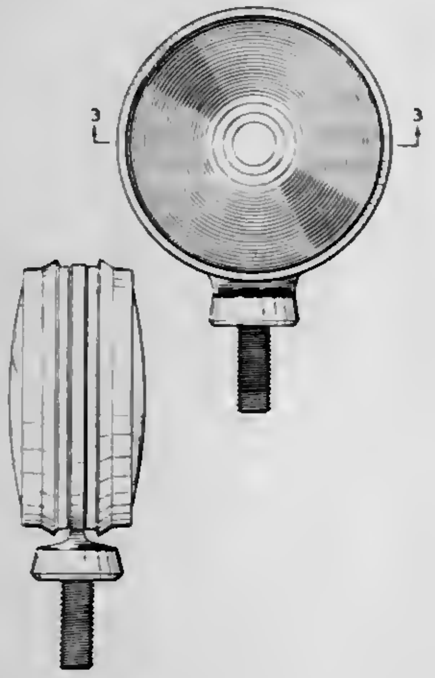
U.S. Cl. D48—32 A



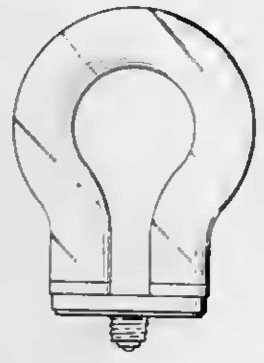
248,591
COMBINED STOP AND TAIL LAMP LENS
Karel Urbaněk, Weston, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada
Filed Sep. 29, 1976, Ser. No. 727,976
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



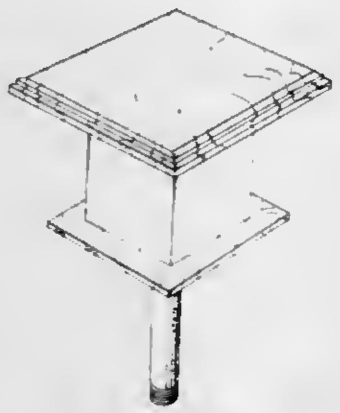
248,592
WARNING LAMP
Karel Urbaněk, Weston, and Arthur F. Bleiweiss, Toronto, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada
Filed May 4, 1977, Ser. No. 793,898
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



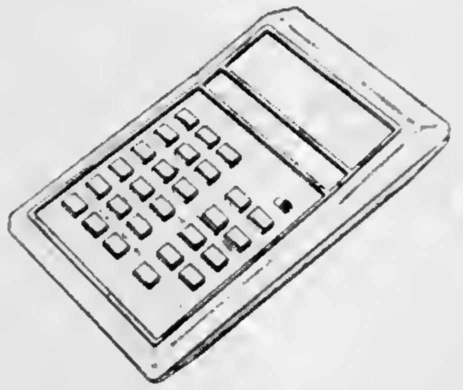
248,593
FLUORESCENT LIGHT BULB
Joseph Oster, Allentown, Pa., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Jun. 1, 1976, Ser. No. 691,946
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—33



248,594
OUTDOOR LIGHT FIXTURE
Paul W. Tirsbier, 1734 S. Martine Ave., Scotch Plains, N.J. 07076
Filed Aug. 1, 1977, Ser. No. 821,287
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—35



248,595
PORTABLE CALCULATING MACHINE
Myron Beltler, West Orange, and Stuart D. Leer, Chatham, both of N.J., assignors to Littoo Business Systems, Inc.
Filed Mar. 21, 1977, Ser. No. 779,728
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Ahlstrom Osakeyhtio: *See*—
  - Metso, Pertti Lauri, 4,100,662, Cl. 29-110.000.
- A. Ehrenreich GmbH & Co. KG.: *See*—
  - Scheerer, Wolfgang, 4,101,228, Cl. 403-137.000.
- A. F. Industries, Inc.: *See*—
  - Fieser, Arthur H.; and Finney, Donald C., 4,101,328, Cl. 428-624.000.
- A. H. Robins Company, Incorporated: *See*—
  - Ward, John Wesley; and Leonard, Charles Arthur, 4,101,662, Cl. 424-267.000.
- A. W. Chesterton Company: *See*—
  - Kozlowski, Peter F., 4,100,835, Cl. 87-1.000.
- AB Record Taxameter AB: *See*—
  - Borgstrom, Carl Gote Lennart, 4,101,762, Cl. 235-95.00C.
- Abbott Laboratories: *See*—
  - Difiglio, Joseph J.; and George, Richard W., 4,101,284, Cl. 23-259.000.
  - Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.
- Abe, Koichiro: *See*—
  - Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro, 4,101,944, Cl. 360-85.000.
- Abe, Naohiro: *See*—
  - Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.
- Abe, Seikou: *See*—
  - Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.
- Abe, Yasuaki: *See*—
  - Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
- Aboyne Pty. Limited: *See*—
  - Pappas, Dennis Gerasimos, 4,101,872, Cl. 340-539.000.
- Abramoska, Alfred A., Jr., to Arthur Products Co. Liquid filling tube with protective tip. 4,100,948, Cl. 141-392.000.
- Abromavage, John C.: *See*—
  - Sage, Howard M.; and Abromavage, John C., 4,101,061, Cl. 224-42.10F.
- ABU Aktiebolag: *See*—
  - Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, 4,101,087, Cl. 242-84.20A.
- ACF Industries, Incorporated: *See*—
  - Fischer, Robert L., 4,101,754, Cl. 219-121.00P.
  - Kull, George A., 4,101,175, Cl. 302-53.000.
- Acme-Cleveland Corporation: *See*—
  - Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., 4,100,961, Cl. 164-180.000.
- Adam, Arlette, nee Chosson; LeFrancier, Pierre; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Hydrosoluble agents having non specific immunodepressive properties. 4,101,649, Cl. 424-12.000.
- Adams, Richard C., to G. T. Schjeldahl Company. Bottom seal cut-off. 4,101,369, Cl. 156-510.000.
- Adams, Steven M.; and Monroe, Joseph C., to Fall, Herbert S. Locking lever safety stop. 4,101,178, Cl. 308-3.600.
- Advanced Engineering & Manufacturing Company, Inc.: *See*—
  - Kapplinger, Lawrence E., 4,100,885, Cl. 119-73.000.
- AEG-Elotherm, G.m.b.H.: *See*—
  - Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.
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  - Adam, Arlette, nee Chosson; LeFrancier, Pierre; and Lederer, Edgar, 4,101,649, Cl. 424-12.000.
  - Bertucci, Albert Flamidien, 4,101,299, Cl. 55-222.000.
  - Bessaguet, Louis Pierre, 4,100,701, Cl. 51-157.000.
- AGFA-Gevaert A.G.: *See*—
  - Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, 4,101,217, Cl. 355-38.000.
  - Fottner, Gunther; and Waibel, Gottfried, 4,101,215, Cl. 355-15.000.
- Aggen, Glenroy Newcomb, to Tecumseh Products Company. Apparatus for fastening ceramic magnets to a flywheel using centrifugal force. 4,101,371, Cl. 156-560.000.
- Agroferm AG: *See*—
  - Lafferty, Robert M.; and Heinzle, Elmar, 4,101,533, Cl. 528-491.000.
- Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Clock pulse generating apparatus. 4,101,838, Cl. 328-63.000.
- Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, to Northrop Weaving Machinery Limited. Rapier looms. 4,100,941, Cl. 139-449.000.
- Airco, Inc.: *See*—
  - Marancik, William G., 4,101,731, Cl. 174-126.00S.
- Airhart, Tom P., to Atlantic Richfield Company. Fast cycle seismic gas exploder and method. 4,100,991, Cl. 181-117.000.
- Aisin Seiki Kabushiki Kaisha: *See*—
  - Tamura, Tooru, 4,100,894, Cl. 123-117.00A.
- Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, to Hitachi, Ltd. Chemically digestive agents. 4,101,440, Cl. 252-186.000.
- Aktiebolaget Electrolux: *See*—
  - Johansson, Erik Karl Gustav, 4,100,644, Cl. 15-397.000.
  - Leinfelt, Karl Eric, 4,100,878, Cl. 116-114.0AD.
- Akzona Incorporated: *See*—
  - Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.
  - Panneman, Harm Jan, 4,101,675, Cl. 424-326.000.
- Albanese, Andres, to Bell Telephone Laboratories, Incorporated. Laser control circuit. 4,101,847, Cl. 331-94.50S.
- Albertson, Clarence Elmo, to Borg-Warner Corporation. Solar powered absorption refrigeration system. 4,100,756, Cl. 62-2.000.
- Aldrich Machine Works: *See*—
  - Wornall, William D.; and Valk, Nick, 4,100,651, Cl. 19-145.500.
- Alert-O-Drive (Pty) Ltd.: *See*—
  - Henderson, Henning M., 4,101,869, Cl. 340-52.00R.
- Alford, Andrew. Localizer antenna array for use with localizer transmitters operating at one carrier frequency. 4,101,892, Cl. 343-108.00R.
- Allen & Hanburys Limited: *See*—
  - Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,101,579, Cl. 260-559.00R.
- Allen, Joseph C.; and Chien, Sze-Foo, to Texaco Inc. System for decreasing resistance to flow of crude oil up from a well or through a pipeline. 4,100,967, Cl. 166-68.000.
- Allen, Robert F., to Eastman Kodak Company. Conduit and method for processing webs with a liquid solution. 4,101,325, Cl. 96-48.00R.
- Allesch, Ernst; and Bank, Nathan. Foldable rotary clothes hoist. 4,101,037, Cl. 211-167.000.
- Alley, Robert P., to General Electric Company. Ballast EMI and shock hazard reduction. 4,101,806, Cl. 315-86.000.
- Allied Chemical Corporation: *See*—
  - Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.
  - Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.
- Almasy, Ernest W. Track mounted lubrication apparatus. 4,101,002, Cl. 184-15.00B.
- Alsten Company, The: *See*—
  - Schuander, Eric, 4,101,023, Cl. 206-45.190.
- Altec Industries, Inc.: *See*—
  - Freudenthal, Frank D., 4,100,973, Cl. 173-44.000.
- Aluminium Pechiney: *See*—
  - Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.
- Aluminum Company of America: *See*—
  - Feichter, Lowell H.; and Anderson, Albert R., 4,101,343, Cl. 136-230.000.
  - Hargis, Robert L., 4,101,393, Cl. 204-67.000.
  - Lamberti, Thomas G.; and Rowe, Harry B., 4,101,632, Cl. 423-210.000.
  - Urbanic, John M.; and Major, Burney A., 4,101,751, Cl. 219-74.000.
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  - Williams, David E., 4,101,611, Cl. 261-142.000.
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  - Morgan, Donald F.; and Wolosky, Irwin S., 4,101,463, Cl. 260-2.300.
- American Color & Chemical Corporation: *See*—
  - Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.
- American Cyanamid Company: *See*—
  - Boldizar, Leslie, 4,101,520, Cl. 528-248.000.
  - Lutz, Albert William; and Diehl, Robert Eugene, 4,101,582, Cl. 260-574.000.
- American Hoechst Corporation: *See*—
  - Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.

  - McFadden, Arthur Raymond; and Aultz, Daniel Eugene, 4,101,559, Cl. 260-347.300.
- American Optical Corporation: *See*—
  - Krohn, David A.; and Deeg, Emil W., 4,101,302, Cl. 65-30.00R.
- American Safety Equipment Corporation: *See*—
  - Sieber, William J., 4,101,143, Cl. 280-42.000.
- American Technical Industries, Inc.: *See*—
  - Dieffenbach, Percy; and Zon, Louis, 4,101,697, Cl. 428-9.000.
- Ameron, Inc.: *See*—
  - Wells, Frank M.; and Black, Gordon J., 4,101,622, Cl. 264-251.000.
- Ammann, Steve, to Quantor Corporation. Film processing apparatus. 4,101,919, Cl. 354-319.000.
- Ammons, Vernon G., to PPG Industries, Inc. Hard, optically clear polyurethane articles. 4,101,529, Cl. 528-67.000.
- AMP Incorporated: *See*—
  - Carter, Clyde Thomas, 4,101,095, Cl. 242-115.000.
  - Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
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- Anderson, Rogers H., to Honeywell Inc. Halide optical elements. 4,101,331, Cl. 106-73.100.
- Anderson, William B.; and Yulga, Julius J., to Rexnord Inc. Roller assembly. 4,101,180, Cl. 308-20.000.
- Ando, Hiromi, to Tokico Ltd. Vacuum augmentation device. 4,100,839, Cl. 91-369.00B.
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  - Tateoka, Kiyoshi; Ando, Hiromi; and Azuma, Tomizo, 4,100,838, Cl. 91-1.000.
- Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Work-post console for semi automatic machines. 4,101,084, Cl. 242-7.110.
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  - Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.
- Andrevski, Zygmunt Marian, to RCA Corporation. Flat display device with beam guide. 4,101,802, Cl. 313-422.000.
- Andrews, Christopher Michael, to Ciba-Geigy Corporation. New compositions for curing epoxide resins. 4,101,459, Cl. 260-18.0EP.
- Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., to General Electric Company. Semiconductor body heater. 4,101,759, Cl. 219-343.000.
- Anthony, Timothy M. Jump rope. 4,101,123, Cl. 272-75.000.
- Antos, George J., to UOP Inc. Catalytic reforming of a naphtha fraction. 4,101,418, Cl. 208-139.000.
- Antoszewski, Alex Joseph, to Leigh Products, Inc. Folding wall bracket. 4,101,107, Cl. 248-218.400.
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  - Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
- Aoki, Katashi, to Nissei Plastics Industrial Co., Ltd. Injection blow molding method for hollow article having openings at both ends. 4,101,618, Cl. 264-97.000.
- Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Pickup tone arm. 4,101,133, Cl. 274-23.00R.
- Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic metal powder. 4,101,311, Cl. 75-0.500.
- Aoyama, Eiji, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic recording level control circuit with manual sensitivity compensating circuit. 4,101,843, Cl. 330-280.000.
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- Archer, Dorothy J.: *See*—
  - Mineck, Fred, 4,100,898, Cl. 123-119.00B.
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  - Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.
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- Argus Chemical Corporation: *See*—
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,101,508, Cl. 260-45.80N.
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  - Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, 4,101,569, Cl. 260-463.000.
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- Arno, David Michael, to Johns-Manville Corporation. Radially expansible collet for a tubular sleeve. 4,101,085, Cl. 242-18.00G.
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- Arthur D. Little, Inc.: *See*—
  - Clancy, John J.; and Wells, Robert C., 4,100,853, Cl. 101-401.100.
- Arthur Products Co.: *See*—
  - Abramoska, Alfred A., Jr., 4,100,948, Cl. 141-392.000.
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  - Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,101,324, Cl. 96-36.300.
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  - Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
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  - Takagi, Katsuyuki; and Asano, Chihiro, 4,101,862, Cl. 338-23.000.
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- Askins, Barbara S., to United States of America, National Aeronautics and Space Administration. Method of obtaining intensified image from developed photographic films and plates. 4,101,780, Cl. 250-475.000.
- Aslam, Muhammed Javed. Device for the collection and processing of stool specimens. 4,101,279, Cl. 23-259.000.
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  - Hess, John R.; and Asplund, Herbert Frederick, 4,101,245, Cl. 416-190.000.
- Atkins, Carl E.; and McGuirk, Francis A., Jr., to Wagner Electric Corporation. Dual channel wide-band frequency modulated keyable control circuit and keying circuit therefor. 4,101,791, Cl. 307-308.000.
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  - Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, 4,100,941, Cl. 139-449.000.
- Atlantic Richfield Company: *See*—
  - Airhart, Tom P., 4,100,991, Cl. 181-117.000.
  - Burger, Edward D., 4,101,035, Cl. 209-114.000.
  - Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
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  - Griffiths, Bernard L., 4,101,726, Cl. 13-29.000.
- Au-Tom-A-Ton Research Company: *See*—
  - Vail, Ande R., 4,101,787, Cl. 307-81.000.
- Audi Nsu Auto Union Aktiengesellschaft: *See*—
  - Kromer, Gunter, 4,100,911, Cl. 123-205.000.
- Augostini, Peter P.: *See*—
  - Kent, Jerry B.; and Augostini, Peter P., 4,101,494, Cl. 260-29.60B.
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- Ausnit, Steven. Method of and means for making variable width zipper profile film. 4,101,355, Cl. 156-66.000.
- Austin, Eric Paul, to Simon-Hartley Limited. Electrolytic flotation apparatus. 4,101,409, Cl. 204-277.000.
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  - Smith, Carl H., 4,101,001, Cl. 184-6.400.
- Autosonics, Inc.: *See*—
  - Rand, Burton, 4,101,340, Cl. 134-11.000.
- Autovox S.p.A.: *See*—
  - Cicatelli, Rodolfo, 4,101,949, Cl. 360-137.000.
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  - Dunning, Richard E.; and Rampelberg, Victor H., 4,101,698, Cl. 428-31.000.
- Avtex Fibers Inc.: *See*—
  - Knopka, Williamm N., 4,101,528, Cl. 260-45.75R.
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- B. F. Goodrich Company, The: *See*—
  - Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, 4,100,955, Cl. 152-362.0CS.
  - Rowe, Eugene Hugh, 4,101,604, Cl. 260-862.000.
  - Tucker, Harold A., 4,101,491, Cl. 260-29.60T.
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  - Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
- Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, to USM Corporation. Automatic work guidance mechanism. 4,100,864, Cl. 112-121.110.

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  - Reinecke, Harry; and Bachmann, Gerhard, 4,100,868, Cl. 112-277.000.
- Bacskai, Robert, to Chevron Research Company. Pyrrolidone polymerization catalyst system. 4,101,447, Cl. 252-431.00C.
- Bacskai, Robert, to Chevron Research Company. Anionic copolymerization of 2-pyrrolidone with caprolactam or piperidone. 4,101,531, Cl. 528-315.000.
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  - Bradham, Allen C., III; and Seruga, Edward A., 4,100,799, Cl. 73-197.000.
  - Pelt, Thomas E., 4,100,800, Cl. 73-197.000.
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  - Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.
- Baizer, Manuel M.: *See*—
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- Baker, Lamar T., to Xerox Corporation. MOS buffer circuit. 4,101,788, Cl. 307-205.000.
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- Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., to Republic Steel Corporation. Multiprobe eddy current flaw detection device with means to raise and lower the individual probes. 4,101,832, Cl. 324-227.000.
- Baker, Robert A.; and Bruemmer, Joseph H., to United States of America, Agriculture. Clarification of citrus juices. 4,101,678, Cl. 426-50.000.
- Bako, Lazlo, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Combination lock. 4,100,775, Cl. 70-3.000.
- Balchunas, Charles A., to General Electric Company. Appliance strain relief. 4,101,729, Cl. 174-65.00R.
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  - Lange, Karl Heinz, 4,101,915, Cl. 354-144.000.
- Balkwill, John Treagus, to International Telephone and Telegraph Corporation. Perforate glass structures and method of making the same. 4,101,303, Cl. 65-31.000.
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- Baltek Corporation: *See*—
  - Roberts, Wm. Mel; and Kohn, Jean, 4,101,045, Cl. 220-404.000.
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  - Daxinger, Helmut, 4,101,200, Cl. 350-166.000.
- Banigan, Thomas F.: *See*—
  - Morrisroe, John J.; and Banigan, Thomas F., 4,101,589, Cl. 260-615.00B.
- Bank, Nathan: *See*—
  - Allesch, Ernst; and Bank, Nathan, 4,101,037, Cl. 211-167.000.
- Banks, Arthur James: *See*—
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- Barbot, Jean Luc Y.; and Remon-Beauvais, Philippe M., to Etat Francais. Pneumatic cell for gas confinement in surface effect vehicle. 4,100,989, Cl. 180-127.000.
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- Barie, Walter P., Jr.; and Eurich, James T., to Gulf Research & Development Company. Clear and colorless epoxide dianhydride cured resins. 4,101,516, Cl. 528-112.000.
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- Barker, Robert I.; and King, David P., to Monsanto Company. Optical method and apparatus for determining stress relaxation. 4,101,612, Cl. 264-22.000.
- Barkey, Kenneth T., to Eastman Kodak Company. Process for making stabilized polyesters used in radiation-sensitive compositions for lithographic plates having improved wear life including hindered phenols and phosphoric acid esters. 4,101,326, Cl. 96-67.000.
- Barnby, Donald W. Competitive game apparatus. 4,101,131, Cl. 273-239.000.
- Barnes, Casper W., Jr., to Dresser Industries, Inc. Fluid flow regulation. 4,100,927, Cl. 137-9.000.
- Barp, Bruno; and Holik, Herbert, to Escher Wyss GmbH. Drying cylinder for a paper making machine. 4,100,683, Cl. 34-124.000.
- Barr, Derek Julian, to Barr & Murphy Limited. Drying apparatus and method. 4,101,264, Cl. 432-14.000.
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  - Barr, Derek Julian, 4,101,264, Cl. 432-14.000.
- Barrable, Victor Ernest, to Cape Boards & Panels Ltd. Building board. 4,101,335, Cl. 106-99.000.
- Barrett, Warren E. Telephone book holder. 4,101,184, Cl. 312-233.000.
- Barron, Alvie, to Royal Tool Company, Inc. Drilling stabilizer including mechanical interlock device. 4,101,179, Cl. 308-4.00A.
- Barroso, Angel Lorenzo. Clamping machine. 4,100,716, Cl. 53-138.00A.
- Barsellotti, John Anthony, to International Standard Electric Corporation. Line circuit for key telephone systems. 4,101,740, Cl. 179-99.000.
- Bart, Hans U., to Teledyne Industries, Inc. Piezoelectric fuel injector valve. 4,101,076, Cl. 239-584.000.
- Bart, Philip D., to PBI, Inc. Apparatus for aerating a liquid. 4,101,607, Cl. 261-36.00R.
- Bartoletto, Avellino J. Chain shackle. 4,100,729, Cl. 59-86.000.
- Bartolini, Robert Alfred: *See*—
  - Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.
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  - Bauer, Wolfgang; Martin, Wolfgang; and Lehrer, Erwin, 4,100,659, Cl. 28-255.000.
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  - Kohl, Lambert; Schneider, Richard; and Uhl, Karl, 4,101,027, Cl. 206-309.000.
  - Nienburg, Hans Juergen; and Kummer, Rudolf, 4,101,588, Cl. 260-615.00A.
- Bass, Sidney; and Rich, Hubert Allen, to Mattel, Inc. Sewing machine. 4,100,867, Cl. 112-270.000.
- Batova, Kemal: *See*—
  - Denkinger, Marian C.; and Batova, Kemal, 4,101,106, Cl. 248-188.900.
- Battelle Development Corporation: *See*—
  - Selders, Matthias Peter, 4,101,341, Cl. 136-89.0TF.
- Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., to John Thomas Batts, Inc. Tally. 4,101,059, Cl. 223-85.000.
- Batts, Robert Lee, to Johns-Manville Corporation. Method of coating strand material. 4,101,695, Cl. 427-434.00D.
- Baude, Frederic John; and Cupery, Willis Eli, to Du Pont de Nemours, E. I., and Company. Stabilized formulations of 2-alkoxyimino-N-carbamoyl-2-cyanoacetamides. 4,101,669, Cl. 424-286.000.
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  - Gretler, Heinrich, 4,100,778, Cl. 70-406.000.
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  - Dietrich, Walter; and Bauer, Manfred, 4,100,843, Cl. 93-53.00M.
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  - Dennstadt, Heinz; and Baum, Walter, 4,100,772, Cl. 69-47.000.
- Baxter Travenol Laboratories, Inc.: *See*—
  - Miller, Joe A., 4,100,953, Cl. 150-0.500.
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  - Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.
  - Bockelman, Wolfgang; and Niederprum, Hans, 4,101,271, Cl. 8-94.260.
  - Burkhardt, Tilo; and Schonfelder, Manfred, 4,101,530, Cl. 528-45.000.
  - Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, 4,101,575, Cl. 260-553.00E.
  - Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.
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  - Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.
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  - Bomford, Michael J.; and Gessinger, Gernot, 4,101,712, Cl. 428-547.000.
  - Gyarmathy, Georg; and Pfenninger, Hans, 4,100,745, Cl. 60-652.000.
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- Beckett, Allan: *See*—
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  - Anderson, Robert J., 4,101,276, Cl. 23-230.00B.
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  - Way, Allan S., 4,101,219, Cl. 356-89.000.
- Becton, Dickinson and Company: *See*—
  - Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.
- Beecham Group Limited: *See*—
  - Clark, Judith Ann, 4,101,676, Cl. 424-330.000.
- Belfiore, Erasmo: *See*—
  - Wilkinson, Brendan Michael; and Belfiore, Erasmo, 4,100,982, Cl. 175-206.000.
- Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, to RCA Corporation. Overcoat structure for optical video disc. 4,101,907, Cl. 346-135.000.
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  - Cox, Calvin Howard, 4,101,129, Cl. 273-143.00R.

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Flint, John R.; and Rabindran, K. George, 4,101,763, Cl. 250-214.00R.

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Albanese, Andres, 4,101,847, Cl. 331-94.50S.

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Geppert, Barbara; and Huth, Kurt, 4,101,047, Cl. 220-258.000.

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Kavadias, Gerry; and Belleau, Bernard R., 4,101,556, Cl. 260-307.00C.

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Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjuoova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

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Burnett, Richard T., 4,101,010, Cl. 188-79.50P.

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Benjamin, Gary L., to Kuss Corporation. Water mattress construction. 4,100,634, Cl. 5-365.000.

Benton, Lawrence M., Jr. Visual display with magnetic overlay. 4,101,884, Cl. 340-366.00B.

Berchtold, Jean, to Spin Physics. Process for preparing hot-pressed sintered alloys. 4,101,348, Cl. 148-105.000.

Berger, Stuart. Holder device for paper articles and writing instruments. 4,100,684, Cl. 35-62.000.

Berges, David A., to Smithkline Corporation. 7βAcylamino-3-(alkanesulfonamidoalkyl substituted tetrazolylthiomethyl) cephalosporins, antibacterial compositions containing them and methods of treating bacterial infections with them. 4,101,656, Cl. 424-246.000.

Bergman, Thomas W. Separator for separating higher density metal values from earthen material. 4,101,419, Cl. 209-13.000.

Berniolles, Jean-Marie; and Jogand, Patrick, to Commissariat a l'Energie Atomique. Fast neutron reactor. 4,101,377, Cl. 176-40.000.

Bers, Abraham: *See—*

Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., 4,101,965, Cl. 364-821.000.

Berthet, Aristide: *See—*

Vayssiere, Pierre; and Berthet, Aristide, 4,101,313, Cl. 75-60.000.

Berthet, Michel; Gillet, Roger; Laumood, Yves; Lehuen, Christian; and Marquet, Andre, to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.; and Electricite de France, Service National. Rotating machine using a cooling fluid supplied by a rotating seal. 4,101,793, Cl. 310-52.000.

Bertin & Cie: *See—*

Facon, Pierre Jean Alphonse, 4,100,747, Cl. 61-5.000.

Bertling, Gerhard: *See—*

Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, 4,100,897, Cl. 123-119.0EC.

Bertucci, Albert Flamidien, to Agence Nationale de Valorisation de la Recherche (ANVAR). Apparatus for discharging smokes, fumes and greases from kitchens. 4,101,299, Cl. 55-222.000.

Bessaguet, Louis Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Ultrasonic machining. 4,100,701, Cl. 51-157.000.

Betts, William L., to United States of America, Army. Digital filter for pulse code modulation signals. 4,101,964, Cl. 364-724.000.

Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, to Hoechst Aktiengesellschaft. Process for the level dyeing of synthetic fiber materials. 4,101,274, Cl. 8-173.000.

Beyer, Horst; and Buran, Ulrich, to Goetzewerke Friedrich Goetze AG. Plasma deposition welding powder for producing wear resistant layers. 4,101,319, Cl. 75-252.000.

BFG Glassgroup: *See—*

Marchand, Jean, 4,101,304, Cl. 65-135.000.

Bhandari, Ashok Kumar; and Kalbag, Shrinath Sheshgiri, to Lever Brothers Company. Treatment of saponified synthetic fatty acids. 4,101,562, Cl. 260-419.000.

BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft: *See—*

Maier, Johann, 4,101,367, Cl. 156-471.000.

Bianchi, John E.; and Nichols, Richard D. E. Holster with improved belt loop lock. 4,101,060, Cl. 224-2.00B.

Bianchi, Raymond A.; and Campen, Harry E., to Caterpillar Tractor Co. Idler wear strip retainer for track-type vehicles. 4,101,177, Cl. 305-31.000.

Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., to Societe Nationale des Poudres et Explosifs. Flame resistance of foams using diethyl bydroxymethylphosphonate esters. 4,101,472, Cl. 521-85.000.

Bien, Else, administrator: *See—*

Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.

Bien, Hans-Samuel, deceased: *See—*

Groll, Manfred; and Bien, Hans-Samuel, deceased, 4,101,551, Cl. 260-283.0SA.

Bierman, Laurence William; and Long, Gary Lynn, to J. R. Simplot Company. Direct granulation process for triple superphosphate. 4,101,637, Cl. 423-309.000.

Biethan, Uwe: *See—*

Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.

Bijker, Anno: *See—*

Pons, Dick A.; and Bijker, Anno, 4,101,490, Cl. 260-29.6MP.

Bingham, John A. C.; and Maxwell, Ronald K., to Vadic Corporation, The. Duplex data transmission modem utilizing an injected tone for shifting power within the transmit spectrum. 4,101,833, Cl. 325-30.000.

Bingo, Kazuyoshi; and Kawai, Katsuo, to Japan Atomic Energy Research Institute. Method for direct measurement of beta-ray absorbed dose rate and an instrument therefor. 4,101,769, Cl. 250-361.00R.

Birke, August H., to Shell Oil Company. Lubricant compositions. 4,101,429, Cl. 252-32.70E.

Biro, Katalin: *See—*

Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.

Bishop, Arthur E. Method and apparatus for manufacturing valve components. 4,100,785, Cl. 72-189.000.

Bishop, Byron Norman. Block and brace assembly. 4,101,111, Cl. 249-205.000.

Bizen, Kunio: *See—*

Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

Black, Gordon J.: *See—*

Wells, Frank M.; and Black, Gordon J., 4,101,622, Cl. 264-251.000.

Blackburn, Keith: *See—*

Ross, Douglas; and Blackburn, Keith, 4,101,144, Cl. 280-423.00B.

Blackmer, David E.; and Jaeger, C. Rene, to DBX, Inc. Adaptive filter. 4,101,849, Cl. 333-14.000.

Blahak, Johannes: *See—*

Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, 4,101,569, Cl. 260-463.000.

Blain, Jean R.: *See—*

Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.

Blanchard, James A. Fishing rod jigging apparatus. 4,100,695, Cl. 43-19.200.

Bloch, deceased; Rene: *See—*

Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, 4,101,380, Cl. 195-63.000.

Blockley, Alec Gordon: *See—*

McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, 4,100,825, Cl. 82-3.000.

Bloom, Allen: *See—*

Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.

Blum, Emil. Musical chime device. 4,101,885, Cl. 340-384.00E.

Blumenthal, Robert N.; and Melville, Andreas T. Hot gas measuring device. 4,101,404, Cl. 204-195.00S.

Bobrov, Vladimir Timofeevich; Druzhaev, Jury Avraamovich; and Lebedeva, Nelli Alexandrovna. Method for excitation and reception of ultrasonic plate waves in workpieces and devices for realizing same. 4,100,809, Cl. 73-638.000.

Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich. Building roofing structure. 4,100,708, Cl. 52-222.000.

Bochkarev, Ellin Petrovich: *See—*

Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Bock, Manfred; Pedain, Josef; and Braden, Rudolf, to Bayer Aktiengesellschaft. Cycloaliphatic triamines. 4,101,578, Cl. 260-563.00R.

Bockelman, Wolfgang; and Niederprum, Hans, to Bayer Aktiengesellschaft. Tanning skins using polycarboxylic acid partial esters. 4,101,271, Cl. 8-94.260.

Boehmke, Gunther: *See—*

Reitz, Gunther; and Boehmke, Gunther, 4,101,489, Cl. 260-29.300.

Boehringer Iogelheim GmbH: *See—*

Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.

Boehringer Mannheim GmbH: *See—*

Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.

Boeing Company, The: *See—*

Dehler, William H., 4,101,828, Cl. 324-65.00R.

Feleus, Christiaan C., 4,100,876, Cl. 114-274.000.

Scott, John H.; and Weist, Walter R., 4,100,877, Cl. 115-11.000.

Bohrdt, Joaquin: *See—*

Grieger, Gerhard; and Bohrdt, Joaquin, 4,101,746, Cl. 200-82.00B.

Bohy, August G.: *See—*

Barch, Herbert W.; and Bohy, August G., 4,100,723, Cl. 57-34.00B.

Barch, Herbert W.; and Bohy, August G., 4,100,726, Cl. 57-157.00F.

Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, to GB Fermentation Industries, Inc. Enzyme complex hydrolyzing bacterial mucus. 4,101,379, Cl. 195-62.000.

Boldizar, Leslie, to American Cyanamid Company. Methylated, methylolated melamine composition. 4,101,520, Cl. 528-248.000.

Bomford, Michael J.; and Gessinger, Gernot, to BBC Browo Boveri & Company Limited. Method of producing a material with locally different properties and applications of the method. 4,101,712, Cl. 428-547.000.

Bonati, Attilio, to Inverni Della Beffa S.p.A. Pharmaceutically active complexes and pharmaceutical compositions containing eascin and sterols. 4,101,652, Cl. 424-49.000.

Bondarev, Gennady Ivanovich: *See—*

Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.

Bongartz, Paul: *See—*

Haag, Franz; and Bongartz, Paul, 4,101,116, Cl. 366-142.000.

Bonk, Joseph P., to Colgate-Palmolive Company. Pre-moistened towelette dispenser. 4,101,026, Cl. 206-205.000.

Bonnerot, Georges: *See—*

Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.

Boop, Gene T. Technique for disarming and arming electrically fireable explosive well tool. 4,100,978, Cl. 175-4.550.

Bopp, Louis A.: *See—*

Schmidt, Gertraud A.; and Bopp, Louis A., 4,101,512, Cl. 260-45.95C.

Borchert, Robert Curtis, to Union Carbide Corporation. Enhanced heat transfer device manufacture. 4,101,691, Cl. 427-229.000.

Borg-Warner Corporation: *See—*

Albertson, Clarence Elmo, 4,100,756, Cl. 62-2.000.

Harnish, James Ranck, 4,100,935, Cl. 137-533.110.

Meixner, Edwin Joseph, 4,100,794, Cl. 73-136.00A.

Radke, Edmund John, 4,101,015, Cl. 192-106.200.

Woollard, Gary A., 4,100,818, Cl. 74-230.17E.

Borgert, Wilhelm: *See—*

Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.

Borgstrom, Carl Gote Lennart, to AB Record Taxameter AB. Recording distance measuring instrument at vehicle wheel hub. 4,101,762, Cl. 235-95.00C.

Borsi, Jozsef: *See—*

Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.

Bos, Horst, to Gebr. Marklin & Cie. GmbH. Driving mirror assembly. 4,101,205, Cl. 350-289.000.

Bosch, Paul, to Robert Bosch GmbH. Radial piston machine. 4,100,840, Cl. 91-491.000.

Bosch-Siemens Hausgerate GmbH: *See—*

Mayer, Rolf; and Speckhart, Max, 4,101,082, Cl. 241-282.100.

Bosso, Joseph F.; and Sturni, Lance C., to PPG Industries, Inc. Cationic electrodepositable compositions. 4,101,486, Cl. 260-29.2TN.

Botek Praezisions-Bohrtechnik Schur & Co., Firma: *See—*

Herrmann, Lothar; and Schur, Gotthold, 4,100,983, Cl. 175-383.000.

Bous, Karl. Apparatus for dyeing filamentary material. 4,100,724, Cl. 57-35.000.

Bousaid, Issam S., to Texaco Inc. Oil recovery process using an emulsion slug with tapered surfactant concentration. 4,100,966, Cl. 166-273.000.

Bouvier, Jean-Pierre: *See—*

Dandrel, Francois; and Bouvier, Jean-Pierre, 4,101,811, Cl. 315-200.00R.

Boyce, Jennings A.: *See—*

Stine, Clifford R.; and Boyce, Jennings A., 4,101,699, Cl. 428-36.000.

Bracey, Jep T., to Towler, Martin L.; and Langdon, Jack M., part interest to each. Oxygen impregnation method. 4,101,608, Cl. 261-36.00R.

Brackman, Donald A., to Hobart Corporation. Food processing apparatus. 4,101,977, Cl. 366-246.000.

Brackman, Donald A., to Hobart Corporation. Food processing apparatus. 4,101,978, Cl. 366-314.000.

Braden, Rudolf: *See—*

Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.

Bradham, Allen C., III; and Seruga, Edward A., to Badger Meter, Inc. Compound meter assembly. 4,100,799, Cl. 73-197.000.

Bradley, Harry: *See—*

Ryan, Peter; and Bradley, Harry, 4,100,817, Cl. 74-111.000.

Braid, Milton; and Leonardi, Samuel J., to Mobil Oil Corporation. Lubricant compositions. 4,101,430, Cl. 252-42.700.

Brandes, Wilhelm: *See—*

Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, 4,101,575, Cl. 260-553.00E.

Branlard, Paul; and Merle, Jean Pierre, to Societe Distugil. Process for the manufacture of stable polychloroprene latex. 4,101,481, Cl. 260-23.70A.

Bratkowski, Walter V.: *See—*

Shoupp, William E.; and Bratkowski, Walter V., 4,101,792, Cl. 310-15.000.

Braun, Robert J.: *See—*

Lamont, James; and Braun, Robert J., 4,101,422, Cl. 210-84.000.

Breckenridge, Lloyd L., to Mobil Oil Corporation. Recovery of p-xylene and benzene from eight carbon atom aromatic fractions. 4,101,597, Cl. 260-668.00A.

Breedlove, Harold W.; and Brown, Walter L., to United States of America, Army. Test cell holder. 4,101,824, Cl. 324-20.00R.

Breitfeld, Gunter, to Volkswagenwerk Aktiengesellschaft. Vehicle safety belt apparatus. 4,101,091, Cl. 242-107.000.

Brejnik, Carl; and Whitlow, William T. Electronic calorie counter. 4,101,071, Cl. 235-92.0MT.

Bretthauer, Hans-Jurgen: *See—*

Focke, Heinz; and Bretthauer, Hans-Jurgen, 4,100,718, Cl. 53-234.000.

Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, to Robert Bosch GmbH. Apparatus for regulating the fuel-air mixture delivered to an internal combustion engine. 4,100,897, Cl. 123-119.0EC.

Bridenbaugh, Edwin Redmond, to International Telephone and Telegraph Corporation. Two-way loudspeaking device for telephone stations. 4,101,735, Cl. 179-1.0HF.

Bridgestone Tire Company Limited: *See—*

Takahashi, Takuya; and Ishigami, Masashi, 4,101,626, Cl. 264-313.000.

Brill, Alfred P., III, to Dow Corning Corporation. Low oiling gel filled flexible articles and gels therefor. 4,100,627, Cl. 3-36.000.

Bristol-Myers Company: *See—*

Crenshaw, Ronnie R.; and Partyka, Richard A., 4,101,548, Cl. 544-284.000.

Kavadias, Gerry; and Belleau, Bernard R., 4,101,556, Cl. 260-307.00C.

Samour, Carlos M.; and Vida, Julius A., 4,101,668, Cl. 424-275.000.

Bristol Products, Inc.: *See—*

Schoff, Dale H., 4,101,190, Cl. 339-113.00L.

Broach, George C.; and Thurman, Donald W., to G. C. Broach Company, The. Equipment and process involving combustion and air. 4,101,265, Cl. 432-29.000.

Broan Manufacturing Co., Inc.: *See—*

Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.

Brodsky, Philip H., to Monsanto Company. Brake lining compositions having friction particles of an aromatic amine modified novolac resin and an aromatic carboxylic compound. 4,101,500, Cl. 260-38.000.

Brody, Herbert M., to International Telephone & Telegraph Corporation. Multi-source heat pump HVAC system. 4,100,763, Cl. 62-238.000.

Brody, Philip S., to United States of America, Army. Optical memory with storage in three dimensions. 4,101,975, Cl. 365-117.000.

Broeg, Charles B.: *See—*

Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.

Broerse, Pieter Hendrik: *See—*

Wanninkhof, Markus Wilhelm Matthijs; van der Velden, Johnny Wilhelmus; and Broerse, Pieter Hendrik, 4,101,260, Cl. 431-95.00R.

Brookes, Neil Roger: *See—*

Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, 4,100,732, Cl. 60-39.360.

Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., to Monsanto Company. Durable fire retardant for forest and rangelands. 4,101,485, Cl. 260-29.4UA.

Brouard, Claude Marie Henri Emile: *See—*

Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, 4,101,543, Cl. 260-162.000.

Broune, Abel U. Transaction card. 4,100,689, Cl. 40-2.200.

Brown Boveri Corporation: *See—*

Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.

Browo, Dale M.; and Garfinkel, Marvin, to General Electric Company. Semiconductor radiation detector. 4,101,924, Cl. 357-30.000.

Brown, Gaylord William, to Sweetheart Plastic, Inc. Sheet support apparatus. 4,101,252, Cl. 425-394.000.

Brown, Ralph V.: *See—*

Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.

Brown, Walter L.: *See—*

Breedlove, Harold W.; and Brown, Walter L., 4,101,824, Cl. 324-20.00R.

Brown, William J.: *See—*

Ederati, Richard M.; and Brown, William J., 4,101,147, Cl. 280-775.000.

Browne, Robert E.: *See—*

Schooley, Willard A.; and Browne, Robert E., 4,101,424, Cl. 250-504.000.

Bruemmer, Joseph H.: *See—*

Baker, Robert A.; and Bruemmer, Joseph H., 4,101,678, Cl. 426-50.000.

Brunton Company, The: *See—*

Kramer, Melvin G., 4,101,882, Cl. 340-347.00P.

Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, to General Electric Company. Centrifugal compressor advanced dump diffuser. 4,100,732, Cl. 60-39.360.

- Bryla, Theodore N.: *See—*
  - Poulin, Clyde J.; and Bryla, Theodore N., 4,101,352, Cl. 149-19.200.
- BSP International Foundations Limited: *See—*
  - Elliott, Roger Michael, 4,100,977, Cl. 173-134.000.
- Bubnich, Frank J.; and Bubnich, Marketta A. Vehicle parking guide and signaling device. 4,101,868, Cl. 340-51.000.
- Bubnich, Marketta A.: *See—*
  - Bubnich, Frank J.; and Bubnich, Marketta A., 4,101,868, Cl. 340-51.000.
- Buck, Stanley Edward, to Domtar Inc. Die cut tray. 4,101,068, Cl. 229-35.000.
- Buckler, Ernest Jack; and Richmond, Michael Hugh, to Polysar Limited. Filled-polystyrene laminates. 4,101,050, Cl. 229-3.50R.
- Bue, Richard C.; and Carlson, Casey L., to Sico Incorporated. Folding wall table. 4,100,858, Cl. 108-48.000.
- Buendia, Jean: *See—*
  - Martel, Jacques; Huynh, Chanh; and Buendia, Jean, 4,101,574, Cl. 260-544.00L.
- Buff, Grier E.; and Phillips, Talmadge V., to Republic Steel Corporation. Flash welding apparatus and method. 4,101,753, Cl. 219-97.000.
- Bugaut, Andree: *See—*
  - Kalopissis, Gregoire; and Bugaut, Andree, 4,101,576, Cl. 260-559.00A.
- Buhler-Miag GmbH: *See—*
  - Faist, Walter, 4,101,083, Cl. 241-285.00R.
- Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, to Hoechst Aktiengesellschaft. Radiation-sensitive copying composition. 4,101,323, Cl. 96-35.000.
- Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., to Texaco Inc. Shaped, bonded boride catalysts. 4,101,560, Cl. 260-348.290.
- Buljan, Sergei-Tomislav, to GTE Sylvania Incorporated. Process for producing Si_3N_4 article. 4,101,616, Cl. 264-65.000.
- Bunker Ramo Corporation: *See—*
  - Bauerle, Gerhard; and Hubner, Oswald, 4,101,192, Cl. 339-217.00S.
- Buran, Ulrich: *See—*
  - Beyer, Horst; and Buran, Ulrich, 4,101,319, Cl. 75-252.000.
- Burckhardt, Urs; Werthemann, Lucius; and Troxler, Richard Josef, to Ciba-Geigy Corporation. Process for the production of deoxy-alpha-acids. 4,101,585, Cl. 260-592.000.
- Burger, Edward D., to Atlantic Richfield Company. Conveyor belt solids separator with combined scraper and gas jet control. 4,101,035, Cl. 209-114.000.
- Burk, Bruce; and Burnett, Arthur P., to J. M. Ney Company, The. Leucite-containing porcelains and method of making same. 4,101,330, Cl. 106-45.000.
- Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Catalyst demetallization utilizing a combination of reductive and oxidative washes. 4,101,444, Cl. 252-411.00R.
- Burkhardt, Tilo; and Schonfelder, Manfred, to Bayer Aktiengesellschaft. Process for the production of polyisocyanate mixtures containing blocked isocyanate groups. 4,101,530, Cl. 528-45.000.
- Burn, Ian, to Sprague Electric Company. Monolithic base-metal glass-ceramic capacitor. 4,101,952, Cl. 361-305.000.
- Burnett, Arthur P.: *See—*
  - Burk, Bruce; and Burnett, Arthur P., 4,101,330, Cl. 106-45.000.
- Burnett, Richard T., to Bendix Corporation, The. Drum brake with automatic adjustment. 4,101,010, Cl. 188-79.50P.
- Burnett, Richard T., to Bendix Corporation, The. Drum brake adjuster. 4,101,011, Cl. 188-79.5GT.
- Burroughs Corporation: *See—*
  - Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, 4,101,960, Cl. 364-200.000.
- Burzin, Klaus; and Feldmann, Rainer, to Chemische Werke Huls Aktiengesellschaft. Method for the production of colorless polyester amides. 4,101,524, Cl. 528-288.000.
- Butcher, David Henry. Pressure-responsive transducer for regulating internal combustion engine. 4,100,893, Cl. 123-103.00B.
- Butler, Anthony: *See—*
  - Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, 4,101,242, Cl. 415-134.000.
- Butsch, Otto R., to Sycor, Inc. Drive spindle assembly for disc file. 4,101,945, Cl. 360-102.000.
- Butterworth, Arthur L.; and Niedzwiecki, Joseph F., to Trane Company, The. Reciprocating refrigerant compressor valve arrangement. 4,100,934, Cl. 137-512.000.
- Buxbaum, Lothar, to Ciba-Geigy Corporation. Process for the manufacture of linear polyesters which contain phosphites and/or phosphates. 4,101,526, Cl. 528-179.000.
- Cachia, Josef M.: *See—*
  - Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, 4,101,093, Cl. 242-107.40A.
- Cafarella, John H.: *See—*
  - Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., 4,101,965, Cl. 364-821.000.
- Cahen, Raymond N. M.: *See—*
  - Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,101,599, Cl. 260-683.900.
- Calpis Shokuhin Kogyo Kabushiki Kaisha: *See—*
  - Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, 4,101,683, Cl. 426-618.000.
- Cam Industries, Inc.: *See—*
  - Sprague, Brinton, 4,101,758, Cl. 219-285.000.
- Cameron, Larry D.; and Jacque, Albert W. Underwater protection device. 4,100,692, Cl. 42-1.00L.
- Campbell, Alfred, to Warner-Lambert. New nonapeptides and methods for their production. 4,101,538, Cl. 260-112.5LH.
- Campen, Harry E.: *See—*
  - Bianchi, Raymond A.; and Campen, Harry E., 4,101,177, Cl. 305-31.000.
- Canon Kabushiki Kaisha: *See—*
  - Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, 4,101,912, Cl. 354-106.000.
- Cape Boards & Panels Ltd.: *See—*
  - Barrable, Victor Ernest, 4,101,335, Cl. 106-99.000.
- Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, to Commissariat a l'Energie Atomique. Sampling rod for corrosive gases or fumes in an incinerator, particularly when installed on a ship. 4,100,806, Cl. 73-421.50A.
- Caretti, Robert: *See—*
  - Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.
- Carl Still, Firma: *See—*
  - Tippmer, Kurt, 4,101,642, Cl. 423-573.00G.
- Carlson, Casey L.: *See—*
  - Bue, Richard C.; and Carlson, Casey L., 4,100,858, Cl. 108-48.000.
- Carlson, Fred E., to Raymond Lee Organization, Inc., The. Golf club anchor. 4,100,652, Cl. 24-3.00R.
- Carlson, Ingemar. Solar energy heating apparatus. 4,100,915, Cl. 126-271.000.
- Carlsson, Leif Ronny, to Telefonaktiebolaget L M Ericsson. Traveling wave tube with depressed collector power supply. 4,101,804, Cl. 315-3.500.
- Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., to Clayson N.V. Grain tank and grain conveyor means of harvesting machines. 4,100,720, Cl. 56-14.600.
- Carpenter Rigging and Supply Company, Inc.: *See—*
  - Martin, Bernard L.; and Vogel, Bruce N., 4,101,114, Cl. 254-134.3FT.
- Carre, Jean-Jacques; and Meyer, Yves, to Societe Anonyme DBA. Braking correction device. 4,101,176, Cl. 303-6.00C.
- Carrier Corporation: *See—*
  - Leonard, Louis H., 4,100,755, Cl. 62-2.000.
- Carson, Craig Ronald: *See—*
  - Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, 4,101,455, Cl. 252-531.000.
- Carter, Clarence F., to Carter Industries, Inc. Web forming apparatus. 4,100,949, Cl. 144-3.00R.
- Carter, Clyde Thomas, to AMP Incorporated. Adjustable and expandable spool or reel assembly. 4,101,095, Cl. 242-115.000.
- Carter Industries, Inc.: *See—*
  - Carter, Clarence F., 4,100,949, Cl. 144-3.00R.
- Casio Computer Co., Ltd.: *See—*
  - Hakata, Masayuki, 4,101,962, Cl. 364-413.000.
- Cassaigne, Raoul Louis Andre: *See—*
  - Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
- Castaneda, Ernesto G. Shopping cart theft-control apparatus. 4,101,234, Cl. 404-6.000.
- Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, to International Business Machines Corporation. Frequency selective optical data storage system. 4,101,976, Cl. 365-119.000.
- Catenacci, Gerald Anthony. Method of slip-forming roadbeds and apparatus therefor. 4,101,237, Cl. 404-98.000.
- Caterpillar Tractor Co.: *See—*
  - Bianchi, Raymond A.; and Campen, Harry E., 4,101,177, Cl. 305-31.000.
  - Ederati, Richard M.; and Brown, William J., 4,101,147, Cl. 280-775.000.
  - Fischer, Robert L., 4,100,951, Cl. 144-309.0AC.
  - Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., 4,101,251, Cl. 417-313.000.
  - Mounts, William T.; and Stratton, Joseph B., 4,101,160, Cl. 296-35.00R.
  - Palma, Milton J., 4,101,038, Cl. 214-44.00R.
  - Shaffer, Walter Moore, 4,100,739, Cl. 60-413.000.
  - Stedman, Robert N., 4,100,990, Cl. 180-135.000.
  - Straesser, Chris Robert, 4,100,664, Cl. 29-156.600.
- Cech, Theo. Striker cartridge. 4,100,693, Cl. 42-1.00N.
- Celanese Corporation: *See—*
  - Costanza, John R.; and Collins, George L., 4,101,399, Cl. 204-159.190.
  - Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.
  - Hwang, H. Shinn; and Taylor, Paul D., 4,101,450, Cl. 252-460.000.
  - Poist, John E., 4,101,564, Cl. 260-429.700.
  - Poist, John E., 4,101,565, Cl. 260-429.700.
  - Thomas, Norman W., 4,101,601, Cl. 260-836.000.
- Cenci, Harry J.; and Swift, Graham, to Rohm and Haas Company. Method for curing polymers containing one or more carboxy or anhydride functions by means of polymers having hydrosyamide groups, and compositions. 4,101,606, Cl. 260-857.0UN.
- Cerwin Vega, Inc.: *See—*
  - Czerwinski, Eugene J., 4,101,736, Cl. 179-1.00E.
- Chaffin, John D. Earth boring apparatus for geological drilling and coring. 4,100,981, Cl. 175-60.000.
- Champenois, Michel Maurice Luce, to Produits Chimiques Ugine Kuhlmann. Dyed polymers and copolymers having a cyanovinyl-azo dye incorporated in the structure thereof. 4,101,269, Cl. 8-4.000.

- Champion International Corporation: *See—*
  - Stillman, Nathan, 4,101,711, Cl. 428-474.000.
- Champion Products Inc.: *See—*
  - Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.
- Chang, Bansun. Zoom operating light. 4,101,957, Cl. 362-268.000.
- Chang, Moon Ki. Novel reagent and method for the determination of urea in biological fluids. 4,101,382, Cl. 195-103.5UR.
- Chang, Stephen S., to Vitrum AB. Purification of nutritive oils. 4,101,673, Cl. 424-312.000.
- Chas. S. Tanner Co.: *See—*
  - Lindemann, Martin K.; and Wacome, Donald M., 4,101,492, Cl. 260-29.6NR.
- Charves, Everett; Pulley, David F.; and Stander, Arthur O., to United States of America, Navy. Sealant-primer coating. 4,101,497, Cl. 260-31.20N.
- Chatchenko, Sergei Grigorievich: *See—*
  - Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
- Chayes, Norman Chanine, to Combustion Engineering, Inc. Band type tube support. 4,100,889, Cl. 122-510.000.
- Chazard, Georges: *See—*
  - Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
- Cheak, Edward G., to Norfield Manufacturing Co.,. Door hinge applying apparatus. 4,100,661, Cl. 29-33.00K.
- Chemed Corporation: *See—*
  - Hwa, Chih Ming; and Jacob, Jose T., 4,101,441, Cl. 252-389.00A.
- Chemische Werke Huls Aktiengesellschaft: *See—*
  - Burzin, Klaus; and Feldmann, Rainer, 4,101,524, Cl. 528-288.000.
  - Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, 4,101,496, Cl. 260-31.20R.
- Chen, Nai Y.; and Reagan, William J., to Mobil Oil Corporation. Conversion of ethyl benzene to para xylene. 4,101,595, Cl. 260-668.00A.
- Cheney, Paul L. Fluid suspension freezer and method. 4,100,760, Cl. 62-57.000.
- Chenin, Claude: *See—*
  - Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
- Chessin, Hyman; and Seyb, Edgar J., Jr., to M & T Chemicals Inc. Prevention of anode bag clogging in nickel iron plating. 4,101,388, Cl. 204-43.00T.
- Chevalier, Gerard: *See—*
  - Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
- Chevron Research Company: *See—*
  - Bacskai, Robert, 4,101,447, Cl. 252-431.00C.
  - Bacskai, Robert, 4,101,531, Cl. 528-315.000.
  - Crawford, John, 4,101,428, Cl. 252-32.70E.
  - MacFadden, Donald L., 4,101,679, Cl. 426-53.000.
  - Wedel, Carroll J., 4,101,479, Cl. 260-23.00H.
- Chien, Sze-Foo: *See—*
  - Allen, Joseph C.; and Chien, Sze-Foo, 4,100,967, Cl. 166-68.000.
- Chilton, Robert S. Carburetor heater. 4,100,899, Cl. 123-122.00A.
- Chloride, Incorporated: *See—*
  - Malinowski, William J., 4,101,785, Cl. 250-574.000.
- Choi, Charles K., to Occidental Petroleum Corporation. Process and apparatus for rapid pyrolysis of carbonaceous materials. 4,101,412, Cl. 208-8.000.
- Christe, Karl O., to Rockwell International Corporation. Production of OH_3^{30} salts. 4,101,640, Cl. 423-462.000.
- Christensen, Craig M., to Noctua, Inc. Radiation beam splitter. 4,101,199, Cl. 350-152.000.
- Chromalloy American Corporation: *See—*
  - Hodgson, James H., 4,101,078, Cl. 239-651.000.
- Churchill, Geoffrey B.; and White, J. Craig, to Monsanto Company. Composite sheet member having a plurality of coextruded laminar layers. 4,101,702, Cl. 428-213.000.
- Ciba-Geigy AG: *See—*
  - Renner, Alfred, 4,101,521, Cl. 528-242.000.
- Ciba-Geigy Corporation: *See—*
  - Andrews, Christopher Michael, 4,101,459, Cl. 260-18.0EP.
  - Burckhardt, Urs; Werthemann, Lucius; and Troxler, Richard Josef, 4,101,585, Cl. 260-592.000.
  - Buxbaum, Lothar, 4,101,526, Cl. 528-179.000.
  - Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,101,672, Cl. 424-301.000.
  - Petitpierre, Jean Claude; and Ramanathan, Visvanathan, 4,101,541, Cl. 260-158.000.
  - Ramey, Chester E.; and Luzzi, John J., 4,101,509, Cl. 260-45.75N.
  - Schmid, Rolf; and Kreibich, Ursula, 4,101,476, Cl. 260-22.0EP.
  - Spivack, John D., 4,101,550, Cl. 544-387.000.
- Cicatelli, Rodolfo, to Autovox S.p.A. Single control key for tape recorders. 4,101,949, Cl. 360-137.000.
- Citizen Watch Company Limited: *See—*
  - Ebihara, Heichachiro; and Yamada, Takashi, 4,101,790, Cl. 307-221.00C.
- City Tank Corporation: *See—*
  - Stewart, Melvin E., 4,100,740, Cl. 60-431.000.
- Clamp-All Corp.: *See—*
  - Ferguson, Harry J. S., 4,101,151, Cl. 285-236.000.
- Clancy, John J.; and Wells, Robert C., to Arthur D. Little, Inc. Method of forming a porous shaped body capable of retaining liquids therein. 4,100,853, Cl. 101-401.100.
- Clapot, Claude; Dumont, Louis; and Vial, Jean, to Philagro S.A. Methional derivatives and compositions with a growth-regulating effect upon plants. 4,101,307, Cl. 71-88.000.
- Clark, Alexander B., Jr. Fork lift pallet. 4,100,859, Cl. 108-51.300.
- Clark, Judith Ann, to Beecham Group Limited. Diphenylpropylamines to treat depression. 4,101,676, Cl. 424-330.000.
- Clark, Malcolm D. Manual control apparatus. 4,100,816, Cl. 74-89.140.
- Clark, Morris E.: *See—*
  - Larson, Harold V.; and Clark, Morris E., 4,101,636, Cl. 423-305.000.
- Clark, Ross Ruel: *See—*
  - Craig, Edwin D.; and Clark, Ross Ruel, 4,101,742, Cl. 179-100.10C.
- Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, to Schering Aktiengesellschaft. Oral dosage form for X-ray contrast media containing a pharmaceutically acceptable base and method of use thereof. 4,101,647, Cl. 424-5.000.
- Clay, Robert A. Shot peening process. 4,100,782, Cl. 72-53.000.
- Clayson N.V.: *See—*
  - Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.
- Clayton, Lorimer, Jr.; and Livaditis, Elias J., to Scientific-Atlanta, Inc. Threshold extension FM demodulator apparatus for wide band width FM signals. 4,101,837, Cl. 325-347.000.
- Clemar Manufacturing Corporation: *See—*
  - Ruggles, Richard L.; and Panday, Vinod, 4,101,786, Cl. 307-38.000.
- Clemmer Industries (1964) Limited: *See—*
  - Meyers, Earl, 4,100,645, Cl. 16-2.000.
- Cline, Harvey E.: *See—*
  - Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
- CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG: *See—*
  - Fricke, Jobst; and Reuter, Helmut, 4,101,840, Cl. 330-127.000.
- Coal Industry (Patents) Limited: *See—*
  - Hodgkinson, John Hedley, 4,101,173, Cl. 299-33.000.
  - Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, 4,101,413, Cl. 208-8.000.
- Cohen, Nathan. Device for preventing unintended unlocking of automobile car doors. 4,101,155, Cl. 292-347.000.
- Coispeau, Gerard Emile Edgard, to Produits Chimiques Ugine Kuhlmann. 3-Trifluoromethyl-4-phenyl-pyrazolium azo dyestuffs. 4,101,540, Cl. 260-147.000.
- Colasanti, Arduino; Cachia, Josef M.; and Arff, Heino, to Allied Chemical Corporation. Friction dampened pendulum sensor. 4,101,093, Cl. 242-107.40A.
- Cole, Bryon M.: *See—*
  - Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., 4,101,959, Cl. 364-200.000.
- Colein, Bernard Albert Victor: *See—*
  - Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
- Colgate-Palmolive Company: *See—*
  - Bonk, Joseph P., 4,101,026, Cl. 206-205.000.
  - Hernandez, John Michael, 4,100,922, Cl. 128-284.000.
  - Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
  - Schaar, Charles H., 4,100,921, Cl. 128-284.000.
- Collier, Ben C. Socket for wedge base bulbs. 4,101,187, Cl. 339-59.00L.
- Collin, David Trevor: *See—*
  - Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, 4,101,579, Cl. 260-559.00R.
- Collins, Floyd K., to GTE Sylvania Incorporated. Shielded cathode support structure. 4,101,801, Cl. 313-417.000.
- Collins, George L.: *See—*
  - Costanza, John R.; and Collins, George L., 4,101,399, Cl. 204-159.190.
- Colville, William T.: *See—*
  - Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.
- Combustion Engineering, Inc.: *See—*
  - Chayes, Norman Chanine, 4,100,889, Cl. 122-510.000.
- Combustion Unlimited Incorporated: *See—*
  - Straitz, John F., III, 4,101,257, Cl. 431-15.000.
  - Straitz, John F., III, 4,101,261, Cl. 431-202.000.
- Commissariat a l'Energie Atomique: *See—*
  - Berniolles, Jean-Marie; and Jogand, Patrick, 4,101,377, Cl. 176-40.000.
  - Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
  - d'Andrea, Felix; and Minjolle, Louis, 4,100,881, Cl. 118-319.000.
  - Hilaire, Pierre; and Lonchampt, Georges, 4,101,407, Cl. 204-251.000.
- Commonwealth Scientific and Industrial Research Organization: *See—*
  - Guise, Geoffrey Bruce; and Jones, Francis William, 4,101,272, Cl. 8-127.600.
- Communications Satellite Corporation: *See—*
  - Uzunoglu, Vasil, 4,101,966, Cl. 364-841.000.
- Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer: *See—*
  - Failliot, Olivier, 4,101,359, Cl. 156-179.000.
- Compagnie Generale des Etablissements Michelin: *See—*
  - Durand, Pierre, 4,101,717, Cl. 429-15.000.
- Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
  - Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.

- Concorde Fibers, Inc.: *See—*
  - Norwood, David, 4,101,613, Cl. 264-40.300.
- Conner, Joe Derrell. Deer hunting stand attachment. 4,100,999, Cl. 182-122.000.
- Conners, John A.; and Posner, Hyman. Pipe line coupling system. 4,101,112, Cl. 251-148.000.
- Connors, Robert H.: *See—*
  - Klopfenstein, King L.; and Connors, Robert H., 4,100,984, Cl. 177-50.000.
- Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., to Conrey, Richard N.; and McQuaid, Phillip T. Electronic athletic equipment. 4,101,132, Cl. 273-29.00A.
- Conroy, Richard F. M.: *See—*
  - Smith, Jay, III; and Conroy, Richard F. M., 4,101,134, Cl. 274-23.00R.
  - Smith, Jay, III; and Conroy, Richard F. M., 4,101,135, Cl. 274-39.00A.
- Constien, Vernon G.: *See—*
  - Copeland, Claude T.; and Constien, Vernon G., 4,101,474, Cl. 260-13.000.
- Continental Oil Company: *See—*
  - Miller, Thomas R., 4,101,174, Cl. 302-11.000.
- Contour Chair-Lounge Co., Inc.: *See—*
  - Ferro, Arthur Charles, 4,101,168, Cl. 297-329.000.
- Contronic Controls Limited: *See—*
  - Humphries, Peter E., 4,101,875, Cl. 340-504.000.
- Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., to Marvin Glass & Associates. Method of making a doll head. 4,101,619, Cl. 264-156.000.
- Cook, James A.: *See—*
  - Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., 4,100,793, Cl. 73-118.000.
- Coombes, Michael: *See—*
  - Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.
- Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. Compositions of a polyphenylene ether resin and high molecular weight alkenyl aromatic resins modified with EPDM rubber. 4,101,503, Cl. 260-42.180.
- Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. High impact compositions of a polyphenylene ether resin and alkenyl aromatic resins modified with EPDM rubber. 4,101,504, Cl. 260-42.180.
- Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. Compositions of a polyphenylene ether resin and EPDM rubber-modified alkenyl aromatic resins having specified gel content. 4,101,505, Cl. 260-42.180.
- Copeland, Claude T.; and Constien, Vernon G., to Dow Chemical Company, The. Aqueous based epoxy slurry for forming a consolidated gravel pack. 4,101,474, Cl. 260-13.000.
- Coplin, John Frederick; Butler, Anthony; and Neal, Peter Frederick, to Rolls-Royce Limited. Matching thermal expansion of components of turbo-machines. 4,101,242, Cl. 415-134.000.
- Copper Range Company: *See—*
  - Mattila, Eugene W.; and Maher, Joseph M., 4,101,141, Cl. 279-19.000.
- Corbett, John M.: *See—*
  - Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.
- Corll, James A. Exercising apparatus. 4,101,136, Cl. 272-97.000.
- Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, to Metallgesellschaft Aktiengesellschaft. Tubular heater for cracking hydrocarbons. 4,101,376, Cl. 176-39.000.
- Corrigan, John H. Treatment of commodities through contact with fluid media. 4,100,682, Cl. 34-22.000.
- Corsaro, Vincent A.; and Gutbier, Ernst A., to Western Electric Co., Inc. Soldering method and apparatus utilizing dual solder waves of different variable velocities. 4,101,066, Cl. 228-180.00R.
- Cossin, George E. Settling basin sampler. 4,100,805, Cl. 73-421.00B.
- Costanza, John R.; and Collins, George L., to Celanese Corporation. Production of solvent resistant brominated and/or chlorinated aromatic polyester fibrous materials. 4,101,399, Cl. 204-159.190.
- Costes, Michel Leon; and Hoyle, James Franklin, to International Business Machines Corporation. Test circuit for a protective coupler. 4,101,743, Cl. 179-175.000.
- Coudreuse, Michel: *See—*
  - Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.
- Coupek, Jiri: *See—*
  - Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.
- Cox, Calvin Howard, to Bell-Fruit Manufacturing Company Limited. Gaming machines. 4,101,129, Cl. 273-143.00R.
- CPC International Inc.: *See—*
  - Edwards, Larry W., 4,101,680, Cl. 426-96.000.
- Craig, Edwin D.; and Clark, Ross Ruel, to Craig, Edwin D. Audio message system with programmer. 4,101,742, Cl. 179-100.10C.
- Craig, Paul M. Support column with ceiling thrusters. 4,101,036, Cl. 211-86.000.
- Craig, Timothy Philip; and Stimple, James Roy, to Motorola, Inc. Sectored antenna receiving system. 4,101,836, Cl. 325-302.000.
- Crain, Harry M.: *See—*
  - Poole, Lynn A.; and Crain, Harry M., 4,101,839, Cl. 328-165.000.
- Crane, Roy B., to Keene Corporation. Fluorescent fixture. 4,101,956, Cl. 362-217.000.
- Crawford, John, to Chevron Research Company. Composition comprising a mixture of the zinc salts of O,O-di(primary and secondary) alkyldithiophosphoric acids. 4,101,428, Cl. 252-32.70E.
- Crenshaw, Ronnie R.; and Partyka, Richard A., to Bristol-Myers Company. 1,2,3-Thiadiazole amides. 4,101,548, Cl. 544-284.000.
- Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, to Oxy Metal Industries Corporation. Composition for electrodeposition of metal deposits, its method of preparation and uses thereof. 4,101,387, Cl. 204-43.00T.
- Crewe, Albert V.: *See—*
  - Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., 4,101,813, Cl. 315-370.000.
- Crews, Michael R.; and Thiele, Gary A., to United States of America, Navy. Modified T-bar fed slot antenna. 4,101,900, Cl. 343-789.000.
- Cromie, Harry W., to Medical Engineering Corp. Package for prosthetic heart valve or the like. 4,101,031, Cl. 206-438.000.
- Crossley, William James: *See—*
  - Sanders, Richard Norman; and Crossley, William James, 4,101,930, Cl. 358-183.000.
- Crowe, Sam R.: *See—*
  - Gray, Tommy L.; and Crowe, Sam R., 4,100,812, Cl. 73-732.000.
- Crowley, Ralph P., to Phillips Petroleum Company. Solvent deasphalting. 4,101,415, Cl. 208-45.000.
- Crum, James R. Carburetor, kit and tool for use therein. 4,100,663, Cl. 29-156.40R.
- CTS Corporation: *See—*
  - Van Benthuysen, John D., 4,101,864, Cl. 338-183.000.
- Culbertson, Richard; and Klucznik, Paul J., to General Electric Company. Integral storage assembly for detachable power cords. 4,101,089, Cl. 242-85.100.
- Cullen, Donald E.; and Reeder, Thomas M., to United Technologies Corporation. Differential surface acoustic wave transducer. 4,100,811, Cl. 73-654.000.
- Cummins Engine Company, Inc.: *See—*
  - Timour, Sune E.; and Littrell, Thomas D., 4,101,003, Cl. 184-106.000.
- Cunningham, Arthur L.; and Mathai, John, to Sherwin-Williams Company, The. Moisture curing polymers prepared from polyfunctional isocyanates and a dioxazabicyclo octane. 4,101,527, Cl. 528-73.000.
- Cupery, Willis Eli: *See—*
  - Baude, Frederic John; and Cupery, Willis Eli, 4,101,669, Cl. 424-286.000.
- Currall, John Josiah, to Weathershields Limited. Opening roof assemblies for vehicles. 4,101,161, Cl. 296-137.00H.
- Curran, James Hall, to Spray Engineering Company. Two-fluid spray nozzle producing fine atomization of liquid. 4,101,073, Cl. 239-14.000.
- Cuscurida, Michael; and Speranza, George P., to Texaco Development Corp. Urethane catalyst. 4,101,462, Cl. 521-115.000.
- Cutler-Hammer, Inc.: *See—*
  - Josemans, Leonardus J.; and Swessel, John A., Jr., 4,101,749, Cl. 200-317.000.
- Cyprus Metallurgical Processes Corporation: *See—*
  - Peters, Mark A.; and Johnson, Robert K., 4,101,315, Cl. 75-104.000.
- Cyran, Robert E.: *See—*
  - Solovieff, Paul G.; and Cyran, Robert E., 4,100,774, Cl. 70-380.000.
- Czechoslovenska akademie ved: *See—*
  - Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.
- Czerwinski, Eugene J., to Cerwin Vega, Inc. Device for increasing the compliance of a speaker enclosure. 4,101,736, Cl. 179-1.00E.
- Dahlstrom, Mark Sorensen; and Simon, Paul, to International Business Machines Corporation. Charge electrode assembly for ink jet printer. 4,101,906, Cl. 346-75.000.
- Daido Tokushuko Kabushiki Kaisha: *See—*
  - Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.
- Daiichi Seiyaku Co., Ltd.: *See—*
  - Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.
- Dalton, Richard K.: *See—*
  - White, Roger L.; and Dalton, Richard K., 4,101,256, Cl. 425-441.000.
- d'Andrea, Felix; and Minjolle, Louis, to Commissariat a l'Energie Atomique. Apparatus for applying a covering on heat-sensitive articles by means of a blowpipe. 4,100,881, Cl. 118-319.000.
- Dandrel, Francois; and Bouvier, Jean-Pierre. Delayed extinction control. 4,101,811, Cl. 315-200.00R.
- Dano, Tage Halfdan, to F. L. Smidth & Co. Cement manufacture. 4,101,337, Cl. 106-101.000.
- Danti, Bernard R.: *See—*
  - Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., 4,101,423, Cl. 210-494.00M.
- Dao, Tich T., to Signetics Corporation. Binary to multistate bus driver, receiver and method. 4,101,734, Cl. 178-68.000.
- Dassler, Adolf. Sports shoe. 4,100,685, Cl. 36-3.00B.
- Davern, John W.: *See—*
  - Vargo, Joseph, Jr.; and Davern, John W., 4,101,064, Cl. 227-53.000.
- Davey, John T.; and Kahn, Lawrence P., to Seco Manufacturing, Inc. Fire protection water supply valve. 4,100,933, Cl. 137-495.000.
- Davis, Bill G., to Jetco, Inc. Pressure ratio valve. 4,100,910, Cl. 123-196.00S.
- Davis, Farris L., to Bear Brand Hosiery Co. Method and apparatus for forming a combination garment and products thereof. 4,100,624, Cl. 2-409.000.
- Davis, Gerald L.; and Scott, Timothy C., to Sundstrand Corporation. Integrated controls assembly. 4,100,762, Cl. 62-160.000.

- Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., to Celanese Corporation. Polyester yarn of high strength possessing an unusually stable internal structure. 4,101,525, Cl. 528-309.000.
- Davis, Howard C.: *See—*
  - Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.
- Davis, William F.; and Pace, Wilson David, to Motorola, Inc. Start-to-run circuit for an electronic ignition system. 4,100,907, Cl. 123-148.00S.
- Davison, Sol: *See—*
  - Gergen, William P.; and Davison, Sol, 4,101,605, Cl. 260-873.000.
- Daxinger, Helmut, to Balzers Patent-und Beteiligungs-Aktiengesellschaft. Coating composition for a light transmitting absorbing coating on substrates. 4,101,200, Cl. 350-166.000.
- Day, Clive Richard: *See—*
  - Midwinter, John Edwin; and Day, Clive Richard, 4,101,305, Cl. 65-145.000.
- Dazey Products Co.: *See—*
  - Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., 4,100,917, Cl. 128-66.000.
- DBX, Inc.: *See—*
  - Blackmer, David E.; and Jaeger, C. Rene, 4,101,849, Cl. 333-14.000.
- Deabriges, Jean: *See—*
  - Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.
- Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., to Labofina S.A. Hydrogenation process of olefin polymers for producing white oils. 4,101,599, Cl. 260-683.900.
- DeBoise, Thomas W.: *See—*
  - Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., 4,101,288, Cl. 23-288.00B.
- Decoene, Frans J. G. C.: *See—*
  - Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.
- Deeg, Emil W.: *See—*
  - Krohn, David A.; and Deeg, Emil W., 4,101,302, Cl. 65-30.00R.
- Deem, Mary Lease; and Stueben, Kenneth Charles, to Union Carbide Corporation. Aldol reactions with bifunctional co-catalysts. 4,101,586, Cl. 260-593.00R.
- Deere & Company: *See—*
  - Honnold, Darrel Lee, 4,100,971, Cl. 172-547.000.
- De Freitas, Richard E., to Hybrid Systems Corporation. Multiple state responsive delta-sigma converter and delay line. 4,101,881, Cl. 340-347.00R.
- Dehler, William H., to Boeing Company, The. Corrosion detector. 4,101,828, Cl. 324-65.00R.
- Delano, Charles George. Technique for running casing. 4,100,968, Cl. 166-315.000.
- Delecourt, Robert Louis Felix: *See—*
  - Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
- DeLuca, John P.: *See—*
  - Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, 4,101,287, Cl. 23-288.00K.
- DeMarinis, Robert M.; and Weisbach, Jerry A., to SmithKline Corporation. Cephamycins as antibacterial agents. 4,101,657, Cl. 424-246.000.
- Demchuk, Alexandr Fedorovich: *See—*
  - Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
- Demizu, Hiromi: *See—*
  - Mochizuki, Nobuo; and Demizu, Hiromi, 4,100,884, Cl. 118-653.000.
- De Munari, Delio. Installation for the production of energy which utilizes a source of heat or natural thermic differences in level. 4,100,744, Cl. 60-651.000.
- Demyanets, Vladimir Grigorievich: *See—*
  - Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
- Deneke, Ulfert: *See—*
  - Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.
- Denison, Dean R.; and Kren, George J., to Perkin-Elmer Corporation, The. Fluid flow indicator and flow switch. 4,101,874, Cl. 340-606.000.
- Denkinger, Marian C.; and Batova, Kemal. Cushion leveler for tables and chairs. 4,101,106, Cl. 248-188.900.
- Dennstadt, Heinz; and Baum, Walter, to USM Corporation. Continuous leather processing machine. 4,100,772, Cl. 69-47.000.
- Depoutot, Michel: *See—*
  - Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.
- Deribas, Andrei Andreevich: *See—*
  - Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
- Derrick, Danny O'Brian: *See—*
  - Ruff, George Robert; and Derrick, Danny O'Brian, 4,100,668, Cl. 29-523.000.
- Desai, Arvind: *See—*
  - Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.
- Destron, Inc.: *See—*
  - Stone, David E., 4,101,805, Cl. 315-74.000.
- Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Automatic digital circuit for generating chords in a digital organ. 4,100,831, Cl. 84-1.010.
- Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
  - Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, 4,101,570, Cl. 260-502.00R.
- Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,101,591, Cl. 260-649.00F.
- Diana, Silvio. Precast building structure. 4,100,705, Cl. 52-82.000.
- DiCenzo, Guy J. Shelving structure. 4,101,105, Cl. 248-158.000.
- Diederich, Gerd: *See—*
  - Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.
- Dieffenbach, Percy; and Zon, Louis, to American Technical Industries, Inc. Cone like sheet for Christmas tree. 4,101,697, Cl. 428-9.000.
- Diehl, Robert Eugene: *See—*
  - Lutz, Albert William; and Diehl, Robert Eugene, 4,101,582, Cl. 260-574.000.
- Diesel Kiki Co., Ltd.: *See—*
  - Mori, Koichi, 4,100,890, Cl. 123-140.00R.
- Dietrich, Gunter, to Rahdener Maschinenfabrik August Kolbus. Methods of an apparatus for wrapping jackets around books. 4,100,639, Cl. 11-1.00R.
- Dietrich, Walter; and Bauer, Manfred, to Robert Bosch GmbH. Method and apparatus for erecting folded blanks. 4,100,843, Cl. 93-53.00M.
- Difiglio, Joseph J.; and George, Richard W., to Abbott Laboratories. Multiple bead dispenser for diagnostic assay. 4,101,284, Cl. 23-259.000.
- Digital Equipment Corporation: *See—*
  - Lawson, Roger E.; and Richesson, Maurice A., 4,101,969, Cl. 364-900.000.
- Dillenbeck, Warren H. Heat exchange system. 4,100,963, Cl. 165-17.000.
- Dimensional Development Corporation: *See—*
  - Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,101,210, Cl. 353-7.000.
- Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., to RCA Corporation. Television synchronizing apparatus. 4,101,926, Cl. 358-17.000.
- Doane, Tuthill. Portable camp stove. 4,100,912, Cl. 126-43.000.
- Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie KG: *See—*
  - Ulbrich, Horst, 4,101,648, Cl. 424-9.000.
- Dr. Johannes Heidenhain GmbH: *See—*
  - Nelle, Gunther, 4,101,764, Cl. 250-237.00G.
- Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts: *See—*
  - Patzschke, Hans-Peter; and Gobel, Armin, 4,101,495, Cl. 260-29.7NR.
- Dokoupil, Jiri. Method and apparatus for flexibilizing leather. 4,100,771, Cl. 69-33.000.
- Dolbear, Geoffrey E., to Occidental Petroleum Corporation. Process for hydrogenation of hydrocarbon tars. 4,101,416, Cl. 208-108.000.
- Dolomanov, Ljudvig Alexandrovich: *See—*
  - Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
- Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., to Informer, Inc. Terminal display and storage system. 4,101,959, Cl. 364-200.000.
- Domtar Inc: *See—*
  - Buck, Stanley Edward, 4,101,068, Cl. 229-35.000.
- Doner, John T., to Whirlpool Corporation. Door interlock system for microwave oven. 4,101,750, Cl. 219-10.55C.
- Donnelly, James E.: *See—*
  - Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., 4,100,791, Cl. 73-37.700.
- Dooley, Joseph: *See—*
  - Masson, John Richard; and Dooley, Joseph, 4,101,684, Cl. 426-625.000.
- Doolin, Wendell M.: *See—*
  - Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., 4,100,961, Cl. 164-180.000.
- Dorffel, Jorg; Andrejewski, Werner; and Biethan, Uwe, to Chemische Werke Huls Aktiengesellschaft. Highly pigmentable, liquid coating compositions. 4,101,496, Cl. 260-31.20R.
- Dorp, Walter Vom; Ritter, Hans Georg; and Witteck, Fritz, to Mannes-

mann Aktiengesellschaft. Feed mechanism for pilger rolling mills. 4,100,786, Cl. 72-252.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Protective hydrophobic and oleophilic coating for aluminum products. 4,101,346, Cl. 148-6.270.

Doss, Daniel L.; and Melander, Robert A., to Owatonna Tool Company. Instrument for testing a breakerless ignition system. 4,101,822, Cl. 324-16.00R.

Doss, Richard C.; and Walton, Edward L., to Phillips Petroleum Company. Sealant based on mixture of unsaturated and hydrogenated block copolymers. 4,101,482, Cl. 260-27.0BB.

Doss, Richard C., to Phillips Petroleum Company. Sealant based on thermoplastic elastomer and mixed modifying resins. 4,101,484, Cl. 260-27.0BB.

Dotzer, Richard; and Stoger, Klaus, to Siemens Aktiengesellschaft. Methods of coating and surface finishing articles made of metals and their alloys. 4,101,386, Cl. 204-32.00R.

Doub, Leonard: *See—*

Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, 4,101,661, Cl. 424-266.000.

Dove, Douglas J. A., to Interstore Transfer Specialists, Inc. Containers for transferring merchandise between distribution service centers and retail stores, while security sealed in either an expanded or a reduced volume configuration. 4,101,052, Cl. 229-23.00R.

Dow Chemical Company, The: *See—*

Copeland, Claude T.; and Constien, Vernon G., 4,101,474, Cl. 260-13.000.

Frenier, Wayne W.; and Settineri, William J., 4,101,438, Cl. 252-151.000.

Frevel, Ludo K.; and Kressley, Leonard J., 4,101,451, Cl. 252-465.000.

Havens, Carl B., 4,101,614, Cl. 264-40.600.

Mixan, Craig E.; and Goralski, Christian T., 4,101,546, Cl. 544-408.000.

Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.

Small, Hamish; and Stevens, Timothy S., 4,101,460, Cl. 521-28.000.

Dow Corning Corporation: *See—*

Brill, Alfred P., III, 4,100,627, Cl. 3-36.000.

Dowa Mining Co., Ltd.: *See—*

Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, 4,101,286, Cl. 23-283.000.

Dozier, Donald P. Quick opening lock assembly for doors and method. 4,101,153, Cl. 292-92.000.

Drapaljuk, Vladislav Vitalievich: *See—*

Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.

Drapeau, Donald R., to Hi-G Incorporated. Miniature relay. 4,101,855, Cl. 335-106.000.

Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., to Wehr Corporation. Flow control unit for air distribution system. 4,100,938, Cl. 137-625.310.

Dresser Industries, Inc.: *See—*

Barnes, Casper W., Jr., 4,100,927, Cl. 137-9.000.

Driesen, Gerard M. V.: *See—*

Gomperts, Robert J.; and Driesen, Gerard M. V., 4,101,829, Cl. 324-126.000.

Drozdov, Jury Anatolievich: *See—*

Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.

Druzhaev, Jury Avraamovich: *See—*

Bobrov, Vladimir Timofeevich; Druzhaev, Jury Avraamovich; and Lebedeva, Nelli Alexandrovna, 4,100,809, Cl. 73-638.000.

DSO "Cherna Metalurgia": *See—*

Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.

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Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich, 4,101,725, Cl. 13-18.000.

Duffy, Richard J.; and Rodden, Philip J., to USM Corporation. Apparatus for making locking nuts. 4,100,882, Cl. 118-620.000.

Dumbeck, Robert F., to Rexnord Inc. Load monitoring apparatus and method. 4,101,831, Cl. 324-166.000.

Dumont, Louis: *See—*

Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,101,307, Cl. 71-88.000.

DuNah, Richard E., to Precision Lamp. Ornamental article with illuminated display. 4,101,955, Cl. 362-104.000.

Duncan, Robert, to Westinghouse Electric Corp. Process for welding corner cells in fuel assembly grids. 4,101,752, Cl. 219-91.200.

Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, to Abbott Laboratories. Aminotetralins and use in inducing anesthesia. 4,101,677, Cl. 424-330.000.

Dunning, Richard E.; and Rampelberg, Victor H., to Avery International Corp. Elastomeric reflective metal surfaces. 4,101,698, Cl. 428-31.000.

Du Pont de Nemours, E. I., and Company: *See—*

Baude, Frederic John; and Cupery, Willis Eli, 4,101,669, Cl. 424-286.000.

Larry, John Robert, 4,101,708, Cl. 428-432.000.

Magel, Bernard, 4,100,725, Cl. 57-140.00J.

Marcus, Sanford Morton, 4,101,710, Cl. 428-472.000.

Ochomogo, Oscar Rene, 4,101,308, Cl. 71-93.000.

Smathers, Donald Lee, 4,101,577, Cl. 260-561.00R.

Titone, Simone Charles, 4,100,770, Cl. 66-193.000.

Durand, Francois. Hydrostatic braking device for vehicles running downhill. 4,101,012, Cl. 188-290.000.

Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Electrochemical generators with a sedimentation bed and divergent feed. 4,101,717, Cl. 429-15.000.

Duriez, Jean; and Evin, Jean. Process for the control and regulation of the speed of a mobile. 4,101,013, Cl. 187-29.00R.

Durkin, Joseph A.: *See—*

Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., 4,101,560, Cl. 260-348.290.

Durr, Ernst, to Kolle, Fritz. Electrical switching relay construction and housing therefor. 4,101,856, Cl. 335-135.000.

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Zawacki, Joseph H.; and Dutton, John P., 4,100,781, Cl. 72-41.000.

Dvorak, Jarda: *See—*

Kober, Marvin; and Dvorak, Jarda, 4,100,670, Cl. 29-564.100.

Dworsky, Lawrence Noah; and Whalin, Jeffery Alden, to Motorola, Inc. UHF isolator using stacked conductor sheets. 4,101,850, Cl. 333-24.200.

Dyachkovsky, Fridrikh Stepanovich: *See—*

Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

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Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.

Dynamit Nobel Aktiengesellschaft: *See—*

Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, 4,101,620, Cl. 264-177.00R.

Kotzsch, Hans-Joachim; Muller, Gerhard; and Vahlensieck, Hans-Joachim, 4,101,397, Cl. 204-158.0HA.

Wienand, Michael; and Juch, Ernst, 4,101,689, Cl. 427-122.000.

E & E Specialties, Inc.: *See—*

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E. R. Squibb & Sons, Inc.: *See—*

Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., 4,101,723, Cl. 544-360.000.

Earley, Donald M.: *See—*

Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.

Earth Pack, Inc.: *See—*

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East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., to Stone & Webster Engineering Corporation. Impact energy absorbing pipe restraints. 4,101,117, Cl. 267-136.000.

East, George H., Jr.: *See—*

Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.

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Allen, Robert F., 4,101,325, Cl. 96-48.00R.

Barkey, Kenneth T., 4,101,326, Cl. 96-67.000.

Kayson, Walter, 4,101,211, Cl. 355-3.0DD.

Lambeth, David Noel, 4,101,947, Cl. 360-114.000.

Thomas, William A., Jr., 4,101,086, Cl. 242-18.0PW.

Ebihara, Heichachiro; and Yamada, Takashi, to Citizen Watch Company Limited. Shift register with reduced number of components. 4,101,790, Cl. 307-221.00C.

Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, to Robert Bosch GmbH. Fuel injection system. 4,100,904, Cl. 123-139.0AW.

Eckhardt, Wolfgang: *See—*

Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, 4,101,672, Cl. 424-301.000.

Ederati, Richard M.; and Brown, William J., to Caterpillar Tractor Co. Steering column adjustment means. 4,101,147, Cl. 280-775.000.

Edwards, Aubrey John. Loudspeaker harness. 4,101,109, Cl. 248-317.000.

Edwards, Douglas Cameron; and Walker, John, to Polysar Limited. Mineral oil compositions with an isobutylene polymer containing bound 2,6-di-t-butyl phenol groups. 4,101,434, Cl. 252-52.00R.

Edwards, James H.: *See—*

Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., 4,101,423, Cl. 210-494.00M.

Edwards, Larry W., to CPC International Inc. Co-crystallization of dextrose and sucrose on cereal products. 4,101,680, Cl. 426-96.000.

Ekman, Adolphe. Device for indicating speed levels for motor vehicles. 4,101,870, Cl. 340-53.000.

Ekstrom, Olov: *See—*

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Electricite de France, Service National: *See—*

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Electronics Corporation of America: *See—*

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Elek, Sandor: *See—*

Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvan, 4,101,552, Cl. 260-285.500.

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Mago nee Karacsony, Erzsebet; Borsi, Jozsef; Tardos, Laszlo; Kiraly, Ildiko; Elek, Sandor; and Elekes, Istvao, 4,101,552, Cl. 260-285.500.

Elitex Koncern textilniho strojirenstvi: *See—*

Resch, Josef; Matuska, Jan; and Trejtnar, Jindrich, 4,100,945, Cl. 139-291.00C.

Elliott Brothers (London) Limited: *See—*

Richmond, Michael; and Prichard, Richard Michael Hesketh, 4,101,933, Cl. 358-254.000.

Elliott, Roger Michael, to BSP International Foundations Limited. Drop hammers. 4,100,977, Cl. 173-134.000.

Elzinga, Johannes Mattheus; and Sondern, Albertus Derk, to U.S. Philips Corporation. X-ray system having a driving mechanism for an X-ray source and an X-ray detector. 4,101,774, Cl. 250-402.000.

Emery Industries, Inc.: *See—*

Lamont, James; and Braun, Robert J., 4,101,422, Cl. 210-84.000.

Emhart Industries, Inc.: *See—*

Solovieff, Paul G.; and Cyran, Robert E., 4,100,774, Cl. 70-380.000.

EMI Limited: *See—*

LeMay, Christopher Archibald Gordon; and Randall, Robert Paul, 4,101,773, Cl. 250-401.000.

Lill, Brian Herbert, 4,101,768, Cl. 250-360.000.

Emil Wohlhaupter u. Co.: *See—*

Wohlhaupter, Gerhard, 4,101,239, Cl. 408-182.000.

Enders, Edgar; Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. N-aryl-N'-(2,3-dihalogeno-alkanoyl)-ureas. 4,101,575, Cl. 260-553.00E.

Endlich, Wilhelm: *See—*

Muller, Dieter; Endlich, Wilhelm; and Kugler, Siegfried, 4,100,954, Cl. 151-41.700.

Endress & Hauser GmbH & Co.: *See—*

Schurr, Peter, 4,101,865, Cl. 340-1.00L.

Engdahl, Paul D. Peak-recording accelerometer. 4,100,807, Cl. 73-492.000.

Engelhardt, Friedrich: *See—*

Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.

Engler, Maynard F.: *See—*

Kircher, Morton S.; and Engler, Maynard F., 4,101,410, Cl. 204-282.000.

English Clays Lovering Pochin & Co. Ltd.: *See—*

Webster, John David; Wilkinson, Anthony Austin; and Tucker, Frederick George, 4,101,623, Cl. 264-270.000.

English Electric Company Limited, The: *See—*

Lee, Alan Stuart, 4,101,148, Cl. 285-13.000.

Englund, Gosta Roland; and Wincent, Karl Tommy, to Svenska Dataregister Aktiebolag. Matrix print head. 4,101,017, Cl. 400-124.000.

Ensslin, Frieder Hans; and Hazen, Christopher Stevens, to Sybron Corporation. X-ray tube current stabilizing circuit. 4,101,775, Cl. 250-409.000.

Epp Corp.: *See—*

Solmon, Donald C.; and Lennon, Donald J. J., 4,101,909, Cl. 346-153.000.

Epstein, Max; and Nalamwar, Ashok L., to Northwestern University. Microacoustic shear bulk wave device. 4,101,852, Cl. 333-30.00R.

Erickson, John W., to Kobe, Inc. Vortex jet pump. 4,101,246, Cl. 417-171.000.

Erikson, Carl A.: *See—*

Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.

Erismann, Hans; and Graf, Werner, to Graf & Cie. A.-G. Method and apparatus for producing a uniform textile fiber sliver. 4,100,649, Cl. 19-0.200.

Escher Wyss GmbH: *See—*

Barp, Bruno; and Holik, Herbert, 4,100,683, Cl. 34-124.000.

Estes, John H.: *See—*

Buinicky, Ernest P.; Durkin, Joseph A.; and Estes, John H., 4,101,560, Cl. 260-348.290.

Eston, Gary A.: *See—*

Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E., 4,100,686, Cl. 36-29.000.

Etat Francais: *See—*

Barbot, Jean Luc Y.; and Remon-Beauvais, Philippe M., 4,100,989, Cl. 180-127.000.

Etheringtoo, Clifford, to United Kingdom Atomic Energy Authority. Extrusion. 4,101,253, Cl. 425-79.000.

Ethyl Corporation: *See—*

LoMaglio, Lewis C., 4,101,057, Cl. 222-207.000.

Ettipio, Marion Carol. Artificial breast and nightgown incorporating same. 4,100,621, Cl. 2-114.000.

Eurich, James T.: *See—*

Barie, Walter P., Jr.; and Eurich, James T., 4,101,516, Cl. 528-112.000.

Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., to Vought Corporation. Apparatus for evaluating a bond. 4,100,808, Cl. 73-588.000.

Evans, Norol T., to Hughes Aircraft Company. Constant false alarm rate doppler radar system. 4,101,889, Cl. 343-7.700.

Evett, Joel. Shift lever and integral handbrake apparatus. 4,100,820, Cl. 74-489.000.

Evin, Jean: *See—*

Duriez, Jean; and Evin, Jean, 4,101,013, Cl. 187-29.00R.

Exxon Research & Engineering Co.: *See—*

Floyd, Joseph C.; and Plank, Don A., 4,101,511, Cl. 260-45.85T.

Horowitz, Harold S.; and Longo, John M., 4,101,716, Cl. 429-13.000.

Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., 4,101,557, Cl. 260-327.00E.

Sartori, Guido; and Savage, David W., 4,101,633, Cl. 423-228.000.

Shaub, Harold, 4,101,427, Cl. 252-32.70E.

Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, 4,101,287, Cl. 23-288.00K.

F. L. Smidth & Co.: *See—*

Dano, Tage Halfdan, 4,101,337, Cl. 106-101.000.

Groiss, Karl, 4,101,268, Cl. 432-80.000.

Touborg, Jorn, 4,101,336, Cl. 106-106.000.

Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, to General Tire & Rubber Company, The. Reaction products of hydrazides and certain unsaturated esters. 4,101,602, Cl. 260-839.000.

Facet Enterprises, Inc.: *See—*

Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.

Facon, Pierre Jean Alphonse, to Bertin & Cie. Swell abatement device. 4,100,747, Cl. 61-5.000.

Fahey, Darryl R., to Phillips Petroleum Company. Oxidative addition production of trans-halo-2(1,3-alkadienyl)bis(triethylphosphine) complexes of nickel(II), palladium(II), and platinum(II). 4,101,566, Cl. 260-439.00R.

Failliot, Olivier, to Compagnie des Etablissements de la Risle-Papeteries de Pont-Audemer. Composite material for use in covering walls, and a method of manufacturing same. 4,101,359, Cl. 156-179.000.

Faist, Walter, to Buhler-Miag GmbH. Housing for roll stands for grinding cereals or similar material. 4,101,083, Cl. 241-285.00R.

Fall, Herbert S.: *See—*

Adams, Steven M.; and Monroe, Joseph C., 4,101,178, Cl. 308-3.600.

Fantasia Confections, Inc.: *See—*

Lakatos, Charles, 4,100,830, Cl. 83-371.000.

Farfaglia, Silvio T.: *See—*

Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.

Farioli, Felice: *See—*

Ruoti, Vincenzo; and Farioli, Felice, 4,101,532, Cl. 528-311.000.

Farmer, Felta Carl, Jr., to RCA Corporation. Method and apparatus for measuring cathode emission slump. 4,101,823, Cl. 324-20.0CR.

Fasnacht, Floyd A., Jr., to United States of America, Energy. Vapor generator steam drum spray head. 4,100,888, Cl. 122-438.000.

Fateeva, Galina Vasilievna: *See—*

Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.

Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, to Friedrich Uhde GmbH. Apparatus for the fermentative conversion of a nutrient mixture by means of microorganisms. 4,101,384, Cl. 195-142.000.

Feder, Ernest, to United Technologies Corporation. Acoustic liner. 4,100,993, Cl. 181-213.000.

Federal Paper Board Co., Inc.: *See—*

Ganz, Robert H., 4,100,715, Cl. 53-48.000.

Feichter, Lowell H.; and Anderson, Albert R., to Aluminum Company of America. Thermocouple device. 4,101,343, Cl. 136-230.000.

Fein, Michael E.; and Salisbury, Charles W., to Owens-Illinois, Inc. Gas laser. 4,101,846, Cl. 331-94.50D.

Feinberg, Robert S.; and Selick, David A. Tennis ball rejuvenator and maintainer. 4,101,029, Cl. 206-315.00B.

Feldmann, Rainer: *See—*

Burzin, Klaus; and Feldmann, Rainer, 4,101,524, Cl. 528-288.000.

Feleus, Christiaan C., to Boeing Company, The. Hydrofoil fixed strut steering control. 4,100,876, Cl. 114-274.000.

Fell, Peter Howard: *See—*

Kent, Alan Hugh; and Fell, Peter Howard, 4,101,197, Cl. 350-96.170.

Fenton, John D.: *See—*

Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., 4,100,808, Cl. 73-588.000.

Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, to AGFA-Gevaert A.G. Automatic color printing apparatus. 4,101,217, Cl. 355-38.000.

Ferguson, Harry J. S., to Clamp-All Corp. Clamp assembly. 4,101,151, Cl. 285-236.000.

Ferguson, Robert H. Pizza cutting board. 4,100,676, Cl. 30-292.000.

- Fernaeus, Sven Evert; and Jonsson, Erik Anselm. Apparatus for manufacturing wave-shape building blocks. 4,101,255, Cl. 425-219.000.
- Ferro, Arthur Charles, to Contour Chair-Lounge Co., Inc. Adjustable chair. 4,101,168, Cl. 297-329.000.
- Ferrolegeringar Trollhatteverken AB: *See—*
  - Wallen, Jan, 4,101,316, Cl. 75-129.000.
- Fetisov, Valentin Ivanovich: *See—*
  - Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Aleaeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
- Fewkes, Harold L., to Little, Robert J.; and Morris, Ronald E., part interest to each. Water powered lift for speakers apparatus. 4,101,005, Cl. 187-17.000.
- FIAT Societa per Azioni: *See—*
  - Gaggiano, Nicola, 4,101,138, Cl. 277-11.000.
- Fiber Controls Corporation: *See—*
  - Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., 4,100,791, Cl. 73-37.700.
- Fichet-Bauche: *See—*
  - Guiraud, Francois, 4,100,647, Cl. 16-139.000.
  - Guiraud, Francois, 4,100,776, Cl. 70-303.00A.
- Fielding, John O.: *See—*
  - Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
- Fieser, Arthur H.; and Finney, Donald C., to A. F. Industries, Inc. White rust inhibitor. 4,101,328, Cl. 428-624.000.
- Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, to Institut Biokhimii I Fiziologii Mikroorganizmov. Biological ball mill. 4,101,079, Cl. 241-46.150.
- Finney, Donald C.: *See—*
  - Fieser, Arthur H.; and Finney, Donald C., 4,101,328, Cl. 428-624.000.
- Firestone Tire & Rubber Company, The: *See—*
  - Lohr, Delmar Frederick, Jr., 4,101,507, Cl. 260-45.80N.
- Fischer, Donald A., to Kalt Manufacturing Company. Forging machine. 4,100,638, Cl. 10-15.000.
- Fischer, Klaus; and Keul, Robert, to Saint-Gobain Industries. Neutral bronze glazings. 4,101,705, Cl. 428-220.000.
- Fischer, Robert L., to Caterpillar Tractor Co. Tree shear-pivoted secondary blade. 4,100,951, Cl. 144-309.0AC.
- Fischer, Robert L., to ACF Industries, Incorporated. Adjusting circuit for use in plasma arc cutting torch. 4,101,754, Cl. 219-121.00P.
- Fisher, Leonard Joseph: *See—*
  - Pantland, Frederick William; and Pantland, Ernest Francis, 4,100,931, Cl. 137-77.000.
- Fisli, Tibor, to Xerox Corporation. Process of making high speed multifaceted polygonal scanners. 4,101,365, Cl. 156-294.000.
- Fisons Limited: *See—*
  - Hoare, Gordon Harold; and Lovegrove, Brian Walter, 4,101,070, Cl. 233-1.00R.
  - Needham, Brian John; and Smith, Michael Arthur, 4,101,581, Cl. 260-566.00B.
- Fister, Aloysius J., to McGraw-Edison Company. Protector for electric circuits. 4,101,860, Cl. 337-159.000.
- Fitzmaurice, Colin; and Webster, Norman William Fletcher, to Graesser Salicylates Limited. Method of preparing chromium alkanoates. 4,101,567, Cl. 260-438.50R.
- Fleischer, Henry; and 105. Coupling device. 4,101,149, Cl. 285-55.000.
- Fleissner, Hans, to Vepa Aktiengesellschaft. Process and apparatus for the continuous dyeing or printing of endless lengths of materials. 4,101,270, Cl. 8-17.000.
- Flemming, Norbert A., to Polymer Corporation, The. Bar stock feed tube assembly. 4,100,827, Cl. 82-38.00A.
- Fletchic, Donald K.: *See—*
  - Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., 4,101,619, Cl. 264-156.000.
- Flexicore Co., Inc., The: *See—*
  - Shoe, Theodore W., 4,100,713, Cl. 52-648.000.
- Flint, John R.; and Rabindran, K. George, to Bell & Howell Company. Control system for an image detector. 4,101,763, Cl. 250-214.00R.
- Flint, John R., to Bell & Howell Company. Lamp control circuit. 4,101,808, Cl. 315-151.000.
- Florence, Judit Katalin, to Singer Company, The. Sorter with overlap operation. 4,101,968, Cl. 364-900.000.
- Floyd, Joseph C.; and Plank, Don A., to Exxon Research & Engineering Co. Novel bisphenol derivatives and uses thereof. 4,101,511, Cl. 260-45.85T.
- FMC Corporation: *See—*
  - Haley, Harold A., 4,101,625, Cl. 264-287.000.
  - Lotto, Ronald L., 4,101,363, Cl. 156-250.000.
  - Tucker, Albert R., 4,100,752, Cl. 61-86.000.
- Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, to Hoffmann-La Roche Inc. Aminophenyl esters of 5-carboxyalkyl barbituric acids. 4,101,549, Cl. 544-301.000.
- Focke, Heinz; and Bretthauer, Hans-Jurgen, to Focke & Pfuhl. Means for the production and filling of a parallelepipedic packet. 4,100,718, Cl. 53-234.000.
- Focke & Pfuhl: *See—*
  - Focke, Heinz; and Bretthauer, Hans-Jurgen, 4,100,718, Cl. 53-234.000.
- Forde, Arnold. Rescue apparatus for submerged vessels. 4,100,871, Cl. 114-51.000.
- Fordertechnik Streicher GmbH: *See—*
  - Plessing, Kurt, 4,101,113, Cl. 251-214.000.
- Fornoff, Louis Leonard: *See—*
  - Ambrosini, Ronald Frank; Anderson, Richard Alan; Fornoff, Louis Leonard; and Manchanda, Krishan Dayal, 4,101,631, Cl. 423-210.000.
- Foster, Harold M.: *See—*
  - Vacek, Lubomir; and Foster, Harold M., 4,101,558, Cl. 260-328.000.
- Fottner, Gunther; and Waibel, Gottfried, to AGFA-Gevaert A.G. Cleaning device for an electrostatic copier. 4,101,215, Cl. 355-15.000.
- Foucras, Jean: *See—*
  - Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
- Fox, Donald P.: *See—*
  - Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., 4,101,832, Cl. 324-227.000.
- Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., to Minnesota Mining and Manufacturing Company. Catalyst for condensation of hydrolyzable silanes and storage stable compositions thereof. 4,101,513, Cl. 526-193.000.
- Fox, Ray D. Nozzle refacing tool. 4,101,240, Cl. 408-211.000.
- Fox, Rita T.: *See—*
  - Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., 4,101,723, Cl. 544-360.000.
- Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, to Procter & Gamble Company, The. Low phosphate content glassy phosphate detergent compositions having optimum detergency. 4,101,455, Cl. 252-531.000.
- Frank Speno Railroad Ballast Cleaning Co., Inc.: *See—*
  - Panetti, Romolo, 4,100,795, Cl. 73-146.000.
- Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate: *See—*
  - Reinecke, Harry; and Bachmann, Gerhard, 4,100,868, Cl. 112-277.000.
- Franzl, Gertrude K. Adjustable safety seating device for bathtubs. 4,100,628, Cl. 4-185.00S.
- Frass, Hans Werner: *See—*
  - Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, 4,101,323, Cl. 96-35.000.
- Frass, Werner, to Hoechst Aktiengesellschaft. Light-sensitive copying compositions and photoinitiators contained therein. 4,101,327, Cl. 96-115.00P.
- Fredon, Pierre Andre Gaston. Locking devices. 4,100,777, Cl. 70-363.000.
- Freeman, Thomas E.: *See—*
  - Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E., 4,100,686, Cl. 36-29.000.
- Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Sulfonium compounds as corrosion inhibitors in aqueous acidic cleaning solutions. 4,101,438, Cl. 252-151.000.
- Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Cine camera. 4,101,209, Cl. 352-91.00C.
- Freudenthal, Frank D., to Altec Industries, Inc. Side load protection arrangement for rotating equipment. 4,100,973, Cl. 173-44.000.
- Frevel, Ludo K.; and Kressley, Leonard J., to Dow Chemical Company, The. Enhancement of promoted copper catalyst. 4,101,451, Cl. 252-465.000.
- Frey, Thomas M., to Xerox Corporation. Controlled-width-synchronization of recorded pixels. 4,101,943, Cl. 360-84.000.
- Frick Company: *See—*
  - Garland, Milton W., 4,100,757, Cl. 62-52.000.
- Fricke, Jobst; and Reuter, Helmut, to CMB Colonia Management und Beratungsgesellschaft mbH & Co. KG. Volume control arrangement for an electro-acoustic system. 4,101,840, Cl. 330-127.000.
- Friederich, Ernst, to Rohm GmbH. Method for injection molding of hollow shaped bodies from thermoplastic resins. 4,101,617, Cl. 264-93.000.
- Friedman, Michael: *See—*
  - Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.
- Friedrich Deckel Aktiengesellschaft: *See—*
  - Geiger, Michael, 4,100,821, Cl. 74-606.00R.
- Friedrich Uhde GmbH: *See—*
  - Faust, Uwe; Knecht, Rudolf; Lautenschlager, Wolfgang; and Wengeler, Wilhelm, 4,101,384, Cl. 195-142.000.
  - Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.
- Fries, Christopher. Portable greenhouse. 4,100,698, Cl. 47-29.000.
- Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, to Paul Gillet GmbH. Apparatus for purification of waste from combustion engines. 4,101,280, Cl. 23-288.0FC.
- Fritz Eichenauer, Firma: *See—*
  - Roller, Hanno, 4,101,760, Cl. 219-544.000.
- Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, to International Business Machines Corporation. Arrangement for absorbing vibrations. 4,101,008, Cl. 188-1.00B.
- Frost, Francis Edmund; and Mack, Robert. Pneumatic automatic screwfeeder. 4,101,054, Cl. 221-278.000.
- Fuji Photo Film Co., Ltd.: *See—*
  - Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, 4,101,311, Cl. 75-0.500.
  - Miyamoto, Akio; and Matsukawa, Hiroharu, 4,101,690, Cl. 427-150.000.

  - Oishi, Kengo; and Suzuki, Osamu, 4,101,096, Cl. 242-199.000.
  - Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,101,948, Cl. 360-137.000.
- Fujiike, Hiroshi: *See—*
  - Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
- Fujikura Cable Works, Ltd., The: *See—*
  - Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
- Fujikura, Masakuni; Kono, Tomio; Teral, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, to Daido Tokushuko Kabushiki Kaisha. Ferrite-austenite stainless steel castings having an improved erosion-corrosion resistance. 4,101,347, Cl. 148-38.000.
- Fujikura, Yoshiaki: *See—*
  - Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
- Fujimi Kenmazai Kogyo Co., Ltd.: *See—*
  - Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.
- Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, to Kumiai Chemical Industry Co., Ltd. Germicidal and acaricidal compositions. 4,101,670, Cl. 424-300.000.
- Fujimoto, Yasuo: *See—*
  - Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
- Fujimura, Toshio: *See—*
  - Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, 4,101,878, Cl. 340-310.00R.
- Fujishiro, Takeshi: *See—*
  - Kita, Toru; and Fujishiro, Takeshi, 4,101,403, Cl. 204-195.00S.
- Fujishiro, Yuji; and Ohta, Hideo, to Japan Society for Promotion of Machine Industry. Device for mounting resin plate onto plate cylinder. 4,100,854, Cl. 101-415.100.
- Fukuda, Shigeyoshi: *See—*
  - Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
- Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, to Nippon Mektron Kabushiki Kaisha. Method of manufacturing laminated buses. 4,101,361, Cl. 156-250.000.
- Fukui, Akio: *See—*
  - Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
- Fukukita, Hiroshi: *See—*
  - Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.
- Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, to Matsushita Electric Industrial Company. Ultrasonic probe. 4,101,795, Cl. 310-336.000.
- Fukunaga, Motoaki, to Glory Kogyo Kabushiki Kaisha. Coin jamming detecting device. 4,100,925, Cl. 133-3.00F.
- Fukuoka, Kenji, to Olympus Optical Co., Ltd. Coding system. 4,101,934, Cl. 358-261.000.
- Fuller, Clyde R.: *See—*
  - Shah, Pradeep L.; and Fuller, Clyde R., 4,101,351, Cl. 148-188.000.
- Furuya, Seiji; and Smartt, Roger H. Individual, disposable holders for cigarettes and dispensers thereof. 4,101,024, Cl. 206-102.000.
- G. C. Broach Company, The: *See—*
  - Broach, George C.; and Thurman, Donald W., 4,101,265, Cl. 432-29.000.
- G. T. Schjeldahl Company: *See—*
  - Adams, Richard C., 4,101,369, Cl. 156-510.000.
- Gablin, Kenneth A.; and Hansen, Larry J., to Nuclear Engineering Co., Inc. Safe transporation of hazardous materials. 4,100,860, Cl. 109-83.000.
- Gabor, Charles K., to Raymond Lee Organization, Inc., The. Paint roller and brush combination. 4,100,642, Cl. 15-114.000.
- GAF Corporation: *See—*
  - Khattab, Ghazi; and Naviello, Gerard P., 4,101,502, Cl. 260-40.00R.
- Gaggiano, Nicola, to FIAT Societa per Azioni. Gasket for internal combustion engines, incorporating locating pins. 4,101,138, Cl. 277-11.000.
- Gair, Albert W.: *See—*
  - Herbenar, Edward J.; and Gair, Albert W., 4,101,227, Cl. 403-27.000.
- Gaisser, Max: *See—*
  - Ott, Theodor; and Gaisser, Max, 4,100,636, Cl. 7-158.000.
- Gallagher, John Bernard: *See—*
  - Kindraka, James Alexander; and Gallagher, John Beroard, 4,101,539, Cl. 260-112.50R.
- Gallistel, Albert F.; and Lindenfelser, Jerome W., to Photo-Control Corporation. Four-up polaroid camera. 4,101,913, Cl. 354-122.000.
- Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich. Installation for explosion machining of articles. 4,100,783, Cl. 72-56.000.
- Gantke, Franz: *See—*
  - Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
- Ganz, Robert H., to Federal Paper Board Co., Inc. Bottle packaging machine. 4,100,715, Cl. 53-48.000.
- Gardipee, Walter E. Fisherman's knot tying jig. 4,101,152, Cl. 289-17.000.
- Gardner, Beth Ann: *See—*
  - Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.
- Gardner-Denver Company: *See—*
  - Wilkinson, Brendan Michael; and Belfiore, Erasmo, 4,100,982, Cl. 175-206.000.
- Garfinkel, Marvin: *See—*
  - Brown, Dale M.; and Garfinkel, Marvin, 4,101,924, Cl. 357-30.000.
- Garland, Milton W., to Frick Company. Closed circuit ammonia system for liquid heating from water. 4,100,757, Cl. 62-52.000.
- Garrison, Donald W.: *See—*
  - Reese, Robert O.; and Garrison, Donald W., 4,101,963, Cl. 364-705.000.
- Garrison, Judd F.: *See—*
  - Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., 4,101,059, Cl. 223-85.000.
- Garwin, Leo. Isotopically enriched helium-4. 4,101,375, Cl. 176-37.000.
- Gas- und Wassermesserfabrik AG: *See—*
  - Gass, Heinz, 4,100,803, Cl. 73-230.000.
- Gass, Heinz, to Gas- und Wassermesserfabrik AG. Apparatus for measuring the volume of a flowing fluid, particularly a gas in pipes. 4,100,803, Cl. 73-230.000.
- Gassman, Paul G., to Ohio State University Research Foundation, The. Alpha-methylthio-alpha-(2-aminophenyl) acetaldehyde diloweralkyl acetals. 4,101,583, Cl. 260-575.000.
- Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., to Caterpillar Tractor Co. Hydraulic conduit having pivoting and telescoping capability. 4,101,251, Cl. 417-313.000.
- Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., to Akzona Incorporated. Test apparatus. 4,100,796, Cl. 73-160.000.
- GB Fermentation Industries, Inc.: *See—*
  - Boidin, Philippe Gerard Marie-Joseph; Cassaigne, Raoul Louis Andre; Colein, Bernard Albert Victor; and Delecourt, Robert Louis Felix, 4,101,379, Cl. 195-62.000.
- Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, to Champion Products Inc. System for controlling the moisture content of flock in a flocking machine. 4,101,685, Cl. 427-8.000.
- Gebr. Marklin & Cie. GmbH: *See—*
  - Bos, Horst, 4,101,205, Cl. 350-289.000.
- Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, to Hoechst Aktiengesellschaft. Production of methyldichlorophosphane. 4,101,573, Cl. 260-543.00P.
- Geiger, Michael, to Friedrich Deckel Aktiengesellschaft. Multistage gear controlling mechanism. 4,100,821, Cl. 74-606.00R.
- Geisler, Phillip H.: *See—*
  - Wade, Jerry D.; and Geisler, Phillip H., 4,100,886, Cl. 119-98.000.
- Geiszler, Adolph Oscar: *See—*
  - Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.
- Geldner, Joachim: *See—*
  - Rones, Josef; and Geldner, Joachim, 4,101,437, Cl. 252-149.000.
- General Cable Corporation: *See—*
  - Schmidt, Gertraud A.; and Bopp, Louis A., 4,101,512, Cl. 260-45.95C.
- General Communications Co., Inc.: *See—*
  - Taylor, Frank D.; and Novotny, Ronald J., 4,101,835, Cl. 325-55.000.
- General Electric Company: *See—*
  - Alley, Robert P., 4,101,806, Cl. 315-86.000.
  - Anderson, Robert M.; and Hanson, James M., 4,101,953, Cl. 362-11.000.
  - Anthony, Thomas R.; Cline, Harvey E.; Fielding, John O.; and Erikson, Carl A., 4,101,759, Cl. 219-343.000.
  - Balchunas, Charles A., 4,101,729, Cl. 174-65.00R.
  - Bean, Charles P.; and Uzgiris, Egidijus E., 4,101,220, Cl. 356-105.000.
  - Brown, Dale M.; and Garfinkel, Marvin, 4,101,924, Cl. 357-30.000.
  - Bryans, Alexander Connor; Weinstein, Barry; Brookes, Neil Roger; and Vdoviak, John William, 4,100,732, Cl. 60-39.360.
  - Cooper, Glenn Dale; and Katchman, Arthur, 4,101,503, Cl. 260-42.180.
  - Cooper, Glenn Dale; and Katchman, Arthur, 4,101,504, Cl. 260-42.180.
  - Cooper, Glenn Dale; and Katchman, Arthur, 4,101,505, Cl. 260-42.180.
  - Culbertson, Richard; and Klucznik, Paul J., 4,101,089, Cl. 242-85.100.
  - Hallgren, John E., 4,101,519, Cl. 528-197.000.
  - Hirsch, Harold H.; and Rairden, John R., III, 4,101,713, Cl. 428-554.000.
  - Kimura, Shiro G., 4,101,294, Cl. 48-77.000.
  - Lupinski, John H.; and Gorowitz, Bernard, 4,100,883, Cl. 118-630.000.
  - Morais, Don, 4,101,809, Cl. 315-156.000.
  - Peterson, Marvin A., 4,101,487, Cl. 260-29.20N.
  - Rairden, John R., III, 4,101,714, Cl. 428-639.000.
  - Rairden, John R., III, 4,101,715, Cl. 428-652.000.
  - Sensabaugh, Paul F., 4,100,653, Cl. 24-3.00J.
  - Stutt, Charles A.; and Rankin, Richard W., 4,101,834, Cl. 325-42.000.
  - Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,101,693, Cl. 427-386.000.
  - Ziemba, Richard Thomas, 4,100,856, Cl. 102-206.000.

General-Electro Mechanical Corp.: *See—*
Vargo, Joseph, Jr.; and Davern, John W., 4,101,064, Cl. 227-53.000.
General Foods Limited: *See—*
Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.
General Motors Corporation: *See—*
Thune, Robert H., 4,100,828, Cl. 83-1.000.
General Tire & Rubber Company, The: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
Gentse, Mstislav Vladimirovich: *See—*
Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
Geophysical Systems Corporation: *See—*
Martin, Lincoln A., 4,101,867, Cl. 340-15.5TC.
George, Richard W.: *See—*
Difiglio, Joseph J.; and George, Richard W., 4,101,284, Cl. 23-259.000.
Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, to DSO "Cherna Metalurgia". Contact clamp for graphite electrodes. 4,101,186, Cl. 339-5.00S.
Geppert, Barbara; and Huth, Kurt, to Bellaplast GmbH. Laminated material of thermoplastic synthetic material, process of making and container closed therewith. 4,101,047, Cl. 220-258.000.
Gergen, William P.; and Davison, Sol, to Shell Oil Company. Thermoplasticpolyester/block copolymer blend. 4,101,605, Cl. 260-873.000.
Germani, Cesare, to Omita S.p.A. Method and apparatus for transferring the weft. 4,100,944, Cl. 139-439.000.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, 4,101,408, Cl. 204-272.000.
Gessinger, Gernot: *See—*
Bomford, Michael J.; and Gessinger, Gernot, 4,101,712, Cl. 428-547.000.
Gettings, Jacob D.: *See—*
Mowen, Robert P.; and Gettings, Jacob D., 4,100,862, Cl. 111-52.000.
GF Business Equipment, Inc.: *See—*
Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., 4,101,166, Cl. 297-304.000.
Gibson, Robert R., to Van Horne, William J. Caulking spout. 4,101,077, Cl. 239-598.000.
Gies, Rolf: *See—*
Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.
Gikow, Emanuel, deceased (by Gikow, Ida M., executrix); and Tilton, Richard S., to United States of America, Army. Tunable helical resonator. 4,101,854, Cl. 333-82.00B.
Gikow, Ida M., executrix: *See—*
Gikow, Emanuel, deceased; and Tilton, Richard S., 4,101,854, Cl. 333-82.00B.
Gildemeister AG: *See—*
Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, 4,100,671, Cl. 29-568.000.
Gillet, Roger: *See—*
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Gillette Company, The: *See—*
Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.
Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, to Texaco Development Corp. 2,2-Dialkylepoxides. 4,101,515, Cl. 252-182.000.
Glancy, John, to Indiana University Foundation. Dynamic orthotic knee extension assist device. 4,100,918, Cl. 128-80.00F.
Glimmer Security Systems Inc.: *See—*
Lurkis, Alexander; and Hill, John I., 4,101,876, Cl. 340-555.000.
Globin, Nikolai Kirillovich: *See—*
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Glory Kogyo Kabushiki Kaisha: *See—*
Fukunaga, Motoaki, 4,100,925, Cl. 133-3.00F.
Gobel, Armin: *See—*
Patzschke, Hans-Peter; and Gobel, Armin, 4,101,495, Cl. 260-29.7NR.
Goetsch, Henry E.; Cook, James A.; and Armstrong, Lee R., to United Technologies Corporation. Air/fuel regulator diagnostics for internal combustion engine. 4,100,793, Cl. 73-118.000.
Goetzewerke Friedrich Goetze AG: *See—*
Beyer, Horst; and Buran, Ulrich, 4,101,319, Cl. 75-252.000.
Goffe, William L.: *See—*
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Goldacker, Hubert: *See—*
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Golden, William R.: *See—*
Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.
Goldeo Wonder Limited: *See—*
Masson, John Richard; and Dooley, Joseph, 4,101,684, Cl. 426-625.000.
Goldesberry, John M.: *See—*
Morrison, Gary Eugene, 4,101,897, Cl. 343-715.000.
Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich. Device for epitaxial growing of semiconductor periodic structures from gas phase. 4,100,879, Cl. 118-49.100.
Goldstein, Norman A.: *See—*
East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Golladay, Steven D.: *See—*
Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., 4,101,813, Cl. 315-370.000.
Gomperts, Robert J.; and Driesen, Gerard M. V., to GTE International, Inc. Differential current detector. 4,101,829, Cl. 324-126.000.
Good, Wayne W., to Harter Corporation. Frame construction for a divider wall. 4,100,709, Cl. 52-239.000.
Goralski, Christian T.: *See—*
Mixan, Craig E.; and Goralski, Christian T., 4,101,546, Cl. 544-408.000.
Gorchev, Dimiter; and McGraw, John D., to Mitco Corporation. Induction ventilation system. 4,100,964, Cl. 165-40.000.
Gordon, Michael E., to Polaroid Corporation. I.D. cards. 4,101,701, Cl. 428-189.000.
Gorgerat, Jean Pierre, to Rueger S.A. Bimetallic temperature measuring device. 4,100,804, Cl. 73-363.900.
Gorowitz, Bernard: *See—*
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Goryo, Tadashi: *See—*
Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
Goss, Harold R.; Krutilla, Michael A.; and Doolin, Wendell M., to Acme-Cleveland Corporation. Foundry molding machine. 4,100,961, Cl. 164-180.000.
Gottschalk, Robert E.; and Mayer, Albert L., to Panavision, Incorporated. Illuminated ground glass for camera. 4,101,916, Cl. 354-219.000.
Gould Inc.: *See—*
Netzel, Philip C., 4,101,730, Cl. 174-75.00R.
Wilson, George A., 4,101,744, Cl. 200-50.0AA.
Gould, James S.; and Gould, Samuel, to Indicator Controls Corporation. Mounting bracket assembly for pedestrian traffic signal. 4,101,191, Cl. 339-125.00R.
Gould, Samuel: *See—*
Gould, James S.; and Gould, Samuel, 4,101,191, Cl. 339-125.00R.
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Mattimoe, George E.; and Gouveia, Michael P., 4,101,056, Cl. 222-26.000.
Gow Enterprises Limited: *See—*
Westerlund, G. Oscar, 4,101,406, Cl. 204-239.000.
Goyard, Pierre Jean-Marie, to International Standard Electric Corporation. Radar reconnaissance system for track vehicle recognition. 4,101,890, Cl. 343-8.000.
Graesser Salicylates Limited: *See—*
Fitzmaurice, Colin; and Webster, Norman William Fletcher, 4,101,567, Cl. 260-438.50R.
Graf & Cie. A.-G.: *See—*
Erismann, Hans; and Graf, Werner, 4,100,649, Cl. 19-0.200.
Graf, Werner: *See—*
Erismann, Hans; and Graf, Werner, 4,100,649, Cl. 19-0.200.
Grapes, Eugene F.: *See—*
Patterson, William W., III; and Grapes, Eugene F., 4,100,875, Cl. 114-251.000.
Gray, Tommy L.; and Crowe, Sam R., to Span Instruments. Dry pressure gauge with dampened needle movement. 4,100,812, Cl. 73-732.000.
Greif Bros. Corporation: *See—*
Santoni, Cesar, 4,101,156, Cl. 292-256.690.
Greig, John H., to MSI Electronics Inc. Mercury probe. 4,101,830, Cl. 324-158.00F.
Gretag Aktiengesellschaft: *See—*
Grossmann, Walter, 4,101,216, Cl. 355-35.000.
Gretler, Heinrich, to Bauer Kaba AG Sicherheits-Schliessyteme. Key with transverse slots and method of making same. 4,100,778, Cl. 70-406.000.
Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Apparatus for controlling the drive for hydraulically actuated high-voltage power circuit breakers. 4,101,746, Cl. 200-82.00B.

Grieser, Fred J., Jr.: *See—*
Grieser, Fred J., Sr.; and Grieser, Fred J., Jr., 4,100,637, Cl. 7-158.000.
Grieser, Fred J., Sr.; and Grieser, Fred J., Jr. Combination tool. 4,100,637, Cl. 7-158.000.
Griesfelder, Charles: *See—*
Baker, Richard G.; Vild, Joseph P.; Griesfelder, Charles; and Fox, Donald P., 4,101,832, Cl. 324-227.000.
Griffin, Warren H.: *See—*
Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., 4,101,467, Cl. 521-79.000.
Griffiths, Bernard L., to Atlas Foundry & Mfg. Co. Water cooling jacket for induction furnace water bushing. 4,101,726, Cl. 13-29.000.
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate. Apparatus for conserving energy in electrical appliances. 4,101,886, Cl. 165-14.000.
Grissinger, Glenn R., to Teledyne Industries, Inc. High speed bun production system. 4,100,848, Cl. 99-353.000.
Grist, Warren W., to Earth Pack, Inc. Earth working apparatus. 4,100,688, Cl. 37-117.500.
Groiss, Karl, to F. L. Smidth & Co. Rotary kiln with planetary cooler. 4,101,268, Cl. 432-80.000.
Groll, Manfred; and Bien, Hans-Samuel, deceased (by Bien, Else, administrator), to Bayer Aktiengesellschaft. Quinophthalone dyestuffs. 4,101,551, Cl. 260-283.0SA.
Grootjans, Jacques F. J.: *See—*
Debande, Guy F. S.; Cahen, Raymond N. M.; and Grootjans, Jacques F. J., 4,101,599, Cl. 260-683.900.
Gross, Jerome A. Expanding crimp tool for valved dispensers and the like. 4,100,869, Cl. 113-18.00R.
Grossmann, Walter, to Gretag Aktiengesellschaft. Method and apparatus for print exposure control. 4,101,216, Cl. 355-35.000.
Grotberg, Robert B. Vertical axle paddle motor. 4,101,244, Cl. 416-41.000.
Gruber, David P.: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, to Mannesmann Aktiengesellschaft. Treating a stream of molten metal. 4,100,959, Cl. 164-56.000.
GTE International, Inc.: *See—*
Gomperts, Robert J.; and Driesen, Gerard M. V., 4,101,829, Cl. 324-126.000.
GTE Sylvania Incorporated: *See—*
Buljan, Sergei-Tomislav, 4,101,616, Cl. 264-65.000.
Collins, Floyd K., 4,101,801, Cl. 313-417.000.
Kirby, Thomas J., 4,101,821, Cl. 323-119.000.
Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.
Guiraud, Francois, to Fichet-Bauche. Pivot device for doors of strong boxes, safes or the like. 4,100,647, Cl. 16-139.000.
Guiraud, Francois, to Fichet-Bauche. Combination lock for safes and the like. 4,100,776, Cl. 70-303.00A.
Guise, Geoffrey Bruce; and Jones, Francis William, to Commonwealth Scientific and Industrial Research Organization. Process for the treatment of wool with polyorganosiloxanes. 4,101,272, Cl. 8-127.600.
Gulf Research & Development Company: *See—*
Barie, Walter P., Jr.; and Eurich, James T., 4,101,516, Cl. 528-112.000.
Mitchell, Bruce Richard; and Swift, Harold Eugene, 4,101,417, Cl. 208-120.000.
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Gulko, Arnold G.; and Steinberg, Jacob H. Solar cells. 4,101,923, Cl. 357-30.000.
Gurevich, Grigory Aronovich: *See—*
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Gurwara, Sweet K.: *See—*
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Gutbier, Ernst A.: *See—*
Corsaro, Vincent A.; and Gutbier, Ernst A., 4,101,066, Cl. 228-180.00R.
Gutridge, Jack E.; and Marulic, Walter J., to Pullman Incorporated. Passageway between adjacent railway passenger car compartments. 4,100,857, Cl. 105-323.000.
Gyarmathy, Georg; and Pfenninger, Hans, to BBC Brown Boveri & Company Limited. Thermal power plant with compressed air storage. 4,100,745, Cl. 60-652.000.
H & F Faller Sales Corp. Ltd.: *See—*
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H. J. Langen & Sons Ltd.: *See—*
Langen, Marinus J. M., 4,101,020, Cl. 198-478.000.
Haag, Franz; and Bongartz, Paul, to MOTAN Gesellschaft mit beschrankter Haftung. Apparatus for mixing granulated and/or pulverous materials. 4,101,116, Cl. 366-142.000.
Haapala, Ray. Tier support system for fancy cakes. 4,101,232, Cl. 403-261.000.
Haarer, Dietrich: *See—*
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Haferl, Peter Eduard, to RCA Corporation. Side pincushion distortion correction circuit. 4,101,814, Cl. 315-371.000.
Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., to Facet Enterprises, Inc. Portable fluid transfer pump. 4,101,950, Cl. 361-203.000.
Haid, Erich: *See—*
Klose, Sigmar; Deneke, Ulfert; Haid, Erich; and Weimann, Gunter, 4,101,381, Cl. 195-99.000.
Hajduk, Marian Stanislaw, to Tendy Electronics Co. Single bit logic microprocessor. 4,101,967, Cl. 364-900.000.
Hakata, Masayuki, to Casio Computer Co., Ltd. Electronic calculator for determining biorhythm data. 4,101,962, Cl. 364-413.000.
Hale, William J.; Horst, William R.; and Walker, Donald A., to NCR Corporation. Method for writing and viewing magnetic human readable characters and viewing means therefor. 4,101,905, Cl. 346-74.100.
Haley, Harold A., to FMC Corporation. Method for making corrugated molecularly oriented plastic strapping. 4,101,625, Cl. 264-287.000.
Halker, Bruce B.: *See—*
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Hallcher, Richard C., to Monsanto Company. Electrolytic oxidative methyl-methyl coupling of cresol salts. 4,101,391, Cl. 204-59.00R.
Hallcher, Richard C.; and Baizer, Manuel M., to Monsanto Company. Process for electrolytic oxidative methyl-methyl coupling of cresol salts. 4,101,392, Cl. 204-59.00R.
Hallgren, John E., to General Electric Company. Polycarbonate equilibration method. 4,101,519, Cl. 528-197.000.
Hamel, Edmund, to OFA AG. Method of making a core yarn. 4,100,727, Cl. 57-160.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label printing apparatus. 4,100,852, Cl. 101-295.000.
Hammer, Henry H., to Twin Oaks Community. Hammock chair. 4,101,165, Cl. 297-273.000.
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Hanai, Ichiro, to Sony Corporation. Apparatus for reproducing high fidelity magnetic tapes from a master tape. 4,101,938, Cl. 360-16.000.
Hans Giesbert KG: *See—*
Sauer, Walter, 4,101,021, Cl. 198-668.000.
Hansen, Larry J.: *See—*
Gablin, Kenneth A.; and Hansen, Larry J., 4,100,860, Cl. 109-83.000.
Hansen, Roger M., to Stratabolt Corporation. Mine roof or rock bolt expansion anchor of the bail type. 4,100,748, Cl. 61-45.00B.
Hansenwinkle, Earl Dean; Kuanoni, Clement; and Wislocker, Frank, to Weyerhaeuser Company. Width adjusting thickness setting clamping system. 4,101,372, Cl. 156-580.000.
Hanson, James M.: *See—*
Anderson, Robert M.; and Hanson, James M., 4,101,953, Cl. 362-11.000.
Hanson, Marlin Marshall: *See—*
Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, 4,101,972, Cl. 365-29.000.
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Minami, Hiroshi; Harao, Norio; and Tsuneoka, Takuji, 4,101,766, Cl. 250-320.000.
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Kelley, Larry P.; and Hardy, Craig A., 4,101,925, Cl. 357-68.000.
Hargis, Robert L., to Aluminum Company of America. Method of cleaning filter bags in a system for effluent gas recycling and recovery from electrolytic cells for production of aluminum from aluminum chloride. 4,101,393, Cl. 204-67.000.
Harnish, James Ranck, to Borg-Warner Corporation. Check valve for heat pump systems. 4,100,935, Cl. 137-533.110.
Harp, James L., Jr., to United States of America, Army. Turbocompound engine with turbocharger control, 4,100,742, Cl. 60-602.000.
Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, to ABU Aktiebolag. Braking device in a non-rotary type fishing reel. 4,101,087, Cl. 242-84.20A.
Harris Corporation: *See—*
Wiggin, Joseph F., 4,101,932, Cl. 358-223.000.
Harris, Frederick John, to Olin Corporation. Controlling hardness of anchor bolt expansion sleeves. 4,100,834, Cl. 85-77.000.
Harrison, George W., to Team, Inc. Across the line plugging apparatus and method. 4,100,929, Cl. 137-15.000.
Hart, John Peter: *See—*
Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.
Harter Corporation: *See—*
Good, Wayne W., 4,100,709, Cl. 52-239.000.
Hartley, David; Lunts, Lawrence Henry Charles; and Collin, David Trevor, to Allen & Hanburys Limited. Phenethanolamine ethers. 4,101,579, Cl. 260-559.00R.
Hartley, Derald L.: *See—*
Gay, Arthur D.; Hartley, Derald L.; and Klekamp, William H., 4,101,251, Cl. 417-313.000.
Hartmann, Charles Harold, to Varian Associates, Inc. Ionization detector utilizing tritiated scandium with an acceptable tritium emanation rate at high temperature. 4,101,278, Cl. 23-232.00C.
Harvey, Gerald J., to William Printz Company, Inc. Electronic orsat for gas analysis. 4,100,790, Cl. 73-23.100.
Hasbro Development Corp.: *See—*
Smith, Jay, III; and Conroy, Richard F. M., 4,101,134, Cl. 274-23.00R.
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Hasegawa, Masakatsu; and Hokkoku, Syusaburo, to Meito Sangyo

Kabushiki Kaisha. Magnetic iron oxide-dextran complex and process for its production. 4,101,435, Cl. 252-62.530.
Haskell, Theodore H.: *See*—
  Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, 4,101,661, Cl. 424-266.000.
Hasker, Jan: *See*—
  van Esdonk, Johannes; Hasker, Jan; and Vervest, Johannes Cornelis Gerardus, 4,101,185, Cl. 316-19.000.
Hattori, Mitsuhiro: *See*—
  Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, 4,101,249, Cl. 417-269.000.
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Hauck, Frederic P.; Fox, Rita T.; and Watrous, John R., to E. R. Squibb & Sons, Inc. Substituted piperazinopropanols. 4,101,723, Cl. 544-360.000.
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  Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.
Haumann, Dewey H., Jr.: *See*—
  Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., 4,101,267, Cl. 432-60.000.
Hauni-Werke Korber & Co. KG: *See*—
  Korber, Kurt A., 4,100,845, Cl. 93-77.0FT.
Haus, Rein, to Wheelock Signals, Inc. Audiovisual signaling device. 4,101,880, Cl. 340-326.000.
Hauser, James C.: *See*—
  Mitchell, Michael W.; and Hauser, James C., 4,100,635, Cl. 5-368.000.
Hauser, Raimund: *See*—
  Freudenschuss, Otto, 4,101,209, Cl. 352-91.00C.
Havens, Carl B., to Dow Chemical Company, The. Blown film process. 4,101,614, Cl. 264-40.600.
Hayashi, Hideaki: *See*—
  Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, 4,101,133, Cl. 274-23.00R.
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  Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.
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  Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, 4,100,736, Cl. 60-278.000.
Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,101,593, Cl. 260-666.00A.
Hazen, Christopher Stevens: *See*—
  Ensslin, Frieder Hans; and Hazen, Christopher Stevens, 4,101,775, Cl. 250-409.000.
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  Thomas, Hector, 4,100,784, Cl. 72-98.000.
Heath, George. Adjustable tennis racket. 4,101,125, Cl. 273-75.000.
Heeres, Jan, to Janssen Pharmaceutica N.V. 1-(2-Ar-4-aryloxymethyl-1,3-dioxolan-2-ylmethyl)-imidazoles. 4,101,664, Cl. 424-273.00R.
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Hegewaldt, Fritz: *See*—
  Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.
Hehl, Walter; and Matthaei, Horst, to International Business Machines Corporation. Non reactive positioning device. 4,101,009, Cl. 188-1.00B.
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  Jahn, Hans-Georg, 4,100,851, Cl. 101-248.000.
  Jeschke, Willi; and Wirz, Arno, 4,101,122, Cl. 271-277.000.
Heim, Richard C., to Westinghouse Electric Corp. Apparatus for ultrasonic cleaning with liquid solvent in a blanket of vapor. 4,100,926, Cl. 134-64.00R.
Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, to Brown Boveri Corporation. Furnace conversion method and apparatus. 4,101,724, Cl. 13-1.000.
Heinzle, Elmar: *See*—
  Lafferty, Robert M.; and Heinzle, Elmar, 4,101,533, Cl. 528-491.000.
Heitzman, Charles J. Pulsating fluid spray device. 4,101,075, Cl. 239-101.000.
Heldt, Earl R., to Hewlett-Packard Company. Fiber optic connector with split ferrule assembly. 4,101,198, Cl. 350-96.200.
Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, to ITT Industries, Incorporated. Anticollision car radar. 4,101,888, Cl. 343-7.0VM.
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, to American Hoechst Corporation. Benzoylpiperidylalkylindoles. 4,101,663, Cl. 424-267.000.
Hempenius, Klaas; Van Mourik, Jan Cornelis; and Stevens, Petrus Franciscus, to U.S. Philips Corporation. Keyboard. 4,101,883, Cl. 340-365.00R.
Henderson, Henning M., to Alert-O-Drive (Pty) Ltd. Vehicle warning devices. 4,101,869, Cl. 340-52.00R.
Henninger, William H. High torque rotary electromagnetic actuator. 4,101,858, Cl. 335-272.000.
Henry, Rodney D., to Rockwell International Corporation. Homogeneous multilayer dielectric mirror and method of making same. 4,101,707, Cl. 428-409.000.
Henze, Richard H.: *See*—
  Paquette, Francis A.; and Henze, Richard H., 4,101,044, Cl. 215-228.000.
Herbenar, Edward J.; and Gair, Albert W., to TRW Inc. Pivot joint. 4,101,227, Cl. 403-27.000.
Hercules Incorporated: *See*—
  Kim, Charles W.; Liu, Chia-Seng; and MacDuff, Richard, 4,101,358, Cl. 156-167.000.
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  Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, 4,100,864, Cl. 112-121.110.
Hergeth KG Muschinenfabrik und Apparatebann: *See*—
  Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.
Hernandez, John Michael, to Colgate-Palmolive Company. Disposable diaper. 4,100,922, Cl. 128-284.000.
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  Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.
Herrmann, Lothar; and Schur, Gotthold, to Botek Praezisions-Bohrtechnik Schur & Co., Firma. Boring device. 4,100,983, Cl. 175-383.000.
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Herzig, Joachim, to Bayer Aktiengesellschaft. Polyorganosiloxanes containing homogeneously distributed fillers. 4,101,499, Cl. 260-37.0SB.
Hess, John R.; and Asplund, Herbert Frederick, to United Technologies Corporation. Interblade damper and seal for turbomachinery rotor. 4,101,245, Cl. 416-190.000.
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  Meyer, Jeffry R.; and Hess, Robert L., 4,101,748, Cl. 200-148.00A.
Hesse, Wolfgang; and Jacobi, Paul, to Hoechst Aktiengesellschaft. Process for hardening a resin which is the reaction product of an epoxy resin, an olefinically unsaturated monocarboxylic acid and a polycarboxylic acid anhydride unit. 4,101,398, Cl. 204-159.160.
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  Krautter, Kurt, 4,100,648, Cl. 16-163.000.
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  Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.
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  Heldt, Earl R., 4,101,198, Cl. 350-96.200.
  Neukermans, Armand Paul; and Kruger, William Paul, 4,101,781, Cl. 250-483.000.
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  Schaar, Lothar, 4,101,306, Cl. 65-323.000.
Hi-G Incorporated: *See*—
  Drapeau, Donald R., 4,101,855, Cl. 335-106.000.
Hickam, William M., to Westinghouse Electric Corp. Detection of incipient faults in hydrogen-cooled generators. 4,101,277, Cl. 23-232.00R.
Hickle, William H., to United States of America, Navy. Strain actuated hydraulic holdback bar. 4,101,098, Cl. 244-63.000.
Hickle, William H., to United States of America, Navy. Repeatable release holdback bar. 4,101,099, Cl. 244-63.000.
Hijikata, Akiko: *See*—
  Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
Hilaire, Pierre; and Lonchampt, Georges, to Commissariat a l'Energie Atomique. Horizontal electrolyzers with mercury cathode. 4,101,407, Cl. 204-251.000.
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Hildebrecht, Harold V., to Towmotor Corporation. Vehicle including differential mounting. 4,100,988, Cl. 180-75.000.
Hiles, Maurice Arthur Frederick, to National Research Development Corporation. Energy absorbing materials. 4,101,704, Cl. 428-218.000.
Hill, Boyce M.: *See*—
  Jones, Kendall; and Hill, Boyce M., 4,100,629, Cl. 4-295.000.
Hill, Homer G.; and Pansius, William G., to Owens-Corning Fiberglas Corporation. Coated glass fibers. 4,101,334, Cl. 106-99.000.
Hill, Howard M., to Xerox Corporation. Method and apparatus for controlling the temperature of low pressure metal or metal halide lamps. 4,101,807, Cl. 315-116.000.
Hill, John I.: *See*—
  Lurkis, Alexander; and Hill, John I., 4,101,876, Cl. 340-555.000.
Hinson, Virgil: *See*—
  Jarman, Gladys T., 4,100,975, Cl. 173-91.000.
Hintermeier, Karl: *See*—
  Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.
Hinterwaldner, Rudolf. Hardenable one-component substance, method of producing and hardening same and its application. 4,101,501, Cl. 260-40.00R.
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, to U.S. Philips Corporation. Adjustable mount for electrostatic printer stylus within cylindrical printing roller. 4,101,908, Cl. 346-139.00C.
Hirayama, Tadamasa: *See*—
  Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.

Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, to Kogyo Gijutsuin, President of. Magnetic bubble information writing device. 4,101,971, Cl. 365-11.000.
Hirsch, Harold H.; and Rairden, John R., III, to General Electric Company. Flame spray oxidation and corrosion resistant superalloys. 4,101,713, Cl. 428-554.000.
Hishinuma, Yukio: *See*—
  Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
Hitachi Cable, Ltd.: *See*—
  Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
Hitachi Chemical Company, Ltd.: *See*—
  Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.
  Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.
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  Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
  Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
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  Ishizuka, Kohei; and Kita, Yasuhiro, 4,101,851, Cl. 333-28.00R.
  Kawaji, Mitsuo; Usui, Toshio; and Kawano, Masaichiro, 4,101,879, Cl. 340-324.0AD.
  Kosugi, Hiroshi, 4,101,853, Cl. 333-70.00R.
  Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
  Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
  Shimizu, Keizo; Maruyama, Takeshi; and Fujimura, Toshio, 4,101,878, Cl. 340-310.00R.
  Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.
  Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.
Hitachi Maxell, Ltd.: *See*—
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Hitchinson, Patrick W.: *See*—
  Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., 4,101,681, Cl. 426-387.000.
Hitco: *See*—
  Shaffer, Robert C., 4,101,354, Cl. 156-60.000.
Hoare, Gordon Harold; and Lovegrove, Brian Walter, to Fisons Limited. Centrifuge rotor coupling. 4,101,070, Cl. 233-1.00R.
Hobart Corporation: *See*—
  Brackman, Donald A., 4,101,977, Cl. 366-246.000.
  Brackman, Donald A., 4,101,978, Cl. 366-314.000.
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  Heine, Hans Gunther; Hochstrasser, Otto; and Hegewaldt, Fritz, 4,101,724, Cl. 13-1.000.
Hodgkinson, John Hedley, to Coal Industry (Patents) Limited. Roof prop and platform movably mounted on boom of tunnelling machine. 4,101,173, Cl. 299-33.000.
Hodgson, James H., to Chromalloy American Corporation. Flail type manure spreader with adjustable hood. 4,101,078, Cl. 239-651.000.
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  Beutler, Helmut; Engelhardt, Friedrich; Hintermeier, Karl; and Ribka, Joachim, 4,101,274, Cl. 8-173.000.
  Buhr, Gerhard; Ruckert, Hans; and Frass, Hans Werner, 4,101,323, Cl. 96-35.000.
  Frass, Werner, 4,101,327, Cl. 96-115.00P.
  Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
  Hesse, Wolfgang; and Jacobi, Paul, 4,101,398, Cl. 204-159.160.
  Schroter, Herbert, 4,101,918, Cl. 354-299.000.
Hoefer Scientific Instruments: *See*—
  Hoefer, Stanton A., 4,101,401, Cl. 204-180.00G.
Hoefer, Stanton A., to Hoefer Scientific Instruments. Fluid isolation electrophoresis apparatus and method. 4,101,401, Cl. 204-180.00G.
Hoepfner, Voachim: *See*—
  Tihanyi, Jenoe; and Hoepfner, Voachim, 4,101,922, Cl. 357-23.000.
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  Kowallik, Josef, 4,100,710, Cl. 52-309.900.
Hofer, Wolfgang O.; and Kirschner, Jurgen. Ion electron converter. 4,101,771, Cl. 250-397.000.
Hoffend, Thomas R.: *See*—
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Hoffmann-La Roche Inc.: *See*—
  Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.
Hofmann, Heinrich, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Combustion chamber system for the production of propelling gases. 4,100,836, Cl. 89-7.000.
Hogan, John P.; and Norwood, Donald D., to Phillips Petroleum Company. Polymerization process using spray dried titanium-containing catalyst. 4,101,722, Cl. 526-106.000.
Hogan, Robert Paul, II. Charcoal briquette packaging technique. 4,101,292, Cl. 44-40.000.
Hokari, Sadao: *See*—
  Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
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  Barp, Bruno; and Holik, Herbert, 4,100,683, Cl. 34-124.000.
Holland, James Brooks: *See*—
  Dunnigan, Daniel Ambrose; Geiszler, Adolph Oscar; and Holland, James Brooks, 4,101,677, Cl. 424-330.000.
Hollander, Bruce L. Picture frame leveling device. 4,100,681, Cl. 33-389.000.
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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  Jacobsz, Roelof F., 4,101,258, Cl. 431-26.000.
Honig, Milton L., to Stauffer Chemical Company. Lead acetate impregnated magnesium silicate for the production of perchloromethyl mercaptan. 4,101,446, Cl. 252-430.000.
Honnold, Darrel Lee, to Deere & Company. Rotary hoe stripping means. 4,100,971, Cl. 172-547.000.
Hooper, Edwin B., Jr., to United States of America, Energy. Means for counteracting charged particle beam divergence. 4,101,765, Cl. 250-251.000.
Hopkins, Robert Sherman, Jr.: *See*—
  Dischert, Robert Adams; Banks, Arthur James; and Hopkins, Robert Sherman, Jr., 4,101,926, Cl. 358-17.000.
Hopple Plastics, Inc.: *See*—
  Wallace, Harry S.; and Taylor, Robert C., 4,101,049, Cl. 229-2.50R.
Horian, James G.: *See*—
  Horian, Richard C.; and Horian, James G., 4,100,643, Cl. 15-246.000.
Horian, Richard C.; and Horian, James G. Magnetic tape sensing head cleaner. 4,100,643, Cl. 15-246.000.
Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, to Sumitomo Chemical Company, Limited. Process for producing alumina fiber or alumina-silica fiber. 4,101,615, Cl. 264-63.000.
Horinka, Paul R.: *See*—
  Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.
Horowitz, Harold S.; and Longo, John M., to Exxon Research & Engineering Co. Use of high surface area mixed metal oxides of manganese and calcium in electrochemical processes. 4,101,716, Cl. 429-13.000.
Horsitmann, Hendrik. Fault indicator including a reed relay responsive to above normal current flow in a conductor. 4,101,826, Cl. 324-51.000.
Horst, William R.: *See*—
  Hale, William J.; Horst, William R.; and Walker, Donald A., 4,101,905, Cl. 346-74.100.
Houk, William J., to Ranco Incorporated. Differential pressure operated switch. 4,101,747, Cl. 200-83.00A.
Houlihan, William J., to Sandoz, Inc. Imidazo[2,1-A]isoquinolines. 4,101,553, Cl. 260-288.0CF.
Housman, James H.: *See*—
  Housman, Robert B., 4,100,962, Cl. 164-435.000.
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Howard, Leroy J., Jr., to UOP Inc. Method for drying a hydrocarbon conversion apparatus. 4,101,594, Cl. 260-668.00A.
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  Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
Hubele, Adolf; Kunz, Walter; and Eckhardt, Wolfgang, to Ciba-Geigy Corporation. Microbicidal alanine thioesters. 4,101,672, Cl. 424-301.000.
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  Zucker, Jerry, 4,101,535, Cl. 260-97.700.
Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., to American Color & Chemical Corporation. Water soluble monoazo dyes for polyamide material. 4,101,544, Cl. 260-207.100.
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  Roesner, Bruce B.; and McGreivy, Denis J., 4,101,349, Cl. 148-175.000.
  Seliger, Robert L., 4,101,782, Cl. 250-492.00B.
  Yaggy, Leon S., 4,101,931, Cl. 358-217.000.
Hultsch, Gunther, to Krauss-Maffei Aktiengesellschaft. Centrifuge drum with lateral filtration. 4,101,421, Cl. 210-178.000.
Humphries, Peter E., to Contronic Controls Limited. Multi-satellite intrusion alarm control system. 4,101,875, Cl. 340-504.000.

- Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., to Steel Company of Canada, Limited, The. Galvanizing steel strip in selected areas thereof. 4,101,345, Cl. 148-6.15R.
- Hunts, Barney Dean: *See—*
  - Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
- Hurlow, Gerald S.; Blain, Jean R.; Coombes, Michael; Richard, Jean-Claude; and Hitchinson, Patrick W., to General Foods Limited. Dearomatization of coffee oil. 4,101,681, Cl. 426-387.000.
- Huth, Kurt: *See—*
  - Geppert, Barbara; and Huth, Kurt, 4,101,047, Cl. 220-258.000.
- Hutter Apparatebau AG: *See—*
  - Hutter, Felix Jakob, 4,101,783, Cl. 250-540.000.
- Hutter, Felix Jakob, to Hutter Apparatebau AG. Ozone generator. 4,101,783, Cl. 250-540.000.
- Huynh, Chanh: *See—*
  - Martel, Jacques; Huynh, Chanh; and Buendia, Jean, 4,101,574, Cl. 260-544.00L.
- Hwa, Chih Ming; and Jacob, Jose T., to Chemed Corporation. Composition and method of inhibiting corrosion. 4,101,441, Cl. 252-389.00A.
- Hwang, H. Shinn; and Taylor, Paul D., to Celanese Corporation. Catalyst for production of acetic acid. 4,101,450, Cl. 252-460.000.
- Hybrid Systems Corporation: *See—*
  - De Freitas, Richard E., 4,101,881, Cl. 340-347.00R.
- Hyman, Henry F. Hole repair kit. 4,100,712, Cl. 52-514.000.
- I.T.E. Imperial Corporation: *See—*
  - Mooney, Thomas; and Shemtov, Sami, 4,101,103, Cl. 248-58.000.
- Ibuka, Masaru: *See—*
  - Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.
- Ichiki, Eiichi: *See—*
  - Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
- ICI Americas Inc.: *See—*
  - Rutledge, Thomas F., 4,101,561, Cl. 260-396.00N.
- Ick, Jurgen: *See—*
  - Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.
- Iida, Kiichi: *See—*
  - Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,101,324, Cl. 96-36.300.
- Ikeda, Hiroshi: *See—*
  - Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
- Ikeda, Takeo: *See—*
  - Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
- Ikeda, Toshiki: *See—*
  - Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro, 4,101,944, Cl. 360-85.000.
- Ikrath, Gertrude, executrix: *See—*
  - Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.
- Ikrath, Kurt, deceased (by Ikrath, Gertrude, executrix); Sexton, Paul; Pingitore, Peter; and Kennebeck, William, to United States of America, Army. Camouflaged dual-slot antenna. 4,101,896, Cl. 343-713.000.
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  - Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, 4,101,645, Cl. 423-648.00A.
- Imada, Yukio: *See—*
  - Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
- Imai, Toshihiro, to Olympus Optical Co., Ltd. Objective optical system for endoscopes. 4,101,196, Cl. 350-96.310.
- IMC Chemical Group, Inc.: *See—*
  - Kindraka, James Alexander; and Gallagher, John Bernard, 4,101,539, Cl. 260-112.50R.
  - Purcell, Robert F.; and Selleck, James R., Jr., 4,101,433, Cl. 252-49.500.
- Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., to Motorola, Inc. Personalizable read-only memory. 4,101,974, Cl. 365-96.000.
- Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Method and apparatus for drawing optical fiber. 4,101,300, Cl. 65-2.000.
- Imperial Chemical Industries Limited: *See—*
  - Whittam, Thomas Vincent; and Youll, Barry, 4,101,598, Cl. 260-668.00A.
- Imperial, George R.: *See—*
  - Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.
- Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, to Kao Soap Co., Ltd. 3-Amino-4-homoisotwistane and an acid addition salt thereof and a process for producing the same. 4,101,580, Cl. 260-563.00P.
- Indiana University Foundation: *See—*
  - Glancy, John, 4,100,918, Cl. 128-80.00F.
- Indicator Controls Corporation: *See—*
  - Gould, James S.; and Gould, Samuel, 4,101,191, Cl. 339-125.00R.
- Industrie Koot B.V.: *See—*
  - Oskam, Aane Adriaan; and Koot, Hermanus Marinus Ignatius, 4,101,206, Cl. 350-289.000.
- Informer, Inc.: *See—*
  - Domike, Donald A.; Cole, Bryon M.; and Matthews, Richard A., 4,101,959, Cl. 364-200.000.
- Ingebrigtsen, Kjell A.; Bers, Abraham; and Cafarella, John H., to Massachusetts Institute of Technology. Surface acoustic wave devices for processing and storing signals. 4,101,965, Cl. 364-821.000.
- Ingram, David Lee. Base fed, top-loaded vertical whip antenna. 4,101,898, Cl. 343-752.000.
- Inland Container Corporation: *See—*
  - Watkins, Caesar E., 4,101,022, Cl. 206-45.140.
- Inoue-Japax Research (IJR) Inc.: *See—*
  - Inoue, Kiyoshi, 4,101,405, Cl. 204-224.00M.
- Inoue, Kenichi: *See—*
  - Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
- Inoue, Kiyoshi, to Inoue-Japax Research (IJR) Inc. Shaping apparatus. 4,101,405, Cl. 204-224.00M.
- Inoue, Makoto; Ikeda, Toshiki; and Abe, Koichiro. Magazine loading device for magnetic video recording and reproducing apparatus. 4,101,944, Cl. 360-85.000.
- Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, to Mitsubishi Chemical Industries Limited; and Nippon Shinyaku Company, Limited. 2-Aminomethyl-5-phenyloxazoles and the pharmaceutically acceptable acid addition salts thereof. 4,101,660, Cl. 424-250.000.
- Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, to Nissan Chemical Industries, Ltd. Process for the manufacture of a slurry containing highly concentrated phosphoric acid and calcium sulfate hemihydrate in a readily filterable form. 4,101,638, Cl. 423-320.000.
- Institut Biokhimii I Fiziologii Mikroorganizmov: *See—*
  - Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, 4,101,079, Cl. 241-46.150.
- Institut de Recherches de la Siderurgie Francaise (IRSID): *See—*
  - Vayssiere, Pierre; and Berthet, Aristide, 4,101,313, Cl. 75-60.000.
- Interlake, Inc.: *See—*
  - McConnell, Kennedy, 4,101,233, Cl. 403-397.000.
- International Business Machines Corporation: *See—*
  - Castro, George; Haarer, Dietrich; MacFarlane, Roger Morton; and Trommsdorff, Hans Peter, 4,101,976, Cl. 365-119.000.
  - Costes, Michel Leon; and Hoyle, James Franklin, 4,101,743, Cl. 179-175.000.
  - Dahlstrom, Mark Sorensen; and Simon, Paul, 4,101,906, Cl. 346-75.000.
  - Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, 4,101,008, Cl. 188-1.00B.
  - Hehl, Walter; and Matthaei, Horst, 4,101,009, Cl. 188-1.00B.
  - Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., 4,101,006, Cl. 400-144.300.
  - Litkenhus, John Robert; and Stafford, Donald Wayne, 4,101,224, Cl. 400-328.000.
  - Mathisen, Einar Skau, 4,101,222, Cl. 356-244.000.
- International Harvester Company: *See—*
  - Kolinger, Kenneth J.; Williams, Norman E.; Earley, Donald M.; and Golden, William R., 4,100,965, Cl. 165-119.000.
- International Nickel Company: *See—*
  - Luch, Daniel, 4,101,385, Cl. 204-20.000.
- International Paper Company: *See—*
  - Rieben, Horace Johnnie; and Taylor, Lawrence F., 4,101,048, Cl. 229-34.00R.
- International Standard Electric Corporation: *See—*
  - Barsellotti, John Anthony, 4,101,740, Cl. 179-99.000.
  - Goyard, Pierre Jean-Marie, 4,101,890, Cl. 343-8.000.
  - Kunstatter, George, 4,101,741, Cl. 179-99.000.
- International Tapetronics Corporation: *See—*
  - Jenkins, John P., 4,101,937, Cl. 360-76.000.
- International Telephone and Telegraph Corporation: *See—*
  - Balkwill, John Treagus, 4,101,303, Cl. 65-31.000.
  - Bridenbaugh, Edwin Redmond, 4,101,735, Cl. 179-1.0HF.
  - Brody, Herbert M., 4,100,763, Cl. 62-238.000.
  - Whitaker, Donald Edward, 4,101,733, Cl. 178-58.00R.
- Interstore Transfer Specialists, Inc.: *See—*
  - Dove, Douglas J. A., 4,101,052, Cl. 229-23.00R.
- Inukai, Mitsuo: *See—*
  - Sasaki, Shiro; Inukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., 4,101,171, Cl. 297-389.000.
- Inverni Della Beffa S.p.A.: *See—*
  - Bonati, Attilio, 4,101,652, Cl. 424-49.000.
- Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, to Minolta Camera Kabushiki Kaisha. Toner dispensing device with electrical integrating circuit. 4,101,214, Cl. 355-10.000.
- Irrifrance: *See—*
  - Turion, Jean-Claude, 4,100,936, Cl. 137-596.200.
- Irvin Industries, Inc.: *See—*
  - Wallin, Jan-Olof, 4,101,094, Cl. 242-107.40A.
- Isgrig, Glenn W. Target amusement device. 4,101,127, Cl. 273-95.00B.
- Ishida, Kazuo: *See—*
  - Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
- Ishida, Kiyohito: *See—*
  - Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.

- Ishigaki, Yoshio: *See—*
  - Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.
- Ishigami, Masashi: *See—*
  - Takahashi, Takuya; and Ishigami, Masashi, 4,101,626, Cl. 264-313.000.
- Ishikawa, Keiichi, to Tokyo Shibaura Electric Co., Ltd. Fire prevention device for the fixing stage of an electrophotographic machine. 4,101,266, Cl. 432-46.000.
- Ishikura, Koji: *See—*
  - Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.
- Ishimaru, Toshiaki: *See—*
  - Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.
- Ishitsuka, Yoshio: *See—*
  - Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.
- Ishiuchi, Hiroshi: *See—*
  - Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
- Ishizuka, Kohei; and Kita, Yasuhiro, to Hitachi, Ltd. Variable equalizer. 4,101,851, Cl. 333-28.00R.
- Ishizuka, Takashi; and Miwa, Naoki, to Nitto Electric Industrial Co., Ltd. Water-soluble heat-resistant insulating varnish. 4,101,488, Cl. 260-29.20N.
- Isobe, Asao: *See—*
  - Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.
- Isono, Katsuo; and Sanada, Seiji, to Sony Corporation. VIR control apparatus for color television receiver. 4,101,927, Cl. 358-27.000.
- Itagaki, Hideaki: *See—*
  - Kamikura, Shigeo; Itagaki, Hideaki; and Kawanka, Ryoiti, 4,100,768, Cl. 66-75.200.
- Itoh, Yuzo: *See—*
  - Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.
- ITT Industries, Incorporated: *See—*
  - Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, 4,101,888, Cl. 343-7.0VM.
  - Nordin, Dag, 4,101,139, Cl. 277-22.000.
- Iwabuchi, Syoichi: *See—*
  - Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.
- Iwaki, Shinpachiro: *See—*
  - Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.
- Iwamoto, Kazuo: *See—*
  - Tamura, Kohki; and Iwamoto, Kazuo, 4,101,718, Cl. 429-26.000.
- Izon Corporation: *See—*
  - Yevick, George J., 4,101,188, Cl. 350-96.240.
- J. I. Case Company: *See—*
  - Seaberg, David H.; and Kao, Gou-Lian, 4,100,738, Cl. 60-327.000.
- J. M. Ney Company, The: *See—*
  - Burk, Bruce; and Burnett, Arthur P., 4,101,330, Cl. 106-45.000.
- J. R. Simplot Company: *See—*
  - Bierman, Laurence William; and Long, Gary Lynn, 4,101,637, Cl. 423-309.000.
- Jacob, Jose T.: *See—*
  - Hwa, Chih Ming; and Jacob, Jose T., 4,101,441, Cl. 252-389.00A.
- Jacobi, Paul: *See—*
  - Hesse, Wolfgang; and Jacobi, Paul, 4,101,398, Cl. 204-159.160.
- Jacobsz, Roelof F., to Honeywell Inc. Fuel burner sequencing device with safety checking means. 4,101,258, Cl. 431-26.000.
- Jacque, Albert W.: *See—*
  - Cameron, Larry D.; and Jacque, Albert W., 4,100,692, Cl. 42-1.00L.
- Jacques, James O., to Xerox Corporation. Track following servo system and track following code. 4,101,942, Cl. 360-77.000.
- Jaeger, C. Rene: *See—*
  - Blackmer, David E.; and Jaeger, C. Rene, 4,101,849, Cl. 333-14.000.
- Jaffe, Michael L.: *See—*
  - Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.
- Jahn, Hans-Georg, to Heidelberger Druckmaschinen Aktiengesellschaft. Device for adjusting lateral and circumferential registry in rotary printing machines. 4,100,851, Cl. 101-248.000.
- Jain, Atul: *See—*
  - United States of America, National Aeronautics and Space Administration; and Jain, Atul, 4,101,891, Cl. 343-17.2PC.
- James, Roger Halsted: *See—*
  - Striebel, Edmund Emil; Koblish, Theodore Richard; Madden, Thomas Joseph; and James, Roger Halsted, 4,100,733, Cl. 60-39.74B.
- Janes, Roderick Stewart; and Lloyd, Maurice Edward, to Lucas Industries Limited. Fuel control for a multi-engine gas turbine installation. 4,100,731, Cl. 60-39.150.
- Janssen Pharmaceutica N.V.: *See—*
  - Heeres, Jan, 4,101,664, Cl. 424-273.00R.
  - Heeres, Jan, 4,101,665, Cl. 424-273.00R.
  - Heeres, Jan, 4,101,666, Cl. 424-273.00R.
- Japan Atomic Energy Research Institute: *See—*
  - Bingo, Kazuyoshi; and Kawai, Katsuo, 4,101,769, Cl. 250-361.00R.
- Japan Society for Promotion of Machine Industry: *See—*
  - Fujishiro, Yuji; and Ohta, Hideo, 4,100,854, Cl. 101-415.100.
- Jarman, Davis R.: *See—*
  - Jarman, Gladys T., 4,100,975, Cl. 173-91.000.
- Jarman, Gladys T., to Jarman, Davis R.; and Hinson, Virgil. Power booster. 4,100,975, Cl. 173-91.000.
- Jeff, Adolph L. Precision cutting tool. 4,100,677, Cl. 30-321.000.
- Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, to U.S. Dynamics Corporation. Floating hook arrangement for an apparatus for bagging garments. 4,100,719, Cl. 53-241.000.
- Jenkins, John P., to International Tapetronics Corporation. Automatic azimuth control for magnetic tape recording and reproducing apparatus. 4,101,937, Cl. 360-76.000.
- Jenne, Gustav, to Jenne & Strahm AG fur Tiefbautechnik. Self-propelled pneumatic burrowing device. 4,100,980, Cl. 175-19.000.
- Jenne, Richard L., to Texas Instruments Incorporated. Thermostatic switch and method of assembly. 4,101,861, Cl. 337-368.000.
- Jenne & Strahm AG fur Tiefbautechnik: *See—*
  - Jenne, Gustav, 4,100,980, Cl. 175-19.000.
- Jennen, Friedrich; and Tricoire, Jean, to Troponwerke Dinklage & Co. Thermographic plate for measuring temperature distributions. 4,101,696, Cl. 428-1.000.
- Jensen, Carl Anton: *See—*
  - Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, 4,101,960, Cl. 364-200.000.
- Jensen, Donald F.; Rosenthal, Arnold B.; and Ross, Charles O., to International Business Machines Corporation. Carrier traverse control for a serial printer. 4,101,006, Cl. 400-144.300.
- Jentsch, Dietmar: *See—*
  - Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.
- Jeschke, Willi; and Wirz, Arno, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet turn-over device for a first-form printing and perfecting press with clamping grippers. 4,101,122, Cl. 271-277.000.
- Jeswine, Adolph. Vertical auger snow removal device. 4,100,687, Cl. 37-43.00K.
- Jetco, Inc.: *See—*
  - Davis, Bill G., 4,100,910, Cl. 123-196.00S.
- Jezl, James L.; and Peters, Edwin F., to Standard Oil Company a corporation of Indiana. Horizontal reactor for the vapor phase polymerization of monomers. 4,101,289, Cl. 23-288.00E.
- Jochems, Pieter Johannes Wilhelmus: *See—*
  - Kooi, Else; Jochems, Pieter Johannes Wilhelmus; and Van Zanten, Adrianus Teunis, 4,101,344, Cl. 148-1.500.
- Jockel, Heinz: *See—*
  - Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 4,101,376, Cl. 176-39.000.
- Jogand, Patrick: *See—*
  - Berniolles, Jean-Marie; and Jogand, Patrick, 4,101,377, Cl. 176-40.000.
- Johansson, Erik Karl Gustav, to Aktiebolaget Electrolux. Vacuum cleaner nozzle with rotatable comb-shaped part. 4,100,644, Cl. 15-397.000.
- John Thomas Batts, Inc.: *See—*
  - Batts, John H.; Garrison, Judd F.; and Wolff, Douglas F., 4,101,059, Cl. 223-85.000.
- Johns-Manville Corporation: *See—*
  - Arno, David Michael, 4,101,085, Cl. 242-18.00G.
  - Batts, Robert Lee, 4,101,695, Cl. 427-434.00D.
  - Ray, Richard James, Jr.; Kopy, Daniel Paul; and Rohweder, Theodore Richard, 4,101,700, Cl. 428-131.000.
- Johnson, Anna M. Bedding. 4,100,632, Cl. 5-334.00R.
- Johnson, Harlan B., to PPG Industries, Inc. Electrolytic method. 4,101,394, Cl. 204-77.000.
- Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., to PPG Industries, Inc. Method of casting silicon. 4,101,624, Cl. 264-273.000.
- Johnson, Joseph E., Jr.; and Warrell, Richard D., to Monsanto Company. Container and support clip combination. 4,101,043, Cl. 215-100.00R.
- Johnson, Robert K.: *See—*
  - Peters, Mark A.; and Johnson, Robert K., 4,101,315, Cl. 75-104.000.
- Jonathan Temple Incorporated: *See—*
  - Philips, Michael R., 4,100,866, Cl. 112-231.000.
- Jones, Francis William: *See—*
  - Guise, Geoffrey Bruce; and Jones, Francis William, 4,101,272, Cl. 8-127.600.
- Jones, Howard S., Jr., to United States of America, Army. Multifrequency antenna system integrated into a radome. 4,101,895, Cl. 343-708.000.
- Jones, Howard S., Jr.; and Reggia, Frank, to United States of America, Army. Compact low-profile electrically small VHF antenna. 4,101,899, Cl. 343-788.000.
- Jones, James Thomas. Convertible trailer for hauling grain and a harvesting machine. 4,101,158, Cl. 296-10.000.
- Jones, Kendall; and Hill, Boyce M., to Viking Industries, Inc. Aircraft lavatory drain plug. 4,100,629, Cl. 4-295.000.
- Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, to Coal Industry (Patents) Limited. Extraction of coal. 4,101,413, Cl. 208-8.000.
- Jonsson, Erik Anselm: *See—*
  - Fernaeus, Sven Evert; and Jonsson, Erik Anselm, 4,101,255, Cl. 425-219.000.
- Jordan, Ronald H. Carrying case for wrenches. 4,101,025, Cl. 206-377.000.
- Josemans, Leonardus J.; and Swessel, John A., Jr., to Cutler-Hammer,

- Inc. Electrical attachment of indicating lamp to terminals in electric switches. 4,101,749, Cl. 200-317.000.
- Jos. Schneider & Co. Optische Werke: *See—*
  - Tesch, Karl, 4,101,202, Cl. 350-187.000.
- Joy Manufacturing Company: *See—*
  - Wayment, William Ross, 4,101,333, Cl. 106-85.000.
- Joyce, James W., to United States of America, Army. Fluidic partial pressure sensor. 4,100,789, Cl. 73-23.000.
- Juch, Ernst: *See—*
  - Wienand, Michael; and Juch, Ernst, 4,101,689, Cl. 427-122.000.
- Juelg, James Edwin, Jr. Shirt construction. 4,100,622, Cl. 2-115.000.
- Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, to Gildemeister AG. Arrangement for automatically changing the clamping jaws of the chuck of a machine tool. 4,100,671, Cl. 29-568.000.
- Jurin, Petr Ipatovich: *See—*
  - Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, 4,101,243, Cl. 415-201.000.
- Jushkov, Jury Vasilievich: *See—*
  - Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich;. Demyanets, Vladimir Origorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
- Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
  - Artbauer, Jan, 4,101,728, Cl. 174-29.000.
- Kabushiki Kaisha Daini Seikosha: *See—*
  - Yamashita, Shiro, 4,101,848, Cl. 331-116.00R.
- Kabushiki Kaisha Komatsu Seisakusho: *See—*
  - Kasuya, Tamotsu, 4,101,241, Cl. 415-113.000.
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  - Nakayama, Shozo; Kurahashi, Masayuki; and Hattori, Mitsuhiro, 4,101,249, Cl. 417-269.000.
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- Kochetkov, Vladimir Alexeevich: *See—*
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- Labofina S.A.: *See—*
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  - Hoare, Gordon Harold; and Lovegrove, Brian Walter, 4,101,070, Cl. 233-1.00R.
- Lowther, Frank Eugene, to W. R. Grace & Co. Ozone decomposition and electrodesorption process. 4,101,296, Cl. 55-33.000.
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  - Janes, Roderick Stewart; and Lloyd, Maurice Edward, 4,100,731, Cl. 60-39.150.
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- Lyapin, Andrei Grigorievich: *See—*
  - Levitov, Vladimir Ilich; Lyapin, Andrei Grigorievich; and Scherbina, Oleg Vasilievich, 4,101,727, Cl. 174-28.000.
- Lytton, Kenneth G.: *See—*
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  - Russo, Robert V., 4,101,471, Cl. 521-121.000.
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- MacFadden, Donald L., to Chevron Research Company. Cellulose fermentation process. 4,101,679, Cl. 426-53.000.
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- MacLeay, Ronald Edward: *See—*
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  - Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 4,101,522, Cl. 528-292.000.
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- Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, to Hitachi, Ltd. Three phase controlling system. 4,101,819, Cl. 323-24.000.
- Maeda, Yutaka; and Kawabe, Mitsuhiro, to Okuma Machinery Works Ltd. Position-correctable numerical control system. 4,101,817, Cl. 318-603.000.
- Magee, John E. Control system for limiting elevator car movement speed unless car doors are fully closed. 4,101,007, Cl. 187-29.00R.
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  - Mercier, Henri; Magrone, Robert; and Deabriges, Jean, 4,101,629, Cl. 423-121.000.
- Maguire, Edward John, Jr.: *See—*
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- Mahnke, Parker E. Pull type exercising apparatus. 4,101,124, Cl. 272-134.000.
- Maier, Johann, to BHS-Bayerische Berg-,Hutten-und Salzerke Aktiengesellschaft. Single face corrugating machine. 4,101,367, Cl. 156-471.000.
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- Maletin, Alexei Mikhailovich, deceased: *See—*
  - Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
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- Mallory, James D., to Owens-Illinois, Inc. Valve block. 4,100,937, Cl. 137-596.160.
- Malmstrom, Karl Gunnar; and Mattsson, Karl Lennart. Improvments in or relating to boilers. 4,100,887, Cl. 122-379.000.
- Malone, Hugh Robert, to Motorola, Inc. Oscillator apparatus adapted to lock onto a single pulse of radio frequency waves. 4,101,844, Cl. 331-10.000.
- Malpass, Dennis B.; and Watson, Spencer C., to Texas Alkyls, Inc. Production of dialkylaluminum hydrides. 4,101,568, Cl. 260-448.00A.
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  - Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.
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- Mansol Ceramics Company: *See—*
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- Marancik, William G., to Airco, Inc. Composite multifilament superconductors. 4,101,731, Cl. 174-126.00S.
- Marchand, Jean, to BFG Glassgroup. Method and apparatus for feeding glass out of a melting tank to a flat glass forming means. 4,101,304, Cl. 65-135.000.
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- Marcus, Sanford Morton, to Du Pont de Nemours, E. I., and Company. Silver compositions. 4,101,710, Cl. 428-472.000.
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- Marion, Frank A., to Universal Propulsion Company, Inc. Oxygen gas generator and method of manufacturing the gas generator. 4,101,291, Cl. 44-17.000.
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- Marquez, Manuel J., to Raymond Lee Organization, Inc., The. Ladder step. 4,100,998, Cl. 182-116.000.
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- Marshall, Margaret V.: *See—*
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- Martin, Bernard L.; and Vogel, Bruce N., to Carpenter Rigging and Supply Company, Inc. Cable pulling system. 4,101,114, Cl. 254-134.3FT.
- Martin, Julian Richard: *See—*
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- Martin, Lincoln A., to Geophysical Systems Corporation. Method of determining weathering corrections in seismic operations. 4,101,867, Cl. 340-15.5TC.
- Martin, Wolfgang: *See—*
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- Marvin Glass & Associates: *See—*
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- Massey, Robert G.: *See—*
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- Mast, John George, Jr., to Procter & Gamble Company, The. Disposable product applicator and dispensing package therefor. 4,101,053, Cl. 221-232.000.
- Mathai, John: *See—*
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- Matheson, Stuart C. Apparatus for removing ice and sleet from a third rail of an electrified railway vehicle. 4,101,014, Cl. 191-62.000.
- Mathisen, Einar Skau, to International Business Machines Corporation. Spectrophotometer sample holder with improved sample viewing apparatus. 4,101,222, Cl. 356-244.000.
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- Matsuda, Hitoshi: *See—*
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- Matsukawa, Hiroharu: *See—*
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- Matsushita Electric Industrial Company: *See—*
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- Matthews, Richard A.: *See—*
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- Mattila, Eugene W.; and Maher, Joseph M., to Copper Range Company. Drive chuck. 4,101,141, Cl. 279-19.000.
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- Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, to Becton, Dickinson and Company. Prefillable, hermetically sealed container adapted for use with a humidifier or nebulizer head. 4,101,041, Cl. 215-6.000.
- Maxwell, Ronald K.: *See—*
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- May, Erhard T. Apparatus for the treatment of thread and the like. 4,100,880, Cl. 118-234.000.
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- Mayer, Albert L.: *See—*
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- Mayer, Edward A., to Texaco Inc. Vacuum assist fuel system. 4,100,758, Cl. 62-54.000.
- Mayer, Hermann, to Robert Bosch GmbH. Automatic diaphragm control system means for preventing energization of the diaphragm adjusting mechanism when the adjusting mechanism is at the limit of its adjusting range. 4,101,910, Cl. 354-42.000.
- Mayer, Rolf; and Speckhart, Max, to Bosch-Siemens Hausgerate GmbH. Electric motor-driven coffee mill. 4,101,082, Cl. 241-282.100.
- Mazanek, Jan; Blahak, Johannes; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of 4,4'-dinitrodiphenyl carbonate. 4,101,569, Cl. 260-463.000.
- MBI, Inc.: *See—*
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- McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, to Wickman Machine Tool Sales Limited. Controls for multi spindle lathes. 4,100,825, Cl. 82-3.000.
- McConnell, Kennedy, to Interlake, Inc. Panel mounting clip for storage rack. 4,101,233, Cl. 403-397.000.
- McEntire, Edward E., to Texaco Development Corp. Bis (dimethylaminopropyl)-amine derivatives as polyurethane catalysts. 4,101,466, Cl. 521-115.000.
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- McFadden, Arthur Raymond; and Aultz, Daniel Eugene, to American Hoechst Corporation. Precursors of heterofuranobenzoxepin acetic acids. 4,101,559, Cl. 260-347.300.
- McGraw-Edison Company: *See—*
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- McGraw, John D.: *See—*
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- McManus, Francis C. A. Modular office furniture. 4,101,183, Cl. 312-195.000.
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- McNeil Laboratories, Incorporated: *See—*
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- Mecone, David W.: *See—*
  - Shaffer, John W.; Mecone, David W.; and Colville, William T., 4,101,259, Cl. 431-93.000.
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  - Cromie, Harry W., 4,101,031, Cl. 206-438.000.
- Meier, Eugen, to Mettler Instrumente Ag. Vibration-resistant balance. 4,100,985, Cl. 177-189.000.
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  - Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.
- Meiners, Hans-Joachim: *See—*
  - Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, 4,101,468, Cl. 521-115.000.

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- Meixner, Edwin Joseph, to Borg-Warner Corporation. System for measuring torque and speed of rotating shaft. 4,100,794, Cl. 73-136.00A.
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  - Doss, Daniel L.; and Melander, Robert A., 4,101,822, Cl. 324-16.00R.
- Melville, Andreas T.: *See—*
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- Menier, Vincent J., to North American Systems, Inc. Method of forming paper products. 4,101,627, Cl. 264-323.000.
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  - Babson, Edward Spencer; Herdeg, Donald Franklin; and Mercaldi, William Burrows, 4,100,864, Cl. 112-121.110.
- Mercet, Gerard: *See—*
  - Andre, Pierre; Caretti, Robert; Depoutot, Michel; and Mercet, Gerard, 4,101,084, Cl. 242-7.110.
- Mercier, Henri; Magrone, Robert; and Deabriges, Jean, to Aluminium Pechiney. Purification of solutions circulating in the bayer cycle. 4,101,629, Cl. 423-121.000.
- Merle, Jean Pierre: *See—*
  - Branlard, Paul; and Merle, Jean Pierre, 4,101,481, Cl. 260-23.70A.
- Merrill, Wayne S.; Edwards, James H.; and Danti, Bernard R., to Millipore Corporation. Tubular filtration element and method of making it. 4,101,423, Cl. 210-494.00M.
- Merryman, Wayne R., to Pacific Western Systems. Timing pulse generator. 4,101,761, Cl. 235-92.0CA.
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  - Hofmann, Heinrich, 4,100,836, Cl. 89-7.000.
- Metallgesellschaft Aktiengesellschaft: *See—*
  - Cornelius, Gerhard; Jockel, Heinz; and Kupfer, Hans, 4,101,376, Cl. 176-39.000.
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- Meyer, Jack M., to Neenah Foundry Company. Sealing manhole cover for use on existing unsealed sanitary sewer manhole cover frames. 4,101,236, Cl. 404-25.000.
- Meyer, Jeffry R.; and Hess, Robert L., to Westinghouse Electric Corp. Modular puffer-type circuit-interrupter unit adaptable for different voltage and current ratings. 4,101,748, Cl. 200-148.00A.
- Meyer, Yves: *See—*
  - Carre, Jean-Jacques; and Meyer, Yves, 4,101,176, Cl. 303-6.00C.
- Meyers, Earl, to Clemmer Industries (1964) Limited. Bushing. 4,100,645, Cl. 16-2.000.
- Meynig, Robert E. Time cycle actuator. 4,100,939, Cl. 137-627.500.
- Michels, Albertus Peter Johannes, to U.S. Philips Corporation. Hot-gas engine. 4,100,741, Cl. 60-517.000.
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  - Page, Roy Arthur, 4,101,368, Cl. 156-503.000.
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  - Strop, Petr; Coupek, Jiri; Mikes, Otakar; and Hradil, Jiri, 4,101,461, Cl. 521-32.000.
- Mikhailov, Gennady Grigorievich: *See—*
  - Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
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  - Owen, David Peter; and Miles, Barry Donald Ruberry, 4,101,939, Cl. 360-36.000.
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- Miller, George J.; Lytton, Kenneth G.; and Donnelly, James E., to Fiber Controls Corporation. Auto-leveler. 4,100,791, Cl. 73-37.700.
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  - Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.
- Miller, Joe A., to Baxter Travenol Laboratories, Inc. Flexible collapsible container defining relatively rigid shoulder and base at opposite ends. 4,100,953, Cl. 150-0.500.
- Miller, John E.; and Postema, James R., to Universal Electric Company. Motor seals. 4,101,794, Cl. 310-71.000.
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  - Schermerhorn, Jerry D.; and Miller, John W. V., 4,101,810, Cl. 315-169.0TV.
- Miller, Scott William: *See—*
  - Van Dyck, Kenneth Arthur; Wyatt, James Bartlett; Stephenson, Charles Francis; and Miller, Scott William, 4,101,757, Cl. 219-225.000.
- Miller, Thomas R., to Continental Oil Company. Slurry control system. 4,101,174, Cl. 302-11.000.
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  - Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., 4,101,974, Cl. 365-96.000.
- Milliken Research Corporation: *See—*
  - Shortte, Willard Harmond, Jr., 4,100,863, Cl. 112-79.00R.
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- Minard, Marguerite F., to Raymond Lee Organization, Inc., The. Utility knob. 4,101,104, Cl. 248-95.000.
- Mineck, Fred, to Archer, Dorothy J.; Mineck, Jay A.; and Lindsley, Warren F. B., part interest to each. Combination crankcase ventilation valve and supplementary carburetor. 4,100,898, Cl. 123-119.00B.
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- Minjolle, Louis: *See—*
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  - Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., 4,101,513, Cl. 526-193.000.
  - Thom, Karl Friedrich, 4,101,514, Cl. 528-109.000.
  - Tung, Chi Fang, 4,100,625, Cl. 2-410.000.
- Minolla, Horst, to Klippan GmbH Hamburg. Detent action buckle. 4,100,657, Cl. 24-230.0AL.
- Minolta Camera Kabushiki Kaisha: *See—*
  - Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
  - Mutsushita, Shuzo, 4,101,223, Cl. 354-286.000.
  - Ohneda, Shoichi; and Okano, Yukio, 4,101,929, Cl. 358-44.000.
  - Ueda, Hiroshi; and Matsushita, Shuzo, 4,101,917, Cl. 354-273.000.
  - Yamaguchi, Tamikazu, 4,101,203, Cl. 350-217.000.
  - Yamashita, Maki; and Kognre, Yasuzi, 4,101,914, Cl. 354-128.000.
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  - Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
- Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, to Sandoz Ltd. 1,4-Diaminoanthraquinones. 4,101,547, Cl. 544-294.000.
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  - Prade, Ernstfried, 4,100,870, Cl. 114-39.000.
- Mitchell, Bruce Richard; and Swift, Harold Eugene, to Gulf Research & Development Company. Method of negating the effects of metals poisoning on zeolitic cracking catalysts. 4,101,417, Cl. 208-120.000.
- Mitchell, Kenneth M.; and Wise, John J., to Mobil Oil Company. Low pressure xylene isomerization. 4,101,596, Cl. 260-668.00A.
- Mitchell, Michael W.; and Hauser, James C. Water bed construction. 4,100,635, Cl. 5-368.000.
- Mitco Corporation: *See—*
  - Gorchev, Dimiter; and McGraw, John D., 4,100,964, Cl. 165-40.000.
- Mitsubishi Chemical Industries Limited: *See—*
  - Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
  - Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
  - Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
  - Matsuno, Yoshiyuki; Kobayashi, Hiroshi; and Watanabe, Ryo, 4,100,872, Cl. 114-73.000.
  - Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
- Mitsui, Nobuo: *See—*
  - Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; Watanabe, Akinori; Komuro, Katsu; and Hokari, Sadao, 4,101,819, Cl. 323-24.000.
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  - Kamada, Hidemoto; Miura, Chiaki; and Utena, Makoto, 4,101,683, Cl. 426-618.000.
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- Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air control system in an internal combustion engine. 4,100,735, Cl. 60-276.000.
- Miyamoto, Akio; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Desensitizing composition. 4,101,690, Cl. 427-150.000.

- Miyazaki, Kensaku; and Shinohara, Toshio, to Olympus Optical Co., Ltd. Screen microscope with variable illumination. 4,101,194, Cl. 350-9.000.
- Miyazaki, Sadao: *See—*
  - Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.
- Miyazaki, Yasushi: *See—*
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  - Seshima, Kensuke, 4,101,120, Cl. 269-323.000.
- Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Printing plate and method for forming the same having small projections in non-image areas. 4,101,324, Cl. 96-36.300.
- Mizuno, Yukio, to Nissan Motor Company, Limited. Apparatus for selectively inserting weft yarns into the shed in a weaving loom. 4,100,947, Cl. 139-453.000.
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  - Mitchell, Kenneth M.; and Wise, John J., 4,101,596, Cl. 260-668.00A.
- Mobil Oil Corporation: *See—*
  - Braid, Milton; and Leonardi, Samuel J., 4,101,430, Cl. 252-42.700.
  - Breckenridge, Lloyd L., 4,101,597, Cl. 260-668.00A.
  - Chen, Nai Y.; and Reagan, William J., 4,101,595, Cl. 260-668.00A.
  - Okorodudu, Abraham O. M., 4,101,432, Cl. 252-49.800.
  - Ruehle, William H., 4,101,866, Cl. 340-7.00R.
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  - Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
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- Mochizuki, Nobuo; and Demizu, Hiromi, to Ricoh Company, Ltd. Rubber developer roller using single component toner. 4,100,884, Cl. 118-653.000.
- Model, Hans-Jurgen: *See—*
  - Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, 4,100,829, Cl. 83-106.000.
- Modulus Corporation: *See—*
  - Payne, William J., 4,100,666, Cl. 29-407.000.
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- Moedritzer, Kurt, to Monsanto Company. Method for the manufacture of organo substituted phosphonium salts. 4,101,587, Cl. 260-606.50F.
- Moeller, Werner: *See—*
  - Gayler, Joachim; Remy, Rolf; Moeller, Werner; and Holler, Fritz G., 4,100,796, Cl. 73-160.000.
- Moertel, George B., to Textron Inc. Slide fastener stringer and method of manufacture. 4,100,656, Cl. 24-205.16C.
- Mogilevsky, Israel. Dental articulator. 4,100,679, Cl. 32-32.000.
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  - Hamisch, Paul H., Jr., 4,100,852, Cl. 101-295.000.
- Monroe, Joseph C.: *See—*
  - Adams, Steven M.; and Monroe, Joseph C., 4,101,178, Cl. 308-3.600.
- Monroe, Lawrence S., to Textron Inc. Method and apparatus for folding and fusing the elements of a slide fastener string. 4,101,360, Cl. 156-200.000.
- Monsanto Company: *See—*
  - Barker, Robert I.; and King, David P., 4,101,612, Cl. 264-22.000.
  - Brodsky, Philip H., 4,101,500, Cl. 260-38.000.
  - Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.
  - Churchill, Geoffrey B.; and White, J. Craig, 4,101,702, Cl. 428-213.000.
  - Hallcher, Richard C., 4,101,391, Cl. 204-59.00R.
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  - Johnson, Joseph E., Jr.; and Warrell, Richard D., 4,101,043, Cl. 215-100.00R.
  - Moedritzer, Kurt, 4,101,587, Cl. 260-606.50F.
  - Ort, Morris R., 4,101,517, Cl. 528-271.000.
- Montanari, Piero, to WABCO Westinghouse. Fail-safe resistor. 4,101,820, Cl. 323-94.00R.
- Monti, Anthony: *See—*
  - Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.
- Mooney, Thomas; and Shemtov, Sami, to I.T.E. Imperial Corporation. Cradle type conduit hangers. 4,101,103, Cl. 248-58.000.
- Moore, Ernest George: *See—*
  - Jelling, Murray; Kahn, Alexander; Moore, Ernest George; and Friedman, Michael, 4,100,719, Cl. 53-241.000.
- Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,101,809, Cl. 315-156.000.
- Morgan, Donald F.; and Wolosky, Irwin S., to Amerace Corporation. Molded composition and article molded therefrom. 4,101,463, Cl. 260-2.300.
- Mori, Koichi, to Diesel Kiki Co., Ltd. Mechanical governor for internal combustion engine. 4,100,890, Cl. 123-140.00R.
- Mori, Mamoru; and Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt device for use in vehicle. 4,101,170, Cl. 297-389.000.
- Morin, Robert J. Collapsible chair. 4,101,163, Cl. 297-16.000.
- Morini, Rino. Blanking and forming press for sheet metal caps. 4,100,788, Cl. 72-329.000.
- Morishita, Hazime: *See—*
  - Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
- Moroz, Raymond D.: *See—*
  - Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.
- Morris, Arthur E., to University of Missouri, The Curators of the. Process for recovery of lead from lead sulfide concentrates. 4,101,314, Cl. 75-77.000.
- Morris, Ronald E.: *See—*
  - Fewkes, Harold L., 4,101,005, Cl. 187-17.000.
- Morrison, Gary Eugene, to Goldesberry, John M., a part interest. C.B. radio antenna unit system and process. 4,101,897, Cl. 343-715.000.
- Morrisroe, John J.; and Banigan, Thomas F., to Pilot Chemical Company. 1,3,4 Triols and derivatives thereof. 4,101,589, Cl. 260-615.00B.
- Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, to AMP Incorporated. Discrete wire interconnections for connector blocks. 4,101,189, Cl. 339-99.00R.
- Moskal, John J., to Premier Industrial Corporation. Non-aqueous water-displacing sealant composition for vehicle glass joints. 4,101,483, Cl. 260-27.0BB.
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  - Haag, Franz; and Bongartz, Paul, 4,101,116, Cl. 366-142.000.
- Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, to Tokuyama Soda Kabushiki Kaisha. Cathode-structure for electrolysis. 4,101,395, Cl. 204-98.000.
- Motorola, Inc.: *See—*
  - Craig, Timothy Philip; and Stimple, James Roy, 4,101,836, Cl. 325-302.000.
  - Davis, William F.; and Pace, Wilson David, 4,100,907, Cl. 123-148.00S.
  - Dworsky, Lawrence Noah; and Whalin, Jeffery Alden, 4,101,850, Cl. 333-24.200.
  - Immer, Dennis L.; Millhollan, Michael S.; and Treadway, Ronald L., 4,101,974, Cl. 365-96.000.
  - Kommrusch, Richard Stephen, 4,101,901, Cl. 343-853.000.
  - Malone, Hugh Robert, 4,101,844, Cl. 331-10.000.
- Mott, George E.; and Seguin, Ronald D., to Texaco Inc. Marine structure with riser conductor and pipeline connection. 4,100,753, Cl. 61-86.000.
- Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., to Stone & Webster Engineering Corporation. Impact energy absorbing pipe restraints. 4,101,118, Cl. 267-136.000.
- Mounts, William T.; and Stratton, Joseph B., to Caterpillar Tractor Co. Semi-modular cab joint line sealing arrangement. 4,101,160, Cl. 296-35.00R.
- Mowen, Robert P.; and Gettings, Jacob D. 4-Row trac planter. 4,100,862, Cl. 111-52.000.
- MSI Electronics Inc.: *See—*
  - Greig, John H., 4,101,830, Cl. 324-158.00F.
- Mueller, Horst, to Siemens Aktiengesellschaft. Demultiplexer for originally synchronous digital signals internested word-wise. 4,101,739, Cl. 179-15.00A.
- Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., to Xerox Corporation. Roll fuser cleaning system. 4,101,267, Cl. 432-60.000.
- Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., to Exxon Research & Engineering Co. Selective synthesis of 2-haloalkanethiols and episulfides therefrom. 4,101,557, Cl. 260-327.00E.
- Muijs, Cornelis G. M.: *See—*
  - Carnewal, Jose A. C. L.; Decoene, Frans J. G. C.; and Muijs, Cornelis G. M., 4,100,720, Cl. 56-14.600.
- Muller, Dieter; Endlich, Wilhelm; and Kugler, Siegfried. Dowel or anchoring means. 4,100,954, Cl. 151-41.700.
- Muller, Gerhard: *See—*
  - Kotzsch, Hans-Joachim; Muller, Gerhard; and Vahlensieck, Hans-Joachim, 4,101,397, Cl. 204-158.0HA.
- Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, to Metz Apparatewerke. Photographic flash unit. 4,101,812, Cl. 315-241.00P.
- Muraishi, Masakazu; and Sekino, Takao, to Nissan Motor Company, Limited. Adjustable seat for a motor vehicle. 4,101,169, Cl. 297-341.000.
- Murakami, Masayuki: *See—*
  - Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.
- Murakami, Tadayoshi: *See—*
  - Arashi, Norio; Hishinuma, Yukio; and Murakami, Tadayoshi, 4,101,290, Cl. 23-288.00R.
- Murano, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Air-conditioning apparatus. 4,100,764, Cl. 62-289.000.
- Murata Manufacturing Co., Ltd.: *See—*
  - Kuze, Saburo, 4,101,951, Cl. 361-293.000.
- Murata, Tomoji: *See—*
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- Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Constant boiling mixtures of 1-chloro-2,2,2-trifluoroethane and hydrocarbons. 4,101,436, Cl. 252-67.000.
- Muschelknautz, Edgar: *See—*
  - Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.
- Musgrave, Daniel Dennis. Ready magazine holder. 4,100,694, Cl. 42-90.000.

- Muto, Masaaki: *See—*
  - Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.
- Mutsushita, Shuzo, to Minolta Camera Kabushiki Kaisha. Attachment member for exchangeable lenses. 4,101,223, Cl. 354-286.000.
- Myers, William Perry; and Torzala, Terence August, to Bendix Corporation, The. Pressure cycling control for fluid separator mechanism. 4,101,298, Cl. 55-163.000.
- Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, to Dowa Mining Co., Ltd. Bubble forming device having no moving parts. 4,101,286, Cl. 23-283.000.
- Nagasawa, Hiroyuki; and Kaneko, Kunio, to Sony Corporation. Green light emitting diode. 4,101,920, Cl. 357-17.000.
- Nagasawa, Michitaro: *See—*
  - Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
- Nakabayashi Kabushiki Kaisha: *See—*
  - Takimoto, Yasukatsu, 4,100,640, Cl. 11-1.00R.
- Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, to Toagosei Chemical Industry Co., Ltd. Crosslinking emulsion. 4,101,493, Cl. 260-29.60R.
- Nakahara, Takuo: *See—*
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- Nakai, Kouji: *See—*
  - Nakano, Keiichi; and Nakai, Kouji, 4,100,909, Cl. 123-196.0AB.
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  - Ranus, Walter J., Jr.; and McClure, Lester Dennis, 4,101,584, Cl. 260-590.00D.
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  - Stiling, Rodney A., 4,101,630, Cl. 423-171.000.
- National Research Development Corporation: *See—*
  - Hiles, Maurice Arthur Frederick, 4,101,704, Cl. 428-218.000.
  - Wray, Gordon Richard; and Parry, Ruth Mary, 4,100,814, Cl. 74-43.000.
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  - Khattab, Ghazi; and Naviello, Gerard P., 4,101,502, Cl. 260-40.00R.
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  - Hale, William J.; Horst, William R.; and Walker, Donald A., 4,101,905, Cl. 346-74.100.
  - Smith, Gerald P., 4,101,745, Cl. 200-61.610.
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  - Goldin, Grigory Borisovich; Khlebnikov, Valentin Petrovich; Koro-Jushkov, Jury Vasilievich; Maslov, Vadim Nikolaevich; Korobov, Oleg Evgenievich; Kuklev, Vladimir Petrovich; Demyanets, Vladimir Grigorievich; Dolomanov, Ljudvig Alexandrovich; Kudeyarova, Emilia Stanislavovna; Nechaev, Vladimir Viktorovich; Bochkarev, Ellin Petrovich; Voronin, Nikolai Georgievich; and Drozdov, Jury Anatolievich, 4,100,879, Cl. 118-49.100.
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  - Meyer, Jack M., 4,101,236, Cl. 404-25.000.
- Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Incremental measuring system. 4,101,764, Cl. 250-237.00G.
- Nelson, Donald F. Parking lot exit control means. 4,101,235, Cl. 404-6.000.
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- Nessa, Christopher Eric. Blind fastener. 4,100,833, Cl. 85-3.00S.
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  - Kaldenbach, Willem Paul, 4,100,873, Cl. 114-125.000.
- Netzel, Philip C., to Gould Inc. Termination for stranded cable. 4,101,730, Cl. 174-75.00R.
- Neudorfer, Robert J. Method for joining crossed support members to each other. 4,100,952, Cl. 144-314.00B.
- Neukermans, Armand Paul; and Kruger, William Paul, to Hewlett-Packard Company. Stable fiber optic scintillative X-ray screen and method of production. 4,101,781, Cl. 250-483.000.
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  - Richards, Basil James, 4,101,016, Cl. 194-97.00A.
- Newburgh, Ronald G., to Electronics Corporation of America. Lead sulfide activation process. 4,101,452, Cl. 252-501.000.
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- Nichols, George Frederick: *See—*
  - Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 4,101,402, Cl. 204-192.00C.
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  - Nicholson, John Patrick, 4,101,332, Cl. 106-85.000.
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  - Butterworth, Arthur L.; and Niedzwiecki, Joseph F., 4,100,934, Cl. 137-512.000.
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  - Aoyama, Eiji, 4,101,843, Cl. 330-280.000.
- Nikota, John P. Fishing lure-and-line snap swivel. 4,100,658, Cl. 24-231.000.
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- Nims, Jerry Curtis: *See—*
  - Lo, Allen Kwok Wah; and Nims, Jerry Curtis, 4,101,210, Cl. 353-7.000.
- Nippon Chemiphar Co., Ltd.: *See—*
  - Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
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  - Aoki, Naohisa; Matsuda, Hitoshi; and Hayashi, Hideaki, 4,101,133, Cl. 274-23.00R.
- Nippon Mektron Kabushiki Kaisha: *See—*
  - Fukuda, Shunichi; Muto, Masaaki; and Iwabuchi, Syoichi, 4,101,361, Cl. 156-250.000.
- Nippon Oil Company Ltd.: *See—*
  - Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, 4,101,635, Cl. 423-242.000.
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  - Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
- Nippon Soken, Inc.: *See—*
  - Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, 4,100,895, Cl. 123-117.00R.
  - Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.
  - Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, 4,100,734, Cl. 60-278.000.
- Nippon Steel Corporation: *See—*
  - Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.
  - Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
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- Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, to Mitsubishi Chemical Industries Limited; and Noda Institute for Scientific Research. Process for the microbiological oxidation of steroids. 4,101,378, Cl. 195-51.00G.
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- Nishimura, Masakatsu: *See—*
  - Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, 4,101,395, Cl. 204-98.000.
- Nishiura, Ichiro: *See—*
  - Uda, Kazumi; Tamura, Motohiko; Nishiura, Ichiro; and Fujiike, Hiroshi, 4,101,297, Cl. 55-43.000.
- Nishiyama, Hissei: *See—*
  - Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.
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  - Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.
- Nissan Motor Company, Limited: *See—*
  - Asano, Masaharu, 4,100,892, Cl. 123-32.0EE.
  - Kita, Toru; and Fujishiro, Takeshi, 4,101,403, Cl. 204-195.00S.
  - Mizuno, Yukio, 4,100,947, Cl. 139-453.000.
  - Muraishi, Masakazu; and Sekino, Takao, 4,101,169, Cl. 297-341.000.
  - Nakajima, Yasuo; Hayashi, Yoshimasa; and Takagi, Yasuo, 4,100,736, Cl. 60-278.000.
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  - Sugihara, Kunihiko, 4,100,737, Cl. 60-292.000.
- Nissei Plastics Industrial Co., Ltd.: *See—*
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- Nitschke, Eberhard; Desai, Arvind; and Ilgner, Hartmut, to Friedrich Uhde GmbH. Process for the production of hydrogen/deuterium-containing gas. 4,101,645, Cl. 423-648.00A.
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  - Ishizuka, Takashi; and Miwa, Naoki, 4,101,488, Cl. 260-29.20N.
- Niwa, Shinichi: *See—*
  - Taketani, Yutaka; and Niwa, Shinichi, 4,101,458, Cl. 252-62.200.
- Noctua, Inc.: *See—*
  - Christensen, Craig M., 4,101,199, Cl. 350-152.000.
- Noda Institute for Scientific Research: *See—*
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  - Renaud, Jean; Noiriel, Gilles; and Chazard, Georges, 4,101,456, Cl. 252-551.000.
- Nolan, Joe M. Fuel vaporizer. 4,100,905, Cl. 123-141.000.
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  - Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.
- Nomura, Tatsuo: *See—*
  - Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
- Nonogaki, Saburo: *See—*
  - Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
- Nordin, Dag, to ITT Industries, Incorporated. Bearing bracket assembly for a submersible motor driven pump. 4,101,139, Cl. 277-22.000.
- Noren, Richard W.: *See—*
  - Fox, Frederick J.; Noren, Richard W.; and Krankkala, George E., 4,101,513, Cl. 526-193.000.
- Norfield Manufacturing Co.,: *See—*
  - Cheak, Edward G., 4,100,661, Cl. 29-33.00K.
- Norte-Klessmann & Co. K.G.: *See—*
  - Kohler, Walter, 4,100,837, Cl. 90-11.00R.
- North American Systems, Inc.: *See—*
  - Menier, Vincent J., 4,101,627, Cl. 264-323.000.
- Northrop Weaving Machinery Limited: *See—*
  - Ainsworth, David; Beckett, Allan; and Atkinson, Cyril Millward, 4,100,941, Cl. 139-449.000.
- Northwestern Mutual Life Insurance Company, The: *See—*
  - Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.
- Northwestern University: *See—*
  - Epstein, Max; and Nalamwar, Ashok L., 4,101,852, Cl. 333-30.00R.
- Norton, Robert O., to Labconco Corporation. Convertible, laminar flow biological safety cabinet apparatus. 4,100,847, Cl. 98-115.0LH.
- Norwood, David, to Concorde Fibers, Inc. Production of shaped, high polymeric articles. 4,101,613, Cl. 264-40.300.
- Norwood, Donald D.: *See—*
  - Hogan, John P.; and Norwood, Donald D., 4,101,722, Cl. 526-106.000.
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  - Taylor, Frank D.; and Novotny, Ronald J., 4,101,835, Cl. 325-55.000.
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  - Gablin, Kenneth A.; and Hansen, Larry J., 4,100,860, Cl. 109-83.000.
- Nurk, Siegfried. Circular knitting machine method for manufacturing one piece panty hose or the like. 4,100,769, Cl. 66-177.000.
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  - Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, 4,101,092, Cl. 242-107.40B.
- Nyman, Frederick Russell: *See—*
  - Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, 4,101,402, Cl. 204-192.00C.
- Nyu, Kiyosato: *See—*
  - Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
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  - Kranefeld, Wilhelm; and Schneider, Helmut, 4,100,707, Cl. 52-115.000.
- Obayashi, Hideki: *See—*
  - Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, 4,100,734, Cl. 60-278.000.
- Obear, Robert F.: *See—*
  - Peirce, Allen E.; Obear, Robert F.; and Olson, David E., 4,100,700, Cl. 51-92.00R.
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- O'Callaghan, Larry John. Underwater power head. 4,100,855, Cl. 102-48.000.
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  - Choi, Charles K., 4,101,412, Cl. 208-8.000.
  - Dolbear, Geoffrey E., 4,101,416, Cl. 208-108.000.
  - Lumpkin, Robert E., Jr., 4,101,263, Cl. 432-13.000.
- Ochomogo, Oscar Rene, to Du Pont de Nemours, E. I., and Company. Selective herbicide. 4,101,308, Cl. 71-93.000.
- Oehm, Klaus, to Volkswagenwerk Aktiengesellschaft. Gas bag safety device for flat steering wheel. 4,101,146, Cl. 280-731.000.
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  - Uhrhan, Paul; Lantzsch, Reinhard; Oertel, Harald; Roos, Ernst; and Arlt, Dieter, 4,101,506, Cl. 260-45.80N.
- OFA AG: *See—*
  - Hamel, Edmund, 4,100,727, Cl. 57-160.000.
- Offner, Franklin F. Method and apparatus for determining the location of a leak in a pipe buried underground. 4,101,827, Cl. 324-65.00R.
- Oganesyan, Oganes Vardanovich; and Pyanov, Nikolai Ivanovich, to Tsentralny Nauchno-Issledovatelsky Institut Travmatologii I Ortopedii Imeni N.N. Priorova. Apparatus for surgical treatment of bones and joints. 4,100,919, Cl. 128-84.00B.
- Ogasawara, Takahisa: *See—*
  - Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.
- Ogasawara, Toyotsugu, to Tomy Kogyo Co., Inc. Transfer mechanism intended for use with movable figurines. 4,100,696, Cl. 46-40.000.
- Ogawa, Haruki: *See—*
  - Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, 4,101,670, Cl. 424-300.000.
- Ogino, Sadashi: *See—*
  - Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, 4,101,312, Cl. 75-52.000.
- Ohashi, Michihiro: *See—*
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- Ohata, Katsuya: *See—*
  - Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,101,660, Cl. 424-250.000.
- Ohio State University Research Foundation, The: *See—*
  - Gassman, Paul G., 4,101,583, Cl. 260-575.000.
- Ohkubo, Kazuo: *See—*
  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
- Ohneda, Shoichi; and Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Color encoding video system with optical low pass filter. 4,101,929, Cl. 358-44.000.
- Ohorodnik, Alexander: *See—*
  - Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
- Ohsawa, Mitsuo, to Sony Corporation. Differential amplifier. 4,101,842, Cl. 330-257.000.
- Ohta, Hideo: *See—*
  - Fujishiro, Yuji; and Ohta, Hideo, 4,100,854, Cl. 101-415.100.
- Ohtsu, Takaji: *See—*
  - Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
- Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,101,096, Cl. 242-199.000.
- OK Machine & Tool Corp.: *See—*
  - Kober, Marvin; and Dvorak, Jarda, 4,100,670, Cl. 29-564.100.
- Okada, Akio: *See—*
  - Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.
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  - Kobayashi, Toshiyuki; Okada, Akio; Mayama, Takeshi; and Okada, Akira, 4,101,651, Cl. 424-35.000.
- Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, to Hitachi, Ltd. Gain control circuit. 4,101,841, Cl. 330-254.000.

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- Okano, Masao, to Toyo Valve Co., Ltd. Copper alloys with improved corrosion resistance and machinability. 4,101,317, Cl. 75-156.500.
- Okano, Yukio: *See—*
  - Ohneda, Shoichi; and Okano, Yukio, 4,101,929, Cl. 358-44.000.
- Okladnikov, Vladlen Alexeevich: *See—*
  - Gambarov, Vitaly Stepanovich; Demchuk, Alexandr Fedorovich; Okladnikov, Vladlen Alexeevich; Troinin, Boris Leonidovich; Deribas, Andrei Andreevich; Tsarenko, Alexandr Grigorievich; Fetisov, Valentin Ivanovich; Khenkin, Veniamin Yakovlevich; Neupokoev, Georgy Petrovich; Drapaljuk, Vladislav Vitalievich; and Gentse, Mstislav Vladimirovich, 4,100,783, Cl. 72-56.000.
- Okorodudu, Abraham O. M., to Mobil Oil Corporation. Lubricant compositions containing organophosphorus derivatives of hydroxycarboxylic acids. 4,101,432, Cl. 252-49.800.
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  - Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.
- Okudaira, Sadayuki: *See—*
  - Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.
- Okuma Machinery Works Ltd.: *See—*
  - Maeda, Yutaka; and Kawabe, Mitsuhiro, 4,101,817, Cl. 318-603.000.
- Okuno, Youichi: *See—*
  - Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, 4,101,912, Cl. 354-106.000.
- Olin Corporation: *See—*
  - Harris, Frederick John, 4,100,834, Cl. 85-77.000.
  - Kircher, Morton S.; and Engler, Maynard F., 4,101,410, Cl. 204-282.000.
  - Larson, Harold V.; and Clark, Morris E., 4,101,636, Cl. 423-305.000.
  - Tobin, John H., 4,101,554, Cl. 260-290.0HL.
- Oliveira, Joseph P., II. Touch-tone encoder unit for mobile radio transmitter. 4,101,871, Cl. 340-171.00R.
- Oliver, J. Allen: *See—*
  - Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, 4,101,100, Cl. 244-114.00R.
- Olson, David E.: *See—*
  - Peirce, Allen E.; Obear, Robert F.; and Olson, David E., 4,100,700, Cl. 51-92.00R.
- Olsson, Gunnar. Soil stabilizing apparatus. 4,100,861, Cl. 111-7.000.
- Oltman, Herbert D. Drive and steering apparatus. 4,101,004, Cl. 180-6.200.
- Olympia Werke AG: *See—*
  - Loock, Ehrenfried, 4,101,329, Cl. 106-22.000.
- Olympus Optical Co., Ltd.: *See—*
  - Fukuoka, Kenji, 4,101,934, Cl. 358-261.000.
  - Imai, Toshihiro, 4,101,196, Cl. 350-96.310.
  - Koizumi, Toshimichi; and Unami, Miwako, 4,101,204, Cl. 350-224.000.
  - Maitani, Yoshihisa; and Kidawara, Atsushi, 4,101,911, Cl. 354-53.000.
  - Miyazaki, Kensaku; and Shinohara, Toshio, 4,101,194, Cl. 350-9.000.
  - Tojyo, Tsutomu, 4,101,201, Cl. 350-175.0ML.
- Omita S.p.A.: *See—*
  - Germani, Cesare, 4,100,944, Cl. 139-439.000.
- O'Neill, John Edward. Folded composite structure. 4,100,690, Cl. 40-154.000.
- Ono, Akihiro: *See—*
  - Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, 4,101,275, Cl. 23-230.00R.
- Ontario Research Foundation: *See—*
  - White, Robert Charles, 4,100,626, Cl. 3-1.910.
- Oofusa, Masaatsu: *See—*
  - Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.
- Oogami, Eiryo, to Yoshida Kogyo K.K. Adjustable transom assembly. 4,100,704, Cl. 52-65.000.
- Orbital Collection Systems, Inc.: *See—*
  - Talenti, Pier F., 4,101,039, Cl. 214-83.320.
- Orcutt, John W., to Texas Instruments Incorporated. Pressure relief valve. 4,100,930, Cl. 137-68.00R.
- Orfeo, Sabatino R.: *See—*
  - Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.
- Orford, Raymond Leslie; and Smith, Dexter William, to Lucas Industries Limited. Sintered composition. 4,101,453, Cl. 252-503.000.
- Ornberg, Stellan, to Kalmar Lans Landsting. Tilting unit for furniture substructures. 4,101,167, Cl. 297-328.000.
- Ort, Morris R., to Monsanto Company. Preparation of polyesters of 1,2-bis(hydroxyphenyl)ethanes and aromatic dicarboxylic acids. 4,101,517, Cl. 528-271.000.
- Osaka Transformer Co., Ltd.: *See—*
  - Uratani, Takafumi, 4,101,755, Cl. 219-124.310.
- Osborne, William B., to Walter Kidde and Co., Inc. Monitored fire protection system. 4,101,887, Cl. 340-652.000.
- Oskam, Aane Adriaan; and Koot, Hermanus Marinus Ignatius, to Industrie Koot B.V. Adjustable motor car mirror with compact electrically driven adjusting means. 4,101,206, Cl. 350-289.000.
- Oswald, Alexis A.: *See—*
  - Mueller, Wolfgang H.; Oswald, Alexis A.; and Kozak, Peter J., 4,101,557, Cl. 260-327.00E.
- Otani, Yuzo: *See—*
  - Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.
- O'Toole, Lawrence P. Externally-programable switch. 4,101,857, Cl. 335-206.000.
- Otsuka, Koji: *See—*
  - Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.
- Otsuka, Shinya: *See—*
  - Ueno, Hiroshi; Otsuka, Shinya; Tsukamoto, Tetsuo; and Kishimoto, Akira, 4,101,534, Cl. 260-857.0TW.
- Ott, Theodor; and Gaisser, Max, to Ott, Theodor. Cutter. 4,100,636, Cl. 7-158.000.
- Otte, Dieter W.: *See—*
  - Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.
- Outboard Marine Corporation: *See—*
  - Stolley, Ronald M., 4,101,040, Cl. 214-131.00R.
  - Travis, Robert R., 4,101,137, Cl. 277-1.000.
- Owatonna Tool Company: *See—*
  - Doss, Daniel L.; and Melander, Robert A., 4,101,822, Cl. 324-16.00R.
- Owen, David Peter; and Miles, Barry Donald Ruberry, to Quantel Limited. Video synchronizer with velocity compensation. 4,101,939, Cl. 360-36.000.
- Owens-Corning Fiberglas Corporation: *See—*
  - Hill, Homer G.; and Pansius, William G., 4,101,334, Cl. 106-99.000.
  - Stalego, Joseph P., 4,101,475, Cl. 260-21.000.
- Owens-Illinois, Inc.: *See—*
  - Amberg, Stephen W., 4,100,841, Cl. 93-1.00G.
  - Fein, Michael E.; and Salisbury, Charles W., 4,101,846, Cl. 331-94.50D.
  - Mallory, James D., 4,100,937, Cl. 137-596.160.
  - Rough, Robert R., Sr.; and Peters, Homer D. F., 4,100,680, Cl. 33-126.70A.
  - Schermerhorn, Jerry D.; and Miller, John W. V., 4,101,810, Cl. 315-169.0TV.
  - Taylor, Lynn J., 4,101,207, Cl. 350-344.000.
  - Taylor, Lynn J.; and Tobias, John W., 4,101,720, Cl. 526-3.000.
- Oxy Metal Industries Corporation: *See—*
  - Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.
  - Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, 4,101,339, Cl. 134-2.000.
  - Rones, Josef; and Geldner, Joachim, 4,101,437, Cl. 252-149.000.
- Oy Tahka AB: *See—*
  - Lehtola, Erkki Topias, 4,100,819, Cl. 74-245.00R.
- Ozaki, Tadashi; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Exhaust gas purification system for an internal combustion engine. 4,100,734, Cl. 60-278.000.
- P.D. Rasspe Soehne: *See—*
  - Schmitz, Hermann, 4,100,932, Cl. 137-488.000.
- Pace, Wilson David: *See—*
  - Davis, William F.; and Pace, Wilson David, 4,100,907, Cl. 123-148.00S.
- Pacific Engineering & Production Company of Nevada: *See—*
  - Rhees, Raymond C.; and Halker, Bruce B., 4,101,390, Cl. 204-57.000.
- Pacific Western Systems: *See—*
  - Merryman, Wayne R., 4,101,761, Cl. 235-92.0CA.
- Pagani, Giorgio, to Snamprogetti S.p.A. Radial-flow reactor for the synthesis of ammonia with production of high thermal-level steam. 4,101,281, Cl. 23-288.00K.
- Page, Louis J. Ophthalmic device for tensionally securing lenses thereto. 4,101,208, Cl. 351-58.000.
- Page, Roy Arthur, to Midland Designing & Manufacturing Co. Ltd., The. Inner tube splicing machines. 4,101,368, Cl. 156-503.000.
- Palkiewicz, John Louis: *See—*
  - Tsen, Lo Kwang; and Palkiewicz, John Louis, 4,101,693, Cl. 427-386.000.
- Palma, Milton J., to Caterpillar Tractor Co. Service rack for lift trucks. 4,101,038, Cl. 214-44.00R.
- Panavision, Incorporated: *See—*
  - Gottschalk, Robert E.; and Mayer, Albert L., 4,101,916, Cl. 354-219.000.
- Panday, Vinod: *See—*
  - Ruggles, Richard L.; and Panday, Vinod, 4,101,786, Cl. 307-38.000.
- Panetti, Romolo, to Speno International S.A.; and Frank Speno Railroad Ballast Cleaning Co., Inc. Process and a system for measuring and recording undulatory deformations of a rail surface. 4,100,795, Cl. 73-146.000.
- Pankey, Titus, Jr.: *See—*
  - Thomas, Richard E.; and Pankey, Titus, Jr., 4,101,800, Cl. 313-346.0DC.
- Panneman, Harm Jan, to Akzona Incorporated. Novel 2,6-di-substituted phenyl-aminoquanidine containing compositions and methods of using same and pharmaceutical compositions containing the same and therapeutic method. 4,101,675, Cl. 424-326.000.
- Panov, Evgeny Petrovich: *See—*
  - Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Ar-

kadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.

Pansini, Andrew L. Swimming pool cleaners. 4,100,641, Cl. 15-1.700.

Pansius, William G.: *See—*

Hill, Homer G.; and Pansius, William G., 4,101,334, Cl. 106-99.000.

Pantland, Ernest Francis: *See—*

Pantland, Frederick William; and Pantland, Ernest Francis, 4,100,931, Cl. 137-77.000.

Pantland, Frederick William; and Pantland, Ernest Francis, to Fisher, Leonard Joseph. Fire damper. 4,100,931, Cl. 137-77.000.

Pappas, Dennis Gerasimos, to Aboyne Pty. Limited. Fire detection system. 4,101,872, Cl. 340-539.000.

Paquette, Francis A.; and Henze, Richard H. Closure cap and support for holding a bottle of carbonated beverage in inverted position. 4,101,044, Cl. 215-228.000.

Parisien, Rudolph E. Fence rail fastener. 4,101,226, Cl. 403-4.000.

Park, Chung Poo; Griffin, Warren H.; and Corbett, John M., to Dow Chemical Company, The. Soft ethylenic polymer foams. 4,101,467, Cl. 521-79.000.

Parke, Davis & Company: *See—*

Nicolaides, Ernest D.; and Tinney, Francis John, 4,101,537, Cl. 260-112.5LH.

Parker, Norman W.; Golladay, Steven D.; and Crewe, Albert V., to United States of America, Energy. Double deflection system for an electron beam device. 4,101,813, Cl. 315-370.000.

Parr, Edward Leon: *See—*

Straza, George Thomas; and Parr, Edward Leon, 4,100,787, Cl. 72-310.000.

Parry, Ruth Mary: *See—*

Wray, Gordon Richard; and Parry, Ruth Mary, 4,100,814, Cl. 74-43.000.

Partyka, Richard A.: *See—*

Crenshaw, Ronnie R.; and Partyka, Richard A., 4,101,548, Cl. 544-284.000.

Patrick, Charles: *See—*

Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, 4,100,955, Cl. 152-362.0CS.

Patterson, Robert A.; and Lacy, Larry D., to Rockwell International Corporation. Apparatus and method for effecting redundant control data transfer in a digital flight control system. 4,101,958, Cl. 364-200.000.

Patterson, William W., III; and Grapes, Eugene F. Connectors. 4,100,875, Cl. 114-251.000.

Patzschke, Hans-Peter; and Gobel, Armin, to Dr. Kurt Herberts & Co. Gesellschaft mit beschrankter Haftung vorm. Otto Louis Herberts. Modified water-dilutable diolefin polymer oils containing carboxyl groups. 4,101,495, Cl. 260-29.7NR.

Paul Gillet GmbH: *See—*

Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, 4,101,280, Cl. 23-288.0FC.

Payne, Jimmy R.: *See—*

Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.

Payne, William J., to Modulus Corporation. Assembly method. 4,100,666, Cl. 29-407.000.

PBI, Inc.: *See—*

Bart, Philip D., 4,101,607, Cl. 261-36.00R.

Peacock, Bobbie D. Step construction employing insertable fastener having deformable projections. 4,100,997, Cl. 182-90.000.

Pecher, Wolfgang: *See—*

Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, 4,101,812, Cl. 315-241.00P.

Pecoraro, Ann. Body protector. 4,100,620, Cl. 2-102.000.

Pedain, Josef: *See—*

Bock, Manfred; Pedain, Josef; and Braden, Rudolf, 4,101,578, Cl. 260-563.00R.

Peech, John M.: *See—*

East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.

Peirce, Allen E.; Obear, Robert F.; and Olson, David E., to Western Gear Corporation. Workpiece conditioning grinder system. 4,100,700, Cl. 51-92.00R.

Pelensky, Joseph: *See—*

Geary, Joseph E.; Pelensky, Joseph; and Hart, John Peter, 4,101,685, Cl. 427-8.000.

Pelt, Thomas E., to Badger Meter, Inc. Flow control assemblies. 4,100,800, Cl. 73-197.000.

Pelton, John Franklin, to Union Carbide Corporation. Control system for refuse compacter. 4,100,849, Cl. 100-41.000.

Pelz, Robert W.: *See—*

Whang, Tack J.; and Pelz, Robert W., 4,101,709, Cl. 428-433.000.

Pemper, Steven J. Casting process. 4,100,669, Cl. 29-527.600.

Penn Yan Boats, Incorporated: *See—*

Stuart, Robert B., 4,100,994, Cl. 181-261.000.

Pennella, Filippo: *See—*

Rycheck, Mark R.; and Pennella, Filippo, 4,101,592, Cl. 260-666.00P.

Pennwalt Corporation: *See—*

Kamens, Ernest Rudolph; Kressin, Donald Milton; Lange, Harold Carl; and MacLeay, Ronald Edward, 4,101,464, Cl. 521-88.000.

Sheppard, Chester Stephen; and MacLeay, Ronald Edward, 4,101,522, Cl. 528-292.000.

Pepe, Charles R. Machine suspended from a crane or similar device for driving and extracting piling and the like. 4,100,974, Cl. 173-49.000.

Peppel, William Jennings, all of: *See—*

Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.

Pepping, Roelf, to Machinefabriek W. Hubert & Co. B.V. Method for dewatering sludge. 4,101,400, Cl. 204-180.00R.

Perkin-Elmer Corporation, The: *See—*

Denison, Dean R.; and Kren, George J., 4,101,874, Cl. 340-606.000.

Pernyeszi, Joseph: *See—*

Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, 4,101,072, Cl. 235-455.000.

Perrey, Hermann; Meiners, Hans-Joachim; and Ick, Jurgen, to Bayer Aktiengesellschaft. Process for cold-hardening polyurethane foams using sulfonamide emulsifiers. 4,101,468, Cl. 521-115.000.

Peters, Edwin F.: *See—*

Jezl, James L.; and Peters, Edwin F., 4,101,289, Cl. 23-288.00E.

Peters, Homer D. F.: *See—*

Rough, Robert R., Sr.; and Peters, Homer D. F., 4,100,680, Cl. 33-126.70A.

Peters, Mark A.; and Johnson, Robert K., to Cyprus Metallurgical Processes Corporation. Recovery of silver from cuprous chloride solutions by co-crystallization with sodium chloride. 4,101,315, Cl. 75-104.000.

Peterson, James R. Tremolo for a string instrument. 4,100,832, Cl. 84-313.000.

Peterson, Marvin A., to General Electric Company. Coating medium. 4,101,487, Cl. 260-29.20N.

Petitpierre, Jean Claude; and Ramanathan, Visvanathan, to Ciba-Oeigy Corporation. 3-Cyano-1,2,4-thiadiazolyl-5-czo dyestuffs. 4,101,541, Cl. 260-158.000.

Petrolite Corporation: *See—*

Landis, Joel Victor, 4,101,563, Cl. 260-425.000.

Quinlan, Patrick M., 4,101,674, Cl. 424-325.000.

Redmore, Derek, 4,101,654, Cl. 424-200.000.

Petschauer, Karl: *See—*

Heller, Hans-Dieter; Hertler, Wolfram; and Petschauer, Karl, 4,101,888, Cl. 343-7.0VM.

Pfenninger, Hans: *See—*

Gyarmathy, Georg; and Pfenninger, Hans, 4,100,745, Cl. 60-652.000.

Philagro S.A.: *See—*

Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,101,307, Cl. 71-88.000.

Philip, Alexander Schroder, to Plessey Handel und Investments AG. Control arrangement in a time-space-time (t-s-t) time division multiple (t.d.m.) telecommunication switching system. 4,101,737, Cl. 179-15.0AT.

Philips, Michael R., to Jonathan Temple Incorporated. Core construction for a sewing machine bobbin. 4,100,866, Cl. 112-231.000.

Phillips Petroleum Company: *See—*

Crowley, Ralph P., 4,101,415, Cl. 208-45.000.

Doss, Richard C.; and Walton, Edward L., 4,101,482, Cl. 260-27.0BB.

Doss, Richard C., 4,101,484, Cl. 260-27.0BB.

Fahey, Darryl R., 4,101,566, Cl. 260-439.00R.

Hogan, John P.; and Norwood, Donald D., 4,101,722, Cl. 526-106.000.

Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.

Ririe, Otis E., 4,101,282, Cl. 23-254.00R.

Rycheck, Mark R.; and Pennella, Filippo, 4,101,592, Cl. 260-666.00P.

Phillips, Talmadge V.: *See—*

Buff, Grier E.; and Phillips, Talmadge V., 4,101,753, Cl. 219-97.000.

Photo-Control Corporation: *See—*

Gallistel, Albert F.; and Lindenfelser, Jerome W., 4,101,913, Cl. 354-122.000.

Piech, Corina; and Schleicher, Wolfram, to Piech, Corina. Protective helmet. 4,100,619, Cl. 2-10.000.

Pieper, Helmut: *See—*

Keck, Johannes; Noll, Klaus-Reinhold; Pieper, Helmut; Kruger, Gerd; and Puschmann, Sigfrid, 4,101,671, Cl. 424-330.000.

Pierce, Richard L.: *See—*

Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.

Pillsbury Company, The: *See—*

Reid, Francis R., 4,100,846, Cl. 93-94.00R.

Pilot Chemical Company: *See—*

Morrisroe, John J.; and Banigan, Thomas F., 4,101,589, Cl. 260-615.00B.

Pimshtein, Pavel Gdalievich: *See—*

Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.

Pingitore, Peter: *See—*

Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.

Pintos, Jose Luis. Combination sun screen and pillow. 4,100,633, Cl. 5-337.000.

Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, to S.A.E.S. Getters S.p.A. Getter device with improved support member. 4,101,247, Cl. 417-48.000.

Pirotin, Shelden D.: *See—*

East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.

Pitney-Bowes, Inc.: *See—*

Rastorguyeff, Andrew Wladimir, 4,101,121, Cl. 270-68.00A.

Place, Geoffrey; and Maguire, Edward John, Jr., to Procter & Gamble Company, The. Enzyme-containing automatic dishwashing composition. 4,101,457, Cl. 252-559.000.

Plank, Don A.: *See—*

Floyd, Joseph C.; and Plank, Don A., 4,101,511, Cl. 260-45.85T.

Plastic Forming Company, Inc., The: *See—*

Schurman, Peter T., 4,101,033, Cl. 206-521.000.

Pleschiutschnigg, Fritz-Peter: *See—*

Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.

Plessey Handel und Investments AG: *See—*

Kent, Alan Hugh; and Fell, Peter Howard, 4,101,197, Cl. 350-96.170.

Philip, Alexander Schroder, 4,101,737, Cl. 179-15.0AT.

Waterworth, Peter; and Reid, Douglas Charles John, 4,101,193, Cl. 350-6.800.

Plessing, Kurt, to Fordertechnik Streicher GmbH. Stopcock with rotary and adjustable plug in the stopcock housing. 4,101,113, Cl. 251-214.000.

Ploeg, Johannes E. G., to Shell Oil Company. Process for the simultaneous removal of nitrogen and sulfur oxides from a gas stream. 4,101,634, Cl. 423-239.000.

Poist, John E., to Celanese Corporation. Platinum-tin hydroformylation catalyst. 4,101,564, Cl. 260-429.700.

Poist, John E., to Celanese Corporation. Hydroformylation catalyst. 4,101,565, Cl. 260-429.700.

Poitras, Edward J. Colorant dispenser having time sequence dispensing cycle. 4,101,055, Cl. 222-17.000.

Polaroid Corporation: *See—*

Gordon, Michael E., 4,101,701, Cl. 428-189.000.

Poll, Ian, to Shell Oil Company. Process for the removal of sulphur oxides from gases. 4,101,641, Cl. 423-567.00R.

Pollitzer, Ernest L.: *See—*

Hayes, John C.; and Pollitzer, Ernest L., 4,101,593, Cl. 260-666.00A.

Polpudnikov, Viktor Sergeevich: *See—*

Fikhte, Boris Abramovich; Gurevich, Grigory Aronovich; Ushakov, Vyacheslav Mitrofanovich; and Polpudnikov, Viktor Sergeevich, 4,101,079, Cl. 241-46.130.

Polymer Corporation, The: *See—*

Flemming, Norbert A., 4,100,827, Cl. 82-38.00A.

Polysar Limited: *See—*

Buckler, Ernest Jack; and Richmond, Michael Hugh, 4,101,050, Cl. 229-3.50R.

Edwards, Douglas Cameron; and Walker, John, 4,101,434, Cl. 252-52.00R.

Pons, Dick A.; and Bijker, Anno, to Synres International B.V. Process for preparing aqueous emulsions of addition polymers with built-in emulsifier. 4,101,490, Cl. 260-29.6MP.

Poole, Lynn A.; and Crain, Harry M., to United States of America, Navy. Analog-digital ratio detector. 4,101,839, Cl. 328-165.000.

Posner, Hyman: *See—*

Conners, John A.; and Posner, Hyman, 4,101,112, Cl. 251-148.000.

Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., to Texas Instruments Incorporated. Self-aligned epitaxial method for the fabrication of semiconductor devices. 4,101,350, Cl. 148-175.000.

Post Office, The: *See—*

Midwinter, John Edwin; and Day, Clive Richard, 4,101,305, Cl. 65-145.000.

Postema, James R.: *See—*

Miller, John E.; and Postema, James R., 4,101,794, Cl. 310-71.000.

Pottinger, Marion G.; Miller, Edward G., Jr.; and Patrick, Charles, to B. F. Goodrich Company, The. Pneumatic tire. 4,100,955, Cl. 152-362.0CS.

Potulov, Vyacheslav Mikhailovich: *See—*

Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.

Poulin, Clyde J.; and Bryla, Theodore N., to United States of America, Navy. Deflagrative electronic component potting compound. 4,101,352, Cl. 149-19.200.

Powers, Edward J.: *See—*

Davis, Herbert L.; Jaffe, Michael L.; LaNieve, Herman L., III; and Powers, Edward J., 4,101,525, Cl. 528-309.000.

PPG Industries, Inc.: *See—*

Ammons, Vernon G., 4,101,529, Cl. 528-67.000.

Barch, Herbert W.; and Bohy, August G., 4,100,723, Cl. 57-34.00B.

Barch, Herbert W.; and Bohy, August G., 4,100,726, Cl. 57-157.00F.

Bosso, Joseph F.; and Sturni, Lance C., 4,101,486, Cl. 260-29.2TN.

Johnson, Harlan B., 4,101,394, Cl. 204-77.000.

Johnson, Harlan B.; Martinsons, Aleksandrs; and Welch, Cletus N., 4,101,624, Cl. 264-273.000.

Prade, Ernstfried, to Mistral Windsurfing AG. Surfboard. 4,100,870, Cl. 114-39.000.

Pradon, Jacques. Telescopic set of steps with variable slope. 4,100,995, Cl. 182-1.000.

Pradt, Louis Atwater, to Sterling Drug, Inc. Regulation of a wet air oxidation unit for production of useful energy. 4,100,730, Cl. 60-39.050.

Precision Lamp: *See—*

DuNah, Richard E., 4,101,955, Cl. 362-104.000.

Preiss, Herbert: *See—*

Nemecek, Franz; Muschelknautz, Edgar; Lindner, Wolfgang; and Preiss, Herbert, 4,100,660, Cl. 28-271.000.

Premier Industrial Corporation: *See—*

Moskal, John J., 4,101,483, Cl. 260-27.0BB.

Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See—*

Bako, Lazlo, 4,100,775, Cl. 70-3.000.

Preus, Paul. Protected aquatic sports area. 4,100,746, Cl. 61-1.00F.

Previte, Peter Luciano, to Singer Company, The. Flexure suspension assembly. 4,100,813, Cl. 74-5.00F.

Price, David Watkin: *See—*

Jones, William Derek; Kimber, Geoffrey Michael; McLaren, James; and Price, David Watkin, 4,101,413, Cl. 208-8.000.

Prichard, Richard Michael Hesketh: *See—*

Richmond, Michael; and Prichard, Richard Michael Hesketh, 4,101,933, Cl. 358-254.000.

Procter & Gamble Company, The: *See—*

Francis, Edward; Carson, Craig Ronald; and McKay, Michael Lance, 4,101,455, Cl. 252-531.000.

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- Ranco Incorporated: *See—*
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- Rand, Burton, to Autosonics, Inc. Solvent spray cleaning system for minimizing solvent losses. 4,101,340, Cl. 134-11.000.
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- Randermann, Ervin, Jr., to Schlumberger Technology Corporation. Tubing tester valve apparatus. 4,100,969, Cl. 166-324.000.
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- Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. Benzhydryl guanidines. 4,101,659, Cl. 424-248.560.
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- Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., to GF Business Equipment, Inc. Chair control mechanism. 4,101,166, Cl. 297-304.000.
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  - Gabor, Charles K., 4,100,642, Cl. 15-114.000.
  - Marquez, Manuel J., 4,100,998, Cl. 182-116.000.
  - Minard, Marguerite F., 4,101,104, Cl. 248-95.000.
- RCA Corporation: *See—*
  - Andrevski, Zygmunt Marian, 4,101,802, Cl. 313-422.000.
  - Bell, Alan Edward; Bartolini, Robert Alfred; and Bloom, Allen, 4,101,907, Cl. 346-135.000.
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  - Haferl, Peter Eduard, 4,101,814, Cl. 315-371.000.
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- Redmore, Derek, to Petrolite Corporation. Microbiocidal process employing full quaternary nitrogen-heterocyclic phosphonates. 4,101,654, Cl. 424-200.000.
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- Reeder, Thomas M.: *See—*
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- Reese, Robert O.; and Garrison, Donald W., to Time Computer, Inc. Wristwatch calculator with interface chip. 4,101,963, Cl. 364-705.000.
- Reeves, George I.; and Keegan, Jack J., to Beckman Instruments, Inc. Magnetic pick up for use with electronic ignition systems. 4,101,859, Cl. 336-90.000.
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- Reid, William P., to Tetrafluor, Inc. Peripherally grooved seal. 4,101,140, Cl. 277-165.000.
- Reid, William P. Fluid purification device and ultraviolet lamp therefor. 4,101,777, Cl. 250-436.000.
- Reil, Wilhelm. Packaging means. 4,101,051, Cl. 229-17.00R.
- Reinecke, Harry; and Bachmann, Gerhard, to Frankl & Kirchner GmbH. & Co. KG. Fabrik fur Elektromotoren und elektrische Apparate. Apparatus for limiting maximum number of stitches of sewing machines. 4,100,868, Cl. 112-277.000.
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- Renaud, Jean; Nniriel, Gilles; and Chazard, Georges, to Colgate-Palmolive Company. Light duty liquid detergent. 4,101,456, Cl. 252-551.000.
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- Renner, Alfred, to Ciba-Geigy AG. Process for the manufacture of highly disperse solids consisting of crosslinked urea-formaldehyde polycondensation products. 4,101,521, Cl. 528-242.000.
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  - Buff, Grier E.; and Phillips, Talmadge V., 4,101,753, Cl. 219-97.000.
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- Rexnord Inc.: *See—*
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- Reymore, Harold E., Jr.: *See—*
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- Rich, Daniel H.; and Gurwara, Sweet K., to Wisconsin Alumni Research Foundation. Solid phase synthesis of protected peptides. 4,101,721, Cl. 526-19.000.
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- Richards, Basil James, to New Century Novelty Company Pty. Limited. Coin testing apparatus. 4,101,016, Cl. 194-97.00A.
- Richards, Earl. Golf mat. 4,101,130, Cl. 273-187.00A.
- Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., to Phillips Petroleum Company. Apparatus for forming a container. 4,100,842, Cl. 93-39.00C.
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- Richey, Vernon T. Tool for fishing an object from a bore hole. 4,101,157, Cl. 294-86.210.
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  - Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szabolcs, 4,101,545, Cl. 260-239.500.
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- Rigbi, Zvi, to Technion Research and Development Foundation, Ltd. Formation of spheres of thermoplastic materials, especially glass. 4,101,301, Cl. 65-21.000.
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- Ritter Brothers Enterprises, Inc.: *See—*
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  - Dietrich, Walter; and Bauer, Manfred, 4,100,843, Cl. 93-53.00M.
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  - Henry, Rodney D., 4,101,707, Cl. 428-409.000.
  - Patterson, Robert A.; and Lacy, Larry D., 4,101,958, Cl. 364-200.000.
  - Slay, Larry G., 4,101,903, Cl. 346-33.00R.
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- Rosenberg, Frieda M. Shoulder strap. 4,100,924, Cl. 128-510.000.
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- Rosman, Allan. Drive system for a moving mechanism. 4,100,822, Cl. 74-674.000.
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- Rothrock, Arthur A. Method of splicing motion picture sound film. 4,101,357, Cl. 156-159.000.
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- Rudy, Erwin. Cemented carbide-steel composites for earthmoving and mining applications. 4,101,318, Cl. 75-240.000.
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- Ruehle, William H., to Mobil Oil Corporation. Marine detector spread having arrays of different lengths. 4,101,866, Cl. 340-7.00R.
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- Ruff, George Robert; and Derrick, Danny O'Brian, to Shakespeare Company. Method of making a rung assembly for a ladder. 4,100,668, Cl. 29-523.000.
- Ruggles, Richard L.; and Panday, Vinod, to Clemar Manufacturing Corporation. Master-satellite irrigation control system with remote proportional timing. 4,101,786, Cl. 307-38.000.
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- Russell, David D.; and Shkapenko, George, to Samuel Moore & Company. Polyol blends and polyurethane prepared therefrom. 4,101,439, Cl. 252-182.000.
- Russell, George F. Laminating travelling press. 4,101,370, Cl. 156-555.000.
- Russer, Peter, to Licentia Patent-Verwaltungs-G.m.b.H. Method of and arrangement for producing coherent mode radiation. 4,101,845, Cl. 331-94.50M.
- Russo, Robert V., to M & T Chemicals Inc. High resiliency foam with improved load bearing ability by use of organotin mercaptides. 4,101,471, Cl. 521-121.000.
- Ruti Machinery Works Ltd.: *See—*
  - Tschudi, Rudolf, 4,100,942, Cl. 139-1.00R.
- Rutledge, Charles Thomas: *See—*
  - Linstromberg, William John; and Rutledge, Charles Thomas, 4,100,761, Cl. 62-137.000.

Rutledge, Thomas F., to ICI Americas Inc. Oxidxtive coupling of alkylphenols catalyzed by metal complexes of imino acid compounds. 4,101,561, Cl. 260-396.00N.

Ryan, Peter; and Bradley, Harry, to Lucas Industries Limited. Automatic indexing mechanism. 4,100,817, Cl. 74-111.000.

Rycheck, Mark R.; and Pennella, Filippo, to Phillips Petroleum Company. Catalytic hydrogenation. 4,101,592, Cl. 260-666.00P.

Ryu, Shoji: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.

S.A.E.S. Getters S.p.A.: *See—*
Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, 4,101,247, Cl. 417-48.000.

S I G Schweizerische Industrie-Gesellschaft: *See—*
Luginbuhl, Pierre, 4,101,420, Cl. 209-104.000.

S.L.M. (Model) Engineers Limited: *See—*
Lewicki, Edward, 4,101,863, Cl. 338-128.000.

Sabourin, Edward T.: *See—*
Schulz, J. Gustav; and Sabourin, Edward T., 4,101,469, Cl. 521-83.000.

Sadler, John H. Apparatus for converting coal into gas substitutes. 4,101,295, Cl. 48-99.000.

Sage, Howard M.; and Abromavage, John C., to U-Haul International, Inc. Adjustable car top carrier support. 4,101,061, Cl. 224-42.10F.

Sahara, Hiroshi: *See—*
Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.

Saiki, Yoshio: *See—*
Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.

Saint-Gobain Industries: *See—*
Fischer, Klaus; and Keul, Robert, 4,101,705, Cl. 428-220.000.

St.Martin, Norman P.: *See—*
Kulwicki, Bernard M.; and St.Martin, Norman P., 4,101,454, Cl. 252-514.000.

Saito, Nobuo; Yoshizawa, Shigeru; and Toyooka, Takashi, to Kogyo Gijutsuin, President of. Magnetic bubble module. 4,101,970, Cl. 365-2.000.

Saito, Nobuo: *See—*
Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.

Saitoh, Shin-Ichi: *See—*
Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.

Saitoh, Tomio: *See—*
Sumiyoshi, Keiji; and Saitoh, Tomio, 4,101,212, Cl. 355-3.0TR.

Sakai, Daniel S.: *See—*
Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.

Sakamoto, Seiji: *See—*
Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.

Sakudo, Noriyuki: *See—*
Suzuki, Keizo; Okudaira, Sadayuki; Kanomata, Ichiro; and Sakudo, Noriyuki, 4,101,411, Cl. 204-298.000.

Salisbury, Charles W.: *See—*
Fein, Michael E.; and Salisbury, Charles W., 4,101,846, Cl. 331-94.50D.

Samour, Carlos M.; and Vida, Julius A., to Bristol-Myers Company. Antiosteoporotic agents. 4,101,668, Cl. 424-275.000.

Samuel Moore & Company: *See—*
Russell, David D.; and Shkapenko, George, 4,101,439, Cl. 252-182.000.
Stine, Clifford R.; and Boyce, Jennings A., 4,101,699, Cl. 428-36.000.

Sanada, Seiji: *See—*
Isono, Katsuo; and Sanada, Seiji, 4,101,927, Cl. 358-27.000.

Sanders, Richard Norman; and Crossley, William James, to Prowest Electronics Limited. Television picture wiping. 4,101,930, Cl. 358-183.000.

Sandoz, Inc.: *See—*
Houlihan, William J., 4,101,553, Cl. 260-288.0CF.

Sandoz Ltd.: *See—*
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

Santoni, Cesar, to Greif Bros. Corporation. Clamping ring for removable covers of drums. 4,101,156, Cl. 292-256.690.

Sanyo Electric Co., Ltd.: *See—*
Taketani, Yutaka; and Niwa, Shinichi, 4,101,458, Cl. 252-62.200.

Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process and composition for removing carbon dioxide containing acidic gases from gaseous mixtures. 4,101,633, Cl. 423-228.000.

Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, to Tokyo Shibaura Electric Co., Ltd. Electronic copying apparatus. 4,101,218, Cl. 355-57.000.

Sasaki, Shiro; Ioukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., to Toyota Jidosha Kogyo Kabushiki Kaisha. Tongue plate for seat belt device. 4,101,171, Cl. 297-389.000.

Sassak, Frank. Program controlled tube bending machine and a binary feed mechanism for use therein. 4,100,780, Cl. 72-7.000.

Sata, Toshikatsu: *See—*
Motani, Kensuke; Sata, Toshikatsu; and Nishimura, Masakatsu, 4,101,395, Cl. 204-98.000.

Sato, Jun-ichi: *See—*
Fukumoto, Akira; Kawabuchi, Masami; Fukukita, Hiroshi; and Sato, Jun-ichi, 4,101,795, Cl. 310-336.000.

Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, to Maruzen Oil Co., Ltd. Process for separation and purification of vinylphenol. 4,101,590, Cl. 568-750.000.

Sato, Nobuhiro: *See—*
Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.

Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, to Sony Corporation. Color television receiver. 4,101,928, Cl. 358-28.000.

Sato, Tadazi: *See—*
Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.

Satterwhite, Charles R. Aerial conveyor system. 4,101,019, Cl. 198-300.000.

Sauer, Walter, to Hans Giesbert KG. Apparatus for conveying bulk materials. 4,101,021, Cl. 198-668.000.

Savage, David W.: *See—*
Sartori, Guido; and Savage, David W., 4,101,633, Cl. 423-228.000.

Savelkouls, Leonardus Joseph, to Progress Processing Limited. Metal coating process. 4,101,356, Cl. 156-71.000.

Sazhin, Gennady Vasilievich: *See—*
Surovikin, Vitaly Fedorovich; Sazhin, Gennady Vasilievich; Romanov, Mikhail Ivanovich; and Korenyak, Nikolai Kalistratovich, 4,101,639, Cl. 423-449.000.

Schaar, Charles H., to Colgate-Palmolive Company. Diaper fastener. 4,100,921, Cl. 128-284.000.

Schaar, Lothar, to Heye, Hermann. Moulding tool. 4,101,306, Cl. 65-323.000.

Schachter, Joseph D. Key chain retainer. 4,100,779, Cl. 70-456.00R.

Schaefer, Wolfgang: *See—*
Junike, Wilhelm; Rall, Klaus; Schaefer, Wolfgang; and Twiefel, Gunther, 4,100,671, Cl. 29-568.000.

Schafer, Stefan: *See—*
Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.

Scheerer, Wolfgang, to A. Ehrenreich GmbH & Co. KG. Housing for a flexible coupling. 4,101,228, Cl. 403-137.000.

Scherbina, Oleg Vasilievich: *See—*
Levitov, Vladimir Ilich; Lyapin, Andrei Grigorievich; and Scherbina, Oleg Vasilievich, 4,101,727, Cl. 174-28.000.

Schering Aktiengesellschaft: *See—*
Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.

Schermerborn, Jerry D.; and Miller, John W. V., to Owens-Illinois, Inc. System for and method of operating gas discharge display and memory. 4,101,810, Cl. 315-169.0TV.

Scheuing, Claus: *See—*
Frosch, Albert; Mannsdoerfer, Walter; and Scheuing, Claus, 4,101,008, Cl. 188-1.00B.

Schieber, Hans; and Schimko, Reinhold, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Knitting machine pattern mechanism. 4,100,767, Cl. 66-75.200.

Schiffman, Murray M., to MBI, Inc. Method and apparatus for producing a design on a flat surface adapted to be formed into an arcuate surface. 4,101,373, Cl. 156-659.000.

Schimko, Reinhold: *See—*
Schieber, Hans; and Schimko, Reinhold, 4,100,767, Cl. 66-75.200.

Schinke, Franz: *See—*
Hinz, Hans-Dieter; Rothgordt, Ulf; and Schinke, Franz, 4,101,908, Cl. 346-139.00C.

Schintlmeister, Wilfried, to Schwarzkopf Development Corporation. Coated cemented carbide elements. 4,101,703, Cl. 428-216.000.

Schlaifer, Nate: *See—*
Grimes, Johnny C.; Pierce, Richard L.; Payne, Jimmy R.; and Schlaifer, Nate, 4,101,886, Cl. 165-14.000.

Schleicher, Wolfram: *See—*
Piech, Corina; and Schleicher, Wolfram, 4,100,619, Cl. 2-10.000.

Schlumberger Technology Corporation: *See—*
Randermann, Ervin, Jr., 4,100,969, Cl. 166-324.000.

Schmedemann, Walter, to U.S. Philips Corporation. Apparatus for mechanically supporting a medical device in a plane. 4,101,779, Cl. 250-445.00R.

Schmelow, Harald Martin; Weman, Per Olof; and Arff, Heino, to N.V. Klippan S.A., a part interest. Universal emergency locking retractor. 4,101,092, Cl. 242-107.40B.

Schmid, Rolf; and Kreibich, Ursula, to Ciba-Geigy Corporation. Process for the manufacture of crystalline, crosslinked, elastomeric epoxide resins. 4,101,476, Cl. 260-22.0EP.

Schmidt, Gertraud A.; and Bopp, Louis A., to General Cable Corporation. Dispersion of antioxidant in cross-linkable polyethylene. 4,101,512, Cl. 260-45.95C.

Schmidt, Hartinus Thomsen, to Schmidt & Sonner Maskinfabrik A/S. Beater mill. 4,101,080, Cl. 241-51.000.

Schmidt, Paul. Displacement hammer apparatus for sinking and lining boreholes. 4,100,972, Cl. 173-23.000.

Schmidt, Paul. Pneumatic percussion boring device. 4,100,979, Cl. 175-19.000.

Schmidt & Sonner Maskinfabrik A/S: *See—*
Schmidt, Hartinus Thomsen, 4,101,080, Cl. 241-51,000.

Schmieder, Helmut; Goldacker, Hubert; and Roos, Werner, to Gesellschaft fur Kernforschung m.b.H. Countercurrent extraction column for liquid-liquid extraction. 4,101,408, Cl. 204-272.000.

Schmitz, Hermann, to P.D. Rasspe Soehne. Pipe burst safety device for natural gas pipe lines or the like. 4,100,932, Cl. 137-488.000.

Schmitz, Johannes Hubertus Antonius: *See—*
Wiedijk, Piet; Schmitz, Johannes Hubertus Antonius; and Van der Stap, Antonius Henricus Maria, 4,101,799, Cl. 313-331.000.

Schneider, Helmut: *See—*
Kranefeld, Wilhelm; and Schneider, Helmut, 4,100,707, Cl. 52-115.000.

Schneider, Richard: *See—*
Kohl, Lambert; Schneider, Richard; and Uhi, Karl, 4,101,027, Cl. 206-309.000.

Schoenauer, Wolfgang: *See—*
Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

Schoepe, Adolf. Ball cock construction for controlling the level of liquids such as water in tanks. 4,100,928, Cl. 137-15.000.

Schoff, Dale H., to Bristol Products, Inc. Indicator device for modular heating cable. 4,101,190, Cl. 339-113.00L.

Scholz, Werner, to Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Circuit for delaying a composite video signal by a line duration, particularly for use with a video record player. 4,101,940, Cl. 360-37.000.

Schonfelder, Manfred: *See—*
Burkhardt, Tilo; and Schonfelder, Manfred, 4,101,530, Cl. 528-45.000.

Schooley, Willard A.; and Browne, Robert E., to Sun Chemical Corporation. Water jacket for ultraviolet lamp. 4,101,424, Cl. 250-504.000.

Schott, Adolf: *See—*
Muller, Ludwig Friedrich; Schott, Adolf; and Pecher, Wolfgang, 4,101,812, Cl. 315-241.00P.

Schrewe, Hans: *See—*
Gruner, Hans; Schrewe, Hans; Diederich, Gerd; Haufe, Claus-Dieter; and Pleschiutschnigg, Fritz-Peter, 4,100,959, Cl. 164-56.000.

Schreyer, Gerd: *See—*
Kruger, Manfred; Schreyer, Gerd; and Weiberg, Otto, 4,101,570, Cl. 260-502.00R.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Developing apparatus for light-sensitive materials comprising an evaporator for evaporating a developer medium from a solution. 4,101,918, Cl. 354-299.000.

Schuander, Eric, to Alsten Company, The. Ring box with removable display stand. 4,101,023, Cl. 206-45.190.

Schubeis, Ewald Ingemar Emanuel. Self-closing hinge. 4,100,646, Cl. 16-54.000.

Schulten, Christian: *See—*
Frietzsche, Gunther; Krause, Peter; and Schulten, Christian, 4,101,280, Cl. 23-288.0FC.

Schulz, J. Gustav; and Sabourin, Edward T., to Gulf Research & Development Company. Foamable resinous polymer compositions containing acid mixtures. 4,101,469, Cl. 521-83.000.

Schunck, Gunter; and Randwo, Albert, to Leybold-Heraeus GmbH & Co. KG. Process for the photo-optical measurement of the absorption behavior of solid, liquid and gaseous media. 4,101,221, Cl. 356-205.000.

Schur, Gotthold: *See—*
Herrmann, Lothar; and Schur, Gotthold, 4,100,983, Cl. 175-383.000.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Molded case for supporting and enclosing an article. 4,101,033, Cl. 206-521.000.

Schurr, Peter, to Endress & Hauser GmbH & Co. Sonic echo-sounder for the measurement of levels of substances. 4,101,865, Cl. 340-1.00L.

Schwartz, James W.: *See—*
Retsky, Michael Walter; and Schwartz, James W., 4,101,803, Cl. 315-3.000.

Schwarzkopf Development Corporation: *See—*
Schintlmeister, Wilfried, 4,101,703, Cl. 428-216.000.

Schymetzko, Karl-Heinz: *See—*
Kops, Friedrich; Kaufmann, Helmut; and Schymetzko, Karl-Heinz, 4,101,620, Cl. 264-177.00R.

Science Spectrum, Inc.: *See—*
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 4,101,383, Cl. 195-103.50R.

Scientific-Atlanta, Inc.: *See—*
Clayton, Lorimer, Jr.; and Livaditis, Elias J., 4,101,837, Cl. 325-347.000.

Scientific Technology Incorporated: *See—*
Key, Paul Franklyn; and Lazzara, Anthony Ross, 4,101,784, Cl. 250-555.000.

Scott, John H.; and Weist, Walter R., to Boeing Company, The. Protective control system for water-jet propulsion systems. 4,100,877, Cl. 115-11.000.

Scott, Timothy C.: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,100,762, Cl. 62-160.000.

Scully, Andrew J., to United States of America, Army. Easy access oil filter drain system. 4,101,000, Cl. 184-1.500.

Seaberg, David H.; and Kao, Gou-Lian, to J. I. Case Company. Method and apparatus for steering. 4,100,738, Cl. 60-327.000.

Seanor, Donald A.: *See—*
Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.

Seco Manufacturing, Inc.: *See—*
Davey, John T.; and Kahn, Lawrence P., 4,100,933, Cl. 137-495.000.

Seguin, Ronald D.: *See—*
Mott, George E.; and Seguin, Ronald D., 4,100,753, Cl. 61-86.000.

Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, to Fujikura Cable Works, Ltd., The. Apparatus for twisting insulated conductors for use in multiconductor communication cable into quads. 4,100,721, Cl. 57-34.0AT.

Seimiya, Motoo: *See—*
Koseki, Isamu; and Seimiya, Motoo, 4,101,309, Cl. 75-0.5AB.

Sekine, Kenichi: *See—*
Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.

Sekino, Takao: *See—*
Muraishi, Masakazu; and Sekino, Takao, 4,101,169, Cl. 297-341.000.

Selders, Matthias Peter, to Battelle Development Corporation. CdSe-SnSe photovoltaic cell. 4,101,341, Cl. 136-89.0TF.

Selick, David A.: *See—*
Feinberg, Robert S.; and Selick, David A., 4,101,029, Cl. 206-315.00B.

Seliger, Robert L., to Hughes Aircraft Company. Process for making patterns in resist and for making ion absorption masks useful therewith. 4,101,782, Cl. 250-492.00B.

Selleck, James R., Jr.: *See—*
Purcell, Robert F.; and Selleck, James R., Jr., 4,101,433, Cl. 252-49.500.

Sellers, Edward C.; and Malkani, Chandler, to Xerox Corporation. Magnetic imaging method. 4,101,320, Cl. 96-1.400.

Sellinger, Du Wayne M.: *See—*
Wolbrink, David W.; Kaepernick, William A.; Sellinger, Du Wayne M.; and Otte, Dieter W., 4,100,850, Cl. 100-287.000.

Sendo, Yuji: *See—*
Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.

Sensabaugh, Paul F., to General Electric Company. Device for attaching a microphone-speaker to an article of clothing. 4,100,653, Cl. 24-3.00J.

Sensors, Inc.: *See—*
Lennington, John W.; and Szeles, Donald M., 4,101,767, Cl. 250-339.000.

Seruga, Edward A.: *See—*
Bradham, Allen C., III; and Seruga, Edward A., 4,100,799, Cl. 73-197.000.

Seshima, Kensuke, to Mizuho Ika Kogyo Kabushiki Kaisha. Electrically driven, separate type, surgical operation table. 4,101,120, Cl. 269-323.000.

Settineri, William J.: *See—*
Frenier, Wayne W.; and Settineri, William J., 4,101,438, Cl. 252-151.000.

Sexton, Paul: *See—*
Ikrath, Kurt, deceased; Sexton, Paul; Pingitore, Peter; and Kennebeck, William, 4,101,896, Cl. 343-713.000.

Seyb, Edgar J., Jr.: *See—*
Chessin, Hyman; and Seyb, Edgar J., Jr., 4,101,388, Cl. 204-43.00T.

Sgarlato, Thomas E.; Eston, Gary A.; and Freeman, Thomas E. Shoe sole construction. 4,100,686, Cl. 36-29.000.

Shaffer, John W.; Mecone, David W.; and Colville, William T., to GTE Sylvania Incorporated. Multilamp photoflash assembly with rotatable actuator. 4,101,259, Cl. 431-93.000.

Shaffer, Robert C., to Hitco. Coating for fibrous carbon material in boron containing composites. 4,101,354, Cl. 156-60.000.

Shaffer, Walter Moore, to Caterpillar Tractor Co. Pressure sensitive charging means for a steering system. 4,100,739, Cl. 60-413.000.

Shah, Pradeep L.; and Fuller, Clyde R., to Texas Instruments Incorporated. Process for fabricating inexpensive high performance solar cells using doped oxide junction and insitu anti-reflection coatings. 4,101,351, Cl. 148-188.000.

Shakespeare Company: *See—*
Ruff, George Robert; and Derrick, Danny O'Brian, 4,100,668, Cl. 29-523.000.

Sharp, Jonathan E. Shock absorber for a safety belt lanyard. 4,100,996, Cl. 182-3.000.

Shaub, Harold, to Exxon Research & Engineering Co. Lubricant composition. 4,101,427, Cl. 252-32.70E.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Catalyst compositions especially useful for preparation of unsaturated acids. 4,101,448, Cl. 252-437.000.

Shel, Marat Moiseevich: *See—*
Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.

Shelepov, Nikolai Semenovich; Kildjushev, Valery Alexeevich; Kitaev, Evgeny Mitrofanovich; Dubodin, Vissarion Makarovich; and Kochetkov, Vladimir Alexeevich. Hearth electrode for melting furnaces. 4,101,725, Cl. 13-18.000.

Shell Oil Company: *See—*
Birke, August H., 4,101,429, Cl. 252-32.70E.
Gergen, William P.; and Davison, Sol, 4,101,605, Cl. 260-873.000.
Ploeg, Johannes E. G., 4,101,634, Cl. 423-239.000.
Poll, Ian, 4,101,641, Cl. 423-567.00R.
Snyder, John L., 4,101,498, Cl. 260-33.6AQ.

- Shelton, Warren E., to Shelton, Warren E. Screens for side and rear door openings of vans and like vehicles. 4,100,957, Cl. 160-368.00R.
- Shemtov, Sami: *See*—
  - Mooney, Thomas; and Shemtov, Sami, 4,101,103, Cl. 248-58.000.
- Sheng, Sheng P., to Marietta Concrete Company. Mechanism for gripping hoops encircling building structures. 4,100,654, Cl. 24-20.00R.
- Shepherd, Thomas: *See*—
  - Thawley, Clive Stafford; and Shepherd, Thomas, 4,101,150, Cl. 285-226.000.
- Sheppard, Chester Stephen; and MacLeay, Ronald Edward, to Pennwalt Corporation. Azo compounds containing acylating function and azo containing polymers. 4,101,522, Cl. 528-292.000.
- Shepter, Joseph J., to Vibra-Metrics, Inc. Switch control system. 4,101,816, Cl. 318-130.000.
- Sherwin-Williams Company, The: *See*—
  - Cunningham, Arthur L.; and Mathai, John, 4,101,527, Cl. 528-73.000.
  - Vacek, Lubomir; and Foster, Harold M., 4,101,558, Cl. 260-328.000.
- Shestak, Nikolai Petrovich: *See*—
  - Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
- Sheterom, Samuel G., Jr.: *See*—
  - Speiser, Arthur S.; and Sheterom, Samuel G., Jr., 4,101,119, Cl. 269-203.000.
- Shevlyakov, Ivan Davydovich: *See*—
  - Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
- Shiba, Tetsuo: *See*—
  - Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, 4,101,536, Cl. 260-112.50R.
- Shibata, Toshihiro: *See*—
  - Minagawa, Motooobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,101,508, Cl. 260-45.80N.
- Shibazaki, Kenji: *See*—
  - Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
- Shigeyuki, Kobayashi: *See*—
  - Seiichi, Nishikawa; Shuji, Hasebe; Kazuhiko, Ohashi; Shigeyuki, Kobayashi; and Kazuyuki, Maekawa, 4,100,721, Cl. 57-34.0AT.
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- Shilov, Leonid Alexandrovich: *See*—
  - Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
- Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, to Sony Corporation. Memory type insulating gate field effect semiconductor device. 4,101,921, Cl. 357-23.000.
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  - Uetani, Yoshio; Shimizu, Akio; Kajita, Kozo; Ishiuchi, Hiroshi; Goryo, Tadashi; and Ishida, Kazuo, 4,101,719, Cl. 429-206.000.
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- Shimizu, Kuniaki: *See*—
  - Fujimori, Kunihiko; Shimizu, Kuniaki; and Ogawa, Haruki, 4,101,670, Cl. 424-300.000.
- Shimizu, Shiegemitu: *See*—
  - Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
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- Shinohara, Toshio: *See*—
  - Miyazaki, Kensaku; and Shinohara, Toshio, 4,101,194, Cl. 350-9.000.
- Shionogi & Co., Ltd.: *See*—
  - Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, 4,101,658, Cl. 424-246.000.
- Shipitalo, William M., to Towmotor Corporation. Split pillow block for mounting a differential. 4,100,986, Cl. 180-75.000.
- Shivachev, Peter Lazarov: *See*—
  - Georgiev, Georgi Metev; Shivachev, Peter Lazarov; Koychev, Todor Yankov; Lazov, Lyuben Kostov; and Valchev, Alexander Yordanov, 4,101,186, Cl. 339-5.00S.
- Shkapenko, George: *See*—
  - Russell, David D.; and Shkapenko, George, 4,101,439, Cl. 252-182.000.
- Shoe, Theodore W., to Flexicore Co., Inc., The. Structural connection. 4,100,713, Cl. 52-648.000.
- Shoemaker, John Robert: *See*—
  - Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
- Shortte, Willard Harmond, Jr., to Milliken Research Corporation. Tufting machine. 4,100,863, Cl. 112-79.00R.
- Shoupp, William E.; and Bratkowski, Walter V., to Westinghouse Electric Corp. Mechanically-powered electric generator for instant-photographic camera and other apparatus. 4,101,792, Cl. 310-15.000.
- Shuji, Hasebe: *See*—
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- Shvarts, Arkady Grigorievich: *See*—
  - Kostjuchenko, Vladimir Mitrofanovich; Panov, Evgeny Petrovich; Shvarts, Arkady Grigorievich; Pruzhanskaya, Nadezhda Arkadievna; Vasilievykh, Natalya Yakovlevna; and Fateeva, Galina Vasilievna, 4,101,478, Cl. 260-23.00S.
- Sickler, Raymond W. Awning assembly. 4,100,703, Cl. 52-16.000.
- Sico Incorporated: *See*—
  - Bue, Richard C.; and Carlson, Casey L., 4,100,858, Cl. 108-48.000.
- Sieber, William J., to American Safety Equipment Corporation. Wheelchairs. 4,101,143, Cl. 280-42.000.
- Siegmund, Robert: *See*—
  - Wirth, Walter; Siegmund, Robert; and Borgert, Wilhelm, 4,100,650, Cl. 19-105.000.
- Siemens Aktiengesellschaft: *See*—
  - Dotzer, Richard; and Stoger, Klaus, 4,101,386, Cl. 204-32.00R.
  - Grieger, Gerhard; and Bohrdt, Joaquin, 4,101,746, Cl. 200-82.00B.
  - Mueller, Horst, 4,101,739, Cl. 179-15.00A.
  - Nilsson, Kenth; and Ekstrom, Olov, 4,100,798, Cl. 73-194.00E.
  - Tihanyi, Jenoe; and Hoepfner, Voachim, 4,101,922, Cl. 357-23.000.
  - von Rauch, Moriz; and Veneklasen, Lee H., 4,101,778, Cl. 250-441.000.
- Signetics Corporation: *See*—
  - Dao, Tieh T., 4,101,734, Cl. 178-68.000.
- Silfvast, William Thomas, to Bell Telephone Laboratories, Incorporated. Isotope enrichment by resonance trapping. 4,101,396, Cl. 204-157.10R.
- Silver Seiko Co., Ltd.: *See*—
  - Kamikura, Shigeo; Itagaki, Hideaki; and Kawaoka, Ryoiti, 4,100,768, Cl. 66-75.200.
- Sima, Gordon R., Jr.; and Taylor, John L., Jr., to Bendix Corporation, The. Light coupled read-out system for noise dosimeter. 4,100,810, Cl. 73-647.000.
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  - Austin, Eric Paul, 4,101,409, Cl. 204-277.000.
- Simon, Paul: *See*—
  - Dahlstrom, Mark Sorensen; and Simon, Paul, 4,101,906, Cl. 346-75.000.
- Simon, Shulamit: *See*—
  - Rubinstein, Menachem; Simon, Shulamit; and Bloch, deceased; Rene, 4,101,380, Cl. 195-63.000.
- Singer Company, The: *See*—
  - Florence, Judit Katalin, 4,101,968, Cl. 364-900.000.
  - Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
  - Previte, Peter Luciano, 4,100,813, Cl. 74-5.00F.
  - Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, 4,101,072, Cl. 235-455.000.
- Siuta, Theodore L.: *See*—
  - Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.
- Sivakov, Jury Mikhailovich: *See*—
  - Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich, 4,101,600, Cl. 260-683.15D.
- Skaife, Margaret R., Trustee: *See*—
  - Skaife, William, 4,100,699, Cl. 47-81.000.
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- Slay, Larry G., to Rockwell International Corporation. Method and apparatus for monitoring bcd continuously varying data. 4,101,903, Cl. 346-33.00R.
- Sloan, Marlo S.; and Renfro, Arthur B., Jr., to Sloan Purge Products Co., Inc. Heat sink welding and purging apparatus. 4,101,067, Cl. 228-222.000.
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  - Sloan, Marlo S.; and Renfro, Arthur B., Jr., 4,101,067, Cl. 228-222.000.
- Slone, Norman. Box-spring assembly. 4,100,631, Cl. 5-239.000.
- Small, Hamish; and Stevens, Timothy S., to Dow Chemical Company, The. High performance ion exchange composition. 4,101,460, Cl. 521-28.000.
- Smartt, Roger H.: *See*—
  - Furuya, Seiji; and Smartt, Roger H., 4,101,024, Cl. 206-102.000.
- Smathers, Donald Lee, to Du Pont de Nemours, E. I., and Company. Process for making lower alkyl formamides. 4,101,577, Cl. 260-561.00R.

- Smith, Carl H., to Auto Research Corporation. Dual timer with delay. 4,101,001, Cl. 184-6.400.
- Smith, David W.; LeBlanc, Raymond C.; and Oliver, J. Allen, to Value Engineering Company. Aircraft flight line servicing system. 4,101,100, Cl. 244-114.00R.
- Smith, Dexter William: *See*—
  - Orford, Raymond Leslie; and Smith, Dexter William, 4,101,453, Cl. 252-503.000.
- Smith, Gerald P., to NCR Corporation. Drawer operated switch assembly. 4,101,745, Cl. 200-61.610.
- Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., to Texaco Inc. Method and a support assembly for supporting an air ring in a regenerator in a fluid catalytic cracking unit. 4,101,288, Cl. 23-288.00B.
- Smith, Jay, III; and Conroy, Richard F. M., to Hasbro Development Corp. Sound reproducing unit tone arm. 4,101,134, Cl. 274-23.00R.
- Smith, Jay, III; and Conroy, Richard F. M., to Hasbro Development Corp. Sound reproducing unit. 4,101,135, Cl. 274-39.00A.
- Smith, Martin A. Variable width glass sphere dispenser. 4,101,058, Cl. 222-274.000.
- Smith, Michael Arthur: *See*—
  - Needham, Brian John; and Smith, Michael Arthur, 4,101,581, Cl. 260-566.00B.
- Smith, Oliver Wendell; and Koleske, Joseph Victor, to Union Carbide Corporation. High solids coating compositions. 4,101,603, Cl. 260-850.000.
- Smithkline Corporation: *See*—
  - Berges, David A., 4,101,656, Cl. 424-246.000.
  - DeMarinis, Robert M.; and Weisbach, Jerry A., 4,101,657, Cl. 424-246.000.
- Snamprogetti S.p.A.: *See*—
  - Pagani, Giorgio, 4,101,281, Cl. 23-288.00K.
- SNIA VISCOSA Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
  - Ruoti, Vincenzo; and Farioli, Felice, 4,101,532, Cl. 528-311.000.
- Snyder, John L., to Shell Oil Company. Fire-resistant composition. 4,101,498, Cl. 260-33.6AQ.
- S.p.A. Luigi Rizzi & C.: *See*—
  - Repetto, Silvio, 4,100,773, Cl. 69-48.000.
- Societe Anonyme DBA: *See*—
  - Carre, Jean-Jacques; and Meyer, Yves, 4,101,176, Cl. 303-6.00C.
- Societe Anonyme dite: Etablissements GENOUD & CIE: *See*—
  - Neyret, Guy, 4,101,262, Cl. 431-344.000.
- Societe Distugil: *See*—
  - Branlard, Paul; and Merle, Jean Pierre, 4,101,481, Cl. 260-23.70A.
- Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.: *See*—
  - Berthet, Michel; Gillet, Roger; Laumond, Yves; Lehuen, Christian; and Marquet, Andre, 4,101,793, Cl. 310-52.000.
- Societe Nationale des Poudres et Explosifs: *See*—
  - Biehler, Jean-Marie J.; Lecolier, Serge L.; and Le Roy, Patrice M., 4,101,472, Cl. 521-85.000.
- Societe Nationale Industrielle Aerospatiale: *See*—
  - Barkats, Gerard; Chenin, Claude; Foucras, Jean; and Marnay, Louis, 4,101,101, Cl. 244-173.000.
- Soderstrom, Melvin Andrew: *See*—
  - Moser, Jessie Lee; Shoemaker, John Robert; and Soderstrom, Melvin Andrew, 4,101,189, Cl. 339-99.00R.
- Sokolowski, Eugene K., to Teletype Corporation. Paper edge sensor. 4,101,018, Cl. 400-582.000.
- Solmon, Donald C.; and Lennon, Donald J. J., to Epp Corp. Magnetic inking apparatus for pulsed electrical printing. 4,101,909, Cl. 346-153.000.
- Solovieff, Paul G.; and Cyran, Robert E., to Emhart Industries, Inc. Lockset having improved torque blade construction. 4,100,774, Cl. 70-380.000.
- Soloviev, Gennady Ivanovich: *See*—
  - Bobrovnikov, Anatoly Pavlovich; Mikhailov, Gennady Grigorievich; Soloviev, Gennady Ivanovich; and Chatchenko, Sergei Grigorievich, 4,100,708, Cl. 52-222.000.
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- Sony Corporation: *See*—
  - Hanai, Ichiro, 4,101,938, Cl. 360-16.000.
  - Isono, Katsuo; and Sanada, Seiji, 4,101,927, Cl. 358-27.000.
  - Nagasawa, Hiroyuki; and Kaneko, Kunio, 4,101,920, Cl. 357-17.000.
  - Ohsawa, Mitsuo, 4,101,842, Cl. 330-257.000.
  - Sato, Tadashi; Ibuka, Masaru; Ishigaki, Yoshio; and Sahara, Hiroshi, 4,101,928, Cl. 358-28.000.
  - Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
  - Takamatsu, Ryoji, 4,101,946, Cl. 360-105.000.
  - Uedaira, Satoru, 4,101,389, Cl. 204-44.000.
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- Southern Imperial Coatings Corporation: *See*—
  - Lomasney, Henry L.; Lomasney, William J.; Metil, Ignatius; and Lagos, Dickens M., 4,101,692, Cl. 427-333.000.
- Spada, Albert J.: *See*—
  - East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
  - Mottola, Elia A.; East, George H., Jr.; Goldstein, Norman A.; Huang, Wu-Cheng; Roemer, Robert E.; and Spada, Albert J., 4,101,118, Cl. 267-136.000.
- Span Instruments: *See*—
  - Gray, Tommy L.; and Crowe, Sam R., 4,100,812, Cl. 73-732.000.
- Spanswick, James, to Standard Oil Company a corporation of Indiana. Fire retardant polymer. 4,101,510, Cl. 260-45.75B.
- Spears, Robert Wayne. Trickle emitter for subterranean irrigation. 4,100,940, Cl. 137-877.000.
- Speck, Ulrich: *See*—
  - Clauss, Wolfram; Speck, Ulrich; and Jentsch, Dietmar, 4,101,647, Cl. 424-5.000.
- Speckhart, Max: *See*—
  - Mayer, Rolf; and Speckhart, Max, 4,101,082, Cl. 241-282.100.
- Speiser, Arthur S.; and Sheterom, Samuel G., Jr. Fluid-operated vise. 4,101,119, Cl. 269-203.000.
- Spengler, Ernst M., to R & S Stanzformen GmbH. Box blank punching tool. 4,100,844, Cl. 93-59.0ES.
- Speno International S.A.: *See*—
  - Panetti, Romolo, 4,100,795, Cl. 73-146.000.
- Speranza, George P.: *See*—
  - Cuscurida, Michael; and Speranza, George P., 4,101,462, Cl. 521-115.000.
- Sperry Rand Corporation: *See*—
  - Lins, Stanley James; Lund, Roger Edward; and Hanson, Marlin Marshall, 4,101,972, Cl. 365-29.000.
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  - Berchtold, Jean, 4,101,348, Cl. 148-105.000.
- Spitze, LeRoy A.: *See*—
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  - Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,101,602, Cl. 260-839.000.
- Sprague, Brinton, to Cam Industries, Inc. Electric steam generator having a movable distribution means. 4,101,758, Cl. 219-285.000.
- Sprague Electric Company: *See*—
  - Burn, Ian, 4,101,952, Cl. 361-305.000.
- Spray Engineering Company: *See*—
  - Curran, James Hall, 4,101,073, Cl. 239-14.000.
- Staff, Bonner W.: *See*—
  - Evans, Charles B.; Fenton, John D.; and Staff, Bonner W., 4,100,808, Cl. 73-588.000.
- Stafford, Donald Wayne: *See*—
  - Litkenhus, John Robert; and Stafford, Donald Wayne, 4,101,224, Cl. 400-328.000.
- Stahl, Francis: *See*—
  - Kelly, William Tolson, III; and Stahl, Francis, 4,101,818, Cl. 320-2.000.
- Stahl, Richard F.: *See*—
  - Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,101,436, Cl. 252-67.000.
- Stalego, Joseph P., to Owens-Corning Fiberglas Corporation. Flame resistant materials and method of making same. 4,101,475, Cl. 260-21.000.
- Stanadyne, Inc.: *See*—
  - Roosa, Vernon D., 4,100,903, Cl. 123-139.0AQ.
- Standard Oil Company, The: *See*—
  - Shaw, Wilfrid G.; and Terrill, David B., 4,101,448, Cl. 252-437.000.
- Standard Oil Company a corporation of Indiana: *See*—
  - Jezl, James L.; and Peters, Edwin F., 4,101,289, Cl. 23-288.00E.
  - Spanswick, James, 4,101,510, Cl. 260-45.75B.
- Stander, Arthur O.: *See*—
  - Charves, Everett; Pulley, David F.; and Stander, Arthur O., 4,101,497, Cl. 260-31.20N.
- Stangl, Ernst; Gies, Rolf; Model, Hans-Jurgen; and Stengel, Edgar, to AEG-Elotherm, G.m.b.H. Apparatus for shearing metallic bars. 4,100,829, Cl. 83-106.000.
- Stauffer Chemical Company: *See*—
  - Honig, Milton L., 4,101,446, Cl. 252-430.000.
  - Martines, Vincent C., 4,101,572, Cl. 260-343.00H.
  - Tilles, Harry, 4,101,555, Cl. 260-293.850.
- Stauth, Tommy E. Manual impact stake driving apparatus. 4,101,088, Cl. 242-85.000.
- Stearns, Clyde W. End dogging feeding device. 4,100,950, Cl. 144-242.00D.
- Stedman, Robert N., to Caterpillar Tractor Co. Steering apparatus. 4,100,990, Cl. 180-135.000.
- Steel Company of Canada, Limited, The: *See*—
  - Hunter, Robert F.; Koprich, Stephen R.; Baird-Kerr, Richard G.; and Sakai, Daniel S., 4,101,345, Cl. 148-6.15R.
- Steil, Karl-Heinz: *See*—
  - Gehrmann, Klaus; Ohorodnik, Alexander; Steil, Karl-Heinz; and Schafer, Stefan, 4,101,573, Cl. 260-543.00P.
- Steinberg, Jacob H.: *See*—
  - Gulko, Arnold G.; and Steinberg, Jacob H., 4,101,923, Cl. 357-30.000.
- Steiner, Edward L.: *See*—
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- Steiner, Karl Ulrich: *See*—
  - Mislin, Roland; Schoenauer, Wolfgang; and Steiner, Karl Ulrich, 4,101,547, Cl. 544-294.000.

- Stengel, Edgar: *See—*
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- Stephenson, Charles Francis: *See—*
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- Sterling Drug, Inc.: *See—*
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- Sterman, Samuel: *See—*
  - Rosen, Meyer Robert; and Sterman, Samuel, 4,101,443, Cl. 252-358.000.
- Stevens, Petrus Franciscus: *See—*
  - Hempenius, Klaas; Van Mourik, Jan Cornelis; and Stevens, Petrus Franciscus, 4,101,883, Cl. 340-365.00R.
- Stevens, Timothy S.: *See—*
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- Stevenson, Richard Marshall: *See—*
  - Creutz, Hans-Gerhard; Herr, Roy Wilbur; and Stevenson, Richard Marshall, 4,101,387, Cl. 204-43.00T.
- Stewart, Buster D. Van overhead console. 4,101,159, Cl. 296-37.700.
- Stewart, Melvin E., to City Tank Corporation. Refuse vehicle hydraulic supply system. 4,100,740, Cl. 60-431.000.
- Stiling, Rodney A., to National Gypsum Company. Continuous calcining of gypsum. 4,101,630, Cl. 423-171.000.
- Stillman, Nathan, to Champion International Corporation. Bone resistant packaging material. 4,101,711, Cl. 428-474.000.
- Stimple, James Roy: *See—*
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- Stine, Clifford R.; and Boyce, Jennings A., to Samuel Moore & Company. Synthetic resinous tube. 4,101,699, Cl. 428-36.000.
- Stiot, Jean-Pierre Henri; Brouard, Claude Marie Henri Emile; and Leroy, Jean Marie Louis, to Produits Chimiques Ugine Kuhlmann. Benzene-azo-beterocyclic dyestuffs derived from alkyl aminocinnamates or aminocinnamide. 4,101,543, Cl. 260-162.000.
- Stith, Morris Randall, Jr. Method of positioning and supporting a machine. 4,100,714, Cl. 52-741.000.
- Stoger, Klaus: *See—*
  - Dotzer, Richard; and Stoger, Klaus, 4,101,386, Cl. 204-32.00R.
- Stokes, Richard Arthur; Kuck, David Jerome; and Jensen, Carl Anton, to Burroughs Corporation. Scientific processor. 4,101,960, Cl. 364-200.000.
- Stolley, Ronald M., to Outboard Marine Corporation. Vehicle for transporting palletized loads. 4,101,040, Cl. 214-131.00R.
- Stone, Charles W., to Reed Tool Co. Pneumatic impact drilling tool. 4,100,976, Cl. 173-133.000.
- Stone, David E., to Destron, Inc. Touch-responsive socket. 4,101,805, Cl. 315-74.000.
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  - East, George H., Jr.; Goldstein, Norman A.; Peech, John M.; Pirotin, Shelden D.; Roemer, Robert E.; and Spada, Albert J., 4,101,117, Cl. 267-136.000.
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- Story Chemical Corporation: *See—*
  - Lander, Harry L., 4,101,473, Cl. 260-13.000.
- Straesser, Chris Robert, to Caterpillar Tractor Co. Apex seal for rotary engines. 4,100,664, Cl. 29-156.600.
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- Stratabolt Corporation: *See—*
  - Hansen, Roger M., 4,100,748, Cl. 61-45.00B.
- Stratton, Joseph B.: *See—*
  - Mounts, William T.; and Stratton, Joseph B., 4,101,160, Cl. 296-35.00R.
- Straub, Wilhelm. Method and apparatus for controlling the air of combustion of carburetor engines. 4,100,900, Cl. 123-124.00R.
- Strausak, Benedikt: *See—*
  - Vavrina, Josef; and Strausak, Benedikt, 4,101,182, Cl. 312-8.000.
- Straza Enterprizes, Ltd.: *See—*
  - Straza, George Thomas; and Parr, Edward Leon, 4,100,787, Cl. 72-310.000.
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- Streib, Albrecht. Releasable assembly of structural members. 4,101,231, Cl. 403-252.000.
- Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., to Xerox Corporation. Method of fusing toner images using functionalized polymeric release agents. 4,101,686, Cl. 427-22.000.
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- Strong, Lawrence M.; and Rilling, Chester H., to Questor Corporation. Bottle disc. 4,101,042, Cl. 215-11.00R.
- Strongwater, Murray. Genuine leather fabric and method for making same. 4,100,623, Cl. 2-158.000.
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- Structural Fibers, Inc.: *See—*
  - Wiltshire, Arthur J., 4,101,254, Cl. 425-82.100.
- Strupczewski, Joseph T.: *See—*
  - Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,101,663, Cl. 424-267.000.
- Stuart, Robert B., to Penn Yan Boats, Incorporated. Marine exhaust silencer. 4,100,994, Cl. 181-261.000.
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  - Deem, Mary Lease; and Stueben, Kenneth Charles, 4,101,586, Cl. 260-593.00R.
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- Stumpp, Gerhard: *See—*
  - Eckert, Konrad; Knapp, Heinrich; and Stumpp, Gerhard, 4,100,904, Cl. 123-139.0AW.
- Sturni, Lance C.: *See—*
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  - Rapaport, Robert M.; Monti, Anthony; Moroz, Raymond D.; and Broeg, Charles B., 4,101,338, Cl. 127-46.00B.
- Sugihara, Kunihiko, to Nissan Motor Company, Limited. Exhaust gas purifying system employing an exhaust gas flow controller. 4,100,737, Cl. 60-292.000.
- Sugimoto, Mitsuo, to Rikagaku Kenkyusho. Ferrite vascular contrast media. 4,101,646, Cl. 424-4.000.
- Sukman, Edwin L., to M & T Chemicals Inc. Insecticidal and ovicidal method. 4,101,655, Cl. 424-204.000.
- Sumi, Masao: *See—*
  - Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
- Sumitomo Chemical Company, Limited: *See—*
  - Horikiri, Shozo; Tsuji, Kozo; Abe, Yasuaki; Fukui, Akio; and Ichiki, Eiichi, 4,101,615, Cl. 264-63.000.
  - Matsuba, Takafumi; Kuriyama, Ryozo; Saitoh, Shin-Ichi; and Ishitsuka, Yoshio, 4,101,273, Cl. 8-172.00R.
- Sumiyoshi, Keiji; and Saitoh, Tomio, to Konishiroku Photo Industry Co., Ltd. Image transfer complementary apparatus for electrophotographic copying machine. 4,101,212, Cl. 355-3.0TR.
- Sumrow, Paul E. Cover holder for evaporative cooler. 4,101,609, Cl. 261-105.000.
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  - Schooley, Willard A.; and Browne, Robert E., 4,101,424, Cl. 250-504.000.
  - Wolkowicz, Richard I., 4,101,706, Cl. 428-294.000.
- Sun, Jui-Yuan: *See—*
  - Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
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  - Davis, Gerald L.; and Scott, Timothy C., 4,100,762, Cl. 62-160.000.
- Sundstrom, Karl Erik. Disposable reagent container and actuation mechanism. 4,101,283, Cl. 23-259.000.
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- SURELAB Superior Research Laboratories, Inc.: *See—*
  - Marschke, Jon V., 4,100,824, Cl. 81-121.00R.
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  - Kaneko, Hideaki; Miyazaki, Yasushi; and Suzuki, Masanori, 4,101,339, Cl. 134-2.000.
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- Suzuki, Seigo, to Tokyo Shibaura Electric Co., Ltd. Start and stop system. 4,101,732, Cl. 178-53.10R.
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- Svenska Dataregister Aktiebolag: *See—*
  - Englund, Gosta Roland; and Wincent, Karl Tommy, 4,101,017, Cl. 400-124.000.
- Sweed, Norman H.; DeLuca, John P.; and Kamholz, Kenneth, to Exxon Research & Engineering Co. Combined heat exchanger reactor. 4,101,287, Cl. 23-288.00K.
- Sweetheart Plastic, Inc.: *See—*
  - Brown, Gaylord William, 4,101,252, Cl. 425-394.000.
- Swessel, John A., Jr.: *See—*
  - Josemans, Leonardus J.; and Swessel, John A., Jr., 4,101,749, Cl. 200-317.000.
- Swift, Graham: *See—*
  - Cenci, Harry J.; and Swift, Graham, 4,101,606, Cl. 260-857.0UN.

- Swift, Harold Eugene: *See—*
  - Mitchell, Bruce Richard; and Swift, Harold Eugene, 4,101,417, Cl. 208-120.000.
- Sybron Corporation: *See—*
  - Ensslin, Frieder Hans; and Hazen, Christopher Stevens, 4,101,775, Cl. 250-409.000.
- Sycor, Inc.: *See—*
  - Butsch, Otto R., 4,101,945, Cl. 360-102.000.
- Sylvester, Gordon: *See—*
  - Mauro, Charles L., Jr.; Siuta, Theodore L.; and Sylvester, Gordon, 4,101,041, Cl. 215-6.000.
- Sylvester, Gordon C.: *See—*
  - Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., 4,100,938, Cl. 137-625.310.
- Synres International B.V.: *See—*
  - Pons, Dick A.; and Bijker, Anno, 4,101,490, Cl. 260-29.6MP.
- Szeberenyi, Szaboles: *See—*
  - Tuba, Zoltan; Marsai, Maria; Biro, Katalin; Szporny, Laszlo; Karpati, Egon; and Szeberenyi, Szaboles, 4,101,545, Cl. 260-239.500.
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  - Lennington, John W.; and Szeles, Donald M., 4,101,767, Cl. 250-339.000.
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- Tadokoro, Eiichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Method for cleaning flexible magnetic discs. 4,101,948, Cl. 360-137.000.
- Taguchi, Isamu; Ono, Akihiro; and Matsumoto, Ryutaro, to Nippon Steel Corporation; and Kokoshi Electric Co. Automatic photometric analyzer. 4,101,275, Cl. 23-230.00R.
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  - Inoue, Takasuke; Itoh, Yuzo; Nakajima, Sataro; Tajika, Shin-Ichi; and Saiki, Yoshio, 4,101,638, Cl. 423-320.000.
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- Takahashi, Kaishuhiko: *See—*
  - Nishikawa, Daikichiro; Imada, Yukio; Kinoshita, Masayuki; Takahashi, Kaishuhiko; Machida, Hajime; and Nagasawa, Michitaro, 4,101,378, Cl. 195-51.00G.
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- Takahashi, Taro. Tool holding apparatus in an NC lathe. 4,100,826, Cl. 82-25.000.
- Takaishi, Naotake: *See—*
  - Inamoto, Yoshiaki; Ikeda, Hiroshi; Fujikura, Yoshiaki; and Takaishi, Naotake, 4,101,580, Cl. 260-563.00P.
- Takamatsu, Ryoji, to Sony Corporation. Tape playing machine with movable head mount. 4,101,946, Cl. 360-105.000.
- Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, to Kao Soap Co., Ltd. Resin composition for powder coatings. 4,101,518, Cl. 528-100.000.
- Takase, Tsuneo: *See—*
  - Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,101,838, Cl. 328-63.000.
- Takemura, Yozo; Fukuda, Shigeyoshi; and Ogino, Sadashi, to Nippon Steel Corporation. Method for operation of a converter. 4,101,312, Cl. 75-52.000.
- Taketani, Yutaka; and Niwa, Shinichi, to Sanyo Electric Co., Ltd. Electrolyte for electrolytic capacitors. 4,101,458, Cl. 252-62.200.
- Takimoto, Yasukatsu, to Nakabayashi Kabushiki Kaisha. Binding machine. 4,100,640, Cl. 11-1.00R.
- Talenti, Pier F., to Orbital Collection Systems, Inc. Apparatus for collecting and compacting waste material. 4,101,039, Cl. 214-83.320.
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  - Aonuma, Masashi; Tamai, Yasuo; and Kodama, Fumio, 4,101,311, Cl. 75-0.500.
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  - Saruwatari, Ryoji; Tamakawa, Fumio; Ikeda, Takeo; and Misawa, Norio, 4,101,218, Cl. 355-57.000.
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  - Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,101,653, Cl. 424-177.000.
- Tamura, Kohki; and Iwamoto, Kazuo, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Battery of laminated structure having battery frame of novel structure. 4,101,718, Cl. 429-26.000.
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- Tamura, Tooru, to Aisin Seiki Kabushiki Kaisha. Flow restrictor. 4,100,894, Cl. 123-117.00A.
- Tanaka, Eiji: *See—*
  - Kosuda, Tooru; Ohashi, Michihiro; Tanaka, Eiji; Mochizuki, Hiroshi; and Abe, Seikou, 4,100,902, Cl. 123-139.0BC.
- Tanaka, Makoto: *See—*
  - Akagi, Motoo; Morishita, Hazime; Nonogaki, Saburo; Tanaka, Makoto; and Kaneko, Tadao, 4,101,440, Cl. 252-186.000.
- Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Automatic tape run-reversing device. 4,101,941, Cl. 360-74.000.
- Tanaka, Yoshihiro: *See—*
  - Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
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- Tardos, Laszlo: *See—*
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- Tashiro, Ichiro: *See—*
  - Suzuki, Osamu; Ueda, Shozo; and Tashiro, Ichiro, 4,100,722, Cl. 57-34.00R.
- Tatemichi, Hidemaro: *See—*
  - Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.
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- Tatkov, Viktor Arsentievich; Jurin, Petr Ipatovich; Bondarev, Gennady Ivanovich; and Koryagin, Mikhail Andreevich, to Vsesohuzny nauchno-issledovatelsku I Proktno-Konstruk torsky institut. Dobychi Uglya Grdravlicheskin Sposobom "Vollgidrougal". Centrifugal two-stage pump. 4,101,243, Cl. 415-201.000.
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  - Sato, Mikio; Tawara, Kinya; Iwaki, Shinpachiro; Matsumoto, Kohji; and Sekine, Kenichi, 4,101,590, Cl. 568-750.000.
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  - Sima, Gordon R., Jr.; and Taylor, John L., Jr., 4,100,810, Cl. 73-647.000.
- Taylor, Lawrence F.: *See—*
  - Rieben, Horace Johnnie; and Taylor, Lawrence F., 4,101,048, Cl. 229-34.00R.
- Taylor, Lynn J., to Owens-Illinois, Inc. Preparation of liquid crystal containing polymeric structure. 4,101,207, Cl. 350-344.000.
- Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable plastic. 4,101,720, Cl. 526-3.000.
- Taylor, Paul D.: *See—*
  - Hwang, H. Shinn; and Taylor, Paul D., 4,101,450, Cl. 252-460.000.
- Taylor, Raymond C.: *See—*
  - Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.
- Taylor, Robert C.: *See—*
  - Wallace, Harry S.; and Taylor, Robert C., 4,101,049, Cl. 229-2.50R.
- Team, Inc.: *See—*
  - Harrison, George W., 4,100,929, Cl. 137-15.000.
- Technicon Instruments Corporation: *See—*
  - Oberhardt, Bruce J.; and Kopelman, Donald F., 4,100,797, Cl. 73-194.00E.
  - Watts, Leonard, 4,100,960, Cl. 164-119.000.
- Technion Research and Development Foundation, Ltd.: *See—*
  - Rigbi, Zvi, 4,101,301, Cl. 65-21.000.
- Tecumseh Products Company: *See—*
  - Aggen, Glenroy Newcomb, 4,101,371, Cl. 156-560.000.
- Ted Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
  - Scholz, Werner, 4,101,940, Cl. 360-37.000.
- Teicher, Harry: *See—*
  - Brooks, Donald L.; Losee, Michael L.; Teicher, Harry; and Williams, Charles R., 4,101,485, Cl. 260-29.4UA.
- Teitel, Sidney: *See—*
  - Focella, Antonino; Heveran, John Edward; Teitel, Sidney; and Weigele, Manfred, 4,101,549, Cl. 544-301.000.
- Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
  - Bellanger, Maurice Georges; Bonnerot, Georges; and Coudreuse, Michel, 4,101,738, Cl. 179-15.0FD.
- Teledyne Industries, Inc.: *See—*
  - Bart, Hans U., 4,101,076, Cl. 239-584.000.
  - Grissinger, Glenn R., 4,100,848, Cl. 99-353.000.
- Telefonaktiebolaget L M Ericsson: *See—*
  - Carlsson, Leif Ronny, 4,101,804, Cl. 315-3.500.
- Teletype Corporation: *See—*
  - Sokolowski, Eugene K., 4,101,018, Cl. 400-582.000.
- Tendy Electronics Co.: *See—*
  - Hajduk, Marian Stanislaw, 4,101,967, Cl. 364-900.000.
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  - Fujikura, Masakuni; Kono, Tomio; Terai, Kazuto; Abe, Naohiro; and Ishida, Kiyohito, 4,101,347, Cl. 148-38.000.
- Teraoka, Kazuharu; and Nishimura, Kazuo, to Teraoka Seikosho Co., Ltd. Electronic digital display scale with label printer. 4,101,366, Cl. 156-378.000.
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  - Teraoka, Kazuharu; and Nishimura, Kazuo, 4,101,366, Cl. 156-378.000.
- Terrill, David B.: *See—*
  - Shaw, Wilfrid G.; and Terrill, David B., 4,101,448, Cl. 252-437.000.
- Terzian, Rouben T.: *See—*
  - Conway, Lyle A.; Terzian, Rouben T.; and Fletchic, Donald K., 4,101,619, Cl. 264-156.000.
- Tesch, Karl, to Jos. Schneider & Co. Optische Werke. Varifocal camera objective with adjustment-range selection. 4,101,202, Cl. 350-187.000.

- Tetrafluor, Inc.: *See*—
  - Reid, William P., 4,101,140, Cl. 277-165.000.
- Texaco Development Corp.: *See*—
  - Cuscurida, Michael; and Speranza, George P., 4,101,462, Cl. 521-115.000.
  - Gipson, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.
  - McEntire, Edward E., 4,101,466, Cl. 521-115.000.
  - McEntire, Edward E., 4,101,470, Cl. 521-118.000.
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  - Allen, Joseph C.; and Chien, Sze-Foo, 4,100,967, Cl. 166-68.000.
  - Boussaid, Issam S., 4,100,966, Cl. 166-273.000.
  - Buinicky, Ernest P.; Durkin, Joseph A.; and Eates, John H., 4,101,560, Cl. 260-348.290.
  - Kuntschik, Lawrence F., 4,101,431, Cl. 252-46.700.
  - Mayer, Edward A., 4,100,758, Cl. 62-54.000.
  - Mott, George E.; and Seguin, Ronald D., 4,100,753, Cl. 61-86.000.
  - Smith, James A.; MacLean, John P.; and DeBoise, Thomas W., 4,101,288, Cl. 23-288.00B.
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  - Malpass, Dennis B.; and Watson, Spencer C., 4,101,568, Cl. 260-448.00A.
- Texas Instruments Incorporated: *See*—
  - Jenne, Richard L., 4,101,861, Cl. 337-368.000.
  - Kulwicki, Bernard M.; and St.Martin, Norman P., 4,101,454, Cl. 252-514.000.
  - Orcutt, John W., 4,100,930, Cl. 137-68.00R.
  - Possley, Glen G.; Massey, Robert G.; and Williams, Billy B., 4,101,350, Cl. 148-175.000.
  - Shah, Pradeep L.; and Fuller, Clyde R., 4,101,351, Cl. 148-188.000.
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  - Rauschenberg, Richard A.; Textoris, Melvin A.; and Williams, Philip J., 4,101,166, Cl. 297-304.000.
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  - Moertel, George B., 4,100,656, Cl. 24-205.16C.
  - Monroe, Lawrence S., 4,101,360, Cl. 156-200.000.
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- Thatcher, Arthur K.; and McCarter, Ed R. Computer controlled sonic fuel system. 4,100,896, Cl. 123-119.0EE.
- Thawley, Clive Stafford; and Shepherd, Thomas, to Uniroyal Limited. Expansion joints. 4,101,150, Cl. 285-226.000.
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  - Crews, Michael R.; and Thiele, Gary A., 4,101,900, Cl. 343-789.000.
- Thom, Karl Friedrich, to Minnesota Mining and Manufacturing Company. Imidazole type curing agents and latent systems containing them. 4,101,514, Cl. 528-109.000.
- Thomas, Hector, to Heat Exchangers Africa Limited. Finned tubing. 4,100,784, Cl. 72-98.000.
- Thomas, James A.: *See*—
  - Hager, Donald L.; Brown, Ralph V.; and Thomas, James A., 4,101,950, Cl. 361-203.000.
- Thomas, Norman W., to Celanese Corporation. Epoxy-catalyst additive system to produce higher I.V. polybutylene terephthalate from low I.V. polymer. 4,101,601, Cl. 260-836.000.
- Thomas, Richard E.; and Pankey, Titus, Jr., to United States of America, Navy. Controlled-porosity dispenser cathode. 4,101,800, Cl. 313-346.0DC.
- Thomas, William A., Jr., to Eastman Kodak Company. Yarn tie-up and transfer tail method, and yarn package tube and apparatus for the method. 4,101,086, Cl. 242-18.0PW.
- Thomason, Larry V. Continuous concrete pipe laying machine. 4,100,751, Cl. 61-72.200.
- Thomson-CSF: *See*—
  - Rougeot, Henri; and Roziere, Guy, 4,101,770, Cl. 250-363.00S.
  - Trigon, Roland, 4,101,902, Cl. 343-854.000.
- Thufvesson, Kenth Anker: *See*—
  - Harre, Kurt Johan Stausgaard; and Thufvesson, Kenth Anker, 4,101,087, Cl. 242-84.20A.
- Thune, Robert H., to General Motors Corporation. Apparatus for rib trimming of universally molded battery container. 4,100,828, Cl. 83-1.000.
- Thurman, Donald W.: *See*—
  - Broach, George C.; and Thurman, Donald W., 4,101,265, Cl. 432-29.000.
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  - Tiegel, Ralph O., 4,100,674, Cl. 29-623.500.
- Tiegel, Ralph G., to Tiegel Manufacturing Company. Method for making a side terminal weld. 4,100,674, Cl. 29-623.500.
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  - Kuus, Gijsbert; and Tielemans, Peter Andreas, Waltherus, 4,101,796, Cl. 313-178.000.
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  - Gikow, Emanuel, deceased; and Tilton, Richard S., 4,101,854, Cl. 333-82.00B.
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  - Reese, Robert O.; and Garrison, Donald W., 4,101,963, Cl. 364-705.000.
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- Tinney, Francis John: *See*—
  - Nicolaides, Ernest D.; and Tinney, Francis John, 4,101,537, Cl. 260-112.5LH.
- Tippmer, Kurt, to Carl Still, Firma. Method for converting the ammonia and hydrogen sulfide contained in coke-oven gases into nitrogen and water and sulfur respectively. 4,101,642, Cl. 423-573.00G.
- Titone, Simone Charles, to Du Pont de Nemours, E. I., and Company. Process and nonraveling knit tubular products having axial stretch. 4,100,770, Cl. 66-193.000.
- Toagosei Chemical Industry Co., Ltd.: *See*—
  - Nakagawa, Teruo; Ogasawara, Takahisa; and Tatemichi, Hidemaro, 4,101,493, Cl. 260-29.60R.
- Tobias, John W.: *See*—
  - Taylor, Lynn J.; and Tobias, John W., 4,101,720, Cl. 526-3.000.
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- Toda, Gyozo: *See*—
  - Imoto, Katsuyuki; Toda, Gyozo; and Sumi, Masao, 4,101,300, Cl. 65-2.000.
- Toeda, Hiroshi: *See*—
  - Okada, Shigeru; Arai, Takao; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,101,841, Cl. 330-254.000.
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  - Sasaki, Shiro; Inukai, Mitsuo; and Tokai Rika Denki Seisakusho K.K., 4,101,171, Cl. 297-389.000.
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  - Ando, Hiromi, 4,100,839, Cl. 91-369.00B.
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  - Morris, Arthur E., 4,101,314, Cl. 75-77.000.
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  - Wanninkhof, Markus Wilhelm Matthijs; van der Velden, Johnny Wilhelmus; and Broerse, Pieter Hendrik, 4,101,260, Cl. 431-95.00R.
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- Vogel, Rudolf. Method and apparatus for installing pipes in off-shore locations. 4,100,754, Cl. 61-98.000.
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  - Breitfeld, Gunter, 4,101,091, Cl. 242-107.000.
  - Oehm, Klaus, 4,101,146, Cl. 280-731.000.
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- Voss, Klaus: *See—*
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- Vossen, John Louis, Jr.; Nyman, Frederick Russell; and Nichols, George Frederick, to RCA Corporation. Adherence of metal films to polymeric materials. 4,101,402, Cl. 204-192.00C.
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- Wallen, Jan, to Ferrolegeringar Trollhatteverken AB. Conversion of molybdenite concentrate to ferro-molybdenum and simultaneous removal of impurities by direct reduction with sulfide forming reducing agents. 4,101,316, Cl. 75-129.000.
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- Ward, John Wesley; and Leonard, Charles Arthur, to A. H. Robins Company, Incorporated. Method for inhibiting emesis and compositions therefor. 4,101,662, Cl. 424-267.000.
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- Watanabe, Yoshiaki; Sunouchi, Akio; and Okuno, Youichi, to Canon Kabushiki Kaisha. Data recording device for camera. 4,101,912, Cl. 354-106.000.
- Waterworth, Peter; and Reid, Douglas Charles John, to Plessey Handel und Investments AG. Scanning system. 4,101,193, Cl. 350-6.800.
- Watkins, Caesar E., to Inland Container Corporation. Recessed end container. 4,101,022, Cl. 206-45.140.
- Watkins, Royston K.: *See—*
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- Watrous, John R.: *See—*
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- Watson, Susan Steves, to Kay Laboratories, Inc. Method for splicing cables and hot pack for use therein. 4,101,353, Cl. 156-49.000.

- Watts, Leonard, to Technicon Instruments Corporation. Method and apparatus for casting metals. 4,100,960, Cl. 164-119.000.
- Way, Allan S., to Beckman Instruments, Inc. Apparatus for calibrating an optical null spectrophotometer. 4,101,219, Cl. 356-89.000.
- Wayment, William Ross, to Joy Manufacturing Company. Method of mine backfilling and material therefor. 4,101,333, Cl. 106-85.000.
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- Weaver, Daniel J.; Treiber, Robert; and Pernyeszi, Joseph, to Singer Company, The. Data-gathering device for scanning data having a variable amplitude modulation and signal to noise ratio. 4,101,072, Cl. 235-455.000.
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- Weist, Walter R.: *See—*
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- Western Gear Corporation: *See—*
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- Whirlpool Corporation: *See—*
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- Whitaker, Donald Edward, to International Telephone and Telegraph Corporation. Electronic DX signaling circuit. 4,101,733, Cl. 178-58.00R.
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- White, John A. Adverse conditioning system. 4,100,706, Cl. 52-101.000.
- White, Robert Charles, to Ontario Research Foundation. Wrist implant apparatus. 4,100,626, Cl. 3-1.910.
- White, Roger L.; and Dalton, Richard K., to E & E Specialties, Inc. Mold for forming a plastic article having an undercut or negative draft portion. 4,101,256, Cl. 425-441.000.
- Whitlow, William T.: *See—*
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- Whittam, Thomas Vincent; and Youll, Barry, to Imperial Chemical Iodustries Limited. Isomerization of alkyl benzenes using a nu-l zeolite catalyst. 4,101,598, Cl. 260-668.00A.
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- Wiggin, Joseph F., to Harris Corporation. Video preamplifier for camera operated in act mode. 4,101,932, Cl. 358-223.000.
- Wiik, Tor. Method for manufacturing thermoplastic articles. 4,101,628, Cl. 264-325.000.
- Wilkinson, Anthony Austin: *See—*
  - Webster, John David; Wilkinson, Anthony Austin; and Tucker, Frederick George, 4,101,623, Cl. 264-270.000.
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- Williams, David E., to Amark Industries, Inc. Nebulizer. 4,101,611, Cl. 261-142.000.
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- Williams, Norman E.: *See—*
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- Williams, Salvion Ed. Solar energy collector. 4,100,914, Cl. 126-270.000.
- Willis, Donald Henry, to RCA Corporation. Horizontal deflection circuit with high voltage selection capability. 4,101,815, Cl. 315-411.000.
- Wilson, Oeorge A., to Gould Inc. Circuit breaker racking mechanism for drawout type switchgear. 4,101,744, Cl. 200-50.0AA.
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  - Englund, Gosta Roland; and Wincent, Karl Tommy, 4,101,017, Cl. 400-124.000.
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- Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,101,069, Cl. 229-40.000.
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  - Hill, Howard M., 4,101,807, Cl. 315-116.000.
  - Jacques, James O., 4,101,942, Cl. 360-77.000.
  - Laskowski, Kenneth W.; and Steiner, Edward L., 4,101,213, Cl. 355-5.000.
  - Levy, Mortimer; and Goffe, William L., 4,101,321, Cl. 96-1.50R.
  - Mueller, Karl J.; Haumann, Dewey H., Jr.; and Kromm, Alvin D., Jr., 4,101,267, Cl. 432-60.000.
  - Sellers, Edward C.; and Malkani, Chandler, 4,101,320, Cl. 96-1.400.
  - Strella, Stephen; Seanor, Donald A.; Imperial, George R.; and Hoffend, Thomas R., 4,101,686, Cl. 427-22.000.
  - Weigl, John Wolfgang; and Mammino, Joseph, 4,101,904, Cl. 346-74.100.
- Yaggy, Leon S., to Hughes Aircraft Company. Silicon diode array vidicon with electronically controlled sensitivity. 4,101,931, Cl. 358-217.000.
- Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, to Nippon Chemiphar Co., Ltd. Benzo[b,f]thiepin derivatives. 4,101,667, Cl. 424-275.000.
- Yamada, Hideo: *See—*
  - Tsukada, Katsushige; Hayashi, Nobuyuki; Yamada, Hideo; Ishimaru, Toshiaki; Isobe, Asao; and Sato, Tadazi, 4,101,364, Cl. 156-286.000.
- Yamada, Takashi: *See—*
  - Ebihara, Heichachiro; and Yamada, Takashi, 4,101,790, Cl. 307-221.00C.
- Yamaguchi, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Packing box. 4,101,034, Cl. 206-612.000.
- Yamaguchi, Jiro: *See—*
  - Shimada, Takashi; Inoue, Kenichi; Ohtsu, Takaji; Mochizuki, Hidenobu; and Yamaguchi, Jiro, 4,101,921, Cl. 357-23.000.
- Yamaguchi, Tamikazu, to Minolta Camera Kabushiki Kaisha. Gauss type lens system. 4,101,203, Cl. 350-217.000.
- Yamaguchi, Tetsuo: *See—*
  - Aihara, Mitsuo; Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,101,838, Cl. 328-63.000.
- Yamaguchi, Yoshinobu: *See—*
  - Noda, Mikio; Yamaguchi, Yoshinobu; Uwano, Ken-ichiro; Sato, Nobuhiro; Tomita, Tadayoshi; and Otsuka, Koji, 4,101,449, Cl. 252-457.000.
- Yamamichi, Yoshikazu: *See—*
  - Nagao, Jun-ichi; Machiguchi, Hiroyuki; and Yamamichi, Yoshikazu, 4,101,286, Cl. 23-283.000.
- Yamamoto, Iwao; and Koga, Moriro, to said Iwao Yamamoto; by said Moriro Koga, a part interest. Off center electrode spark plug. 4,101,797, Cl. 313-141.000.
- Yamamoto, Ryuji: *See—*
  - Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, 4,101,621, Cl. 264-182.000.
- Yamamoto, Shunji: *See—*
  - Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Shimizu, Shiegemitu; Tokura, Yukio; and Yamamoto, Shunji, 4,101,214, Cl. 355-10.000.
- Yamamoto, Syunichi: *See—*
  - Nambu, Masao; Yamamoto, Syunichi; and Koiwai, Yoshihisa, 4,101,635, Cl. 423-242.000.
- Yamamoto, Toshihiro; Okubo, Yoshioki; Toyoda, Kenichi; and Yamamoto, Ryuji, to Kanebo, Ltd. Method for producing flame resistant acrylic fibers. 4,101,621, Cl. 264-182.000.
- Yamamura, Yuichi; Shiba, Tetsuo; Azuma, Ichiro; Kusumoto, Shoichi; Hirayama, Tadamasa; and Kusama, Tsuneo, to Daiichi Seiyaku Co., Ltd. Muramyldipeptide derivatives and process for the preparation thereof. 4,101,536, Cl. 260-112.50R.
- Yamanaka, Toru: *See—*
  - Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,101,667, Cl. 424-275.000.
- Yamano, Jüchi. Electrically heated curling iron and stand therefor. 4,101,756, Cl. 219-222.000.
- Yamashita, Kazutaka: *See—*
  - Takamori, Shigeru; Yamashita, Kazutaka; and Kono, Yoshinao, 4,101,518, Cl. 528-100.000.
- Yamashita, Maki; and Kogure, Yasuzi, to Minolta Camera Kabushiki Kaisha. Indicating devices for use in cameras. 4,101,914, Cl. 354-128.000.
- Yamashita, Shiro, to Kabushiki Kaisha Daini Seikosha. Oscillator. 4,101,848, Cl. 331-116.00R.
- Yano, Akikazu: *See—*
  - Watanabe, Masamichi; Nakahara, Takuo; Sakamoto, Seiji; Bizen, Kunio; Yano, Akikazu; and Otani, Yuzo, 4,101,523, Cl. 528-309.000.
- Yano, Robert A.: *See—*
  - Trumbull, Harold E.; Davis, Howard C.; and Yano, Robert A., 4,100,743, Cl. 60-639.000.
- Yatabe, Kenichi. Metal bracket for use in orthodontic treatment. 4,100,678, Cl. 32-14.00A.
- Yeakey, Ernest Leon: *See—*
  - Gipsoo, Robert Malone; Yeakey, Ernest Leon; and Peppel, William Jennings, all of, 4,101,515, Cl. 252-182.000.
- Yearsley, Norman: *See—*
  - McConnell, Edmund Alexander; Yearsley, Norman; and Blockley, Alec Gordon, 4,100,825, Cl. 82-3.000.
- Yellen, Robert. Practice tennis device. 4,101,128, Cl. 273-106.00A.
- Yevick, George J., to Izon Corporation. Fiber optic system. 4,101,188, Cl. 350-96.240.
- Yoo, Jin S.: *See—*
  - Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,101,444, Cl. 252-411.00R.
- Yoshida Kogyo K.K.: *See—*
  - Oogami, Eiryo, 4,100,704, Cl. 52-65.000.
  - Terada, Seiko; Nishiyama, Hissei; and Oofusa, Masaatsu, 4,100,943, Cl. 139-201.000.
- Yoshioka, Mitsuru; Sendo, Yuji; Ishikura, Koji; Murakami, Masayuki; and Miyazaki, Sadao, to Shionogi & Co., Ltd. Antibacterial hydrazono cephalosporins. 4,101,658, Cl. 424-246.000.
- Yoshioka, Yoshiaki: *See—*
  - Konishi, Fumiya; Kusao, Kenji; and Yoshioka, Yoshiaki, 4,101,772, Cl. 250-399.000.
- Yoshizawa, Shigeru: *See—*
  - Hiroshima, Minoru; Yoshizawa, Shigeru; Saito, Nobuo; Asano, Atsushi; and Aoki, Hirokazu, 4,101,971, Cl. 365-11.000.
  - Saito, Nobuo; Yoshizawa, Shigeru; and Toyooka, Takashi, 4,101,970, Cl. 365-2.000.
- Youll, Barry: *See—*
  - Whittam, Thomas Vincent; and Youll, Barry, 4,101,598, Cl. 260-668.00A.
- Young, Donald C.; and Maly, George P., to Union Oil Company of California. Non-aqueous acid emulsion composition and method for acid-treating siliceous geological formations. 4,101,425, Cl. 252-8.55C.
- Young, Donald C.: *See—*
  - Maly, George P.; and Young, Donald C., 4,101,426, Cl. 252-8.55C.
- Young, Jerry W.: *See—*
  - Richards, Frank P.; Taylor, Raymond C.; Young, Jerry W.; and Farfaglia, Silvio T., 4,100,842, Cl. 93-39.00C.
- Yulga, Julius J.: *See—*
  - Anderson, William B.; and Yulga, Julius J., 4,101,180, Cl. 308-20.000.
- Yursis, Paul J.: *See—*
  - Conrey, Richard N.; McQuaid, Phillip T.; and Yursis, Paul J., 4,101,132, Cl. 273-29.00A.
- Zahler, Rueben: *See—*
  - Dravnieks, Konstantins; Zahler, Rueben; and Sylvester, Gordon C., 4,100,938, Cl. 137-625.310.
- Zahn, Wolfgang: *See—*
  - Fergg, Berthold; Zahn, Wolfgang; and Knapp, Walter, 4,101,217, Cl. 355-38.000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
  - Umezawa, Hamao, 4,101,650, Cl. 424-44.000.
- Zanella, Dominic A.: *See—*
  - Huffman, Allan M.; Horinka, Paul R.; and Zanella, Dominic A., 4,101,544, Cl. 260-207.100.
- Zapart, Bruno J. Fast grind fixture. 4,100,702, Cl. 51-216.00H.
- Zawacki, Joseph H.; and Dutton, John P., to Lear Siegler, Inc. Axle spindle forming method. 4,100,781, Cl. 72-41.000.
- Zeller, Hans Georg: *See—*
  - Brettschneider, Johannes; Bertling, Gerhard; and Zeller, Hans Georg, 4,100,897, Cl. 123-119.0EC.

Zenger, Alfred John: *See*—
  Landau, John Vernon, Jr.; Hunts, Barney Dean; Rupinski, Frederick Alexander; and Zenger, Alfred John, 4,100,865, Cl. 112-121.110.
Zenith Radio Corporation: *See*—
  Retsky, Michael Walter; and Schwartz, James W., 4,101,803, Cl. 315-3.000.
Zettwoog, Pierre: *See*—
  Carbonnelle, Jacques; Chevalier, Gerard; and Zettwoog, Pierre, 4,100,806, Cl. 73-421.50A.
Zhukov, Viktor Ivanovich; Shestak, Nikolai Petrovich; Belov, Gennady Petrovich; Dyadjunova, Maria Nikolaevna; Shilov, Leonid Alexandrovich; Shevlyakov, Ivan Davydovich; Dyachkovsky, Fridrikh Stepanovich; Liakumovich, Alexandr Grigorievich; Vernov, Pavel Alexandrovich; and Sivakov, Jury Mikhailovich. Method of dimerizatioo of alpha-olefins. 4,101,600, Cl. 260-683.15D.
Ziemba, Richard Thomas, to General Electric Company. Fuze encoder. 4,100,856, Cl. 102-206.000.
Zillessen, Christoph: *See*—
  Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
Ziselman, Boris Georgievich: *See*—
  Novikov, Alexandr Nikolaevich; Kudrikova, Evdokia Danilovna; Shel, Marat Moiseevich; Pimshtein, Pavel Gdalievich; Globin, Nikolai Kirillovich; Ziselman, Boris Georgievich; Potulov, Vyacheslav Mikhailovich; Maletin, Alexei Mikhailovich, deceased; Maletin, Ljubov Alexeevna, administrator; and Maletina, Tatyana Alexeevna, administrator, 4,101,065, Cl. 228-155.000.
Zon, Louis: *See*—
  Dieffenbach, Percy; and Zon, Louis, 4,101,697, Cl. 428-9.000.
Zucchinelli, Mario: *See*—
  Pirota, Franco; Violini, Nello; and Zucchinelli, Mario, 4,101,247, Cl. 417-48.000.
Zucker, Jerry, to Hudsoo Pulp & Paper Corp. Method and apparatus for recovering saponified tall oil. 4,101,535, Cl. 260-97.700.
Zugenbuhler, Verne L.: *See*—
  Talge, Henry J.; McNair, Samuel L.; and Zugenbuhler, Verne L., 4,100,917, Cl. 128-66.000.
Zywietz, Walter: *See*—
  Radner, Gerd; Zillessen, Christoph; Zywietz, Walter; Gantke, Franz; and Walter, Harald, 4,100,749, Cl. 61-45.00C.
105: *See*—
  Fleischer, Henry; and 105, 4,101,149, Cl. 285-55.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., to Standard Forge and Axle Co. Method of casting brake shoes. Re. 29,704, Cl. 164-131.000.
Compere, Newton L. Rupturable blister pill package with safety backing. Re. 29,705, Cl. 206-531.000.
Fatt, Irving, to University of California, The Regents of The. Non-invasively measuring arterial oxygen tension. Re. 29,703, Cl. 128-2.00E.
Gifford, Bruce M.: *See*—
  Owen, A. B.; and Gifford, Bruce M., Re. 29,702, Cl. 29-520.000.
KcKinney, Hunter R.: *See*—
  Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.
Lamons Metal Gasket Company: *See*—
  Owen, A. B.; and Gifford, Bruce M., Re. 29,702, Cl. 29-520.000.
McKenzie, Roland W.: *See*—
  Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.
Owen, A. B.; and Gifford, Bruce M., to Lamons Metal Gasket Company. Spiral wound gasket assembly method. Re. 29,702, Cl. 29-520.000.
Standard Forge and Axle Co.: *See*—
  Bradshaw, Harry D.; McKenzie, Roland W.; and KcKinney, Hunter R., Re. 29,704, Cl. 164-131.000.
University of California, The Regents of The: *See*—
  Fatt, Irving, Re. 29,703, Cl. 128-2.00E.

LIST OF PLANT PATENTEES

McGredy, Samuel D. Rose plant. 4,281, 7-18-78, Cl. 12.000.
Pan-American Plant Company: *See*—
  Shoesmith, Leonard H., 4,280, Cl. 77.000.
Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant. 4,280, 7-18-78, Cl. 77.000.
Weeks, O. L. Rose plant. 4,282, 7-18-78, Cl. 18.000.

LIST OF DESIGN PATENTEES

Absher, Charles A. Tractor pan. 248,558, 7-18-78, Cl. D15-32.000.
Airway Industries, Inc.: *See*—
  Davis, Michael, 248,539, Cl. D8-336.000.
Anchor Hocking Corporation: *See*—
  Benes, Frank J., 248,526, Cl. D7-1.000.
Antonio Nova S.r.l.: *See*—
  Nova, Oscar; and Nova, Renzo, 248,512, Cl. D2-272.000.
Assmann G.m.b.H.: *See*—
  Schulze-Bahr, Werner; and Weis, Karl, 248,552, Cl. D14-3.000.
Backstrom, Olof Fredrik; and Linden, Erkki Olavi. Pruning-shears. 248,534, 7-18-78, Cl. D8-5.000.
Baker, Roy L. Combined gun holster and cartridge loops. 248,563, 7-18-78, Cl. D22-13.000.
Ball, Richard: *See*—
  Bleiweiss, Arthur A.; and Ball, Richard, 248,590, Cl. D48-32.00A.
Beitler, Myron; and Leer, Stuart D., to Litton Business Systems, Inc. Portable calculating machine. 248,595, 7-18-78, Cl. D64-11.00B.
Benes, Frank J., to Anchor Hocking Corporation. Serving dish or similar article. 248,526, 7-18-78, Cl. D7-1.000.
Berkley & Company, Inc.: *See*—
  Oberg, Gary R., 248,541, Cl. D8-372.000.
Bleiweiss, Arthur A.; and Ball, Richard, to Dominion Auto Accessories Limited. Multi-function lens. 248,590, 7-18-78, Cl. D48-32.00A.
Bleiweiss, Arthur F.: *See*—
  Urbanek, Karel; and Bleiweiss, Arthur F., 248,592, Cl. D48-32.00R.
Bryk, Charles S., to Texasgulf Inc. Glass mug. 248,527, 7-18-78, Cl. D7-9.000.
Byrne, David S., to Warner-Lambert Company. Razor handle. 248,577, 7-18-78, Cl. D28-48.000.
Byrne, David S., to Warner-Lambert Company. Razor handle. 248,578, 7-18-78, Cl. D28-48.000.
Combi Co. Ltd.: *See*—
  Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.
Corda, Charles Richard. Chair. 248,522, 7-18-78, Cl. D6-72.000.
Dart Industries Inc.: *See*—
  Haynes, Rodney R., Sr., 248,520, Cl. D6-63.000.
  Haynes, Rodney R., Sr., 248,521, Cl. D6-63.000.
Davis, Michael, to Airway Industries, Inc. Combined closure flap and lock for luggage or the like. 248,539, 7-18-78, Cl. D8-336.000.
Deering, Hartland W., Jr., to Minnesota Mining and Manufacturing Company. Tape dispenser. 248,561, 7-18-78, Cl. D19-69.000.
Dibenedetto, Luigi, to TRW Data Systems. Combined security access gate and controlling card reader therefor. 248,555, 7-18-78, Cl. D14-49.000.
Doi, Sinichiro: *See*—
  Sekido, Iwae; and Doi, Sinichiro, 248,551, Cl. D12-211.000.
Doman, Donald W., to Kohler Co. Spout. 248,564, 7-18-78, Cl. D23-32.000.
Domasin, Richard. Plumbing and landscaping tool for installing and removing sprinkler heads. 248,536, 7-18-78, Cl. D8-21.000.
Dominion Auto Accessories Limited: *See*—
  Bleiweiss, Arthur A.; and Ball, Richard, 248,590, Cl. D48-32.00A.
  Urbanek, Karel, 248,591, Cl. D48-32.00A.
  Urbanek, Karel; and Bleiweiss, Arthur F., 248,592, Cl. D48-32.00R.
Eckel, David S.; and Lechter, George S. Mirror. 248,525, 7-18-78, Cl. D6-237.000.
Esselte Obergs AB: *See*—
  Winther, Ole, 248,517, Cl. D6-3.000.
Fagersta Secoroc AB: *See*—
  Sjostrom, Arne; and Svanstrom, Alf, 248,535, Cl. D8-14.000.
Fernando, Fontana, to Fontana Fernando S.p.A. Combined wrist watch case and band. 248,547, 7-18-78, Cl. D10-32.000.
Finch, Lloyd J. Stool. 248,519, 7-18-78, Cl. D6-32.000.
Fontana Fernando S.p.A.: *See*—
  Fernando, Fontana, 248,547, Cl. D10-32.000.
Fukuoka, Tatsuo. Shoe. 248,511, 7-18-78, Cl. D2-269.000.
Funahashi, Takaji. Felt pen. 248,560, 7-18-78, Cl. D19-43.000.
Gabourie, Gregory S., to Global Upholstery Company Limited. Seating unit for a swivel chair. 248,524, 7-18-78, Cl. D6-197.000.
Global Upholstery Company Limited: *See*—
  Gabourie, Gregory S., 248,524, Cl. D6-197.000.
Gobin, Donald L.; and Scanland, Joseph E., to Roper Corporation. Cutter pin for mower. 248,557, 7-18-78, Cl. D15-17.000.
Goldstein, Morton I. Portable reading table for books. 248,523, 7-18-78, Cl. D6-184.000.
Gorke, Ronald R., to Medtronic, Inc. Telephone electrocardiogram transmitting equipment case. 248,566, 7-18-78, Cl. D24-8.000.
Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, to Matsushita Electric Works, Ltd. Electric shaver. 248,579, 7-18-78, Cl. D28-49.000.
Graham, Roger. Smoking device. 248,572, 7-18-78, Cl. D27-03.000.
Graham, Roger. Smoking device. 248,573, 7-18-78, Cl. D27-03.000.
Graham, Roger. Bowl for a smoking device. 248,574, 7-18-78, Cl. D27-05.000.
Hawkins, Richard T. Data terminal. 248,554, 7-18-78, Cl. D14-43.000.
Haynes, Rodney R., Sr., to Dart Industries Inc. Sofa. 248,520, 7-18-78, Cl. D6-63.000.
Haynes, Rodney R., Sr., to Dart Industries Inc. Curved sofa. 248,521, 7-18-78, Cl. D6-63.000.

- Herbst, Lewis R. Prefabricated sound barrier wall. 248,571, 7-18-78, Cl. D25-38.000.
- Huff, Edward F. Child's swing. 248,518, 7-18-78, Cl. D6-10.000.
- Ichikawa, Kuniharu: *See—*
  - Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.
- Interlego A.G.: *See—*
  - Tapdrup, Erik Peter, 248,582, Cl. D34-4.00R.
- Ishii, Yoshiyasu: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.
- Ismach, Aaron. Animal intradermal nozzle for jet injection device. 248,568, 7-18-78, Cl. D24-25.000.
- Jacobs, Jack Z. Bottle design. 248,542, 7-18-78, Cl. D9-23.000.
- Janssens, Wilhelmus Gerardus Elisabeth, to U.S. Philips Corporation. Hair dryer. 248,575, 7-18-78, Cl. D28-12.000.
- Janssens, Wilhelmus Gerardus Elisabeth, to U.S. Philips Corporation. Hair dryer casing. 248,576, 7-18-78, Cl. D28-12.000.
- Johanssoo, Karl Hugo. Invertible chair. 248,516, 7-18-78, Cl. D6-3.000.
- Jung Li Hsing Industry Co., Ltd.: *See—*
  - Lu, Wan Chan, 248,514, Cl. D2-311.000.
- Kidde Consumer Durables Corp.: *See—*
  - Oster, Joseph, 248,593, Cl. D48-33.000.
- Kohler Co.: *See—*
  - Doman, Donald W., 248,564, Cl. D23-32.000.
- LaPolice, George Donald, to Singer Company, The. Sewing machine. 248,559, 7-18-78, Cl. D15-69.000.
- Lea, Melvin A., to Oneida Ltd. Spoon or similar article. 248,532, 7-18-78, Cl. D7-137.000.
- Lea, Melvin A., to Oneida Ltd. Spoon or similar article. 248,533, 7-18-78, Cl. D7-151.000.
- Lechter, George S.: *See—*
  - Eckel, David S.; and Lechter, George S., 248,525, Cl. D6-237.000.
- Leer, Stuart D.: *See—*
  - Beitler, Myron; and Leer, Stuart D., 248,595, Cl. D64-11.00B.
- Lewis, Cecil. Fishing lure. 248,562, 7-18-78, Cl. D22-28.000.
- Lincolo, Launa J. Pendulum game device. 248,585, 7-18-78, Cl. D34-15.00P.
- Linden, Erkki Olavi: *See—*
  - Backstrom, Olof Fredrik; and Linden, Erkki Olavi, 248,534, Cl. D8-5.000.
- Linder, Peter J. Padlock protector. 248,540, 7-18-78, Cl. D8-346.000.
- Litton Business Systems, Inc.: *See—*
  - Beitler, Myron; and Leer, Stuart D., 248,595, Cl. D64-11.00B.
- Lopez, Vincent G. Medical instrument basket apparatus. 248,549, 7-18-78, Cl. D12-29.000.
- Lu, Wan Chan, to Jung Li Hsing Industry Co., Ltd. Athletic shoe. 248,514, 7-18-78, Cl. D2-311.000.
- Luttrell, Jabe Roy; and Rhine, Edward Vincent. Mailbox. 248,580, 7-18-78, Cl. D31-24.000.
- Madl, Alfred W., to Sunbeam Corporation. Massager. 248,569, 7-18-78, Cl. D24-41.000.
- Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 248,528, 7-18-78, Cl. D7-137.000.
- Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 248,529, 7-18-78, Cl. D7-137.000.
- Matsuda, Hiroaki: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,586, Cl. D34-15.00C.
- Matsushita Electric Works, Ltd.: *See—*
  - Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.
- Medtronic, Inc.: *See—*
  - Gorke, Ronald R., 248,566, Cl. D24-8.000.
- Minnesota Mining and Manufacturing Company: *See—*
  - Deering, Hartland W., Jr., 248,561, Cl. D19-69.000.
- Montague, Archer Allen, Jr. Applique or the like. 248,588, 7-18-78, Cl. D33-9.00C.
- Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co. Ltd. Toy music box. 248,586, 7-18-78, Cl. D34-15.00C.
- National Steel Corporation: *See—*
  - Saunders, William T., 248,544, Cl. D9-216.000.
- Nova, Oscar; and Nova, Renzo, to Antonio Nova S.r.l. Boot. 248,512, 7-18-78, Cl. D2-272.000.
- Nova, Renzo: *See—*
  - Nova, Oscar; and Nova, Renzo, 248,512, Cl. D2-272.000.
- Oberg, Gary R., to Berkley & Company, Inc. Hook for hanging meat. 248,541, 7-18-78, Cl. D8-372.000.
- Olson, Robert T. Key hanger. 248,515, 7-18-78, Cl. D2-400.000.
- Oneida Ltd.: *See—*
  - Lea, Melvin A., 248,532, Cl. D7-137.000.
  - Lea, Melvin A., 248,533, Cl. D7-151.000.
  - Manderfield, Ellen B., 248,528, Cl. D7-137.000.
  - Manderfield, Ellen B., 248,529, Cl. D7-137.000.
  - Richmond, Colin B., II, 248,530, Cl. D7-137.000.
  - Richmond, Colin B., II, 248,531, Cl. D7-137.000.
- Oster, Joseph, to Kidde Consumer Durables Corp. Fluorescent light bulb. 248,593, 7-18-78, Cl. D48-33.000.
- Pacific Handy Cutter, Inc.: *See—*
  - Richards, James L., 248,538, Cl. D8-99.000.
- Parker Pen Company, The: *See—*
  - Strelcheck, Steven G., 248,543, Cl. D9-171.000.
- Powell, Ronald. Toy animal figure. 248,581, 7-18-78, Cl. D34-2.00R.
- Quaker Oats Company, The: *See—*
  - Snyder, Paul D., 248,584, Cl. D34-15.00R.
- Rebert, James F.; and Rebert, John W. Low console tape deck player. 248,553, 7-18-78, Cl. D14-5.000.
- Rebert, John W.: *See—*
  - Rebert, James F.; and Rebert, John W., 248,553, Cl. D14-5.000.
- Rhine, Edward Vincent: *See—*
  - Luttrell, Jabe Roy; and Rhine, Edward Vincent, 248,580, Cl. D31-24.000.
- Richards, James L., to Pacific Handy Cutter, Inc. Adjustable blade knife. 248,538, 7-18-78, Cl. D8-99.000.
- Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 248,530, 7-18-78, Cl. D7-137.000.
- Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 248,531, 7-18-78, Cl. D7-137.000.
- Rieke Corporation: *See—*
  - Summers, Kenneth L., 248,545, Cl. D9-254.000.
- Roper Corporation: *See—*
  - Gobin, Donald L.; and Scanland, Joseph E., 248,557, Cl. D15-17.000.
- Rumbaugh, James T. Water ski rope handle. 248,587, 7-18-78, Cl. D34-41.000.
- S/V Tool Company, Inc.: *See—*
  - Smith, Lloyd T., 248,537, Cl. D8-82.000.
- Saunders, William T., to National Steel Corporation. Seam-free can. 248,544, 7-18-78, Cl. D9-216.000.
- Scanland, Joseph E.: *See—*
  - Gobin, Donald L.; and Scanland, Joseph E., 248,557, Cl. D15-17.000.
- Schulze-Bahr, Werner; and Weis, Karl, to Assmann G.m.b.H. Miniature dictating machine. 248,552, 7-18-78, Cl. D14-3.000.
- Sekido, Iwae; and Doi, Sinichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha (Toyota Motor Co., Ltd.). Wheel. 248,551, 7-18-78, Cl. D12-211.000.
- Siefer, Bernard Stuart: *See—*
  - Smith, Judson L.; and Siefer, Bernard Stuart, 248,570, Cl. D25-31.000.
- Siegel, Owen R. Teonis player figurine. 248,548, 7-18-78, Cl. D11-160.000.
- Singer Company, The: *See—*
  - LaPolice, George Donald, 248,559, Cl. D15-69.000.
- Sjostrom, Arne; and Svanstrom, Alf, to Fagersta Secoroc AB. Lifting and handling tool for rotary roller bits. 248,535, 7-18-78, Cl. D8-14.000.
- Smith, Judson L.; and Siefer, Bernard Stuart, to Smith, Judson L. Car wash building. 248,570, 7-18-78, Cl. D25-31.000.
- Smith, Lloyd T., to S/V Tool Company, Inc. Screwdriver. 248,537, 7-18-78, Cl. D8-82.000.
- Snyder, Paul D., to Quaker Oats Company, The. Educational block toy. 248,584, 7-18-78, Cl. D34-15.00R.
- Snyder, Richard D. Aircraft clock. 248,546, 7-18-78, Cl. D10-15.000.
- Soler, Andres Navarro. Sport shoe. 248,513, 7-18-78, Cl. D2-310.000.
- Strelcheck, Steven G., to Parker Pen Company, The. Packaging container for a tape or the like. 248,543, 7-18-78, Cl. D9-171.000.
- Summers, Kenneth L., to Rieke Corporation. Drum closure. 248,545, 7-18-78, Cl. D9-254.000.
- Sunbeam Corporation: *See—*
  - Madl, Alfred W., 248,569, Cl. D24-41.000.
- Svanstrom, Alf: *See—*
  - Sjostrom, Arne; and Svanstrom, Alf, 248,535, Cl. D8-14.000.
- Takagi, Takeshi: *See—*
  - Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.
- Tapdrup, Erik Peter, to Interlego A.G. Toy figure. 248,582, 7-18-78, Cl. D34-4.00R.
- Texasgulf Inc.: *See—*
  - Bryk, Charles S., 248,527, Cl. D7-9.000.
- Thomas, Wesley L. Telephone. 248,556, 7-18-78, Cl. D14-53.000.
- Tirsbier, Paul W. Outdoor light fixture. 248,594, 7-18-78, Cl. D48-35.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha (Toyota Motor Co., Ltd.): *See—*
  - Sekido, Iwae; and Doi, Sinichiro, 248,551, Cl. D12-211.000.
- TRW Data Systems: *See—*
  - Dibenedetto, Luigi, 248,555, Cl. D14-49.000.
- U.S. Philips Corporation: *See—*
  - Janssens, Wilhelmus Gerardus Elisabeth, 248,575, Cl. D28-12.000.
  - Janssens, Wilhelmus Gerardus Elisabeth, 248,576, Cl. D28-12.000.
- Urbanek, Karel, to Dominion Auto Accessories Limited. Combined stop and tail lamp lens. 248,591, 7-18-78, Cl. D48-32.00A.
- Urbanek, Karel; and Bleiweiss, Arthur F., to Dominion Auto Accessories Limited. Warning lamp. 248,592, 7-18-78, Cl. D48-32.00R.
- Ward, James R. Sterilizer cabinet. 248,567, 7-18-78, Cl. D24-9.000.
- Warner-Lambert Company: *See—*
  - Byrne, David S., 248,577, Cl. D28-48.000.
  - Byrne, David S., 248,578, Cl. D28-48.000.
- Watson, Covington B. Combined heat exchanger and fireplace grate or the like. 248,565, 7-18-78, Cl. D23-94.000.
- Weis, Karl: *See—*
  - Schulze-Bahr, Werner; and Weis, Karl, 248,552, Cl. D14-3.000.
- Williams, Clarence. Lamp base. 248,589, 7-18-78, Cl. D48-20.00R.
- Winther, Ole, to Esselte Obergs AB. Stand for letter trays. 248,517, 7-18-78, Cl. D6-3.000.
- Woodard, Boyd R. Vehicle wind deflector. 248,550, 7-18-78, Cl. D12-181.000.
- Yamamoto, Shinji: *See—*
  - Gotoh, Akio; Takagi, Takeshi; Ichikawa, Kuniharu; and Yamamoto, Shinji, 248,579, Cl. D28-49.000.
- Zuuring, Peter F. Ice-skate. 248,583, 7-18-78, Cl. D34-14.00B.

CLASSIFICATION OF PATENTS

ISSUED JULY 18, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	
10	4,100,619
102	4,100,620
114	4,100,621
115	4,100,622
158	4,100,623
409	4,100,624
410	4,100,625
CLASS 3	
1.91	4,100,626
36	4,100,627
CLASS 4	
185 S	4,100,628
295	4,100,629
CLASS 5	
66	4,100,630
239	4,100,631
334 R	4,100,632
337	4,100,633
365	4,100,634
368	4,100,635
CLASS 7	
158	4,100,636
	4,100,637
CLASS 8	
4	4,101,269
17	4,101,270
94.26	4,101,271
127.6	4,101,272
172 R	4,101,273
173	4,101,274
CLASS 10	
15	4,100,638
CLASS 11	
1 R	4,100,639
	4,100,640
CLASS 13	
1	4,101,724
18	4,101,725
29	4,101,726
CLASS 15	
1.7	4,100,641
114	4,100,642
246	4,100,643
397	4,100,644
CLASS 16	
2	4,100,645
54	4,100,646
139	4,100,647
163	4,100,648
CLASS 19	
0.2	4,100,649
105	4,100,650
145.5	4,100,651
CLASS 23	
230 B	4,101,276
230 R	4,101,275
232 C	4,101,278
232 R	4,101,277
254 R	4,101,282
259	4,101,279
	4,101,283
	4,101,284
270 B	4,101,285
283	4,101,286
288 B	4,101,288
288 E	4,101,289
288 FC	4,101,280
288 K	4,101,281
	4,101,287
288 R	4,101,290
CLASS 24	
3 3	4,100,653
3 R	4,100,652
20 R	4,100,654
163 K	4,100,655
205.16 C	4,100,656
230 AL	4,100,657
231	4,100,658
CLASS 28	
255	4,100,659
271	4,100,660
CLASS 29	
33 K	4,100,661
110	4,100,662
156.4 R	4,100,663
156.6	4,100,664
252	4,100,665
407	4,100,666
429	4,100,667
520	Re.29,702
523	4,100,668
527.6	4,100,669
564.1	4,100,670
568	4,100,671
577 C	4,100,672
611	4,100,673
623.5	4,100,674
627	4,100,675
CLASS 30	
292	4,100,676
321	4,100,677
CLASS 32	
14 A	4,100,678
32	4,100,679
CLASS 33	
126.7 A	4,100,680
389	4,100,681
CLASS 34	
22	4,100,682
124	4,100,683
CLASS 35	
62	4,100,684
CLASS 36	
3 B	4,100,685
29	4,100,686
CLASS 37	
43 K	4,100,687
117.5	4,100,688
CLASS 40	
2.2	4,100,689
154	4,100,690
CLASS 42	
1 D	4,100,691
1 L	4,100,692
1 N	4,100,693
90	4,100,694
CLASS 43	
19.2	4,100,695
CLASS 44	
17	4,101,291
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51	4,101,293
CLASS 46	
40	4,100,696
269	4,100,697
CLASS 47	
29	4,100,698
81	4,100,699
CLASS 48	
77	4,101,294
99	4,101,295
CLASS 51	
92 R	4,100,700
157	4,100,701
216 H	4,100,702
CLASS 52	
16	4,100,703
65	4,100,704
82	4,100,705
101	4,100,706
115	4,100,707
222	4,100,708
239	4,100,709
309.9	4,100,710
489	4,100,711
514	4,100,712
648	4,100,713
741	4,100,714
CLASS 53	
48	4,100,715
138 A	4,100,716
138 R	4,100,717
234	4,100,718
241	4,100,719
CLASS 55	
33	4,101,296
43	4,101,297
163	4,101,298
222	4,101,299
CLASS 56	
14.6	4,100,720
CLASS 57	
34 AT	4,100,721
34 B	4,100,723
34 R	4,100,722
35	4,100,724
140 J	4,100,725
157 F	4,100,726
160	4,100,727
CLASS 58	
74	4,100,728
CLASS 59	
86	4,100,729
CLASS 60	
39.05	4,100,730
39.15	4,100,731
39.36	4,100,732
39.74 B	4,100,733
276	4,100,735
278	4,100,734
	4,100,736
292	4,100,737
327	4,100,738
413	4,100,739
431	4,100,740
517	4,100,741
602	4,100,742
639	4,100,743
651	4,100,744
652	4,100,745
CLASS 61	
1 F	4,100,746
5	4,100,747
45 B	4,100,748
45 C	4,100,749
53.64	4,100,750
72.2	4,100,751
86	4,100,752
	4,100,753
98	4,100,754
CLASS 62	
2	4,100,755
	4,100,756
52	4,100,757
54	4,100,758
55	4,100,759
57	4,100,760
137	4,100,761
160	4,100,762
238	4,100,763
289	4,100,764
499	4,100,765
CLASS 65	
2	4,101,300
21	4,101,301
30 R	4,101,302
31	4,101,303
135	4,101,304
145	4,101,305
323	4,101,306
CLASS 66	
64	4,100,766
75.2	4,100,767
	4,100,768
177	4,100,769
193	4,100,770
CLASS 69	
33	4,100,771
47	4,100,772
48	4,100,773
CLASS 70	
3	4,100,775
303 A	4,100,776
363	4,100,777
380	4,100,774
406	4,100,778
456 R	4,100,779
CLASS 71	
88	4,101,307
93	4,101,308
CLASS 72	
7	4,100,780
41	4,100,781
53	4,100,782
56	4,100,783
98	4,100,784
189	4,100,785
252	4,100,786
310	4,100,787
329	4,100,788
CLASS 73	
23	4,100,789
23.1	4,100,790
37.7	4,100,791
39	4,100,792
118	4,100,793
136 A	4,100,794
146	4,100,795
160	4,100,796
194 E	4,100,797
	4,100,798
197	4,100,799
	4,100,800
202	4,100,801
215	4,100,802
230	4,100,803
363.9	4,100,804
421 B	4,100,805
421.5 A	4,100,806
492	4,100,807
588	4,100,808
638	4,100,809
647	4,100,810
654	4,100,811
732	4,100,812
CLASS 74	
5 F	4,100,813
43	4,100,814
60	4,100,815
89.14	4,100,816
111	4,100,817
230.17 E	4,100,818
245 R	4,100,819
489	4,100,820
606 R	4,100,821
674	4,100,822
863	4,100,823
CLASS 75	
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0.5 AB	4,101,309
0.5 B	4,101,310
52	4,101,312
60	4,101,313
77	4,101,314
104	4,101,315
129	4,101,316
156.5	4,101,317
240	4,101,318
252	4,101,319
CLASS 81	
121 R	4,100,824
CLASS 82	
3	4,100,825
25	4,100,826
38 A	4,100,827
CLASS 83	
1	4,100,828
106	4,100,829
371	4,100,830
CLASS 84	
1.01	4,100,831
313	4,100,832
CLASS 85	
3 S	4,100,833
77	4,100,834
CLASS 87	
1	4,100,835
CLASS 89	
7	4,100,836
CLASS 90	
11 R	4,100,837
CLASS 91	
1	4,100,838
369 B	4,100,839
491	4,100,840
CLASS 93	
1 G	4,100,841
39 C	4,100,842
53 M	4,100,843
59 ES	4,100,844
77 FT	4,100,845
94 R	4,100,846
CLASS 96	
1.4	4,101,320
1.5 R	4,101,321
33	4,101,322
35	4,101,323
36.3	4,101,324
48 R	4,101,325
67	4,101,326
115 P	4,101,327
CLASS 98	
115 LH	4,100,847
CLASS 99	
353	4,100,848
CLASS 100	
41	4,100,849
287	4,100,850
CLASS 101	
248	4,100,851
295	4,100,852
401.1	4,100,853
415.1	4,100,854
CLASS 102	
48	4,100,855
206	4,100,856
CLASS 105	
323	4,100,857
CLASS 106	
22	4,101,329
45	4,101,330
73.1	4,101,331
85	4,101,332
	4,101,333
99	4,101,334
	4,101,335
101	4,101,337
106	4,101,336
CLASS 108	
48	4,100,858
51.3	4,100,859
CLASS 109	
83	4,100,860
CLASS 111	
7	4,100,861
52	4,100,862
CLASS 112	
79 R	4,100,863
121.11	4,100,864
	4,100,865
231	4,100,866
270	4,100,867
277	4,100,868
CLASS 113	
18 R	4,100,869
CLASS 114	
39	4,100,870
51	4,100,871
73	4,100,872
125	4,100,873
162	4,100,874
251	4,100,875
274	4,100,876
CLASS 115	
11	4,100,877
CLASS 116	
114 AD	4,100,878
CLASS 118	
49.1	4,100,879
234	4,100,880
319	4,100,881
620	4,100,882
630	4,100,883
653	4,100,884
CLASS 119	
73	4,100,885
98	4,100,886
CLASS 122	
379	4,100,887
438	4,100,888
510	4,100,889
CLASS 123	
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32 EE	4,100,892
103 B	4,100,893
117 A	4,100,894
117 R	4,100,895
119 B	4,100,898
119 EC	4,100,897
119 EE	4,100,896
122 A	4,100,899
124 R	4,100,900
139 AQ	4,100,903
139 AW	4,100,901
	4,100,904
139 BC	4,100,902
140 R	4,100,890
141	4,100,905
148 E	4,100,906
	4,100,908
148 S	4,100,907
196 AB	4,100,909
196 S	4,100,910
205	4,100,911
CLASS 126	
43	4,100,912
121	4,100,913
270	4,100,914
271	4,100,915
CLASS 127	
46 B	4,101,338
CLASS 128	
2 E	Re.29,703
2 V	4,100,916
66	4,100,917
80 F	4,100,918
84 B	4,100,919
172.1	4,100,920
284	4,100,921
	4,100,922
348	4,100,923
510	4,100,924
CLASS 133	
3 F	4,100,925
CLASS 134	
2	4,101,339
11	4,101,340
64 R	4,100,926
CLASS 136	
89 TF	4,101,341
228	4,101,342
230	4,101,343
CLASS 137	
9	4,100,927
15	4,100,928
	4,100,929
68 R	4,100,930
77	4,100,931
488	4,100,932

495	4,100,933
512	4,100,934
533.11	4,100,935
596.16	4,100,937
596.2	4,100,936
625.31	4,100,938
627.5	4,100,939
877	4,100,940
CLASS 139	
1 R	4,100,942
201	4,100,943
291 C	4,100,945
	4,100,946
439	4,100,944
449	4,100,941
453	4,100,947
CLASS 141	
392	4,100,948
CLASS 144	
3 R	4,100,949
242 D	4,100,950
309 AC	4,100,951
314 B	4,100,952
CLASS 148	
1.5	4,101,344
6.15 R	4,101,345
6.27	4,101,346
38	4,101,347
105	4,101,348
175	4,101,349
	4,101,350
188	4,101,351
CLASS 149	
19.2	4,101,352
CLASS 150	
0.5	4,100,953
CLASS 151	
41.7	4,100,954
CLASS 152	
362 CS	4,100,955
427	4,100,956
CLASS 156	
49	4,101,353
60	4,101,354
66	4,101,355
71	4,101,356
159	4,101,357
167	4,101,358
179	4,101,359
200	4,101,360
235	4,101,362
250	4,101,361
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286	4,101,364
294	4,101,365
378	4,101,366
471	4,101,367
503	4,101,368
510	4,101,369
535	4,101,370
560	4,101,371
580	4,101,372
639	4,101,373
CLASS 160	
368 R	4,100,957
CLASS 162	
306	4,101,374
CLASS 164	
7	4,100,958
36	4,100,959
119	4,100,960
131	Re.29,704
180	4,100,961
435	4,100,962
CLASS 165	
14	4,101,886
17	4,100,963
40	4,100,964
119	4,100,965
CLASS 166	
68	4,100,967
273	4,100,966
315	4,100,968
324	4,100,969
CLASS 169	
57	4,100,970
CLASS 172	
347	4,100,971
CLASS 173	
23	4,100,972
44	4,100,973
49	4,100,974
91	4,100,975
133	4,100,976
134	4,100,977
CLASS 174	
28	4,101,727
29	4,101,728
65 R	4,101,729
75 R	4,101,730
126 S	4,101,731
CLASS 175	
4.55	4,100,978
19	4,100,979
	4,100,980
60	4,100,981
206	4,100,982
383	4,100,983
CLASS 176	
37	4,101,375
39	4,101,376
40	4,101,377
CLASS 177	
50	4,100,984
189	4,100,985
CLASS 178	
53.1 R	4,101,732
58 R	4,101,733
68	4,101,734
CLASS 179	
1 E	4,101,736
1 HF	4,101,735
15 A	4,101,739
15 AT	4,101,737
15 FD	4,101,738
99	4,101,740
	4,101,741
100.1 C	4,101,742
175	4,101,743
CLASS 180	
6.2	4,101,004
75	4,100,986
	4,100,987
	4,100,988
127	4,100,989
135	4,100,990
CLASS 181	
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166	4,100,992
213	4,100,993
261	4,100,994
CLASS 182	
1	4,100,995
3	4,100,996
90	4,100,997
116	4,100,998
122	4,100,999
CLASS 184	
1.5	4,101,000
6.4	4,101,001
15 B	4,101,002
106	4,101,003
CLASS 187	
17	4,101,005
29 R	4,101,007
	4,101,013
CLASS 188	
1 B	4,101,008
	4,101,009
79.5 GT	4,101,011
79.5 P	4,101,010
290	4,101,012
CLASS 191	
62	4,101,014
CLASS 192	
106.2	4,101,015
CLASS 194	
97 A	4,101,016
CLASS 195	
51 G	4,101,378
62	4,101,379
63	4,101,380
99	4,101,381
103.5 R	4,101,383
103.5 UR	4,101,382
142	4,101,384
CLASS 198	
300	4,101,019
478	4,101,020
668	4,101,021
CLASS 200	
50 AA	4,101,744
61.61	4,101,745
82 B	4,101,746
83 A	4,101,747
148 A	4,101,748
317	4,101,749
CLASS 204	
20	4,101,385
32 R	4,101,386
43 T	4,101,387
	4,101,388
44	4,101,389
57	4,101,390
59 R	4,101,391
	4,101,392
67	4,101,393
77	4,101,394
98	4,101,395
157.1 R	4,101,396
158 HA	4,101,397
159.16	4,101,398
159.19	4,101,399
180 G	4,101,401
180 R	4,101,400
192 C	4,101,402
195 S	4,101,403
	4,101,404
224 M	4,101,405
239	4,101,406
251	4,101,407
272	4,101,408
277	4,101,409
282	4,101,410
298	4,101,411
CLASS 206	
45.14	4,101,022
45.19	4,101,023
102	4,101,024
205	4,101,026
309	4,101,027
311	4,101,028
315 B	4,101,029
377	4,101,025
398	4,101,030
438	4,101,031
457	4,101,032
521	4,101,033
531	Re.29,705
612	4,101,034
CLASS 208	
8	4,101,412
	4,101,413
18	4,101,414
45	4,101,415
108	4,101,416
120	4,101,417
139	4,101,418
CLASS 209	
13	4,101,419
104	4,101,420
114	4,101,035
CLASS 210	
84	4,101,422
178	4,101,421
494 M	4,101,423
CLASS 211	
86	4,101,036
167	4,101,037
CLASS 214	
44 R	4,101,038
83.32	4,101,039
131 R	4,101,040
CLASS 215	
6	4,101,041
11 R	4,101,042
100 R	4,101,043
228	4,101,044
CLASS 219	
10.55 C	4,101,750
74	4,101,751
91.2	4,101,752
97	4,101,753
121 P	4,101,754
124.31	4,101,755
222	4,101,756
225	4,101,757
285	4,101,758
343	4,101,759
544	4,101,760
CLASS 220	
90	4,101,046
258	4,101,047
404	4,101,045
CLASS 221	
232	4,101,053
278	4,101,054
CLASS 222	
17	4,101,055
26	4,101,056
207	4,101,057
274	4,101,058
CLASS 223	
85	4,101,059
CLASS 224	
2 B	4,101,060
42.1 F	4,101,061
CLASS 227	
19	4,101,063
53	4,101,064
CLASS 228	
155	4,101,065
180 R	4,101,066
222	4,101,067
CLASS 229	
2.5 R	4,101,049
3.5 R	4,101,050
17 R	4,101,051
23 R	4,101,052
34 R	4,101,048
35	4,101,068
40	4,101,069
CLASS 233	
1 R	4,101,070
CLASS 235	
92 CA	4,101,761
92 MT	4,101,071
95 C	4,101,762
455	4,101,072
CLASS 239	
14	4,101,073
101	4,101,075
584	4,101,076
585	4,101,074
598	4,101,077
651	4,101,078
CLASS 241	
46.15	4,101,079
51	4,101,080
101.7	4,101,081
282.1	4,101,082
285 R	4,101,083
CLASS 242	
7.11	4,101,084
18 G	4,101,085
18 PW	4,101,086
84.2 A	4,101,087
85	4,101,088
85.1	4,101,089
96	4,101,090
107	4,101,091
107.4 A	4,101,093
	4,101,094
107.4 B	4,101,092
115	4,101,095
199	4,101,096
205	4,101,097
CLASS 244	
63	4,101,098
	4,101,099
114 R	4,101,100
173	4,101,101
CLASS 248	
20	4,101,102
58	4,101,103
95	4,101,104
158	4,101,105
188.9	4,101,106
218.4	4,101,107
243	4,101,108
317	4,101,109
395	4,101,110
CLASS 249	
205	4,101,111
CLASS 250	
214 R	4,101,763
237 G	4,101,764
251	4,101,765
320	4,101,766
339	4,101,767
360	4,101,768
361 R	4,101,769
363 S	4,101,770
397	4,101,771
399	4,101,772
401	4,101,773
402	4,101,774
409	4,101,775
416 TV	4,101,776
436	4,101,777
441	4,101,778
445 R	4,101,779
475	4,101,780
483	4,101,781
492 B	4,101,782
504	4,101,424
540	4,101,783
555	4,101,784
574	4,101,785
CLASS 251	
148	4,101,112
214	4,101,113
CLASS 252	
8.55 C	4,101,425
	4,101,426
32.7 E	4,101,427
	4,101,428
	4,101,429
42.7	4,101,430
46.7	4,101,431
49.5	4,101,433
49.8	4,101,432
52 R	4,101,434
62.2	4,101,458
62.53	4,101,435
67	4,101,436
149	4,101,437
151	4,101,438
182	4,101,439
	4,101,515
186	4,101,440
358	4,101,442
	4,101,443
389 A	4,101,441
411 R	4,101,444
429 R	4,101,445
430	4,101,446
431 C	4,101,447
437	4,101,448
457	4,101,449
460	4,101,450
465	4,101,451
501	4,101,452
503	4,101,453
514	4,101,454
531	4,101,455
551	4,101,456
559	4,101,457
CLASS 254	
134.3 FT	4,101,114
CLASS 256	
13.1	4,101,115
CLASS 260	
2.3	4,101,463
13	4,101,473
	4,101,474
18 EP	4,101,459
21	4,101,475
22 CB	4,101,477
22 EP	4,101,476
23 AR	4,101,480
23 H	4,101,479
23 S	4,101,478
23.7 A	4,101,481
27 BB	4,101,482
	4,101,483
	4,101,484
29.2 N	4,101,487
	4,101,488
29.2 TN	4,101,486
29.3	4,101,489
29.4 UA	4,101,485
29.6 B	4,101,494
29.6 MP	4,101,490
29.6 NR	4,101,492
29.6 R	4,101,493
29.6 T	4,101,491
29.7 NR	4,101,495
31.2 N	4,101,497
31.2 R	4,101,496
33.6 AQ	4,101,498
37 SB	4,101,499
38	4,101,500
40 R	4,101,501
	4,101,502
42.18	4,101,503
	4,101,504
	4,101,505
45.75 B	4,101,510
45.75 N	4,101,509
45.75 R	4,101,528
45.8 N	4,101,506
	4,101,507
	4,101,508
45.85 T	4,101,511
45.95 C	4,101,512
97.7	4,101,535
112.5 LH	4,101,537
	4,101,538
112.5 R	4,101,536
	4,101,539
147	4,101,540
158	4,101,541
	4,101,542
162	4,101,543
207.1	4,101,544
239.5	4,101,545
283 SA	4,101,551
285.5	4,101,552
288 CF	4,101,553
290 HL	4,101,554
293.85	4,101,555
307 C	4,101,556
327 E	4,101,557
328	4,101,558
347.3	4,101,559
348.29	4,101,560
396 N	4,101,561
419	4,101,562
425	4,101,563
429.7	4,101,564
	4,101,565
438.5 R	4,101,567
439 R	4,101,566
448 A	4,101,568
463	4,101,569
502 R	4,101,570
543 H	4,101,572
543 P	4,101,573
543 R	4,101,571
544 L	4,101,574
553 E	4,101,575
559 A	4,101,576
559 R	4,101,579
561 R	4,101,577
563 P	4,101,580
563 R	4,101,578
566 B	4,101,581
574	4,101,582
575	4,101,583
590 D	4,101,584
592	4,101,585
593 R	4,101,586
606.5 F	4,101,587
615 A	4,101,588
615 B	4,101,589
649 F	4,101,591
666 A	4,101,593
666 P	4,101,592
668 A	4,101,594
	4,101,595
	4,101,596
	4,101,597
	4,101,598
683.15 D	4,101,600
683.9	4,101,599
836	4,101,601
839	4,101,602
850	4,101,603
857 TW	4,101,534
857 UN	4,101,606
862	4,101,604
873	4,101,605
CLASS 261	
36 R	4,101,607
	4,101,608
105	4,101,609
110	4,101,610
142	4,101,611
CLASS 264	
22	4,101,612
40.3	4,101,613
40.6	4,101,614
63	4,101,615
65	4,101,616
93	4,101,617
97	4,101,618
156	4,101,619
177 R	4,101,620
182	4,101,621
251	4,101,622
270	4,101,623
273	4,101,624
287	4,101,625
313	4,101,626
323	4,101,627
325	4,101,628
CLASS 267	
136	4,101,117
	4,101,118
CLASS 269	
203	4,101,119
323	4,101,120
CLASS 270	
68 A	4,101,121
CLASS 271	
277	4,101,122
CLASS 272	
75	4,101,123
97	4,101,136
134	4,101,124
CLASS 273	
29 A	4,101,132
75	4,101,125

95 B	4,101,127
95 R	4,101,126
106 A	4,101,128
143 R	4,101,129
187 A	4,101,130
239	4,101,131
CLASS 274	
23 R	4,101,133
	4,101,134
39 A	4,101,135
CLASS 277	
1	4,101,137
11	4,101,138
22	4,101,139
165	4,101,140
CLASS 279	
19	4,101,141
CLASS 280	
16	4,101,142
42	4,101,143
423 B	4,101,144
605	4,101,145
731	4,101,146
775	4,101,147
CLASS 285	
13	4,101,148
55	4,101,149
226	4,101,150
236	4,101,151
CLASS 289	
17	4,101,152
CLASS 292	
92	4,101,153
237	4,101,154
256.69	4,101,156
347	4,101,155
CLASS 294	
86.21	4,101,157
CLASS 296	
10	4,101,158
35 R	4,101,160
37.7	4,101,062
	4,101,159
137 B	4,101,162
137 H	4,101,161
CLASS 297	
16	4,101,163
159	4,101,164
273	4,101,165
304	4,101,166
328	4,101,167
329	4,101,168
341	4,101,169
389	4,101,170
	4,101,171
CLASS 299	
2	4,101,172
33	4,101,173
CLASS 302	
11	4,101,174
53	4,101,175
CLASS 303	
6 C	4,101,176
CLASS 305	
31	4,101,177
CLASS 307	
38	4,101,786
81	4,101,787
205	4,101,788
220 R	4,101,789
221 C	4,101,790
308	4,101,791
CLASS 308	
3.6	4,101,178
4 A	4,101,179
20	4,101,180
36	4,101,181
CLASS 310	
15	4,101,792
52	4,101,793
71	4,101,794
336	4,101,795
CLASS 312	
8	4,101,182
195	4,101,183
233	4,101,184
CLASS 313	
141	4,101,797
178	4,101,796
315	4,101,798
331	4,101,799
346 DC	4,101,800
417	4,101,801
422	4,101,802
CLASS 315	
3	4,101,803
3.5	4,101,804
74	4,101,805
86	4,101,806
116	4,101,807
151	4,101,808
156	4,101,809
169 TV	4,101,810
200 R	4,101,811
241 P	4,101,812
370	4,101,813
371	4,101,814
411	4,101,815
CLASS 316	
19	4,101,185
CLASS 318	
130	4,101,816
603	4,101,817
CLASS 320	
2	4,101,818
CLASS 323	
24	4,101,819
94 R	4,101,820
119	4,101,821
CLASS 324	
16 R	4,101,822
20 CR	4,101,823
20 R	4,101,824
32	4,101,825
51	4,101,826
65 R	4,101,827
	4,101,828
126	4,101,829
158 F	4,101,830
166	4,101,831
227	4,101,832
CLASS 325	
30	4,101,833
42	4,101,834
55	4,101,835
302	4,101,836
347	4,101,837
CLASS 328	
63	4,101,838
165	4,101,839
CLASS 330	
127	4,101,840
254	4,101,841
257	4,101,842
280	4,101,843
CLASS 331	
10	4,101,844
94.5 D	4,101,846
94.5 M	4,101,845
94.5 S	4,101,847
116 R	4,101,848
CLASS 333	
14	4,101,849
24.2	4,101,850
28 R	4,101,851
30 R	4,101,852
70 R	4,101,853
82 B	4,101,854
CLASS 335	
106	4,101,855
135	4,101,856
206	4,101,857
272	4,101,858
CLASS 336	
90	4,101,859
CLASS 337	
139	4,101,860
368	4,101,861
CLASS 338	
23	4,101,862
128	4,101,863
183	4,101,864
CLASS 339	
5 S	4,101,186
59 L	4,101,187
99 R	4,101,189
113 L	4,101,190
125 R	4,101,191
217 S	4,101,192
CLASS 340	
1 L	4,101,865
7 R	4,101,866
15.5 TC	4,101,867
51	4,101,868
52 R	4,101,869
53	4,101,870
171 R	4,101,871
310 R	4,101,878
324 AD	4,101,879
326	4,101,880
347 P	4,101,882
347 R	4,101,881
365 R	4,101,883
366 B	4,101,884
384 E	4,101,885
504	4,101,875
539	4,101,872
	4,101,873
555	4,101,876
569	4,101,877
606	4,101,874
652	4,101,887
CLASS 343	
7 VM	4,101,888
7.7	4,101,889
8	4,101,890
17.2 PC	4,101,891
108 R	4,101,892
	4,101,893
112 R	4,101,894
708	4,101,895
713	4,101,896
715	4,101,897
752	4,101,898
788	4,101,899
789	4,101,900
853	4,101,901
854	4,101,902
CLASS 346	
33 R	4,101,903
74.1	4,101,904
	4,101,905
75	4,101,906
135	4,101,907
139 C	4,101,908
153	4,101,909
CLASS 350	
6.8	4,101,193
9	4,101,194
55	4,101,195
96.17	4,101,197
96.20	4,101,198
96.24	4,101,188
96.31	4,101,196
152	4,101,199
166	4,101,200
175 ML	4,101,201
187	4,101,202
217	4,101,203
224	4,101,204
289	4,101,205
	4,101,206
344	4,101,207
CLASS 351	
58	4,101,208
CLASS 352	
91 C	4,101,209
CLASS 353	
7	4,101,210
CLASS 354	
42	4,101,910
53	4,101,911
106	4,101,912
122	4,101,913
128	4,101,914
144	4,101,915
219	4,101,916
273	4,101,917
286	4,101,223
299	4,101,918
319	4,101,919
CLASS 355	
3 DD	4,101,211
3 TR	4,101,212
5	4,101,213
10	4,101,214
15	4,101,215
35	4,101,216
38	4,101,217
57	4,101,218
CLASS 356	
89	4,101,219
105	4,101,220
205	4,101,221
244	4,101,222
CLASS 357	
17	4,101,920
23	4,101,921
	4,101,922
30	4,101,923
	4,101,924
68	4,101,925
CLASS 358	
17	4,101,926
27	4,101,927
28	4,101,928
44	4,101,929
183	4,101,930
217	4,101,931
223	4,101,932
254	4,101,933
261	4,101,934
293	4,101,935
CLASS 360	
10	4,101,936
16	4,101,938
36	4,101,939
37	4,101,940
74	4,101,941
76	4,101,937
77	4,101,942
84	4,101,943
85	4,101,944
102	4,101,945
105	4,101,946
114	4,101,947
137	4,101,948
	4,101,949
CLASS 361	
203	4,101,950
293	4,101,951
305	4,101,952
CLASS 362	
11	4,101,953
26	4,101,954
104	4,101,955
217	4,101,956
268	4,101,957
CLASS 364	
200	4,101,958
	4,101,959
	4,101,960
413	4,101,962
417	4,101,961
705	4,101,963
724	4,101,964
821	4,101,965
841	4,101,966
900	4,101,967
	4,101,968
	4,101,969
CLASS 365	
2	4,101,970
11	4,101,971
29	4,101,972
73	4,101,973
96	4,101,974
117	4,101,975
119	4,101,976
CLASS 366	
142	4,101,116
246	4,101,977
314	4,101,978
CLASS 400	
124	4,101,017
144.3	4,101,006
328	4,101,224
582	4,101,018
CLASS 401	
119	4,101,225
CLASS 403	
4	4,101,226
27	4,101,227
137	4,101,228
171	4,101,229
	4,101,230
252	4,101,231
261	4,101,232
397	4,101,233
CLASS 404	
6	4,101,234
	4,101,235
25	4,101,236
98	4,101,237
CLASS 408	
59	4,101,238
182	4,101,239
211	4,101,240
CLASS 415	
113	4,101,241
134	4,101,242
201	4,101,243
CLASS 416	
41	4,101,244
190	4,101,245
CLASS 417	
48	4,101,247
171	4,101,246
204	4,101,248
269	4,101,249
	4,101,250
313	4,101,251
CLASS 423	
121	4,101,629
171	4,101,630
210	4,101,631
	4,101,632
228	4,101,633
239	4,101,634
242	4,101,635
305	4,101,636
309	4,101,637
320	4,101,638
449	4,101,639
462	4,101,640
567 R	4,101,641
573 G	4,101,642
575	4,101,643
581	4,101,644
648 A	4,101,645
CLASS 424	
4	4,101,646
5	4,101,647
9	4,101,648
12	4,101,649
35	4,101,651
44	4,101,650
49	4,101,652
177	4,101,653
200	4,101,654
204	4,101,655
246	4,101,656
	4,101,657
	4,101,658
248.56	4,101,659
250	4,101,660
266	4,101,661
267	4,101,662
	4,101,663
273 R	4,101,664
	4,101,665
	4,101,666
275	4,101,667
	4,101,668
286	4,101,669
300	4,101,670
301	4,101,672
312	4,101,673
325	4,101,674
326	4,101,675
330	4,101,671
	4,101,676
	4,101,677
CLASS 425	
79	4,101,253
82.1	4,101,254
219	4,101,255
394	4,101,252
441	4,101,256
CLASS 426	
50	4,101,678
53	4,101,679
96	4,101,680
387	4,101,681
482	4,101,682
618	4,101,683
625	4,101,684
CLASS 427	
8	4,101,685
22	4,101,686
25	4,101,687
56	4,101,688
122	4,101,689
150	4,101,690
229	4,101,691
333	4,101,692
386	4,101,693
399	4,101,694
434 D	4,101,695
CLASS 428	
1	4,101,696
9	4,101,697
31	4,101,698
36	4,101,699
131	4,101,700
189	4,101,701
213	4,101,702
216	4,101,703
218	4,101,704
220	4,101,705
294	4,101,706
409	4,101,707
432	4,101,708
433	4,101,709
472	4,101,710
474	4,101,711
547	4,101,712
554	4,101,713
624	4,101,328
639	4,101,714
652	4,101,715
CLASS 429	
13	4,101,716
15	4,101,717
26	4,101,718
206	4,101,719
CLASS 431	
15	4,101,257
26	4,101,258
93	4,101,259
95 R	4,101,260
202	4,101,261
344	4,101,262
CLASS 432	
13	4,101,263
14	4,101,264
29	4,101,265
46	4,101,266
60	4,101,267
80	4,101,268
CLASS 521	
28	4,101,460
32	4,101,461
79	4,101,467
83	4,101,469
85	4,101,472
88	4,101,464
115	4,101,462
	4,101,466
	4,101,468
118	4,101,465
	4,101,470
121	4,101,471
CLASS 526	
3	4,101,720
19	4,101,721
106	4,101,722
193	4,101,513
CLASS 528	
45	4,101,530
67	4,101,529
73	4,101,527
100	4,101,518
109	4,101,514
112	4,101,516
179	4,101,526
197	4,101,519
242	4,101,521
248	4,101,520
271	4,101,517
288	4,101,524
292	4,101,522
309	4,101,523
	4,101,525
311	4,101,532
315	4,101,531
491	4,101,533
CLASS 544	
284	4,101,548
294	4,101,547
301	4,101,549
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PATENT AND TRADEMARK OFFICE NOTICES

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LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 28,801, Re. S.N. 902,766, Filed May 3, 1978, Cl. 356/201, APPARATUS FOR EVALUATION OF BIOLOGICAL FLUID, Jesse L. Acker, et al., Owner of Record: *Inventors*, Attorney or Agent: James W. Badie, Ex. Gp.: 257

3,483,121, Re. S.N. 901,284, Filed Apr. 28, 1978, Cl. 252/8.55 R, FORMATION FRACTURING, Wesley A. Jordan, Owner of Record: *General Mills Chemicals, Inc., Minneapolis, Minn.*, Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 223

3,764,978, Re. S.N. 912,277, Filed Jun. 5, 1978, Cl. 340/146.3 D, COMBINED MAGNETIC OPTICAL CHARACTER READER, Robert M. Tyburski, et al., Owner of Record: *Optical Recognition Systems, Inc., Reston, Va.*, Attorney or Agent: Joseph A. DeGrandi, et al., Ex. Gp.: 237

3,781,169, Re. S.N. 907,785, Filed May 19, 1978, Cl. 8/34, DISPERSING AND STABILIZING AGENTS FOR DYESTUFFS, Reinhold Deubel, et al., Owner of Record: *Hoechst Aktiengesellschaft, Frankfurt, Germany*, Attorney or Agent: Henry W. Koster, et al., Ex. Gp.: 141

3,835,410, Re. S.N. 901,766, Filed May 1, 1978, Cl. 330/19, CURRENT AMPLIFIER, Harold Allen Wittlinger, Owner of Record: *Inventor*, Attorney or Agent: Harold Christoffersen, Ex. Gp.: 252

3,885,506, Re. S.N. 906,799, Filed May 17, 1978, Cl. 105/367, RAILROAD CAR WITH DEPRESSED FLOOR, William D. Mundinger, et al., Owner of Record: *Pullman Incorporated, Chicago, Ill.*, Attorney or Agent: Richard J. Myers, et al., Ex. Gp.: 314

4,044,474, Re. S.N. 904,940, Filed May 11, 1978, Cl. 34/86, ANIMAL DRYER, Edwin R. Greene, et al., Owner of Record: *Inventors*, Attorney or Agent: Theodore J. Bielen, Jr., et al., Ex. Gp.: 344

4,079,866, Re. S.N. 911,178, Filed May 31, 1978, Cl. 222/335, LUBRICANT METERING VALVE IN LUBRICATING SYSTEMS, Zeo Asioli, Owner of Record: *Inventor*, Attorney or Agent: Alvin Browdy, et al., Ex. Gp.: 311

PATENT NOTICES

Certificates of Correction for the Week of July 25, 1978

3,803,135
3,956,043
4,009,934
4,012,485
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Disclaimers

3,950,512.—*Jerrell Bemis Emery*, Chalfont, and *James Long Bittle*, Doylestown, Pa. ANIMAL VACCINES. Patent dated Apr. 13, 1976. Disclaimer filed May 9, 1978, by the assignee, *Pitman-Moore, Incorporated.*

Hereby enters this disclaimer to claims 2, 3, 5, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20 and 21 of said patent.

4,018,726.—*Andrew V. Scholly*, Metairie, and *David H. Coy*, New Orleans, La. (D-PHE6)-LH-RH AND INTERMEDIATES THEREFOR. Patent dated Apr. 19, 1977. Disclaimer filed May 26, 1978, by the assignee, *The Administrators of The Tulane University Educational Fund.*

Hereby enters this disclaimer to all seven claims of said patent.

4,083,824.—*Thomas G. Harris*, Lancaster, Pa. NON-VINYL SURFACE COVERING COMPOSITION. Patent dated Apr. 11, 1978. Disclaimer filed May 30, 1978, by the assignee, *Armstrong Cork Company.*

Hereby enters this disclaimer to claims 1 to 8 of said patent.

Patents Available for Licensing or Sale

3,680,237. OUTDOOR-ILLUMINATED SIGN. John Finnerty, 251 De Grande Ave., Teaneck, N.J. 07666.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 N. Lake Shore Drive, 14-M, Chicago, Ill. 60610.

4,056,897. PLANTER DESIGN AND CONSTRUCTION. Mary Ellen Pearce; John Scott. Correspondence to: E. Barron Batchelder, Sixbey, Friedman & Leedom, P. C., Suite 206, 2001 Jefferson Davis Hwy., Arlington, Va. 22202.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,086,026. WINDMILL WITH RADIAL VANES. Robert J. Tamanini, 4 Pinewood Road, Wyomissing, Pa. 19610.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,578,840. REVOLVING REFLECTOR.
3,835,507. ROPE HOLDING DEVICE.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,087,281. METHOD OF PRODUCING OPTICAL IMAGE ON CHROMIUM OR ALUMINUM FILM WITH HIGH-ENERGY LIGHT BEAM.
4,087,626. SCRAMBLER AND UNSCRAMBLER FOR SERIAL DATA.
4,088,406. METHOD OF PERFORMING CONTACTLESS PHOTOLITHOGRAPHY.
4,088,510. MAGNESIUM OXIDE DYNODE AND METHOD OF PREPARATION.
4,088,867. CREATING A CLOSED IMAGE FROM SEGMENTS.
4,088,920. FLAT DISPLAY DEVICE WITH BEAM GUIDE.
4,088,931. PINCUSHION CORRECTION CIRCUIT.
4,088,941. VOLTAGE REFERENCE CIRCUITS.
4,088,942. FERRORESONANT TRANSFORMER STRUCTURE.
4,088,947. ELECTRICAL CONTINUITY TEST APPARATUS HAVING A FORWARD BIASED DIODE ACROSS THE TEST TERMINALS.
4,088,968. FREQUENCY LINEARIZATION AND SENSITIVITY EQUALIZATION OF A FREQUENCY MODULATED CRYSTAL OSCILLATOR.
4,089,687. PHOTOGRAPHIC METHOD FOR PRINTING PARTICLE PATTERN WITH IMPROVED ADHERENCE UTILIZING VANADATES.
4,090,095. CHARGE COUPLED DEVICE WITH DIODE RESET FOR FLOATING GATE OUTPUT.
4,090,139. COMPLEMENTARY SYMMETRY FET MIXER CIRCUITS.
4,090,153. SURFACE ACOUSTIC WAVE ABSORBER.
4,090,204. ELECTRONICALLY STEERED ANTENNA SYSTEM USING A REFLECTIVE SURFACE FORMED OF PIEZOELECTRIC TRANSDUCERS.
4,090,238. PRIORITY VECTORED INTERRUPT USING DIRECT MEMORY ACCESS.
4,090,758. METHOD OF REGENERATING A LEAD MONOXIDE TARGET LAYER OF A CAMERA TUBE.
4,090,777. METHOD OF ALIGNING OPTICAL FIBERS WITH LIGHT EMITTING OPTICAL DEVICES.
4,090,851. SI3N4 COATED CRUCIBLE AND DIE MEANS FOR GROWING SINGLE CRYSTALLINE SILICON SHEETS.
4,090,915. FORMING PATTERNED POLYCRYSTALLINE SILICON.
4,091,144. ARTICLE WITH ELECTRICALLY-RESISTIVE GLAZE FOR USE IN HIGH-ELECTRIC FIELDS AND METHOD OF MAKING SAME.
4,091,334. CONNECTION OF A PLURALITY OF DEVICES TO A CIRCULAR WAVEGUIDE.
4,091,337. COAXIAL CAVITY MICROWAVE OSCILLATOR WITH MANUALLY ADJUSTABLE CAPACITIVE FEEDBACK ELEMENT.
4,091,347. CONVERGENCE APPARATUS FOR IN-LINE BEAMS.
4,091,387. BEAM FORMING NETWORK.
4,091,406. COMBINATION GLASS/LOW TEMPERATURE DEPOSITED SIWNXHYOZ PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR SEMICONDUCTOR DEVICES.
4,091,407. COMBINATION GLASS/LOW TEMPERATURE DEPOSITED SIWNXHYOZ PASSIVATING OVERCOAT WITH IMPROVED CRACK AND CORROSION RESISTANCE FOR A SEMICONDUCTOR DEVICE.
4,091,409. SEMICONDUCTOR DEVICE HAVING SYMMETRICAL CURRENT DISTRIBUTION.
4,091,430. GUARD CIRCUIT FOR HIGH IMPEDANCE SIGNAL CIRCUITS.
4,091,527. METHOD FOR ADJUSTING THE LEAKAGE CURRENT OF SILICON-ON-SAPPHIRE INSULATED GATE FIELD EFFECT TRANSISTORS.
4,091,847. PROCESS FOR FILLING DYNAMIC SCATTERING LIQUID CRYSTAL CELLS.
4,092,209. SILICON IMPLANTED AND BOMBARDED WITH PHOSPHORUS IONS.

4,092,561. STRIPE CONTACT PROVIDING A UNIFORM CURRENT DENSITY.

4,092,609. CIRCUIT FOR REDUCING RIPPLE VOLTAGE.

4,092,612. AMPLIFIER CIRCUITS.

4,092,659. MULTI-LAYER REFLECTOR FOR ELECTROLUMINESCENT DEVICE.

4,092,672. MASTER OSCILLATOR SYNCHRONIZING SYSTEM.

4,092,728. PARALLEL ACCESS MEMORY SYSTEM.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

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Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent-application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements & Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782.

Patent application 860,275. Synchronization of Blades for Rotary Slash Cutters. Dec. 13, 1977.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW.,
Washington, D.C. 20590

Patent application 883,222. Rail Car Identification Apparatus. Filed Mar. 13, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, & WELFARE

National Institutes of Health, Chief, Patent Branch,
Westwood Building, Bethesda, Md. 20014

Patent application 855,384. Fiber Optic pH Probe. Filed Nov. 28, 1077.

Patent application 859,079. System for Obtaining Displacement-Amplitude Information from a Quadrature-Dual Interferometer. Filed Dec. 9, 1977.

Patent application 865,712. Portable Ultrasonic Measurement System. Filed Dec. 29, 1977.

Patent application 870,090. Cerebrospinal Fluid Protein Fragments. Filed Jan. 17, 1978.

Patent application 877,379. System for Multifunctional Control of Upper Limb Prosthesis via EMG Signal Identification. Filed Feb. 13, 1978.

Patent 4,040,905. Sub-Human Primate Diploid Cell Lines as Substrates for Virus Vaccine Production. Filed Oct. 27, 1971. Patented Aug. 9, 1977. Not available NTIS.

Patent 4,048,016. Identification of Non-Fermentative Gram-Negative Bacteria. Filed Apr. 25, 1975. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,058,602. Synthesis, Structure, and Antitumor Activity of 5,6-Dihydro-5-Azacytidine. Filed Aug. 0, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,066,405. Method for Total Protein Fractionation and Analysis of Human Saliva. Filed Oct. 4, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,066,506. Method of Separating and Purifying Two Active Forms of Urokinase Using Affinity Chromatography. Filed Oct. 8, 1976. Patented Jan. 3, 1978. Not available NTIS.

Patent 4,068,127. X-Ray Generating Apparatus Comprising Means for Rotating the Filament. Filed July 8, 1976. Patented Jan. 10, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent 4,053,302. Synthetic Fluorspar for Conditioning Electric Furnace Slags. Filed Mar. 11, 1977. Patented Oct. 11, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent application 873,745. Sequential Probability Ratio Test for Friend Identification Systems. Filed Jan. 30, 1978.

Patent 4,039,833. High Density Infrared Detector Array. Filed Aug. 17, 1976. Patented Aug. 2, 1977. Not available NTIS.

NATIONAL AERONAUTICS & SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 837,794. Atomic Hydrogen Storage Method and Apparatus. Filed Sept. 29, 1977.

Patent application 858,769. Microwave Power Converter. Filed Dec. 8, 1977.

Patent application 861,391. Method and Apparatus for Measuring Minority Carrier Lifetimes and Bulk Diffusion Length in p-N Junction Solar Cells. Filed Dec. 10, 1977.

Patent application 861,392. Resolution Enhanced Sound Detecting Apparatus. Filed Dec. 16, 1977.

Patent application 880,725. An Annular Wing. Filed Feb. 24, 1978.

Patent application 880,838. Shock Isolator for Operating a Diode Laser and Closed-Cycle Refrigerator. Filed Feb. 24, 1978.

Patent application 885,061. End Effector Device. Filed Mar. 9, 1978.

Patent application 885,066. A Portable Device Particularly Suited for Use in Starting Air-Start Units for Aircraft. Filed Mar. 9, 1978.

Patent 4,055,072. Apparatus for Measuring a Sorbate Dispersed in a Fluid Stream. Filed Sept. 19, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,055,707. Selective Coating for Solar Panels. Filed Dec. 22, 1975. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,072,532. High Temperature Resistant Cermet and Ceramic Compositions. Filed Nov. 20, 1975. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,075,057. Non-Equilibrium Radiation Nuclear Reactor. Filed Mar. 21, 1975. Patented Feb. 21, 1978. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 1, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides: Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-17-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-13-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-22-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-15-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-31-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents	Numbers 2,067 to 2,075, inclusive

REISSUES

JULY 25, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,706

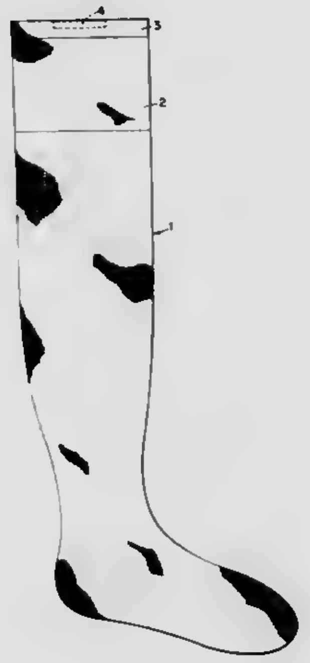
HOSIERY SUPPORT

Kurt Ernst Findeisen, Spring City, Pa., assignor to Findeisen Brothers, Spring City, Pa.

Original No. 3,965,702, dated Jun. 29, 1976, Ser. No. 413,677, Nov. 7, 1973. Application for reissue Jun. 16, 1977, Ser. No. 807,042

Int. Cl.^{2} D04B *9/54;* **A41B** *11/00*

U.S. Cl. 66—173 **2 Claims**



1. In a self-sustaining stocking having an elastic yarn knit in selected courses at its open end and having a small welt of double fabric at said end with a natural tendency to roll downwardly on a wearer, a flexible resilient stay positioned within the double fabric of the welt, said stay being of a length which is less than 25% of the *fully extended* circumference of the said welt, said stay being unrestrained within the confines of the said welt such that [is] *it* may migrate circumferentially thereof, said stay preventing circumferentially complete downward rolling of the welt on the wearer.

Re. 29,707

PRODUCT PRESSURIZED AIR DISPENSER HAVING IMPROVED PRODUCT CONTROL VALVE ACTUATOR

Herbert H. Loeffler, 53 Spy Pond La., Arlington, Mass. 02174

Original No. 3,979,027, dated Sep. 7, 1976, Ser. No. 615,087, Sep. 19, 1975. Continuation-in-part of Ser. No. 520,946, Nov. 4, 1974, Pat. No. 3,910,465. Application for reissue May 19, 1977, Ser. No. 798,498

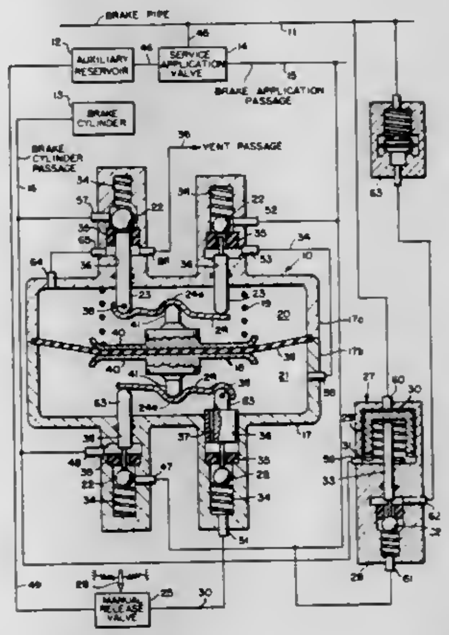
Int. Cl.^{2} B67D *5/54*

U.S. Cl. 222—193 **5 Claims**

1. In a dispenser for dispensing a fine spray by means of compressed air and having a body having a dispensing nozzle means therein for mixing and dispensing a fluent product and compressed air, a piston-cylinder means depending from said body and having a fixed member in said body and a movable member movable relative to said fixed member for compressing air therebetween, said fixed member having a fluent product containing recess therein opening toward said movable member, a product pressurizing piston in said product containing recess having an end exposed toward said movable member, said body having a product flow path therethrough from said product containing recess to said nozzle means and a product control valve means in said product flow path for controlling flow of product therethrough, and said body further having a compressed air flow path therethrough to said nozzle means and compressed air valve means in said compressed air flow path which is opened near the end of the movement of said movable means for releasing compressed air at a predetermined pressure into said compressed air flow path, the improvement comprising:

a product valve actuator having an actuator element coupled to said product valve, a flexible diaphragm extending outwardly from said actuator element and sealing means on the periphery of said diaphragm fixed in sealing engagement to said body, said compressed air flow path opening beneath said diaphragm and said product valve actuator being movable in response to the pressure of the compressed air for opening said product valve,

whereby when the movable member is moved toward the fixed member for compressing air, the compressed air acts on said product pressurizing piston for pressurizing the product, the compressed air at a predetermined pressure is released to said flow path, said valve actuator is moved to open said product valve.



Re. 29,708

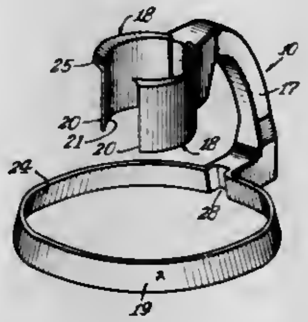
DECANTER HANDLE STRUCTURE

Norman H. Schlegel, Chicago, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Original No. 3,717,288, dated Feb. 20, 1973, Ser. No. 126,853, Mar. 22, 1971. Application for reissue Nov. 11, 1976, Ser. No. 740,831

Int. Cl.^{2} A47B *95/02*

U.S. Cl. 222—465 **1 Claim**



23. For use with a glass decanter having a globular bowl portion terminating in an upper distal outturned portion defining a pouring spout, a handle structure comprising a one-piece element *defining a handle adapted to be grasped for manually carrying the decanter, a pair of arcuate gripping means having connecting portions fixedly connected to a common fixed upper portion of the handle and defining deflectible gripping portions spaced apart forwardly of said handle upper portion and extending at least approximately 270° whereby said gripping means is adapted for yieldingly firmly embracing the decanter subjacent said pouring spout, and an annular band extending in a continuous arc from a lower portion of the handle and having a large diameter preselected to embrace and protect the bowl portion of a decanter at the portion thereof having largest horizontal cross section for cooperating with said gripping elements in stabilizing the handle in retained association with the decanter, said element being formed of a material having limited resilience, the opening of said annular band being unobstructed axially thereof whereby said handle structure is mountable on said decanter by firstly moving said annular bond vertically about the decanter to said decanter portion of largest cross section and then swinging the gripping means to embrace laterally opposed portions of said upper decanter portion below said pouring spout, said gripping portions each defining a segmentally cylindrical lower portion and an outturned upper end portion, said upper portion of the handle having a height equal to that of said cylindrical portion and being spaced radially outwardly of said upper decanter portion by said connecting portions of the gripping means, said handle upper portion defining a planar top surface and a stepped lower surface, said handle including a grasping portion defining an upper surface continuing uninterruptedly outwardly and downwardly from said planar top surface, said grosping portion and upper handle portion further defining a U-shaped downwardly opening recess spaced outwardly of the connecting portions of the gripping means by at least approximately half the outward extent of the handle upper portion away from said connecting portions.*

Re. 29,709

APPARATUS FOR COOLING CASTINGS AND FOR COOLING AND DRYING MOULDING SAND

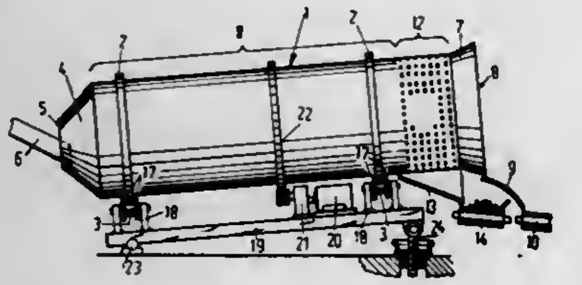
Herbert Vissers, deceased, late of Nieuw-Vennep, Netherlands by Hermanus H. Vissers, assignor to Expert, N.V., Curacao, Netherlands Antilles

Original No. 3,942,644, dated Mar. 9, 1976, Ser. No. 401,282, Sep. 27, 1973. Application for reissue Aug. 16, 1976, Ser. No. 714,675

Claims priority, application Netherlands, Sep. 29, 1972, 7213261

Int. Cl.^{2} B07B *1/15*

U.S. Cl. 209—86 **9 Claims**



1. An apparatus for cooling castings while cooling and drying molding sand, comprising in combination:

- an elongate, generally horizontal drum having an inlet end and an open discharge end defining a casting discharge mouth;
- wall means at said inlet end for defining a restricted opening centered with respect to the axis of the drum, and means for feeding the molding sand and casting contents of molding flasks into said drum through said restricted opening;
- said drum including an imperforate section leading from said wall means to adjacent the discharge end of said drum and including at least a terminal region nearest said discharge end which is of frusto-conical section which narrows toward said discharge end;
- said drum also having a perforate section leading from said frusto-conical terminal region of the imperforate section, whereby to discharge sand from said drum before reaching said discharge end of the drum; and
- means for selectively elevating the discharge end of the drum relative to its inlet end whereby to alter the inclination of said frusto-conical terminal region and thereby alter the residence time of the material passing through the drum.

Re. 29,710

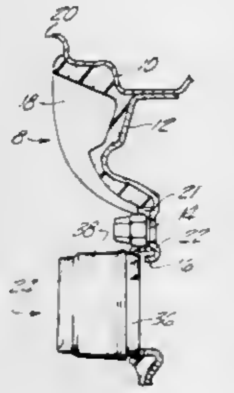
WHEEL AND GREASE CAP ASSEMBLY

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Original No. 3,998,494, dated Dec. 21, 1976, Ser. No. 560,997, Mar. 21, 1975. Application for reissue Apr. 28, 1977, Ser. No. 792,031

Int. Cl.^{2} B60B *7/00*

U.S. Cl. 301—37 P **3 Claims**



1. A wheel and grease cap assembly including a metal wheel having wheel mounting holes arranged on an annular circle and a plastic member attached to and covering the wheel, said plastic member having a portion extending radially inward of said circle and between said mounting holes and having an inner annular surface adjacent said circle, an annular groove formed in said inner annular surface and having a radially inward facing bottom portion, a cap attached to said plastic member and having [a retaining ring] *an annular flange portion* axially extending inside of said inner annular surface of said plastic member, said cap having a plurality of circumferentially spaced attaching portions formed on said [retaining ring] *annular flange portion* and located in said annular groove, said attaching portions being deflectable relative to said cap for resiliently restraining removal of said cap from said plastic member, said attaching portions presenting outer radius portions engageable with said bottom portion of said annular groove to retard relative rotation of said cap and said wheel, said annular groove being formed of segments with one segment extending between adjacent mounting holes of said wheel, a cam surface formed in said plastic member circumferentially adjacent to opposite ends of each of said segments of said groove and at the exterior thereof to engage and simultaneously deflect said grease cap relative to said wheel during attachment of said grease cap to said wheel.

Re. 29,711

POLYUREAS AND PREPARATION THEREOF

Louis L. Wood, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Original No. 3,892,696, dated Jul. 1, 1975, Ser. No. 252,793, May 12, 1972. Continuation of Ser. No. 670,602, Mar. 26, 1976, abandoned. Application for reissue Jan. 4, 1977, Ser. No. 756,924

Int. Cl.^{2} C08G *22/00, 51/34*

U.S. Cl. 260—29.2 TN **11 Claims**

1. A method for preparing aqueous polyurea solution which consists essentially of preparing a non-crosslinked polyurea by reacting a first component comprising *a poly(oxyalkylene) polyol capped with polyisocyanate, said* polyisocyanate selected from the group consisting of polyaryl polyisocyanate, tolylene diisocyanate, triphenylmethane-4,4'4",-triisocyanate, benzene-1,3,5-triisocyanate, toluene-2,4,6-triisocyanate, diphenyl-2,4,4'-triisocyanate, hexamethylene diisocyanate, xylylene diisocyanate, chlorophenylene diisocyanate, diphenylmethane-4,4'-diisocyanate, naphthalene-1,5-diisocyanate, xylene-alpha,alpha'-diisothiocyante, 3,3'-dimethyl-4,4'-biphenylene diisocyanate, 3,3'-dimethoxy-4,4'biphenylene diisocyanate, 2,2',5,5'-tetramethyl-4,4'-biphenylene diisocyanate, 4,4'-methylenebis (phenylisocyanate)c 4,4'-sulfonylbis (phenylisocyanate), 4,4'-methylene di-orthotolylisocyanate, ethylene diisocyanate, ethylene diisothiocyanate, trimethylenediisocyanate and the like; and a second component comprising polyamine having from about 2 to about 23 pendant amine groups in a non-protonic carbonyl containing solvent selected from the group consisting of acetone, methyl ethyl ketone, cyclohexanone, acetaldehyde, propionaldehyde, butyradelhyde, and isobutyraldehyde; said polyamine and said solvent being first combined for from about 2 minutes to about 24 hours at temperature of −5° C. to about 150° C.; the molar ratio of isocyanate groups in the polyisocyanate to amine groups in the polyamine being from about 1:1 to about 1:20 isocyanate to amine; adding water and removing the solvent from the non-crosslinked polyurea.

PLANT PATENTS

GRANTED JULY 25, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,283
ROSE PLANT

Robert V. Lindquist, Sr., Hemet, Calif., assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Nov. 11, 1977, Ser. No. 850,813
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class substantially as herein shown and described, characterized particularly as to novelty by (1) blooms which display a very wide spectrum of color ranging from bright yellow at the center through near white to deep rose at the petal margins, and (2) highly glossy foliage.

4,284
HYBRID TEA ROSE PLANT

Robert V. Lindquist, Sr., Hemet, Calif., assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Nov. 10, 1977, Ser. No. 850,402
Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea class substantially as herein shown and described, characterized particularly as to novelty by (1) blooms which display a spectrum of red shades ranging from a lighter hue at the petal base to a vibrant watermelon red on the petal edge which is particularly dramatic under sunny skies, and (2) a vigorous and erect growth habit.

4,285
CHERRY PLUM BUSH

LeRoy I. Moling, Rte. 3, Fergus Falls, Minn. 56537
Filed Mar. 25, 1977, Ser. No. 781,333
Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. I claim a new and distinctive variety of a Cherry-Plum Bush substantially as herein shown and described characterized particularly as to novelty by the unique combination of a relatively short widespread growth of a bush having tough flexible stems and branches, able to bear a heavy fruit load and having fruit buds approximately every $\frac{3}{8}$ to $\frac{5}{8}$ inch along all of the stems and branches and a cluster of buds at the base of each branch, being very disease and insect resistant and able to withstand frigid temperatures without cover and having a rapid growth producing a first crop in the growing season following grafting, the fruit being substantially freestone, having a small pit and cavity and having a relatively thick, sweet, smooth, textured fruit; the variety — which resembles the "Sapalta" Cherry Plum — being distinctively characterized, in comparison, by fruit which has thicker flesh, a smaller pit, and by being almost free of astringency.

PATENTS

GRANTED JUL. 25, 1978

ERRATA

For CLASS	See PATENT NO.
029–25.42	4,102,021
037–104	4,102,066
075–124	4,102,225
096–114.1	4,102,312
173–137	4,102,534
296–102	4,102,537
432–003	4,102,632
062–344	4,102,660
055–002	4,102,661
427–191	4,102,678
362–071	4,102,712
521–174	4,102,828
521–081	4,102,829
521–165	4,102,830
521–099	4,102,831
521–103	4,102,832
521–159	4,102,833
528–046.518	4,102,860
528–088	4,102,862
528–111	4,102,863
528–173	4,102,864
528–215	4,102,865
528–135	4,102,866
528–289	4,102,867
427–178	4,102,869
528–073	4,102,870
528–324	4,102,871
528–362	4,102,872
528–331	4,102,873
528–387	4,102,874
528–388	4,102,875
526–019	4,102,876
544–283	4,102,885
423–579	4,102,950
423–594	4,102,951
424–001	4,102,979
428–155	4,103,002
415–212 R	4,103,063
528–487	4,103,074
260–175	4,103,092
361–086	4,103,181

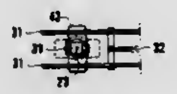
PATENTS

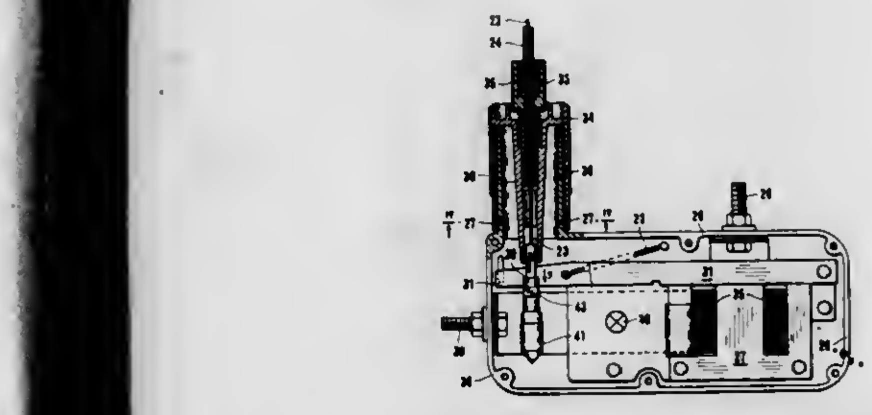
GRANTED JULY 25, 1978

GENERAL AND MECHANICAL

4,101,979
WELDING MASK WITH AUTOMATIC OBSCURING OF THE VISUAL FIELD

Eugenio Tarrone, Via Antonio Cecchi 3, I-10152 Torino, Italy
Filed Nov. 9, 1976, Ser. No. 740,209
Claims priority, application Italy, Dec. 16, 1975, 70094 A/75; Nov. 5, 1976, 69641 A/76
Int. Cl.² A61F *9/06*
U.S. Cl. 2—8 **4 Claims**





1. In a welding mask for carrying out arc welding, comprising an opaque shell, a vision window in said opaque shell, a movable frame having at least one obscured glass arranged in said vision window for displacement between a position of inactivity and a position of activity in which it obscures said vision window, a housing separate from said opaque shell, an actuation means arranged within said housing, a sheath connected at one end to said opaque shell and at the other end to said housing, and a flexible cable connected at one end to said movable frame and at the other end to said actuation means, said sheath and flexible cable forming a transmission means for displacing said movable frame under action of said actuation means;

the improvement that said actuation means comprises an electromagnet having an electric winding adapted to be connected to the electric circuit of an arc welding apparatus, and an anchor cooperable with said electromagnet,

and bayonet joint means inserted between said sheath and said housing as well as between said flexible cable and said anchor, whereby said housing with the actuation means can be connected and disconnected by a single operation to and from said transmission means and opaque shell.

4,101,980
PROTECTIVE DEVICE HAVING A SHIELD FOR PROTECTING THE FACE OF A USER

Walter Stepan, Allersberg, and Klaus Hennecke, Schwabach, both of Germany, assignors to UVEX Winter Optik GmbH, Furth, Bay, Germany
Filed Apr. 19, 1976, Ser. No. 678,135
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1975, 7513464[U]
Int. Cl.² A42B *1/08;* **A61F** *9/00*
U.S. Cl. 2—9 **10 Claims**

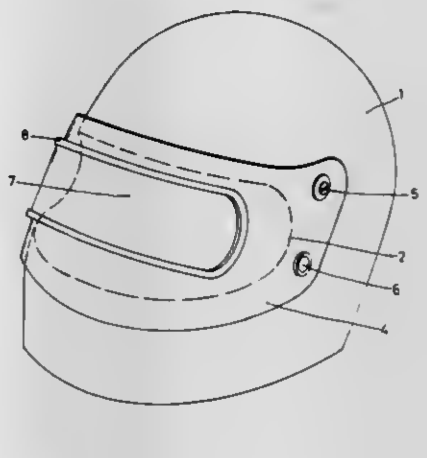
1. A face shielding, protective device for use by a user in connection with a safety helmet comprising, in combination:

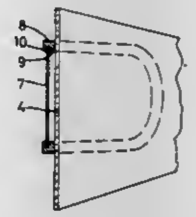
a contoured face shield of a flexible, transparent, shatterproof plastic, said shield having a front side which is to face away from the user;

means on said shield for movably attaching said shield to a helmet, said means for attaching defining a swivel axis;

a frame including a shoulder portion, said shoulder being affixed to said front side of said shield; and

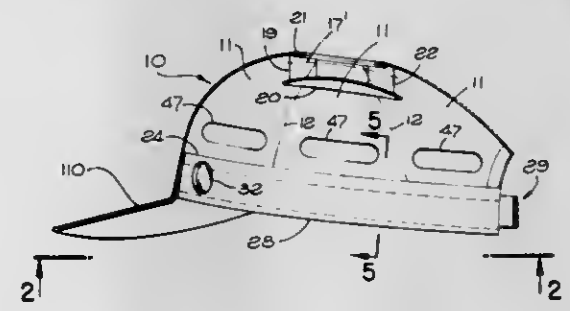
a guard made of scratch-resistant, mineral safety glass mounted in said frame, said guard being at least partially bent to conform to the contour of said shield and completely covering the field of vision of the user, and wherein said guard is mounted removably and interchangeably on said face shield.

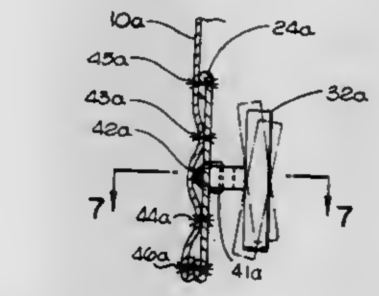




4,101,981
VENTILATED HAT OR CAP

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001
Filed Apr. 15, 1977, Ser. No. 787,839
Int. Cl.² A42B *1/00*
U.S. Cl. 2—182.6 **18 Claims**





7. A hat or cap comprising:

a crown structure adapted to extend across the top of a user's head and downwardly about the user's head;

a hat band structure at the bottom of said crown structure and adapted to extend across the front of the head and rearwardly at its sides;

a plurality of spacer elements projecting inwardly from said hat band structure and adapted to engage the user's head in a relation holding the hat band structure in spaced relation thereto to allow for air circulation between the head and hat band structure;

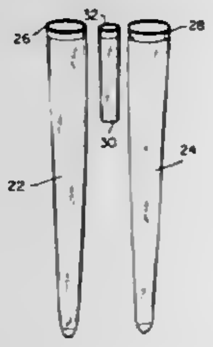
said spacer elements having head contacting portions and having outer portions with openings extending therethrough; and

connecting means attached to said hat band structure and extending through said openings in said outer portions of said spacer elements and attaching said elements to said hat band structure for universal pivotal movement relative to the hat band structure;

said hat band structure including flexible hat band material and a stiffening member secured thereto and extending therealong;

said connecting means including a connecting element extending about said stiffening member and through said opening of one of the spacer elements in a relation mounting the spacer element for universal pivotal movement.

4,101,982
PANTY HOSE GARMENT AND METHOD OF MANUFACTURE THEREOF
David Muller, 7053 Guelph, Cote St. Luc, Quebec, Canada
Filed Sep. 17, 1976, Ser. No. 725,094
Int. Cl.² A41B *9/04*
U.S. Cl. 2—409 **10 Claims**



1. A method of forming a combination stocking-panty garment comprising the steps of:

a. forming a longitudinal slit in each of first and second circular knit tubular blanks intermediate the front and rear thereof;

b. forming first and second diametrically opposed longitudinal slits in a third circular knit tubular blank intermediate the front and rear thereof;

c. seaming the edge of the slit of said first tubular blank to the edge of the first slit of said third tubular blank and seaming the edge of the slit of said second tubular blank to the edge of said second slit of said third tubular blank.

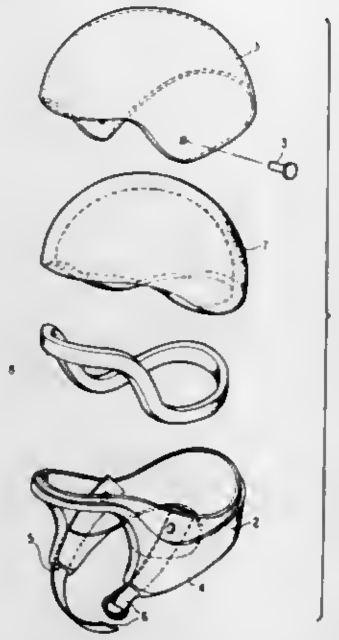
6. A combination stocking-panty produced by the following steps:

a. forming a longitudinal slit in each of first and second circularly knit tubular blanks intermediate the front and rear thereof;

b. forming first and second diametrically opposed longitudinal slits in a third circularly knit tubular blank intermediate the front and rear thereof;

c. seaming the edge of the slit of said first tubular blank to the edge of the first slit of said third tubular blank and seaming the edge of the slit of said second tubular blank to the edge of said second slit of said third tubular blank.

4,101,983
ENVELOPING HELMET OF COMPOSITE STRUCTURE
Alain Dera, Rueil-Malmaison, and Marcel Goupy, Saint Cloud, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Jun. 3, 1977, Ser. No. 803,268
Claims priority, application France, Jun. 4, 1976, 76 17029; Jan. 19, 1977, 77 01392; Jan. 26, 1977, 77 02100
Int. Cl.² A42B *3/02*
U.S. Cl. 2—412 **12 Claims**

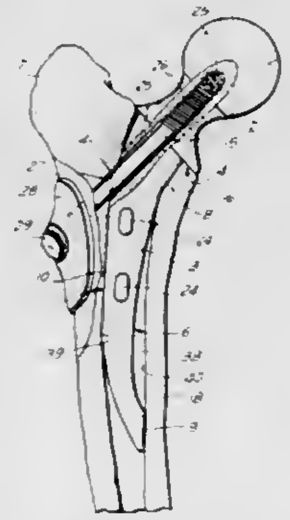


1. A protective helmet, of composite structure, intended especially for riders of two-wheeled vehicles, the outer part thereof comprising an upper rigid shell obtained by injection of polycarbonates or ABS, or molding of stratified polyesters, and joined to a semi-rigid lower shell of plastic of the plastified PVC type or of injected thermoplastic polyurethane and having extensions over the regions of the ears, such being connected by gluing and/or riveting or clipping, and the interior shock absorbing part consisting of an upper rigid absorber of polystyrene foam of density between 15 and 20 g/dm³ or a semi-rigid polyurethane foam of density between 30 and 120 g/dm³, of hemispherical shape, and a lower absorber in the form of a semi-rigid sponge ring, e.g. of polyurethane foam.

4,101,984
CARDIOVASCULAR PROSTHETIC DEVICES AND IMPLANTS WITH POROUS SYSTEMS
David C. MacGregor, 81 Wimbleton Rd., Islington, Ontario, Canada
Filed May 5, 1976, Ser. No. 683,382
Claims priority, application Canada, May 9, 1975, 226993; United Kingdom, Dec. 22, 1975, 52474/75
Int. Cl.² A61F *1/22, 1/24*
U.S. Cl. 3—1.5 **6 Claims**

1. A heart valve structure comprising an occluder, an occluder seating ring and occluder guide means, each of said occluder seating ring and occluder guide means being constructed of metal inert to blood and consisting of a dense rigid, coherent metal substrate and a rigid porous metal coating adhered to at least a substantial portion of said substrate, said porous metal coating including a plurality of metal particles bonded together at their points of contact with each other and with said substrate to form a network of interconnected pores substantially uniformly distributed through the coating, said porous coating having a porosity of about 10 to about 50% and a thickness of about 20 to about 300 microns, said porous coating and the coating-substrate interface having a shear strength greater than about 1000 psi, the composite of said porous coating and substrate having a high fatigue tolerance, said metal particles having a particle size of −500 mesh.

4,101,985
HIP-JOINT PROSTHESIS
Friedrich Baumann, Am Kircbweg 2, 8580 Neuburg-Ried, Germany, and Max Bernhard Ulrich, Amselweg 55, 7900 Ulm (Donau), Germany
Filed Mar. 18, 1977, Ser. No. 778,931
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611985
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.912 **14 Claims**



1. A prosthesis comprising a ball head shaped to fit in an acetabulum, an elongated shaft shaped to fit in and between the two opposite sides of a medullary cavity of a femur, and a stem between and connecting said head to one end of said shaft, said shaft being curved in a plane and having a concave longitudinal edge and a convex longitudinal edge and said stem being inclined in said plane to the longitudinal axis of said shaft, said prosthesis being formed with:

a laterally projecting shoulder engageable against a sawed-off end of a femur in whose medullary cavity said shaft is to be engaged;

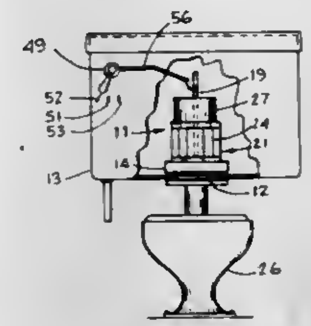
an inner engagement surface on said concave edge adjacent said shoulder and engageable with one of said sides of a medullary cavity of said femur;

an outer engagement surface on said concave edge at the other end of said shaft and engageable with said one side of a medullary cavity of said femur;

an intermediate engagement surface on said convex edge between said inner and outer engagement surfaces and generally parallel to said outer engagement surface, said intermediate engagement surface being engageable with the other side of a medullary cavity of said femur; and

a connecting surface to each longitudinal side of and inclined to each of said engagement surfaces and normally adapted to lie out of contact with the sides of said medullary cavity.

4,101,986
REGULATABLE FLUSH VALVE FOR TANK FLUSH TOILETS
Walter C. Ng, 2716 Pickfair La., Livermore, Calif. 94550, and Conrad A. Wilgus, 5506 Greenridge Rd., Castro Valley, Calif. 94546
Filed Jul. 29, 1977, Ser. No. 820,164
Int. Cl.² E03D *1/34*
U.S. Cl. 4—325 **11 Claims**



1. In a tank type flush toilet including a tank for containing a liquid flushing medium, a bowl for receiving waste materials, an outlet communicating between said tank and bowl and a pivoting handle and lever mechanism for lifting a valving element disposed in said outlet of said tank, a regulatable flush valve mechanism comprising in combination therewith,

a liquid vortex generating element secured coaxially above said outlet within said tank,

a cup element secured coaxially above said liquid vortex generating element having a bottom with a hole defined therethrough axially aligned with said outlet,

a valve element having a central passageway disposed coaxially within said vortex generating element adapted to plug said outlet,

an overflow tube having a lower end secured to and communicating with said central passageway of said valve element and extending upwardly therefrom through said hole defined in the bottom surface of said cup element to a point above said cup element, said overflow tube having an upper end secured to the lever of said pivoting handle and lever mechanism whereby said liquid flushing medium overflows into said tube,

a piston element coaxially secured to said overflow tube axially positioned within said cup element to provide in combination therewith an enclosed volume,

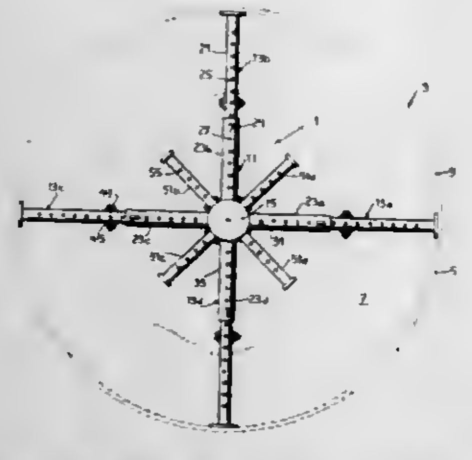
check valve means for permitting the liquid flushing medium to flow into and preventing said liquid from flowing out of said enclosed volume defined by said piston and cup elements,

regulating means for controlling flow of said liquid flushing medium out of said enclosed volume defined by said piston and cup elements whereby turning said handle of said handle and lever mechanism raises said overflow tube, piston element and valve element allowing the liquid flushing medium to flow from said tank through said vortex generating element out said outlet and into said bowl, the volume of liquid flowing from the tank being determined by the distance said valve element is raised above the outlet and by the rate at which said liquid flows from said enclosed volume.

4,101,987
DAMAGE PREVENTIVE DEVICE FOR SWIMMING POOLS
Real Gagnon, 5827-3rd Ave., Rosemont, Quebec, Canada
Filed Nov. 29, 1976, Ser. No. 745,971
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172 **3 Claims**

1. A device for preventing a thin walled swimming pool of the above-ground type, which contains water, from being damaged by floating ice masses in the fall or spring, which

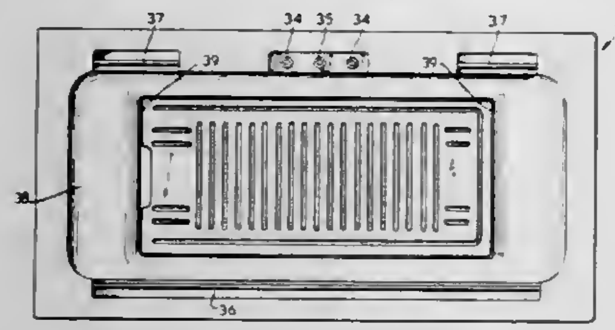
device comprises a frame to be inserted into the water within the pool before the water freezes and after it gets too cold to use the pool, said frame comprising: a vertical post to be centrally positioned on the bottom of the pool, said post to become at least partially encased by the ice within the pool when the water freezes; a plurality of telescopic arms extending radially from the post toward the walls of the pool and means to adjust the length of said arms to bias the ends of said arms against the walls of the pool thereby immovably fixing the frame with respect to the walls of the pool to prevent ice masses from moving about in the pool and cause possible damage to the walls thereof.



4,101,988
BATHS

Stanley Leslie Sierant, Marlands, Cross Roads, Keighley, West Yorkshire, BD21 5QE, England

Filed Jun. 14, 1976, Ser. No. 695,898
Int. Cl.^{2} A61H *9/00;* A47K *3/22*
U.S. Cl. 4—173 R 9 Claims



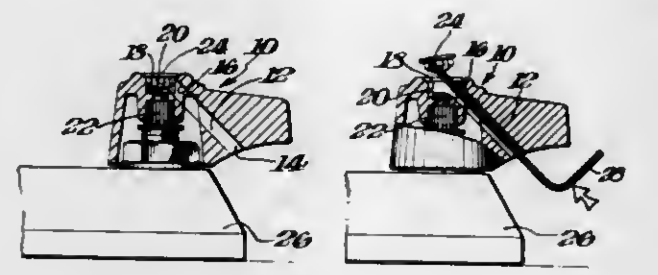
1. A bath comprising a tub portion having a generally rectangular recess therein and a generally rectangular panel fitting snugly within said recess, said panel comprising:

(a) an upper sheet-like member forming an upper face of said panel and having first and second sets of a plurality of exit apertures passing therethrough;
(b) a lower sheet-like member sealed to said upper sheet-like member and forming the lower face of said panel;
(c) a plurality of ribs and recesses on at least one of said sheet-like members, said ribs and recesses cooperating with the other of said sheet-like members to define at least first and second passageways within said panel, said passageways being isolated from each other and said recesses forming said first and second passageways being in registration with said first and second sets of apertures respectively;
(d) a first inlet aperture in said lower sheet-like member and communicating with said first passageway; and
(e) a second inlet aperture in said lower sheet-like member and communicating with said second passageway; an air supply conduit extending from said first inlet aperture through the underside of said tub portion of said bath in sealed relationship therewith for directing air into said first passageway, distributing said air within said panel throughout said first passageway and projecting said air from the panel through said first set of exit apertures; and a water supply conduit extending from said second inlet aperture through the underside of said tub portion of said bath in sealed relationship therewith for directing water into said second passageway, distributing water within said panel throughout said second passageway and projecting said water from said panel through said second set of exit apertures.

4,101,989
VANDAL-PROOF FIXTURE HANDLE

Carmen J. Lagarelli, Clayton, Del., assignor to Speakman Company, Wilmington, Del.

Filed Sep. 16, 1976, Ser. No. 723,893
Int. Cl.^{2} F16K *21/00;* E03C *1/04*
U.S. Cl. 4—191 2 Claims

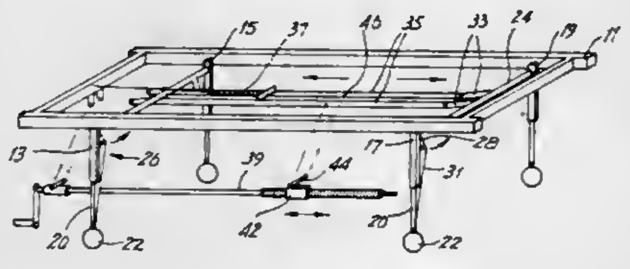


1. A vandal-proof handle suitable for attachment to a movable shaft having a central axis, the handle having a central bore surrounding and coacting with the axis of the shaft the axis of the shaft, a recess in the upper portion of the handle aligned with the handle bore, removable retaining means located in the lower portion of said recess for attachment of the handle to the shaft, a removable cap arranged in the upper portion of the recess concealing the retaining means from view of the handle user, a concealed bore through a handle at an angle to the handle bore concealed said bore extending from an external surface of the handle not readily visible to a handle user under normal operation to that portion of the recess above the retaining means and below the cap, whereby the cap can be readily removed only by a device inserted through the concealed bore and into the recess to a point underlying and in contact with the cap.

4,101,990
ADJUSTABLE HEIGHT BED

John Anthony Holland, Osborne Park, Australia, assignor to Avion Australia Pty Ltd., Osborne Park, Australia

Continuation of Ser. No. 594,494, Jul. 9, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,651
Claims priority, application Australia, Jul. 12, 1974, PB8188; Aug. 20, 1974, PB8595; Nov. 7, 1974, 75147/74
Int. Cl.^{2} A61G *07/10;* A47C *20/04*
U.S. Cl. 5—63 5 Claims



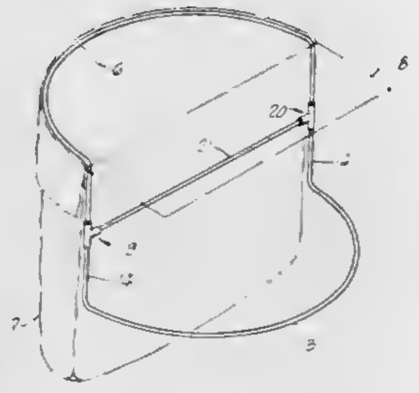
1. A bed comprising a mattress supporting frame; two pairs of legs each rigidly mounted on the frame and being independent of the others; each leg having an upper portion and a lower portion, the upper portion being mounted on the frame and telescopically engaged by the lower portion; an operating

shaft associated with each pair of legs pivotably and transversely mounted in relation to the pair of legs; a pair of radial arms on each said operating shaft each being connected to the lower portion of one of said legs such that on application of a turning force on the operating shaft to effect turning thereof, the height of the frame above the floor can be varied; a drive means for selectively producing such turning, and counterbalance means mounted between the frame and the operating shafts to apply a rotary biassing force thereto, the biassing force applied to the operating shafts being sufficient to overcome the weight of the mattress-supporting frame and at least a portion of the weight of the occupant of the bed, said drive means comprising a screw threaded rod rotatably mounted on the mattress-supporting frame and means connecting the screw threaded rod and the operating shafts such that rotation of the screw threaded rod causes turning of the operating shafts, said means connecting the screw threaded rod and the operating shafts comprising a pair of linkage members for said shafts, and a pair of second radial arms mounted on each operating shaft and connected to a respective linkage member, said counterbalance means being substantially horizontally disposed and connected to said linkage members whereby the biassing force applied to each leg via said linkage members and radial arms is substantially constant and independent of the height of the frame above the floor.

4,101,991
ENEMA WASTE RECEPTACLE AND FRAME

Saverio Sandonato, 50 Evans St., New Hyde Park, N.Y. 11040

Filed Jan. 26, 1977, Ser. No. 762,404
Int. Cl.^{2} A01G *9/02;* A47C *21/00*
U.S. Cl. 5—90 4 Claims

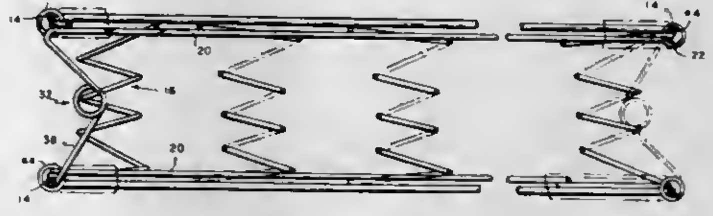


1. An attachment for a bed having a mattress and a mattress support means, the improvement comprising in combination, a frame and a flexible leakproof receptacle, having a lip, to permit a reclining patient to discharge wastes, said frame having a base portion projecting between the mattress and the mattress support means, a center section connected to said base portion, such that said center portion is perpendicular to said base portion and held flush against the side of the mattress when said base portion is inserted between the mattress and the mattress support means and an upper portion extending outwardly from said center portion, said upper portion being perpendicular to said center portion and parallel to said base portion and supporting said receptacle, such that said receptacle is held flush with the side of the mattress and generally level with the upper surface of the mattress, and holding its open end in an open position to receive wastes, said portion of the receptacle extending along the surface of the mattress is in the form of a lip.

4,101,992
SPRING ASSEMBLY WITH REINFORCEMENT

Alexander M. Levine, Boston, and Henry R. Ramsey, Dudley, both of Mass., assignors to Webster Spring Co. Inc., Oxford, Mass.

Filed Feb. 17, 1977, Ser. No. 769,460
Int. Cl.^{2} F16F *3/00;* A47C *23/02*
U.S. Cl. 5—260 10 Claims

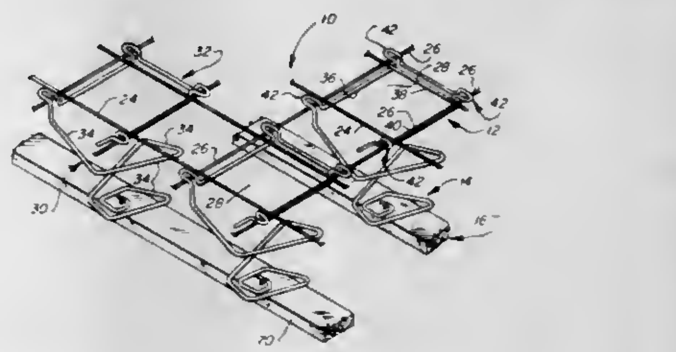


1. In a spring assembly including upper and lower border wires of rectangular configuration and a plurality of longitudinally spaced transversely extending rows of coils, said coils being connected at their upper and lower ends to the border wires and to each other; pairs of elongate stiffening elements disposed transversely of the assembly along the top and bottom ends of the coils in a row of coils, said stiffening elements being inextensible and affording resistance to deflection perependicular to the planes of the border wires and a torsion spring at one end of one element and at the other end of the other element situated between the border wires at the longitudinal sides, said torsion springs being resistant to compression perpendicular to the assembly, means connecting the torsion springs to the ends in laterally offset planes parallel to the elements and at distances therefrom so as to be situated in the spaces between rows of coils, means connecting each stiffening element to the transversely spaced border wires of the supporting surface in which it is situated and means connecting each torsion spring to the vertically spaced border wires at the longitudinal edges, said torsion springs being connected to the top and bottom border wires.

4,101,993
WIRE SPRING ASSEMBLY AND COMPONENTS

Chester Robert Yates, Carthage, Mo., and Guy E. Hall, Riverside, Calif., assignors to Steadley Company, Inc., Carthage, Mo.

Filed Feb. 22, 1977, Ser. No. 770,799
Int. Cl.^{2} A47C *23/04*
U.S. Cl. 5—267 19 Claims



1. A wire spring assembly comprising:
a rectangular border frame having elongate side and end border members;
a first series of laterally spaced parallel grid wires extending between the end border members;
and a second series of laterally spaced parallel grid wires extending between the side border members and crossing the first series of wires at right angles thereto;
the two series of wires being fixedly connected at their ends to the border members and to each other at their crossing

points to define a substantially planar grid of lateral and longitudinal rows of adjacent rectangular openings;

and a plurality of resilient wire spring components, each formed of a single length of wire, detachably connected to and depending from the grid;

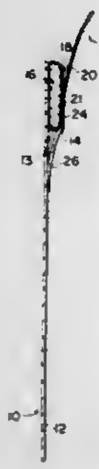
each component including vertically extensive spring body means and an attachment head;

the attachment head lying substantially in a horizontal plane and having a generally rectangular planform;

and portions of the head being vertically offset from other portions to overlie two grid wires of one series and to underlie two grid wires of the other series;

the portions resiliently gripping the grid wires to detachably lock the head in place and prevent rotation in its mounting.

4,101,994
COMBINATION BEACH BAG AND BLANKET
F. Russell Hoyt, 682 Azalea Dr., Rockville, Md. 20850
Filed Jul. 1, 1977, Ser. No. 812,247
Int. Cl.² A47G *9/00*
U.S. Cl. 5—344 **5 Claims**



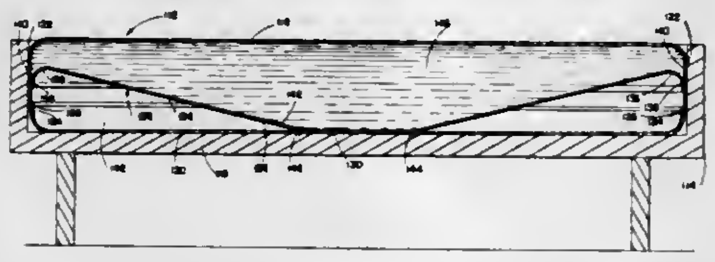
1. A combination beach bag and blanket construction comprising:

a. a rectangular openable and closeable bag portion having a stiffening member on one side thereof corresponding to the bottom side of the blanket when positioned on the ground during use, said bag portion having a bottom side and a top side and being receptive of a user's gear for holding same when used as a bag and for providing a pillow on the top side when used as a blanket;

b. a flexible planar blanket portion connected to said bag portion at one edge of said bottom side and foldable into a rectangular configuration of dimension similar to that of said stiffening member; and

c. a flexible carrying handle connected to said top side of the bag portion and having a first hand grasping portion extending outwardly from an edge of said top side disposed opposite said one edge and a second hand grasping portion positioned to lie on the blanket portion when unfolded and extendable around and engaging the folded blanket portion for juxtaposition with the first hand grasping portion, said first and said second hand grasping portions each having a U-shape and connected to one another to form a unitary closed loop shape comprising said carrying handle, whereby the folded blanket portion and the bag portion are maintained in side by side relationship having said first and said second hand grasping portions extending outwardly therefrom.

4,101,995
WATER BED MATTRESS
Raymond M. Phillips, 2566 S. Tuna Canyon Rd., Malibu, Calif. 90265
Continuation-in-part of Ser. No. 581,262, May 27, 1975, Pat. No. 4,006,501. This application Dec. 8, 1976, Ser. No. 748,707
Int. Cl.² A47C *27/08*
U.S. Cl. 5—371 **14 Claims**



1. A water bed mattress for use in a rigid retaining frame and which mattress assumes its peripheral shape from said frame, said mattress comprising

(a) an upper sheet having a peripheral end margin,

(b) a lower sheet having a peripheral end margin and being in spaced apart relationship to said upper sheet,

(c) a peripherally extending side wall extending between and joined in operative relationship to said upper and lower sheets and forming a water chamber between said side wall and upper and lower sheets,

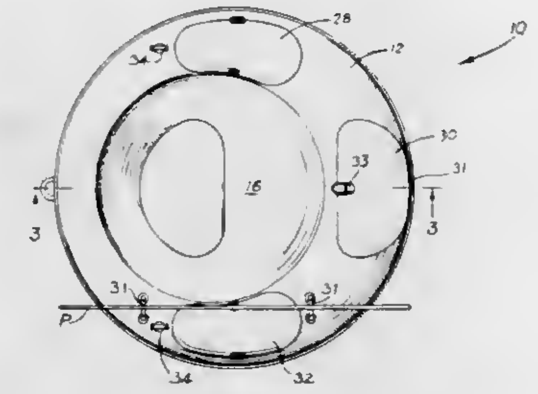
(d) and a peripherally extending panel forming an air chamber located in the corner portion where said side wall and said lower sheet are joined, said panel having one end extending inwardly from the peripheral end margin of said lower sheet and being secured to said lower sheet inwardly of its peripheral end margin, said panel having another end secured to said side wall or to the lower sheet in close proximity to the side wall so that said air chamber is bounded by at least said panel and said lower sheet, and said water chamber is bounded by at least said lower sheet, said panel, said upper sheet and a portion of said side wall, said air chamber, when filled with air, provides continuous peripheral support by the air to the water in said water chamber, and where said water chamber having a periphery substantially contiguous with the periphery of said air chamber such that the air chamber can provide continuous peripheral support, said panel being of such size and shape that the air chamber is always at least slightly below the upper sheet so that the entire upper sheet is always supported by water and that an individual reclining on said mattress is still supported peripherally by said air chamber.

4,101,996
FOOT PROPELLED WATER VEHICLE
Larry Gene Mikulecky, 530 Shorepines Ave., Coos Bay, Oreg. 97420
Filed Oct. 18, 1976, Ser. No. 733,056
Int. Cl.² B63C *9/08*
U.S. Cl. 9—1.3 **3 Claims**

1. A foot propelled water vehicle comprising:

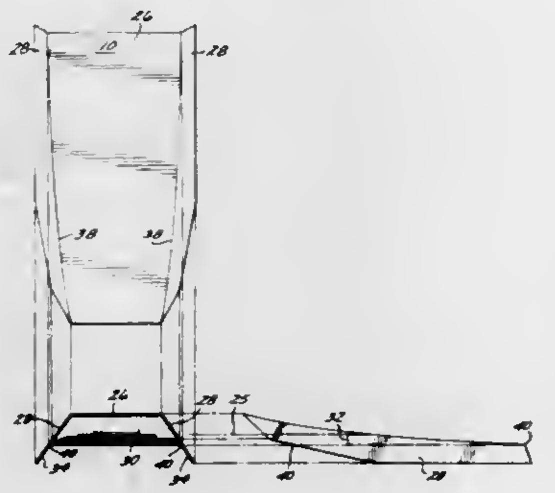
a hard-shelled body having a generally flat bottom, a generally circular periphery and curved sides, an upper surface curving from said sides inwardly to form a central V-shaped seating cavity, the space between said bottom and said upper surface defining the body interior, at least a portion of which is hollow,

said seating cavity being integrally formed with said body and defining a continuous surface having downwardly inclined front and rear portions, said front portion being inclined at an angle less with respect to the horizontal than said rear portion, said cavity being sized and positioned to accommodate a seated individual therein with the individual's feet extending over the side of said body adjacent said front portion with the individual's weight substantially centered along the vehicle's central, vertical axis, and



at least one opening provided on the periphery of said upper surface communicating with said hollow portion of said interior and being covered by an openable hatch cover permitting selective access to said interior.

4,101,997
WATER SKI FOR POWER DRIVEN WATER VEHICLE
Nelson Tyler, Van Nuys, Calif., assignor to Still Water Properties, N.V., Curacao, Netherlands Antilles
Continuation of Ser. No. 682,140, Apr. 30, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,780
Int. Cl.² A63C *15/00*
U.S. Cl. 9—310 A **4 Claims**

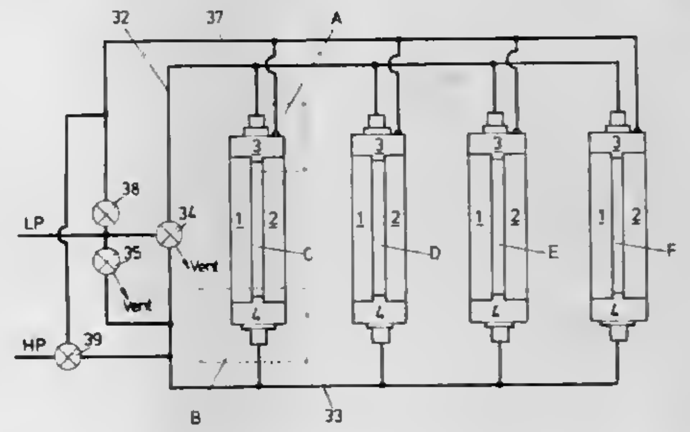


1. A water ski comprising:

an elongated central section having an underside defining a planing surface adapted to plane across the water at a predetermined acute trim angle relative to a horizontal plane corresponding to the water surface; and

a pair of elongated side plates depending from said central section and having downwardly and laterally inclined inner side surfaces lying generally in a pair of planes intersecting above said planing surface, the pair of juncture lines between said pair of side surfaces and said planing surface being laterally divergent in a downstream direction when viewed from above, said side plates further having downwardly and laterally directed outer side surfaces, both said inner side surfaces and said outer side surfaces being adapted to be normally contacted by the water upon passage of said plates through the water.

4,101,998
BUOYANCY CONTROL APPARATUS FOR DIVERS
Brian Leonard Buckle, 16 Sunningdale Grove, Colwyn Heights, Colwyn Bay, Wales
Filed Apr. 13, 1977, Ser. No. 787,060
Claims priority, application United Kingdom, Apr. 14, 1976, 15284/76; Sep. 3, 1976, 36604/76
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.
Int. Cl.² B63C *9/16*
U.S. Cl. 9—316 **11 Claims**



1. In a buoyancy control apparatus for carrying by a diver comprising:

fluid-tight reservoir means;

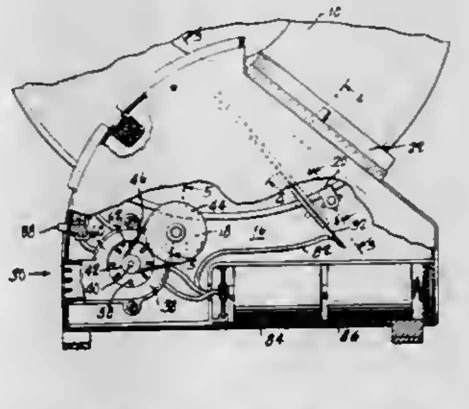
water inlet valve means for admitting water to said reservoir from externally of the apparatus to displace gas from the reservoir;

gas outlet valve means for releasing said displaced gas from the reservoir to externally of the apparatus;

gas inlet valve means for admitting compressed gas to the reservoir to displace water from the reservoir; and

water outlet valve means for releasing said displaced water from the reservoir; whereby water and gas can be selectively admitted to the reservoir to displace gas and water respectively already in the reservoir thereby to change buoyancy of the apparatus, the improvement consisting in that said reservoir is comprised of a plurality of parallel longitudinally extending passageways.

4,101,999
BATTERY OPERATED DEVICE FOR CLEANING PHONOGRAPH RECORDS AND THE LIKE
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Jan. 12, 1977, Ser. No. 758,703
Int. Cl.² B08B *6/00*
U.S. Cl. 15—1.5 R **7 Claims**



1. A device for cleaning phonograph records comprising:

a housing enclosing a cleaning chamber and having an elongated record slot through which a record is at least partly inserted into the cleaning chamber;

means for supporting the part of the record inserted into the cleaning chamber and for rotating the record about its axis so as to move successive parts of the record through the cleaning chamber;

means for causing an air flow impinging on the sides of the record part which is in the cleaning chamber, rather than on the record part which is outside of or at an entrance to the cleaning chamber, and thence exiting from the device, said air flow causing means including elongated air inlets in the housing which face the sides of a record inserted in the cleaning chamber; and

means for dissipating static electrical charge and means for supporting the dissipating means in electrical contact with the record part which is in the cleaning chamber to reduce thereby the static electrical charge that may be present on the record.

4,102,000
CARPET SWEEPER

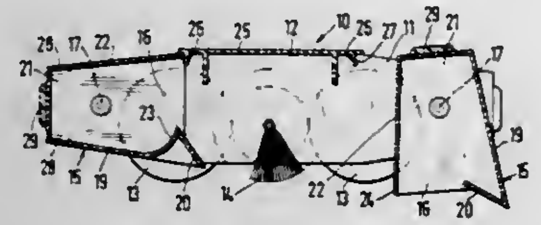
Johannes Liebscher, and Rainer Friedrich, both of Nassau, Lahn, Fed. Rep. of Germany, assignors to Leifheit International Günter Leifheit GMBH, Nassau, Lahn, Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,353

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605878

Int. Cl.² A47L *11/08*

U.S. Cl. 15—41 R **15 Claims**



1. A device for sweeping surfaces, particularly carpets and the like, comprising a housing having an open bottom; at least one brush mounted on said housing for rotation about an axis and operative for contacting a surface to be swept during movement of the device over such surface; means for rotating said brush about said axis so that dirt picked up by said brush from the surface being swept travels in a path; at least one dirt-collecting receptacle having an open end portion bounding all sides of an opening; means for pivotally mounting said dirt-collecting receptacle on said housing for movement between a filling position in which said open end portion and said opening are respectively located about and in said path for deposition of dirt in said receptacle, and a discharging position in which said open end portion of said receptacle projects downwardly from said housing through said open bottom thereof so that said opening is located out of said path for discharging deposited dirt from said receptacle; and means for locking said receptacle in said filling position, comprising cooperating locking portions on said housing and said receptacle, respectively.

4,102,001
APPARATUS FOR REMOVING SOLIDS DEPOSITED ON INNER SURFACE OF ROTARY KILN

Takashi Baba, Matsudo; Susumu Hunahashi, Ryugasaki, and Toshihiko Kawabata, Chiba, all of Japan, assignors to Kubota Ltd., Osaka, Japan

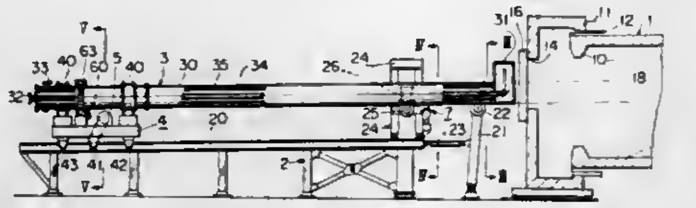
Filed Mar. 18, 1977, Ser. No. 778,960

Claims priority, application Japan, Mar. 18, 1976, 51-30638

Int. Cl.² B08B *9/08*

U.S. Cl. 15—104.1 C **5 Claims**

1. An apparatus for removing solids deposited on the inner surface of a rotary kiln including guide rails extending toward a burner hood of the kiln in parallel to the axis of the kiln, an elongated boring bar reciprocally movably supported by the guide rails and having a cutting edge projecting from its front end, and reciprocating means operatively connected to the boring bar to move the cutting edge along the wall of the kiln for the removal of the solid deposit, the apparatus comprising rotating means operatively connected to the boring bar for rotating the boring bar in positive and reverse directions to thereby turn the cutting edge to suitable tilted positions. the rotating means being operable to tilt the cutting edge to an inward retracted position free of engagement with a tuyere dam on the kiln and to tilt the cutting edge to a projected position close to the kiln wall beyond the dam to cut the solid deposit on the kiln inner surface to a desired depth.



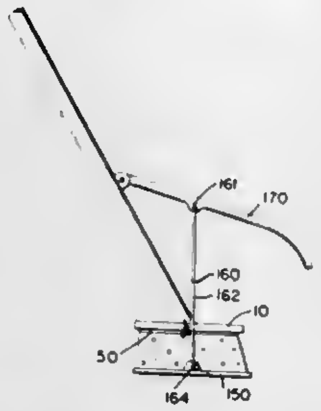
4,102,002
SELF-WRINGING MAP

Germaine T. Jones, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 20, 1977, Ser. No. 789,145

Int. Cl.² A47L *13/14, 13/257*

U.S. Cl. 15—119 A **2 Claims**



1. A mop, comprising

an elongated, upwardly and rearwardly extending handle;

a flat elongated horizontal rectangular first plate secured to the bottom of the handle;

a sponge;

locking means detachably securing the sponge to the bottom of the first plate, said locking means comprising a rectangular second plate affixed to the top of the sponge, the second plate being of substantially the same proportions as the first plate having ends and lips extending downwardly therefrom at said ends at right angles to the plane of the second plate, and a pair of lever actuated, pivoted hooks attached to a corresponding end of the first plate engaging the lips for detachably securing the second plate to the bottom of the first plate;

a pivot attached to the front of the handle above the first plate;

a lever attached at its lower end to the pivot and extending upwardly from the pivot along the handle, the lever being pivotable about the pivot in the plane defined by the handle and a vertical line;

an elongated rectangular wringer plate having a center grill; and

a Y-shaped link member pivotally secured to the wringer plate and the lever in a manner whereby said wringer plate is pivotally secured between the ends of the legs of the Y and the tail of the Y is pivotally secured to the lever intermediate its ends.

4,102,003
WIPER BLADE STRUCTURE FOR VEHICLES

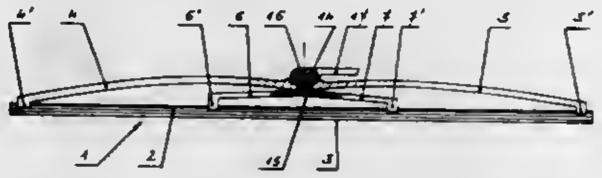
Théodore Hancu, Geneva, Switzerland, assignor to Societe d'Exploitation de Brevets J.B., Fribourg, Switzerland

Filed Dec. 30, 1976, Ser. No. 755,692

Claims priority, application Switzerland, Jan. 7, 1976, 90/76

Int. Cl.² B60S *1/02*

U.S. Cl. 15—250.42 **1 Claim**



1. A windshield wiper comprising a wiper arm, a wiper blade structure pivoted to said wiper arm, said blade structure comprising a squeegee, a center bridge having two support arms connected to said squeegee at central regions thereof on opposite sides of the connection of the structure to the wiper arm, an outer bridge having two support arms connected to said squeegee at opposite ends thereof, said outer bridge comprising a unitary structure and being resiliently flexible along substantially its entire length, said center bridge having a projection and said outer bridge having an opening through which said projection extends, a portion of said projection on that side of the outer bridge opposite to the side upon which the center bridge is disposed, having a pivot hole, a pivot pin secured to said wiper arm and projecting into said pivot hole whereby adjacent portions of said wiper arm and center bridge constitute means holding said bridges together.

4,102,004
DOOR CLOSER

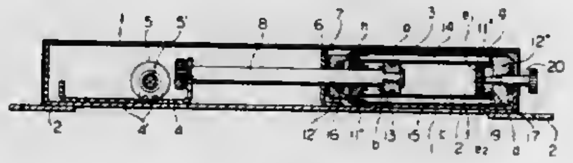
Toshiro Nagase, Sagamihara, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Feb. 7, 1977, Ser. No. 766,504

Claims priority, application Japan, Feb. 16, 1976, 51-16937[U]

Int. Cl.² E05F *3/00*

U.S. Cl. 16—49 **5 Claims**



1. A door closer or a device for controlling the opening or closing speed of a door, said device comprising:

a casing;

a dual tube hydraulic cylinder positioned within said casing, said cylinder including an inner tube located within an outer tube and fixedly positioned with respect thereto, there being an annular chamber defined between said inner and outer tubes;

a piston slidably positioned within said inner tube;

a piston rod extending through a first end of said cylinder, said piston rod having a first end fixed to said piston;

an actuating plate attached to a second end of said piston rod, said actuating plate having rack teeth thereon;

a pinion positioned in said casing in engagement with said rack teeth, said pinion adapted to be operatively connected to a door;

hydraulic oil enclosed within said inner tube and a portion of said annular chamber;

means for allowing said oil to flow between the interior of said inner tube and said annular chamber upon movement of said piston within said inner tube;

the remaining portion of said annular chamber being filled with a pressurized gas, such that movement of said piston in a first direction within said inner tube causes hydraulic oil to flow from the interior of said inner tube into said annular chamber and to compress said pressurized gas, the thus compressed pressurized gas thereby acting as means for forcing hydraulic oil from said annular chamber into the interior of said inner tube and for forcing said piston to move in a second direction within said inner tube; and

means, extending from the exterior of said cylinder through a second end thereof, for controlling the amount of hydraulic oil flow between said inner tube and said annular chamber.

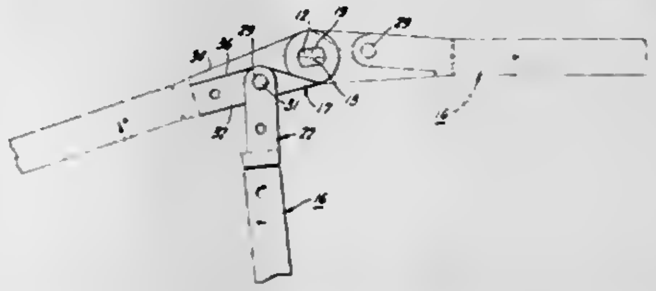
4,102,005
DOOR CLOSER ARM

Raymond H. Schnarr, Princeton, Ill., and John P. Jester, Fort Washington, Pa., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Jul. 5, 1977, Ser. No. 813,091

Int. Cl.² E05E *3/00*

U.S. Cl. 16—49 **10 Claims**



1. An arm for a door closer having a shaft adapted to rotate about a first axis comprising an arm base, means on said base engageable with said shaft for rotation therewith, an arm extension, means on said extension for engagement with a restraining device, means for connecting said arm extension and said arm base to each other for rotation relative to each other about a second axis, and means for limiting said relative rotation.

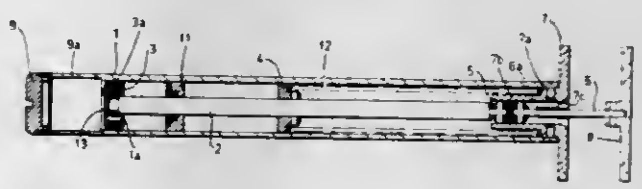
4,102,006
DOOR CLOSER

Albert Edward Jenkins, Lapworth, England, assignor to Perkins & Powell Limited, Birmingham, England

Filed Aug. 26, 1976, Ser. No. 717,878

Int. Cl.² E05F *3/04*

U.S. Cl. 16—51 **8 Claims**



1. A door closer comprising,

(a) a tubular housing, a bushing at one end, a rigid rod extending through the bushing and extending axially of the housing to be movable longitudinally of the housing,

(b) resilient means for urging said rod inwardly of the housing,

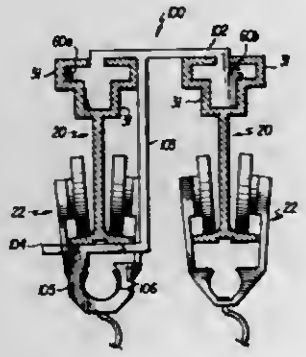
(c) fluid control means in said housing comprising a fluid filled chamber defined by the housing and a piston carried by said rod and slidable in said fluid filled chamber, the chamber being divided into two compartments and incorporating valve means between said compartments which permit relatively free movement of the fluid from one compartment to the other when the rod is moved outwardly of the housing but which when the rod is moved inwardly affords sufficient resistance to movement of the fluid as to check the rate at which the rod is moved under the force of said resilient means,

(d) a fixing plate and articulated connecting means for connecting said plate to said rod, said connecting means comprising a rigid link.

4,102,007

CURTAIN SUSPENSION ASSEMBLY

Richard W. Janson, Box 8110, Canton, Ohio 44711
Division of Ser. No. 617,508, Sep. 29, 1976, Pat. No. 4,014,071. This application Oct. 22, 1976, Ser. No. 734,989
Int. Cl.² A47H *1/04*
U.S. Cl. 16—94 R **5 Claims**

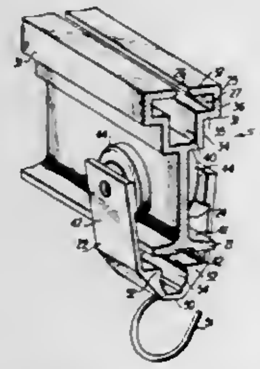


1. A traverse rod for supporting curtains and the like which comprises: an upper rod support portion which comprises two spaced-apart arms which define between them a cruciform-shaped groove, the upper ends of said arms defining a slot giving access centrally into said groove; a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said supporting portion adapted to receive curtain or the like carriers for horizontal movement therealong; and spacer means in combination with the rod and a further like rod, said spacer means providing a predetermined lateral spacing distance between the first-mentioned rod and the additional like traverse rod, said spacer means comprising a plate member joining a pair of like cruciform-shaped members, each of said cruciform-shaped members, each of said cruciform-shaped members being received in a corresponding shaped groove of one of the rods thereby separating the rods by said distance, said spacer means comprising an obstruction means which limits movement of any said carriers received by said supporting portion of at least one of the rods, said spacer means being provided with rope support means adapted to support rope for opening and closing curtains suspended from the rods.

4,102,008

CURTAIN SUSPENSION ASSEMBLY

Richard W. Janson, Box 8110, Canton, Ohio 44711
Division of Ser. No. 617,508, Sep. 29, 1975, Pat. No. 4,014,071. This application Oct. 22, 1976, Ser. No. 734,983
Int. Cl.² A47H *1/04*
U.S. Cl. 16—96 R **16 Claims**

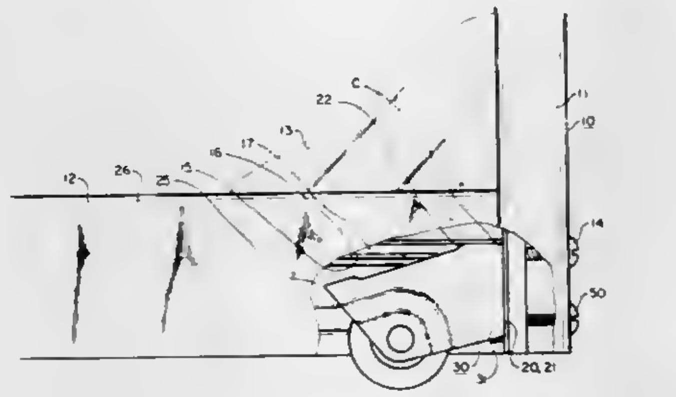


1. A traverse rod for supporting curtains and the like, the rod comprising an extruded material with a uniform cross-section throughout its length and comprising an upper rod portion which comprises two spaced apart arms which define between them a groove for slideably receiving supporting structure for the rod, the upper ends of said arms defining a slot giving said supporting structure access centrally into said groove, and a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said lower portion including flange means adapted to receive curtain or the like carriers for horizontal movement therealong, stop means for limiting movement of said rod supporting structure received in said groove, said stop means comprising a bolt received through said slot rigidly connected only to said arms, said bolt included in a portion in said groove.

4,102,009

ROLLER ASSEMBLY FOR SLIDING DOORS AND WINDOWS

Donald V. Kelly, 15903 Condor Ridge Rd., Canyon County, Calif. 91351
Filed Mar. 21, 1977, Ser. No. 779,475
Int. Cl.² E05D *13/02*
U.S. Cl. 16—100 **2 Claims**



1. A door or window assembly including a vertical stile and a horizontal rail at substantially a right angle corner, said rail defining an open bottom cavity;

a roller assembly including a roller journaled therein and partially extending out of said assembly to provide a rolling support surface for said assembly;

said roller assembly having a thickness generally corresponding to the transverse dimension of said cavity;

said roller assembly including an end region spaced from said roller and constituting an area for pivotal movement;

said end region defining a right angle corner whereby at one degree of adjustment said right angle corner matches the right angle corner defined by said stile and rail;

an adjusting screw extending through said assembly and engaging said roller assembly for pivoting the roller assembly generally about the corner defined by the stile and rail by contact with said stile and rail in all positions of adjustment to change the degree of extension of the roller from the cavity defined by the rail;

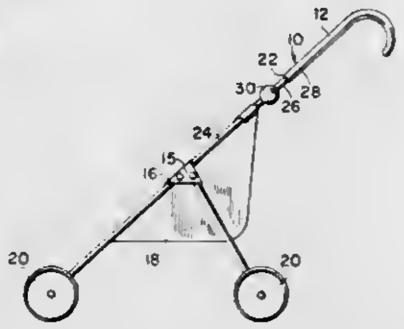
wherein said roller assembly is generally U shaped and includes at least a pair of integral feet adjacent to the end journaling the roller acting as stops for the full upward adjusted position of the roller and supports for the rail when in such position;

wherein said roller assembly includes a second pair of surfaces adjacent to the corner nearest the corner defined by the rail and stile whereby said latter surfaces remain in contact with said rail regardless of the degree of extension of the roller and constitutes supports therefore.

4,102,010

HANDLE ASSEMBLY FOR A BABY CARRIAGE

Esther Lazazzero, 86 Greenlawn Ave., Clifton, N.J. 07013
Filed Dec. 22, 1976, Ser. No. 753,454
Int. Cl.² B25G *1/04;* B62B *9/20*
U.S. Cl. 16—115 **1 Claim**



1. An improved handle assembly for a baby carriage having a frame, a seat portion, and a plurality of wheels rotatably joined to said frame, wherein the improvement comprises:

(a) a pair of handle members, each said handle member having upper and lower tubularly shaped portions, a lower end of said lower tubularly shaped portion integrally joined to said frame, said upper portion formed from upper and lower telescoping sections;

(b) a ratchet pivot means joining said lower section of said upper portion to said lower portion for allowing said upper portion to be angled with respect to said lower portion including an outer casing having a base, a top with an acruate channel therethrough, and a cylindrically shaped sidewall with an acruate shaped opening, said outer casing affixed to an upper end of said lower portion, a semi circularly shaped concave multi-toothed gear mounted in said casing, a semi circularly shaped convex multitoothed gear movably disposed in said outer casing, said convex and said concave gears meshing together, a lower end of said lower section of said upper portion extending through said acruate opening and integrally affixed to said convex gear, an externally threaded bolt affixed perpendicularly to an upper surface of said convex gear and extending upwardly through said acruate channel, a nut means threadably engaging said bolt externally to said casing and frictionally engaging said top of said casing; and

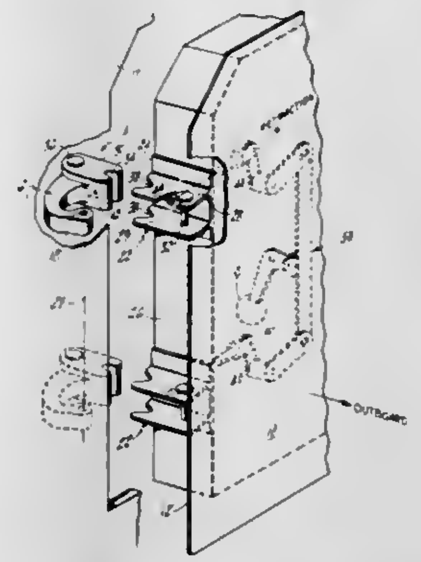
(c) means for locking said upper and said lower section of said upper portions together including an inner surface of said hollow upper section having a longitudinally aligned channel disposed therein and a plurality of spaced, transverse grooves disposed therein at right angles to said channel, a plurality of spaced bosses disposed in a longitudinal alignment on an outer surface of said lower section of said upper portion, said lower section slidably disposed in said upper section, said bosses slidably disposed in said channel, said upper section rotatable on said lower section thereby moving said bosses into said transverse grooves.

4,102,011

HINGED DOOR QUICK RELEASE

Frederick Argles Clack, Jr., Avon, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jun. 24, 1977, Ser. No. 809,837
Int. Cl.² E05D *7/12;* B64C *1/00*
U.S. Cl. 16—149 **10 Claims**

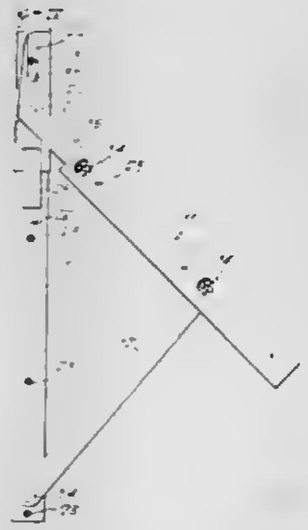
1. For use with a vehicle door that is pivotable about a vertical axis by one or more hinge joints each having relatively movable mating hinge members, a separate jettison joint at each hinge location comprising first and second support members releasably connected by a retractable pin, wherein said first member is fixedly attached to the door and said second member is an extension of one of the mating hinge members, means associated with said first and second members providing fixed longitudinal, vertical, and inward restraint for the door, wherein the vertical restraint means includes a laterally extending contact stop, the longitudinal and inward restraint means include one or more vertically depending contact stops, said retractable pin providing outward restraint means during engagement with the first and second members.



4,102,012

SLIDING AND SWINGING WINDOW STAYS

Ronald Percival Davis, Wellington, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand
Filed Dec. 1, 1976, Ser. No. 746,616
Claims priority, application New Zealand, Dec. 3, 1975, 179432; Sep. 23, 1976, 182146
Int. Cl.² E05F *3/22*
U.S. Cl. 16—179 **19 Claims**

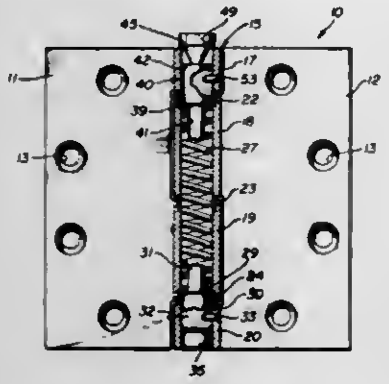


1. A window stay for adjustable mounting of a window sash on a window frame comprising a first mounting plate adapted for attachment to the frame of a window, a second mounting plate or plates adapted for attachment to a sash of a window, a carriage freely slidably mounted on the first mounting plate, first and second arms each of which is pivoted at one end to the or a second mounting plate, the first arm being pivoted at its other end to the first mounting plate, the second arm, which is of shorter length than the first arm, being pivoted at its other end to the carriage, means to lock said carriage in at least a position where the pivot mount of the second arm to the carriage is at its greatest distance away from the pivot mount of said first arm to said first mounting plate, whereby with the stay in use a sash can be moved from a closed position in a window frame to an open position and thereupon opened further by releasing the carriage from its said locked position.

4,102,013
TAMPER-PROOF SPRING HINGE

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Dec. 13, 1976, Ser. No. 749,793
Int. Cl.^{2} E05F *1/12;* E05D *5/12*
U.S. Cl. 16—189 **10 Claims**

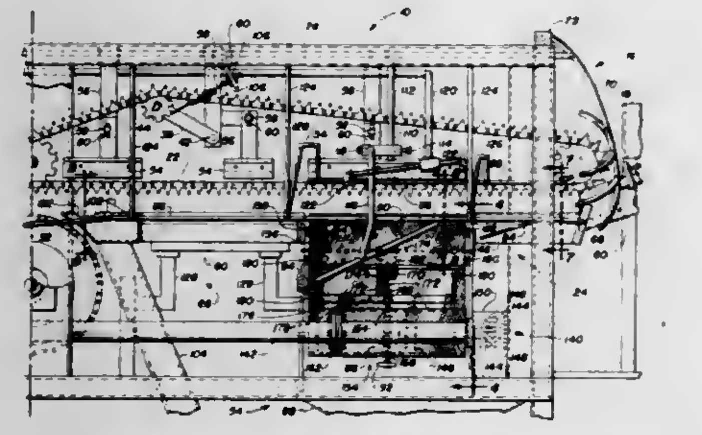


1. Tamper-proof spring biased hinge means comprising a pair of hinge leaves, each leaf defining at least one hollow hinge knuckle aligned with a hinge knuckle defined on the opposite leaf, and a bi-ended torsion spring mechanism within the aligned hinge knuckles, a first plug received within and affixed to one hinge knuckle and engaged with one end of the torsion spring mechanism, and a second plug received within and adapted to be affixed to the second hinge knuckle and engaged with the other end of said second spring mechanism, the second plug including head means having tool engaging surface thereon initially engageable by tool means for pre-torsioning said spring mechanism and means removably joining said head means to the remainder of said second plug thereby rendering said head means removable after said spring is torsioned and said second plug fixed to said second hinge knuckle, with both said first and second plugs being free from any tool engageable means upon removal of said head means.

4,102,014
MODIFICATION ASSEMBLY TO A MACHINE FOR PROCESSING THE BACKS OF POULTRY

Eugene G. Martin, and Dale M. Risser, both of Ephrata, Pa., assignors to Victor F. Weaver, Inc., New Holland, Pa.

Filed Apr. 4, 1977, Ser. No. 784,655
Int. Cl.^{2} A22C *21/00*
U.S. Cl. 17—11 **45 Claims**



1. A machine for processing the back carcass members of poultry comprising a frame structure to support processing stations within said machine for removing the tails and skin from the backs of a progressive series of poultry back carcass members while making a single pass therethrough having progressively assembled thereto inward from the infeed end of said machine:

(a). a poultry back carcass member infeed staging tray,

(b). a configured poultry back carcass member water slide infeed trough,

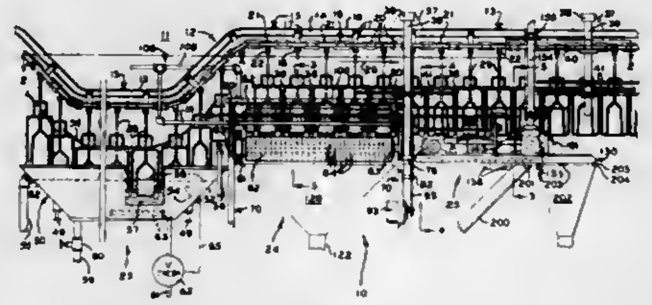
(c). an operator infeed safety guard assembly, and

(d). an improvement modification assembly for automatically processing the interior surfaces of poultry back carcass members sequentially conveyed therethrough, said improvement modification assembly — comprises — in combination a laterally disposed poultry back carcass member flank distending means followed by a longitudinally aligned and laterally disposed rotating screen poultry back carcass member interior fatty tissue removal means in turn followed by a longitudinally aligned and laterally disposed kidney retaining membrane severing — means and a — kidney removal means, and a longitudinally continuous poultry back carcass member support and transit means.

4,102,015
METHOD AND APPARATUS FOR PROCESSING POULTRY FEET AND THE LIKE

Duane Herrick, Turlock, Calif., assignor to Foster Farms, Calif.

Filed Aug. 31, 1977, Ser. No. 829,267
Int. Cl.^{2} A22C *21/00*
U.S. Cl. 17—11 **11 Claims**



10. An apparatus for processing poultry feet and the like for use with a line for processing poultry wherein shackles suspended from a conveyor individually engage the legs of each bird for transport along a predetermined processing path, said apparatus comprising:

(A) an upwardly open tank having a liquid bath therein;

(B) means for maintaining said bath at a predetermined level and at a predetermined blanching temperature;

(C) means for guiding the shackles along said path so that the feet are immersed in said bath for a time sufficient to blanch the skin and loosen it from the feet without appreciably cooking the feet;

(D) a pair of substantially parallel, axially elongated, and substantially cylindrical rollers mounted for rotation about radially spaced axes extending adjacent to and laterally of the path of travel of said feet;

(E) a plurality of resiliently flexible fingers extending substantially radially from each of said rollers;

(F) means for rotating each of said rollers so that the tips of the fingers travel away from the shackles between said rollers;

(G) means for guiding the shackles along said path in following relation to the tank so that the feet extend laterally of the path of travel and pass between said rollers and are oppositely frictionally engaged therebetween by fingers of each roller, to further loosen the skin from the feet;

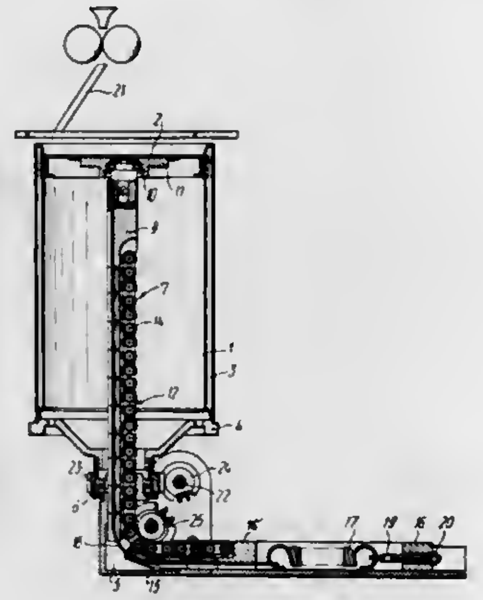
(H) means for guiding the shackles laterally away from the rollers as the feet pass therebetween so that the feet are withdrawn from between the rollers to strip the skin from the feet; and

(I) means mounted in following relation to said rollers for severing the feet laterally extended from said shackles adjacent to said path from their respective legs.

4,102,016
SLIVER PLACING DEVICE FOR DRAW FRAMES AND LIKE MACHINE

Ivan Dmitrievich Pak, ulitsa Juzhnaya, 29a, kv. 34; Boris Alexeevich Tjukov, ulitsa Uritskogo, 44a/10, kv. 57; Archil Levanovich Karalashvili, Ternovka, ulitsa Experimentalnaya, 4, kv. 33, and Jury Nikolaevich Denisov, proezd Kalinina, 2, kv. 9, all of Penza, U.S.S.R.

Filed Dec. 30, 1976, Ser. No. 755,547
Int. Cl.^{2} B65H *54/80*
U.S. Cl. 19—159 R **6 Claims**



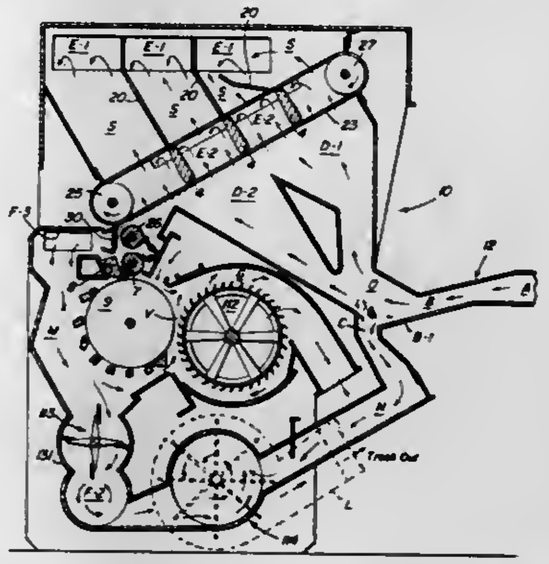
1. A sliver placing device for draw frames and like machines, comprising a rotatable can adapted to have a sliver placed thereinto; means for imparting rotation to said can; a bottom forming part of said can and being movable in the process of placing the sliver thereupon; a flexible rod means for lifting and lowering said bottom and being made up of several portions including an upper portion having a rotatable base for said bottom, an intermediate flexible rod portion having bearing abutments, and a lower portion having a carriage block; a tensioned, flexible but non-stretchable member connected to said upper portion of said flexible rod means and extending therefrom along said intermediate flexible rod portion, spring means operatively connected with said and tensioned member for maintaining the latter under tension and in permanent contact with the bearing abutments, thus providing for rigidity of said flexible rod portion when the latter is operated to lift and lower said movable bottom, and means operatively connected with said flexible rod means for actuating the latter to lift and lower said movable bottom while moving said flexible rod means along a path having horizontal and vertical straight portions and a curvilinear portion therebetween, with said carriage block of said lower portion of said flexible rod means being movable along said horizontal portion of said path.

4,102,017
COTTON LINT CLEANER

John E. Foerster, Memphis, Tenn., assignor to Foerster Process Systems, Inc., Lubbock, Tex.

Filed Mar. 8, 1976, Ser. No. 665,099
Int. Cl.^{2} D01B *1/00*
U.S. Cl. 19—203 **12 Claims**

1. A cotton lint cleaner having a support frame, input air flow duct work mounted upon said support frame, a condenser means connected to said input duct work for collection of fibrous material thereon, feed rollers associated with said condenser means, a cylindrical saw associated with said feed rollers, air doffing means associated with the cylindrical saw, said air doffing means arranged for creating air flow past the cylindrical saw to doff cotton collected thereon including means for inducting air into the center of said doffing means and discharging said air at an increased pressure radially thereof, and an exhaust impeller connected by further duct work with said doffing means for expelling trash from the cleaner, said condenser means including a flexible belt having suitable apertures spaced therein and mounted for movement across the path of air flow from said input duct work for condensing fibrous material thereon as contained in the air flow, said belt being mounted upon spaced driven rollers for movement of said belt transversely to the path of air flow, said input air flow duct work including splatter board structure for preliminary separating by gravity fibrous material from trash prior to the passage of air flow containing trash material to said condenser belt.



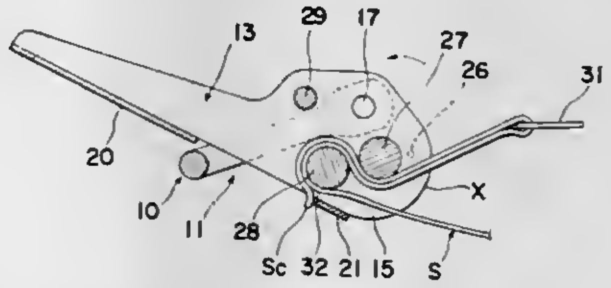
4,102,018
CLASPING DEVICE

Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan

Filed Jul. 20, 1977, Ser. No. 817,537

Claims priority, application Japan, Dec. 21, 1976, 51-172024[U]; Mar. 19, 1977, 52-33682[U]; Mar. 19, 1977, 52-33683[U]

Int. Cl.^{2} B25B *25/00;* B65B *13/24*
U.S. Cl. 24—68 CD **7 Claims**



1. A clasping device comprising:

a frame means having a pair of spaced connections, aligned with and positioned adjacent each other, and having an opening defined between said connections;

a manipulatable tongue means pivotable within the opening between the connections of the frame means and comprised of a pair of substantially elongated plate members spaced a distance slightly smaller than the distance between the connections of the frame means at the opening, each of the plate members having a first end and a second end opposite said first end, the first ends of the respective plate members being connected with each other by means of a bridge plate integral therewith and the second ends of the plate members being integrally formed with respective substantially circular walls, said tongue means being connected to the frame means with the connections respectively pivoted to the substantially circular walls to define an axis of pivot about which the manipulatable tongue means is movable between released and fastened positions relative to the frame means;

a first cross pin member extending between the substantially circular walls with its opposed ends rigidly secured thereto and positioned inwardly of the walls with its peripheral surface spaced a first predetermined minimum distance from a peripheral edge portion of any one of the walls which is remote from the first end of the corresponding plate member;

a second cross pin member extending in spaced and parallel relation to the first cross pin member between the substantially circular walls with its opposed ends rigidly secured thereto and positioned inwardly of the walls and substantially rearwardly of the first cross pin member in terms of a direction of the first end of any one of the plate members;

a barrier member having its opposed ends connected to respective peripheral edge portions of the substantially circular walls, said barrier member extending in spaced and parallel relation to any one of said first and second cross pin members and cooperating with the second cross pin member to define a substantially ribbon-shaped clearance, said barrier member being spaced a second predetermined minimum distance from the peripheral surface of the second cross pin member;

a flexible strap having first and second ends respectively connected with an anchoring means and a slotted plate member, said flexible strap when the manipulatable tongue means is held in the released position extending from the anchoring means through the clearance between the second cross pin member and the barrier member, past around and in contact with the second cross pin member thereby forming a loop around the second cross pin member, and back past beneath and in contact with the first cross pin member, with the second end of said strap emerging outwardly of the manipulatable tongue means, so that when the strap is drawn taut as the tongue means is pivoted towards the fastened position portions of the strap one on each side of the loop are urged in overlapping relation to each other against the first cross pin member to provide substantial frictional resistance to relative movement of the strap loop after the strap is tightened by pivoting of the tongue means to the fastened position, said first predetermined distance being within the range of two times the thickness of the strap to three times the thickness of the strap; and

a third cross pin member extending between the substantially circular walls with its opposed ends rigidly secured thereto and positioned substantially rearwardly of the second cross pin member in terms of the direction of the first end of any one of the plate members, said third cross pin member being further so positioned as to provide an access clearance between the first ends of the plate members and the strap when the tongue means is pivoted to the fastened position with said first ends of said plate members spaced from said strap.

4,102,019

LOCKING ASSEMBLIES WHICH MAINTAIN BOW LOOPS IN CORDS

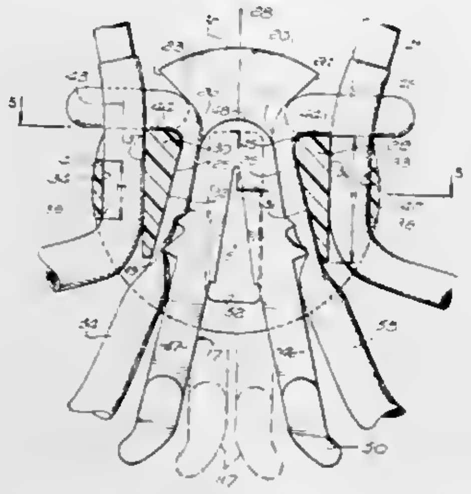
Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91001

Filed Mar. 7, 1977, Ser. No. 774,937

Int. Cl.² F16G *11/04*

U.S. Cl. 24—117 **11 Claims**

1. The combination comprising:
a fastener body containing a central passage having first and second ends and a restricted locking portion;
two cords extending through said passage; and
a locking unit located at least partially within said passage and movable relative to said body between a locking position in which it grips said cords tightly and locks them against longitudinal movement toward said first end of said passage and a released position permitting such movement;
said cords having portions extending out of said second end of said passage to the outside of the body and forming respectively two loops which extend first outwardly away from said body and then back to the body at opposite sides of said passage;
said cords being retained at first ends of said loops by said gripped engagement with said unit;
said body containing two side passages located at opposite sides respectively of said central passage and said unit therein, and which receive and hold portions of said cords at second ends of the loops in a relation retaining and locating said portions at said opposite sides of the central passage and locking unit and maintaining the looped configuration of both cords;
said body having two spaced walls defining opposite sides of said central passage and which have inner surfaces converging toward one another to wedge said cords together in conjunction with said locking unit, said spaced walls having outer surfaces which extend in essentially a common direction without convergence and serve as inner wall surfaces of said two side passages respectively.



4,102,020

SAFETY BELT DEVICE

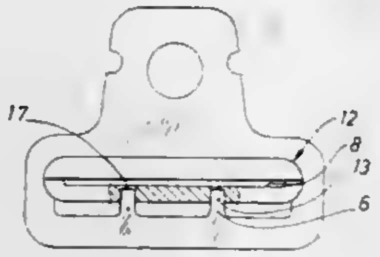
Stig Martin Lindblad, Vastergatan 21, S-440 20 Vargarda, Sweden

Filed Jun. 23, 1976, Ser. No. 698,875

Claims priority, application Sweden, Nov. 28, 1975, 7513419

Int. Cl.² A44B *11/02;* A47C *31/00*

U.S. Cl. 24—164 **3 Claims**



1. A guide slit device for safety belts for vehicles comprising a holding part to be anchored in a vehicle, said holding part having an opening therein, a separate slit unit arranged within said opening and having a slit arranged to receive the band of the belt extending through the slit, said slit being defined by a lower wall having a supporting surface arranged to support and deflect the band which is pressed against the supporting surface of said slit with a force which is increased by an increased traction force acting on the band, said lower wall having penetrable portions of reduced thickness, a plurality of locking teeth fixed to the lower edge of said opening in said holding part and aligned with and directed toward said penetrable portions whereby the band may move freely in the slit when the locking teeth are retracted relative to said slit unit, said locking teeth being capable of penetrating said penetrable portions when said slit unit moves under the action of a traction force which exceeds a predetermined value so that said locking teeth will penetrate said penetrable portions and penetrate the band so as to lock it in a fixed position relative to the guide slit device.

4,102,021

METHOD FOR MAKING CAPACITORS WITH PLATED TERMINALS

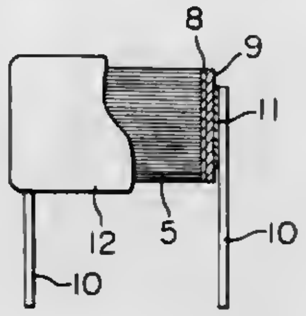
Kaname Nakao, Neyagawa; Tanejiro Ikeda, Higashi-Osaka; Koichi Kawata, Sakai, and Shoji Hara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 30, 1976, Ser. No. 728,177

Claims priority, application Japan, Oct. 6, 1975, 50-120996; Mar. 31, 1976, 51-36416; Jun. 14, 1976, 51-70049

Int. Cl.² H01G *4/06*

U.S. Cl. 29—25.42 **5 Claims**



1. A method for manufacture of thin film capacitors which comprises providing electrodes separated by a film dielectric to form a capacitor element with two opposed end faces, etching the opposed end faces of said capacitor element without use of liquid etchants, and depositing terminals by ion plating metal on each of the opposed end faces of the capacitor element.

4,102,022

AUTOMATICALLY LOCKING SLIDER FOR SLIDE FASTENERS

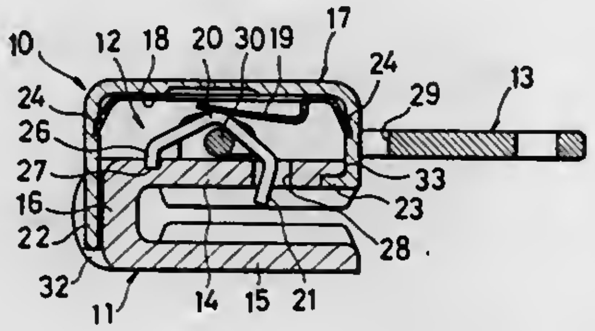
Tsunetaka Aoki, Kamiichi, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Oct. 26, 1977, Ser. No. 845,624

Claims priority, application Japan, Oct. 26, 1976, 51-143978[U]

Int. Cl.² A44B *19/30*

U.S. Cl. 24—205.14 R **5 Claims**



1. An automatically locking slider for slide fasteners comprising, in combination, a body defining a guide channel therein, a cover fixedly mounted on the slider body, a leaf spring supported within the cover by having its opposite ends urged against the opposed inside surfaces of the cover under its own resiliency, the leaf spring having a part thereof formed into a resilient tongue, a locking pawl normally biased by the resilient tongue of the leaf spring into the guide channel in the slider body, and a pull tab pivotally mounted on the slider body and adapted to move the locking pawl away from the guide channel in the slider body against the bias of the resilient tongue of the leaf spring upon exertion of a pull on the pull tab.

4,102,023

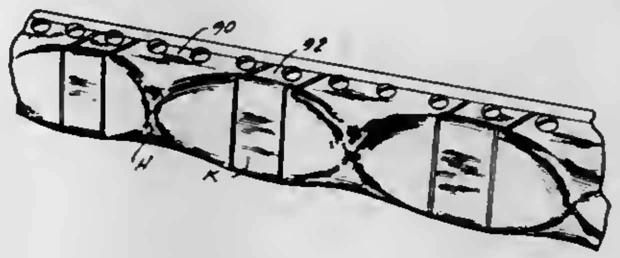
CONTOUR SHEAR DEVICE FOR PILE FABRICS

Norman Christian Abler, Menomonee Falls, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 30, 1976, Ser. No. 719,017

Int. Cl.² D06C *23/02*

U.S. Cl. 26—16 **11 Claims**



1. Apparatus for use in shearing pile fabrics to a particular contour comprising:
a shear rest,
a contour surface forming a part of said shear rest and providing a web path over said part of said shear rest, a portion of said contour surface forming a mirror image of a contour to be provided on finished pile fabric surfaces,
said contour surface including a plurality of distinguishable contours arranged in cooperative association with each other,
the contours being selected such that the length of the web path over the contour surface in the direction of travel of a pile fabric is the same across each distinguishable contour of the contour surface.

5. Apparatus for shearing continuously travelling lengths of pile fabrics to a desired contour, comprising:
shearing means;
a shear rest over which a pile fabric may travel,
said shear rest incorporating contour means,
said contour means including first contour elements having surfaces to bring pile fabrics into close proximity to said shearing means, and
said contour means having second contour elements having surfaces to bring pile fabrics into less close proximity to said shearing means,
the contour surfaces of said second contour elements being extended in the direction of the axis of travel of the pile fabric over the shear rest sufficiently to compensate for said less close proximity so that web paths formed thereby in the direction of the axis of travel of the pile fabric are of substantially equal length across each distinguishable contour of the contour elements to promote even contouring of a pile fabric sheared on the shear rest.

4,102,024

METHOD AND APPARATUS FOR MAKING FLATTENED EXPANDED LEAD STRIP FOR BATTERY PLATES

John P. Badger, Genoa, and Jack R. Rinker, Toledo, both of Ohio, assignors to Eltra Corporation, Toledo, Ohio

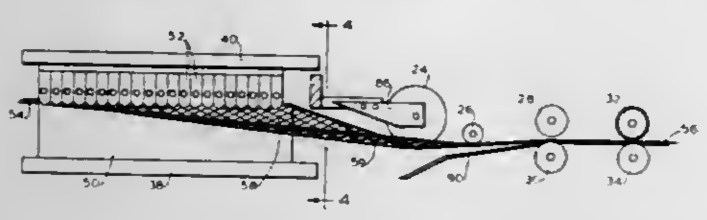
Filed Dec. 23, 1976, Ser. No. 754,131

Int. Cl.² B21D *31/04*

U.S. Cl. 29—6.2 **19 Claims**

1. A method of making expanded metal strip comprising:
moving a metal strip through an expanding machine having a row of progressive dies and a cutter;
operating the machine in synchronism with movement of the strip so that the strip is expanded into a non-planar shape with a mesh portion and a longitudinally extending unexpanded portion; and
Flattening the expanded strip from its non-planar shape by moving the expanded strip past a diverter so that the

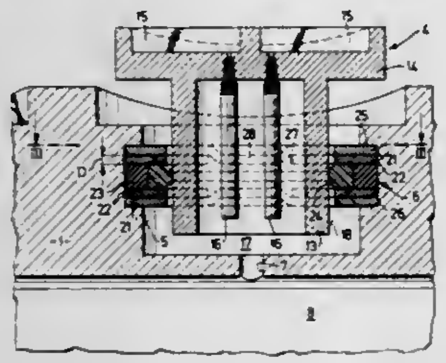
unexpanded portion is forced to a level substantially even with the outer edge of the mesh portion located trans-



versely therefrom while the outer edge of the mesh portion is maintained substantially straight and taut.

4,102,025
CONTROLLED DEFLECTION ROLL

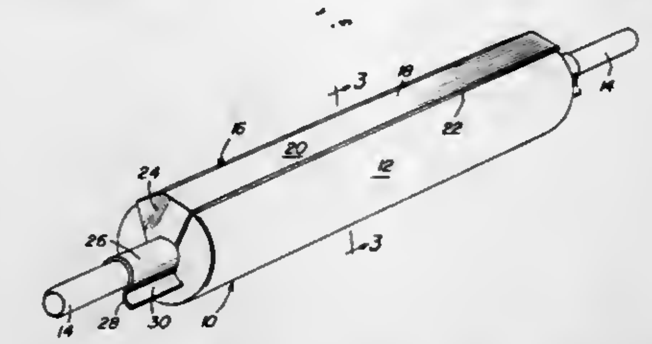
Rolf Lehmann, Mutschellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland
Filed Feb. 22, 1977, Ser. No. 770,783
Claims priority, application Switzerland, Feb. 26, 1976, 2359/76
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 AD **6 Claims**



1. A deflection compensating roll which comprises a beam, a roll shell rotatably mounted about said beam, at least one fluid-actuated support element for exerting forces against the interior of said shell having a cylindrical portion tiltably guided within a cylindrical bore formed in said beam, and a bearing surface adjacent the interior of said shell, said cylindrical portion and the wall of said bore defining an intermediate space therebetween, means for introducing fluid under pressure into said bore, and means for sealing off said intermediate space while permitting said support element to tilt with respect to the axis of said bore upon deflection of said beam during operation, said sealing means positioned in a circumferential groove formed in the wall of said bore and including a sealing member in seal-tight engagement with said cylindrical portion of said support element, at least a pair of associated generally annular ring members disposed within said groove and extending at least partially into said intermediate space on at least one side of said sealing member, each ring member having a gap defined by a segmental cutout and at least one ring member of each pair having a diametrically opposed portion displaced out of the plane of the ring member and parallel thereto, said displaced portion extending over a circumferential distance of the ring member not greater than the circumferential distance of the gap defined by said segmental cutout of the associated ring member such that when the ring members are positioned in stacked relation, said displaced portion of said at least one ring member is positioned within the gap defined by the segmental cutout of the associated ring member for supporting at least one side of said sealing member against forces exerted by said fluid introduced into said bore.

4,102,026
STRIPPER BAR FOR ROLLING PIN

Ralph G. DeMasi, 208 Hilldale Ave., Syracuse, N.Y. 13206
Filed Apr. 8, 1977, Ser. No. 786,482
Int. Cl.² B05C *1/08*
U.S. Cl. 29—110.5 **11 Claims**



1. Apparatus attachable to a rolling pin for stripping adhering material from the surface of a rotating cylinder member, the rolling pin having handle members extending from either end of the cylindrical member parallel to the longitudinal axis of said member, the apparatus comprising:

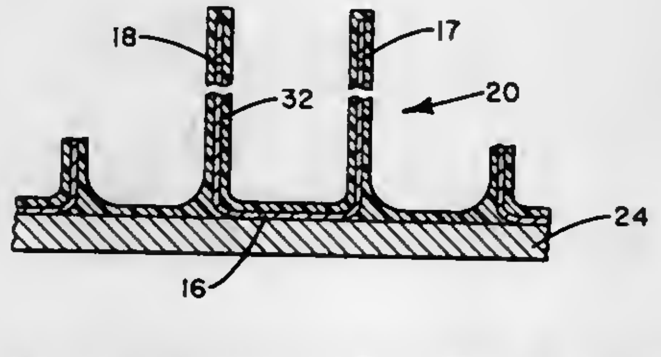
a major body portion having a length greater than the length of the cylindrical member, the major body portion having a continuous outer surface and having lateral edge portions extending along each longitudinal side thereof;

a connecting member joined at one end thereof to one each of the respective ends of the major body portion; and

end members joined at each end of the major body portion to one each of the connecting members, each end member comprising an arcuate body portion and arcuate flanges recurving from lateral edges of the arcuate body portion, the spacing between the flanges on either side of the arcuate body portion being dimensioned to allow one of the handle members of the rolling pin to snap fit within the space defined by the arcuate body portion of the end member, each end member snap fitting over each one of the handle members to bring the lateral edge portions of the major body portion into proximity to the surface of the cylindrical member of said rolling pin, the apparatus remaining essentially stationary relative to the cylindrical member on rotation of the said cylindrical member when pressure is applied to the flange, the lateral edge portions of the major body portion acting to strip adhering material from the surface of the cylindrical member on rotation of said cylindrical member during working of said material.

4,102,027
SPINE FINNED TUBE

James E. Greever, Dewitt, N.Y., and James P. Schafer, Minnetonka, Minn., assignors to Carrier Corporation, Syracuse, N.Y.
Filed May 25, 1976, Ser. No. 689,774
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.3 AH **11 Claims**



1. A method of producing a heat exchanger tube having an aluminum component including the steps of

slitting a flat elongated sheet of thin gauge material laterally inwardly from both edges thereof to form uniformly spaced fins along the edges of said sheet,

bending the fins to a position substantially perpendicular to the plane of the sheet so as to form a U-shaped member having two substantially parallel rows of fins extending upwardly from the base thereof,

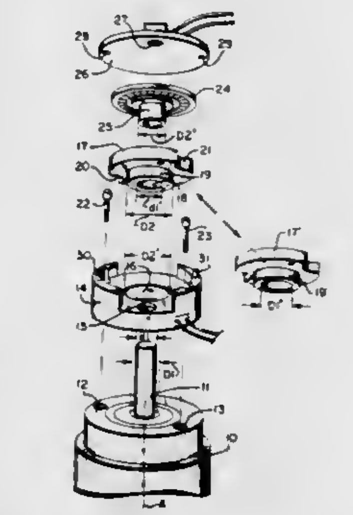
wrapping the base of the U-shaped element about a tube to provide continuous contact between the base and the outer surface of the tube whereby the fins extend radially outwardly from the tube,

establishing a meniscus of adhesive material along both sides of the fin member at the point of contact between the fin member and the tube surface whereby the integrity of the metal-to-metal contact between the base of the fin and the tube surface is preserved, and

curing the adhesive to securely bond the fin member to the tube surface.

4,102,028
OPTICAL ENCODER ASSEMBLY AND CENTERING FIXTURE

Richard Kenneth Currie, Santa Barbara, Calif., assignor to Anton J. Blaser, Santa Barbara, Calif.
Filed Apr. 11, 1977, Ser. No. 786,658
Int. Cl.² B25B *27/14*
U.S. Cl. 29—281.5 **3 Claims**



1. An optical encoder assembly and centering fixture to be used on a motor shaft of given diameter, including, in combination:

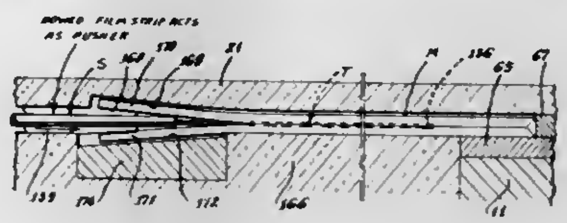
(a) a mounting member carrying a light source adjacent to a peripheral point and having a central bore of greater diameter than said given diameter of the shaft of said motor and wherein said light source is positioned at a proper radial distance from the axis of said shaft for proper alignment with the remaining components of the assembly only when said mounting member is centered on the motor with said shaft extending through said central bore in exact coaxial relationship therewith;

(b) a centering fixture comprising a disc shaped element having a central hole of diameter corresponding to said given diameter of said shaft to receive said shaft in a friction fit, said element further including

(c) a reduced external diameter portion through which said hole passes in coaxial relationship, the reduced external diameter of said portion corresponding to the internal diameter of said central bore of said mounting member so that said reduced external diameter portion is receivable in a friction fit in said central bore whereby when the hole in said element receives said shaft, and the reduced external diameter portion of said element is received in said central bore, said mounting member is precisely centered in coaxial relationship to said shaft and may be secured to said motor, said disc shaped element thereafter being removed from said shaft so that the remaining components of said optical encoder assembly can be properly assembled on said mounting member with assurance that said light source is properly positioned.

4,102,029
METHOD FOR LOADING FILM TRANSPARENCIES INTO SLIDE MOUNTS

Edwin R. Thompson, Stamford, Conn., assignor to Forox Corporation, Stamford, Conn.
Filed Nov. 1, 1976, Ser. No. 737,201
Int. Cl.² B23P *17/00*
U.S. Cl. 29—417 **18 Claims**



1. The method of automatically loading film transparencies into slide mounts each having at least one window therein for viewing the transparency held in the mount comprising the steps of:

providing slide mounts each having two sides defining a receiving pocket between them for receiving a film transparency into the pocket to be held in sandwich relationship between the two sides of the mount,

said two sides of each mount defining a resiliently spreadable region at one end of the mount communicating with said pocket through which a film transparency can be slid into the pocket for retaining a film transparency in said pocket when said spreadable region is in its normal position,

providing at least one fixed wedge member adjacent to a loading station,

moving the slide mounts one at a time edgewise into said loading station,

engaging the edge of each successive slide mount with said fixed wedge member as the slide mount is being moved edgewise into the loading station for spreading said spreadable region at the end of the slide mount,

sliding a film transparency into the pocket in the respective slide mount in the loading station through said spreadable region which has been spread by engagement with said fixed wedge, and

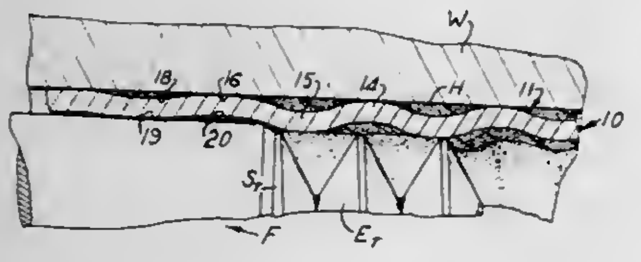
moving the respective loaded slide mounts one at a time away from the loading station and withdrawing the respective slide mount away from said fixed wedge for allowing said spreadable region to return to its normal position for retaining the respective film transparency in the pocket of the respective slide mount.

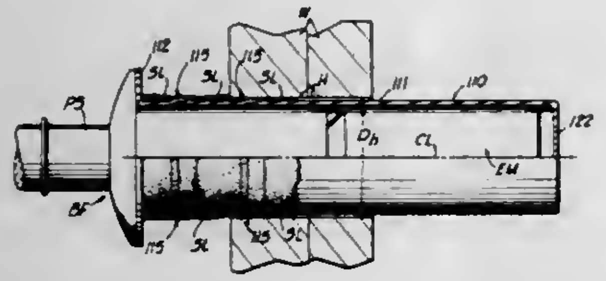
4,102,030
METHOD OF FORMING A SEALING SLEEVE JOINT CONSTRUCTION

John O. King, Jr., 3990 N. Ivy Rd., Atlanta, Ga. 30342
Continuation-in-part of Ser. No. 378,443, Jul. 12, 1973, Pat. No. 3,962,843, which is a continuation-in-part of Ser. No. 268,478, Jul. 3, 1972, Pat. No. 3,835,615, which is a continuation-in-part of Ser. No. 33,281, Apr. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 711,368, Mar. 7, 1968, abandoned. This application Jun. 14, 1976, Ser. No. 695,437
Int. Cl.² B23P *3/00, 25/00*
U.S. Cl. 29—458 **10 Claims**

1. A method of forming a fastener joint comprising the steps of:

(a) forcing a sleeve member with a resilient tubular side wall having a predetermined wall thickness and a plurality of generally circumferentially extending resilient bends formed therein, each of the bends lying generally in a transverse plane normal to the centerline of the side wall with the bends axially spaced from each other along the side wall centerline so that the side wall has a first effective major outside diameter and a second effective inside minor diameter where the difference between the first major diameter and the second minor diameter is greater than the wall thickness of the side wall, into holes through work pieces where the holes have a diameter a prescribed amount smaller than the first major outside diameter of the side wall so as to partly resiliently flatten the bends in the side wall of said sleeve member; and,





(b) installing the bearing area of a fastener in the sleeve member where the final installed diameter of the bearing area of the fastener is larger than the second minor inside diameter of the side wall of the sleeve member to further partly resiliently flatten the bends in the sleeve member and cause each of the bends sealingly engage the hole surface to seal the holes about the fastener.

10. The method of claim 3 further including the step of applying a sealant to the inside of the sleeve member prior to step (a).

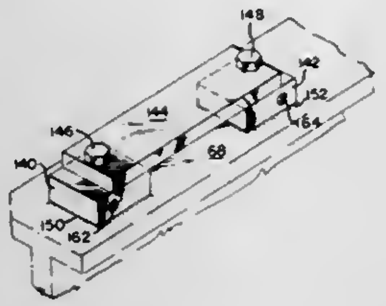
4,102,031
METHOD OF INSTALLING A TRANSDUCER ON A STRUCTURAL MEMBER

Keith W. Reichow, Renton; David C. English, Seattle, and Jerry L. McCauley, Renton, all of Wash., assignors to 'Structural Instrumentation, Inc., Tukwila, Wash.

Division of Ser. No. 615,827, Sep. 29, 1975, Pat. No. 4,042,049. This application Dec. 10, 1976, Ser. No. 749,348

Int. Cl.² B23Q *3/00*

U.S. Cl. 29—464 **4 Claims**



1. A method of installing a transducer on a structural member, the transducer having a pair of parallel fastener means spaced apart a predetermined distance, said method comprising:

providing a pair of mounting pads having a pair of fastener receiving means adapted to receive said pair of fastener means,

detachably connecting a spacer to said pads with said pair of fastener receiving means spaced apart said predetermined distance,

securing said spacer connected pads to said structural member,

detaching said spacer from said pads, and

mounting said transducer on said pads by engaging said pair of fastener means with said pair of fastener receiving means.

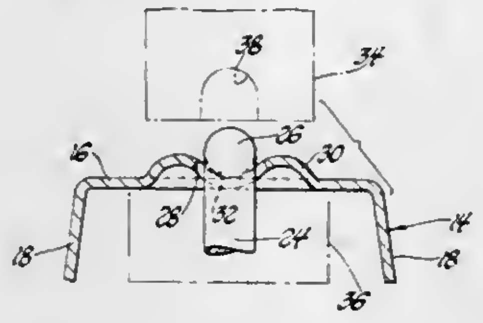
4,102,032
METHOD OF FABRICATING FURNITURE SPRING SUPPORT

William L Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1976, Ser. No. 746,836

Int. Cl.² B21D *39/00;* B23P *11/00*

U.S. Cl. 29—520 **6 Claims**



1. A method of attaching a coil spring to a support member of a furniture assembly when the coil spring includes a bottom coil and a radially extending support portion interconnecting the bottom coil and an axially extending tail, said method comprising the steps of forming an aperture in said support member and an upset portion disposed about at least a portion of the periphery of the aperture and out of the plane of the support member, inserting said tail of said spring into said aperture, and flattening the upset portion toward the plane of the support member to force the periphery of the aperture into gripping engagement with the tail of the coil spring.

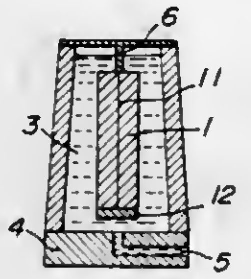
4,102,033
METHOD OF PRODUCING LAYER-LIKE CLAD METAL MATERIALS

Toshihiko Emi; Masashi Kawana, both of Chiba; Katsuo Kinoshita, Narashino, and Shinichiro Adachi, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 21, 1977, Ser. No. 779,464

Int. Cl.² B22D *7/02*

U.S. Cl. 29—527.3 **7 Claims**



1. A method of producing layer-like clad metal materials, comprising applying at least one organic substance selected from the group consisting of phenolic resin, amino resin, epoxy resin, polyamide resin, acrylic resin, polyester resin, and vinyl acetate resin, on a surface of a metallic core material having at its surface substantially no oxide film to form a coating film having a thickness of 50-3,000 μm, fixing said core material in a casting mold, using a fixing metal member in such a manner that the lower end of the core material is located at a position of 5-30 cm above the bottom surface of the mold, pouring a molten metal having the same composition around said core material up to a height of at least 5 cm above the upper end of the core material, into said mold by a bottom pouring process to form a clad metal ingot, subjecting said ingot to slab rolling or forging to form an intermediate product, and then subjecting said intermediate product to a hot working and, if necessary, a cold working.

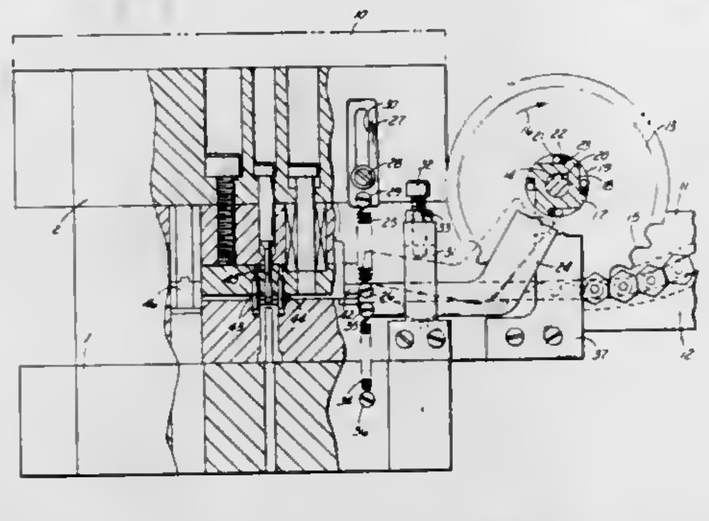
4,102,034
PART ORIENTING AND FEEDING MECHANISM

Clyde E. Ott, c/o Pace Precision Tool & Die Co., Ohio Ave., DuBois, Pa. 15801

Filed Aug. 31, 1976, Ser. No. 719,341

Int. Cl.² B21D *43/04;* B26D *5/22*

U.S. Cl. 29—565 **4 Claims**



1. In part feeding and orienting mechanism of the class described, in combination, means to perform dieing operations on parts, guide means to carry such parts toward feeding mechanism connected to said dieing means, said mechanism including an index member to engage the parts and maintain them in spaced relation, means to move the member and each part engaged therewith a predetermined distance in timed relation to the dieing operation, each part so moved, engaging the part ahead thereof to move that part to position for performing said operation thereon, and orienting elements in the dieing means positioned to engage each part separately after such movement and precisely locate the same for performing said operation, the means to perform dieing operations comprise a progressive die to perform successive operations on the parts in separate steps as such parts move to successive positions, the guide means provide gravity supply of such parts toward the feeding mechanism, the feeding mechanism includes an index wheel having part engaging portions thereon, ratchet means connected to the die for movement by a movable part of said die, being provided to move said index wheel a predetermined distance and thus the parts engaged thereby likewise, and means to control the said movement.

4,102,035
MACHINING CENTER WITH AUTOMATIC TOOL CHANGER

Leonhard Voglrieder, Howell, and Raymond O. Hempel, Jr., La Salle, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 25, 1977, Ser. No. 790,224

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—568 **45 Claims**

1. In a machine tool, the combination of:

(a) a tool spindle slide assembly, including a tool spindle rotatable on a first axis and being operatively mounted for transverse movement along a second axis perpendicular to said first axis of rotation of the tool spindle;

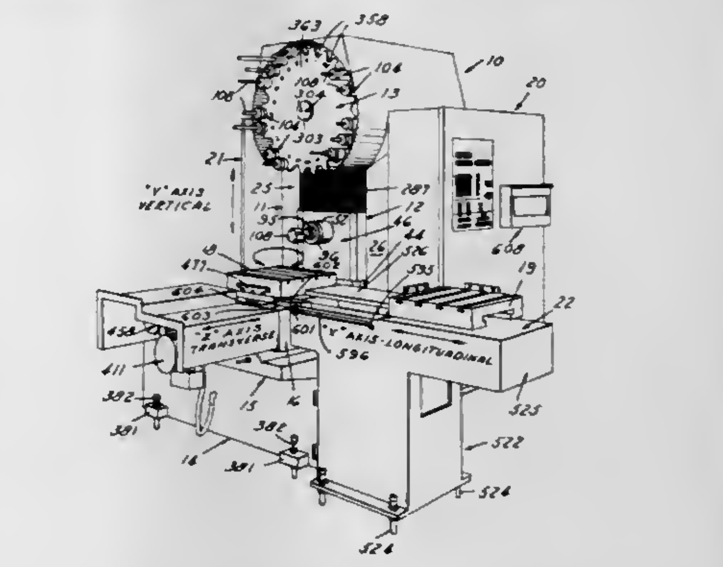
(b) a rotary tool storage and tool changer means rotatably mounted on a third axis which is parallel to said first axis and perpendicular to said second axis, and provided with a plurality of annularly disposed tool holding sockets rotatable in a plane transverse to said third axis and which are each adapted for releasably holding a tool therein;

(c) means for moving said tool spindle slide assembly along said second axis to align said tool spindle with one of said tool holding sockets, whereby said rotary tool storage and tool changer means will releassbly grasp a tool supported in said tool spindle;

(d) means for providing relative axial movement between the tool spindle and the rotary tool storage and tool changer means in one direction for removing said tool from the tool spindle;

(e) means for rotating the rotary tool storage and tool changer means to position a selected tool holding socket in axial alignment with said tool spindle; and,

(f) said means for providing relative axial movement between the tool spindle and the rotary tool storage and tool changer means, also providing relative axial movement in the other direction for inserting another tool from said selected holding socket into the tool spindle.



4,102,036
METHOD OF INSTALLING A SLEEVE BOLT IN AN OPENING

Larry Salter, Lakewood, Calif., assignor to Paul R. Briles, Inglewood, Calif.

Division of Ser. No. 724,412, Sep. 17, 1976. This application Jul. 14, 1977, Ser. No. 815,520

Int. Cl.² B23P *19/02*

U.S. Cl. 29—525 **3 Claims**

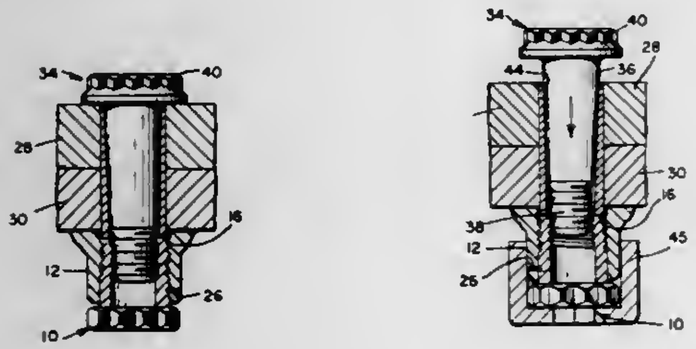
1. A method for installing a tapered shank and mating sleeve in a cylindrical opening located in a plurality of materials adapted to be connected together and comprising the steps of,

pre-assembling a two part installation nut in which the first member has external threads for mating with internal threads on the second member,

then threading internal threads on the first member onto the external threads located on the end of the tapered shank until the end surface of the first member abuts against one end of the projecting sleeve,

then while holding a bearing surface of the second member against the bottommost surface of the material being connected together, rotating the second member until the sleeve is positioned in the cylindrical opening in a desired position,

then locking the first member and second member together, and then while holding the second member against the material, pulling the tapered shank into the opening while at the same time holding the sleeve in the desired position in the opening until the sleeve has been radially expanded.



4,102,037

METHOD OF CREATING A MILLIMETER WAVE SOURCE AND OF ADAPTING SUCH A SOURCE TO WAVEGUIDE TRANSMISSION

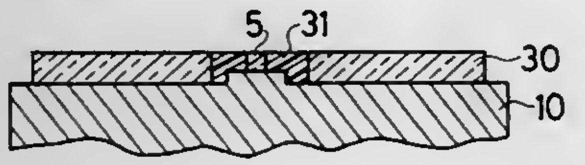
Jacques Espaignol, and Edmond Klein, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 13, 1977, Ser. No. 787,058

Claims priority, application France, Apr. 16, 1976, 76 11442

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—583 **5 Claims**



1. A method of manufacturing a millimeter wave source, said source being formed commencing from a semiconductor diode, comprising the following steps:

(a) the welding of a semiconductor chip, able of operating as an oscillator of the desired frequency, the chip for example being an avalanche diode, to the centre of a metal mounting presenting a projecting platform, the latter extending above a flat portion of said mounting by a height *h*;

(b) etching of said chip by chemical agents, the chip having preiously been protected at its major faces respectively by said metal mounting and by a wax which is resistant to said chemical agents and is deposited upon the opposite face of said mounting;

(c) the positioning around said platform, of an impedancematching device constituted by a cylindrical frustum of a dielectric substance containing an axial hole sufficiently large to surround said projection, said hole ultimately being filled with a polymerisable resin which after polymerisation has a dielectric coefficient of the same order as said dielectric substance;

(d) the polymerisation of the resin followed by the grinding of said matching device in order to bare said semiconductor chip;

(e) the metallising of the part ground during the previous stage.

4,102,038

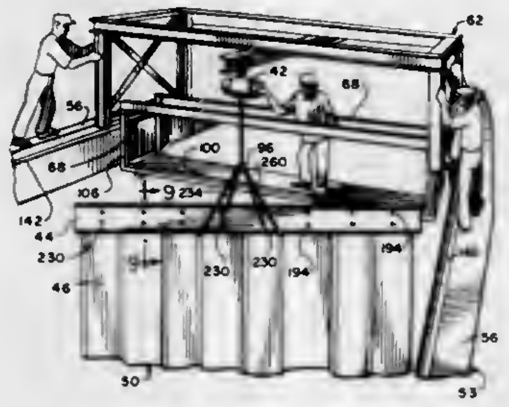
METHOD OF ASSEMBLING COLLECTOR ELECTRODE PANELS IN ELECTROSTATIC PRECIPITATORS

Robert L. Eagan, 9731 Mansfield St., Oak Lawn, Ill. 60453

Filed May 2, 1977, Ser. No. 792,588

Int. Cl.^{2} H01S *4/00*

U.S. Cl. 29—592 R **4 Claims**



1. A method of installing collecting electrode plates in an electrostatic precipitator comprising:

opening one end of a framed, stacked bundle of said plates to expose the mounting bore holes;

attaching a hoisting means to said bore holes and raising the bundle to a substantially vertical position to release the remaining framing;

raising and supporting said feed bundle in a chamber of said precipitator;

arranging said freed plates in the required array and in a substantially coplanar relationship within said chamber to form an assembled collecting electrode assembly;

attaching the top support beams to said array of plates; and

moving said collecting electrode assembly from said support to an operating position in said precipitator chamber.

4,102,039

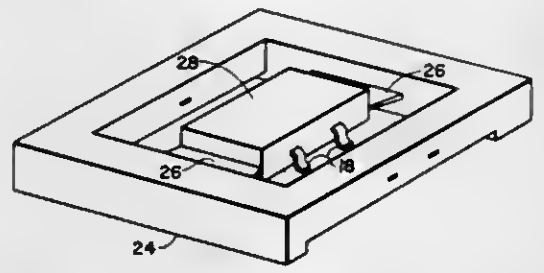
METHOD OF PACKAGING ELECTRONIC COMPONENTS

David L. Henrickson, Phoenix; John J. Kaiser, Scottsdale, both of Ariz.; William C. Koehn, Glasgow, Scotland, and David P. Raven, North Wales, Pa., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1977, Ser. No. 768,298

Int. Cl.^{2} H01L *21/66*

U.S. Cl. 29—593 **4 Claims**



1. A method of packaging an electronic component which comprises:

(a) providing a lead frame having a plurality of device sites and associated terminals at each device site,

(b) attaching at each device site a device to its associated terminals for forming an electrical connection therebetween, and

(c) forming in a single molding step,

a plastic coating over said device for producing an encapsulated device,

a plastic carrier disposed around said encapsulated device, and

frangible plastic tabs integrally connnecting said encapsulated device to said carrier for maintaining said encapsulated device in a fixed supported position within said carrier.

4,102,040

METHOD OF MANUFACTURING A CURVED COMPONENT OF A MAGNETIC CIRCUIT

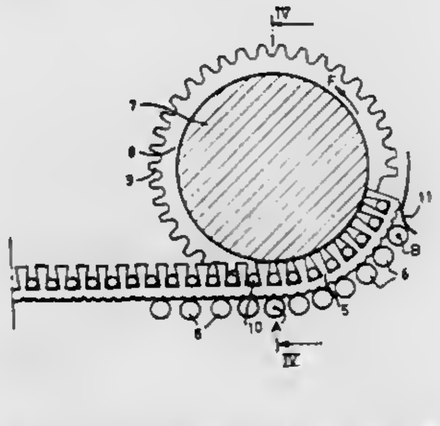
Bernard J. Rich, Issy-Les-Moulineaux, France, assignor to Societe Anonyme pour l'Equipement Electrique des Vehicules S.E.V. Marchal and S.E.V. Alternateurs, both of Issy-Les Moulineaus, France

Filed Jul. 1, 1976, Ser. No. 701,510

Claims priority, application France, Jul. 3, 1975, 7520927; Feb. 17, 1976, 7604317; Feb. 25, 1976, 7605287

Int. Cl.^{2} H02K *15/02*

U.S. Cl. 29—598 **22 Claims**



1. A method of manufacturing a curved magnetic circuit assembly comprising the steps of forming a plurality of flat identical strips defined by two edges having substantially parallel median lines one of said edges of each strip having a plurality of teeth defining slots between the teeth, stacking said strips to form a stack in which the slots are aligned with each other, introducing spindles into said slots in said stack of strips, arcuately bending said stack in a circular former to form a curved magnetic circuit assembly having aligned teeth and slots; wherein said step of introducing spindles comprises introducing spindles into said slots having a length greater than the thickness of the stack of strip; and said step of bending comprises driving said spindles to bend said stack in the circular former.

4,102,041

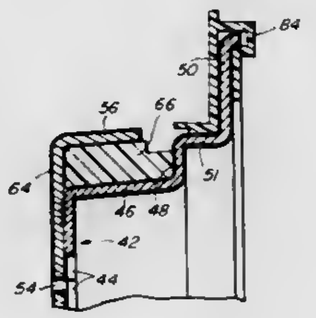
METHOD OF MAKING MICROWAVE OVEN SEAL STRUCTURE

John R. Copping, and Richard A. Foerstner, both of Iowa City, Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa

Filed Mar. 28, 1977, Ser. No. 782,113

Int. Cl.^{2} H01P *11/00;* H05B *9/06*

U.S. Cl. 29—600 **10 Claims**



1. The method comprising:

forming wall portions of a microwave energy choke by bending said portions in an annular region of a first conductive member;

forming a second conductive member with portions overhanging said wall portions by bending said wall portions of said second member;

welding said second member to said first member; and

coating said wall portions of said first member and said overhanging portions of said second member with a protective nonconductive coating after said second member is welded to said first member.

4,102,042

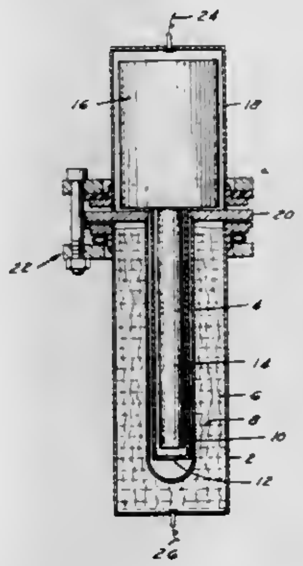
METHOD FOR PREPARING A SODIUM/SULFUR CELL

Steven A. Weiner, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1977, Ser. No. 777,284

Int. Cl.^{2} H01M *6/30*

U.S. Cl. 29—623.2 **7 Claims**



1. A method for preparing a sodium/sulfur cell comprising:

A. inserting a solid sodium slug, adapted to be connected to an external circuit, into the anodic reaction zone of a cell subassembly maintained within an inert atmosphere, said cell subassembly comprising a cell container and a tubular cation-permeable barrier disposed interiorly thereof such that a first reaction zone is located within said cation-permeable barrier and a second reaction zone is located between the outer surface of said cation-permeable barrier and the inner surface of said container, one of said reaction zones being said anodic reaction zone and the other of said reaction zones being a cathodic reaction zone containing a precast composite cathodic reactant comprising a sulfur impregnated porous conductive material connected to said cation-permeable barrier and adapted to be connected to said external circuit; and

B. providing closure means for said subassembly and sealing the same to said subassembly at a temperature less than about 100° C.

4,102,043

PIN INSERTING APPARATUS

Ralph W. Andrade, and Alexander W. Duncan, both of Clayton, N.C., assignors to GTE Sylvania Incorporated, Stamford, Conn.

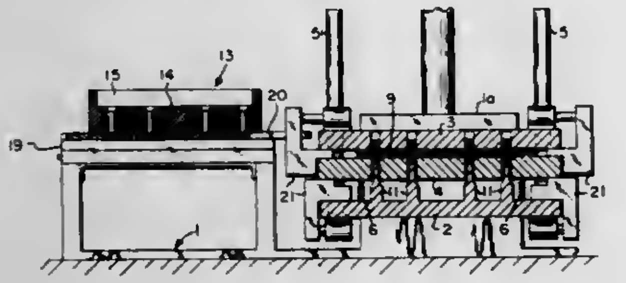
Filed Jan. 17, 1978, Ser. No. 870,188

Int. Cl.^{2} H05K *3/30*

U.S. Cl. 29—739 **1 Claim**

1. Apparatus for inserting electrical connecting pins into holes in a printed circuit board, said holes having predetermined locations, said apparatus comprising a vibrating table means and a press means having a first platten and a parallel second platten with at least one of said first and second plattens movable in a direction perpendicular to said plattens and hav-

ing a parallel intermediate platten positioned between said first and second platten by resilient means, said second platten having a plurality of pin clearance holes, said intermediate platten having a plurality of pin guide holes at least some of which are aligned with said pin clearance holes, said first platten having a plurality of stand-off posts perpendicularly affixed thereto with each of said stand-off posts aligned with one of said pin guide holes, said stand-off posts having smaller diameter than said pin guide holes and having length as great as the length of said resilient means, a pin-loading means having a gate means and a template with attached rim, said template having a plurality of tapered holes at least some of which are alignable with at least some of said pin guide holes, said gate means slidably attached to said template and having gate holes alignable with at least some of said tapered holes.



4,102,044

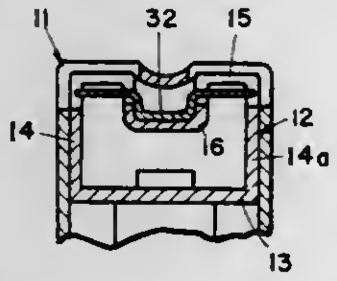
DEVICE TO IMPROVE CUTTING ACTION OF ELECTRIC SHAVERS

James E. Rookus, 2902 Marshall SE. Apt. E-11, Grand Rapids, Mich. 49508

Filed Mar. 16, 1977, Ser. No. 778,232

Int. Cl.^{2} B26B *19/42*

U.S. Cl. 30—34.2 **14 Claims**



11. A blade assembly having an elongated blade of the lengthwise reciprocating type for an electric shaver and an outer screen against which said blade is seated, said blade having a plurality of laterally extending, parallel bars forming its upper face, said bars being spaced apart by slots; a hair entrapment member secured to said blade, said member having a plurality of tongues, one in each slot, said tongues all being co-planar in a plane offset below the lower surface of said bars; said tongues extending substantially the full length of said slots and being narrower than said slots for forming hair receiving openings on each side thereof immediately adjacent to said bars.

4,102,045

HAND TOOL FOR CUTTING ENDS OF DECORATIVE MOLDING

Eugene H. Bergh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 17, 1977, Ser. No. 778,382

Int. Cl.^{2} B26B *29/00*

U.S. Cl. 30—287 **3 Claims**

1. A hand tool for cutting and forming terminating ends on a flexible esthetic molding product, said tool comprising

an anvil having a support surface with a front and a rear edge shaped to support a surface of said molding product and wall means adjacent said rear edge defining two pairs of angularly disposed guide surfaces for positioning an edge of said molding product in first and second fixed locations during cutting operations,

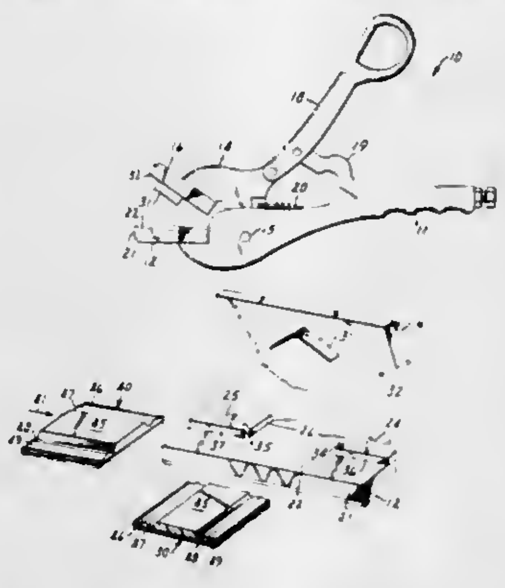
an uninterrupted cutting knife having angularly disposed cutting edges between its ends with a vertex thereof contacting said support surface adjacent said front edge and the ends thereof contacting said support surface adjacent the rear edge for cutting said molding product when disposed on said anvil and contacting a pair of said guide surfaces, said cutting knife being adapted to cut a predetermined pattern in the molding product at an end thereof when the molding product is placed against a first pair of guide surfaces and to cut an insert to mate said end when the molding product is positioned against a second pair of guide surfaces, wherein said first pair of guide surfaces position a molding product transverse to said cutting knife and positioned between the ends of said knife to sever the molding product across its width and said second pair of guide surfaces define a path generally parallel to a line joining the ends of the cutting knife to cut an insert from an edge of the molding,

a support member for supporting said knife,

a handle,

a lever pivoted on said handle, and

a jaw member connected to each of said handle and lever for supporting said anvil and said support member for moving said knife through said molding product supported on said support surface upon relative movement between said handle and lever to bring said jaw members toward each other.



4,102,046

CUTTING EDGES COATED WITH POLYFLUOROCARBON POLYMER

Keith Stanley Downing, Tilehurst, and Richard Johnston, Woodley, both of England, assignors to The Gillette Company, Boston, Mass.

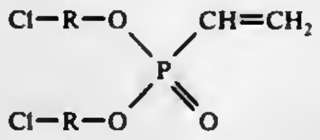
Filed May 2, 1977, Ser. No. 793,144

Claims priority, application United Kingdom, Jun. 5, 1976, 18652/76

Int. Cl.^{2} B26B *21/54*

U.S. Cl. 30—346.53 **8 Claims**

1. A cutting edge having an outer surface of alumina, silica, tungsten, titanium or tantalum, said outer surface being coated with a sintered polyfluorocarbon polymer to which there had been added prior to sintering a bis-(chloroalkyl) vinyl phosphonate selected from the group represented by the formula:



wherein each R is an alkylene group comprising 1 to 4 carbon atoms.

4,102,047

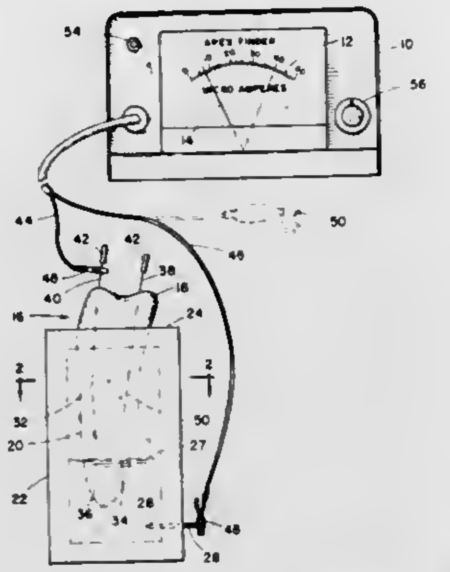
DENTAL TEACHING DEVICE

Barva N. Walker, Mesquite, Tex., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed Apr. 18, 1977, Ser. No. 788,218

Int. Cl.^{2} G09B *23/28*

U.S. Cl. 32—71 **3 Claims**



1. A teaching device to acquaint dental students with endodontic root canal techniques performed by dentists and comprising in combination:

(a) an electronic oscillator having a scale reading in electric current measurements,

(b) a transparent model of a human tooth including root and cusp formed from electrical insulating material in a greatly enlarged size compared to a human tooth,

(c) a transparent enclosure having a hollow interior into which the root portion of said tooth model extends and the cusp of the tooth model extending above the upper end of said enclosure,

(d) said tooth model having one or more elongated root canal-simulating passages of uniform diameter therein extending from the cusp to the lower end portion of the root of said tooth model,

(e) a saline solution in the lower part of said enclosure extending around the lower end of said root at least to the lower ends of said canal-simulating passages,

(f) small diameter metal wires simulating dental reamers and files and closely complementary in diameter to said canal-simulating passages for slidable movement therein, said wires having a length greater than said passages, one end of said wires extending above the cusp at all times for manual engagement and manipulation of said wires within said passages,

(g) a metal ground element extending through a wall of said enclosure into said solution and having an exterior terminal end, and

(h) electrical circuit conductors connectable respectively between said oscillator and one of said metal wires and said ground element, whereby when the lower end of one of said wires is projected to the lower end of the passage in which it is mounted to contact the solution surrounding said root, the needle of said oscillator will move to a predetermined value on said scale of said oscillator which will correspond to an electrical value indicating that the lower end of said wire is exactly at the lower end of said passage in the root of said tooth model.

4,102,048

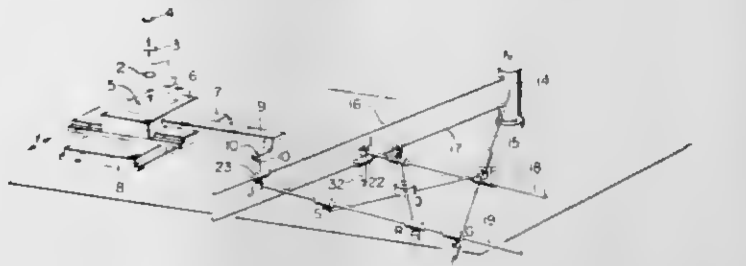
DEVICE FOR CORRECTING POSITIONAL DEVIATION AND REDUCED SCALE OF PHOTOGRAPH

Takashi Maruyama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 578,082, May 16, 1975, abandoned. This application Feb. 27, 1976, Ser. No. 662,090

Int. Cl.^{2} G06G *7/00*

U.S. Cl. 33—1 A **6 Claims**



1. A device for correcting, with respect to the reference plane of an object having a group of contour lines thereon, the positional deviation and variation on a reduced scale created corresponding to the height of each contour line when the object is photographed on film through a photographic objective, the device comprising:

tracing means for tracing and generating a displacement along each of the contour lines photographed on the film;

a shaft provided on a point (N);

a correction mechanism including first guide bar means rotatably supported on the shaft, second guide bar means rotatably supported on the shaft, the first and the second guide bar means intersecting at the point N on the shaft with a predetermined angle (α), two parallel bars slidably mounted on and intersecting each of the first and the second guide bar means, means for maintaining the parallel bars parallel to each other, means for setting said parallel bars to said first guide bar means so that each distance ($\overline{NF}$) and ($\overline{NG}$) from the intersecting point (N) of the first and the second guide bar means to the intersecting points (F, G) between said first guide bar means and said two parallel bars, may satisfy the relationship

$$\frac{\overline{\overline{NF}}}{\overline{\overline{NG}}} = \frac{H - \Delta H}{H}$$

where H is the distance from the center of the photographic objective to the reference plane of the object, and ΔH is a distance from the contour line being traced by the tracing means to said reference plane,

said correction mechanism being connected to said tracing means at a point (J) where one of said two parallel bars which intersects said first guide bar means at the point (G) intersects said second guide bar means so that when said tracing means traces a principal point on the film the relation NF = NG may be attained; and

an indicating means for indicating a locus provided at a point (I) of intersection between the other one of said two parallel bars and said second guide bar means.

4,102,049

GRIP MEASURING DEVICE

Carl A. Harth, 1205 Wynnewood Dr., West Palm Beach, Fla. 33409

Filed Jan. 17, 1977, Ser. No. 759,664

Int. Cl.^{2} G01B *3/02*

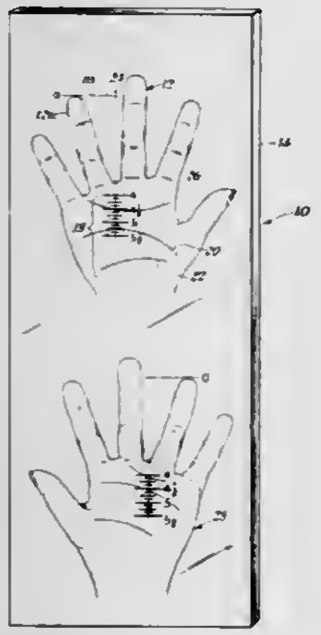
U.S. Cl. 33—1 B **1 Claim**

1. A device for measuring the size of the human hand to

establish a grip size for use in determining a tennis racquet grip size or the like comprising:

a rigid, transparent planar surface;

an indicia outline of a human hand disposed on said surface and an indicia line disposed on said surface representing the longest palm crease of a human hand within said human hand outline;



a plurality of incremental measurement marks disposed on said surface displaying measurement values measured from the outline ring finger tip to the central hand outline indicia, said measurement marks being representative of the distance from the ring finger tip to a palm crease on the hand, said measurement marks being disposed in an area relative to the human hand outline to provide measurement from the ring finger tip to a particular palm crease of the human hand.

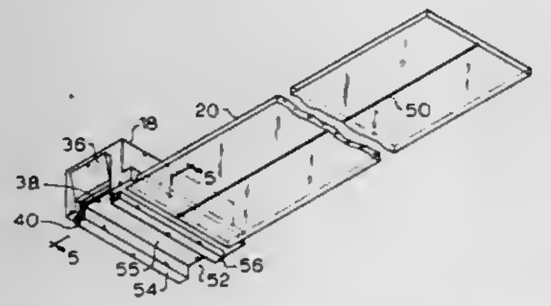
4,102,050
CURSOR ASSEMBLY

Ronald Arthur Roth, 274 Burton Avenue, Barrie, Ontario, Canada (L4N 2S2)

Filed Oct. 15, 1976, Ser. No. 732,732

Int. Cl.^{2} B43L *13/04*

U.S. Cl. 33—76 R **4 Claims**



1. A cursor assembly for use on a viewing window of a microfiche viewer or the like comprising:

(a) a ferrous guide rail adapted to be secured to a surface of a viewing window of a reader,

(b) a slide member having a slipway recess extending longitudinally thereof, said slide member being mounted on said guide rail with said guide rail extending longitudinally through said slipway to guide said slide member along said guide rail,

(c) a permanent magnet carried by said slide member, said slipway being located within the magnetic field of said magnet whereby said slide member may be magnetically secured with respect to a guide rail extending through said slipway,

(d) a reader bar projecting outwardly from said slide member to extend across a viewing window in use,

(e) said slipway being wider than said guide rail to permit said slipway to be angularly inclined with respect to said guide rail to be angularly adjustable with respect to said guide rail to be aligned with images readable at said viewing window,

(f) said slipway recess is U-shaped and has a pair of oppositely disposed side walls formed from a ferrous material which is magnetized by said permanent magnet whereby each of said side walls of said slipway recess is magnetically attracted to said guide rail such that when one or other of the side walls of the U-shaped slipway recess engages said guide rail said reader bar will extend at right engles to said guide rail and when said slipway is angularly inclined with respect to said guide rail opposite ends of said side walls will be magnetically secured to said guide rail to secure the reader bar in an angularly inclined position with respect to said guide rail.

4,102,051
SIDE-BAR FOR MEASURING AND/OR TRACING DEVICE

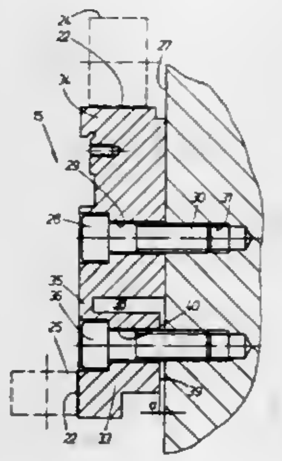
Karl Reiff, Plochingen, and Klaus Masur, Esslingen, both of Germany, assignors to Fa. C. Stiefelmauer K.G., Esslingen, Germany

Filed Dec. 27, 1976, Ser. No. 754,818

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609670

Int. Cl.^{2} G01B *5/20;* **F16C** *23/00*

U.S. Cl. 33—174 P **16 Claims**



1. A guide rail, for guiding the carriage of a measuring or tracing device along one longitudinal side of a stationary levelling plate having an upper plane surface with a linear reference line thereon, and means for securing said guide rail along said one side of said levelling plate, said guide rail including:

(i) a first strip section extending along the whole of the length of the rail and having thereon a longitudinal guide surface for positioning said carriage in a plane parallel to a plane transverse to said plane surface and passing through said reference line

(ii) a second strip section having thereon:

(a) a carriage-bearing guide surface for positioning said carriage in a plane parallel to the plane defined by said plate upper surface, and

(b) a butting face for abutting against the side of the plate

(iii) flexible bi-axial joint means connecting said first strip to said second strip over at least a major part of their length, whereby, with said second strip section secured to the levelling plate with the butting face butted against the side of the plate, said first strip section may be moved, relative to said second strip section, normal to said guide surface for bringing the guide surface into parallelism with the reference line.

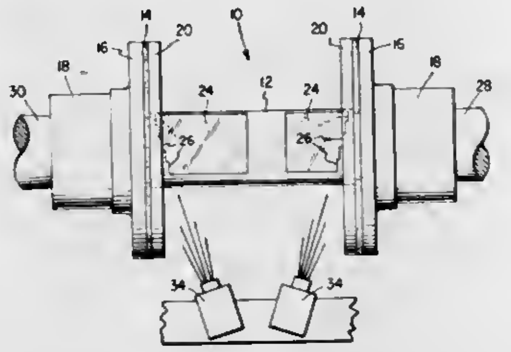
4,102,052
DEFLECTION INDICATOR FOR COUPLINGS

Heinz P. Bloch, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 14, 1976, Ser. No. 750,521

Int. Cl.^{2} G01B *5/25, 11/27*

U.S. Cl. 33—180 R **13 Claims**



1. A system for monitoring axial deflection in turbomachinery coupling when operating in the presence of stroboscopic flashing of predetermined frequency, including a torque tube having at least a flexible diaphragm at an end thereof adapted to coupling a shaft thereto, and an inner guard having a central bore substantially parallel with and radially spaced from the outer surface of said central tube, and

deflection indicator means on said tube adjacent and partly underlying said guard, said indicator means including a plurality of indicium constructed and arranged for providing an indication of axial positioning of said shaft when coupled to said coupling with respect to said tube when viewed in the presence of said flashing, said indicium including first indicia corresponding to an axially aligned position of said coupling with said shaft and second and third indicium for indicating axially misaligned positions thereof, wherein said second indicia correspond to a misalignment in a first direction and said third indicia correspond to misalignment in a second direction opposite to said first direction.

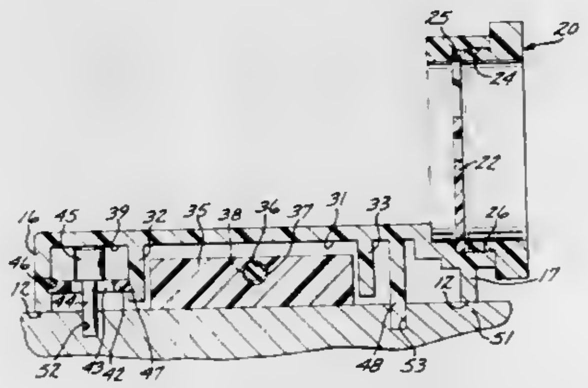
4,102,053
REMOVABLE RIFLE SIGHT

Stephen Earl Colwell, Westminster, Calif. 92676

Filed Jul. 11, 1977, Ser. No. 814,170

Int. Cl.^{2} F41G *1/08*

U.S. Cl. 33—233 **6 Claims**



1. A sighting device adapted for convenient substitution for a rear sight assembly attached by way of a fore and aft tapped opening in the barrel structure of a fire arm, comprising:

a rectangularly shaped support fixture which includes a central cavity on the interior thereof communicating to the exterior across a first lateral surface of said fixture, and a fore and aft cavity respectively formed in said fixture in longitudinal relationship adjacent said central cavity;

a ceramic magnet conformed for sliding receipt in said central cavity, including a transverse bore formed thereacross;

a lever assembly mounted for pivotal motion across said central cavity and including an eccentrically disposed center segment conformed for receipt in said transverse bore;

a support plate including a longitudinal slot receipted in said fore cavity in substantially parallel alignment with said first lateral surface, said longitudinal slot being disposed in longitudinal alignment relative said fixture;

a forward pin received for translation within said longitudinal slot and extending for insertion in said fore tapped opening;

an aft pin attached within said rear cavity and extending for receipt within said aft tapped opening; and

a sighting aperture assembly formed on said fixture in adjacent proximity relative said aft pin.

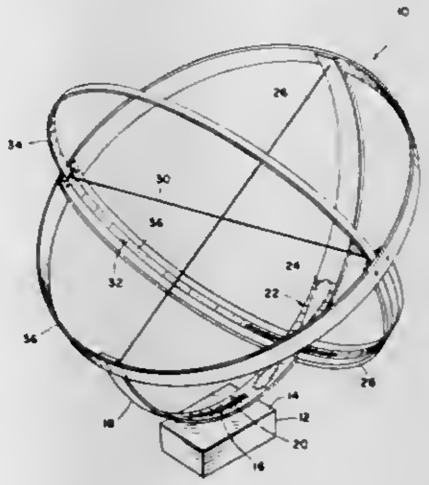
4,102,054
SUNDIAL

Kemp S. Lewis, Tulsa, Okla., assignor to Danny R. Williams and Kenneth D. McPhail, both of Bartlesville, Okla.

Filed Apr. 28, 1977, Ser. No. 791,719

Int. Cl.^{2} G01C *21/02, 17/34*

U.S. Cl. 33—270 **9 Claims**



1. An adjustable sundial comprising:

(a) a first semi-circular member, a straight cord means subtended between the ends of the first semi-circular member, date calibrations inscribed on the concave surface of the first member extending approximately plus or minus 23.5° about the midpoint of the first semi-circular member, and having spacing corresponding to the sun's declination;

(b) a second semi-circular member of substantially the same size as the first member, the midpoint of the second member being secured to the midpoint of the first member and at a right angle with respect thereto, a second straight cord means subtended between the ends of the second member and crossing said first cord means at a right angle with respect thereto;

(c) a circular segment slip ring member having the same radius and curvature as the second member reciprocally disposed on the concave surface of said second member, a plurality of equally spaced time calibrations ranging from morning to evening on the concave surface of said slip ring, the 12 o'clock indicia being located near the midpoint thereof; and

(d) sun declination adjusting means carried by the sundial and cooperating with the slip ring member for correcting the time according to the sun's declination.

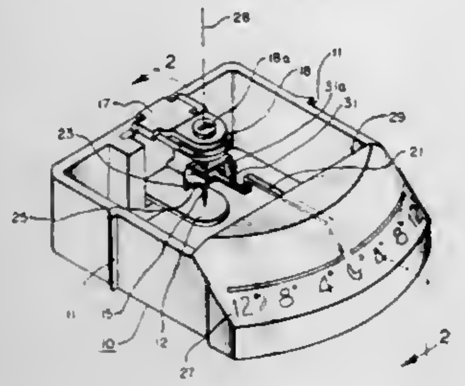
4,102,055
SENSITIVE INCLINOMETER

Joseph A. Volk, Jr., Florissant, Mo., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 28, 1977, Ser. No. 782,130

Int. Cl.² G01C *9/12*

U.S. Cl. 33—345 **1 Claim**



1. A sensitive inclinometer for indicating angular deflection from vertical comprising:

a bracket assembly

a shaft;

means, including a bracket mounted in said bracket assembly and having bearing means, for rotatably mounting the two ends of said shaft;

a needle extending generally perpendicular to said shaft, having a free end and one end secured to said shaft and rotatable therewith in a direction and to an extent determined by the direction and amount of rotation of said shaft from a reference position;

a generally horizontal graduated scale, on said bracket assembly, having degree indicia thereon, the free end of said needle pointing to the center of said scale when said shaft is in its reference position;

a magnetic spring system, including a magnet secured to said shaft rotatable therewith and a fixed magnet secured to said bracket assembly, for positioning said needle to its reference position when said shaft is vertically aligned, while the indicia at the center of said scale indicating that a zero deflection or tilt angle exists between the shaft's axis and vertical;

a first weight, including a first metal tab offset from and extending at a right angle to said needle, secured to and offset from said shaft, the gravitational force on said first weight being in a direction parallel to the shaft's axis when said shaft is vertically aligned, thereby exerting no torque on said shaft,

said first weight producing a clockwise torque on said shaft when said shaft is titlted in one direction away from vertical and in the tilt plane defined by said shaft and the center of said scale, thereby causing pivoting of said needle to a point on one side of the center of said scale to indicate the tilt direction and also the tilt angle between the shaft's axis and vertical,

said first weight exerting a counterclockwise torque on said shaft when said shaft is tilted in the tilt plane in the other direction away from vertical, thereby effecting pivoting of said needle to a point on the other side of the center of said scale to indicate the tilt direction and angle,

said magnetic spring system producing, when said shaft is tilted, a countertorque on said shaft equal and in opposition to the torque produced by said first weight in order to hold said needle steady on said scale;

and a second weight, including a second metal tab fixed to and offset from said shaft on the side opposite said needle and extending in alignment with said needle, for counterbalancing the weight of said needle so that said needle produces no torque on said shaft regardless of the tilt angle.

4,102,056
METHOD AND APPARATUS FOR INTRODUCING A PARTICULATE OR PULVERULENT MATERIAL INTO A FLOW OF GAS

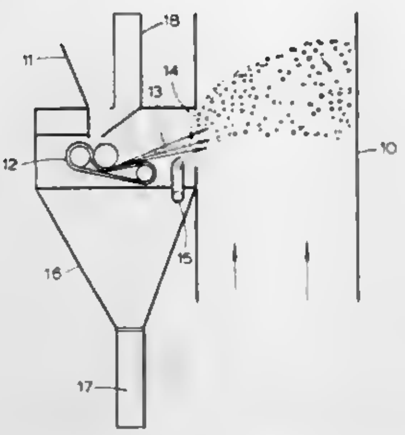
Peter Aage Rørby Angelo, Allerød; Ole Klingest, Lyngby, and Christian Schwarzbach, Glostrup, all of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Apr. 22, 1976, Ser. No. 679,368

Claims priority, application Denmark, Apr. 22, 1975, 1726/75

Int. Cl.² F26B *3/08*

U.S. Cl. 34—10 **6 Claims**



1. A method of introducing a particulate or pulverulent material into a flow of a first gas confined within a substantially vertical tube or duct having a lateral inlet opening so as to transport said material within said duct by said gas flow, said method comprising:

throwing a freely floating or airborne stream of said material from mechanical conveyor means into said tube or duct inlet opening from a position substantially spaced therefrom, said freely floating stream of material being exposed to at least one generally transversely directed jet of a second gas outside said duct so as to spread the particles of material in said stream and direct them into said duct through said inlet opening.

4,102,057
MANUFACTURE OF DETERGENT COMPOSITIONS

Michael David Key, Rotterdam, Netherlands, and William Gordon McNee, Chester, England, assignors to Lever Brothers Company, New York, N.Y.

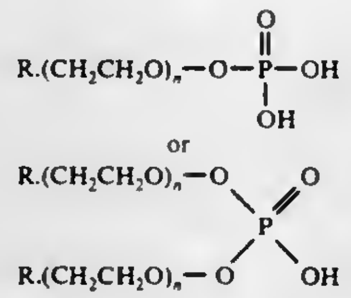
Filed Mar. 3, 1977, Ser. No. 774,070

Claims priority, application United Kingdom, Mar. 5, 1976, 8935/76

Int. Cl.² F26B *3/08*

U.S. Cl. 34—10 **5 Claims**

1. In a spray-drying process for manufacturing a fabric washing detergent powder which contains an alkoxylated alcohol nonionic surfactant and a $C_{12\text{-}20}$ mono- or dialkyl phosphate having the general formula



$$\mathrm{R.(CH_2CH_2O)_n{-}O{-}\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle OH}{|}}{P}}{-}OH}$$

or

$$\mathrm{[R.(CH_2CH_2O)_n{-}O]_2P({=}O){-}OH}$$

wherein R is a $C_{12\text{-}20}$ alkyl group and n is 0 or an integer from 1–15

wherein a main crutcher slurry of fabric washing powder components is pressurised, conveyed in a high pressure line to the nozzles of a spray-drying tower and spray-dried to a powder, the improvement which comprises dissolving or suspending the mono- or dialkyl ester of phosphoric acid in the nonionic surfactant and introducing the resultant solution or suspension into the high pressure line.

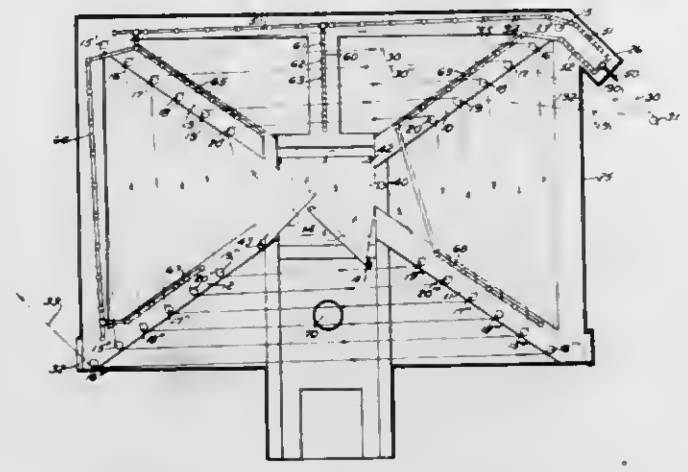
4,102,058
FABRIC FINISHING MACHINE

Lloyd Foster, Sr., Chopmist Hill Rd., Box 61, Chepachet, R.I. 02814

Continuation-in-part of Ser. No. 779,624, Mar. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 650,846, Jan. 21, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,928

Int. Cl.² F26B *13/00*

U.S. Cl. 34—155 **14 Claims**



1. In a fabric finishing machine a group of rolls over which the fabric web is lead comprising means for directing the incoming fabric web to said group of rolls, a first roll at an angle to the direction of feed of the incoming web about which the web is lead with its back to said roll, a second roll with its axis at an angle to the first roll about which the web is lead with its back to said second roll, and a third roll with its axis at an angle to the first and second rolls and not parallel to either about which the web is lead with its back to the said third roll to reverse the face and back of the fabric web as it enters and leaves the group of rolls.

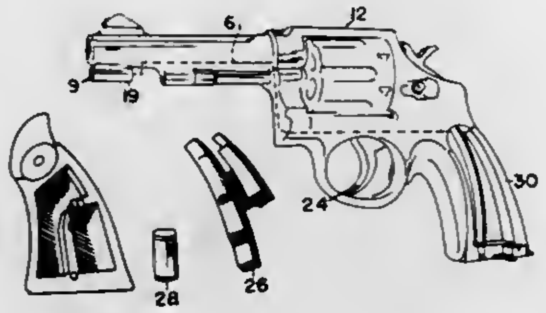
4,102,059
SMALL ARMS LASER TRAINING DEVICE

Joe W. Kimble, Vienna, Va.; Duane A. Burchick, Greenbelt, Md., and Edsel E. Dotson, Alexandria, Va., assignors to Cerberonics Inc., Falls Church, Va.

Division of Ser. No. 564,861, Apr. 3, 1975, Pat. No. 3,995,376. This application Aug. 2, 1976, Ser. No. 710,676

Int. Cl.² G09B *9/00*

U.S. Cl. 35—25 **10 Claims**



1. A weapon marksman training system comprising in combination, a barreled weapon adapted to be selectively operated from a number of modes including live fire, laser means mounted to said weapon in parallel axial alignment with the bore of the barrel, laser pulse generating means completely enclosed in said weapon and located remote from said laser means, said laser pulse generating means being electrically connected to said laser means by connecting circuitry, said laser pulse generating means comprising a power source and an electrical circuit connected to said power source, said laser pulse generating means adapted to cause said laser means to generate a burst of coherent light, a target adapted to be used with said laser weapon, said target comprising a housing, sensor means mounted to said housing, said sensor means adapted to produce an electrical pulse when struck by coherent light, circuit means connected to said sensor means adapted to transmit only electrical pulses of a predetermined width and amplitude and indicator means electrically connected to said circuit means to receive said pulses from said circuit means and produce a signal indicating a true hit on said target from said weapon.

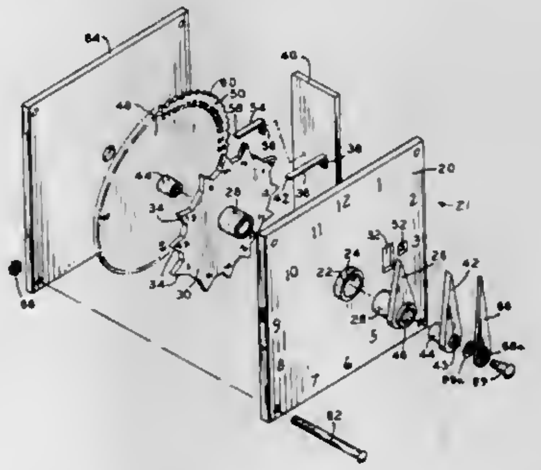
4,102,060
TEACHING AID FOR READING AN HOROLOGICAL CLOCK

Ronald G. Berry, R.R. #2, Columbia City, Ind. 46725

Filed Dec. 20, 1976, Ser. No. 752,434

Int. Cl.² G09B *19/12*

U.S. Cl. 35—39 **3 Claims**



1. A teaching aid for reading an horological clock having a rotatable minute hand and a rotatable hour hand comprising:

a clock face having horological divisions placed in sequential relation thereon;

first means for rotatably supporting an hour hand substantially centrally of said divisions and related to said divisions in sufficient proximity to visually identify the position of said hour hand relative said divisions;

second means for rotatably supporting a minute hand concentrically with and separately from said hour hand and related to said divisions in sufficient proximity to visually identify the position of said minute hand relative said divisions;

third means for digitally indicating at a predetermined display area the divisions corresponding to the respective placements of said hour and minute hands;

means for displaying said digital indications to digitally represent at said display area the division at which said hour hand is placed and the horological earlier division of the two nearest adjacent divisions between which said hour hand is placed for all horological readings and for accurate horological coordination between the hour and minute hands;

third means comprises a first disc associated and rotatable with said hour hand; said first disc carrying a first set of digital numerals corresponding to said hourly horological divisions;

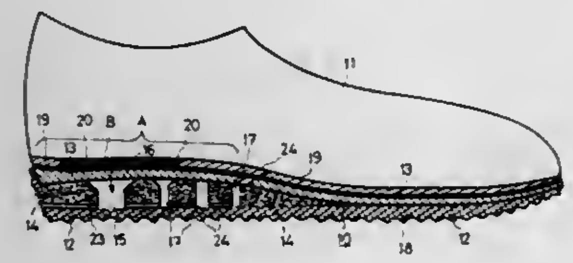
said third means further comprising a second disc having a diameter an increment different than the diameter of said first disc and rotatably with said minute hand; said second disc carrying a second set of digital numerals corresponding to the horological minute divisions; said second set of numerals being registerable with said display area and being spacedly positioned on said second disc to digitally

represent at said display area that division at which said minute hand is placed for all horological readings;
said first disc having a radially extending projection corresponding to each of said digital numerals in said first set;
a first resilient arm having one end fixedly mounted relative said clock face, and the other end of said first arm being registerable with said projections to resiliently bear against said first disc projections thereby audibly indicating change in rotative position of said first disc from one digital numeral to a next adjacent numeral.

4,102,061
SHOE SOLE STRUCTURE

Seppo Saaristo, Vantaa, Finland, assignor to Karhu-Titan Oy, Finland

Filed Mar. 2, 1977, Ser. No. 773,655
Claims priority, application Finland, Mar. 8, 1976, 760588
Int. Cl.² A43B *13/18*
U.S. Cl. 36—28 **7 Claims**



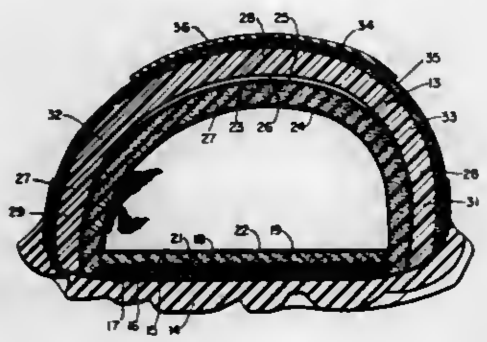
1. In a shoe, an insole, an outsole, and a midsole situated between said insole and outsole, and a wedge member situated between said midsole and outsole at a heel region thereof and extending from said heel region toward an arch region of said midsole and outsole, said wedge member having an upper region situated next to said midsole and being formed with at least one opening extending from said midsole at said upper region of said wedge member downwardly toward said outsole, said opening having a maximum area directly next to said midsole at the lower surface thereof and tapering downwardly for at least part of the distance from said midsole said insole and midsole both being of sufficient flexibility to extend at least partly into said opening of said wedge member when the shoe is worn with the foot of the wearer pressing downwardly on said insole and through the latter on said midsole, whereby the shoe can adapt itself to differently shaped feet while affording a uniform support for the foot, said insole and midsole cooperating with said opening for decreasing the volume thereof when said insole and midsole are displaced downwardly when receiving the weight of a foot in said shoe with said insole and midsole having sufficient elasticity to move outwardly of said opening, increasing the volume thereof, when the weight of the foot is not transmitted to said wedge member.

4,102,062
SAFETY BOOT WITH METATARSAL PROTECTION

Richard R. Adams, Bettendorf, Iowa, assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Jul. 18, 1977, Ser. No. 816,805
Int. Cl.² A43B *13/22*
U.S. Cl. 36—72 R **9 Claims**

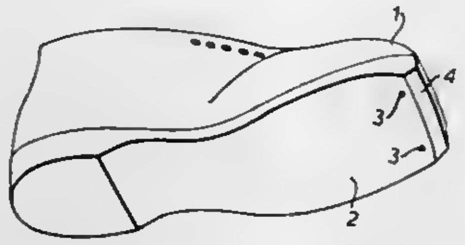
1. In a safety boot having an upper portion and a lower foot receiving portion extending from an ankle region to a toe enclosing region and a sole on the bottom of said foot receiving portion, means incorporated in said foot receiving portion providing wearer instep protection comprising a U-shaped guard of hard non-brittle synthetic plastics material extending arcuately at its upper part over the metatarsal portion of the wearer's foot and extending substantially straight downwardly at its sides at opposite sides of the wearer's foot to terminate in edges in substantial abutment with the sole whereby impact and crushing forces are transmitted substantially straight down said sides to be distributed and absorbed along said sole, said guard being relatively rigid but capable of temporary deformation and return to shape under excessive impact, and said foot receiving portion comprising an inner cushion wall region for extending around and enclosing the wearer's foot inwardly of said guard free of attachment to said upper part of said guard.



4,102,063
SKI-BOOT

Jacob Iblen, Brandbu, Norway, assignor to Alfa Skofabrik A/S, Brandbu, Norway

Filed Feb. 7, 1977, Ser. No. 766,008
Claims priority, application Norway, Apr. 30, 1976, 761495
Int. Cl.² A43B *5/04;* **B62B** *0/00*
U.S. Cl. 36—117 **3 Claims**



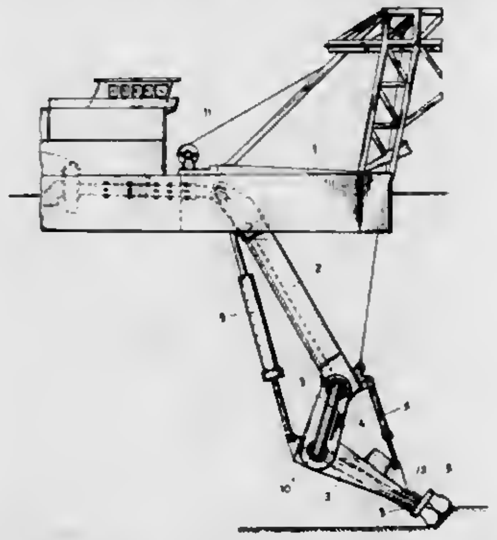
1. In a cross-country ski-boot of the type including a front portion, a heel portion, and a relatively flexible sole to be used for cross-country skiing wherein the heel is repeatedly raised and lowered relative to the ski-binding during normal cross-country skiing activity, the sole including holes in its underside for engaging studs on a plate of a toe-binding type of ski-binding which retains the front portion against the plate and leaves the heel portion unrestrained in a manner enabling the heel portion to be repeatedly freely raised and lowered relative to the front portion and to the plate; the improvement wherein the front edge of the sole located in front of the holes is inclined upwardly and forwardly to permit a limited forward rolling motion of the boot as the heel portion is raised during normal cross-country skiing activity before appreciable bending of the sole occurs, to minimize being stresses in the front portion of the boot during raising and lowering of the heel portion.

4,102,064
SWELL COMPENSATOR FOR SUCTION DREDGING SYSTEM

Hendrik Pot, Alblasserdam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Sep. 7, 1976, Ser. No. 721,048
Claims priority, application Netherlands, Sep. 5, 1975, 7510520
Int. Cl.² E02F *3/90*
U.S. Cl. 37—67 **5 Claims**

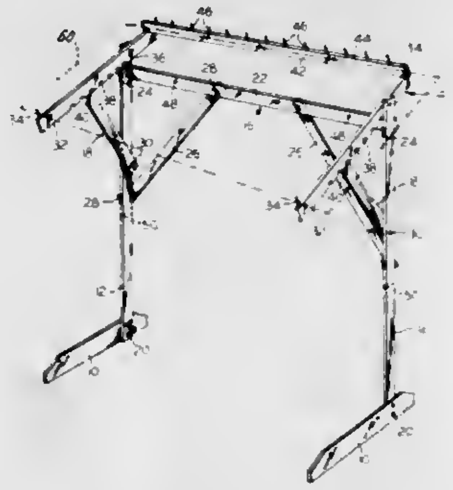
1. In a suction dredging system comprising a vessel having an arm or ladder pivotally secured to it about a horizontal axis, which can be placed and held in an obliquely downwardly directed position and which itself comprises an upper and a lower part which are pivotally interconnected about spaced horizontal axes by a link that makes an angle with both parts of the ladder in such a manner that motions of the upper part of the ladder in a vertical plane are hardly transmitted to the lower part of the ladder, the lower part of the ladder supporting the suction mouth of a suction pipe and a cutting member of the type that rotates around a shaft substantially extending in the vertical plane of the ladder, and a pair of hydropneumatic springs acting between said lower part of the ladder and another portion of said dredging system; the improvement in which said springs lie in different planes parallel to said horizontal axes.



4,102,065
ADJUSTABLE STAND FOR NEEDLEWORK AND THE LIKE

Boynton Selden, West Hartford, Conn., assignor to Michele R. Selden, Trustee, West Hartford, Conn.

Filed May 16, 1977, Ser. No. 796,859
Int. Cl.² D05C *1/02;* **D06C** *3/08*
U.S. Cl. 38—102.1 **10 Claims**

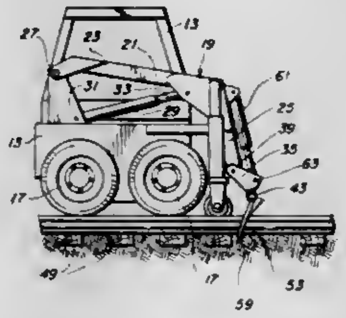


1. A collapsible and adjustable stand for supporting needlework and the like comprising:
A. a pair of horizontally spaced base members;
B. a pair of horizontally spaced vertical leg members;
C. disengageable fastening means securing the lower ends of said vertical leg members to said base members with said base members extending in parallel spaced relationship and adapted to support the stand upon a floor or like surface and with said leg members extending vertically upwardly therefrom in spaced parallel relationship;
D. needlework support means including:
(1) a pair of elongated horizontally spaced end elements extending parallel to said base members and adjacent the upper ends of said vertical leg members;
(2) a multiplicity of spaced upwardly projecting pins on said support means to retain the associated needlework on said support means;
E. detachable fastening means pivotally mounting said end elements of said needlework support means upon the upper end portions of said vertical leg members;
F. angular adjustment means for said support means including:
(1) strut members extending upwardly from said vertical leg members to said end elements of said support means, said strut members and end elements having cooperating means permitting engagement of the upper end portions of said strut members at each of a multiplicity of points spaced along the length of said end elements; and
(2) detachable fastening means pivotally securing the lower end portions of said strut members to said vertical leg members, whereby said support means may be adjusted into a multiplicity of angularly pivoted positions relative to said leg members; and
G. bracing means extending between said vertical leg members intermediate the length thereof and including:
(1) an enlongated brace member extending between said vertical members intermediate the length thereof; and
(2) detachable fastening means securing said brace member to said vertical leg members.

4,102,066
SCARIFYING APPARATUS AND METHOD FOR RAILROAD BED BALLAST REMOVAL

James W. Christoff, R.R. #1, Box 199, Crete, Ill. 60417

Filed May 11, 1977, Ser. No. 795,717
Int. Cl.² E02F *5/22;* **E01B** *29/06*
U.S. Cl. 37—104 **9 Claims**

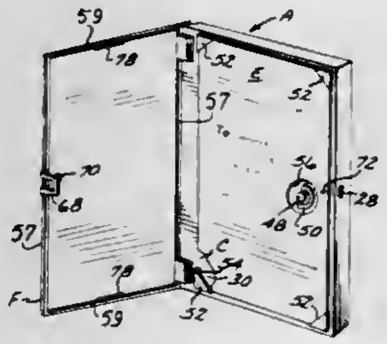


1. Scarifying apparatus for removing ballast from a railroad bed, to permit the insertion of a cross tie under a pair of parallel rails supported by the ties, the scarifying apparatus being mounted on a vehicle movable along the rails and comprising:
a frame movably mounted on the vehicle;
a first digging plate pivotally mounted on said frame along an axis transverse to the rails, said first digging plate extending between the rails;
a second digging plate pivotally mounted on said frame along an axis transverse to the rails, said second digging plate being located outwardly of one of the rails;
a third digging plate pivotally mounted on said frame along an axis transverse to the rails, said third digging plate being located outwardly of the other rail;
each of said digging plates having an insertion portion along the outer edge thereof, each of said insertion portions being positioned at an obtuse angle with respect to the forward surface of the respective digging plate;
first driving means to move said frame;
second driving means to pivot said digging plates, said first and second driving means actuated at appropriate times in conjunction with a predetermined movement of the vehicle to form a tie receiving trench of the proper dimensions with the removed ballast being positioned for refilling of the trench;

- a first retractable arm to be extended under one of the rails during the trench forming operation while being retracted during the lowering and raising of said digging plates;
- a second retractable arm to be extended under the other rail during the trench forming operation while being retracted during the lowering and raising of said digging plates; and
- third driving means to extend and retract said retractable arms.

4,102,067
COMBINED GREETING CARD AND MUSIC BOX STRUCTURE

Fred A. Tarrant, 9661 Skylark Blvd., Garden Grove, Calif. 92641
Filed Oct. 6, 1976, Ser. No. 730,266
Int. Cl.² G09F *27/00*
U.S. Cl. 40—455 **2 Claims**

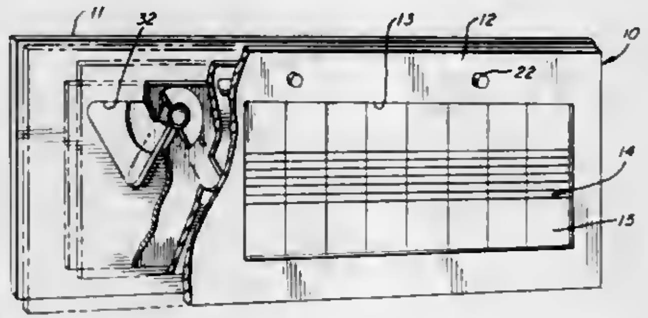


1. A combined greeting card and music box structure that includes:

- a. a spring actuated music box mechanism that has first and second oppositely disposed side surfaces, and a spring loaded actuator pin that projects outwardly from said first surface and normally occupies a first position where it prevents operation of said music box mechanism, but said actuator pin when allowed to move to a second position causing said spring actuated music box mechanism to operate;
- b. a box formed from a resilient material, which box includes a back that has a forward and rearward surface, and a continuous side wall that extends forwardly from said back;
- c. a greeting card;
- d. a cover that closes and cooperates with said box to define a confined space, said cover having first and second side surfaces said cover having said spring actuated music box mechanism secured to said first side surface and extending into said confined space and said actuator pin extending forwardly from said mechanism through an opening in said cover beyond said second side surface, said cover having said greeting card mounted on said second side surface thereof, with said back and cover including a plurality of reinforcing ribs that extend towards one another from said forward surface and said first side surface that are in abutting contact, and said box, cover and reinforcing ribs cooperating to provide a resonator to amplify music from said music box mechanism when said actuator pin is allowed to move to said second position;
- e. an opaque panel that has first and second sides, said panel including a decorative insignia visible from said first side thereof;
- f. hinge means for pivotally supporting said panel from said box, said panel when in a first position overlying said greeting card and with said second side pressure contacting said spring loaded pin to maintain the latter in said first position, and said panel when pivoted to a second position allowing said greeting card to be viewed and permitting said spring-loaded pin to move to said second position to allow said spring-actuated music box mechanism to operate; and
- g. first means for removably locking said panel in said first position on said box to overlie said greeting card.

4,102,068
DISPLAY DEVICE

Robert K. Rutchik, Vernon Hills, Ill., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.
Filed Mar. 17, 1977, Ser. No. 778,369
Int. Cl.² G09F *11/00*
U.S. Cl. 40—491 **11 Claims**

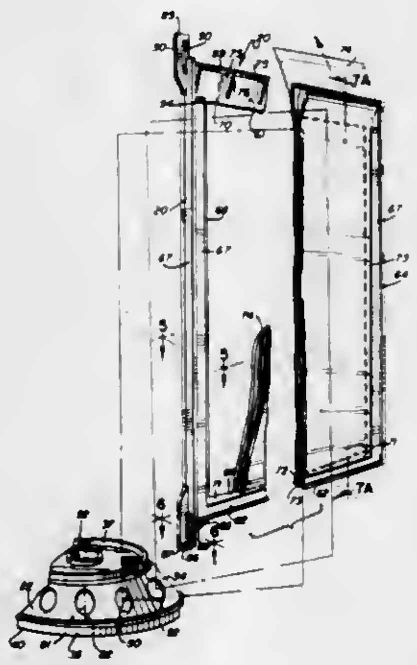


1. In an interleaving display device having first and second movable display panels and a third fixed display panel capable of being positioned selectively in any one of a plurality of different configurations including a first configuration wherein said first panel overlies said second panel that in turn overlies said third panel so as to display said first panel, a second configuration wherein said second panel overlies said third panel that in turn overlies said first panel so as to display said second panel, and a third configuration wherein said third panel overlies said first panel that in turn overlies said second panel so as to display said third panel, the improvement comprising

control means for effecting a direct repositioning from any one of said configurations to either of the other two configurations.

4,102,069
REVOLVING SELF-SERVICE DISPLAY STAND

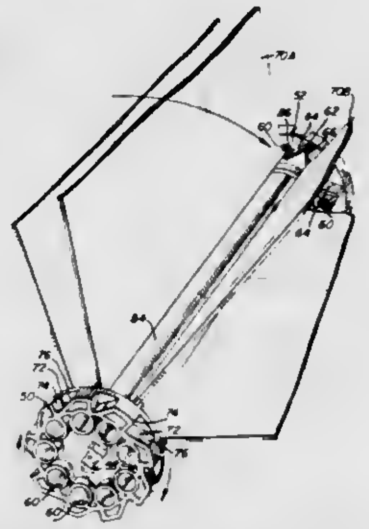
Ronald P. Eckert, Northbrook, Ill., assignor to DLM, Inc., Niles, Ill.
Filed Jul. 9, 1976, Ser. No. 703,958
Int. Cl.² G09F *11/02*
U.S. Cl. 40—497 **18 Claims**



1. A revolving self-service poster display stand having a base, an upstanding pedestal mounted on said base for revolving about a vertical axis, a plurality of frames radially projecting from said pedestal, each frame having one side wall with upper and lower pivot members carried thereby, said upper and lower pivot members being cruciform in cross section and extending into elliptical openings formed in spaced conically sloping surfaces of said pedestal, and means on said lower pivot member for engaging with means on the edge of one of said elliptical openings for positioning said frame in a radially oriented position under the influence of the weight of said frame.

4,102,070
FLIP CARD DISPLAY

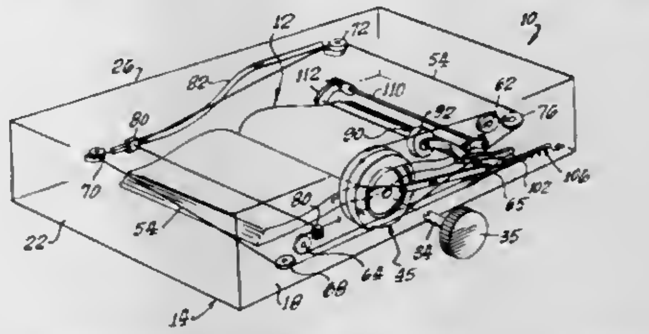
Virgil S. Simon, Glenview, Ill., assignor to Thomas A. Schutz Co., Inc., Morton Grove, Ill.
Filed Jun. 7, 1976, Ser. No. 693,636
Int. Cl.² G09F *11/06*
U.S. Cl. 40—498 **8 Claims**



1. In a display device having a housing with a top wall, a bottom wall and a pair of side walls connected to said top wall and said bottom wall, said side walls having an upper portion with a vertically disposed forward edge and a lower portion with an angularly disposed forward edge extending from said vertically disposed edge toward a forward corner of said bottom wall, a vertically disposed opening defined by said vertically disposed edges and by a front edge of said top wall, and an angularly disposed opening defined by said angularly disposed forward edges and by a front edge of said bottom wall, card holder means bridging between said two side walls of said housing, an actuator connected through one of said walls and operatively engaging said card holder means, a plurality of equally spaced openings formed in each end portion of said card holder means with one opening in one end portion being aligned with one opening in the other end portion, said end portions of said card holder means are spaced apart discs in which said equally spaced openings are formed, a display card pivotally mounted in each pair of said aligned openings, abutment means formed on the outer edge of each end portion between each adjacent pair of openings in said end portions, said abutment means are formed on said discs between said adjacent pairs of openings with an abutment means on one disc aligned with an abutment means on the other disc, release means carried by the housing and extending into the path of movement of said display cards, indexing means on said card holder means coacting with a spring member on said housing for urging one abutment means in contact with one of said display cards for holding said card in engagement with said release means for viewing through said vertically disposed opening as a preceding card rests on one of said abutment means for viewing through said angularly disposed opening.

4,102,071
AUTOMATIC PAGE TURNING APPARATUS

James A. D'Arcy, 32325 Coast Hwy., South Laguna, Calif. 92651
Continuation of Ser. No. 669,821, Mar. 24, 1976, abandoned.
This application Feb. 16, 1977, Ser. No. 768,962
Int. Cl.² G09F *11/06*
U.S. Cl. 40—531 **24 Claims**

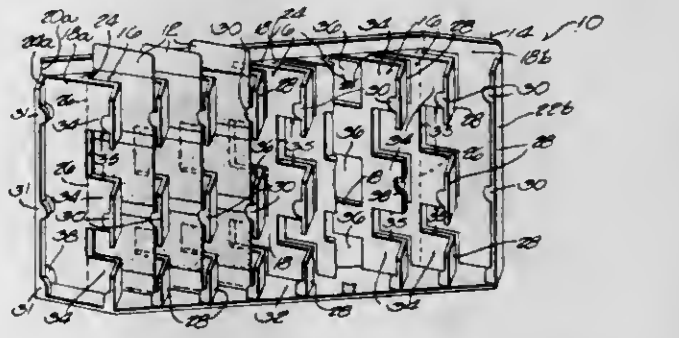


1. An automatic page-turning apparatus for books and the like, wherein the apparatus comprises:

- a housing having a plurality of walls defining a compartment wherein a book is removably disposed;
- a page-separating means operable within said compartment for direct contact with the page to be turned in said book, said means including a pusher to engage an exposed page to be turned and to slidably push said page against another for developing a bulge therein,
- a page-turning means movably mounted within said housing and arranged to sequentially operate with said page-separating means, said page-turning means located to engage and displace said bulge,
- operating means interconnecting said page-separating means and said page-turning means for reciprocating back and forth movements and to different extents; and
- page hold-down means arranged within said compartment for direct engagement with said page, whereby said book is held in an open, readable mode.

4,102,072
DISPLAY DEVICE FOR HOLDING PAINT CHIP CARDS

Edward M. Buschman, New York, N.Y., assignor to Display Corporation International, Milwaukee, Wis.
Filed Mar. 17, 1977, Ser. No. 778,691
Int. Cl.² G09F *1/10*
U.S. Cl. 40—124.2 **7 Claims**



1. A display device adapted to hold elongated paint chip cards comprising, in combination,

- a plurality of back walls, including a first back wall and a last back wall, said back walls being arranged in parallel staggered relation and each having first and second spaced edges,
- said first edges being located in a first plane and said second edges being located in a second plane spaced from said first plane,
- said first and second planes being parallel and said back walls extending at an angle thereto,
- the edges of each back wall except said first edge of said first back wall and said second edge of said last back wall,

being located intermediate the first and second edges of an adjacent back wall so that adjacent back walls partially overlap,

and a step wall extending from said first edge of each of said back walls, each of said steps walls, except the back wall, extending to and engaging an adjacent one of said back walls at a line intermediate the first and second edges of said one back wall,

said display device being integrally molded from plastic.

4,102,073

ANIMAL IDENTIFICATION TAG

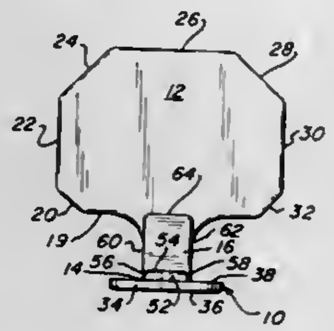
Norman J. Hayes, P.O. Box 618, Cody, Wyo. 82414

Filed Feb. 7, 1977, Ser. No. 765,909

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.^{2} G09F *3/08*

U.S. Cl. 40—301 **29 Claims**



1. An animal identification tag assembly comprising:

an identification member adapted to be mounted in a generally outwardly extending upright position on the upper outer surface of an animal,

a base portion of said identification member having a first lower abutment surface adapted to be seated on the upper outer surface of the animal ear and having peripheral edge surfaces defining said first abutment surface;

a connecting hole extending through said base portion transversely to said first abutment surface, and centrally located in said base portion in inwardly spaced relationship to said peripheral edge surfaces;

a second upper abutment surface on said base portion of said identification member adjacent said connecting hole therein and spaced from said first lower abutment surface;

an identification flange portion of said identification member extending transversely outwardly from said base portion and adapted to extend outwardly therefrom in an upright position relative to the ear of an animal;

said identification flange portion being connected to said base portion adjacent one of the peripheral edge surfaces thereof and being laterally offset and spaced from said connecting hole and said second abutment surface; and

a connecting member adapted to be mounted in connecting retaining engagement with said identification member,

a base portion of said connecting member having a third abutment surface adapted to be seated on the upper inner surface of the animal ear;

a connecting shaft portion extending transversely outwardly relative to said base portion of said connecting member and adapted to extend through the animal ear and through said connecting hole in said base portion of said identification member;

a head portion on said shaft portion adapted to be located laterally outwardly beyond said base portion of said identification member and having a fourth abutment surface adapted to retainingly engage said second upper abutment surface adjacent said connecting hole in said identification member in laterally offset spaced relationship to said identification flange portion.

4,102,074

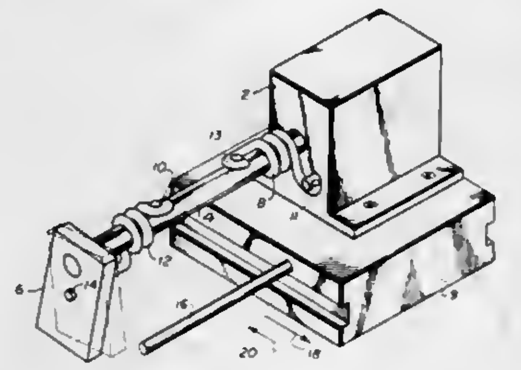
COUNTING DEVICE IMPULSE ACTIVATOR WITH TORQUE LIMITER

William L. Andre, Ben Lomond, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1977, Ser. No. 766,310

Int. Cl.^{2} F41F *1/00, 27/00;* G06M *1/00*

U.S. Cl. 42—1 E **4 Claims**



1. An impulse activated counting device having a counting device impulse activator with torque limiter including:

a weight mounted for pivotal movement on a counter actuating shaft,

spring means biasing said weight to a pre-set rotary position on said shaft,

said shaft being rotatably mounted on said counter for registering rotary movement of said shaft, and

a spring interconnecting said shaft and said counter to resiliently resist rotation of said shaft.

4,102,075

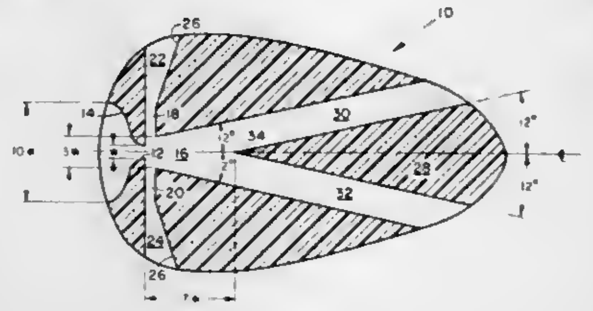
AQUATIC SOUND GENERATING SYSTEM FOR FISHING LURES

Anthony S. Wagner, 104 Red Horse G.R., and Kenneth R. Kay, 1239 North Blvd., both of, Universal City, Tex. 78148

Continuation-in-part of Ser. No. 541,699, Jan. 16, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,717

Int. Cl.^{2} A01K *85/01*

U.S. Cl. 43—17.1 **9 Claims**



1. A fishing lure having a self-resonating variable pressure diffuser system for generating aquatic sounds to imitate the sound of live bait as the lure is drawn through the water comprising:

a lure body shaped to simulate live bait, said body having means for attaching a fishing line thereto and means for attaching a fish hook thereto; said diffuser system comprising a bistable fluidic amplifier incorporated in said lure body, said bistable fluidic amplifier having passages extending through said lure body whereupon normal retrieval of said fishing lure causes water to flow through said passages of said amplifier, said amplifier being tuned to resonate at a frequency of between 10 to 30 cycles per second to generate aquatic compression waves which imitate the sound of live bait as the lure is pulled through the water.

4,102,076

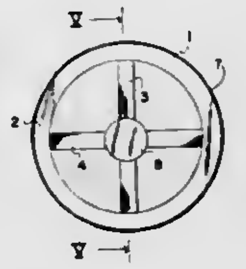
ACTION TOY

Herbert U. Martin, Chula Vista, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 25, 1977, Ser. No. 771,918

Int. Cl.^{2} A63H *33/02*

U.S. Cl. 46—220 **1 Claim**



1. An action toy, comprising

a wheel having a rim and a pair of diametrical struts intersecting each other at the center of the wheel, the rim having an outer circumference which rolls on a supporting surface;

flexible material having an inner surface affixed to the outer circumference of the wheel and an undulating outer surface, the flexible material affixed to the wheel having undulations extending at right angles to circles around the outer circumference of said wheel;

a rod having an elongated rod-like handle having spaced opposite first and second ends, adapted to be manually gripped at the first end;

a cross-rod affixed to the handle at the second end thereof and extending at right angles therewith to form a T-shape; and

flexible material having an inner surface affixed to the cross-rod and an undulating outer surface contacting the undulating outer surface of the circumference of the wheel in part when a user rolls the wheel via the cross-rod, the flexible material affixed to the cross rod having undulations extending in the same direction as the undulations of the circumference of the wheel whereby part of the surface of the circumference of the wheel is gripped by part of the surface of the cross-rod when the user rolls the wheel via the cross-rod.

4,102,077

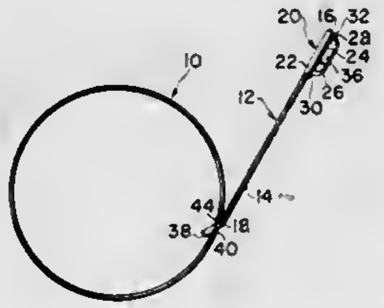
HOOP AND SELECTIVELY DISENGAGEABLE TRUNDLING APPARATUS

Joseph Marino, 5241 NE. 1st Ave., Ft. Lauderdale, Fla. 33334

Filed Feb. 17, 1977, Ser. No. 769,678

Int. Cl.^{2} A63H *33/02*

U.S. Cl. 46—220 **4 Claims**



1. A hoop and selectively disengagable trundling apparatus comprising:

an elongated rigid bar element, having first and second ends;

a handle element fixedly secured to said first end of said bar element;

a pair of complementary arcuate jaw elements disposed on said second end of said bar element, said jaw elements forming an openable capturing loop;

opening means for selectively opening said capturing loop disposed adjacent to said bar element;

a hoop dimensioned to be selectively captured by said capturing loop when said jaw elements are in a closed position, and to be selectively disengaged from said capturing loop when said jaw elements are in an open position, said hoop being capable of free rotation about the circumference thereof when within said capturing loop;

wherein one of said arcuate jaw elements is fixedly secured on a first end thereof to said second end of said rigid bar element, the other said arcuate jaw element being pivotally affixed on a first end thereof to said second end of said rigid bar element, the second ends of each of said arcuate jaw elements falling adjacently and forming a closed capturing loop when in the closed position, the pivoting of said other arcuate jaw element opening said capturing loop and permitting the passage of said hoop between said second ends of said arcuate jaw elements.

4,102,078

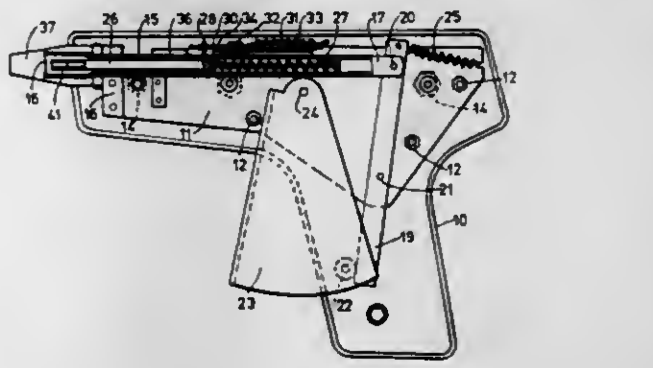
BUDDING GUN

Lionel Joseph William Pettifer, c/o Industrial Development (Bangor), University College of North Wales, Dean St., Bangor, Wales

Filed Jun. 21, 1977, Ser. No. 808,471

Int. Cl.^{2} A01G *1/00*

U.S. Cl. 47—7 **2 Claims**

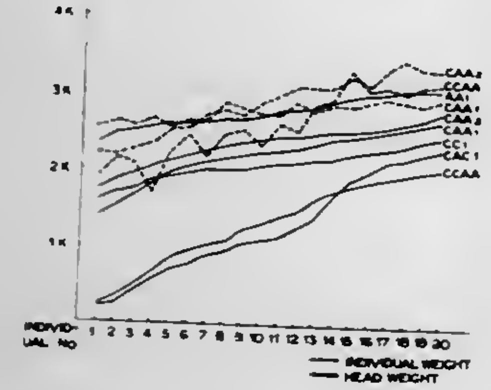


1. A budding gun comprising a frame assembly supporting an axially movable tube terminating at one end in a cutting edge and a pair of pivotable cutting blades disposed one on each side of the said end of the tube and inclined to the longitudinal axis of the tube, the cutting blades being urged together to form a single cutting edge substantially on and normal to the axis of the tube, a spring-loaded plunger slidable within the tube between a retracted position and an extended position in which the leading end of the plunger protrudes beyond said one end of the tube, and releasable securing means for retaining the plunger in the retracted position whereby in use the tube is first advanced axially relative to the cutting blades to pivotally open and project beyond the cutting blades to excise and store a bud, the tube being then withdrawn to allow the cutting blades to pivotally close and form the single cutting edge and thereafter the single cutting edge is utilised to make an incision in the bark or rind at a position to receive the stored bud, the tube is again moved axially to open the cutting blades to thereby lift the bark or rind on each side of the incision and the plunger is released to eject the stored bud into the incision.

4,102,079

METHOD OF BREEDING NEW VARIETIES OF THE FIRST FILIAL GENERATION PLANT

Setsuo Kataoka, 2-10-4 Shimizu, Suginami-Ku, Tokyo, Japan
Filed Mar. 25, 1977, Ser. No. 781,328
Claims priority, application Japan, Jul. 5, 1976, 51/78902
Int. Cl.² A01H *1/02*
U.S. Cl. 47—58 **4 Claims**

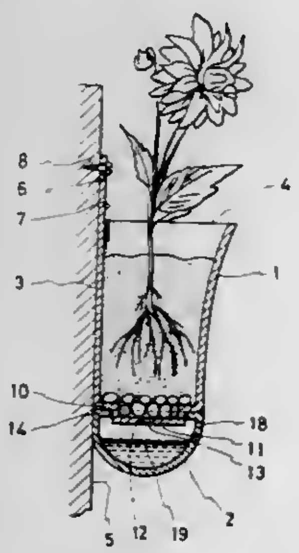


1. A method of breeding new varieties of a first filial generation plant which comprises: crossing a self-incompatible allopolyploidy plant as female with a plant of Brassica species having genomes AA, AACC or AABB as male and which is cross compatible with said female, said allopolyploidy plant being obtained by immersing the seeds of an interspecific plant formed by crossing a plant of Brassica species with a different plant of Brassica species, said species having genomes CC and AA in colchicine solution, and said Brassica species having a chromosome number which is smaller than that of said allopolyploidy plant, and collecting the seeds of said first filial generation plant.

4,102,080

FLOWERPOT

Dairoku Kojo, 3-2-6-402, Chishirodai Minami, Chiba City Chiba Prefecture, Japan
Filed Nov. 5, 1976, Ser. No. 739,376
Int. Cl.² A01G *9/02*
U.S. Cl. 47—67 **6 Claims**

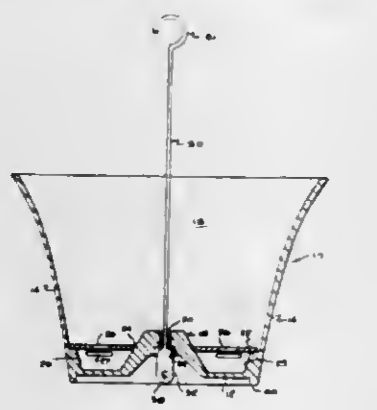


1. A flowerpot comprising a body having a top opening for receiving soil, said body having a side wall comprised of a first portion of a generally arcuate configuration and a second portion which is generally flat, said body having a bottom wall comprised of a first peripheral portion extending inwardly from said side wall of said body and a second cup-shaped portion depending downwardly from said peripheral portion, said cup-shaped portion having a flat bottom section and an upright section joined to said peripheral portion, a water-receiving bowl comprising a first portion of a generally arcuate configuration and a second portion which is generally flat, said bowl having a peripheral flange section defining a bowl opening, said bowl being detachably mounted on said body such that said cup-shaped portion of said body bottom wall is received in said bowl opening with said peripheral flange section of said bowl abutting said first peripheral portion of said body, said upright section of said cup-shaped portion having lateral projections which underlie said peripheral flange section of said bowl to thereby securely support said bowl on said body, said bowl upon being mounted on said body being rotatable to a selective position so that said flat portions of said body and bowl and said arcuate portions of said body and bowl are respectively aligned with each other, said flowerpot being mountable on a vertical wall with said aligned flat portion of said body and bowl being disposed against said vertical wall.

4,102,081

PLANT CONTAINER

Edwin M. Morrow, Rte. 1, Brevard, N.C. 28712
Filed Feb. 14, 1977, Ser. No. 768,110
Int. Cl.² A01G *9/02*
U.S. Cl. 47—67 **1 Claim**

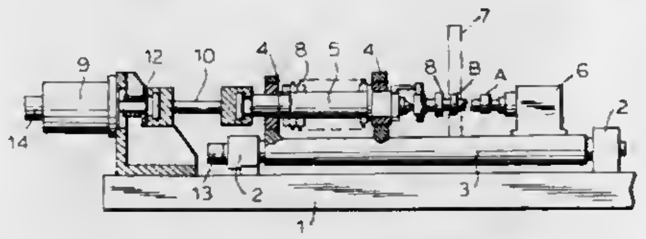


1. A plant container comprising a pot having bottom and side walls defining an open top cavity, a projection extending centrally upwardly in said cavity in the bottom portion thereof, a passageway extending along the central axis of the pot and through the bottom wall of the pot and having an opening in the upper surface of said projection, said passageway including a transverse keyway portion extending through said bottom wall, the undersurface of said pot adjacent the lower opening of said passageway having groove means arcuately displaced about the axis of said passageway from said keyway portion, a generally flat plate, means in said pot cavity for supporting said plate in spaced relation above said bottom wall to form a false bottom in said cavity, a hanging rod for said pot, the lower end of said hanging rod comprising a flattened portion having side edges receivable in said keyway portion of said passageway during passage of said hanging rod therethrough, and being receivable in said groove means on the undersurface of said pot when rotated about the axis of said passageway whereby upper edge portions of said flattened portion of said hanging rod are received in said groove means to supportably suspend the pot on said rod when the central axis of the rod is substantially vertical, and means on the lower end of said rod defining an opening for supportably receiving the upper end of another hanging rod therein whereby a plurality of said containers may be supported in vertically spaced hanging relation.

4,102,082

CAM GRINDING APPARATUS WITH MEANS TO MAINTAIN THE GRINDING SPEED CONSTANT

Yasuo Katsumi, Kameoka; Shoei Matsuda, Otsu, and Toyojiro Inano, Muko, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 22, 1977, Ser. No. 770,758
Int. Cl.² B24B *17/10, 5/42*
U.S. Cl. 51—101 R **4 Claims**

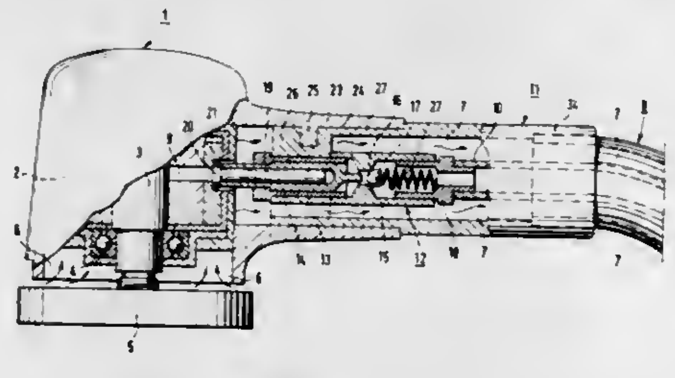


1. A cam grinding apparatus comprising a base member, a rocking bar rockably mounted on said base member, a master cam shaft rotatably mounted on said rocking bar, a drive motor connected to said master cam shaft for rotatably driving said master cam shaft, means on said apparatus to mount a cam shaft which is to be ground for being driven by said master cam shaft, a grindstone for grinding the cam shaft which is to be ground while being rocked by said rocking bar and rotated by said master cam shaft, detecting means for detecting at least one of the rotational angle of said drive motor and the rocking phase angle of said rocking bar, rotational speed command means to which said detecting means are connected and responsive to output signals from said detecting means for generating a step-like voltage waveform representing a desired rotational speed of said drive motor, and rotational speed control means connected to said rotational speed command means and to said drive motor and responsive to said step-like voltage waveform for controlling the rotational speed of said drive motor so that the circumferential speed of the cam section of the cam shaft which is to be ground at the contact point between the cam section and said grindstone is kept substantially constant.

4,102,083

PARTICLE SUCTION SYSTEMS

Leif E. Stern, Lund, Sweden, assignor to Bill Peter Philip Nederman, Helsingborg, Sweden
Filed Oct. 14, 1976, Ser. No. 732,216
Claims priority, application Sweden, Oct. 16, 1975, 7511588
Int. Cl.² B24B *23/02*
U.S. Cl. 51—170 R **6 Claims**



1. A normally hand-held pneumatic machine tool and connecting conduit arrangement, including:

a pneumatic machine tool including a housing, said housing containing: a pneumatic motor connectable with a tool for operating the same; socket means; a dust particle suction duct arranged to suck off particles formed while said tool is engaged with a work piece, one end of said suction duct opening into said socket means; and an air supply duct connected at one end thereof with said pneumatic motor, the other end of said air supply duct opening into said socket means, said air supply duct leading directly to said pneumatic motor from said socket means and being unobstructed therebetween;

a quick coupling device arranged to be connectable with and disconnectable from said socket means;

a suction conduit connected with said quick coupling device, and arranged to be connectable thereby to said suction duct within said socket means;

an air supply conduit connected with said quick coupling device; and

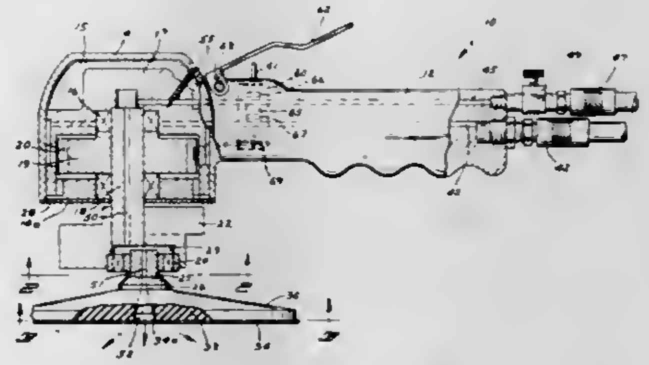
a valve device carried by said quick coupling device and connected with said air supply conduit, said valve device being operable for controlling the flow of air from said air supply conduit;

said valve device being arranged to be connectable with said other end of said air supply duct within said socket means when said quick coupling device is inserted into said socket means, and controlling the supply of air thereto from said air supply conduit.

4,102,084

WET SANDING DEVICE

Thomas N. Bloomquist, 12685 Buchanan St., Blaine, Minn. 55434
Filed Aug. 12, 1977, Ser. No. 824,063
Int. Cl.² B24B *23/02*
U.S. Cl. 51—170 MT **1 Claim**



1. A sanding device, having in combination

a handle structure having in connection therewith a motor housing having an air motor therein comprising a plurality of vanes,

a shaft driven by said motor extending outwardly of said housing,

a sanding head carried by said shaft and driven by the same,

an air line extending from said motor outwardly of said handle to an air supply,

an axial bore through said motor shaft and an axial bore through said sanding head, said bores communicating with each other,

a water line extending through said handle to a water supply,

said water line extending to said bore of said motor shaft,

a flow control valve structure carried by said handle,

said water line and said air line having a pair of aligned vertical passages therethrough,

a valve core extending through said vertical passages and having a pair of passages therethrough to simultaneously be in phase with said water line and said air line,

means carried by said handle structure normally urging said valve core to be out of phase with said water line and said air line,

a single operating handle engaging said valve core to urge the same to be in phase with said water line and said air line, and

means controlling the flow and velocity of water through said water line.

4,102,085
ABRASIVE COATED SHARPENING TOOL AND METHOD OF MAKING IT

Peter K. Church, Cascade, and Alan G. Phillips, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Sep. 2, 1976, Ser. No. 719,729

Int. Cl.² B24D *3/06, 3/10*

U.S. Cl. 51—295 **15 Claims**

1. A method of making a sharpening tool having an abrasive surface which comprises:
- providing a substrate of metal having an oxide coating formed thereon;
- applying a coating on the substrate of a slurry containing a relatively hard, ductile metal powder, an amount of abrasive grain and impregnated with a binder consisting of a soluble inorganic chromium compound convertible to an insoluble chromium compound upon heating;
- heat curing the slurry coated substrate to convert the chromium compound to an insoluble chromium compound at a temperature of at least 600° F. but below a temperature sufficiently high to excessively oxidize, melt and deform either the metal powder, the metal substrate and/or the abrasive grain; and,
- repeating the impregnation of the slurry coating with a solution of a soluble chromium compound and heat curing cycle at least once.

12. A sharpening tool comprising a metal substrate having adhered thereto a coating of closely packed porous mesh of finely divided discrete particles at least the surface of which consists of a refractory oxide of at least one metallic element having a vitrification temperature in excess of 600° F. essentially devoid of vitreous and/or sinter bonding between the particles being bonded together by chromic oxide formed at temperatures below about 1000° F. having substantial deposits of chromic oxide within the pores thereof wherein at least a portion of the particles is powdered metal and another portion is abrasive grain.

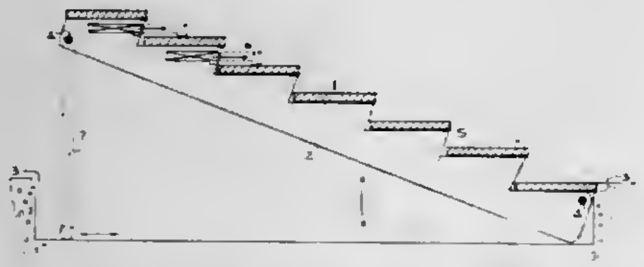
4,102,086
HIDDEN TIERS

Richard Thomas Korman, 2800 NE. 24th St., Ft. Lauderdale, Fla. 33305

Filed Feb. 10, 1977, Ser. No. 767,646

Int. Cl.² E04H *3/12*

U.S. Cl. 52—9 **1 Claim**



1. A convertible seating platform which forms a tiered seating array in a first up position and which is pivotal to a down position forming a floor surface comprising:
- a floor having a cavity and a recessed lip around said cavity;
- a pair of rigid supporting members disposed in a parallel array, said rigid supporting members having upper surfaces having a plurality of angled grooved portions, each of said grooves having an apex;
- a plurality of planar seating members pivotally connected to said supporting members along the upper apex portion of the upper surface of said supporting members; and
- a moveable means for elevating said supporting members at one end above said floor in a first upper position where one end of each supporting member is elevated above the plane of the floor, said seating member ends engaging the angular surface grooves in the up position and said floor cavity recessed lip in the down position.

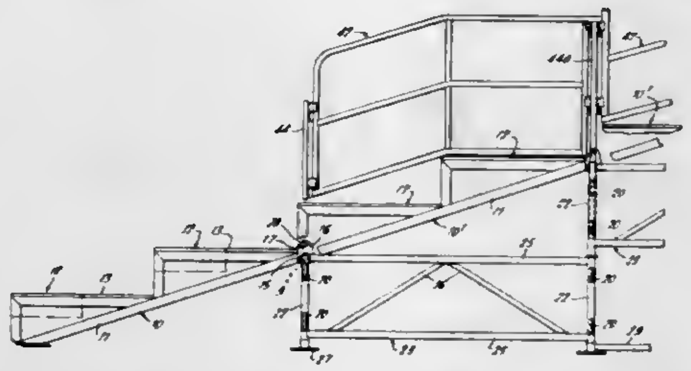
4,102,087
STAND CONSTRUCTION SYSTEM

Barry Michael Frank Jarvis, Snitterfield, England, assignor to Exhibition Showplace Services Limited, United Kingdom

Filed Mar. 11, 1977, Ser. No. 776,723

Int. Cl.² E04H *3/12*

U.S. Cl. 52—9 **10 Claims**



1. A modular stand construction system comprising a support frame, support means on said support frame to be spaced from a surface on which the system rests, a floor-carrying member, a floor means mounted on said floor-carrying member, connecting means adjacent a rear end of said floor-carrying member locatable on said support means to position said rear end substantially horizontally, said floor-carrying member having its front end arranged to be supported directly by the surface or by support means of a further support frame to be arranged at a lower level than the support means of the first said support frame, and a collapsible seat coupled to said floor means, said collapsible seat being engaged with said floor means when in an erect position and being movable from the erect position to a stowed position beneath said floor means by disengaging and pivoting said seat forward to a substantially horizontal position and then sliding it beneath said floor means.

4,102,088
MANHOLE-PIT LINING AND METHOD OF MAKING AND INSTALLING SAME

Gustav Keller, Weiperterstr. 10, 8820 Gunzenhausen, and Gerhard Enssle, Spitalgasse 1, 8867 Oettingen, both of Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,016

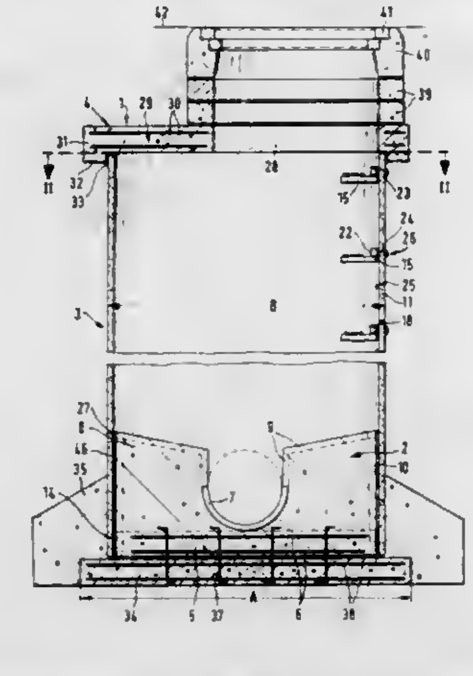
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 2605535

Int. Cl.² E02D *29/14*

U.S. Cl. 52—20 **13 Claims**

8. A manhole-pit lining comprising:
- a base part having a base plate and a channel formation unitarily formed therewith;
- an upwardly tubular middle part having a lower end fitted around said channel formation, an upwardly open upper end, and at least one laterally extending pipe connection between said ends and aligned with said channel formation, said middle part being formed with a plurality of horizontally throughgoing polygonal-section holes;
- a step inside said middle part at each of said holes;
- a bolt having a polygonal-section shank received snugly in each of said holes and each securing a respective step to said middle part;

- a watertight joint between and rigidly fixing together said lower end of said middle part and said base part; and



- a cover part including a manhole cover secured over said upper end.

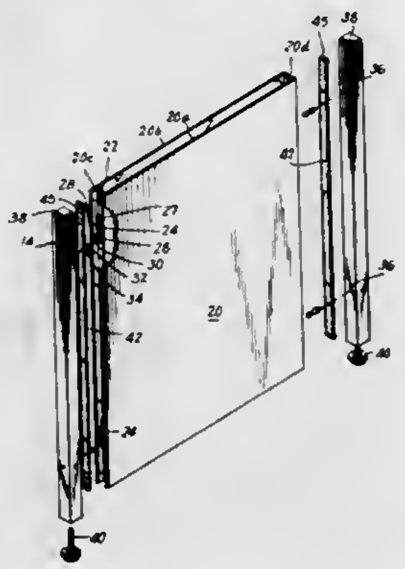
4,102,089
PARTITION STRUCTURE

John C. Paisley, Rte. 1, Box 4A, Orange, Va. 22960

Continuation-in-part of Ser. No. 723,894, Sep. 16, 1976, Pat. No. 4,038,790. This application Feb. 24, 1977, Ser. No. 771,765

Int. Cl.² E04B *2/82*

U.S. Cl. 52—36 **12 Claims**



1. A partition structure including a support post having a plurality of vertical sides and a partition panel secured to one of said sides, said panel having an edge portion located in parallel, closely spaced alignment with one side of the post to define a thin cavity therebetween, and a single flat elongated bracket support strip located in said cavity and secured to one side of the post, said strip having a plurality of vertically spaced embossments of predetermined configuration formed thereon and projecting from only one side of the strip, and a support bracket having an inner edge portion including a plurality of spaced mounting tabs formed thereon, said mounting tabs being spaced from each other at regular intervals selected to enter said cavity between said embossments and having an edge configuration selected to mate with at least a portion of the predetermined configuration of said embossments; said post and panel defining an open slot therebetween permitting access into said cavity and said embossments each having a first relatively flat surface portion extending perpendicularly to said slot and a second relatively flat surface portion extending generally perpendicularly to the first surface portion, said first and second flat surface portions defining a generally L-shaped bearing surface and said edge configuration of said tab having a complementary L-shaped configuration.

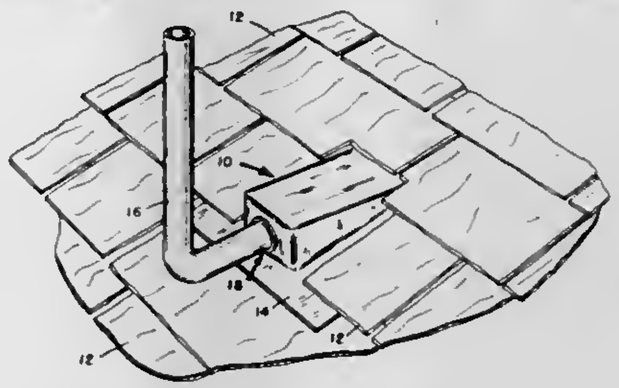
4,102,090
ROOF FLANGE FOR HORIZONTAL PIPES

Jerry Lee Anguish, Mineral Wells, Tex., assignor to Butler Ventamatic Corp., Mineral Wells, Tex.

Filed Sep. 28, 1977, Ser. No. 837,174

Int. Cl.² E04D *13/14*

U.S. Cl. 52—58 **9 Claims**



1. A roof flange assembly for providing a weather-tight seal around a pipe entering a sloped roof, said roof flange assembly comprising:
- a unitary plastic plate having substantially wide flat edge portions and having a centrally located hollow upraised portion,
- said upraised portion having a substantially flat top surface and defining a substantially vertically arranged forward facing flat portion and two upraised flat side portions,
- an aperture located in said forward facing flat portion and communicating with the interior of said upraised portion, and
- a resilient grommet arranged in said aperture so as to form a seal with said forward facing flat portion therebetween and having an inside diameter selected to fit tightly around said pipe.

4,102,091
PREFABRICATED BUILDINGS

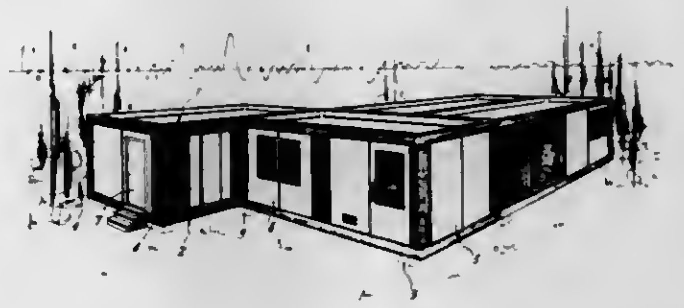
Hervé Farge, Maurepas, France, assignor to Societe Anonyme dite: S I C O F, France

Filed Nov. 29, 1976, Ser. No. 745,667

Claims priority, application France, Dec. 1, 1975, 75 36663

Int. Cl.² E04H *1/12*

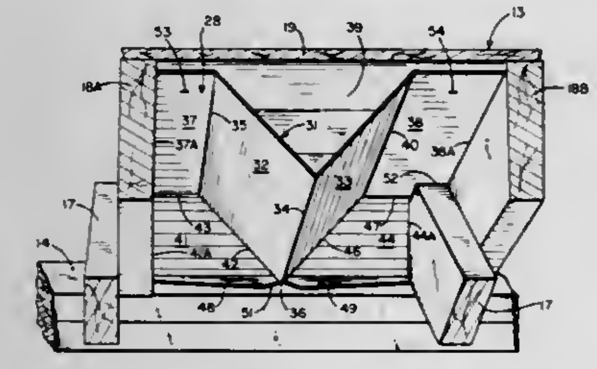
U.S. Cl. 52—79.7 **7 Claims**



1. A prefabricated modular building of parallelepipedal shape, comprising a roof, a floor, vertical wall sections, and means for interconnecting same, the roof and the floor being each of unitary sandwich construction and formed from molded material, each of the roof and floor comprising; a peripheral rib providing a strengthening member and a housing

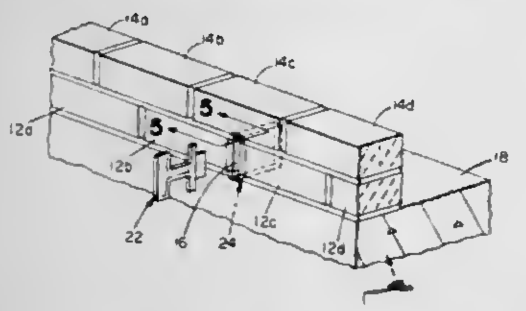
for services, and as parts of the sandwich construction, means comprising an inner layer of stratified material, a layer of plywood, a layer of insulation comprising a material selected from foam and light concrete, an outer layer of stratified material, and, on each side of the corresponding peripheral rib and for fixing the vertical wall sections, inner wooden frames and outer wooden frames for the roof, and inner wooden frames and outer wooden frames for the floor.

4,102,092
VENTING DEVICE
Bruce K. Ward, 2904 Virginia Ave., St. Louis Park, Minn. 55426
Filed Apr. 15, 1977, Ser. No. 787,744
Int. Cl.² E04B *7/18*
U.S. Cl. 52—92 **46 Claims**



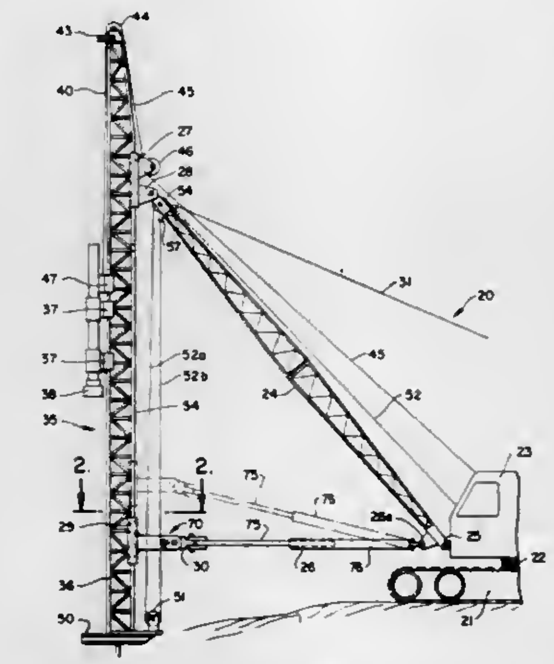
1. A vent device used to provide an air vent passage between the soffit space and attic space of a structure, said structure having a plate, laterally spaced roof rafters, and roof structure attached to the rafters, said roof structure being spaced from the plate comprising: a one-piece sheet member having at least one generally V-shaped body locatable between adjacent roof rafters forming with the inside of the roof structure an air vent passage between the soffit space and attic space, said body having a first portion engageable with the plate and second portions engageable with the roof structure, and baffle means attached to one end of the body locatable between and engageable with the roof structure and plate to close the space between the plate and roof structure without closing the air vent passage.

4,102,093
INSECT CONTROL SYSTEM
William F. Harris, 137 Catamount Rd., Tewksbury, Mass. 01876
Filed Oct. 25, 1977, Ser. No. 844,883
Int. Cl.² E04B *1/72*
U.S. Cl. 52—101 **7 Claims**



1. An insect control system for buildings of masonry construction and the like comprising a perforated, flexible resilient sheet member of width and height each greater than the width and height respectively of the weep hole with which it is to be used; and an inserter member that has a blade of width and height less than the width and height respectively of the weep hole with which it is to be used and a manipulating handle for securance to the blade, said sheet member being adapted to be inserted into the weep hole by said inserter blade so that its peripheral edges are deflected and in firm engagement with the margins of the weep hole, the inserted sheet member being effective to block the entry of insects into the building through the weep hole while not impairing ventilation.

4,102,094
BOTTOM BRACE FOR CRANE
Alan G. MacKinnon, Newcomerstown, Ohio, assignor to The Foundation Equipment Corporation, Newcomerstown, Ohio
Filed Sep. 26, 1975, Ser. No. 617,200
Int. Cl.² E21C *11/00*
U.S. Cl. 52—116 **10 Claims**



1. Crane apparatus comprising a control cab; an upwardly and forwardly angled boom pivotally attached at the lower end thereof to said cab; a generally forwardly projecting horizontal brace pivoted at one end thereof to a lower end portion of said boom; an elongated lead; upper and lower guide means carried at the outer forwardly directed ends of said boom and brace, respectively, and slidably engaging said lead adjacent to upper and lower portions thereof; a first pulley mounted adjacent to the lower end of said lead; a second pulley mounted adjacent to the upper end of said boom; a lead rope secured to an outer end portion of said boom, said lead rope comprising a first rope portion extending downwardly and around said first pulley; a second lead rope portion extending upwardly over said second pulley and rearwardly downwardly toward said control cab for raising and lowering said lead with respect to said guide means; said lower guide means having a pair of horizontally spaced, rearwardly projecting arms; connector means carried by the distal end portions of said arms connecting the forward end of said brace to said lower guide means; a power driven capstan rotatably mounted between said arms on an axis normal to said first lead rope portion, said first lead rope portion making a plurality of turns around said capstan for driving said lower guide means along said lead and independently of said lead in response to rotation of said capstan.

4,102,095
MODULAR SCREEN ASSEMBLY
Clifford W. Gartung, Newport Beach, Calif., assignor to Pielon Corporation, Santa Ana, Calif.
Filed Jan. 17, 1977, Ser. No. 760,004
Int. Cl.² E04B *2/56;* E04C *3/32*
U.S. Cl. 52—122 **18 Claims**

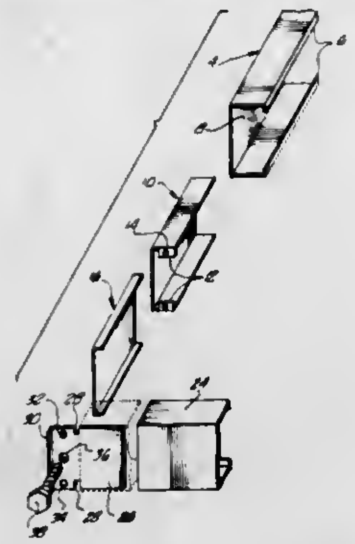
1. An improved modular sound-absorbing office screen system comprising;

a first hollow rigid frame having an upper horizontal U-shaped channel member and a pair of side U-shaped channel members, each with inwardly extending peripheral edge members, fastened together;

a wall panel mounted within the hollow rigid frame;

a second lower horizontal U-shaped channel member;

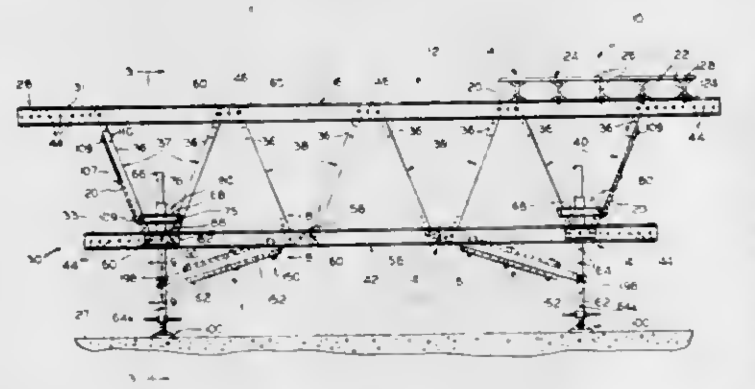
plate members extending from each end of said second channel member and having means for laterally fastening said second channel member to each of said side U-shaped channel members adjacent said wall panel;



a fastener member mounted within each side channel member for fastening respectively to one plate member; and

foot support members movably mounted between said fastener members and said side channel members for vertically supporting said screen system.

4,102,096
LEG BRACE ASSEMBLY FOR ADJUSTABLE SHORING APPARATUS
David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed Mar. 2, 1977, Ser. No. 773,388
Int. Cl.² E04D *15/00*
U.S. Cl. 52—122 **11 Claims**



1. In combination with adjustable shoring apparatus including

a truss-like structure,

a vertically extending elongated leg associated with and extending below said structure to provide support therefor, said leg being vertically reciprocally movable relative to said structure for adjusting the combined height thereof,

said leg having a vertical series of support pin holes which extend transversely therethrough, and

means for adjustably connecting said leg to said structure at a selected vertical position relative thereto including means on the structure defining a support pin hole arranged for registering successively with said support pin holes in the leg, and a support pin removably insertable through said registering support pin holes,

a leg brace assembly which comprises:

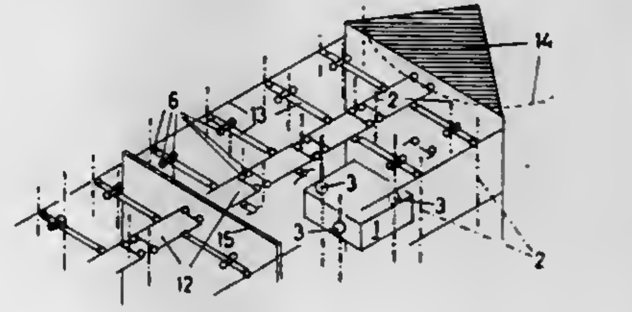
an elongated leg brace member,

means for connecting said leg brace member to said structure for swinging movement of the leg brace member about an axis extending transversely of the structure, and

means for detachably connecting said leg brace member to said leg at a point spaced below said structure and spaced above the lower end of said leg to thereby brace the leg against the structure, said latter means including means on the leg brace member defining a connecting pin hole arranged for registering with a selected one of said support pin holes in said leg, and a connecting pin removably insertable through said connecting pin hole and said support pin hole registering therewith,

whereby said leg brace member may be disconnected from said leg and swung upwardly about said axis to a position wherein the leg brace member is disposed completely above the bottom surface of the structure to permit movement of the shoring apparatus on said surface without interference from the leg brace member.

4,102,097
CONSTRUCTION FOR SUPPORTING SPACE UNITS INSTALLED IN A BUILDING ESPECIALLY A MULTI-STOREY BUILDING
Elemer Zalotay, Cacilienstrasse 34, Bern 3007, Switzerland
Continuation-in-part of Ser. No. 526,328, Dec. 23, 1974, abandoned. This application May 19, 1976, Ser. No. 687,734
Int. Cl.² E04H *9/02*
U.S. Cl. 52—167 **4 Claims**

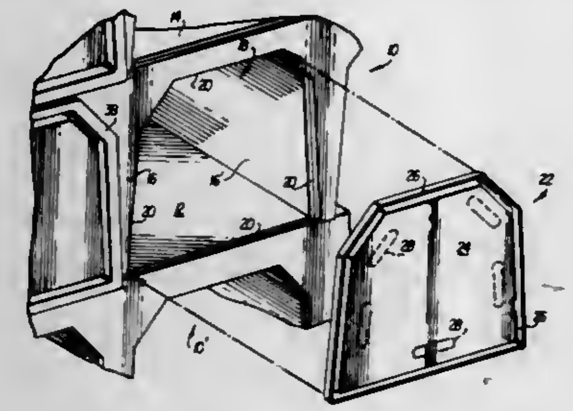


1. A construction for supporting space units installed in a multi-storied building, in a statically determinate manner, characterized by only three vertical columns embedded in the ground and grouped around and adjacent to each said space unit, said columns being provided with joints for supporting said space units in such a way as to allow them to move variably in a vertical direction when a portion of at least one of said columns is subjected to a vertically acting variable working load; and by horizontal beams and horizontal slabs that are embedded in vertical constructions which take up wind forces, said beams and slabs being connected to one another in such a way as to allow relative vertical movement of the columns and also the turning of the space units in all directions while preventing lateral movement due to wind forces.

4,102,098
CRYPT CLOSURE PANEL AND METHOD FOR SEALING A CRYPT OPENING
Edward C. Duwe, 3840 Highland Shores, and William E. Duwe, 1203 Washington Ave., both of Oshkosh, Wis. 54901
Filed May 13, 1977, Ser. No. 796,736
Int. Cl.² E04H *13/00;* A61G *17/08*
U.S. Cl. 52—140 **9 Claims**

1. In combination with a crypt module having a polygonal opening therein for receiving a burial casket, a polygonal closure panel for fluid sealing said opening, said closure panel including relatively resilient edge means integrally formed with said closure panel and conformable substantially to the shape of the crypt module opening for sealing the opening, said edge means comprising a substantially U-shaped, inwardly

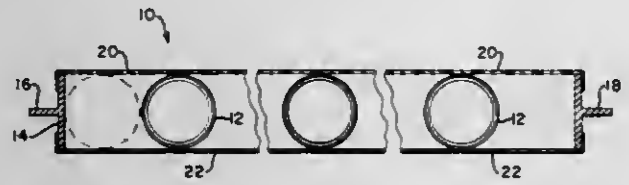
yieldable groove extending about the perimeter of said closure panel and forming an interference fit between said opening and



said closure panel when said closure panel is positioned in said crypt module opening.

4,102,099
INSULATING PANEL

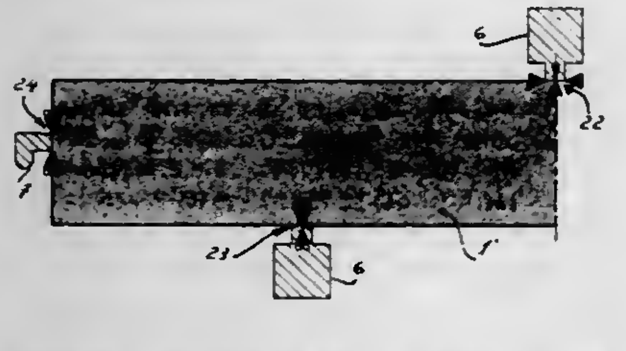
Frank Robert Gross, and Roble Cook Gross, both of 3926 Wood Thrush Rd., Akron, Ohio 44313
Filed May 11, 1977, Ser. No. 795,739
Int. Cl.² E06B *7/12*
U.S. Cl. 52—171 **2 Claims**



1. An insulating panel for a greenhouse comprising a plurality of transparent tubular plastic members positioned in a layer, a light transmitting support structure with said plastic members on one face thereof, a transparent cover sheet means extending over at least one surface of said plastic members and secured to said support structure to form a unitary insulating structure therefrom, and a reenforcing coil spring received in and supporting each of said tubular plastic members.

4,102,100
BUILDING WITH EXTERNAL PROVISION OF SERVICES

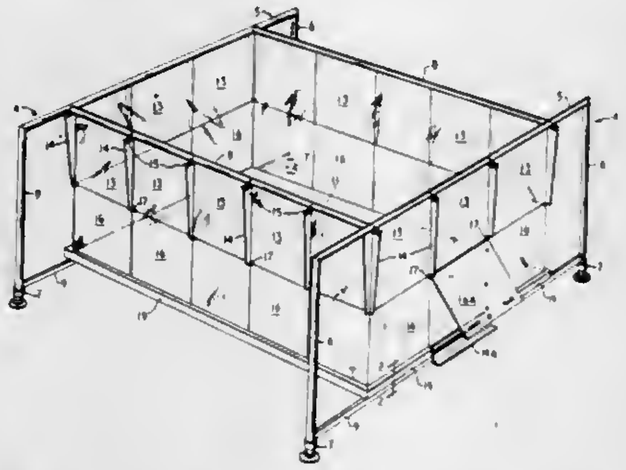
Roger Perreten, Veyrier, Switzerland, assignor to Etablissement d'Etudes et de Recherches Architecturales E.R.A., Geneva, Switzerland
Filed Feb. 1, 1977, Ser. No. 764,684
Claims priority, application Switzerland, Feb. 20, 1976, 2070/76
Int. Cl.² E04B *5/43*
U.S. Cl. 52—227 **16 Claims**



1. A building comprising at least one monobloc supporting floor unit and external vertical wind-bracing structures serving for access, service areas and technical equipment, the floor unit comprising a plurality of prefabricated shaped concrete girders which are jointed and assembled side by side, a first connection interconnecting said floor unit and one of said external structures on one side of said building for relative sliding movement only in a vertical direction, and a second connection interconnecting said floor unit with another of said external structures on a different side of said building for relative sliding movement only in a vertical direction and in one horizontal direction, thereby to absorb the dimensional variations in the floor unit transverse to the girders constituting said unit.

4,102,101
GLASS PANES, AND BUILDINGS AND THE LIKE INCLUDING GLASS PANES

Carl Philip Nielsen, Hunters Hill, and Noel Sydney Davidson Wood, East Lindfield, both of Australia, assignors to Harnee Pty. Ltd., Waverton, Australia
Filed Dec. 9, 1976, Ser. No. 748,870
Int. Cl.² A63B *61/00;* E04B *2/56*
U.S. Cl. 52—263 **4 Claims**

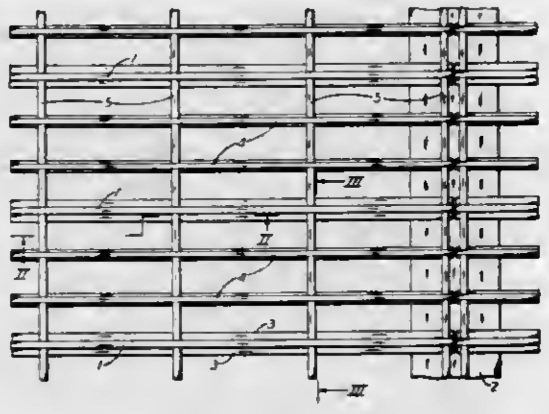


1. A squash, hand ball, racket ball or like court comprising a plurality of panes of glass each having a broken pattern of dots or lines of an opaque white material separate from the pane itself applied to one side of the pane, the other side of the pane being untreated and uncovered, the pattern being such that concentrated light from the side of the glass to which the pattern is applied is reflected to such an extent that persons on that side of the glass may see the wall and may "read" the path of an object moving relative to said wall whilst persons disposed on the other side of said wall may see through the wall to a sufficient extent to also follow the path of said moving object, and the court further comprising an overhead frame from which each of said panes is suspended, with an unfilled gap between adjacent panes of the order of 3 mm; and the court further comprising a floor member adapted for mounting approximately one meter above ground level, and wherein respective glass pane walls are suspended so that their lower edge portions are secured between a felt or like strip disposed around the floor edge and a second felt strip within a facia disposed in the plane of the floor.

4,102,102
NONWELDED METAL GRATING

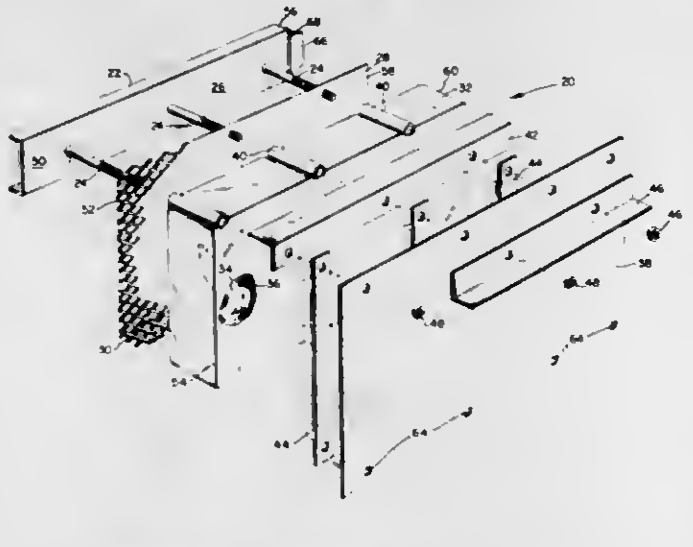
Thomas A. Greulich, 144 Spring House La., Pittsburgh, Pa. 15238
Filed Jul. 15, 1977, Ser. No. 816,027
Int. Cl.² E04B *5/18*
U.S. Cl. 52—338 **2 Claims**

1. A metal grating comprising a plurality of parallel horizontal beams provided with laterally projecting flanges, each beam having a plurality of longitudinally spaced vertical slots extending transversely therethrough, the lower wall of each slot being formed by the top of the free end portion of a tongue struck out of the beam, parallel cross bars of greater height than said slots extending through the slots and resting on the tongues and having notches extending downwardly from the tops of the bars receiving the portions of said beams above said slots with said portions substantially engaging the bottoms of the notches, the height of said tongues being great enough to permit the bars during assembly to be inserted in said slots while the tongues are bent laterally out of the beams, whereupon the bars can be raised in the slots and the tongues bent back beneath the bars to support them, pans resting on said beam flanges and spanning the spaces between the beams, and concrete resting on said pans and filling all of the space between said beams and bars to embed them in the concrete with the top of the concrete substantially flush with the tops of the beams.



4,102,103
BREECHING INSULATION PANELS AND METHOD OF CONSTRUCTION

Emil Marcmann, P.O. Box 5, Medford, N.J. 08055
Filed Feb. 14, 1977, Ser. No. 768,541
Int. Cl.² E04B *2/00*
U.S. Cl. 52—406 **12 Claims**



1. An insulating panel comprising:

(a) a horizontally elongated supporting member having a plurality of studs for receiving screw-threaded fasteners, the studs extending orthogonally from a face of the supporting member,

(b) an inside material-retaining sheet, hung from the plurality of studs, the inside material-retaining sheet having an angled portion forming a shelf along the lower edge thereof, one end of said supporting member extending beyond a lateral edge of the inside material-retaining sheet, the opposite end of the supporting member receding a similar substantial distance from the opposite edge of the material-retaining sheet.

(c) a rectangular block of insulating material positioned against the inside material-retaining sheet between the shelf and the plurality of studs,

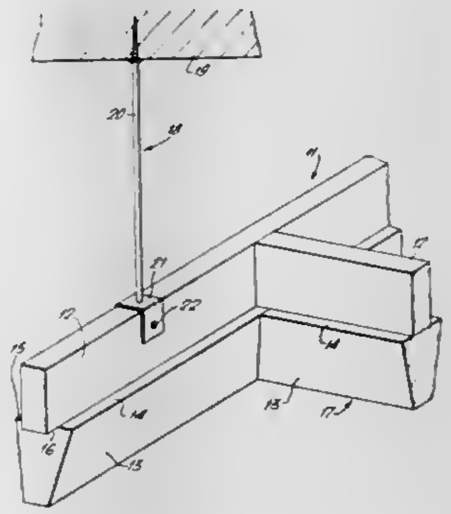
(d) a continuous metal facing sheet positioned on the studs to form the outside surface of the insulating panel, the facing sheet extending beyond the lateral dimensions of the rectangular block of insulating material on at least two of its four sides,

(e) tubular spacing means surrounding the studs between the inside material-retaining sheet and the facing sheet for maintaining the necessary distance between the material-retaining sheet and the facing sheet to prevent the collapse of the interstititial block of insulating material, and

(f) a plurality of screw-threaded fasteners threaded on the plurality of studs for maintaining the enumerated components of the insulating panel in a fixed relationship with respect to each other.

4,102,104
FRAME MEMBER

Matthew Porter Currie, "Osborne" Ivybank Crescent, Port Glasgow, Great Britain, assignor to Matthew Porter Currie, Port Glasgow and John Victor Malarkey, Newton Mearns, both of, Great Britain, part interest to each
Filed Sep. 9, 1976, Ser. No. 721,822
Claims priority, application United Kingdom, Sep. 13, 1975, 37721/75
Int. Cl.² E04B *5/52*
U.S. Cl. 52—494 **9 Claims**



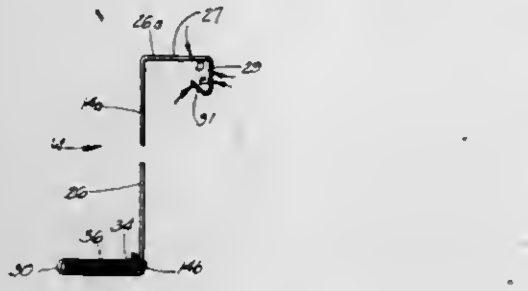
1. An elongate frame member having a side face which has a first projecting bearing portion extending therealong a first surface extending from the first bearing portion, the first surface having at least a portion which tapers inwardly, the frame member having an end face which has a portion tapering outwardly at the same taper angle as the tapered portion of the first surface, the end face having a second bearing portion coplanar with and presented in a direction opposite to the first bearing portion so that the second bearing portion of the end face of one such frame member can rest against the first bearing of the side face of another such frame member with their respective tapered portions engaging one another.

4,102,105
INTERLOCKED CHANNEL SECTION PANELS AND CONNECTORS THEREFOR

Donald M. Taylor, Hamilton, and Donald H. Ward, Middletown, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio
Continuation-in-part of Ser. No. 581,909, May 29, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,479
Int. Cl.² E04D *1/34*
U.S. Cl. 52—520 **26 Claims**

1. A clip connector for anchoring pairs of rigid interlocked metal panels of channel configuration to spaced supporting members comprising a body portion having an upstanding planar element, an upper horizontal planar portion, a deformable flange hook portion comprising a planar element depending downwardly from said upper portion and deformable towards said upstanding planar element at the line of juncture

between said deformable flange hook portion and said upper horizontal planar portion, an outermost bend retention hook extending from the free end of said deformable flange hook portion of said body portion, said retention hook terminating in a free end positioned between said upstanding planar element and said deformable hook portion, said clip connector being formed such that the included angle between said upper horizontal planar portion and said flange hook portion is within the range of 15° to 90° before deformation of said flange hook portion and such that the included angle between said deformable flange hook portion and said outermost bend retention hook thereof is within the range of 25° to 90°, a foot formed from the bottom of said planar element and extending therefrom, said foot having an elongated slot formed therein extending horizontally thereof substantially parallel to said body portion, and a washer member overlying said foot, said washer member having an aperture therethrough in alignment with said elongated slot, whereby during thermal movement of said panels, said panels are allowed to move with respect to said supporting members.



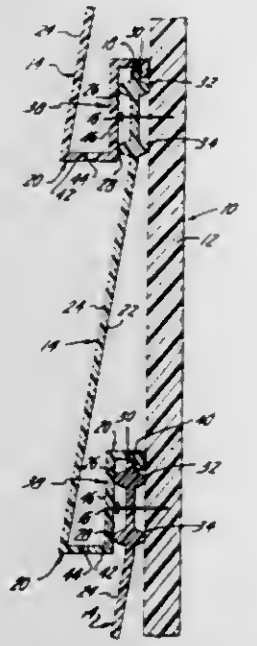
4,102,106
SIDING PANEL

Michael D. Golder, Waldwick, and William M. Bernat, Garfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 754,987

Int. Cl.² E04D *1/00*

U.S. Cl. 52—533 **7 Claims**



1. An elongated siding panel having first and second longitudinally extending edge portions and first and second surfaces, and further comprising:

(a) a first pair of parallel, spaced ridges on the first surface of the first edge portion of said panel, said ridges being adjacent to but spaced from the edge of said first edge portion and being parallel therewith;

(b) a second pair of spaced parallel ridges, said second pair of ridges being positioned on the second surface of the panel opposite and parallel with the first pair of ridges; and

(c) a flange extending from the first surface of the second edge portion of said panel adjacent the edge of the second edge portion, said flange terminating in a generally U shaped opening which is coplanar with the first edge portion of the panel and which opens in a direction away from said first edge portion.

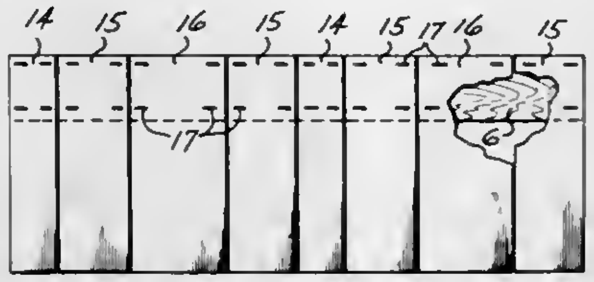
4,102,107
PREFABRICATED SHINGLE PANELS

Frank S. Barker, Pompano Beach, Fla., and Willis G. Pehl, Chehalis, Wash., assignors to Shakertown Corporation, Winlock, Wash.

Division of Ser. No. 48,255, Jun. 22, 1970, abandoned. This application Sep. 9, 1974, Ser. No. 504,317

Int. Cl.² E04D *1/20*

U.S. Cl. 52—553 **1 Claim**



1. A prefabricated regular modular shingle panel comprising an elongated backing board of substantially rectangular cross section, and only a single course of several individual wooden shingles, each shingle having a tip portion and a butt portion and being tapered in thickness away from said butt portion toward said tip portion, and said shingles being arranged with their lengths extending transversely to the length of said backing board, with their tip portions overlying and secured to said backing board and with their butt portions overhanging one edge of said backing board in free cantilever fashion without any underlayer for a distance at least as great as the width of said backing board, said course of shingles including at least three shingles of different selected predetermined widths in the direction lengthwise of said backing board arranged in each of at least two repetitive identical series of such selected predetermined widths, and said backing board being of a length to extend continuously at least throughout said two repetitive predetermined series of shingles in said course.

4,102,108
FASTENING MEANS FOR A LOAD-BEARING STRUCTURE

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Continuation-in-part of Ser. No. 746,314, Dec. 1, 1976. This application Mar. 14, 1977, Ser. No. 777,428

Int. Cl.² E04C *3/02;* F16D *1/12*

U.S. Cl. 52—693 **14 Claims**

1. In a load-bearing structure including horizontally extending chord means having a pair of spaced apart vertical webs, and a tubular member having spaced parallel opposite walls and extending outwardly from said chord means, said member having an end disposed between said webs with said walls each adjacent to one of the webs, said end having a pair of registering circular bolt holes in respective walls and adjacent to said webs, said webs each having a circular bolt hole registering with each adjacent wall bolt hole, said pair of wall bolt holes and said web bolt holes registering therewith being adapted for receiving therein threaded bolt and nut-type fastening means serving to connect said chord means and said member together in a structure adapted for supporting a load on said chord means, and also serving to transfer load forces between said webs and said walls on both sides of said member, fastening means inserted in said pair of wall bolt holes and said web bolt holes registering therewith, and comprising:

a bolt having

a head,

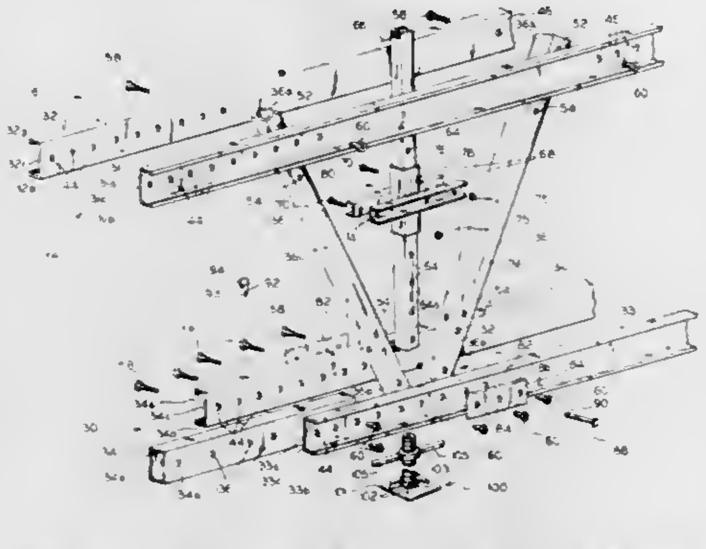
a shank integral with said head and projecting axially therefrom, said shank including a cylindrical bearing portion of reduced diameter, and

a threaded stem of further reduced diameter projecting axially from said shank, and

a nut having

a head, and

a shank integral with said nut head and projecting axially therefrom, said nut shank including a cylindrical bearing portion of reduced diameter the same as the diameter of said bolt shank bearing portion,



said nut head and shank having a threaded bore extending axially therethrough and adapted for receiving said stem in threaded engagement with the nut;

said bolt shank being inserted through one of said wall bolt holes and said web bolt hole registering therewith in load-bearing engagement of its bearing portion with the wall and the web having the holes therein, and extending from said bolt head in the direction of the paired wall bolt hole,

said nut shank being inserted through said paired wall bolt hole and said web bolt hole registering therewith in load-bearing engagement of its bearing portion with the wall and the web having the holes therein, and extending from said nut head in the direction of said one wall bolt hole,

said nut receiving said stem in threaded engagement in said bore.

4,102,109
PRESS

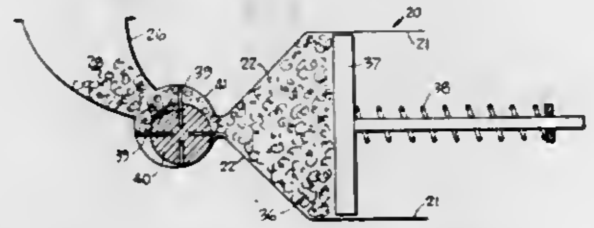
Theodor Victor Modrá, Thistle Island, and Norman Wills Growden, Wedge Island, both of Port Lincoln, Australia

Filed Apr. 13, 1977, Ser. No. 786,966

Claims priority, application Australia, Apr. 13, 1976, 5575/76

Int. Cl.² B65B *1/24, 63/02*

U.S. Cl. 53—24 **7 Claims**



4. A method of pressing wool into a bale in a wool press having walls which surround a bale-forming space, and spaced apart surfaces which define between them a mouth to said space, the maximum width in a direction perpendicular to a said surface being less than the maximum bale space width between said walls in the same direction, the maximum mouth width being sufficiently small that wool when in said space at superatmospheric pressure does not disgorge from the mouth,

the method comprising injecting wool through said mouth under high pressure into said space, discontinuing said wool injection when a bale has been formed therein, surrounding the bale with bale retaining means, and removing the bale from said space.

4,102,110
COIN PACKAGING SYSTEM

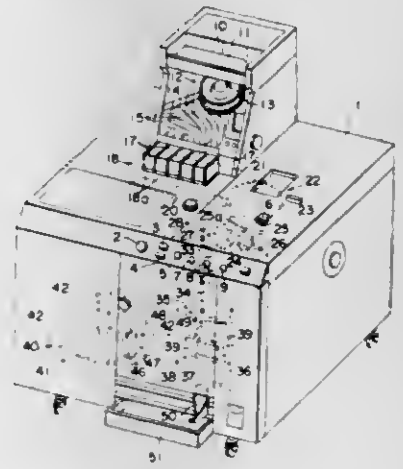
Nobuhiro Iizuka, and Yoshihiro Hatanaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Aug. 30, 1977, Ser. No. 829,092

Claims priority, application Japan, Sep. 6, 1976, 51-106406; Sep. 18, 1976, 51-112203

Int. Cl.² B65B *57/10, 57/20, 11/04*

U.S. Cl. 53—59 R **3 Claims**



1. A coin packaging system comprising:

(a) a coin sorting section for sorting out coins of plural denominations according to the denominations;

(b) a coin packaging section for packaging coins of a denomination selected out of the coins thus sorted out, for every predetermined number of pieces thereof; and

(c) a coin selecting means for selecting a denomination of coins to be packaged out of the coins sorted out by said coin sorting section, so that said coin packaging section operates to package the coins sorted out according to the denominations, on the basis of a denomination selected.

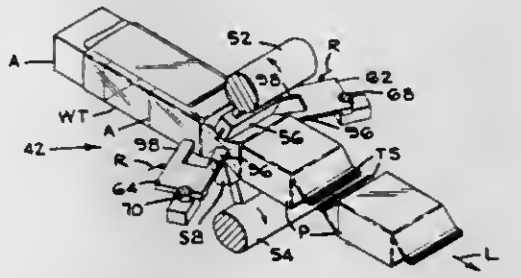
4,102,111
WRAPPING MACHINE

Michael R. Nack, and Gary M. Le Tourneau, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Jun. 1, 1976, Ser. No. 691,662

Int. Cl.² B65B *9/10*

U.S. Cl. 53—182 R **7 Claims**



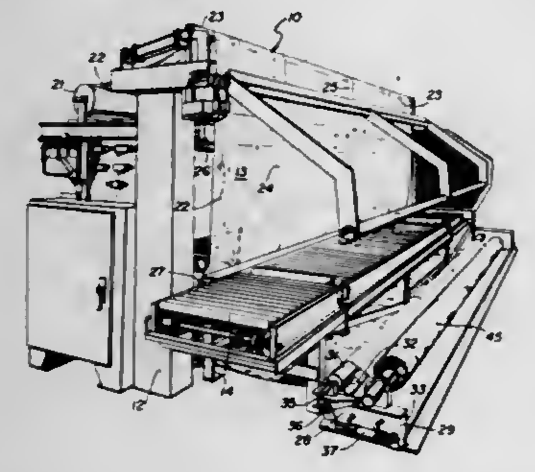
1. In a horizontal form, fill and seal wrapping machine including means for continually unwinding and forming a strip of thermoplastic web material into a tube, means for depositing longitudinally spaced articles in said tube and cooperating

opposed pairs of rotary tucking means moving in the direction of web movement to engage and tuck web portions between said spaced articles, said rotary tucking means being rotatable about spaced pairs of axes lying in the same or substantially the same plane disposed transversely of the direction of movement of the web tube, the improvement in said tucking means comprising means for concurrently driving said tucking means to substantially simultaneously engage the tuck and opposed panels of the web tube, one pair of said tucking means being heated and provided with web severing means to, respectively, seal and sever the web tube along a line in said plane transverse to the direction of web movement and closely adjacent to said articles, the seal formed by said one pair of tucking means being generally in the form of a rectangle located adjacent said spaced articles and extending from one to the other edge of the web tube, and the other pair of said tucking means each consisting of integral fingers spaced a fixed distance laterally of each other and while tucking the opposed web tube portions toward each other said fingers being positioned on either side of said heated tucking means and thus straddling the web tube portion while sealing and severing occurs, said fingers of said other pair of tucking means in withdrawing from the tucked and sealed web tube avoid interference with the seal.

4,102,112
PACKAGING MACHINE

Henry B. Rose, Worcbester, Mass., assignor to Curtis & Marble Corporation, Worcester, Mass.

Filed Dec. 8, 1975, Ser. No. 638,467
Int. Cl.² B65B *11/08*
U.S. Cl. 53—228 **5 Claims**



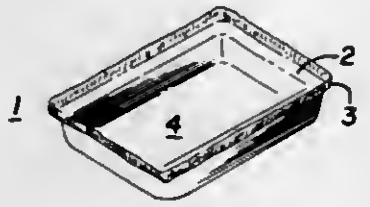
I. A packaging machine capable of use with elongated articles of varying lengths, comprising:

(a) a frame having an opening through which an article passes laterally from an input side to an output side,
(b) means supporting a plurality of rolls of wrapping material on the frame above the opening for independent unrolling, so that strips of material pass downwardly to form a plurality of bights in the opening in side-by-side relationship with a slight overlap between adjacent strips,
(c) means for advancing the article through the opening and into the bights of the strips to select automatically from the total number of strips a sub-multiple adequate to enclose the entire length of the article,
(d) means mounted on the frame and extending across the opening to form a joint to each other between two portions of the bight of each strip after the article has passed through the opening, the means to form the joint consisting of two opposed heating elements extending longitudinally of the opening on the output side thereof, the lower element and the upper element being relatively movable vertically to engage the strips after the article has passed through the opening, and
(e) take-up means to pull the strips downwardly but nonreversably a predetermined small amount after the joint has been formed, the take-up means holding the lower portions of the strips, so that the passage of the article through the opening causes it to engage the bight of the strips and to pull the strips downwardly only from the rolls, the take-up means acting on the material after the sealing operation to move the sealed joint to a position substantially below the level at which the said operation takes place, the take-up means comprising a ratchet mechanism to rotate one of a pair of pinch rolls fixed relative to the frame, the ratchet mechanism operating through an over-running clutch to rotate a roll for the accumulation of material from the lower end of the strips.

4,102,113
COVER FEEDING APPARATUS

Glenn F. Raque, and Edward A. Robinson, both of Louisville, Ky., assignors to Raque Food Systems Inc., Louisville, Ky.

Filed Jun. 27, 1977, Ser. No. 810,027
Int. Cl.² B65B *7/28*
U.S. Cl. 53—366 **9 Claims**



I. An apparatus for supplying and locating a generally planar cover of selected peripheral configuration over a cooperative opening of similar configuraton of a moving container where the opening is surrounded by an outwardly directed generally horizontal cover receiving first flange where the first flange has an upwardly extending second flange so the cover is received on the first flange and within the second flange including:

(a) conveyor means to move said container along a selected first axis at selected first velocity with the opening directed upwardly;
(b) cover supply means to supply a cover to engage the first flange in a direction generally parallel to the direction of travel of the container from a location above the container;
(c) cover feed means to receive the cover from the cover supply means and feed the cover onto the first flange means along a second axis at an acute angle relative to the first axis at a selected second velocity where the velocity component of the cover, in a direction parallel to the first axis, is in excess of the first velocity so the cover means engages the first flange and moves along the first flange until the leading edge of the cover engages the front of the second flange and then feeds the balance of the cover to be fully received within the second flange.

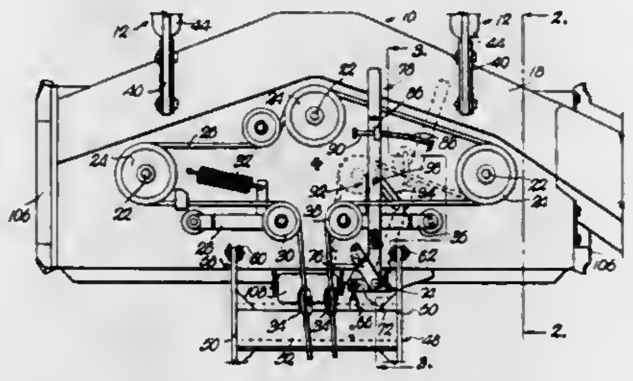
4,102,114
COMBINATION LEVEL ADJUST AND SELF-TENSIONING BELT ASSEMBLY FOR MOWERS

Larry A. Estes, New Palestine, and Gerald D. Williams, Indianapolis, both of Ind., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 10, 1976, Ser. No. 713,252
Int. Cl.² A01D *35/26*
U.S. Cl. 56—15.2 **11 Claims**

7. An implement adapted for shiftable mounting on a tractor or the like and having a belt and pulley drive train for coupling with a first driving pulley at a fixed position on the tractor, said implement including:

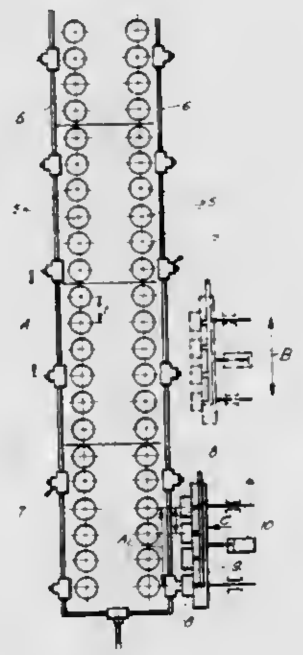
structure for selectively shifting the position of a second pulley in said belt and pulley drive train with respect to said implement;
height adjustment mechanism for raising and lowering a portion of the implement, whereby the distance between said first pulley and the remainder of said belt and pulley drive train is altered;
linkage means operably interconnecting said structure and said mechanism, for shifting said second pulley by an amount to compensate for alterations in the distance between said first pulley and the remainder of said drive train which occur during height adjusting movement of the implement.



4,102,115
COMPRESSED AIR SUPPLY ARRANGEMENT FOR A SERVICE CARRIAGE

Zdenek Hemala; Guenter Nudinger, both of Kempten, and Gerhard Wehrmeister, St. Mang, all of Germany, assignors to Saurer-Allma GmbH, Kempten, Germany

Filed Sep. 27, 1976, Ser. No. 727,147
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 7531565
Int. Cl.² D01H *13/00, 9/10*
U.S. Cl. 57—34 R **6 Claims**

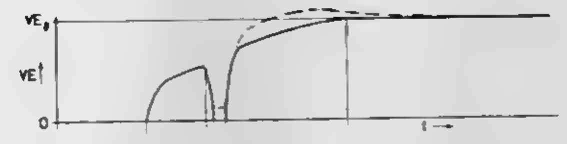


1. In a compressed air supply arrangement for a service carriage which is supported for travel along the side of at least one spinning, twisting or winding frame having a plurality of equally spaced spindles and a plurality of equally spaced work stations to be serviced and a compressed air system of which is supplied with compressed air from a stationary source of compressed air via a compressed air duct, the improvement comprising wherein said compressed air duct is stationarily arranged at each side of said frame and extends in the longitudinal direction of said frame and is connected to said compressed air source, said air duct having a plurality of automatically closing button-actuated valves connected in circuit therewith, each of said valves having a closure member, wherein the spacing of said valves corresponds to a whole integer multiple of the spindle spacing, and wherein there is provided on said service carriage a plurality of coupling heads arranged one behind another in the direction of movement of said carriage and mounted on a common slide and have a fixed spacing therebetween and means for supporting said common slide for movement transversely to the direction of movement of said carriage and at right angles to said air duct to effect the simultaneous movement of said plural coupling heads toward and away from said air duct, said coupling heads each having an opening member engageable with said closure member for opening said closure member of said valve when firmly engaged with said valve, said coupling heads being connected in fluid circuit to said compressed air system on said service carriage, wherein the spacing between said coupling heads is equal to said spindle spacing and wherein said spacing between said valves is greater by one spindle spacing than the total spacing between the endmost ones of said plurality of coupling heads.

4,102,116
METHOD AND APPARATUS FOR CONTROLLING A THREAD-JOINING OPERATION IN ROTOR SPINNING MACHINES

Josef Derichs; Hans Raasch; Ludwig Neuhaus; Dieter Langheinrich, all of Monchen Gladback; Helmut Schlösser, Viersen, and Erwin Baitsch, Nettetal, all of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Feb. 14, 1977, Ser. No. 768,496
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605978
Int. Cl.² D01H *15/00, 13/32*
U.S. Cl. 57—34 R **29 Claims**

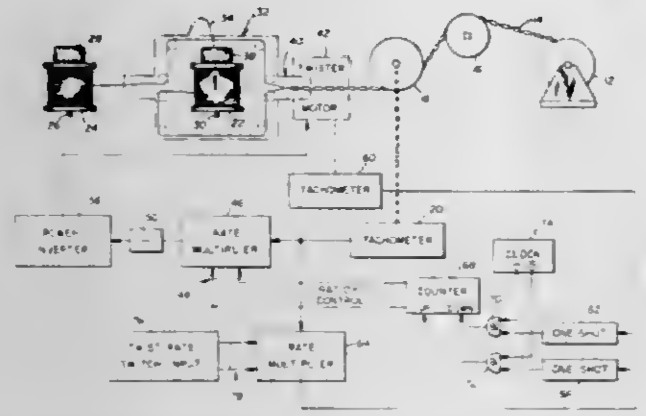


I. Method of controlling a thread-joining operation in a rotor-spinning machine having a rotor formed with a fiber-collecting channel, wherein a pulse proportional to the rotary speed of the rotor is applied to control a measure of the material being processed in the spinning operation which comprises automatically controlling spin feeding into the rotor of a quantity of fiber required for thread-joining and feeding the fiber beginning with withdrawal of a thread formed from the fiber, returning into the rotor the thread end to be joined and withdrawing the joined thread from the rotor during start-up of the rotor, the automatic control being in accordance with the pulse proportional to the rotary speed of the fiber-collecting channel of the rotor serving as control input variable for at least one of the fiber feed, the thread withdrawal, the starting-up of the spin feeding and the starting-up of the returning of the thread end.

II. Device for carrying out a method of controlling a thread-joining operation in a rotor-spinning machine having a rotor formed with a fiber-collecting channel comprising a control device associated with the rotor-spinning machine for controlling spin feeding into the rotor of a quantity of fiber required for thread-joining, and feeding of the fiber beginning with withdrawal of a thread formed from the fiber, and for return into the rotor of the thread end to be joined and withdrawal of the joined thread from the rotor, said control device being programmable during start-up of the rotor for effecting the control, the thread withdrawal velocity as well as the fiber feeding velocity being variable by a quantity proportional to the peripheral velocity of the fiber collecting channel of the rotor as control input variable.

4,102,117
WIRE TWISTING METHOD AND APPARATUS

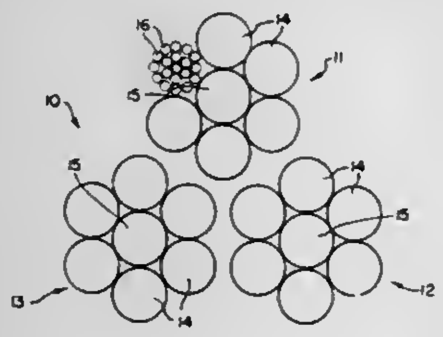
Georg Christian Ernst Dornberger, Phoenix, Ariz., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Jun. 25, 1976, Ser. No. 699,821
Int. Cl.^{2} H01B *13/00*
U.S. Cl. 57—93 **10 Claims**

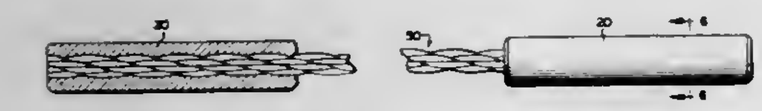


4. In an apparatus for twisting two wires to form a twisted pair having a capstan with a rotational speed representative of the linear speed of the twisted pair;
- means for twisting the wires at an angular speed;
- means responsive to the linear speed of the twisted pair for generating a series of pulses having a frequency proportional to the linear speed of the twisted pair;
- means responsive to the frequency of the pulses for driving the twisting means at a speed proportional to the frequency of the pulses, and
- means for varying the ratio between the frequency of the pulses generated and the speed of the twisting means.

4,102,118
MULTI-PART WIRE ROPE FABRIC ASSEMBLY

Claud Ray Wheeler, Saint Joseph, Mo., assignor to Wire Rope Corporation of America, Inc., Saint Joseph, Mo.
Filed Mar. 16, 1977, Ser. No. 778,072
Int. Cl.^{2} F16G *11/02;* **D07B** *1/00*
U.S. Cl. 57—144 **5 Claims**

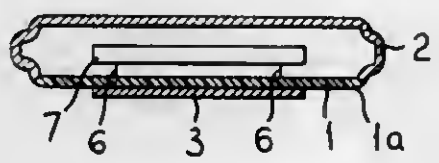




1. An assembly comprising:
- a length of multi-part wire rope fabric containing three to nine helically layed wire ropes;
- a metal terminal fitting swaged onto each end of the length of multi-part fabric with a holding strength equal to or greater than the strength of the multi-part fabric; and
- said metal terminals constituting axles for supporting and rotating the assembly, and each terminal is a metal cylindrical sleeve in which the fabric is axially centered.

4,102,119
ELECTRONIC TIMEPIECE

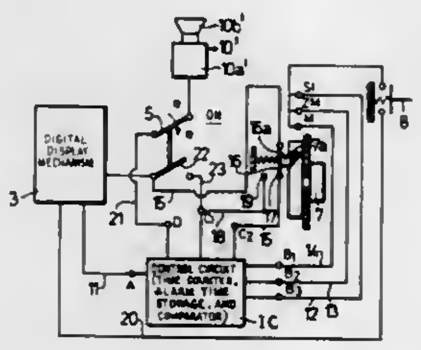
Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Nov. 9, 1976, Ser. No. 739,852
Claims priority, application Japan, Nov. 11, 1975, 50-135556; Nov. 11, 1975, 50-135560
Int. Cl.^{2} G04C *3/00;* **G04B** *37/00*
U.S. Cl. 58—23 R **3 Claims**



1. In an electronic timepiece: a display operative for displaying time in response to an electrical enabling signal applied thereto; a timepiece case housing said display, said timepiece case including a case back having an electrically insulative exterior portion; at least one electrode mounted on said electrically insulative exterior portion of said case back and positioned to inductively couple with an arm of a person wearing the electronic timepiece; and circuit means responsive to signals induced in said electrode from the arm of a person wearing the timepiece for developing an enabling signal and for applying said enabling signal to said display to enable said display when the timepiece is worn on the arm of a person.

4,102,120
ELECTRONIC ALARM CLOCK WITH A SERVICING ARRANGEMENT FOR TIME ADJUSTMENT

Hans Flaig, and Friedrich Assmus, both of Schramberg, Germany, assignors to Gebruder Junghans GmbH, Schramberg, Germany
Filed Jul. 13, 1976, Ser. No. 704,829
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1975, 7523854
Int. Cl.^{2} G04C *9/00, 21/12*
U.S. Cl. 58—38 R **8 Claims**

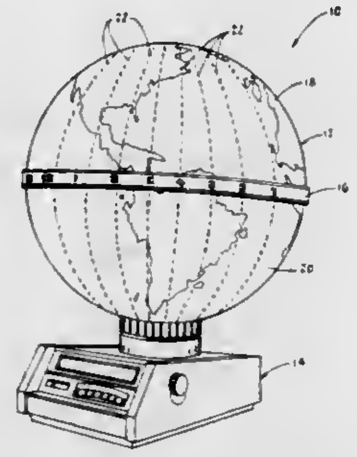

10b'
10'
10a'
DIGITAL DISPLAY MECHANISM
3
5
ON
22
23
15
15a
S1
ZM
M
8
7
15
21
0
18
C2
15
B1
B2
B3
11
A
CONTROL CIRCUIT (TIME COUNTER, ALARM TIME STORAGE, AND COMPARATOR)
20
1C
12
13

1. In an electronic alarm clock of the type including:
- a digital display mechanism;
- an alarm device;
- a master circuit including:
  - an integrated control circuit having a counter for the time of day connected to said display mechanism, means for storing a wake-up alarm time, and means for comparing the wake-up alarm time to the time of day and being connected to the alarm device to activate the latter;
  - a main circuit connecting said counter and said display mechanism;
  - a gate-in circuit connecting said control circuit to said display mechanism for gating-in the wake-up alarm time onto said display mechanism;
- manually operable selecting switch means connected to said master circuit for selecting a type of display to be adjusted;

- a manually actuable alarm control switch for deactuating said alarm device;
- a manually actuable triggering switch connected to said master circuit for adjusting the type of display selected by said switch means, the improvement wherein the improvement comprises:
  - said selecting switch means comprises first and second individually actuable switches, said first switch being connected for selecting types of wake-up alarm displays, such as hours, etc., for adjustment, and said second switch being connected for selecting types of time-of-day displays, such as hours, etc., for adjustment;
  - said switches being independently shiftable into various stop positions for selecting the type of display to be adjusted, and
  - said triggering switch, when actuated, being operable to adjust the value of a display selected by either of said first and second switches.

4,102,121
THREE DIMENSIONAL TIME PIECE

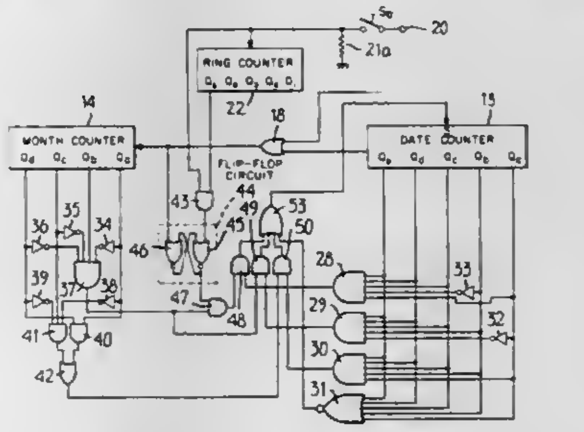
Robert W. Veazey, Lustercraft Plastics, Inc. 1818 S. Meridian, Wichita, Kans. 67213
Filed Nov. 8, 1976, Ser. No. 739,435
Int. Cl.^{2} F21V *3/00;* **G04B** *19/22;* **G09B** *27/00*
U.S. Cl. 58—44 **4 Claims**



1. A three dimensional time piece for determing the correct time anywhere in the world and whether the selected location in the world at that moment is in daylight or darkness, the time piece comprising:
- a base;
- a world globe swivelly mounted on said base, said globe having 24 longitudinal lines equally spaced 15° apart on the surface of said globe and representing the time zones of the world, said globe made of translucent material for shining light therethrough;
- a time band attached to the globe and mounted on the equator of said globe, said band indicating the 24 hours of the day;
- a light attached to one side of a light shade, said light and said light shade disposed inside said globe, said shade longitudinally dividing the inside of said globe, the unlighted side of said globe representing nighttime in the world while the lighted side of said globe represents daytime;
- an electrically driven synchronous motor attached to a drive gear for driving a pinion gear, said pinion gear turning a tubular shaft disposed inside said globe and attached to said time band and said light shade for turning said time band and said light shade one revolution per 24 hours;
- a time clock mounted inside said base for telling the present time at the location of the time piece; and
- a dial indicating the month of a year, said dial attached to said base and said light shade, said dial driven by a second electrically driven synchronized motor one revolution per year, said dial by turning adjusts the tilt of said light shade and said light in said globe thereby changing the light intensity reflected on the northern and southern hemispheres of said globe and representing the inclination of the sun and the corresponding season of the year.

4,102,122
ELECTRONIC WATCH

Kojiro Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Nov. 4, 1976, Ser. No. 738,875
Claims priority, application Japan, Nov. 4, 1975, 50/132345
Int. Cl.^{2} G04B *19/24*
U.S. Cl. 58—58 **4 Claims**



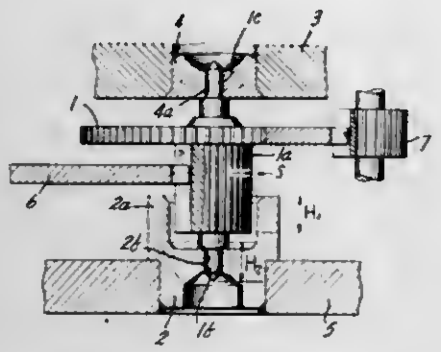
1. An electronic watch, comprising:
- means for developing a repetitive timing signal having a repetition rate defining an interval of time;
- counter means comprising a time counter, a day counter and a month counter receptive of said timing signal for counting the same and for developing counts respectively representing time of the day, day of the month, and the month, wherein said day counter includes means responsive to a control signal for limiting a maximum count of said day counter to 28, 29, 30 or 31 days according to the month;
- date control means for developing said control signal and for applying the same to said day counter for limiting the maximum count of said day counter to 31 days during a long month, 30 days during a short month and 28 or 29 days during February; and
- display means responsive to the respective counts of said counter means for displaying time of the day, day of the month, and the month.

4,102,123
BEARING FOR A TIMEPIECE TRAIN

Yoshio Tatsumi; Eiichi Matsuura; Keikichi Takahashi, and Nobuo Tsukada, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan
Filed Dec. 16, 1976, Ser. No. 751,073
Claims priority, application Japan, Dec. 17, 1975, 50-170839
Int. Cl.^{2} G04B *29/00, 33/00, 31/00*
U.S. Cl. 58—140 R **2 Claims**

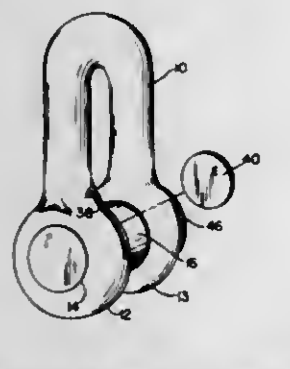
1. In a timepiece: a base plate; a wheel and pinion mechanism comprised of integral wheel and pinion portions having upper and lower shafts extending outwardly therefrom; and means mounting said wheel and pinion mechanism on said base plate for rotation in a given orientation relative to said base plate comprising means defining an opening in said base plate, and a bearing having a base portion fixedly inserted into said opening and an elongated hole in said base portion rotatably receiving therein said lower shaft of said wheel and pinion mechanism and having a cylindrical portion surrounding the outer periphery of said pinion portion and being spaced therefrom along their respective axial lengths a predetermined distance effective to enable said pinion portion to abut the inner wall of said bearing cylindrical portion when said wheel and pinion mechanism tilts on its lower shaft a predetermined amount from said

given orientation thereby preventing falling of said wheel and pinion mechanism and maintaining it substantially in said given



orientation while otherwise avoiding contact between said bearing cylindrical portion and said pinion portion when said wheel and pinion mechanism is in said given orientation.

4,102,124
LOCKING CLEVIS OR THE LIKE
William E. Swager, P. O. Box 656, Fremont, Ind. 46737
Filed Jul. 12, 1976, Ser. No. 704,628
Int. Cl.² F16B *21/00;* F16G *13/06*
U.S. Cl. 59—86 **18 Claims**

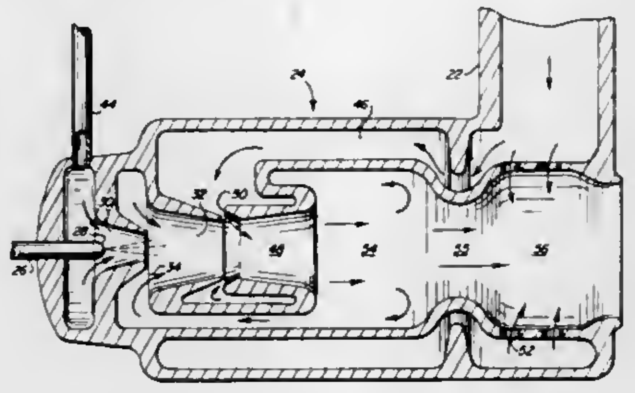


1. The combination of a support comprising a bent bar-like body having ends terminating in eyes provided by bores in each end, the opposed edges of said bores that face each other being chamfered to serve as a guide, and a closure pin or bolt axially slideable and rotatable in said eyes, at least one detent mounted for radial sliding movement in said pin and means radially biasing said detent through the sliding surface of said pin, a retaining area in at least one eye of said support adjacent to said detent and shaped to receive the end of said detent in biased position, locking said pin or bolt against axial movement while allowing rotation in said eyes, a slot cut through an outer surface of at least one of the eyes of said support communicating with the end of said detent in said retaining area and key means insertable in said slot to depress said detent radially releasing said pin for axial movement of said support.

4,102,125
HIGH TEMPERATURE GAS TURBINE
Helmut R. Schelp, Pacific Palisades, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Division of Ser. No. 645,004, Dec. 29, 1975, Pat. No. 4,041,699. This application Feb. 22, 1977, Ser. No. 773,869
Int. Cl.² F02C *7/00, 7/12*
U.S. Cl. 60—39.53 **12 Claims**

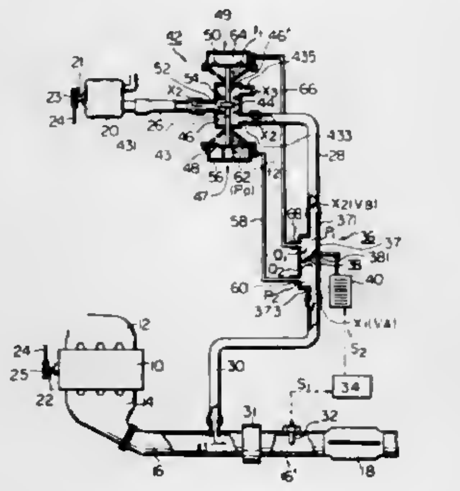
1. A combustor for a gas turbine engine said engine having a compressor and a turbine cooled by a fluid with a boiling point above standard atmospheric temperature and pressure, said combustor comprising:

a premixing chamber connected to a source of engine fuel and the cooling fluid outlet from said turbine;
a first mixing chamber for mixing and vaporizing the fuel and cooling fluid mixture from said premixing chamber;
a second mixing chamber operatively associated with said first mixing chamber and receiving the contents thereof for mixing the contents of said first mixing chamber with a portion of cycle fluid from said compressor;
a first combustion chamber connected to said second mixing chamber and receiving the contents thereof for gasification and primary combustion of the contents of said second mixing chamber; and



a second combustion chamber operably associated with said first combustion chamber and receiving the contents thereof together with the remainder of the cycle fluid from said compressor for secondary combustion therein.

4,102,126
APPARATUS FOR INTRODUCING SECONDARY AIR INTO AN EXHAUST SYSTEM OF AN INTERNAL COMBUSTION ENGINE
Hideo Miyagi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Jan. 5, 1977, Ser. No. 756,859
Claims priority, application Japan, Sep. 21, 1976, 51/112419
Int. Cl.² F01N *3/10*
U.S. Cl. 60—276 **4 Claims**

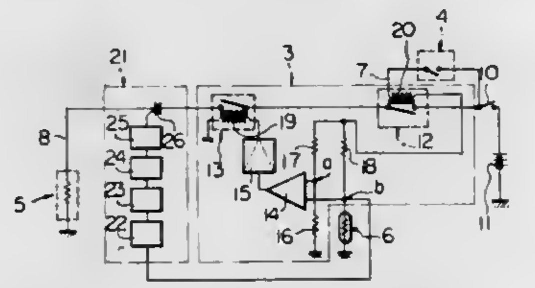


1. An apparatus for introducing secondary air into an exhaust system of an internal combustion engine provided with a three-way catalytic convertor arranged in the exhaust system, said apparatus comprising:

air pump means driven by the engine;
pipe means which connects said air pump means with the exhaust system at a location situated upstream of said catalytic converter, for introducing an amount of secondary air into the exhaust system;
flow control valve means having a casing, arranged between said pipe means and having a valve member arranged in the casing for controlling the amount of secondary air introduced into the exhaust system from the air pump, said valve member being capable of being moved in one direction in order to decrease said amount of secondary air and capable of being moved in another direction opposite to said one direction in order to increase said amount of secondary air;
sensing means for sensing the atmosphere of the exhaust gas, arranged in the exhaust system in order to provide electrical signals indicating an excess air ratio λ of the exhaust gas;
operating means connected to said sensing means for moving said valve member in such a manner that said valve member is moved in said one direction for decreasing the amount of secondary air when an electrical signal indicating $\lambda > 1.0$ is transmitted from the sensing means to the operating means and that said valve member is moved in said other direction for increasing the amount of secondary air when another electrical signal indicating $\lambda < 1.0$ is transmitted from the sensing means, so that the atmosphere of the exhaust gas is controlled to a stoichiometric atmosphere in which λ is kept near 1.0, and;
pressure control valve means arranged between said pipe means at a location situated between said air pump means and said flow control valve means for keeping a predetermined constant difference between the pressure of the secondary air in said pipe means at a position located upstream of said flow control valve means and a pressure of the secondary air in said pipe means at another position located downstream from said flow control valve means,

whereby a precise control of the atmosphere of the exhaust gas to said stoichiometric atmosphere by said flow control valve means is effectively attained.

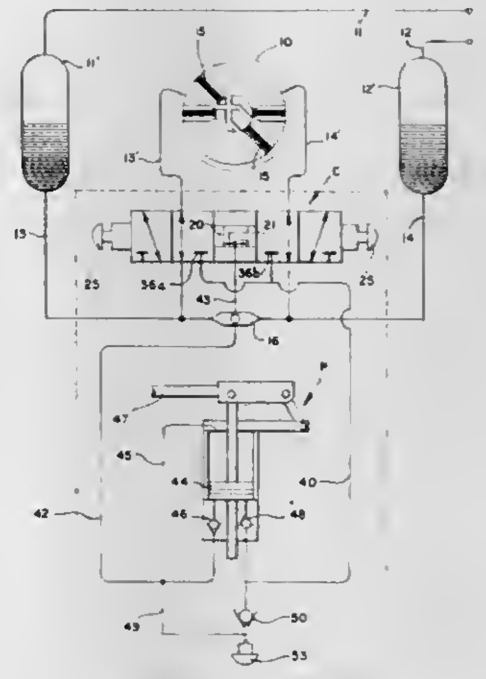
4,102,127
CATALYZER HEATING DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Junichi Saiki, Susono; Syouzi Watanabe, Numazu; Takehisa Yaegashi, and Tetsuro Nagano, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Mar. 15, 1977, Ser. No. 777,574
Claims priority, application Japan, Jan. 31, 1977, 52-8722
Int. Cl.² F02B *75/10;* F01N *3/15*
U.S. Cl. 60—284 **8 Claims**



1. A catalyzer heating device of an internal combustion engine having in its exhaust system a catalytic converter containing a catalyzer therein, said device comprising:

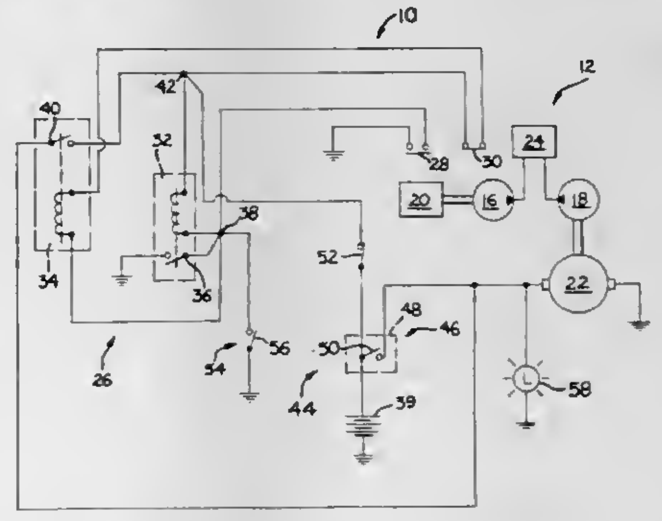
a power source;
means in said catalytic converter for heating said catalyzer;
a first detecting means for providing a first signal indicating that the temperature of the engine is below a predetermined level;
a second detecting means for providing a second signal indicating the temperature of said catalyzer, and;
control means for establishing an electrical connection between said power source and said heating means in response to said first and said second signals when the temperature of the engine is below a predetermined level and when the temperature of said catalyzer is below a predetermined level.

4,102,128
HAND PUMP SYSTEM FOR HYDRAULIC MOTOR
Jon L. Shafer, Houston, Tex., and William K. LeBlanc, Mansfield, Ohio, assignors to Shafer Valve Company, Mansfield, Ohio, a part interest
Filed Jul. 1, 1977, Ser. No. 812,140
Int. Cl.² F15B *20/00, 13/09*
U.S. Cl. 60—400 **14 Claims**



1. In combination with a hydraulic motor operable in opposite directions by pressure storage tanks when subjected alternately to supply and discharge pressures, a hand piston pump, a control valve normally connecting said motor and storage tanks and having shiftable elements for connecting said hand pump selectively with said storage tanks to move said motor in either direction, and conduit means for connecting both sides of said pump piston to pressure selectively from either of said tanks and for returning said elements to normal position, when said tanks are subjected to supply and discharge pressures.

4,102,129
CONTROL APPARATUS
Richard J. Maes, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 1, 1977, Ser. No. 812,094
Int. Cl.² F15B *20/00*
U.S. Cl. 60—403 **6 Claims**



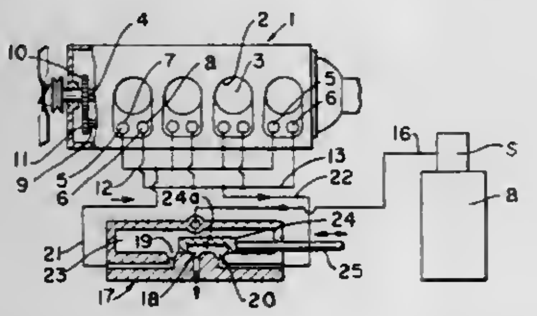
1. Control apparatus for an apparatus having first and second mechanisms, comprising:

first means for automatically, controllably energizing said second mechanism in response to a preselected condition of said first mechanism; and

second means for selectively, controllably energizing said second mechanism independently of said first means and independently of the condition of said first mechanism and for controllably energizing said second mechanism in response to the preselected condition of said first mechanism.

4,102,130
CONVERTING AN INTERNAL COMBUSTION ENGINE TO A SINGLE ACTING ENGINE DRIVEN BY STEAM OR COMPRESSED AIR

Harry Charles Stricklin, 2004 E. 224th St., Euclid, Ohio 44117
Continuation of Ser. No. 455,921, Mar. 28, 1974, abandoned.
This application Apr. 19, 1976, Ser. No. 668,749
Int. Cl.^{2} F01L *13/02;* F01B *23/02*
U.S. Cl. 60—407 **3 Claims**



1. A method of converting to a single acting, reversible steam engine a four cycle internal combustion engine which includes an engine block, a cylinder therein having an intake port and an exhaust port, an inlet valve and an exhaust valve for said ports, respectively, a piston reciprocable in the cylinder, a crankshaft driven by the piston, a cam shaft, timing gears interconnecting the crankshaft and cam shaft so that the cam shaft is driven by the crankshaft in a ratio of one revolution of the cam shaft to two revolutions of the crankshaft, cams on said cam shaft for the valves, respectively, and arranged one cam for each valve for lifting and lowering the associated valve so as to open and close its associated port in and for a four cycle operation of the engine;

said method comprising:

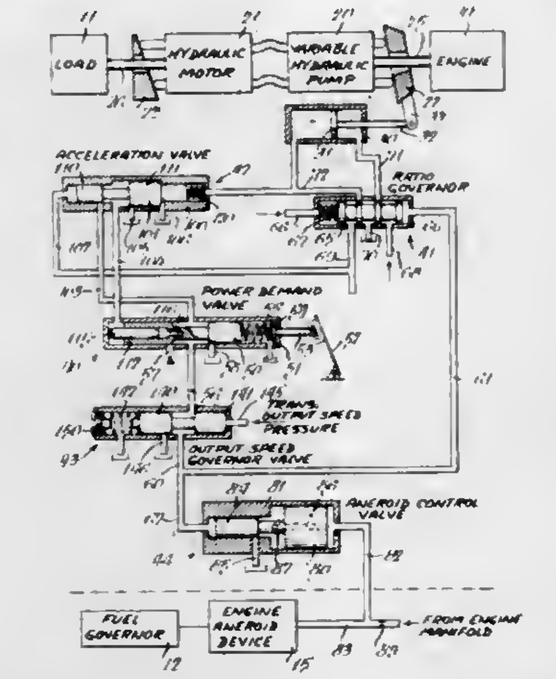
changing the relation of the camming action on said valves by said cam shaft in relation to the rotation of the crankshaft to cause each of said valves to open and close in substantially the original relation to piston position once per revolution of the crankshaft; then

arranging for continuous introduction of high pressure fluid to the entrance side of said intake port and controlling its passage through said intake port by said inlet valve and for continuous delivery of fluid from the cylinder to the inlet side of the exhaust port and venting of fluid from the outlet side of the exhaust port and controlling the venting through the exhaust port by said exhaust valve, to effect driving of the engine in one direction; and

arranging for manually selectively reversing the introduction and venting of said high pressure fluid to said ports in a manner to effect continuous introduction of the high pressure fluid to the outlet side of the said exhaust port and the continuous venting of the entrance side of the said inlet port, thereby to cause driving of the engine in a direction which is the reverse of said one direction.

4,102,131
INTEGRATED TRANSMISSION-ENGINE CONTROL

David W. Reynolds, Huxley, and Frederic W. Pollman, Ames, both of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.
Filed May 5, 1977, Ser. No. 794,094
Int. Cl.^{2} F16D *31/02;* F15B *11/02*
U.S. Cl. 60—431 **22 Claims**



1. An integrated transmission-engine control including a transmission having a pump drivable by an engine, a fluid pressure operated ratio governor means for the transmission, fluid pressure operated means for controlling the supply of fuel to an engine, a power demand valve for converting a particular power demand to a particular fluid pressure primary control signal, and means for applying said primary control signal to the ratio governor means in opposition to a signal representing engine speed to set the transmission ratio to establish engine speed and to the fuel supply controlling means to establish a fuel setting to match engine horsepower to engine speed for minimum fuel consumption.

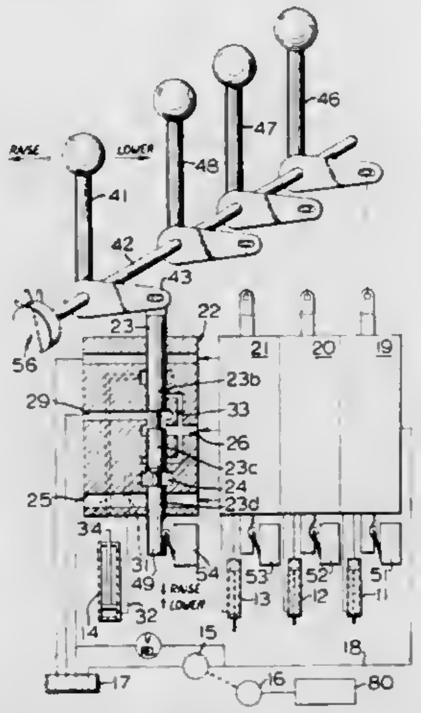
4,102,132
MOTOR CONTROL

Norman H. G. Palmer, Leicester, England, assignor to Towmotor Corporation, Mentor, Ohio
Filed Jul. 13, 1977, Ser. No. 815,118
Claims priority, application United Kingdom, Mar. 22, 1977, 12055/77
Int. Cl.^{2} F15B *11/02, 11/16*
U.S. Cl. 60—433 **24 Claims**

1. In a system for moving the lift forks of a lift truck in a plurality of directions, said system including a plurality of hydraulically operable means one for each direction of movement, a fluid pump, a valve for each hydraulically operable means, a manually-operable lever operatively associated with each of said valves for moving said valves from neutral to operative position, said valves being serially connected downstream of said pump for serial flow from said pump through all of said valves when all of said valves are in neutral position, each said valve being operable when in operative position to communicate pump flow therethrough to the hydraulically operable means associated therewith and to cut off pump flow to the valves downstream thereof, an electric motor drivingly connected to said pump, a battery and electronic switch means connected in series with said motor and battery, the improvement comprising:

(a) oscillator means for closing said electronic switch means on each cycle of operation of said oscillator means,
(b) means for opening said electronic switch means after each closure thereof by said oscillator means,

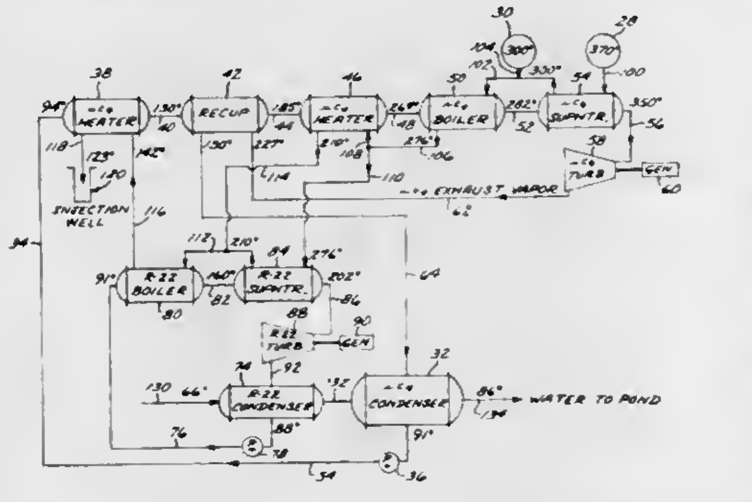
(c) signal-responsive means for setting the ratio of closed to open time of said electronic switch means during a cycle of operation of said oscillator means in proportion to the magnitude of a signal applied to said signal-responsive means,
(d) signal-generating means for generating a plurality of signals of predeterminable magnitude, each of said signals being associated with a different one of said valves,



(e) means responsive to movement of each of said valves from neutral to operative position for applying the signal associated with said valve to said signal-responsive means and for inhibiting the application to said signal-responsive means of a signal associated with any downstream valve,
(f) said signal-generating means including means for continuously varying the magnitude of one of said signals in proportion to the magnitude of movement from neutral position of the valve associated with said signal.

4,102,133
MULTIPLE WELL DUAL FLUID GEOTHERMAL POWER CYCLE

James Hilbert Anderson, 1615 Hillock La., York, Pa. 17403
Filed Apr. 21, 1977, Ser. No. 789,369
Int. Cl.^{2} F03G *7/04*
U.S. Cl. 60—641 **40 Claims**



1. The method of producing power from geothermal energy which comprises:

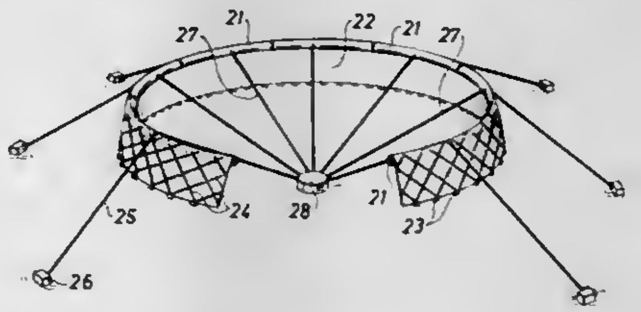
providing first and second hot geothermal fluids from respective first and second geothermal wells, said first geothermal fluid being provided at a higher temperature than said second geothermal fluid,

transferring heat energy from said first geothermal fluid in a first heat exchange step into a power fluid cycle of the type which is adapted to produce power by power fluid expansion, so as to raise the temperature of power fluid in said cycle to a first temperature, and

transferring heat energy from said second geothermal fluid in a second heat exchange step into said power fluid cycle so as to raise the temperature of power fluid in said cycle to a second temperature that is lower than said first temperature.

4,102,134
HOT WATER RESERVOIR

Peter Heinrich Erwin Margen, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden
Filed Dec. 23, 1976, Ser. No. 753,947
Claims priority, application Sweden, Dec. 23, 1975, 7514624
Int. Cl.^{2} E02B *3/00*
U.S. Cl. 61—1 F **8 Claims**



1. A hot water reservoir comprising:

a plurality of buoys floating on the surface of a body of water and enclosing a limited area thereof;

a substantially vertical wall of at least two sheets of flexible material impervious to water, said sheets fastened at their upper ends to said buoys and having stagnant water therebetween;

weights fastened to the lower edge of said wall to maintain the wall in its substantially vertical position;

cables extending between the buoys and the weights to reinforce said wall;

anchoring wires extending from the buoys toward the interior of the reservoir adapted to neutralize the tension on the wall of the reservoir caused by the difference in level between the hot water inside the reservoir and the cold water outside the reservoir; and

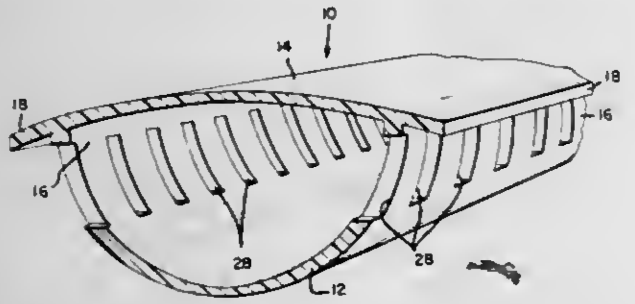
a floatable sheet operatively disposed on the hot water surface to reduce evaporation and loss of heat from the hot water.

4,102,135
UNDERGROUND DRAINAGE PIPE

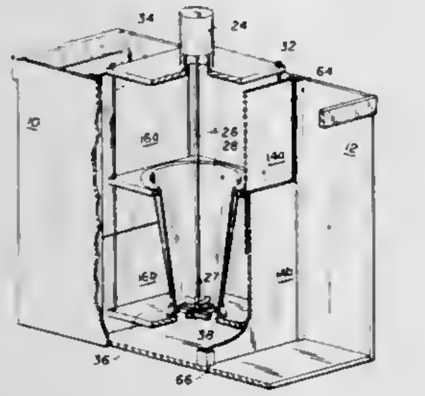
Robert Sinbad Auriemma, R.D. No. 1, P.O. Box 104, Bethel, Pa. 19507
Continuation-in-part of Ser. No. 682,492, May 3, 1976, Pat. No. 4,065,925. This application Apr. 1, 1977, Ser. No. 783,767
Int. Cl.^{2} E02B *11/00*
U.S. Cl. 61—10 **4 Claims**

1. An underground drainage pipe formed of a length of extruded stiffly flexible plastic and adapted to withstand vertical loading forces without stress concentration including in transverse cross section, a generally U-shaped trough opening upwardly with lips at the upper trough edges, the horizontal width of the trough between the lips being approximately twice the vertical height of the trough from the bottom thereof to a line joining the lips; a series of spaced drainage openings formed through the thickness of each lip; a generally flat roof overlying the trough and integrally joining the trough beyond

the lips so that the roof and trough are substantially D-shaped in transverse cross section, roof extensions projecting outwardly of the trough beyond the lips to form protective wings; said lips joining said generally flat roof at an angle of approximately 90°, the circumferencial length of the roof between the lips being substantially less than the circumferencial length of the trough between the lips, said pipe being symmetrical to either side of a plane passing through the mid points of the trough and roof, and said trough having a minimum thickness at its mid point and increasing in thickness smoothly and gradually to either side of the mid point to a maximum thickness at the lips whereby upon vertical loading of the pipe the uniform tapering of thickness in the trough distributes stresses along the trough to avoid stress concentration.

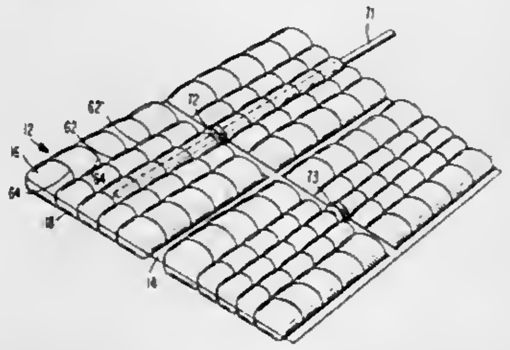


4,102,136
PUMP SYSTEM PROVIDING SELECTIVE DIRECTIONAL FLOW ACROSS FLUID BARRIER
John L. Winther, 12 El Sereno Rd., Orinda, Calif. 94563
Filed May 4, 1977, Ser. No. 793,677
Int. Cl.² E02B *7/20*
U.S. Cl. 61—29 **9 Claims**



1. In a combination a pump and pump manifolding system for producing selective directional liquid flow across a barrier between at least a plurality of adjacent fluid reservoirs, said system comprising: a housing for placement in said barrier having at least two sidewalls, one of said sidewalls forming a fluid-tight barrier with one reservoir and the other of said sidewalls forming a fluid-tight barrier with the other of said reservoirs; said housing divided into upper and lower fluid chambers, said lower fluid chamber adapted for the inflow of fluid to be pumped and said upper fluid chamber adapted for the outflow of fluid to be pumped; a low head pump having an intake communicated to said lower chamber and a discharge communicated to said upper chamber, each of said sidewalls including a first opening portion for establishing fluid communication between the lower chamber of said housing and said adjacent reservoir and a second opening portion for establishing fluid communication between said upper chamber and said fluid reservoir whereby selective manipulation of a first opening portion in one sidewall and a second opening portion in said other sidewall permits said selective directional flow between said adjacent reservoirs.

4,102,137
COATING AND PROTECTIVE DEVICE
Mauricio Porraz, Gutenberg 47, Mexico 5, Mexico, and Margret Klose, Zollikofen, Switzerland, assignors to Mauriclo Porraz, Mexico City, Mexico
Filed Dec. 6, 1976, Ser. No. 747,749
Int. Cl.² E02B *3/12*
U.S. Cl. 61—38 **7 Claims**



1. A coating and protection device comprising:

a plurality of spaced, generally rectangular containment portions, each said containment portion having spaced first and second walls forming pouches which receive a flowable, settable slurry, said walls being of woven construction;

a plurality of flexible joints extending longitudinally and transversely between adjacent containment portions and joining said containment portions to form a flexible mat which is flexible both longitudinally and transversely after receipt and setting of a slurry, said flexible joints being formed by interweaving said first and second walls;

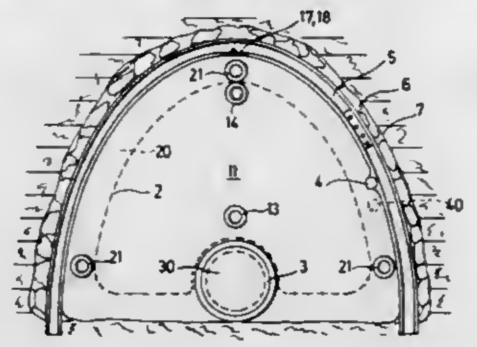
a plurality of interconnecting passages in said flexible joints extending between adjacent ones of said pouches, said interconnecting passages being structured to receive injection pipes insertable through a plurality of said pouches and said interconnecting passages to serially feed the slurry to said pouches as said injection pipes are withdrawn through said pouches and said interconnecting passages;

a plurality of reinforcing guys, each of said guys having a portion extending between said first and second walls and further having a portion woven integrally with said first and second walls; and

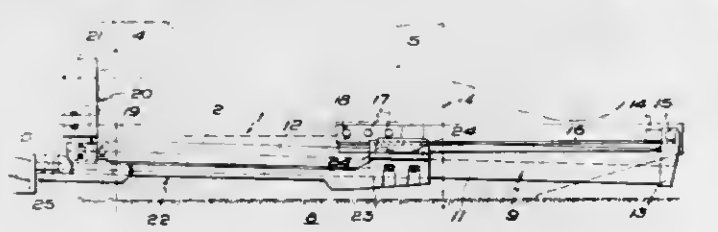
reinforcing strands integrally formed with said walls and being disposed generally perpendicularly to said portions of said reinforcing guys woven integrally with said walls.

4,102,138
METHOD FOR CLOSING OFF A MINE GALLERY ESPECIALLY FOR USE TO PREVENT SPREADING OF UNDERGROUND EXPLOSIONS
Raimund Dreker, Essen; Gerhard Endras, Augsburg, and Bernhard Langerbein, Lunen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany
Division of Ser. No. 585,806, Jun. 11, 1975, Pat. No. 4,036,024. This application Feb. 28, 1977, Ser. No. 772,631
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1974, 2428290
Int. Cl.² E21F *5/00*
U.S. Cl. 61—42 **4 Claims**

1. A method of closing off the passage through a mine gallery, comprising the steps of placing an inflatable bag into the open passage of the mine gallery; inflating the bag with gas under pressure until the inflated bag extends transversely through said passage and engages with the peripheral surface thereof the inner surface of the mine gallery to completely seal the passage; subsequently pumping into the bag a flowable material which quickly hardens after being filled into the bag while permitting at the same time the gas to escape from the interior of the bag through an overpressure valve arranged at the highest point of the inflated bag, until the bag is completely filled with said hardenable material to thus form, after hardening of the material, a solid wall extending across the passage of the mine gallery in engagement with the inner surface of the latter.



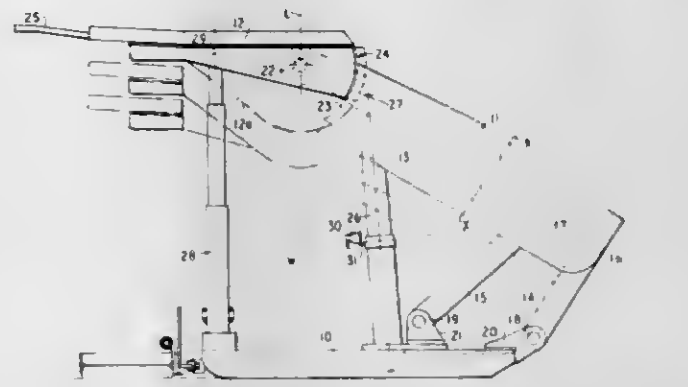
4,102,139
MINING EQUIPMENT
Malcolm Wake, Wakefield, England, assignor to Fletcher Sutcliffe Wild Limited, England
Filed May 21, 1976, Ser. No. 688,938
Claims priority, application United Kingdom, May 22, 1975, 22142/75; May 22, 1975, 22140/74
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **16 Claims**



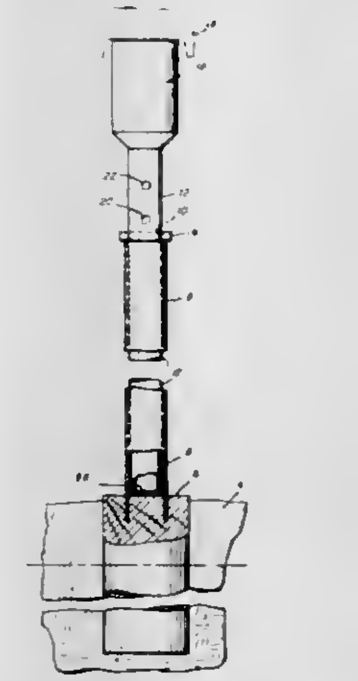
1. A self-advancing, hydraulically powered mine roof support apparatus comprising a roof support means; a base means for supporting said roof support means on a mine floor; at least one advancing piston and cylinder unit pivotally carried by said base means; a relay bar having first and second ends, said first end being rigidly connected to said advancing unit, said second, free end adapted to be attached to a mine face conveyor; and a lifting ram connected between said roof support means and said relay bar in proximity to a forward end of said mine roof support means, said lifting ram being operative to lift one of said advancing unit and the forward end of said base means to avoid obstructions located on the mine floor.

4,102,140
SELF-ADVANCING MINE ROOF SUPPORTS
Archelaius Dawson Allen, Leyland, England, assignor to Gullick Dobson Limited, England
Filed Nov. 14, 1975, Ser. No. 632,013
Claims priority, application United Kingdom, Jul. 19, 1975, 30347/75
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **22 Claims**

1. A mine roof face support system comprising a plurality of self-advancing mine-roof supports in a row in front of a mine-face, each said mine-roof support being coupled to a face conveyor running transversely of the row of supports and including ram means for advancing that support relative to the face conveyor and the face conveyor relative to that support, and each said mine-roof support comprising a one-piece rigid base located rearwardly of said face conveyor, a roof-engaging canopy extending over the face conveyor and a forward part of the base, a shield inclined upwardly and forwardly from the rear of the base to the rear of the canopy, first pivot means coupling an upper part of the shield to the rear of the canopy, second pivot means coupling a lower part of the shield to the rear of the base, first hydraulically extensible prop means operatively positioned between said base and said shield, and second hydraulically extensible prop means operatively positioned between said base and said canopy, the first and second hydraulically extensible prop means being spaced to afford between them a covered access running parallel with and rearwardly of the face conveyor, and the first pivot means including a linkage prescribing movement of the lower part of the shield over the base to maintain a constant vertical canopy tip position.



4,102,141
METHOD OF AND EQUIPMENT FOR USE IN DRIVING COMPOSITE PILES
Richard L. Ingalls, South Portland, Me., assignor to H. B. Fleming, Inc., South Portland, Me.
Filed Nov. 11, 1976, Ser. No. 741,133
Int. Cl.² E02D *5/26*
U.S. Cl. 61—53.5 **3 Claims**



1. Apparatus for embedding a tubular metal pile section in a wooden pile section and thereafter driving the two sections into the ground a desired distance, said apparatus comprising a mandrel member insertable in the metal tubing and provided with at least one transversely disposed bore, and means for locating the mandrel in driving engagement with the top edge of the tubular section and for spacing the bottom end of the mandrel a predetermined distance above an exposed end of the wooden pile section corresponding to the distance that the lower end of the tubular metal section is to be embedded, said means including a pin member received through said bore for bearing against the top edge of the metal pile section.

4,102,142

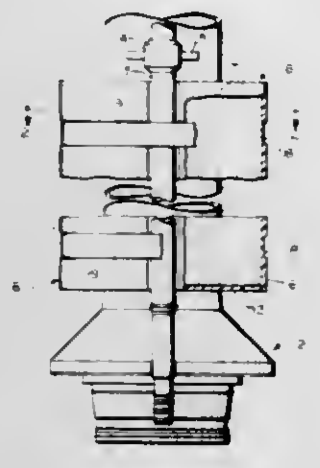
UNDERWATER RISER BUOYANCY

George Lee, Monterey Park, Calif., assignor to Hitco, Irvine, Calif.

Filed Dec. 30, 1976, Ser. No. 755,660

Int. Cl.² E21C *19/00;* E21B *43/01*

U.S. Cl. 61—86 **10 Claims**



1. In an underwater pipe assembly, such as a subsea riser, which requires buoyancy control, the combination of
- a length of pipe to be incorporated in the assembly;
- at least two elongated buoyancy members each comprising a plurality of elongated rigid hollow tubular elements disposed side-by-side and a liquid-tight shell enclosing said tubular elements as a group, said tubular elements each being in the form of a continuous length having a uniform transverse cross-section and each comprising
- an inner wall,
- an outer wall, and
- two flat outwardly divergent side walls,
- the complementary side walls of adjacent pairs of said tubular elements being in face-to-face engagement,
- said shell having an inner wall which extends over said inner walls of all of said tubular elements, is transversely arcuate and embraces said pipe;
- said divergent side walls of said tubular elements lying in respective planes which are radial with respect to said pipe; and

securing means extending around the combination of said buoyancy members and said pipe and securing the buoyancy members to the pipe.

4,102,143

ANCHORING OF STRUCTURES

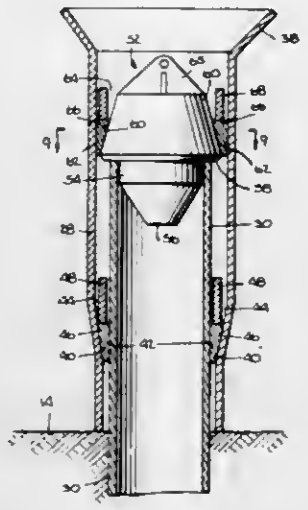
Lindsey J. Phares, Sugar Land, and George J. Gendron, Houston, both of Tex., assignors to Raymond International Inc., Houston, Tex.

Filed Jan. 13, 1977, Ser. No. 759,028

Int. Cl.² E02B *17/00*

U.S. Cl. 61—94 **44 Claims**

1. Apparatus for anchoring a structure, said apparatus comprising an elongated anchor member adapted to be anchored at a given location, a tubular sleeve member adapted to be affixed to said structure and to surround said anchor member, first and second wedge type locking assemblies interposed between said sleeve and anchor members at longitudinally spaced apart locations therealong to prevent relative movement of said sleeve member in either a first or an opposite longitudinal direction with respect to said anchor member, the first wedge type locking assembly comprising means defining a first surface region on said sleeve member which faces and is inclined toward a corresponding first surface region on said anchor member as said surfaces extend in said first longitudinal direction, at least one first wedge element extending into and configured in accord with shape of the space between said first surface regions for locking same together when said first wedge element is moved in said first direction, the second wedge type locking assembly comprising means defining a second surface region on said anchor member which faces, and is inclined toward, a corresponding second surface region on said sleeve member as said surfaces extend in said first longitudinal direction, at least one second wedge element extending into and configured in accord with the shape of the space between said second surface regions when said second wedge element is moved in said first direction, means biasing said first and second wedge elements in said first longitudinal direction and the corresponding surface regions being held against movement in said opposite longitudinal direction with respect to their associated members.



4,102,144

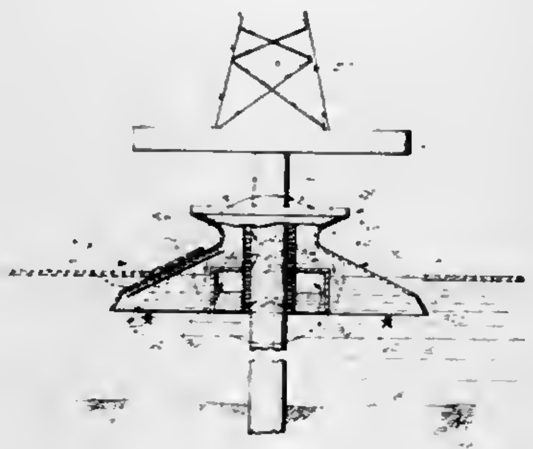
METHOD AND APPARATUS FOR PROTECTING OFFSHORE STRUCTURES AGAINST FORCES FROM MOVING ICE SHEETS

Edward O. Anders, Houston, Tex., assignor to Global Marine, Inc., Los Angeles, Calif.

Filed May 31, 1977, Ser. No. 801,551

Int. Cl.² E02B *15/02;* B63B *35/44*

U.S. Cl. 61—103 **46 Claims**



1. A method for protecting a marine structure fixed in a body of water from forces exerted by sheet ice moving across the water surface comprising the steps of:
- placing adjacent the marine structure a shield surface which slopes away from the structure in a direction opposite to the direction of ice movement from the structure proceeding from an upper portion above the water surface to a lower portion disposed below the water surface,
- allowing a portion of the sheet ice to move substantially into contact with the shield surface so that a submerged portion of the shield surface is disposed below the ice,
- raising the shield surface to an elevated position thereof to cause the surface to lift the ice and to break pieces therefrom, and
- moving the shield surface in the elevated position thereof to a position thereof downstream from the marine structure relative to the direction of ice movement.

4,102,145

ANCHORING A PIPELINE TO THE GROUND

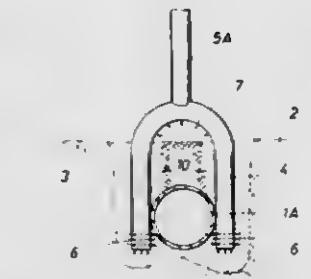
Johannes van Steveninck, and Johannes R. Hogervorst, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 31, 1977, Ser. No. 801,964

Claims priority, application United Kingdom, Jun. 3, 1976, 22985/76

Int. Cl.² F16L *1/00*

U.S. Cl. 61—105 **6 Claims**



1. A method of anchoring a pipeline by securing an anchoring device to the ground, said anchoring device being provided with fluidization nozzles, comprising placing the anchoring device over the pipeline and on the ground, supplying water to the fluidization nozzles and fluidizing the ground material by passing water through the fluidization nozzles and into the ground material, allowing the anchoring device to sink into the fluidized ground material and anchor the pipeline, at least some of the ground material remaining in contact with the anchoring device, passing a fluid substance through the fluidization nozzles and into the interstices of the ground material about the anchoring device and allowing the fluid substance to solidity and secure the anchoring device to the ground.

4,102,146

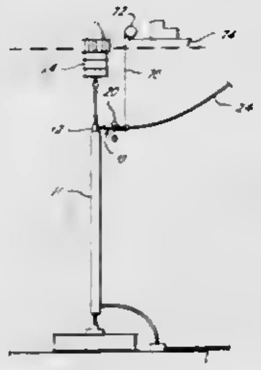
METHOD OF AND APPARATUS FOR HANDLING HOSE UNDERWATER

David S. Dietrich, Magnolia, Tex., assignor to Sofec, Inc., Houston, Tex.

Filed May 25, 1977, Ser. No. 800,313

Int. Cl.² F16L *1/00;* B23Q *3/00*

U.S. Cl. 61—110 **11 Claims**



1. An apparatus for moving a hose into position for connection to an underwater pipe, comprising
- a saddle having a hose receiving portion positioned in an underwater location and near the end of said underwater pipe,
- means for pulling a hose down in the water,
- said pulling means being in a preselected position with respect to said saddle, and
- means for moving said saddle to bring said saddle in approximate parallel relation to said hose,
- said saddle moving means pivoting said saddle about a vertical axis and about a horizontal axis transverse to the axis of said underwater pipe and being positioned to move said hose into axial alignment with said underwater pipe.

4,102,147

SUBMERSIBLE POSITIONING AND GUIDING APPARATUS FOR PILE DRIVING

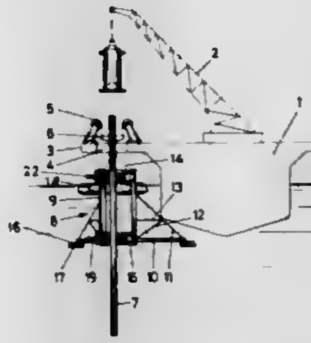
Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep NV, Rijswijk, Netherlands

Filed Mar. 3, 1976, Ser. No. 663,609

Claims priority, application Netherlands, Oct. 13, 1975, 7512022

Int. Cl.² E02D *7/00, 7/02*

U.S. Cl. 61—53.5 **5 Claims**



1. Apparatus for guiding and supporting a pile during submerged pile-driving by means of a pile-driving hammer to be placed on top of the pile, said apparatus comprising: a frame assembly having at least three radially projecting arms, said arms having footpads at the outer ends thereof for supporting the apparatus on the ocean floor, said frame assembly having at least three vertically extending posts placed at equal distances from each other around a central axis of the apparatus and at equal distances from said axis, said frame defining a guide passage for a pile proximate the lower ends of the posts, said frame carrying radially movable inwardly extending guide members proximate the upper ends of the posts for guiding said pile and means attached to said frame assembly for submerging and raising said apparatus in water.

4,102,148

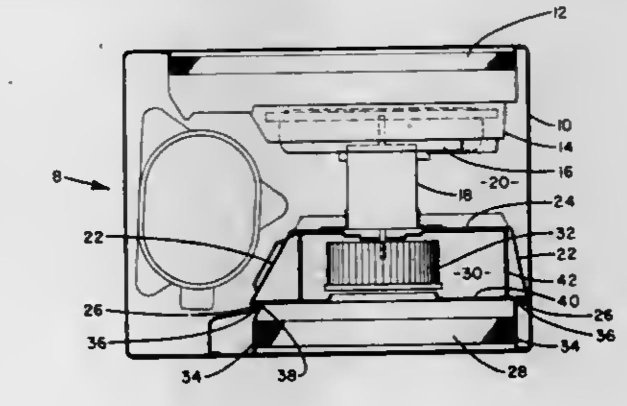
AIR CONDITIONING APPARATUS AND METHOD OF ASSEMBLING SAME

Richard E. Matthews, E. Syracuse, and Theodore S. Bolton, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 2, 1977, Ser. No. 793,028

Int. Cl.² F25B *45/00;* F25D *23/12, 19/00*

U.S. Cl. 62—77 **23 Claims**



1. In an air conditioning unit containing a base pan, a condenser fan, an evaporator fan and being divided into an evaporator section and a condenser section improved apparatus for easy assembly said improved apparatus comprising:

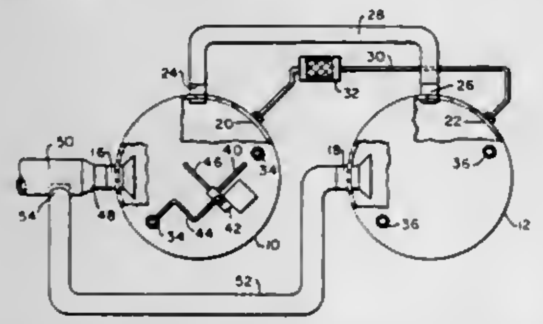
- a partition for dividing the unit into an evaporator section and a condenser section having a body, two resilient legs one attached to each end of the partition body and two resilient arms extending inward from the ends of the leg sections;
- a fan scroll having a scroll body and an air guide surface whereby the arms of the partition may be stressed into a displaced position engaging the scroll body holding the scroll body in place with the air guide surface tight to the partition; and
- a heat exchanger assembly fixed to the base pan and having attached flanges extending therefrom so that when the arms of the partition are stressed into a displaced position the partition arms engage the flanges whereby the stressed partition holds the partition tightly to the tube sheet flanges and further holds the scroll to the partition and the tube sheet.

10. A method of assembling air conditioning units containing a base pan, an evaporator fan, a condenser fan and being divided into a condenser section and an evaporator section which comprises:

- mounting a heat exchanger assembly to a base pan, the assembly having flanges extending therefrom;
- constructing a partition having two resilient leg sections, one attached to each end of the partition, and two resilient arm sections extending from the ends of the leg sections;
- providing a fan scroll;
- affixing the fan scroll to the partition by engaging the resilient partition arms against the fan scroll to create an internal stress within the partition, said internal stress holding the partition to the fan scroll; and
- sliding the partition arm sections of the now combined fan scroll and partition over the heat exchanger assembly flanges so that the partition is further displaced to create additional internal stresses holding the partition and fan scroll to the heat exchanger assembly.

4,102,149
VARIABLE CAPACITY MULTIPLE COMPRESSOR REFRIGERATION SYSTEM

Thomas F. Conley, Staunton, Va.; Ernest F. Gylland, Jr., Seattle, Wash., and George E. Steele, Staunton, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 22, 1977, Ser. No. 789,909
Int. Cl.^{2} F25B *41/00, 31/00*
U.S. Cl. 62—196 A **4 Claims**



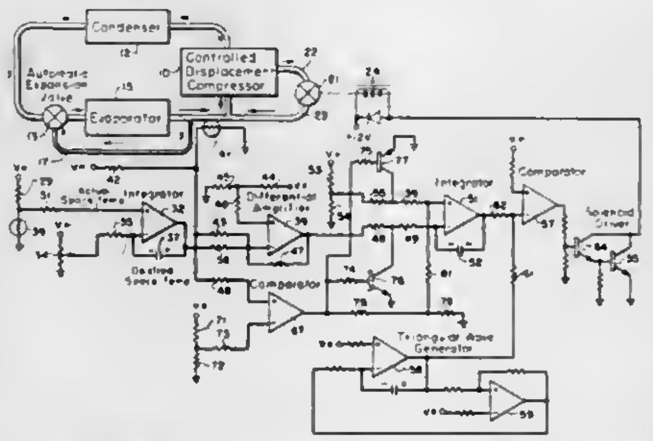
1. In a variable capacity multiple compressor refrigeration system of the type having a first hermetic compressor which always runs while the system is operating and includes unloading means for running at half load, and a second hermetic shell compressor which operates at full load or not at all, so that four operating capacities are available from the system:

- each of the compressors having shells with suction gas inlets identically sized and located on the upper portion of the shells, with oil equalizer line ports identically sized and located on the lower portion of the shells near the level of the normal oil level during operation, and with gas exchange line ports identically sized and located on the upper portion of the shells;
- first suction conduit means for connecting the inlet port of said first compressor to the system suction gas return line, the suction gas return line having a larger diameter than the diameter of said inlet ports;
- second suction conduit means connecting the inlet port of said second compressor to the system suction gas return line;
- an oil equalizer line connecting said oil equalizer line ports;

a gas exchange line connecting said gas exchange line ports, said gas exchange line functioning to pass suction gas from the shell of said first compressor to said second compressor when said second compressor is running, and said first compressor is running in an unloaded condition, to promote cooling of said first compressor in its unloaded condition.

4,102,150
CONTROL SYSTEM FOR REFRIGERATION APPARATUS

Kenneth John Kountz, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 1, 1976, Ser. No. 737,233
Int. Cl.^{2} F25B *49/00*
U.S. Cl. 62—209 **14 Claims**

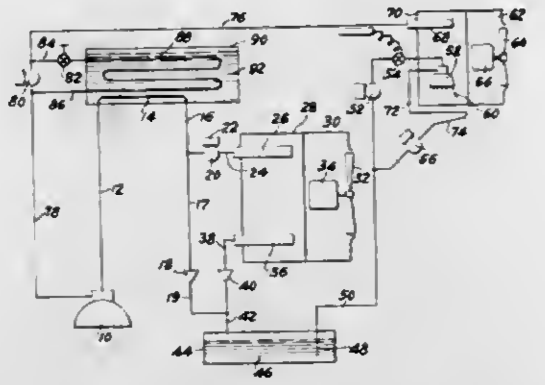

Condenser
Controlled Displacement Compressor
Automatic Expansion Valve
Evaporator
Integrator
Comparator
Differential Amplifier
Comparator
Triangular Wave Generator
Solenoid

1. In a refrigeration system where refrigerant flows through a closed vapor cycle refrigeration circuit having an evaporator, a controlled displacement compressor, a condenser and an automatic expansion device, a control system for regulating the refrigerant flow rate through the evaporator in order to maintain a substantially constant desired temperature in a space to which cooled air is supplied by the refrigeration system, comprising:

- means, including a first temperature sensor located in the space to be temperature controlled, for providing a space temperature signal representing the actual ambient temperature therein;
- means, including an adjustable device, for providing a temperature set point signal representing the desired temperature for the temperature controlled space;
- means responsive to said space temperature signal and to said temperature set point signal for providing a temperature control point signal which represents a desired evaporator refrigerant outlet temperature, referenced with respect to a predetermined desired minimum evaporator outlet temperature;
- means, including a second temperature sensor positioned adjacent to the evaporator outlet, for providing an evaporator outlet temperature signal representing the actual temperature of the refrigerant at the evaporator outlet;
- means responsive to said temperature control point signal and to said evaporator outlet temperature signal for providing an error signal which varies as a function of the difference between the desired control point temperature and the actual evaporator outlet temperature;
- and means responsive to said error signal for varying the displacement of the controlled displacement compressor to modulate the refrigerant flowing through the evaporator to establish the evaporator outlet temperature at said control point, thereby to maintain the controlled space at the desired temperature.

4,102,151
HOT GAS DEFROST SYSTEM WITH DUAL FUNCTION LIQUID LINE

Daniel Kramer, Yardley, Pa.; Israel Kramer, Trenton, N.J.; Harold Kramer, Morrisville, Pa.; Lawrence Board, Dallas, Tex.; Ram Chopra, and William Micai, both of Trenton, N.J., assignors to Kramer Trenton Company, Trenton, N.J., by said Israel Kramer, Harold Kramer, Larry Board, Ram Kumar Chopra and William Micai
Continuation of Ser. No. 678,477, Apr. 20, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,289
Int. Cl.^{2} F25B *47/00*
U.S. Cl. 62—278 **20 Claims**



1. An improved refrigeration system having refrigeration periods and defrost periods comprising a compressor having an inlet connection and a discharge connection; air cooled condenser means for exposure to summer and winter conditions, said condenser means having an inlet and an outlet; a first conduit connecting the compressor discharge and the condenser inlet; frosting and defrosting evaporator means having at least one inlet and a suction outlet; expansion means for feeding refrigerant liquid to an evaporator inlet; means for holding and conveying liquid refrigerant from the condenser outlet to the expansion means; a suction conduit connecting said suction outlet with the compressor inlet; wherein the improvement comprises:

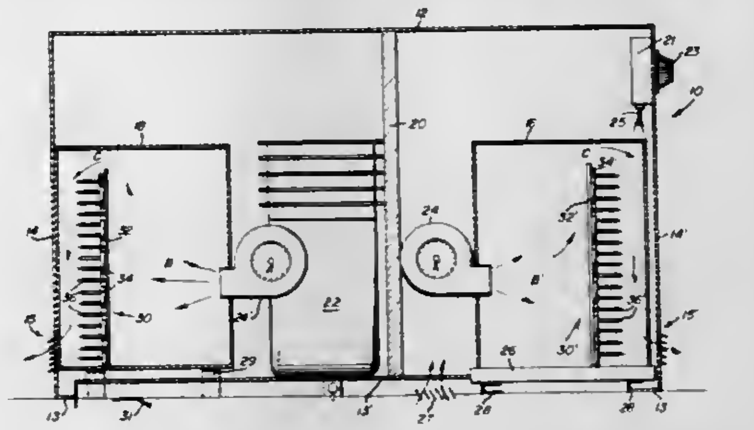
- (a) first valve means positioned in the first conduit for allowing flow to the condenser inlet during refrigerating periods and for positively preventing said flow during defrost periods;
- (b) a hot gas conduit connecting the liquid conduit means with an evaporator inlet;
- (c) second valve means for allowing flow in said hot gas conduit during defrost periods and for preventing said flow during refrigeration periods;
- (d) a bypass conduit connecting the first conduit with the liquid conduit means;
- (e) third valve means in the bypass conduit for allowing hot gas flow therethrough when said first valve means prevents flow to the condensor inlet and for preventing flow therethrough when said first valve means allows flow to the condenser inlet;

whereby hot gas is caused to positively bypass the condenser and to flow in the liquid conduit means during defrost periods.

4,102,152
HEAT EXCHANGE DEVICE FOR AIR CONDITIONERS

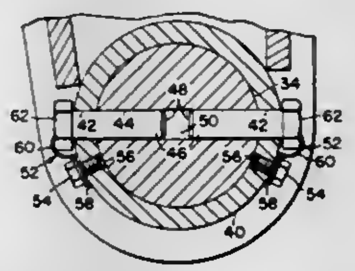
Darrell W. Covault, 30 Green Ct., Bridgeton, Mo. 63044
Filed Aug. 27, 1976, Ser. No. 718,420
Int. Cl.^{2} F25B *39/04;* **F28F** *1/32*
U.S. Cl. 62—428 **2 Claims**

1. In an air conditioning system including a compressor, a housing structure for said compressor, a condenser unit within the housing structure and having an air flow exit vent formed therein, a blower directing air from externally of the housing structure into the condenser unit, a cooling unit within the housing structure and having an air flow exit vent formed therein, an expansion apparatus associated with the cooling unit, and a blower directing air from externally of the housing structure into the cooling unit, the improvement comprising a first plate-like heat exchange and support member mounted in the condenser unit, a second plate-like heat exchange and support member mounted in the cooling unit, each of the members being disposed between the respective blowers in the units and the air flow exit vents formed therein such that the flow of air is directed into contact with the members, tube means for containing a refrigerant fluid secured to surface portions of each heat exchange and support member, and a plurality of pins projecting from a surface of each heat exchange and support member and being secured thereto, the pins extending from the surface of the heat exchange and support members into unobstructed contact with the flow of air.



4,102,153
NON-JAMMING SHEAR PIN ASSEMBLY

David Emmert Stover, and Alvin Lewis Menzel, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Apr. 21, 1977, Ser. No. 789,363
Int. Cl.^{2} F16D *9/00*
U.S. Cl. 64—28 R **5 Claims**



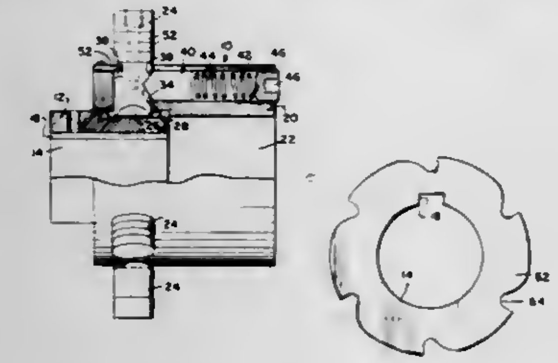
1. In combination with a drive shaft having a circular cross section and a driven element having a hub provided with a circular opening in which the drive shaft is received, a shear pin assembly for fixing the driven member to the drive shaft, comprising: a first through bore extending through the shaft; a second through bore extending through said hub and axially aligned with said first through bore; and a pair of shear pins positioned in the first and second through bores and having head ends positioned against the hub at opposite ends of the second through bores and having inner ends axially spaced from each other and located in said first through bore; and retaining means extending between the hub and head ends of the shear pins and releasably holding the shear pins in position.

4,102,154
TORQUE DISCONNECT SAFETY COUPLING

Josef Dahlstrand, Jr., 6736 E. 82nd St., Indianapolis, Ind. 46250
Filed Sep. 7, 1976, Ser. No. 709,939
Int. Cl.^{2} F16D *3/56, 7/00*
U.S. Cl. 64—29 **9 Claims**

1. In a torque release coupling; a drive hub, having a cylindrical outer periphery with circumferentially spaced cam lobes

therein, a driven rotary member comprising an annular housing circumferentially spaced about said hub and adapted to be driven thereby, a radial piston slidably disposed in a radial bore in said housing and having an inner end for engagement in said cam lobes for releasably engaging and locking said hub and housing in driving relation, said inner end being shaped to conform to the profile of said cam lobe, said housing having an axial bore intersecting said radial bore with a slidable axial piston disposed therein, said radial piston having notch means therein facing said axial piston, said axial piston having an end to conform to said notch means and adapted to be engaged in said notch means when said hub and housing are engaged in said notch mean when said hub and housing are engaged in driving relation to resist the torque, adjustable biasing means disposed in said axial bore normally urging said axial piston into engagement with said radial piston when the torque is below a predetermined value, said radial piston extending externally outside of the periphery of said housing and having adjustable and detachable weight means disposed on the externally extending portion to permit readily changing of said weights for varying the centrifugal force causing the inner end of the radial piston into said cam lobe, and means preventing said radial piston from being released from the housing when a predetermined torque overload is exceeded comprising shroud means secured to said housing with a portion thereof extending into a recess disposed in said radial piston; whereby said axial piston and radial piston coact to maintain the hub and housing in engagement with each other when the torque is below a predetermined value.



4,102,155
KNITTING METHOD

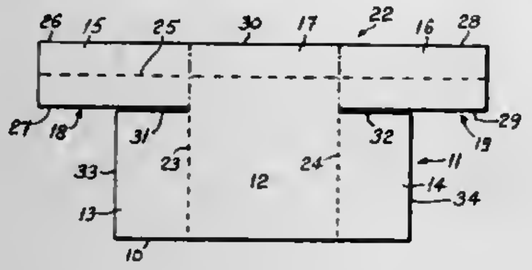
Frank Robinson, and Nigel Stephen Whatmough, both of Breaston, England, assignors to Courtaulds Limited, London, England

Filed Apr. 13, 1977, Ser. No. 787,024

Claims priority, application United Kingdom, Apr. 14, 1976, 15223/76

Int. Cl.² A41B *9/02*

U.S. Cl. 66—176 **24 Claims**



1. A method of knitting a blank for a sleeved garment, the method comprising the steps, in either order, of knitting a piece of fabric constituting the body of the garment having front and rear body parts with wales extending in the direction from waist to neck of the garment blank, and knitting another piece of fabric comprising sleeves for the garment with courses extending in the length direction of the sleeves, and also comprising a shoulder region of the garment located between the two sleeves with courses continuous between the sleeves and said shoulder region, said shoulder region being knitted as an extension of the body of the garment with wales continuous between the body and said shoulder region.

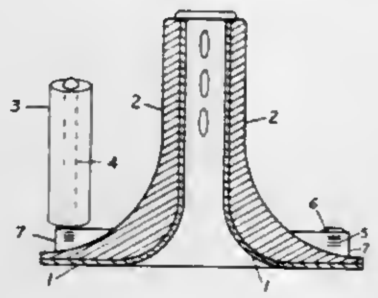
4,102,156
AGITATOR FOR WASHING MACHINES

Wallace D. James, 5946 Barbados Way E., West Palm Beach, Fla. 33407

Filed Jan. 31, 1977, Ser. No. 764,414

Int. Cl.² D06F *13/02*

U.S. Cl. 68—4 **4 Claims**



1. An agitator for an agitator type washing machine for selectively washing clothes and washing cylindrical filters, said agitator including:

an elongated shaft portion of substantially circular cross-section, said shaft portion tapering radially outwardly at its bottom portion to form an outwardly extending agitator flange portion;
a plurality of longitudinal, arcuate vanes extending substantially radially outwardly from said shaft portion;
at least one wedge-shaped flange carried by said shaft portion on the upper surface of said agitator and providing a substantially horizontal surface on said agitator;
at least one tapped aperture formed in the upper surface of said wedge-shaped flange; and
at least one threaded, elongated rod removably threadedly engaging said aperture and extending substantially vertically upwardly from said wedge-shaped flange when engaged in said aperture, said rod securing cylindrical filters to said agitator for washing said filters.

4,102,157
APPARATUS FOR REMOVING ORGANIC SOLVENTS FROM TEXTILE MATERIAL

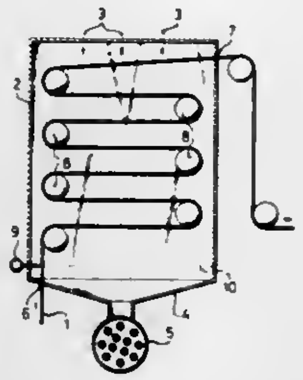
Manfred Schuierer, Michelstadt, Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Germany

Filed May 4, 1977, Ser. No. 793,530

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620815

Int. Cl.² D06B *3/12, 9/06*

U.S. Cl. 68—5 D **2 Claims**



1. Apparatus for removing organic solvents from textile material with steam comprising a treatment chamber having an upper end and a lower funnel-shaped end, steam inlet means at said upper end, condenser means at said lower end, a web inlet at said lower end, a web outlet at said upper end, and means for guiding a textile web in a generally upward path from said web inlet to said web outlet.

4,102,158
DRAIN DISPOSING DEVICE IN SEAL MECHANISM ON A CLOTH MATERIAL INLET SIDE OF HIGH PRESSURE STEAMER

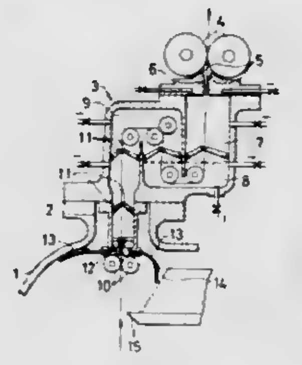
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co. Ltd., Japan

Filed Nov. 26, 1976, Ser. No. 745,210

Claims priority, application Japan, Dec. 5, 1975, 50-145619

Int. Cl.² D06B *23/18*

U.S. Cl. 68—5 E **1 Claim**



1. A seal mechanism for the cloth material inlet side of a high pressure steamer comprising first means forming an enclosed passageway having a first opening for admitting cloth into the passageway from the exterior of said mechanism and a second opening for admitting cloth from the passageway into the high pressure steamer, second means for sealing each of said first and second openings, third means for dividing said passageway between the sealed first and second openings into a plurality of serially arranged pressure reducing chambers, drain receiving trays located within at least one of said pressure reducing chambers and extending transversely of the direction of movement of cloth material through said passageway from the first opening to the second opening, said drain receiving trays subdividing at least the one of said pressure reducing chambers for enhancing the stepwise pressure reducing effect within said pressure reducing chamber, said drain receiving trays arranged to collect drain in said pressure reducing chamber within which they are located and to lead the drain away from the cloth passing through the passageway to the inside surfaces of said pressure reducing chamber, fourth means for collecting the drain within said passageway and for keeping the drain away from the cloth therethrough, and fifth means forming drain guiding passages in communication with said fourth means for discharging the drain collected from said drain receiving trays to one of the interior of the high pressure steamer and the exterior of said seal mechanism located exteriorly of the high pressure steamer.

4,102,159
WASHING MACHINE

Herbert Cruz, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

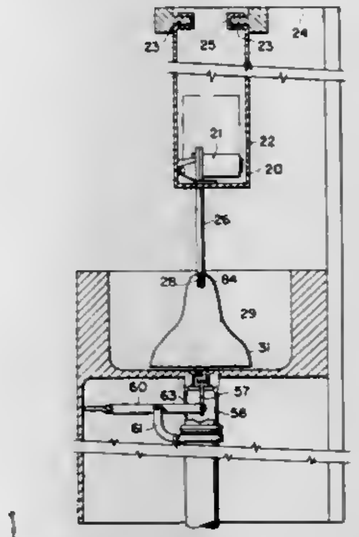
Filed Mar. 7, 1977, Ser. No. 774,795

Int. Cl.² D06F *13/02, 39/08*

U.S. Cl. 68—132 **2 Claims**

1. A washing machine unit adaptable for installation in an open sink comprising

a motorized unit fitted with suspension means for mounting above a sink,
a propeller joined concentrically at an upper section of the propeller by a first shaft to the motorized unit,
a bushing cup mountable in the drain opening of the sink,
said propeller fitted with a second shaft extending concentrically from a lower section of the propeller into the bushing cup,
said bushing cup formed of a body section of a lesser external size in cross-section than the cross-sectional size of the said drain opening, with an external flange extending about the upper periphery of said body section of an external cross-sectional size and shape to close said drain opening when the said flange rests on the upper periphery of said drain opening, with
said bushing cup formed with a blind cylindrical hole extending from the upper surface of the bushing cup along the vertical axis of said bushing cup, said hole of a depth and cross-section to freely slidably fit about the lower section of said second shaft both with the bushing cup in a first position in which the bushing cup flange rests on the upper periphery of said drain opening and with the bushing cup in a second position in which the bushing cup and said flange is elevated so that the flange is spaced above the upper periphery of the drain opening,



such that the bushing cup serves both as a bearing to the lower section of the second shaft and as a slidable valve seat for closing or opening the drain opening, together with
lever means for moving the bushing cup along the axial direction of the second shaft from said first position to said second position, said lever means serving to hold the bushing cup in place.

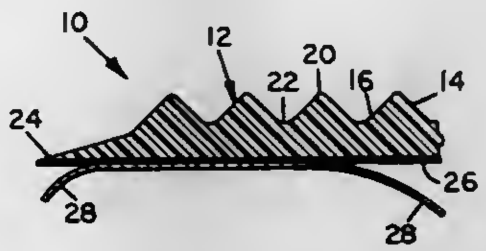
4,102,160
PERSONAL CLOTHES WASHBOARD DEVICE

George J. Herbst, 283 Atlantic Isle, North Miami Beach, Fla. 33160

Filed Mar. 28, 1977, Ser. No. 781,557

Int. Cl.² D06F *3/02*

U.S. Cl. 68—229 **1 Claim**



1. A readily, permanently attachable washboard surface sheet for a wall of a washbasin, washtub, and the like, comprising a somewhat flexible sheet (10), means for attaching the backwall of said sheet (10) to the basin or tub wall, said sheet having a washboard surface (12) over which clothing items may be rubbed in a cleansing action, said washboard surface comprising a plurality of parallel, spaced apart ridges (14) and furrows (16), said ridges having rounded peaks (20) and said

furrows having rounded valleys (22), a basin wall permanently self-attaching high-tack adhesive material on said backwall of said washboard sheet (10), and a readily peelable protective cover sheet (28) on said high-tack adhesive material (26), said washboard sheet (10) being composed of semi-rigid high density plastic material, the ends of said ridges and furrows being sloped (30) to a feathered short side sheet edge (32), said sheet having a feathered long thin edge (24) terminating substantially in the plane of said backwall, said long thin edge being parallel to said ridges and and furrows to attach to the basin or tubwall, whereby the item of clothing being cleansed thereover will slide smoothly over said long thin feathered edge onto said washboard surface and over said ridges and furrows.

4,102,161

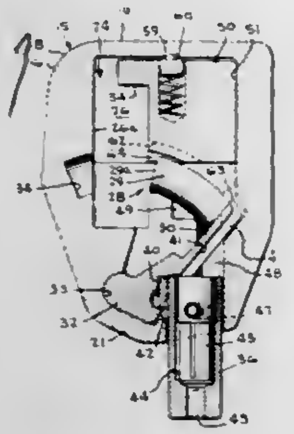
ENSHROUDING LOCK DEVICE FOR PAIRED LOCKING BARS AND THE LIKE

Paul R. Proefrock, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Dec. 5, 1977, Ser. No. 857,749

Int. Cl.² E05B *67/16*

U.S. Cl. 70—42 **22 Claims**



1. A high security hasp-enshrouding lock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in adjacent vertical planes in parallel, laterally alined abutment, the lock comprising a strong penetration and distortion resistant lock casing having a rearwardly opening cavity bounded by spaced bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded over most of their extent by the lock body against access by attacking tools, the lock including a shackle having a bar portion movable generally transversely relative to said vertical planes between a locking position extending transversely through the cavity and the hasp apertures and a retracted position enabling withdrawal of the hasp portion from the cavity, a locking mechanism with the lock body for locking the shackle in said locking position and releasing the same for movement to the retracted position, a wedge-attack-resisting pivoted hasp-clamping member in said cavity disposed laterally adjacent the pair of laterally alined abutting hasp portions and having a wedge-engaging surface projecting rearwardly from the lock casing for resisting destructive attack by wedge-type attack tools driven into the zone immediately rearwardly of the lock casing by persons seeking destructive tearing of the shackle forwardly through the hasp portions, the hasp-clamping member comprising a contact surface portion defining a hasp-receiving passage between the latter and an opposite wall surface of the cavity to receive the laterally alined abutting hasp portions therebetween and having pivot means defining a vertical pivot axis therefor spaced laterally of said passage providing pivotal mounting of the hasp-clamping member for lateral swinging movement in the cavity, said hasp-clamping member normally occupying a first position wherein its rear end portion projects through the rearward opening of said cavity for a predetermined distance beyond the rear of the lock casing and adjacent the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven against the rear of the lock casing, the pivotal mounting of said hasp-clamping member imparting a predetermined component of lateral hasp gripping movement to its contact surface toward the opposite bounding wall surface when the hasp-clamping member is driven forwardly from said first position by the attacking tool and thereby bring the contact surface and the opposite cavity wall surface into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity, said locking mechanism including a clindrical actuating member supported for reciprocative axial movement in said casing along an actuator axis generally perpendicular to the transverse path of the shackle between axially spaced locking and unlocking positions and having a key lock tumbler mechanism for locking and unlocking the actuating member for movement between such positions, and means controlled by said tumbler mechanism and actuating member coactive with control surfaces on said lock casing for restraining said tumbler mechanism and actuating member at their locked positions and releasing them for manually controlled movement of the shackle to said retracted position.

4,102,162

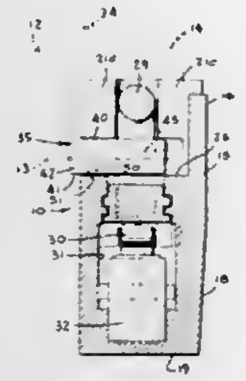
PADLOCK HAVING GUIDED WEDGES FOR RESISTING DESTRUCTIVE WEDGE ATTACK

James Clayton Miller, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Oct. 3, 1977, Ser. No. 839,459

Int. Cl.² E05B *67/02;* E05C *19/08*

U.S. Cl. 70—52 **11 Claims**



1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising reactive wedge structure for resisting destructive attack responsive to driving wedge-type attack tools in the zone located between the rear of the padlock and a rearwardly adjacent stationary surface of a portion of the locking bars or adjacent wall surface or the like by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the reactive wedge structure comprising an attack reactive wedge member extending forwardly into the cavity alongside the laterally alined abutting hasp portions between the adjacent lateral surface of the adjacent hasp portion and the confronting

bounding wall surface, said wedge member having a contact surface and a camming surface forming oppositely facing forwardly converging lateral surfaces thereof disposed adjacent and confronting the last mentioned hasp and bounding wall surfaces, respectively, providing a wider rear end portion projecting through said rearward opening for a predetermined distance beyond the rear of the lock body into said zone to be engaged by the attacking tool when driven between the lock body and rearwardly adjacent surface, and said lock body having portions along said confronting bounding surface adjacent the wedge member for imparting a predetermined component of lateral hasp gripping movement to the wedge member toward the opposite bounding wall surface when the wedge member is driven forwardly by the attacking tool and thereby bring portions of the padlock into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,102,163

DEVICE FOR SECURING SKIS AND SKI STICKS

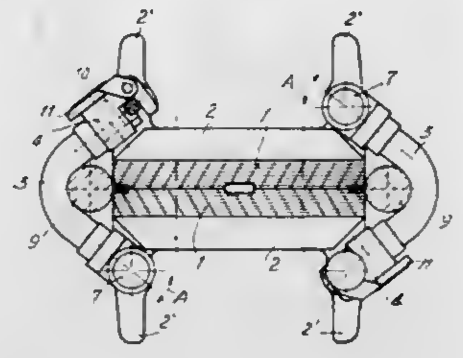
Karl Bösch, Steinbühlweg 57, 4123 Allschwil, Switzerland

Filed Nov. 22, 1976, Ser. No. 743,659

Claims priority, application Switzerland, Mar. 30, 1976, 3943/76

Int. Cl.² E05B *73/00*

U.S. Cl. 70—58 **7 Claims**



1. A device for securing skis and ski sticks together comprising:

(i) a pair of holder members for disposing one on the upper face of each of a pair of skis

(ii) a pair of securing arms, each securing arm being mounted by a respective pivot on a respective holder member

(iii) a pair of lock and lock bolt assemblies, each assembly having one of said items on a respective arm and the other of said items on the other of the two holder members,

the arrangement being such that, with the pair of skis disposed bearing-surface to bearing-surface and with a pair of ski sticks disposed one at each side of the skis, the securing arms in locked condition serve to retain the skis and ski sticks secured together.

4,102,164

THEFT PREVENTION APPARATUS FOR A MOTOR VEHICLE

Joseph F. Barbush, Country Club Hills, Ill., assignor to Allen Taradash, Des Plaines, Ill.

Filed Jun. 27, 1977, Ser. No. 810,362

Int. Cl.² E05B *65/19;* B60R *25/04*

U.S. Cl. 70—241 **11 Claims**

1. Apparatus for automatically locking the hood of a motor vehicle and disabling the ignition system of the vehicle when the ignition system is switched off, said apparatus comprising:

hood lock means adapted to lock said hood in a closed position;

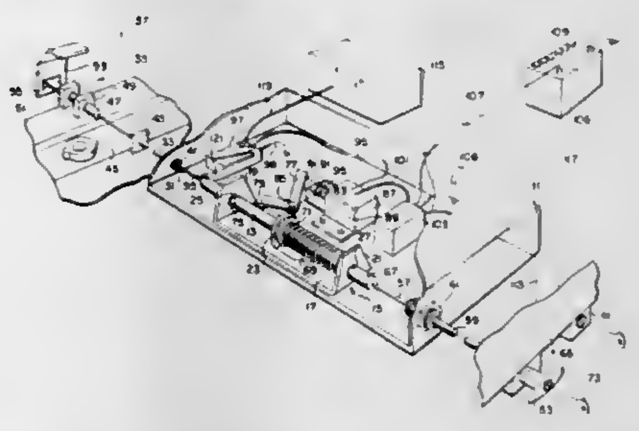
means including a slide member adapted to move reciprocally in a longitudinal direction,

said slide member having a transverse radial groove;

means coupling said slide member to said hood lock means for translating the positioning of said slide member to said hood lock means to lock said hood lock means when said slide member is in an enabling position and to unlock said hood lock means when said slide member is removed from said enabling position;

means for biasing said slide member toward said enabling position;

means including a latching member for engaging said groove of said slide member to hold said slide member removed from said enabling position;



means coupled to the ignition system for withdrawing said latching member from engagement with said groove to release said slide member to slide to said enabling position responsive to the ignition system being switched off; and,

means including a switch positioned to engage said slide member when said slide member is at said enabling position for disabling the ignition system when said slide member engages said switch.

4,102,165

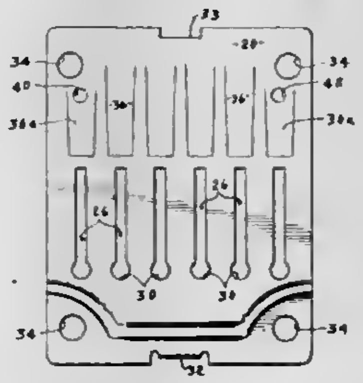
KEY HOLDER

Walter Henry Dziura, Nautatuck, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 1, 1977, Ser. No. 820,781

Int. Cl.² A47G *29/10*

U.S. Cl. 70—456 B **1 Claim**



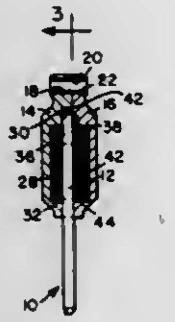
1. A key holder of the character described comprising a body of sheet material having front, top and back portions constructed with an internal region to contain heads of a plurality of key loops, said body having a plurality of parallel slots in the top portion along said region each narrower than the diameters of the heads of said key loops, said slots each extending to an enlarged opening in the front portion for passage of said heads therethrough, the enlarged openings being arranged in a linear path adjacent the juncture of said top and front portions, a series of fingers stamped from the back of the holder and extending toward the top and having their distal ends disposed in the internal region, the ends respectively overlaying said openings for holding inserted key loops in the holder and impeding their passage through said openings, the holder being formed with a pair of apertures therethrough adjacent the bottom thereof respectively at opposite corners

thereof, the fingers adjacent the openings being foreshortened to allow space for the openings and the said adjacent fingers being perforated to make them flex more readily so that each finger flexes under approximately the same force as each other finger.

4,102,166

KEY BOW COVER

Donald R. Hughes, 2600 Brower Ave., Simi Valley, Calif. 93065
Continuation of Ser. No. 718,014, Aug. 26, 1976, abandoned.
This application Oct. 25, 1977, Ser. No. 845,397
Int. Cl.² E05B *19/04*; A47G *29/10*
U.S. Cl. 70—456 R **5 Claims**



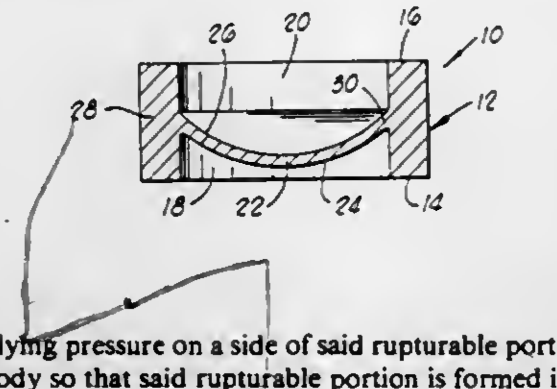
1. A key bow cover comprising:
a first plate having a first internal chamber;
a second plate having a second internal chamber, said second plate being hingedly connected to said first plate so that said second plate may be moved relative to said first plate permitting access into said first and said second interior chambers;
fastener means interconnecting said first and said second plates, said fastening means when operable maintaining said first and said second plates in an abutting relationship with said first and said second interior chambers cooperating together to form a single closed chamber, with said fastening means being disconnected said second plate being capable of being hingedly moved relative to said first plate;
said first interior chamber being substantially twice the size of said second interior chamber, whereby the bow of a key and a coin may be placed within said first interior chamber and a second coin placed within said second interior chamber;
said fastening means comprises a pair of spaced apart snaps;
a key bow retaining means attached to said first plate and located within said first internal chamber, said key bow retaining means adapted to connect with the bow of a key when placed within said first internal chamber and functions to normally prevent accidental disassociation of the key from said first internal chamber when said first internal chamber is exposed;
said retaining means comprises an elongated projection having an enlarged head which is adapted to be placed through an appropriate opening formed within the bow of a key; and
an insert located about the key bow and within said first interior chamber.

4,102,167

METHOD OF MANUFACTURING INTEGRAL FLUID PRESSURE RUPTURABLE APPARATUS

Loren E. Wood, and Edward H. Short, III, both of Tulsa, Okla., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 649,743, Jan. 16, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,825
Int. Cl.² B21D *22/10*
U.S. Cl. 72—54 **9 Claims**

1. A method of manufacturing an integral reverse buckling fluid pressure rupturable apparatus comprising:
forming a recess in a support body having opposite ends, said recess extending from one of said opposite ends of said body towards the other and terminating in close proximity to said other end whereby a relatively thin integral fluid pressure rupturable portion remains in said body; and

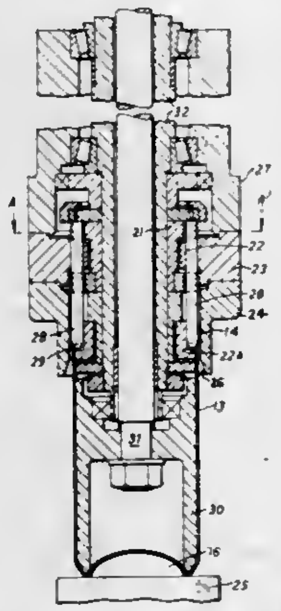


applying pressure on a side of said rupturable portion of said body so that said rupturable portion is formed into a concave-convex shape.

4,102,168

ROTARY EXPANSION TOOL

Frederick D. Brookes, Northwood, and Jozef T. Franek, Chorleywood, both of England, assignors to Metal Box Limited, Reading, England
Filed Apr. 4, 1977, Ser. No. 784,461
Claims priority, application United Kingdom, Apr. 22, 1976, 16254/76
Int. Cl.² B21D *41/02*
U.S. Cl. 72—117 **14 Claims**

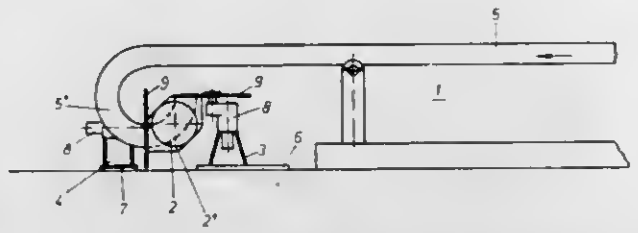


1. A rotary expansion tool for radically expanding the mouth of a hollow article, said tool comprising a cage, a plurality of rollers held by the cage in circumferentially spaced relation for movement in an orbit about a longitudinal axis, and separately formed inner race and outer race, coaxial with said orbit, said inner race holding the rollers between said inner race and said outer race, each roller having a work portion projecting longitudinally beyond said outer race, drive means operatively connected to said rollers for precessing said rollers within said outer race in said orbit around said axis to effect rotation of said work portions prior to engagement thereof with an article, and support means for holding an article coaxially with said orbit with said rotating work portions progressively engaging the mouth of the article so as to expand the mouth outwardly and axially to a predetermined dimension.

4,102,169

METHOD AND APPARATUS FOR PIPE BENDING

Rolf Koser, Osterheide, Fed. Rep. of Germany, assignor to Sidro GmbH & Co. Ludwig Moller, Bunde, Fed. Rep. of Germany
Filed Nov. 11, 1976, Ser. No. 740,955
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1976, 2605795
Int. Cl.² B21D *9/00*
U.S. Cl. 72—128 **5 Claims**

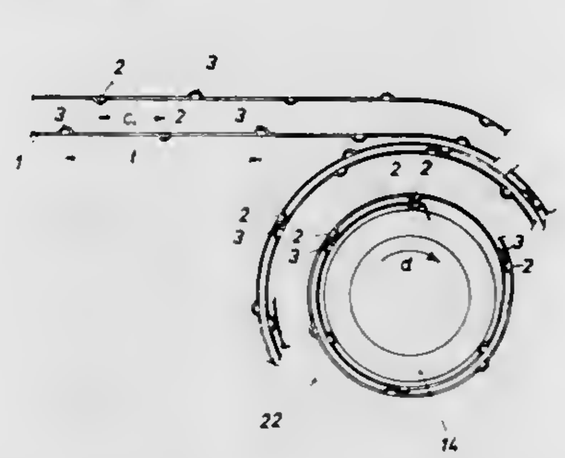


1. A method for the production, from a run of linear pipe of indefinite length, of pipe bends which are cut to a required length and hot-calibrated and do not require any further treatment, said method comprising the steps of:
(i) heating an end portion of said linear pipe run to a temperature suitable for forming a bend in said end portion;
(ii) while said end portion is at said temperature, forming a bend therein; then
(iii) while said bent end portion is still at said temperature, calibrating or sizing said end portion to finished dimensions; and,
(iv) while said calibrated bent end portion is still at said temperature, severing said end portion at two axially spaced points thereon to provide a calibrated cut pipe bend.

4,102,170

METHOD FOR MAKING A SPIRAL COIL HAVING SPACED TURNS

Hermann Wilkening, Dusseldorf-Kaiserswerth, and Hans-Joachim Loges, Dusseldorf, both of Germany, assignors to IOG Industrie-Ofenbau GmbH, Dusseldorf, Germany
Filed Jun. 3, 1976, Ser. No. 692,430
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1975, 2524763
Int. Cl.² B21C *47/04*
U.S. Cl. 72—147 **19 Claims**

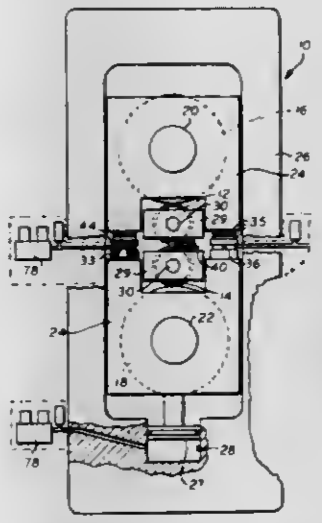


1. Method for making a spiral coil comprising the steps of;
(a) moving a band horizontally toward a horizontal winding mandrel for winding a coil,
(b) continuously forming in advance of said mandrel a succession of regularly spaced deformations in the band edges, said deformations alternately protruding from the opposite band surfaces and determining the spacing of adjacent turns of the coil, and
(c) progressively shifting said succession of deformations along the band for each successive turn of the coil by a predetermined dimension such that all oppositely protruding deformations between adjacent turns come into tangential interlocking engagement with each other, such predetermined dimension of shift taking into account the increase in turn length due to band thickness and coil spacing and the spacing between deformations.

4,102,171

LOAD TRANSFER BLOCK FOR ROLLING MILLS

Henry Alfred Petry, Sparta, and William I. deVersterre, Warren, both of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.
Filed Jun. 13, 1977, Ser. No. 806,068
Int. Cl.² B21B *31/00*
U.S. Cl. 72—245 **13 Claims**

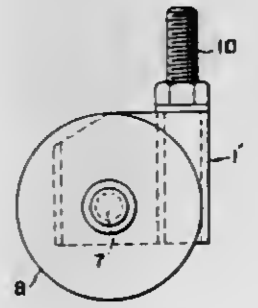


1. Apparatus comprising a load transfer block for a prestressed rolling mill including a hydraulic motor having a cylinder, a piston in the cylinder, the cylinder and piston having relative movement with respect to one another, a chamber into which the hydraulic fluid in the cylinder can flow in the event of excessive loading on the hydraulic motor, an obstruction for preventing access of the hydraulic fluid to the chamber during normal operation of the hydraulic motor, a surface exposed to gas pressure for holding the obstruction in position to prevent escape of hydraulic fluid from the motor cylinder during normal loading of the hydraulic motor, the gas pressure being correlated with the intended maximum load on the motor for displacement of the obstruction when the motor is subjected to substantial overload.

4,102,172

CASTER FRAME

Shuichiro Iiyoshi, Tokyo, Japan, assignor to Yugen Kaisha Iiyoshi Seisakusho, Japan
Division of Ser. No. 629,783, Nov. 6, 1975, abandoned. This application Apr. 22, 1977, Ser. No. 790,131
Int. Cl.² B21K *1/26*
U.S. Cl. 72—254 **4 Claims**



1. A method of producing caster supporting frames having a first end portion with a hollow space therethrough for receiving therein an upright connector rod, and a second end portion

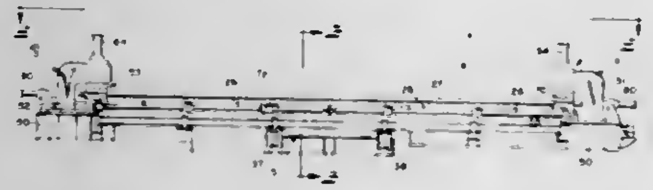
for supporting a horizontal axle of a caster wheel or wheels, said method comprising the steps of:

shaping a bar-like rod or uniform cross-sectional configuration to have along one side thereof a first through hole extending longitudinally therethrough and along the other side thereof a second through hole extending longitudinally therethrough parallel to said first through hole; and

cutting said bar-like rod transverse to the longitudinal length thereof into a number of pieces of a predetermined length to obtain the caster supporting frames, whereby said first through hole forms said hollow space of said first end portion and said second end portion is also hollow therethrough.

4,102,173
END FORMING APPARATUS FOR ELONGATED WORK PIECES

Joseph T. Saloom, Youngstown, Ohio, assignor to Wheatland Tube Company, Philadelphia, Pa.
Filed Mar. 30, 1977, Ser. No. 782,766
Int. Cl.² B21D *19/08*
U.S. Cl. 72—306 12 Claims

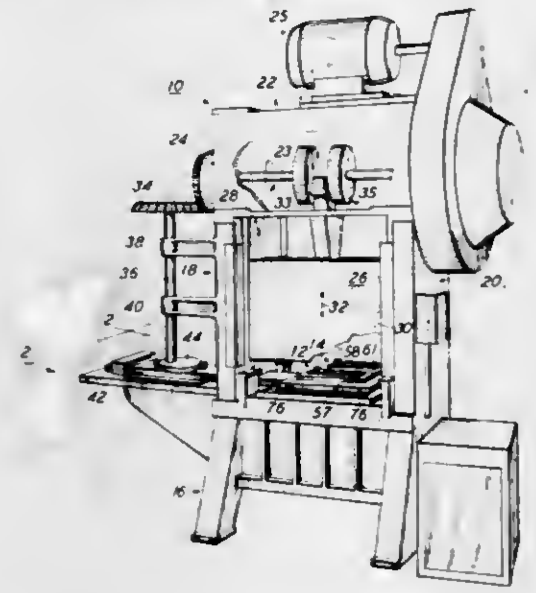


1. An apparatus for forming work pieces comprising a first generally C-shape head defining a feed opening therein, a first clamp member fixedly mounted on said head and extending into the feed opening, a second movable clamp member mounted on said head and extending into said opening generally in alignment with but in an opposite direction from said first clamp member, said second movable clamp member selectively reciprocating between open and closed positions, means automatically to convey a work piece to the feed opening of said first head for support by said first clamp member when said second movable clamp member is in open position while simultaneously removing a work piece from said first clamp member, and forming means reciprocally movable into and out of said feed opening generally perpendicularly to the first and second clamp members, said forming member moving into said feed opening and engaging and forming the work piece when the second clamp member is in the closed position engaging the work piece, thereby to cooperate with said first clamp member tightly to grip and hold the work piece in position during forming.

4,102,174
MULTI-TRACK MACHINE PRESS

Robert Blase, 1009 Round Hill Rd., Fairfield, Conn. 06430
Filed Jul. 9, 1976, Ser. No. 703,801
Int. Cl.² B21D *43/02*
U.S. Cl. 72—421 9 Claims

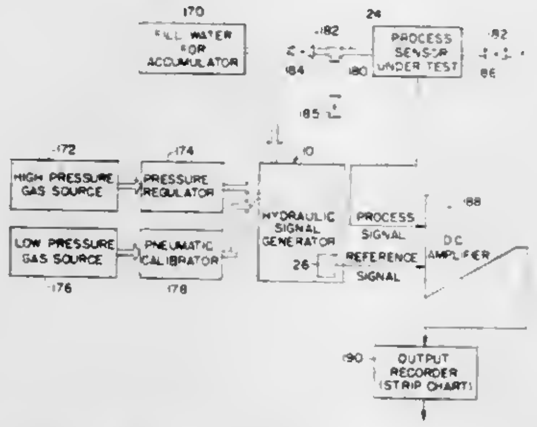
1. A multi-track machine press comprising:
A. a base with at least two upstanding members;
B. a ram movably mounted to the upstanding members of the base;
C. a first motor driven upper shaft rotatably mounted in the upstanding members of the base;
D. connecting means for driving the ram from said first upper shaft;
E. a second shaft driven by said first upper shaft in a two-to-one gear reduction;
F. a cam mounted near the lower end of said shaft, said cam having constant radii portions;
G. a drive bar having upstanding cam followers interacting with said cam, wherein rotation of said cam imparts linear movement to the drive bar;
H. at least two apertured pillow blocks interconnected to the base through which said drive bar passes for maintaining orientation of said drive bar;
I. at least two slides mounted for sliding movement on the base, said sliding movement perpendicular to the movement of the ram; and



J. lateral positioning means interconnected with said slides for positioning said slides with respect to each other and for interconnecting said slides to the drive bar; whereby rotation of the upper shaft causes the ram to repetitively move between its uppermost and downwardmost positions while said slides repetitively move between their left-handmost and right-handmost positions.

4,102,175
RESPONSE TIME VERIFICATION OF IN SITU HYDRAULIC PRESSURE SENSORS IN A NUCLEAR REACTOR

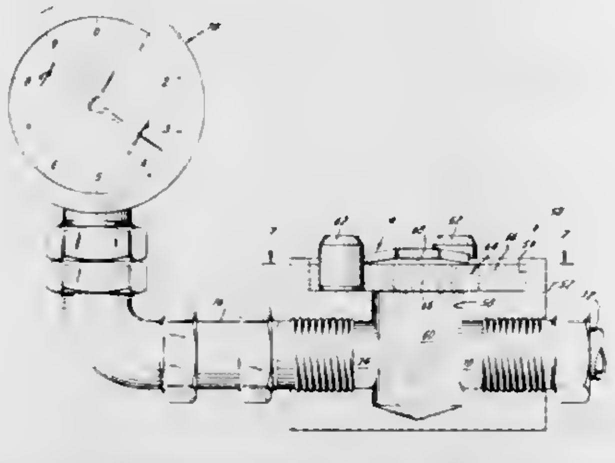
Carlton G. Foster, Mountain View, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Oct. 15, 1976, Ser. No. 732,560
Int. Cl.² G01L *27/00*
U.S. Cl. 73—4 R 18 Claims



1. A hydraulic signal generator for use in in situ verification of the response time of a hydraulic process sensor comprising a first reservoir for containing a gas under pressure; a second reservoir for containing a gas and a liquid under pressure; conduit means connecting said first and second reservoirs for communicating gas between said first and second reservoirs; means in said conduit means intermediate of said reservoirs for gating said conduit means; throttle means in said conduit means intermediate of said reservoirs for providing substantially linear pneumatic pressure equalization in the pressure ranges of interest between said reservoirs; and non expansible outlet means coupled to said second reservoir for providing hydraulic fluid communication between said second reservoir and said process sensor.

4,102,176
METHOD AND APPARATUS FOR MEASURING INTENSITY OF PEENING OF SMALL SURFACES

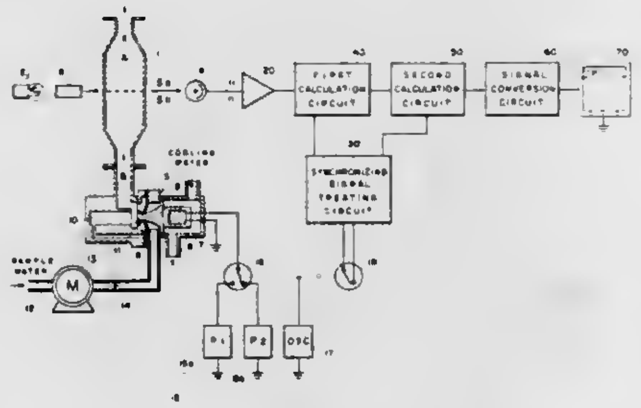
Henry O. Fuchs, Stanford, Calif., assignor to Metal Improvement Company, Inc., Teaneck, N.J.
Filed Apr. 29, 1977, Ser. No. 792,189
Int. Cl.² G01N *33/00*
U.S. Cl. 73—12 27 Claims



6. A peening intensity test member comprising:
(a) a base structure having at least one flat surface;
(b) test element of relatively thin configuration and having opposite flat surfaces of substantially the same size as the flat surface of said base structure;
(c) said test element being disposed with one flat surface thereof in abutment against said flat surface of the base member; and
(d) securing means for removably connecting said test element to said base structure so that substantially all of the surface of the test element opposite from said one surface thereof is exposed for peening.

4,102,177
DENSITOMETER

Mitsuyoshi Okada, Yokohama; Tetsuya Okuno, Chofu; Takebiko Sato, Yokohama, and Masao Shima, Tokyo, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan
Filed Apr. 4, 1977, Ser. No. 784,281
Claims priority, application Japan, Nov. 12, 1976, 51-136726
Int. Cl.² G01N *9/24, 21/06*
U.S. Cl. 73—32 R 13 Claims


FIRST CALCULATION CIRCUIT
SECOND CALCULATION CIRCUIT
SIGNAL CONVERSION CIRCUIT
SYNCHRONIZING SIGNAL TREATING CIRCUIT
COOLING WATER
SAMPLE WATER
M
P1
P2
OSC
20
40
50
60
70

1. A densitometer for measuring a concentration of a liquid in a system including liquids and suspended solids insoluble in each other, comprising in combination:

means for producing two emulsified conditions of the system, a first condition containing an emulsified liquid of relatively large particle diameter and a second condition containing an emulsified liquid of a relatively small particle diameter;

means for illumination;

means for receiving light from said illuminating means and producing an electrical signal proportional to the quantity of light received;

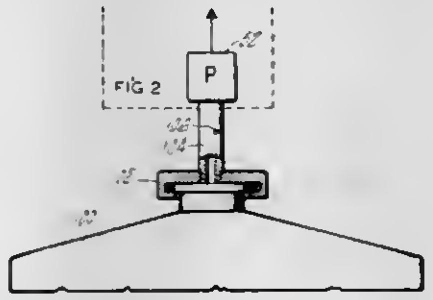
means for containing said system, said containing means disposed between said illuminating means and said light receiving means;

said light receiving means generating a first signal in response to the light passing through said system in said first condition and a second signal in response to the light passing through said system in said second condition; and

means responsive to said first signal and said second signal for generating a signal proportional to the concentration of said emulsified liquid.

4,102,178
GAS IN COOLANT DIAGNOSTICS FOR INTERNAL COMBUSTION ENGINE

Henry J. Mercik, Jr., Enfield, and Henry E. Goetsch, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 25, 1977, Ser. No. 781,094
Int. Cl.² G01M *15/00*
U.S. Cl. 73—49.7 5 Claims



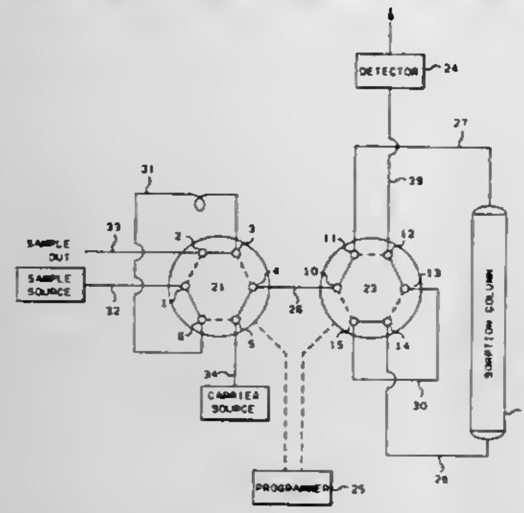
3. In a method of measuring gas in the coolant of an engine cooling system, the steps of:
operating the engine;
determining that the thermostat of the engine is open;
allowing gas to escape from the cooling system through a small orifice of a known size; and
measuring the pressure across the orifice.

4,102,179
LIQUID COLUMN CHROMATOGRAPHIC SEPARATION

James B. Snell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 1, 1977, Ser. No. 783,514
Int. Cl.² G01N *31/08*
U.S. Cl. 73—61.1 C 17 Claims

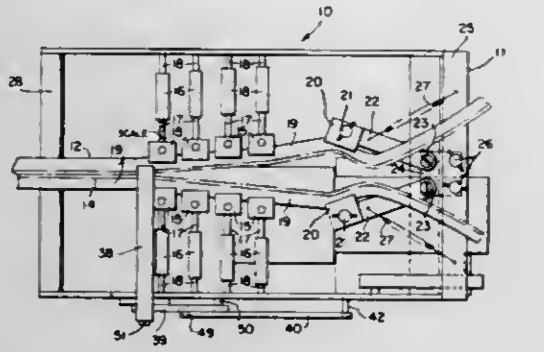
1. A process for sequentially subjecting a plurality of liquid samples to chromatographic separation and analysis comprising sequentially passing each liquid sample through at least a portion of a column packed with particulate sorbent to effect for each said liquid sample elution of at least a portion of the components of each said liquid sample from the column in response to the relative affinity of said components for the sorbent, and analyzing at least a portion of the components of each said liquid sample as said portion of the components is eluted from said column, wherein periodically the point of introduction of liquid sample into the column is reversed in

such a fashion that differences observed in the analysis of the various liquid samples can be attributed to differences in the liquid samples rather than differences due to compacting of the particulate sorbent in the column.



4,102,180
SLIDE FASTENER ENDURANCE TESTER

Vasant K. Devarakonda, Holliston, and John L. Kovar, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 30, 1977, Ser. No. 811,933
Int. Cl.^{2} G01N *3/08*
U.S. Cl. 73—91 **9 Claims**

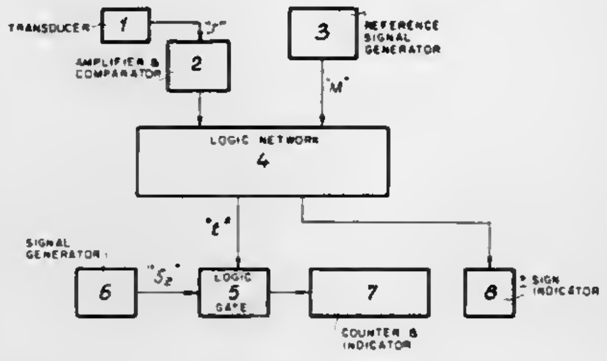


1. In a slide fastener endurance tester comprising means for supporting a slide fastener extended longitudinally and transversely and means for reciprocatingly moving the slider of said slide fastener back and forth along a predetermined portion of the chain of said slide fastener to open and close said slide fastener, the improvement which comprises means for variably and controllably loading said slide fastener transversely thereof and means for variably and controllably loading said slide fastener longitudinally thereof while said slider is being reciprocatingly moved along said chain, and means for counting the number of cycles of said reciprocating movements of said slider along said chain.

4,102,181
PROCEDURE FOR DETERMINING THE STARTING POINT OF FUEL INJECTION ESPECIALLY FOR RUNNING INTERNAL-COMBUSTION ENGINES

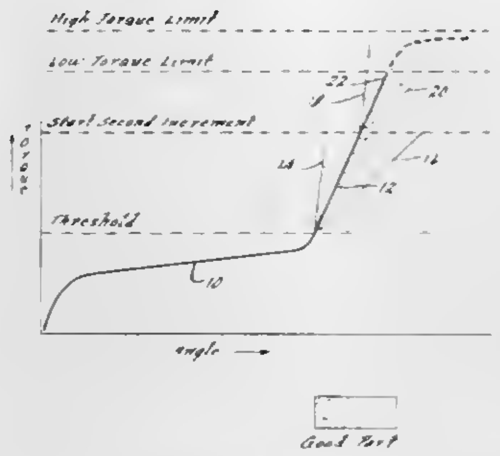
Gyula Cser, Budapest; Géza Mizser, Cegléd; Péter Rausnitz, and Zoltán Székely, both of Budapest, all of Hungary, assignors to Antólpari Kutató Intézet, Budapest, Hungary
Filed Dec. 21, 1976, Ser. No. 753,008
Claims priority, application Hungary, Dec. 23, 1975, AU 352
Int. Cl.^{2} G01M *15/00*
U.S. Cl. 73—119 A **5 Claims**

1. A process for determining the starting point of fuel injection in internal-combustion engines having a fuel-injection nozzle with a housing and a needle valve and a displacement limited by a stroke limiter, comprising the steps of: observing and consecutively registering vibrations and other noise phenomena arising from abutments of the needle in the valve against the stroke limiter, or full opening of the needle valve; and selecting the ascending flank of a first half-wave signal from that vibration; the registering being accomplished with a sensing element placed at least in the vicinity of the nozzle housing.



4,102,182
QUALITY CHECKING SYSTEM FOR A THREADED FASTENER ASSEMBLY

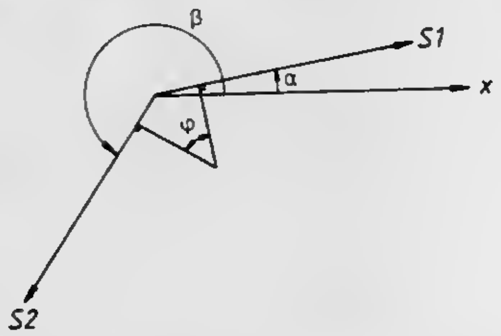
Lowell R. Brown, Farmington Hills, and Nathaniel L. Field, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 5, 1976, Ser. No. 683,370
Int. Cl.^{2} G01L *3/02*
U.S. Cl. 73—136 R **3 Claims**



1. A method for quality checking threaded fastener assemblies comprising the steps of establishing a minimum torque threshold level, high and low final applied torque limits and an intermediate torque limit, monitoring the absolute torque value during torquing of the fastener in the torque ranges between the threshold value and the intermediate torque limit and between the intermediate torque limit and final applied torque, simultaneously checking the threaded fastener rotation in each of the aforesaid torque ranges by measuring the slope of the torque angle relationship during tightening of the fastener and for detecting variations in the slope angle to values either above or below specified slope limits within each torque range, the measurement of torque on the fastener being determined by storing electronic clock pulses in a digital storage counter and triggering a transfer of clock pulses to the counter in response to torque signals received from a torque transducer, transferring the torque signal counter value to a logic circuit, transferring fastener angle pulses from a pulse transducer to the logic circuit whereby the logic circuit responds by distributing electronic clock pulses to an angle storage counter, dividing the stored value for the torque pulses by the stored value of the angle pulses to establish a slope relationship between torque applied to the fastener and the angle of fastener rotation for a corresponding torque and detecting the variations in the magnitude of that quotient from preselected values above and below established limits whereby both slope value of the torque angle relationship and the torque value itself may be detected.

4,102,183
METHOD OF MINIMIZING ERRORS IN MEASURING OF TENSION IN MOVING STRIP

Rune Thenander, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden
Filed Aug. 12, 1977, Ser. No. 824,172
Claims priority, application Sweden, Aug. 16, 1976, 76091081
Int. Cl.^{2} G01L *5/04*
U.S. Cl. 73—144 **1 Claim**



1. A method for determining the tension in a moving strip by measuring the force along a direction on load cells at the ends of a measuring roll over the periphery of which the strip is partially wrapped and wherein the errors in measuring the tension when the strip is accelerating or decelerating in speed are minimized, the steps including

(1) measuring an angle α between an initial generally horizontal measuring direction X passing through the load cells and the predetermined direction of passage of the strip away from the periphery of the measuring roll:
(2) measuring an angle β between the initial generally horizontal measuring direction X passing through the load cells and the direction opposite to the predetermined direction of passage of the strip towards the periphery of the measuring roll:
(3) calculating the force F_{acc} needed to accelerate the measuring roll;
(4) calculating both ΔS1 and ΔS2 from the following formulas

$$\Delta S1 = F_{acc} \cdot (\cos\beta/\cos\alpha + \cos\beta)$$

and

$$\Delta S2 = -F_{acc}(\cos\alpha/\cos\alpha + \cos\beta)$$

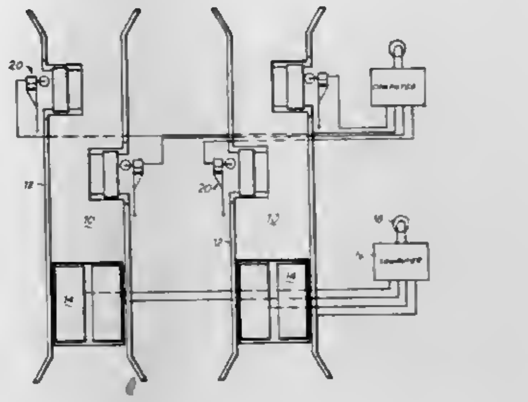
wherein S1 is the tension on the strip in the direction of passage of the strip away from the measuring roll and S2 is the tension on the strip in the direction opposite to the direction of movement of the strip towards the measuring roll,
(5) determing the angles α and β such that either one or both of ΔS1 or ΔS2 is a minimum and thereby determining the direction X^1 which corresponds to such minimum, and
(6) measuring the tension on said load cells at the ends of the measuring roll along the direction X^1.

4,102,184
TIRE PRESSURE AND MATE CHECK

Billy J. Castleberry, P.O. Box 647, Lubbock, Tex. 79408
Filed Oct. 21, 1976, Ser. No. 734,550
Int. Cl.^{2} B60C *23/06*
U.S. Cl. 73—146.2 **28 Claims**

1. A device for in situ determining the inflation pressure in a pneumatic tire having sidewalls comprising:

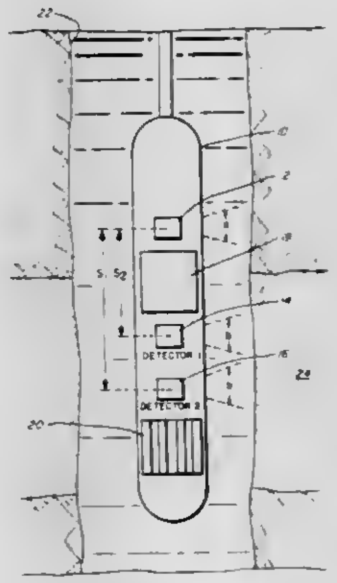
a. a driveway for a vehicle having said tire,
b. guide rails projecting upward from the driveway to guide the vehicle therealong,
c. a cradle along the driveway in the path of said tire on the vehicle,
d. a probe on a bracket,



e. push means operatively associated with said probe for pushing the probe horizontally into the sidewall of a tire to be tested,
f. measuring means operatively associated with said probe for measuring the results of the pushing indicative of inflation pressure of the tire, and
g. said probe connected to said cradle.

4,102,185
ACOUSTIC-NUCLEAR PERMEABILITY LOGGING SYSTEM

Donald J. Dowling, and Dan M. Arnold, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 9, 1976, Ser. No. 748,978
Int. Cl.^{2} E21B *47/10*
U.S. Cl. 73—155 **35 Claims**



13. A method of evaluating the permeability of an underground formation adjacent a borehole therethrough comprising the steps of irradiating underground material, including particles of fluid in the vicinity of said formation, with neutrons of 10 MEV or more energy, generating one or more acoustic pulses in said fluid in said borehole in the vicinity of said formation, determining the net flow of fluid across the boundary between said borehole and said formation due to the interaction of said pulses with said boundary, by measuring the net flow of said fluid in said borehole through the mechanism of detecting the radiation emitted by particles produced as a result of said neutron irradiation and which are part of said fluid flowing in said borehole, and determining a measure of said permeability of said formation based on said net fluid flow across and boundary.

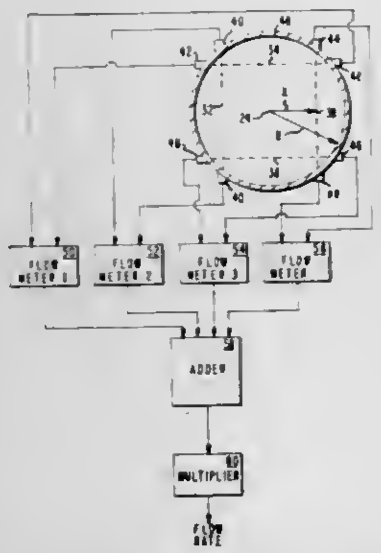
4,102,186
METHOD AND SYSTEM FOR MEASURING FLOW RATE

Alvin E. Brown, Claremont, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1976, Ser. No. 708,284

Int. Cl.² G01F *1/66*

U.S. Cl. 73—194 A **13 Claims**



8. A method for determining the volumetric flow rate of a fluid flowing as turbulent or plug flow in a cylindrical conduit having a radius R and a flow axis comprising the steps of:

determining the average flow velocities of said fluid in each of more than two equal length chordal measuring paths of length greater than $2\sqrt{R^2-X^2}$ and lying at a radial distance X of between about 0.5R and 0.6R,

multiplying each said average flow velocity by a constant related to said radial distance X and the path length thereby to provide volumetric flow rate, and

obtaining the average of the products of each said average flow velocity by said constant.

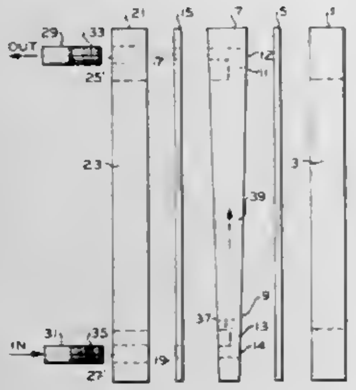
4,102,187
FLUID FLOW METER

Keith A. Williams, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1977, Ser. No. 827,762

Int. Cl.² G01F *1/22*

U.S. Cl. 73—209 **8 Claims**



1. A fluid flow meter comprising a fluid-tight, sandwiched assembly of a first flat faced plate; a first sheet of transparent, fluid impervious material; a second flat faced plate; a second sheet of transparent, fluid impervious material; and a third flat faced plate; all co-extensive in face size;

(a) each of said plates having at least one elongated slot cut therethrough, said slots of the same length and width and said plates assembled with slots in coplanar alignment;

(b) said second plate symmetrically tapered to be wider at the upper end than the lower end; and having extensions of said slot cut less than all the way through said second plate with a perforation extending through the second plate into said extension at each end of the second plate;

(c) the sheet assembled adjacent to a perforation in the second plate having a perforation therein aligned with the perforation of said second plate;

(d) the plate assembled adjacent a perforated sheet having a perforation therein aligned with the perforation in said sheet thereby forming passage for fluid from outside the meter to the slot in said second plate; and

(e) a plummet inserted in the slot in the second plate.

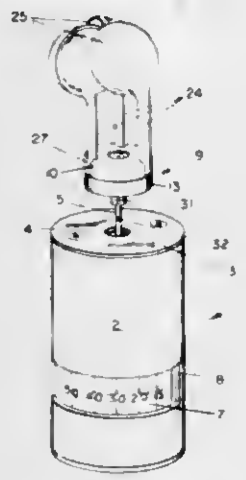
4,102,188
PORTABLE ANEMOMETER WITH COLLAPSIBLE ROTORS

R. A. Simerl, 528 Epping Forest Rd., Annapolis, Md. 21401

Filed Aug. 5, 1977, Ser. No. 822,325

Int. Cl.² G01F *1/06*

U.S. Cl. 73—170 R **7 Claims**



1. An anemometer comprising a tubular casing, a spindle journalled in said casing and projecting upwardly therefrom for rotation relative thereto, spaced radial arms pivotally arranged relative to the projected end of said spindle, cupped means on the outer ends of said arms whereby said arms are wind drivingly rotated, and link means pivoted to said spindle and the inner ends of and for moving said arms from active horizontal to inactive collapsed positions relative to said spindle.

4,102,189
TURBINE FLOWMETER WITH OVERSPEED PROTECTION

Gary D. Cohrs, Tempe, Ariz., assignor to Flow Technology, Inc., Phoenix, Ariz.

Filed Jun. 20, 1977, Ser. No. 807,989

Int. Cl.² G01F *1/115, 1/12*

U.S. Cl. 73—230 **8 Claims**

1. A turbine flowmeter comprising:

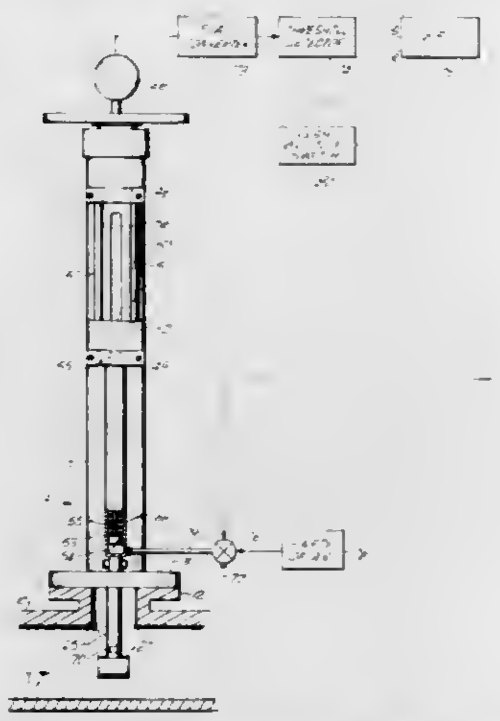
a turbine wheel;

means for supporting the turbine wheel for rotation;

a sleeve through which the supporting means passes for inserting the turbine wheel in a line to intercept fluid flowing therethrough and to rotate responsive to the intercepted fluid;

means for controlling the rotational position of the supporting means as it passes through the sleeve to align the turbine wheel with the direction of flow through the line;

means for sensing the rotation of the turbine wheel; and



means responsive to the sensing means for rotating the sleeve and the supporting means as a unit to reduce the fluid intercepted by the turbine wheel.

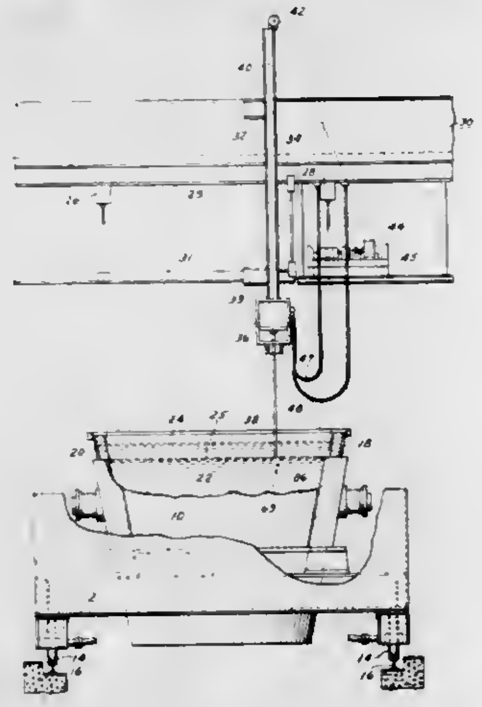
4,102,190
METHOD AND APPARATUS FOR DETERMINING THE WEIGHT OF SLAG ON A BATH OF MOLTEN METAL

Ronald J. Fradeneck, and Edmund J. Biancarelli, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 7, 1977, Ser. No. 785,727

Int. Cl.² G01G *9/00;* G01F *23/14*

U.S. Cl. 73—302 **3 Claims**



1. A method of determining the weight of the molten slag covering a bath of molten metal, comprising:

(a) determining the surface area of the slag and the pressure head at the slag-metal interface,

(b) multiplying said surface area by said pressure head,

(c) said pressure head is determined by:

(i) inserting a consumable tubular member downwardly into said vessel until said member passes below the interface between said molten slag and said molten metal while passing a gas at a constant flow rate through said member, and

(ii) measuring the pressure head at the bottom of said tubular member at about the instant said bottom is at said interface, and

(d) the instant the bottom of said tubular member is at said interface is determined by:

(i) maintaining constant the downward movement of said tubular member,

(ii) measuring the pressure at said bottom at constant intervals,

(iii) subtracting the maximum change in pressure that can occur in said slag during said interval from the change in pressure between each successive interval,

(iv) subtracting the change in pressure at each (n-1) interval from the change in pressure at each successive interval,

(v) in response to a control signal, calculating the pressure head at the bottom of said member, and

(vi) producing a control signal when one of the following two conditions exists:

(a) the results of the subtractions of both (iii) and (iv) are positive; and

(b) a predetermined time interval has elapsed since the pressure head at said bottom exceeded a predetermined value.

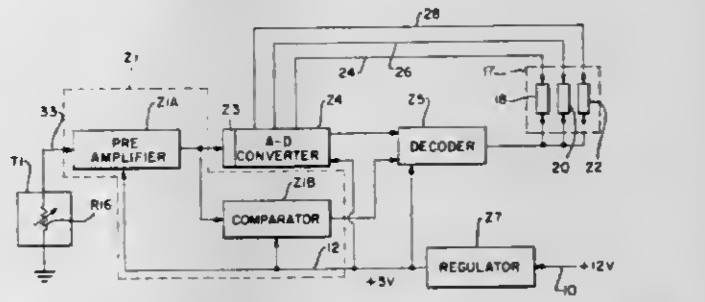
4,102,191
DIGITAL FUEL GAUGE

Roger J. Harris, 5424 Gregg St., Dallas, Tex. 75235

Filed Nov. 19, 1976, Ser. No. 743,458

Int. Cl.² G01F *23/06, 23/10*

U.S. Cl. 73—313 **4 Claims**



1. Apparatus to measure the quantity of liquid in a storage tank comprising: a DC voltage supply; means to regulate said DC voltage supply; a voltage divider network means connected to said regulated voltage supply; a liquid level sensing means connected to one side of the voltage divider network, said voltage divider network producing a first DC voltage proportional to the ratio of the volume of liquid in the tank to the inside volume of said tank; a preamplifier means connected to the other side of the voltage divider network for producing a second DC voltage representing the actual volume of liquid in said tank; an A-D converter means, the output of said preamplifier means being connected to an A-D converter means to convert said second DC voltage to a binary coded decimal digit code said binary coded decimal code being comprised of several groups of binary bits, each group representing a different decimal digit, said converter means sequentially generating each group of binary bits; decoder means connected to said output of said A-D converter means to receive said sequentially generated binary decimal digit code, said decoder means producing decimal digit codes; display means comprised of a plurality of display units each dedicated to a different decimal digit connected to said decoder means to receive said decimal digit code; enabler means connected between A-D converter means and the display means to selectively enable each display unit so that each display unit receives only the decimal digit code to which it has been dedicated; voltage comparator means adapted to receive a voltage output of the preamplifier means to compare same with a predetermined voltage level

such that when the output of the preamplifier means falls below a predetermined voltage level, the voltage comparator means initiates a warning signal; NAND gates connected between the voltage comparator means and decoder means; oscillator means connected to said NAND gates such that when the voltage comparator enables the NAND gates, the output of the decoder means is periodically interrupted; and a decade counter, the input of said decade counter being connected to the output of the oscillator means, the output of the decade counter being connected to the A-D converter means to control the cycle of the output of the A-D converter means.

4,102,192
METALLIC CARBOXYLATE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

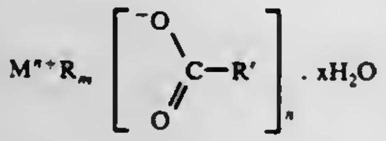
James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1976, Ser. No. 676,435

Int. Cl.² C09K *3/00;* **G01K** *3/00, 11/00;* **C08K** *5/09;* **C08L** *63/00*

U.S. Cl. 73—339 R **35 Claims**

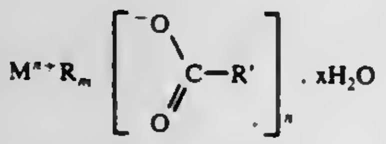
1. A composition curable at room temperature consisting essentially of about 20 to about 250 phr of at least one metallic carboxylate and a solution of an air-dryable epoxy resinous carrier stable at 60° C when cured, and unreactive with said metallic carboxylate, said metallic carboxylate having the general formula



$$M^{n+}R_m\left[\begin{array}{c}{}^{-}O\\ \diagdown\\ C-R'\\ /\!\!/\\ O\end{array}\right]_n\cdot xH_2O$$

where each R is independently selected from the group consisting of alkyl to C_{20}, and aryl, each R′ is independently selected from alkyl to C_6, M is copper, lead, tin, or mercury, *m* is 0 to 4, *n* is 1 to 4, and *x* 15 0 to 10.

16. A thermal detection system for electrical apparatus cooled by a gas stream, comprising a thermoparticulating coating on a portion of said electrical apparatus exposed to said gas stream and a monitor for detecting the presence of thermoparticulated particles in said gas stream, said coating comprising a solid layer of a room temperature air-dryed epoxy or polyester resinous carrier containing about 20 to about 250 phr of a metallic carboxylate having the general formula



$$M^{n+}R_m\left[\begin{array}{c}{}^{-}O\\ \diagdown\\ C-R'\\ /\!\!/\\ O\end{array}\right]_n\cdot xH_2O$$

where each R is independently selected from the group consisting of hydrogen, alkyl to C_{20}, cycloalkyl to C_{20}, alkylaryl to C_{20}, arylalkyl to C_{20}, aryl, and heterocyclic, each R′ is independently selected from alkyl to C_6, M is copper, lead, tin, or mercury, *m* is 0 to 4, *n* is 1 to 4, and *x* is 0 to 10.

4,102,193
METHOD FOR PROTECTING ELECTRICAL APPARATUS AND THERMAL DETECTION SYSTEM USING SULFONIC ACID THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 645,164, Dec. 30, 1975, Pat. No. 4,046,733. This application May 19, 1977, Ser. No. 798,542

Int. Cl.² G01K *1/02, 3/00, 11/00, 13/00*

U.S. Cl. 73—339 R **16 Claims**

1. A method of protecting electrical apparatus from damage due to overheating and for thereafter determining the location of said overheating, said apparatus including a gas stream and a monitor for detecting particles in said gas stream and for emitting a signal when said particles are detected comprising:

(A) preparing a composition which comprises
  (1) a thermoparticulating compound selected from the group consisting of sulfonic acids, amine salts of sulfonic acids, and mixtures thereof; and
  (2) a solution of a resinous carrier curable at room temperature, stable at 60° C when cured, and unreactive with said thermoparticulating compound;
(B) applying said composition to said electrical apparatus at positions exposed to said gas stream;
(C) evaporating said solvent; and
(D) monitoring said gas stream for the presence of thermoparticulated particles therein.

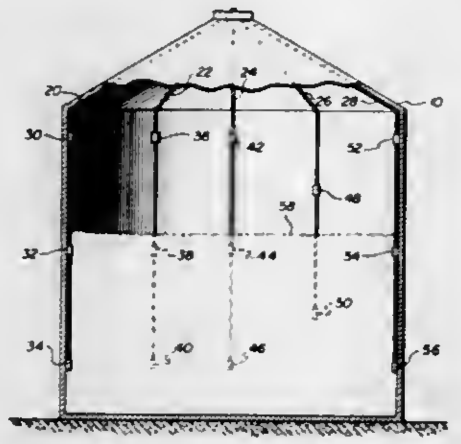
4,102,194
ELECTRONIC BIN TEMPERATURE MONITOR

William T. Eng, Springfield, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Sep. 20, 1976, Ser. No. 724,731

Int. Cl.² G01K *1/02, 3/00*

U.S. Cl. 73—340 **6 Claims**



1. An apparatus for monitoring the temperature of grain in a storage bin comprising: temperature sensing circuit means including a plurality of sensors and a calibration resistance, each said sensor respectively disposed in one of a plurality of discrete locations within said storage bin to sense the temperature of the grain at each of said locations and develop a corresponding electrical temperature signal, and said calibration resistance provides a calibration temperature signal; scaling amplifier means responsive to said plurality of temperature signals and said calibration temperature signal to provide a scaled temperature signal, scanning circuit means including a digital electronic multiplexer circuit connected with said temperature sensing circuit means and said scaling amplifier means for effectively coupling each of said temperature signals and said calibration temperature signal to said scaling amplifier in a predetermined sequence, alarm means, adjustable alarm circuit means connected with said scaling amplifier means and for producing an electrical signal corresponding to a desired maximum temperature, means for receiving and comparing said scaled temperature signal and said desired maximum temperature signal and producing an alarm signal for actuating said alarm means whenever the temperature of the grain at the associated location meets or exceeds said desired maximum temperature, digital electronic readout circuit means connected to said scaling amplifier means and responsive to said scaled temperature signal for sequentially providing a digital display of said grain temperature at each said discrete location.

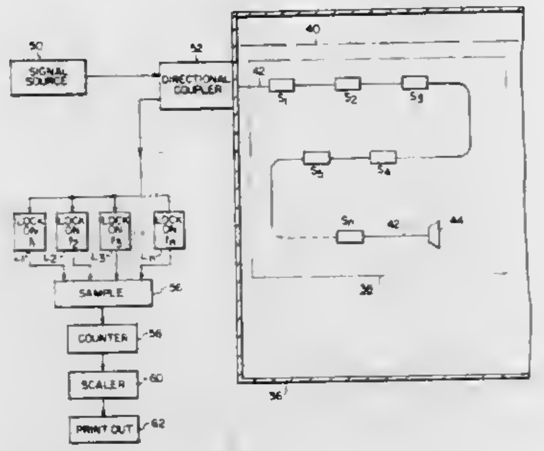
4,102,195
HOT SPOT TEMPERATURE SENSOR

John H. Thompson, Severna Park; Stephen Kowalyshyn, Columbia, and Arthur Nelkin, Annapolis, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 8, 1977, Ser. No. 766,819

Int. Cl.² G01K *11/26*

U.S. Cl. 73—340 **23 Claims**



1. A temperature sensing system, comprising:
(A) an acoustic waveguide;
(B) transmitting means coupled to said acoustic waveguide for transmitting a continuous wave acoustic signal down said acoustic waveguide;
(C) a mechanical resonator having a resonant frequency which varies with temperature;
(D) a compliant coupling member for coupling said acoustic signal in said acoustic waveguide to said resonator which will then reflect back up said acoustic waveguide any acoustic signal of a frequency equal to the then resonant frequency of said resonator; and
(E) means for detecting and processing the reflected back signal.

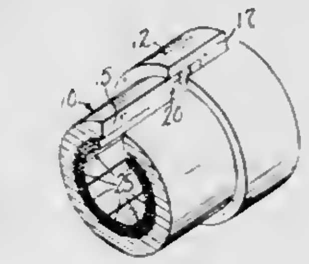
4,102,196
HEAT SENSOR

Ludwig K. Holtermann, 43 Ragged Rock Rd., Old Saybrook, Conn. 06475

Filed Apr. 8, 1977, Ser. No. 786,004

Int. Cl.² G01K *7/06*

U.S. Cl. 73—341 **8 Claims**



1. A temperature sensor for monitoring the temperature of an elongated slender target comprising a hollow cylindrical housing of heat conductive material, flanged cap members, one fitted on each end of the housing, openings in the center of each cap member providing access to the interior of the housing and located on the axis thereof, and a plurality of sensor units fixed to the interior wall of the housing and extending axially thereof, each sensor unit comprising an elongated electric non-conductive substrate, a wire winding on said substrate, the wire being made up of different materials adapted to form thermocouples at their junction points and being so wound on the substrate as to provide a multiplicity of axially aligned hot junctions along one surface of the substrate and a multiplicity of axially aligned cold junctions along an opposite surface of the substrate, the sensor units being connected in series and the end terminals of the series being adapted for connection to an instrument.

4,102,197
SAMPLING MOLTEN STEEL

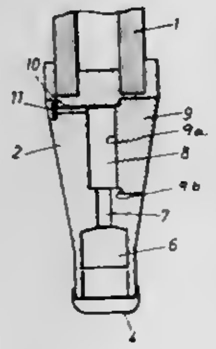
Freidrich Bardenheuer, Krefeld, Germany, and Gustav Kolb, 5984 Garbeck, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf and Gustav Kolb, Garbeck, both of Germany, part interest to each

Filed Mar. 7, 1977, Ser. No. 775,160

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609945

Int. Cl.² G01N *1/12*

U.S. Cl. 73—354 **15 Claims**



1. A ceramic sampling device for sampling molten steel, comprising:
a single piece body having an entrance chamber, an inlet duct extending from the chamber to a mold cavity of disc-shaped configuration, but being defined by an open configuration of the body, the body further including a venting duct and destructible means for closing the venting duct; and
a stopper inserted into and affixed to the body at said open configuration and providing a mold-completing surface as to one flat side of the disc, said stopper and mold completing surface having a diameter equal to the diameter of the disc.

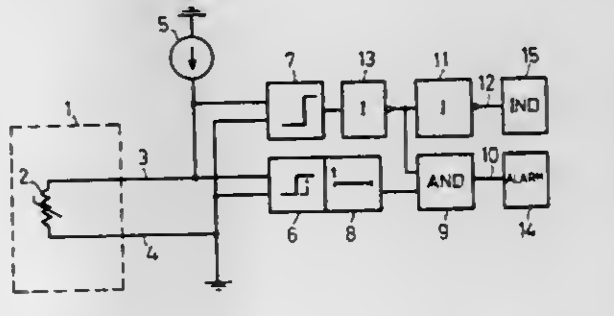
4,102,198
RESISTANCE THERMOMETER MEASURING SYSTEM

Gudmar Hammarlund, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Oct. 6, 1976, Ser. No. 730,249

Int. Cl.² G01K *7/16*

U.S. Cl. 73—362 AR **5 Claims**



1. A resistance thermomenter measuring system comprising:
a temperature responsive resistance member, said resistance member having two connection leads;
current supply means for supplying current to said resistance member;
a first voltage sensing means coupled in parallel with said resistance member and serving to provide an alarm signal

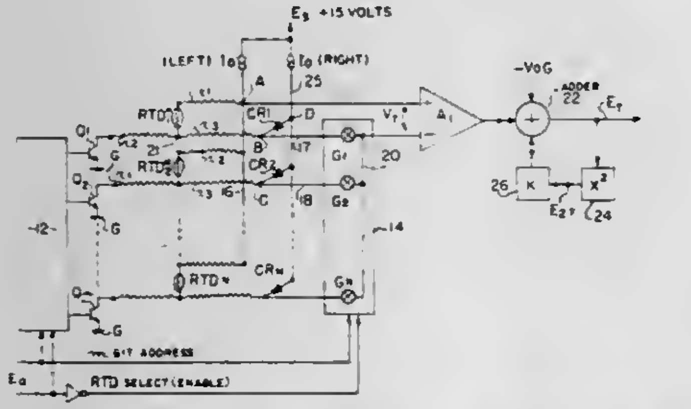
a preselected time after the voltage across said resistance member exceeds a first preset level corresponding to a preselected temperature of said resistance member;

second voltage sensing means coupled in parallel with said resistance member and serving to provide a malfunction indicating signal immediately after the voltage across said resistance member exceeds a second level, such second level being higher than the first level and indicative of a malfunction in said resistance member such malfunction occurring when there is an interruption in the portion of the circuit formed by said resistance member and its connecting leads; and,

means for combining said alarm signal and said malfunction indicating signal and for blocking said alarm signal when both signals appear simultaneously.

4,102,199
RTD MEASUREMENT SYSTEM

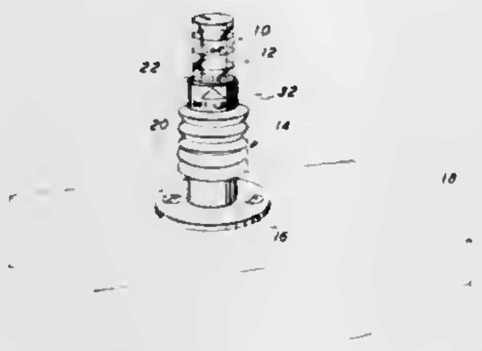
Panaylotis J. Tsipouras, Rocky River, Ohio, assignor to Megasystems, Inc., Cleveland, Ohio
Filed Aug. 26, 1976, Ser. No. 717,936
Int. Cl.^{2} G01K *7/24*
U.S. Cl. 73—362 AR **6 Claims**



1. A measurement system for electrically determining the temperature at a plurality of locations of interest comprising, a resistance-temperature device disposed at each said location and having a resistance element exposed to the temperature at said location and whose magnitude of resistance is responsive to and related to the temperature thereat, a plurality pf pairs of first and second conductors, each pair connecting across one of said resistance elements and to a source of constant current, first circuit means having third conductor means separately connecting with one end of each said resistance elements, said first circuit means including switch means operable to separately connect each said third conductor means and said connected resistance element to the ground of said system, means for sequentially operating said switch means to sequentially connect each said connected resistance element between said system ground and source of current thereby causing current from said source to flow through the first and second conductors and said connected resistance element, the circuit connections of each pair of said first and second conductors with the said current source being effective to cause current to flow through said conductor pair in opposite directions with respect to each other, said first and second conductors of each pair being equal in effective resistivity as to cause an equal voltage drop of opposite polarity across each said conductor of each pair effective to cancel each said voltage drop across each said conductor of each pair, the current flow through the connected resistance element causing a first voltage signal to be developed thereacross whose magnitude is proportional to the temperature at said location, second circuit means connecting across each said resistance element and providing an output voltage signal that is proportional to the first voltage signal, means providing a second voltage signal whose magnitude is equal to the output voltage signal of the second circuit means when the temperature at the selected location of interest is zero, said second circuit means including an adder circuit operable to add said first voltage signal to a second voltage signal of opposite sign when the selected resistance element is connected between said system ground and source of current to provide a difference voltage signal therebetween, and means for providing a third voltage signal and for mixing said third voltage signal with said difference voltage signal effective to provide a temperature indicator voltage whose magnitude is linearly directly proportional to the temperature at the selected location of interest.

4,102,200
TEMPERATURE INDICATOR

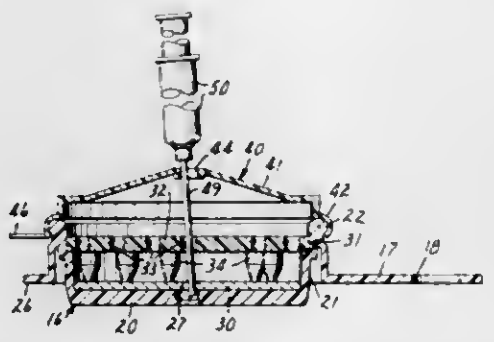
Joseph R. Kelsch, Jr., 31 Sioux Dr., Commack, N.Y. 11725
Filed Nov. 2, 1976, Ser. No. 738,376
Int. Cl.^{2} G01K *1/02*
U.S. Cl. 73—371 **6 Claims**



1. A temperature indicator comprising: a graduated electroluminescent tube which glows along a length in accordance with the movement of temperature-responsive liquid up and down the tube, an opaque expansible sleeve encasing said tube whereby the top edge of said sleeve is alignable with a graduation on said tube with the sleeve covering the entire tube below said graduation, and means connected to said sleeve for mounting said sleeve and tube on an object, the temperature of which is to be sensed.

4,102,201
VAPOR SAMPLING AND ANALYTICAL DEVICE

John A. Trine, Landfall, and David L. Braun, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 26, 1977, Ser. No. 836,760
Int. Cl.^{2} G01N *1/22*
U.S. Cl. 73—421.5 R **17 Claims**



15. A method of determining the amount of at least one selected component of a fluid mixture comprising the steps of:

collecting the selected component by exposing said fluid mixture for a measured period of time to a collecting layer disposed within a chamber formed by body members and having an open end with at least one porous attenuating layer disposed across said open end to allow passage of said fluid into said chamber;

sealing said chamber at the expiration of said measured period;

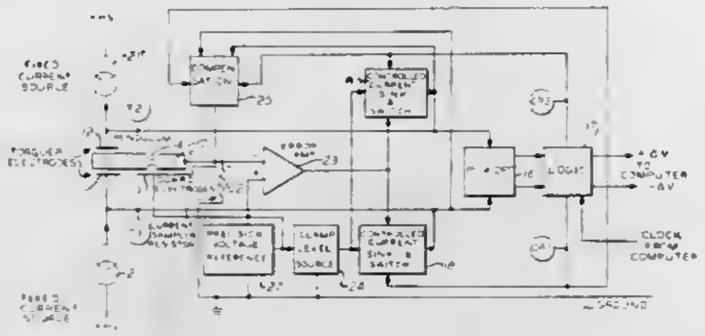
adding to said chamber a measured amount on an elutant to desorb the selected component from said collecting layer;

withdrawing an aliquot of the elutant containing the selected component;

analyzing the solution to determine the amount of the selected component present therein.

4,102,202
ELECTROSTATIC ACCELEROMETER

Lincoln Stark Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.
Filed Nov. 26, 1976, Ser. No. 745,259
Int. Cl.^{2} G01P *15/00*
U.S. Cl. 73—517 B **7 Claims**



1. An electrostatic accelerometer comprising:

a conductive pendulous mass pivotally movable about a hinge point said pendulous mass being responsive to acceleration along a sensing axis,

first and second electrodes disposed on the opposite sides of said pendulous mass and in capacitive relation therewith,

sources of constant current connected to said electrodes for building up a charge on said electrodes to enable said electrodes to force said pendulous mass to its null position, said charge on said electrodes being indicative of the position and direction of said pendulous mass from null,

a high gain differential amplifier said pendulous mass connected to a first input of said amplifier,

a source of reference voltage connected to a second input of said amplifier,

a resistance means connected between ground and said first amplifier input whereby said amplifier is capable of maintaining a zero potential difference between said first and second amplifier inputs through action of said constant current sources connected as control loops, and

means responsive to said charge on said electrodes for measuring the position and direction of displacement of said pendulous mass from null position.

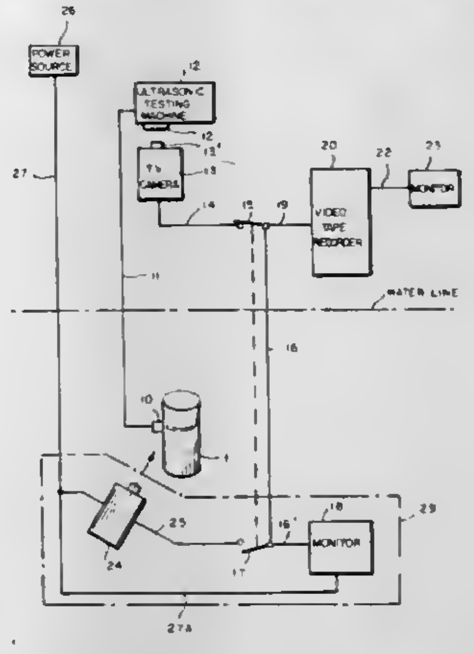
4,102,203
UNDERWATER INSPECTION AND COMMUNICATION APPARATUS

Bruce J. Sylvester, Duxbury, and Roger P. Sylvester, Kingston, both of Mass., assignors to J. G. Sylvester Associates, Inc., Rockland, Mass.
Filed Dec. 16, 1976, Ser. No. 751,143
Int. Cl.^{2} G01N *29/04*
U.S. Cl. 73—620 **10 Claims**

1. A system for conducting ultrasonic inspection of a structure submerged below a water surface, comprising;

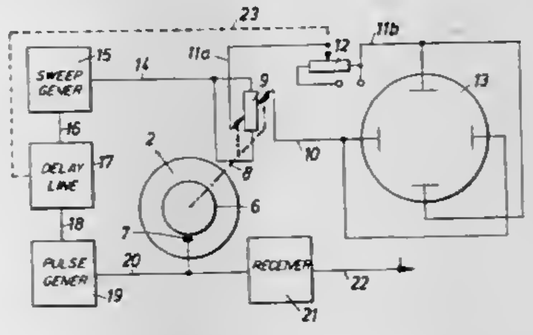
a mobile subsurface unit comprising transducer means for transmitting bursts of high frequency sound waves through one surface of said structure and detecting reflections of said sound waves, and monitoring means for monitoring the magnitude of the sonic signals generated by manipulation of the transducer means over the surface of the structure, said transducer means being movable over the surface of said structure apart from the monitoring means; and

above-surface equipment comprising image-forming means for forming a visual image demonstrating the signals transmitted and detected by said transducer means; connecting means, connected to said image-forming means and said transducer means, for conveying signals transmitted or detected by said transducer means to said image-forming means; and image-transmitting means for transmitting the visual signal formed by the image-forming means to the monitoring means in said subsurface unit.



4,102,204
ULTRASONIC SECTION PLANE EXAMINATION AND DISPLAY

Carl Kretz, Redl 20, Zipf, Austria
Filed Dec. 10, 1976, Ser. No. 749,539
Claims priority, appilcation Austria, Dec. 23, 1975, 9777/75
Int. Cl.^{2} G01N *29/04*
U.S. Cl. 73—626 **24 Claims**



1. Equipment for ultrasonic examination of a specimen in a section plane and for producing moving section plane pictures in response to said examination, comprising, in combination, an ultrasonic transducer head having a predetermined peripheral portion, said predetermined peripheral portion having an outside surface adapted to be contacted with said specimen in a predetermined section plane, said ultrasonic transducer head comprising a stationary housing having an internal cavity circular in shape at least throughout the sector subtended by said predetermined peripheral portion, and said ultrasonic transducer head further comprising a wheel mounted in said housing for rotation around an axis spaced inwardly from said peripheral portion and eccentrically thereto, the periphery of said wheel and said internal surface of said stationary housing defining a gap extending around said periphery of said wheel and having the smallest width in said sector; a sound transmitting liquid filling said gap; a plurality of ultrasonic transducer means peripherally spaced around said wheel and adapted to revolve therewith around said axis, for projecting an ultrasonic beam through said peripheral portion into said specimen upon activation thereby causing said beam to perform an angular movement in said predetermined section plane, and for receiv-

ing, through said peripheral portion, echoes originating at echo-producing portions of said specimen in said section plane in response to said beam and generating corresponding echo signals; control means for operating each of said transducer means; display means having a fluorescent screen and adapted to be operatively connected to each of said transducer means, for tracing on said screen a base line moving angularly in synchronism with the movement of the ultrasonic beam of a transducer means connected thereto to sweep a substantially trapezoidal area of said screen, and for displaying on said screen echo signals from the transducer means connected thereto at locations representing echo-producing portions of said specimen; and activating means for activating each of said transducer means, said activating means comprising means for operatively connecting each of said transducer means to said control means and to said display means only while said transducer means moves along said predetermined peripheral portion, whereby the thus-activated transducer means projects said beam into said specimen and sweeps a substantially trapezoidal area in said predetermined plane, said substantially trapezoidal area adjoining said thus-activated transducer means.

4,102,205

METHOD AND APPARATUS FOR ULTRASONIC NONDESTRUCTIVE TESTING OF WORKPIECES WITH AUTOMATIC COMPENSATION FOR THE PROBE, WORKPIECE MATERIAL, AND TEMPERATURE

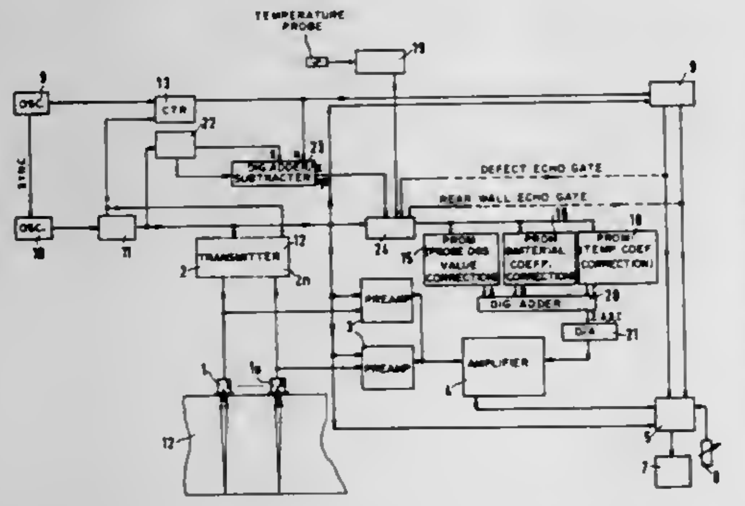
Wilfried Pies, Erftstadt-Bliesheim, and Reinhard Brandt, Turnich, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed May 4, 1977, Ser. No. 793,611

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623522

Int. Cl.² G01N *29/04*

U.S. Cl. 73—626 **11 Claims**



1. The method of testing workpieces by the ultrasonic pulse-echo method comprising:

coupling a plurality of electroacoustic transducer probe means via a coupling means to the surface of a workpiece to be tested;

storing in memory means, digitally addressed with respect to predetermined workpiece test regions, data relating to each of the probe means and data relating to the workpiece properties;

energizing said probe means for causing each of said probe means to transmit an ultrasonic search signal into the workpiece and subsequently to provide an echo responsive electrical signal arising from a respective search signal intercepting an acoustic discontinuity in the workpiece;

responsive to said probe means being energized addressing said memory means for continuously retrieving the respective probe means and workpiece properties stored data corresponding to the workpiece region traversed by the respective search signal;

combining the retrieved stored data from the memory means for forming a compensating signal;

compensating an echo responsive signal as a function of the compensating signal to derive a compensated output signal, and

evaluating said compensated output signal.

4,102,206

DEVICE FOR INSPECTING A TUBE BY ULTRASONICS

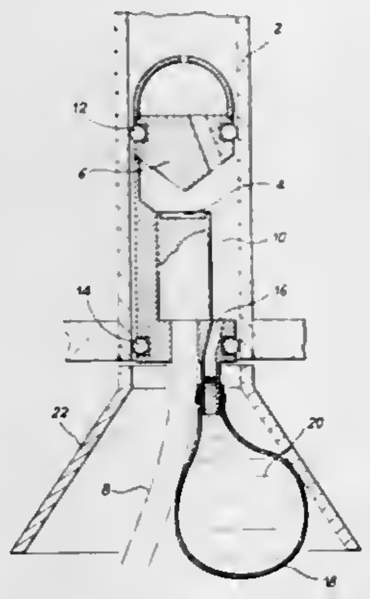
Jean Perdijon, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 5, 1977, Ser. No. 813,098

Claims priority, application France, Jul. 21, 1976, 76 22208

Int. Cl.² G01N *29/04*

U.S. Cl. 73—644 **4 Claims**



1. A device for introducing an acoustic coupling liquid into a volume defined by an acoustic inspection probe and the walls of a tube to be inspected as the probe is inserted into said tube, comprising a flexible pocket reservoir filled with said liquid and associated with a lower portion of said probe, and a conduit between said pocket reservoir and the volume to be filled, whereby said pocket reservoir is compressed as the probe is inserted into said tube and at least part of the liquid in said reservoir is expelled via said conduit into the volume, said liquid returning to the pocket via said conduit under the force of gravity as the probe is removed from the tube permitting the flexible pocket to reassume its original shape.

4,102,207

ELECTROMAGNETIC ULTRASOUND TRANSDUCER

Harold M. Frost, Rockville, Md., and Thomas L. Szabo, Boston, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 16, 1976, Ser. No. 751,240

Int. Cl.² G01N *29/00*

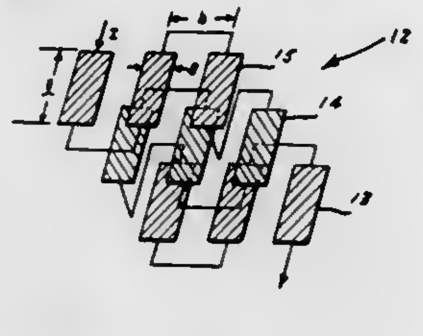
U.S. Cl. 73—643 **1 Claim**

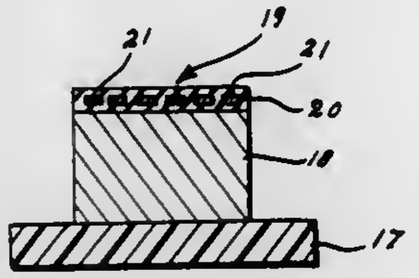
1. An electromagnetic ultrasound transducer comprising the combination of

a flexible permanent magnet,

a plurality of flexible multiconductor flat cable segments, the several conductors of each said segment being interconnected to provide a meander type electromagnetic transducer circuit, said flat cable segments being stacked in a contiguous layered arrangement and interconnected to provide a single continuous meander transducer circuit having a terminal at each end thereof, the stack of cable segments being affixed to one surface of said magnet, the

magnet magnetization axis being substantially perpendicular to the plane surfaces of said flat cable segments, and





means for applying an alternating current signal to said transducer circuit terminals.

4,102,208

SOUND LEVEL METER

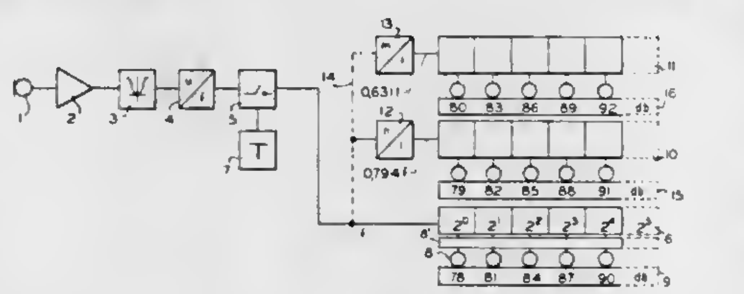
Tilman Betz, Groebenzell, Germany, assignor to Rohde and Schwarz, Germany

Filed Apr. 6, 1977, Ser. No. 785,014

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616585

Int. Cl.² G01H *3/12*

U.S. Cl. 73—647 **19 Claims**



1. A sound level meter, comprising:

signal receiving means for receiving and converting sound level into a corresponding electrical signal;

exponentiating means connected to said signal receiving means to raise the values of the electrical signal to a higher power;

converting means for converting the electrical voltage amplitude of the electrical signals of the exponentiating means into a corresponding frequency;

multistage binary counting means for counting pulses applied thereto;

a plurality of individual indicators connected to respective stages of the counter;

a dB scale associated with said indicators;

gating means connected between said converting means and said binary counting means; and

timing means controlling said gating means and operable to open said gating means for a predetermined interval.

4,102,209

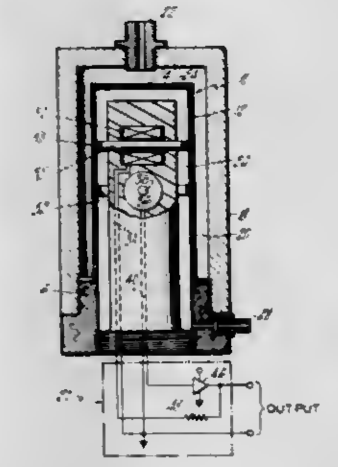
TEMPERATURE COMPENSATED VIBRATING CYLINDER PRESSURE TRANSDUCER

Charles B. Brahm, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 17, 1977, Ser. No. 807,625

Int. Cl.² G01L *19/04*

U.S. Cl. 73—702 **5 Claims**



1. A vibrating cylinder pressure transducer for measuring the pressure of a fluid, comprising:

a housing having an internal cavity forming an outer pressure chamber;

a cylinder disposed within said cavity and sealed with respect thereto, said cylinder having sidewall, which vibrates in operation and an end wall, defining an inner pressure chamber;

drive means for creating magnetic flux to act upon said sidewall of said vibrating cylinder;

pickup means disposed adjacent said sidewall for sensing movement of said vibrating cylinder; and

means having a high permeability at high temperature disposed on the sidewall of said vibrating cylinder adjacent said drive and pickup means for providing a low reluctance magnetic path at high temperatures.

4,102,210

PRESSURE TRANSDUCERS

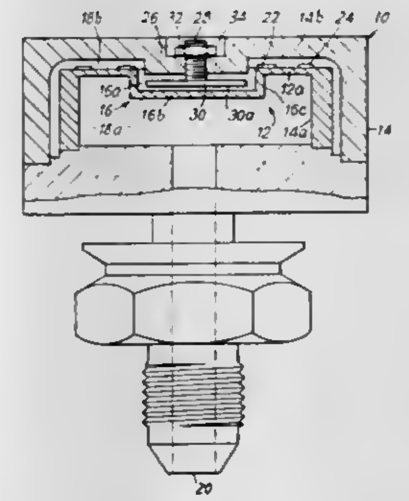
Frederick Robert Couston, and Roy Robert Bannock, both of Basingstoke, England, assignors to Bell & Howell Limited, Basingstoke, England

Filed Mar. 15, 1976, Ser. No. 666,627

Claims priority, application United Kingdom, Mar. 18, 1975, 11297/75

Int. Cl.² G01L *9/06*

U.S. Cl. 73—727 **14 Claims**

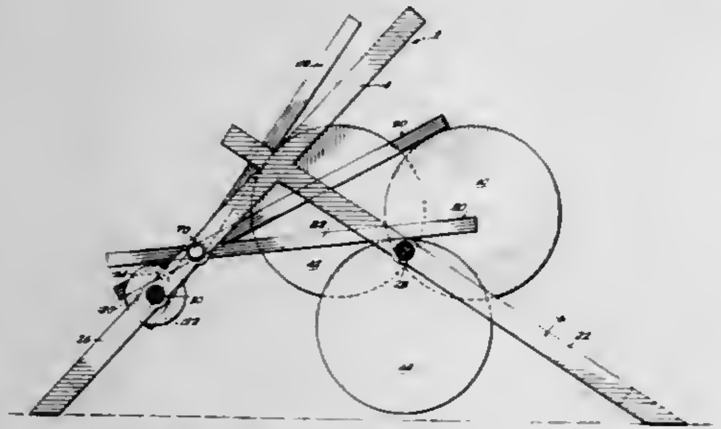


1. A transducer responsive to pressure, comprising a diaphragm having first and second opposed surfaces and a cup-

shaped portion formed concentrically in said diaphragm, said cup-shaped portion having external and internal surfaces forming part of said first and second surfaces respectively of said diaphragm, means for rigidly securing said diaphragm around its periphery to define an annular portion thereof between said periphery and said cup-shaped portion, means for applying a pressure to the first said surface of the diaphragm to produce in the annular portion an area of tension stress and an area of compression stress and means disposed on said annular portion in the area of tension stress and in the area of compression stress and being responsive to the resulting axial deflection of said diaphragm for providing an indication of the applied pressure.

4,102,211
FORCE TRANSMITTING MEANS

Carlos Amortegui, 1116 Wilmington St., Opa Locka, Fla. 33054
Continuation-in-part of Ser. No. 632,475, Nov. 17, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,732
Int. Cl.² F16H *21/14*
U.S. Cl. 74—66 **1 Claim**

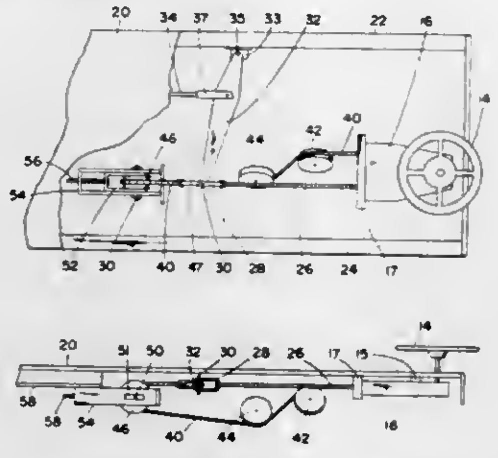


1. A force transfer device comprising:
a frame,
  a first and a second pair of bifurcated legs, each pair extending at an angle with respect to one another,
a drive shaft spanning said first pair of legs,
three eccentric wheels of common diameter equi-angularly fixed to said shaft and equi-spaced from one another on said shaft and keyed for rotation with said shaft,
a driven shaft spanning the second pair of legs and a plurality of wheels on said shaft of a diameter less than said eccentric wheels and spaced from one another defining a plurality of adjacent axially spaced annular slots therebetween,
pivot means spanning said second pair of legs above said driven shaft; and
lever means pivotally connected to said pivot means and comprising a plurality of levers, each lever including a first portion in one of the slots between said wheels of said driven shaft and each lever including a second portion extending into peripheral engagement with one of said eccentric wheels,
whereby when the eccentric wheels are rotated by operator means arranged to drive the drive shaft, the lever means exert a torque on the driven shaft.

4,102,212
RAILWAY FLAT CAR HAND BRAKE SYSTEM

Richard W. Hackbarth, Roseville, and Douglas A. Puariea, St. Paul, both of Minn., assignors to The Maxson Corporation, St. Paul, Minn.
Filed Dec. 6, 1976, Ser. No. 748,120
Int. Cl.² F16H *27/02*
U.S. Cl. 74—89.22 **7 Claims**

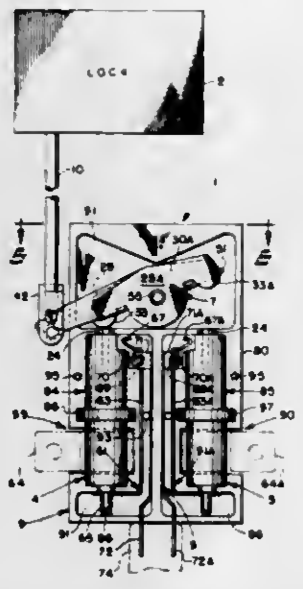
1. In a hand brake system for use with a railway flat car of the type in which the brakes are activated by suitable mechanical linkage connecting the brakes to a standard vertical wheel high powered hand brake of the non-reel type wherein a pulled chain from the vertical wheel hand brake is connected to the mechanical linkage and an idle chain drops loosely out of the brake housing, the improvement comprising the positioning of said vertical wheel hand brake horizontally below the flat car deck with the shaft for the hand wheel extending up through the deck; and with a movable member connected to operate the mechanical linkage;



a connection point between the pulled chain from the vertical wheel hand brake and said movable member; and
an idle chain take up and return means positioned to convey the idle chain from the vertical wheel hand brake to said movable member connection point employed by the pulled chain but from the side of the member opposite the pulled chain.

4,102,213
DOOR LOCK ACTUATOR UNIT

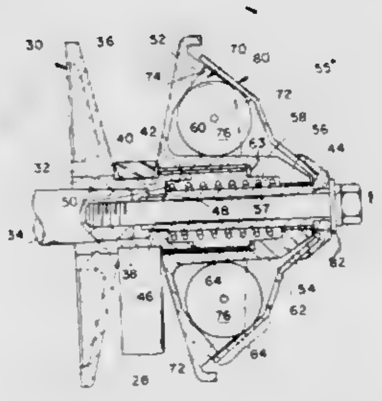
Lynn C. Smith, Willoughby Hills, Ohio, assignor to Design & Manufacturing Corporation, Willoughby, Ohio
Filed Oct. 15, 1976, Ser. No. 732,652
Int. Cl.² F16H *21/44*
U.S. Cl. 74—110 **10 Claims**



1. An actuator unit comprising two selectively energized spaced linear actuators each having an expansion stroke and a contraction stoke, said actuators being contracted when deenergized, a pivotally mounted lever assembly positioned adjacent said actuators to place the pivotal mount between the actuators and respectively to align each side of the lever assembly with the actuators for selective engagement thereby, output means connected to said lever assembly to be moved between at least two positions by the pivotal movement of the lever assembly, control means operative selectively to energize either of said actuators during the entire expansion stroke thereof during which the side of the lever assembly aligned therewith is engaged pivotally to move the assembly to change the position of the output means and then to deenergize the same for its contraction stroke to complete its cycle in its normally contracted condition, the lever assembly including a lost motion means to permit an energized actuator normally to complete its expansion and contraction cycle even if the output means is being held to preclude movement to the position that would normally result from energization of said actuator.

4,102,214
VARIABLE-SPEED PULLEY AND CLUTCH

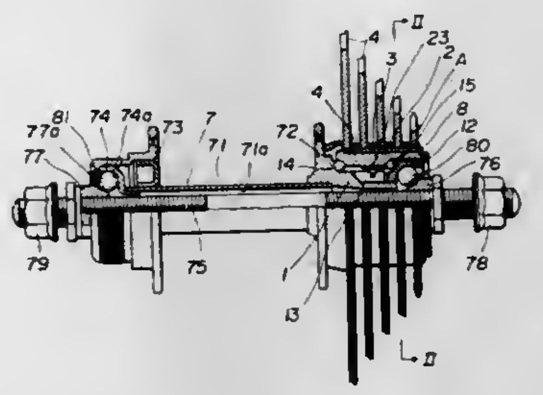
Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.
Filed Nov. 18, 1976, Ser. No. 742,834
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 E **19 Claims**



1. A variable-speed pulley, comprising a fixed pulley flange and a movable pulley flange movable toward and away from the fixed pulley flange to vary the width of the belt-receiving groove,
  said fixed flange being carried by a pulley hub extending across the pulley groove, having a cylindrical primary bearing of substantial length at the opposite side of the groove, and having an end thrust face at the end of said bearing,
  a hub extension fixed to said hub, extending beyond said thrust face and providing an extended bearing surface of smaller diameter than said primary bearing surface,
  the movable flange being carried by a sleeve hub having a cylindrical inboard bearing surface engaged with said primary bearing and movable axially and rotationally thereof, said inboard bearing surface being of sufficient length to support the sleeve hub on said primary bearing throughout the opening and closing movement of the movable flange,
  a thrust face on the sleeve hub radially inward of said inboard bearing surface and positioned to engage the end thrust face of said pulley hub so as to limit the closing movement of the pulley flanges,
  an outboard bearing on said sleeve hub, axially beyond and radially inward of said thrust faces, engaged with the extended bearing surfaces of the hub extension, and movable along said extension so as to support said movable pulley flange throughout its movement,
  a reaction member fixed at the end of said hub extension,
  centrifugal weights acting between the movable pulley flange and said reaction member and operative to move the movable flange in pulley-closing direction in response to centrifugal force generated by rotation of the pulley,
  said structure being adapted to receive one or more spacers between said thrust faces on the pulley hub and sleeve hub and thereby vary the closed width between the ulley flanges.

4,102,215
MULTI-SPEED FREEWHEEL FOR A BICYCLE

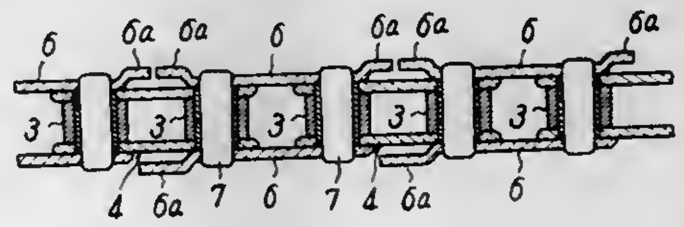
Masashi Nagano, and Koya Sonol, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan
Filed May 11, 1977, Ser. No. 795,886
Claims priority, application Japan, May 19, 1976, 51-64690[U]; May 19, 1976, 51-64691[U]
Int. Cl.² F16H *55/30, 9/00, 11/08*
U.S. Cl. 74—243 DR **15 Claims**



1. A multi-speed freewheel mounted to a hub of a bicycle, said multi-speed freewheel comprising,
  a. a cylindrical inner member fixed to said hub,
  b. a cylindrical outer assembly having inner and outer peripheries, said assembly being mountable onto an outer periphery of said inner member so as to be rotatably supported with respect to said inner member,
said outer assembly having on its outer periphery spaced configurations directed axially of said outer assembly,
  c. a unidirectional transmission provided between the outer periphery of said inner member and the inner periphery of said outer assembly,
said transmission serving to transmit unidirectional rotation from said outer assembly to said inner member,
  d. a sprocket-block having an inner periphery mountably engageable with the outer periphery of said outer assembly,
said sprocket-block comprising a plurality of sprockets each having a center hole of a diameter larger than that of the outer periphery of said outer assembly, said sprockets being aligned at regularly spaced intervals longitudinally of said outer assembly, the surface of each sprocket defining said hole having spaced configurations thereon engageable with the configurations of said outer assembly, and
  e. means for fixing said sprocket-block to said outer assembly after said sprocket-block is mountably engaged thereon.

4,102,216
DRIVING CHAIN FOR BICYCLES

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Dec. 6, 1976, Ser. No. 748,144
Claims priority, application Japan, Dec. 29, 1975, 51-180311[U]
Int. Cl.² F16G *13/02*
U.S. Cl. 74—245 R **2 Claims**



1. A driving chain for a bicycle, which transmits a driving force by pedalling from front chain sprockets to rear chain

sprockets, comprising a plurality of inner link plates defining busb holes, a plurality of outer link plates defining pin boles and pins connecting the outer and inner link plates lengthwise through said holes, said pins projecting at axially both ends thereof outwardly from the outer surface of the outer link plates, said outer link plates being expanded outwardly at the intermediate portions between a pair of pins at both ends lengthwise of said outer link plates to the extent that said pins project from the outer surface of said outer link plates, so that the expanded portions are contactable with the teeth of an adjacent sprocket and said outer link plates in relation of being opposite to each other are enlarged at the inner distance therebetween.

4,102,217
SUPPORT ASSEMBLY OF A COLLAPSIBLE STEERING COLUMN

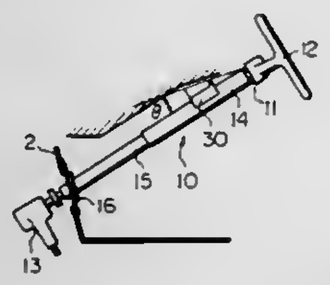
Yoshimi Yamamoto, Shizuoka; Kazuo Ikawa, and Naoki Ogawa, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd. and Fuji Kiko Company, Ltd., both of, Japan

Filed Jan. 11, 1977, Ser. No. 758,405

Claims priority, application Japan, Jan. 13, 1976, 51-1792[U]

Int. Cl.² B62D *1/16*

U.S. Cl. 74—492 **3 Claims**



1. In an automotive collapsible steering column assembly with a telescopically movable portion, the combination comprising,

a clamp attachment fixed to the telescopically movable portion of the steering column and having a top panel extending in the longitudinal direction of the steering column, said top panel including one longitudinal end formed with an upwardly directed, hook-shaped extension and an opposite longitudinal end,

a clamp plate secured to a part of the vehicle body and being laid upon said top panel in slidable engagement therewith, said clamp plate having one longitudinal end formed with a downwardly directed, hook-shaped extension engageable with the opposite end of said top panel and an opposite longitudinal end, said clamp plate having means for preventing lateral displacement of the clamp plate with respect to the clamp attachment,

means for combining said clamp plate and said top panel of the clamp attachment together, said means being breakable under a predetermined impact force applied thereto to permit said clamp attachment to slide off said clamp plate.

4,102,218
FASTENING DEVICE FOR TILTABLE STEERING MECHANISMS

Mitsuru Naka, and Masao Sakamoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 3, 1977, Ser. No. 803,270

Claims priority, application Japan, Dec. 24, 1976, 51-174866[U]

Int. Cl.² B62D *1/18;* G05G *5/18*

U.S. Cl. 74—493 **10 Claims**

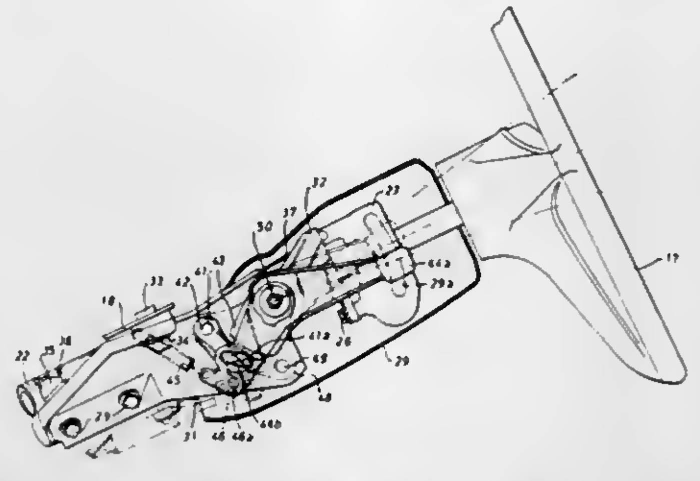
1. In an automotive vehicle, a fastening device for a tiltable steering mechanism including a steering shaft tiltably connected to steering gear means, a tubular housing having said steering shaft journalled therein, and a steering wheel mounted on said steering shaft, comprising:

a stationary bracket mounted on a portion of the vehicle body structure and having a pair of opposing arms;

a movable bracket secured to said tubular housing and having a pair of opposing arms coupled and pivoted to the pair of arms of said stationary bracket for permitting angular adjustment of said steering shaft and said steering wheel;

a toothed portion united with one of the arms of said movable bracket;

a latch member pivoted to a portion of said stationary bracket and movable between a locked position in which said latch member engages said toothed portion to lock said steering wheel in a desired angular position and an unlocked position in which said latch member disengages from said toothed portion to permit free movement for angular adjustment of said steering wheel;



a manual lever pivoted to said stationary bracket coaxially with said movable bracket to be moved perpendicularly with respect to the pivot axis and being operatively connected with said latch member to move said latch member toward the unlocked position;

an engaging element provided on said manual lever and engageable with the bottom face of said latch member to hold said latch member in the locked position when said manual lever is released; and

resilient means for biasing said manual lever to maintain the engagement of said latch member against said toothed portion of said movable bracket;

whereby when said manual lever is operated against biasing of said resilient means, said engaging element is separated from said latch member to permit movement of said latch member from the locked position to the unlocked position.

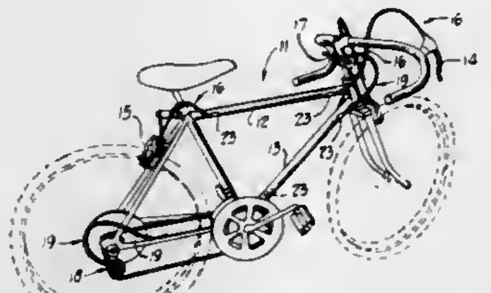
4,102,219
FAIR-LEADS FOR A CONTROL WIRE

Gerhard R. Plamper, Valley City, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Aug. 19, 1977, Ser. No. 826,023

Int. Cl.² F16C *1/10*

U.S. Cl. 74—502 **6 Claims**



4. In a vehicle such as a bicycle or the like having an elongated tube as part of its structure and having a Bowden type control wire under tension operable by the operator for controlling a function of the vehicle, the said tube having a pair of openings in the side wall thereof at spaced locations along the tube, the combination of a pair of fair-leads mounted in said openings, respectively, for guidance of the control wire to within the tube at one of said openings and outwardly from the tube at the other of said openings, said fair-leads having bores extending therethrough for accommodating said control wire, the bore in said each of said fair-leads being at an acute angle to the axis of the tube and being inclined toward the other of said fair-leads whereby the control wire extends through the fair-leads at such acute angles and the wire under tension urges the fair-leads in said openings toward each other, each said fair-lead interiorly of the tube at the end of the fair-lead directed toward the other fair-lead in the other opening having a shoulder overlapping the inner side wall of the tube at such end to resist movement of the fair-lead outwardly of the tube in a direction radially outward of the tube, the wire under tension exerting such a component of force on the fair-lead as to urge the fair-lead radially inwardly of the tube and to press against the outer side wall of the tube, the fair-lead at the other end directed away from the other opening.

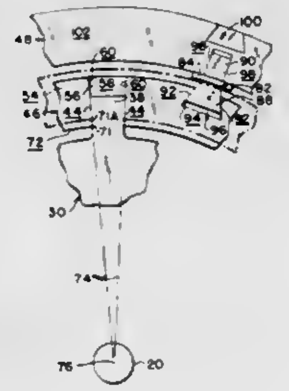
4,102,220
MULTI-RING INERTIAL ENERGY STORAGE WHEEL HAVING TAPERED RING MOUNTING MEMBERS

William M. Brobeck, Orinda, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 1, 1976, Ser. No. 701,825

Int. Cl.² F16C *15/00*

U.S. Cl. 74—572 **21 Claims**



1. In an inertial energy storage wheel having at least one rotor, the rotor including an axially oriented end face and a plurality of radially oriented grooves in the end face, a plurality of radially oriented connecting members having a shape complementary to a shape of the grooves and disposed therein, the connecting members protruding in a radial direction past the grooves, and mounting means radially spaced from the rotor and attached to the connecting members for the transmission of rotational forces between the rotor and such means, the improvement to the rotor and the connecting member comprising: a connecting member having diverging sides extensions of which generally intersect at an axis of the rotor, and a groove in the rotor having side walls which diverge in accordance with the sides of the connecting member to form a snug fit between the sides and the side walls when the rotor is at rest, the divergency of the sides and of the side walls having a magnitude and an orientation such that upon dilation of the rotor during its rotation, the rotor and the connecting members are permitted to move with respect to each other in a radial direction while the sides and the side walls of the connecting members and the grooves, respectively, remain in mutual contact and engagement and maintain their snug fit.

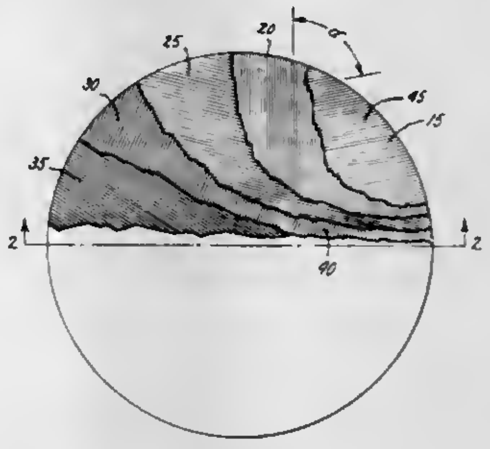
4,102,221
CROSS-PLY COMPOSITE FLYWHEEL

Burton D. Hatch, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,896

Int. Cl.² F16F *15/30*

U.S. Cl. 74—572 **14 Claims**



1. A flywheel comprising a plurality of fiber layers, the fibers of each layer being parallel to each other and extending in radial and chordal directions, said layers being embedded in a monolithic matrix of binder material, the fibers of each successive layer being oriented at a single predetermined angle to those of the preceding adjacent layer such that at least four layers of fibers are disposed between any two layers in which the fibers of said two layers extend substantially parallel to each other, said predetermined angle having a value between approximately 70° and approximately 110°.

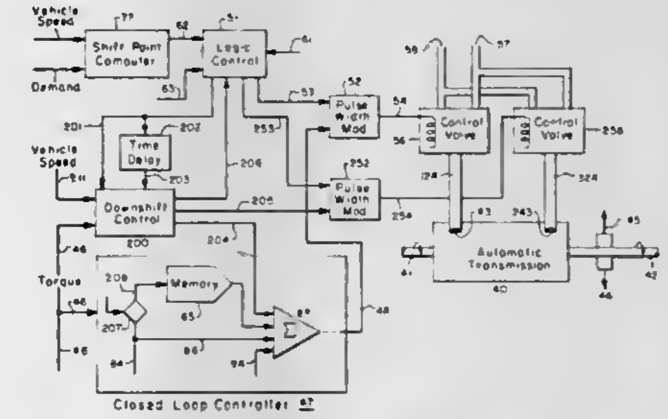
4,102,222
TRANSMISSION CONTROL SYSTEM

Alan Leonard Miller, Mount Prospect, and Werner Paul Petzold, Harwood Heights, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 3, 1977, Ser. No. 756,470

Int. Cl.² B60K *41/10*

U.S. Cl. 74—866 **15 Claims**



1. An electronic control system for regulating change of gear ratio in a vehicle having an engine and an automatic transmission with input and output mechanical driving connections, which transmission also has first and second controllable friction elements, one of which elements is released and the other of which is engaged during a gear ratio change, which system comprises:

a transducer, positioned to sense the output torque To at the transmission output driving connections and to provide a first electrical signal which varies as a function of the output torque;

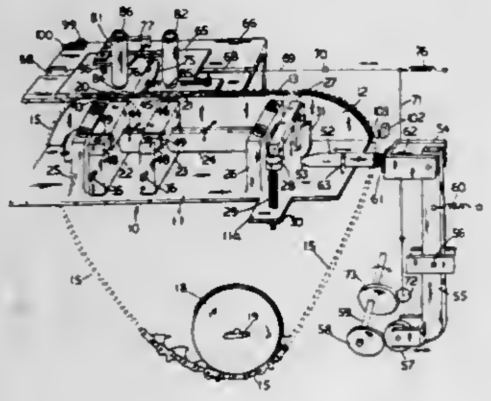
means for providing a vehicle speed signal, and for operating on the vehicle speed signal to produce a second electrical signal which is also a function of the transmission gear ratios and the engine inertia;

additional means connected to modify the second electrical signal in accordance with a predetermined time Δt over which the engine speed is to be changed from a first value to a second value, thus providing a calculated engine acceleration torque signal; and

means, including an output summation stage, connected to receive a third signal which is the integrated difference between the initial torque signal To and the calculated engine acceleration torque signal, and also to receive the second signal, to provide an output signal at the appropriate time to control the on-coming one of the controllable elements in the transmission.

4,102,223
AUTOMATIC SHARPENING MACHINE FOR SAW CHAINS

Geoffrey H. Robinson, and Ronald F. Robinson, both of 2598 Weston Rd., Weston, Ontario, Canada (M9N 2A8)
Filed Oct. 7, 1976, Ser. No. 730,336
Int. Cl.² B23D *63/16*
U.S. Cl. 76—25 A **16 Claims**



1. In a machine for automatically sharpening cutter elements of a saw chain, an apparatus for mounting said saw chain comprising a support means having an elongated groove therein operative for receiving said saw chain to be slidably mounted thereon, holder finger means for engaging mounting rivets of a selected cutter element in said saw chain, said holder finger means being carried by at least one rectangular block body which is adjustably mounted on a rotatable keyed shaft disposed adjacent said support means and extending in the direction of elongation of said groove bias means connected to said shaft for operatively providing a rotating force to said shaft to cause said holder finger means to abut pressingly said rivets of said selected cutter element, and a back plate mounted on said support means cooperative with said holder finger means to clamp said selected cutter element firmly on said support means while said selected cutter element is being sharpened by a grinding disc.

4,102,224
GRINDING MACHINE WITH MEANS FOR ADVANCING A SAW

James L. Wright, 81085 N. Beech Rd., Creswell, Oreg. 97426
Filed Apr. 6, 1977, Ser. No. 785,194
Int. Cl.² B23D *47/04*
U.S. Cl. 76—79 **7 Claims**

1. In a grinding machine for grinding the teeth in a circular saw, a frame,

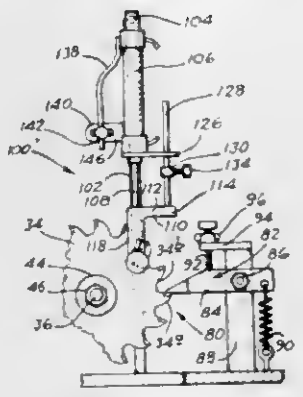
holding means mounted on said frame for holding the saw at the eye region thereof with the saw rotatable about its axis,

an indexing device mounted on said frame spaced radially from the axis of a saw so held adapted to have a tooth of the saw rest thereagainst thus to position the saw tooth for grinding,

first clamp mechanism mounted on said frame for clamping a saw held by said holding means, and

saw-advancing means for rotating in increments a saw held by said holding means thus to place successive teeth in a position resting against said indexing means,

said saw advancing means comprising a second clamp mechanism spaced from the first clamp mechanism for clamping onto opposite bases of the saw at a location spaced radially from the axis of the saw,



said second clamp mechanism on being clamped onto a saw and on rotation of the saw riding with the saw in an arcuate path spaced radially from said axis of the saw

and power-operated means operatively interposed between said frame and said second clamp mechanism for imparting movement to said clamp mechanism in said arcuate path and with such movement rotational movement to the saw.

4,102,225
LOW CHROMIUM OXIDATION RESISTANT AUSTENITIC STAINLESS STEEL

Harold Thomas Michels, Manhasset, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.
Filed Nov. 17, 1976, Ser. No. 742,429
Int. Cl.² C22C *38/02, 38/06*
U.S. Cl. 75—124 **9 Claims**

1. An austenitic nickel-chromium stainless steel alloy consisting essentially of 10% to 15% chromium, about 10% to about 18% nickel, 0.5% to 4.5% silicon and 0.5% to 4.5% aluminum in amounts providing a total silicon-plus-aluminum content of 2% to 7% and correlated with the chromium content to provide that

$$\%\,\mathrm{Cr}+2(\%\,\mathrm{Si}+\%\,\mathrm{Al}) = 19 \text{ to } 24,$$

0.02% to 0.15% carbon, up to 0.7% titanium, up to 2% manganese, up to 0.05% magnesium and balance essentially iron in an amount at least 60% of the alloy.

4,102,226
JAR OPENING APPARATUS

John McGuire, 198-40 32nd Ave., Bayside, N.Y. 11360
Filed May 2, 1977, Ser. No. 792,718
Int. Cl.² B67B *7/36*
U.S. Cl. 81—3.33 **4 Claims**

1. An apparatus for opening a cover of a container comprising:

(a) a base;

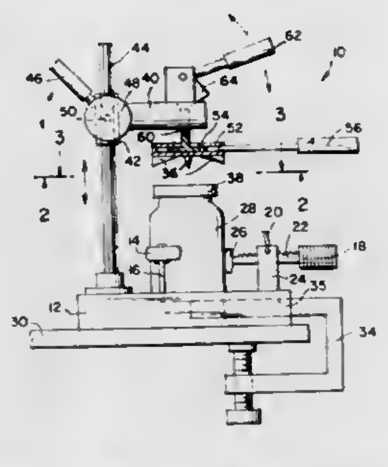
(b) means on said base for securing a container in a stationary position;

(c) arm means adjustably secured to said base;

(d) positioning means on said base for releasably securing said arm means in a variety of vertical positions above said base;

(e) gripping means movably secured to said arm to contact said cover;

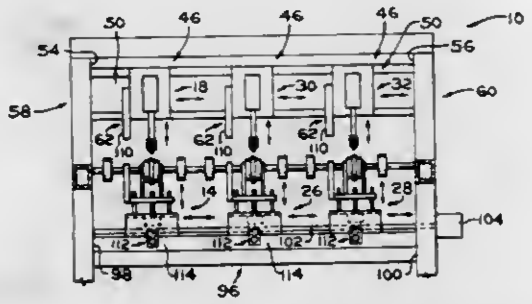
(f) said gripping means comprising a plate and means on said arm means for adjusting the position of said plate relative to said arm means; a disc shaped sleeve member slidably and rotatably secured to said plate by means of an enlarged slot encompassing a said plate and;



(g) gripping surfaces on said sleeve member for gripping said cover.

4,102,227
METHOD OF AND APPARATUS FOR ALIGNING A SCORING WHEEL WITH A SUPPORT WHEEL

Gabriel Simko, Springdale Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed May 3, 1976, Ser. No. 682,425
Int. Cl.² B26D *3/08*
U.S. Cl. 83—7 **20 Claims**



1. A method of positioning in predetermined spaced relationship respective ones of a first set of a plurality of discrete objects mounted for movement along a first predetermined path with respective ones of a second set of a plurality of discrete objects mounted along a second predetermined path, wherein the first and second predetermined paths are in spaced relationship to one another, comprising the steps of:

mounting the objects of the second set in a predetermined spaced relationship with one another along the second predetermined path;

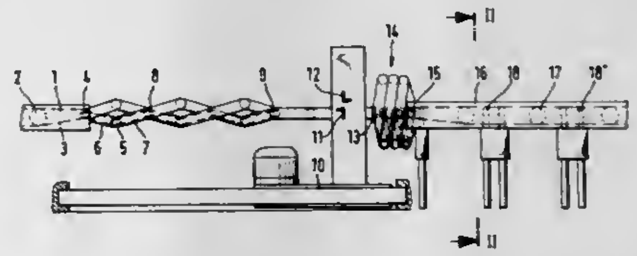
applying a common force to each of the objects of the first set to simultaneously urge the objects of the first set along the first predetermined path in a direction to position a selected one of the objects of the first set in predetermined spaced relationship with its respective one of the objects of the second set; while

preventing movement of the remaining ones of the objects of the first set as the common force moves the selected object of the first set towards its respective one of the objects of the second set to position same in a predetermined spaced relationship to one another; and

repeating said applying and preventing steps on the remaining objects of the first set to position the remaining objects of the first set in a predetermined spaced relationship with their respective objects of the second set.

4,102,228
CUTTING APPARATUS

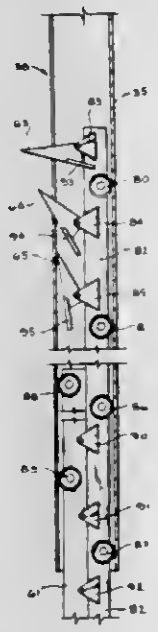
Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, Wuppertal-Barmen; Wolfgang Hellkotter, Dortmund; Albert Einhaus, Hagen, and Karl Robert Buschmann, Gevelsberg, all of Fed. Rep. of Germany, assignors to Carl Ullrich Peddinghaus, Fed. Rep. of Germany
Filed Feb. 7, 1977, Ser. No. 766,199
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604823
Int. Cl.² B26D *7/06*
U.S. Cl. 83—156 **8 Claims**



1. Cutting apparatus for steel rod comprising a feed track for conveying rods to be cut, said feed track having an output end, a discharge track aligned with said feed track and for receiving rods from the feed track, said discharge track having an input end spaced from said output end of said feed track, a series of selectively raisable and lowerable stops associated with said discharge track for positioning the leading end of a rod to be cut by raising of a selected one of said stops, a movable shear unit located between said output end of said feed track and said input end of said discharge track, means for adjusting the position of said shear unit relative to said output and input ends respectively to alter the position of operation of said unit and an intermediate track section between the shear unit and the input end of the discharge track said intermediate section being adjustable in length to accommodate changes in position of the shear unit.

4,102,229
SAWMILL LOG TURNING APPARATUS

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979
Division of Ser. No. 470,338, May 16, 1974. This application Dec. 1, 1976, Ser. No. 746,519
Int. Cl.² B27B *31/04*
U.S. Cl. 83—712 **3 Claims**



1. As a subcombination,

- an elongate support member having a generally flat edge surface adjacent each end,
- a first pair of bracket members fixed to one end of said support member and extending laterally therefrom across the flat edge surface adjacent said one end thereof,
- a second pair of bracket members fixed to the other end of said support member and also extending laterally therefrom across the flat edge surface adjacent said other end thereof, and
- a generally triangular weighted engaging member pivotally interconnected between one of said pair of bracket members with one side thereof abuttable with the corresponding one of said flat edge surfaces of said support member for limiting rotation of said engaging member between said one pair of brackets.

4,102,230
SOUND-DEADENING DEVICE FOR ROTARY SAW BLADES

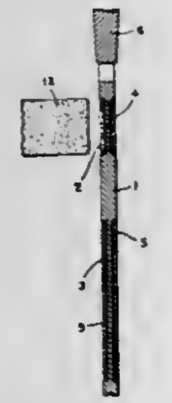
Erik Börje Magnusson, and Erik Inge Bertil Karlsson, both of Hallsberg, Sweden, assignors to Imk Industriservice AB, Hallsberg, Sweden

Filed Oct. 12, 1976, Ser. No. 731,779

Claims priority, application Sweden, Oct. 16, 1975, 7511590

Int. Cl.² B27B ***33/08***

U.S. Cl. 83—835 **2 Claims**



1. In a rotary saw blade having a cutting periphery and having a center hole for mounting on a drive shaft, said rotary saw blade having a first side surface and a second side surface defining therebetween the cutting periphery, wherein the improvement comprises: at least one annular recess formed on each of said first and second side surfaces, each of said recesses being filled with a first layer of a melted binding metal in order to increase adhesion and a second layer of one of a melted metal and a melted alloy, said second layer being situated outside of said first layer so that said second layer is flush with the outside portion of the respective side surface, wherein a sound-deadening effect is achieved in the rotary saw blade when it is in use.

4,102,231
CIRCULAR SAW BLADES

Leopold Jägers, Rudolf-Diesel-Strasse 1, D-5350 Euskirchen, Germany

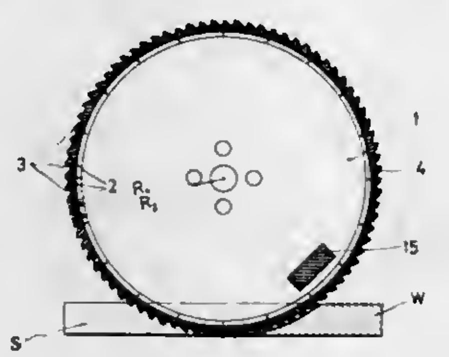
Filed Feb. 17, 1977, Ser. No. 769,713

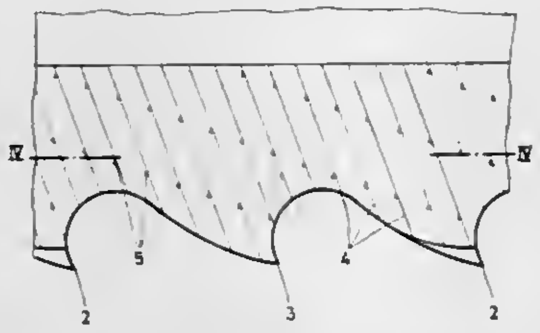
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606598

Int. Cl.² B23D ***61/02***

U.S. Cl. 83—854 **6 Claims**

1. A circular saw blade for sawing cold steel and the like, comprising a main blade portion (1, 8) with a number of leader teeth (2) and follower teeth (3) alternating on its periphery, wherein in the region of each of said teeth said blade portion is provided on both lateral surfaces with at least two lateral cutting edges (4), said cutting edges extending from said teeth radially inwards.





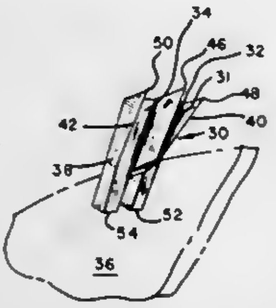
4,102,232
SAW TOOTH INSERT

Kenneth M. Cage, Marysville, and C. Warren Turner, Redmond, both of Wash., assignors to Black Clawson Inc., Everett, Wash.

Filed Mar. 2, 1977, Ser. No. 773,751

Int. Cl.² B27B ***33/02, 33/08***

U.S. Cl. 83—854 **11 Claims**



1. A saw tooth insert secured to a saw plate having an uninterrupted outer edge portion defining a surface of revolution for cutting wood or the like, said saw tooth insert having a front cutting face containing two adjacent grooves extending along the cutting face substantially radially outward from the rotational axis of said saw plate, with lower portions of said grooves ending on opposite sides of said saw plate, and upper portions of said grooves forming a central cutting edge between them such that a chip of material being sawed will be split in two with a portion being directed by each said groove along each side of said saw plate toward said axis, said insert further having a U-shaped opening formed in the lower central portion of the insert forming lower leg portions on said insert of equal width such that they can be disposed on opposite sides of said saw plate for securing said insert thereto and forming a saddle-shaped portion configured to mate with the outer peripheral edge portion of said saw plate.

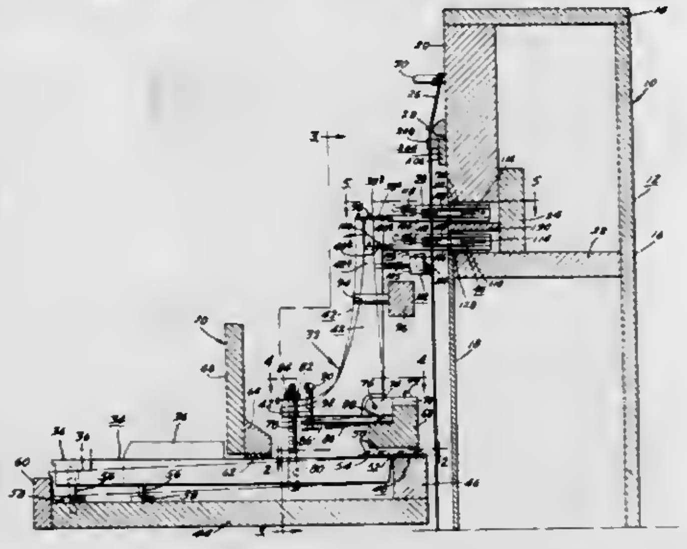
4,102,233
UPRIGHT HARPSICHORD ACTION

Evan J. Kern, 434 W. Main St., Kotztown, Pa. 19530

Filed Jul. 7, 1977, Ser. No. 813,439

Int. Cl.² G10C ***1/06***

U.S. Cl. 84—258 **18 Claims**



1. A harpsichord action comprising a frame assembly, a string supported vertically in tension by said frame assembly, a key disposed substantially horizontally and hingedly attached at its rear end to said frame assembly at a point in front of said string, a jack lever disposed above said key in vertical alignment therewith and pivotally attached to said frame assembly, said string being disposed in substantial alignment with said key and jack lever and extending from a point above and behind said jack lever and key to a point therebelow, a jack connected to said jack lever, a jack guide behind said string adapted to support said jack for sliding movement toward and away from said string, said jack having a plectrum adapted to engage and pluck said string, the depression of said key producing a rotation of said jack lever and a movement of said jack and plectrum toward said string to produce a plucking of said string.

7. An upright harpsichord comprising a frame assembly, a keyboard comprising a plurality of keys each hingedly mounted at the inner end thereof to said frame assembly, a plurality of jack levers pivotally attached to said frame assembly, each said jack lever being disposed above an underlying key in vertical planar alignment therewith, means connecting each said key to the corresponding aligned jack lever whereby depression of each said key produces rotary movement of the corresponding jack lever, said frame assembly including string support means for supporting a substantially vertical array of parallel strings in tension, said strings each extending from a point above and behind said jack levers and keys to a point therebelow, at least one string being disposed in substantial alignment with each said key and jack lever, a jack guide extending horizontally behind said array of strings, each said jack lever having a jack connected thereto and supported by said jack guide for sliding movement toward and away from the string aligned therewith, each said jack including a plectrum adapted to engage and pluck said aligned string, the selective depression of the keys producing a rotation of the corresponding jack levers and a sliding movement of the jacks connected thereto to provide a selective plucking of the strings.

4,102,234
PICK HARNESS

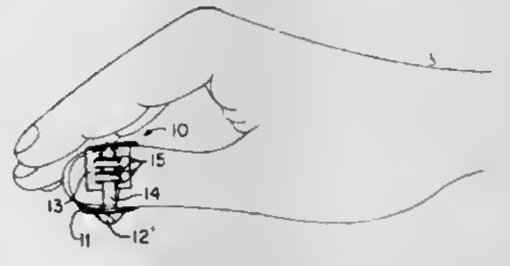
Walter G. Brundage, 27 Haberem Ave., Unionville, Conn. 06085

Filed Mar. 30, 1977, Ser. No. 783,076

Int. Cl.² G10D ***3/16***

U.S. Cl. 84—322 **5 Claims**

1. In combination with a conventional guitar pick having flat sides and a generally triangular configuration, a harness for securing the pick in normal playing position on the thumb of a player, said harness comprising a thin strap of flexible resilient material having a flat central portion overlying a flat side of the pick and provided with triangularly related slits receiving and securing the apices of the pick and having strap ends extending from opposite edges of the central portion with one of the strap ends extending generally perpendicularly to one of the slits, and means for adjustably securing the strap ends together about the thumb of a player with the flat central portion of the strap holding a flat side of the pick against the underside of a player's thumb with an apex of the pick projecting through said one of the slits tangentially to the underside of the player's thumb.



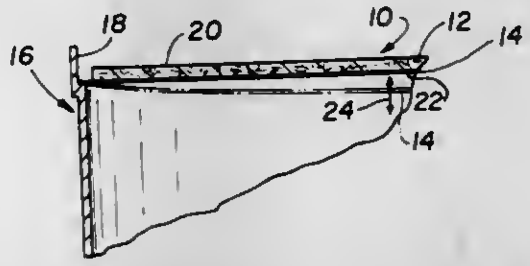
4,102,235
DRUM PRACTICE PAD

Laurence G. Le Masters, 12 Monmouth Pl., Huntington Station, N.Y. 11746

Filed Aug. 19, 1976, Ser. No. 716,014

Int. Cl.² G10D ***13/02***

U.S. Cl. 84—411 R **2 Claims**



1. In combination a drum and a drum practice pad of the type fabricated of a construction material having sound-muffling characteristics and used in a directly supported position on the playing head of said drum, said pad comprising a flexible, oil-tanned leather in a flat disc-like shape sized to cover said supporting drum playing head, to thereby contribute by its weight both to a reduction in the vibratory motion of the drum playing head and to minimize any shifting movements of said pad relative to said drum playing head.

4,102,236
MOLDED CURVED DRUMS AND MOLDS THEREFOR

Roger W. North, 1332 SE. 16th, Portland, Oreg. 97214

Filed Oct. 18, 1976, Ser. No. 733,271

Int. Cl.² G10D ***13/02***

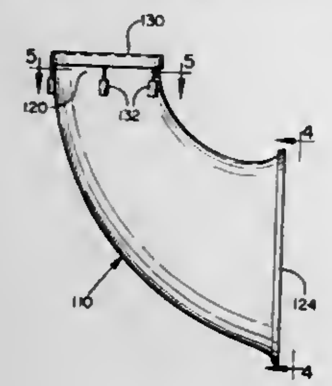
U.S. Cl. 84—411 R **5 Claims**

1. A molded drum shell curved through a substantial angle in the order of 90° and having a head end and a trumpet end,

the end being circular in transverse cross-section and having

a predetermined diameter,

the trumpet end having a minimum transverse dimension substantially larger than said predetermined diameter,



the shell tapering from circular at the head end to generally elliptical proceeding from the head end toward the trumpet end.

4,102,237

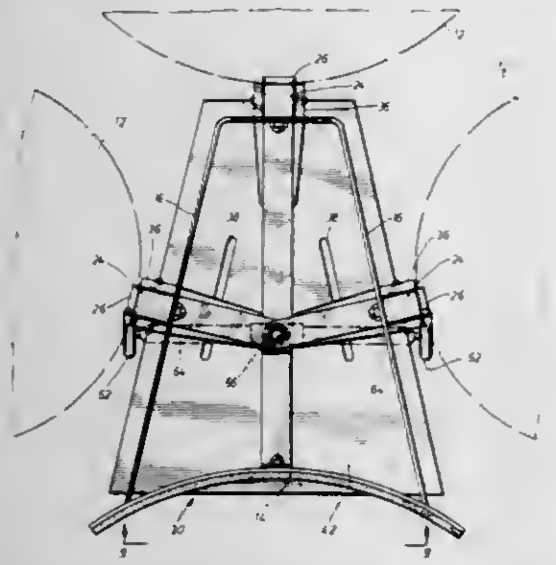
STAND FOR AN ASSEMBLY OF MUSICAL DRUMS

Richard R. Suess, 7245 Fairbanks-N. Houston Rd., Houston, Tex. 77040, and Frank A. Suess, San Antonio, Tex., assignors to Richard R. Suess, Houston, Tex.

Filed Mar. 3, 1977, Ser. No. 773,903

Int. Cl.² G10D *13/02*

U.S. Cl. 84—421 **10 Claims**



1. A stand for supporting an assembly of musical drums, said assembly adapted to be carried by a marching bandsman and including a plurality of percussive drums and a carrier commonly supporting the drums around a perimeter thereof, the carrier having a plurality of connectors extending outwardly for securing each of the drums, the stand comprising:

- a basin defining structure for receiving said carrier, said basin defining structure including a base plate and a plurality of upstanding members which define a plurality of basin slots for receiving respective ones of said connectors, said upstanding members being movably securable to the base plate for accommodating carriers of different sizes and configurating; and
- a base coupled to and vertically supporting the basin defining structure.

4,102,238

ANCHORING ASSEMBLY FASTENABLE BY AN EXPLOSIVE POWDER DRIVEN SETTING TOOL

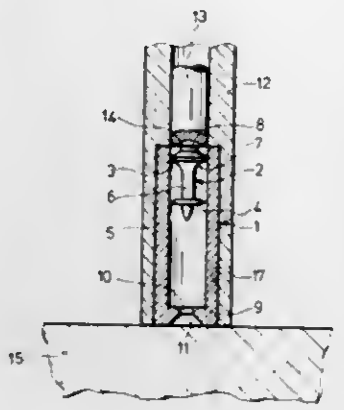
Elmar Thurner, Altenstadt, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 21, 1977, Ser. No. 789,524

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617509

Int. Cl.² B23P *19/00;* F16B *15/00*

U.S. Cl. 85—10 E **11 Claims**



1. Anchoring assembly, in particular for use in a composite concrete and structural steel beam, comprising an axially extending cylindrical container-shaped member having a closed end and an open end spaced apart in the axial direction thereof and an axially elongated bore extending between the ends, a fastening stud positioned within the bore in said member and being partially displaceable therefrom by means of an explosive powder actuated fastening element setting tool applied to the open end of said member, said fastening stud comprising an axially elongated shank having a first end closer to the closed end of the bore and a second end closer to the open end of the bore and a head located at the second end of said shank and extending transversely outwardly therefrom, the closed end of said member having an opening therethrough spaced radially inwardly from the surface of the bore so that at least an axially extending portion of said shank of said fastening stud can be driven therethrough into a receiving material, wherein the improvement comprises that said fastening stud has an axial length considerably less than the axial length of the bore in the sleeve and is positioned in said bore with the first end of said shank spaced axially in the direction of said open end from the closed end thereof for being displaced toward the closed end by the setting tool.

4,102,239

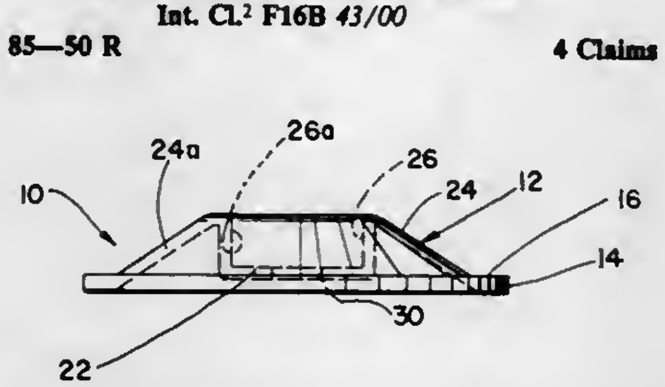
WASHER

Charles M. Dallas, 1269 N. Pierce Ave., North Bellmore, N.Y. 11710

Filed Feb. 17, 1977, Ser. No. 769,446

Int. Cl.² F16B *43/00*

U.S. Cl. 85—50 R **4 Claims**



1. A washer assembly, comprising a first outer portion in the form of a hollow truncated right angle cone, the apex of said cone defining a first aperture, the widest end of said cone fixedly secured to a first flat disc shaped member having a first central opening, said widest end located at the marginal edges defining said first central opening, a second element adapted to be seated in said cone and including a second flat disc shaped member having a second central opening therein, said first aperture residing in a plane parallel to said first disc shaped member, a cylindrically shaped tubular member having one end thereof fixedly secured to the marginal edges of said cone defining said aperture, the other end of said tubular member fixedly secured to the outermost marginal edges of said second flat disc shaped member, said second flat disc shaped member being disposed intermediate said apex end and said widest end of said cone.

4,102,240

BLASTING SLURRY PUMP TRUCK

Merrill A. Cook, and Robert B. Clay, both of 2026 Beneficial Life Tower, Salt Lake City, Utah 84111

Filed Jan. 3, 1977, Ser. No. 756,242

Int. Cl.² C06D *1/08*

U.S. Cl. 86—20 C **21 Claims**

1. A pump truck for handling aqueous slurry blasting agents which is provided with a compressed air drive for all liquids and which is free from augers, electrical drives, ingredient flow drive motors, and hydraulic drives.

4,102,241

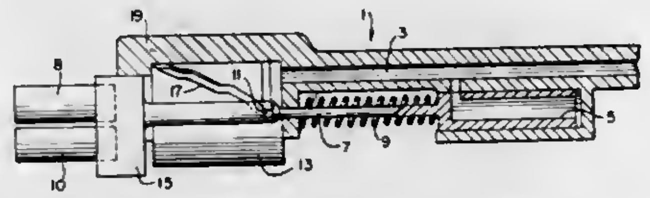
HIGH-RATE-OF-FIRE RIFLE MECHANISM OR DUAL CYCLIC RATE MECHANISM

Robert F. Magardo, Harford County, Md.; Leonard R. Ambrosini, Scott County, Iowa, and Raymond S. Isenson, Santa Barbara County, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part nf Ser. No. 423,043, Dec. 7, 1973, abandoned. This application Oct. 26, 1976, Ser. No. 735,238

Int. Cl.² F41D *9/06*

U.S. Cl. 89—155 **1 Claim**



1. A high-rate-of-fire rifle mechanism comprising:

- a single barrel;
- a gas chamber;
- a passageway between said gas chamber and said single barrel;
- an operating rod having one end in communication with said gas chamber and a rammer integrally formed at its other end;
- a return spring surrounding a portion of said operating rod;
- a rotary cylindrical drum having three chambers, each chamber holding one round of ammunition for serial indexing in a firing position along said single barrel;
- a trigger mechanism;
- a cam path formed on the surface of said rotary cylindrical drum, whereby movement of said operating rod and follower effect rotation of said cylindrical drum;
- a follower secured to said operating rod, said follower riding in said cam path;
- means to provide three rounds of ammunition at a time for loading a round into each of said three chambers;
- said cam path, said follower, said operating rod, said gas chamber, said cylindrical drum and said rammer effecting the firing of each of said three rounds in said three chambers in succession as a single burst, and loading of three new rounds in said three chambers while ejecting the said three fired rounds each time said trigger mechanism is activated, said operating rod making only one traverse rearward and back to its rest position each time three rounds of ammunition are fired and said follower making only one traverse of said cam path each time three rounds of ammunition are fired.

4,102,242

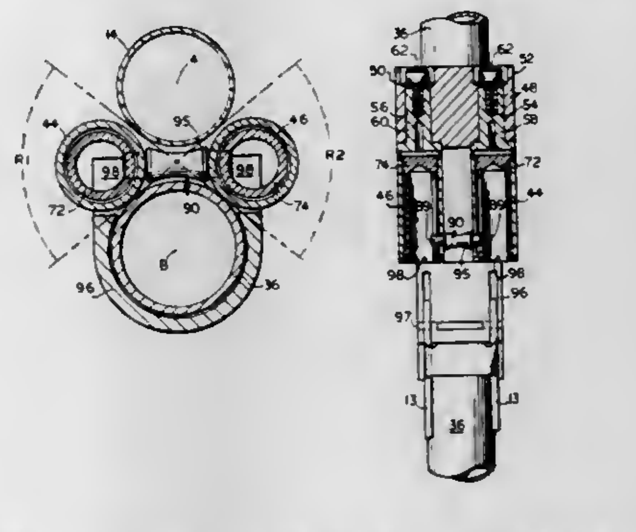
AUTOLOADING GAS-OPERATED FIREARM

Carl F. Liedke, North Haven, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.

Continuation-in-part of Ser. No. 601,627, Aug. 4, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,041

Int. Cl.² F41D *5/04*

U.S. Cl. 89—191 R **9 Claims**



5. A gas-power system for a gas-operated autoloading shotgun having a receiver, a barrel removably mounted on said receiver and a tubular magazine mounted on said receiver under, parallel to, and spaced from, said barrel, said gas-power system comprising

- a pair of gas cylinders symmetrically disposed relative to said barrel, each of said cylinders having a cylindrical extension of reduced diameter co-axial therewith,
- a bracket rigidly mounted on said barrel and having a pair of open bores disposed parallel to said barrel, for receiving and supporting said extensions on said cylinders,
- means for detachably securing said cylinder extensions in said bores,
- gas-port means in said extension, bracket and barrel interconnecting the interior of said barrel with the interior of each of said cylinders,
- a piston mounted for reciprocal movement within each of said cylinders, and
- means for limiting such reciprocal movement of each of said pistons within its cylinder.

4,102,243

GAS REGULATOR FOR GAS OPERATED FIREARMS

Fred LeRoy Jennie, Anaheim, Calif., assignor to Weatherby, Inc., South Gate, Calif.

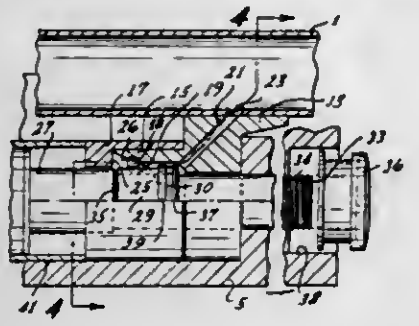
Continuation-in-part of Ser. No. 710,216, Jul. 30, 1976, abandoned. This application Sep. 27, 1976, Ser. No. 726,939

Int. Cl.² F41D *5/08*

U.S. Cl. 89—193 **1 Claim**

1. In a gas operated firearm having a gas operated piston for operating the action of the firearm, there being channel means for conveying gas from the barrel of the firearm to the piston means, the improvement comprising a metering device positioned for regulating a flow of gas through the channel means to the piston means, the metering device including cylinder means having an adjustable member positioned to restrict the flow of gasses between the metering device and the bore of the

cylinder means, the adjustable member being a metering plug positioned in the bore of the cylinder means, the said metering plug having an annular rib, and said metering plug being reversible within the bore of the cylinder means.



4,102,244

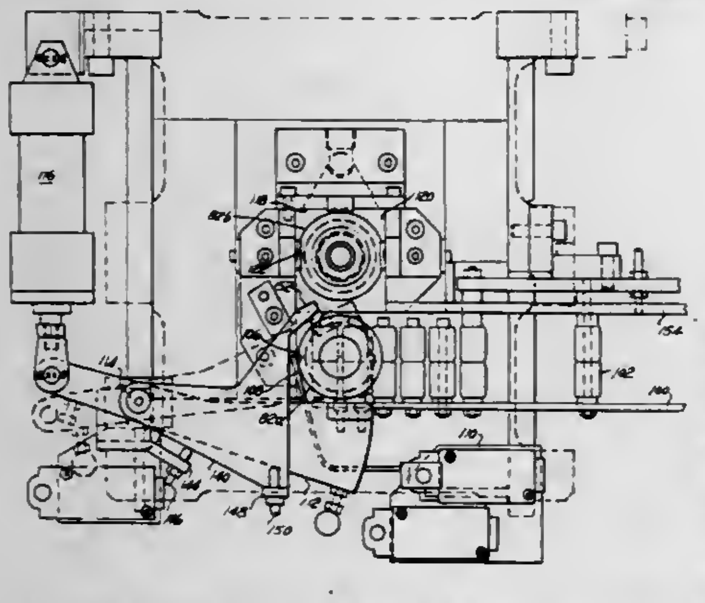
POT BROACH

Eugene J. Bistrick; Axel B. Abrahamsson, both of Warren; Andrew J. Szewczyk, Harper Woods; Frank A. McCabe, Detroit; Richard A. Schlaf, Sterling Heights, and Leonard A. Gabriele, Warren, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 734,301, Oct. 20, 1976, Pat. No. 4,065,222. This application Jan. 27, 1977, Ser. No. 810,307

Int. Cl.^{2} B23F *1/00, 9/04;* **B23D** *41/06*

U.S. Cl. 90—1 **10 Claims**



1. A vertical pull-up pot broaching machine, comprising a rigid frame, a generally tubular pot broach mounted in a fixed position on said frame, said pot broach comprising a longitudinally segmental rigid tubular support body, a first series of flat-sided, abutting, internally toothed cutting rings, each ring having a multiplicity of cutting teeth in a single circumferentially extending array, a second series of flat-sided, abutting, locating and support rings, said second series of rings having internally open, radially extending, circumferentially spaced slots, flat-sided elongated sticks received in said slots, said sticks having progressively stepped cutting teeth adapted to remove material from the bottoms of tooth spaces but by the cutting teeth of said first series of rings, a slide on said frame above said pot broach, a drawbar detachably connected to said slide to be pulled vertically upwardly thereby through said pot broach, a work supporting seat adjacent the lower end of said drawbar, a retriever mounted on said frame below said pot broach for vertical movement thereon, means for moving said slide and retriever independently, an automatic loader comprising a locator having a horizontal support surface having a portion shaped to receive the foremost of a series of work blanks and a locating portion having a central opening to receive said drawbar and having a plurality of vertically extending guides to engage the periphery of a work blank to locate it in vertical alignment with said pot broach and to guide it during initial vertical movement thereof, a first pusher movable laterally into engagement with the foremost of a series of work blanks movable toward said locator, said pusher having a portion shaped to retain the series of blanks against advance as the leading blank is moved laterally onto the locating portion of said support surface, an unloader above the upper end of said pot broach comprising resilient means to engage and retain a finished gear in position as said drawbar is moved downwardly by said retriever, and a second pusher movable laterally of the finished gear to move it away from said resilient means toward a discharge chute.

4,102,245

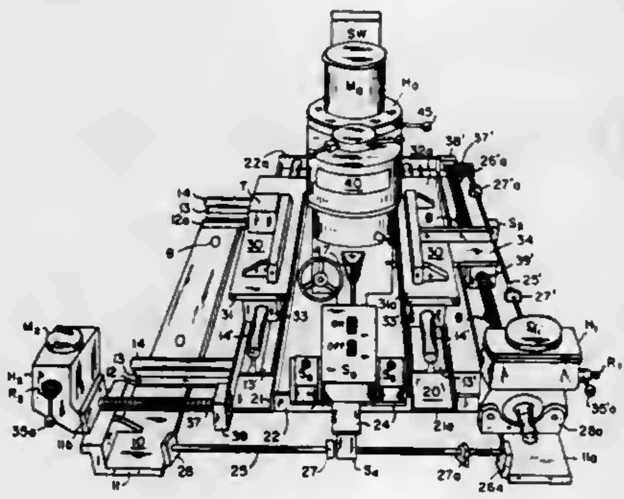
DOOR FRAME TRUING APPARATUS

James R. Cousins, Washington, Pa., assignor to Hallmor, Inc., Bethel Park, Pa.

Filed Apr. 28, 1976, Ser. No. 681,024

Int. Cl.^{2} B23C *1/20, 9/00*

U.S. Cl. 90—12 R **5 Claims**



1. In a portable machine for truing a continuous door sealing flange of a high temperature furnace or oven, a substantially rectangular base support frame having a pair of transversely spaced-apart substantially parallel longitudinal side members and a first pair of spaced-apart parallel rail members connected across said pair of side members and defining an open central portion therewith, means for removably securing said base support frame in position with respect to the flange being trued, a movable secondary frame having a pair of transversely spaced-apart substantially parallel longitudinal side members and a pair of spaced-apart parallel transverse end members connected across said pair of side members and defining an open central portion therewith, said secondary frame having rail-engaging means for moving it for back and forth movement along said first pair of rail members transversely across said base support frame, a second pair of spaced-apart parallel rail members mounted to extend longitudinally along said pair of longitudinal side members of said secondary frame, an overhead tertiary frame having a pair of transversely spaced-apart parallel longitudinally extending side members and having rail-engaging means for mounting said tertiary frame for back and forth movement along said second pair of rails with respect to said secondary frame in a substantially right angular direction with respect to movement of said secondary frame along said base support frame, said tertiary frame defining an open central portion, motor-driven milling means operatively carried by said tertiary frame and having a truing head extending therefrom through the open central portions of said tertiary and secondary and base support frames for engagement with and movement along the door sealing flange as effected by movements of said tertiary and secondary frames with respect to said base support frame and each other, first motor means mounted on one longitudinal side member of said base support frame, a first screw shaft at one end operatively connected to said first motor means and extending therefrom transversely of

said base support frame, a first screw block carried by one longitudinal side member of said secondary frame and receiving a forward end portion of said first screw shaft therein for moving said secondary frame transversely back and forth along said first pair of rails with respect to said base support frame, a second motor means mounted adjacent one end of and on the other longitudinal side member of said pair of said secondary frame, a second screw shaft at one end operatively connected to said second motor means and extending forwardly therefrom longitudinally of said secondary and tertiary frames, a second screw block carried by one longitudinal side member of said tertiary frame and receiving a forward end portion of said second screw shaft therein for moving said tertiary frame longitudinally back and forth with respect to said secondary frame, electrical control means for automatically progressively actuating said first and second motor means forwardly and then backwardly to, in sequence, forwardly advance said secondary and tertiary frames and to, in sequence, backwardly retract them to move said truing head in a full cycle continuous encircling path along the door sealing flange, said control means having switch means for automatically stopping movement of said secondary and tertiary frames on completion of the full cycle path of movement, and said control means having manual means for stopping the automatic progression of said frames at any selected position of their movements and for then thereat reinitiating their automatic progression to continue the truing operation.

4,102,246

HAND-OPERATED PROFILING MACHINE

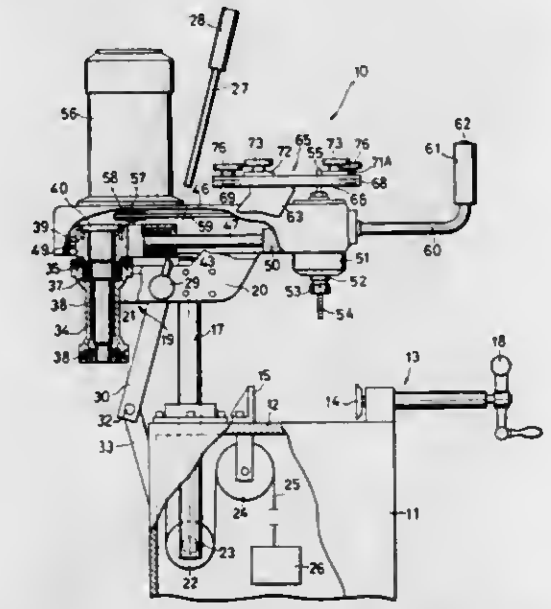
Taiichi Okamoto, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,596

Claims priority, application Japan, Jul. 5, 1976, 51-80064

Int. Cl.^{2} B23C *1/16*

U.S. Cl. 90—13.2 **9 Claims**



1. A hand-operated profiling machine comprising;

(a) a table;

(b) a support mounted on and being movable toward and away from said table, said support having a shaft extending substantially perpendicularly to said table;

(c) a head supported on said support and having means for holding a cutter, said head being pivotable about and movable toward and away from said shaft; and

(d) guide means mounted on said support, said head being confined in motion relative to said shaft by said guide means.

4,102,247

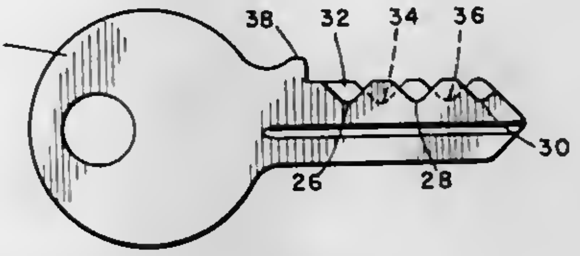
DEPTH KEY SET

Victor Vincent Fanberg, 5221 Mt. Ariane Ter., San Diego, Calif. 92111

Filed Oct. 4, 1976, Ser. No. 729,347

Int. Cl.^{2} B23Q *35/42*

U.S. Cl. 90—62 R **3 Claims**



1. A set of master keys comprising:

a pair of keys for each desired cut depth,

a first key in each of said pairs having cuts at the odd numbered longitudinal cut positions,

and a second key in each of said pairs having cuts at even numbered cut positions.

4,102,248

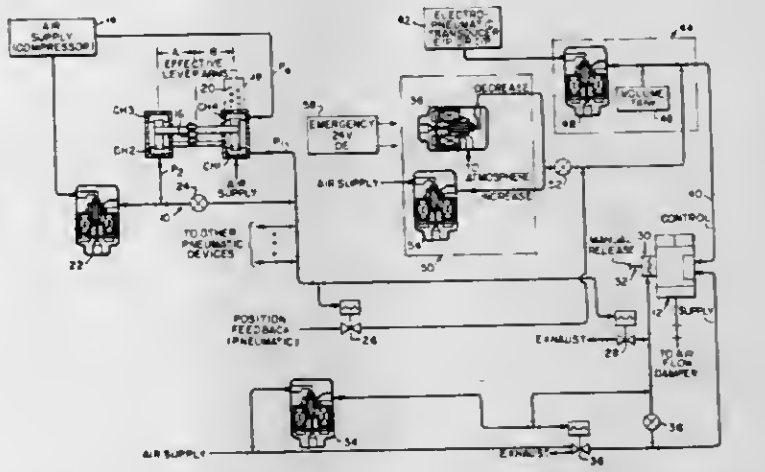
PROTECTIVE SYSTEM FOR PNEUMATICALLY OPERATED DEVICES

Lyle F. Martz, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 665,134

Int. Cl.^{2} F15B *15/26*

U.S. Cl. 91—42 **1 Claim**



1. A protective system for immobilizing a pneumatically operated device in the event of loss of air supply comprising:

means for sensing the air supply providing a signal P which is a function of the magnitude of pressure of said air supply;

means for braking said pneumatically operated device, having an air chamber said braking means being inactivated by the presence of air pressure;

a needle valve;

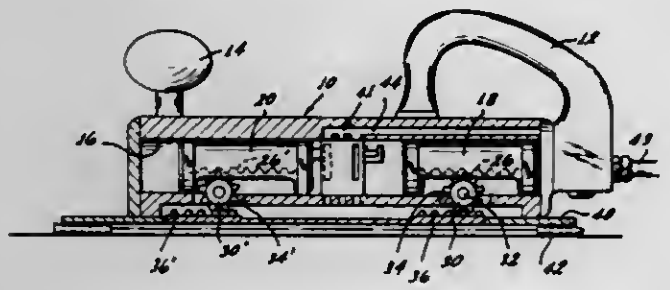
first and second pneumatically operated relays, each having an operating chamber, the operating chamber of said first relay being connected to said sensing means to receive said signal P which keeps said first relay normally closed, said first relay being connected to said air chamber and to the operating chamber of said second relay said second relay being normally open and connected to said air chamber through said needle valve, and to said air supply, whereby when the air supply fails said signal P goes to zero causing said first relay to open to atmosphere exhausting said air chamber in the operating chamber of said second relay which thereby closes thus actuating the brake means and disconnecting the air supply;

- an electropneumatic transducer means for sending a pneumatic control signal;
- a solenoid valve connected in series with said electropneumatic transducer means;
- a pneumatic memory means interposed between said solenoid valve and said pneumatically operated device for maintaining an air pressure which is a function of the displacement of said pneumatically operated device; and
- a third pneumatic relay having an operating chamber connected to said signal P having ports which are normally closed, said third pneumatic relay connecting a pneumatic feedback signal from said pneumatically operated device to said pneumatic memory means whereby when said signal P goes to zero, said ports open and the pneumatic feedback signal is connected directly to said pneumatic memory.

4,102,249
PNEUMATICALLY DRIVEN DEVICES

Burton M. Berniker, 6524 Whitaker Ave., Van Nuys, Calif. 91406

Filed Aug. 18, 1976, Ser. No. 715,426
Int. Cl.^{2} F01B *9/00;* **F15B** *15/26*
U.S. Cl. 91—186 **10 Claims**



1. In an apparatus having a body with a cylindrical bore in the body, a piston that is reciprocatable in the bore, means whereby pressure is caused to act on one end of the piston in one end of the bore for driving the piston away from that end of the bore, the construction being such that the piston pressurizes fluid at the other end of the bore, the other end of the piston being constructed to have a groove and having a sealing ring in the groove, with space in back of the ring, and the said other end of the piston being provided with passageway means whereby pressurized fluid at the other end of the piston is communicated to the space inwardly of the said sealing ring whereby to expand it outwardly against the walls of the bore whereby the said sealing ring serves to provide a braking effect on the movement of the piston towards the said other end of the bore.

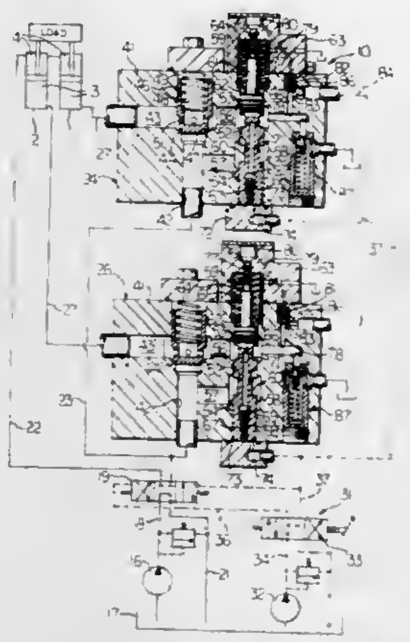
4,102,250
LOAD CHECK AND BYPASS VALVE

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 16, 1976, Ser. No. 714,448
Int. Cl.^{2} F15B *11/00, 13/00*
U.S. Cl. 91—412 **13 Claims**

1. In a hydraulic load lifting system including a source of fluid supply, a pair of hydraulic lift motors each having a load supporting end, a pair of load check valves individually connected to the load supporting means of the motors, each of the check valves being connected to the source of fluid supply for providing substantially unrestricted fluid flow therethrough from the source of fluid supply to the load supporting ends of the motors while blocking reverse fluid flow therethrough, the improvement comprising:

- a pair of bypass valves connected to the source of supply and individually connected to the load supporting ends of the motors for controlling the flow of fluid exhausted from the load supporting ends of the motors to the source of fluid supply, each of the bypass valves being movable between an opened position at which fluid is free to flow therethrough from the load supporting end of the respective motor to the source of fluid supply and a closed position at which fluid flow therethrough is blocked;
- first means responsive to the load generated fluid pressure in the load supporting end of the motors for exerting a valve opening force on the respective bypass valve;
- second means responsive to the load generated fluid pressure in the load supporting end of one of the motors for exerting a valve closing force on the associated one of the bypass valves;

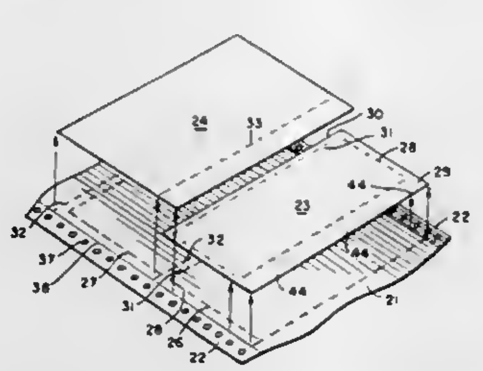


- third means responsive to the load generated fluid pressure in the load supporting end of the other of the motors for exerting a valve closing force on the other of the bypass valves; and
- fourth means connecting the second means to the third means for communicating the load generated fluid pressure in the load supporting end of said one motor to said third means so that the valve closing force exerted on both of said bypass valves is responsive to the load generated fluid pressure in the load supporting end of said one motor.

4,102,251
METHOD OF MAKING A CONTINUOUS ENVELOPE

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 696,353, Jun. 15, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,228
Int. Cl.^{2} B31B *27/60*
U.S. Cl. 93—63 M **6 Claims**



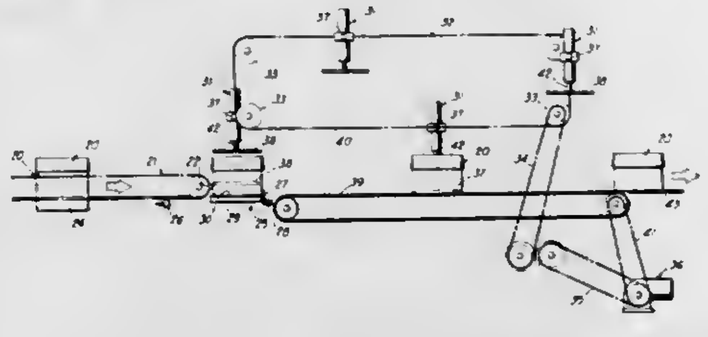
1. A method of continuous envelope structure manufacture comprising the steps of

- advancing a continuous web along a predetermined path,
- uniting thereto a plurality of ply segments to form a continuous ply, each ply segment having a bottom edge and a top edge extending transversely of the length of said continuous ply with the top edge being free of union with said continuous ply to provide an envelope flap, said ply segments being positioned relative to said continuous ply incident to union thereof to overlap the top edge of one segment relative to the bottom edge of an adjacent segment,
- simultaneously perforating the united ply segments and continuous web along a transverse line adjacent each segment bottom edge to develop lines of potential severance in said continuous web, and
- zig-zag folding the united ply segments and continuous web along said transverse lines.

4,102,252
CONTINUOUS MOTION APPARATUS AND METHOD FOR SEALING CARTONS

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Filed Mar. 25, 1977, Ser. No. 781,157
Int. Cl.^{2} B31B *1/64*
U.S. Cl. 93—36.3 **16 Claims**



14. A continuous motion method of sealing the bottom flaps of cartons as the cartons are delivered in a regular succession from a high speed carton erecting machine comprising the steps of briefly interrupting the movement of each carton to square it in relation to its line of travel and folding and closing the bottom flaps of the carton while it is briefly interrupted, releasing the carton and engaging it with a continuous motion endless path bottom flap compression device by introducing such device through the open top of the carton and moving the device downwardly into compressive contact with the bottom of the carton, and substantially simultaneously supporting the bottom of the carton and moving the supported carton in the same direction and at the same speed as said continuous motion endless path compression device.

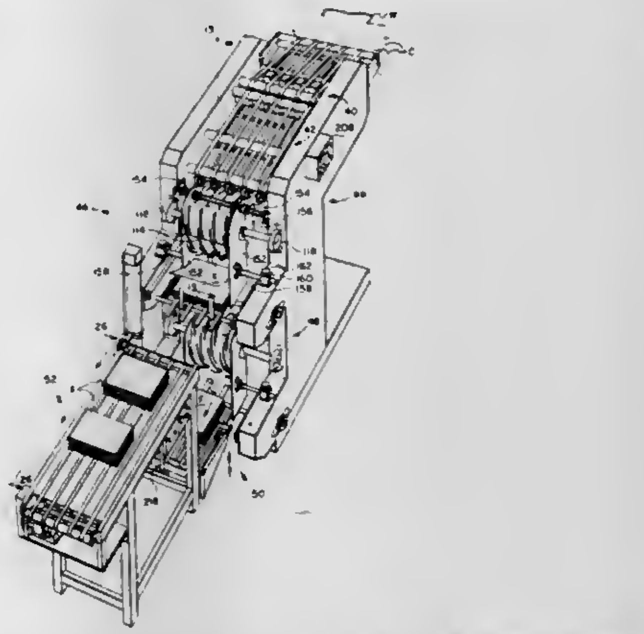
4,102,253
COUNTING AND STACKING UNIT

David James H. Gannicott, 22 Nuffield Dr., Scarborough, Canada

Filed Oct. 26, 1976, Ser. No. 735,688
Int. Cl.^{2} B31B *1/98*
U.S. Cl. 93—93 C **14 Claims**

1. Apparatus for the counting and stacking of sets of forms such as business forms, having a plurality of sheets of paper, bonded together along one or more edges to provide a form set, said bonded form sets being supplied to said counting and stacking apparatus, said counting and stacking apparatus comprising;

- main conveyor means for receiving said business forms and moving the same along a predetermined main path;
- first and second branch conveyor means communicating with said main conveyor means, for moving said forms along either a first or a second branch delivery path;
- selectively operable diverting gate means for diverting form sets to one of said first or said second branch paths selectively;
- first and second stacking means, communicating with said first and second branch conveyor means, said first and second stacking means being adapted to receive form sets from their respective said conveyor means, and assemble the same into stacks of form sets, said first and second stacking means being located one above the other, at predetermined first and second levels and wherein each of said stacking means comprises rotary stacking members having a plurality of fingers, defining generally open-ended slots, said fingers being mounted for rotation on a spindle, and being oriented in relation to a said respective branch conveyor means to receive form sets delivered therefrom in said slots, said finger means being rotatable with said form sets located in said slots;
- ejector members extending between said finger means, whereby to intercept form sets carried in said slots, and eject the same therefrom, to form a stack;
- vibration means operable to generate repetative vibration movements;
- coupling means connecting said vibration means with said ejector members, whereby to vibrate said ejector members to and fro, thereby applying a jogging action to form sets at said stacking means during stacking;



- a delivery table located at said first level;
- movable hoist means located between said first and second stacking means and said delivery table;
- power-operated means for moving said hoist means into registration with one or other of said first and second stacking means, whereby to receive a stack of business forms therefrom;
- conveyor means on said hoist means, intermittently operable to receive a stack of forms from a said stacking means, and subsequently to transfer such stack from said hoist means onto said delivery table, and,
- counting means for counting form sets moving along said first or second branch conveyor means respectively, and connected with said gate means for operating the same to switch delivery of form sets from one of said first or second branch conveyor means to the other, when a predetermined count of form sets has been recorded on said counting means.

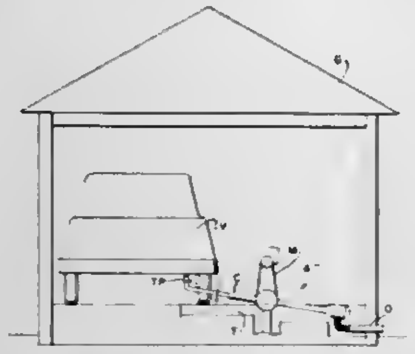
4,102,254
EXHAUST DISPOSAL SYSTEM

James L. Grant, 353 Tompkins Ave., Brooklyn, N.Y. 11216

Filed Jan. 4, 1977, Ser. Nn. 756,914
Int. Cl.^{2} F23J *11/00*
U.S. Cl. 98—115 R **8 Claims**

1. An exhaust system for a vehicle or the like, including conduit means, said conduit means being movable from an inoperative position to an operative position, with said inoperative position being defined with one end of said conduit means being out of contact with an exhaust outlet and with said

operative position being defined with said one end being in communication with said exhaust outlet, respectively, means moving said conduit means between said two positions, blower means associated with the other end of said conduit means for conducting exhaust fumes from said exhaust outlet therethrough and into the atmosphere, said moving means comprising a support, motor means mounted thereon, said motor means being driven from a source of electric power, switch means energizing said motor means, lifting means disposed



between said motor means and said conduit means, including a first member being driven by said motor means and being in driving relationship with a second member mounted on said conduit means whereby rotation of the first member causes said conduit means to move from said inoperative to said operative position, said lifting means comprising an endless member disposed between said first and second members having a lug thereon and a limit switch electrically connected to said motor means engageable by said lug to stop the motor.

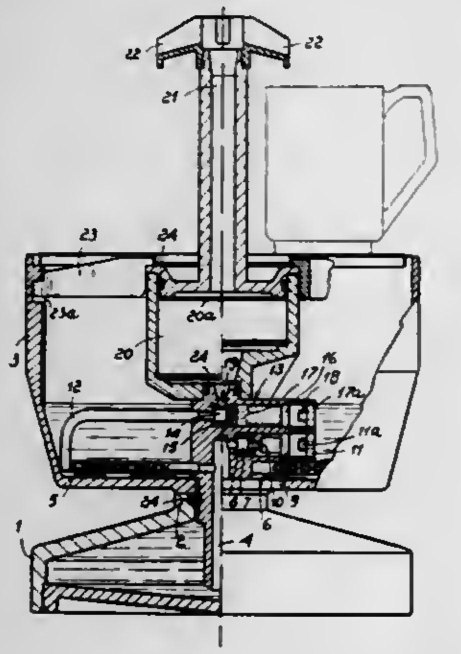
4,102,255
HIGH PRESSURE HOUSEHOLD COFFEE MACHINE

Luigi Gasparrini, Via Timavo, 22, Rome, Italy

Filed Apr. 19, 1976, Ser. No. 678,283

Int. Cl.² A47J *31/24*

U.S. Cl. 99—303 **6 Claims**



1. A machine for preparing "espresso" coffee, particularly for use as a home appliance, including a container for the water to be heated and intended to form the coffee drink, a percolation chamber above said water container and including a layer of powdered coffee through which the heated water is caused to percolate under pressure a delivery conduit connected to said percolation chamber to receive and direct said heated water to a container, a pipe extending between said percolation chamber and said water container having one end submerged in the water contained in said water container and another end opening into the bottom of said percolation chamber, a valve in communication with said pipe between said another end and said percolation chamber, and a cooling space surrounding a portion, of said pipe wherein said cooling space is located above said water container and contains a cooling fluid separated from the water in said water container, said cooling space and fluid providing a controlled cooling of said hot water passing in said pipe to cause activation of said coffee charge in said percolation chamber without burning same the machine further comprising a partition wall arranged between said cooling space and said water container for limiting the heat transfer therebetween.

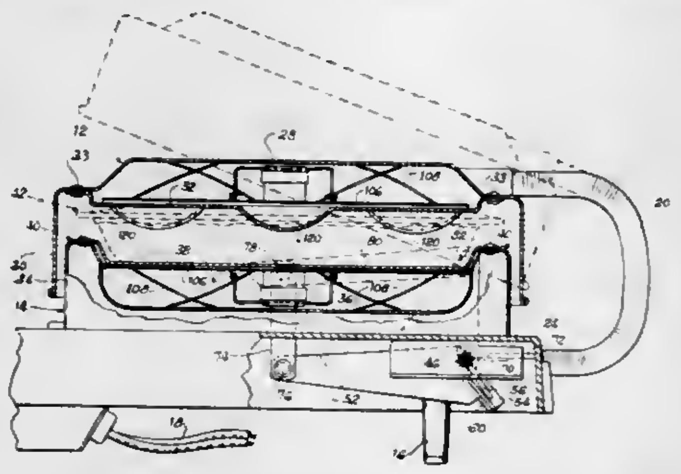
4,102,256
COOKING APPARATUS

Raymond John, Carpentersville; Jerome G. Apfelbaum, Arlington Heights, and Robert L. Moore, LaGrange, all of Ill., assignors to Engineering Inventions Inc., LaGrange and Multisensors Inc., Chicago, both of, Ill.

Continuation of Ser. No. 292,479, Sep. 27, 1972, abandoned. This application May 17, 1976, Ser. No. 687,099

Int. Cl.² A47J *37/06*

U.S. Cl. 99—372 **16 Claims**



1. A cooking apparatus for food comprising a support for the food, said support comprising upper and lower housings having facing inner walls for receiving said food therebetween, at least one of said walls comprising a thin-walled flexible member of low heat retaining capacity defining the cooking surface, said flexible member having its ends fixed relative to said housing, thin flexible heating means positioned against one side of the thin-walled flexible member, said thin-walled flexible member and said heating means comprising separate members subject to relative movement and thereby being subject to warpage relative to each other due to thermal stress, mounting means comprising means for maintaining said heating means in position against said thin-walled flexible member to achieve continued intimate association thereof, means for electrically insulating said heating means from said thin-walled flexible member, said maintaining means including resilient means located for engagement with said heating means at a plurality of spaced-apart points over substantially the entire extent of said heating means for thereby applying forces substantially completely over the extent of said heating means, and means thermally insulating said heating means from the portions of said support other than said thin-walled flexible member whereby the food serves as the primary heat sink for heat generated by said heating elements.

4,102,257
STUFFING APPARATUS

Clemente Del Ser Gonzalez, Pasco Talleres No. 36, Villaverde Alto, Madrid, Spain

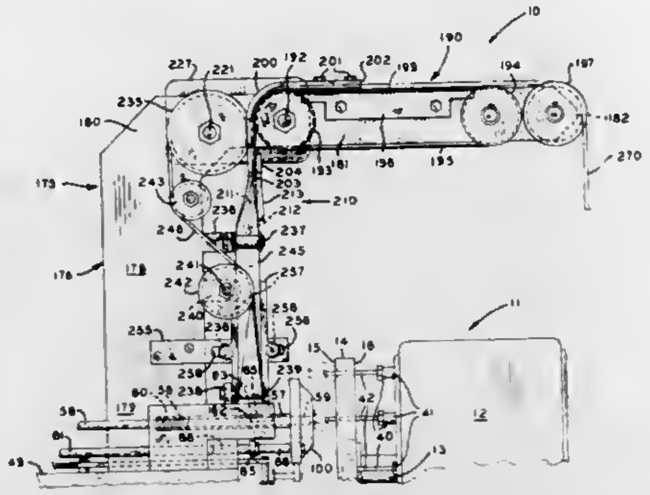
Filed Feb. 14, 1977, Ser. No. 768,055

Int. Cl.² A23D *1/00*

U.S. Cl. 99—494 **15 Claims**

1. In a machine for inserting stuffing material into objects, each of which has a cavity communicating with the exterior

thereof through a mouth, wherein the machine has a stuffing station and is adapted to deliver said objects successively to the stuffing station with the mouths disposed in a common direction, the improvement comprising a dilating mechanism having a plurality of fingers movable to and from said cavities substantially equally spaced about an axis aligned with the stuffing station movable toward said axis to contracted positions adapted to be received by the cavities of successive objects positioned at the stuffing station and from said axis to dilate the cavities and defining a passage therebetween along



said axis; means for inserting said stuffing material through the mouths and into the cavities of objects at the stuffing station; and means operable while each object is at the stuffing station for successively moving the fingers toward the axis to constrict the fingers about the passage, inserting the fingers along the axis into the cavity of an object disposed at the stuffing station, spreading the fingers from the axis to dilate the cavity, inserting stuffing material through the passage into the cavity, retracting the fingers to retracted positions, and withdrawing the fingers from the cavity along said axis.

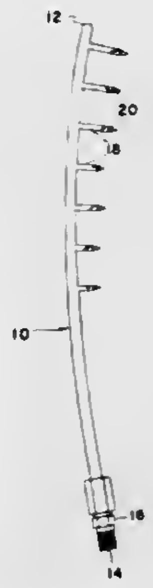
4,102,258
APPARATUS FOR INJECTING A LIQUID ADDITIVE INTO POULTRY FLESH

Eldon J. Strandine, Chicago, and Carl H. Koonz, Northbrook, both of Ill., assignors to Swift & Company, Chicago, Ill.

Division of Ser. No. 493,686, Aug. 1, 1974, Pat. No. 4,008,338. This application Oct. 13, 1976, Ser. No. 732,114

Int. Cl.² A22C *21/00*

U.S. Cl. 99—532 **3 Claims**



1. An improved injection apparatus which is inserted by hand between the skin and flesh of a poultry carcass from the posterior end for injecting an additive material into the flesh thereof, said apparatus being connectable to a source of additive supply and wherein the improvement comprises: a single hollow slender manifold closed at one end and connectable at the other opposite end with the source of liquid additive supply, the closed end of the manifold being blunt and smooth and said manifold being of a length approximating the longitudal length of said carcass; a plurality of hollow tines rigidly connected and extending substantially perpendicular and comblike to said manifold, said tines being spaced along approximately two-thirds or less of said manifold from said closed end and along one side of said manifold with the tines and manifold being substantially co-planar, said tines having closed pointed ends; and orifices in said hollow tines, said tines communicating with the hollow interior of said manifold wherein liquid additive delivered to said manifold will discharge through said orifices.

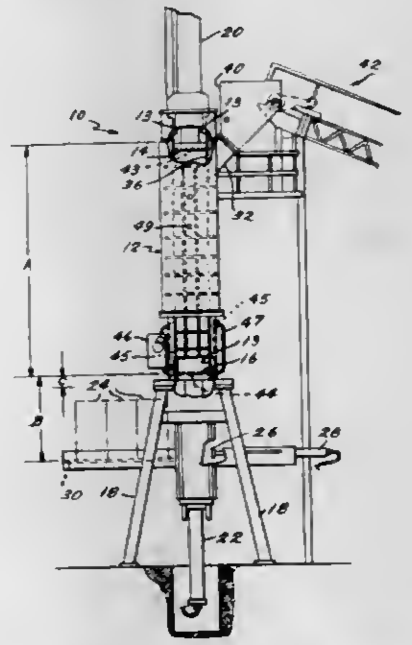
4,102,259
VERTICAL CLOSED CHAMBER BALER

Wallace M. Thompson, and William D. Beeland, both of Cordele, Ga., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Filed Aug. 26, 1976, Ser. No. 717,872

Int. Cl.² B65B *13/20*

U.S. Cl. 100—3 **3 Claims**

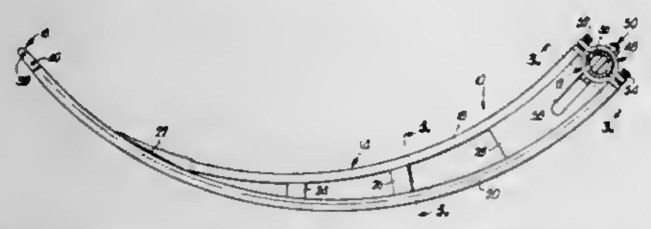


1. A method of compressing particulate stringy combustible material comprising feeding a stream of the material along an inclined path and then through a side opening of a vertical chamber and onto a vertically movable gate ram which supports the material, closing the side opening when the upper surface of the material in the chamber reaches a predetermined level which is at least as high as the upper edge of the side opening, said closing step including moving a door horizontally across the side opening along a path which lies in the plane of the side opening so that in the closed position the door forms part of the wall of the chamber, the leading edge of the door being inclined with respect to the direction of travel and passing through a mass of the particulate material existing at the side opening and cooperating with a vertical anvil at the end of its travel in a manner to shear particulate material between the anvil and the door edge along a path which begins at one end of the anvil and travels along the anvil to its other end, moving a compression ram downwardly past the closed opening toward the gate ram while holding said gate ram stationary thereby compacting the material, applying straps to the compacted material while in the chamber to form a baled mass moving the compression ram and the gate ram downwardly until the baled mass has moved out of the chamber, moving the compression ram upwardly away from the baled mass, and moving an ejector ram horizontally to push the baled mass from the gate ram.

4,102,260

CANTILEVERED TYING NEEDLE CONSTRUCTION FOR CROP BALERS

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.
Filed Feb. 11, 1977, Ser. No. 767,981
Int. Cl.^{2} B65B *13/04*
U.S. Cl. 100—24 9 Claims

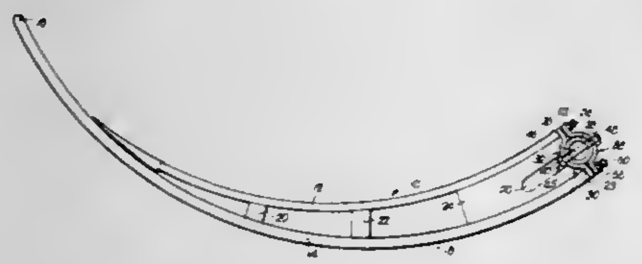


1. A tying needle for crop balers comprising:
mounting means for attaching the needle to a movable support;
an elongated, generally planar frame extending outwardly from said mounting means and terminating in a remote tip,
said frame tapering within said plane as said tip is approached; and
means at said tip for retaining a strand of tying material with the needle during movement of the same with said support,
said frame including a pair of longitudinally extending structural members laterally spaced apart adjacent said mounting means and converging as said tip is approached.

4,102,261

ADJUSTABLE MOUNTING FOR TYING NEEDLES

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.
Filed Feb. 11, 1977, Ser. No. 767,986
Int. Cl.^{2} B65B *13/04*
U.S. Cl. 100—24 15 Claims



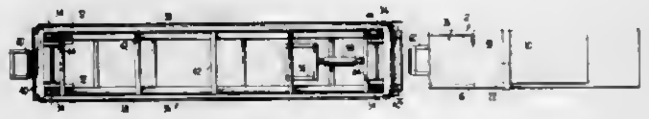
1. A cantilevered mounting for an elongated tying needle comprising:
a transverse support having an arcuate periphery:
structure at one end of the needle fastening the same tightly against said support with a predetermined amount of force; and
means for adjustably rotating the needle about said periphery while said predetermined amount of force remains applied whereby to vary the circumferential position of the opposite end of the needle with respect to the support.

4,102,262

APPARATUS FOR LOADING REFUSE INTO CONTAINERS

Harvey W. Liberman; Paul L. Goranson, both of Knoxville; R. Houston Rutledge, Jr., Maryville, and John C. Salyers, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Dec. 17, 1975, Ser. No. 641,375
Int. Cl.^{2} B30B *15/16*
U.S. Cl. 100—53 25 Claims

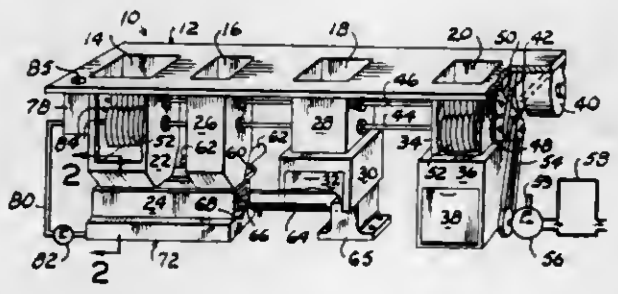
1. A refuse loading station comprising:
a refuse packer assembly;
a refuse container having a movable wall member and a vertically slidable closure;
a loading dock disposed in front of said packer assembly, said loading dock including a loading carriage and track means for supporting said carriage for limited movement toward and away from said packer assembly;
said carriage including means for removably supporting said container;
power actuable means on said loading dock for reciprocating said carriage to shift said container toward said packer assembly to a refuse loading position, and to shift said container away from said packer assembly to a container-removal position; and
a refuse clearing member for clearing refuse situated between said packer assembly and said container subsequent to said container being loaded, said clearing member including:
a cutter edge for severing refuse; and
an inclined refuse deflecting surface located under a bottom edge of said closure when said container is in a refuse loading position to deflect into said container refuse which is situated under said closure when said closure is lowered.



4,102,263

GARBAGE RECYCLING SYSTEM

Robin R. Forsberg, 898 McGlincy La., Campbell, Calif. 95008
Filed Aug. 3, 1977, Ser. No. 821,449
Int. Cl.^{2} B30B *15/30*
U.S. Cl. 100—74 1 Claim

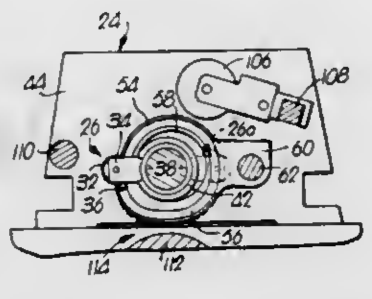


1. Apparatus for treating garbage, comprising:
a receptacle having an open bottom and having an open upper end forming a passageway for receiving and passing garbage;
shredder means including a motor driven shredder disposed transversely of the receptacle passageway for acting on garbage and reducing its bulk when garbage is placed within said receptacle;
container means including a mold having a cover for opening and closing the mold disposed below said receptacle for receiving garbage falling by gravity through said receptacle;
a ram operatively connected with said mold for compacting garbage therein;
a reservoir underlying said mold;
a liquid within said reservoir,
said mold and said reservoir having cooperating apertures formed in at least one wall providing liquid communication between said mold and said reservoir;
a pressure tank disposed adjacent said receptacle;
a plurality of nozzles providing liquid communication between said pressure tank and said receptacle; and,
pump and tubing means connecting said tank with said reservoir for spraying garbage deposited in said receptacle.

4,102,264

NUMBERING THROW-OFF FOR COLLATOR

Richard L. Sommers, and Fred H. Sickler, both of Emporia, Kans., assignors to Didde-Glaser, Inc., Emporia, Kans.
Filed Dec. 22, 1976, Ser. No. 753,528
Int. Cl.^{2} B41L *45/00*
U.S. Cl. 101—77 9 Claims

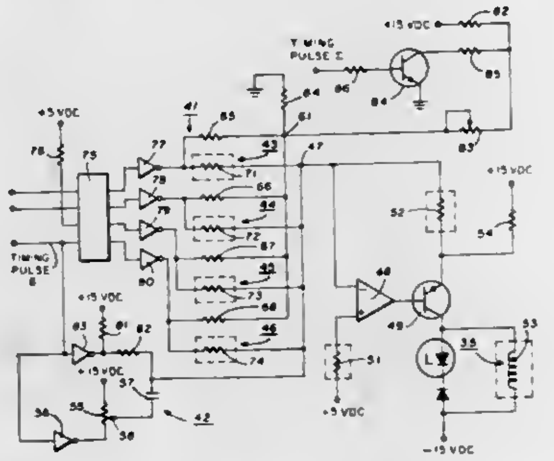


1. A numbering unit for successively numbering webs or the like in a predetermined sequence, said apparatus comprising:
at least one rotatable numbering machine mounted on a rotatable shaft and having a movable indexing arm for successively changing the number applied to said webs or the like during rotation of said machine and in accordance with said predetermined sequence;
a cam member having a groove therein for receiving said arm;
a pivotal shaft supporting said cam member and permitting shifting of the cam member between a first indexing position where said arm is successively moved for indexing said machine as the machine rotates and said arm travels within said groove, and a second position where said machine is not indexed during rotation thereof with said arm traveling within said groove; and
means for pivoting said pivotal shaft for shifting said cam member between said first and second positions, said pivoting means including
a plate coupled to said cam-supporting shaft and shiftable between respective positions corresponding to the first and second positions of said cam member;
operating means for pivoting said plate between said respective positions thereof for shifting of said cam member between said first and second positions.

4,102,265

HAMMER DRIVER CONTROLLER FOR IMPACT PRINTERS

David R. Deetz, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 622,582, Oct. 15, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,714
Int. Cl.^{2} B41J *7/92*
U.S. Cl. 101—93.03 4 Claims

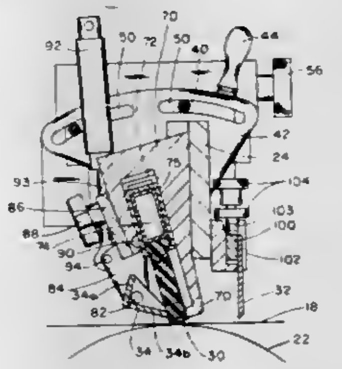


1. In an impact printer having
a hammer for serially printing replicas of selected characters, belonging to different predetermined classes, on a recording medium in response to energizing current applied to an electromagnetic driver for said hammer, and
means for supplying a control signal to differentiate between said different classes of characters;
the improvement comprising a controller for supplying said energizing current for said hammer driver; said controller including
means for establishing different finite set point current levels to obtain a substantially uniform printing density for characters of said different classes,
means for selecting an appropriate one of said set point levels in response to said control signal as a prelude to printing each of said selected characters, and
means for causing said current to decay from a high initial level toward the selected set point level during the printing of each of said selected characters, whereby an impulse force is applied to said hammer to aid in overcoming any static friction and a controlled impact energy is imparted to said hammer to achieve substantially uniform density in the printing of each of said selected characters.

4,102,266

SQUEEGEE, INK SCOOP AND FLOOD BLADE ASSEMBLY

Frank L. Porth, Morley, Mich., assignor to James A. Black, Kent City, Mich.
Filed Mar. 18, 1977, Ser. No. 778,867
Int. Cl.^{2} B41F *15/44, 15/46*
U.S. Cl. 101—124 4 Claims



1. A stencilling squeegee, flow coater and scoop assembly for cooperation with a stencil screen reciprocating in advance stencilling strokes and reverse return strokes, comprising:
an elongated squeegee mount and squeegee supported thereby;
a pair of spaced supports for said squeegee mount;
said squeegee mount and squeegee being vertically shiftable by said supports between a lowered stencilling position during the stencil screen advance stroke, and an elevated nonstencilling position during the stencil screen return stroke;
an elongated fluid scoop between said supports, parallel to and spaced from said squeegee;
said fluid scoop comprising a trough-type member positioned ahead of said squeegee relative to the screen advance, said fluid scoop being pivotally shiftable from a fluid dumping position, through a fluid scooping action approaching and sweeping adjacent the screen to scoop up excess fluid in front of said squeegee, to a fluid retention position, whereby excess fluid in front of the squeegee can be scooped up at the end of the stencilling stroke and retained during the return stroke, and said fluid scoop being shiftable from said fluid retention position back to said fluid dumping position whereby excess fluid can be dumped prior to lowering of said squeegee by said supports at the start of the stencilling stroke for use of the fluid during subsequent stencilling strokes; and a flow coater between said supports and behind said squeegee

relative to the screen advance to flow coat the fluid dumped from said scoop into a coating of fluid on the screen during the stencilling stroke as the squeegee preceding it performs the stencilling function.

4,102,267
FEEDING OF SHEETS AND CARDS IN A ROTARY DUPLICATOR MACHINE CAPABLE OF WHOLE-PAGE AND LINEWISE PRINTING

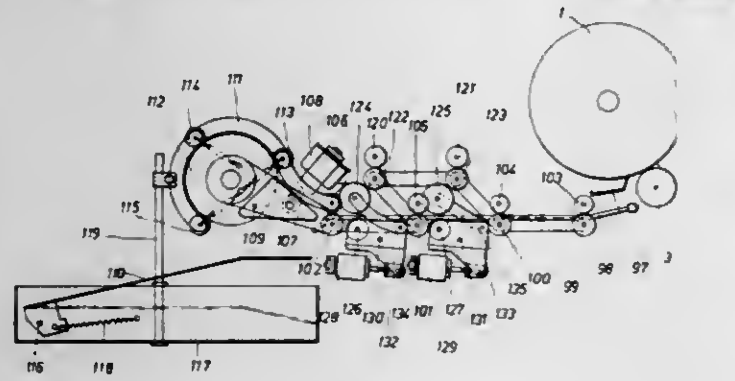
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Fed. Rep. of Germany

Filed Apr. 20, 1977, Ser. No. 789,433

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 2618658

Int. Cl.² B41L *11/08*

U.S. Cl. 101—132.5 **10 Claims**



1. In a rotary duplicator machine of the type provided with a printing drum, a printing form mounted on the drum and bearing a transferrable image in the form of a text comprised of a plurality of successive lines, a conuterpressure element movable into and out of counterpressure engagement with the printing drum to effect transfer of the whole text, preselected individual lines or preselected groups of lines to sheet material transported between the printing drum and the counterpressure element, and infeed rollers located upstream of the image transfer location for feeding sheet material to the image transfer location, in combination, stacked-sheet feeding means operative for removing whole-page sheets onto which the entire text on the printing form is to be transferred from a stack of such sheets and feeding such whole-page sheets to the infeed rollers; card infeed transport means defining a card infeed transport path located beneath the stacked-sheet feeding means and operative for feeding cards to the infeed rollers; at least one stacked-card feeding means operative for removing cards of smaller format than the whole-page sheets and onto which only preselected parts of the text on the printing form are to be transferred from a stack of such cards and feeding such cards into the card infeed transport path, the at least one stacked-card feeding means comprising a respective container for a stack of such cards located to the side of the card infeed transport path and provided with means defining an exit slit from the container, the exit slit having about the thickness of one card, and a feeding knife for removing individual cards from the stack in the container and ejecting them from the container through the slit and into the card infeed transport path; and control means operative for detecting when an ejected card has in its entirety left the card container and entered the card infeed transport path and in response to such detection initiating transport operation of the card infeed transport means.

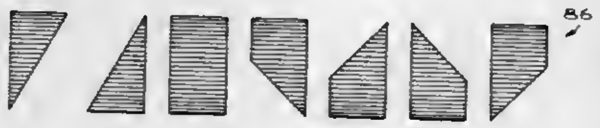
4,102,268
IMPACT PRINTER TYPE CHARACTER

Fernando V. Guarderas, Woodland Hills, and Luis Leon, Redondo Beach, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Jun. 30, 1975, Ser. No. 591,538

Int. Cl.² B41J *7/70*

U.S. Cl. 101—399 **2 Claims**



1. A type surface useful in an impact printer which moves type characters, from the leading to the trailing edges thereof, past a plurality of aligned hammers, each hammer being individually actuatable to impact against a selected type character to print an image of the selected character on a paper passed therebetween, said type surface including at least one type character thereon for printing a single element of a matrix character comprised of a plurality of such elements, said one type character comprising:

a plurality of land area portions each raised above said type surface;

said plurality of land area portions being spaced from one another and distributed within an area on said type surface so as to define a substantially rectangular periphery;

said plurality of land area portions being positioned within said periphery such that a line projected in the direction of type surface movement from the leading to the trailing edge of said one type character intersects multiple land area portions whereby a hammer impacting against said land area portions will print a solid block having a periphery substantially corresponding to said substantially rectangular periphery with the spaces between land area portions being filled in as a consequence of smear attributable to the relative movement between said type surface and hammer.

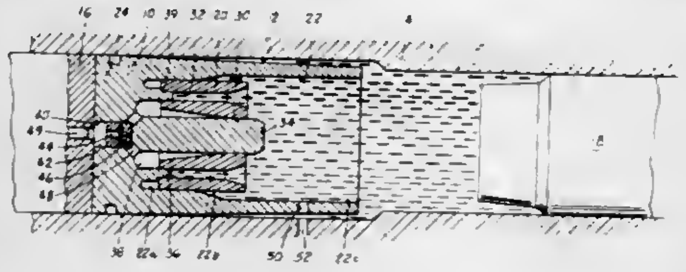
4,102,269
LIQUID PROPELLANT WEAPON SYSTEM

Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 17, 1977, Ser. No. 778,770

Int. Cl.² F42B *5/16, 9/14*

U.S. Cl. 102—38 LP **11 Claims**



1. A round of ammunition comprising:

a projectile having a first average density;

a cavity generator having a second average density;

a charge of liquid propellant having a third average density which is greater than said second average density; and

a cartridge case;

said cavity generator having a forward face, an aft face, and a passageway extending longitudinally therebetween; and

said cartridge case having means for obturating said passageway.

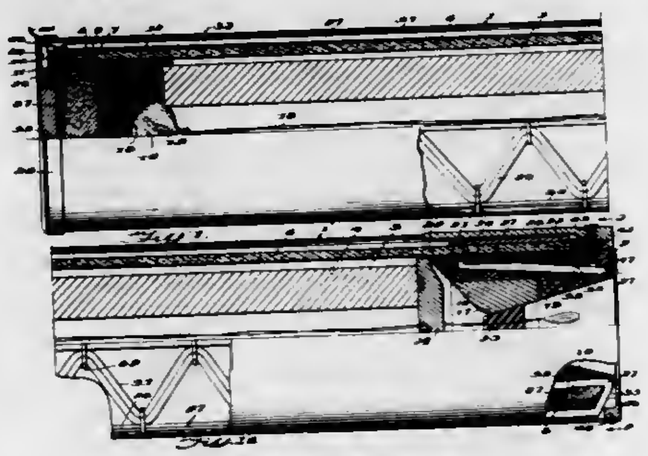
4,102,270
DISPOSABLE BOOSTER

Silvio P. Gualillo, Baltimore County; Russell L. Hopping, Towson; Ivan E. Tuhy, Baltimore; Charles L. Barker, Dundalk, and Herbert H. Buschers, Towson, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed May 8, 1951, Ser. No. 225,174

Int. Cl.² F42B *15/10*

U.S. Cl. 102—49.5 **6 Claims**



1. A booster comprising an open ended housing, a propellant charge carried within said housing, a trap assembly interposed between said propellant and opening for restraining said propellant, said trap including an annular ring member, and a plurality of radially extending arms held in disengageable interlocking relation with said ring member, said interlocking arms and ring member being arranged to maintain a rigid assembly upon the application of force from one direction, but which are readily collapsible upon the removal of said force after the booster has been expended.

4,102,271
ARMOR-PIERCING TANDEM SHELL OR PROJECTILE

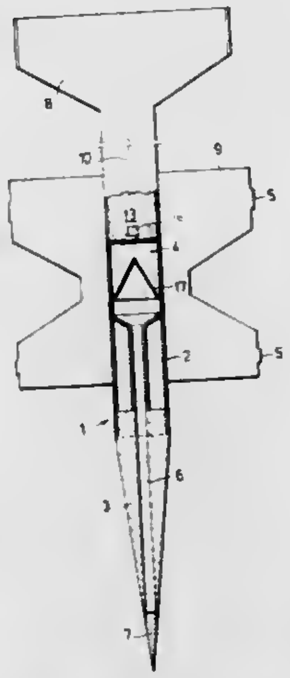
Karl-Wilhelm Bethmann, Duesseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,378

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1976, 26054557

Int. Cl.² F42B *11/14*

U.S. Cl. 102—52 **8 Claims**



1. An improved armor-piercing tandem projectile particularly adapted for piercing multi-layered armored targets and having a shell body incorporating at least two armor-piercing means which differentiate each other at least with respect to their moments of impacting the target, the rearmost one of the armor-piercing means including a shaped hollow explosive charge; the improvement comprising:

a first most forwardly disposed armor-piercing means, relative to the target, having the first, in point of time, impacting moment of said armor-piercing means, acting by its kinetic energy;

a second most rearwardly disposed armor-piercing means having a chamber;

said first and second armor-piercing means being rigidly secured to each other,

shaped hollow explosive charge means operatively mounted in said chamber, said shaped hollow explosive charge means including spike forming means;

said first armor-piercing means being formed as an impact body which has a fowardly extending conduit in communication with said shaped hollow explosive charge means.

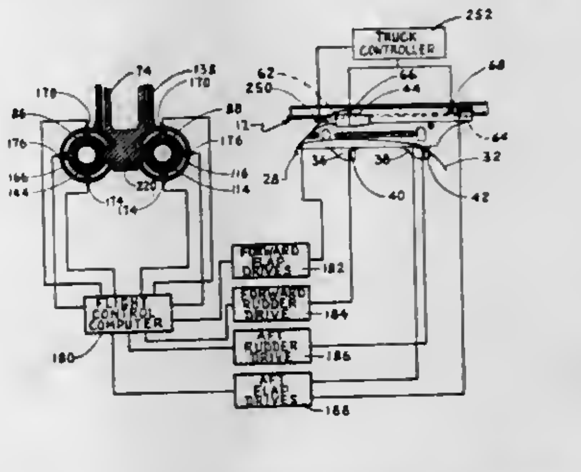
4,102,272
HIGH-SPEED TRANSPORTATION SYSTEM

Elvest L. Lehl, 2450 Newell, Wichita, Kans. 67203, and Glen W. Zumwalt, 6311 Marjorie La., Wichita, Kans. 67208

Filed May 27, 1975, Ser. No. 580,872

Int. Cl.² B60V *3/00;* B61B *13/08*

U.S. Cl. 104—23 FS **28 Claims**



20. A high-speed transportation system comprising an elongated guide means, a self-propelled aerodynamically dirigible aircraft disposed exteriorly of, below and operatively connected by means carried at the top of the aircraft to the guide means to travel a path guided by the guide means, means for directably controlling the aircraft to travel said path including sensing means carried by the aircraft in operative association with the guide means to sense displacement from the latter with the means for controlling the aircraft operating to maintain the displacement at a set value and means pivotally supporting the guide means at spaced positions for lateral swinging movement.

4,102,273
APPARATUS FOR POSITIONING BATTERY-OPERATED ROAD VEHICLES AT BATTERY REPLACEMENT STATIONS

Theodor Merkle, Itzelberg, and Paul Meyer, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,946

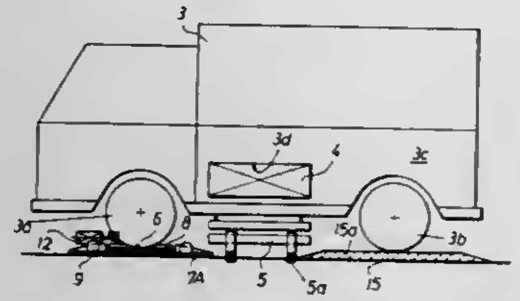
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558637

Int. Cl.² B60K *1/04;* B60S *5/00*

U.S. Cl. 104—34 **9 Claims**

1. Apparatus for positioning battery operated road vehicles which have battery compartments at battery replacement stations wherein fresh batteries are moved toward or spent batteries are moved away from the compartments of vehicles along a predetermined path, comprising a threshold structure which can be traversed by the wheels of a vehicle and includes a ground-contacting first carriage movable back and forth in a

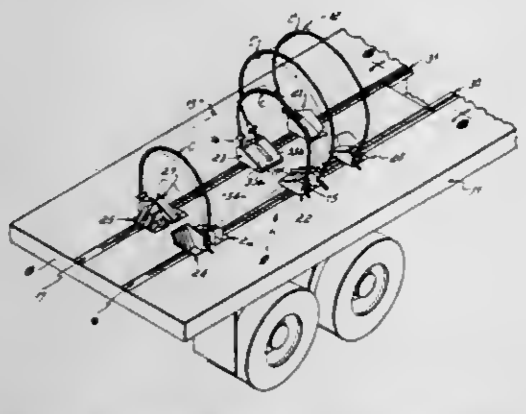
first direction, and a second carriage movable in said first carriage back and forth in a second direction substantially at right angles to said first direction, said second carriage being adapted to support the wheels of a single set of aligned wheels on a vehicle which is driven onto said structure in the general direction of movement of said first carriage and said second carriage having socket means arranged to receive at least one wheel of said single set of aligned wheels, the movement of said first carriage resulting in movement of the vehicle in said first direction and the movement of said second carriage resulting in a change of orientation of the vehicle about a substantially vertical axis while said set of aligned wheels is supported by said second carriage when the movement of at least one of said carriages is necessary to move the compartment of the vehicle at said station to an optimum position with respect to said path; and means for driving said second carriage in said second direction.



4,102,274
CYLINDRICAL CARGO SECUREMENT APPARATUS AND METHOD THEREFORE

Steven L. Feary, Ft. Mitchell, Ky., and Bradley W. Boesel, Cincinnati, Ohio, assignors to Carriers Securement Systems, Inc., Ft. Mitchell, Ky.

Filed Feb. 18, 1976, Ser. No. 659,016
Int. Cl.^{2} B60P *7/12, 7/16;* B61D *45/49, 49/00*
U.S. Cl. 105—367 **31 Claims**

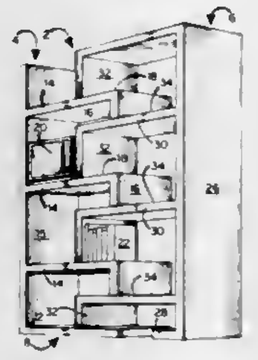


1. Apparatus for securing objects to supporting platforms and including:
- a pair of spaced apart parallel elongated tracks attached to said platform;
- a pair of end chocks, each one of said end chocks selectively fixed to a respective track;
- a pair of adjustable chocks, each one of said adjustable chocks slidably mounted in a respective track;
- a pair of anchor means, each of said anchor means being movable along its respective track and being selectively fixable to a respective track proximate an adjustable chock, and
- means operatively connecting each adjustable chock to a respective anchor means for moving said adjustable chocks against an end of said object and with respect to said anchor means when said anchor means is selectively fixed to said respective track.

4,102,275
ADJUSTABLE MODULAR BOOKCASE

Albert M. Spound, Royal Crest Estates 10 Newcastle Dr., Nashua, N.H. 03060, and Richard D. Horowitz, 180 Beacon St., Boston, Mass. 02116

Filed Apr. 13, 1977, Ser. No. 787,272
Int. Cl.^{2} A47B *45/00*
U.S. Cl. 108—92 **12 Claims**



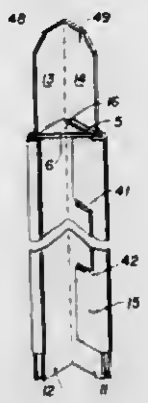
1. An adjustable, self-supporting, modular shelf unit adapted to stand on a horizontal floor comprising:
- first and second shelf sections each comprising:
  - a single substantially upstanding side support;
  - a plurality of spaced horizontal shelves each extending inwardly from the respective side supports;
  - a central support extending substantially vertical from each of said spaced horizontal shelves;
- each horizontal shelf of said first section disposed in vertical, offset, interdigitated, meshed relation to each horizontal shelf of said second section;
- said first and second shelf sections being movable inwardly and outwardly with respect to one another in the horizontal plane;
- the upper surface of each shelf of each section providing vertical support to the confronting central support of the other section;
- the outer end of each central support of said first section being slidable on the confronting surface of the corresponding shelf of said second section;
- the outer end of each central support of said second section being slidable on the confronting surface of the corresponding shelf of said first section;
- means for supporting the lowermost shelf of said adjustable, self-supporting, modular shelf unit in substantially parallel relationship to said floor.

4,102,276
DECORATING OR SHELF SYSTEM

Bruno Roveroni, Eisenbahnstrasse 10, D 6079 Sprendlingen, Germany

Filed Jun. 18, 1975, Ser. No. 587,835
Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2405510; Jun. 18, 1974, 2429122
Int. Cl.^{2} A47F *5/11*
U.S. Cl. 108—156 **3 Claims**

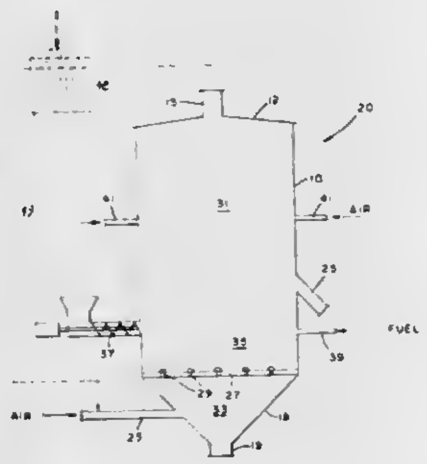
1. A foldable blank for forming a column element for a knock down shelf or display system of the type having upright columns supporting a plurality of shelves therebetween comprising:
- an elongated substantially rectangular flat blank having a plurality of parallel score lines extending longitudinally of said blank and defining a plurality of rectangular panel portions thereof, said blank being foldable on said score lines to form a column having two sides extending at right angles to each other, each side comprising at least two of said panel portions folded flat against each other, and at least one panel portion having a score line at an angle to said parallel score lines defining a further panel portion foldable to extend between said two sides and forming a shelf supporting surface integral with said column.



4,102,277
INCINERATION OF LIME-CONDITIONED SEWAGE SLUDGE WITH HIGH SULFUR FUEL

Clarence J. Wall, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,169
Int. Cl.^{2} F23G *5/02*
U.S. Cl. 110—342 **9 Claims**



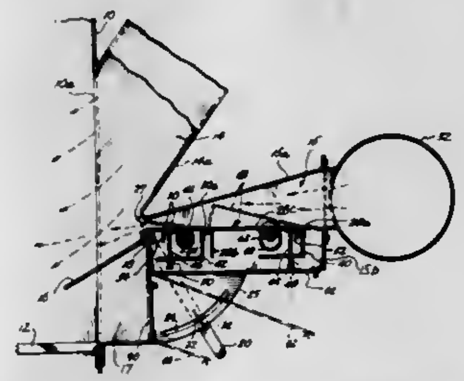
1. An economical, non-polluting process for the disposal of a sewage waste stream in which the waste stream is dewatered and the sludge formed thereby is incinerated, comprising the steps of;
- a. adding a quantity of lime to the sewage waste stream sufficient to function as a filtering aid,
- b. dewatering the sewage waste stream by filtering to form sludge filter cake containing a relatively large amount of lime therein,
- c. incinerating the sludge filter cake using a high-sulfur fuel as auxiliary fuel at a temperature at which the sulfur present in the fuel and in the sludge filter cake reacts with the lime in the sludge filter cake and with oxygen to produce $CaSO_4$ and
- d. removing the $CaSO_4$ with the solids produced by the incineration operation for disposal.

9. An economical, non-polluting process for the disposal of a sewage waste stream in which the waste stream is dewatered and the sludge produced thereby is incinerated, comprising the steps of;
- a. adding lime to said sewage waste stream as a filtering aid in the amount of at least 10 pounds per 100 pounds of dry solids in the filter cake produced in the dewatering step hereafter,
- b. dewatering the sewage waste stream in a filter press to form sludge filter cake containing lime in an amount at least 50% in excess of that required for reaction with the sulfur present in the incineration step hereafter,
- c. incinerating the sludge filter cake in a fluidized bed reactor at a temperature from about 1200° F up to about 1600° F using a high-sulfur auxiliary fuel whereby the sulfur present during incineration reacts with the lime in the filter cake and with oxygen to produce $CaSO_4$ and
- d. removing the $CaSO_4$ with the other solids, including ash, produced during incineration.

4,102,278
FURNACE HOGGED FUEL DISPERSER USING MODULATED AIRFLOW

Gerald P. McManama, Seattle, Wash., assignor to Wyatt Engineers, Inc., Seattle, Wash.

Filed May 11, 1977, Ser. No. 795,768
Int. Cl.^{2} F23K *3/02*
U.S. Cl. 110—105 **10 Claims**



1. Apparatus for dispersing hogged fuel pneumatically with improved combustion distribution over the area of a furnace fire grate comprising, in combination with means for discharging hogged fuel particles downwardly toward the grate in a free fall trajectory, air duct means adapted to receive pressurized air at one end and having a discharge orifice at its opposite end directed in intersecting relationship with said trajectory to blow the fuel particles therefrom out over the area of the grate, tandemly positioned oscillatable airflow restrictor gates each operably mounted in said duct means to vary the air velocity flowing through said orifice, and drive means operable to oscillate one such gate at a multiple of the frequency of the other.

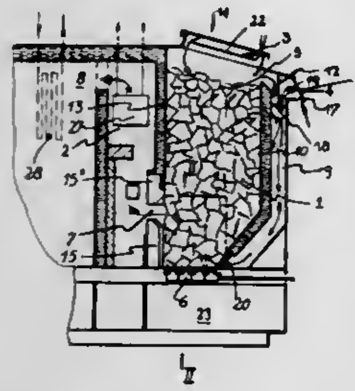
4,102,279
FURNACE PLANT

Rupert Gröschl; Josef Gröschl; Ludwig Gröschl, and Johann Gröschl, all of Wald, Schoberpass, Austria, assignors to Stefan Hahn, Styria; Norbert Drescher, Burgenland and Firma Johana Gröschl, Styra, all of Austria

Filed Nov. 24, 1976, Ser. No. 744,607
Claims priority, application Austria, Nov. 28, 1975, 9068/75; Jul. 8, 1976, 5023/76
Int. Cl.^{2} F23G *5/00*
U.S. Cl. 110—234 **19 Claims**

1. A furnace comprising:
- a housing forming a charging shaft and an adjoining combustion chamber communicating with each other through a connection near the bottom of said shaft;
- a grate below said connection underneath said shaft;
- partition means in said housing separating said shaft from an upright duct communicating with said shaft through an upper port and a lower port adjacent said grate;
- intake means above said shaft supplying same with fresh air for sustaining a combustion of a solid charge in said shaft, part of said fresh air mingling with gaseous products of incomplete combustion to form a mixture recirculated via

said upper port, said duct and said lower port to said shaft for further burning; and



baffle means above said shaft for preventing the escape of said gaseous products via said intake means.

4,102,280

FEED DEVICE FOR FLEXIBLE WORKPIECES, ESPECIALLY FOR A SEWING MACHINE

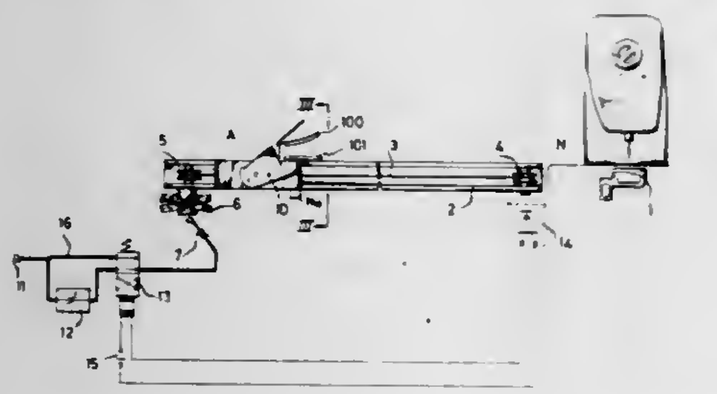
Franz Hannemann, Detmold, Germany, assignor to Durkoppwerke GmbH, Bielefeld, Germany

Filed Feb. 16, 1977, Ser. No. 769,202

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607235

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **3 Claims**



1. A feed-control device for flexible workpieces, comprising:
a rail defining a transport path for fabric workpieces to be advanced;
a clamp engageable with said workpieces and displaceable from a starting location to another location;
feed means engageable with said workpieces for advancing said workpieces to draw said clamp from said starting location to said other location; and
retarding means connected with said clamp for applying an adjustable retarding force thereto resisting the displacement of said workpieces from said starting location to said other location with a variable retardation capable of reduction to substantially zero, said retarding means including a cable displaceable along said rail and connected to said clamp, said device including a turbine operatively connected to said cable, a nozzle trained on said turbine, said nozzle being connected to a source of compressed air, a throttle connected to said source and a bypass line connected in parallel to said throttle, and means for selectively connecting said throttle and said bypass line to said nozzle.

4,102,281

WORKPIECE GUIDE DEVICE FOR SEWING MACHINES

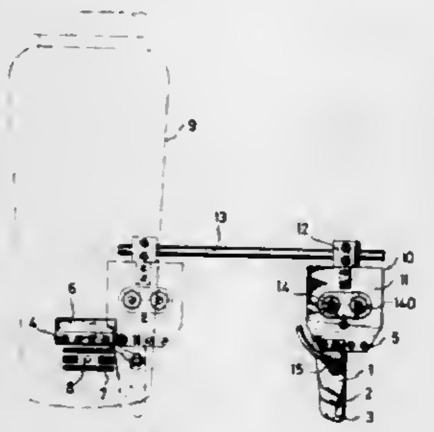
Harald Colibrunn, Spenge; Hermann Breitinger, Bielefeld, and Herbert Diekmann, Vlotho, all of Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,880

Claims priority, applicatioo Fed. Rep. of Germany, Dec. 2, 1975, 2554022

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **4 Claims**



1. The combination with a sewing machine having a stitching location on a sewing table, of a fabric-guide device capable of the controlled feeding of a pair of fabric pieces to said stitching location and thereafter forming a guide for the fabric pieces as they are advanced past said location by the fabric-feed members of the sewing machine, said device comprising:
a substantially vertically disposed first linear edge guide fixed on said table adjacent said location;
a guide rail mounted on said machine and extending generally parallel to said first linear edge guide;
a slide shiftable along said rail toward and away from said location, said slide comprising:
a plurality of vertically spaced plates adapted to receive said fabric pieces between them and separating said pieces;
a second linear edge guide movable with said slide and coplanar with said first linear edge guide while forming a guide surface for the individual pieces separated by said plates, and
a pneumatic fabric clamp on said slide for securing said pieces against at least one of said plates; and
adjustable abutment means along said track for limiting the displacement of said slide therealong and defining extreme positions of said slide proximal to said location and remote therefrom.

4,102,282

METERING DEVICE FOR SEWING MACHINES

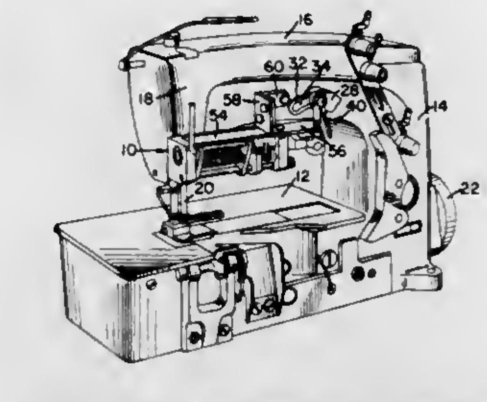
James C. Hsiao, Chicago, and Robert H. Gaudlitz, Cary, both of Ill., assignors to Union Special Corporatioo, Chicago, Ill.

Filed Apr. 1, 1977, Ser. No. 783,907

Int. Cl.² D05B *21/00, 27/14*

U.S. Cl. 112—121.26 **21 Claims**

1. An attachment for use with a sewing machine having a mechanism drive means, and lever means operably connected to said drive means to be reciprocated thereby, said attachment comprising:
a support means;
roller means carried by said support means including coaxially aligned first and second one way coupling means being associated therewith;
one of said coupling means being in operative engagement with said lever means for driving said roller means upon one direction of movement of said lever means; and



means for dependently associating said coupling means such that return movement of said lever results in the other coupling means driving said roller means.

4,102,283

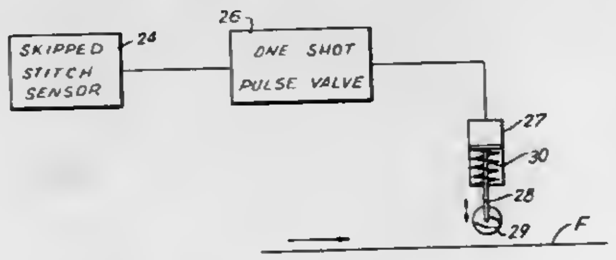
SKIPPED STITCH DETECTOR FOR CHAIN STITCH SEWING MACHINES

John L. Rockerath, Utica, and John H. Blum, Cold Brook, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,920

Int. Cl.² D05B *51/00*

U.S. Cl. 112—131 **7 Claims**



1. A skipped stitch detector system for a chain stitch type sewing machine of the type including
(a) a thread supply,
(b) a thread tension control device,
(c) a reciprocating sewing needle,
(d) thread guide means between said thread tension control device and said needle, said detector system comprising,
(e) low mass, yieldably displaceable means engaging the thread between said thread guide means and said tension control device and urging said thread out of its normal, guided path, as a function of the momentary tension in said thread,
(f) said displaceable means being cyclically displaceable through a limited distance during normal sewing and being displaceable through a further distance in response to momentary abnormal loss of tension in said thread, and
(g) sensor means positioned in the path of said yieldably displaceable means responsive to an abnormally displaced position of said yieldably displaceable means for executing a control function.

4,102,284

STACKER MECHANISM

Günter Rohr, Hemmingen, Fed. Rep. of Germany, assignor to Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

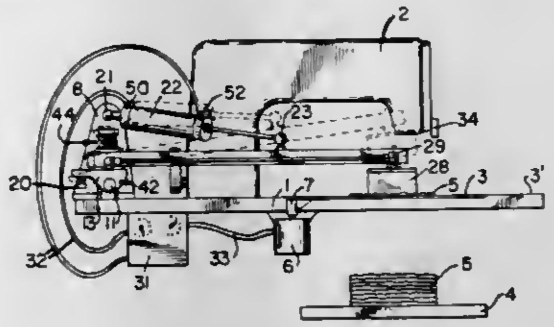
Filed Jun. 29, 1977, Ser. No. 811,103

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640148

Int. Cl.² D05B *33/00*

U.S. Cl. 112—121.29 **11 Claims**

1. A stacker mechanism having an arm means and a wiper mechanism secured to said arm means, said stacker mechanism comprising:
a frame means;
a support means having first and second pivotal connections, said first pivotal connection adapted to rotatably mount said support means on said frame means, the second pivotal connection being adapted to pivotally mount one end of said arm means;



a single actuator means for moving said arm means about said pivotal connections; and
a motion retarding assembly means operatively associated with said arm means for imparting thereto a frictional resistance to turning movement thereby creating a higher coefficient of friction at said second pivotal connection relative said first pivotal connection whereby movement of said arm means will result in said wiper mechanism being moved in the direction of least resistance.

4,102,285

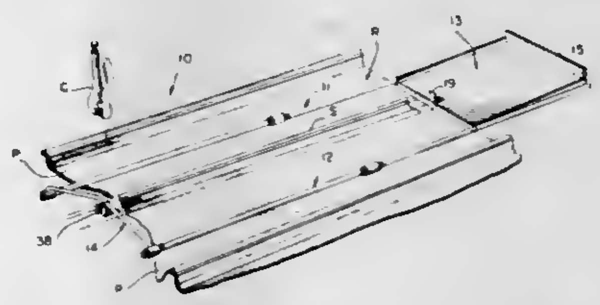
KNOCK-DOWN STARTING PLATFORM FOR A ROOF SEAMING MACHINE

James W. Martin, Kansas City, and John R. Hardwick, Gower, both of Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed May 5, 1977, Ser. No. 794,150

Int. Cl.² B21D *39/00*

U.S. Cl. 113—54 R **7 Claims**



1. A kit for a knock-down starting platform for a roof seaming machine, comprising: a machine support platform, a first pair of elongate side frame members connected at one end to the support platform, a second pair of elongate side frame members, a pair of couplings adapted to be mounted on ends of said side frame members for releasably coupling each of said first side frame members to a corresponding one of said second side frame members, a bridge member, connecting means on said bridge member for releasably connecting said bridge member to said second frame members on the other ends of said frame members so that said bridge member is located on the other end of the side frame members and spans the distance therebetween, said bridge member being bent upwardly between the ends thereof to define a clearance space for accommodating therebeneath a seam between adjoined roof panels and said pairs of side frame members being releasably joined together for ease in storage, handling and shipping.

4,102,286

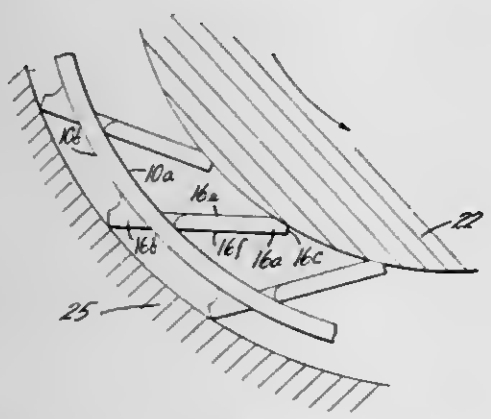
METHOD OF MAKING LOUVERED CONNECTORS AND CONTACT ELEMENTS THEREOF

Glenn W. Johnson, Jr., Summit, and Paul F. Lindlau, East Orange, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Division of Ser. No. 683,527, May 5, 1976, Pat. No. 4,039,238, which is a continuation of Ser. No. 503,783, Sep. 6, 1974, abandoned. This application May 20, 1977, Ser. No. 798,898

Int. Cl.² B21D *53/00*

U.S. Cl. 113—119 **3 Claims**



1. A method for making a contact element of the type having resilient contact fingers engageable with a complementary contact element comprising the steps of:
   (a) forming transverse openings through opposed first and second flat surfaces of an elongate strip member; then
   (b) displacing outwardly of said strip member first surface an end portion of each strip member expanse between respectively adjacent transverse boundaries of successive of such openings; then
   (c) forming said strip member into a cylinder with said end portions of said expanses thereof extending interiorly of said cylinder; then
   (d) inserting into the interior of said cylinder a cylindrical hone of diameter greater than the diameter of the locus of the extremities of said end portions and equal to the diameter of said complementary contact element; and then
   (e) rotating said hone, thereby removing a part of each said end portion to define a curved surface at the extremity of each said end portion.

4,102,287

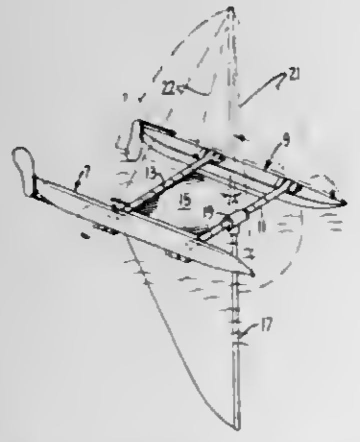
CATAMARAN WITH SWINGABLE MAST AND HULLS

Hamilton Y. Ferris, 880 W. Cliff Dr., #6, Santa Cruz, Calif. 95061

Filed Apr. 5, 1977, Ser. No. 784,667

Int. Cl.² B63H *9/04*

U.S. Cl. 114—39 **5 Claims**



1. In a boat:
a. a center supporting structure disposed on a horizontal plane and including a forward spar,
b. a pair of hulls at each side edge of said center supporting structure and connected together by said forward spar,
c. hull locking means attaching said hulls to said forward spar, said locking means having bearing means rotatably mounting said hulls on said forward spar so that said hulls are mounted for rotation at the side edges of said central structure,
d. said hulls normally extending downward from said center structure into water and supporting said central structure above the water surface,
e. locking means on said bearing means normally maintaining said hulls extending downwardly from said center structure,
f. said locking means being adapted to release said hulls and permit said hulls to be rotated 180° and relocked whereby said center structure can be turned over to an inverted position and said hulls repositioned to extend downward from said inverted position of the center structure, and
g. a mast supporting bearing rotatably mounted on said forward spar of the boat, said mast supporting bearing journally receiving said forward spar therethrough so that said mast supporting bearing is rotatably about said forward spar through an angle of at least about 180° so that a mast supported on said forward spar is movable from a first position extending vertically downwardly from said forward spar to a second position about 180° from said first position with said mast vertically upwardly from said forward spar so that a capsized boat can be righted by one person.

4,102,288

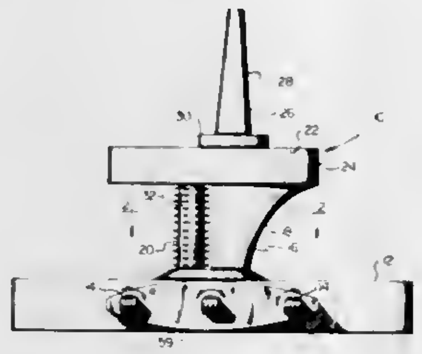
OPERATIONS VESSEL FOR ICE COVERED SEAS

Holland James Berry, Calgary, Canada, and George W. Morgan, Houston, Tex., assignors to Sun Oil Company Limited, Calgary, Canada

Filed Feb. 28, 1977, Ser. No. 772,787

Int. Cl.² B63B *35/08, 35/12*

U.S. Cl. 114—41 **4 Claims**



1. An improved monopod operations platform for ice covered seas of the type having a deck structure atop an intermediate hull upstanding from a submersible flotation hull, wherein the improvement comprises said intermediate hull having a bow region constructed in the form of a nautical wedge and a stern section adapted for ice disaggregation in both a transit and non-transit mode, said stern section including a pair of ice disaggregating drums mounted for counter-rotation in a generally parallel relationship for eliminating resultant reaction torque therefrom, said improvement further comprising a plurality of fully vectorable thrusters provided around the submersible hull, said thrusters being adapted for rotation about generally horizontal axes for obtaining programmable thrust vector control.

4,102,289

DEVICE FOR SETTING AND FURLING SAILS

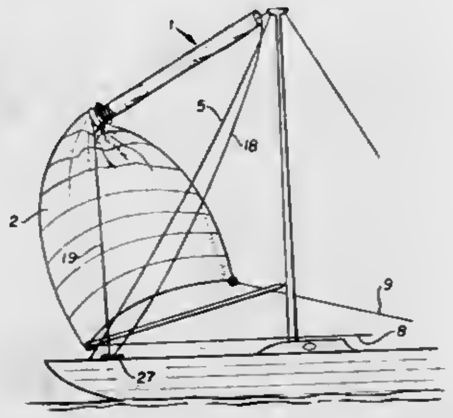
Bengt Ebbe Oscar Ebbeson, Järnvägsgatan 8, 302 49 Halmstad, and Björn Alvar Wisjö, Nyvangen 1, 302 57 Halmstad, both of Sweden

Continuation-in-part of Ser. No. 609,789, Sep. 2, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,916

Claims priority, application Sweden, Sep. 2, 1974, 7411067

Int. Cl.² B63H *9/10*

U.S. Cl. 114—104 **7 Claims**



1. A device for attachment to an end of an elongated longitudinally collapsible sleeve of a thin textile sheet material for furling a light sail into the sleeve, the device comprising
   (a) two identical substantially rigid, funnel-shaped members assembled into a detachable unit, each member having
      (1) an inner end,
      (2) an outwardly flaring outer end,
      (3) a portion extending from the outer to the inner end, the funnel-shaped member portion defining an entirely smooth and even sliding and gliding surface for the sail when furled into the sleeve through the outwardly flaring end, the surface of the portion being generated by a spherical curve extending over substantially a quarter of a circle and the inner end lying on a circle generated by an innermost point of said curve whereby none of the funnel-shaped member extends radially inwardly beyond the circle, and
      (4) a substantially semi-circular cylindrical flange extending about the inner end and defining a substantially semi-circular groove therein, the two funnel-shaped members being assembled coaxially and symmetrically with respect to a median plane extending between the circular inner ends of the members and the cylindrical flanges being symmetrically arranged with respect to a vertical plane passing through the axis of the funnel-shaped members, a respective one of the flanges matingly extending into a respective one of the grooves, and the length of the flanges being such that an annular space remains between the circular inner ends of the members,
   (b) fastening elements holding the flanges in the grooves and thus forming the two funnel-shaped members into the detachable unit, and
   (c) a fastening ring frictionally wedged into the annular space and adapted for attachment to the sleeve end.

4,102,290

UNDERWATER BOTTOM CLEANING SYSTEM AND APPARATUS

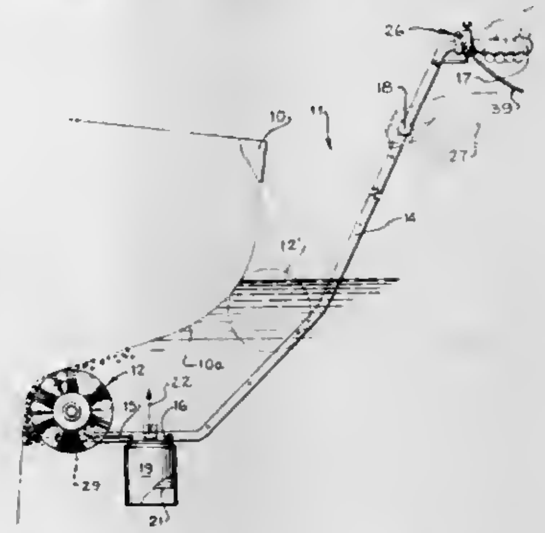
David Weiss, 819 Mitten Rd. #39, Burlingame, Calif. 94010

Continuation of Ser. No. 692,841, Jun. 4, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,606

Int. Cl.² B63B *59/00*

U.S. Cl. 114—222 **7 Claims**

5. In a bottom cleaning system for cleaning underwater hull portions of a vessel comprising means forming a berth alongside which a vessel can approach for cleaning of those underwater hull portions confronting the first named means, a cleaning assembly including cleaning means, an elongate substantially rigid operating arm supporting said cleaning means from an end thereof and extending between said cleaning means and the first named said berth means, means having a controllable buoyancy carried by said operating arm at a position between said berth means and said cleaning means disposed along said member and serving to lift and lower said cleaning means into and out of cleaning relation with respect to said hull portions, and means operable from said berth for varying the buoyancy of said buoyant means to vary the force supplied between the cleaning means and said hull portions.



4,102,291

ELECTRICAL GENERATOR FOR A SAILBOAT

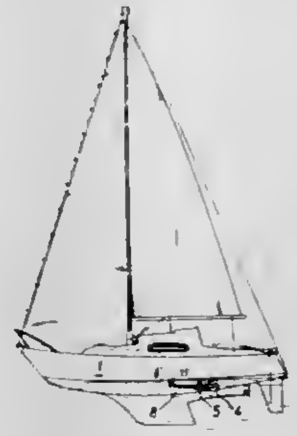
Ralf Sebald, Vorhoelzerstrasse 3, 8000 Munich 71, Fed. Rep. of Germany

Filed Sep. 29, 1976, Ser. No. 728,010

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544939

Int. Cl.² B63G *8/42;* F03B *13/10*

U.S. Cl. 114—244 **7 Claims**



1. The combination comprising:
a sailboat displaceable through the water and having a hull partially above and partially below the waterline;
an electrical generator on said sailboat having an input operable for generating electricity;
a propeller immersible in the water;
a bracket mounted on said hull below said waterline;
a hollow sleeve passing in watertight fashion through said hull between said generator and said propeller and through a location above said waterline; and
a core rotatable in and passing through said sleeve, said core having an inner end connected to said input and an outer end journaled in said bracket for rotation about an axis generally parallel to the normal direction of movement of said sailboat through the water and connected to said propeller, whereby on displacement of said sailboat the

water rotates said propeller and thereby rotates said input to generate electricity.

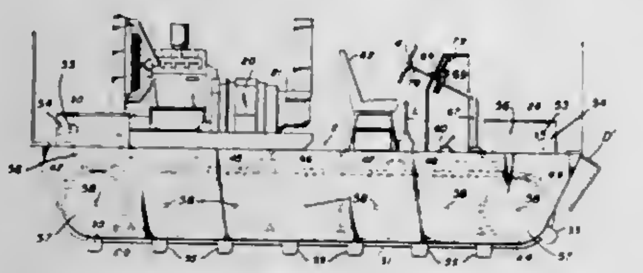
4,102,292
AMPHIBIOUS VEHICLE

Ralph W. Hunter, deceased, late of Jacksonville, Fla., and Marcia Hunter McLaulin, administrator, P.O. Box 1227, Sanford, Fla. 32771

Continuation of Ser. No. 729,813, Oct. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 657,230, Feb. 11, 1976, abandoned. This application Sep. 7, 1977, Ser. No. 831,126

Int. Cl.² B60F *3/00*

U.S. Cl. 115—1 R **2 Claims**



1. A vehicle for land or water travel comprising a planar deck and a plurality of depending fins from the underside of the deck, a source of power mounted on the upperside of the said deck, transversely spaced sets of buoyant power drums mounted on power drum axle means supported between the fins selectively rotatably driven by said power source in either a clockwise or a counterclockwise direction, said transversely spaced sets of power drums each being mounted on said axle means driven by said power source, one of each set of power drums being mounted at the respective fore and aft ends of the vehicle, dual spaced sets of buoyant idler drums mounted on idler drum axle means in substantially parallel relation to and longitudinally between said spaced sets of fore and aft power drums mounted on said power drum axle means, an endless belt reeved around each of said sets of transversely spaced sets of buoyant idler drums, said endless belts having inflated transverse cleats thereon to help maintain said deck above a water line of the vehicle, gear means for each of said power drums keyed on said axle means to rotatably drive said endless belts with said cleats to effect propulsion of said vehicle and said buoyant idler drums and said inflated transverse cleats, said source of power comprising a diesel engine directly coupled to drive a generator means and provide energization of port and starboard electric motors, each motor having a rotor shaft and a drive gear in mesh with the said gear means of said power drums to impart drive to each respective set of power drums at the fore and aft of said vehicle, steering means for selectively changing the speed of the power drums on the left or right of the vehicle, said steering means comprising a steering wheel, a steering column and a sleeve below said steering wheel on said steering column, said steering wheel being keyed to said column to turn the same to the right or left in said sleeve, rehostat means including respective port and starboard resistance sections supported by said sleeve around said steering column, a pusher arm keyed to said steering column movable to right or left by said steering wheel, ring mounted slider arms movable over said resistance sections by said pusher arm responsive to rotation of said steering wheel and steering column, said rehostat resistance sections and slider arms being in circuit between said generator means and said motor means for selectively varying the resistance of said resistance sections in circuit with said port and starboard motors drivably coupled by said motor drive gears to the gear means of the said power drums on the left or right side of the vehicle, to thereby change the speed of the power drums on the left or right side of the vehicle, and a manual lever means to provide a forward, neutral and reverse control of the vehicle drive motors, to thereby coact with the manual turning of said steering wheel for control of the vehicle.

4,102,293
DEVICE FOR PROPELLING SHIPS

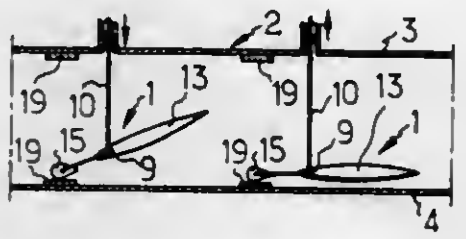
Olivier Geoffroy de la Roche Kerandraon, Paris, France, assignor to Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.", France

Filed Jun. 20, 1977, Ser. No. 808,393

Claims priority, application France, Jul. 29, 1976, 76 23269

Int. Cl.² B63H *1/30*

U.S. Cl. 115—28 R **8 Claims**



1. In a propelling device for ships or any other vessels or watercraft, comprising at least one surface accommodated within a casing or housing immersed in a fluid and provided with an inlet port and an outlet port for the fluid as well as a lower wall and an upper wall between which the said surface is subjected to a to-and-fro movement while at the same time being allowed to freely oscillate under the action of at least one actuating shaft connected to the said surface by a movable joint, the improvements consisting in that the said surface is constituted by a main blade or wing actuated by the said shaft and located within the outlet-port side of the said casing, the said main blade being connected to at least one smaller leading blade located within the inlet-port side of the said casing, a free space being provided between the said main blade and the said smaller blade, at least the lower wall of the casing being provided with a proximity detector arranged in the region of the said smaller blade.

8. In a propelling device for ships or any other vessels or water craft, comprising at least one surface accommodated within a casing or housing immersed in a fluid and provided with an inlet port and an outlet port for the fluid as well as a lower wall and an upper wall between which the said surface is subjected to a to-and-fro movement while at the same time being allowed to freely oscillate under the action of at least one actuating shaft connected to the said surface by a movable joint, the improvements consisting in that the said surface is constituted by a main blade or wing actuated by the said shaft and located within the outlet-port side of the said casing, the said main blade being connected to at least one smaller leading blade located within the inlet-port side of the said casing, a free space being provided between the said main blade and the said smaller blade, the said main blade being connected to two superposed smaller blades braced or tied together by rods, bars or the like.

4,102,294
COFFEE POT PERK ALARM

Charles R. Barber, Lufkin, Tex., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1977, Ser. No. 791,978

Int. Cl.² A47J *27/212*

U.S. Cl. 116—103 **1 Claim**

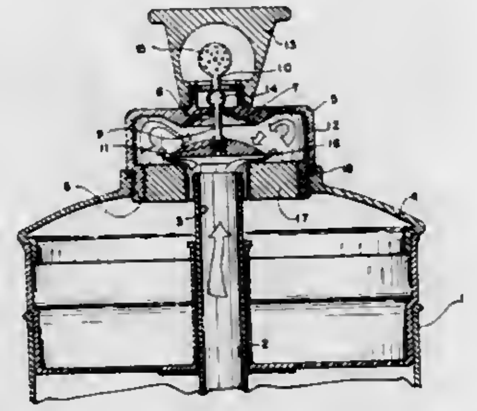
1. A coffee pot perk alarm for a coffee pot having a perforated tube removably positioned essentially coaxially in the pot and extending from the bottom of the pot to the top of the pot whereby water flows upward through the tube to the top thereof and through the top thereof when the coffee perks and a lid removably covering the pot at the top of the tube, said coffee pot perk alarm comprising

an alarm housing coaxially removably coupled to the lid via a hole coaxially formed through the lid, and accommodating the top of the tube coaxially therein, said housing opening into the pot via the hole;

a collar having a coaxial bore formed therethrough provided in the top of the alarm housing, spaced above the lid and in coaxial relation with said lid;

a stem in the housing extending through the bore and having spaced opposite upper and lower ends;

a substantially spherical member coaxially affixed to the stem at an intermediate point thereof and having a diameter greater than the diameter of the bore of the collar and resting in said bore whereby said stem is freely rockable in said collar;



a hollow shell mounted on the stem at the upper end of said stem and having a rattle member encased therein and producing an alarm sound whenever it strikes said shell; and

an actuating member mounted on the stem at the lower end of said stem and being positioned in close proximity with the top of the tube whereby when the coffee perks water flows through the top of the tube and strikes the actuating member producing an oscillatory motion of the stem about the spherical member thereof and causing the rattle member to strike the shell to produce a series of alarm sounds.

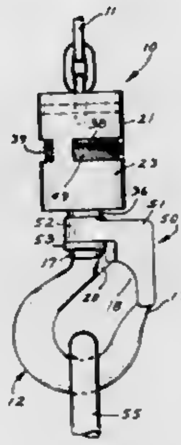
4,102,295
LOAD INDICATING APPARATUS

Edward J. Crook, Jr., Tulsa, and Charles R. Garrett, Collinsville, both of Okla., assignors to American Hoist & Derrick Company, St. Paul, Minn.

Continuation of Ser. No. 573,438, May 1, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,686

Int. Cl.² B66C *1/40*

U.S. Cl. 116—114 R **9 Claims**



1. A load indicator usable with load lifting machinery having a rated load capacity and connectable between a load line and a load handling member of the machinery, said indicator including:

a housing having a generally upright side wall partially defining a chamber, said housing having a lower end closed by an end wall and an upper end connectable to a load line;

said housing end wall being provided with an opening;

first connecting means securing a load line to said housing;

a deflectable plunger assembly located in said chamber and extending therefrom;

said deflectable plunger assembly being vertically movable in said chamber relative to said housing and freely rotatable in said chamber relative to said housing;

said housing side wall being provided with at least one sight opening permitting viewing said plunger assembly in the chamber from outside of the housing;

said plunger assembly having a transverse head with a side wall portion visually distinct from the outside of said housing side wall adjacent the sight opening and vertically intermediately movable in said chamber between a position toward the upper end of the chamber out of view through said opening and a position toward the lower end of the chamber totally covering said opening from within the chamber;

said plunger assembly having rod means secured to the head and extending outward of the chamber and housing through said end wall opening such that vertical movement of that portion of the rod means located outward of the chamber and housing results in directly corresponding movement of the transverse head in the chamber;

second connecting means on the rod means connecting it to a load handling member, said second connecting means including a threaded opening in said rod means in engagement with a threaded shank of the load handling member;

bias means in said chamber disposed between said head and a portion of the housing biasing said head toward the upper end of the chamber to locate said visually distinct side wall portion in the out-of-view position, said bias means including a disc spring located in said chamber assembled in said chamber under a percentage of spring deflection when said side wall portion is in the out-of-view position;

swivel bearing means disposed between said bias means and said portion of the housing to facilitate free rotation of the plunger assembly in said chamber relative to said housing when said plunger assembly is vertically deflected responsive to a load;

said head being vertically movable in said chamber against the action of the biasing means responsive to a tension load between the load line and the load handling member a distance representative of the extent of loading on the load handling member as compared to a rated load capacity toward said position with said side wall portion totally covering said opening;

said bias means being linearly calibrated to provide biasing force equal to a preselected load value upon movement of said visually distinct side wall portion from said out-of-sight position to said position totally covering said opening; and

a circumferential shoulder located on the side wall in the chamber in position to intercept said head and prevent further movement thereof after said side wall portion moves to said position totally covering said opening.

4,102,296
MARINE SAFETY SIGNAL DEVICE

Harold E. Felix, 16142 Mariner Dr., Huntington Beach, Calif. 92649

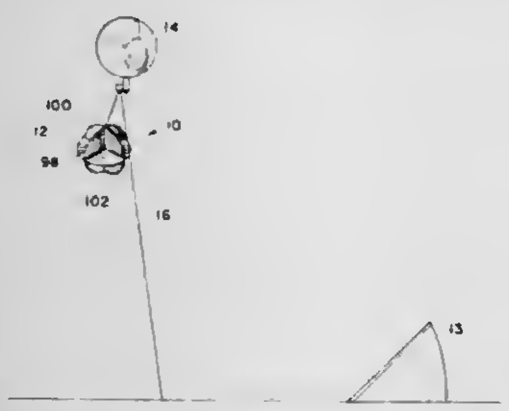
Filed Mar. 16, 1977, Ser. No. 778,044

Int. Cl.² B63B *45/00;* **G09F** *9/00*

U.S. Cl. 116—124 B **1 Claim**

1. A marine safety signal device, which comprises an elongated line member, one end of said line member secured to a boat, a balloon element secured to another end of said line element, said balloon element including an inflatable bladder portion, a cylindrically shaped sleeve having an open end and a closed end, said bladder portion secured into said open end of

said sleeve, a one way check valve element disposed in said closed end of said sleeve, a cylindrically shaped tubular element, one end of said tubular element affixed onto said closed end of said sleeve around said valve, a radar detectable element formed from three perpendicularly intersecting metallic reflecting elements having holes therethrough, said other end of said line member tied through one of said holes, means for inflating said balloon element including a bottle shaped housing having a base with a center opening therethrough, an upwardly extending sidewall and a neck portion, said tubularly shaped element sealed by a water and pressure sensitive adhesive within said neck portion, a needle like piercing element disposed in said cylindrically shaped element and extending outwardly from a free end of said tubular element, a gas cylinder having a base and an upwardly extending sidewall and a neck portion disposed in a chamber of said bottle shaped housing, said gas cylinder having a gas lighter than air disposed therein, a piercable valve element disposed in said neck of said gas valve, means for pushing said gas cylinder forwardly within said bottle shaped housing whereby said piercing element pierces said piercing valve, wherein said pushing means includes a cylindrically shaped rod slidably disposed through said center opening of said base of said bottle shaped housing, a first disc element affixed to one end of said rod within said chamber, said first disc element hitting against said base of said gas cylinder, a second disc element affixed to another end of said rod externally to said bottle shaped housing, means for hitting said disc element having a hammer arm, said hammer arm pivotally mounted in a bracket secured to said boat, said hammer arm having a head at one end thereof, said head hitting against said second disc element, a spring element, said spring element communicating between said boat and said hammer arm, means for maintaining said hammer arm in a cocked position including a water soluble thermoplastic rod, said water soluble rod secured between said boat and another end of said hammer arm, said rod dissolved by water to release said bammer arm from said cocked position.



4,102,297
ACOUSTICAL SIGNAL APPARATUS

Francis X. Reilly, Lyndhurst, N.J., assignor to Leslie Co., Parsippany, N.J.

Filed Apr. 15, 1977, Ser. No. 787,972

Int. Cl.² G10K *9/04*

U.S. Cl. 116—142 FP **9 Claims**

1. An acoustical signal apparatus, comprising:

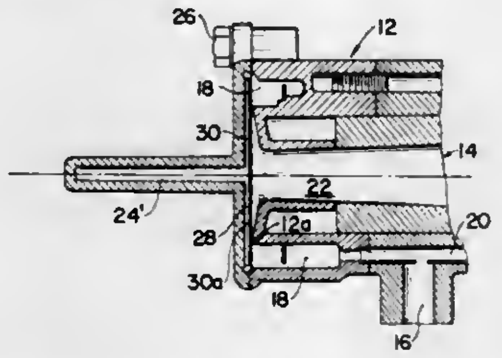
a housing having an inlet for receiving a pressure medium to operate the apparatus and having an outlet for the pressure medium;

a first chamber connected to said inlet and said outlet for receiving said pressure medium from said inlet;

a sound-emitting horn connected to said housing for receiving said pressure medium from said outlet and having a predetermined horn frequency;

an elongated resonating chamber having one end in continuous fluid communication with said housing and the other end continuously closed;

a diaphragm connected to said housing between said first chamber and said resonating chamber for oscillating movement in response to pressure changes in said first chamber and said resonating chamber, said diaphragm including means for controlling the flow of said pressure medium from said first chamber to said outlet and to said horn, said diaphragm having a natural frequency higher than said horn frequency;



said resonating chamber selected to be of a size such that when filled with said pressure medium, it has a characteristic frequency which has a tuning effect on said diaphragm to prevent said diaphragm from vibrating at its natural frequency so that said diaphragm is forced to vibrate at said horn frequency.

4,102,298
DEVICE FOR DEPOSITION OF SEMI-CONDUCTOR MATERIAL

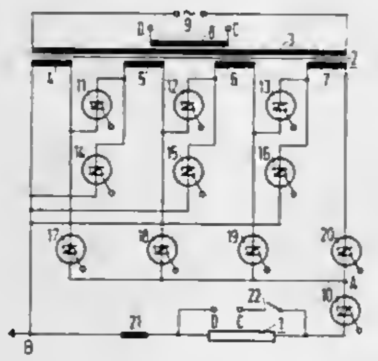
Wolfgang Dietze, Munich, and Hans Stut, Groebenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 10, 1976, Ser. No. 694,717

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1975, 2528192

Int. Cl.² C23C *13/04;* **H05B** *1/02*

U.S. Cl. 118—5 **18 Claims**



1. A device for the deposition of semiconductor material, in particular silicon, from a reaction gas permitting the thermal separation of the respective semiconductor material and the deposition upon the surface of a rod-shaped carrier made of semiconductor material which is heated within the reaction gas, in which the rod-shaped carrier, for the heating thereof, is supplied from a supply line over a remote-control electronic switch, with heating current from an alternating voltage source, with the heating current controlled over an auxiliary voltage actuating the remote-control electronic switch, the combination of a transformer having a primary winding adapted to be connected to an A.C. voltage source, said transformer having at least two separate secondary windings of like electrical characteristics, which can be applied in series with the rod-shaped carrier, remote-control electronic switches for selectively connecting said windings in series with the rod-shaped carrier whereby said carrier is selectively connected with an individual secondary winding, a plurality of secondary windings connected in series and/or parallel relation, a zero-voltage oscillation control unit, at least one electronic switch, controlling the flow of heating current through the rod-shaped

carrier, controlled by said zero-voltage oscillation control unit, and an electronic threshold-value switch, responsive to current flow through said rod-shaped carrier, for controlling said remote-control switches to determine the secondary winding or windings operatively connected to said rod-shaped carrier, whereby different voltage-current relationships may be provided thereat.

4,102,299
APPARATUS FOR APPLYING A COATING COMPOSITION ONTO A MOVING WEB

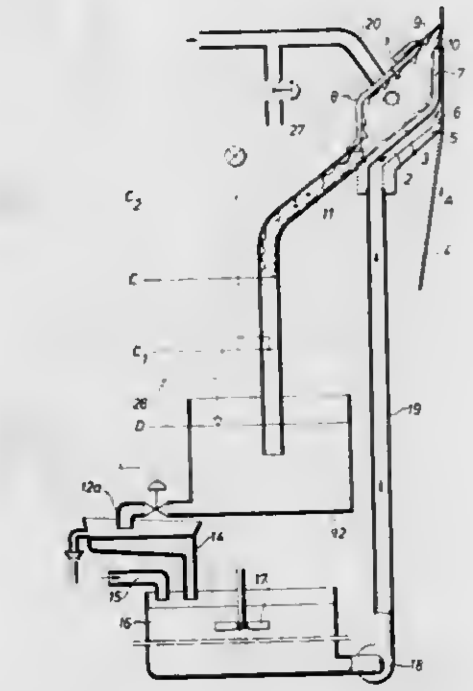
Hans Ivar Wallstén, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Oct. 15, 1975, Ser. No. 622,493

Claims priority, application Sweden, Oct. 16, 1974, 7413043

Int. Cl.² B05C *5/02, 11/04*

U.S. Cl. 118—50 **13 Claims**



1. Apparatus for applying a coating composition to a continuously moving web comprising:

applicator means for applying said coating composition in amounts well in excess of the desired final coating amount;

smoothing means positioned a spaced distance from said applicator means and including a smoothing means housing defining a hollow chamber and a smoothing slot along one side of said housing, said slot being arranged transverse to the direction of movement of the web;

the trailing edge of said slot being formed by a thin flexible blade having a free edge engaging said web for smoothing the coating and removing the excess composition applied to the web, said blade forming an acute angle with the portion of the web moving over said slot;

vacuum means communicating with said hollow chamber and being regulated to draw the web against said slot and thereby control the thickness of the coating applied to the web as well as totally avoiding the need for any backing member for urging the web against the smoothing means slot;

composition removal means communicating with said smoothing chamber for carrying the excess composition out of said chamber;

the excess amount of composition being sufficient to wash solid matter away from the blade and thereby keep the region of the blade smoothing edge free of solid matter;

said applicator means comprising a second housing having a chamber and an elongated applicator slot arranged transverse to the direction of movement of the web whereby the web moves across said applicator slot to receive coating composition prior to smoothing thereof;

the applicator slot and the smoothing slot being separated by a spaced distance, one of said housings having a wall extending between said slots and having an exterior surface facing the moving web and having a length greater than the length of both slots measured in the direction of movement of the web.

4,102,300
APPARATUS FOR CONTINUOUSLY COATING A METAL WIRE AT HIGH VELOCITY

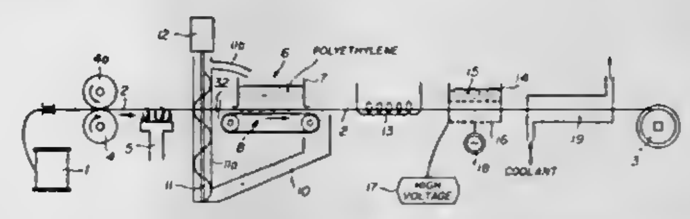
Philippe Robert, Epalinges, Switzerland; Claude Guignard, St. Genis Pouilly, France, and Francis Stagoll, Grand-Lancy, Switzerland, assignors to S.A. des Câbleries & Tréfileries de Cossonay, Cossonay Gare; Société d'Exploitation des Câbles Electriques, Cortaillod and Câbleries de Brugg S.A., Brugg, all of, Switzerland

Division of Ser. No. 605,053, Aug. 15, 1975. This application Dec. 8, 1976, Ser. No. 748,773

Claims priority, application Switzerland, Aug. 16, 1974, 11223/74

Int. Cl.² B05C *19/00*

U.S. Cl. 118—67 **9 Claims**



1. An apparatus for coating a metal wire with thermoplastic material, comprising:

a supply station and a take-up station defining a path for a wire stretched therebetween;

feed means engaging said wire for continuously longitudinally advancing same along said path at an absolute velocity exceeding a threshold value above which a surrounding mass of stationary thermoplastic particles would exert a significant abrasive effect;

a treatment chamber between said stations traversed by said wire and filled with a mass of thermoplastic particles;

preheating means along said path upstream of said treatment chamber for raising the temperature of said wire to a level sufficient to cause adherence of some of said particles thereto;

transport means independent of said feed means disposed at least partly in said chamber for continuously moving at least a portion of said mass proximal to said wire codirectionally therewith at a speed different from the velocity of said wire but with a speed difference less than said threshold value to prevent the occurrence of said abrasive effect; and

reheating means along said path downstream of said treatment chamber for fusing adhering particles on said wire into a continuous envelope.

4,102,301
APPARATUS FOR COATING PLASTIC FILM

Grahame Melvin Reade, Wheathampstead, and Alan Charles Viney, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 506,544, Sep. 16, 1974, Pat. No. 4,002,780, which is a continuation-in-part of Ser. No. 235,718, Mar. 17, 1972, abandoned. This application Oct. 22, 1976, Ser. No. 735,121

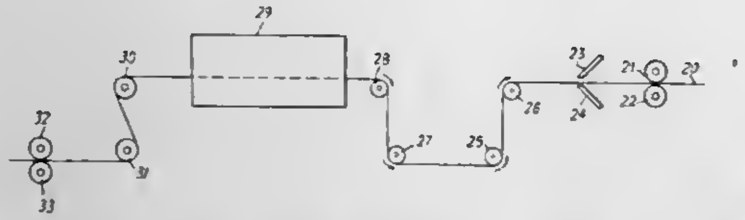
Claims priority, application United Kingdom, Mar. 26, 1971, 7910/71

Int. Cl.² B05C *5/02, 11/02*

U.S. Cl. 118—67 **4 Claims**

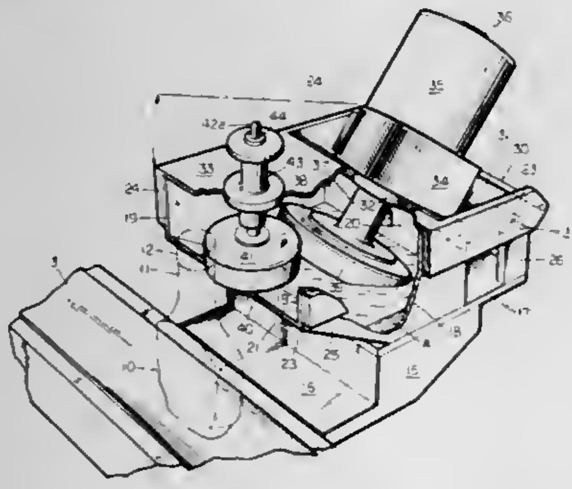
1. A device for coating tubular plastics film in lay-flat form comprising two groups each containing a plurality of nozzles substantially equally spaced apart through each of which flowable coating material may be extruded at substantially the same

rate, means for advancing the tubular film in lay-flat form along a path lengthwise between said groups and past said nozzles to receive a plurality of lines of the coating material spaced across each surface of the film, and at least two spreading rollers spaced apart long said path and in contact with each surface of the film, said rollers rotating in a direction contrary to the direction of advancement of said surfaces, for applying to said surfaces a pressure sufficient to spread and merge the deposited lines of coating material upon said surfaces.



4,102,302
ADHESIVE APPLICATOR DEVICE

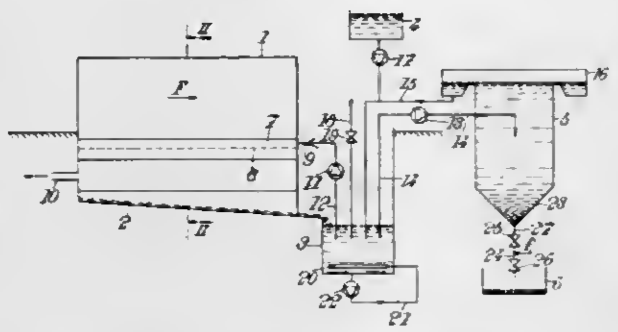
Stephen W. Amberg, and John F. Spicer, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 2, 1977, Ser. No. 773,648
Int. Cl.^{2} B05C *1/02*
U.S. Cl. 118—239 **6 Claims**



1. The combination comprising
a horizontal power driven conveyor span supporting a plurality of bottles in vertical upright position in a spaced apart series for movement in a single file succession past an adhesive applying station,
a lateral frame at said applying station,
an adhesive application device supported on said frame comprising
a container for a body of liquid adhesive supported on said frame,
a generally horizontal support means pivotally connected to said frame overlying said adhesive body in said container and rotatable between an active adhesive applying position and a rotated remote position,
a feed wheel including a beveled outer peripheral surface,
a shaft connected to said wheel for rotation of the latter about its central axis, said shaft being supported in a vertically inclined position on said horizontal support means, said feed wheel being similarly inclined in adhesive applying position for rotation of a portion of its peripheral surface in the adhesive body,
a motor drive means mounted on said support means and connected to rotate said shaft,
an applicator roller including a substantially cylindrical outer peripheral surface and a central vertical shaft supporting said roller for free rotation, said vertical shaft being rotably supported on said horizontal support means, and
a support for said vertical roller shaft connected to said overlapping pivotal horizontal support means to maintain the peripheral surface of said roller in running engagement with the beveled surface of the feed wheel and engageable while in the active adhesive applying position with the exterior surface of bottles at the adhesive applying station.

4,102,303
PROCESS AND PAINT SPRAY BOOTH USING A WASHING LIQUID AND REUSE THEREOF

André Guy Cordier, Montrouge, and John George Stockholm, Vernouillet, both of France, assignors to Air Industrie, Courbevoie, France
Filed Nov. 6, 1975, Ser. No. 629,417
Claims priority, application France, Nov. 18, 1974, 74 37934
Int. Cl.^{2} B05B *1/28*
U.S. Cl. 118—326 **6 Claims**



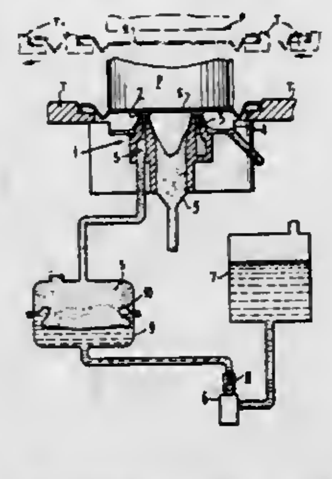
1. A process for purification of a gas laden with fine paint particles, comprising washing by a liquid in which the fine paint particles are non-miscible comprising passing the particle laden gas through the washing liquid, collecting the liquid which has washed the gas, and which is laden with fine particles in suspension, and dividing the washing liquid laden with fine particles into two streams of different flow rates, a first stream which is recycled to said washing step from the collection without undergoing substantial settling, and a second stream which is of a lesser flow rate than that of the first stream and which undergoes settling during which the particles in suspension are separated from the liquid itself, the second liquid now being cleaned, and combining and recycling the clean second liquid with the first recycled liquid to the washing step.

4,102,304
APPARATUS FOR APPLICATION OF SEALANT

Michael Debenham, Frankston, Australia, assignor to The Broken Hill Proprietary Company, Limited, Melbourne, Australia
Continuation of Ser. No. 466,057, May 1, 1974, abandoned. This application Jun. 21, 1976, Ser. No. 697,844
Claims priority, application Australia, May 1, 1973, 3155/73
Int. Cl.^{2} B05C *5/00;* **B21D** *51/46*
U.S. Cl. 118—421 **12 Claims**

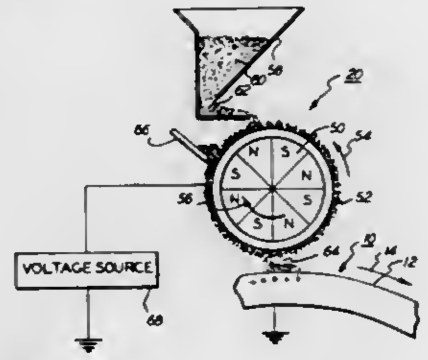
1. Apparatus for applying substantially uniform amounts of sealant material to container members, said apparatus comprising a sealant transfer head and container member holding means for holding and aligning a container member over the transfer head, said transfer head including sealant transfer face means for continuously forming a meniscus of sealant during periods between sealant transfers, a part of the meniscus transferable to said container member, said face means and said meniscus having a configuration generally corresponding to the area of the container member that is to be covered by sealant, said transfer head also including sealant supply means opening to said face means for continuously supplying amounts of sealant thereto, said sealant transfer face means and said sealant supply means cooperating so that said sealant supply

means provides to said sealant transfer face means sealant in an amount which in the interval between successive sealant applications to the next container member exceeds the amount of sealant required to cover a given container member area, and said sealant on said transfer face means continuously forms said meniscus of sealant during periods between said sealant transfers, and excess sealant removal means for removing excess sealant by permitting the same to at least initially flow away from said transfer face means to thereby leave a substantially uniform amount of sealant in the form of a meniscus of the transfer face means, said transfer head and said container member holding means cooperating to cause a container member to periodically contact said sealant meniscus in order to transfer a substantially uniform amount of sealant from said transfer head to said container member to cover said container member area with sealant.



4,102,305
DEVELOPMENT SYSTEM WITH ELECTRICAL FIELD GENERATING MEANS

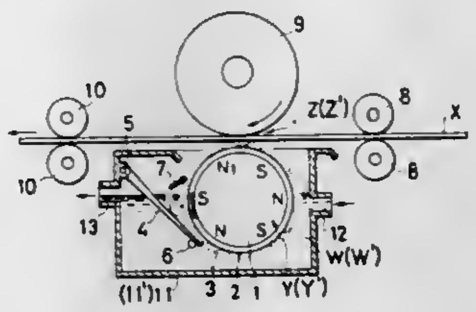
William M. Schwarz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 1, 1977, Ser. No. 812,216
Int. Cl.^{2} G03G *15/09*
U.S. Cl. 118—651 **14 Claims**



1. An apparatus for developing a latent image with particles having the resistivity thereof varying as a function of the electrical field applied thereto, including:
means for depositing the particles on the latent image; and
means for generating an electrical field between the latent image and said depositing means, said generating means forming a constant electrical field with an alternating electrical field superimposed thereover with the alternating electrical field having a peak amplitude sufficient to render the particles substantially conductive.

4,102,306
DEVELOPING ROLLER AND RINSING DEVICE

Tatsuo Ohta, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed May 10, 1977, Ser. No. 795,629
Claims priority, application Japan, May 31, 1976, 51-62401; May 31, 1976, 51-62402
Int. Cl.^{2} G03G *21/00, 15/10, 15/09*
U.S. Cl. 118—658 **8 Claims**



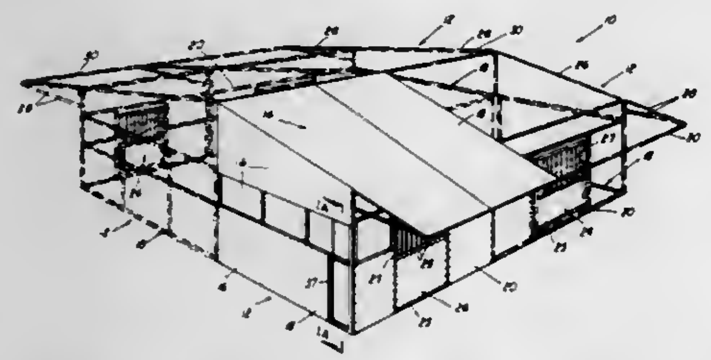
1. In an electrophotographic apparatus, a device for developing or rinsing an electrostatic image bearing surface with a liquid at a contact zone wherein said liquid is brought into contact with said image bearing surface only at said zone, comprising:
at least one roller comprising a stationary magnetic member having a plurality of magnetic poles located at predetermined positions around periphery of said magnetic member, a non-magnetic cylindrical member surrounding said stationary magnetic member and adapted to rotate along the outer periphery of said magnetic member, and a magnetic brush of magnetic particles formed on the surface of the rotatable non-magnetic member for carrying the liquid to the contact zone;
an agitating plate located downstream of the contact zone and adjustably arranged at an interval from the roller for scraping the magnetic brush after it has been rotated past the contact zone to remove liquid from the surface of said magnetic brush;
a cutting blade located downstream of said agitating plate and arranged at an adjustable interval from the roller for adjusting the thickness of the magnetic brush; and
means for imbuing the adjusted portion of the magnetic brush with said liquid located downstream from said cutting blade so that liquid of substantially uniform concentration is brought into contact with the electrostatic image bearing surface at the contact zone by rotation of the non-magnetic member.

4,102,307
PORTABLE LIVESTOCK STALL

Richard D. Cusick, and Larry W. Wall, both of Wichita, Kans., assignors to Kansas Stall Company, Inc., Wichita, Kans.
Filed Sep. 13, 1976, Ser. No. 722,786
Int. Cl.^{2} A01K *1/00*
U.S. Cl. 119—16 **8 Claims**

1. A portable livestock stall for installing on top of the ground surface, the stall comprising:
a pair of vertical, tubular, parallel side wall frames;
a vertical, tubular center wall frame;
a vertical, tubular front wall frame parallel to said center wall frame and having a door pivotally attached thereto;
a plurality of pins received in tubular sleeves attached to the ends of said wall frames for connecting together the ends of said side wall frames to the ends of said front wall frame and said center wall frame thereby forming a stall frame, said pins being of sufficient length for extending through said tubular sleeves adjacent the ground surface and into the ground surface for securing the stall thereto;

flexible padding disposed between the inner and outer sides of said wall frames; and

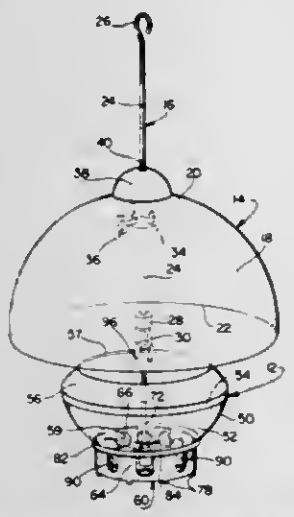


flexible fabric attached to the inner and outer sides of said wall frames for retaining said padding therein and enclosing said stall frame.

4,102,308
BIRD FEEDER

Peter Kilham, Foster, R.I., assignor to Droll Yankees, Inc., Foster, R.I.

Filed Sep. 8, 1976, Ser. No. 722,069
Int. Cl.² A01K *39/00*
U.S. Cl. 119—52 R **26 Claims**



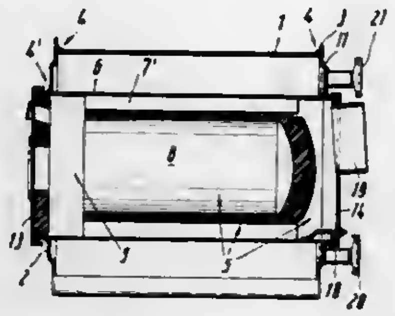
18. A bird feeder and the like comprising a feed assembly including means for storing and dispensing feed, a protective outwardly flared hood member positioned thereabove and laterally terminating beyond the extent of said assembly, connection means for interconnecting and positioning said hood member and said feed assembly with respect to each other, said connection means including a relatively rigid primary rod passing through said bood and a second relatively rigid rod, the upper terminus of which is directly pivotally interconnected to said primary rod at the lower terminus thereof, said secondary rod further supporting said feed assembly for free swinging movement independent of movement of said hood.

4,102,309
BOILER FOR LIQUID OR GASEOUS FUELS

Hans Viessmann, Battenberg, Eder, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,534
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552388
Int. Cl.² F22B *7/00*
U.S. Cl. 122—136 R **6 Claims**

1. A water boiler comprising, in combination:
(a) a housing for holding the water to be boiled and comprised of
  (1) a front wall,
  (2) a rear wall,
  (3) a side wall extending between the front wall and the rear wall, the front and rear walls defining apertures surrounded by outwardly flaring edges, and
  (4) external fillet weld seams connecting the side wall fluid-tightly to the front and rear walls,
(b) a tube mounted in the apertures of the front and rear walls, the tube defining outer and inner surfaces, the outer surface of the tube defining a water chamber with the housing, and the tube having opposite ends protruding, respectively, beyond the front and rear walls,
  (1) the tube consisting of a sheet metal blank having two abutting edges extending the length of the tube,
(c) external fillet weld seams connecting the outwardly flaring edges of the rear and front wall apertures fluid-tightly to the protruding ends of the tube,

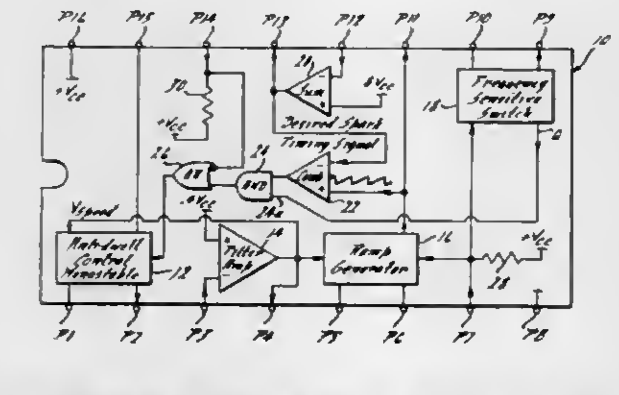


(d) circumferentially spaced and longitudinally extending sheet metal profiles affixed to the inner surface of the tube,
(e) an external, longitudinally extending weld seam fluid-tightly connecting the abutting edges of the sheet metal blank between two adjacent ones of the profiles,
(f) a housing defining a fuel combustion chamber mounted within the tube and surrounded by the sheet metal profiles, the combustion chamber being in communication with the sheet metal profiles whereby the profiles operate as flues for combustion gases generated in the combustion chamber,
(g) a fuel burner inlet arranged to burn fuel in the combustion chamber, and
(h) a combustion gas discharge in communication with the flues for removing the combustion gases.

4,102,310
ELECTRONIC CIRCUIT FOR USE IN A VARIETY OF ENGINE CONTROL SYSTEMS

LaVerne A. Caron, Sterling Heights, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 20, 1976, Ser. No. 752,493
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **17 Claims**

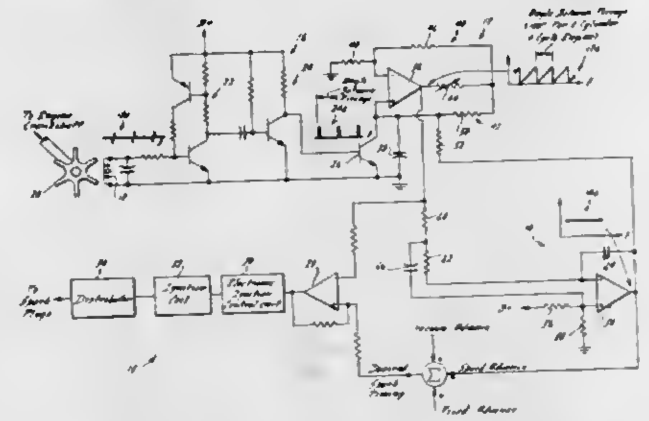


1. In an internal combustion engine, an electronic engine timing control circuit for providing control of an engine function comprising:
an output stage which is switched from one state to another state for producing an output signal;
an output terminal connected with said output stage at which said output signal is given;
a first input terminal receiving a variable frequency trigger signal representative of engine speed;
a second input terminal receiving a variable frequency trigger signal representative of engine speed;
a third input terminal receiving a desired timing signal derived from at least one parameter useful in controlling said engine function and representing desired timing of said output signal; and
circuit means coupling said three input terminals and said output stage such that the trigger signal at said first input terminal always causes said output stage to produce said output signal so long as said output stage is in its one state at the time that the effect of the trigger signal received at said first input terminal is felt by said output stage, and when the trigger signal at said second input terminal has a frequency greater than a selected frequency, the desired timing signal controls, at least in part, the time at which said output stage produces said output signal; and
utilization means coupled to said output terminal for providing control of said engine function by said output signal.

4,102,311
CIRCUIT FOR GENERATING A SAWTOOTH ENGINE CRANK ANGLE SIGNAL AND AN ANALOG ENGINE SPEED SIGNAL

Frederick William Crall, Farmington; Lawrence William Tomczak, and LaVerne Andrew Caron, both of Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 30, 1975, Ser. No. 545,274
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **3 Claims**

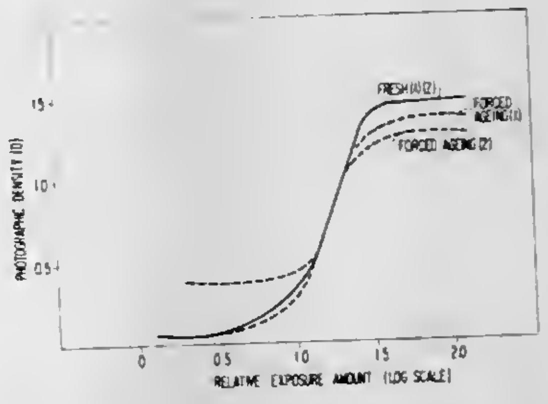


1. In an electronic engine spark timing controller for controlling the timing of spark ignition in an internal combustion engine, the combination comprising:
a closed-loop regulated sawtooth generator comprising an integrator circuit which provides an output signal having a magnitude which changes as a given linear function of time and is periodically reset to an initial value at predetermined engine crank angles to thereby develop a sawtooth waveform whose frequency is representative of the speed of the engine;
a comparator circuit having input circuit means and output circuit means;
a reference circuit for providing a reference signal whose magnitude is representative of a magnitude of said sawtooth waveform which is desired immediately prior to the resetting of said integrator circuit;
means operatively coupling said reference and integrator circuits to the input circuit means of said comparator circuit so that said reference signal and said sawtooth waveform may be compared by said comparator circuit, said comparator circuit including means for providing at its output circuit means an adjustment signal whose magnitude is a function of the comparison between said reference signal and the actual magnitude of said sawtooth waveform immediately prior to the resetting of said integrator circuit, and means operatively coupled with the output circuit means of said comparator circuit for feeding back said said adjustment signal to said integrator circuit to cause the actual magnitude of said sawtooth waveform immediately prior to resetting of said integrator circuit to be closed-loop regulated to said desired magnitude thereof over a range of engine operating speeds;
an adjustable calibration element operatively coupled in said integrator circuit for adjusting the gain thereof to cause the magnitude of said adjustment signal to bear a desired relationship to the frequency of said sawtooth waveform without affecting the linearity of the output signal of said integrator circuit or said desired magnitude to which said sawtooth waveform is closed-loop regulated;
and means for controlling the engine spark timing including means for controlling the engine spark timing in accordance with the magnitude of said adjustment signal;
wherein said integrator circuit comprises an operational amplifier having a pair of inputs and an output, a coupling circuit connecting said operational amplifier output with one of said operational amplifier inputs, a second coupling circuit connecting said operational amplifier output with the other of said operational amplifier inputs, said adjustable calibration element being connected in common with both said coupling circuits, and
a capacitor operatively connected in one of said coupling circuits and arranged so that the charging rate thereof controls the rate of change of the output signal of said integrator circuit, and
wherein said comparator circuit includes an operational amplifier and a resistor connected in the output thereof to provide an adjustable current source which produces said adjustment signal.

4,102,312
THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIALS

Kenji Sashihara, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 30, 1975, Ser. No. 627,315
Int. Cl.² G03C *1/02, 1/00, 3/00, 1/30*
U.S. Cl. 96—114.1 **12 Claims**



1. In a thermally developable light-sensitive material comprising a support having thereon at least one layer containing at least (1) an organic silver salt, (b) a light-sensitive silver halide or a component capable of forming a light-sensitive silver halide and (c) a reducing agent, the improvement which comprises tbe material further comprising (d)(i) a palladium-containing compound in at least one layer provided on the support or (d)(ii) a palladium-containing compound in the support, wherein said palladium-containing compound is present in an amount of about 10^{-8} to about 10^{-2} mole per mole of the organic silver salt, and, said palladium-containing compound has the general formula:

$$Pd\ (R_1COCHCOR_2)_2$$

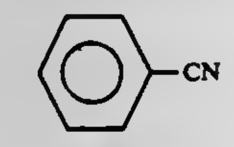
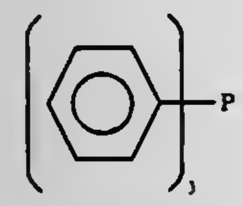
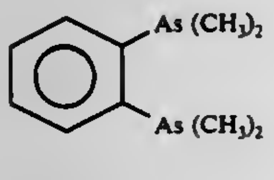
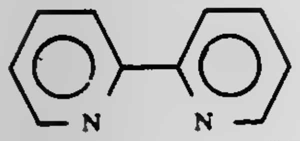
wherein R_1 and R_2 have the following meaning:

R_1	R_2
C_6H_5	C_6H_5
C_6H_5	CH_3
CH_3	CH_3
CF_3	CH_3

or has the general formula:

L_2PdX_2

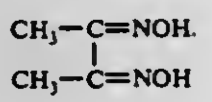
wherein L and X have the following meaning:

L	X
$C_6H_5CH_2SCH_2C_6H_5$	Cl
	Cl
$CH_2{=}CHCN$	Cl
	Cl
$(C_2H_5)_3\,P$	Br
	I
	Cl

or has the general formula:

$Pd\,(DMGH)_2$

wherein DMGH:

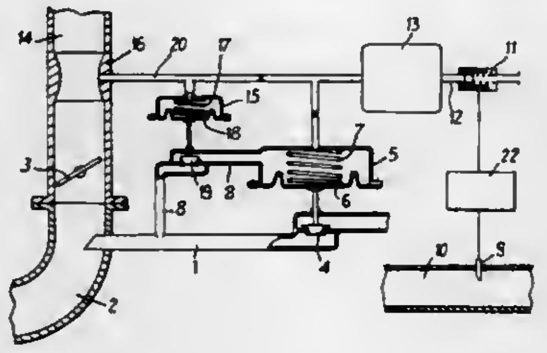


$$\begin{array}{l} CH_3{-}C{=}NOH. \\ \quad\;\; | \\ CH_3{-}C{=}NOH \end{array}$$

4,102,313
DEVICE FOR THE REGULATION OF THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

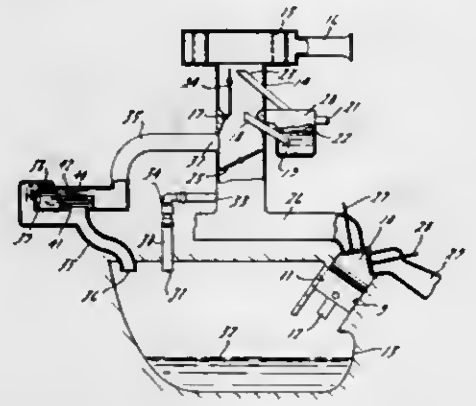
Bernard R. Laprade; Xavier J. Laprade, both of Arudy, and Pierre J. Gele, 3, rue Vaussenat, Tarbes, all of France
Filed Jun. 15, 1976, Ser. No. 696,189
Claims priority, application France, Jun. 18, 1975, 75 19077
Int. Cl.² F02M *7/20*
U.S. Cl. 123—119 EC **7 Claims**

1. A device for the regulation of the air-fuel mixture of internal combustion engines comprising a gas inlet opening into the inlet manifold downstream of the throttle valve for the control of the air flow, said gas inlet being controlled by a valve controlled by a capsule comprising a movable member held by an elastic return device, said movable member being subject to the partial vacuum prevailing in the manifold, the partial vacuum being itself modulated firstly as a function of the air flowrate in the inlet pipe and secondly as a function of the composition of the exhaust gases by an electromagnetic valve arranged in a pipe connecting the capsule to the atmosphere.



4,102,314
CRANKCASE VENTILATION

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Mar. 30, 1977, Ser. No. 782,671
Int. Cl.² F02F *9/00*
U.S. Cl. 123—119 B **6 Claims**



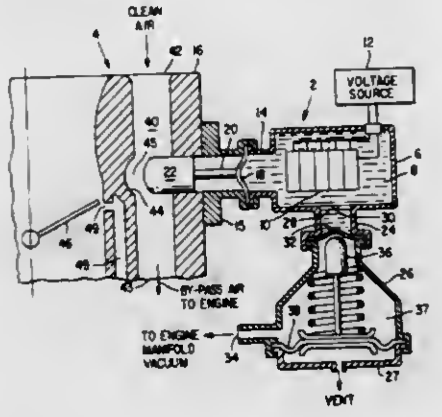
1. In an internal combustion engine having a combustion chamber comprising a cylinder opening into a crankcase, a piston movable within said cylinder and separating the combustion chamber from the crankcase, a fuel-air supply conduit, throttle means in said conduit, means for effecting a mixture of fuel and air in a predetermined ratio in said conduit upstream of said throttle means, and means for connecting said conduit downstream of said throttle means with said combustion chamber for supplying said mixture thereto, the combination of means for recirculating piston blow-by gases from said crankcase into said supply conduit at approximately said predetermined ratio of fuel and air comprising first conduit means for connecting said crankcase with said supply conduit at a location downstream of said throttle means, and second conduit means connecting said crankcase with said supply conduit at a location upstream of said throttle means for supplying said mixture to said crankcase whenever the pressure in the latter is less than the pressure upstream of said throttle means.

4,102,315
PROPORTIONAL CONTROLLER FOR CONTROLLING AIR FLOW TO AN ENGINE

Magdi M. Fahim, Rochester, Mich., and William D. Marscher, Coventry, Conn., assignors to The Bendix Corporation, Southfield, Mich.
Filed Jan. 14, 1977, Ser. No. 759,309
Int. Cl.² F02M *23/04, 23/10*
U.S. Cl. 123—124 B **10 Claims**

1. A proportional controller for controlling air flow to an engine during engine start-up and warm-up periods, comprising:

valve means including a valve member positioned in an engine air flow channel in cooperative relation therewith to provide an air flow control orifice, the valve position initially dependent upon the volume of a thermoexpansive and incompressible material sensitive to ambient temperature conditions, with the orifice area and air flow thereupon being at a maximum;

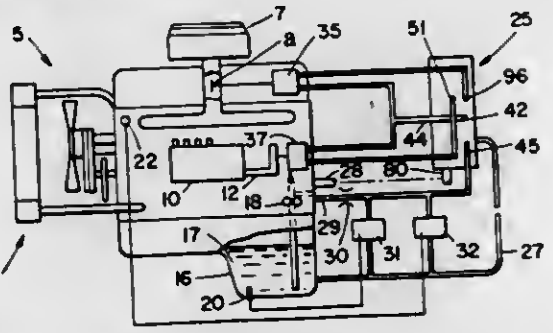


first means responsive to engine manifold vacuum during the engine start-up period for displacing the valve in the channel to reduce the orifice area and the flow of air after the engine starts, said first means displacing said valve by acting on said thermoexpansive material; and

second means in cooperative relation with the valve means for displacing the valve member in the channel during engine warm-up to ultimately close the orifice and block the flow of air through the channel when the engine is fully warmed up, said second means displacing said valve by acting on said thermoexpansive material.

4,102,316
HYDROMECHANICAL SHUTOFF FOR AN INTERNAL COMBUSTION ENGINE

Gary Glen Valbert, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 7, 1977, Ser. No. 785,632
Int. Cl.² F02B *77/08*
U.S. Cl. 123—198 DB **27 Claims**



1. In an internal combustion engine having fuel shutoff means and air shutoff means each operable for respectively blocking fuel and air supply to the engine, the engine further having a pressurized lubrication system and a liquid coolant system; an engine shutoff device comprising:

a housing;

an unpressurized source of fluid;

engine driven fluid pump means mounted in said housing for pressurizing said fluid;

the housing defining first circuit passage means for communicating pressurized fluid from the engine driven pump means to the source;

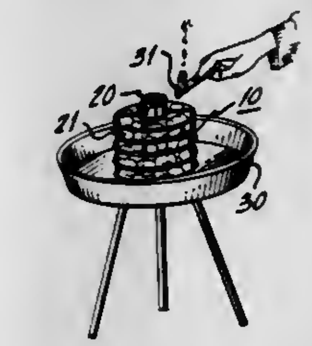
first valve means interposed in said first circuit passage means and operably responsive to engine oil pressure for allowing communication of pressurized fluid from said engine driven pump means to said source while said engine oil pressure is greater than a first predetermined pressure;

second valve means also interposed in said first circuit passage means in a parallel arrangement with said first valve means and operably responsive to engine oil pressure for allowing communication of pressurized fluid from said engine driven pump to said source while said engine pressure is greater than a second predetermined pressure, the second predetermined pressure being greater than said first predetermined pressure; and,

fuel lock means responsive to pressure in said first circuit passage means for operating the fuel shutoff means to block fuel to said engine.

4,102,317
APPARATUS FOR IGNITING CHARCOAL BRIQUETTES

John R. Shonnard, 5 Wells La., East Setauket, N.Y. 11733, and Rocco J. Natale, 57 Glenwood Dr., Hauppauge, N.Y. 11787
Filed Feb. 16, 1977, Ser. No. 769,407
Int. Cl.² F24B *3/00*
U.S. Cl. 126—25 B **9 Claims**



1. Apparatus for igniting charcoal briquettes or similar fuels, comprising:

a frame member comprising a right and a left vertical bracket each of an "L" shaped configuration with the inverted top ends of said "L"s facing each other; a plurality of spaced rings, each of said spaced rings secured to said brackets and transverse to said brackets to form a longitudinal tubular housing member, a smaller ring positioned at said top end of said housing, said smaller ring secured to said top ends of said right and left brackets and positioned relatively coaxially to said rings; a horizontal bar located near said bottom end of said housing and positioned relatively on a diameter of one of said spaced rings and including a central projection on said bar, a combustible tubular flue member, said tubular flue member positioned within and encircled by said smaller ring at one end and surrounding said projection of said horizontal bar at said other end, said housing adapted to accommodate a plurality of charcoal briquettes positioned within the space between said rings and said flue, to cause said briquettes to ignite when said flue is burned.

4,102,318
STRATIFIED COMBUSTION FURNACE

Paul W. Runquist, 1030 Neil Creek Rd., Ashland, Oreg. 97520
Filed Nov. 4, 1976, Ser. No. 738,733
Int. Cl.² F24H *3/10*
U.S. Cl. 126—103 **6 Claims**

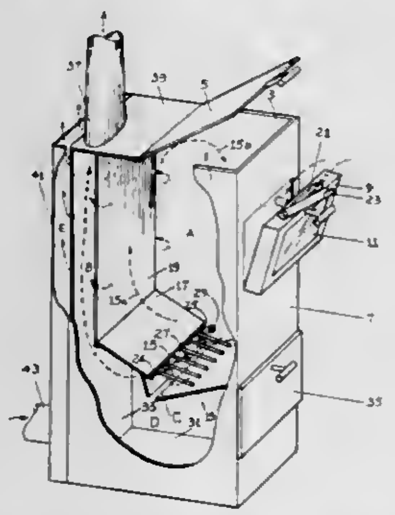
1. A plural stage, log burning, down draft heating apparatus for heating and delivering clean air to enclosed areas of a building comprising, in combination,

(a) a primary combustion chamber of generally uniform rectangular horizontal cross-section through which solid fuel, such as logs, and air may be supplied for the purpose of combustion, and having an outlet substantially narrowed in one horizontal dimension only for the products of combustion at its lower extremity,

(b) a grate of much smaller width than the unreduced horizontal width of the primary combustion chamber, disposed across said outlet, through which grate embers of restricted size and most of the gaseous products of combustion are required to pass downward,

(c) convergent means in said combustion chamber for funneling solid fuel onto the grate,

(d) means located beneath the grate for intercepting embers that fall through the grate and detaining them until they have been burned down to much smaller dimensions than the maximum that can be passed by the grate, so that a secondary down draft combustion chamber is provided,



(e) a bottom receptacle communicating with said secondary combustion chamber for the reception and accumulation of ashes and the transmission of the gaseous products of combustion, and

(f) upwardly extending gas discharge means communicating with the bottom receptacle and extending above the down draft heating apparatus for inducing the gaseous products of combustion to flow downward through the primary and secondary combustion chambers into said bottom receptacle and for discharging them thence upward into the atmosphere.

4,102,319

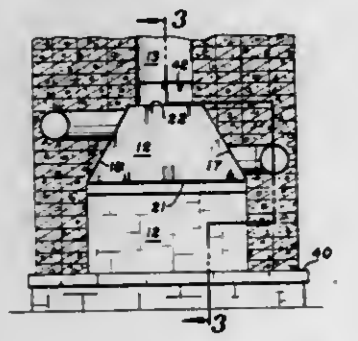
FIREPLACE ROOM HEATER

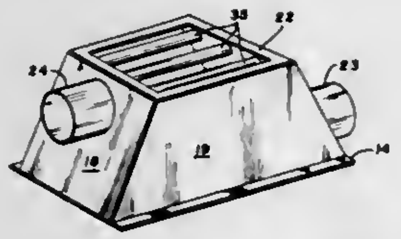
Linus J. Koopmeiners, St. Cloud, Minn., assignor to The Gran-A-Stone Company, St. Cloud, Minn.

Filed Nov. 15, 1976, Ser. No. 741,709

Int. Cl.² F24B *7/04*

U.S. Cl. 126—121 **2 Claims**





1. Fireplace room heater means comprising:

(a) a generally pyramidal hooded shell member adapted to be mounted in a fireplace flue, said shell member comprising an outer front wall, an outer rear wall and first and second side walls each sloping inwardly and upwardly to define a generally rectangular open bottom and a generally rectangular open top of a smaller perimeter than that of said open bottom and a pair of inner walls including an inner front wall and an inner rear wall, said inner front wall being generally parallel to and spaced apart from said outer front wall to form an intake air manifold therebetween, said inner rear wall being generally parallel to and spaced apart from said outer rear wall to form an exhaust air manifold therebetween, said inner walls being spaced apart from one another to define a flue zone thereacross;

(b) an inlet port in communication with the base portion of said intake manifold, and an outlet port in communication with the upper portion of said exhaust manifold, and a plurality of duct means extending across said flue zone and being in communication with said intake manifold and exhaust manifold respectively;

(c) said duct means being arranged in generally axially parallel relationship in a plurality of rows, with the individual members of each row being arranged in predetermined stacked and staggered relationship relative to the individual members in adjacent rows, and with the individual members in adjacent rows being axially offset, one from the other, said ducts extending along an inclined axis from said intake manifold to said exhaust manifold, and with the duct axis of the ducts of each individual row being spaced apart vertically a distance generally equal to twice the outer duct diameter; and

(d) a top row of ducts extending across and coupling the upper portion of said manifolds, one to the other, and with the duct axis of the ducts of said top row being offset from the duct axis of the ducts of the next adjacent row.

4,102,320

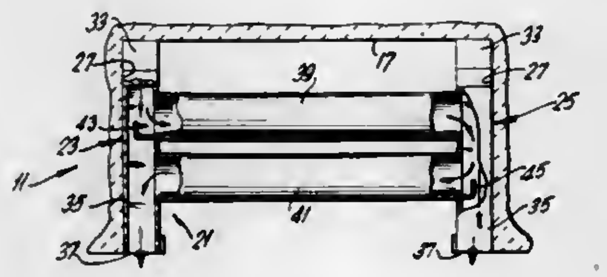
FIREPLACE HEAT EXCHANGER

Anthony Mastropole, East Meredith, N.Y. 13757

Filed May 13, 1977, Ser. No. 796,692

Int. Cl.² F24B *7/04*

U.S. Cl. 126—121 **10 Claims**



1. A heat exchanger for installation in a fireplace comprising:

a left U-shaped side section and a right U-shaped side section each having a lower duct, a riser duct and an upper duct, the lower duct and the upper duct of each respective U-shaped side section being substantially parallel with one another and both lower ducts and both upper ducts having an outer end and an inner end, each outer end being open, each riser duct being inclined generally upwardly, and being connected at its upper end to the inner end of its respective upper duct and at its lower end to the inner end of its respective lower duct, said left and right U-shaped sections being spaced apart to permit a source of heat to be placed between the two U-shaped side sections;

a rear horizontal duct connected at one end to the upper duct of the left U-shaped side section adjacent the inner end of the upper duct and at the other end to the upper duct of the right U-shaped side section adjacent to the inner end of the upper duct;

a forward horizontal duct located adjacent the rear horizontal duct toward the open ends of said upper duct and lower duct and being connected at one end to the upper duct of the left U-shaped side section and at the other end to the upper duct of the right U-shaped side section; and baffle means for deflecting air from the left U-shaped side section and the right U-shaped side section into the rear horizontal duct and the forward horizontal duct.

4,102,321

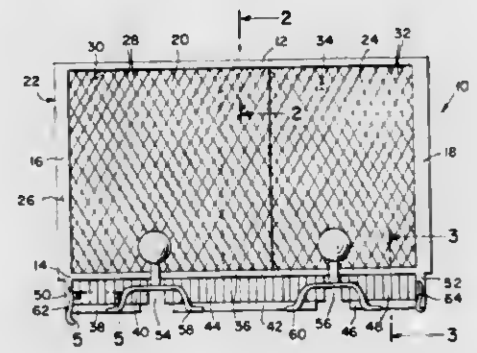
FIREPLACE SCREEN

Norman Githens, 8 Dolphin Dr., Massapequa, N.Y. 11758

Filed Mar. 2, 1977, Ser. No. 773,598

Int. Cl.² F24C *15/12*

U.S. Cl. 126—140 **5 Claims**



1. A fireplace screen adapted to fit over an opening of a fireplace to be in front of a fuel burning space thereof comprising:

a rigid supportive frame having front and rear face portions and including rigid top, bottom and opposite-side channel members fixedly connected to one another;

a first solid rigid sheet fixedly secured to said rigid supportive frame intermediate said front face portion and said rear face portion;

a second solid rigid sheet slidably affixed to said frame intermediate said front face portion and said rear face portion;

means to removably secure said rear face portion to a ferromagnetic material bordering said opening of said fireplace; and

at least three foldable accordian-like members slidably affixed to said bottom channel member, said at least three members extensible in length providing a pair of passageways when partially fully extended and providing a substantially continuous uninterrupted surface when fully extended.

4,102,322

OVEN DOOR CONSTRUCTION

John T. Dooer, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 16, 1976, Ser. No. 696,532

Int. Cl.² F23M *7/04*

U.S. Cl. 126—198 **19 Claims**

1. An oven door structure comprising:

a front panel having a window opening;

a rear panel having a rearwardly recessed window opening;

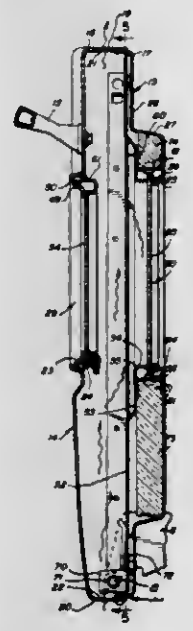
panel securing means for securing said panels in parallel spaced relationship with said window openings aligned and defining an air flow space therebetween;

means for providing a cooling air flow through said space; a front viewing panel assembly having a front light transmitting viewing panel;

front viewing panel assembly securing means removably swingably mounting said front viewing panel assembly to said front panel to cause said front viewing panel to extend across said front panel window opening, said front viewing panel assembly having frame means extending rearwardly into said space;

a rear viewing panel assembly having a rear light transmitting viewing panel; and

rear viewing panel assembly securing means for readily removably securing said rear viewing panel assembly to said rear panel to extend across said rearwardly recessed rear panel window opening, said front viewing panel assembly frame means being spaced fully forwardly of said rear viewing panel assembly whereby said air flow space is effectively unobstructed between said frame means and said rear viewing panel assembly, said frame means defining means for causing a portion of the cooling air flow to be deflected rearwardly to the recessed rear viewing panel for effective cooling of the rear viewing panel assembly notwithstanding the recessed disposition thereof, the air flow space having substantially maximum width between said viewing panels.



4,102,323

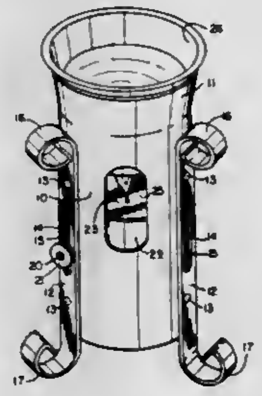
HEATER FOR BUTTER AND THE LIKE

Peter G. Pritz, c/o Trico Non Ferrous Metal Products, Inc., Wyandotte Rd., Willow Grove, Pa. 19090

Filed Dec. 12, 1977, Ser. No. 859,691

Int. Cl.² A47G *23/04*

U.S. Cl. 126—261 **5 Claims**



1. A heater for a receptacle whose contents are to be heated comprising

a hollow vertical cylindrical housing having a wall with a flaring upper wall portion for the support thereon of the receptacle and a lower wall portion,

a plurality of vertical strips secured to said housing wall and having lower leg portions extending below and outwardly with respect to the lower portion of said housing wall and at least one of said strips having a handle means extending outwardly from its upper end and contiguous to said upper wall portion,

a shelf within said housing having a mounting bracket secured thereto,

a heating member supported on said shelf, and members for controlling the positioning of said shelf comprising

a threaded stud carried by said mounting bracking and extending through an upwardly extending slot in said housing wall, and

a nut on said stud for clamping said shelf at a desired position of vertical adjustment.

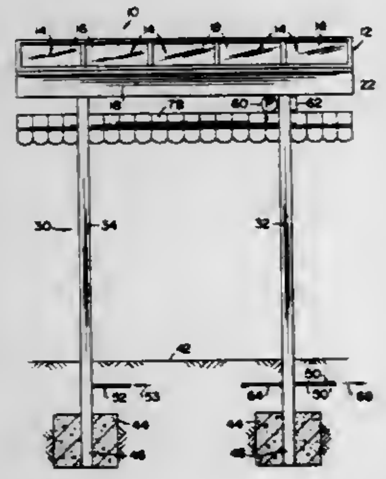
4,102,324
SOLAR HEATING ASSEMBLY

Oliver E. Netherton, 119 N. Arcturas Ave., Clearwater, Fla. 33515

Filed Jul. 23, 1976, Ser. No. 708,213

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



1. A solar heating assembly of the type primarily used to heat fluid from solar radiant energy and utilized in combination with brace means of the type adapted for attachment to a predetermined surface, said combination comprising: a collector assembly including a casing and a fluid conduit means disposed within said casing, said casing including an inner wall surface defined by a plurality of panel members disposed in substantially angular orientation relative to one another, said casing further comprising a facing portion disposed to define a substantially enclosed interior of the casing relative to the plurality of panel members; conduit connection means connected substantially adjacent said facing portion and disposed to extend into the interior space of said casing, said fluid conduit means connected to said conduit connection means and disposed in substantially suspended relation therefrom into the interior space of said casing and in spaced apart relation from each of said plurality of panel members; said brace means comprising a plurality of support columns disposed in laterally spaced relation from one another, said brace means connected in supporting relation to said casing and said support columns disposed at least in part between said casing and the predetermined surface on which said brace means are mounted; and an interconnecting conduit disposed in interconnecting fluid communicating relation between said fluid conduit means within said casing at a point of delivery of the heated fluid, at least one of said support columns having a substantially hollow interior configuration extended along at least a portion of its length, said interconnecting conduit disposed on the interior of said one support column for at least a portion of its length, whereby the rise in temperature within said casing is caused by exposure of said fluid conduit means to solar radiant energy causing the heating of fluid within said fluid conduit means mounted within said casing and disposed in predetermined relation to a supporting surface by said support columns.

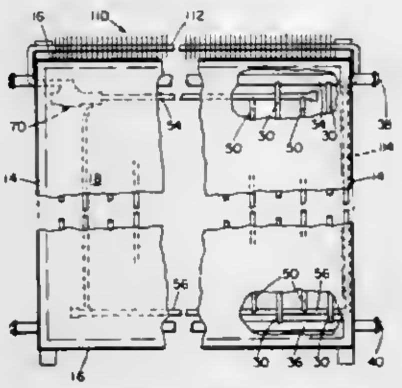
4,102,325
TEMPERATURE CONTROL IN SOLAR-TO-THERMAL ENERGY CONVERTERS

Richard D. Cummings, Reading, Mass., assignor to Daystar Corporation, Burlington, Mass.

Filed May 4, 1977, Ser. No. 793,495

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **13 Claims**



1. In a solar-to-thermal energy converter comprising an insulating frame, a solar energy absorber mounted in said frame, fluid flow heat exchange means thermally coupled to said absorber to carry away as thermal energy the absorbed solar energy, and a window transmissive to solar energy mounted in said frame above said absorber, that improvement consisting of a temperature actuated heat loss enhancer comprising

fluid flow heat pickup means thermally coupled to said absorber,

an exterior heat rejector element,

fluid flow heat rejection means thermally coupled to said element, and

a thermally actuated valve connected between said pickup and rejection means to form a fluid flow circuit separate from said fluid flow heat exchange means and powered by heat-produced differential buoyancy forces of the fluid therein when said valve is open.

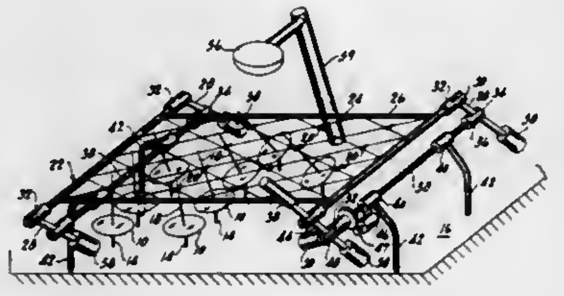
4,102,326
CENTRAL RECEIVER SOLAR COLLECTOR USING MECHANICALLY LINKED MIRRORS

Warren T. Sommer, 2608 N. Humboldt Blvd., Milwaukee, Wis. 53212

Filed Sep. 28, 1977, Ser. No. 837,181

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **19 Claims**



1. A solar radiation collector utilizing mechanically linked mirrors to provide radiation concentration, comprising:

(a) a radiation receiver,

(b) a first rigid structure substantially greater in dimensional extent in at least one dimension than the dimentions of the radiation receiver, the first rigid structure being generally fixed with respect to the radiation receiver at a position displaced from the radiation receiver along a line normal to the directions of major dimensional extent of the first rigid structure,

(c) a first plurality of articulated joints carried by the first rigid structure, the joints allowing free rotation in any direction within a substantial range of angular positions,

(d) a plurality of mirrors, each mirror being coupled to and rotatable about an individual joint of the first plurality of articulated joints so that, when properly oriented, each of the mirrors may reflect radiation from a radiation source onto the radiation receiver,

(e) a second rigid structure which is translatably movable in three mutually perpendicular directions with respect to the first rigid structure, with the motion being constrained so that each point on the second rigid structure generally moves over a spherical surface particular to that point,

(f) a plurality of positional guides carried by the second rigid structure, each individual positional guide being paired with an individual joint of the first plurality of articulated joints in that each positional guide is disposed with respect to the second rigid structure in such a way that the particular spherical surface to which a positional guide is constrained contains an articulated joint of the first plurality of joints, with the articulated joint positioned at the intersection with the spherical surface of a straight line which passes through the position of the radiation receiver and the center of the particular sphere of constraint,

(g) a plurality of linear guide members, each coupled to an individual articulated joint of the first plurality of joints and extending to the positional guide associated with that particular joint, with the positional guide slidably engaging the linear guide member and with each linear guide member adapted to orient the individual mirror associated with that particular joint to a position normal to the linear guide member, and

(h) means for moving the second rigid structure, in response to changes in the angular position of the sun, so that each positional guide lies along a line which passes through the center of the particular sphere of constraint for that positional guide and is aligned in the direction of the sun.

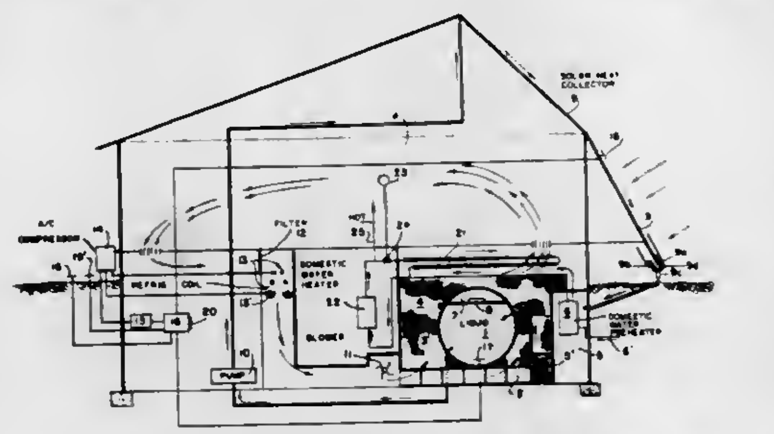
4,102,327
SOLAR HEATING (COOLING) SYSTEM

Harry E. Thomason, 6802 Walker Mill Rd., SE., Washington, D.C. 20027

Filed Sep. 18, 1973, Ser. No. 398,323

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **5 Claims**



1. Combination heat storage (cold storage) and auxiliary heating apparatus comprising a container having liquid space adjacent to the bottom for heat storage and an air space adjacent to the top for auxiliary heat, means between said liquid space and said air space substantially separating said spaces, means for circulating liquid from said liquid space to a source of heat for warming and back to said liquid space for storage, means for supplying auxiliary heat to said air space to supplement stored heat from said liquid space, and means to channel air to be heated to an area adjacent to the bottom of said container and up around said container for preheating said air and adjacent to the top of said container for adding heat to said air by said auxiliary heat means.

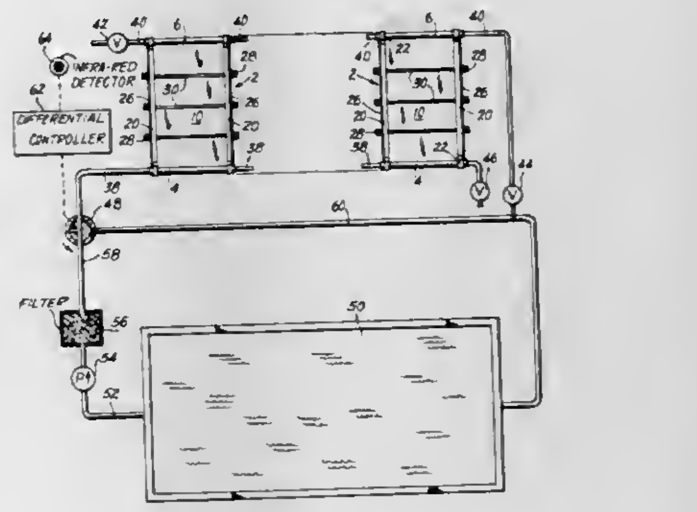
4,102,328
SOLAR HEATING AND CONTROL SYSTEM

John E. Stiff, 3111 S. Valley View, Las Vegas, Nev. 89102

Filed Aug. 2, 1976, Ser. No. 710,799

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **4 Claims**



1. A solar energy collector panel array, each panel comprising:

a tubular inlet header and a tubular outlet header, said headers being arranged in spaced parallel relation and each having a longitudinal slot in the side thereof facing the other header, said slots being of less length than said headers and terminating inwardly of the ends thereof;

a generally planar matrix panel comprising spaced parallel sheets, one of which is black and the other of which is clear and a multiplicity of parallel partitions extending between said sheets to define adjacent flow channels having open ends at opposite ends of said matrix panel, the width of said matrix panel transverse to said flow channels being substantially equal to the length of said slots in said headers;

said opposite ends of said matrix panel extending through said slots in respective headers and being sealed thereto and said flow channels being free of constrictions to provide unobstructed communication between the interiors of said inlet and outlet headers;

said array of panels being arranged with panels in side-by-side relation, first conduit means interconnecting adjacent unslotted ends of said inlet headers, second conduit means interconnecting adjacent unslotted ends of said outlet headers, and pump means for circulating a heat absorbing fluid medium from a supply thereof to said inlet headers, through said flow channels to said outlet headers and back to said supply;

means for selectively directing said medium from said pump means to said inlet headers or directly back to said supply;

means for sensing the intensity of infrared radiation in the vicinity of said array of panels and providing a first signal proportional to said intensity;

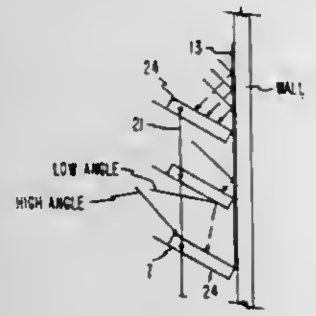
means for sensing the temperature of said medium in said supply and providing a second signal proportional to said temperature; and

means for comparing said first and second signals and for controlling said valve means to direct medium from said pump means to said inlet headers only when said infrared radiation is sufficient to further heat said medium from said supply.

4,102,329
SYSTEM FOR COLLECTING SOLAR ENERGY

Arthur V. Smith, Jr., 6525 Independence St., Arvada, Colo. 80004

Filed Mar. 24, 1977, Ser. No. 780,769
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **17 Claims**

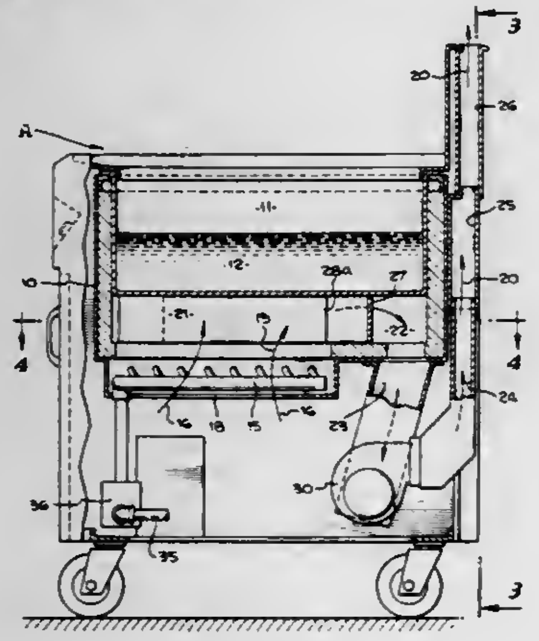


1. A system for collecting solar energy comprising:
(a) a plurality of solar energy collecting units each of said units comprising;
a flat planar solar reflecting support surface,
enclosure means having a flat planar solar reflecting outer surface and an inside surface opposite to said reflecting surface for mounting solar energy collecting means,
means for pivotally mounting the enclosure means to the support surface for rotation with respect to said support surface about a pivotal axis,
solar energy collecting means mounted within said enclosure means between said inside surface and said support surface for collecting solar energy,
(b) whereby said solar energy collecting units can be mounted to a structure side by side such that each enclosure means can be positioned such that the collector means are enclosed and protected or can be rotated about its pivotal axis for aligning its collecting means to direct sunlight and to reflected sunlight from the support surface and from the outer reflecting surface of the enclosure means on an adjacent unit.

4,102,330
LIQUID VAT HEATING APPARATUS

Donald D. Hutchinson, 229 Montreal, Playa del Rey, Calif. 90291

Continuation of Ser. No. 685,693, May 12, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,294
Int. Cl.^{2} A47J *27/00*
U.S. Cl. 126—374 **6 Claims**

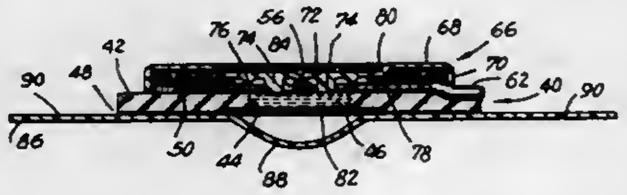


1. A heating apparatus including
a vat filled with liquid that is to be heated;
a combustion chamber including a housing disposed at least partially beneath the vat in thermal communication therewith;
a gas burner disposed within the combustion chamber;
the chamber housing having air inlet means cooperating with and below the elevation of the burner for supplying fresh air thereto and an exhaust passageway coupled to the combustion chamber for conducting therefrom substantially all of the heated air and combustion products generated by the burner;
and means for selectively turning the burner on and off;
said exhaust passageway including a first portion in direct communication with and extending downwardly from said combustion chamber to an elevation lower than the lowest elevation of said chamber, and a second portion if direct communication with said first portion at said lowest elevation thereof below said chamber and extending upwardly to an elevation higher than said gas burner;
a blower fan operatively connected to said combustion chamber and operable for moving the heated air and combustion products in said combustion chamber through said exhaust passageway; and
control means coupled to said burner and to said blower fan and cooperable with said selective on-off means for turning off said blower fan whenever said gas burner is turned off.

4,102,331
DEVICE FOR TRANSMITTING ELECTRICAL ENERGY

Joseph Grayzel, Englewood, and William Terrell, Scotch Plains, both of N.J., assignors to Datascope Corporation, Paramus, N.J.

Filed Sep. 21, 1976, Ser. No. 725,326
Int. Cl.^{2} A61B *5/04*
U.S. Cl. 128—2.1 E **16 Claims**

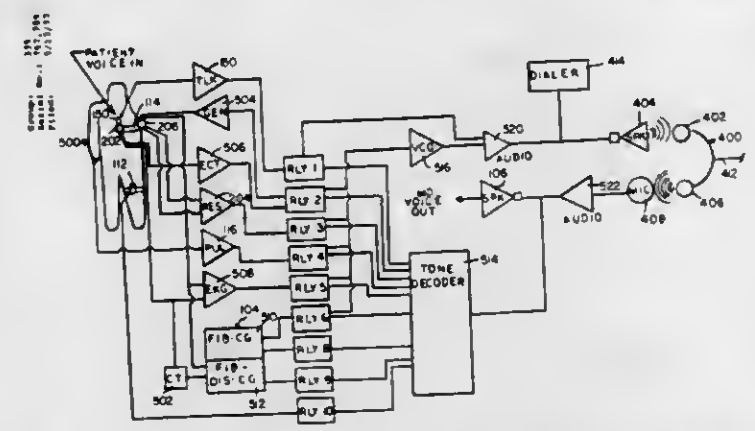


1. In a device for transmitting electrical energy, support means having an outer face adapted to be placed in engagement with a surface such as a human skin surface, said support means having an outer peripheral edge surrounding said outer face thereof and being formed inwardly of said outer peripheral edge with an opening extending at least partly into said support means from said outer face thereof, an electrically-conductive gel situated in said opening of said support means and being at least partly exposed at said outer face of said support means for engaging and making electrical contact with the surface engaged by said outer face of said support means, at least one carbon yarn having an unattached, non-insulated, exposed portion situated at said opening in said gel and engaged thereby for making electrical contact therewith, electrical insulation means covering said carbon yarn at the region of the non-insulated portion thereof situated in said gel, said insulation means being fixed to and carried by said support means for supporting said carbon yarn through said insulation means while protecting said carbon yarn from mechanical stresses, said yarn together with said insulation means having a length sufficiently great to extend through a substantial distance beyond said support means, and said carbon yarn carrying at an end portion distant from said portion in said gel a contact means for making electrical contact with an electrical instrument or the like, said contact means being situated next to an end of said insulation means which is distant from said non-insulated portion of said carbon yarn.

4,102,332
REMOTE, TELEPHONIC CARDIAC RESUSCITATION DEVICE

Lawreoce J. Gessman, 21 Sabine Ave., Narberth, Pa. 19072

Filed May 17, 1977, Ser. No. 797,754
Int. Cl.^{2} A61N *1/36*
U.S. Cl. 128—2.1 A **24 Claims**

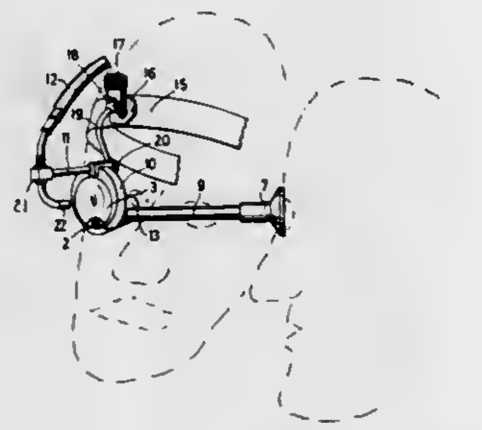


18. A remote, telephonic, cardiac resuscitation apparatus comprising a portable, patient-operatable portion and a remote physician-operatable portion, said physician operatable portion comprising:
(a) an acoustic telephone coupler;
(b) means for decoding physiological data received in the form of a variable pitch from said acoustic coupler;
(c) means for displaying said data to said physician; and
(d) means for transmitting coded tones to said acoustic coupler for selecting the physiologic data to be collected by said patient operatable portion, and for providing commands to said patient operatable portion to treat said patient.

4,102,333
HEAD MOUNTED LAMP WITH JOINT OBSERVATION EYEPIECE

Karl Storz, Auf dem Schildrain 29, 7200 Tuttlingen, Fed. Rep. of Germany

Continuation of Ser. No. 615,789, Sep. 22, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,017
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2530939
Int. Cl.^{2} A61B *1/06*
U.S. Cl. 128—6 **2 Claims**

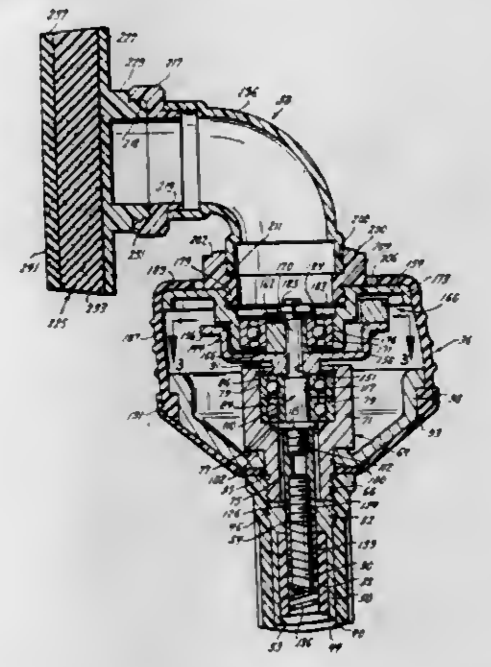


1. A head mounted lamp with joint observation eyepiece comprising
(a) a head band arranged for removable support on a person's head,
(b) a depending support secured on said head band for universal adjustment,
(c) a mirror,
(d) a prism,
(e) an elongated housing having a mounting support provided at the forward end thereof,
(f) said mirror positioned within said mounting support,
(g) means securing said mounting support on a lower portion of said depending support for locating said mounting support and housing below said head band adjacent to one eye of the wearer,
(h) lighting means on said depending support for illuminating said mirror,
(i) means defining a single viewing passageway through said housing and mirror providing a viewing path which opens at the rear of said housing and which is arranged to be disposed at the eye of the wearer of the head band,
(j) said prism in said housing disposed in said viewing path,
(k) a tube secured at one of its ends adjacent to the end of said housing and projecting at approximately a right angle from said housing,
(l) the interior of said tube at said one end communicating with the viewing path through said housing,
(m) said prism having a branch viewing path extending through said tube,
(n) and an eyepiece on the other end of said tube,
(o) said tube being of a length sufficient such that a second person has a viewing location at the eyepiece on said tube out of the way of and at an angle to the person wearing the head band.

4,102,334
MASSAGE UNIT

Thomas Peter Mochlsky, 12153 Queen's Charter Ct., Creve Coeur, Mo. 63141

Filed Dec. 14, 1976, Ser. No. 750,507
Int. Cl.^{2} A61H *1/00*
U.S. Cl. 128—36 **7 Claims**



1. A massage apparatus operable by a human for therapeutic application to a patient comprising:
(a) a base section having a portion to be gripped by the human;
(b) a member mounted eccentrically on the base for eccentric rotation while the grippable base section portion is stationary;
(c) drive linkage extending through the grippable portion and engaged with the eccentric member to rotate the eccentric member while the base is stationary;
(d) an application surface to be applied to the body of the patient;
(e) an elbow member having a first end connected to the eccentric member for orbital movement of said first end, and a second offset end connected to the application surface to revolve the application surface by orbital move-

ment of said first end while the grippable portion is stationary.

4,102,335

MALE POTENCY DEVICE

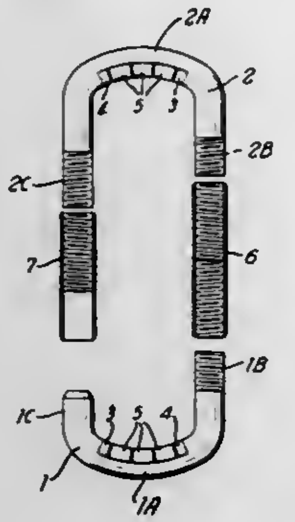
Robert John Woodward, 29 Calfside, Cheam, Surrey, and Walter O'Connell, 63 Garden Ave., Mitcham, Surrey, both of England

Filed Dec. 28, 1976, Ser. No. 755,072

Claims priority, application United Kingdom, Dec. 30, 1975, 53156/75

Int. Cl.^{2} A61F *5/00*

U.S. Cl. 128—68.1 **17 Claims**



1. A male potency device, comprising a ring member adapted to surround the male genitalia and comprising a first straight side and a second straight side separated by curved sides, at least one pair of metallic surfaces of metals having different electrode potentials located on an internal circumference of the ring member and adapted to remain in contact with the male genitalia when the device is worn, a first adjusting means incorporated in the first straight side whereby the circumference of the ring member may be varied by a predetermined amount, and a second adjusting means incorporated in the second straight side and adapted to bring about a like variation in the circumference of the ring member to that brought about by operation of the first adjusting means.

4,102,336

APPARATUS FOR TRACTION THERAPY

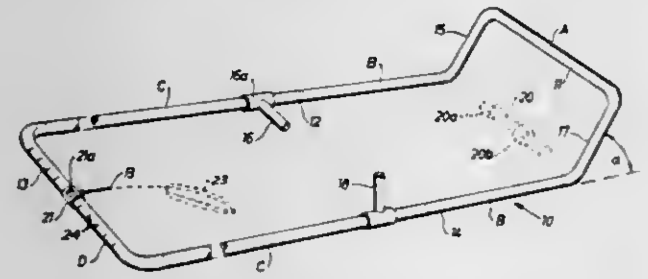
Ingrid Wiener, and Hans Wiener, both of 13, Rystavägen, Täby, Sweden

Filed Aug. 26, 1976, Ser. No. 717,608

Claims priority, application Sweden, Aug. 26, 1975, 7509452; Aug. 26, 1975, 7509453; Jun. 23, 1976, 7607276

Int. Cl.^{2} A61H *1/02*

U.S. Cl. 128—75 **16 Claims**



1. An exercising apparatus for the application of traction to the body of a user, comprising:

a rigid frame adapted to slide on a generally horizontal supporting surface, said frame having a pair of parallel limbs interconnected by at least one transverse member and separated by a distance greater than the width of the user's body;

strap means engageable with the user's body;

fastening means for securing said strap means to said frame, said fastening means including a looped link and a sleeve slidably surrounding said transverse member, said sleeve being longitudinally split between a pair of confronting formations engaged by said looped link; and

a pair of handgrips on said limbs within reach of a user recumbent therebetween on said supporting surface and tied to said frame by said strap means whereby traction can be exerted upon the user's body with simultaneous clamping of said sleeve to said transverse member by the tensioning of said looped link.

4,102,337

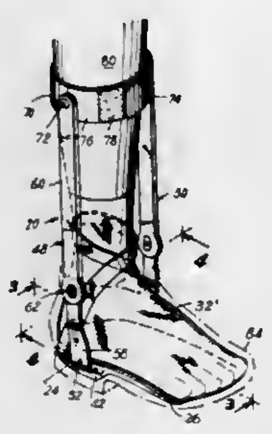
BELOW KNEE ORTHOSIS

Salvatore Golia, 63-71 77 Place, Middle Village, Long Island, N.Y. 11379

Filed Jan. 26, 1977, Ser. No. 765,942

Int. Cl.^{2} A61F *3/00*

U.S. Cl. 128—80 E **9 Claims**



1. A brace comprising foot plate means having a front toe region, a rear heel region, and an intermediate arch region, said foot plate means having an upper surface adapted to be situated beneath a foot, and said foot plate means being formed with at least one transverse slot situated beneath said upper surface and extending inwardly from a side of said foot plate means at a location situated at the rear of said intermediate arch region but forwardly of a rear end of said heel region of said foot plate means, upright bar means having a lower substantially L-shaped bar portion provided with a lower substantially horizontal leg adapted to be received in said slot and with a substantially upright leg extending upwardly from said lower leg, said upright bar means also having an upper bar portion extending upwardly from said upright leg of said lower bar portion, said upright bar means including a pivot means interconnecting said upper bar portion at a lower end region thereof and said lower bar portion at an upper end region thereof pivotally to each other for providing a given degree of turning of said upper bar portion with respect to said lower bar portion about an axis extending transversely across said foot plate means, said upper bar portion of said upright bar means terminating in an upper end region distant from said lower bar portion, upper strap means connected with said upper end region of said upper bar portion for encircling a leg above the ankle thereof for securing said upright bar means at said upper end region of said upper bar portion thereof to a leg, and ankle strap means operatively connected with said foot plate means to the rear of said slot for securing said foot plate means to a foot at the region of an ankle thereof, said foot plate means, upright bar means, upper strap means, and ankle strap means forming a unit of separate from a shoe and capable of being removably inserted into a shoe, so that said unit can be used with different shoes, said foot plate means being formed to the rear of said slot beneath said upper surface of said foot plate means with an additional slot extending transversely of said foot plate means for receiving a part of said ankle strap means.

4,102,338

HARDENABLE SHEET MATERIALS

Robert Sydney Richard Parker, Little Hallingbury, Near Bishop's Stortford, England, assignor to National Research Development Corporation, England

Continuation of Ser. No. 525,731, Nov. 21, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,309

Claims priority, application United Kingdom, Nov. 29, 1973, 55471/73

Int. Cl.^{2} A61F *5/04*

U.S. Cl. 128—90 **37 Claims**

1. A water-hardenable sheet useful as a splinting material for portions of the human and animal anatomy which comprises a flexible web having adhered thereto a cement-forming material, said cement-forming material comprising a water-soluble poly(carboxylic acid) or a precursor thereof that forms a poly(-carboxylic acid) on contact with water and an ion-leachable inorganic particulate material, which together form a cement upon contact with water, said cement-forming material being present in an amount sufficient to form a splinting material for portions of the human or animal anatomy upon the addition of the amount of water necessary to harden said sheet.

4,102,339

DEVICES FOR TENSIONING SURGICAL APPLIANCES

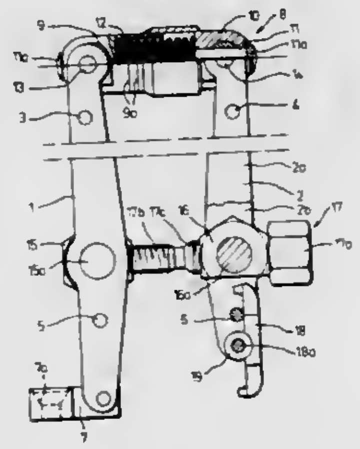
Bernhard Georg Weber, St. Gall, and Beat Flury, Holstein, both of Switzerland, assignors to Synthes AG, Switzerland

Filed Mar. 17, 1977, Ser. No. 778,374

Claims priority, application Switzerland, Mar. 26, 1976, 3801/76

Int. Cl.^{2} A61B *17/18;* **A61F** *5/04*

U.S. Cl. 128—92 E **14 Claims**



10. A surgical tensioning device comprising a first and second lever means, an anchor means pivotally connected to one end of one of said lever means, a hook means pivotally connected to a corresponding end of other lever means, means for articulatedly connecting the other ends of the respective levers, and means connected intermediate the ends of said first and second lever for adjusting the spacing between said anchor means and hook means.

4,102,340

DISPOSABLE ARTICLE WITH PARTICULATE HYDROPHILIC POLYMER IN AN ABSORBENT BED

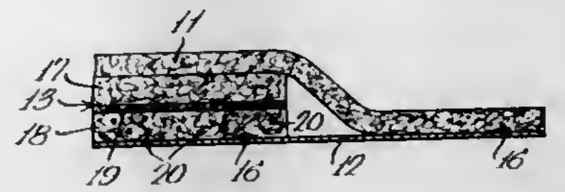
Frederick K. Mesek, Downers Grove, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 531,130, Dec. 9, 1974, abandoned. This application May 9, 1977, Ser. No. 795,149

Int. Cl.^{2} A61F *13/16*

U.S. Cl. 128—287 **25 Claims**

1. An absorbent article of manufacture having a multi-layer absorbent pad means, a moisture-impervious backing sheet on one side of the absorbent pad means, and a porous moisture-impermeable facing sheet overlying the other side of the absorbent pad means; said absorbent pad means comprising a fibrous structure having an intermediate densified fibrous layer, a layer of highly porous, loosely-compacted batt on each side of the densified layer, and a particulate, water-insoluble but water-swellable, polymeric absorbent only in the batt layer situated between the densified layer and the moisture-impervious backing sheet, said particulate absorbent being distributed substantially uniformly throughout said last mentioned batt to define a widely distributed liquid receiving and holding means that is adapted to receive liquid directly from said densified layer, the



batt without said particulate absorbent being at least coextensive in external dimension as the batt containing said particulate absorbent, whereby transfer of liquid from said particulate absorbent to said facing layer is retarded; said densified layer being integral with and formed from a portion of the fibers of at least one of the loosely-compacted batts, said densified layer having relatively higher wickability and relatively higher liquid retentivity than the loosely-compacted batt from which it is formed and defining means for rapidly wicking liquid outwardly from an initially wetted area for enhanced liquid transfer over a large area into the batt containing the particulate absorbent and located between the densified layer and the moisture-impervious backing sheet.

4,102,341

ELECTRIC KNIFE DEVICE

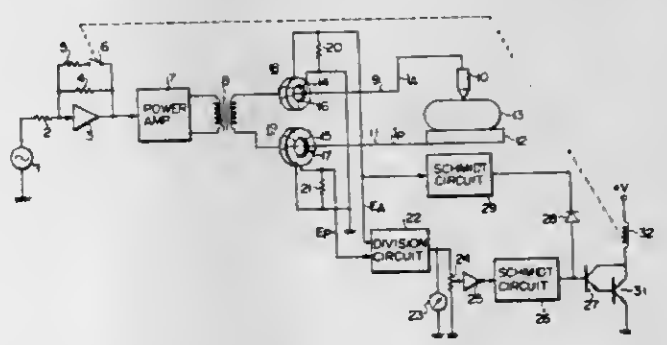
Yuzi Ikuno, Fuchu, and Yutaka Tanaka, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,015

Claims priority, application Japan, Dec. 20, 1975, 50-152368

Int. Cl.^{2} A61N *3/02*

U.S. Cl. 128—303.14 **8 Claims**



1. An electric knife device comprising a high frequency current source having first and second output terminals, a knife electrode connected to the first output terminal, a patient electrode connected to the second output terminal and to be electrically contacted with the patient, first current detector means for detecting the current flowing between the first output terminal and said knife electrode, second current detector means for detecting the current flowing between the second output terminal and said patient electrode, division circuit means for calculating the ratio between the outputs of said first and second current detector means and means fed by the output of said division circuit means for controlling the high frequency current flowing through said knife electrode in

accordance with the ratio calculated by said division circuit means.

4,102,342
VALVED DEVICE

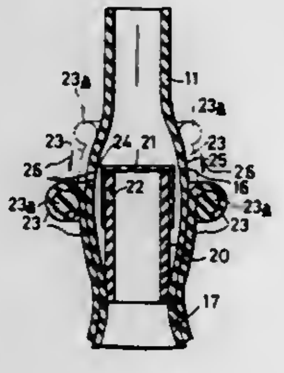
Taichiro Akiyama, Tokyo; Sajiro Ookubo, Oomiya, and Setsuko Ueno, Tokyo, all of Japan, assignors to Taichiro Akiyama, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,076

Claims priority, application Japan, Dec. 29, 1975, 50-156317; May 28, 1976, 50-69345[U]

Int. Cl.^{2} A61B *17/12*

U.S. Cl. 128—325 **8 Claims**



1. A valved device including a chamber, an outer pipe having an interior portion which normally communicates in fluid-tight manner with the interior of said chamber, an opening being provided in said outer pipe and communicating said interior portion with the exterior of said outer pipe, and a hollow valve member attached in surrounding relationship with said outer pipe in such a manner that said opening is normally closed by said valve member, said valve member being adapted to be rolled up on itself along said outer pipe into a ring-shaped configuration whereby said opening is exposed to permit discharge of said fluid, said valve member being attached to a tapered surface of said outer pipe, the valve member being formed of an elastic material with sufficient elasticity such that the valve member normally resists being rolled up on itself and is elastically restored by its elastic force to its original state to close said opening when rolling force is removed, said chamber comprising an envelope connected to said outer pipe, said envelope being adapted to elastically expand and contract, and wherein said envelope is adapted to be expanded by forcibly supplying a fluid through said pipe. and said envelope contracts by the action of its elastic force so that a fluid in said envelope is discharged through said pipe and said exposed opening when said valve member is rolled up.

4,102,343
LIGATURE MECHANISM FOR PRODUCING TOURNIQUET EFFECTS ON LIMBS

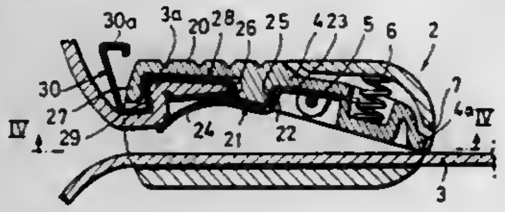
Eberhard Schneider, Cologne, Fed. Rep. of Germany, assignor to Prameta Prazisionsmetall-and Kunststofferzeugnisse G. Baumann & Co., Fed. Rep. of Germany

Filed Jul. 27, 1976, Ser. No. 709,245

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536620; Sep. 17, 1975, 2541433

Int. Cl.^{2} A61B *17/12*

U.S. Cl. 128—327 **18 Claims**



1. A ligature mechanism for producing tourniquet effects on limbs comprising a casing, a clamping lever, means mounting said clamping lever for pivotal movement relative to said casing, a band, said band including first and second terminal end portions and a loop portion therebetween, aperture means in said casing for permitting the passaage of said first terminal end portion through said casing, a portion of said band between said loop and said first terminal end portion being clamped relative to said casing by said clamping lever, fitting means carried by said second terminal end portion, spring means releasably clampingly securing said second terminal end portion fitting means to said lever, and means for releasing the clamping effect of said spring means to release said second terminal end portion from said clamping lever.

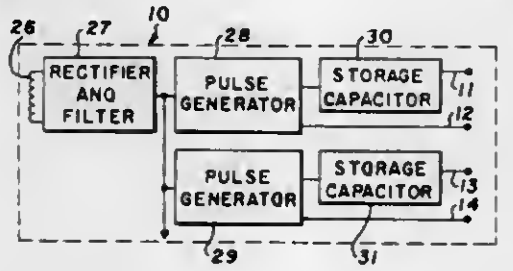
4,102,344
STIMULATOR APPARATUS FOR INTERNAL BODY ORGAN

Christopher J. Conway, Edina, and Eugene G. Glover, St. Paul, both of Minn., assignors to Mentor Corporation, Minneapolis, Minn.

Filed Nov. 15, 1976, Ser. No. 741,948

Int. Cl.^{2} A61N *1/32*

U.S. Cl. 128—419 E **10 Claims**



1. Apparatus for periodically stimulating an internal body organ under the selective control of a device located outside of the body, said apparatus comprising:

an external transmitter unit having means for producing a relatively high frequency output and means for periodically effectively interrupting said high frequency output: and

an implantable unit including

a power supply portion having output terminals and means reactively coupled with said transmitter unit when the latter is in proximity to said implantable unit for producing a D.C. voltage across said output terminals during each duration of the high frequency output,

at least one electrode adapted to be affixed adjacent the organ to be stimulated,

an energy storage device,

an electronic switching device having control elements which cause said electronic switching device to be non-conductive when a voltage of at least a predetermined value is applied between said elements,

circuit means connecting said energy storage device, said electrode, and said electronic switching device in series,

means connecting said power supply portion to said energy storage device to cause energy to be stored in the latter while said switching device is in non-conducting condition,

and means connected across the output terminals of said power supply portion and to said control elements of said switching device for deriving from said power supply portion and applying to said control elements a voltage of at least said predetermined value so that said switching device is non-conductive while said power supply portion is supplying a voltage and means for causing said switching device to become conductive each time said voltage ceases, to cause said energy storage device to cause periodic energization of said electrode to stimulate said organ.

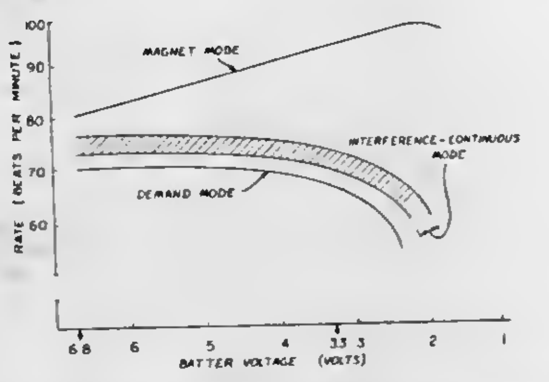
4,102,345
PACER DEMAND-RATE TEST MODE CONTROL

Robert Lee Cannon, III, Waltham, Mass., assignor to American Optical Corporation, Sonthbridge, Mass.

Filed Apr. 21, 1977, Ser. No. 789,489

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 PT **10 Claims**



1. In an improved implantable electronic demand heart oacer for providing stimulation to the heart of a patient, said pacer including terminal means for connection to said heart, a power source for energizing circuitry of said pacer, pulse generator means connected to said source for supplying heart-stimulating impulses at predetermined rates on said terminal means, means for detecting the beating action of said patient's heart as well as said stimulation impulses, means responsive to said detecting means for enabling said pulse generator means to supply said impulses at a demand-rate substantially only in the presence of detected stimulation impulses and the absence of detected heartbeats, and test mode means including manual means for making said stimulation rate dependent upon and indicative of the condition of said source, the improvement comprising:

said test mode means further including demand-rate control means operative for temporarily preventing detection of the patient's heartbeats by said detecting means while concurrently allowing said detecting means to detect said stimulation impulses whereby said means responsive to said detecting means enables said pulse generator to supply said stimulation impulses at said demand-rate in the presence of heartbeats.

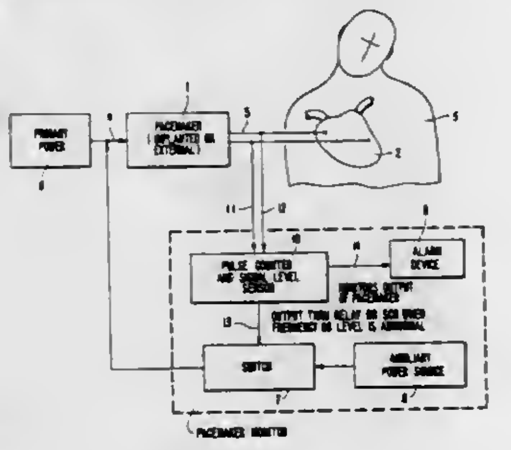
4,102,346
HEART PACEMAKER MONITOR, ALARM AND AUXILIARY POWER SUPPLY

Mabel H. Fulker, Tempe, Ariz., assignor to The Raymood Lee Organization, Inc., New York, N.Y., a part interest

Filed Sep. 1, 1977, Ser. No. 829,612

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—419 PS **3 Claims**



1. A pacemaker monitor for a pacemaker of a human heart, such pacemaker having an input, a primary battery source of power electrically connected to its input, and an output electrically connected to the heart of a user, said pacemaker monitor comprising

an auxiliary battery source of power;

switch means electrically connecting the auxiliary battery source of power to the input of the pacemaker;

an alarm device; and

a monitor device having inputs electrically connected to the output of the pacemaker and outputs electrically connected to the switch means and to the alarm device for counting the pulses supplied to the beart by the pacemaker, detecting the signal level of such pulses and comparing the number of pulses with a preselected number and the signal level with a preselected signal level and closing the switch means to connect the auxiliary battery source of power to the pacemaker and actuating the alarm device when the detected number is less than the preselected number and when the detected level is less than the preselected level.

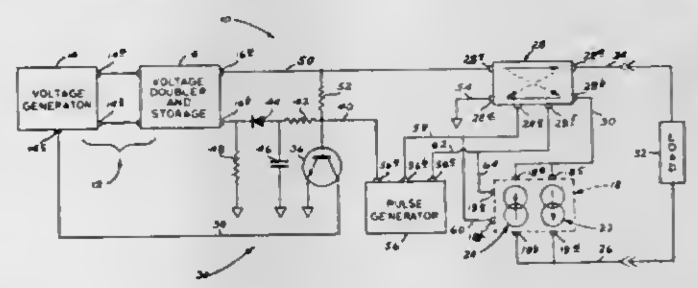
4,102,347
ELECTRONIC PAIN CONTROL SYSTEM

Tex N. Yuki, 1905 SW. Cedar Hills Blvd., Portland, Oreg. 97225

Filed Dec. 3, 1976, Ser. No. 747,352

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—421 **6 Claims**



1. A current supply circuit comprising

a pair of output terminals adapted for connection to a load,

a current source operatively connected to said terminals for supplying current to a load connected therebetween,

a changeable-level voltage source for and operatively connected both to said current source and to said terminals, and

voltage-level control means operatively connected both to said output terminals and to said voltage source for sensing the impedance value of any load connected between said terminals, and for changing the level of voltage produced by said voltage source in accordance with the value of such sensed impedance.

4,102,348
LOW FREQUENCY MEDICAL TREATMENT APPARATUS

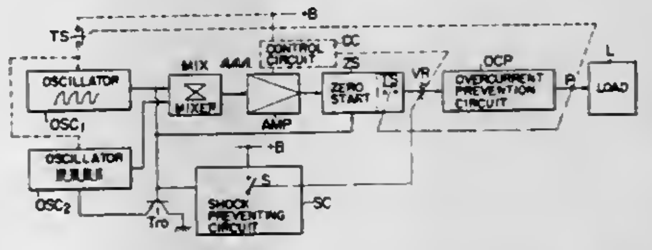
Sokichi Hihara, Yokohama; Mikio Horiuchi, and Takeshi Ohe, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Filed May 13, 1977, Ser. No. 796,512

Claims priority, application Japan, May 19, 1976, 51-56687

Int. Cl.^{2} A61N *1/36*

U.S. Cl. 128—422 **5 Claims**



1. A low frequency medical treatment apparatus for applying through a touching element to the human body a medical

treatment wave obtained by mixing a modulating wave of low frequency and fundamental wave of higher freqnency than that of the modulating wave, which apparatus comprising:

- (a) oscillating means for synchronously generating a modulating wave which rises relatively moderately and decays relatively abruptly, and after a pause interval rises moderately again, and a pulsive fundamental wave whose frequency is higher than that of said modulating wave;
- (b) mixing means connected to said oscillating means, for mixing said modulating wave and fundamental wave generated by said oscillating means to produce a mixed wave;
- (c) zero start means for delivering the mixed wave starting at the zero level thereof under conditions that said modulating wave is in a pause interval and said touching element is in contact with the human body;
- (d) output control means for controlling a level of said mixed wave according to a setting operating thereof, said output control means having a switch which is turned on or off depending on whether or not said output control means is set at its minimum set position;
- (e) shock preventing means for controlling at least one of paths of said modulating wave, fundamental wave and transmission mixed wave so that when said output control means is set at the minimum set position, said switch of said output control means is operated to deliver said mixed wave; and
- (f) over-current preventing means operatively connected to said touching means for preventing a flow of excessive mixed wave in said touching element.

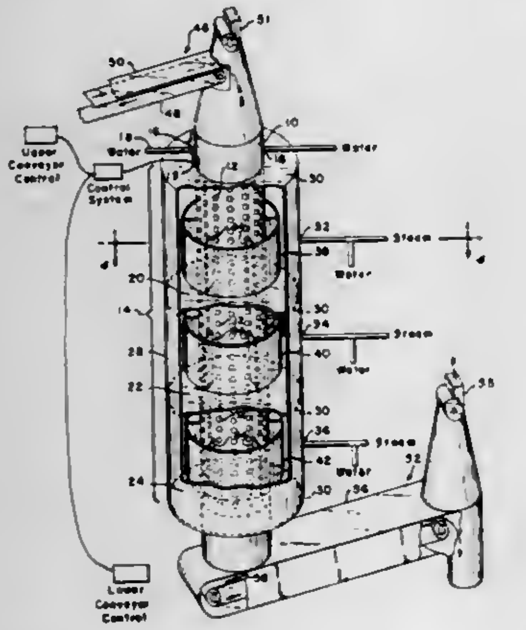
4,102,349
METHOD AND APPARATUS FOR MOISTURIZING TOBACCO STEMS

John D. Psaras, and Leroy R. Sachleben, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 15, 1976, Ser. No. 705,741

Int. Cl.^{2} A24B *3/00, 3/12*

U.S. Cl. 131—135 **43 Claims**



26. A method for uniformly moisturizing whole tobacco stems comprising the steps of:

- a. opening the cellular structure of said stems;
- b. inducing moisture into said cellular structure in an amount in the range of from 20 to 40 weight percent, said range comprising a first induced moisture content;
- c. equlibrating the moisture content of said stems; and
- d. moisturizing said equilibrated stems to a second induced moisture content in the range of from 30 to 60 percent by initially spraying said equilibrated stems with water and thereafter applying a mixture of water and steam to said stems.

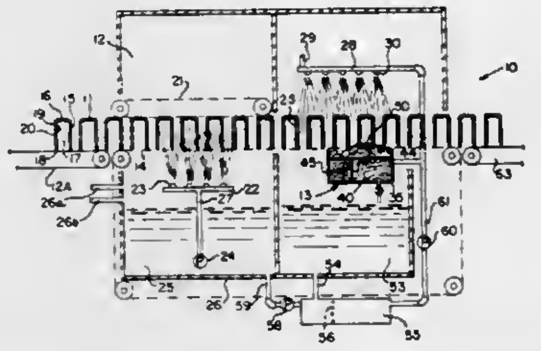
4,102,350
APPARATUS FOR REMOVING EXCESS COATING MATERIAL ACCUMULATED AT THE INTERIOR EDGE PORTIONS OF METAL CONTAINERS

Raymond G. Chelton, Chicago; Elmer C. Ginther, Oak Forest, and Mihailo Djordjevic, Dolton, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,892

Int. Cl.^{2} B08B *3/02*

U.S. Cl. 134—130 **4 Claims**



1. An apparatus for removing excess coating material accumulated at the interior edge portion of an open end of a metal container which portion is to be subjected to double seaming after the excess coating material is removed, the apparatus comprising a receptacle adapted to contain a supply of wash fluid capable of diluting the accumulated coating, a movable reticulated web for conveying the coated container in an upright inverted position with the open end contacting the web, means for moving the web over the receptacle, means for continuously trickling the wash fluid upwardly from the receptacle through the web into contact with the interior edge portion of the container at a flow rate which does not materially effect the position of the inverted container, the trickle of wash fluid being in the form of a ripple having waves of a height sufficient to contact the interior edge portion of the container which is to be subjected to double seaming and which swell within the container interior to effect a washing action on the accumulated coating material.

4,102,351
SPRAYING DEVICE FOR USE IN A BOTTLE CLEANING MACHINE

Joachim Wiendahl, Dortmund; Klaus Jendrichowski, Holzwickede, and Wolfgang Süshradt, Dortmund, all of Germany, assignors to Holstein und Kappert Aktiengesellschaft, Dortmund, Germany

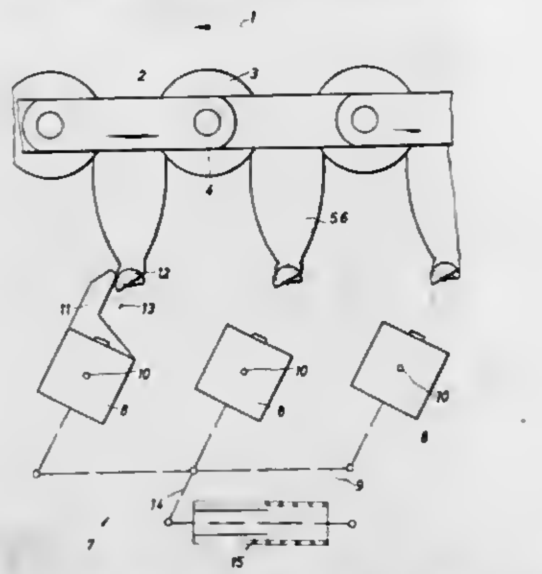
Filed Feb. 10, 1977, Ser. No. 767,315

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1976, 2607077

Int. Cl.^{2} B08B *3/02;* **B67C** *1/00*

U.S. Cl. 134—129 **5 Claims**

1. A spraying device for use in a bottle cleaning machine, comprising a conveyor chain movable through said cleaning machine, a plurality of bottle receiving receptacles supported on said conveyor chain for carrying therein bottles to be cleaned, a plurality of spray tubes for directing a spray in a predetermined and fixed direction with respect to said spray tubes and mounted for pivotal movement only through a predetermined angle of displacement about an axis of rotation for directing the spray therefrom through a predetermined spraying zone into a bottle carried in said bottle receiving receptacles as said conveyor chain moves through said cleaning machine, said spray tubes being arranged in series with respect to the direction of movement of said conveyor chain so that each spray tube is oriented to direct its spray through said angle of displacement into one of said bottles as said bottles move through said spraying zone, coupling means connecting each of said plurality of spray tubes with each other to cause each spray tube to be pivoted about its axis of rotation together with each other spray tube of said plurality through the same angle of displacement, a driving pin carried by each of said bottle receiving receptacles, a driver arm carried by at least one of said spray tubes to be engaged by a driving pin of one of said receptacles for causing pivotal movement of each of said spray tubes through said predetermined angle from a starting position to an end position defining said spraying zone without causing longitudinal displacement of said spray tubes in the direction of said conveyor, said driving pin engaging said driver arm at the starting position of said spraying zone and being disengaged therefrom at said end position as said conveyor chain moves through said cleaning machine, and means connected with said spray tubes for pivotally returning said spray tubes to said starting position when said spray tubes have reached said end position of said spraying zone.



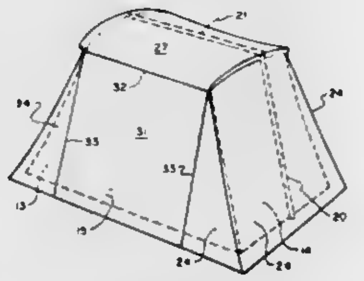
4,102,352
INSULATED TENT

Arthur J. Kirkham, 5534 Avalon Dr., Murray, Utah 84107

Continuation of Ser. No. 670,233, Mar. 25, 1976, abandoned. This appilcation Nov. 1, 1976, Ser. No. 737,701

Int. Cl.^{2} A45F *1/16*

U.S. Cl. 135—1 R **33 Claims**



1. An insulated tent comprising

- (a) a flexible inner tent structure having interconnecting end and sidewalls, one or more of said sidewalls containing doors, a roof interconnecting said walls and hollow sleeves adapted to receive resilient crossarms, said sleeves being of substantially the same length as the end of the upper portion of said endwalls, and being fixedly connected to and extending outwardly of the inner tent structure along the interconnecting portion of the endwalls and roof;
- (b) support structure external of the inner tent having means to hold the base of the inner tent walls in a taut rectangular substantially horizontal position including, an upright pole extending upwardly, adjacent to and midway of each endwall, said upright pole being at least as long as the distance between the top and bottom of the endwall, a horizontal ridgepole of substantially the same length as the length of the inner roof fabric, said ridgepole interconnecting the upright poles at each end by fastening means, resilient crossarms being inserted into said sleeves, said crossarms being longer than said sleeves thereby protruding from each end sleeve opening, means holding said crossarms in a fixed, tensioned, curvilinear position by means contacting the central portion of said resilient crossarms, the outer portion of the ridgepole or the fastening means interconnecting said poles, said support structure functioning such that the upright poles hold the tent in a taut vertical position, the ridgepole holds the tent in a taut horizontal direction along the ridgepole and the resilient crossarms pull the tent walls and roof outwardly and upwardly in a taut position;
- (c) at least one but not more than two outer end sections fitted to the upper portion of either end of the supporting tent structure having a configuration substantially the same as, but larger than, the end portion of the inner tent structure taken along a vertical transverse plane of the inner tent structure approximately at the points the resilient crossarms protrude from the open ends of the sleeves, said outer end sections containing reinforced apertures in the upper corners thereof adapted to fit over the ends of the resilient crossarms and rest against the outside edges of said sleeves in a taut position, fastening means located at the top midportion of said outer end section for fixedly securing said portion to the support structure in the vicinity of the juncture of the upright poles and ridgepole and means for securing the bottom of said outer end section in a taut position spaced outwardly from the inner tent structure thereby creating an insulated air space between the inner tent walls and the outer end sections at either or both ends of the inner tent structure.

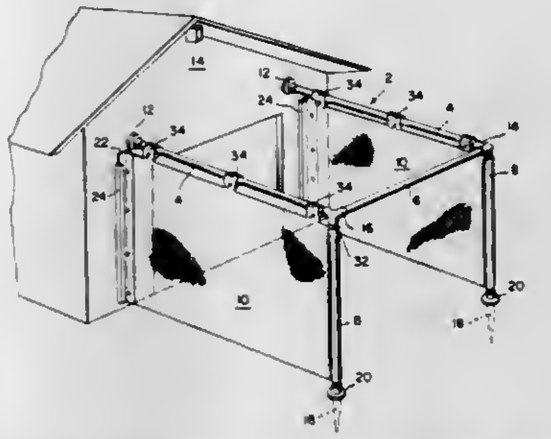
4,102,353
TEMPORARY SHELTER

Charles Pugliese, 83 Peguot La., E. Islip, N.Y. 11730

Filed Jan. 27, 1977, Ser. No. 762,998

Int. Cl.^{2} A45F *1/06*

U.S. Cl. 135—5 R **3 Claims**



1. A portable enclosure adapted for attachment to a permanent structure which rests on the ground, said enclosure comprising means for mounting on said structure and for providing spaced, parallel and vertical slots, means for installation in the ground at positions spaced from and corresponding to said slots and for providing upwardly open receptacles, means for installation on said structure above said slots and for providing horizontally open receptacles, side bars extending horizontally outwards from said horizontally open receptacles, a cross-bar extending between said side bars above said upwardly open receptacles, poles extending upwardly out of said upwardly open receptacles, three-way sockets interconnecting said poles, side bars and cross-bar, side panels engaged with said side bars and poles, T-shaped supports on said panels and slidably engaged in said slots, releasable catches on said side bars holding the latter within the horizontally open receptacles, said side bars and cross-bar constituting a horizontal

frame, a roof, and spring clips releasably attaching said roof to said horizontal frame.

4,102,354

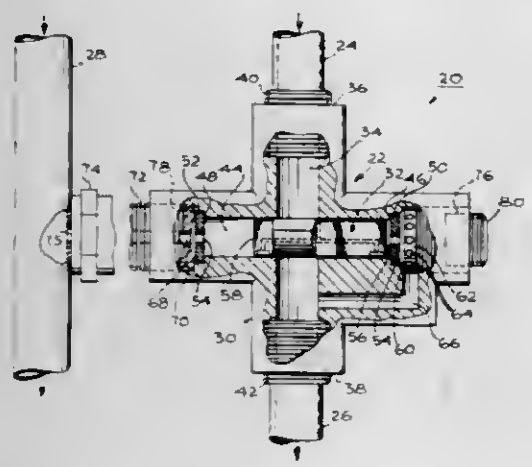
SELF-REGULATING FLUID PRESSURE AND TEMPERATURE VALVE AND ASSEMBLY

Michele Natale, 9812 Amanita Ave., Tujunga, Calif. 91042

Filed Sep. 27, 1976, Ser. No. 726,608

Int. Cl.^{2} G05D *11/03*

U.S. Cl. 137—98 **24 Claims**



1. An improved self-regulating fluid pressure and temperature valve, said valve comprising, in combination:

a. a valve housing having (1) a single fluid-receiving channel extending therethrough for direct connection with a first source of fluid flow, (2) a valve body-receiving channel intersecting said fluid-receiving channel in said housing and extending on opposite sides of said fluid-receiving channel, (3) a fluid-pressure passageway leading from said fluid-receiving channel into communication with one end of said valve body-receiving channel for transmittal of fluid pressure thereto, and (4) conduit means for interconnecting the opposite end of said valve body receiving channel with pressure from a remote second source of fluid flow, without permitting fluid from said second source of fluid flow to pass into and through said housing; and,

b. a free-floating valve body disposed in said valve body-receiving channel and including a main body portion of dimensions sufficient to largely obstruct the flow of fluids through said fluid-receiving channel and a reduced portion having smaller dimensions than said main body portion so as to largely unobstruct the flow of fluid through said fluid-receiving channel, the relative fluid pressures exerted on said opposite ends of said valve body automatically determining the position of said valve body in said valve body-receiving channel and thus the rate of flow of fluid through said fluid-receiving channel, said valve body including inter-communicating passageways extending to the exterior thereof at spaced locations to facilitate a reduction in weight and free flotation of said valve body.

4,102,355

DIAPHRAGM MULTI-PORT VALVE ASSEMBLY

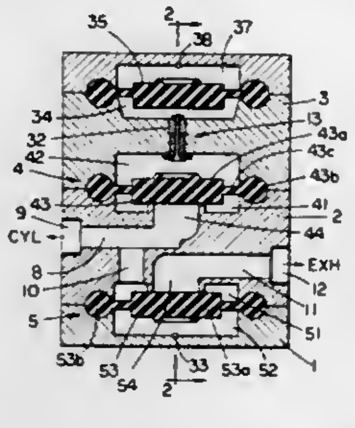
Albert Frederick Hansen, Punga Grove Rd., Whangarei, New Zealand

Filed Nov. 29, 1976, Ser. No. 745,527

Int. Cl.^{2} F15B *13/042*

U.S. Cl. 137—596.15 **9 Claims**

1. A diaphragm valve assembly comprising a first and a second diaphragm valve each comprising a first and a second chamber separated by a diaphragm, a valve port for communication with the first chamber and normally closed by the diaphragm, bleed means connecting the first and second chambers, and control means for actuating the valve, wherein the first chamber of the first valve has an inlet for communication with a supply of fluid under pressure, the port of the first valve is adapted for connection to apparatus to be controlled by fluid under pressure and is connected to the first chamber of the second valve, the port of the second valve is adapted for connection to exhaust, and the second chambers of the valves are connected to the control means which is placeable in at least two conditions in a first of which the pressure in the second chamber of the first valve will be reduced relative to that in the first chamber to permit the diaphragm of the first valve to lift to open the port thereof and in a second of which the pressure in the second chamber of the second valve will be reduced relative to that in the first chamber to permit the diaphragm of the second valve to lift to open the port thereof.



4,102,356

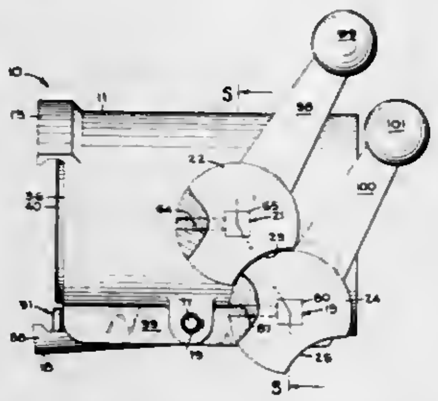
DRY-BREAK COUPLER

Houston W. Knight, Whittier, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 31, 1977, Ser. No. 801,719

Int. Cl.^{2} F16L *29/00, 37/28*

U.S. Cl. 137—614.06 **12 Claims**



1. A dry-break coupler for attachment to an adapter that has an annular locking rib surrounding a central valve, said coupler comprising a tubular body that defines a central flow passage, an adapter latch that is pivotally mounted on the tubular body for locking the adapter in sealed contact with the coupler so that the central valve of the adapter is aligned in series with the central flow passage of the coupler, a first rotatable shaft that is mounted upon the tubular body for operating the adapter latch, a movable valve closure element that is located within the tubular body for both opening and closing the flow passage and for actuating the valved adapter, a second rotatable shaft that extends through the tubular body for operating the movable valve closure element, said first and second rotatable shafts having portions that extend in substantially parallel relationship, and interlocking means mounted upon said rotatable shafts to prevent rotation of the second rotatable shaft as to open the flow passage to the adapter without first moving the adapter latch to a locked position, said interlocking means preventing rotation of the first rotatable shaft to release the coupler adapter latch from the adapter when the valve closure element is in a position with the flow passage open.

4,102,357

VARIABLE FLOW OUTLET VALVES

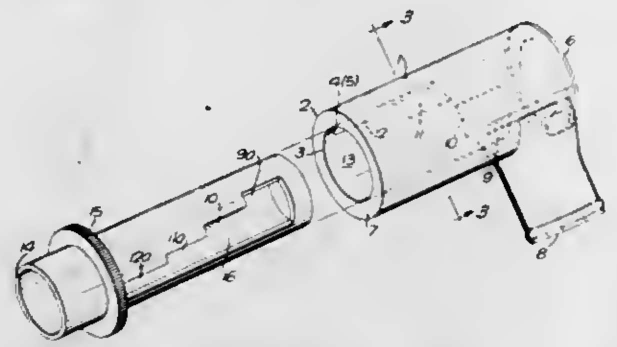
Mark Charlton, Market Weighton, England, assignor to Hawker Siddeley Aviation Limited, England

Filed Oct. 22, 1976, Ser. No. 734,993

Claims priority, application United Kingdom, Oct. 24, 1975, 43859/75

Int. Cl.^{2} F16K *5/10*

U.S. Cl. 137—625.32 **4 Claims**



1. A viasuable outlet are distorbution valve, comprising an outer valve body and a coaxial inner valve sleeve rotatable therein, the outer valve body having inner and outer generally cylindrical wall members with a space between filled with porous material and an air inlet communicating with said space at one end, and the inner sleeve fitting within the inner cylindrical member of the outer body and having an air outlet from the sleeve interior at one end of said sleeve, cooperating ports being provided in the sleeve wall and in the inner cylindrical member of the outer body such that relative rotation of the inner sleeve and outer body changes the axial position along the body and sleeve at which the porous-material filled space in the outer body communicates with the interior of the sleeve.

4,102,358

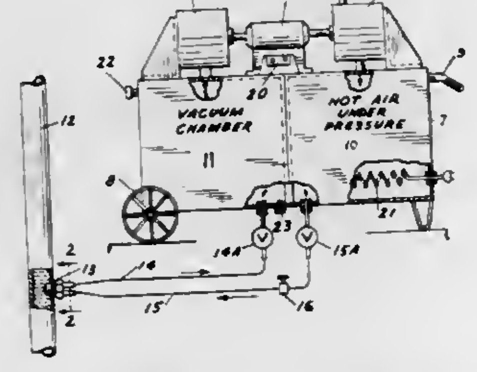
PIPE THAWING DEVICE

Duane Sherock, P.O. Box 131, Plymouth, Mich. 48170

Filed Aug. 8, 1977, Ser. No. 822,673

Int. Cl.^{2} E03B *7/14;* F16L *53/00*

U.S. Cl. 138—35 **6 Claims**



1. In a device of the character described, in combination, a receptacle having a pressure compartment and a vacuum compartment, means to put pressure on said pressure compartment and pull a vacuum on said vacuum compartment, a fitting secured to a frozen pipe, lines communicating the interior of said pipe with the interior of said pressure and said vacuum compartments, means to heat the air in said pressure compartment and control means in said lines to regulate the flow of hot air from said pressure compartment through said fitting and back into said vacuum compartment.

4,102,359

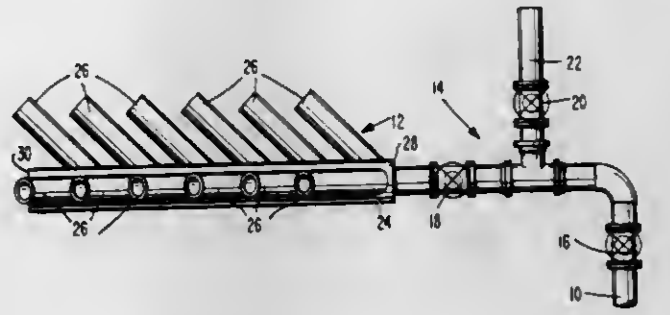
NOISE SUPPRESSOR

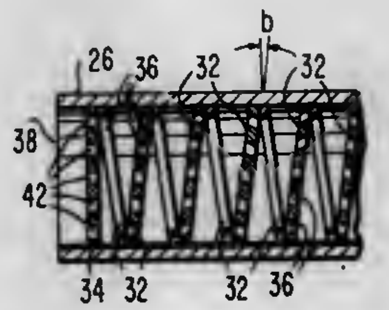
Cowas G. Patel, 2179-1 Castor Ct., Tallahassee, Fla. 32303

Filed Feb. 15, 1977, Ser. No. 768,801

Int. Cl.^{2} F15D *1/02*

U.S. Cl. 138—42 **23 Claims**





1. A noise suppressor comprising:

a first elongated cylindrical pipe member having a first end adapted for attachment to a pressurized gas outlet, having a closed second end, and having a plurality of openings through the sidewall thereof;

a plurality of cylindrical second pipe members, each having a first end attached to the sidewall of said first pipe member over one of the sidewall openings, to permit fluid communication from the interior of said first pipe member to the interiors of said second pipe members, and an open second end; and

a plurality of plate members, each plate member being substantially circular and having a plurality of substantially parallel elongated slots therethrough, each of said second pipe members having a plurality of said plate members mounted therein, the plate members within each second pipe member slanted with respect to a plane normal to the second pipe member longitudinal axis, the direction of slanting alternating between adjacent plate members, each plate member touching its adjacent plate members.

4,102,360

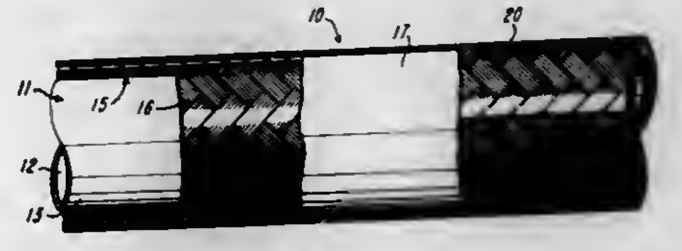
HOSE CONSTRUCTION

Carl E. Hopkins, Dover, N.J., assignor to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 426,986, Dec. 20, 1973, abandoned. This application Jun. 6, 1975, Ser. No. 584,448

Int. Cl.^{2} F16L *11/08*

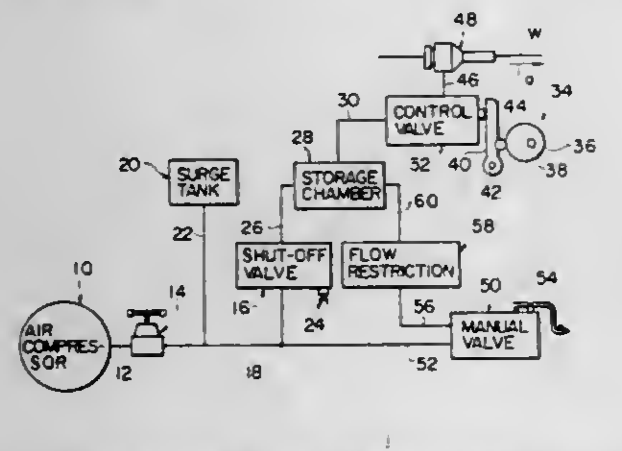
U.S. Cl. 138—127 **6 Claims**



1. A hose construction comprising, an inner tube of irradiated-cured polyethylene, a layer of primer adjoining said tube with said primer layer having an affinity for cured polyethyl-

ene, a layer of adhesive on said layer of primer, at least one layer of tubular reinforcing material disposed against said layer of adhesive, said layers of primer and adhesive assuring a proper bond between said cured polyethylene tube and said braided layer, and a layer of vulcanized rubber adjoining said layer of tubular reinforcing material, said tube and said layers bonded together into a unitary structure.

4,102,361
FLUID SUPPLYING AND DISCHARGING APPARATUS FOR SHUTTLELESS WEAVING LOOM
Shigenori Tanaka, Hachioji, and Akio Tojo, Higashi, both of Japan, assignors to Nissan Motor Company, Ltd., Japan
Filed Nov. 26, 1976, Ser. No. 745,112
Claims priority, application Japan, Jul. 23, 1976, 51-87221
Int. Cl.² D03D *47/30*
U.S. Cl. 139—435 **38 Claims**



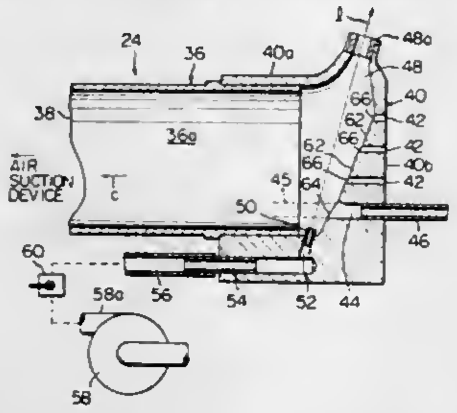
1. A fluid supplying and discharging apparatus for use in a weaving loom of the shuttleless type, comprising a source of fluid under pressure, fluid discharge means communicable with the fluid source and operative to eject a jet stream of the fluid into a weaving shed formed by warp yarns in the loom, first valve means provided between said fluid source and said fluid discharge means and operative to intermittently open in synchronism with the weaving cycles of the loom, second valve means provided between said first valve means and said fluid source and operative to establish communication between the fluid source and the first valve means in response to operative condition of the loom, the second valve means interrupting the communication between the fluid source and the first valve means in response to inoperative condition of the loom, third valve means bypassing said second valve means from said fluid source, the third valve means being manually operable for providing communication between the fluid source and the fluid discharge means when manually operated to open, and flow restriction means for reducing to a predetermined level the pressure of the fluid to be passed to said fluid discharge means through said third valve means.

4,102,362
SHUTTLELESS LOOM
Akio Tojo, Higashi-murayama, Japan, assignor to Nissan Motor Company, Ltd., Japan
Filed Nov. 26, 1976, Ser. No. 745,222
Claims priority, application Japan, Aug. 10, 1976, 51-94489
Int. Cl.² D03D *47/34*
U.S. Cl. 139—435 **7 Claims**

1. A shuttleless loom having yarn throwing means for throwing a weft yarn with respect to a shed of warp yarns, and detaining means for detaining a predetermined length of the weft yarn in air flowing therethrough before the weft yarn is supplied to the yarn throwing means, said detaining means comprising;

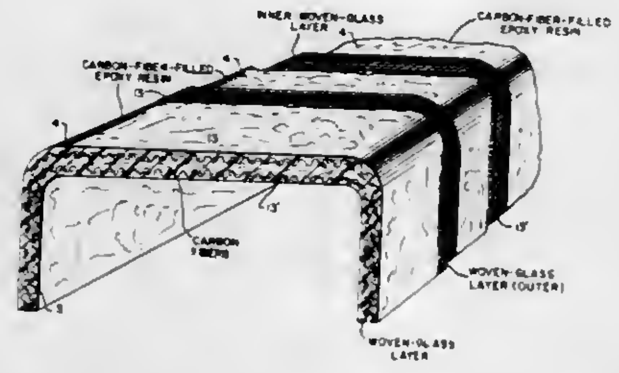
a hollow elongate body defining therein an elongate chamber through which air is inductable, said hollow elongate body having a first end portion communicating in use with means for inducting air, and a second end portion opposite to said first end portion, said second end portion having an inlet bore providing communication between the elongate chamber and the outside of said hollow elongate body for introducing the weft yarn into the elongate chamber, and an outlet opening providing communication between the elongate chamber and the outside of said hollow elongate body for drawing out the weft yarn from the elongate chamber;

the second end portion of said hollow elongate body including a sleeve and a closing end wall closing an end formed by the sleeve, said closing end wall having a plurality of elongate bores providing communication between the elongate chamber and the outside of said hollow elongate body and arranged parallel to the longitudinal axis of said hollow elongate body to induct air therethrough into the elongate chamber, the inlet bore extending through said closing end wall;



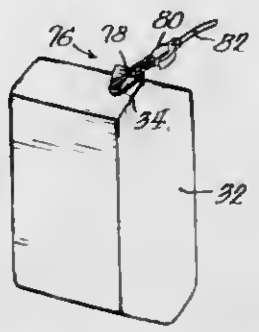
air ejecting means for ejecting air from a portion of said second end portion adjacent said inlet opening through the elongate chamber towards the inlet opening, and said air ejecting means including an air ejecting nozzle member in the sleeve of the second end portion of said hollow elongate body and projecting into the elongate chamber.

4,102,363
NEEDLES FOR SHUTTLE-LESS LOOMS
Albert Henri Deborde, Bourgoin-Jallieu, France, assignor to Saurer Diederichs (Societe Anonyme), Bourgoin-Jallieu, France
Filed Nov. 19, 1976, Ser. No. 743,521
Claims priority, application France, Feb. 10, 1976, 76 04369
Int. Cl.² D03D *47/18*
U.S. Cl. 139—449 **2 Claims**


INNER WOVEN-GLASS LAYER
CARBON-FIBER-FILLED EPOXY RESIN
CARBON-FIBER-FILLED EPOXY RESIN
CARBON FIBERS
WOVEN-GLASS LAYER (OUTER)
WOVEN-GLASS LAYER

1. A needle for the laying of a weft in the shed of a shutterless loom comprising an elongated U-cross section body of carbon fibers impregnated with a synthetic resin, said body having a web and a pair of shanks extending transversely to said web, said web having a thickness greater than that of said shanks, and a pair of woven glass fiber layers imbedded in said synthetic resin and extending over said shanks and said web, one of said glass fiber layers lying as close as possible to the outer surface of said body, the other of said glass fiber layers lying as close as possible to the inner surface of said body, each of said glass fiber layers being spaced inwardly of the respective surface by substantially constant distances.

4,102,364
METHOD OF DUNNAGE BAG INFLATION
John H. Leslie, Winnetka; Barry R. Angarola, Schaumburg, and A. L. Nocom, Des Plaines, all of Ill., assignors to Signode Corporation, Glenview, Ill.
Filed Jul. 29, 1977, Ser. No. 820,088
Int. Cl.² B65B *3/04*
U.S. Cl. 141—4 **16 Claims**

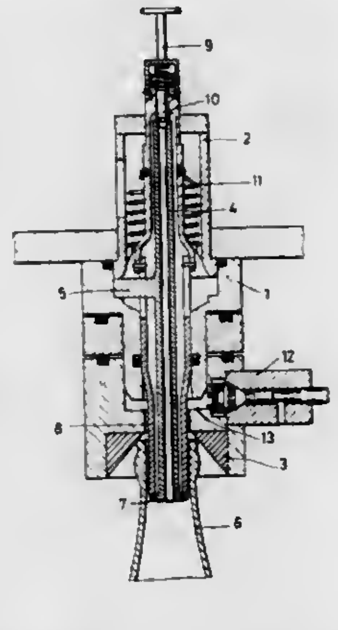


1. A method of filling an inflatable dunnage bag with entrained ambient air to a predetermined maximum stabilized pressurization level, said dunnage bag having a housing mounted in a wall of the bag and extending from the exterior of the bag to the interior of the bag, said housing defining a smooth-walled chamber having an exterior opening in a portion of the exterior of the bag and an interior opening in a portion of the housing communicating with the interior of the bag, said method comprising the steps of:

discharging at least one jet of pressurized gas from a discharge point located in a region of ambient air; and

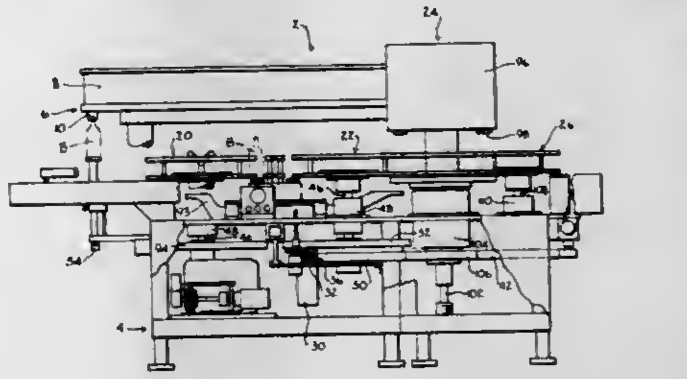
aligning each said gas jet to pass through at least part of said chamber in the direction from said exterior opening to said interior opening whereby ambient air is entrained with the jet through the chamber into the bag.

4,102,365
FILLING MEMBER FOR A COUNTERPRESSURE FILLING MACHINE
Heinrich Jordan, Dortmund, and Siegmar Sindermann, Kamen-Heeren, both of Germany, assignors to Holstein & Kappert Aktiengesellschaft, Dortmund, Germany
Filed Nov. 24, 1976, Ser. No. 744,463
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2552956
Int. Cl.² B67C *3/06*
U.S. Cl. 141—39 **5 Claims**



1. A filling member without a feed pipe for a counterpressure filling machine for filling a liquid into containers, such as bottles, cans and the like, including a valve housing having an upper end and a lower end and forming a vertically extending passage opening from the lower end thereof, a top closure for the upper end of said valve housing, a gas pipe extending vertically and concentrically through the passage in said valve housing, said gas pipe having an outlet opening at the lower end thereof supplying a pressurized gas into a container and a gas valve located within said gas pipe above the outlet opening therefrom for controlling flow of the pressurized gas to the container, means for opening said gas valve to initiate the flow of gas into the container, a centering bell mounted on the lower end of said housing and laterally enclosing the lower end of said gas pipe, wherein the improvement comprises that said gas pipe is fixed to said valve housing, a repelling shield formed on the lower end of said gas pipe laterally surrounding the outlet opening therefrom, said repelling shield forming a sealing seat, the lower end of said valve housing forming a guide surface, said centering bell disposed in contact with the guide surface of said valve housing and extending downwardly therefrom for movement thereon in the axial direction of said gas pipe when contacted by the container to be filled, a vertically extending filling sleeve concentrically disposed about said gas pipe and forming an annular flow passage therebetween, said filling sleeve having a lower outlet end for filling liquid into the container positioned by said centering bell, said filling sleeve being vertically displaceable between an upper open position for flowing liquid into the container and a lower normally closed position with the outlet end of said filling sleeve disposed in sealing engagement with the sealing seat on said repelling shield, spring means supported by said valve housing for biasing said filling sleeve into the open position when pressure equalization occurs between the container and said pressurized gas, said gas valve located in the upper part of said gas pipe, said centering bell laterally enclosing said filling sleeve, said centering bell in combination with the lower end of said valve housing and the outer surface of said filling sleeve forming a gas space and a relief valve connected to said centering bell with said relief valve opening to said gas space and having an open position and a closed position and in the open position connecting the gas space to the ambient atmosphere about the filling member means for opening said relief valve upon completion of container filling.

4,102,366
DRIVE MECHANISM FOR CONTAINER FILLING MACHINE
Stanley J. Puskarz, New Berlin, Wis., assignor to A-T-O Inc., Willoughby, Ohio
Filed Dec. 29, 1976, Ser. No. 755,177
Int. Cl.² B65B *43/50, 43/52*
U.S. Cl. 141—150 **9 Claims**



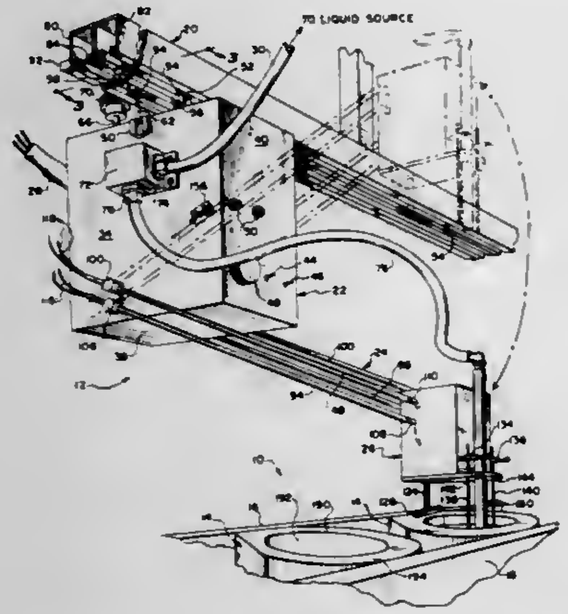
1. In a container filling machine having a stationary base and a filler head mounted in the base for rotary movement about a vertical axis, the base being equipped with first and second, rotatably mounted starwheel units for delivering containers into the filler head for filling action and for receiving containers from the head when filling is completed, and the filler head being provided with an upper liquid reservoir containing a series of depending filling valve assemblies for controlling liquid flow into the containers and with a lower turntable

having a series of container support and lift assemblies mounted around its periphery in equi-circumferentially spaced relation to one another for receiving incoming containers and for moving the same into and out of filling positions relatively of said filling valve assemblies during the course of a container filling cycle, a drive means for the filler head and starwheel units, comprising a main power source mounted in the base of the filler, first and second driven gears associated with a first of the starwheel units and secured for rotation therewith as a unit, a drive gear connected to said power source in direct driving relation with said first starwheel unit through a first of said driven gears, a roller means associated with each of said container support and lift assemblies and supported thereby in a fixed horizontal plane, said second driven gear of said first starwheel unit supported in said fixed horizontal plane and engageable with said roller means to drivingly connect said power source to said filler head, and a third driven gear carried by said second starwheel unit in the horizontal plane of said roller means and engageable by said roller means whereby to drivingly connect said second starwheel unit to said power source.

4,102,367

AUTOMATIC FILLING DEVICE

Abe Shulman, and Jere J. Willing, both of Chicago, Ill., assignors to A-Jer Engineering, Inc., Niles, Ill.
Filed Mar. 21, 1977, Ser. No. 779,358
Int. Cl.² B65B *1/04, 1/48*
U.S. Cl. 141—231 **25 Claims**



1. A system for automatically filling containers with liquid to a predetermined level, said containers being arranged in spaced locations along a line and each container having an opening to a cavity on its interior, a track defining a path parallel with the line of containers, a carriage mounted on the track for translative movement to and between stations along the track,

an arm pivotally mounted at one end of the arm to the carriage and having its opposite end free and carrying a pouring nozzle, the arm adapted to be swung about its mounting in a vertical direction between at least two positions, the first of which is the normal position above the containers and spaced therefrom to permit movement of the carriage along the track without interference with the containers and the second of which is substantially below said first position and in which the nozzle is correctly disposed for filling the container and vertically aligned with the container opening in position to fill the same if the container is properly positioned,

a source of liquid, a flexible conduit connected between the source and the pouring nozzle and having a normally closed valve between the source and the nozzle,

first reversible drive means for driving the carriage along the track,

second reversible drive means for raising and lowering the arm between said first and second positions,

electrical circuitry for operating the system, comprising means for energizing the first drive means to move the carriage along said track in a first direction to a first station, means defining the station and deenergizing the first drive means and acting to energize the second drive means to lower the arm to bring the nozzle to correct disposition at said second position,

control means acting to stop the second drive means lowering the arm if and when the arm reaches said second position and opening said valve to fill the container while preventing energizing of said second drive means while said container is being filled but thereafter closing said valve and energizing the second drive means in reverse to raise the arm to said first position,

said control means acting to stop the second drive means lowering the arm in the event that the arm does not or is not capable of reaching said second position without opening said valve, reversing said second driving means and causing the arm to be returned to said first position and deenergizing the second drive means,

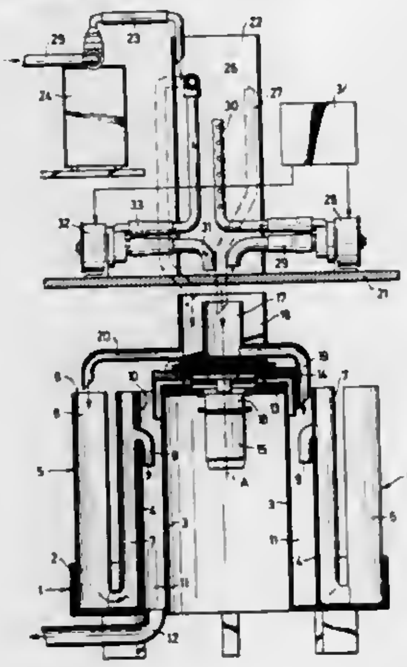
said means for energizing said first drive means being once more enabled when the arm has been returned to said first position and acting to move said carriage to the next-to-be reached station with the arm retained in said first position,

said next-to-be reached station and all other following stations each having elements cooperating with said carriage to provide means for stopping the carriage at each station in turn and attempting to fill the containers.

4,102,368

DEVICE FOR SAMPLING FLUID

Hans Rudolf Marfurt; August Zürrer, both of Marly, and Felix Gärtner, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
Filed Mar. 9, 1977, Ser. No. 775,926
Claims priority, application Switzerland, Mar. 16, 1976, 3265/76
Int. Cl.² B65B *3/26*
U.S. Cl. 141—250 **12 Claims**



1. A fluid sampling device comprising:

a vessel support;

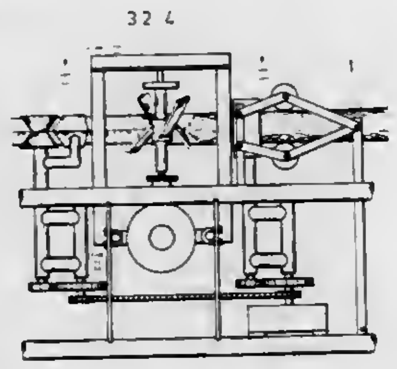
a plurality of sample vessels supported on said vessel support, each said sample vessel including first and second substantially upright tubular arms, said first and second arms being joined at bottom ends thereof, said first arm having an upper end with an inlet opening therein, said second arm having an outlet opening therein, and said outlet opening being at a level below said inlet opening; and

means for sequentially feeding a fluid to be sampled to each of said sample vessels, said feeding means comprising a single buffer vessel adapted to receive therein fluid to be sampled, said buffer vessel having a volume at least three to five times as large as the volume of each said sample vessel, and means for sequentially supplying fluid from said buffer vessel to said first arms of said sample vessels.

4,102,369

MACHINE FOR HEWING SMALL SQUARE TIMBER

Kauko Rautio, Mänly haya, Mantyharju, Finland
Filed Jan. 27, 1977, Ser. No. 762,946
Claims priority, application Finland, Feb. 23, 1976, 760460
Int. Cl.² B27C *1/08*
U.S. Cl. 144—114 R **1 Claim**



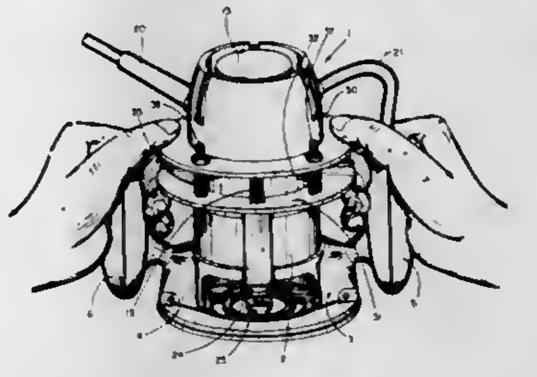
1. An apparatus for hewing substantially small timbers of square cross sectional shape from round tree trunks comprising: supporting means; two vertical and parallel cutting shafts held rotatably by said supporting means; cutting blades mounted on each shaft and arranged so that said cutting blades alternate in inclined direction with respect to the longitudinal axis of the shaft, a first one of said blades being directed upward and forming an angle of 45° with respect to the longitudinal axis of the shaft, second and third adjacent neighboring blades being directed downward and forming an angle of 45° with respect to the longitudinal axis of the shaft, a timber to be hewed being fed horizontally between said vertical cutting shafts, each cutting shaft having said direction alternating blades distributed about the periphery of the shaft at equal intervals, said cutting blades being driven synchronously so than when an upward directed blade is in contact with one side of a timber then a downward directed blade on the other shaft is in contact with the opposite side of the timber, said cutting blades having parallel cutting edges in contact with substantially parallel opposite surfaces of the timber.

4,102,370

PORTABLE ROUTER ATTACHMENT

P. Jackson Vess, 2901 Poplar Dr., Lynwood, Calif. 90262
Filed Jul. 29, 1977, Ser. No. 820,397
Int. Cl.² B27C *5/10*
U.S. Cl. 144—134 D **6 Claims**

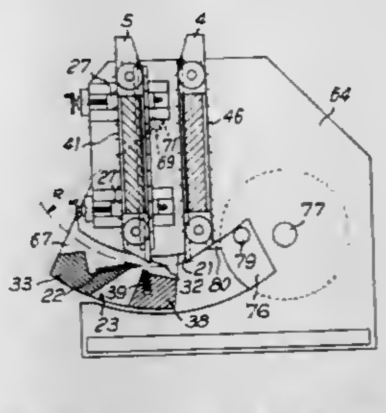
1. Apparatus for providing continuous depth-of-cut adjustment for a portable router having a base portion and a motor portion which slidably mounts vertically within said base portion, the apparatus comprising first rigid spacing means for supporting said motor portion adapted to abut the motor portion, second rigid spacing means adapted to abut the base portion, and biasing means for maintaining the first and second spacing means in biased spaced relationship.



4,102,371

APPARATUS FOR CUTTING VARIOUS MATERIALS

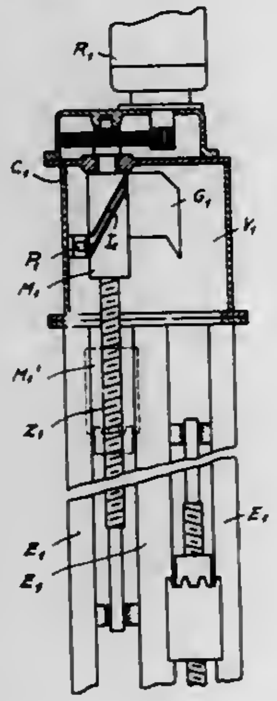
Jean Guillerm, Saint Maur, and Jacques Fondronnier, Creteil, both of France, assignors to Centre Technique du Bois, Paris, France
Division of Ser. No. 617,835, Sep. 29, 1975, Pat. No. 4,013,108. This application Nov. 15, 1976, Ser. No. 741,612
Claims priority, application France, Oct. 8, 1974, 74 33860
The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.
Int. Cl.² B27L *5/00*
U.S. Cl. 144—162 R **9 Claims**



1. An apparatus for cutting various materials and more particularly pieces of wood with a view to obtaining thin products of various thicknesses, comprising two pieces of equipment, on the one hand a cutting tool comprising a knife and a pressure bar, and on the other a support for receiving the material to be cut, said latter piece of equipment being mounted so as to pivot about a geometrical axis spaced from the cutting edge of the knife by a distance corresponding with the constant cutting radius selected and connected to a drive unit which gives to it a pivotal movement in accordance with an amplitude at least equal to the angular opening of the material to be cut, the equipment supporting the material being also provided with a feed device operable to move the material towards the knife as a function of the thickness of the products to be cut, wherein the material supporting equipment is mounted from the cutting tool towards the geometrical pivoting axis, the feed device of the supporting equipment being directed radially and the device having means for regulating the distance between the geometrical axis and the cutting edge.

4,102,372
DEVICE TO FIX THE WOOD-STOCK WITH HOOKS OF DIFFERENT LENGTH AND FOR REMOTE CONTROLLED EXTENSION OR RETRACTION OF SAID HOOKS FROM OR IN THE VERTICAL OR ALMOST VERTICAL SUPPORTING TABLE OF A VENEER SLICING MACHINE

Angelo Cremona, V. le Lombardia, 275, Monza, Italy (20052)
Filed Nov. 1, 1976, Ser. No. 737,276
Claims priority, application Italy, May 21, 1976, 23519 A/76
Int. Cl.² B27C *1/00*
U.S. Cl. 144—178 **6 Claims**

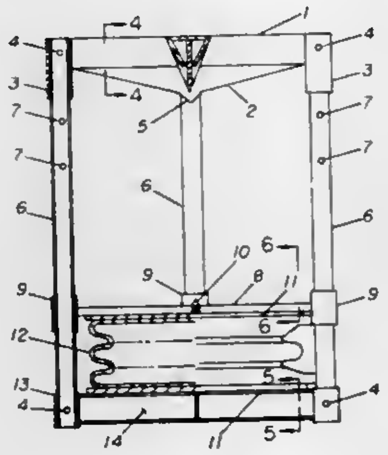


1. A generally vertical veneer slicing apparatus comprising a generally vertical supporting table, a plurality of pairs of opposed holding hooks supported on said table, each of said pairs of hooks forming complementary opposed jaw members, means for effecting vertical adjustment of the respective complementary pairs of holding hooks over a predetermined distance for supporting therebetween wood stock of varying sizes, rotation means for rotating the respective jaw members between an operative projected position relative to said table and an inoperative out of the way position, each of said jaw members having a distinct length at which they project outwardly from said table whereby the respective jaw members are rendered selectively operative to supporting a wood stock therebetween so that the progressively shorter length jaw members support the wood stock as it is being progressively cut away, said adjusting means including a screw operatively connected to each of said complementary pair of jaw members, and a drive means operatively connected to said screw to effect the drive thereof, said rotating means including a nut connected to the respective jaw member, said nut being rotatable on said screw, a helical groove formed in said nut, a pin adapted to be received in said groove whereby said pin effects the rotation of said nut and connected jaw member between operative and inoperative position.

4,102,373
SEMI-AUTOMATIC LOGSPLITTER

Michael Edward Winiasz, 4009 Washington Ave., Lorain, Ohio 44052
Filed May 12, 1977, Ser. No. 796,407
Int. Cl.² A47J *49/02;* B27L *7/00*
U.S. Cl. 144—193 A **10 Claims**

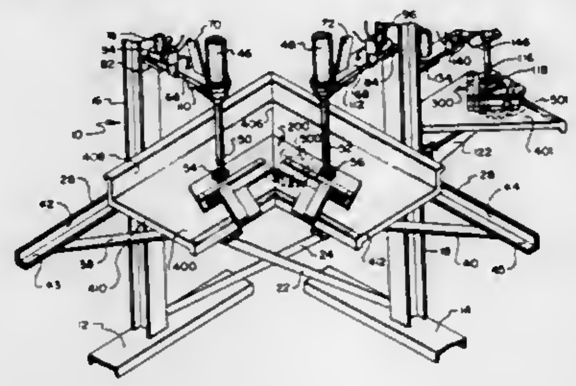
1. A semi-automatic log-splitting device comprising:
a base section;
tubular support members having opposite ends, the tubular support members being attachable to the base section;
means on the base section defining means to attach the support members of one of their respective ends to the base section in an upwardly depending relationship;
a detachable sectional splitting means disposed on the other ends of the tubular support members, the splitting means having
a stabilizing point projecting toward the base section,
tapered knife blade means depending outwardly from the stabilizing point toward the tubular support members, and



means to adjust the splitting means on the tubular support members;
deflector means attached to the knife blade means;
an axially movable intermediate stabilizing means disposed between the base section and the splitting means, the intermediate stabilizing means having a stabilizing clete for cooperation with a log placed between the intermediate stabilizing means and the splitting means and;
means for forcing the intermediate stabilizing means upwardly, whereby the log is split into sections.

4,102,374
JIG AND TEMPLATE APPARATUS AND METHOD FOR PREPARING A CORNER INSERT FOR A LAMINATED PLASTIC COUNTERTOP

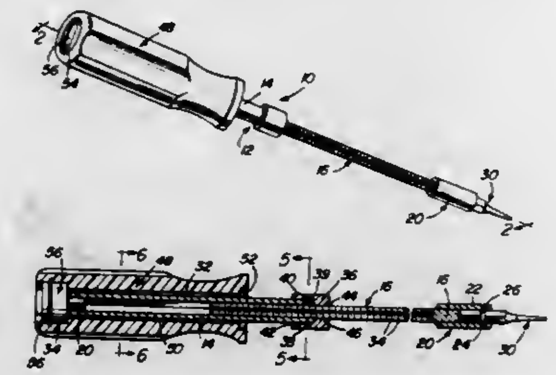
Fred Godfrey Klein, 2861 Cherry Blossom La., Salt Lake City, Utah 84117
Filed Mar. 8, 1976, Ser. No. 664,713
Int. Cl.² B23Q *3/06;* B27C *5/06*
U.S. Cl. 144—314 B **23 Claims**



1. Apparatus for preparing an insert to the inside corner of a workpiece fabricated from two elements joined at a miter, comprising:
a female template for guiding a cutting tool in cutting a female segment from the inside corner of the workpiece;
a male template for guiding a cutting tool in cutting a male insert dimensionally corresponding to at least a portion of the periphery of the void created by removal of the female segment; and
a jig comprising a framework including a scaffold and means for holding the workpiece, female template, and male template securely on the scaffold.

4,102,375
VARIABLE-LENGTH TOOL HOLDER

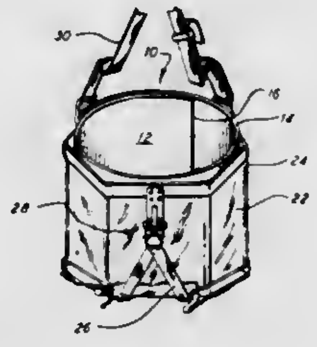
James L. Rossini, 1025 Cedar Pl., Oakdale, Calif. 95361
Filed Jan. 31, 1977, Ser. No. 764,461
Int. Cl.² B25G *1/00*
U.S. Cl. 145—75 **7 Claims**



1. A variable-length tool holder, comprising, in combination:
(a) a shank assembly including a hollow shank, and a shaft adjustably inserted into the hollow shank; and
(b) bit holder means mounted on the shaft for retaining a tool bit on the shank assembly, the hollow shank forming a hole having a non-circular cross section, with the shaft also having a non-circular cross section and mating with the cross section of the hole for rotating with the shank while being slidably disposed within the shank, the shaft being a longitudinally extending element provided with external screw threads along a portion of the longitudinal extent thereof, the shank assembly further including a nut rotatably attached to the shank and having an opening receiving the shaft, and internal screw threads provided in the opening of the nut for engaging with the external screw threads of the shaft, rotation of the nut moving the shaft longitudinally relative to the shank for varying the length of the shank assembly.

4,102,376
FRUIT PICKING RECEPTACLE

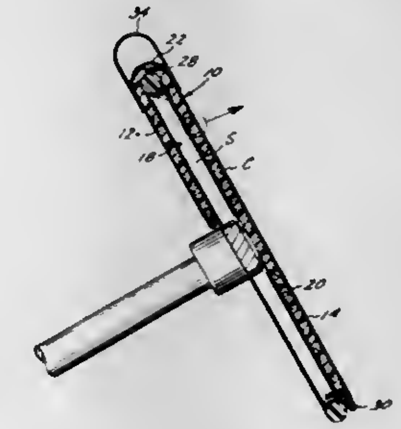
David E. Sharp, Jl-Meva Farms, P.O. Box 259, North Rose, N.Y. 14516
Filed Jul. 15, 1977, Ser. No. 815,944
Int. Cl.² A01D *46/22*
U.S. Cl. 150—2 **4 Claims**



1. A receptacle for use in hand-picking fresh fruit, or the like, of a type susceptable to damage by bruising, said receptacle comprising, in combination;
a. a substantially cylindrical container having side and bottom walls and an open top; and
b. a removable liner formed from a single, flat sheet of flexible, resilient, non-absorbent plastic material and deformable to a configuration substantially conforming to that of the interior of said container, said liner being placed within but unattached to said container and having a thickness and resilience such that fruit deposited in said container is protected by said liner from bruising by contact with said container or objects externally thereof with which said container comes into contact;
c. said liner when laid flat being rectangular with a semi-circular portion extending from one of the long edges thereof, whereby the short edges may be overlapped to form a cylindrical side wall and the semi-circular portion bent substantially at its junction with the rectangular portion to form a bottom wall for insertion in said bag.

4,102,377
STEERING WHEEL COVER DEVICE

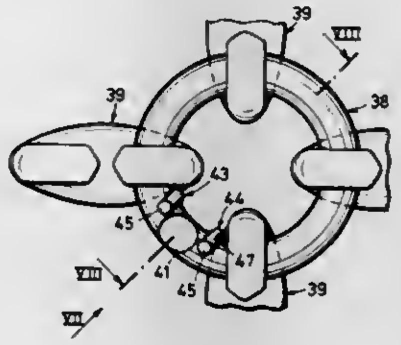
Nels M. Ostrem, 128 Mirabeau Ave., San Pedro, Calif. 90732
Filed Oct. 7, 1977, Ser. No. 840,125
Int. Cl.² B62D *1/06*
U.S. Cl. 150—52 M **3 Claims**



1. A steering wheel cover device, comprising:
a cover sheet of scorch-resistant material formed with an arcuate upper pocket section which receives the upper half of the steering wheel, and a frontal skirt depending from the front of said pocket section to overlie the lower section of the steering wheel; and
a layer of synthetic plastic heat insulating foam secured to the inner surface of said cover sheet that engages the steering wheel.

4,102,378
TIRE CHAIN

Erhard Alfred Weidler, Jahnstrasse 37, 7080 Aalen 1, Fed. Rep. of Germany
Filed Jul. 22, 1976, Ser. No. 707,820
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1975, 2533832
Int. Cl.² B60C *27/06*
U.S. Cl. 152—243 **1 Claim**



1. Tire chain having a chain network which comprises, at least in part, annular links oriented parallel to the surface of the tire and C-shaped links which are oriented vertically to the surface of the tire and can be hooked in said annular links, characterized by the fact that at least one of the ends of the arms of the C-shaped link which limit the introduction slot of the latter has a cross section which is reduced at the expense of

the width of the end; that the annular link has at least one narrowing the shape of which corresponds to the shape of the end of reduced cross section; and that retaining elements for the C-shaped link which has been attached to the annular link are present in the region of the narrowing; wherein the narrowing of said annular link is formed of two notches with limiting surfaces arranged in X-shape, one of said notches extending parallel to the central plane of said annular link, and said retention elements are formed of inserts which are inserted into said narrowing.

4,102,379
STRUCTURE OF SEALING SPLIT RIM TYPE WHEELS

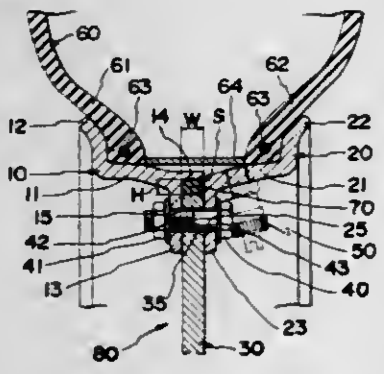
Tadashi Kamiya, Nieza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,954

Claims priority, application Japan, Oct. 3, 1975, 50-134704[U]

Int. Cl.² B60B *25/00*

U.S. Cl. 152—405 **4 Claims**



1. A structure for sealing split rim type wheels, comprising: at least one wheel disc;

a first split rim member provided with an integral jointing piece, said jointing piece having a face thereof butted against a first side face of said wheel disc adjacent the outer periphery of said disc, and being integrally secured to said disc;

said first split rim member being provided with a projecting piece extending substantially perpendicular to the plane of rotation of said disc;

an annular groove, opened substantially on one side only, being formed on the outer periphery of said disc between the outer peripheral edge of said disc, the butted face of said jointing piece, and said projecting piece;

an elastically deformable sealing member substantially securely disposed within said groove;

a second split rim member provided with an integral jointing piece, said jointing piece of said second split rim being adapted to have a face thereof butted against a second side face of said disc opposite to said first side face of said disc, and adjacent the outer periphery of said wheel disc such that:

said disc is held in its peripheral side parts with said first and second split rim members; and

said annular groove is closed on said one opened side thereof by the butted face of said jointing piece of said second split rim member so as to compressibly and fixedly confine said sealing member within said annular groove.

4,102,380
TIRE BEAD BREAKER MACHINE

Charles B. Holder, Bay Springs, Miss., assignor to James A. Samrall, Bay Springs, Miss.

Filed Apr. 20, 1977, Ser. No. 789,015

Int. Cl.² B60C *25/08*

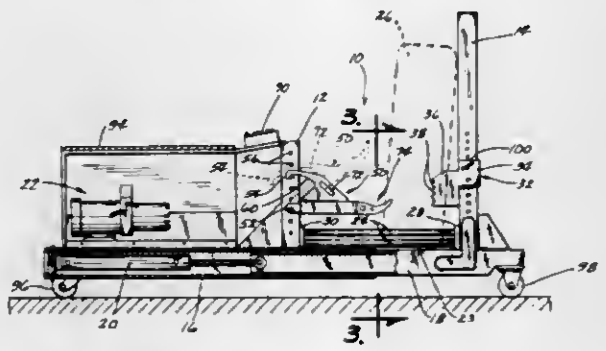
U.S. Cl. 157—1.26 **12 Claims**

1. A tire bead breaker machine comprising,

a frame having horizontally spaced apart upstanding members interconnected by a tire support means,

a rim-holding means on one of said upstanding members for engagement with one side of a tire rim,

a bead breaker arm vertically pivotally connected to said other upstanding member and having a wedge pivotally connected for slight pivotal movement on the outer free end of said arm for engagement with the other side of a tire rim between the tire bead and rim, said arm having a first stop means for preventing downward pivotal movement while allowing free upward pivotal movement whereby said wedge may follow the contour of the rim as it moves between said rim and tire bead, and power means operatively connected to said arm for moving said wedge between said tire bead and rim.



4,102,381
STRIP CURTAIN

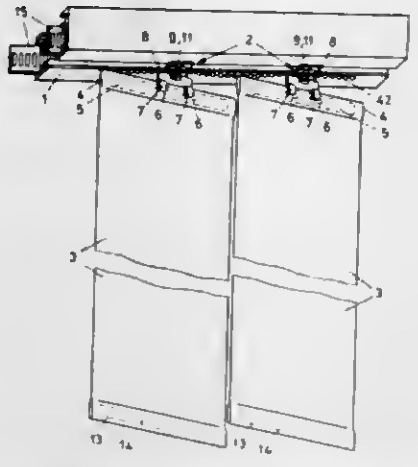
Konrad Bratschi, Muri, Switzerland, assignor to K. Bratschi, Silent Gliss, Muri, Switzerland

Filed Jul. 29, 1977, Ser. No. 820,135

Claims priority, application Switzerland, Aug. 4, 1976, 9959/76

Int. Cl.² E06B *9/30*

U.S. Cl. 160—168 R **12 Claims**



1. A strip curtain which includes a curtain track, sliding elements guided in the track and interconnected by a flexible separation limiting means, said sliding elements being adapted to have attached thereto freely hanging curtain strips, and an actuating tape movably positioned within the curtain track, said curtain comprising:

a vertical pivot shaft for each sliding element,

a pinion mounted on each pivot shaft, the pinion being in permanent engagement with the actuating tape, and

the sliding elements having slip coupling means and stop means limiting the pivoting of the curtain strips.

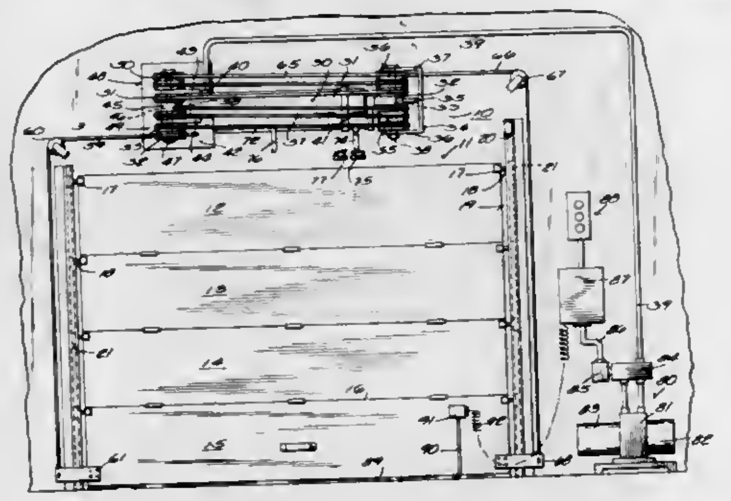
4,102,382
OVERHEAD DOOR OPERATOR

Edwin G. Vesbach, 12011 W. Scherrei Dr., Franklin, Wis. 53132

Filed May 5, 1977, Ser. No. 794,192

Int. Cl.² E05F *15/00, 15/08*

U.S. Cl. 160—188 **8 Claims**



1. Apparatus for opening and closing a door comprising:

a door that is mounted for movement between one position in which it closes an opening and another position generally above the opening,

a fluid actuated device including a cylinder, a piston movable therein and a piston rod,

first sheave means mounted to said piston rod for rotation and for translating with said rod,

second sheave means and stationary means on which said second sheave means is mounted for rotation in spaced relationship with said first sheave means,

cable means looped a plurality of times around said first and second sheave means and having opposite free end portions for being attached, respectively, to spaced apart places on said door,

pump means operative to supply pressurized fluid to said cylinder to extend said piston rod and translate said first sheave means away from said second sheave means to thereby enlarge the size of said cable loops and create tension in said cable for opening said door,

means for closing said door including means for relieving fluid from said cylinder for enabling tension created in said cables by the weight of the door when said door is unclosed, to translate said first sheave means toward said second sheave means and reduce the size of said loops,

an elongated member mounted for translating lengthwise in opposite directions in correspondence with said piston rod,

limit switch operator means mounted to and adjustably positionable along said elongated member,

a plurality of limit switches in the path of travel of said switch operator means for being actuated, respectively, in correspondence with said door reaching its fully open and fully closed positions,

motor means for operating said pump means,

solenoide operated valve means operable to open and cause said relieving of fluid for closing said door when one of said limit switches is not actuated,

means for controlling said valve means to close in response to actuation of said one limit switch when said door reaches the limit of its closing travel,

means for controlling said motor means to start for opening said door, and

means for controlling said motor means to stop in response to actuation of another of said limit switches when said door reaches the limit of its opening travel.

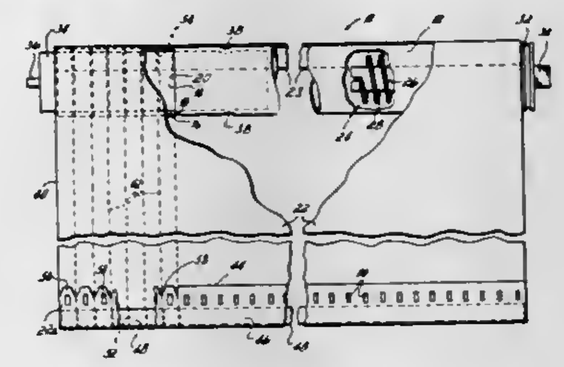
4,102,383
WINDOW SHADE

Gerald W. Miller, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed Oct. 15, 1976, Ser. No. 732,715

Int. Cl.² A47G *5/02*

U.S. Cl. 160—263 **5 Claims**



1. A window shade comprising, in combination,

a roller having a telescoping member receivable in one end,

a shade secured along one end of said roller and extending between the ends of said roller, and having an opposite free end, said shade having a hem opposite said end secured to said roller formed of overlapping shade portions joined along a hem line spaced from the free end of said shade, and having at least one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said edge such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,

said roller including at least at its end receiving the telescoping member a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade adapted to permit removal of discrete lengths of said roller corresponding to said discrete widths of said shade hand-stripped therefrom, and

a plurality of tabs associated with said hem, each said tab extending between said hem line and said free end of said shade, the edges of said tabs being substantially coincident with said hand-strip lines, said tabs being adapted to be grasped and pulled to separate said overlapping shade portions and initiate stripping along said lines from said free end of said shade toward said end secured to said roller while said shade is rolled on said roller.

4,102,384
WINDOW SHADE

Robert C. Gossling, and Gerald W. Miller, both of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Continuation of Ser. No. 688,063, May 19, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,368

Int. Cl.² A47G *5/02*

U.S. Cl. 160—263 **13 Claims**

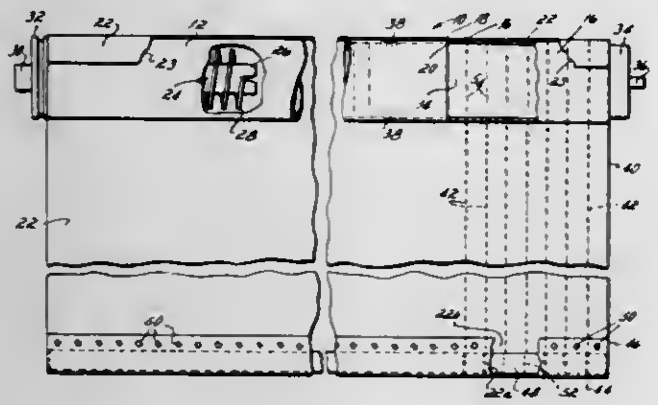
1. A window shade comprising, in combination,

a roller having a telescoping member receivable in one end, and

a shade secured along one end to said roller and extending between the ends of said roller and having a free opposite end, said shade having at least at one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said edge such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,

said roller including at least at its end receiving the telescoping member a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade adapted to permit removal of discrete lengths of said roller corresponding to said discrete widths of said shade hand-stripped therefrom,

said window shade being adapted to be sized to a window opening by hand-stripping of said discrete widths of said



shade from said free end of said shade toward said end secured to said roller while said shade is rolled on said roller, with said discrete length of said roller to be removed being exposed by said hand-stripping of said shade.

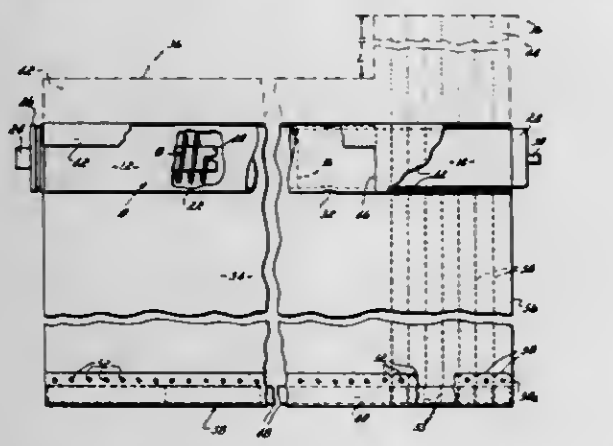
4,102,385
WINDOW SHADE

Gerald W. Miller, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed May 23, 1977, Ser. No. 799,350

Int. Cl.^{2} A47G *5/02*

U.S. Cl. 160—263 **5 Claims**



1. A window shade assembly comprising, in combination, a telescoping roller including a first tubular roller section, a second tubular roller section having one end thereof telescopingly seated within said first section with a portion thereof projecting axially from said first section, a tube surrounding at least a portion of said second member projecting axially from said first member, and means associated with said roller for resisting relative rotative movement between said tubular roller members, said tube having an inside diameter of the sides permitting free axial sliding movement between said members, and

a window shade of flexible sheet material secured along one end to said roller and extending between the ends of said roller and having a free opposite end, said shade having at least at one edge thereof a plurality of spaced hand-strip lines extending from end-to-end substantially parallel to said end such that discrete widths of said shade may be hand-stripped along said lines from said free end of said shade to provide a smooth, straight edge after stripping,

said tube being formed by an extended length of shade material wrapped around said projecting portion of said second roller section a number of times sufficient to form an outside diameter approximately equal to the outside diameter of said first roller section, said spaced hand-stripped lines extending to the roller end of said extended length of shade material so as to define when wrapped around said projecting portion of said second roller section a plurality of longitudinally spaced, circumferentially extending strip lines substantially coincident with said lines of said shade,

said window shade being adapted to be sized to a window opening by hand-stripping of said discrete widths of said shade from said free end of said shade toward said roller end of said extended length of shade material while said shade is rolled on said roller in a continuous stripping operation.

4,102,386
CASTING APPARATUS

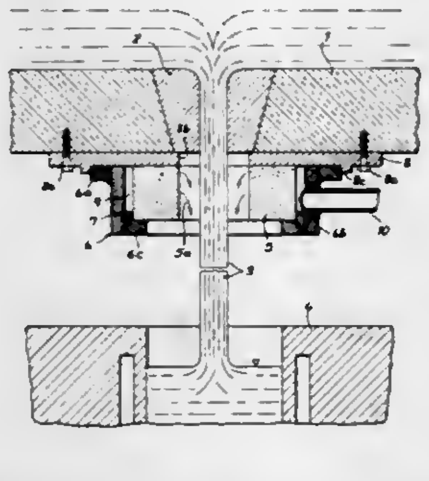
Peter Hildebrandt, Kranzberg; Georg Veranneman, Pullach, and Werner Schottroff, Wolfratshausen, all of Germany, assignors to Linde Aktiengesellshaft, Wiesbaden, Germany

Filed Nov. 12, 1976, Ser. No. 740,832

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550813; Mar. 19, 1976, 2611831

Int. Cl.^{2} B22D *21/02, 23/00*

U.S. Cl. 164—259 **8 Claims**



1. In a casting apparatus having a source of molten casting metal provided with an outlet, a free-falling stream of molten casting metal flowing downwardly from said outlet, and a mold receiving said stream, the improvement which comprises:

a porous ring of high-temperature-resistant gas-permeable material disposed coaxially with said stream and extending over a minor portion of the length thereof,

means for feeding said ring with a protective gas and forcing said gas through the pores thereof whereby said ring distributes protective gas emerging from the pores of said body all around said stream to shield the same from the ambient atmosphere over an unconfined portion of the length thereof, and

means for connecting said ring directly with said source.

4,102,387
AUTO IGNITION TEMPERATURE CONTROL SYSTEM

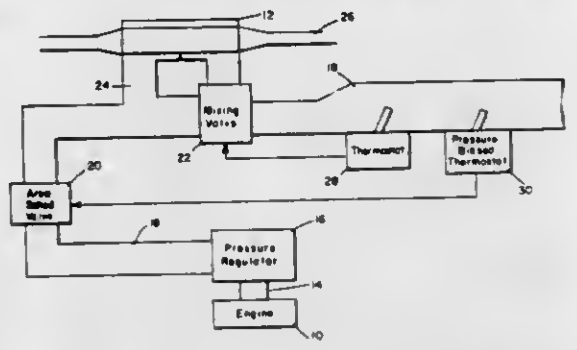
Dan S. Matulich, Rolling Hills Estates, Calif., and B. Franklin Saylor, Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 13, 1976, Ser. No. 704,903

Int. Cl.^{2} F28F *27/00*

U.S. Cl. 165—1 **16 Claims**

1. A temperature control system comprising heat exchanger and flow control means for regulating air temperature within a predetermined range by controlling relative air flow through and past the heat exchanger, and additional flow control means for reducing air flow through said system whenever air temperature exceeds said predetermined range.



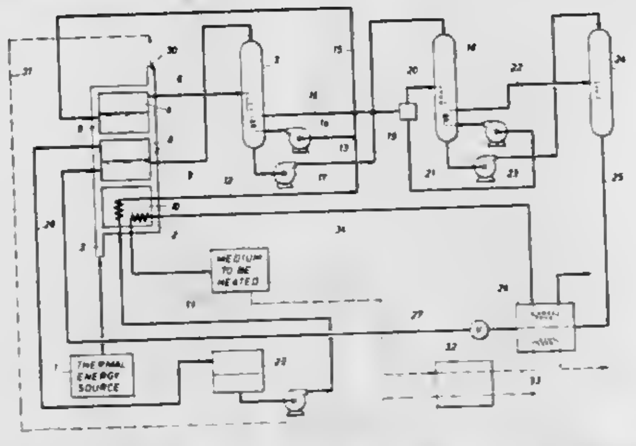
4,102,388
HEAT RECOVERY PROCESS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 725,760, Sep. 23, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,470

Int. Cl.^{2} F25B *13/00, 15/00*

U.S. Cl. 165—1 **32 Claims**



1. A process for transferring thermal energy comprising contacting steam and a water absorbent solution in a first contact zone under conditions to absorb water and dilute the solution, and raise the temperature of the solution, the solution being in indirect heat exchange with an aqueous stream and raising the temperature of the aqueous stream and converting the aqueous stream to steam and water,

passing diluted solution from the first contact zone to a second contact zone;

passing said aqueous stream to a condensation and separation zone wherein the aqueous stream is separated into steam and liquid water,

passing steam from the condensation and separation zone to a second contact zone wherein the steam is contacted with diluted solution from the first contact zone, under conditions to absorb water and dilute further the solution, and raise further the temperature of the solution,

passing liquid water from the condensation and separation zone in indirect heat exchange with the further-diluted solution in said second contact zone, and converting the bulk of the liquid water into high temperature steam,

passing further-diluted solution from the second contact zone to a third contact zone, and contacting further-diluted solution in the third contact zone with said high temperature steam under conditions

to absorb water, and dilute the further-diluted solution, and form a high temperature, heavily diluted solution, and

transferring heat from the high temperature, heavily-diluted solution to a medium to be heated.

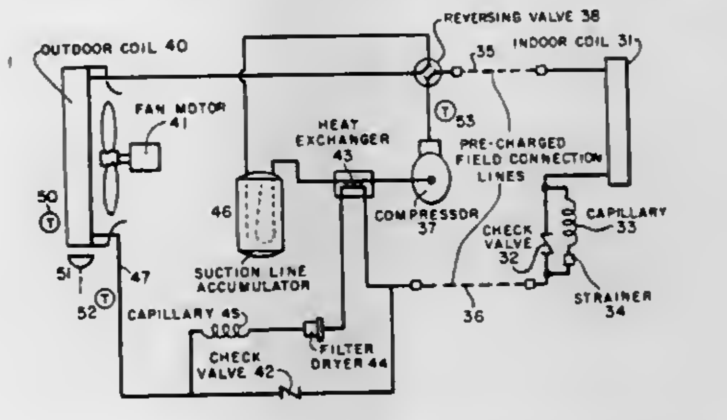
4,102,389
HEAT PUMP CONTROL SYSTEM

Frank Eugene Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 732,674

Int. Cl.^{2} F25B *13/00*

U.S. Cl. 165—29 **8 Claims**



1. A heat pump system including an outdoor coil, an indoor coil, a compressor for receiving low pressure gas from a suction line and for providing high pressure gas to a discharge line, a reversing valve connected in the discharge line, operable in a first position to pass the high pressure gas through the outdoor coil in the cooling cycle and operable in a second position to pass the high pressure gas through the indoor coil in the heating cycle, means for energizing supplemental heat below a balance point temperature and means for energizing standby heat below a minimum set point temperature, a thermostat positioned to sense the temperature in the space served by indoor coil, and a control system connected to regulate operation of the compressor, the reversing valve, and the supplemental and standby heat, which control system comprises:

a timer control circuit, including an input stage for starting the timing interval when an input signal is received, an output stage for delivering an output signal at the expiration of the timing interval, and circuit components including a resistor and a capacitor connected to establish the timing interval duration;

means, coupled between the thermostat and the timer control circuit input stage, for passing an input signal to start the timing interval when the thermostat provides a compressor turn-off command signal;

memory means, having an output connected to regulate compressor operation and an input connected for regulation by the timer control circuit, to insure the compressor cannot be re-started before the expiration of the timing interval; and

a trigger circuit connected to provide a defrost-cycle initiate signal and to provide a signal to the timer control circuit input stage when the trigger circuit is switched, a pressure-responsive sensor positioned adjacent the outdoor coil and connected to supply a first signal when the pressure across the outdoor coil drops below a predetermined minimum value, an integrating circuit, coupled between the pressure-responsive sensor and a first input terminal of the trigger circuit, for integrating the first signal and passing a signal to the trigger circuit only after the first signal has been present for a predetermined minimum time, a temperature-responsive sensor provided to sense the temperature in the liquid line connected to the outdoor coil, and means for passing a signal from the liquid line sensor to a second input terminal of the trigger circuit, which trigger circuit switches only in response to the simultaneous presence of low-pressure and low-temperature signals at the trigger circuit input terminals.

4,102,390

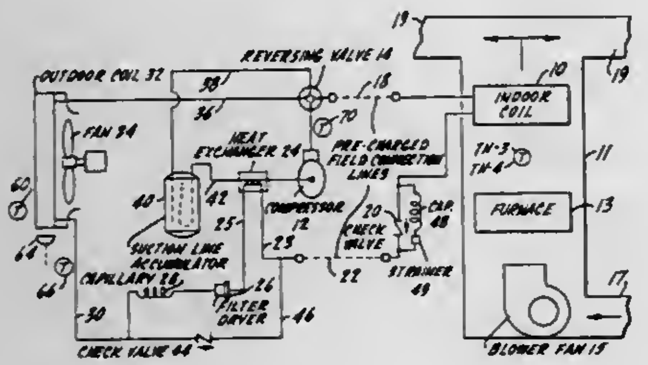
CONTROL SYSTEM FOR HEAT PUMP AND FURNACE COMBINATION

James Ranck Harnish, and Larry Allan Raffensberger, both of York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,751

Int. Cl.^{2} F25B *29/00*

U.S. Cl. 165—29 6 Claims



1. A combination heat pump-furnace system for delivering conditioned air to an enclosure comprising: a heat pump including an inside coil, a compressor and an outside coil all connected in series flow relation, said heat pump further including a reversing valve for selectively directing refrigerant from said compressor to said indoor coil for heating mode operation, or to said outdoor coil for cooling mode operation; a furnace having a heat exchanger section upstream from said indoor coil; means for circulating air through said furnace heat exchanger and then through said indoor coil to said enclosure; first thermostatic means for controlling the operation of said heat pump during heating mode operation; second thermostatic means for controlling the operation of said furnace, said second thermostatic means actuating said furnace when the temperature of air in said enclosure reaches a predetermined low threshold level; third thermostatic means between said furnace heat exchanger and said indoor coil for sensing the air temperature off said furnace heat exchanger; and relay means controlled by said third thermostatic means for discontinuing operation of said heat pump on heating mode only after the temperature, as sensed by said third thermostatic means, reaches some predetermined level to thereby prevent a noticeable drop in the temperature of air supplied to said enclosure which may be caused by premature deactivation of said heat pump.

6. A heat pump system comprising: an inside coil, a compressor and an outside coil all connected in series flow relation, said heat pump further including a reversing valve for selectively directing refrigerant from said compressor to said indoor coil for heating mode operation, or to said outdoor coil for cooling mode operation; means for sensing the need for defrosting said outside coil when said heat pump is operating in the heating mode, said means including a defrost cycle termination sensor; means for supplying heat to said enclosure intermittently during the defrost cycle; means for resuming operation of the heat pump in the heating mode without shutting off said compressor for a predetermined period of time after said defrost cycle termination sensor indicates that the defrost cycle has been completed; and means for discontinuing operation of said heat pump after said time has elapsed if the temperature of air being circulated through said indoor coil is not below a predetermined level.

4,102,391

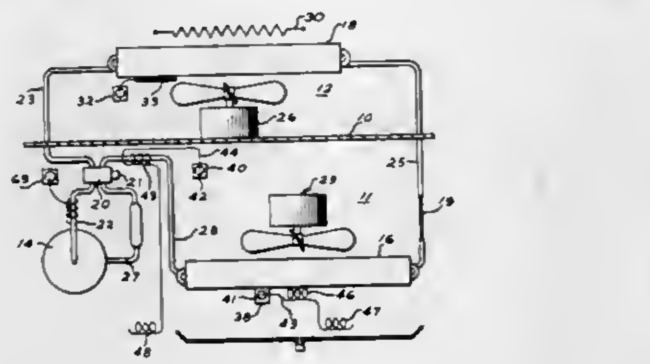
HEAT PUMP FROST CONTROL SYSTEM

Joseph R. Noland, and William M. McCarty, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 10, 1977, Ser. No. 776,194

Int. Cl.^{2} F25B *29/00;* F25D *21/02*

U.S. Cl. 165—29 5 Claims



1. In a self-contained air conditioning unit for heating and cooling an enclosure, a refrigerant circuit including an outdoor heat exchanger and indoor heat exchanger, a compressor, a reversing valve for selectively connecting said compressor to said heat exchangers where by said outdoor heat exchanger functions as an evaporator during operation of said unit on the heating cycle and said indoor heat exchanger functions as an evaporator during operation of said unit on the cooling cycle, fan means for moving enclosure air through said indoor heat exchanger, fan means for moving outdoor ambient air through said outdoor heat exchanger, an air conditioner heating cycle control system comprising:

a frost control means including a sensing element having one portion being exposed to the surface temperature of said outdoor heat exchanger and a second portion being exposed to the drain area temperature, means under control of said portions for maintaining operation of said compressor in the heating cycle when drain area and said heat exchanger surface temperature sensed by said portions are above a preselected frost accumulation level and to deenergize said compressor when either of said portions senses a preselected frost accumulation level.

a second control including a sensing element having one portion being exposed to the line surface temperature of a portion of said refrigerant circuit connecting said outdoor heat exchanger and said reversing valve, and a second portion being exposed to said ambient outdoor temperature, means under control of said portions for maintaining operation of said outdoor fan independent of said first control when both ambient and the line surface temperature sensed by said portions are above a frost accumulation temperature and to complete a circuit to said fan through said first control if either of the portions of said second control senses a preselected frosting temperature to de-energize said outdoor fan when said compressor is de-energized;

a thermostat means having a first switching means operable for energizing said compressor in said heating cycle when the temperature of said enclosure is a predetermined comfort level, and a second switching means operable for de-energizing said compressor when the temperature of said enclosure drops to a second lower predetermined level during the operation of said compressor in said heating cycle; and

a heating means arranged in the path of air through said indoor heat exchanger being energized by said second switching means when the temperature of said enclosure drops to the second lower preselected temperature.

4,102,392

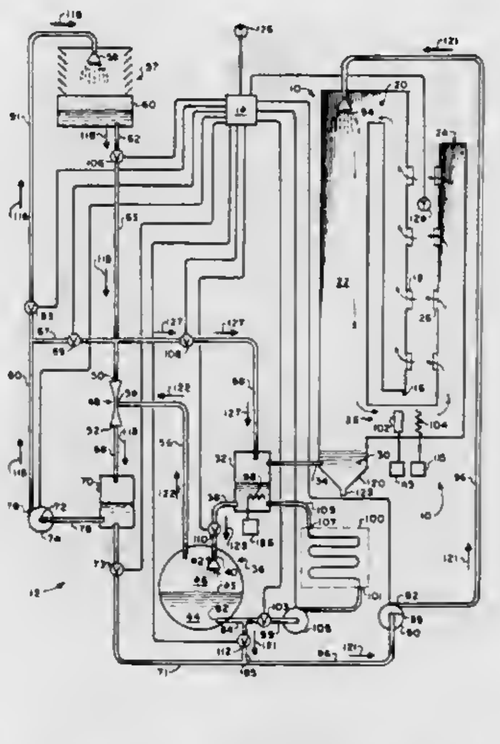
LOW ENERGY CONSUMPTION AIR CONDITIONING SYSTEM

Theodore S. Schneider, 132 N. Clark Dr., Beverly Hills, Calif. 90211

Filed Jan. 10, 1977, Ser. No. 758,031

Int. Cl.^{2} F25B *13/00*

U.S. Cl. 165—62 7 Claims



1. An airconditioning system for a building comprising

means defining an exhaust air conduit system for a building having a plurality of exhaust air inlets and an exhaust air outlet,

means defining a supply air conduit system for a building having a plurality of supply air outlets and a supply air inlet,

an elongated, vertically aligned, generally straight conduit tower adapted to contain air and water having its upper end connected to and in fluid communication with said exhaust air outlet of said exhaust air system, and having its lower end connected to and in fluid communication with said supply air inlet of said supply air system,

means defining a supply of water,

means for conveying said water to a location proximate the upper end of said conduit tower for free fall down said conduit tower, whereby said air flow from said exhaust air conduit system is entrained and carried downward with said flow of water and transported to said supply air inlet,

means for cooling said water after falling through said conduit tower comprising,

means for evaporative cooling said water having a supply water inlet nozzle, a chilled water outlet and a warm water vapor outlet,

means for fluidly connecting said supply water inlet nozzle to said supply of water and said water at the bottom of said conduit tower,

means for fluidly connecting said chilled water outlet to said means for conveying water to a location proximate the upper end of said conduit tower,

means for creating a vacuum in said means for evaporative cooling said water comprising

a venturi having an inlet end, an outlet end and a suction inlet,

means for moving water through said venturi from said inlet end to said outlet end, and

means for fluidly connecting said venturi suction inlet to said warm water vapor outlet of said means for evaporative cooling said water.

4,102,393

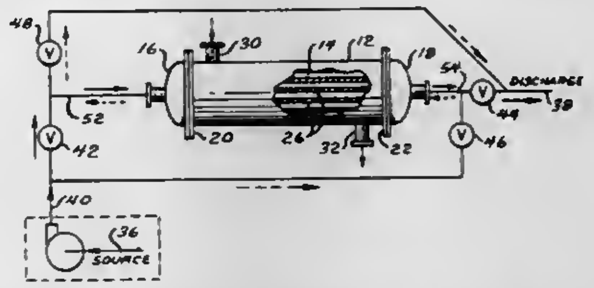
HEAT EXCHANGE APPARATUS

James G. Withers, Jr., Dearborn, Mich., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 617,453, Sep. 23, 1975, Pat. No. 4,007,774. This application Sep. 17, 1976, Ser. No. 724,036

Int. Cl.^{2} F28F *19/00*

U.S. Cl. 165—95 4 Claims



1. An improved heat exchange apparatus for use with a tubeside fluid which is capable of fouling the tube walls comprising at least one tube for circulating fluid through the apparatus, said at least one tube being characterized in that it has integral internal ridging in its inner wall which is generally transverse to the tube axis and has a lead angle of less than 60° as measured from a perpendicular to the tube axis, said ridging being adapted to turbulate said tubeside fluid to prevent fouling of the areas of the tube immediately upstream of the ridging, and valve means for reversing the direction of fluid flow of said tubeside fluid within said at least one tube.

4,102,394

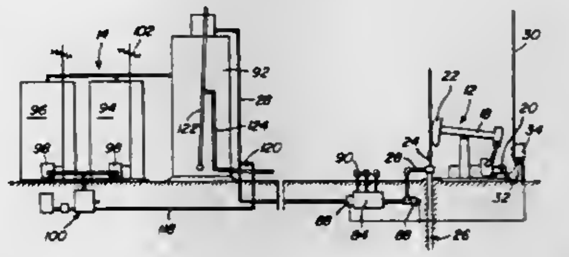
CONTROL UNIT FOR OIL WELLS

Elton M. Botts, Mattoon, Ill., assignor to Energy 76, Inc., Mattoon, Ill.

Filed Jun. 10, 1977, Ser. No. 805,569

Int. Cl.^{2} E21B *43/00*

U.S. Cl. 166—65 R 8 Claims



1. A control unit for oil well pumping units of the type having a pump jack comprising an AC electric motor powering the pump jack, said AC motor having a variable speed and variable cycle to enable the pump jack to be operated at a speed to operate the down hole pump at a strokes per minute to provide a production capacity of the pump equal to the production fluid flowing from the formation, said variable cycle of the motor enabling the upstroke of the pump to be at a greater speed than the downstroke thereby eliminating pounding due to fluid columns engaged by the pump plunger during its downstroke.

4,102,395

PROTECTED WELL SCREEN

Wiley B. Robinson, Dayton, Tex., assignor to Houston Well Screen Company, Houston, Tex.

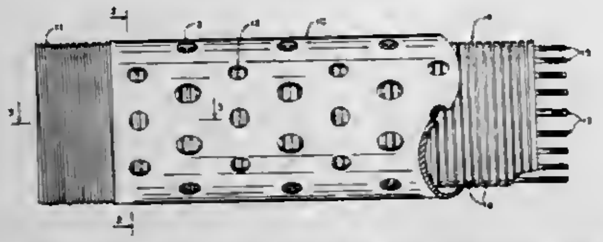
Filed Feb. 16, 1977, Ser. No. 768,972

Int. Cl.^{2} E21B *43/08*

U.S. Cl. 166—231 2 Claims

1. A well screen assembly for use in a gravel-packed section of a producing well comprising a pipe joint having a plurality of perforations in its side wall through which fluid can flow, a well screen positioned inside the pipe joint, said screen includ-

ing a plurality of elongated rods positioned inside the pipe joint parallel to and spaced from the longitudinal axis of the joint, said rods being arranged in a circle, a length of wire helically wrapped around the rods in spaced-apart turns to provide slots between adjacent wraps to screen solid particles from the fluid flowing through the slots, and means engaging the upper and lower ends of the screen for mounting the screen in the pipe joint with the screen spaced from the inside wall of the pipe joint to provide an annular space between the screen and the inside wall of pipe joint over substantially its entire length and electrically connected to the pipe joint only through the mounting means to allow fluid passing into the pipe joint through the perforations to flow freely around the screen in the annular space and to allow gravel when pumped around the outside of the well screen to fill the annular space between the well screen and pipe joint, said mounting means closing the annular space adjacent the upper and lower ends of the screen to hold the gravel in position in the annular space between the screen and the inside wall of the pipe joint.



4,102,396
DETERMINING RESIDUAL OIL SATURATION FOLLOWING FLOODING

Robert C. Ransom, Placentia, and LeRoy W. Holm, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Jun. 23, 1977, Ser. No. 809,313
Int. Cl.^{2} E21B *49/00*

U.S. Cl. 166—252 **25 Claims**

1. A process for determining the fluid saturation of a subterranean reservoir penetrated by one or more injection wells and one or more production wells, which reservoir has been subjected to a secondary recovery operation in which a secondary recovery fluid is injected through the injection wells comprising:

(a) first injecting into a selected well hydrocarbons in an amount sufficient to resaturate the portion of the reservoir in the immediate vicinity of the well to at least about its original hydrocarbon content,

(b) next injecting into said well a secondary recovery fluid in an amount sufficient to expose said portion of the reservoir in the immediate vicinity of the well to the same volume of secondary recovery fluid as was passed through the bulk of the reservoir during the secondary recovery process, and

(c) thereafter logging the well to determine the fluid saturation.

4,102,397
SEALING AN UNDERGROUND COAL DEPOSIT FOR IN SITU PRODUCTION

Rael C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Mar. 7, 1977, Ser. No. 774,597
Int. Cl.^{2} E21B *43/24, 43/26;* E21C *43/00*

U.S. Cl. 166—259 **11 Claims**

1. A method of producing an underground coal deposit comprising the steps of:

establishing a first communication passage between the surface of the earth and an underground coal deposit,

setting a liner within the said first communication passage, the lowermost point of said liner being positioned apart from the uppermost portion of the said underground coal deposit,

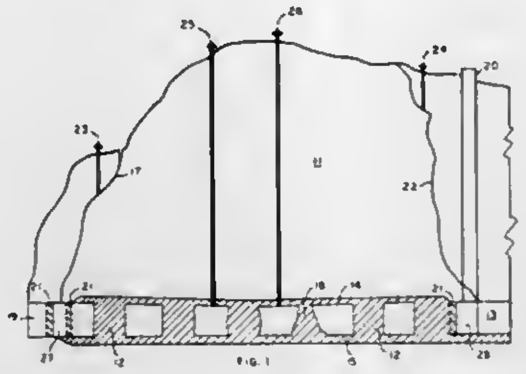
establishing a first hermetic seal between the said liner and the overburden on the periphery of the said first communication passage, the said first hermetic seal being positioned at the lowermost portion of the said liner with the resultant remainder of the annulus between the said liner and the said periphery of the first communication passage being in fluid communication with the earth's atmosphere,

establishing a second hermetic seal between the said liner and the atmosphere, the said second hermetic seal being positioned on the uppermost portion of the said liner,

establishing a fluid injection means in the uppermost portion of the said liner,

establishing fluid withdrawal means in the uppermost portion of the said liner, then

establishing a third hermetic seal by injecting a fluid in the annulus between the said liner and periphery of the said first communication passage, the said fluid forming a column of fluid in the said annulus above the said first hermetic seal.



4,102,398
METHOD OF FORMING GRAVEL PACKS

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,678
Int. Cl.^{2} E21B *43/02*

U.S. Cl. 166—276 **12 Claims**

1. A method of forming a pack of solid particulate material in a well bore penetrating a permeable formation which comprises injecting into the well bore opposite the said permeable formation a slurry of from about 2 to about 10 pounds per gallon of sand having a size of about 20 to about 100 mesh per gallon of carrier liquid to create a permeable pack of said sand against the formation face and wherein in a final step the said pack is electrolessly metal plated to form a consolidated permeable pack thereby minimizing migration of sand and other granular material into the well bore from the said permeable formation, the said sand being copper coated and having an outer coating of a metal selected from the group consisting of cobalt and nickel.

4,102,399
CONSOLIDATED SAND CONTROL PACK

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,677
Int. Cl.^{2} E21B *43/04*

U.S. Cl. 166—276 **14 Claims**

1. A method of forming a pack of solid particulate material in a well bore penetrating a permeable formation which comprises injecting into the well bore opposite the said permeable formation a slurry of from about 2 to about 10 pounds of a solid particulate material selected from the group consisting of silicon carbide, silicon nitride, silicon boride, boron carbide, zirconium boride, zirconium carbide, zircon, garnet and mixtures thereof and having a size of about 20 to about 100 mesh

per gallon of carrier liquid to create a permeable pack of said particulate material against the formation face and wherein in a final step the said pack is electrolessly metal plated to form a consolidated permeable pack thereby minimizing migration of sand and other granular material into the well bore from the said permeable formation, the said particulate material being coated with copper and having an outer coating of a metal selected from the group consisting of nickel and cobalt.

4,102,400
METHOD OF CONTROLLING FLUID LOSS FROM THIXOTROPIC CEMENT

Oliver W. Crinkelmeyer, Kilgore, Tex.; Roland L. Root, Tulsa, Okla., and James R. Sharpe, Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 17, 1977, Ser. No. 807,763
Int. Cl.^{2} E21B *33/16, 33/138*

U.S. Cl. 166—283 **19 Claims**

1. A method of reducing fluid loss from a thixotropic cement slurry to a subterranean formation during emplacement of said slurry in a borehole which penetrates the subterranean formation to cement a conduit in said borehole, said cement slurry being substantially free of an effective amount of a fluid loss additive, comprising:

(a) temporarily positioning the conduit in the borehole;

(b) providing a fluid comprised of water, a water soluble alkali metal silicate, a water soluble metal compound capable of releasing a multivalent metal cation to react with the water soluble silicate, and a water dispersible cellulose compound and an inert particulate which together impart fluid loss control to the fluid, said fluid components being provided in amounts effective to form a pumpable gel;

(c) injecting said fluid into said borehole so that at least a portion of said fluid contacts the walls of the formation;

(d) injecting said thixotropic cement slurry into said borehole following said fluid and circulating said slurry into position; and

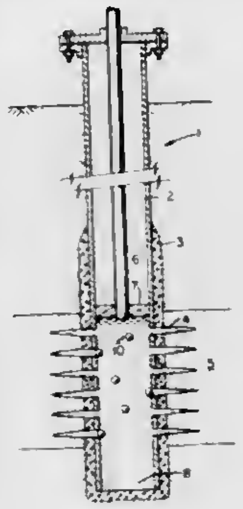
(e) permitting said slurry to set, thereby permanently cementing said conduit into position; the quantity of said fluid contacting said formation being sufficient so that the fluid loss of said cement slurry to said formation is reduced.

4,102,401
WELL TREATMENT FLUID DIVERSION WITH LOW DENSITY BALL SEALERS

Steven R. Erbstoesser, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sep. 6, 1977, Ser. No. 830,729
Int. Cl.^{2} E21B *33/10, 43/25*

U.S. Cl. 166—284 **8 Claims**



2. A method of plugging the perforations in a casing which has been set in a wellbore comprising:

downwardly flowing into said casing a carrier liquid having ball sealers suspended therein, said ball sealers having syntactic foam cores and elastomeric covers, said ball sealers having a density less than the density of the carrier liquid and being of sufficient size to plug the casing perforations; and

maintaining the flow velocity of said carrier fluid at a rate sufficient to overcome the buoyancy of said ball sealers and sufficient to transport said ball sealers to the perforations.

4. A ball sealer for plugging perforations in a casing which has been set in a wellbore comprising:

a. a syntactic foam core, said syntactic foam being a material system comprised of hollow spherical particles dispersed in a binder; and

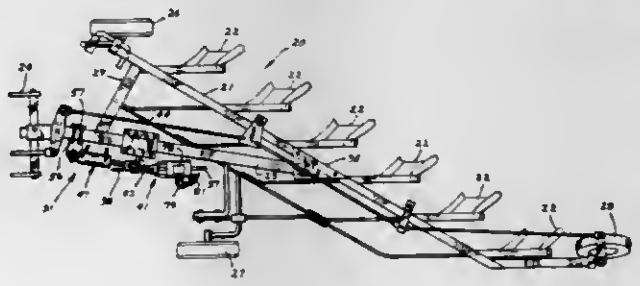
b. an elastomeric covering.

4,102,402
SUBSOILER

Richard W. Steinberg, Mankato, Minn., assignor to Vibra-King, Inc., Mankato, Minn.

Filed Sep. 13, 1976, Ser. No. 722,694
Int. Cl.^{2} A01B *11/00*

U.S. Cl. 172—40 **49 Claims**



30. An apparatus for working subsoil comprising: a frame, an earthworking tool adapted to extend into the subsoil in a normal ground working position, link means pivotally connecting the tool to the frame, means mounted on the frame for providing eccentric movement, and connector means attached to the tool and cooperating with the means for providing eccentric movement to move the tool in an endless path and a coulter rotatably mounted on the link means, said coulter being located forwardly of and in longitudinal alignment with the tool, said means mounted on the frame for providing eccentric movement includes inertia wheel means, eccentric means connected to the wheel means providing the connector means with motion in response to rotation of the wheel means, and means for rotating the inertia wheel means, said inertia wheel means comprises a pair of flywheels, and the means for rotating the wheel means includes a power transmission unit having a pair of drive shafts, having a flywheel mounted on each drive shaft, and means to rotate the drive shafts, said eccentric means comprises an eccentric hub secured to each flywheel, and means rotatably mounting the connector on each hub.

4,102,403
APPARATUS FOR MAKING A SLIT TRENCH

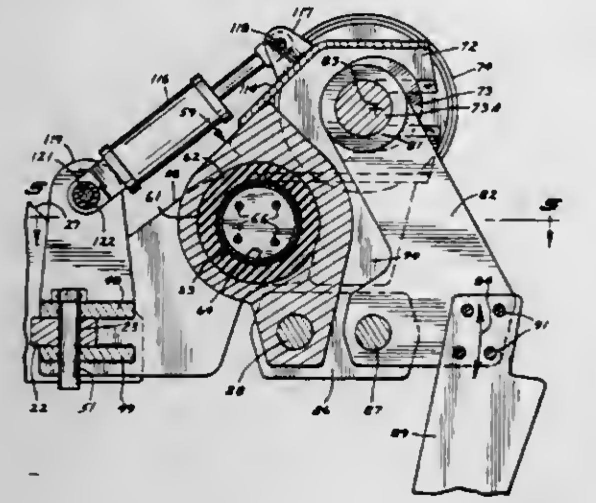
Richard W. Steinberg, Mankato, Minn., assignor to Vibra-King, Inc., Mankato, Minn.

Filed Oct. 15, 1976, Ser. No. 732,796
Int. Cl.^{2} E02F *5/18*

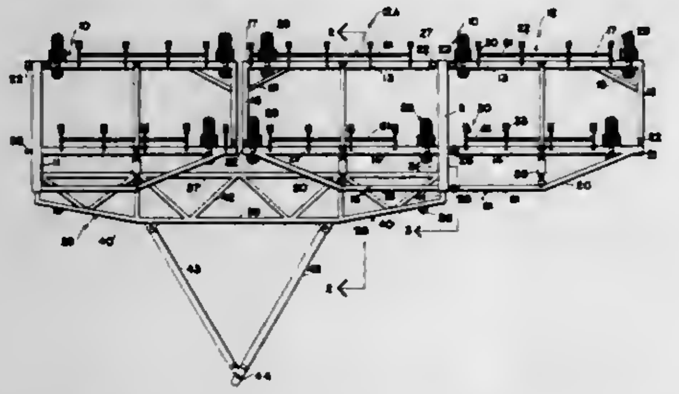
U.S. Cl. 172—40 **41 Claims**

1. Apparatus for making a continuous slit trench in the ground to facilitate the laying of linear structures, as lines, pipes, cables and the like, in the ground comprising: a frame having a forward portion adapted to be connected to a pulling vehicle, a body located adjacent said frame, said body having a cylindrical wall forming an opening through the body, means connecting the body to the frame, said means including a cylindrical hub extended through the opening, means mount-

ing the hub on the frame, and an annular resilient and elastic member surrounding the hub and engageable with the cylindrical wall of the body; annular members mounted on the body and engageable with the sides of said annular resilient and elastic member to hold the annular resilient and elastic member under compression; a member located adjacent the body, link means pivotally connecting lower portions of the body and member; a ground penetrating plow secured to the member adapted to make a slit trench on forward movement of the apparatus; and means connected to the member operable to move the plow in an orbital path along the length of the plow, said annular resilient and elastic member being an energy receiving and transmitting member operable to alter the orbital movement of the plow in relation to the load applied to the plow.

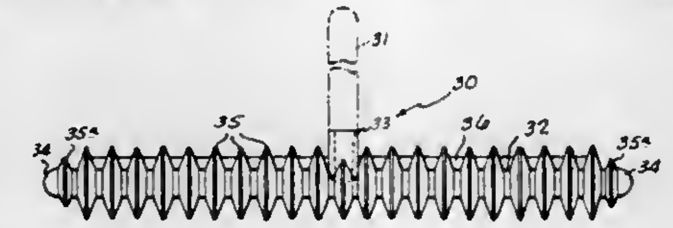


4,102,404
ARTICULATED CULTIVATOR
Kelly A. Krammer, Box 144, Cupar, Canada (S0G 0Y0)
Filed Jan. 14, 1977, Ser. No. 759,334
Claims priority, application Canada, Jan. 22, 1976, 244166
Int. Cl.² A01B *23/04*
U.S. Cl. 172—310 **20 Claims**



1. A cultivator section adapted to be drawn by a source of power such as a tractor and comprising in combination a main beam extending from the front of said section to the rear thereof and a sub on each side of said main beam, means connecting said sub frames and said main beam for hinging action in a vertical direction of one sub frame relative to the other, further means connecting each of said sub frames and said main beam together for universal articulation of part of each of said sub frame relative to another part of each of said sub frame, cultivating elements secured to and depending from said sub frames, ground engaging wheels supporting said cultivating section, and hitch means for detachably connecting said cultivating section to the associated source of power, each said sub sections including a rear chassis member, a front chassis member situated in spaced and parallel relationship to said rear chassis member and an end chassis member extending between the outer ends of said rear and front chassis members, said rear chassis member and said end chassis member being secured together substantially at right angles to one another, said further means connecting said sub frames to said main beam including a universal joint connection between the inner end of said rear chassis member and the rear end of said main beam and a further universal joint connection between the outer end of said front chassis member and the front end of said end chassis member.

4,102,405
GOLF SAND-TRAP SMOOTHING IMPLEMENT
Edward W. Carman, P.O. Box Elmer, Almond Rd., Elmer, N.J. 08318
Continuation-in-part of Ser. No. 712,202, Aug. 6, 1976, abandoned. This application Nov. 12, 1976, Ser. No. 741,492
Int. Cl.² A01B *1/10;* A63B *57/00*
U.S. Cl. 172—378 **7 Claims**

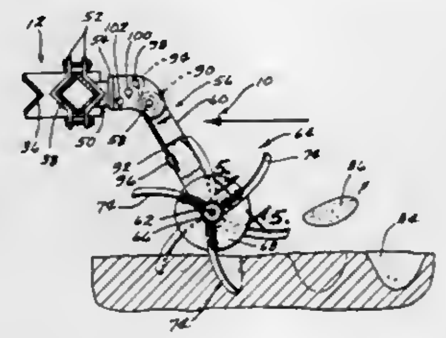


1. A golf sand-trap smoothing implement comprising:

(a) means for penetrating the surface of a sand trap in order to smooth said surface, said penetrating means comprising a unitary substantially cylindrical body having two ends and a longitudinal axis and having integrally formed therewith a plurality of raised ridges spaced along the longitudinal axis of said body and with each of said ridges extending circumferentially around substantially the entire periphery of said body, said ridges each defining an outermost edge which is generally constant in distance from said body along all portions of the circumference thereof, said ridges being relatively rigid and incapable of flexing with respect to said body; and

(b) means for drawing said penetrating means through said sand trap just below said surface in order to effect said smoothing operation comprising elongated handle means and extending away from said body at an angle to said longitudinal axis thereof, said handle means being substantially greater in length than the length of said body between said two ends connected to said body.

4,102,406
GROUND CONDITIONING DEVICE AND METHOD OF CONDITIONING SOIL
Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.
Filed Jan. 24, 1977, Ser. No. 761,769
Int. Cl.² A01B *35/16, 35/28*
U.S. Cl. 172—540 **3 Claims**



1. A ground conditioning device comprising,

an arm having mounting means at one end for connection to an implement frame,

a plate disc member rotatably mounted to the other end of said arm, said disc member having first and second faces,

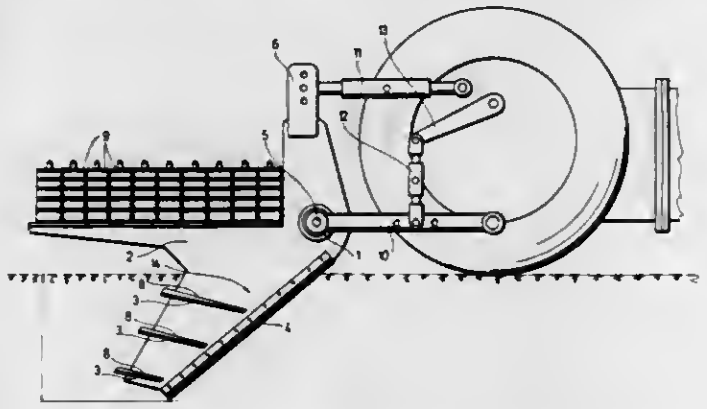
a plurality of fastener elements securely mounted to and extending from said first and second faces in circumferentially spaced apart disposition, said fastener elements of said first face staggered circumferentially alternatively from said fastener elements of said second face, said fastener elements being concave longitudinally,

a plurality of ground engaging spikes adapted to adjoin in nesting relationship said fastener elements so as to extend radially from said disc member,

attachment means for detachably mounting said spikes in mating adjoining relationship to said fastener elements, and

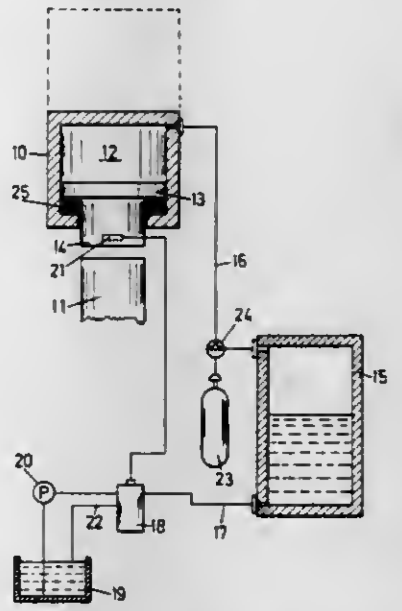
said ground engaging spikes being concave in transverse cross section and concave longitudinally to engage and scoop plugs of soil from the ground as said disc member rotates.

4,102,407
REFORESTATION TILLAGE MECHANISM
István Danszky, Budapest, and Dezsö Szecska, Kecskemet, both of Hungary, assignors to Erdészeti Tudományos Intézet, Budapest, Hungary
Continuation-in-part of Ser. No. 409,258, Oct. 24, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,987
Int. Cl.² A01B *13/08*
U.S. Cl. 172—611 **10 Claims**



1. A reforestation tillage mechanism, attachable to a three-point hitch of a hauling tractor, the mechanism comprising: at least one transverse suspension frame; at least two tiller mechanisms on said frame in a substantially parallel arrangement; three-point hitch connections on said frame for floatingly carrying said tiller mechanisms on the tractor during a tillage operation and for raising the frame for transport; each tiller mechanism comprising blade holder shank having an upper end secured to said frame and being pivotable therewith about said connections in a vertical plane, the main dimension of said shank being substantially normal to the axis about which said frame can pivot; at least one, substantially straight cutter blade removably mounted to a lower forward edge portion of said shank, defining an angle of about 120° to 155°, downwardly inclined with respect to the direction of haulage but opposite thereto; at least one pair of substantially parallel, transversely extending tiller blades removably mounted on opposite sides of said shank behind said cutter blade with respect to the direction of haulage, sloping with respect thereto, and defining an angle of about 10° to 40°, upwardly inclined toward rear free ends of said tiller blades, with respect to the direction of haulage; said holder shank, said cutter blades and said tiller blades forming part of said tiller mechanisms; the aforesaid angles contributing to said tiller mechanisms being floatingly carried while said cutter blades and said tiller blades are partly lowered into the soil, so that said cutter blades and said tiller blades normally till the soil but some large stump can divert said tiller mechanisms upwardly about said hitch, said cutter blades and said tiller blades being then at least partly lifted out of the soil; and weight holder means attached to said frame intermediate said tiller mechanisms to secure removably weight means whereby to increase the weight of the tiller mechanisms and to assist the latter to drop into the soil after the stump has diverted said tiller mechanisms; said cutter blades and said tiller blades being then allowed to drop by the effect of said weight means, whereby to continue the tilling without any breakage.

4,102,408
PILE DRIVING DEVICE
Birger Ludvigson, Södra Vägen 38, Göteborg, Sweden 41254
Filed Feb. 22, 1977, Ser. No. 770,811
Claims priority, application Sweden, Feb. 26, 1976, 76 02300
Int. Cl.² E02D *5/34*
U.S. Cl. 173—2 **13 Claims**



1. A device for displacing an elongate member, for instance a pile by means of a drop hammer, comprising

an — impact cap for transferring impacts from said drop hammer to said elongate member, said impact cap enclosing a cylinder,

a — piston operable in said cylinder to define a gas chamber therein and having a portion extending outside of the cylinder for acting against said elongate member,

a — pressure chamber, separate from the impact cap,

conduit means to communicate said gas chamber and said pressure chamber to form a closed gas volume, pumping means for supplying a pressurized liquid to said pressure chamber and valve means for governing the supply to, and spilling of liquid from said pressure chamber,

a — sensing means adjacent to the end of said elongate member acted upon by the impact cap for converting conditions in said elongate member, dependent upon the resistance met by said member during movements caused by impacts thereon, into transmittable signals, and

means — adapted to receive such signals and to actuate said valve means in response thereto for determining the volume of liquid in said pressure chamber.

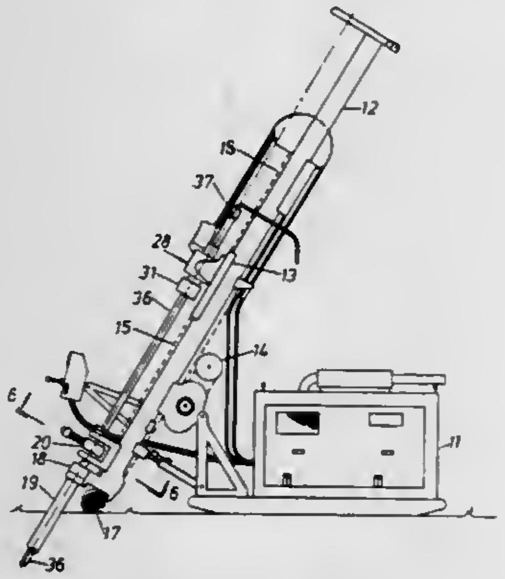
4,102,409
ROCK DRILLING MACHINE
John Arne Lagerstedt, Skarholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 9, 1976, Ser. No. 748,733
Claims priority, application Sweden, Dec. 11, 1975, 7513971
Int. Cl.² E21B *1/00*
U.S. Cl. 173—50 **19 Claims**

1. Rock drilling machine comprising:

a feed beam (12);

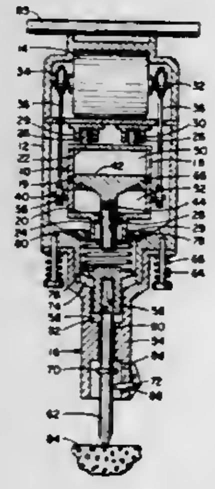
a slide (13) mounted on said feed beam and being movable along said feed beam;

power means (14, 15) coupled to said slide to move said slide along said feed beam;
a first chuck (31) mounted on said slide and having gripping jaws for gripping a drill string (36), said first chuck rotating and feeding the drill string (36) and having a through opening for the drill string;
a motor (34) for rotating said first chuck;



a second chuck (40) mounted on said slide and having gripping jaws for gripping the drill string, said second chuck having a through opening for the drill string;
a reduction gearing (38, 43–46) coupling said second chuck to said motor (34) to be rotated by said motor (34); and
means for selectively rotating the drill string by said first and second chucks, said second chuck rotating the drill string with lower revolution rate and high torque than said first chuck.

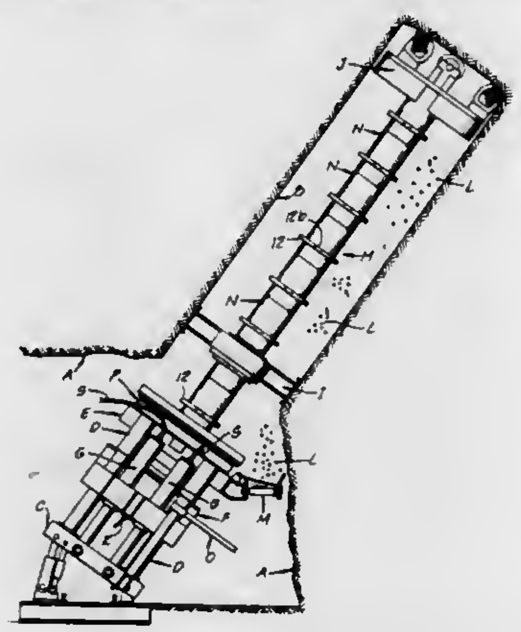
4,102,410
RESILIENT WORK-COUPLED IMPACT DEVICE
Frederick W. Ross, 755 Klamath Dr., Del Mar, Calif. 92014
Filed Mar. 19, 1975, Ser. No. 559,667
Int. Cl.² B25D *17/08*
U.S. Cl. 173—133 **32 Claims**



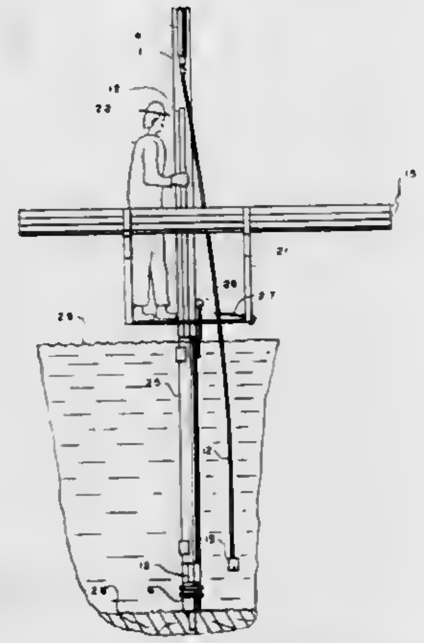
1. An impact device for operation with bias force applied toward a workpiece and comprising:
a frame,
ram means mounted for reciprocation along a selected axis relative to said frame,
power drive means acting between the ram means and the frame for generating the reciprocation of said means by generating reactive reciprocative excursions of said frame along such selected axis,
output means comprising impact tool means operatively mounted in tool guide means for reciprocating movement relative to said frame substantially along such selected axis, said impact tool means positioned for receiving successive impacts from said ram means during reciprocation of the latter, and stop means acting between the frame and the impact tool means for limiting relative travel between the frame and the tool means,
wherein the improvement comprises:
stabilizing means for eliminating frame dynamic impacting against the stop means, for stabilizing the frame reciprocative motion, and for increasing the impact device effectiveness and efficiency with improved hammer-chisel type impacting during operation; said stabilizing means comprising:
said stop means including frame stop means secured on said frame and tool stop means secured on said impact tool means sufficiently spaced respectively along such selected axis for sufficient maximum relative travel between said frame and said impact tool means for free dynamic excursions of said frame relative to said impact tool means clear of substantial contact between said frame stop means and said tool stop means during normal operation of the impact device including operation with such bias force applied and with said impact tool means substantially in constant contact with such workpiece,
resilient bias means operatively interposed between said frame and said impact tool means, said resilient bias means having sufficient spring stiffness and sufficient length to maintain said impact tool means substantially in constant contact with such workpiece during such normal operation of the impact device and to resiliently suspend said frame within the medial portion of said maximum relative travel substantially clear of restrictive contact between said tool stop means and said frame stop means for free dynamic excursions of said frame relative to said impact tool means during each normal operation of the impact device, such free dynamic excursions including the reactive reciprocative excursions of the frame and excursions from dynamic response of the frame as resiliently suspended on the resilient bias means with such bias force applied, and
said resilient bias means having sufficient resilience and length for such substantially free dynamic excursions of said frame during such normal operation of the impact device.

4,102,411
DRILL STEM FOR DRILLING UPWARDLY
Daniel R. Webb, Santa Ana; John F. Steinke, Fountain Valley; Robert W. Berry, Brea, and Stanard R. Funsten, Corona del Mar, all of Calif., assignors to Smith International, Inc., Newport Beach, Calif.
Filed Aug. 26, 1976, Ser. No. 717,830
Int. Cl.² E21B *3/00*
U.S. Cl. 173—164 **8 Claims**

1. A drill stem section for use in upwardly drilling comprising:
a generally cylindrical shell having threaded pin and box joints on its respective ends;
a circumferential collar disposed about said shell at a location remote from both ends thereof, and being secured to said shell, said collar having at least a pair of circumferentially spaced recesses formed in the outer circumferential edge thereof, whereby said shell may be supported both longitudinally and rotationally by means of said collar; and
said shell having a flat circumferential lower end face formed on the normally lowermost end thereof, and also having a spline connection formed in one of the circumferential surfaces of its normally lowermost end portion;
whereby when the drill stem section is being added to or detached from a drill string it may be vertically supported underneath said flat lower end face and may be rotatably driven by means of said spline connection, and when it is part of a drill string it may be supported both vertically and rotationally from said collar.

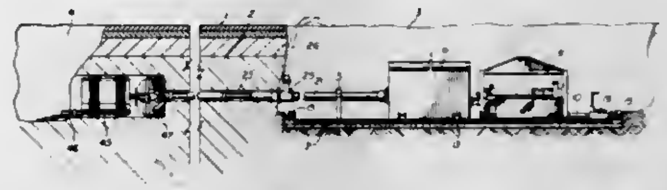


4,102,412
APPARATUS AND METHOD FOR PLACING EXPLOSIVES IN SUBMERGED ROCK
Roy N. Sonomura, P.O. Box 1452, Hilo, Hi. 96720
Filed May 17, 1976, Ser. No. 688,551
Int. Cl.² E21B *7/12*
U.S. Cl. 175—5 **6 Claims**



1. Apparatus for placing explosives in submerged rock comprising:
a. a rock drilling apparatus having a power driven strut, the terminus of which can be forced against the surface to be drilled and a rock drill with the drill rod and drill head operably attached to the strut for extension of the drill head towards and beyond the terminus of the strut of the strut for drilling holes in rock;
b. a short debris guard tube operably attached in fixed position to the strut so as to extend beyond the terminus of the strut and so as to be coaxial with the drill whereby the strut can force the debris guard against the surface to be drilled to keep both surface debris and drillings out of the hole; and
c. an explosives placement tube, the outside diameter of which is slightly less than the drill head and the length of which is greater than the combined depth of the hole to be drilled and the depth of the water at the surface to be drilled; whereby when the hole has been drilled and the drill has been retracted, the drill rod may be deflected and the explosives placement tube inserted into the hole through the debris guard tube with the debris guard tube held against the rock surface by the strut, and the debris guard tube retracted from the surface freeing the drilling apparatus from the explsoives placement tube, leaving the top of the explosives placement tube above the surface of the water.

4,102,413
ROCK DRILLING APPARATUS AND METHOD
Frederick Eric Johnston, 268 Cunningham Ave., Ottawa, Ontario, Canada
Filed Sep. 7, 1976, Ser. No. 720,707
Claims priority, application Canada, Aug. 30, 1976, 260105
Int. Cl.² E21B *9/22, 21/00*
U.S. Cl. 175—53 **12 Claims**

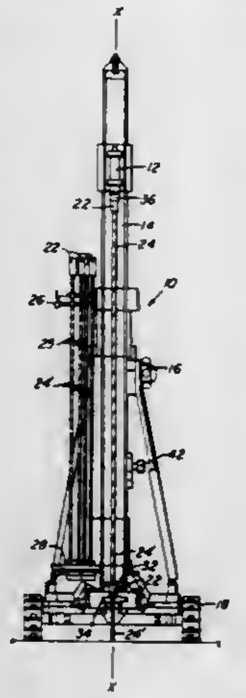


1. An apparatus for drilling and removing waste from a drilled hole comprising a drill head, a drill string driven by the drill head, a drill bit located at the remote end of the drill string, a sealing member positionable around the drill string and securable to a face of a rock body through which the hole is to be drilled and a non-rotatable muck extractor securable to the drill bit so that it can be dragged along behind the bit during a reverse drilling operation wherein the muck extractor consists of a cylindrical drum having a frusto conical shaped insert secured therein, and annular resilient sheets around the drum to form, during use, a seal with the hole being drilled during the reverse drilling operation.

4,102,414
DRILLING APPARATUS
Edward A. Bailey, Newport, and James F. Ordway, West Lebanon, both nf N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Aug. 9, 1976, Ser. No. 712,622
Int. Cl.² B25B *23/00;* E21B *19/00*
U.S. Cl. 175—85 **13 Claims**

1. A drilling apparatus comprising:
a drill means including an elongated drive portion adapted to have a coupling portion of an elongated drill string secured thereto;
a selectively operable restraining means for restraining such coupling portion from rotation with respect to said drill means;
said restraining means including a body member fixedly located with respect to said drill means adjacent said drive portion, and elongated lock means carried by said body member;
said lock means being oriented with a longitudinal extent thereof extending transversely of the axial extent of said

drive portion and being selectively axially movable to engage and disengage such a coupling portion for selectively restraining such coupling portion from rotation with respect to said drill means.



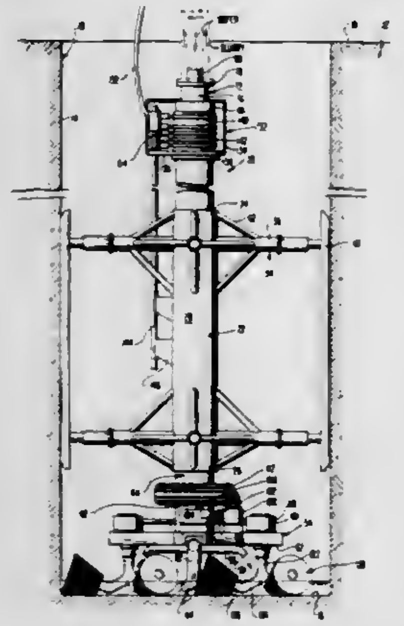
4,102,415
DRILLING DEVICE

Wesley B. Cunningham, 2 Morris St., Charlestown, W. Va. 25301

Filed Feb. 8, 1977, Ser. No. 766,827

Int. Cl.² E21B *3/08*

U.S. Cl. 175—96 **7 Claims**



1. Earth drilling equipment for formation of large diameter shafts in earth, rock and the like, said equipment comprising:

a vertical main body tube having upper and lower ends and an outer side wall, the main body tube having a vertical bore therein;

a plurality of extensible and retractable jacks on the outer side wall, said jacks being movable into supporting relationship with the shaft to position the tube substantially centrally in the shaft and to fix said tube at vertically adjustable positions within said shaft, and being retractable inwardly to adjust the vertical position of the main body tube;

an elongated, tubular outer casing extending vertically through the bore of said main body tube, mounted for rotation therein, and having top and bottom end portions projecting outwardly of the upper and lower ends thereof;

a horizontal base member having a central hub section fixedly secured to the bottom end portion of the outer casing, said base member having upper and lower sides;

an exhaust tube fitted within the outer casing, said exhaust tube having a lower intake end projecting below the base member, and an upper discharge end;

a plurality of scavenging tubes connected to exhaust tube below the base and rotatable with the base;

a fluid input pipe mounted within the exhaust tube, and having top and bottom portions;

a plurality of spouts on said bottom portion of said input pipe;

at least one drive motor mounted on the upper side of the horizontal base;

at least one drive wheel rotatably mounted on the upper side of the base for direct peripheral contact with the shaft, and means drivingly connecting said drive motor to said wheel, the wheel being in frictional contact with the shaft whereby rotation of the wheel rotates said base and said outer casing;

at least one cutter motor on the upper side of the horizontal base;

cutter drive axles extending vertically, rotatably through the base and means connecting the axles with the cutter motor;

a plurality of cutting elements on each of the axles, said cutting elements each comprising a plurality of plates having peripheral cutting edges, being mounted for rotation about their axes and commonly about said axle such that the edges contact the earth or rock to be drilled to grind the same for mixture with the fluids from the input tube spouts to form a slurry for expulsion through said exhaust tube; and

means on said casing and said main body tube for energizing said at least one drive and cutter motors,

said jacks being mounted to said body tube outer side wall, just above said base member and in proximity to said cutting elements to cause said shaft to directly resist reaction torques on said body tube during rock drilling.

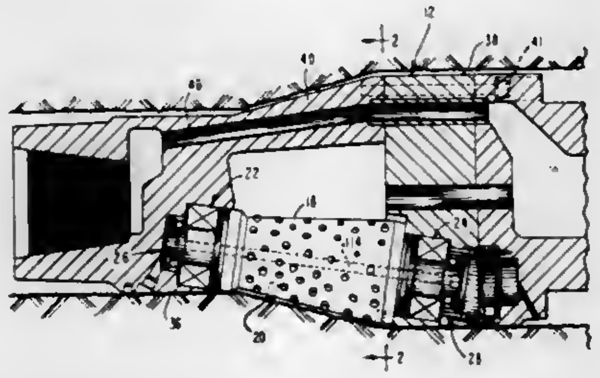
4,102,416
STABILIZED CONICAL BORING TOOL

Hans Albert Hug, Weston, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Sep. 13, 1976, Ser. No. 723,015

Int. Cl.² E21B *9/24*

U.S. Cl. 175—227 **13 Claims**



1. A self-advancing conical boring tool comprising:

(a) a tapered frame formed with a plurality of circumferentially disposed recesses;

(b) a pair of thrust bearings mounted within each of said recesses;

(c) a pair of self-aligning spherical roller bearings mounted within each of said recesses, one of each said roller bearings abutting one of each said thrust bearings;

(d) pressure compensating means mounted to said frame adjacent one of said thrust bearings, said frame formed with a cavity about at least one of said thrust bearings, said pressure compensating means separating said cavity into at least two chambers, one of said chambers communicating with said thrust bearing, the other of said chambers communicating with an exterior surface of said frame;

(e) a roller cutter supported in each said pair of spherical roller bearings and each said pair of thrust bearings, each said roller cutter having a frusto-conical body, stub shafts extending from said body, a longitudinal axis of said body coaxial with a longitudinal axis of said shafts, one of said stub shafts received in one of said spherical roller bearings pair and one of said thrust bearing pair, the other of said stub shafts received in the other of said spherical roller bearing pair and the other of said thrust bearing pair;

(f) each said roller cutter constrained within each said pair of thrust bearings and each said pair of spherical roller bearings for free rotation about an axis that is both oblique and skewed relative to a longitudinal axis of said frame.

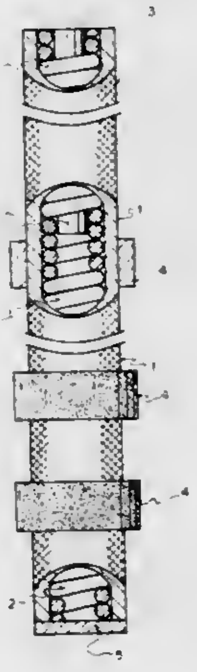
4,102,417
CORE CUT OFF CABLE

W. B. Driver, 19 Sheridan Rd., Arnold, Md. 21012

Filed Nov. 23, 1976, Ser. No. 744,242

Int. Cl.² E21B *25/00*

U.S. Cl. 175—253 **3 Claims**



1. Wherein the invention an improved core cut off cable of the type used inside a core barrel to cut off a drilled core from the formation from which it was drilled and the improved core cut off cable comprises, a closed pitch cylindrical spiral coil of wire rod, a wire cable constructed around and along the length of said coil of wire rod, said coil of wire rod providing a hollow core for said wire cable the length of said wire cable, a plurality of abrasive sections adhered to and along one end portion of said wire cable, a hose laid through said coil of wire rod from the end of said wire cable opposite the end of the end portion of said wire cable where said abrasive sections being located to the end portion of said coil of wire rod that extends through the end portion of said wire cable where said abrasive sections being located, a metal cap attaches to and closes the end of said coil of wire rod of the end portion of said coil of wire rod that extends through the end portion of said wire cable where said abrasive sections being located, said metal cap also attaches to the same respective end of said wire cable, cooling and flushing fluids being pumped through said hose into end portion of said coil of wire rod that extends through the portion of said wire cable where abrasive sections being located, said cooling and flushing fluids being forced under pressure between the coils of said coil of wire rod between the wire of said wire cable to the outside of said wire cable to cool said wire cable said abrasive sections and flush cuttings from said wire cable said abrasive sections and where said abrasive section interfaces with said drilled core, said coil of wire rod keeps said wire cable from collapsing and collapsing said hose when a pulling tension being applied to said wire cable, said hose provides a means of providing cooling and flushing fluids to part of said wire cable where said abrasive section being located.

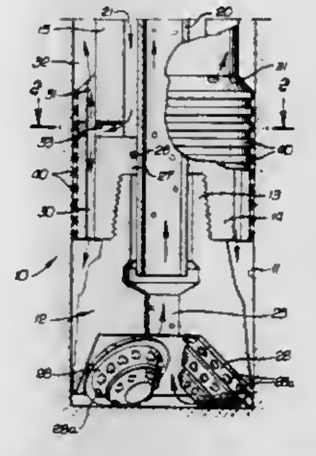
4,102,418
BOREHOLE DRILLING APPARATUS

Archer W. Kammerer, Jr., Columbus, N.C., assignor to Baker-drill Inc., San Angelo, Tex.

Filed Jan. 24, 1977, Ser. No. 761,627

Int. Cl.² E21B *17/00*

U.S. Cl. 175—324 **11 Claims**



6. Apparatus for drilling a borehole in an earth formation; comprising a dual drilling string including inner and outer concentric pipe sections providing an annular passage therebetween, a body member connected to said drilling string, a drill bit connected to said body member and having a central passage opening directly into the open end of said inner pipe section to conduct cuttings produced by the bit upwardly through said drill bit and through said inner pipe section, said body member having passageways for conducting fluid from said annular passage simultaneously into the borehole below said body member and outside and above said drill bit and into the borehole above said body member to create a zone of substantial static fluid along the outside of said body member, said body member having longitudinally spaced peripheral ring portions intermediate the outlet ends of said passageways to provide a labyrinth seal around said body member.

4,102,419
ROLLING CUTTER DRILL BIT WITH ANNULAR SEAL RINGS

Frank J. Klima, 1401 W. Chestnut St., Virginia, Minn. 55792

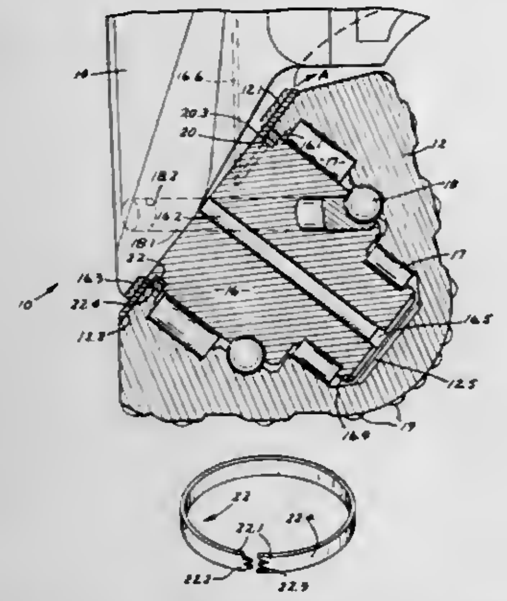
Continuation-in-part of Ser. No. 684,669, May 10, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,089

Int. Cl.² E21C *13/00;* E21B *9/10*

U.S. Cl. 175—371 **9 Claims**

1. A rotary drill bit having a journal, a rolling cutter having a recessed open end for reception of the journal, and interior anti-friction bearings rotatably mounting the cutter on the journal, the journal and the cutter having spaced, circumferential, confronting surfaces adjacent the open end of the cutter with one of the surfaces having an annular groove therein, and sealing ring means comprising annular, spring-loaded sealing ring spring means having at least a pair of axially aligned sealing rings having split ends staggered circumferentially of the journal to define a labyrinth seal pressed against and car-

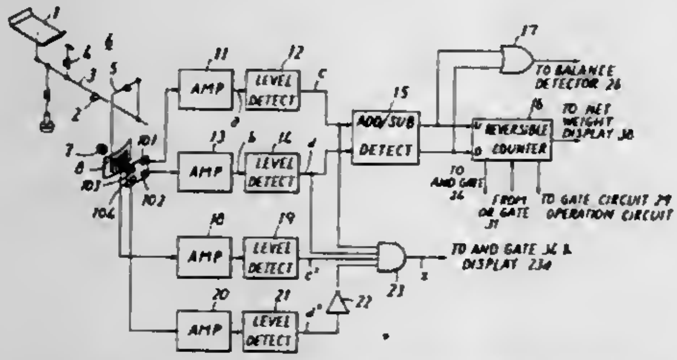
ried by the other circumferential surface and extending into and sealing against the annular groove to seal the interior



anti-friction bearings from contamination by drill cuttings or the like and to restrain escape of internal lubricants.

4,102,420
ELECTRONIC WEIGHING APPARATUS

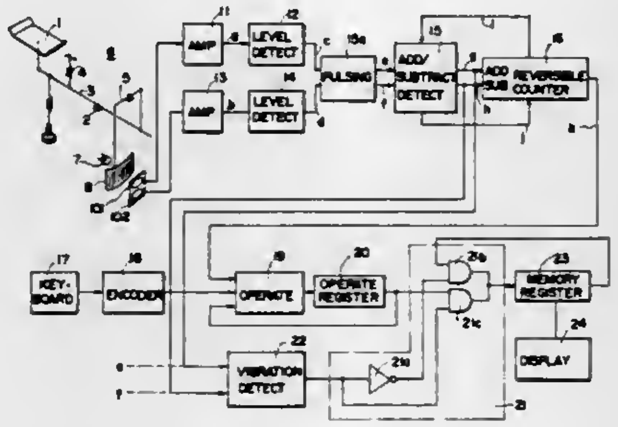
Noboru Uyama, Osaka, and Katsuaki Hara, Tondabayashi, both of Japan, assignors to Kubota Ltd., Osaka, Japan
Filed Oct. 8, 1976, Ser. No. 730,942
Claims priority, application Japan, Dec. 10, 1975, 50-148188
Int. Cl.² G01G *19/413*
U.S. Cl. 177—25 **20 Claims**



1. An electronic weighing apparatus, comprising: means responsive to the weight of an article being weighed for causing a displacement corresponding to the weight of said article, electrical signal providing means responsive to the displacement of said displacement means for providing an electrical signal corresponding to the displacement of said displacement means and thus to the weight of said article, said displacement means assuming an initial position of displacement if and when no article is placed on the apparatus, display means responsive to said electrical signal for displaying the weight of said article, initial position detecting means operatively coupled to said displacement means for indicating by a respective output signal that said displacement means has reached said initial position of displacement, initial state resetting means responsive to the initial position detected output signal from said initial position detecting means for resetting said electrical signal providing means to an initial state, said initial state resetting means comprising initial reset switch means, means responsive to simultaneous outputs from said initial position detecting means and from said initial reset switch means for providing a resetting signal, and means responsive to said resetting signal from said resetting signal providing means for resetting said weight associated electrical signal to the initial value.

4,102,421
ELECTRONIC WEIGHING APPARATUS

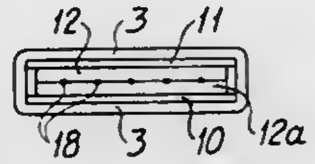
Tsutomu Ozaki, Amagasaki, and Kazuyoshi Enomoto, Kawachinagano, both of Japan, assignors to Kubota Ltd., Osaka, Japan
Filed Jan. 5, 1977, Ser. No. 757,021
Claims priority, application Japan, Jan. 14, 1976, 51-4237
Int. Cl.² G01G *23/10, 23/22, 3/14*
U.S. Cl. 177—185 **10 Claims**



1. An electronic weighing apparatus, comprising: means responsive to the weight of an article being weighed for causing a displacement associated with the weight of said article, means responsive to the displacement of said displacement means for providing an electrical signal representing the displacement of said displacement means and thus the weight of said article, means operatively coupled to said electrical signal providing means for storing said weight associated electrical signal, means responsive to said electrical signal storing means for displaying the weight of said article, vibration detecting means operatively coupled to said electrical signal providing means for detecting an undesired vibration of said displacement means, means operatively coupled to said storing means and to said vibration detecting means and responsive to the output from said vibration detecting means for preventing said weight representing electrical signal from being stored in said storing means for a predetermined time period, said electrical signal providing means comprising pulse generating means responsive to the displacement of said displacement means for generating a pulse train having a number of pulses representative of the displacement of said displacement means, counter means operatively coupled to said pulse generating means for counting the number of pulses in said pulse train, said displacement means being adapted to cause displacement in a first direction in response to a relative increase in the weight of the article and to cause displacement in a second direction in response to a relative decrease in the weight of the article, said pulse generating means being adapted to generate a first pulse train responsive to the displacement of said displacement means in said first direction and to generate a second pulse train responsive to the displacement of said displacement means in the second direction, said vibration detecting means comprising signal output means responsive to sequential generation of said first pulse train and to said second pulse train in the stated order for providing a vibration representing output for a predetermined time period, said signal output means comprising storing means assuming a first state in response to said first pulse train and assuming a second state in response to said second pulse train, delay means coupled to said storing means for delaying one state output of said storing means for a predetermined time period, and means coupled to said delay means and the other output of said storing means for providing a logical product of the output from said delay means and the other output of said storing means.

4,102,422
DEVICE FOR MEASURING LOADS, ESPECIALLY TRANSIENT LOADS

Per Lennart Christiansson, Lund, Sweden, assignor to Telnb AB, Sweden
Filed Apr. 8, 1976, Ser. No. 674,972
Claims priority, application Sweden, Apr. 8, 1975, 7503998
Int. Cl.² G01G *19/02, 3/14*
U.S. Cl. 177—210 C **10 Claims**

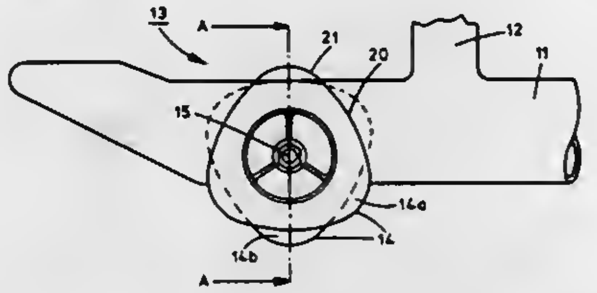


1. A variable capacitance device for sensing and measuring loads, especially transient loads, wherein the capacitance varies as a linear function of the loads to be measured, said device comprising:

(a) two conductive plates,
(b) an elastic dielectric layer between said plates,
(c) means encompassing said device for compressing said two conductive plates toward each other and for maintaining pressure on said conductive plates to preload said dielectric layer to cause the capacitance of the device to vary as a linear function of the loads to be measured,
(d) a plurality of conductive threads embedded in said dielectric layer,
(e) a first electrode of the device connected to said threads, and
(f) a second electrode of the device connected to one of said plates.

4,102,423
GROUND TRACTION DEVICES

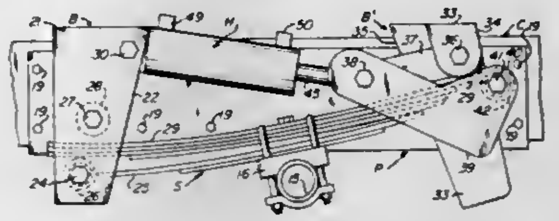
Peter Reid, Hardington Mandeville, Near Yeovit, England, assignor to Westland Aircraft Limited, Yeovil, England
Filed May 26, 1977, Ser. No. 800,848
Claims priority, applicatioo United Kingdom, May 28, 1976, 22461/76
Int. Cl.² B62D *57/00*
U.S. Cl. 180—7 R **10 Claims**



1. A ground traction device comprising, in combination, a fixed axis, ground engaging means mounted for rotation on said fixed axis, means for rotating said ground engaging means on said axis, said ground engaging means including first and second parts, each part having a peripheral surface comprised of a plurality of individual arcs each of similar radius that is greater than a shortest distance between said axis and said surface, curved lobe portions blending ends of adjacent arcs and having a radius less than said distance, said first and second parts comprising solid rubber tires rotationally fixed with respect to each other and rotationally offset about said axis, said rubber tires being constructed of a rubber having a hardness selected in relation to a weight of a structure to be moved so that when operating over hard ground, the curved lobe portions are automatically compressed to assume a radius approximating that of the arcuate portions, whereby said ground engaging means operates automatically as a circular wheel when moving over hard ground.

4,102,424
TAG WHEEL LIFT

Alvin L. Heinze, Weld County, Colo., assignor to Hydraulics Unlimited Manufacturing Co., Eaton, Colo.
Filed Jul. 8, 1977, Ser. No. 813,847
Int. Cl.² B62D *61/12*
U.S. Cl. 180—24.02 **10 Claims**



1. A tag wheel lift for a truck or the like having a chassis, at least one drive wheel at each side of said chassis, mounting means including spring means for supporting said chassis from said drive wheels, at least one tag wheel at each side of said chassis and spaced longitudinally from said drive wheels, and spring means for said tag wheels, whereby said tag wheels, when in use, may support a portion of the load on said chassis, said lift comprising:

first bracket means attachable to said chassis at each side thereof and having a connection for one end of a spring means for the corresponding tag wheel;
second bracket means attachable to said chassis and having a pivot for an upper link means;
lower link means pivotally connected at one end of said upper link means and having a lower end provided with a connection for said spring means for the corresponding tag wheel;
said upper and lower link means being movable from a retracted position in which the connection of said tag wheel spring means to said lower link means lifts said tag wheel above the road and an extended position in which said end of said tag wheel spring means is in a lowered position to cause the corresponding tag wheel to engage the road and support, through said tag wheel spring means, a portion of the load on said chassis; and
hydraulic means for moving the pivotal connection between said upper and lower link means, to move said upper and lower link means between said retracted and extended positions.

4,102,425
FRONT WHEEL DRIVE SYSTEM FOR A VEHICLE

Howard A. Marsden, Pekin, and Willard J. Haak, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 23, 1977, Ser. No. 780,559
Int. Cl.² B60K *17/10*
U.S. Cl. 180—66 F **8 Claims**

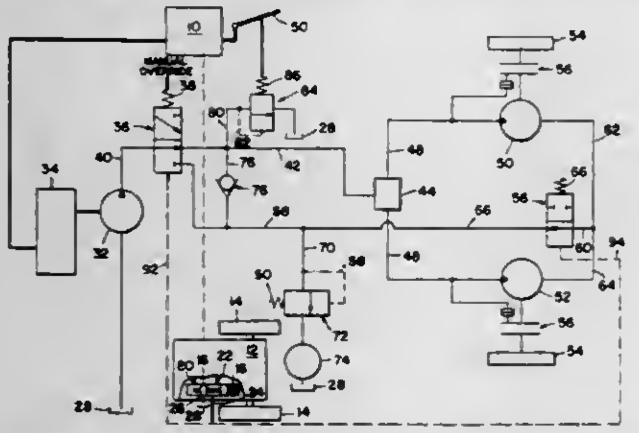
1. a drive system for a wheel of a vehicle comprising:
a fluid pump;
a first valve;
first conduit means interconnecting the pump and first valve;
a fluid motor operatively associated with a wheel of the vehicle;
second conduit means interconnecting the first valve and motor;
a second valve;
third conduit means interconnecting the motor and second valve;
fourth conduit means communicating with the second valve;
the first valve being movable to provide fluid communication therethrough from the pump through the first conduit means through the second conduit means, to the motor;

the first valve being movable to block communication therethrough from the pump through the first conduit means through the second conduit means to the motor;

the second valve being movable to provide fluid communication therethrough from the motor through the third conduit means, to the fourth conduit means;

the second valve being movable to block communication therethrough from the motor through the third conduit means, to the fourth conduit means;

means operatively interconnecting the first and second valves for providing that upon movement of the first valve to provide fluid communication therethrough from the pump, first conduit means, second conduit means, to the fluid motor, the second valve is moved to provide communication therethrough from the motor through the third conduit means to the fourth conduit means, and for providing that upon movement of the first valve to block communication therethrough from the pump, first conduit means, second conduit means to the fluid motor, the second valve moves to block communication therethrough from the motor through the third conduit means to the fourth conduit means;



wherein the means operatively interconnecting the first and second valves comprise additional conduit means, wherein introduction of fluid pressure therein moves the first and second valves to provide fluid communication therethrough respectively, and wherein release of fluid pressure therefrom provides movement of the first and second valves to block communication therethrough respectively; and

further comprising vehicle transmission means operatively associated with the additional conduit means and including means for providing introduction of fluid pressure into the additional conduit means, and for providing release of fluid pressure from the additional conduit means.

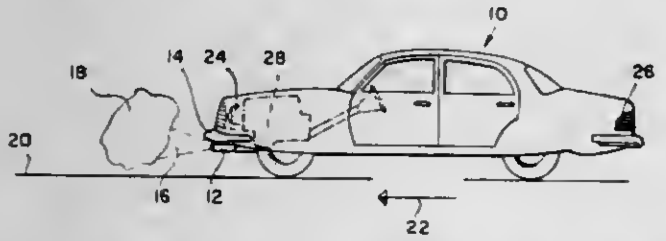
4,102,426
VEHICULAR SAFETY DEVICE

Michael Dennis Walden, 709 Sammon Ave., Toronto, Ontario, Canada (M4C 2E3)

Filed Jun. 4, 1976, Ser. No. 692,724

Int. Cl.² G08G ***1/00***

U.S. Cl. 180—98 **1 Claim**



1. A vehicular safety device comprising fog detecting means for the detection of fog in the pathway of a vehicle, said fog detecting means carried by a frontmost portion of said vehicle, said fog detecting means utilizing rays emanating outwardly and forwardly from said vehicle directed over a roadway carrying said vehicle, said fog detecting means including means to detect said rays reflected from said fog when said fog is located in front of said vehicle and above said roadway, said fog detecting means for controlling apparatus means of said vehicle in a fog detected mode and a lack of fog detected mode, said fog detecting means being disposed in said fog detected mode when said rays are reflected from said fog towards said frontmost portion of said vehicle, said apparatus means including automatic braking means and automatic speed control means and visual signalling means and frontmost lamp control means, said automatic braking means utilized for the application of braking forces to said vehicle when said fog detecting means is in said fog detected mode, said applied braking forces being removed when said detecting means is in said non fog detected mode, said automatic braking means including means for automatically adjusting the amplitude of said braking forces in proportion to the speed of travel of said vehicle, said automatic speed control means limiting the speed of the motor of said vehicle when said fog detecting means is in said fog detected mode, said automatic speed control means being inoperable when said fog detecting means is in said non fog detected mode, said visual signalling means visibly signalling trailing vehicles located behind said vehicle by intermittently operating at least one lamp secured to a rear surface of said vehicle when said fog detecting means is in said fog detected mode, said visual signalling means becoming inoperable when said fog detecting means is in said non fog detected mode, said frontmost lamp controlling means for altering the lighting mode emanating forward of said vehicle from a lamp located on a front surface of said vehicle into a fog lighting mode when said fog detecting means is in said fog detected mode, said frontmost lamp control means for altering said lighting mode to a non fog lighting mode when said fog detecting means is in said non fog detected mode.

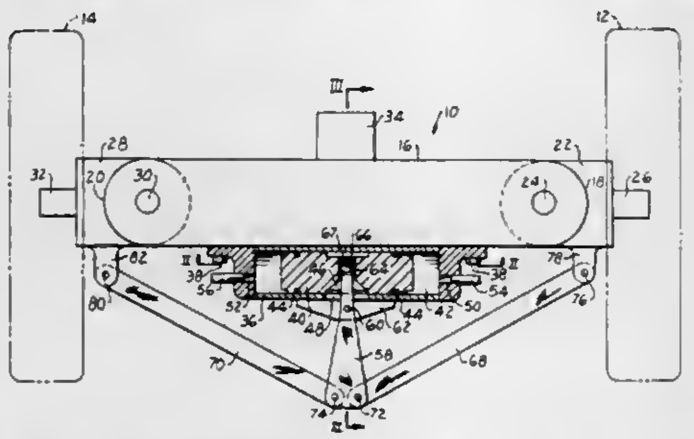
4,102,427
COMPACT STEERING AXLE ASSEMBLY

Charles J. Sabec, Chagrin Falls, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 28, 1977, Ser. No. 791,906

Int. Cl.² B62D ***5/10***

U.S. Cl. 180—156 **14 Claims**



13. A steering axle assembly for steering wheels of a vehicle, comprising:

(a) an elongated main frame;

(b) a pair of steering knuckles, each of said knuckles rotatably supporting one of the wheels and pivotally secured to one end of said main frame for rotation about said one end;

(c) a hydraulic cylinder rigidly fixed to said main frame and having a port on each end for receiving hydraulic fluid through each said port and an opening between the ends of said cylinder;

(d) a piston slidable within said cylinder and having walls defining a radial recess tapering inwardly from said opening;

(e) a bracket connected to the outside of said cylinder;

(f) link means, coupled at one end to said piston and extending from said recess and said opening to another end outside said cylinder, said link means being connected to said bracket by a pivot about which said link means is rotatable, wherein said one end of said link means supports a roller in abutment with said walls; and p1 (g) a pair of rods, each pivotally connected at one end to said other end of said link means and pivotally connected at another end to one of said steering knuckles.

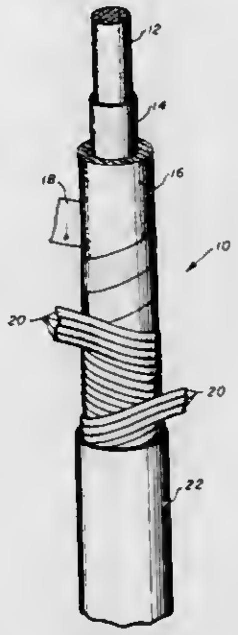
4,102,428
NO-FLASH SEISMIC CORD

Stanley R. Kelly, Simsbury, Conn.; John P. O'Brien, and William C. Morrow, both of Littleton, Colo., assignors to Ensign-Bickford Company, Simsbury, Conn.

Filed Nov. 3, 1976, Ser. No. 738,347

Int. Cl.² G01V ***1/06;*** **C06C** ***5/00***

U.S. Cl. 181—116 **10 Claims**



1. In a seismic explorative system using a linear detonating cord as a seismic source with the cord resting on top of the earth's surface in essentially an uncovered condition, the improvement wherein the linear detonating cord is a high core load nonincendive cord providing enhanced useful seismic energy and reduced background noise, comprising an elongated core of detonating explosive having a core load of about 100–400 grains per foot, a layer encircling said core and consisting essentially of particulate flame quenching material adjacent said core along the entire length thereof and positioned between said core and the earth's surface when the cord is resting on said surface, the load level of the flame quenching material being about equal to the core load of the explosive and having a load level of about 100–450 grains per foot, and a flame retardant outer sheath confining and protectively enclosing both said core and said encircling layer.

4,102,429
APPARATUS FOR GENERATING SEISMIC WAVES

Clifford D. Dransfield, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 10, 1976, Ser. No. 740,645

Int. Cl.² G01V ***1/04, 1/06***

U.S. Cl. 181—117 **8 Claims**

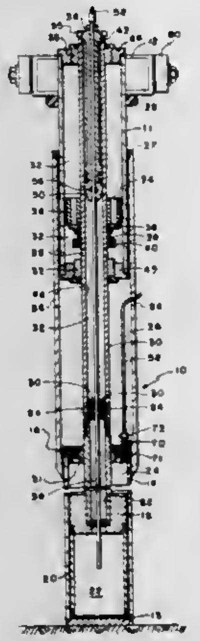
7. In an apparatus for controlling the movement of a seismic wave generator of the type adapted to impart a seismic pulse to the earth and thereafter rebound upwardly, the improvement comprising:

(a) a support frame suspended above the earth;

(b) an upstanding, cylindrical guide member dependently attached to said support frame;

(c) an upstanding seismic generator cylinder positioned beneath said guide member in axial alignment therewith;

(d) a cylindrical sleeve fixed to the top of the generator cylinder and extending upwardly therefrom so as to engage the external surface of said guide member for a limited, slidable, telescoping movement therebetween, the diameter of said sleeve being substantially equal to that of said generator cylinder; and



(e) dashpot means within said guide member operably interconnected with said generator cylinder and adapted to hydraulically damp the movement thereof.

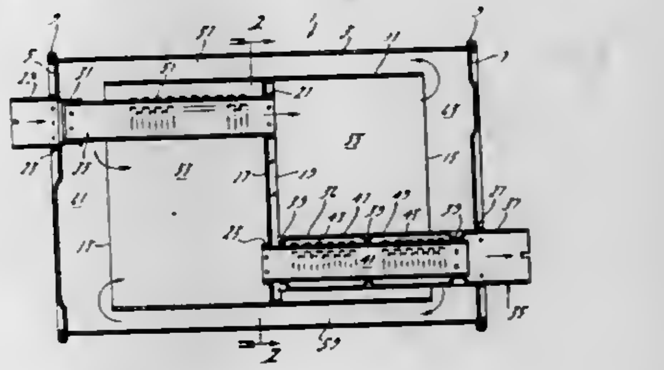
4,102,430
PERIPHERAL RETURN FLOW MUFFLER

George T. Wilson, Oregon, Wis., assignor to Tenneco, Inc., Racine, Wis.

Filed Aug. 11, 1977, Ser. No. 823,629

Int. Cl.² F01N ***1/08***

U.S. Cl. 181—265 **6 Claims**



1. A muffler for attenuating sound in pulsating gas flow systems, such as exhaust systems of internal combustion engines, comprising an outer tubular shell closed at opposite ends and having an inlet at one end and an outlet at the other end, a tubular inner shell positioned within the outer shell and open at each end, said inner shell being radially spaced inwardly from the outer shell to provide longitudinal gas passage means extending between the two shells for the full length of the inner shell and providing a gas flow passsage innerconnecting opposite ends of inner shell, a transverse partition within the inner shell and subdividing it into an inlet chamber and an outlet chamber, an inlet tube connecting said inlet to the inlet chamber and extending through the outlet chamber, an outlet tube connecting the outlet to the outlet chamber and extending through the inlet chamber.

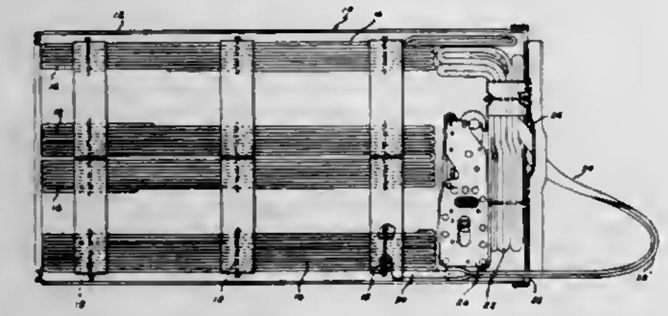
4,102,431
EMERGENCY PERSONNEL LOWERING APPARATUS

Charles E. Carroll, Kettering, and William H. Hobbs, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 13, 1977, Ser. No. 815,136

Int. Cl.² A62B *1/14*

U.S. Cl. 182—5 **6 Claims**



1. A lowering control mechanism for use in controlling the descent of a person along a lowering line, comprising: a support frame, including two spaced frame members, with said lowering line having a portion passing through the support frame between the frame members; a pair of aligned elongated slots in said frame members; a descent control mechanism within said support frame; said descent control mechanism including a bearing member; a plurality of first guide rollers on one side of said elongated slots; a plurality of second guide rollers on the opposite side of the elongated slots from said first guide rollers; said lowering line passing through said support frame along a path across said bearing member and around at least one of said first guide rollers and at least one of said second guide rollers, whereby the lowering line has at least two sections crossing the space between the elongated slots; means connected to said bearing member and engaging said elongated slots for controlling movement of the bearing member in a direction along the longitudinal axis of said slots; means connected to said bearing member for changing the contact area between the sections of the lowering line crossing the space between the elongated slots; means for securing the lowering control mechanism to a person using the lowering control mechanism.

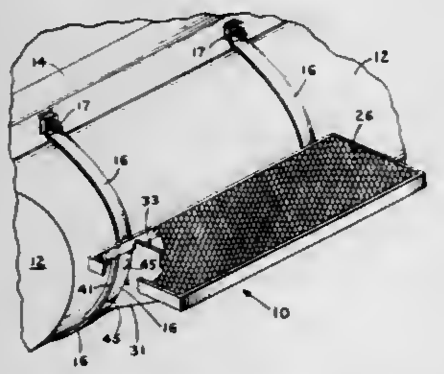
4,102,432
STEP MOUNTING STRUCTURE FOR VEHICLE TANKS

Leopold Bustin, Emmans Rd., Flanders, N.J. 07836

Filed Feb. 11, 1977, Ser. No. 767,688

Int. Cl.² B60R *3/00*

U.S. Cl. 182—92 **4 Claims**



1. A step for mounting on a strap supported tank comprising:

step means;

at least one bearing plate, said bearing plate defining a plane which corresponds in shape to the surface of said tank, and at least one dimple formed in said bearing plate; and

brace means for rigidly securing said step means to said bearing plate, said bearing plate being shaped to be received between said tank and said strap for supporting said tank, said bearing plate being shaped to be in surface-to-surface contact with said tank and said strap.

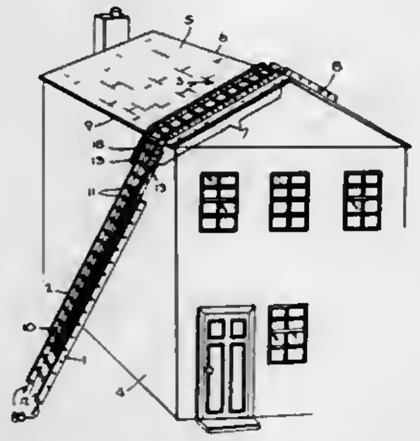
4,102,433
LADDER

Leslie Van Valkenburgh, Rte. 42, Westkill, N.Y. 12492

Filed Feb. 18, 1977, Ser. No. 769,965

Int. Cl.² E06C *1/12*

U.S. Cl. 182—164 **9 Claims**



1. A multiple section extension ladder for access to and use on a roof of a building comprising:

a rigid bottom ladder section, the lower side of the length of the bottom ladder section being adapted to face the side of a building when the bottom ladder section extends from the ground to near the eaves of the roof;

a flexible top ladder section adapted for use upon the roof of a building having

a plurality of relatively shorter ladder subsections disposed in an end-to-end arrangement and adapted to overlie the upper side of the length of the bottom ladder,

a plurality of hinges, the hinges connecting a different pair of adjacent ladder subsections to one another, each hinge having a pivotal axis adjacent the lower side of the flexible top ladder section to enable the shorter ladder subsections to fold about the hinges in a direction extending toward the bottom ladder section and to prevent the shorter ladder subsections from folding in a direction away from the bottom ladder section,

one relatively longer rigid ladder subsection adapted to overlie the upper side of the length of the bottom ladder,

additional hinges attached to the bottom end portion of the rigid ladder subsection and the top end portion of the shorter ladder subsections, the longer ladder subsection when in place on top of a roof being adapted to extend from the ridge of a roof and down the far side of a roof with respect to the bottom ladder section, the shorter ladder subsections when in place on top of a roof extending along the side of the roof adjacent the bottom ladder section between the ridge and the eaves of the roof wherein one or more of said relatively shorter subsections can extend below the eaves of the roof,

means for slidably mounting the lower side of the length of the flexible top ladder section to the upper side of the length of said rigid bottom ladder section in a facing relationship; and

means for slidably moving said flexible top ladder section with respect to the rigid bottom ladder section.

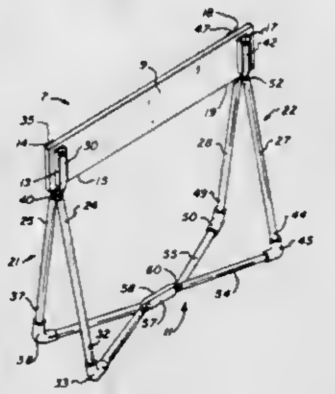
4,102,434
COLLAPSIBLE SAWHORSE

Paul C. Blank, Del Camino Park, Rte. 4, Space 103, Longmont, Colo. 80501

Filed Feb. 7, 1977, Ser. No. 766,111

Int. Cl.² F16M *11/00*

U.S. Cl. 182—181 **11 Claims**



1. A sawhorse device, comprising:

an elongated beam having first and second opposite end portions;

guide means on said opposite end portions of said elongated beam;

a first support assembly including a top portion receivable in said guide means at said first end portion of said elongated beam and a bottom portion having a pair of spaced feet;

a second support assembly including a top portion receivable in said guide means at said second end portion of said elongated beam and a bottom portion having a pair of spaced feet; and

feet connecting means extending between said feet of said first and second support assemblies, said feet connecting means having opposite end portions engaging different ones of said feet and a central portion that is raised at least slightly with respect to a plane through the bottom of said spaced feet.

4,102,435
MECHANICAL SAFETY UNIT ON SPINDLE-DRIVEN LIFTS

Dionys Hofmann, Darmstadt-Marienhohe, Germany, assignor to Gebr. Hnfmann KG, Darmstadt, Germany

Continuation of Ser. No. 548,810, Feb. 10, 1975, abandoned.

This application Jul. 30, 1976, Ser. No. 710,158

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408717

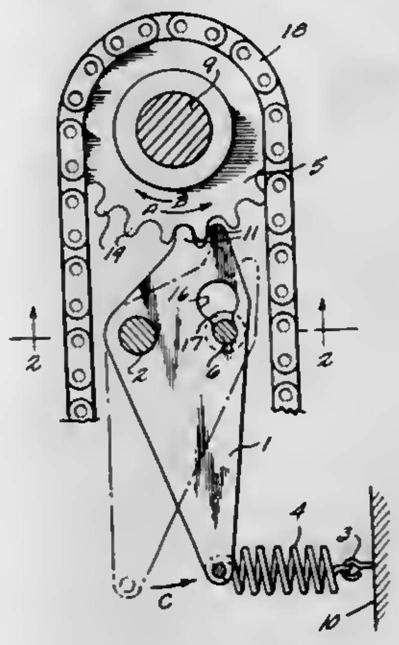
Int. Cl.² B66F *7/28*

U.S. Cl. 187—8.5 **11 Claims**

1. An apparatus for latching against upward movement a spindle driven lift of the type having a lifting nut on which a lifting carriage guided in a column is supported and a safety nut mounted for movement on the spindle for guiding the column in the event of the lifting nut failure comprising

a pawl member,

means rotatably mounting said pawl member adjacent the spindle so that said pawl member in a locking position prevents rotation of said spindle in the direction which causes upward movement of said lift, and



means responsive to failure of said lifting nut for causing said pawl member to shift to said locking position.

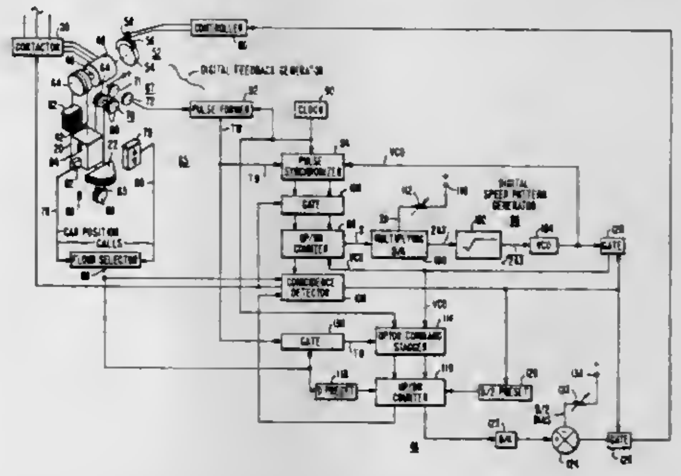
4,102,436
ELEVATOR SYSTEM

Andress Kernick, Franklin Township, Westmoreland County; Richard J. Ravas, Monroeville, both of Pa., and Manvel A. Geyer, Severna Park, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 640,300

Int. Cl.² B66B *1/30*

U.S. Cl. 187—29 R **24 Claims**



1. An elevator system comprising:

a building having a hoistway,

an elevator car mounted for movement in said hoistway, said elevator car to be stopped at a predetermined stopping point from any initial speed at and below a predetermined maximum speed, at a predetermined rate of deceleration,

detector means, including means mounted in said hoistway, said detector means providing a position signal when said elevator car is a predetermined distance D from the stopping point,

means providing a first train of pulses responsive to movement of the elevator car, with each pulse indicating a predetermined increment of car movement,

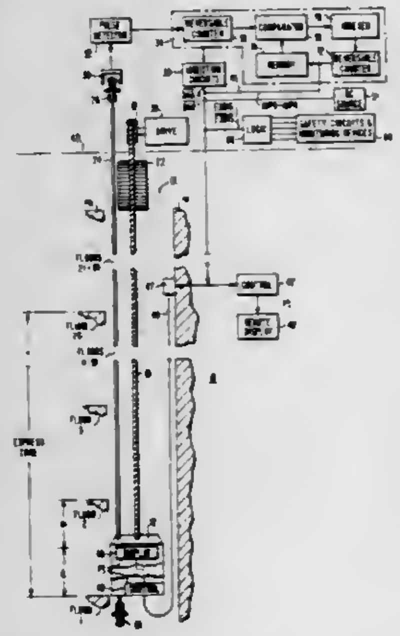
first counter means providing a count responsive to the distance the elevator car should be decelerated according to its present speed,

second counter means providing a count indicative of said distance D, said counter means being decremented by said first train of pulses responsive to said detector means providing said position signal, means providing a coinci-

dence signal when the count on said second counter means is equal to the count of said first counter means,
said first counter means, in response to said coincidence signal, initiating a second train of pulses at the rate the elevator car should traverse the remaining increments to the stopping point,
said second counter means, in response to said coincidence signal, comparing said first and second trains of pulses and providing an error count responsive to the difference in the number of pulses in each pulse train since the coincidence signal, and
means responsive to said error count for decelerating the elevator car.

4,102,437
ELEVATOR SYSTEM

Alan F. Mandel, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 31, 1976, Ser. No. 719,211
Int. Cl.² B66B *3/02*
U.S. Cl. 187—29 R **10 Claims**

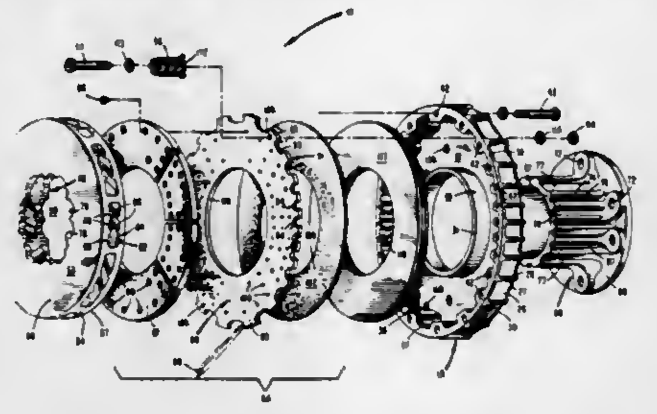


1. An elevator system, comprising:
a structure having a plurality of floors,
an elevator car mounted in said structure to serve at least certain of the floors,
first means providing a first signal indicative of the location of said elevator car in said structure,
second means operable between first and second conditions,
display means,
and control means for driving said display means, said control means being responsive to said first and second means, said control means providing signals for said display means which cause said display means to indicate the location of the elevator car in the structure in response to both the first and second conditions of said second means, with the indicated location of the elevator car being more specific with respect to at least one of the floors when said second means is in its second condition than when it is in its first condition.

4,102,438
DISC BRAKE ASSEMBLY

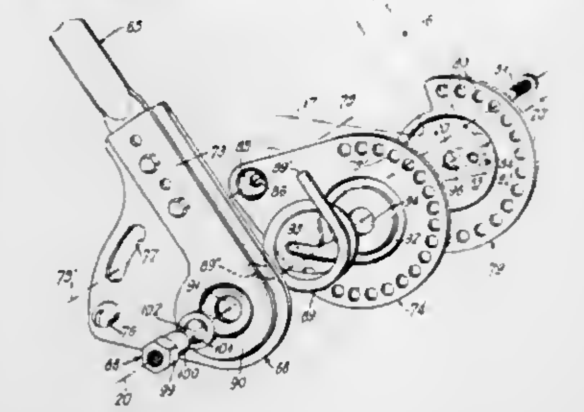
Yvon Rancourt, Quebec, Canada, assignor to The Dolphin Brake Corp., Sunrise, Fla.
Filed Oct. 18, 1976, Ser. No. 733,340
Int. Cl.² F16D *55/40*
U.S. Cl. 188—18 A **36 Claims**

1. A disc brake assembly for a vehicle wheel, the assembly comprising, in combination: a brake housing defining an interior chamber; mounting means for securing said housing to a vehicle; an annular brake disc mounted within said housing, said disc having at least one planar braking surface; attachment means for associating said disc with a vehicle wheel for rotation therewith; at least one brake shoe means disposed within said housing on the planar braking surface side of said disc and mounted for axial movement toward and away from said disc; fluid controlled actuating means disposed within said housing for moving said brake shoe means toward said disc and in braking engagement therewith; fluid inlet means for delivering fluid to said actuating means, to selectively move said brake shoe means toward said disc; wherein each of said brake shoe means includes an annular backing plate, a brake lining secured to one surface of said backing plate for engagement with the adjacent planar braking surface of said disc, and guide means on the outer periphery of each said backing plate; and further comprising cooperating guide means on the inner surface of said housing for cooperating with the guide means on said backing plates and for guiding said backing plates toward and away from said disc without rotation relative to said housing.



4,102,439
TORQUE REACTION OPERATED BICYCLE BRAKING SYSTEM AND MOUNTING STRUCTURE

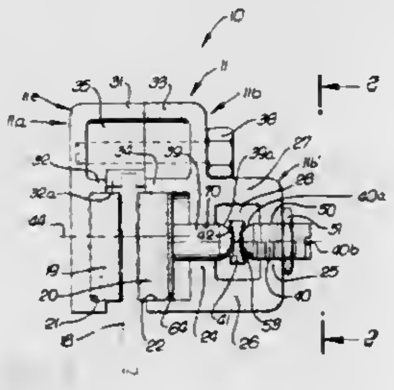
Franklin James Calderazzo, Norwalk, Conn., assignor to Richard N. Jayson, Old Greenwich, Conn., a part interest
Continuation-in-part of Ser. No. 690,922, May 28, 1976. This application Feb. 11, 1977, Ser. No. 767,893
Int. Cl.² B62L *3/00*
U.S. Cl. 188—24 **26 Claims**



1. As an article of manufacture for motional pick-off proportioned to instantaneous rear-wheel braking torque on a bicycle, first and second plates having registering rear-axle mounting apertures for mounting over one end of a bicycle rear axle, one of said plates having a slot arcuate about the axis of axle mounting, first motional pick-off connection means carried by the other plate and extending through the slot and retaining said plates in rotationally displaceable face-to-face relation to an arcuate extent permitted by the slot, the adjacent faces of said plates having coacting coil-spring locating recessed formations for locating a coil spring substantially concentric with the rear-axle mounting apertures, such recessed formations including a tangential extension in one plate and an opposite tangential extension in the other plate, a coil spring in retained assembly to said formations and with tangential ends in said extensions, said coil spring torsionally preloading said connection means against an end of the arcuate slot, second motional pick-off connection means carried by said one plate at substantially the slot radius and near said one end of the slot, means on one of said plates adapted for antirotational engagement to a part of the bicycle frame, and means on the other of said plates adapted for caliper-brake mounting of a rear-wheel brake for limited angular displacement against said preload and within the arcuate extent of the slot.

4,102,440
CAM OPERATED DISC BRAKE

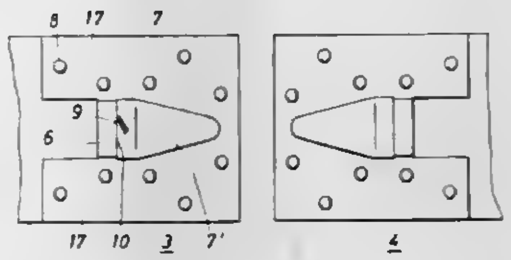
William H. Wood, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.
Filed Apr. 11, 1977, Ser. No. 786,131
Int. Cl.² F16F *55/08*
U.S. Cl. 188—72.7 **10 Claims**



1. In a disc brake assembly, the combination comprising
(a) a frame including a caliper, and brake pads carried thereby in laterally spaced relation to receive a disc therebetween,
(b) first and second members located for relative lateral displacement of effect displacement of the pads relatively toward one another, thereby to brake the disc, there being a lateral axis,
(c) a part in the form of a lever extending between said members, one of the members comprising an elongated plunger having a convex nose received in a first wedging bearing formed by said part, said bearing defining a concave recess in said part, the recess being dish shaped,
(d) means on the frame supporting said part for wedging movement between said members tending to shift said bearing for effecting said relative displacement of the members to brake the disc, said supporting means including a pivot for said lever offset from said axis, the pivot carried by the frame, and
(e) said frame including a first hollow section located laterally of the caliper to receive said part and said plunger nose and a second section located in offset relation to said axis to be intersected by planes passing through said pads and perpendicular to said axis, said second section acting to stiffen said caliper, said frame defining a wall through which said plunger projects, the plunger being cylindrical to define said axis centrally intersecting said nose and recess, the plunger and its nose being freely rotatable about said axis, there being a bearing at said wall supporting the plunger for rotation thereof, the frame and the pad closest to said plunger defining flats which interfit to operatively block rotation of said pad relative to the frame.

4,102,441
FLEXIBLE RESILIENT BRAKE BAND ASSEMBLY

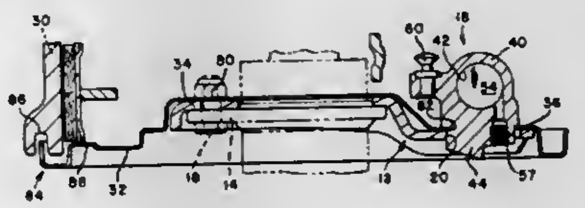
Ernst Kohlbage, Bühl, Baden, Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Buhl, Germany
Continuation of Ser. No. 671,097, Mar. 29, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,885
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515788
Int. Cl.² F16D *49/08*
U.S. Cl. 188—77 W **14 Claims**



1. A brake band assembly for a wrap-around brake comprising a metal band having a pair of ends, a friction lining carried by said metal band, means for actuating and supporting the brake band assembly, at least one support member for said means, said support member being mounted on said band at an end thereof, and at least one securing strap securing said support member to said metal band, said support member comprising at least two separate parts including a shell narrower than the end width of the metal band and formed of a material more wear-resistant than the material of the securing strap, and a collar-like portion of said securing strap at least partly encircling said shell.

4,102,442
DRUM BRAKE

James J. Colpaert, Granger, Ind., assignor to The Bendix Corporation, Southfield, Mich.
Filed May 4, 1977, Ser. No. 793,581
Int. Cl.² F16D *65/02*
U.S. Cl. 188—206 A **2 Claims**

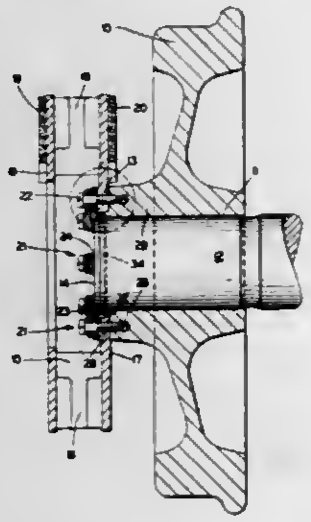


1. In a drum brake having a backing plate which supports a hydraulic actuator and a pair of brake shoes movable by the hydraulic actuator into a braking position, the pair of brake shoes having an inner periphery which defines a central space, the improvement wherein said pair of brake shoes terminate in one pair of ends which engage said hydraulic actuator, said backing plate including a first portion which attaches to an axle assembly and is disposed radially within the central space, and a second portion extending radially therefrom, said second portion supporting the hydraulic actuator in order to position said one pair of ends substantially outside said second portion of said backing plate, said hydraulic actuator carrying at least one resilient member engaging said pair of brake shoes to bias said one pair of ends into engagement with said hydraulic actuator, said hydraulic actuator supporting said pair of brake shoes, and a shield is secured between said hydraulic actuator and said second portion of said backing plate.

4,102,443
DISC MOUNTING RING

William H. Kohler, Delaware, Ohio; James P. Mulder, Oakland, and Michael C. Meslink, Ramsey, both of N.J., assignors to Abex Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,443
Int. Cl.^{2} F16D *65/10*
U.S. Cl. 188—218 XL **5 Claims**

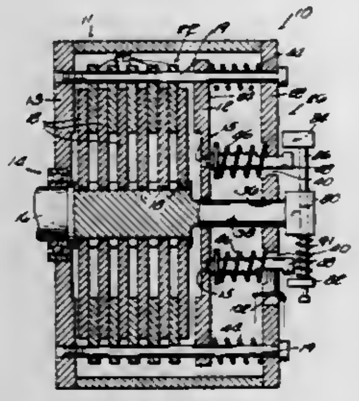


1. A mechanism for mounting a brake disc on a rotatable member by mounting bolt assemblies, wherein the member has a plurality of threaded bores for receiving mounting bolts and the disc has a plurality of mating holes for receiving the mounting bolts, characterized in that the disc mounting holes are radially elongated to permit radial movement of the brake disc relative to the mounting bolts, that the bolt assemblies include spring means mounted on said bolts for tensioning the bolts and that a mounting ring is provided between the brake disc and the spring means to isolate the disc from the spring means and prevent transmittal of radial movement of the disc to the spring means and mounting bolts.

4,102,444
STEPPED TORQUE ROTARY MOTION BRAKE

Karl Palme, Greendale, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 16, 1976, Ser. No. 751,647
Int. Cl.^{2} F16D *65/30*; B60T *7/12*
U.S. Cl. 188—72.1 **8 Claims**



1. A rotary motion brake comprising, in combination,

a frame including a rear mounting plate and a hub journaled within said rear mounting plate,

a brake disc assembly comprising at least one rotatable disc secured to said hub for coincident rotation therewith and at least one stationary disc rotatably fixed with respect to said rear mounting plate,

a pressure plate disposed adjacent and operatively associated with said brake disc assembly for movement into and out of engagement with said brake disc assembly to alternately brake said rotatable disc against and release said rotatable disc for rotation, and

operator assembly means comprising

a front plate secured in fixed relation to said rear mounting plate, and including an aperture and an outer shoulder bordering said aperture,

an axially movable guide rod including an inner end portion having spring retaining means and guide means for moving against said pressure plate, and an outer end portion which slidably axially extends outwardly through said aperture, said outer end portion having a notch including an outer lip engageable with said outer shoulder,

first spring means actuable for generating a first force biasing said pressure plate into engagement with said brake disc assembly,

second spring means supported on said guide rod and compressed between said spring retaining means and said front plate, and actuable for generating a second force in addition to said first force for biasing said pressure plate into engagement with said brake disc assembly,

electromagnetic means connected to said front plate and operative, when energized, for moving said pressure plate out of engagement with said brake disc assembly, and when de-energized, for actuating said first spring means,

said outer lip of said control rod being engageable with said outer shoulder of said aperture to hold said guide rod in a latched position when

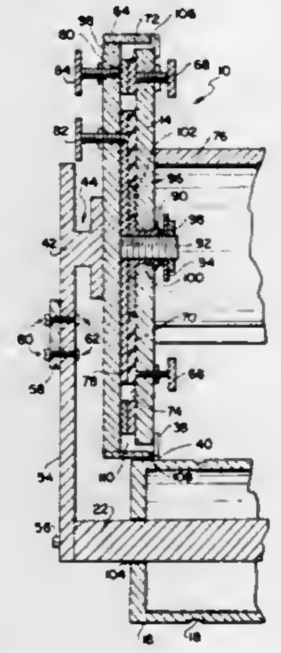
said electromagnetic means is de-energized, thereby preventing actuation of said second spring means, and

governor means including caming means operable for moving said outer lip out of engagement with said outer shoulder thereby affording inward axial movement of said guide rod to an unlatched position for actuating said second spring means in response to the speed of rotation of said rotatable disc being reduced to a predetermined lower speed after actuation of said first spring means, whereby said brake affords a stepped application of first and second retarding torques to gradually brake rotation of said rotatable disc.

4,102,445
DOUBLE CABLE REEL

Fred Eurom, 1541 SW. 47th Ter., Ft. Lauderdale, Fla. 33317

Filed Sep. 14, 1977, Ser. No. 833,092
Int. Cl.^{2} H02G *11/02*
U.S. Cl. 191—12.2 R **8 Claims**



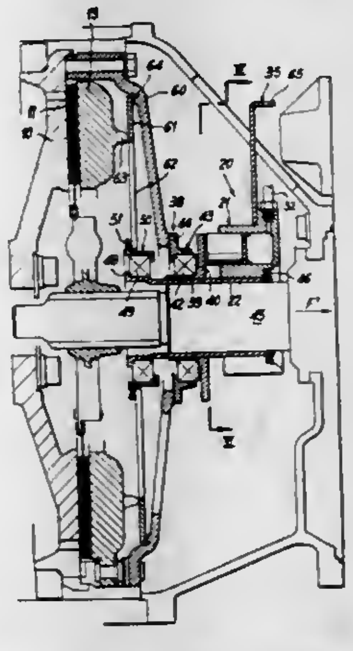
1. A double reel cable comprises a reel including a pair of flanges and a cylindrical core, one of said pair of flanges having a first pair of metallic washers fixedly secured to a lateral surface thereof, said first pair of metallic washers being disposed in concentric relationship, a cover plate, a second pair of metallic washers, said cover plate being disposed in parallel spaced apart relationship with said one of said pair of flanges, said second pair of washers being disposed fixedly secured to a lateral surface of said cover plate located adjacent to said one flange of said pair of flanges, said first pair of washers and said second pair of washers being disposed in juxtaposed touching electrical engagement, said reel being journaled to said cover plate about an axle rod, said axle rod being disposed coaxially aligned with first said pair of washers, a first pair of electrical terminals, said first pair of electrical terminals electrically coupled to said first pair of washers, said first pair of electrical terminals being disposed fixedly secured to said one flange of said pair of flanges, a second pair of electrical terminals, said second pair of electrical terminals, said second pair of electrical terminals being disposed electrically coupled to said second pair of washers, said second pair of electrical terminals being disposed fixedly secured to said cover plate, said one flange of said pair of flanges and said cover plate are being nonelectrically conducting, a cylindrical drum, said cylindrical drum journaled about an axle having a longitudinal axis coaxially aligned with the longitudinal axis of the cylindrical surface of the said cylindrical drum, said longitudinal axis of said cylindrical drum being disposed parallel to said longitudinal axis of said first pair of washers, a portion of the surface of a rubber-like O-ring being disposed in touching frictional engagement with a portion of said surface of said cylindrical drum, a double-wound helical groove being located in said surface of said cylindrical drum, a cam follower rod, one end of said cam follower rod being configured so as to be complimentary shaped with said double-wound helical groove and residing thereinto, a generally U-shaped rod, said cam follower rod having an opening therein, said generally U-shaped rod being disposed secured to said axle about which said cylindrical drum is journaled, an arm, one end of said arm secured to said axle carrying said cylindrical drum, the other end of said arm being disposed removably secured to a block, said block being disposed secured to an outermost lateral surface of said cover plate, an annular groove being located in said block, said annular groove being disposed concentrically aligned with said longitudinal axis of said first pair of annular washers.

4,102,446
HYDRAULICALLY OPERATED CLUTCH

Michel Rist, Boulogne, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Division of Ser. No. 435,580, Jan. 22, 1974, Pat. No. 3,907,085. This application Jun. 19, 1975, Ser. No. 588,229
The portion of the term of this patent subsequent to Sep. 23, 1992, has been disclaimed.
Int. Cl.^{2} F16D *25/08*
U.S. Cl. 192—91 A **13 Claims**

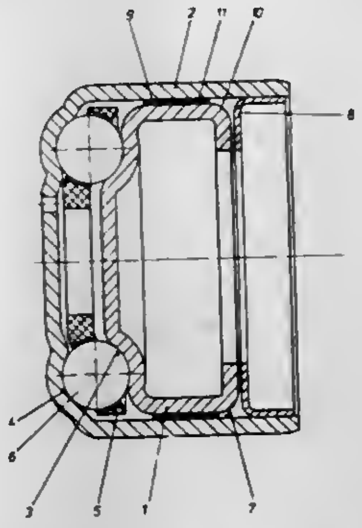
1. In a clutch, a clutch assembly comprising a reaction plate adapted to be fixed for rotation, a friction disc axially movable with respect to said reaction plate and adapted to be fixed to a shaft for rotation independently of said reaction plate, a pressure plate disposed opposite said reaction plate from said friction disc and movable axially in relation to said reaction plate, elastic means normally urging said pressure plate against said friction disc for clamping said friction disc between said pressure plate and said reaction plate, clutch release means includng a first rotating member, said first rotating member including a lever pivotally mounted for relieving the spring force exerted by said elastic means for unclamping said friction disc, a second rotating member, a sleeve mounted for axial movement on said shaft, fluid-operated means comprising a piston member and a cylinder member, said fluid-operated means being exclusively mounted freely on said sleeve, one of said piston and cylinder members normally in abutment at one end of said sleeve, a thrust bearing disposed between said other of said piston and cylinder members and one of said rotating members and adapted to bear thereagainst in response to actuation of said fluid-operated means, and another thrust bearing normally in abutment at the other end of said sleeve and acting against said other of said rotating members, whereby in response to the actuation of said fluid-operated means said piston and said cylinder members effectively urge said thrust bearing towards each other thereby pivoting said pivotally mounted lever of said first rotating member to relieve the spring force and unclamp said friction disc.



4,102,447
CLUTCH RELEASE BEARING

Wilhelm Fischer, Gochsheim, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 783,063
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613731
Int. Cl.^{2} F16D *69/00*
U.S. Cl. 192—110 B **9 Claims**

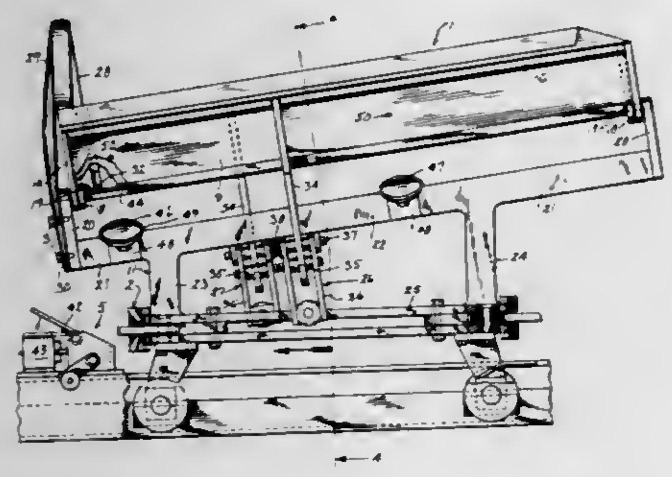


1. In a clutch release thrust bearing comprising an inner rotor disk, an outer cup-shaped rotor disk, a cage holding rolling elements and positioned axially between said inner and outer disks, and a ring in the bore of the outer disk for holding the elements of the bearing together, the inner and outer disks having aligned axially extending portions defining a narrow annular gap; the improvement comprising a friction-reducing material in said gap on one of said disks and substantially but not completely filling said gap, whereby relative radial displacement of said disks is minimized.

4,102,448

CONVEYING APPARATUS INCLUDING TILTING SUPPORT STRUCTURES

David W. Wolbrink, and Richard L. Speaker, both of Hartford, Wis., assignors to S I Handling Systems, Inc., Easton, Pa.
Continuation of Ser. No. 242,330, Apr. 10, 1972, abandoned. This application Feb. 4, 1977, Ser. No. 765,708
Int. Cl.² B65G *43/00*
U.S. Cl. 198—365 **26 Claims**



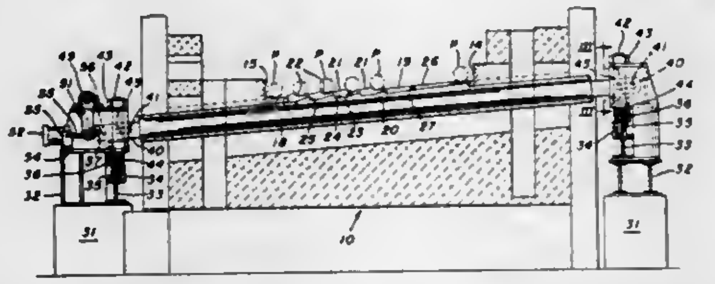
1. An apparatus for transporting articles along a substantially horizontal path and for dispensing articles at an unloading station along said path comprising a first tray member, a second tray member, a carriage means mounted on wheels and having a front end, a pivot support means secured to said carriage means and to said tray members, said pivot support means defining a tilt axis for at least one of said tray members, said tilt axis extending lengthwise of the tray members, means for holding the tray members in a transport position, each of said tray members including a laterally extending support surface disposed above said tilt axis in the transport position thereof, each support surface including first and second interconnected portions each of which extend outwardly and upwardly with a different predetermined angular orientation with respect to said tilt axis to define a generally V-shaped load support assembly when said tray members are in the transport position, said tilt axis being substantially angularly oriented relative to said path and being substantially angularly orientated in a vertical plane between the tray members and locating the front end of the tray members below the rear end thereof, a front wall means spanning the front end of the tray members and projecting thereabove to hold an article thereon, means for gravity biasing an article on said tray members toward said front wall means, said biasing means including said tilt axis being tilted with respect to a plane containing the axis of said wheels and with respect to said path in an amount sufficient to gravity bias an article on said support assembly toward said front wall means and in the direction of transporting whereby the biasing of an article aids in the dispensing of said article by positioning the article against the front wall means.

14. A conveying apparatus comprising, a support carriage, a tray member pivotally mounted on said carriage, a releasable latch means for supporting the tray member in a transport position, said latch means including a latch member on said tray member, a latch lever pivotally attached to the carriage and having a latch leg releasably coupled to the latch member by a pin and notch connection means, a bearing means secured to the latch leg in spaced relation to the pin and notch connection means, and a support bracket secured to the carriage with said bearing means thereon to transfer the load on the lever to the bracket.

4,102,449

WALKING BEAM CONVEYING APPARATUS AND METHOD

Steve Shufran, North Versailles Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Sep. 10, 1976, Ser. No. 722,173
Int. Cl.² B65G *25/04*
U.S. Cl. 198—774 **3 Claims**



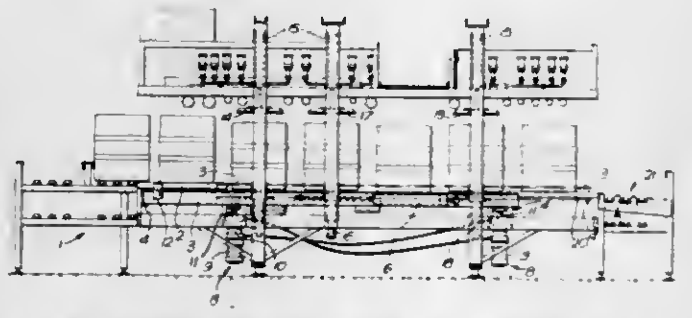
1. In a structure in which elongated cylindrical articles are handled, said structure including entry and exit troughs and a walking beam conveying apparatus for carrying articles from said entry trough to said exit trough, said conveying apparatus comprising:
- a plurality of elongated parallel stationary beams extending from said entry trough to said exit trough;
- a plurality of elongated parallel movable beams extending from said entry trough to said exit trough; and

means on said beams providing article-receiving notches;
the combination therewith of an improved mechanism for operating said movable beams, said mechanism comprising:
independently operable means at opposite ends of said beams for raising and lowering said movable beams at both ends simultaneously to advance articles from one set of notches to the next or for raising and lowering said movable beams at their entry ends only to introduce articles from said entry trough to the beams without advancing articles already occupying said notches;
means on said beams providing sloping surfaces extending from said entry trough to said notches to receive articles for storage; and
means operatively connected with said movable beams for moving them axially.

4,102,450

CONTAINER WASHING AND/OR FILLING MACHINES

Christopher P. Chapman, and Owen Clarkson, both of Rochester, England, assignors to Burnett & Rolfe Limited, Rochester, England
Filed Sep. 17, 1976, Ser. No. 724,093
Claims priority, application United Kingdom, Sep. 23, 1975, 39003/75
Int. Cl.² B65G *25/02*
U.S. Cl. 198—774 **7 Claims**

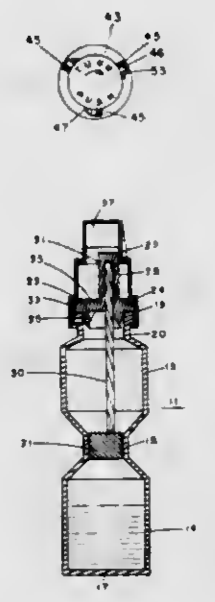


1. In a container handling machine including a base frame, a walking beam conveyor for moving the containers step-wise through said machine, said walking beam conveyor including a horizontally extending walking beam assembly, and two spaced-apart upright pneumatic rams for raising and lowering said walking beam assembly, the improvement futher comprising at least two double-acting hydraulic piston and cylinder assemblies, each having a head end and a base end and forming upper and lower hydraulic chambers respectively on opposite sides of the piston slidably mounted within said cylinder, mounting means for mounting said hydraulic piston and cylinder assemblies vertically at spaced-apart locations between said walking beam assembly and said base frame of said machine, and conduit means cross-connecting a head end of one of said cylinder assemblies to a base end of another of said cylinder assemblies to place an upper chamber of one assembly in direct fluid communication with a lower chamber of another of said cylinder assemblies, and vice-versa; whereby, the pistons are constrained to move in unison by the movement of hydraulic fluid between said assemblies to thereby cause the horizontal attitude of said walking beam assembly to be strictly maintained during operation of the upright pneumatic rams in raising and lowering the walking beam assembly.

4,102,451

MIXING VIAL

John W. Clarke, Indianapolis, and Galer J. Miller, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed May 25, 1977, Ser. No. 800,366
Int. Cl.² B65D *25/08*
U.S. Cl. 206—219 **10 Claims**

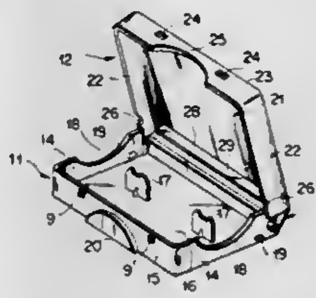


1. In a mixing vial having an upper compartment with an open end, a lower compartment with a closed end and a restricted cylindrical portion therebetween having a cylindrical seal plung isolating said compartments from each other, the improvement comprising a stopper sealing said vial's open end, said stopper having an intergrally formed compressible hollow sleeve, a rigid rod slidably positioned through said stopper with an inner end secured within said sleeve, and a cap removably mounted over said stopper, said cap having a cylindrical lower base portion with an opening defined by an inwardly extending flexible ledge, and a cylindrical upper plunger portion having a top wall slidably extending through said opening and maintained in an upper position by a plurality of ribs on said plunger portion which rest on said base ledge, said ledge having a plurality of cutouts dimensioned to permit passage of said ribs therethrough to bring said plunger in contact with said sleeve containing said rod.

4,102,452

STORAGE CASE

Masaaki Sato, Hachioji, and Shoichi Saito, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 23, 1975, Ser. No. 643,859
Claims priority, application Japan, Dec. 25, 1974, 50-4169[U]
Int. Cl.² B65D *43/16, 51/04, 85/67*
U.S. Cl. 206—387 **11 Claims**



1. A storage case comprising:
- a box-shaped case body having a front side plate, right and left side plates, internal rear side plate and bottom plate which define an upwardly directed opening;
- a covering having an upper plate, right and left side plates and front side plate, said upper plate closing said opening of said case body and simultaneously said right and left side plates and front side plate of said covering overlapping said right and left side plates and front side plate of said case body when said covering is closed;
- a rear side plate formed integrally with said case body and covering to enable said covering to be tilted relatively to said case body thereby permitting closing of the case;
- an engaging mechanism including a first engagement section provided for an outer face of said front side plate of said case body and a second engagement portion provided for an inner face of said front side plate of said covering and, when said covering is closed, engaged with said first engagement section to prevent said covering from being opened; and
- a shifting mechanism position distally from said engaging means for shifting said covering toward said rear side plate including a pair of projections provided respectively on lower ends of outer faces of each of said side plates of said case body adjacent said rear side plate and leaving abutment faces facing toward said rear side plate respectively, said mechanism further including a pair of notches provided respectively, in lower ends of said right and left side plates of said covering so that when said covering is being closed it is shifted toward said rear side plate by abutment and engagement of said pair of notches on and with said rearward abutment faces of said pair of projections, said notches and said abutment faces disengaged when said case is opened.

4,102,453

NESTING AND STACKING CONTAINER

James C. Carroll, and Lewis T. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jun. 28, 1976, Ser. No. 700,705
Int. Cl.² B65D *21/04*
U.S. Cl. 206—507 **17 Claims**

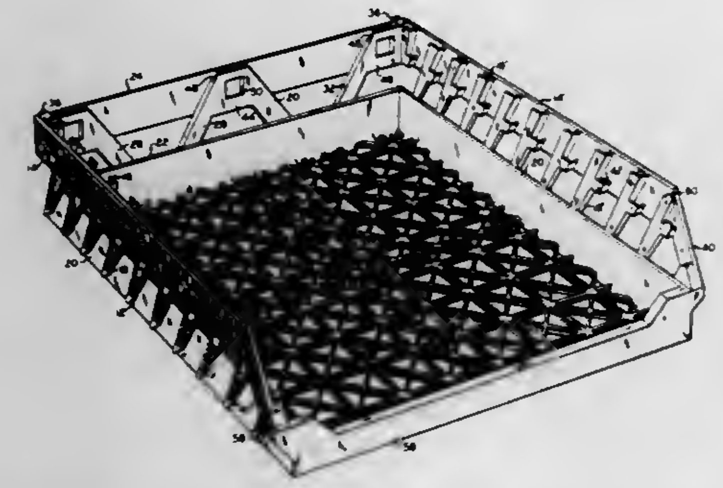
1. A nesting and stacking container of integrally molded construction comprising:
- a generally rectangular horizontal bottom and opposed first and second walls projecting upwardly from said bottom, each said wall comprising:
  - an upper rail member located above said bottom, spaced vertically therefrom, parallel therewith and located in a vertical plane outside the outer edge of said bottom;
  - a plurality of bar members connecting said bottom with said upper rail, all said bars being located in a vertical plane

inside the vertical plane of said rail member, parallel therewith, and outside the outer edge of said bottom, said bars in said plane being inclined in the same direction at the same angle and spaced one from the other a distance at least equal to the width of said bars;

a stacking foot on the bottom of each bar; and

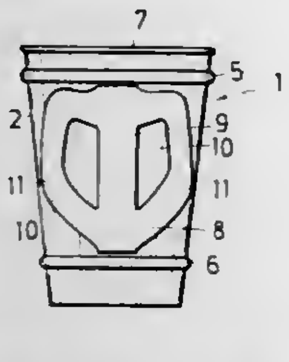
a stacking saddle on the top of each bar, each such stacking saddle being adapted to receive a stacking foot;

the angle of inclination of said bars being such that the stacking foot of one bar is directly in vertical line with the stacking saddle of an adjacent bar inclined toward said one bar;



whereby an upper container will stack vertically on a like oriented lower container with stacking saddles of the lower container receiving stacking feet of the upper container, and will nest with said lower container without relative rotation of said container when said bars of said upper container are positioned between said bars of said lower container, such that at nest position with said lower container, the lower edge of said upper rail member of said upper container is in register with the upper edge of the like upper rail of said lower like container.

4,102,454
CONICAL DISPOSABLE MUG
Juhani Karevaara, Hameenlinna, Finland, assignor to Huhtamaki Oy, Hameenlinna, Finland
Filed Apr. 27, 1977, Ser. No. 791,596
Int. Cl.² B65D *21/02, 3/28*
U.S. Cl. 206—514 **1 Claim**



1. A disposable drinking container formed to be stacked with respect to similar containers, and to form a plurality of stacked containers one within another, said container including: a bottom wall, a conical shaped side wall extending upwardly from said bottom wall, a handle secured to the exterior of said side wall being formed of two flat co-acting members; said handle being secured to said side wall in parallel relation thereto and being adapted to bend outwardly; several protuberance means disposed on the outer periphery of said side wall disposed above and below said handle, said protuberance means being spaced apart from one another projecting outwardly for an amount equal to that of the thickness of said handle therebetween, whereby, each of said containers in stacked relation form an annular chamber circumscribed by respective protuberance means of an inner container and inner wall surface of an outer container; and said handle being disposed within said chamber.

4,102,455
RADIOASSAY KIT FOR METHOD OF DETERMINING METHOTREXATE
Stanley E. Charm, and Henry E. Blair, both of 136 Harrison Ave., Boston, Mass. 02111
Continuation of Ser. No. 650,690, Jan. 20, 1976, Pat. No. 4,043,759. This application Dec. 23, 1976, Ser. No. 753,852
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.² A61B *19/00;* **A61K** *43/00*
U.S. Cl. 206—569 **8 Claims**

6. A methotrexate radioassay kit for the determination of methotrexate in biological fluids by the competitive binding of I^{125} labeled and unlabeled methotrexate to the enzyme dihydrofolate reductase, and the determination of the methotrexate in the sample by comparison of displacement of the bound-labeled methotrexate to the displacement by known methotrexate standards, which kit comprises in containers:

a. an aqueous buffer solution containing a phosphate buffering agent for a pH of about 6.2 at which the determination is to be carried out;

b. a nonhuman serum solution adapted to be mixed with the buffered solution to provide, prior to use, a buffered serum solution for determining standard data on known methotrexate levels;

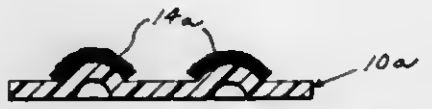
c. an aqueous, water-soluble, organic solvent solution of a labeled I^{125} methotrexate derivative adapted to be added in known quantities to the sample and to obtain standard data;

d. a solution containing a known amount of methotrexate which is adapted to be diluted by the buffered solution for the preparation of standard data;

e. A solution of the enzyme dihydrofolate adapted for addition in known amounts to the sample and known methotrexate to prepare standard data, and for competitive binding with known amounts of I^{125} methotrexate in the sample; and

f. a gelatin-, dextran- or hemoglobin-treated, charcoal, particulate sorbent material which is adapted to sorb preferentially free unbound methotrexate, whereby the amount of methotrexate in a biological fluid sample may be determined.

4,102,456
KIT FOR THREE-DIMENSIONAL PLASTIC OBJECTS
Betty Jean Morris, Brookfield, Wis., assignor to K & B Innovations, Inc., Brookfield, Wis.
Filed Jan. 21, 1977, Ser. No. 761,409
Int. Cl.² B65D *69/00*
U.S. Cl. 206—575 **4 Claims**



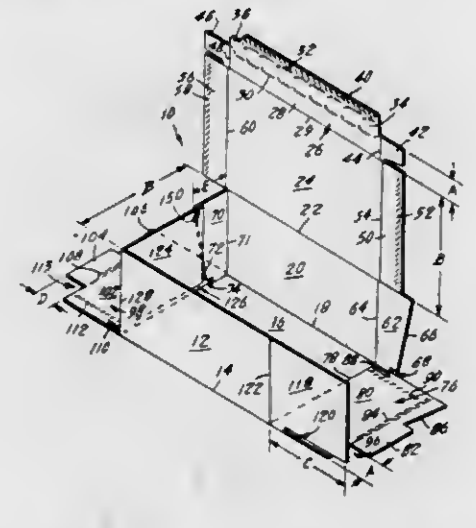
1. A kit for making a three dimensional object of plastic includes:

(a) at least one sheet of shrinkable plastic which when subjected to a suitable temperature condition will soften and shrink;

(b) a supply of particulate material which will not soften and shrink when subjected to the plastic sheet softening and shrinking temperature conditions; and

(c) means for adhering the particulate material to selected portions of the plastic sheet so that when the particulate material is adhered to the plastic sheet and the plastic sheet is subjected to softening and shrinking temperature conditions the plastic sheet softens and shrinks and the selected portions of sheet coated with the particulate material bulge outwardly to form three dimension object.

4,102,457
CARTONS FOR ICE CREAM AND THE LIKE
George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.
Filed Jun. 20, 1977, Ser. No. 808,182
Int. Cl.² B65D *5/54*
U.S. Cl. 206—611 **14 Claims**



1. In a paperboard carton for ice cream having an upstanding front wall, a bottom wall hinged to said front wall, an upstanding rear wall hinged to said bottom wall, a top cover panel hinged to the top of said rear wall, a front cover panel downwardly hinged to the front edge of said top cover panel and overlapping the upper portion of said front wall when the carton is closed, said front cover panel having regions separated by a pair of spaced upper and lower weakness lines substantially parallel to the hinge line between said top cover panel and said front cover panel into an upper cover front skirt region, an intermediate detachable region, and a lower margin region adhesively attachable to the outside of said front wall, a pair of corner glue tabs rearwardly hinged to opposite ends of said front cover panel, a pair of cover end skirt panels downwardly hinged to opposite ends of said top cover panel, a pair of rearward inner end wall panels forwardly hinged to opposite ends of said rear wall, a pair of front inner end wall panels rearwardly hinged to opposite ends of said front wall, and a pair of upstanding end walls hinged to opposite ends of said bottom wall, the improvement comprising:

each said end wall having a weakness line substantially parallel to its hinge line and dividing each said end wall into two regions, an upper margin region and a lower end panel adjacent said bottom wall.

4,102,458
DEVICE IN RACKS FOR SALES PACKAGES AND THE LIKE
Henry Fors, Sundbyberg, Sweden, assignor to Fors & Forss AB, Vallingby, Sweden
Filed Jan. 21, 1977, Ser. No. 760,996
Claims priority, application Sweden, Jan. 23, 1976, 7600706
Int. Cl.² A47F *7/03*
U.S. Cl. 211—4 **7 Claims**

1. A rack for supporting and displaying at least one article of goods and/or sales package of the type having predetermined dimensions and having a generally flat bottom face, said rack comprising:

at least one shelf space having a depth dimensioned to substantially correspond to the depth dimension of an article to be positioned in said shelf space and having a free height which approximates the height of an article to be positioned in said shelf space;

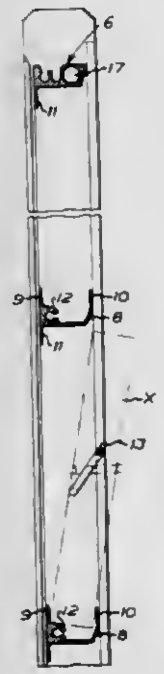
means provided at the back and opposite ends of said shelf space for preventing the rearward and sideways removal of an article positioned therein;

top means provided at the top of said shelf space for preventing the upward movement of an article positioned therein;

an immovably positioned shelf member defining the bottom of said shelf space;

an immovable projection extending upwardly from the front edge of said shelf member, the upper edge of said projection being spaced from said top means to define a vertical opening therebetween of a dimension less than the height of an article to be positioned in said shelf space;

ridge means, extending upwardly from the back edge of said shelf member, for providing the sole support for an article positioned in said shelf space by engaging such article along the rear edge of the flat bottom face thereof and for allowing such article to tend to swing by gravity about such rear edge toward said vertical opening; and

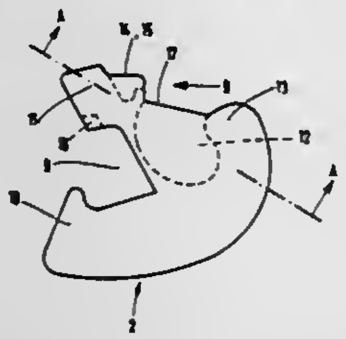


a shiftable abutment means extending transversely of said shelf space at a position above said shelf member, said abutment means being movable between an inner first position vertically above said shelf projection and an outer second position spaced from said shelf space, such that when an article is positioned within said shelf space with the rear edge of the flat bottom face of the article resting on said ridge means and when said abutment means is in said inner first position, the article is maintained entirely within and is prevented from being removed from said shelf space by said abutment means, and such that when said abutment means is in said outer second position, the article is allowed to swing by gravity about the rear edge so that the upper end of the article extends through the vertical opening and the article can be removed therefrom.

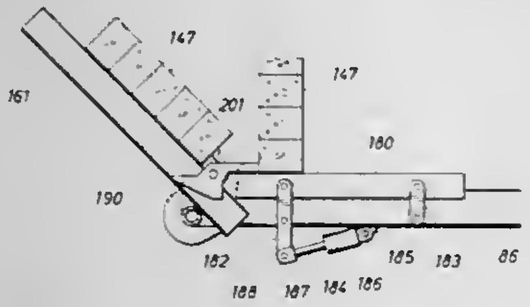
4,102,459
ADAPTOR DEVICE FOR COUPLING RAILWAY VEHICLES HAVING DIFFERENT TYPES OF COUPLERS
Axel Schelle, Rottach-Scherfen, and Kuno Nell, Zorneding, both of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany
Filed Jul. 20, 1977, Ser. No. 817,450
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632571
Int. Cl.² B61G *3/00*
U.S. Cl. 213—112 **5 Claims**

1. An adaptor device for the coupling of Janney and Willi-

son couplers on railway vehicles comprising a body portion having two opposed sides, said sides having rigid configurations conforming respectively to the configurations of Janney and Willison couplers in their locked positions, and means on said body portion for vertically positioning the adaptor device between such couplers in coupling position to provide for automatic engagement of the couplers.



4,102,460
TIMBER STACKING ASSEMBLY
Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979
Continuation-in-part of Ser. No. 747,553, Dec. 6, 1976. This application Jan. 31, 1977, Ser. No. 763,726
Int. Cl.² B65G *57/28*
U.S. Cl. 214—6 C **6 Claims**



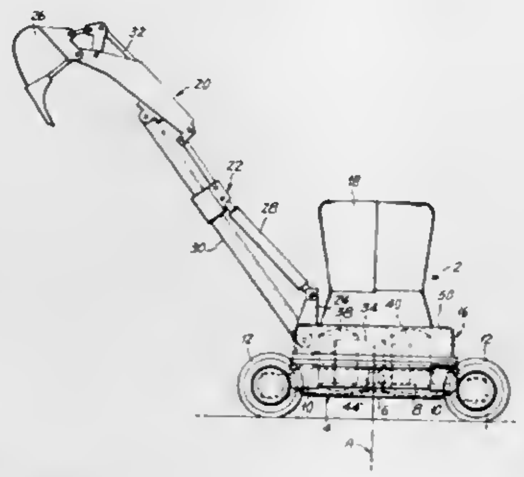
1. In a timber stacking assembly having at least one elongated lifting arm and means for moving said lifting arm from a first position to a second position, the improvement in a lifting arm stop mechanism comprising:

a stacking foot element associated with said lifting arm adjacent one end thereof.
means for pivotally mounting said stacking foot element with respect to said lifting arm, and
latching means associated with said stacking foot element for locking said stacking foot element against pivoting movement when said lifting arm is in said first position and for unlocking said stacking foot element for pivoting movement when said lifting arm is in said second position, said latching means including a first counterweight connected to said stacking foot element, a second counterweight, and linkage means connected between said stacking foot element and said second counterweight.

4,102,461
EXCAVATOR WITH LOW CENTER OF GRAVITY
Ingebret Sóyland, Solhngda 2, Brynehaugen, N-4340 Bryne, Norway
Continuation-in-part of Ser. No. 597,230, Jul. 18, 1975, abandoned. This application May 23, 1977, Ser. No. 799,340
Claims priority, application Norway, Jul. 19, 1974, 742642
Int. Cl.² E02F *9/20*
U.S. Cl. 214—132 **8 Claims**

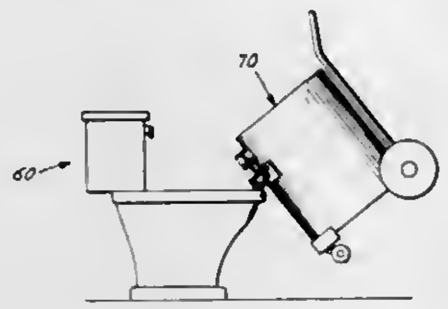
2. An excavator, comprising:

a lower frame, said lower frame having the configuration of a large vessel and including a bottom support plate and a generally vertical side wall, said bottom support plate being engageable with soft ground to prevent said excavator from sinking too deeply thereinto;
wheel means mounted fore and aft on the exterior of said lower frame;
an upper frame;
means for rotatably connecting said upper frame to said lower frame, for rotation about a vertical axis;
means connected between said upper frame and said lower frame, operable to effect relative rotation therebetween;
a boom and bucket assembly;



cabin means;
means for mounting said boom and bucket assembly and said cabin means on said upper frame, for rotation therewith;
an internal combustion engine, a hydraulic pump, and associated heavy equipment components; and
means for suspending said engine, said hydraulic pump and said associated heavy equipment components from said upper frame, whereby said items are rotatable with said upper frame and are substantially received within said vessel-like lower frame.

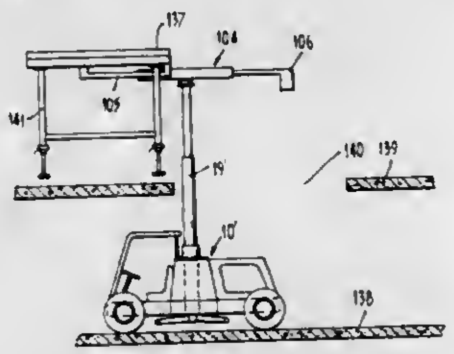
4,102,462
TIP DEVICE FOR A VACUUM CLEANER TANK
Rex E. Beach, El Paso, Tex., and Roland A. Blomgren, Glen Ellyn, Ill., assignors to Service Master Industries, Inc., Downers Grove, Ill.
Filed Jul. 22, 1977, Ser. No. 817,965
Int. Cl.² B65G *65/34*
U.S. Cl. 214—301 **1 Claim**



1. A device for supporting and stabilizing a container against a receptacle which defines an opening, so that the container may be manually tipped and the contents of the container discharged into the opening, said container having a longitudinal axis thereby defining longitudinal and transverse directions, said container including a longitudinally extending cylindrical sidewall and a transverse bottom wall, said sidewall extending longitudinally below said bottom wall, said sidewall and said bottom wall thereby defining a lip which extends below said bottom wall, said receptacle including a rim about said opening, said device comprising, in combination:

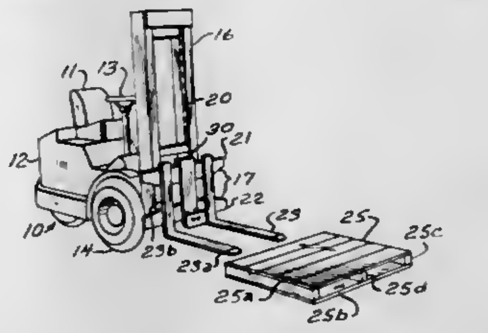
an elongated pivot member engageable against said rim to provide a transverse axis about which said container may be tipped;
spaced arms secured to said elongated angle member adjacent the ends thereof;
a brace member including a partially cylindrical curved surface, said brace member connected to the pivot member by the arms and adapted to contact said cylindrical sidewall along said curved surface;
a pair of elongated legs, each of said legs having an end attached to one of said arms and another end at which said legs are joined;
a pair of hooks joined to said legs at said joined end, said hooks engageable about said lip; and
an elastic cord secured between said arms, said cord being securable to said container, whereby said cord may be attached to the container to draw said hooks against said lip and hold said brace member against said container in position for use.

4,102,463
TRANSPORTER FOR SLAB CASTING TABLES
Hans Heinrich Schmidt, 1 Linton Ave., Lower Templestowe, Victoria, Australia
Filed Dec. 14, 1976, Ser. No. 750,429
Claims priority, application Australia, Dec. 17, 1975, PC4309
Int. Cl.² B66F *9/14*
U.S. Cl. 214—671 **15 Claims**



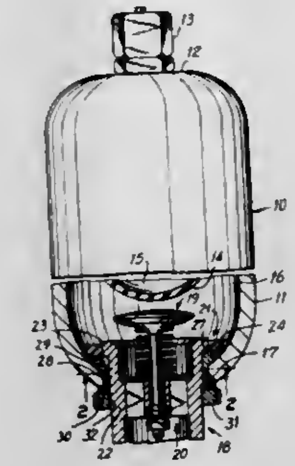
1. A mobile transporter for use in transporting equipment during the construction of a building, said transporter comprising a lower section supported on ground engaging means for movement thereon, a mast supported within said lower section for vertical movement relative to the lower section, and an upper frame supported on the upper end of said mast and adapted, in use, to supportingly engage beneath a load to be transported thereon, wherein the lower end of said mast carries a ground engaging support structure, lifting means interconnected between the support structure and said lower section for, in use, lowering and raising said mast and support structure between a position wherein said lower section is supported on said ground engaging means and a position whereby the support structure is moved to a ground engaging position for subsequently lifting said lower section and its ground engaging means off the ground whereby said lower section is supported on said support structure, and means cooperating with said mast and support structure arrangement and said lower section for achieving relative rotating movement between said lower section and said mast, wherein said mast incorporates means to raise said upper frame independently of said lifting means from a lower position spaced from the ground to a vertically higher position up to in the order of at least twice the distance that the upper frame is above the ground in the lower position, wherein said mast includes a plurality of coaxial telescoping members wherein one of said members is connected to said lower section and another of said members is attached to said upper frame.

4,102,464
PALLET SAVER DEVICE FOR FORK LIFT TRUCKS
Frank C. Schuster, Peoria, Ill., assignor to Little Giant Products, Inc., Peoria, Ill.
Filed Feb. 14, 1977, Ser. No. 768,056
Int. Cl.² B66F *17/00*
U.S. Cl. 214—750 **10 Claims**



1. In an attachment for a lift truck having a pair of spaced apart forks extending therefrom for handling a pallet, each fork having a leg secured to a carriage vertically movable on said truck and a horizontally projecting tine defining a surface for carrying a load connected to said leg by a fillet, said attachment comprising: mounting means for securing said attachment to and extending from said carriage, an impact bumper carried by said mounting means, and a contact surface on said impact bumper forward of said fork legs and fillets and positioned for initial contact with said pallet free of the other elements of said attachment, said bumper and said contact surface being mounted centrally of the carriage between and out of contact with said forks and extending in line with and below the plane of said fork load carrying surface and adapted for cushioned impact centrally of said pallet before the vertical legs and fillets of said forks contact said pallet.

4,102,465
LOCKING RING FOR PRESSURE VESSEL AND METHOD OF MAKING THE SAME
Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.
Filed May 6, 1977, Ser. No. 794,478
Int. Cl.² F16L *55/04;* **F16J** *15/02*
U.S. Cl. 220—3 **3 Claims**



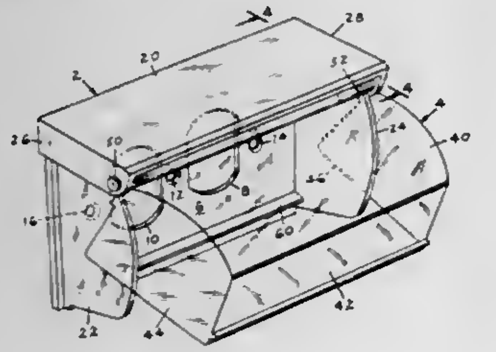
1. A locking ring assembly for retaining the closure plug of a hydraulic pressure accumulator device in the oil port of said device comprising, in combination, first and second arcuate metallic segments, said segments each encompassing an arc of substantially 180°, said segments being disposed in an essentially annular configuration, said segments including on their outer periphery a circumferential, outwardly facing groove, the groove portions of said segments being aligned to define an annulus, said groove portions, in transverse section, including an outwardly directed, restricted open mouth portion and a

radially inwardly located recess, the transverse dimension of said recess being substantially greater than the transverse dimension of said mouth portion, whereby said groove portion defines a non-entrant configuration, the combination including a resilient, elastic, continuous annular retainer collar surrounding and molded in situ over said segments, said retainer collar including an integral annular bead portion filling said groove portions of said segments, said retainer collar maintaining said segments in said arcuate configuration.

4,102,466

WEATHERPROOF RECEPTACLE COVER AND SHIELD

Harald B. Jadatz, Deer Park, N.Y., assignor to Slater Electric Co., Glen Cove, N.Y.
Filed Feb. 6, 1975, Ser. No. 547,708
Int. Cl.² H02G *3/18*
U.S. Cl. 220—3.8 **5 Claims**



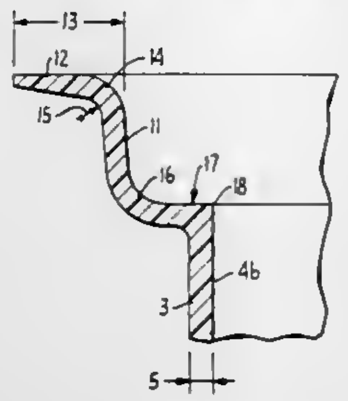
1. A weatherproof cover for attachment to the open face of a vertically mounted electrical receptacle outlet box and for forming a weather enclosure therewith, said cover including a plate having at least one opening extending therethrough for receiving an electrical receptacle mounted in said box, said plate having a hood having a wall extending horizontally along the top edge and having walls extending vertically along the opposite side edges of said plate, said hood wall extending horizontally along the top edge of said plate extending outwardly and horizontally beyond the side walls of said hood, said plate having a downwardly and outwardly sloping lip extending horizontally across said plate intermediate the side walls of said hood and spaced upwardly from the bottom edge of said plate, and a closure mounted adjacent the leading edge of the hood for pivoted movement along a line spaced inwardly and below the outward leading edge of said top edge hood wall, said closure having a front wall, a bottom wall and side walls at the opposite ends of said front and bottom walls, said closure walls and the hood walls extending horizontally along the top edge and vertically along the opposite side edges of said plate and forming a weather enclosure for the electrical receptacle when said closure is in closed position and a weathershield for the electrical receptacle when said closure is in open position and means for spring biasing said closure on said pivoted axis into closed position.

4,102,467

TAPERED PLASTIC CONTAINER WITH SEAMED METAL END AND METHOD FOR MAKING IT

Keith R. Woodley, San Francisco, Calif., assignor to Wescan, Inc., San Francisco, Calif.
Filed May 4, 1977, Ser. No. 793,732
Int. Cl.² B65D *7/42*
U.S. Cl. 220—67 **5 Claims**

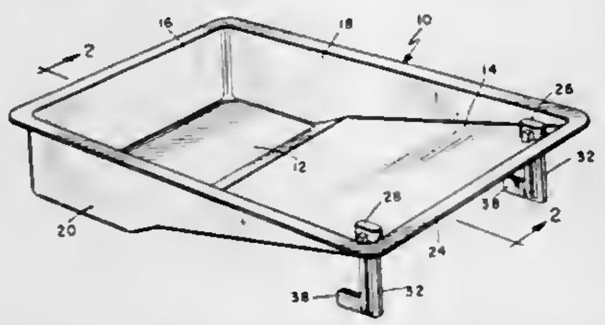
1. A molded one-piece plastic container body including a bottom wall; an upstanding side wall with an open upper end adapted to be closed by a metal end; and upper seam forming portion carrier on said side wall and being radially outwardly offset from the next adjacent portion of said side wall; an intermediate radius having a generally flat inner end supporting surface generally perpendicular to the axis of the container body and interconnecting said side wall and said upper seam forming portion; a radially outwardly directed flange carried upon said seam forming portion and gradually tapering from a thickness substantially equal to the thickness of the upstanding side wall to a thickness generally one-half that of said upstanding side wall at its outer end, said flange being connected to said upper seam forming portion through an outer shoulder section of uniform thickness and having a radius of curvature substantially less than said wall thickness.



4,102,468

STACKABLE PAINT TRAY

Robert Ivan Goldman, 6658 Cibola Rd., San Diego, Calif. 92120
Filed Dec. 16, 1976, Ser. No. 751,026
Int. Cl.² B65D *25/24;* B05C *11/46;* A45C *5/14;* B65D *21/02*
U.S. Cl. 220—69 **6 Claims**



1. A paint tray for use in conjunction with a paint roller, said tray defined by a generally rectangular bottom having a first generally flat portion at the front thereof and a sloping portion sloping upward from the front to the back of the tray, with side walls extending upward from the bottom thereby defining a container having a deep front end and a shallow rear end, the improvement comprising:

- a pair of spaced apart vertically oriented sockets in the rear underside of said tray formed in projections extending upward from said sloping bottom in said tray, said projections define roller stop means for engaging and stopping a roller short of the back wall thereof; and
- a pair of independent detachable legs each having a plug for extending in tight fitting engagement into said sockets for detachably mounting said legs on said tray at the back underside thereof for supporting said tray and for removal therefrom for providing close stacking of a plurality of said trays.

4,102,469

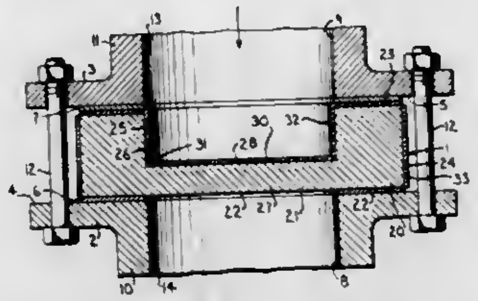
PROTECTED MOLDED RUPTURE DISC

Donald M. Shegrud, and Kenneth R. Shaw, both of Kansas City, Mo., assignors to Continental Disc Corporation, Riverside, Mo.
Filed May 23, 1977, Ser. No. 799,203
Int. Cl.² F16K *17/14*
U.S. Cl. 220—89 A **8 Claims**

1. A pressure relief assembly for exposure to adverse process conditions comprising:

(a) a disc having a molded body with an upper face, a lower face and a rim;

(b) at least one bore extending downwardly through said upper face and into said body, said bore having a depth less than the distance between said upper face and said lower face, forming a cylinddrical bore wall and a planar bore bottom face; said bore wall and said bottom face forming a bottom circumference at the juncture thereof;



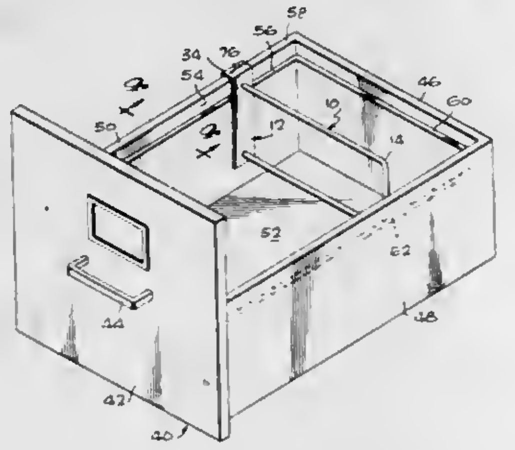
(c) said bottom face forming one face of a frangible diaphragm designed to rupture within a predicted range of pressure differential thereacross; and

(d) an impermeable, high temperature resistant liner coextensively engaging said bottom circumference and said bottom face thereby forming a coextensive combination wherein said liner is characterized by lack of resistance to deflection of said frangible diaphragm to the point of diaphragm rupture.

4,102,470

DRAWER FILE FOLDER STOP

Jay Timmons, Palos Verdes Estates, Calif., assignor to Hiebert, Inc., Torrance, Calif.
Filed Jan. 28, 1977, Ser. No. 763,657
Int. Cl.² A47F *7/00;* A47B *88/00*
U.S. Cl. 220—22.3 **8 Claims**

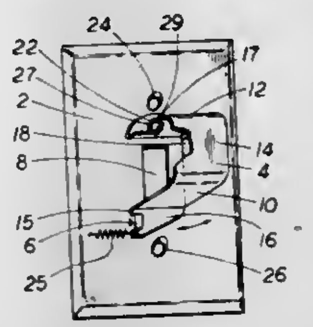


1. A drawer file folder stop comprising a plate having a relatively flat body portion having opposite sides, a top portion extending outwardly from one of the opposite sides of and generally normal to the body portion at an end of the body portion, the top portion extending outwardly from the body portion by a given distance, and a lip portion extending outwardly from the top portion in spaced-apart and generally parallel relation to the body portion, the lip portion extending outwardly from the top portion by distance substantially less than the given distance, a generally cylindrical pin mounted on the body portion at said one of the opposite sides thereof at a location substantially closer to the end of the body portion than to an opposite end of the body portion, and an elongated holder mounted on and extending outwardly from and generally normal to the other one of the opposite sides of the body portion.

4,102,471

SWITCH GUARD ASSEMBLY

Nicola Lore, 35 Burkhardt Ave., Bethpage, N.Y. 11714, and Charles Di Pietro, 15 Doherty Ave., Elmont, N.Y. 11003
Filed Sep. 8, 1977, Ser. No. 831,611
Int. Cl.² H02G *3/14*
U.S. Cl. 220—242 **12 Claims**

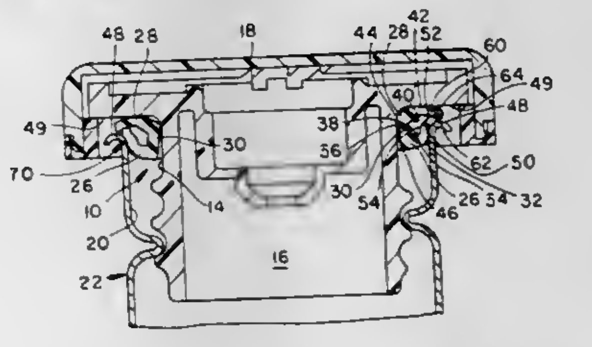


1. A switch guard assembly for preventing accidental actuation of a switch, the assembly including a switch plate and comprising a box-shaped member mounted on the switch plate and having a front wall formed with a surface disposed substantially parallel to the switch plate, said front wall being closed against access by the fingers of an operator's hand through the front wall to a switch actuator extending out of the switch plate, said box-shaped member having at least one fully open side for affording access to the switch actuator by the fingers of an operator's hand.

4,102,472

O-RINGS FOR VEHICLE FUEL TANK FILLER NECK CAPS

Paul H. Sloan, Jr., Sturgis, Mich., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.
Continuation-in-part of Ser. No. 706,051, Jul. 16, 1976. This application May 24, 1977, Ser. No. 798,981
Int. Cl.² B65D *39/08, 45/02*
U.S. Cl. 220—295 **16 Claims**



12. In combination, a gas cap, a filler neck, and an annular ring providing a seal between said cap and said neck, said ring having peripherally and radially outwardly extending axially inner and axially outer lips of a connecting web disposed about said cap, said axially outer lip being formed to have a peripherally and inwardly extending bead at its radially outer edge and said inner lip being formed to provide a peripherally and outwardly extending bead at its radially outer edge.

4,102,473

QUICK COUPLING/LOCKING DEVICE

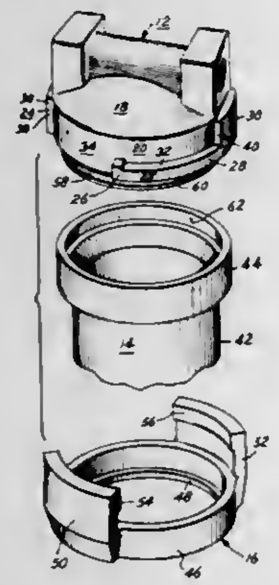
Walter E. Draxler, Arlington Heights, Ill., assignor to Arrow Pneumatic, Inc., Forest Park, Ill.
Filed Oct. 5, 1977, Ser. No. 839,337
Int. Cl.² B65D *45/32*
U.S. Cl. 220—319 **5 Claims**

1. An improved interlocking assembly for a device such as an air filter, an air lubricator, filter-regulator piggyback or the like, comprising:

a head member including a generally cylindrical outer wall, more than one uniformly radially outwardly projecting arcuate ledge formations integrally formed on said outer wall and more than one arcuate slots defined on said outer wall between said ledge formations, said ledge formation including an axially extending locking tab adjacent said slot and defining a transversely extending arcuate support surface adjacent said locking tab, said support surface being axially recessed from said locking tab and having an arcuate length substantially equal to the arcuate length of said slot;

a pressure vessel including a generally cylindrical open end section and a circumferential outwardly projecting shoulder integrally formed on said open section;

a collar having an annular ring section, a circumferential radially inwardly projecting lip integrally formed on said ring section, and more than one circumferentially spaced, outwardly projecting, axially extending lug members, said lug member having an inwardly projecting end defining a transversely extending arcuate contact surface, said lug member having an arcuate length substantially equal to the arcuate length of said slot, said lip having an inner diameter less than the diameter of said shoulder, said ring portion having an inner diameter substantially equal to the diameter of said shoulder;



said pressure vessel and collar thereby cooperating so that said pressure vessel normally nests in said ring section with said shoulder abutting said lip,

said head member and collar thereby cooperating so that said contact surface normally rests on said support surface, said collar being movable sequentially, axially in a first axial direction so that said ends extend axially past said locking tabs, rotatably so that said ends are in registry with said slots and axially in a direction opposite said first axial direction until said head member and collar separate,

said locking tabs thus preventing said collar from being rotated unless said collar is moved in said first axial direction, whereby said pressure vessel is normally held against said head member by said collar, is readily removable and is prevented from being accidentally removed.

4,102,474
CLOSURE MEMBER

Douglas John Platts, Worksop, England, assignor to General Descaling Company Limited, England

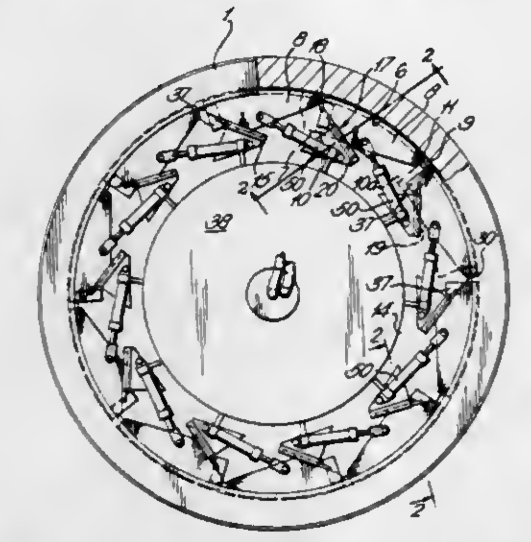
Filed May 27, 1975, Ser. No. 580,983

Claims priority, application United Kingdom, May 28, 1974, 23537/74

Int. Cl.² B65D *45/28*

U.S. Cl. 220—323 **19 Claims**

1. The combination of a closure member and a pressure member including a body having an aperture to be closed, said closure member comprising a door fitting in said aperture, a plurality of blocks slidably mounted adjacent the periphery of said door for movement from a withdrawn position at least substantially wholly within the periphery of said door to a position in which a part of each block protrudes beyond the periphery of said door for engagement with said body, said parts of said blocks together forming a protrusion extending substantially around the periphery of said door, and means for moving the blocks from the withdrawn position to the protruding position, and said aperture in part defining an annular groove receiving said parts of said blocks; and an annular seal having separately defined surfaces sealing to said door and to said body, said seal being sufficiently flexible to be moved out of contact with the door when acted upon by a force originating outside of said pressure member, and thrust bars being arranged to transmit force applied from outside of said pressure member to said seal.



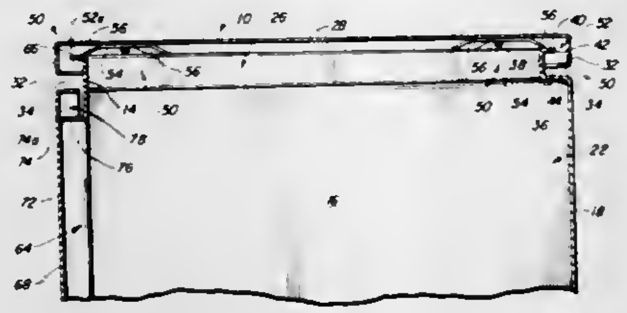
4,102,475
TAMPER-RESISTANT ENCLOSURE FOR ELECTRICAL EQUIPMENT

Arvydas J. Kalvaitis, Northbrook, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,244

Int. Cl.² B65D *51/16*

U.S. Cl. 220—366 **11 Claims**



1. An improved equipment enclosure of the type including a housing having an opening defined by generally planar walls, the opening being closed by a generally planar cover co-extensive with the opening; wherein the improvement comprises:

(a) a flange formed on at least a portion of the periphery of the cover;

(b) an inwardly directed lip formed on the periphery of the free edge of the flange;

(c) an inwardly directed first shelf formed on at least a portion of the free edge of one or more selected walls;

(d) a rim formed on the inner edge of the shelf;

(e) an outwardly directed first ledge formed on the free edge of the rim; and

(f) means for mounting the cover to the housing so that

  (i) the outer edge of the ledge is offset inwardly from the inner edge of the lip,

  (ii) the lip is positioned between the ledge and the shelf, and

  (iii) the ledge is positioned between the lip and the cover.

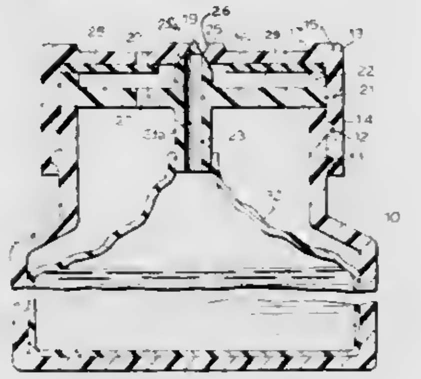
4,102,476
SQUEEZE BOTTLE DISPENSER WITH AIR CHECK VALVE ON COVER

Herbert H. Loeffler, Arlington, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,759

Int. Cl.² B05B *11/04;* B65D *47/34*

U.S. Cl. 222—209 **7 Claims**



1. A squeeze bottle type dispenser, comprising a resiliently collapsible container for the liquid to be dispensed, a cover means on said container, said cover means having a flexible resilient central portion flexible outwardly of the cover means away from the container under gas pressure generated in said container when said container is squeezed, a dispensing valve member on said cover having a dispensing orifice therein and an interior surface facing into said container, a dispensing valve body fixed in position within said container adjacent said cover and having an exterior surface complementary in shape to that of the interior surface of said dispensing valve member and with which the interior surface of said valve member tightly engages when the parts of the dispenser are in the non-dispensing positions, the interior of said valve body being hollow and said valve body having product dispensing apertures opening from said hollow interior through said exterior surface thereof and being normally covered by said valve member when the parts of the dispenser are in the non-dispensing positions, said dispenser having an air chamber therein surrounding the outside of said valve body and being in communication with the upper portion of the interior of said container and opening into the gap between said exterior surface of said valve body, and the interior surface of said valve member when the valve member is moved away from said valve body for permitting compressed gas from within the container to flow through said gap when the container is squeezed, said dispenser having an air return flow path therethrough and valve means in said air return flow path opening said air return flow path when the pressure on the outside of the container is greater than the pressure on the inside of the container, and liquid delivery means within said container and connected to said valve body for delivering liquid to said hollow interior of said valve body when the container is collapsed.

4,102,477
SUGAR DISPENSING APPARATUS

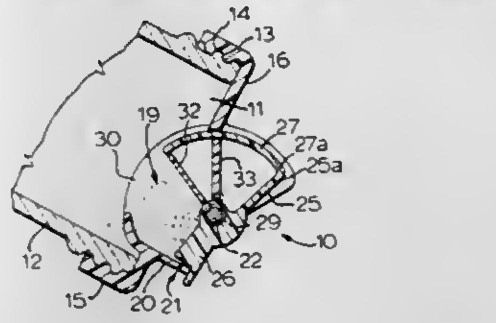
Jong Un Yoon, 83 Elmvalz Ave., Brampton, Ontario, Canada

Filed Aug. 30, 1976, Ser. No. 718,541

Int. Cl.² G01F *11/28*

U.S. Cl. 222—438 **3 Claims**

1. A device for use with a container for dispensing measured quantities of free-flowing particulate substance from a container comprising a chamber having an inlet and an outlet, two spaced-apart side walls, a front wall and a back wall; the top edges of said walls defining said outlet and the bottom edges of said walls defining said inlet; said front wall at the outlet forming a spout for said device; a cover for said outlet and a moveable arcuate shutter for said inlet; a lever arm being integral with said cover and said arcuate shutter; the juncture of said cover and said lever arm being pivotally connected to a pin disposed between and journalled through said side walls adjacent said outlet whereby said lever arm, said cover and said arcuate shutter pivot about a common axis; said cover and said arcuate shutter being spring biased in the outlet closed and inlet open position, said lever arm being depressible against the spring bias such that said lever arm pivots about the longitudinal axis of said pin to move said cover away from said outlet of said chamber and to move said arcuate shutter over said inlet of said chamber to permit a free-flowing particulate substance to flow out of said chamber.



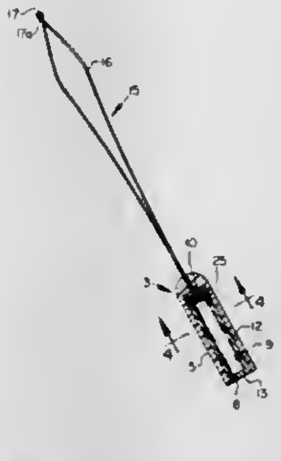
4,102,478
NEEDLE THREADER

Constantin Samoilov, 237 N. Front St., Woodburn, Oreg. 97071

Filed Dec. 27, 1976, Ser. No. 754,832

Int. Cl.² D05B *87/02*

U.S. Cl. 223—99 **6 Claims**



1. In a needle threader:

a handle portion comprising:

a first support member comprising an outer support member of tubular shape,

a second support member for cooperative interengagement with said first support member, said members having mutually interengaging surfaces, said second support member comprising an inner support member snugly disposed within said outer support member,

a wire threading loop having at one end two terminal wire ends and at the opposite end, medially of said wire ends, a thread-engaging tip portion, said wire ends being tightly sandwiched between said interengaging surfaces of said inner and outer support members so as to be held rigidly in place thereby,

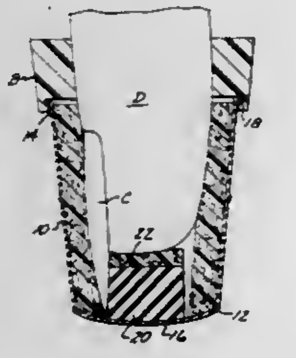
said outer support member including a hollow axial bore for slidably receiving said inner support member and extending from an open end of said outer support member to a closed end thereof,

means defining a wire passage extending axially through said closed end and opening into said bore for receiving a portion of said wire threading loop, and a raised collar portion extending inwardly of said bore from said closed end, said collar portion surrounding the opening of said wire passage into said bore and being spaced from the sidewalls of said bore so as to fit snugly within a portion of said inner support member.

4,102,479
THIMBLE STRUCTURE

Gertrude Braley, 5602 Palos Verdes Blvd., Torrance, Calif. 90505

Filed Apr. 28, 1977, Ser. No. 791,779
Int. Cl.² D05B ***91/04***
U.S. Cl. 223—101 **1 Claim**



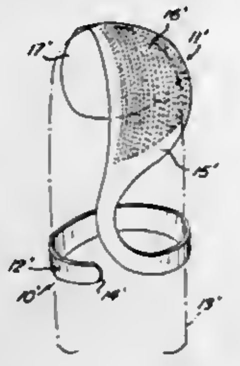
1. In combination with a thimble that includes a frusto-conical shell that has a plurality of spaced transverse perforations therein, said shell having first and second ends; an end piece that closes said first end; an outwardly projecting circular bead on said second end, an assembly that permits said thimble to be worn on a finger that has a projecting finger nail of substantial length, said assembly including:
- a. a resilient porous liner secured to the interior surface of said shell to frictionally grip a finger inserted therein, and keep the finger dry from perspiration by allowing air to circulate between the finger and ambient atmosphere through said liner and said perforations;
- b. a resilient pad of less transverse cross sectional area than that of said end piece;
- c. a pedestal of not greater transverse cross sectional area than said pad that extends from the inner surface of said end piece longitudinally within said shell, with said pedestal supporting said pad on the free end thereof, and said pad and pedestal being spaced from said lines to define a ring-shaped recess into which said fingernail of a user extends when the tip portion of the finger of which said fingernail forms a part is disposed in said thimble; and
- d. a circular band that has an interiorly disposed recess that engages said bead to support said band from said shell and in longitudinal alignment therewith, said band having an interior frusto-conical surface that is a continuation of said frusto-conical surface in said shell, and said band of substantially the same depth as the height of said pedestal to permit substantially the same length of said tip portion of said finger to be inserted within the interior of said shell and band as would be possible to insert in said shell if said tip portion had no projecting fingernail and said pedestal and pad were not present in said shell.

4,102,480
THIMBLES

Bawn O'Beirne-Ranelagh, 31 Clanricarde Gardens, London W2, England

Filed Sep. 20, 1976, Ser. No. 725,113
Claims priority, application United Kingdom, Sep. 24, 1975, 39137/75
Int. Cl.² A41H ***31/00***
U.S. Cl. 223—101 **7 Claims**

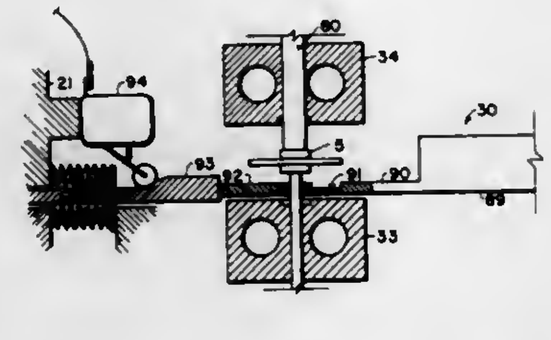
1. A finger guard comprising a first ring-like portion capable of gripping the finger on which the guard is to be placed adjacent the end of the finger, and an elongated protective portion joined to said ring-like portion along an arcuate section thereof of substantially less than 90° and extending transversely away from the plane of said ring-like portion in a helix-like path and terminating in a terminal portion remote from said ring-like portion and which extends back toward but terminates short of said ring-like portion, said elongated protective portion adapted to lie against the inside of the finger of a user and said terminal portion adapted to extend over at least a part of the fingernail of the user.



4,102,481
SEALING PRESS FOR AUTOMATED ASSEMBLY APPARATUS

Ernest C. Ollenbach, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 575,771, May 8, 1975, abandoned. This application Nov. 19, 1976, Ser. No. 743,381
Int. Cl.² H01L ***21/52***
U.S. Cl. 228—6 R **5 Claims**

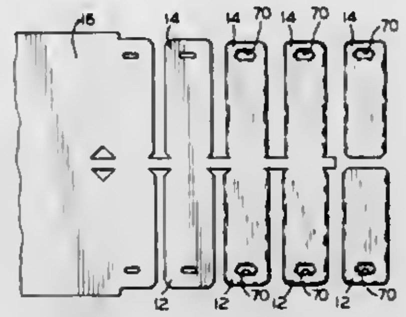


1. A press for sealing upper and lower ceramic members to a metal member, comprising:
- (1) upper and lower die block members, each configured to receive the upper and lower ceramic members, respectively;
- (2) means for automatic loading of said upper and lower ceramic members into said upper and lower die block members;
- (3) means for aligning said upper and said lower ceramic members;
- (4) means for aligning said metal member between said aligned ceramic members;
- (5) means for applying heat to each of said upper and lower ceramic members by means of said upper and lower die block members;
- (6) means for applying pressure to said upper and lower ceramic members by means of said upper and lower die block members;
- (7) means for separating said upper and lower ceramic members from said upper and lower die block members;
- (8) means for holding said upper and lower ceramic members in an intermediate position between said upper and lower die block members when said upper and lower die block members are separated.

4,102,482
PROCESS FOR PRODUCING FUSIBLE LINKS

Donald Ray Rueggegger, 425 W. Maple, Waterloo, Ind. 46793

Division of Ser. No. 554,650, Mar. 3, 1975, Pat. No. 4,055,829. This application Jan. 21, 1977, Ser. No. 761,435
Int. Cl.² A62C ***37/30***
U.S. Cl. 228—170 **5 Claims**

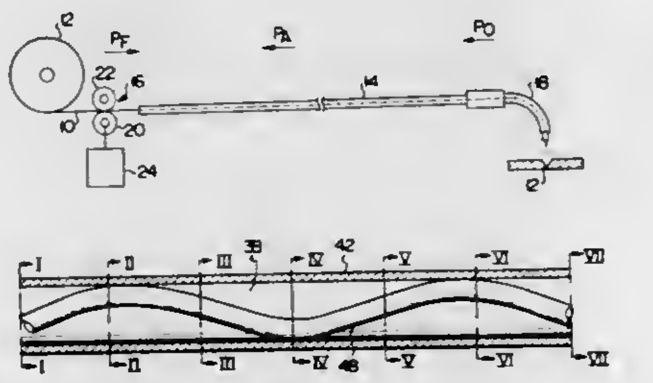


1. A process for making fusible links adapted to be temperature responsive for effecting operation of alarms or other devices, comprising the steps of progressively forming from flat sheet metal stock two interfittable rectangular links, bending the outer edge of said links into a flange extending along three of the sides of said link, each of opposite sides of the respective link flanges including complementary inclined camming side which effect lateral spreading movement of the confronting surfaces of said links when they are drawn in opposite directions, "terne" coating the outer surfaces of said link and then flux coating and thereafter soldering the links together with a eutectic solder.

4,102,483
METHOD FOR FEEDING A WELDING WIRE

Fumio Ueyama, Ikoma, and Tadashi Hattori, Takarazuka, both of Japan, assignors to Osaka Denki Co., Ltd., Osaka, Japan

Filed Mar. 11, 1976, Ser. No. 665,678
Claims priority, application Japan, Mar. 13, 1975, 50-30963; Mar. 13, 1975, 50-30964; Mar. 13, 1975, 50-30965
Int. Cl.² B23K ***9/12***
U.S. Cl. 228—244 **4 Claims**



1. A method for feeding a welding wire comprising:

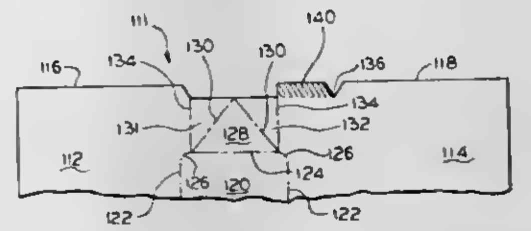
feeding a substantially straight welding wire having a substantially circular cross-section to an elongated conduit cable having a wire guide bore with an elongated cross-section, said conduit cable having a wire exit end coupled to a welding torch, and

continuously imparting a feeding force to the straight welding wire at the wire entry side of the conduit cable to cause the straight welding wire to deform in said elongated cross-section of said bore into the form of a sine curve in one plane and in the axial direction of said bore due to the co-relation of said feeding force on said wire and a force applied at the tip end of said wire by said welding torch at said exit end.

4,102,484
LEAKAGE RESISTANCE CARTON

Michael A. Kipp, Phoenixville, and Richard T. Walter, Norristown, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed May 4, 1977, Ser. No. 793,777
Int. Cl.² B65D ***5/24, 3/00***
U.S. Cl. 229—16 A **3 Claims**

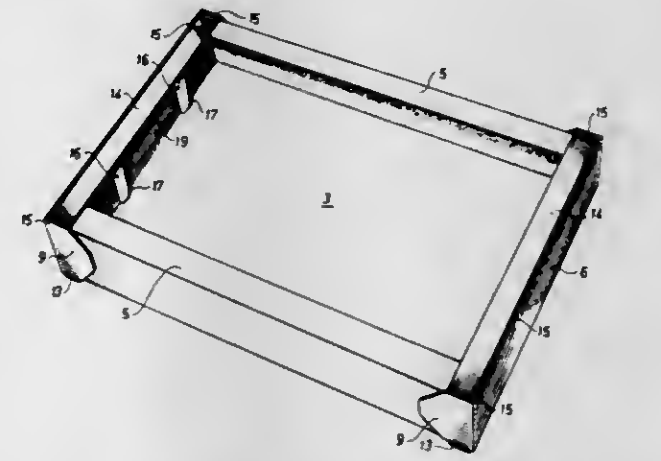


1. A tubular carton formed from a cut and scored blank of paperboard, or the like, said carton comprising:
- (a) a side wall formed from a pair of generally rectangular side wall panels having their edges secured in an overlapped relationship;
- (b) a bottom wall foldably secured at opposite side edges to bottom edges of said side wall panels along fold lines;
- (c) a first gusset panel foldably secured to said bottom wall along a longitudinal fold line substantially normal to said fold lines between said bottom wall and said side wall panels;
- (d) a pair of second gusset panels each foldably secured along diverging fold lines to said first gusset panels and to a respective one of said side wall panels;
- (e) a recess formed along an edge of at least one of said side wall panels and interposed between a gusset panel and an edge of the other one of said pair of said side wall penels when said carton is in erected condition;
- (f) a spot of adhesive applied in the area of a point common to said first gusset panel and each of said pair of said second gusset panels.

4,102,485
TRANSPORT BOX

Sven Johnsson, Huskvarna, Sweden, assignor to Pacfex Aktiebolag, Kinna, Sweden

Continuation of Ser. No. 682,670, May 3, 1976, abandoned. This application Dec. 2, 1976, Ser. No. 746,686
Int. Cl.² B65D ***11/20, 61/00***
U.S. Cl. 229—23 R **11 Claims**



1. A box comprising a casing made of a sheet which is folded to form a bottom and two side walls, each with inwardly-extending flanges on their top edges; and two end elements adapted to receive the opposite ends of the folded casing and to

fix them relative to the end elements, each said end element comprising side portions adapted to lie along the side walls of the casing and to positively engage therewith; guide bars with guiding edges which slope towards the bottom edges of the insides of the end elements to guide the opposite end of the casing towards said bottom edges during assembly; a bottom flange at said bottom edge to support the bottom of the casing; and an inwardly directed projection on each side portion of each end element engaging in a bole in each respective side wall for positive engagement therewith.

4,102,486

PACK, MORE PARTICULARLY FOR CIGARETTES

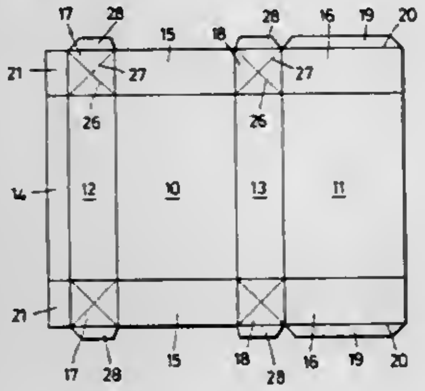
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Oct. 6, 1976, Ser. No. 730,116

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2445256

Int. Cl.² B65D *85/10*

U.S. Cl. 229—37 R **2 Claims**



1. A foldable blank for forming a rectangular cigarette pack, comprising:

(a) sequentially connected first side (12), front (10), second side (13) and rear (11) rectangular walls,

(b) sequentially connected first (17), second (15), third (18) and fourth (16) rectangular end flaps adjoining the lateral edges of the first side, front, second side and rear walls, respectively,

(c) first (28), second (28) and third (19) closure strips adjoining the lateral edges of the first, third and fourth end flaps, respectively, and

(d) a pair of intersecting diagonal fold lines on each of the first and third end flaps,

(e) the blank being adapted to first be formed into a tube whereafter the fourth end flap is folded down over the contents of the pack, which simultaneously causes the first and third end flaps to fold about one of their diagonal fold lines in a triangular manner and brings the first, second and third closure strips into planar engagement with the inside of the second end flap, said closure strips being adapted to be adhesively secured thereto.

4,102,487

DISPOSABLE RESEALABLE CONTAINER

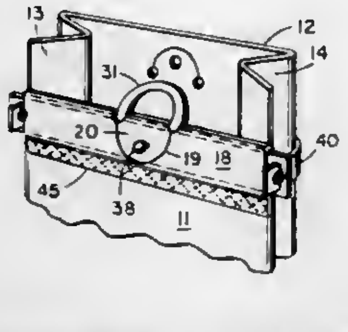
Ricardo Hurtado Soto, Apartado 91711, Bogota, Colombia

Filed May 5, 1977, Ser. No. 794,005

Int. Cl.² B65D *33/02, 33/06, 33/16*

U.S. Cl. 229—54 R **7 Claims**

1. A sealable container comprising a bag having generally flat front and back panels and first and second pleated sides joining said front and back panels together and cooperating therewith to define an open mouth; an elongated stiffener member attached to said front panel and spaced from said mouth beneath a foldable upper portion of said bag and defining first and second extensions extending laterally beyond said front panel, each extension defining a slot; a flexible band extending about said back panel and said pleated sides and having its ends extending through said slots of said band extensions; and lock means for securing said band to said stiffener member; whereby said pleats may be folded to close the mouth of said bag, said upper foldable portion may be folded over said stiffener member to seal said bag, and the free ends of said band may be drawn around the folded portion of said bag and attached to said lock means to secure said bag.



4,102,488

DISPOSABLE CONTAINER

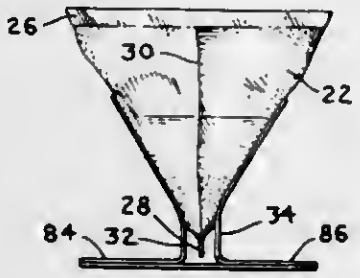
Darrell R. Morrow, 7 Pamela Ct., Old Bridge, N.J. 08857, and Michael Schuler, 40 Mildwood Ave., Edison, N.J. 08817

Division of Ser. No. 493,178, Jul. 30, 1974, Pat. No. 3,950,918.

This application Mar. 15, 1976, Ser. No. 666,790

Int. Cl.² B65D *33/02*

U.S. Cl. 229—55 **12 Claims**



1. A foldable blank for forming the base of a container, said blank having a top and bottom surface, and lengthwise and crosswise dimensions, comprising:

a pair of first folding guide means spaced on the periphery of said blank, each of said first folding guide means coacting with the end of the blank adjacent thereto to define arm panel means;

a pair of second folding guide means spaced on the periphery of said blank within said first pair of folding guide means, said pair of second folding guide means defining a base surface panel on said blank;

each of said adjacent first and second folding guide means defining a pair of shoulder surface panels, the peripheral length of each of said pair of shoulder panels not exceeding half the peripheral length of said base panel, each of said shoulder panels adapted to be folded over and lie against said base panel;

first adhesive means disposed on the top surface of said blank within said pair of first folding guide means adapted to adhere each of said pair of shoulder panel means to the adjacent area of said base panel means when said blank is folded along each of said second folding guide means;

second adhesive means disposed on said top surface of said blank on each of said arm panel means;

removable protective means covering said adhesive comprising: a continuous layer extending over both arms of said blank;

separating means on said layer disposed proximate said pair of first folding guide means for separating said continuous layer into three separate segments, one for each of said arm panel means and the remaining segment covering the adhesive means disposed on the remainder of said top surface; removable protective means are removed, from

said remaining segment and said blank is then folded along said first and second pair of folding guide means in a sequence whereby it is folded along each of said first pair of second folding guide means before being folded along the adjacent first folding guide means, said adhesive means will coact with said base and shoulder panel means to adhere said shoulder panel means to said base panel means, and, said second adhesive means will enable each of said pair of arm panel means to adhere to an item disposed above said shoulder panel means, when said protective means are removed from said arm panel means.

4,102,489

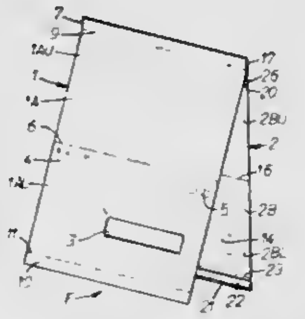
BUSINESS REPLY FORM

Roland T. Lucas, Milwaukee, Wis., assignor to St. Luke's Hospital Research Foundation, Inc., Milwaukee, Wis.

Filed Dec. 1, 1977, Ser. No. 856,214

Int. Cl.² B65D *27/06*

U.S. Cl. 229—73 **14 Claims**



1. A business reply form for use between a sender and a recipient comprising:

a first sheet foldable in one direction;

a second sheet foldable in said one direction and shorter than said first sheet;

each sheet having outer and inner sides and top and bottom edges and said sheets being secured together along their top edges;

first tear lines spaced from the top and bottom edges of each sheet and defining first tear strips;

a second tear line spaced from said first tear line at the top edge of said second sheet defining a second tear strip;

a first layer of adhesive for securing the outer side of the first tear strip at the top edge of said second sheet with the inner side of the first tear strip at the bottom edge of said first sheet when both sheets are folded in said one direction;

a second layer of adhesive for securing the inner side of the first tear strip at the bottom edge of said second sheet with the inner side of the second tear strip at the top edge of said second sheet when said second sheet is folded in a direction opposite to said one direction;

an address space on the inner side of said second sheet;

and a window in said first sheet in registration with said address space.

4,102,490

DATA RING FOR VERTICAL TUBE ROTOR

Steven John Chulay, Los Altos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 6, 1977, Ser. No. 803,818

Int. Cl.² B04B *5/04*

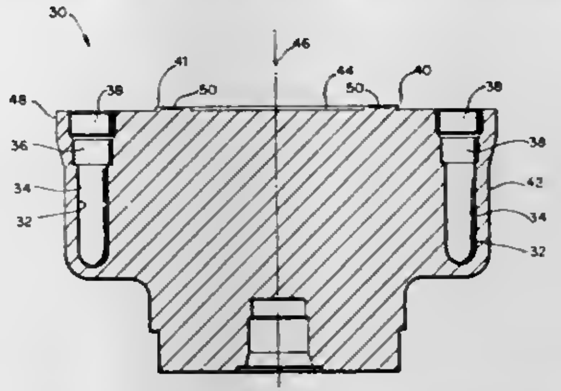
U.S. Cl. 233—26 **6 Claims**

1. A centrifuge rotor comprising:

a rotor body;

a plurality of tube apertures symmetrically arrayed in a circular pattern within said rotor body; and

means integrally formed with and positioned above the upper surface of said rotor for identifying each of said apertures, said identifying means and said rotor body being formed from one integral member, said upper surface being coincident with a high stress field in said rotor during centrifugation, said identifying means being outside of said high stress field to eliminate potential weak areas in said upper surface of said rotor during centrifugation.



4,102,491

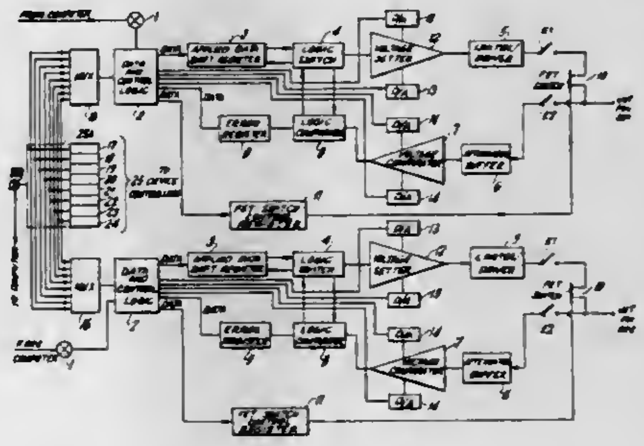
VARIABLE FUNCTION DIGITAL WORD GENERATING, RECEIVING AND MONITORING DEVICE

Louis DeVito, West Milford, and Albert H. Esser, Clifton, both of N.J., assignors to Instrumentation Engineering, Inc., Franklin Lakes, N.J.

Filed Dec. 23, 1975, Ser. No. 643,746

Int. Cl.² G01R *31/00;* **G06F** *11/00*

U.S. Cl. 235—302 **6 Claims**



1. Improved digital word generating and receiving apparatus for generating and applying serially to plural terminals of a unit under test plural stimulus multibit digital words and for receiving for analysis from the terminals of the unit under test plural response signals, having a unique applied data shift register for applying said multibit digital words to each of said terminals and a unique means for receiving said response signals therefrom, wherein the improvement comprises means for controlling the application from said plural applied data shift registers of said plural multibit digital words to said plural unit under test terminals so that each of said plural applied data shift registers is able to apply multibit digital words to its associated unit under test terminal at a rate independent from that of other applied data shift registers.

4,102,492

UNIVERSAL PROGRAMMABLE PROCESS CONTROL APPARATUS

Joseph Gold, Springfield, and Frank Parese, Linden, both of N.J., assignors to Valcor Engineering Corp., Kenilworth, N.J.

Continuation of Ser. No. 700,300, Jun. 28, 1976, abandoned.

This application Jul. 28, 1977, Ser. No. 819,875

Int. Cl.² G06K *15/00;* **H01H** *43/08;* **G06F** *7/38;* **G05B** *5/00*

U.S. Cl. 235—375 **22 Claims**

1. Apparatus for selectively enabling and disabling a process depending on the instantaneous magnitude of a measurement

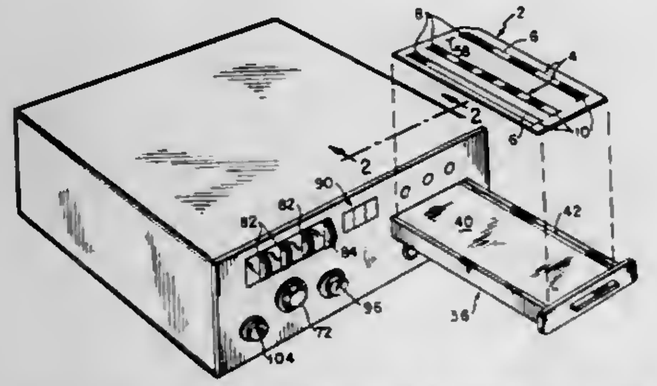
made during the process in accordance witn a prescribed program comprising:

a control switch actuable between a process enabling state and a process disabling state,

a plurality of memory core means each of which can be selectively placed in one of a first state and a second state,

measurement means for determining the instantaneous value of a parameter which value is variable during the process, said measurement meang having a measurement output signal with a characteristic having a magnitude indicative of the instantaneous magnitude of said measurement, and

means responsive to said measurement output signal for sequentially interrogating the memory core means in order to determine the state of the interrogated memory core means, said control switch means being responsive to said interrogating means for being in said enabling state when the interrogated memory core means is in its first state and for being in said disabling state when the interrogated memory core means is in its second state.



4,102,493
SYSTEMS FOR STORING AND TRANSFERRING DATA

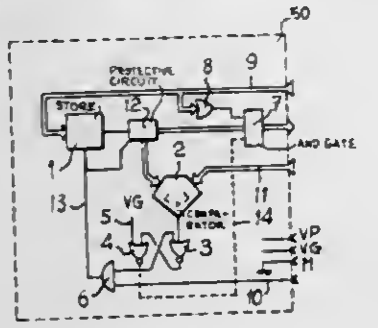
Roland Moreno, Paris, France, assignor to Societe Internationale pour l'Innovation, France

Filed May 13, 1976, Ser. No. 686,011

Claims priority, application France, May 13, 1975, 75 14807

Int. Cl.² G06K *5/00, 19/06*

U.S. Cl. 235—419 **24 Claims**



1. A system for storing and transferring data in confidential manner, the system comprising: at least one independent electronic portable article, and at least one independent transfer device, the portable article comprising: at least one store for storing data in an easily transportable form containing enabling data, coupling means accessible from the exterior of the portable article and used for temporarily coupling the portable article to the transfer device, and store control circuits connected between the coupling means and the store, an identification circuit entirely contained in the portable article and connected to the store and the coupling means, the identification circuit comparing the enabling data in the store with a confidential item introduced into the transfer device by the possessor of the portable article; the store and the control circuits being constructed in the form of logic microstructures; the transfer device comprising: means actuated by the person in possession of the portable store, so as to insert a confidential item into the transfer device, and means for transferring data to the portable article.

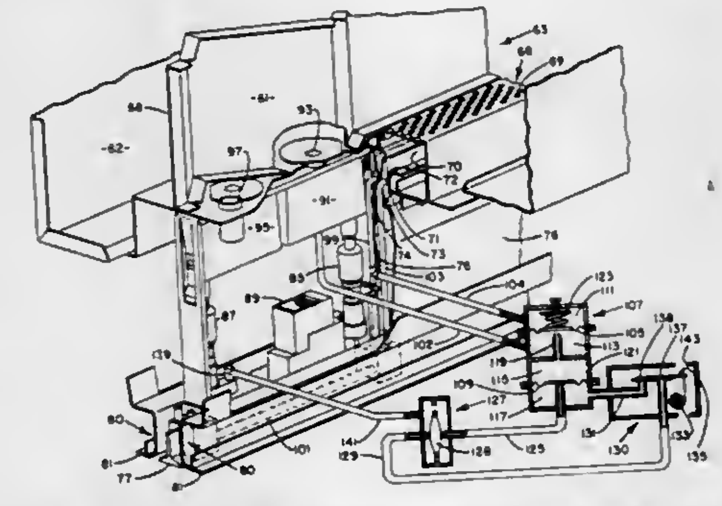
4,102,494
AIR DISTRIBUTION SYSTEM

Milton H. Coleman, East Syracuse, and William E. Clark, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,387

Int. Cl.² F24F *11/02*

U.S. Cl. 236—1 B **5 Claims**



1. In an air conditioning system for conditioning the air in a plurality of enclosed areas in a building, each of the enclosed areas having a peripberal portion requiring conditioned air having a variable temperature, and an interior portion requiring conditioned air at a constant temperature, terminal means disposed in each of the enclosed areas for the supply of conditioned air thereinto; first air conditioning apparatus to provide conditioned air at a temperature level which may be varied; means to supply said varying temperature conditioned air to a first portion of said terminal means; second air conditioning apparatus to provide conditioned air at a relatively constant temperature level; means to supply said relatively constant temperature air to a second portion of said terminal means; said terminal means including first control means to regulate the quantity of said constant temperature air discharged into said area in accordance with the temperature in said interior portion of said area, including means to generate a variable magnitude control signal indicative of the quantity of constant temperature air discharged into said area; and second control means responsive to a second control signal to regulate the quantity of said variable temperature air discharged into said area, the improvement comprising:

temperature responsive means to sense the temperature of said variable temperature conditioned air and to selectively direct said second control signal through first and second flow paths in response to said sensed temperature;

valve means interposed in said second flow path and responsive to the magnitude of said first control signal to transmit said second control signal when the magnitude of said first signal increases above a predetermined level and to terminate the transmission of said second control signal when the magnitude of said first signal decreases below said predetermined level; and

thermostatic means interposed in said first and second flow paths to vary the magnitude of said second control signal including means responsive to the temperature of the air in the space being conditioned to regulate the flow of said second control signal through said first and second flow paths in accordance with the sensed air temperature to vary the magnitude of said second control signal to vary the volume of said variable temperature air stream discharged into said space irrespective of the temperature of said air stream.

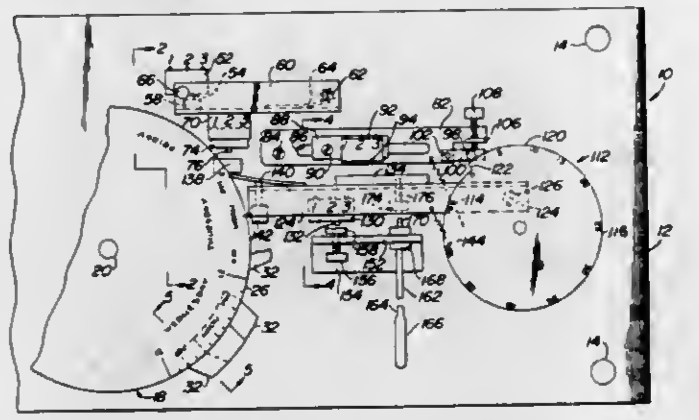
4,102,495
HEAT CONTROL DEVICE

M. Rotledge Flynn, and Raymond P. Schultz, both of Wilkes-Barre, Pa., assignors to Control Devices, Inc., Wilkes-Barre, Pa.

Filed Jan. 21, 1977, Ser. No. 761,487

Int. Cl.² F23N *5/20*

U.S. Cl. 236—46 R **4 Claims**



1. A heating control system for selectively energizing a heating unit at predetermined intervals during a multiday cycle in response to temperature comprising:

a base, three switches, two arms pivotally mounted on said base and two programmers;

said first switch being mounted to said base and including two contacts and a switch operator which is normally in contact with one of said contacts,

said first arm including means for engaging said first switch operator to close the other of said contacts, and means for urging said arm about said pivot in a direction away from said first switch,

said first programmer being mounted on said base for timed cyclical movement to correspond to said multiday cycle, said programmer being disposed on the opposite side of said first arm from said first switch and including a plurality of raised camming surfaces that correspond to intervals when the circuit to the heating unit is to be enabled, said raised surfaces being engagable with said first arm to move it toward and away from said first switch to selectively cause said operator to contact one or the other of said contacts,

said second switch being mounted on said first arm for movement therewith and including two contacts and a switch operator which is normally in contact with one of said contacts,

means for electrically interconnecting said first and second switches,

said second programmer being mounted for timed cyclical movement for a period which is substantially less than one day, said second programmer including a linearly increasing camming surface,

means for urging said second arm about its pivot in a direction opposite to the direction in which said first arm is urged and so that it bears against said linearly increasing camming surface,

said third switch being mounted on said second arm for movement therewith and including two contacts and a switch operator which is normally in contact with one of said contacts when said second arm lies along the low portion of said linearly increasing camming surface and which is in contact with the other one of said contacts when said second arm lies along the high portion of said camming surface to complete a circuit through said first and second switches to energize the heating unit, and

temperature responsive means that is operative to displace said operator in said second switch to said other contact in said second switch when a predetermined high temperature is reached to open the circuit to the heating unit.

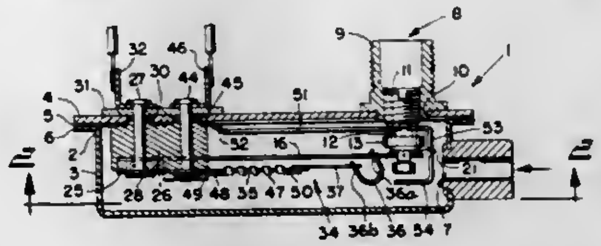
4,102,496
THERMAL VALVE

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Jan. 29, 1976, Ser. No. 653,477

Int. Cl.² F16K *31/56, 31/04*

U.S. Cl. 236—48 R **8 Claims**



1. A fluid valve, comprising a fluid-tight enclosure having an inlet and an outlet, a valve element supported for movement to respective positions to open and to close said outlet, and actuator means for moving said valve element from one of said positions to the other of said positions, said actuator means including a thermally responsive means for producing a mechanical displacement output, movable over-center mechanical energy storage means operatively connected to said valve element for moving said valve element from one to the other of said positions in response to such mechanical displacement output of said thermally responsive means, holder means for supporting said valve element, said energy storage means comprising a resilient member supported between said thermally responsive means and said holder means, said thermally responsive means including an arm movable relative to said holder means in response to a change in temperature of said thermally responsive means, said resilient member having first and second support points movable respectively with said arm and with said holder and thus having two different stable positions depending on the relative locations of said support points, and said resilient member tending in each of said stable positions to urge said support points and thus said arm and said holder means away from each other, whereby in one of said stable positions said resilient member urges said holder means and thus said valve element to a position to close said outlet and in the other one of said stable positions said resilient member urges said holder means and thus said valve element to a position to open said outlet, said resilient member comprising a C-spring, said C-spring having opposed arms, and coupling means at one end of said thermally responsive means for connecting one arm of said C-spring to said thermally responsive means, said coupling means including an electrical insulator having a notch, and said one arm of said C-spring including a bent portion facing said notch and being retained therein under the urging of pre-loaded mechanical energy in said C-spring.

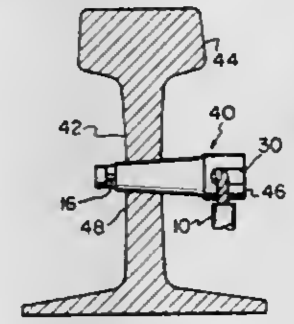
4,102,497
RAIL BOND

Ralph T. Lowerre, Coral Springs, Fla., assignor to Hanlon & Wilson Company, Jeannette, Pa.

Filed Aug. 4, 1976, Ser. No. 711,430

Int. Cl.² B60M *5/00*

U.S. Cl. 238—14.8 **9 Claims**



1. A rail bond terminal comprising:

A. a flexible stranded conductor;

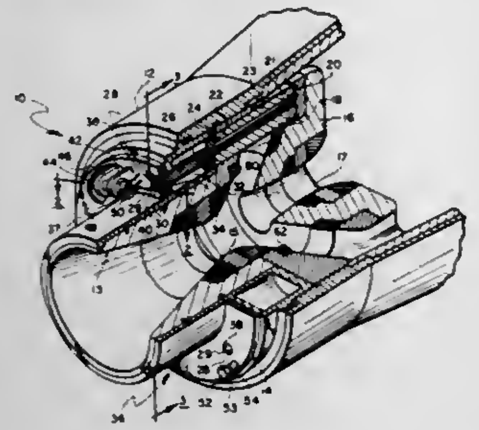
B. an inner sleeve secured to said conductor adjacent one end thereof, the outer surface of said inner sleeve being substantially cylindrical and having an elongated barrel portion and a radially extending flared portion formed thereon adjacent one end;

C. an outer sleeve including a head portion and a shank portion having a tapered outer surface, a cylindrical bore extending through said shank portion and through said head portion such that the outer sleeve is open at both ends, the diameter of the bore being slightly less than the radial extent of said flared portion such that when the inner sleeve and conductor are inserted into the bore, the flared portion frictionally engages the wall of the bore;

D. the end of the elongated barrel portion of said inner sleeve opposite the end adjacent to said flared portion being inserted into said cylindrical bore in said shank portion of said outer sleeve at the smaller end of said shank portion; and

E. a radial opening formed in said head portion of a size sufficient to receive said conductor.

4,102,498
RING LOCK ACTUATION SYSTEM
Charles C. Cherry, McGregor, Tex., assignor to Hercules Incorporated, Wilmington, Del.
Filed Apr. 7, 1975, Ser. No. 566,018
Int. Cl.² B63H *11/10*
U.S. Cl. 239—265.19 **6 Claims**



1. A mechanical ring lock actuation device for actuation of a secondary nozzle body commonly associated with a dual area solid rocket nozzle configuration into a blocking position during rocket engine operation comprising:

a main nozzle body, said body forming a main throat section thereby, said nozzle body terminating at a first end portion perpendicular to an axis of said nozzle body,

a movable centerbody spaced from, concentrically positioned within and axially aligned with said main nozzle body, said centerbody forming a secondary nozzle thereby,

at least one elongated support piston rod axially aligned with and connected at one end to the downstream side of said centerbody and at its opposite end, said piston rod is interfitted with at least one cylinder formed by said main nozzle body,

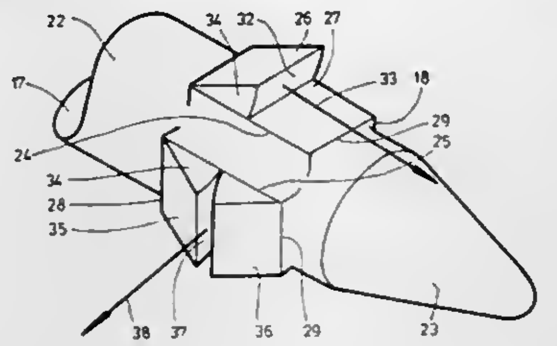
at last one piston rod spike connected to said opposite end of said support piston rod, said spiked rod being axially aligned and centrally positioned within said at least one cylinder, the downstream conically shaped spiked end of said piston rod spike extending through at least one orifice formed by said first end portion of said main nozzle body, said orifice being slightly larger in diameter than the diameter of said spiked piston rod, said spiked rod being slidable within said orifice,

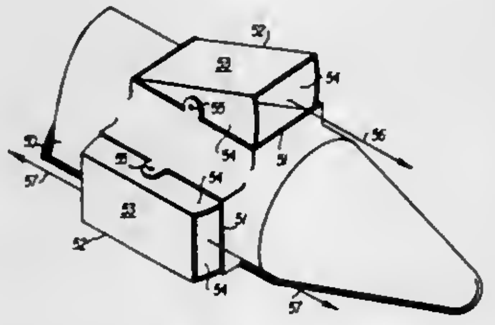
a ring lock plate having a first side positioned adjacent said first end of said main nozzle body and rotatable thereon, said ring lock plate defining at least one chamferred orifice, the smaller opening of said chamferred orifice is defined by a second downstream side of said plate, said smaller opening being the same size as said orifice in said first end of said main nozzle body, the larger opening being defined by said first side of said ring lock plate facing said end of said main nozzle body, the angle of said chamferred orifice parallels the angle of said conically shaped end of said piston rod spike, said ring lock plate is rotated to align a portion of said orifice in said ring lock plate with said at least one orifice in said first end of said nozzle body to allow said conically shaped end of said piston rod spike to protrude into but not through said chamferred orifice, a portion of the conical surface of the spiked end contacting a portion of the parallel wall of said chamferred orifice in said ring lock plate,

means to retain said ring lock plate in said misaligned position to prevent rotation thereby mechanically preventing translation of said centerbody from movement to a blocking position, and

actuation means to release said retaining means to allow said ring lock plate to rotate aligning said at least one chamferred orifice in said plate with said orifice in said first end of said main nozzle body to allow said centerbody to translate to a blocking position.

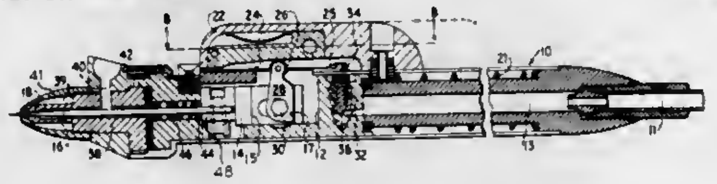
4,102,499
GAS TURBINE POWERPLANTS
John Matthew Hall, Backwell, Nr. Bristol, England, assignor to Rolls Royce (1971) Limited, Great Britain
Continuation of Ser. No. 668,919, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 607,706, Aug. 25, 1975, abandoned. This application Sep. 22, 1977, Ser. No. 835,721
Claims priority, application United Kingdom, Sep. 7, 1974, 39171/74
Int. Cl.² B64C *15/04*
U.S. Cl. 239—265.27 **10 Claims**





1. A gas turbine powerplant having a nozzle capable of varying the direction of discharge of at least a part of a propulsive jet therefrom, the nozzle comprising a wall defining a duct for the propulsive jet, an aperture in the wall, means closing the duct aft of the aperture and a substantially u-shaped flap member pivotally connected about its middle to side edge means of the aperture for pivotal movement relative to the wall, said flap member being pivotable between two extreme positions to define two discharge orifices differently orientated with respect to the duct, one said extreme position corresponding to an orifice arranged to discharge gases in an upstream direction, the other said extreme position corresponding to an orifice arranged to discharge gases in a downstream direction, and there being an intermediate position in which there are defined two discharge orifices capable of discharging equally in upstream and downstream directions.

4,102,500
APPARATUS FOR SPRAYING LIQUIDS
Stanley Herbert Luff, Hull, England, assignor to Humbrol Limited, Hull, England
Filed Dec. 6, 1976, Ser. No. 748,014
Claims priority, application United Kingdom, Dec. 9, 1975, 50341/75
Int. Cl.² B05B *7/12*
U.S. Cl. 239—345 **1 Claim**



1. In the known type of air brush comprising a housing containing a discharge orifice, passageways for supplying air and liquid to said orifice, a needle valve for controlling the flow of liquid to said discharge orifice, and control means to regulate the position of said needle valve with respect to said orifice, the improvement consisting of control means that includes

(a) a slide member adapted to slide along an exterior portion of said housing, a portion of the inner surface of said slide member constituting a cam surface,

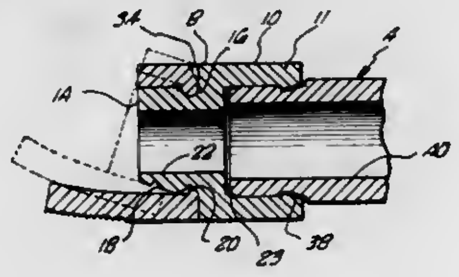
(b) a lever pivotally mounted within said housing, said lever having

(1) a first portion that constitutes a cam follower which is adapted to engage said cam surface of said slide member, and

(2) a second portion that is adapted to bear against an extension on the inner end of said needle valve so as to move said needle valve to a progressively greater open position in a predetermined manner,

(c) means for normally biasing said slide member toward a position wherein the interaction of said cam surface and said cam follower will permit said needle valve to shut off the liquid passageway to said discharge orifice.

4,102,501
DEFLECTOR ASSEMBLY FOR A SPRAY GUN
Jacob De Gelder, Rancho Palos Verdes; William Harvey Hill, Carson, and Ronald F. Englhard, Mission Viejo, all of Calif., assignors to The Leisure Group, Los Angeles, Calif.
Filed Dec. 16, 1976, Ser. No. 751,533
Int. Cl.² B05B *1/26*
U.S. Cl. 239—511 **16 Claims**

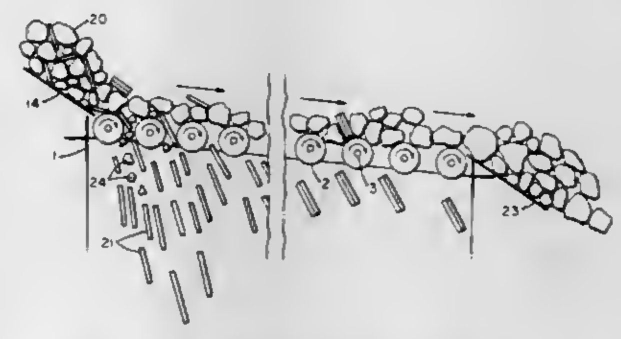


1. A deflector assembly adapted to being mounted on a sprayer nozzle comprising;

a mounting collar, capable of being operatively connected to a spray nozzle, having a first pivotal mounting connector and at least a pair of detents, and

a deflector blade having a complimentary second pivotal mounting connector operatively connected to the first pivotal mounting connector and a locking tine for selective engagement with the detents, whereby the deflector blade is pivotally mounted on the mounting collar for rotation about the respective mounting connectors to provide at least one deflecting position within the flow pattern of the nozzle.

4,102,502
CONCENTRATION OF PLATE-SHAPED MINERALS
Gary Gene Vaplon; Edwin Erickson, both of Libby, Mont., and Joseph L. Young, Santo Domingo, Dominican Republic, assignors to W. R. Grace & Co., Cambridge, Mass.
Filed Dec. 10, 1976, Ser. No. 749,237
Int. Cl.² B02B *23/18*
U.S. Cl. 241—4 **14 Claims**



1. The method of separating minerals which when mined are in the form of plate-shaped particles from other non-plate shaped constituents of the mined mineral ore, said method comprising the steps of;

(a) providing a bed formed by the surfaces of a plurality of spaced rotating rolls arranged generally horizontally along one side another, the axes of said rolls being substantially parallel and the direction of rotation of each roll being the same;

(b) depositing said mined mineral ore onto said bed of rolls;

(c) aligning the flat surfaces of said plate-shaped particles along the surfaces of said rotating rolls thereby causing a substantial portion of said plate-shaped mineral particles in said mined ore to pass through the spaces between said rolls while at the same time conveying a substantial proportion of said non-plate shaped constituents of said ore along the surfaces of said rolls in the direction of rotation of said rolls, and

(d) collecting the said plate-shaped mineral particles passing through said spaces in a zone beneath said bed of rolls, and collecting said non-plate shaped constituents in a zone near the end of said bed.

4,102,503
METHOD OF AND APPARATUS FOR THE LOW-TEMPERATURE MILLING OF MATERIALS
Helmut Meinass, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
Continuation of Ser. No. 676,666, Apr. 14, 1976, abandoned. This application Jul. 6, 1977, Ser. No. 813,411
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516764
Int. Cl.² B02C *23/06*
U.S. Cl. 241—18 **7 Claims**

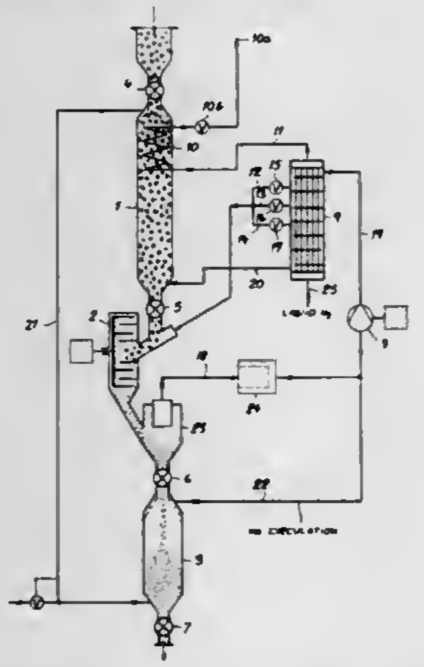
1. A process for comminuting cold-embrittable material comprising the steps of:

(a) chilling said material to a temperature sufficiently low to embrittle it by passing it in direct heat exchange with a cooling gas;

(b) entraining the chilled material through a mill in a carrier gas which can be of the same composition as said cooling gas and in which said chilled material is milled and the milled product is conveyed out of the mill;

(c) separating said milled product from said carrier gas;

(d) continuously circulating said cooling and carrier gas upon the separation of said material therefrom in a gas stream over a closed path without venting or replenishment, said closed path including a compressor and a heat exchanger downstream of said compressor;



(e) cooling said gas stream to a temperature of at most the temperature of step (a) by passing said gas stream at said heat exchanger in indirect heat exchange with a separately displaced coolant fluid;

(f) passing said coolant fluid after it has traversed said heat exchanger in indirect heat exchange with said material to precool the same; and

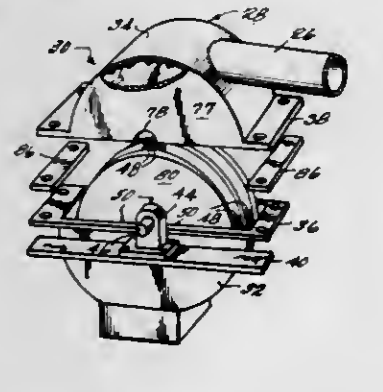
(g) venting said coolant fluid after it has precooled said material.

4,102,504
VIBRATORY HOPPER-FED, FLAIL-TYPE PULVERIZER
George W. Mushrush, 12903 Sturbridge Rd., Woodbridge, Va. 22192, and Thomas Schlemmer, Roswell Rd., Dellroy, Ohio 44620

Filed Sep. 30, 1976, Ser. No. 727,994

Int. Cl.² B02C *13/282*

U.S. Cl. 241—186 R **6 Claims**



1. A flail-type pulverizer, comprising:

(1) a shaft;

(2) bearing means journalling the shaft for rotation;

(3) a plurality of elongated flails pivotally secured to said shaft to project generally radially therefrom;

(4) wall means providing a housing enclosing said flails, and including two opposite end walls and an outer peripheral wall extending between these end walls, the outer peripheral wall bearing a plurality of internal protuberances against which particles being flung by said flails may impact in order to effect particle size reduction;

(5) said housing being provided in at least two angularly adjoining portions, one of which is removable from the other and this removable portion including an angularly substantial part of said outer peripheral wall including many of said protuberances;

(6) means for removably securing said two housing portions together with said protuberances radially adjacent said flails;

(7) at least one layer of bushing material removably received between said two housing portions, for spacing the two housing portions slightly apart, thereby effectively increasing the distance between the radially outer extents of the flails and said protuberances on the outer peripheral wall of the removable portion of the housing, compared to the distance therebetween should said layer be omitted or thinned;

(8) means defining an outlet from said housing; and

(9) means defining an inlet to said housing, spaced angularly about the housing from said outlet of the housing.

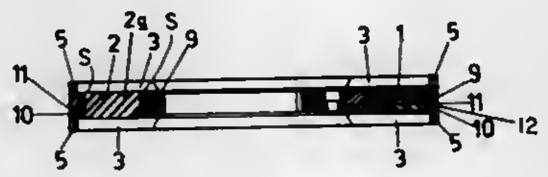
4,102,505
PULP REFINING DISK
Franco Del Sarto, Sao Paulo, Brazil, assignor to Inox Industria E. Comercio de Aco S/A, Sao Paulo, Brazil

Filed Mar. 16, 1977, Ser. No. 778,050

Claims priority, application Brazil, Dec. 8, 1976, 08232; Dec. 8, 1976, 08233

Int. Cl.² B02C *7/12*

U.S. Cl. 241—297 **7 Claims**



1. An improved pulp refining disk comprising a circular rigid plate, means defining axial passages in the plate, an array of spaced-apart winglets projecting up from one face of the plate so as to define an array of grooves between the winglets, each said winglet having opposite ends and a bottom edge, each said winglet extending over a said passage, means for anchoring the edge of each winglet to the plate at a location in a said passage, a settable lightweight plug filling each said passage and means integral with the plate for securing the disk to a refiner.

4,102,506
DEVICE FOR CONTROLLING THE CONTACT PRESSURE OF A TEXTILE COIL ON A SUPPORT OR DRIVING CYLINDER
Hans Raasch, and Hans Grecksch, both of Mönchen-Gladbach, Germany, assignors to W. Schlafhorst & Co., Monchengladbach, Germany

Filed Apr. 26, 1976, Ser. No. 680,299

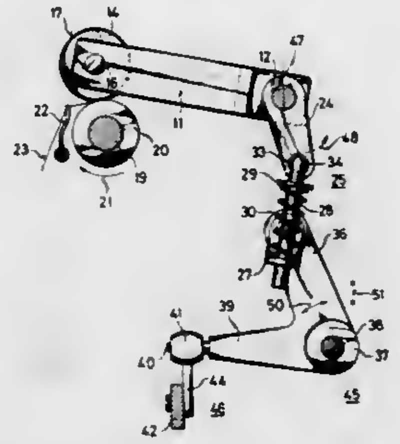
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1975, 2518646

Int. Cl.² B65H *54/42*

U.S. Cl. 242—18 DD **8 Claims**

1. Device for controlling the contact pressure of a textile coil on a support or drive cylinder, comprising articulatingly suspended coil holder means for rotatably supporting the coil over the cylinder, a toggle-joint assembly being movable in a given plane into positions thereof wherein it is partly and fully extended, said toggle-joint assembly including a lever articulatingly connected to said coil holder means and a foot member operatively connected to said lever, said foot member having

an end; and means for adjusting in said given plane the direction in which said toggle-joint assembly extends in said fully extended position thereof, said adjusting means being located at said foot end of said toggle-joint assembly.



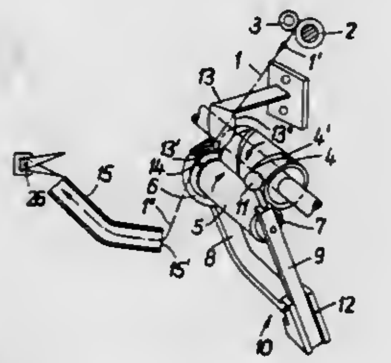
4,102,507
FORMATION OF RESERVE WINDING FOR FURTHER CONNECTION ON BOBBINS OF TEXTILE MACHINES
Herbert Hoffmann, Bremen, and Friedrich Wachendorf, Eggestedt, both of Germany, assignors to Fried. Krupp Gesellscbaft mit beschrankter Haftung, Essen, Germany

Filed Sep. 15, 1976, Ser. No. 723,493

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541761

Int. Cl.² B65H *54/02*

U.S. Cl. 242—18 PW **12 Claims**



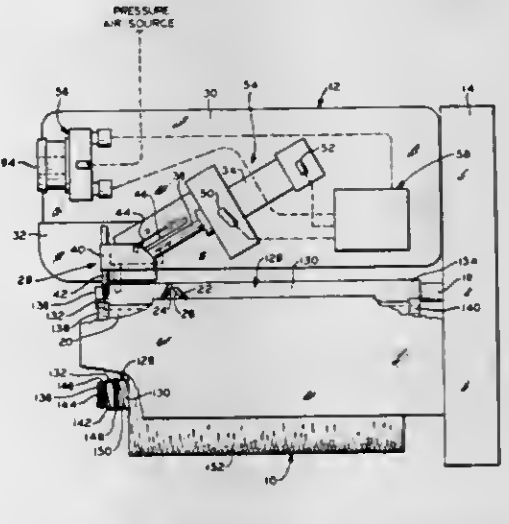
1. In a method for forming a tie on reserve winding on a bobbin which defines a yarn winding region and which is supported in a bobbin holder in a textile machine having a yarn supply device for supplying yarn to the bobbin during a winding operation in which, after severing of the yarn between a full bobbin and the yarn supply device, the yarn which continues to be supplied by the yarn supply device is drawn off by means of a suction device and, after replacement of the full bobbin by an empty bobbin in the bobbin holder, the yarn is brought into engagement with a hook-shaped catch element which is located between the yarn supply and suction device and which rotates together with the bobbin, said method comprising: moving the inlet end of the suction device, together with the yarn portion entering the suction device, in a direction parallel to the axis of the bobbin for causing the yarn, after it leaves the yarn supply device, to be directed by the suction action of the suction device in a direction such that it intersects the plane of rotation of the catch element at the diameter at which the catch element is located; immediately after the catch element has caught the yarn transferring the winding yarn coming from the yarn supply device into the winding region and causing the yarn to be wound there; and, simultaneously with said transferring of the winding yarn extracting the yarn located downstream of the catch element from the suction device and deflecting that yarn in a direction toward the bobbin so as to form a reserve winding on the bobbin adjacent, and axially spaced from, the winding region.

4,102,508
YARN SUPPLY PACKAGE AND METHOD AND APPARATUS FOR THE WINDING THEREOF
Albert F. Stegelman, Borger, Tex., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Jun. 27, 1977, Ser. No. 810,337

Int. Cl.² B65H *54/02, 54/34, 55/00, 55/04*

U.S. Cl. 242—18 PW **10 Claims**



1. An improved yarn supply package comprising:
- rotatable yarn package holder means having first and second end portions for receiving yarn wound thereon;
- a first waste bunch of yarn wound on said yarn package holder means adjacent the first end portion thereof;
- a second waste bunch of said yarn connected to said first waste bunch and wound on said yarn package holder means intermediate said first waste bunch and the second end portion of said yarn package holder means, said second waste bunch being spaced a distance from said first waste bunch; and
- a main yarn package of said yarn connected to said second waste bunch via a transfer tail of said yarn and wound on said yarn package holder means intermediate said second waste bunch and the second end portion of said yarn package holder means, said main yarn package being spaced a distance from said second waste bunch.

4. A method of producing a package of yarn on a yarn package holder assembly comprising a bobbin having first and second end portions and a removable start-up insert mounted on the first end portion thereof, said method comprising the steps of:
- rotating a yarn package holder assembly;
- engaging a running yarn on the start-up insert of the rotating yarn package holder assembly;
- winding said running yarn on the rotating start-up insert to form a first yarn waste bunch thereon;
- moving said running yarn from the first yarn waste bunch to the first end portion of the bobbin;
- winding said running yarn on the first end portion of the rotating bobbin to form a second yarn waste bunch thereon;
- moving said running yarn from the second waste bunch along the rotating bobbin to form a transfer tail on the bobbin; and
- winding and traversing said running yarn on the rotating bobbin intermediate said transfer tail and the second end portion of the bobbin to form a main yarn package thereon.

6. In a continuous delivery yarn winding device of the type which includes chuck means for rotatably supporting at least one yarn package holder, drive roll means for rotating a yarn package holder supported by said chuck means, and yarn

traversing means for traversing a running yarn during the winding thereof upon a yarn package holder to form a main yarn package, the improvement comprising:

yarn tailing means for engaging a running yarn and positioning said yarn relative to a rotating yarn package holder;

yarn engaging means on a first end portion of said yarn package holder for engaging said running yarn whereby said yarn is initially wound about said yarn engaging means adjacent the first end portion of said rotating package holder;

control means operatively connected to said yarn tailing means for positioning said yarn tailing means in first position relative to the rotating yarn package holder in response to a first signal applied thereto whereby said running yarn is aligned with said yarn engaging means to form a first waste bunch of yarn thereon, for automatically moving said yarn tailing means to a second position from said first position relative to the rotating yarn package holder and automatically stopping said yarn tailing means at said second position for a predetermined time period in response to a second signal applied thereto whereby said running yarn is positioned to form a second waste bunch of yarn wound on the rotating yarn package holder a distance from said first waste bunch, and for automatically moving said tailing means from said second position to a third position upon the expiration of said predetermined time period whereby said running yarn forms a transfer tail on said rotating yarn package holder during said movement to the third position and whereby the running yarn is so positioned as to be engaged by said traversing means for traversing said running yarn along said rotating yarn package holder to form a main yarn package and said tailing means is disengaged from said running yarn.

4,102,509
FILAMENT FEEDING APPARATUS AND METHOD

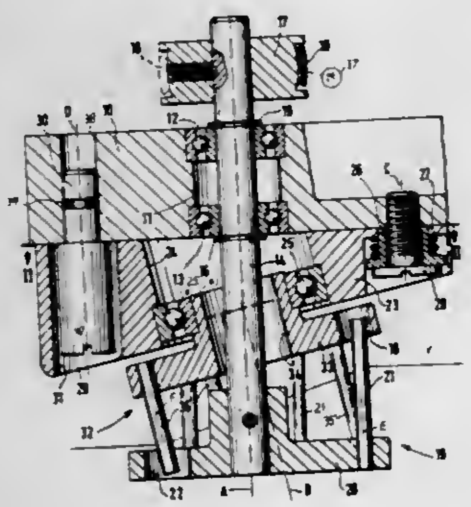
Horst Paepke, Fasanenweg 30, 7407 Rottenburg, Neckar, Fed. Rep. of Germany

Filed Mar. 8, 1977, Ser. No. 775,586

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610709

Int. Cl.² B65H *51/24, 51/26*

U.S. Cl. 242—47.04 **12 Claims**



3. An apparatus for advancing a filament, said apparatus comprising:

a main bearing defining a fixed main rotation axis;

a main support rotatable in said main bearing about said main axis;

an annular main array of main rods centered on and generally parallel to said main axis;

a skew bearing defining a skew axis adjacent and inclined at an acute angle to said main axis;

a skew support rotatable in said skew bearing about said skew axis;

an annular skew array of skew rods centered on and generally parallel to said skew axis and interleaved with said main rods, said main rods being operatively rotationally engaged with said skew array;

means connected to said skew bearing for displacing said skew axis pivotally about a support axis substantially parallel to said main axis without changing said acute angle; and

drive means for rotating said main support and said main rods about said main axis for displacement of said main rods in a generally cylindrical main orbit centered on said main axis and for rotating said skew support and said skew rods via said main rods for displacement of said skew rods in a generally cylindrical skew orbit centered on said skew axis and inclined to said main orbit, whereby a filament fed tangentially to and withdrawn tangentially from said orbits will be urged axially therealong.

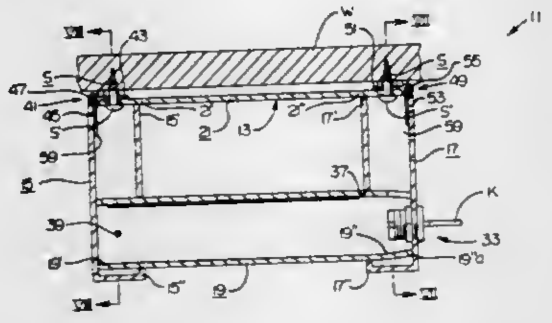
4,102,510
ROLL HOLDER MEANS

James Ralph Anderson, 4030 Cliffdale, Memphis, Tenn. 38127

Filed Aug. 1, 1977, Ser. No. 820,752

Int. Cl.² B65H *19/00*

U.S. Cl. 242—55.2 **9 Claims**



1. Holder means for holding a roll and for being fixedly attached to a supporting surface by at least one fastening member in such a manner that unauthorized removal of said holder means from the supporting surface is prevented, said holder means comprising:

(a) base means having at least one aperture therethrough for allowing a portion of the fastening member to extend therethrough to fixedly attach said base means to the supporting surface;
(b) a first arm member;
(c) a second arm member;
(d) a bar member for extending through the roll; and
(e) attachment means for fixedly attaching said bar member and said first and second arm members together and for fixedly attaching said first and second arm members to said base means with one of said arm members completely covering said aperture through said base means through which a portion of the fastening member extends to prevent access to the fastening member when said bar member and said first and second arm members are fixed in place thereby preventing unauthorized removal of said holder means from the supporting surface.

4,102,511
TURRET FOR WINDERS AND UNWINDERS

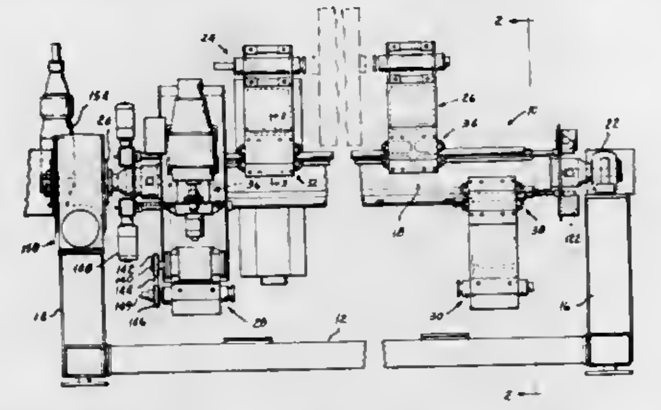
Leonard C. Krimsky, Spring Valley, and Henk Van Rietschoten, Monroe, both nf N.Y., assignors to Worldwide Converting Machinery, Inc., Allendale, N.J.

Filed Dec. 11, 1975, Ser. No. 639,970

Int. Cl.² B65H *19/06*

U.S. Cl. 242—64 **8 Claims**

2. In a winding or unwinding turret apparatus including a roll stand, a main shaft, means mounting said main shaft on said stand for rotary movement around an axis, a roll supporting arm, a pair of cylindrical rods, means mounting said rods on one of said shaft and said arm at circumferentially spaced locations around said shaft and with the longitudinal axes thereof generally parallel to said shaft axis, and respective rolling bearing means between said rods and the other of said shaft and said arm for mounting said arm on said shaft for rotary movement therewith and for movement in the direction of said shaft axis.



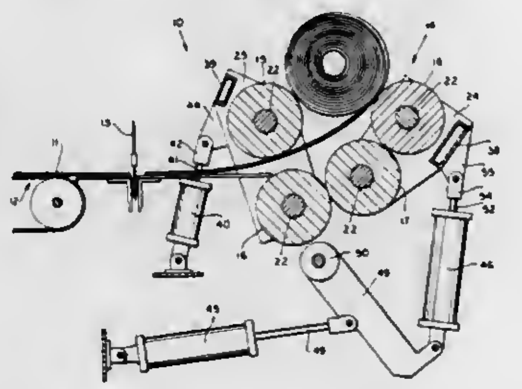
4,102,512
SYSTEM FOR FORMING SHEET MATERIAL INTO SPIRAL ROLLS

Michael Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

Filed May 11, 1977, Ser. No. 795,772

Int. Cl.² B65H *17/12*

U.S. Cl. 242—66 **8 Claims**



8. A method of forming sheet material and the like into a spiral roll comprising moving the sheet material along its length between a lower roller and an upper roller into a space defined by a group of at least one lower and at least two upper rollers arranged parallel to one another and in a cluster, rotating the rollers of the cluster of rollers in the same direction of rotation to form the sheet material into a spiral roll, pivoting at least one upper roller of the cluster of rollers away from the space to open the cluster of rollers at the top in response to an increase in the size of the spiral roll of sheet material, and supporting the spiral roll of sheet material first on the lower roller in the cluster of rollers and subsequently on the upper rollers in the cluster as the size of the spiral roll of sheet material increases.

4,102,513
FILM WRAPPING DISPENSER

Twyman Guard, 795 S. Alton Way, Denver, Colo. 80231

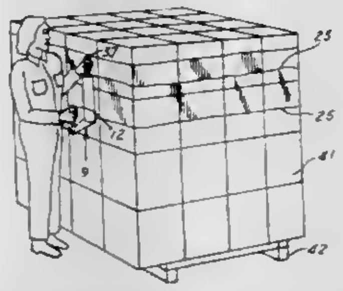
Filed Sep. 14, 1977, Ser. No. 833,138

Int. Cl.² B65H *23/06;* **B44C** *7/00*

U.S. Cl. 242—75.4 **21 Claims**

1. A film dispenser comprising:

reel means including a pair of opposed, rotary end supports mounted on a support shaft for supporting a roll of film for rotation relative to said shaft, one of said rotary end supports being movable along said shaft toward and away from the other of said rotary end supports to clamp the roll of film between said rotary end supports for conjoint rotation of said rotary end supports and said roll relative to said shaft, said reel means having a hand grip means attached to said support shaft by which said reel means is hand-held for pulling on the film while an end portion of the film is held on an object during the wrapping of the film about the object to unwind the film under tensioo, said hand grip means including a first hand grip operatively associated with said one rotary end support to move said one rotary end support along said support shaft to clamp the roll between said pair of rotary end supports and to urge the other of said rotary end supports against a friction surface opposite said one rotary end support to set the tension and to change tension on the film during said wrapping by the movement of said first hand grip.



4,102,514
MINIATURE TAPE CASSETTES

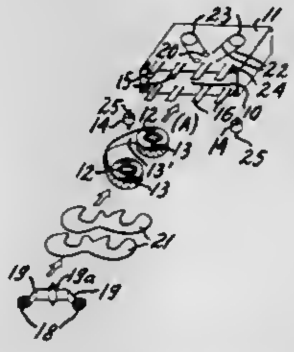
Kazuo Ito, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jul. 12, 1977, Ser. No. 815,018

Claims priority, application Japan, Jul. 12, 1976, 51/82731

Int. Cl.² G11B *23/10*

U.S. Cl. 242—199 **8 Claims**



1. A minature tape cassette comprising an integral one-piece drawn sheet metal casing having an upper wall, lower wall and side walls, one side of said casing being open, said upper wall and lower wall having aligned holes for rotatable receiving hubs of tape spools, and tape spools with tape thereon disposed between said upper wall and lower wall with the hubs thereof rotatably received in said holes, one of said upper wall and lower wall having integral spring strips extending from said holes toward said open side of said casing for insertion of said spools into said casing from the open side thereof for reception of said hubs in said holes.

4,102,515
TAPE CASSETTE

Lodewijk Luciaan Milants, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuatinn of Ser. No. 539,462, Jan. 8, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,683

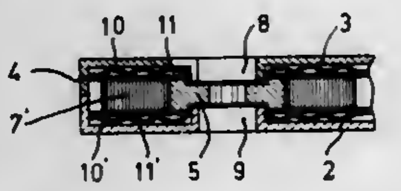
Claims priority, application Netherlands, Feb. 1, 1974, 7401403

Int. Cl.² G03B *1/04;* **G11B** *15/32, 23/04*

U.S. Cl. 242—199 **2 Claims**

1. A cassette for magnetic recording tape, comprising a

casing having a bottom wall, a cover wall, and side walls; two winding hubs for winding and unwinding the tape respectively, fitted within the casing, and adapted for receiving a tape winding about said hubs between the bottom and cover walls; first and second corrugated films located between the tape winding and said bottom and cover walls respectively; and first



and second flat films disposed between said corrugated films and said tape winding respectively, wherein said corrugated films are resilient films having parallel corrugations and having a material composition, thickness, corrugation height and number of corrugations per centimeter selected to produce a spring constant having value between approximately 100 and 400 grams/mm.

4,102,516

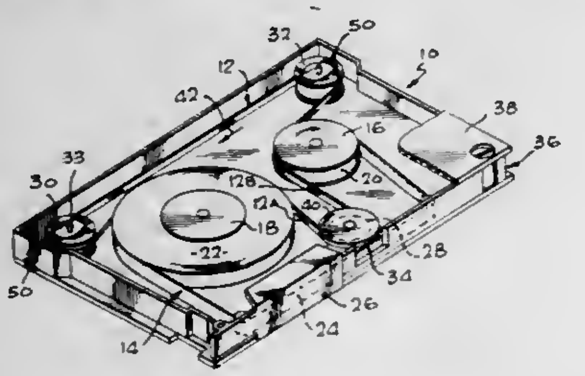
TENSIONING MEANS FOR BELT DRIVEN TAPE CASSETTE

Noah L. Anglin, and Robert H. Berry, both of San Jose, Calif., assignors to Information Terminals Corporation, Sunnyvale, Calif.

Filed Apr. 14, 1977, Ser. No. 787,389

Int. Cl.^{2} G03B *1/04;* G11B *15/32, 23/04*

U.S. Cl. 242—199 **5 Claims**



1. Apparatus for maintaining tape tension in a belt driven cartridge of the type which includes a cartridge housing, a pair of reels for holding rolls of magnetic tape, said reels rotatably mounted on the housing, and an endless belt extending partially about the rolls of tape on the two reels, about a drive roller, and about a pair of corner belt rollers, each corner belt roller being rotatably supported on a corner roller shaft, comprising:

a bowed washer having a middle portion with a hole receiving a corner roller shaft, a pair of washer end portions bearing against a portion of said housing, and a middle washer portion bearing against said corner belt roller, whereby to apply a small but definite drag to the corner belt roller.

4,102,517

TAPE DRIVING APPARATUS FOR TAPE PLAY-BACK AND/OR RECORDING DEVICES

Rodolfo Cicatelli, Gandria, Switzerland, assignor to Antovox S.p.A., Rome, Italy

Filed Sep. 3, 1976, Ser. No. 720,399

Claims priority, application Italy, Sep. 10, 1975, 51283A/75

Int. Cl.^{2} G11B *15/30, 15/29*

U.S. Cl. 242—201 **8 Claims**

1. A tape drive system for a tape playback and/or recording device, comprising:

a tape capstan;

a first driven flywheel coupled to said tape capstan, the rotary motion of said first flywheel being solely coupled to and controlling said tape capstan;

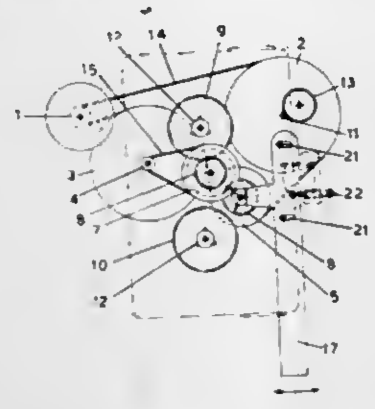
a toothed wheel and a tape collecting reel shaft attached to said toothed wheel;

a wheel on which a tape supplying reel shaft is attached;

a toothed drive wheel coupled in continuous meshing engagement with said toothed collecting reel shaft wheel;

a second driven flywheel;

means for selectively coupling said second flywheel to said toothed drive wheel, the rotary motion of said second flywheel means being selectively coupled to and controlling the rotation of said toothed drive wheel during a play mode of said tape drive system;



an idler wheel;

means coupled to said first and second flywheels and said idler wheel for rotationally driving them; and

means for selectively shifting said idler wheel from a normal play position into a fast forward position in which said idler wheel is in meshing engagement with said toothed wheel that drives said collecting reel shaft wheel, and for shifting said idler wheel from said normal play position into a fast rewind position in which said idler wheel is directly in meshing engagement with the wheel to which said supplying reel shaft is attached to, wherein said shifting means implements fast forward and fast rewind modes of operation.

4,102,518

AIRCRAFT ARRESTING GEAR

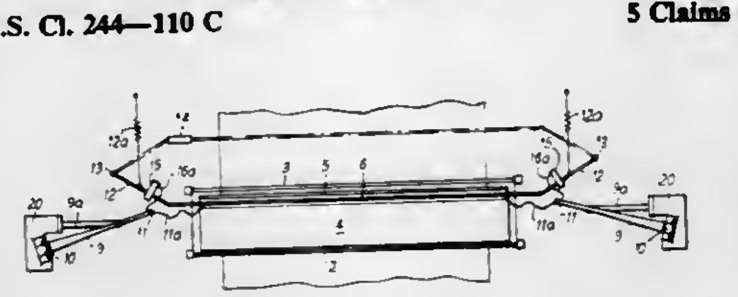
Jean-Paul Bernard, Paris, and Paul Albert Méningand, Clamart, both of France, assignors to Aerazur Constructions Aeronautiques, Issy-les-Moulineaux, France

Continuation-in-part of Ser. No. 711,662, Aug. 4, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 835,930

Claims priority, application France, Aug. 6, 1975, 75 24507

Int. Cl.^{2} B64F *1/02*

U.S. Cl. 244—110 C **5 Claims**



1. For use in association with an aircraft arrester gear, on an airstrip, of the kind including a pair of raisable posts mounted one at each side of the airstrip and an arrester net disposed across the airstrip and connected by a cable to the free end of the raisable posts, the invention which comprises:

i. a bag for positioning on the airstrip to enclose the arrester net in the lowered condition of the net

ii. support means for mounting at each side of the airstrip and having a first position of movement and a second position of movement along the direction of the airstrip

iii. a retainer for positioning across the airstrip and secured to the support means, said retainer in the first position engaging the bag to hold the bag closed, said retainer in the second position being remote from the bag to allow the bag to open

iv. resilient loading means urging the support means to move from first position to the second position,

v. locking means releasably holding the support means in first position

vi. coupling means for connecting the locking means to the raisable posts such that during raising of the posts the locking means is actuated to release the support means for movement from first position to second position.

4,102,519

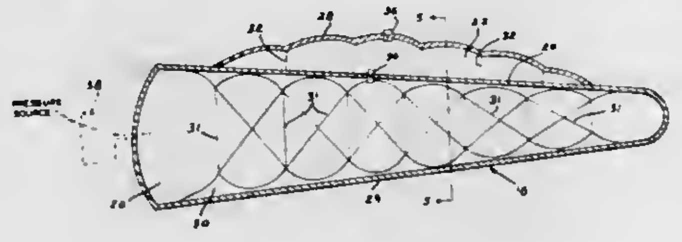
VARIABLE LIFT INFLATABLE AIRFOIL FOR TETHERED BALLOONS

Edward L. Crosby, Jr., Indialantic, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,822

Int. Cl.^{2} B64B *1/42*

U.S. Cl. 244—125 **7 Claims**



1. In a tethered balloon having a body and an inflatable airfoil structure mounted on said body, the improvement residing in said inflatable airfoil structure, said airfoil structure comprising at least one inflatable horizontal fin, said fin being made up of a primary and a secondary chamber, said primary chamber being defined by a pair of non-rigid, gas retaining membranes and a plurality of supporting elements mounted therein, each of said supporting elements being secured between the inner surfaces of said pair of membranes in the spanwise direction, said secondary chamber being mounted on said primary chamber, said secondary chamber being defined by the outer surface of one of said membranes of said primary chamber, another non-rigid, gas retaining membrane and a plurality of supporting elements mounted therein, each of said supporting elements of said secondary chamber being secured between the outer surface of one of said membranes of said primary chamber and the inner surface of said membrane of said secondary chamber, a pair of valves, one of said valves being located within one of said membranes of said primary chamber and the other of said valves being located within said membrane of said secondary chamber, said pair of valves regulating the flow of gas within said secondary chamber and means operatively connected to said primary chamber for providing said primary chamber with a regulated flow of gas.

4,102,520

DUAL-PURPOSE EJECTOR FOR AIRCRAFT LOAD JETTISONING MECHANISM

Jean H. Hasquenoph, Lagny sur Marne, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Filed Nov. 8, 1976, Ser. No. 740,141

Claims priority, application France, Mar. 22, 1976, 76 08186

Int. Cl.^{2} B64D *1/02*

U.S. Cl. 244—137 R **4 Claims**

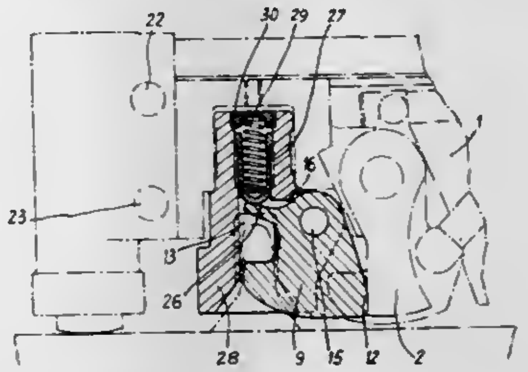
1. An ejector, for suspending loads under aircraft, comprising a carrier device having at each load suspension point:

i. a first hook pivotally mounted in said carrier device and shaped to co-act with a saddle suspension member of the load,

ii. a fastening means disposed in the vicinity of said first hook,

iii. a detachable device removably mounted in said fastening means, said detachable device comprising

a. a housing for receiving an upper part of a load ring,



b. a second hook mounted on and pivotable about a horizontal pin and adapted in a closed position to lock said load ring in said housing, and

c. spring means urging said second hook against said first hook such that opening and closing movements of said first hook automatically cause opening and closing movements of the second hook.

4,102,521

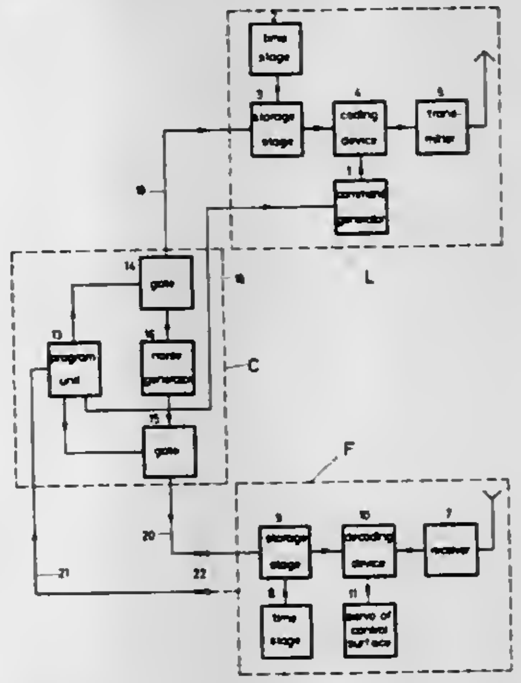
SYSTEM FOR SIGNAL CODING

Joachim Hermano, Munich, Germany, assignor to Boelkow Entwicklungen KG, Munich, Germany

Filed Oct. 12, 1962, Ser. No. 230,804

Int. Cl.^{2} F41G *7/14, 9/00, 7/00*

U.S. Cl. 244—3.11 **4 Claims**

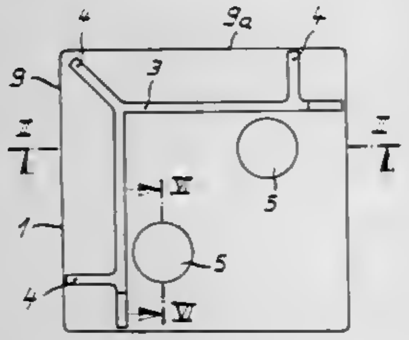


1. In a system for the coding of guidance signals which are produced at a control center and after their coding transmitted to a body to be guided, a control center consisting of a command generator for producing the guidance signals, a coding unit for coding the guidance signals, a storage stage feeding the coding unit, said storage stage being controlled by a time stage, and a transmitter for transmitting the coded guidance signals to the body to be guided for actuating control surfaces therein, furthermore a receiver for the transmitted guidance signals, which receiver is arranged in the body to be guided, a decoding unit coupled to the receiver, a servo mechanism of the control surfaces of the body coupled to the decoding unit, a storage stage coupled to feed the decoding unit, a time stage

coupled to control the storage stage, and a code generator consisting of a noise generator and two gate circuits connected therewith, one of said gate circuits being connected to the storage stage of the control center and the other gate circuit being connected to the storage stage in the body to be guided, which last connection is provided with a releasable plug which disconnects said other gate circuit when the body to be guided is launched.

4,102,522
SUPPORTING ELEMENT FOR SUPPORTING MOUNTS IN A SOUND AND SHOCK INSULATING MANNER

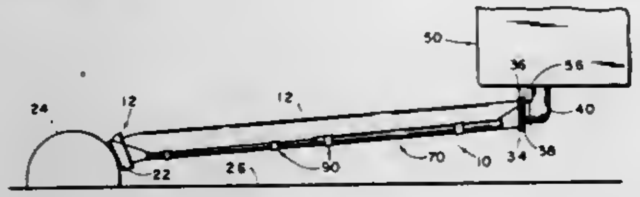
Erich Munz, Weststrasse 11, 5204 Lohmar 1 - Geber, Fed. Rep. of Germany
Filed Feb. 28, 1977, Ser. No. 772,464
Int. Cl.² F16F *15/04*
U.S. Cl. 248—24 **2 Claims**



1. A separate unitary supporting element for supporting relatively heavy objects and machines in a sound and shock insulating manner, which includes in combination: a load distributing supporting plate having a top side and a bottom side, an angle-shaped abutment means fixedly connected to the top side of said supporting plate, comprising a pair of upwardly extending flanges arranged at an angle to each other and spaced inwardly from the periphery of said plate and reinforcing ribs integral with the outer sides of said flanges between said flanges and said periphery, and an oil resistant elastic body of elastomeric material fixedly connected to the bottom side of said supporting plate therebelow and having extension means extending through and above the top side of said supporting plate, said elastic body having serially arranged spaced nubs surrounded by a peripheral rim projecting from said bottom side of said elastic body.

4,102,523
VEHICLE SEWAGE HOSE SUPPORT SYSTEM

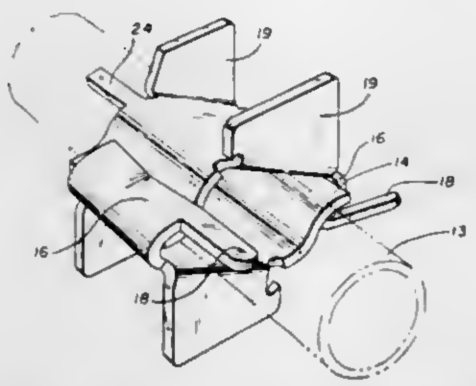
Everett Finnell, 5817 N. 29th St., Omaha, Nebr. 68111
Filed Dec. 8, 1976, Ser. No. 748,671
Int. Cl.² F16L *3/00*
U.S. Cl. 248—49 **5 Claims**



1. A sewage hose support system for recreational vehicles comprising an elongated support assembly module having right and left elongated hose-engaging portions having upwardly facing surfaces for engaging the right and left undersides of a sewage hose extending from a sewage outlet fitting on such a vehicle to a sewage disposeal pipe, said module having two lengthwise sections telescopically attached to each other so that said lengthwise sections can be chiefly disposed under different lengthwise sections of said hose, each lengthwise section of said system having portions defining parts of said right and left hose-engaging portions, and means engaging said module for supporting said module whereby said module can support said hose, said right and left hose-engaging portions being respectively formed by at least two right aligned telescoping members which latter are telescopically interconnected and by at least two left aligned telescoping members which latter are also telescopically connected and laterally spaced with respect to the length of said module from said two right telescoping members, and transverse flexible connecting means connecting said left telescoping members with said right telescoping members so as to prevent said right and left hose-engaging portions from spreading apart, said transverse connecting means comprising a plurality of flexible straps interconnecting said right and left hose-engaging portions, the flexibility of said straps making it possible for said right and left hose engaging portions to be moved laterally towards each other for storage and away from each other for use.

4,102,524
PIPE ANCHOR BRACKET

Zoltan Cseri, Northbrook, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Continuation of Ser. No. 672,086, Mar. 31, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,838
Int. Cl.² F16L *5/00*
U.S. Cl. 248—56 **10 Claims**



1. A pipe anchor bracket comprising two substantially identical members which, when engaged, form a means for attaching pipes to other structures, each said bracket member having a body section with a portion thereof curved to accommodate the outside surface of the pipe to be supported, said body portion terminating at one end in a flange having an outside locking surface being sloped downward from the sides of the member to the center of the member and said body portion terminating at the other end in a curved flange re-curving back towards the body section having an inside locking surface being sloped downward from the sides of the member to the center of the member adapted to engage in a locking manner the outside locking surface of the other substantially identical member, said curved flange having a tab thereon adapted to secure the member to the other substantially identical member with a pipe therebetween, and said body section having two flanged projections each one extending generally at right angles from opposite sides thereof thereby providing welding surfaces for securing the member to a supporting structure.

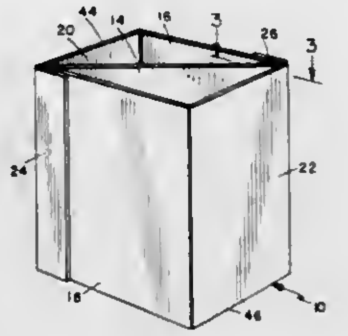
4,102,525
KNOCKDOWN SUPPORT AND SPACER FOR BOOKSHELVES

Robert Norman Albano, 5357 La Jolla Blvd., La Jolla, Calif. 92037
Filed Feb. 14, 1977, Ser. No. 768,217
Int. Cl.² A45D *19/04*
U.S. Cl. 248—174 **7 Claims**

1. A knockdown support column comprising:

a plurality of substantially rigid rectangular panels having top, bottom, and side edges,

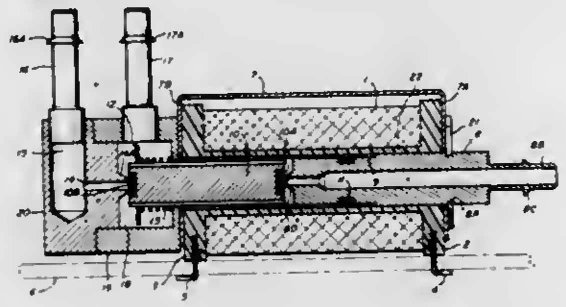
hinge means connecting said panels along said side edges into a string having first and second end panels having a free edge and a plurality of intermediate panels, and



connecting means on said free edge for connecting said free edge to an intermediate one of said panels when said panels are hinged to a position for defining a four sided three dimensional column having a plurality of sides each defined by a separate one of said panels including said end panels, said end panels defining opposite sides of said column.

4,102,526
SOLENOID VALVE

Donald E. Hargraves, 54 Harbor St., Pepperell, Mass. 01463
Filed Feb. 23, 1977, Ser. No. 771,185
Int. Cl.² F16K *31/06, 11/04*
U.S. Cl. 251—139 **2 Claims**



1. In an electrically controlled valve of the type having

(1) a coil for establishing a magnetic field, the coil surrounding a core having through it a central longitudinal passage,

(2) a hollow elongate receiver extending into the central passage of the core,

(3) a pipe of magnetic material, the pipe extending into the central passage, the pipe being fixed to the receiver and having a port arranged to be closed by the seating of a member against the port,

(4) a plunger disposed to slide in the receiver, the plunger being magnetically attracted toward the pipe upon the establishment of a magnetic field by the coil and being adapted to seat against the aforesaid port of the pipe to close that port,

(5) a housing to which the receiver is attached, the housing having a first port therein, and

(6) means providing communication between the first port of the housing and the aforesaid port of the pipe when that port is open,

the improvement wherein

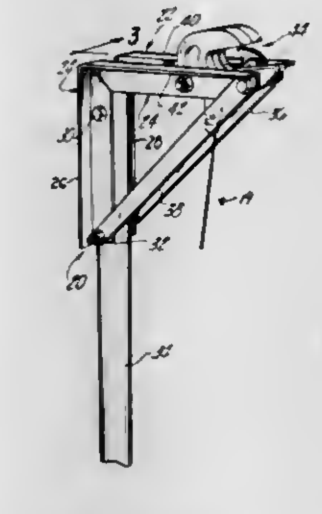
the core has a pair of spaced flanges between which the coil is situated, each flange having a flat face adapted to seat against a supporting surface such as a printed circuit board, and

the improvement further comprising

electrical terminals extending from the flanges, the coil being electrically connected to those terminals whereby the coil can be electrically energized.

4,102,527
GRIPPING PRY TOOLS FOR DISLODGING CONCRETE FORMS AND THE LIKE

Dewey D. Alexander, 18898 Lumpkin, Detroit, Mich. 48234
Filed Jun. 9, 1977, Ser. No. 804,907
Int. Cl.² B66F *15/00*
U.S. Cl. 254—131 **6 Claims**



1. A gripper pry tool comprising:

a tool frame;

a tool handle affixed to said tool frame and extending therefrom;

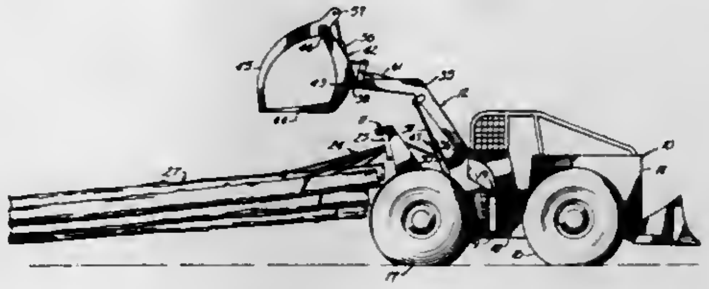
said tool frame including portions thereof extending transversely to said tool handle a lesser distance than the length of said tool handle;

a gripper mechanism mounted to said tool frame portions, said gripper mechanism including means to receive and grip a sheet member lying in a plane generally extending transversely to said tool handle, said means including gripper jaws having an opening therebetween extending transversely to said tool handle to thereby be adapted to receive a portion of a sheet member to be pried extending transversely to said tool handle, said means further including clamping means engaging said portion of said sheet member upon insertion of said portion into said opening and resisting withdrawal thereof to securely grip the inserted portion upon prying of said sheet member by movement of said tool handle;

whereby said sheet member may be pried by the leverage afforded by said tool handle and said gripper mechanism jaws while being securely engaged by said gripper mechanism clamping means to prevent transverse movement of said sheet member away from said tool.

4,102,528
COMBINED LOG SKIDDER AND LOADER

Gerald Edwin Cripe, Rte. 1, Troy, Mont. 59935
Filed Feb. 14, 1977, Ser. No. 768,156
Int. Cl.² B66C *1/42*
U.S. Cl. 254—139.1 **3 Claims**



1. In combination with wheel tractor of the type including an articulated tractor framework having forward and rearward pair of ground engaging wheels respectively supporting forward and rearward sections of the framework, the forward and

rearward sections being pivoted with respect to one another about an upright axis;

said framework having an upright log skidding arch mounted to the rearward section thereof for playing out and taking up a winchline from a powered winch on the rearward section of the framework;

the improvement comprising:

a loader framework mounted to the rearward section of the tractor framework between the rearward pair of wheels and astride the log skidding arch;

a pair of elongated boom members pivotally mounted to the loader framework at opposite sides of the skidding arch about a common horizontal boom axis positioned forward of the rearward pair of wheels, said boom members extending outward from said boom axis in parallel upward and rearward directions to free boom ends that clear the skidding arch;

a pair of log grapples mounted to the free boom ends about axes parallel to the boom axis, said log grapples being operative to open and close about one or more logs for loading purposes; and

cylinder means connecting the loader framework and the boom members, for lifting and lowering the boom members and grapples by pivotal movement thereof about the boom axis;

said cylinder means comprising:

individual hydraulic cylinder assemblies at each side of the skidding arch, each cylinder assembly including a cylinder body and an extensible piston member;

the respective cylinder assemblies being located beneath and to the rear of the boom members;

the respective cylinder bodies each being pivotally mounted to the loader framework about a common pivot axis that is both parallel to and spaced from said boom axis;

the outer ends of the respective piston members being pivotally mounted to the boom members about a common axis that is both parallel to and spaced along the boom members outward from the boom axis;

whereby the log grapples mounted to the boom members are capable of being raised in a forward direction about the boom axis in response to pivotal movement of the boom members due to extension of the piston members with respect to the cylinder bodies of the individual hydraulic cylinder assemblies.

4,102,529

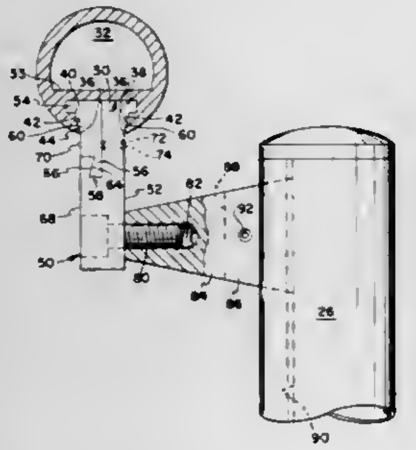
RAILING SYSTEM

Werner H. Neblung, 205 Cupsaw Lake Dr., Ringwood, N.J. 07456, and Gerhard O. Petrich, 41 Algonquin Way, West Milford, N.J. 07480

Filed May 6, 1977, Ser. No. 794,452

Int. Cl.² E04H *17/14;* A47H *1/14*

U.S. Cl. 256—70 **19 Claims**



1. In a mounting arrangement for a railing system:

a railing system member having a longitudinal slot therein, the slot including a longitudinal opening having a lateral width extending between opposite edges, a bottom face spaced inwardly of the opening and a transverse cross-sectional configuration which is at least partly wedge-shaped and is wider than the lateral width of the opening at locations spaced inwardly from the opening and tapers in the inward direction gradually laterally outwardly to said locations to establish at least one laterally outwardly tapered side wall in the slot;

a mounting bracket having first and second portions adapted to be placed side-by-side within the slot at any selected longitudinal location therein, at least one portion having a top face and a tapered side surface complementary to the corresponding tapered side wall of the slot;

actuating means adapted to be advanced relative to one portion of the mounting bracket to abut the other portion so as to urge one portion laterally away from the other portion; and

means for essentially precluding movement of the first and second portions relative to one another in the direction parallel to the inward direction so that the lateral movement of one portion away from the other portion will engage the complementary tapered mounting bracket side surface and slot side wall and urge the bottom face of the slot toward the top face of each portion of the mounting bracket to secure the railing system member and the mounting bracket in wedged engagement with one another.

4,102,530

ROTATING FURNACES

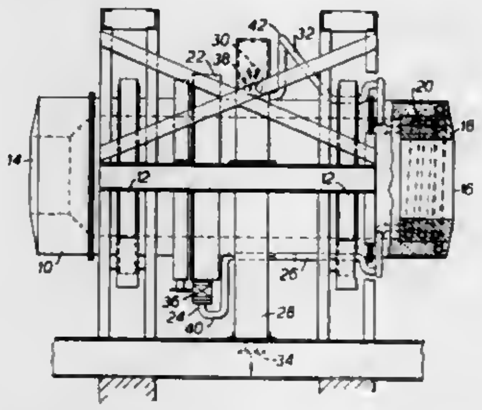
David A. Hawkes, Guisborough; Alan L. Robson, Middlesbrough, and Andray Uemlianin, Redcar, all of England, assignors to British Steel Corporation, London, England

Filed Jul. 11, 1977, Ser. No. 814,473

Claims priority, application United Kingdom, Jul. 16, 1976, 29778/76

Int. Cl.² C21B *7/10*

U.S. Cl. 266—46 **8 Claims**



1. A method of treating material in a rotating generally cylindrical furnace having a charging end and a discharge end including the steps of supplying a cooling liquid to cool the discharge end by continuously passing said liquid through an annular coil at the discharge end, said liquid being delivered at an inlet end of the coil from an annular first trough surrounding the furnace and rotatable therewith to which the cooling liquid is supplied continuously and being impelled through the coil under centrifugal forces of rotation to discharge from an outlet end of the coil into a stationary annular second trough surrounding the furnace.

4,102,531

METHOD OF AND APPARATUS FOR FOLDING A SHEET TO FORM PAGES OF VARIABLE FORMAT

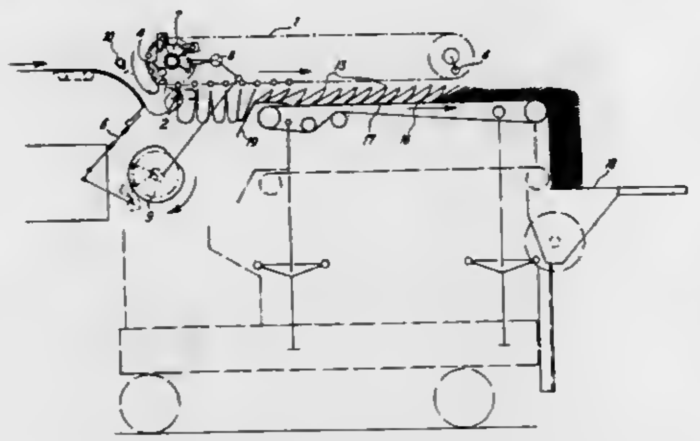
Pedro Jiminez, Evry, France, assignor to Ateliers de Constructions Mecaniques Seailles et Tison, Evryl-Ville-Nouvelle Ris-Orangis, France

Filed Jan. 24, 1977, Ser. No. 762,215

Claims priority, application France, Mar. 4, 1976, 76 06124

Int. Cl.² B65H *45/20*

U.S. Cl. 270—79 **8 Claims**



1. In a method of folding an elongate web to form the same into pages, the steps of:

(a) forming a series of first folds, to be located along respective first edges of the pages, by successively gripping parts of said web at intervals along its length;

(b) imparting a reversed ogival form to intermediate parts of said web between the said first folds;

(c) advancing the said first folds at a first speed while laying said intermediate parts of said web on a conveyor moving substantially parallel to, and at a second speed less than said first speed, so as to form intermediate folds along respective second edges of the pages opposite said first edges.

4,102,532

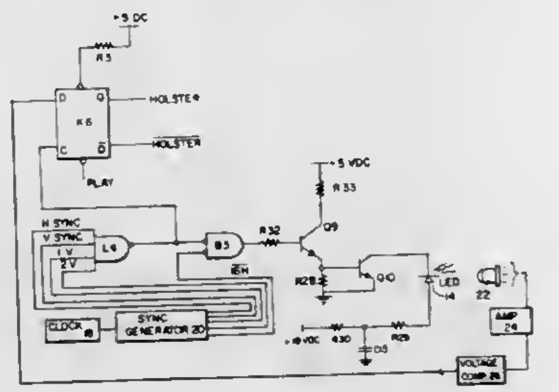
GAME METHOD AND APPARATUS FOR SENSING THE POSITION OF AN OBJECT WITH RESPECT TO ITS RECEPTACLE

Howard K. Van Jepmond, Menlo Park, and Ronald E. Milner, Grass Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1976, Ser. No. 738,669

Int. Cl.² A63B *69/00;* G08B *21/00*

U.S. Cl. 273—1 E **8 Claims**



1. Video game apparatus for determining the position of a simulated weapon employed in the play of an amusement game with respect to a receptacle for said simulated weapon, comprising:

(a) video display means;

(b) a movable simulated weapon employed in the play of a video amusement game;

(c) a receptacle for said simulated weapon operatively connected to the video game;

(d) control means connected to a light source for propagating coded light, said light source being mounted on one of either the simulated weapon or the receptacle;

(e) optical detecting means for receiving the coded light propagated from the light source, said detecting means being mounted on one of either the simulated weapon or the receptacle but not coincident with the light source;

(f) circuit means connected between the light source and the optical detecting means for determining coincidence between the coded light propagated from the light source and the light received by the optical detecting means, said light source and said optical detecting means being positioned such that the position of the simulated weapon with respect to its receptacle is determinable from the receipt of the coded light as indicated by said coincidence; and

(g) means responsive to the circuit means for enabling the video display means.

5. A method for determining the position of a simulated weapon employed in the play of a video amusement game with respect to a receptacle for said simulated weapon, comprising the steps of:

(a) positioning a light source on one of either the simulated weapon or the receptacle each of which is employed in the play of the video amusement game;

(b) positioning an optical detecting means on one of either the simulated weapon or the receptacle but not coincident with the light source;

(c) coding the light propagated from the light source;

(d) determining whether the coded light propagated from the light source is received by the optical detecing means;

(e) aligning the light source with respect to the optical detecting means such that the coded light is received by the optical detector when the simulated weapon is received in its receptacle; and

(f) enabling the video amusement game consequent to detection of the coded light.

4,102,533

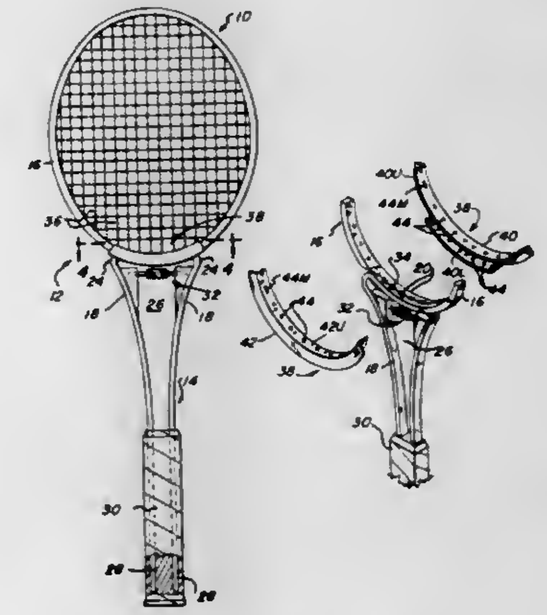
ADJUSTABLE HEAD RACQUET FRAME

Noble N. Ida, Boulder, Colo., assignor to Ida Engineering, Inc., Littleton, Colo.

Filed May 5, 1977, Ser. No. 793,739

Int. Cl.² A63B *51/12*

U.S. Cl. 273—73 E **12 Claims**



1. The stringable racquet frame which comprises: an elongate rod-like member having end portions connected by a medial portion, one of said end portions being bent and crossed over the other of said end portions to form a loop in said medial portion, said loop having arcuate sections adjoining said end

portions, said arcuate sections being arranged in side-by-side overlapping relation, said end portions being bent at points adjacent said overlapped sections to define a pair of limbs extending radially outward from said overlapped sections in side-by-side spaced relation so as to cooperate with one another and with said overlapped sections to form an open throat at the junction between said limbs and loop, said limbs lying in coplanar relation to one another and to said loop, said loop having a plurality of spaced apertures therearound for the reception of strings, and said overlapped sections having the opposed surfaces thereof recessed to produce at least one gap therebetween sized, shaped and positioned to pass the strings therethrough while permitting relative arcuate movement between said surfaces in opposite directions so as to both expand and reduce the size of said loop; handgrip-forming means fastening the limbs together at a point spaced from the base of the loop, said handgrip-forming means and limbs cooperating with one another to define a handle; and string tension adjustment means operatively connected between the limbs across the throat, said tension adjustment means being effective upon actuation in a direction to spread said limbs apart to reduce the size of said loop and reduce the tension in said strings, and said tension adjustment means being effective upon actuation in a direction to close the gap between said limb to enlarge said loop and increase the string tension.

4,102,534

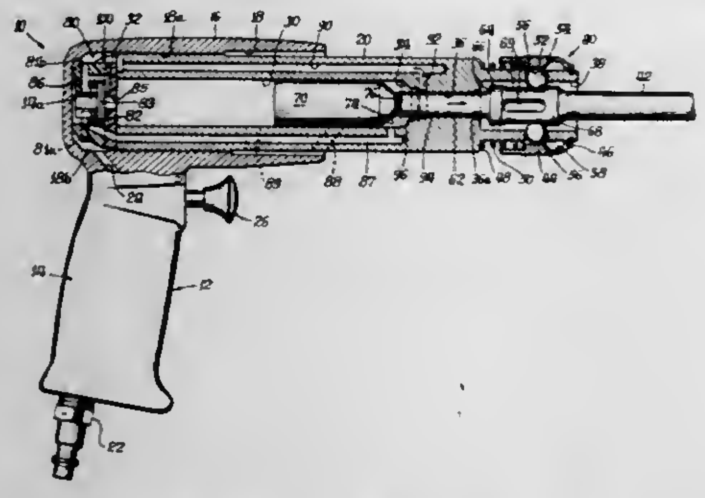
PNEUMATIC HAMMER

Neil W. Benedict, Evanston, Ill., and Robert J. White, West Bloomfield, Mich., assignors to Ajax Tool Works, Inc., Franklin Park, Ill.

Filed Jan. 10, 1977, Ser. No. 757,871

Int. Cl.^{2} B25D *9/00*

U.S. Cl. 173—137 **7 Claims**



1. A hand holdable fluid pressure operated impact tool for use with a working tool, comprising, in combination, housing means defining a handle portion and having first fluid passage means connectable to a source of fluid pressure, said housing means including a barrel portion defining a piston chamber in communication with said first fluid passage means, an impact piston disposed within said piston chamber for axial reciprocating movement therein, said housing means having second fluid pressure passage means communicating with said first fluid passage means and adapted to apply fluid pressure against opposite ends of said impact piston, valve means supported by said housing means and cooperative with said first and second fluid pressure passage means to alternately subject the opposite ends of said piston to fluid pressure so as to effect reciprocating movement of said piston when said first fluid passage means is connected to a source of fluid pressure, manually operable means cooperable with said first fluid passage means to selectively control fluid pressure to said first fluid pressure passage means causing said impact piston to reciprocate irrespective of the position of said working tool, working tool mounting means cooperative with said housing means to mount a working tool on said housing means such that the axis of said working tool is aligned with the direction of movement of said impact piston, said working tool mounting means facilitating longitudinal movement of said working tool relative to said housing means between a first position wherein said working tool may be engaged by said impact piston and a second position where said working tool cannot be engaged by said impact piston so that said working tool must be moved to its said first position in order to effect impact with said piston, said housing means defining an annular stop surface at the forward end of said piston chamber to limit movement of said impact piston in the direction toward said working tool, said housing means further defining a fluid pressure chamber contiguous to said stop surface and in open communication therewith, third fluid pressure passage means formed in said housing means and having upon operation of said manually operable means, continual fluid communication with said first fluid pressure passage means and said fluid pressure chamber so as to continually introduce fluid pressure into said fluid pressure chamber and establish a fluid pressure cushion between said impact piston and said stop surface so that impact forces on said stop surface effected by said impact piston are substantially dissipated prior to direct impact thereagainst, fluid pressure from said third fluid pressure passage means also being adapted to subject said working tool to fluid pressure in a manner to bias said working tool toward its said second position during operation of said impact tool.

4,102,535

BOARD GAME

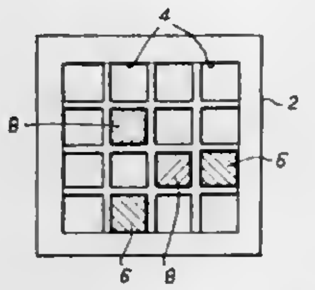
Michael Kiodred, Nottingham, England, assignor to Invicta Plastics Limited, Leicester, England

Filed Dec. 15, 1976, Ser. No. 751,051

Claims priority, application United Kingdom, Dec. 23, 1975, 52689/75

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—282 **3 Claims**



1. A board game for two players comprising a board, said board having means defining a plurality of playing piece receiving areas arranged in a predetermined pattern, a plurality of first playing pieces divided into two sets, each piece of the first set having the same one of two contrasting characteristics, each piece of the second set having the other one of said two contrasting characteristics and each being adapted to be received upon a selected one of said board areas according to a player's selection, and separate second playing pieces for each player cooperable with said board after first playing pieces have been positioned thereon by both players to determine a game winner, said second playing pieces including at least two plates each of dimensions sufficient to overlie the board once positioned therein in any horizontal orientation, a like numbered plurality of apertures in each of said plates, said plates being distinct with the arrangement of apertures in said second playing pieces being irregular and different among said plural second playing pieces, each aperture being alignable with one of said playing piece receiving areas through which apertures respective first playing pieces are viewable when a second playing piece is correctly positioned upon player selected playing piece receiving areas.

4,102,536

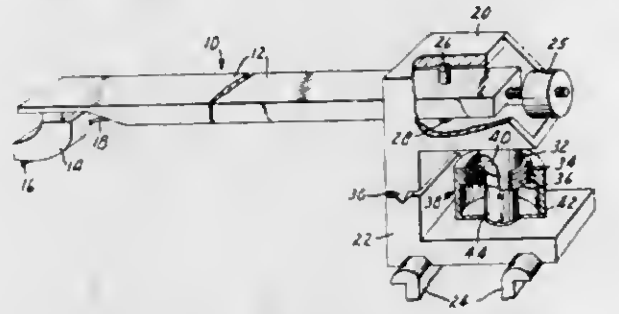
PHONOGRAPH PICKUP DEVICE

Kenneth Clunis, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 569,871, Apr. 21, 1975, abandoned. This application Sep. 15, 1976, Ser. No. 723,588

Int. Cl.^{2} G11B *3/10*

U.S. Cl. 274—23 R **5 Claims**



1. A pickup device for record players comprising
(a) a tone arm having a phonograph cartridge at one end,
(b) support means for pivotally supporting the tone arm for movement toward and away from a record disc surface,
(c) force applying means responsive to a drive signal for controllably applying a force to rotate the tone arm toward said record disc surface to bring said cartridge into contact with said record disc surface, and
(d) cueing control means for controlling the movement of said tone arm to said record disc surface comprising
  (i) magnetic field providing means secured to the support means including inner and outer concentric pole faces, defining a gap therebetween which lies in the same plane as that of the pivot, and means providing magnetic flux to the pole faces such that a magnetic field extending across the gap is established,
  (ii) a sense coil rigidly positioned on the tone arm such that when the cartridge is in contact with said record disc surface the coil is centered in said gap for generating a motion signal corresponding to the rate at which the tone arm moves,
  (iii) circuit means for providing a control signal proportional to the difference between two signals, said circuit means having a reference potentiaL network for providing a reference signal as one of said two signals and having a feedback circuit connected to receive said motion signal and in response thereto providing a signal as the other of said two signals, and
  (iv) drive means responsive to said control signal for producing a said drive signal for energizing said force applying means whereby rotation of the tone arm toward said record disc is electrically controlled.

4,102,537

SEATED-OPERATOR TYPE TRACTOR

Teizo Takahashi, Sakai; Toshiyuki Matsumoto, Yao; Tadashi Nakamura, Kawachinagano, and Ryozo Kuroiwa, Sakai, all of Japan, assignors to Kubota Ltd., Osaka, Japan

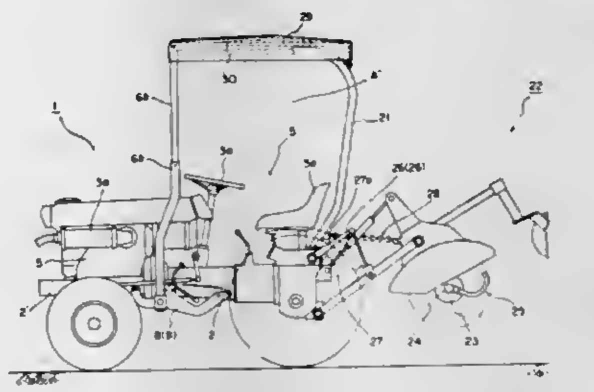
Filed Mar. 17, 1977, Ser. No. 778,503

Claims priority, application Japan, Jun. 23, 1976, 51-74872; Jun. 18, 1976, 51-81011[U]

Int. Cl. B62d *25/06*

U.S. Cl. 296—102 **4 Claims**

1. A seated-operator type tractor comprising a seat for the operator supported on a chassis framing of the tractor, a safety frame upstanding in gate form securely supported on either side of the chassis framing forwardly of the seat, said safety frame having detachable upper and lower portions interconnected at a level slightly higher than the top of a steering wheel on said tractor, and a rear safety frame, characterized in that said rear safety frame is formed in L or J letter shape and extends above and rearwardly of the seat, with one end fixed to a center top portion of safety frame and the other end detachably attached to a center portion of the rear of the tractor body.



4,102,538

LIP SEALING RING FOR A SHAFT

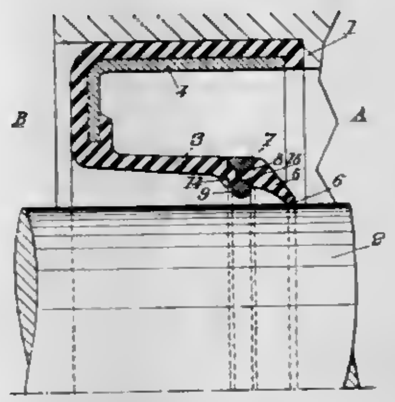
Jacques Bertin, Asnieres, France, assignor to Paulstra, Levallois-Perret, France

Filed Oct. 14, 1975, Ser. No. 622,227

Claims priority, application France, Oct. 21, 1974, 74 35321

Int. Cl.^{2} F16J *15/32*

U.S. Cl. 277—153 **9 Claims**



1. In a shaft sealing joint comprising a sleeve of elastomeric material freely surrounding said shaft, having at one end a lip suitable for elastic contact with the shaft and being at the other end integral with a support, the improvement which comprises providing around said sleeve in the portion of said sleeve that joins the lip, an external rigid annular stiffening ring gripping around said sleeve on the external side of said portion and an internal rigid, annular stiffening ring, gripping around said sleeve on the internal side of said portion, said external rigid annular stiffening ring and said internal rigid annular stiffening ring being located opposite each other on substantially the same longitudinal axis in said portion so as to compress between them said sleeve of elastomeric material and form a neck in said portion.

4,102,539

POWER-ACTUATED CHUCK, ESPECIALLY FOR TURNING MACHINES SUCH AS LATHES

Günter Horst Röhm, Heinrich-Röhm-Str. 50, Sontheim, Fed. Rep. of Germany (7927)

Filed Jul. 12, 1977, Ser. No. 815,017

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1976, 2631583

Int. Cl.^{2} B23B *31/16*

U.S. Cl. 279—114 **10 Claims**

1. A power-actuated chuck for a turning machine, comprising:

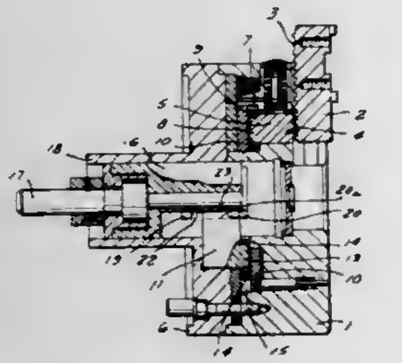
a chuck body rotatable about an axis;

a plurality of jaws angularly spaced about said axis and radially displaceable on said body to engage and disengage a workpiece received between said jaws;

a drive ring rotatable on said body;

mechanism connecting a said drive ring and said jaws for transforming angular displacement of said drive ring into radial displacement of said jaws;

an actuating member axially displaceable on said body and connectible to an axially effective piston-and-cylinder arrangement;



a slider member displaceable on said jaw generally tangentially with respect to said ring and operatively connected thereto for angularly displacing said ring upon linear displacement of said slider member, one of said members being formed with a tooth inclined to said axis and the other of said members being formed with a groove receiving said tooth whereby axial displacement of said actuating member linearly shifts said slider member.

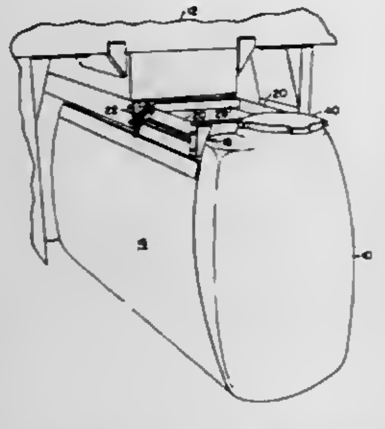
4,102,540
TANK SUSPENSION

Robert Eugene Fox, Minburn, and Wendell Dale Reece, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 7, 1977, Ser. No. 774,764

Int. Cl.² B60P *3/22*

U.S. Cl. 280—5 H **16 Claims**



1. An agricultural implement comprising: a main frame; transversely spaced apart fore-and-aft extending members carried by the frame; an elongated flexible tank receivable between said members; tank support means having transversely spaced fore-and-aft extending sides for respectively engaging the members, sliding therealong and resting thereupon; and means suspending the tank from the support means for limited transverse rocking movement, including a flexible saddle member wherein said receptacle is carried.

4,102,541
ROLLER SKIS

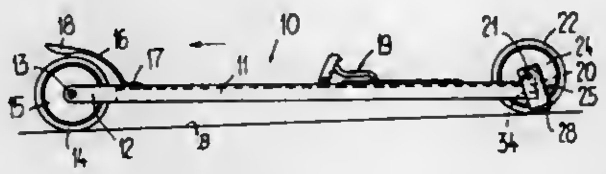
Hans Altorfer, Effretikon, and Oscar Knoll, Tagelswangen, both of Switzerland, assignors to Altorfer AG Metall- und Apparatebau, Illnan-Effretikon, Switzerland

Filed Feb. 3, 1977, Ser. No. 765,152

Claims priority, application Switzerland, Feb. 17, 1976, 1890/76

Int. Cl.² A63C *17/14*

U.S. Cl. 280—11.1 BT **10 Claims**



1. A roller ski equipped with a reverse motion-blocking device, comprising:

a support board having a front end and a rear end;

at least one front wheel mounted at said front end;

rear wheel means mounted at said rear end;

a reverse motion-blocking device embodying a pendulum support engaging with the ground, upon which travels the roller ski by means of the front wheel and said rear wheel means, during reverse motion of the roller ski;

means for hingedly connecting the pendulum support with the roller ski;

means providing two spaced stops carried by said support board at the region of its rear end adjacent the rear wheel means;

said hingedly connecting means mounting said pendulum support to be freely pivotable between said two stops;

said pendulum support having a free end; and

means for frictionally coupling the pendulum support at the region of its free end with said rear wheel means for rendering ineffectual the reverse motion-blocking device during forward motion of the roller ski.

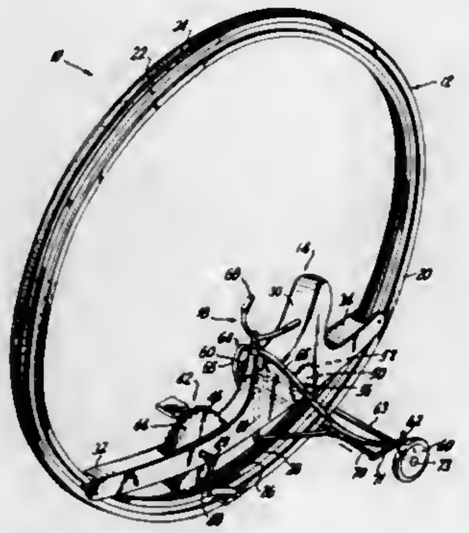
4,102,542
RIDER PROPELLED VEHICLE

Frank A. Pirre, Jr., 40 Elmwood Ave., Norwalk, Conn. 06854, and Andrew McGovern, Buckfield La., Greenwich, Conn. 06830, assignors to Frank A. Pirre, Jr., Norwalk and Andrew J. McGovern, Greenwich, both of Conn., part interest to each

Filed Jul. 2, 1976, Ser. No. 702,351

Int. Cl.² B62K *1/00*

U.S. Cl. 280—207 **15 Claims**



1. A rider propelled vehicle comprising an outer, large diameter wheel, a seat frame located within the periphery of said outer wheel, means for operatively connecting said seat frame to said outer wheel at two spaced points on the frame and for permitting said outer wheel to move through said frame at said two spaced points, means on said frame, including at least one foot pedal, operatively engaged with said outer wheel for rotating said outer wheel upon operation of said foot pedal by a person seated on said frame; said rotating means including a drive wheel rotatably mounted on said seat frame for rotation upon actuation of the foot pedal and being drivingly engaged with said outer wheel; a pair of laterally spaced ground engageable steering wheels located to continuously engage the ground during operation of the vehicle rotatably mounted on said frame and located on opposite sides of said outer wheel rearwardly of the center of gravity of the frame and the center of rotation of the outer wheel; and rider operable means on said frame for steering said steering wheels; and a single idler wheel mounted on said seat frame rearwardly of said drive wheel and drivingly engaged with said outer wheel for rotation thereby upon rotation of the drive wheel; the axis of rotation of said drive wheel being located forwardly of the axis of rotation of said outer wheel; and the axis of rotation of said idler wheel being located rearwardly of the center of gravity of said seat frame; said drive wheel having a larger diameter than said idler wheel; and said drive wheel and idler wheel being substantially equidistant from the center of gravity of said seat frame; whereby the axis of rotation of said drive wheel is closer to the center of rotation of the outer wheel than the axis of rotation of the idler wheel and the center of gravity of the seat frame is located rearwardly of the center of rotation of the outer wheel to resist forward undriven rolling of said outer wheel.

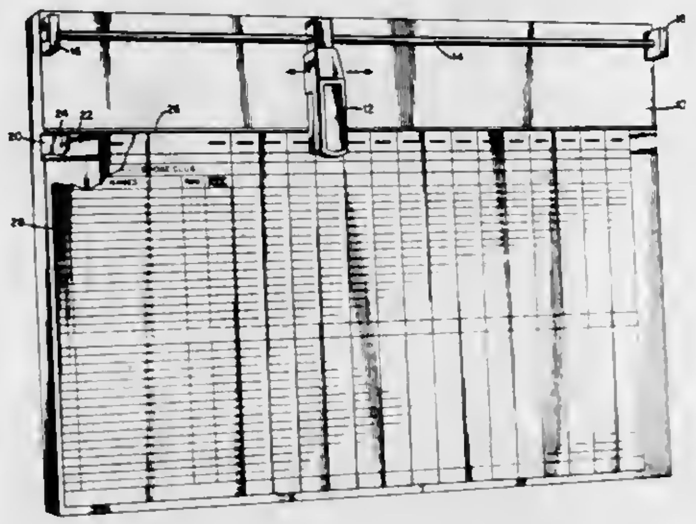
4,102,543
BRIDGE SCORING DEVICE

Samuel C. Smith, 210 Hartman Rd., Newton Centre, Mass. 02159

Filed Aug. 30, 1976, Ser. No. 718,847

Int. Cl.² G09B *19/22*

U.S. Cl. 283—49 **6 Claims**



1. An apparatus for scoring duplicate bridge comprising in combination:

(a) a plurality of identical score sheets each one having horizontal rows and vertical columns for recording the scores of each team with respect to a particular bridge hand, said rows and columns being so designed that the final score for each team with respect to that hand appears in the right-most vertical column of each sheet;

(b) a jacket for each said score sheet comprising an opaque rectangular paper, cardboard or plastic envelope just large enough to contain one of said score sheets in non-folded position and having a slit along one edge thereof for inserting or removing a score sheet;

(c) a substantially flat, rectangular, and generally-vertically positioned score board; and,

(d) means for fastening to aid score board a plurality of said score sheets in horizontally-aligned vertical overlapping relationship so as to expose only the right-most vertical column of each sheet, said means compising a horizontal support located along the vertically uppermost edge of said score board and a staple gun slidably mounted on said support.

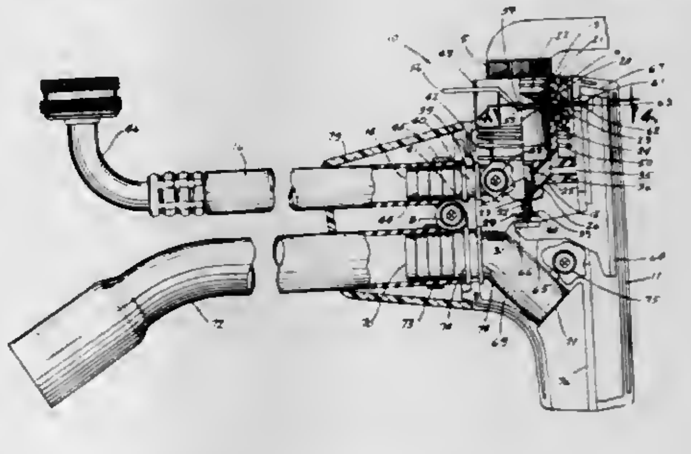
4,102,544
RETAINING RING ASSEMBLY FOR FAUCET COUPLER

John D. Goodlaxson, Colfax, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Feb. 23, 1976, Ser. No. 660,321

Int. Cl.² E03C *1/00;* **F16L** *55/00*

U.S. Cl. 285—8 **12 Claims**



1. A coupler assembly for connecting a portable washing machine to a faucet disposed generally above a sink, the combination comprising: a coupler body defining a conduit having an inlet end for receiving said faucet and an outlet end connectable to said machine; means for connecting said inlet end to said faucet including a retaining ring and further including a plurality of angularly spaced locking means each including a portion extending radially outwardly from said coupler body and a portion extending through said body for engagement with said faucet, said retaining ring having angularly spaced radially inwardly extending segmental shoulders defining angular recesses therebetween, said recesses being generally alignable with said angularly spaced locking means in a first posture of said retaining ring to allow axial assembly of said retaining ring onto said coupler body, said retaining ring being rotatable to a second posture for at least partially aligning said shoulders with said locking means; means for maintaining said retaining ring in said second posture; and spring means for axially biasing said retaining ring to a faucet locking position, said retaining ring being axially retained on said coupler body by engagement of said locking means with said shoulders and being axially movable against said spring means while in said second posture from said faucet locking position to a faucet receiving-releasing position.

4,102,545
SLIDING DOOR LOCKING SYSTEM

Melvin C. Jay, Streamwood, Ill., assignor to Elgin-Macor, Inc., Elgin, Ill.

Filed Feb. 22, 1977, Ser. No. 771,612

Int. Cl.² E05C *5/02;* **E05D** *13/06*

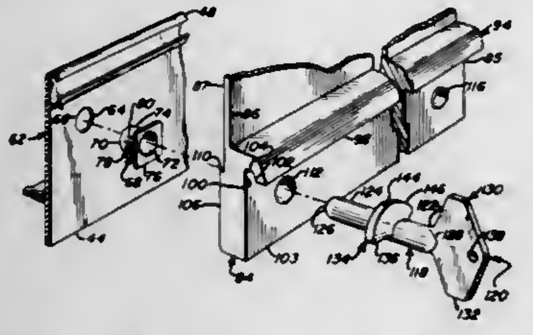
U.S. Cl. 292—57 **11 Claims**

1. A security lock assembly for locking a movable panel to a stationary frame assembly, comprising:

first wall means defining a first aperture connected to said movable panel;

a bracket mounted to said stationary frame assembly including a leg having a cam-receiving portion and second wall means generally spaced from and overlying said first wall means, said second wall means defining at least one aperture positioned for alignment and registration with said first aperture; and

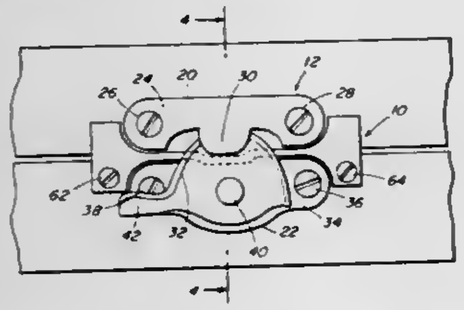
key means having a shank for rotatable and removable insertion into both said first aperture and said one aperture when said first aperture and said one aperture are in alignment and registration, manually graspable head means connected to said shank for permitting grasping of said key means, and cam means carried by and extending from said shank for interlocking engagement with said cam-receiving portion of said bracket to substantially lock said movable panel and said stationary frame assembly in fixed relationship to each other.



4,102,546

BURGLARPROOF GUARD FOR WINDOW LOCK

Michael Costello, 304 Meridian St., East Boston, Mass. 02128
Filed Sep. 2, 1976, Ser. No. 719,946
Int. Cl.² E05C *21/02*
U.S. Cl. 292—346 3 Claims



1. A guard for use with the existing lock elements of a double-hung window having upper and lower sashes, both with a cooperating lock element, comprising

(a) a unitary flat plate member adapted to be mounted between the top of said lower sash and the lower sash lock element,
(b) said member being formed with enlarged perforated end portions and a narrow elongated rib portion connecting said end portions, said rib portion being formed with an offset medial portion adapted to underlie the lock element on said lower sash when installed thereon,
(c) said member being flat throughout and formed with a contoured marginal edge including coplanar flat protrusions at opposite ends thereof adapted to extend over the gap between said sashes when closed and beyond the inner opposing edge of said upper sash,
(d) said edge being formed with a center recess to allow clearance for the other lock element when said window is being opened.

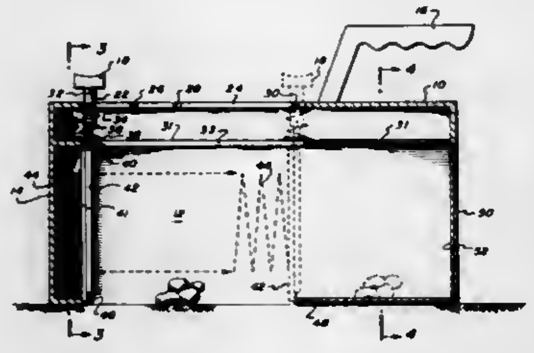
4,102,547

SCAVENGING DEVICE FOR ANIMAL WASTE

Rollin T. Williams, 224 N. Franklin St., Allentown, Pa. 18102
Filed Nov. 18, 1977, Ser. No. 852,662
Int. Cl.² A47F *13/08;* A01K *29/00*
U.S. Cl. 294—1 R 10 Claims

1. A device for scavenging and storing animal waste comprising:

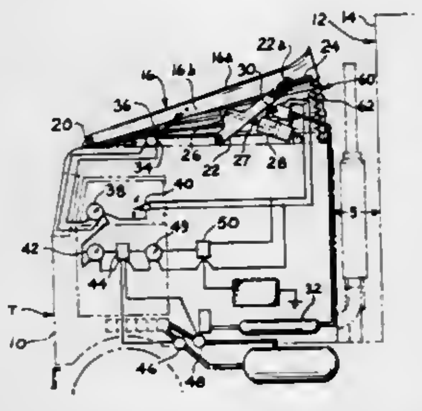
(a) a generally parallelepipedal housing having a first outer top and a second inner top, a front wall, a rear wall, two side walls, and a partial bottom wall releasably attached to said housing;
(b) a scraper face plate slidably mounted within the housing between the sides along a path from proximate said front wall wherein said plate is in full open position to a position toward said back wall, proximate said bottom wall, wherein said scraper plate is in full closed position and thereby sealingly abuts said sides, said inner top and said bottom to form a waste receptacle compartment;
(c) tension means mounted between said front wall and connected to said scraper face plate so that said scraper plate is continuously urged toward said back wall;
(d) means extending through said inner and said outer top for releasably securing said scraper face plate at various locations along its path; and,
(e) handle means for carrying and positioning said device whereby when the device is rested on a generally planar surface with the open compartment of the bottom overlying the waste, movement of the scraper face plate from an open to a closed position pushes said waste into said waste receptacle compartment.



4,102,548

INFINITELY VARIABLE, CONTROLLABLY AND/OR AUTOMATICALLY ADJUSTABLE AIR DEFLECTOR AND METHOD

Timothy J. Kangas, Renton, Wash., assignor to Paccar Inc., Bellevue, Wash.
Filed Dec. 6, 1976, Ser. No. 747,728
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S 14 Claims



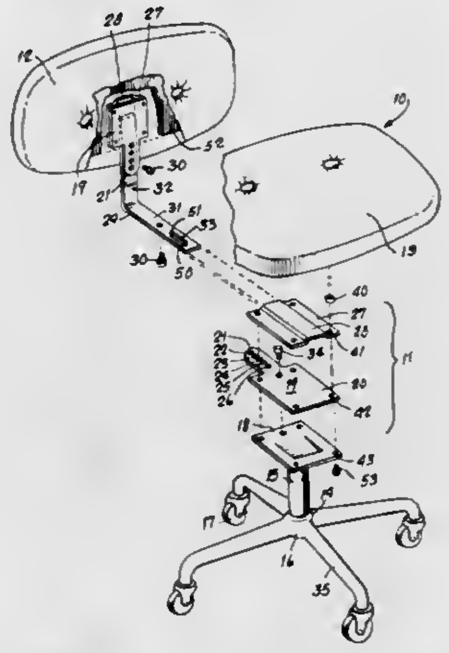
1. A device for reducing aerodynamic drag on an automotive vehicle having a cab forward of a cargo compartment comprising:

air deflecting means mounted on the top of the cab and movable between a lower position closer to the top of the cab and in which air deflection is of one amount, and a higher position in which air is deflected in a greater amount from the top of the cab,
means for moving the air deflecting means, and
control means within the cab for actuating the moving means to vary the location of the deflecting means through various amounts of deflection between said lower and higher positions while the vehicle is traveling such that the air deflecting means may be placed into an optimum reduced drag position.

4,102,549

APPARATUS FOR ADJUSTING THE BACK SUPPORT OF A CHAIR

Andrew I. Morrison, Setauket, and Bruce R. Hannah, Cold Spring, both of N.Y., assignors to Knoll International, Inc., Greenwich, Conn.
Filed Apr. 13, 1977, Ser. No. 787,147
Int. Cl.² B60N *1/02*
U.S. Cl. 297—383 3 Claims

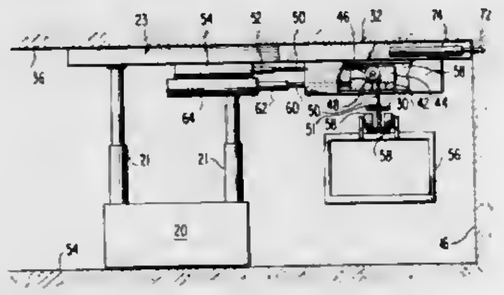


1. Apparatus for adjusting a back support member of flat rigid material forming a part of a chair, comprising a bracket through which said back support member slides, a position stop of flat and flexible sheet material mounted adjacent to and lying flat against said back support member, said position stop including a first part affixed to said bracket and a second part which may be flexed with respect to said first part, a stop member carried by and protruding away from said back support member, apertures in said second part of said position stop, said stop member being engaged with one of said apertures thereby locking said back support member in position, whereby said position stop may be flexed to a disengaged position in which said stop member is free from said apertures and said back support member may be moved within said bracket to another position in which said position stop may be allowed to return to engaged position in which said stop member engages another aperture.

4,102,550

MINING METHOD AND APPARATUS

John A. L. Campbell, Acton, and Daniel J. Moynihan, Chelmsford, both of Mass., assignors to Peabody Coal Company, St. Louis, Mo.
Filed Apr. 20, 1976, Ser. No. 678,680
Int. Cl.² E21D *15/48*
U.S. Cl. 299—11 5 Claims



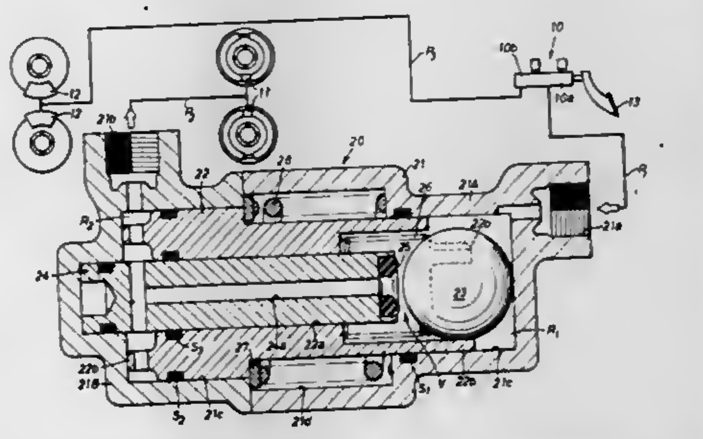
1. An apparatus for an ancillary support system, in combination, a mine roof chock

a flexible frame conveyor including means for suspending the frame thereof for movement along an overhead trackway,
means for supporting an elongate overhead track member on said chock, and means for releasably joining the ends of said overhead track member to ends of like members which, joined end-to-end, constitute serial parts of said overhead trackway,
said chock includng a roof beam
having a first portion thereof overlying vertically adjustable jack means and a second portion constituting an arm having a free end extending laterally outward in one direction from the first portion,
the means for supporting said overhead track member being mounted on said second portion, the means for supporting an overhead track member on said chock providing freedom of directional movement of said track member relative to said chock in vertical and horizontal planes.

4,102,551

FLUID PRESSURE CONTROL VALVE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed May 26, 1977, Ser. No. 800,860
Claims priority, application Japan, Jan. 5, 1976, 51-65980
Int. Cl.² B60T *8/14*
U.S. Cl. 303—24 A 11 Claims



1. An inertia-controlled valve unit for incorporation in a vehicle braking system between a master cylinder and rear wheel brake cylinders, comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said rear wheel brake cylinders, and a stepped bore in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof;
a differential piston slidably disposed within said stepped bore to provide first and second fluid chambers respectively in open communication with said inlet and outlet ports, said piston being provided with an axial bore therethrough and being exposed at the smaller end thereof in said first chamber and at the larger end thereof in said second chamber;
a tubular spool slidably disposed within said axial bore of said piston and having one end fixedly engaged with the inner wall of said housing in said second chamber and the other end exposed in said first chamber, said spool including an axial passage permitting fluid flow between said first and second chambers; and
a cut-off valve including a valve seat provided on the other end of said spool and an inertia-controlled ball located within said first chamber to co-operate with said valve seat and rolling toward said valve seat to cut-off fluid flow from said first chamber to said second chamber when said ball is subjected to a deceleration in excess of a predetermined value.

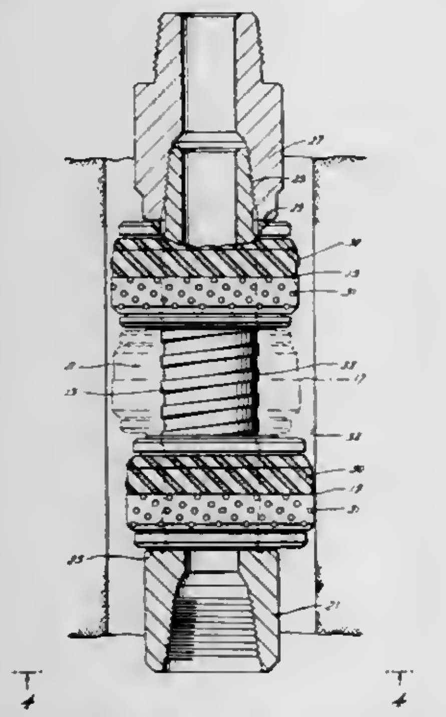
4,102,552
TANDEM ECCENTRIC ROLLER STABILIZER FOR EARTH BORING APPARATUS

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Sep. 7, 1976, Ser. No. 721,089

Int. Cl.^{2} F16C *17/00, 19/00*

U.S. Cl. 308—4 A **32 Claims**



1. Wall contacting tool comprising a mandrel having a plurality of eccentric roller assemblies disposed in tandem along the length of the mandrel, said mandrel and each of said roller assemblies being provided with cooperative screw thread means to position the assemblies with predetermined azimuthal orientation of the planes of their common eccentric diameters, the length of each roller assembly being equal to $(p)(n) + (p)(x)/360$ where p is the thread lead, n is an integer, and x is the azimuthal spacing in degrees of the plane of the common eccentric diameters of the roller assembly relative to that of an adjacent roller assembly.

4,102,553
ROLLER BEARING FOR LONGITUDINALLY MOVABLE MACHINE ELEMENTS

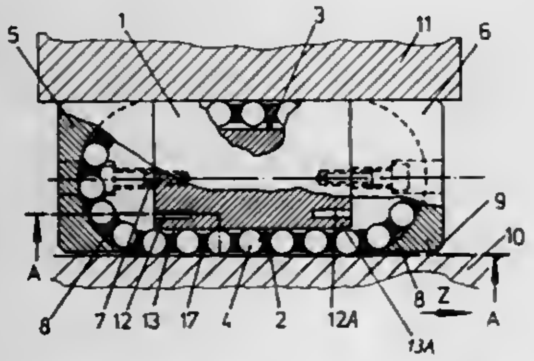
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschweski, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,933

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 7615699[U]

Int. Cl.^{2} F16C *17/00*

U.S. Cl. 308—6 C **10 Claims**



1. In a roller bearing for use between bearing surfaces of machine elements, the roller bearing including (a) a block having a top load surface and a bottom return surface and end and side surfaces adjacent said load surface, (b) a plurality of rollers distributed about said block along a continuous path which includes a load zone defined by said load surface and a first of said bearing surfaces, and (c) means for retaining said rollers in said path, said load surface having (i) length in the direction of movement of said rollers which extend transversely across said load surface, and (ii) running-in and running-out areas respectively where said rollers enter and leave said load zone, each roller having central and opposite end parts, and said running-in and running-out areas each having central and edge portions respectively underlying the central and end parts of said rollers, the improvement wherein said block has defined therein a first pair of generally symmetrical slots in the vicinity of at least one of said running-in and running-out areas, said slots extend along a plane generally parallel to said load surface and below said surface, each slot extends into said block lengthwise from one of said end surfaces and widthwise from an adjacent side surface with said slots being spaced apart in the width direction, the width of each slot is maximum at said end surface and diminishes to minimum at said adjacent side surface, whereby said slots generally underlie only said edge portions of the running-in and running-out areas, said edge portions are elastically yieldable, and loading on said rollers increases as they move through the running-in area and decreases as they move through the running-out area where said areas have said underlying slots.

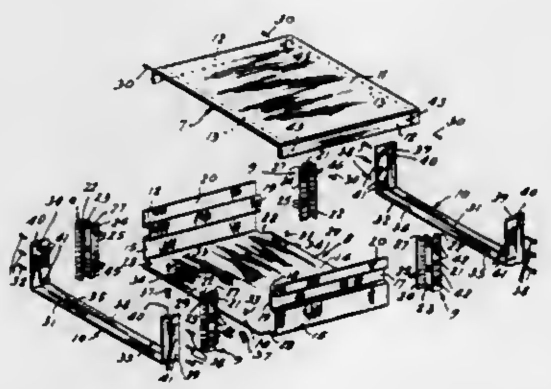
4,102,554
INSTRUMENT CABINET

Richard C. Reimer, Oswego Township, Kendall Coanty, Ill., assignor to Equipto Electronics Corporation, Aurora, Ill.

Filed Dec. 15, 1976, Ser. No. 750,827

Int. Cl.^{2} B65D *7/00*

U.S. Cl. 312—107 **10 Claims**



1. A sheet-material instrument cabinet providing an open-ended chamber receptive of an electronic panel or the like therein, the chamber being defined by top, opposite side and bottom walls, the cabinet comprising: a top member of generally U-shape cross section comprising a top panel having side flanges extending downwardly; a bottom member of generally U-shape cross section comprising a bottom panel having side flanges extending upwardly; a bottom member of generally U-shape cross section comprising a bottom panel having side flanges extending upwardly and disposed in cabinet side forming cooperation with said top member side flanges; said members together defining an open end for the cabinet; ribs along substantially the entire front-to-rear extent of the side walls to rigidify the side walls of the instrument cabinet; connector posts, which are also fastening surfaces for the intended panels, extending between corner areas of said top and bottom panels contiguous to said side flanges and with the opposite ends of the ribs providing locating means to assist in proper positioning of the connector posts relative to the opposite side walls, an end frame bezel cooperatively related to said members and said posts at said open end; means connecting said top and bottom members, said posts and said end frame bezel in unitary assembly; said ribs each having its opposite ends in direct abutting engagement with said posts to further rigidify the side walls of cabinet and means adjacent to said one end for receiving instrument mounting means, wherein said ribs being shaped into the form of outwardly opening handle grooves and comprising chennel portions formed in the opposite side walls thereof.

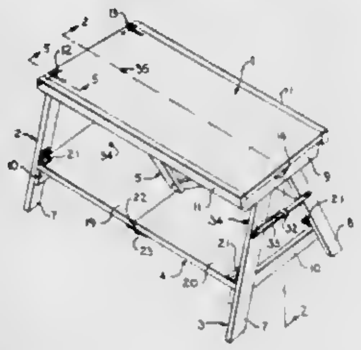
4,102,555
FOLDING WORK TABLE APPARATUS

Thaddeus Tobolski, 731 N. 115th St., Wauwatosa, Wis. 53226

Filed Jan. 31, 1977, Ser. No. 763,864

Int. Cl.^{2} A47B *3/00;* **E04G** *1/34*

U.S. Cl. 312—240 **8 Claims**



1. A folding work table apparatus comprising a pair of laterally spaced first and second vertical leg assemblies having laterally spaced supporting leg members, a rectangular top work table abutting the top of the leg assemblies in a supported work position, said table and leg assemblies having a similar length, a hinge means connected to said table and to said first leg assembly for pivotal movement of said table through 270° from said work position to a storage position abutting the exterior of said first leg assembly, an intermediate shelf structure having a first flat shelf element and a second flat shelf element, first and second hinge means fixedly connected one each to each of said first and second shelf elements and said first and second leg assemblies and having a releasable center connection means firmly supporting the elements in generally coplanar relation and including a movable element to release the connection means for permitting folding of the shelf elements into abutting engagement with the leg members of the leg assemblies, and a pair of stabilizing members one for each of said first and second elements, each member connected to the one of the leg assemblies immediately adjacent the element and to one of the elements of the intermediate shelf structure for firmly supporting the elements, said stabilizing members including release means for permitting said folding of the intermediate shelf structure and positioning of the leg assemblies into an adjacent storage relationship with the shelf elements located between the leg members.

4,102,556
REAR SUPPORT STRUCTURE FOR A CABINET

William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1977, Ser. No. 756,236

Int. Cl.^{2} F16M *11/24*

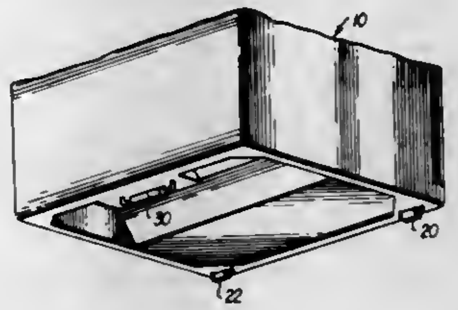
U.S. Cl. 312—250 **12 Claims**

1. A structure for supporting a cabinet on a supporting surface comprising:

(a) a first member positioned on said cabinet and extending transversely of said cabinet;

(b) an elongated member having an axial passage therein, said elongated member being mounted on said first member and being rotatable on said first member to facilitate movement of said cabinet; and

(c) a surface on said elongated member within said passage engaging a surface of said first member, one of said surfaces being of arcuate shape lengthwise of said elongated member to permit tilting of said elongated member relative to said first member, whereby said elongated member is caused to engage the supporting surface along the entire length of said elongated member.



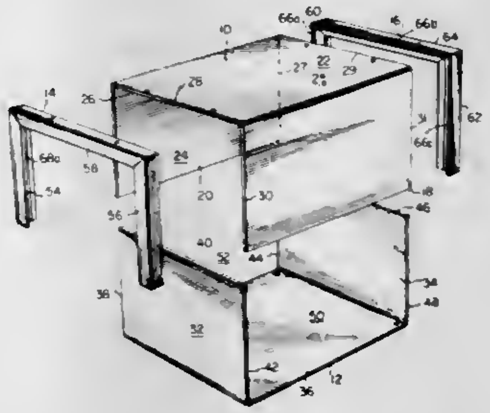
4,102,557
COLLAPSIBLE CONTAINER

Walter Lee, Springfield, Va., and Kenneth C. Litt, Silver Spring, Md., assignors to Pace Incorporated, Silver Spring, Md.

Filed Mar. 1, 1977, Ser. No. 773,290

Int. Cl.^{2} B65D *7/00;* **A47B** *43/00*

U.S. Cl. 312—257 R **3 Claims**



1. A collapsible container comprising

a first channel-like member of predetermined length having open ends, two side members and an intermediate member of predetermined width extending between the two side members, said first channel-like member having first and second U-shaped edges respectively defined by the open ends of the channel-like member;

a second channel-like member having two side members with edges and an intermediate member extending between the two side members, said second channel-like member having a first and second U-shaped edges defined by the respective edges of the two side members, the length of said second channel-like member being approximately the same as the said predetermined width of the intermediate member of said first channel-like member and the width of the intermediate member of said second channel-like member being approximately the same as that of said predetermined length of the first channel-like member; and

first and second U-shaped members, each member having a first groove extending around the inner periphery thereof and a second groove perpendicularly oriented with respect to said first groove and extending around the member,

said first and second U-shaped edges of said first channel-like member being respectively disposed in the first grooves of said first and second U-shaped members and

said first and second U-shaped edges of said second channel-like member being respectively disposed in the second grooves of said first and second U-shaped members.

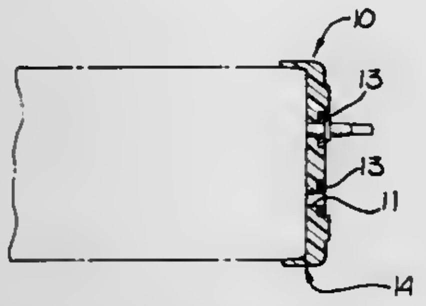
4,102,558
NON-SHOCKING PIN FOR FLUORESCENT TYPE TUBES

Howard Ellis Krachman, Pasadena, Calif., assignor to Developmental Sciences, Inc., Industry, Calif.

Filed Aug. 29, 1977, Ser. No. 828,772

Int. Cl.^{2} H01J *5/50*

U.S. Cl. 339—144 R **12 Claims**



1. The terminal pin of electrically conducting material for use with end caps of fluorescent discharge tubes and the like comprising:

an elongated pin body portion;

a tip portion extending from an end of said body portion, said tip portion having a reduced thickness with respect to that of said body portion; and

insulation covering substantially all the exterior surface of said tip portion.

4,102,559
OPTICAL DEVICE FOR COUPLING OPTICAL FIBERS TO EACH OTHER AND/OR A LIGHT SOURCE

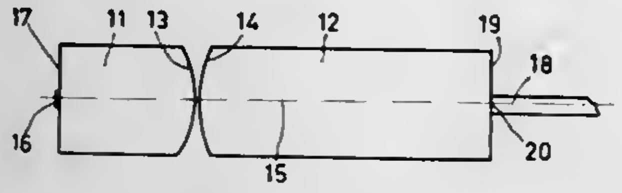
Jean-Jacques Hunzinger, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,559

Claims priority, application France, Dec. 9, 1975, 75 37543

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.18 **11 Claims**



1. An optical device for coupling a source of radiation energy to an optical fiber, comprising in the direction of propagation of light, a first thick plano-convex lens, a thick second plano-convex lens, said two lenses having their convex sides facing and substantially in contact with each other and their axes coinciding with that of a fiber at the fiber input, a source of light energy disposed substantially perpendicular to the lens axis in the immediate vicinity of the center of the plane surface of the first lens and the input end-face of the fiber in the immediate vicinity of the center of the plane surface of said second lens, the radii of curvature of the dioptric faces of the two lenses, their diameters, their thicknesses and the refractive indexes of their constituent materials being such that the system formed by the two lenses optically conjugates the source to the input end-face of the fiber, the diameter of the image of the source being substantially equal to the diameter of the fiber, the image aperture angle being at least equal to half the acceptance angle of the fiber, and the ratio of the radii of the convex dioptric surfaces being such that the spherical aberration is minimal for the selected magnification and the refractive indexes of the materials of the lenses.

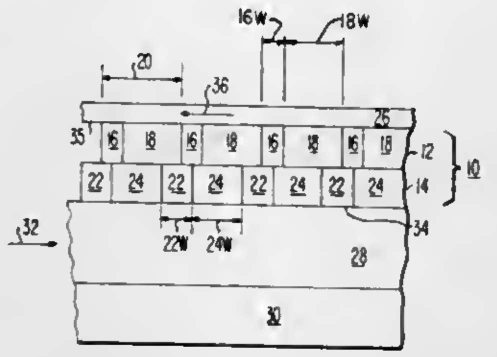
4,102,560
OPTICAL COUPLER

Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 675,260, Apr. 8, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,171

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.19 **3 Claims**



1. An optical coupler that couples electromagnetic energy between a guiding layer carried by a substrate and a medium, said guiding layer and said medium being adapted to alternatively receive an input beam of electromagnetic energy, comprising:

a first diffraction grating; and

a second diffraction grating having a surface contiguously connected to a surface of said first grating, said gratings being disposed intermediate said guiding layer and said medium, said first grating causing a diffraction of evanescent waves that emanate therefrom in response to said input beam to provide diffracted electromagnetic energy that is coupled between said guiding layer and said medium, said first grating having a diffraction strength that causes a coupling to said substrate of a first component of an electromagnetic field having a given amplitude and a given phase, said second grating causing a diffraction of evanescent waves of electromagnetic energy to provide diffracted electromagnetic energy that is coupled between said guiding layer and said medium, said second grating having a diffraction strength that causes a coupling to said substrate of a second component of said field having an amplitude substantially equal to said given amplitude and a phase substantially opposite from said given phase whereby said field is suppressed.

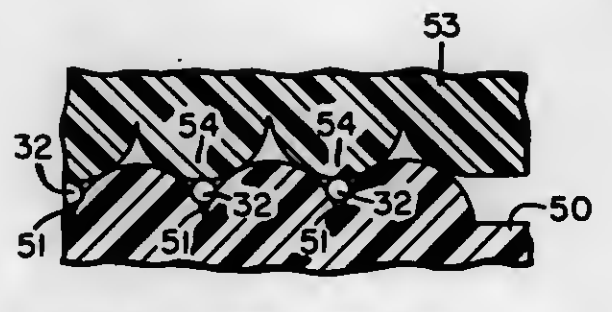
4,102,561
OPTICAL WAVEGUIDE CONNECTOR

Robert M. Hawk, Bath, and Frank L. Thiel, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 2, 1975, Ser. No. 592,362

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96.21 **10 Claims**



1. An optical fiber connector comprising

means defining an elongated aperture for receiving the end portions of a pair of fibers to be connected,

means disposed remote from the endface of at least one of said fibers for tightly clamping said fiber,

means disposed between said means for tightly clamping said fiber and said aperture defining means for loosely clamping said fiber, and

a region disposed between said means for tightly clamping said fiber and said means for loosely clamping said fiber wherein said fiber is bowed, the tendency of said fiber to straighten providing a force which urges the endface thereof to bear against the endface of the other of said fibers.

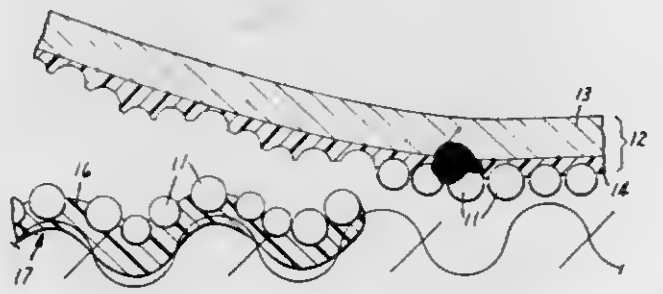
4,102,562
RETROREFLECTIVE TRANSFER SHEET MATERIAL

James H. Harper, North Saint Paul, and Linda S. Smith, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 14, 1976, Ser. No. 695,974

Int. Cl.^{2} G02B *5/128*

U.S. Cl. 350—105 **12 Claims**



9. Transfer sheet material for forming retroreflective graphic images on a substrate, said sheet material comprising a support sheet that includes a dimensionally stable base sheet and a heat-softenable exterior layer, a dense continuous monolayer of transparent microspheres averaging less than about 150 micrometers in diameter and partially and removably embedded in the heat-softenable layer to a depth averaging between about one-quarter and one-half of their diameters, a transparent dielectric mirror coated over the surfaces of the microspheres that are exposed above the heat-softenable layer, a clear thin adhesion-promoting layer coated over the dielectric mirror, and a transfer layer of heat-softenable fabric-penetrating vinyl plastisol ink printed over the layer of microspheres in an imagewise pattern which leaves areas of the layer of microspheres unprinted, the thickness of the transfer layer being at least 40 micrometers and sufficient to embed within the transfer layer the surfaces of the microspheres that are exposed above the support sheet in the printed areas; whereupon when the transfer layer is adhered to a fabric and the support sheet stripped away, the microspheres are pulled from the support sheet to form an image that is retroreflective over its full area.

4,102,563
EYE FUNDUS CAMERA FREE FROM UNDESIRED REFLECTED AND DIFFUSED LIGHT BEAMS

Isao Matsumura, Yokohama; Takeshi Kuwayama, Atsugi, and Yoshimi Kohayakawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,809

Claims priority, application Japan, Dec. 1, 1975, 50-143729

Int. Cl.^{2} A61B *3/10*

U.S. Cl. 351—7 **6 Claims**

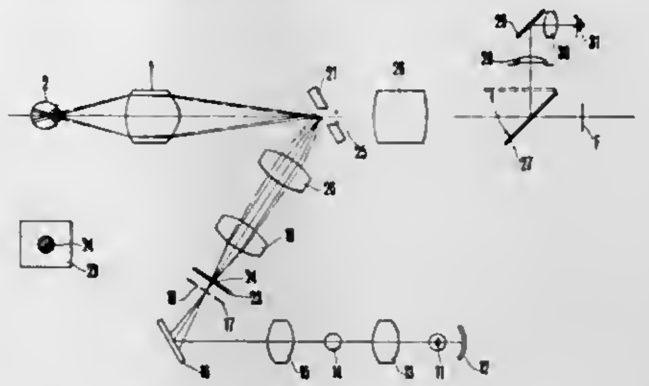
1. An eye fundus camera free from undesired reflected and diffused light beams comprising:

a photographing optical system for photographing the fundus of an eye to be inspected and being provided with a photographing aperture;

an illuminating optical system for illuminating the fundus of the eye to be inspected through a ring-shaped aperture;

a first optical means in said illuminating optical system for forming an image of the ring-shaped aperture in the iris of the eye to be inspected;

a second optical means in said photographing optical system for conjugating the photographing aperture with the cornea of the eye to be inspected so as to eliminate diffused and reflected light beams from the cornea of the eye to be inspected.



4,102,564
PORTABLE DEVICE FOR THE ACCURATE MEASUREMENT OF EYE MOVEMENTS BOTH IN LIGHT AND OBSCURITY

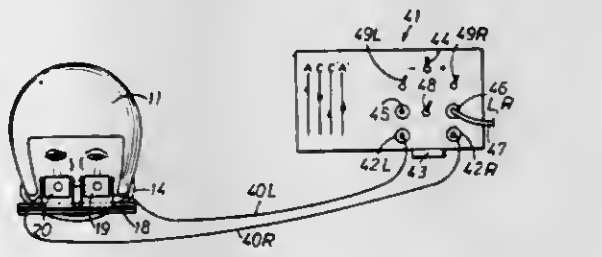
Henry L. Michael, 265 Riverside Dr., New York, N.Y. 10025

Filed Feb. 20, 1976, Ser. No. 660,030

Claims priority, application Belgium, Apr. 18, 1975, 828128; Feb. 10, 1976, 164219

Int. Cl.^{2} A61B *3/14*

U.S. Cl. 351—7 **9 Claims**



1. A device for measurement of movements of an eye of a subject comprising support means for engaging the head of a subject in fixed relation therewith, a housing mounted on said support means at a fixed distance from the eye of the subject, two non-modulated infra-red light sources in said housing positioned to direct infra-red beams of light onto the eye of the subject, two sensing means in said housing equally spaced from said sources along a straight line therewith for receiving infra-red light reflected from said eye by the corresponding sources, said sensing means and said light sources being in fixed relationship in said housing, each of said sensing means including an infra-red light filter to pass substantially only infra-red light, said housing having an opening located in the center of the line joining the sources and the sensing means and through which opening a beam of visible light can be directed towards the subject to permit the irradiating infra-red light to correctly fall upon the eye before commencing an operation, means for selectively interrupting said visible light, means for calibrating said housing on said support means for controlling the positioning of said beams from said sources to the eye and thereby the reflected beams from said eye, and non-modulated electronic means connected to said sensing means for producing an output signal, said calibrating means permitting lateral sliding movement of said housing along an axis parallel to said line joining the sources and sensing means and pivotal movement of said housing along an axis parallel to said line.

4,102,565

SLIT LAMP MICROSCOPE

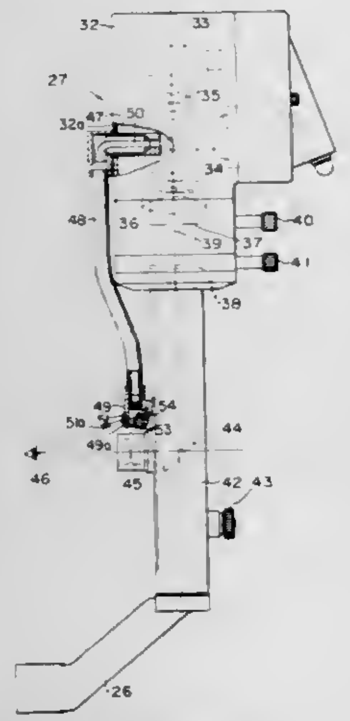
Shiro Takizawa, Tokyo, and Shinichi Nishimura, Ageo, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1976, Ser. No. 703,547

Claims priority, application Japan, Jul. 10, 1975, 50-96021[U]

Int. Cl.^{2} A61B *3/10*

U.S. Cl. 351—14 5 Claims



1. A slit lamp microscope comprising:

a first light source;

means defining a first optical path, having slit means disposed therein, for directing light from said first light source to a patient's eye in the form of a slit;

means defining a second optical path for directing light from said first light source to said patient's eye in the form of uniform illumination;

a second light source;

lens means interposed between said first and second light sources for directing light from said second light source along said first optical path;

said second light source being disposed relative to said first light source such that the second light source does not interfere with the transmission of said light from said first light source along either of said first or second optical paths; and

optical means defining a microscope for investigating said patient's eye.

4,102,566

RIMLESS SPECTACLE

Robert N. Shelton, Leominster, Mass., assignor to Foster Grant Corporation, Leominster, Mass.

Filed May 2, 1977, Ser. No. 792,622

Int. Cl.^{2} G02C *1/04, 5/02*

U.S. Cl. 351—131 7 Claims

1. A rimless spectacle assembly comprising:

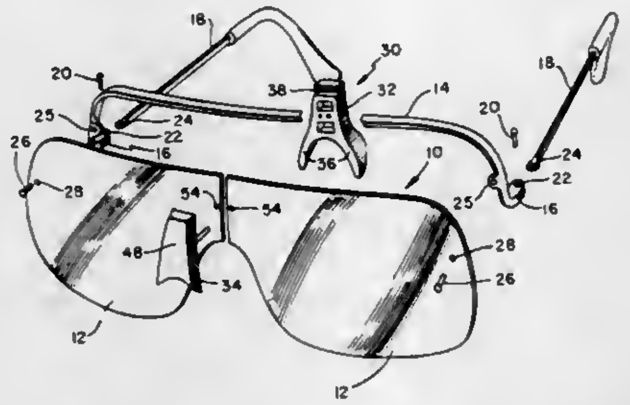
a pair of lenses residing in contiguous edgewise relation for a distance downwardly from the top contour edges of the lenses at the central bridge area of said assembly;

a brow bar extending across the width of said spectacle assembly along the upper edge of said pair of lenses, said brow bar bending downwardly at each end thereof along the side edges of each of said lenses and including portions of said brow bar to which said lenses are connected to near each end thereof and a pair of hinge portions extending rearwardly from the extreme opposite end portions of said brow bar;

a pair of temples pivotly connected to said hinge portions at each end of said brow bar;

a nose bridge assembly consisting of a rear member and a front member;

said rear member including a connecting portion at the upper end thereof engaging said brow bar, a pair of nose engaging pad members extending finger-like from the bottom of said rear member and a central lens engaging portion;



said front member including a lens engaging portion and means for connecting said rear member of said nose bridge assembly with said front member thereof with contiguous portions of said lenses clamped between said lens engaging portions of said front and rear members of said nose bridge assembly.

4,102,567

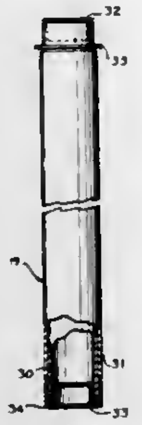
MATERIAL FOR FABRICATION OF ARTIFICIAL INTRAOCULAR LENSES AND HARD CONTACT LENSES

Patricia M. Cuffe, Dudley; Albert R. LeBoeuf, Sturbridge, and Edward A. Travnicek, Southbridge, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 13, 1976, Ser. No. 722,961

Int. Cl.^{2} B32B *27/30, 27/36;* G02C *7/04*

U.S. Cl. 351—160 4 Claims



1. A thin hard optical lens of polymethylmethacrylate material of at least 99% polymethylmethacrylate characterized by good machinability, color uniformity, and optical quality, said material being characterized by having an average molecular weight of at least one million and substantial freedom from strain and free from warpage.

4,102,568

APPARATUS FOR INDICATING MOUNTING POSITIONS OF COMPONENTS

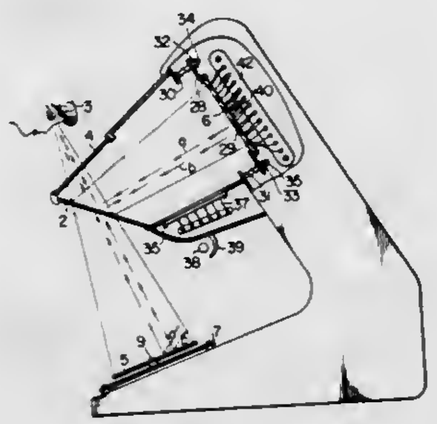
Kiyoshi Miyagi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1975, Ser. No. 641,184

Claims priority, application Japan, Dec. 18, 1974, 49/145932

Int. Cl.^{2} G03B *21/28;* H01R *43/00*

U.S. Cl. 353—28 4 Claims



1. Apparatus for indicating the positions on a printed base at which components such as transistors and resistors are to be mounted, comprising:

a half mirror spaced from said printed base,

component mounting position indicating means comprising

a base containing a plurality of apertures at positions therein corresponding to positions on said printed base at which said components are to be mounted, said component mounting position indicating means being located adjacent said half mirror, said half mirror being positioned such that an operator, when viewing said half mirror, sees therein said printed base and superimposed thereon said component mounting position indicating means,

a light source means,

a plurality of light conductors mounted one each in said apertures,

means for adjusting the relative positions of said printed base and said component mounting position indicating means with respect to each other so that said printed base and said component mounting position indicating means optically conform with each other when viewed through said half mirror,

a plurality of component compartments,

means for exposing a selected one of said compartments at a time to provide access thereto,

means for selectively controlling the illumination of said light conductors by said light source means to thereby illuminate the position on said component mounting position indicating means corresponding to the position on said printed base where a selected component is to be mounted, said means for selectively controlling being coupled to and in interlocking relation with said means for exposing to provide access to the compartment holding said selected component, and

a guide plate located adjacent said component mounting position indicating means containing other light conductors mounted therein, said other light conductors being selectively illuminated by said light source means in accordance with said means for selectively controlling, said guide plate providing instructions for mounting said selected component and being visible simultaneously with said superimposed image of said printed base and component mounting position indicating means.

4,102,569

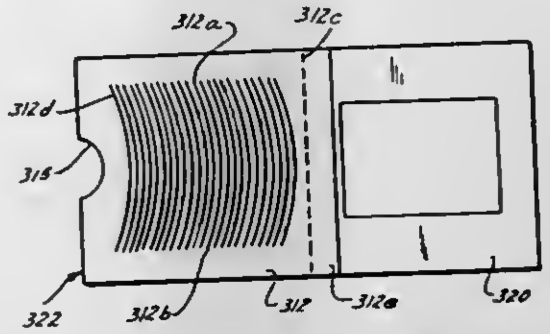
SOUND SLIDE

Morris Schwartz, Plainville, Conn., assignor to Kalart Victor Corporation, Plainville, Conn.

Filed Sep. 7, 1976, Ser. No. 720,951

Int. Cl.^{2} G03B *21/02, 31/06*

U.S. Cl. 353—120 2 Claims



1. A sound slide assembly for a sound slide projector having a sound head movable along a circularly curved path, said assembly comprising: a substantially rectangular plate-shaped single frame body made of rigid material, said body incorporating an image-bearing section and a magnetic sound track section, said two sections being permanently joined to each other along a common edge, said image-bearing section including four side portions defining one opening adapted to receive and maintain in fixed position a photographic transparency, one of said side portions having a crosswise width larger than the other side portions, said one side portion constituting a support base for said sound track section, said support base being covered on its opposite surfaces with magnetic recording material for receiving on said material on each of said surfaces a sound track, each of said sound tracks including a series of spaced, uniformly long tracks which are arcuate in shape and consist of segments of circles all centers of which are located at points at or beyond the outer edge of the sound track section of said widened portion of said sound side body, the line connecting said centers, when extended, substantially bisects the image bearing section.

4,102,570

TRANSFER TYPE COPIER

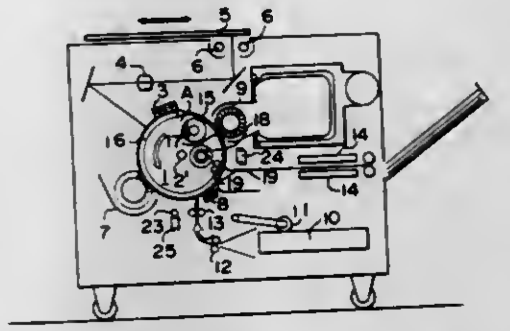
Kazuho Shimoda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 506,203, Sep. 16, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,362

Claims priority, application Japan, Sep. 19, 1973, 48-104873

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—16 3 Claims



1. In a transfer type copier of the type having a drum rotatably mounted between a pair of side panels, and a long web of photosensitive medium mounted on supply and take-up reels within said drum in which a portion of the web is adapted to be carried on part of the peripheral surface of the drum, and means for advancing said web to move said portion back into said drum and to replace said portion with an unused portion of said web, the improvement comprising a drum lid normally engageable with the peripheral surface of said drum and form-

ing that part of the peripheral surface of said drum which does not support said web, and in which said drum lid is movable between a first position in which said lid is connected to and rotatable with said drum and a second position in which said lid is lifted and disconnected from said drum body and not rotatable therewith, in combination with a pair of projections integral with and extending outwardly from opposite ends of said drum and each having an opening therethrough, a pair of extensions normally engageable with said openings connecting said drum lid to said drum for rotation therewith when said drum lid is in said first position, a shaft having an operating knob at one end thereof rotatably supported between said panels, and lever means actuated by rotation of said shaft for lifting said drum lid to said second position, moving it away from the periphery of said drum and disengaging said extensions from said openings, whereby said drum may be rotated independently of said drum lid.

4,102,571

METHOD FOR OPTICALLY MEASURING A DISTANCE

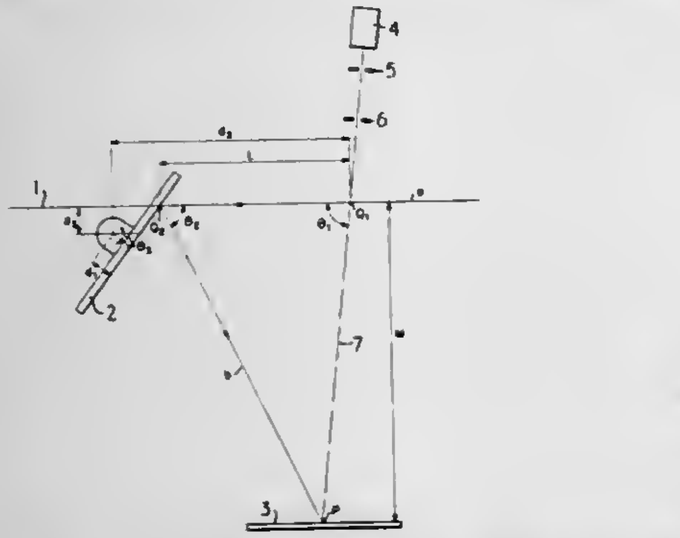
Mamoru Hayamizu, and Yasushi Tanigaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,429

Claims priority, application Japan, Oct. 31, 1975, 50-131788

Int. Cl.^{2} G01C *3/00, 3/08*

U.S. Cl. 356—1 **4 Claims**



1. A method for optically measuring the distance from a reference axis to an object comprising: providing a rotatable polyhedron mirror having a rotary axis about which the mirror rotates and having a plurality of mirror surfaces disposed different distances from said rotary axis; continuously rotating said polyhedron mirror at a constant speed; irradiating a light beam along a predetermined reference axis toward said polyhedron mirror so that each of the rotating mirror surfaces successively reflects the light beam and sweeps the reflected light beam in a line over the object to develop a train of reflected light pulses; and successively detecting by a photodetector the reflected light pulses reflected from a predetermined spot along the swept line and determining the rotary angles of said mirror at the instant of the reflected light detection by said photo-detector, whereby the distance between said spot and said predetermined reference axis can be calculated with the rotary angles of said mirror and with the distances of said mirror surfaces from said rotary axis of the polyhedron mirror.

4,102,572

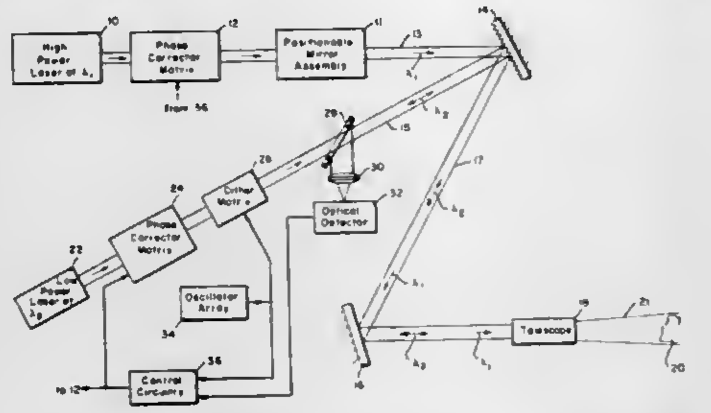
DUAL-WAVELENGTH COHERENT OPTICAL ADAPTIVE SYSTEMS

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 11, 1977, Ser. No. 823,815

Int. Cl.^{2} G01C *3/08;* H01S *3/00*

U.S. Cl. 356—5 **15 Claims**



1. An energy transmission system adapted for compensating for phase distortion in a propagation path to a target, said system comprising:

- means for producing a first energy beam of a first wavelength;
- means for directing said first energy beam along a first path to the target;
- adaptive subsystem means, responsive to energy at a second wavelength returned to the system from the target along a path substantially identical to at least the portion of said first path between the target and the system, for continuously mesuring the phase distortion in said return path and for producing control signals indicative of said measured values; and
- phase corrector matrix means disposed in the path of said first beam and responsive to said control signals for adjusting the relative phase across said first beam so as to compensate for the measured phase distortion;

whereby the energy across said first beam at the target is caused to approach an in-phase condition.

4,102,573

ELECTRODE FOR A SPECTRO-ANALYTICAL ARRANGEMENT

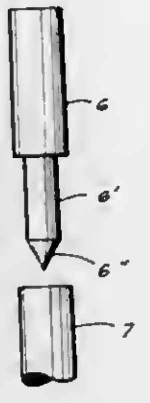
Wilhelm Berstermann, Georgsmarienhutte, Fed. Rep. of Germany, assignor to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,796

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607596

Int. Cl.^{2} G01J *3/30*

U.S. Cl. 356—86 **10 Claims**



1. In an arrangement for spectro-analytically determining the compositions of the materials of metallic bodies using an electric spark discharge between an electrode and a respective metallic body, the improvement wherein the electrode is of a substance consisting of carbonaceous and metallic components.

4,102,574

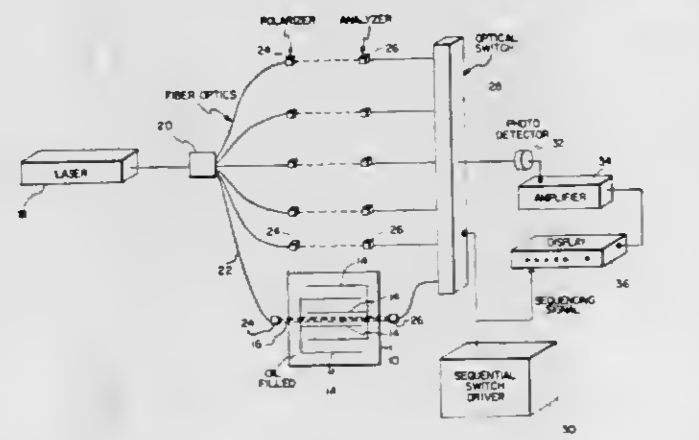
METHOD AND MEANS OF MONITORING THE QUALITY OF A FLUID DIELECTRIC

Herman H. Wieder, and Neil M. Davis, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 11, 1977, Ser. No. 795,690

Int. Cl.^{2} G01N *21/40*

U.S. Cl. 356—117 **7 Claims**



4. Apparatus for monitoring the quality of a fluid dielectric of a capacitor comprising:

(a) a capacitor having a case filled with dielectric fluid and the capacitor plates submerged in said fluid, opposite walls of said case having apertures in alignment with each other,

(b) a source of high intensity light and a first polarizer positioned adjacent one of said apertures for emitting a plane-polarized high intensity light beam through one of said apertures between two of the plates of said capacitor and through the other aperture,

(c) a second polarizer and a light detecting means positioned to detect the amount of said light beam that passes through said dielectric field.

4,102,575

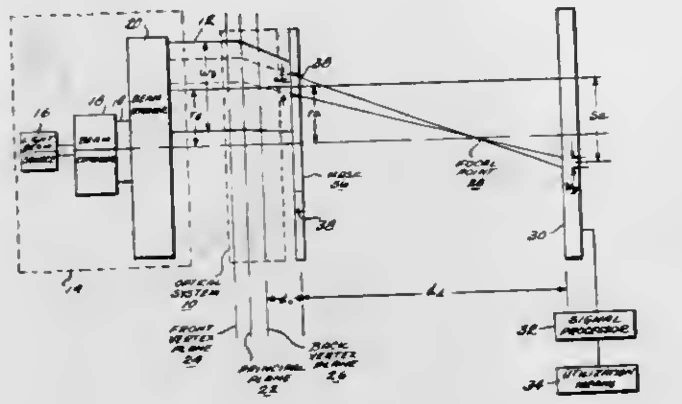
BACK VERTEX ANNULAR APERTURE

Edward F. Lapornik, Washington, D.C., and Douglas D. Rife, Herndon, Va., assignors to Acuity Systems, Incorporated, S. Reston, Va.

Filed Mar. 28, 1977, Ser. No. 782,297

Int. Cl.^{2} G01B *9/00*

U.S. Cl. 356—125 **7 Claims**



1. In an apparatus for measuring refractive properties of a sphero-cylindrical optical system having a vertex and a focal point, said apparatus being of the type including a light source for providing a collimated beam of light of predetermined beamwidth in a predetermined direction, means for positioning said optical system in the path of said beam of light, means for effecting a relative rotation between said light beam and said optical system about an axis parallel to said predetermined direction such that said light beam effectively scans said optical system, to produce a refracted light beam, said refracted light beam tending to illuminate a portion of a subsequent plane parallel to said optical system plane; photodetector means for generating a signal indicative of the instantaneous meridional radial position of said refracted light beam in said subsequent plane, said photodetector signal having predetermined frequency components indicative of respective refractive properties of said optical system; and signal processor means, responsive to said plurality of photodetector output signal frequency components, for generating output signals indicative of said respective refractive properties, the improvement wherein:

- said refracted light beam moves about a locus in an intermediate plane, said intermediate plane being parallel to said optical system plane and at a predetermined axial distance from said vertex; and said apparatus further comprises:
- means including an annular aperture therein for admitting to said subsequent plane only such portion of said light beam as passes through said aperture, said aperture having a predetermined radius and radial width, and being disposed within said locus at said intermediate plane, said radial width being less than the radial width of said locus, whereby deviations in said refracted beam radial position from said predetermined radius are representative of the spherical power of said lens in the instantaneous meridian scanned;
- said aperture including a predetermined number of supportive members connecting said inner and outer edges, said supportive members generating spurious frequency components in said photodetector output signal at frequencies other than said predetermined frequency components; and wherein
- said signal processor means includes means for discriminating between said predetermined frequency components and said spurious frequency components.

4,102,576

MONOCHROMATOR COMBINING A PLURALITY OF LIGHT DISPERSING ELEMENTS

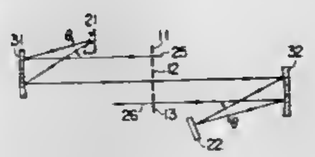
Yoshio Maeda; Koichi Matsumoto, both of Katsuta, and Kenji Fukuda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

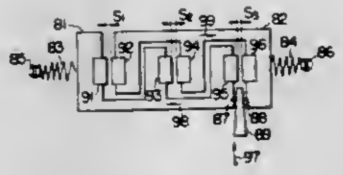
Filed Oct. 21, 1976, Ser. No. 734,636

Claims priority, application Japan, Oct. 27, 1975, 50/129023

Int. Cl.^{2} G01J *3/12*

U.S. Cl. 356—101 **12 Claims**

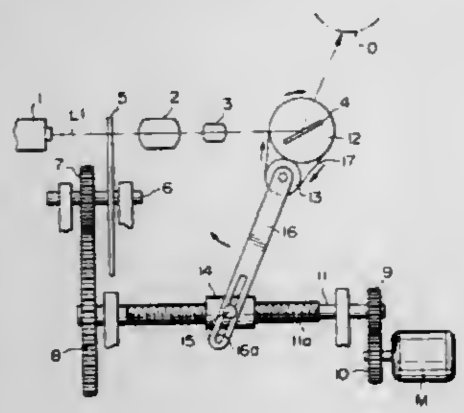




1. A monochromator combining a plurality of light dispersing elements, comprising $(n + 1)$ slits, n light dispersing elements and a plurality of optical collimating elements, n being a natural number, wherein an entrance slit, a first light dispersing element, a first intermediate slit, . . . , an n-th light dispersing

element and an exit slit are successively arranged in a travelling direction of light along its optical path with one of the first and the *n*-th light dispersing element being formed of a prism and each of the other light dispersing elements or another element being formed of a diffraction grating, and the width of the slit disposed adjacent to said prism at the end of the optical path in the monochromator being made greater by a predetermined width than the width of an intermediate slit disposed adjacent to said prism, said predetermined width being not smaller than a deviation of light having a required wavelength resulting from either rotational errors or variation of refractive index of the prism due to variation of temperature.

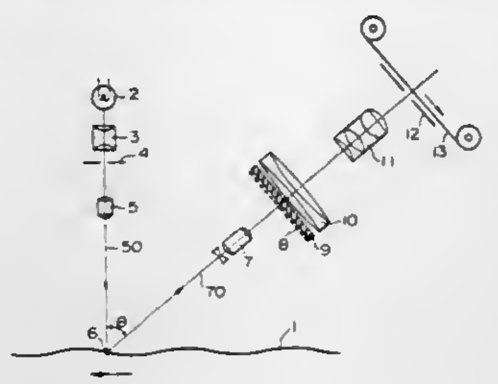
4,102,577
METHOD OF FORMING MOIRE CONTOUR LINES
Masane Suzuki, and Kiyoshi Suzuki, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Jan. 4, 1977, Ser. No. 755,728
Int. Cl.^{2} G01B *11/24*
U.S. Cl. 356—169 **4 Claims**



1. A method of forming a moire contour line pattern representing the surface configuration of a three-dimensional object comprising the steps of:
generating a light beam,
periodically chopping the light beam at a given frequency,
converting said light beam into a plane of light directed to an object,
causing said plane of light to scan in the direction normal to itself as said chopping proceeds thereby forming, in result, an image of a grating on the object, and
superposing said image of the grating with a standard grating to form a moire pattern which represents the surface configuration of said object.

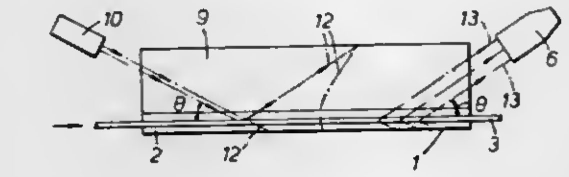
4,102,578
METHOD OF AND APPARATUS FOR RECORDING SURFACE IRREGULARITY OF OBJECT
Masane Suzuki, and Kiyoshi Suzuki, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan
Filed Jan. 13, 1976, Ser. No. 648,814
Claims priority, application Japan, Jan. 15, 1975, 50-6780
Int. Cl.^{2} G01B *11/24*
U.S. Cl. 356—120 **7 Claims**

1. A method of recording surface irregularities of a moving object in the form of contour lines comprising the steps of:
feeding an object in the direction in which the surface thereof extends,
forming a slit image on the surface of the object by means of a first focusing optical system, said slit image extending in the direction perpendicular to the direction in which the object is fed,
projecting an image of the slit image formed on the surface of the object onto a grid by means of a second focusing optical system having an optical axis inclined at an angle with respect to the optical axis of the first focusing optical system to form a light section moire element consisting of a number of light spots arranged at intervals representing the surface irregularities of the object, the grid being oriented in the position in which respective slits forming the grid are in parallel to the direction of said slit image,
forming an image of the light section moire element on a slit located upon a photographic film through a condenser lens and an anamorphic lens which extends the respective light spots of the light section moire element in the lateral direction so that all the light spots extended are crossed by the slit, and



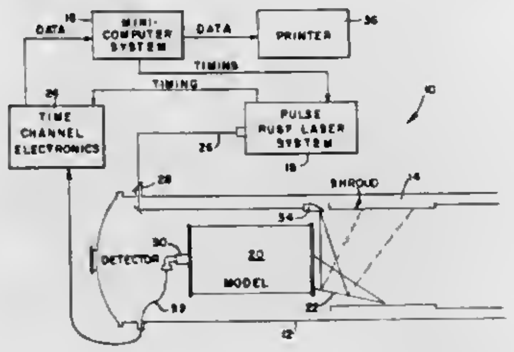
feeding the photographic film in the lateral direction of the slit in synchronization with the movement of the object.

4,102,579
OPTICAL APPARATUS
William James Stewart, Towcester, England, assignor to Plessey Handel nnd Investments A.G., Zug, Switzerland
Filed Nov. 6, 1975, Ser. No. 629,608
Claims priority, application United Kingdom, Nov. 8, 1974, 48337/74
Int. Cl.^{2} G02B *27/00*
U.S. Cl. 356—201 **12 Claims**



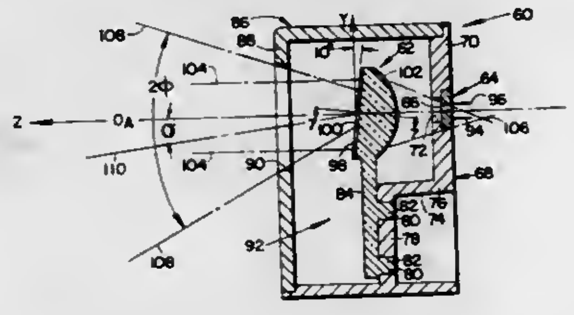
1. An optical apparatus for use in association with an optical fibre having a core member whose cross-sectional boundaries are formed from a set of curves and a cladding member which surrounds the core member and which has a refractive index less than the refractive index of the core member, the apparatus including optical means for examining light radiated at an angle through the cladding member caused by leakage radiation for determining the characteristics of the optical fibre, wherein said optical means includes a prismatic means and optical examining means disposed relative to one face of said prismatic means, said prismatic means includes a container, an optically transparent liquid within said container and through which the optical fibre is passed during its production, at least one wall of the container being of a light transparent material; said optical examining means disposed relative to the said at least one transparent wall of the container for examining the light radiated at an angle through the cladding member; and means adapted to maintain the optical fibre in a parallel relationship with the said at least one transparent wall of the container.

4,102,580
SYSTEM FOR THE MEASUREMENT OF ULTRA-LOW STRAY LIGHT LEVELS
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles L. Wyman; Donald B. Griner; William A. Hurd; Glenn B. Shelton; Gary H. Hunt, all of Huntsville, Ala.; Bill B. Fannin; Robert P. Brealt, both of Tucson, Ariz., and Charles A. Hawkins, Arab, Ala.
Filed Dec. 29, 1976, Ser. No. 755,323
Int. Cl.^{2} G01N *21/48;* G01B *9/00*
U.S. Cl. 356—210 **17 Claims**



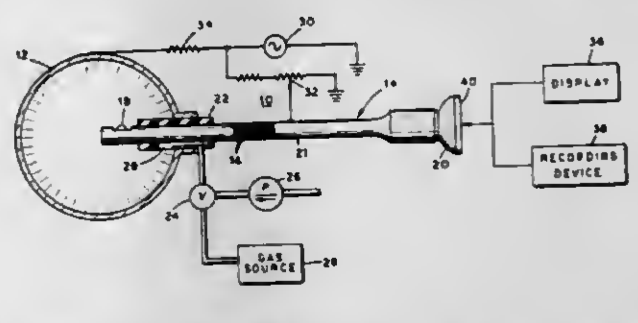
1. A stray light suppression measurement system for determining the effectiveness of a light suppression arrangement comprising:
a vacuum chamber enclosing the light suppression arrangement;
light generating means for producing a short-pulsed high power light beam illuminating a portion of the light suppression arrangement;
detector means provided within the light suppression arrangement for sensing the light reflected onto the image plane of the arrangement, said detector means producing an analog signal; and
time discrimination electronic means connected to said detector means and triggered by the firing of said light generating means for producing a plurality of sample signals into which said analog signal produced by said detector means is loaded thereby producing a time discriminating signal.

4,102,581
UNICELL PHOTOELECTRIC PHOTOMETER
William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 30, 1977, Ser. No. 782,993
Int. Cl.^{2} G01J *1/42;* H01J *3/14*
U.S. Cl. 356—225 **16 Claims**



1. A photometer of the photoelectric type for use in photographic apparatus, said photometer comprising:
a photosensitive transducer having a photosensitive surface of predetermined dimensions, said transducer operating to provide an output response which varies in correspondence with the amount of radiant power incident on said photosensitive surface;
optical means disposed about an optical axis which ultimately intersects said photosensitive surface of said transducer, for optically cooperating with said predetermined dimensions of said photosensitive surface to define a field of view for said photometer, said optical means including:
(a) a first surface through which scene radiation emerges from said optical means, said first surface being configured to converge said radiation emerging from said optical means toward said optical axis onto said transducer, said transducer and said first surface of said optical means, in combination, defining a specific acceptance angle which is substantially rotationally symmetric about said optical axis, and
(b) a second surface positioned to receive radiation from said field of view of said photometer and to introduce said radiation into said optical means, said second surface configured to provide the photometer with specific acceptance angles which are substantially the same as the specific acceptance angle defined by said transducer and said first surface of said optical means, in combination, in one plane while being substantially greater than the specific acceptance angle defined by said transducer and said first surface of said optical means, in combination, in a plane substantially orthogonal to said first plane; and
means for stationing said transducer and said optical means in substantially light tight, spaced apart relation with respect to each other.

4,102,582
EXAMINATION OF INTERIOR SURFACES USING GLOW-DISCHARGE ILLUMINATION
David E. Lord; Richard R. Petrini, and Gary W. Carter, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Nov. 9, 1976, Ser. No. 740,338
Int. Cl.^{2} G01N *21/16*
U.S. Cl. 356—241 **22 Claims**

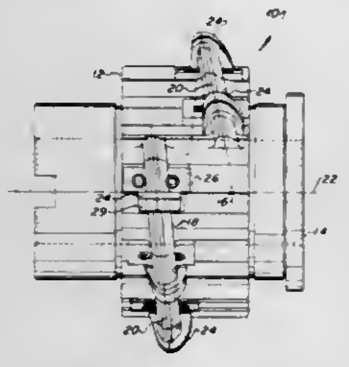


1. A method for examining the interior surfaces of a hollow structure including the steps of:
filling the interior of the hollow structure with an ionizable gas;
ionizing the gas to produce a glow discharge in the gas to illuminate the interior surfaces of the structure; and
examining the glow discharge illuminated surfaces of the structure with a viewing means including a portion positioned within the structure.

4,102,583
PROFILE CUTTER
Arvid L. Nelson, Quincy, Ill., assignor to Gardner-Denver Company, Dallas, Tex.
Filed Mar. 28, 1977, Ser. No. 781,614
Int. Cl.^{2} B26D *1/12*
U.S. Cl. 407—25 **12 Claims**

1. A rotary cutter for use in cutting one or more helical flutes of a predetermined form profile on a generally cylindrical workpiece wherein the workpiece and the cutter are simultaneously rotated about their respective central axes of rotation, said cutter comprising:

- a generally cylindrical cutter body having a longitudinal central axis of rotation; and
- a plurality of cutting blades mounted on said body spaced apart, one blade from the other, with respect to the circumference of said body, said blades being arranged along a helical line with respect to said axis of rotation of said body wherein substantially only one turn of the helix is formed, said blades are spaced apart such that none of the blades are axially aligned with any other blade; and



each blade has a cutting edge the contour of which is different from the cutting edge contour of every other blade and is characterized by a series of points each of which at a particular angular position of said blade with respect to the axis of rotation of said cutter corresponds to the position of a point on the profile of said flute with respect to the axis of rotation of said cutter whereby all points on the profile of said one or more flutes will be cut by each blade of said cutter.

4,102,584
CAPILLARY TUBE PEN POINT

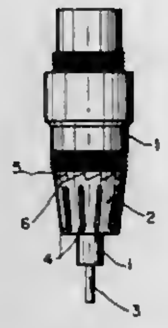
Gerold Anderka, Ellerbek, Fed. Rep. of Germany, assignor to Kob-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Dec. 7, 1976, Ser. No. 748,606

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557705; Dec. 20, 1975, 7540761

Int. Cl.² B43K *1/06*

U.S. Cl. 401—259 **6 Claims**



1. In a capillary writing pen of the type having a cylindrical body portion with an open end a writing pen tip with reservoir and a cartridge shell which is fitted within the cylindrical body such a that a rearward surface of the cartridge shell and the open end of the cylindrical body axially abut each other, while the pen tip extends axially thereof for writing purposes, the improvement comprising:

A. Complemental wave-like surfaces formed in the abutting open end of the cylindrical body and the rearward surface of the cartridge shell such that lateral twisting of said cartridge shell with respect to said cylindrical body results in axial separation of said cartridge shell with respect to said cylindrical body.

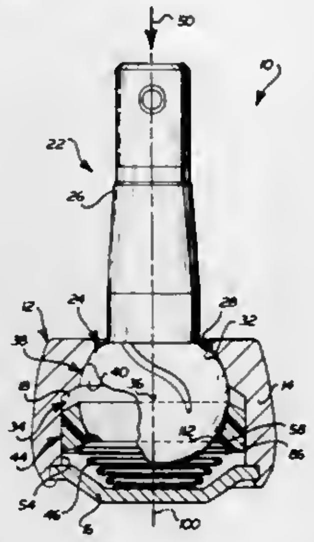
4,102,585
BALL JOINT

Edward John Herbenar, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Jun. 16, 1977, Ser. No. 807,113

Int. Cl.² F16C *11/00;* **F16D** *1/12*

U.S. Cl. 403—138 **15 Claims**



1. A pivot joint comprising a housing defining a socket chamber having a side surface, a ball stud having a head portion disposed in said socket chamber and a shank portion to which axial load forces are applied, bearing means disposed in said socket chamber for supporting said head portion of said ball stud, said bearing means includng a bearing seat having an inner surface area which is disposed in abutting engagement with said head portion of said ball stud and an outer surface area which is disposed in abutting engagement with the side surface of said socket chamber, and means for retaining said bearing seat against movement relative to the side surface of said socket chamber under the influence of axial load forces applied to said shank portion of side ball stud, said means for retaining said bearing seat against movement including means for applying to said bearing seat a static friction force equal to the axial load force applied to said shank portion of said ball stud.

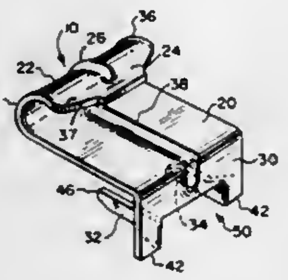
4,102,586
SPRING FASTENER CLIPS FOR WOODEN FURNITURE RAILS

Kenneth Carlton Pearson, Glenview, and Harrison Church Lingle, Northbrook, both of Ill., assignors to Hartco Company, Lincolnwood, Ill.

Filed Jun. 27, 1977, Ser. No. 810,202

Int. Cl.² F16F *3/02*

U.S. Cl. 403—188 **11 Claims**



1. A self-supporting integral sheet metal clip for securing one end of an upholstery spring to the horizontally grained wooden rail of an article of furniture, said clip being formed from an elongated generally rectangular flat blank of sheet metal stock and comprising: a stamping including a flat horizontal base portion designed for positioning on the top surface of the rail and adapted to support said end of the spring, the outer end of said base portion being provided with a downturned leg designed for face-to-face engagement with the outer side of the rail, the lower edge of said downturned leg being formed with a downwardly opening three-sided recess therein having spaced apart side edges of equal extent and which, when the clip is in position on the rail, traverse the wood grain of the rail at a relatively steep angle, the upper edge of recess extending horizontally, and an anchor prong projecting laterally at a right angle to the plane of the leg from each of said side edges and adapted to penetrate the wood of the rail when the leg is forced toward the latter, said side edges constituting fold lines along which the anchor prongs are bent laterally out of the plane of the blank, said anchor prongs being equal in extent to the width of the recess so that in the flat blank they overlap each other and substantially fill the space between the fold lines whereby, when the prongs are folded out of the blank, one prong assumes an elevation which is higher than the elevation of the other prong to the end that the prongs will penetrate the wood of the rail at different elevations.

4,102,587
ANGLE-SHAPED SUPPORT MEMBER

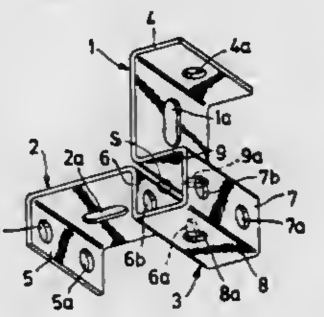
Armin Herb, Peissenberg; Erich Leibhard, and Raimer Uhlig, both of Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed May 18, 1977, Ser. No. 797,922

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623476

Int. Cl.² F16B *9/00*

U.S. Cl. 403—205 **16 Claims**



1. In an angle-shaped support member having a first leg and a second leg with said first and second legs disposed substantially normal to one another, said first and second legs each having a first end located adjacent to one another and a second end spaced from said first end, a flange located at the second end of each of said first and second legs and extending outwardly from said second end in the direction opposite to the direction in which the other said leg extends from said first end, each of said flanges having at least one opening therethrough for receiving a bar extending therethrough, wherein the improvement comprises a box-shaped section secured to and extending outwardly from each of said first ends of said first and second legs oppositely from the direction extending from the first end to the second end of said legs, said box-like section having a first wall extending outwardly from said first end of said first leg and a second wall extending outwardly from the first end of said second leg, one surface of said first wall facing toward said flange located at the second end of said first leg, one surface of said second wall facing toward said flange located at the second end of said second leg, and at least one other wall interconnecting the ends of said first and said second walls spaced outwardly from the first ends of said legs, said first wall and said at least one other wall having at least one opening extending through each of them and the openings being aligned with the at least one opening in said flange extending from said first leg for receiving therethrough the bar to be received through the at least one opening in the flange on said first leg, said second wall and said at least one other wall having at least one opening extending through each of them and the openings in said second wall and said at least one other wall being aligned with the at least one opening in said flange extending from said second leg for securing therethrough the bar to be received through the at least one opening in the flange on said second leg.

4,102,588
PIVOT MOUNTING OF LEVERS

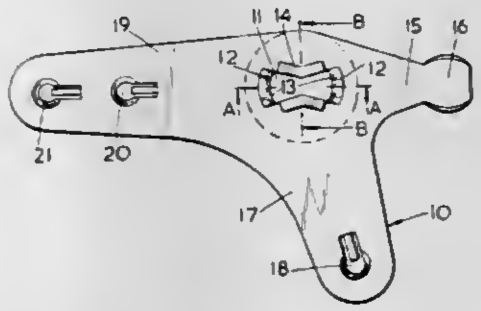
Philip Swingewood Jeavons, Birmingham, England, assignor to Wilmot-Breeden Limited, Birmingham, England

Filed Sep. 16, 1976, Ser. No. 724,066

Claims priority, application United Kingdom, Sep. 16, 1975, 37907/75

Int. Cl.² F16B *9/00*

U.S. Cl. 403—245 **3 Claims**



1. The combination of a plastics lever and a metal support plate relative to which the lever is pivotable between first and second limiting positions; said lever having an aperture which receives a fixed blade projecting from the support plate and the blade being of rectangular form in elevation and including a reduced width neck portion intermediate its ends; the aperture consisting of two segments of a circle which are disposed in overlapping relationship with their medial axes in alignment and the central portions of two opposed sides of the segments being spaced apart a distance less than the spacing between the end portions of said sides of the aperture and the curvate boundary edge portions of the segments, which interconnect said end portions, including resilient locating formations which have snap-engagement with the reduced width neck portion of the blade.

4,102,589
METHOD OF AND MEANS FOR SAFELY RELEASABLY TENSIONING STRUCTURAL PARTS SUCH AS CLAMPING MEMBERS

Helmut Haas, and Klaus-Peter Baulig, both of Cologne, Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed May 21, 1976, Ser. No. 688,717

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522610

Int. Cl.² B25G *3/20*

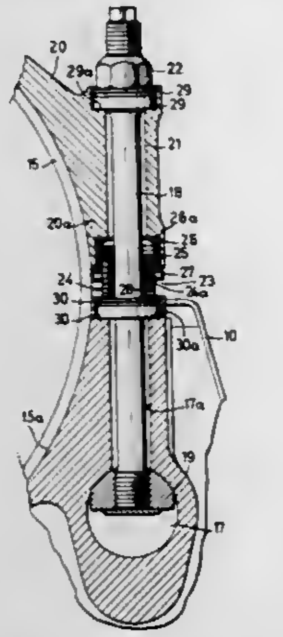
U.S. Cl. 403—373 **7 Claims**

1. In combination with clamping structures having complementary clamping portions for releasably clamping a member which is subject to constant vibrations in use, said clamping structures having spaced drawup portions:

- a securing and tensioning bolt extending in securing relation between said spaced drawup portions and adapted to be drawn up to effect an initial first stage drawing of said drawup portions toward one another to effect pressing of the clamping portions of said structures into retaining clamping engagement with said member to a sufficient prestress level to clamp said member firmly and positively in place but leaving said drawup portions in limited spaced relation defining a gap between the drawup portions;
- said drawup portions having respective shoulders facing toward one another in surrounding relation about said bolt at opposite sides of said gap;
- a two-part relatively adjustable safety spacer device extending across said gap and surrounding said bolt between said

shoulders without interfering with approach of said shoulders during said initial first stage drawing up of the drawup portions;

said two parts of the safety spacer device being adjustable relative to one another after said initial first stage drawup to engage thrustingly in positive rigid spacing relation against said shoulders to hold the spaced first stage drawn up drawup portions against further approach toward one another;



and said bolt being adapted to be drawn up into a second stage tensioned condition of the bolt on the drawup portions to strongly resist loosening of the bolt due to vibrations in the assembly, said adjusted safety spacer device rigidly maintaining said gap between the drawup portions and restraining the drawup portions against increasing clamping pressure of said clamping portions against said member beyond said initial first stage drawing up pressure exerted by action of said bolt on said drawup portions.

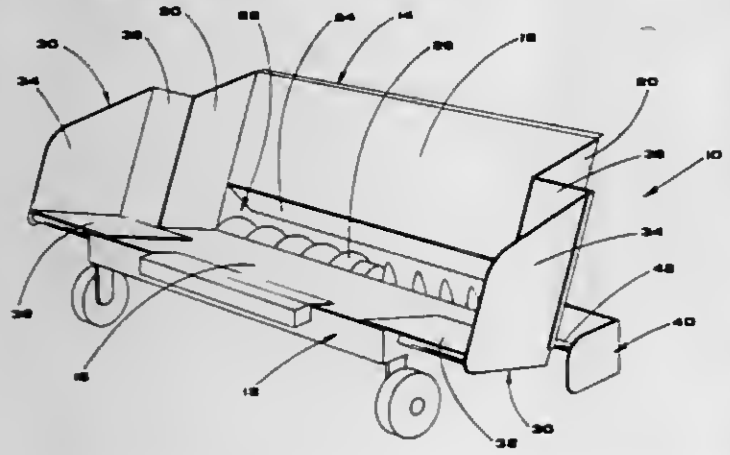
4,102,590
PULL TYPE ASPHALT PAVER

Edward A. Zanzie, St. Louis, Mo., assignor to Paving Products, Inc., St. Louis, Mo.

Filed Nov. 14, 1977, Ser. No. 851,150

Int. Cl.² E01C *19/18*

U.S. Cl. 404—110 **5 Claims**



1. A pull type asphalt paver for spreading asphalt onto a road surface, said paver including a wheeled frame which supports a hopper for receiving asphalt from a dump truck associated therewith, said hopper having a bottom section, a back section and opposite side sections connecting the bottom and back sections to each other, said hopper also being provided with a chute in the vicinity of the juncture of the bottom and back sections through which the asphalt is discharged onto a road surface, said hopper further being provided with laterally movable wing sections on opposite sides of said hopper along bottom and side sections thereof to accomodate dumping of asphalt into the hopper when the dump truck bed is raised without causing contact between the dump truck and the paver, each laterally movable wing section on opposite sides of said hopper being provided with a bottom extension, side extension and back extension, the bottom and side extensions of each laterally movable wing section being laterally movable in and out relative to the bottom and side sections of the hopper, and the back extension of each laterally movable wing section being pivotally mounted relative to the side sections of the hopper in order to enable the back extension of each laterally movable wing section to be disposed substantially parallel to the side sections of the hopper and allow asphalt to be discharged through the bottom and side extensions of each laterally movable wing section.

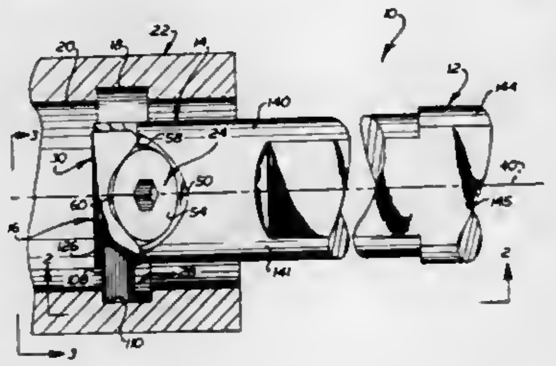
4,102,591
CUTTING TOOL

Arnold B. Alcorn, Wooster, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Dec. 30, 1976, Ser. No. 755,734

Int. Cl.² B26D *1/00*

U.S. Cl. 407—100 **48 Claims**



1. A device for use in cutting material from within an opening formed in workpiece, said device comprising a longitudinally extending tool holder having an outer end portion adapted to extend into the opening in the workpiece, said outer end portion of said tool holder including surface means for defining a recess having a bottom surface and a flat planar side surface extending transversely to said bottom surface, said recess having at least one open end located at one end of said flat planar side surface, said outer end portion of said tool holder further including surface means for defining a threaded opening which extends transversely to said bottom surface of said recess, an insert adapted to be received in said recess in said outer end portion of said tool holder and having a cutting portion engageable with the workpiece, said insert having a top surface, a bottom surface opposite from said top surface and adapted to abuttingly engage the bottom surface of said recess, a first side portion interconnecting said top and bottom surfaces of said insert, said first side portion having a flat planar surface area adapted to abuttingly engage the flat planar side surface of said recess, a second side portion interconnecting said top and bottom surfaces of said insert and disposed opposite from said first side portion, said second side portion of said insert including side surface means for defining a recess intersecting said top surface and having an open side facing outwardly in a direction away from said first side portion of said insert, said side surface means sloping away from said top surface of said insert in a direction away from said first side portion of said insert, and a pair of opposite end portions interconnecting said top and bottom surfaces and disposed at opposite ends of said side portions, said end portions of said body being at least slightly smaller than said open end of said recess in said tool holder to enable said insert to be moved in said recess in said tool holder along a path extending parallel to said

flat side surface, and screw means for holding said insert against movement in said recess in said tool holder along said path, for pressing said bottom surface of said insert against said bottom surface of said recess in a tool holder and for pressing said flat planar surface area of said first side portion of said insert against said flat planar side surface of said recess in said tool holder, said screw means including a shank portion disposed in engagement with said threaded opening in said tool holder and a head end portion, said head end portion of said screw means extending through the open side of said recess in said insert into engagement with said side surface means to apply against said side surface means force having a component directed toward said bottom surface of said recess in said tool holder and another component directed toward said flat planar side surface of said recess in said tool holder.

23. A device for use in cutting material from within a workpiece, said device comprising an insert having a body adapted to be received in a recess in a tool holder, said body of said insert having a bottom surface adapted to engage a bottom surface of the tool holder recess, a top surface spaced apart from and extending generally parallel to said bottom surface, a pair of opposite side portions interconnecting said top and bottom surfaces, at least one of said side portions being adapted to engage a side of the recess in the tool holder, and a pair of opposite end portions interconnecting said top and bottom surfaces and disposed at opposite ends of said side portions, and a cantilevered cutting portion which is smaller than and integrally formed with said body and extends outwardly from one of said end portions, said cantilevered cutting portion having a cutting edge adapted to cut metal from the workpiece and a face surface extending from said cutting edge and intersecting said body at a location between said opposite side portions, said face surface extending at an acute angle to said top and bottom surfaces of said body, said cantilevered cutting portion extending outwardly from said one of said end portions for a distance which is less than the distance between said opposite end portions, said cantilevered cutting portion having a maximum width measured on said face surface parallel to said one end portion which is less than the distance between said opposite side portions, said cantilevered cutting portion having a pair of bottom surfaces which extend transversely to each other and to said face surface, one of said pair of bottom surfaces on said cantilevered cutting portion being disposed in a coplanar relationship with the bottom surface of said body, the other bottom surface of said pair of bottom surfaces being disposed in a plane which is coplanar with a surface of one of said side portions of said body.

4,102,592
MULTIPLE SPINDLE INCLINED DRILLING MACHINE

Harold C. Mackinder, Livonia, Mich., assignor to Lincoln Park Engineering, Inc., Romulus, Mich.

Filed Aug. 5, 1977, Ser. No. 822,080

Int. Cl.² B23B *39/18*

U.S. Cl. 408—46 **14 Claims**

1. In a multiple spindle inclined drilling machine;

a base;

a bed on said base inclined at an acute angle to the horizontal in the range of 20° to 40°, approximately;

a drill unit mounted upon said bed, said drill unit including:

an internally splined cylinder rotatively journaled within the drill unit and inclined at a corresponding acute angle;

a piston rod with a splined connection to said cylinder projecting therefrom for effecting controlled reciprocal movements;

a multiple spindle head spaced above and slidably mounted on said bed and projecting forwardly of said drill unit and connected to said piston rod for reciprocal movements therewith;

an upwardly and rearwardly inclined fixture mount plate secured upon said bed lying in a plane at right angles thereto facing said head;

spaced parallel guide support rods above, parallel to and secured at one end to said bed with the other end of each rod secured to said mount plate;

apertured support means on and adjacent the forward end of said multiple spindle head, slidably and guidably mounted upon said rods;

a rotative drive means on said drill unit having a variable speed output shaft connected to said cylinder for rotating its piston rod;

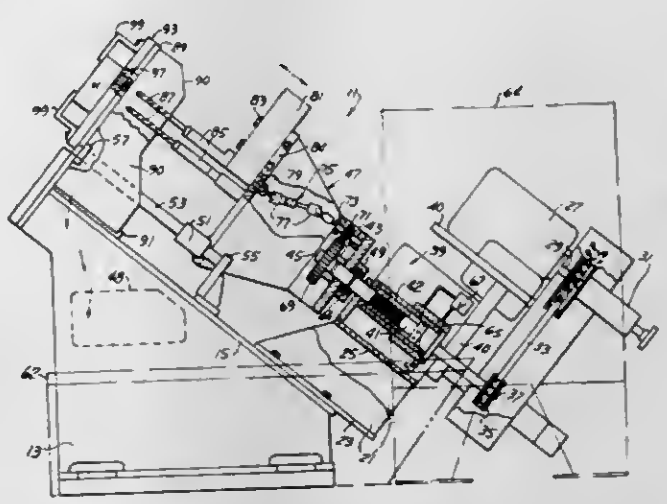
and a plurality of drive spindles with individually mounted drills adjustably supported upon and within said head and connected to and rotated by said piston rod.

7. In a multiple spindle inclined drilling machine;

a base;

a bed on said base inclined at an acute angle to the horizontal in the range of 30° to 40° approximately;

guideways on said bed;



a slide spanning and guidably mounted upon said guideways;

a hydraulic cylinder assembly mounted upon said bed between said ways with its piston rod connected to said slide for effecting controlled reciprocal movements thereof;

a multiple spindle head mounted upon said slide and projecting forwardly thereof;

an apertured fixture adapter mounted upon said bed lying in a plane at right angles thereto and having an apertured upwardly and rearwardly inclined front face;

an upwardly and rearwardly inclined fixture mount plate spanning and overlying and secured to the front face of said adapter plate;

a power rotative drive means on said slide;

and a plurality of drive spindles with individually mounted drills, reamers, or taps adjustably supported upon and within said head and connected to said drive means.

4,102,593
FLUID PRESSURE DRILL FEEDING DEVICE

Keld Torben Schneider Sorensen, Auckland, New Zealand, assignor to K. & V. Sorensen Engineering Ltd., Auckland, New Zealand

Filed Feb. 27, 1976, Ser. No. 661,929

Claims priority, application New Zealand, Mar. 5, 1975, 176840

Int. Cl.² B23B *39/10, 47/16*

U.S. Cl. 408—130 **10 Claims**

1. A drill comprising:

a support shaft;

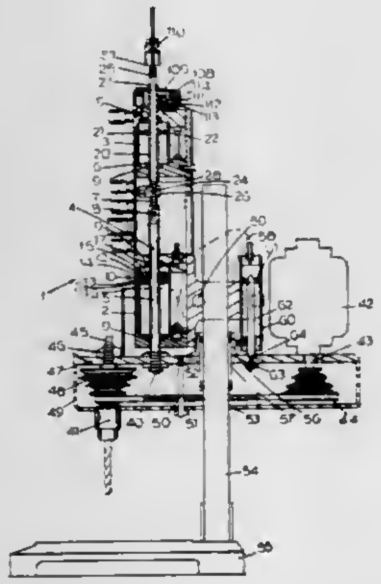
a pneumatic cylinder rigidly affixed to said support shaft;

a control shaft passing through said pneumatic cylinder;

a pneumatic piston mounted within said pneumatic cylinder on said control shaft;

a hydraulic damping cylinder rigidly mounted with respect to said support shaft and positioned such that the longitudinal axes of said pneumatic cylinder and said hydraulic damping cylinder are in substantial alignment;

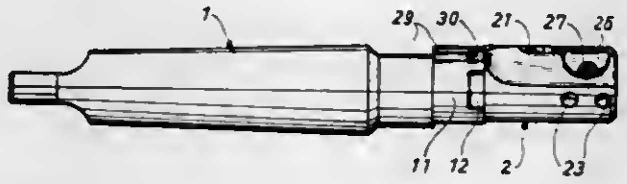
a hollow member passing through said hydraulic damping



cylinder and having said control shaft passing therethrough and extending from the ends thereof;
a hydraulic piston mounted within said hydraulic damping cylinder on said hollow member;
axially adjustable first engagement means between said control shaft member and said hollow member such that movement of the piston in said pneumatic cylinder in the direction away from said hydraulic damping cylinder causes said control shaft to move a distance predetermined by the position of said first engagement means on said control shaft before said first engagement means engages that end of said hollow member which is further from said pneumatic cylinder to thereby cause said hollow member to move said piston in said hydraulic damping cylinder;
second axially adjustable engagement means positioned on said control shaft between said hollow member and said pneumatic cylinder such that movement of the piston in said pneumatic cylinder in the direction toward said hydraulic damping cylinder causes said control shaft to move through a distance predetermined by the position of said second engagement means on said control shaft before said second engagement means engages that end of said hollow member which is nearer said pneumatic cylinder to thereby cause said hollow member to move said piston in said hydraulic damping cylinder;
a support member rigidly affixed to said control shaft externally of said pneumatic cylinder and said hydraulic damping cylinder, said support member being slidably movable on said support shaft;
a drill shaft rotatably mounted on said support member and having a drill chuck mounted thereon, said drill shaft being mounted on said support member in a manner such that relative movement between said drill chuck and said support member in a direction substantially parallel to the longitudinal axis of said drill shaft is substantially prevented;
a motor carried by said support member so that for each change of position of said drill chuck there is a corresponding change in position of said motor; and
drive train provided between said motor and said drill shaft.

4,102,594
FLOATING REAMER

Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany
Filed Nov. 2, 1976, Ser. No. 738,327
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1976, 2549325
Int. Cl.^{2} B23B *29/02, 51/00, 27/16*
U.S. Cl. 408—186 **6 Claims**



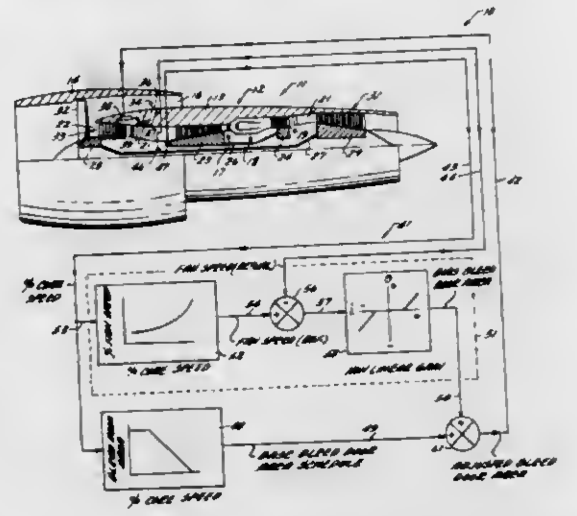
1. A floating reamer comprising:
(a) a shank having an axis of rotation,
  (1) one axial end portion of said shank being forked into two branches radially defining a recess therebetween and having respective guide faces in said recess,
  (2) said guide faces being parallel to said axis of rotation,
  (3) said shank having a third guide face axially bounding said recess and substantially perpendicular to said axis;
(b) a cutting head having an axis and three guide faces slidably engaging said guide faces of said shank respectively in said recess,
  (1) two guide faces of said cutting head being parallel to and equidistant from the axis of said cutting head, and the third guide face of said cutting head being substantially perpendicular to the axis of said cutting head,
  (2) the engaged guide faces of said shank and of said cutting head jointly constituting guide means for guiding said cutting head on said shank in a path toward and away from a position in which said axes coincide;
(c) a securing lug projecting from one of said branches into said recess, one of the two parallel guide faces of said cutting head being formed with a groove movably receiving said lug for axially securing said cutting head to said shank;
(d) two cutting blades mounted on said cutting head,
  (1) each of said blades having at least one cutting edge elongated in the direction of the axis of said cutting head and projecting from said cutting head in opposite radially outward directions substantially parallel to said two guide faces of said cutting head,
  (2) whereby said cutting head oscillates in said path under alternating stresses applied to said cutting edges;
(e) means for radially adjusting each blade on said cutting head and for fixedly securing each blade in the adjusted position; and
(f) two abutment members mounted on said shank and projecting into said path to limit movement of said cutting head away from said position.

4,102,595
BLEED VALVE CONTROL SYSTEM

Robert C. Wibbelsman, Cleves, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Oct. 19, 1976, Ser. No. 733,876
Int. Cl.^{2} F01D *17/06*
U.S. Cl. 415—1 **14 Claims**

1. An improved turbomachine bleed control system of the type having in serial flow relationship a first compressor, a bleed system, and a second compressor, the bleed system being capable of bleeding off discharge air from the first compressor in response to a bleed schedule which varies as a function of airflow in the second compressor wherein the improvement comprises:

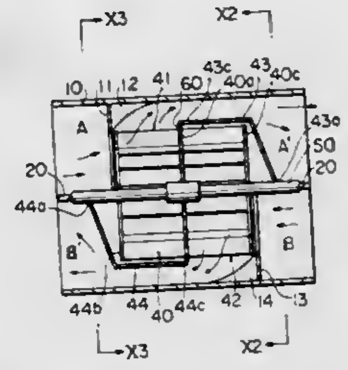
a. means for sensing the first compressor speed and generating a biasing signal as a function thereof; and



b. means for generating a modified bleed schedule by applying said biasing signal to the bleed schedule.

4,102,596
VENTILATING SUCTION AND EXHAUST FAN DEVICE OF SIROCCO TYPE

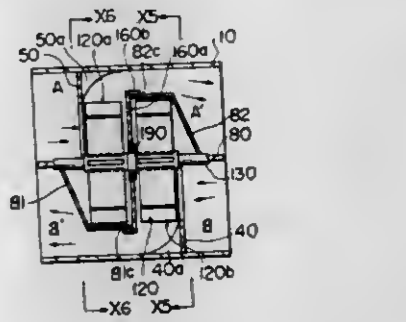
Shinichi Itayama, Osaka, Japan, assignor to Teizo Sakai, Osaka, Japan
Filed Mar. 30, 1977, Ser. No. 782,781
Claims priority, application Japan, Mar. 31, 1976, 51/36534
Int. Cl.^{2} F01D *3/02*
U.S. Cl. 415—101 **6 Claims**



1. A ventilating suction and exhaust fan device of Sirocco type, characterized in that it comprises a casing of cylindrical shape; a partition plate mounted within the casing and extending in a horizontal plane passing through a central axis of the casing and having a rectangular opening formed therein; a cylindrical impeller of Sirocco type rotatably mounted in said opening of the partition plate coaxially with respect to the cylindrical casing, said impeller comprising a central vertical partition disc, a first cylindrical impeller section for exhaustion of air arranged on one side of the disc and a second cylindrical impeller section for suction of air arranged on the other side of the disc; first hood means for preventing the first impeller section from contacting the suction air; and second hood means for preventing the second impeller section from contacting the exhaust air.

4,102,597
VENTILATING SUCTION AND EXHAUST FAN DEVICE OF PLATE TYPE

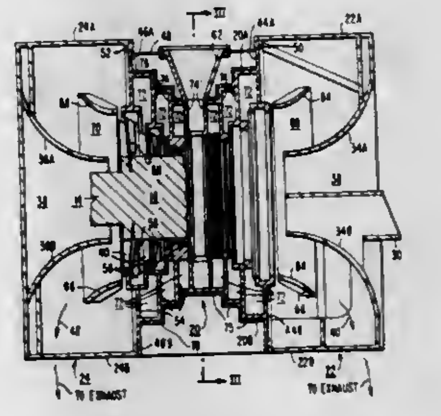
Shinichi Itayama, Osaka, Japan, assignor to Teizo Sakai, Osaka, Japan
Filed Mar. 30, 1977, Ser. No. 782,782
Claims priority, application Japan, Mar. 31, 1976, 51-36535
Int. Cl.^{2} F01D *3/02*
U.S. Cl. 415—101 **8 Claims**



1. A ventilating suction and exhaust fan device of plate type, characterized in that it comprises a casing of cylindrical shape; a horizontal plane passing through a central axis of the casing and having a rectangular opening formed therein; a cylindrical impeller of Plate type rotatably mounted in said opening of the partition plate coaxially with respect to the casing, said impeller comprising at least one impeller section for exhaustion of air, at least one impeller section for suction of air and a central vertical partition disc disposed between said impeller sections; first hood means for preventing said impeller section for exhaustion of air from contacting the suction air; and second hood means for preventing said impeller section for suction of air from contacting the exhaust air.

4,102,598
SINGLE CASE LOW PRESSURE TURBINE

Alvin L. Stock, Nether Providence Township, Delaware County; Gravatt K. Roddis, Media, and William C. Nygren, Middletown Township, Delaware County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 11, 1975, Ser. No. 630,870
Int. Cl.^{2} F01D *25/26, 25/24*
U.S. Cl. 415—135 **8 Claims**



1. A low pressure turbine apparatus comprising:
a rotatable member having blades thereon;
a single casing member surrounding said rotatable member, said single casing member comprising only a center section and axial end sections joined at each axial end of said center section; and
flex plates disposed at each axial end of said center section in such manner that when said end sections are joined thereto said flex plates readily deform to allow differential thermal expansion between said center and end sections.

4,102,599

TURBINE-GENERATOR ASSEMBLY, INSTALLATION AND HOUSING

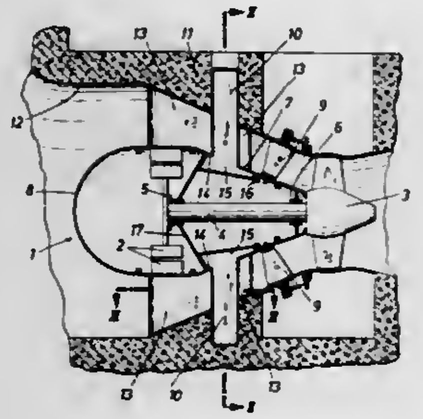
Gerhard Ziegler, Graz, Austria, assignor to Verinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Feb. 22, 1977, Ser. No. 770,900

Claims priority, application Austria, Apr. 13, 1976, 2712/76

Int. Cl.^{2} F03B *11/02*

U.S. Cl. 415—219 R **4 Claims**



4. A housing assembly for a turbine-generator assembly which comprises a central assembly including a shaft, a generator and a water turbine which are axially spaced apart and non-rotatably connected to said shaft, and bearing means for said shaft, which housing assembly is adapted to be installed in a duct structure defining a flow passage and comprises

a shell adapted to surround said central assembly so that said turbine is near one end and said generator is near the other end of said shell and said turbine is adapted to receive water from said flow passage,

at least two arms, each of which projects radially from said shell and has an outer end adapted to be anchored in said duct structure, and an inner end disposed inside said shell,

a plurality of spars, each of which extends in said shell substantially parallel to the axis of said shaft and is rigid with the inner end of one of said radial arms and has mutually opposite first and second end portions, which are respectively nearer to said one end and said opposite end of said shell,

a peripheral reinforcing flange disposed in and rigid with said shell and with said first end of each of said spars, and

retaining means disposed in and rigid with said shell and with said second end portion of each of said spars, whereby said radial arms are rigidly interconnected.

4,102,600

MOVING BLADE RING OF HIGH CIRCUMFERENTIAL SPEED FOR THERMAL AXIALLY PASSED THROUGH TURBINES

Günter Schwab, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

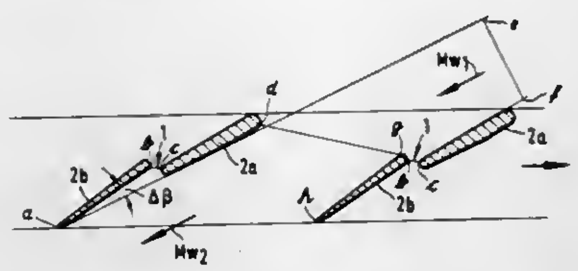
Filed Apr. 8, 1976, Ser. No. 674,752

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1975, 2515444

Int. Cl.^{2} F01D *5/14*

U.S. Cl. 416—91 **2 Claims**

1. A blade ring combination of high circumferential speed for thermal axially passed through turbines and having blades each with a radially outer portion and a profile at a foot portion of a profile length extending from an upper region to the foot portion defining an exit edge along a side thereof, especially for the last stage of condensing steam turbines, with at least the radially outer portion of the blades of said blade ring lying within the range of transonic flow or within the range of supersonic flow, in which each blade of said blade ring changes from the profile at the foot portion of the blade toward the blade tip into a profile part defined to a major extent by at least nearly straight lines, the profile part of each of said blades at about one half of the profile length at the upper region thereof being provided with a slot located along its longitudinal axis and dividing each blade into two sections one of which with the exit edge being turned relative to the other section by an angle corresponding to the post-expansion of the supersonic flow in such a direction that the profile part is turned about an angle so that the exit edge thereof lies in the flow-off direction to provide good efficiency of high Mach figures.



4,102,601

FORCED DRAFT FAN BLADE CONSTRUCTION FOR DYNAMO ELECTRIC MACHINES AND FORCED DRAFT AUTOMOTIVE ALTERNATOR

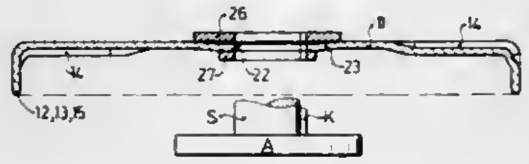
Guido Bischoff, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1976, Ser. No. 689,748

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1975, 2531889

Int. Cl.^{2} F04D *29/20*

U.S. Cl. 416—183 **13 Claims**



1. Fan blade construction for dynamoelectric machines to provide forced air cooling for the machine comprising an essentially flat disk-shaped element (11) formed with a central opening (22) for mounting the element on a shaft (S) and fan blades (12–15) formed on the periphery of the disk-shaped element (11),

wherein the disk-shaped element (11) is formed with a central region (23) which is axially offset from the major plane of the disk-shaped element by a distance

(H) less than the thickness (T) of the material of the disk-shaped element to form a shallow, concave depression at one side thereof and a dish-shaped bulge at the other side thereof, said central offset region surrounding the central opening (22).

4,102,602

ROTOR FOR AN AXIAL TURBINE

Paul Rottenkolber, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

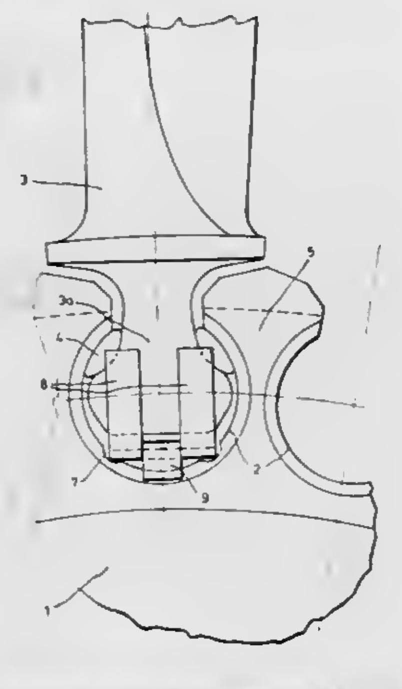
Filed Jan. 29, 1977, Ser. No. 811,171

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639200

Int. Cl.^{2} F01D *5/32*

U.S. Cl. 416—221 **8 Claims**

1. A rotor for an axial flow turbine comprising a metallic disk having a plurality of spaced apart undercut grooves around its periphery, a plurality of ceramic rotor blades, one mounted in each of said grooves, said rotor blades having an enlarged base portion having first supporting surfaces, for engaging second supporting surfaces on said disk comprising the undercut portion of said grooves, and cushion pads interposed between said first and second supporting surfaces, each of said cushion pads being fabricated from resilient material having a selected yield pressure, less than the allowable surface pressure of said ceramic, and having a first cushion surface engaging one of said first supporting surfaces, said first cushion surface having a different radius of curvature in the relaxed state than said first supporting surface, said first cushion surface contacting said first supporting surface over a relatively small area when said rotor is at rest and said contact area increasing with rotation of said rotor as said surfaces are urged together by centrifugal force acting on each of said blades.



4,102,603

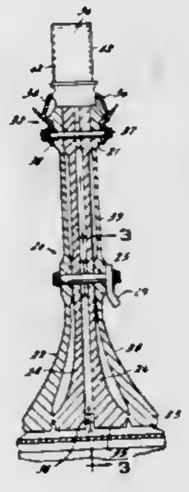
MULTIPLE SECTION ROTOR DISC

James Smith, Topsfield, and Richard Paul Johnston, Peabody, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 15, 1975, Ser. No. 640,766

Int. Cl.^{2} F01D *5/08*

U.S. Cl. 416—244 A **22 Claims**



1. A rotor disk for turbomachinery comprising at least three discrete sections the innermost sections being progressively thicker than the outermost sections and all sections being of such a thickness that the stress created within an inner section upon failure of an adjacent outer section is substantially equal to the stress created in an outer section upon failure of the adjacent inner section.

4,102,604

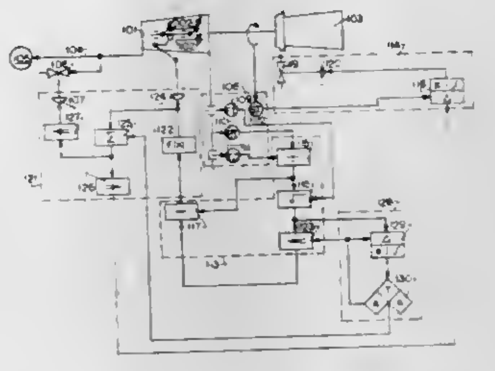
METHOD AND APPARATUS FOR NONINTERACTING CONTROL OF A DYNAMIC COMPRESSOR HAVING ROTATING VANES

Alexander Rutshtein, and Naum Staroselsky, both of West Des Moines, Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa

Filed May 4, 1977, Ser. No. 793,761

Int. Cl.^{2} F04B *49/00*

U.S. Cl. 417—19 **2 Claims**



1. A method of controlling a system including a dynamic compressor with rotating vanes having suction and discharge ports and a safe operating zone, a turbine driver, a pipeline connecting said discharge port to a user of a compressed gas, control members capable of moving a compressor's operating point along its required operating line by changing its performance, a fluid relief means connected to said pipeline, a flow measuring device installed in said suction port of the compressor, a pressure measuring device for measuring suction pressure, a temperature measuring means for measuring suction temperature, said method comprising:

calculating the mass flow rate and volumetric flow rate of a gas through the compressor;

changing the position of rotating vanes to maintain a constant optimum relationship between the vanes position and said volumetric flow rate through the compressor, said relationship being closen to provide for the maximum permissible level of speed of rotation along the line limiting the compressor's safe operating zone which corresponds to a widest safe operating range achievable without opening said fluid relief means;

controlling the required mass flow rate through the compressor by changing the speed of rotation until the compressor's operating point reaches said line limiting the safe operating zone; and

simultaneous and noninteractingly controlling the mass flow rate through the compressor and protecting compressor from approaching its zone of instable operation by simultaneously changing an outflow through said fluid relief means, limiting said maximum permissible level of the speed of rotation and maintaining said optimum relationship between the position of rotating vanes and the volumetric flow rate through the compressor after its operating point reaches said line limiting its safe operating zone.

4,102,605

FLUID PUMPING DEVICE

Seymour Moskowitz, 36 Brandon St., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 596,506, Jul. 16, 1975, Pat. No. 4,021,148. This application Jan. 24, 1977, Ser. No. 761,862

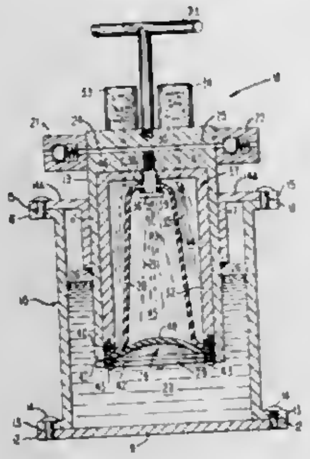
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.^{2} F04F *11/00*

U.S. Cl. 417—98 **10 Claims**

1. A fluid pumping device comprising a closed container configured to receive a fluid, plunger means received within said container and constrained for movement relative thereof, said plunger means including sleeve means forming an interior channel and thermally conductive, flexible membrane means,

said sleeve means constrained for movement within said container, said flexible membrane means connected to said sleeve means and forming at least first and second chambers within said channel, at least a portion of said second chamber disposed within said first chamber, said first chamber constituting a charging chamber and said second chamber constituting a pumping chamber, first inlet means and first outlet means communicating with said charging chamber, second inlet means and second outlet means communicating with said pumping chamber, said second inlet and outlet means including valve means, at least a portion of said flexible means constituting a common wall between said charging chamber and said pumping chamber, a fluid to be pumped entering said pumping chamber through said second inlet means and exiting said pumping chamber through said second outlet means, a charging fluid entering said charging chamber through said first inlet means and exiting said charging chamber though said first outlet means, said thermally conductive, flexible membrane means operative to control heat transfer between said pumping fluid and said charging fluid, variable pressure to volume ratios are provided by controlling said charging fluid entering and exiting said charging chamber as said plunger means moves within said container and said fluid to be pumped enters said pumping chamber through said second inlet means and exits said pumping chamber through said second outlet means.



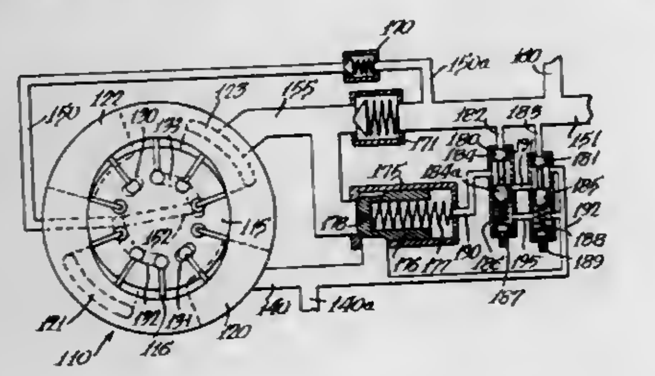
4,102,606
MULTIPLE DISPLACEMENT PUMP SYSTEM HAVING CONTROL SEQUENCE FOR UNLOADING VALVE

Melvin F. Huber, and Lowell D. Hansen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 470,988, May 17, 1974, Pat. No. 3,953,153. This application Mar. 15, 1976, Ser. No. 666,774

Int. Cl.² F04B *23/10, 49/00*

U.S. Cl. 417—204 **1 Claim**



1. A multiple displacement pump system including a vane pump with a rotor carrying a plurality of vanes movable in a pumping path between fluid inlet means and fluid outlet means with a first set of pumping chambers between said vanes and a second set of pumping chambers beneath said vanes, port plate means having ports for connecting said fluid inlet means and said fluid outlet means to said sets of pumping chambers at timed intervals in rotation of the rotor, said fluid outlet means having two separate conduits for receiving fluid from the respective sets of pumping chambers, said fluid inlet means having a single conduit for delivering fluid to the respective sets of pumping chambers, and circuit means including a fluid utilization conduit for delivering either flow from both of said separate conduits to said fluid utilization conduit or only flow from said second set of pumping chambers and having an unloading valve connected between one of the conduits of the outlet means and the fluid inlet means, a pressure-responsive valve responsive to the pressure in the fluid utilization conduit for unblocking said unloading valve against movement at a predetermined pressure, and a second pressure-responsive valve responsive to a higher predetermined pressure in the fluid utilization conduit for shifting said unloading valve to a blocking position.

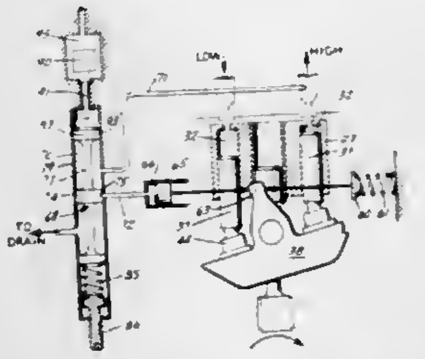
4,102,607
FLUID ENERGY TRANSLATING DEVICE

William Joseph Benson, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 455,968, Mar. 29, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,455

Int. Cl.² F04B *1/30;* **F01B** *13/06*

U.S. Cl. 417—222 **6 Claims**



1. In a fluid energy translating device having an expansible chamber for translating fluid under pressure between low and high pressure ports, and in which displacement of the chamber is determined by a control member having a nul position for essentially non-displacement and a second position establishing displacement, means to locate the control member in nul position upon occurrence of excessive pressure or excessive temperature of fluid being translated and comprising:

(a) a plunger engaging said control member and operated by fluid under pressure to dispose said control member in nul position;

(b) a valve chamber for receiving high pressure fluid translated by said device and a control passage leading therefrom for directing high pressure fluid to the plunger;

(c) a valve in said chamber for closing and disclosing said passage;

(d) means applying a bias to said valve normally to locate the valve in closing position in opposition to fluid pressure tending to locate the valve in opening position;

(e) a thermal element positioned in a temperature sensing chamber to sense an excessively high operating temperature of fluid being translated and having an extendable portion in alignment with and directly engageable with said valve in opposition to said valve bias means; and

(f) passage means for delivering fluid being translated into and out of said temperature sensing chamber.

4,102,608
RECIPROCATORY PISTON AND CYLINDER MACHINES

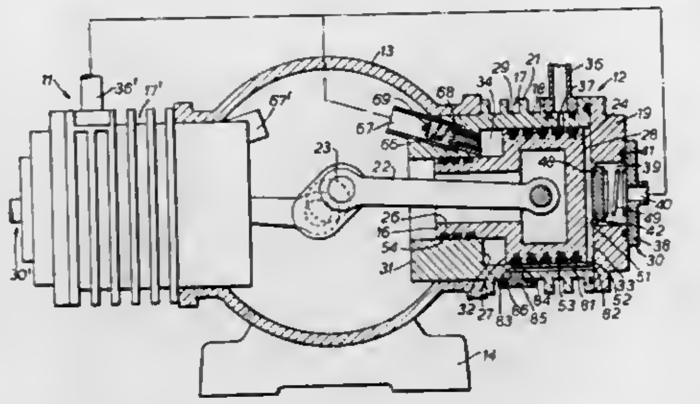
Guenter Karl Willi Balkau, Springvale; Eckhard Bez, Moorabbin, and John Lascelles Farrant, North Balwyn, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 22, 1976, Ser. No. 753,382

Claims priority, application Australia, Dec. 24, 1975, 4394/75; Feb. 26, 1976, 5014/76

Int. Cl.² F04B *49/00*

U.S. Cl. 417—242 **23 Claims**



1. A vacuum pump comprising:
- a cylinder having a first portion closed at one end and a second portion contiguous with, but of smaller diameter than, the first portion;
- a piston having a head portion slidable in the first cylinder portion and a second piston portion of smaller diameter than the head portion and slidable in the second cylinder portion, said piston head portion having a front face facing the closed cylinder end and an annular back face;
- a gas inlet for inlet of gas to the interior of the first cylinder portion between the front face of the piston head portion and the closed cylinder end on reciprocation of the piston;
- a first exhaust duct for exhaustion of gas from the interior of the first cylinder portion ahead of the piston head portion by pumping action of the front face of the piston head portion;
- a one-way valve in said first exhaust duct operable by gas pressure thereon to permit exhaustion of gas from the interior of the first cylinder portion ahead of the piston head portion but closable against reverse gas flow;
- an exhaust means for exhaustion of gas from the interior of the first cylinder portion behind the piston head portion by pumping action of the back face of the piston head portion; and
- a gas transfer passage for transfer of gas from said interior of the first cylinder portion ahead of the piston head portion to the interior of the first cylinder portion behind the piston head portion by pumping action of the front face of the piston head which gas transfer passage is capable of said transfer of gas at gas pressures lower than required to open said one way valve.

4,102,609
VALVE CONTROL SYSTEM FOR AIR POWERED VACUUM PUMP

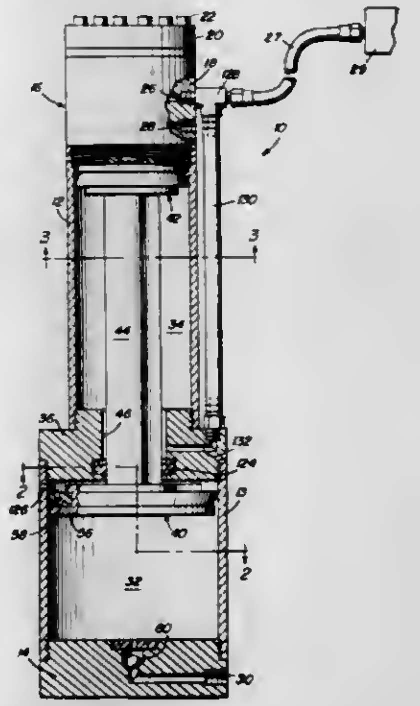
Howard L. Wood, Wolf Point, Mont., assignor to Wood's Powr-Grip Co., Inc., Wolf Point, Mont.

Continuation-in-part of Ser. No. 612,924, Sep. 12, 1975, abandoned. This application Dec. 28, 1976, Ser. No. 755,078

Int. Cl.² F04B *17/00, 35/00;* **F01B** *7/18;* **F01L** *33/00*

U.S. Cl. 417—399 **11 Claims**

1. In combination with a source of fluid under pressure and a power output member reciprocated through a fixed power stroke, a fluid motor device for displacing the power output member through a return stroke from one end of said power stroke, comprising a housing enclosing a motor pressure chamber, a motor piston connected to the power output member and slidably mounted in the housing, a control valve assembly connected to the housing for establishing fluid communication between said source and the motor pressure chamber to effect displacement of the motor piston through the return stroke, including a valve body, a valve element movably mounted in the valve body and displaceable between operative positions, respectively, conducting pressurized fluid from said source to the motor pressure chamber and depressurizing the motor pressure chamber, means for continuously biasing the valve element to one of said operative positions, actuating means engageable by the motor piston at said one end of the power stroke for displacement of the valve element to the other of the operative positions in which pressurized fluid is conducted from the source to the motor pressure chamber, fluid pressure means connected to said source for holding the valve element in said other of the operative positions during movement of the motor piston through the return stroke, and pressure control means fluidly connected to the fluid pressure holding means for regulating pressurization of the motor pressure chamber during the return stroke of the motor piston, said fluid pressure holding means comprising a diaphragm connected to the valve element, means within the housing enclosing opposing pressure chambers on opposite sides of the diaphragm, said valve element conducting unrestricted flow of the pressurized fluid from the source to one of the opposing pressure chambers in said other of the operative positions thereof, and pressure modifying means for establishing fluid communication between the pressure control means and the other of the opposing chambers.



4,102,610
CONSTANT VOLUME SEAL-FREE RECIPROCATING PUMP

John Taboada, 159 Ebbtide, San Antonio, Tex. 78227, and Marvin H. Lindsey, 3911 E. Palfrey, San Antonio, Tex. 78223

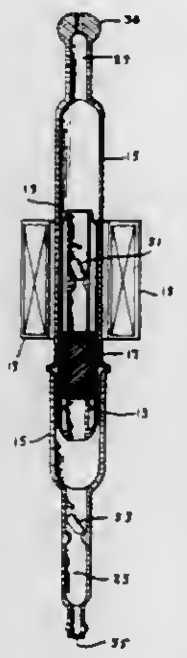
Filed Sep. 3, 1976, Ser. No. 720,465

Int. Cl.² F04B *17/04*

U.S. Cl. 417—417 **1 Claim**

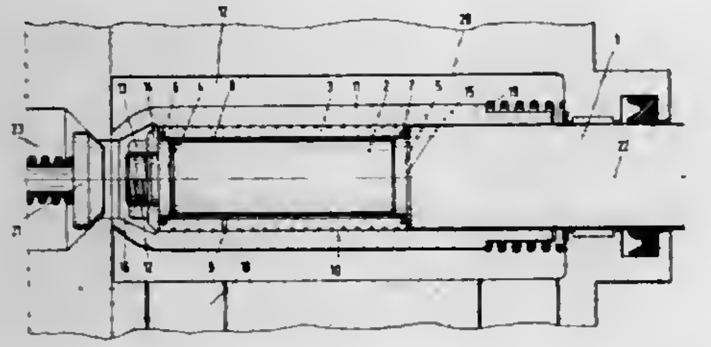
1. An electromagnetic reciprocating pump for handling biomedical fluids, gases, mixtures of gases and fluids and the like under sterile conditions free of contamination, said pump comprising a vertically oriented hollow elongate cylinder having a check valve at the lower extremity thereof, a tubular elongate piston slidably positioned in said cylinder for vertical movement therein, a magnetic component fixedly attached to said piston for movement therewith, a solenoid coil surrounding the outside of said cylinder in close proximity thereto for producing an external magnetic field, said solenoid coil being

positioned immediately above the magnetic component attached to said piston to cause upward movement of said piston by attracting the magnetic component attached thereto, valve means located in said piston for controlling the flow of fluids through said pump in response to cyclic applications of the magnetic field thereto, and a power supply for alternately energizing and deenergizing the solenoid coil producing the external magnetic field including a serially connected transformer and full wave rectifier, a Zener diode connected across said rectifier, a timer operating in the astable mode powered by said power supply, and a relay controlled by the output of said timer for momentarily connecting said power supply to the solenoid coil, such that said piston is caused to move upward in response to magnetic attraction of said magnetic component by the external magnetic field and to move downward under the influence of gravity when the magnetic field is deenergized.



4,102,611
PLUNGER PUMP

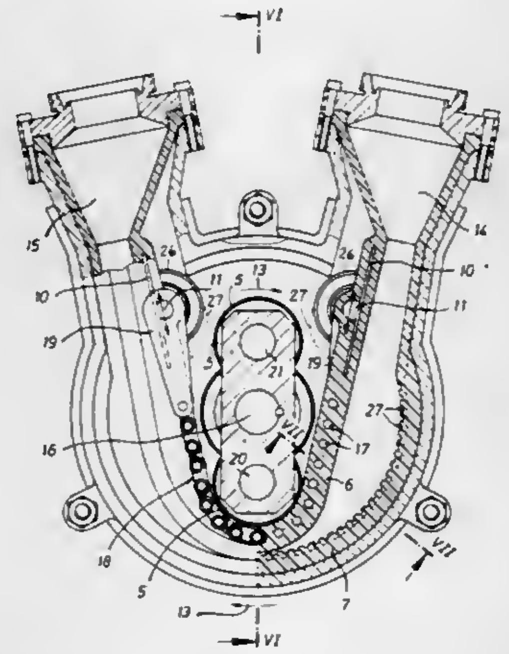
Erich Bröker, Oelde, Fed. Rep. of Germany, assignor to Paul Hammelmann Maschinenfabrik, Oelde, Fed. Rep. of Germany
Filed Apr. 11, 1977, Ser. No. 785,730
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615530
Int. Cl.² F04B *21/02, 39/10*
U.S. Cl. 417—469 **11 Claims**



1. A plunger pump comprising, in combination, a pump housing having a pumping chamber and an end wall; an elongated plunger mounted in said pump housing for reciprocation longitudinally thereof between a retracted and an extended position, at least partly received in said pumping chamber, and having a free end facing said end wall, a first portion longitudinally spaced from said free end and having an external surface, and a second portion extending from said first portion of said free end and having an outer surface inwardly offset from said external surface; a sleeve valve mounted on said plunger for displacement longitudinally thereof and for limited reciprocation therewith between an open and a closed position in which said sleeve valve is spaced from, and in sealing contact with, said end wall, respectively, said sleeve valve, when in said closed position, subdividing said pumping chamber into a pressure space within, and a suction space around, said sleeve valve and having an internal surface in sealing contact with said external surface of said plunger; means for admitting a fluid into said suction space; means for discharging the fluid from said pressure space; and means for sealing said pressure chamber with respect to said suction chamber, including a sealing sleeve surrounding said second portion of said plunger and having an outer contact surface juxtaposed with said internal surface of said sleeve valve and an inner surface bounding with said outer surface of said second portion of said plunger an annular compensating space, and means for maintaining a body of fluid in said compensating space at a compensating pressure sufficient to press said contact surface of said sealing sleeve into sealing contact with said internal surface of said sleeve valve.

4,102,612
REVERSIBLE ROLLER PUMP WITH LONGER HOSE WEAR

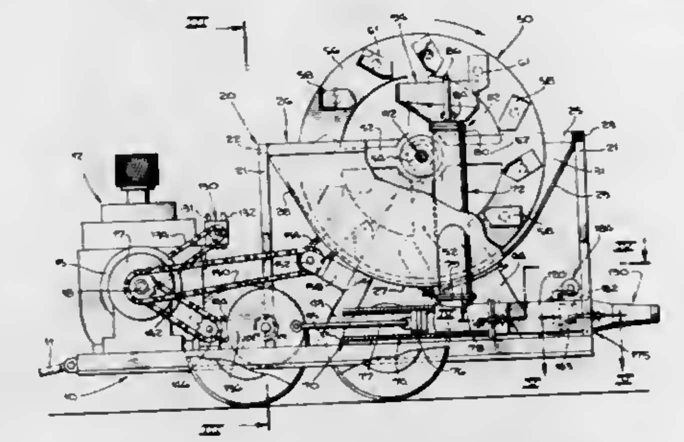
Wilhelm F. K. G. Ritter, Gothaestrasse 3, Kaltenkirchen, Fed. Rep. of Germany (2358)
Filed Jul. 6, 1976, Ser. No. 702,877
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1975, 2530149
Int. Cl.² F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—477 **12 Claims**



1. A hose pump comprising:
a pump housing (22) having an inlet, an outlet, and an arcuate housing portion interposed therebetween;
a roller assembly rotatably journalled in said housing adjacent said arcuate housing portion, said roller assembly having rollers (5) spaced from said housing portion and sequentially passing along said housing portion when said assembly is rotated; and
a flexible hose (1) interposed in the space between said roller assembly and said arcuate housing portion and having ends located in said inlet and outlet, said hose having an outer wall (7) in abutment with said arcuate housing portion and an inner wall (6) sequentially traversed by said rollers to compress it against said outer wall portion, said hose having, in a portion adjacent at least one of the hose ends, a valve flap (10) embedded in the wall of the hose, said flap being mounted on an axle (11) extending externally of said hose and journalled in said housing generally parallel to the axis of rotation of said roller assembly, said valve flap being tiltable with said axle for blocking said hose responsive to the traversing of said hose by said rollers.

4,102,613
CONCRETE PUMPING MACHINE

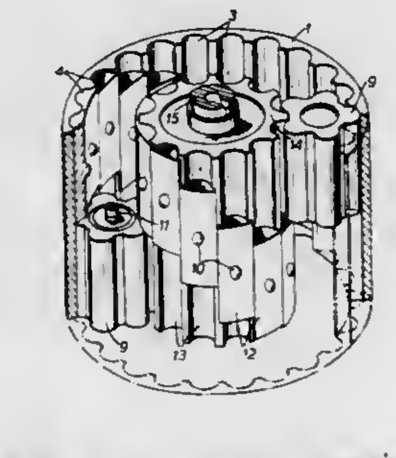
Martin T. Vukicb, 10891 Olinda St., Sun Valley, Calif. 91352
Filed Jan. 6, 1977, Ser. No. 757,482
Int. Cl.² F04B *7/06, 15/02*
U.S. Cl. 417—516 **6 Claims**



1. A machine for pumping flowable material comprising:
a hopper containing a supply of flowable material,
means forming a charging chamber extending vertically in the hopper and having an upper inlet and a lower outlet, the upper inlet projecting above the maximum level of material in the hopper;
a pump including a pumping chamber having an outlet end and a piston in the pumping chamber cyclically movable toward and away from the outlet end, the pumping chamber being provided with an inlet charging port communicating with the charging chamber lower outlet and with the pumping chamber outlet end;
conveyor means for moving flowable material from the hopper to a discharge station above the upper inlet of the charging chamber;
and closure means for closing said upper inlet during piston movement toward said outlet end.

4,102,614
MACHINES FOR GENERATING MOTION

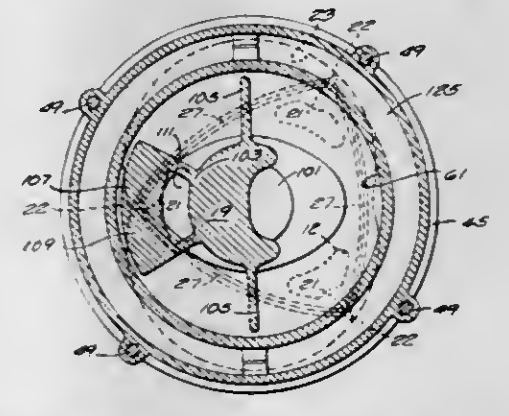
Bernard Gold, 54 Ashley La., Hendon Loodon, England (NW4 1PL)
Filed Feb. 25, 1977, Ser. No. 771,949
Claims priority, application United Kingdom, Feb. 25, 1976, 7458/76
Int. Cl.² F04C *1/02*
U.S. Cl. 418—59 **9 Claims**



1. A machine for generating motion comprising a mutually rotatable co-axial assembly of an internally toothed outer member, a generally cylindrical intermediate core and an externally toothed inner member; an even number of circumferentially evenly spaced toothed gate elements rotationally carried by said core at alternately opposite axial ends, these gate elements meshing with said members; closure means at each axial end of said assembly to seal off the space between inner and outer members and each to sealingly co-operate with one end face of the respective one or group of said gate elements; two arrays of pistons respectively axially slidable along the teeth of the inner and outer members and which co-operate with the inner and outer faces of the core; guide means on said core faces determining paths for both arrays of pistons that direct them with a close sliding fit between the other end faces of the gate elements and the closure means remote therefrom, said space thus being divided by said pistons and said gate elements into double said number of similar mutually separate chambers of generally curved triangular shape; and means providing fluid passages to and from said chambers.

4,102,615
INTERNALLY COOLED ROTARY COMBUSTION ENGINE

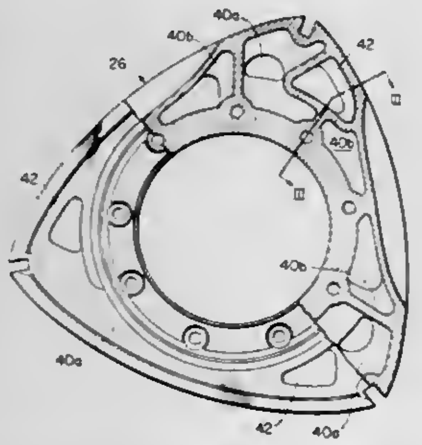
Finn T. Irgens, 2424 N. Harding Blvd., Wauwatosa, Wis. 53226
Filed Oct. 13, 1976, Ser. No. 732,024
Int. Cl.² F01C *21/06*
U.S. Cl. 418—86 **14 Claims**



1. A rotary internal combustion engine comprising a housing including wall means including spaced sides defining a rotor cavity, a rotor shaft rotatably supported by said housing, extending through said rotor cavity, and including an eccentric, a rotor rotatably supported on said eccentric and within said rotor cavity, said rotor including equi-angularly spaced apexes which, together with said rotor cavity, define working chambers rotatable within said rotor cavity, said rotor also including side seal means engaging said rotor cavity sides to restrain leakage of pressure from said working chambers, meshed gear means on said rotor and on said housing for causing rotation of said rotor on said eccentric and rotation of said rotor shaft relative to said housing, and a gas recirculation system extending, at least in part, in said housing and including means defining a closed gas recirculation path including, a first path portion in said rotor through which gas flows in one direction axially of said rotor, a second path portion in said rotor shaft through which gas flows in the direction opposite said one direction and, a third path portion located interiorly of said housing in series communication with and between said first and second path portions and in position for receiving gas leaking past said rotor side seals, and fan means driven by said engine for pumping gas through said recirculation path.

4,102,616
ROTARY PISTON INTERNAL COMBUSTION ENGINE AND ROTOR THEREOF

Yoshikazu Ishikawa, Chofu, Japan, assignor to Nissan Motor Company, Ltd., Japan
Filed May 14, 1976, Ser. No. 686,315
Claims priority, application Japan, Jun. 2, 1975, 50-75126[U]
Int. Cl.² F02B *55/04*
U.S. Cl. 418—91 **7 Claims**

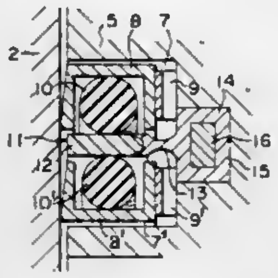


1. A rotary piston internal combustion engine comprising:
means for supplying a cooling liquid medium to the engine;
an outer body having a pair of spaced end walls and a peripheral wall disposed between the end walls to form a cavity therebetween having an axis along which said end walls are spaced, the inner surface of said peripheral wall having a multilobed profile of basically epitrochoidal outline;
a shaft transpiercing said end walls coaxially with said outer body cavity and having an eccentric portion disposed within said cavity;
a rotor journaled on said eccentric portion for rotation within said cavity;
said rotor having a generally polygonal profile with a plurality of apex portions and having a plurality of working faces each extending between two adjacent apexes and bounded axially by the end faces of said rotor, said working faces defining with said outer body a plurality of variable volume working chambers;
each of said working faces having a leading portion in the direction of rotor rotation and a trailing portion opposite thereto;
a portion of said rotor being connected in fluid flow relation with the supplying means so that there is a heat exchange between the liquid medium and the rotor whereby the liquid medium has a tendency to cool each trailing portion; and
at least one compartment means provided on said rotor adjacent a region of each of said trailing portions of said working faces and adapted for reducing the cooling effect of the cooling liquid medium on each trailing portion.

4,102,617
OIL SEAL MEANS IN A ROTARY PISTON ENGINE

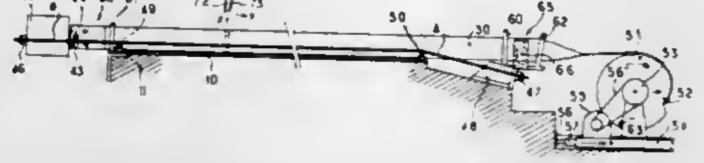
Kazuo Kato, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Mar. 29, 1977, Ser. No. 782,397
Claims priority, application Japan, Nov. 12, 1976, 51-136702
Int. Cl.² F01C *19/00;* **F04C** *15/00, 27/00*
U.S. Cl. 418—142 **5 Claims**

1. An oil seal means in a rotary piston engine comprising first and second annular oil seal grooves concentrically formed in the side wall of a rotor, and first and second combinations of oil seal rings, annular spring means and annular elastic seal elements, said first and second combinations being mounted in said first and second grooves, respectively, wherein the improvement comprises a flexible annular land means provided between said first and second grooves, said land means being movable in any radial directions of the rotor.



4,102,618
MANUFACTURING BENCHES FOR MOULDED CONSTRUCTION

Robert Joseph Ernest Augier, Sorgues, and Jean Marc Eliche, Les Angles, both of France, assignors to Societe Anonyme de Recherche et d'Etudes Techniques, France
Filed Nov. 11, 1976, Ser. No. 741,135
Claims priority, application France, Nov. 17, 1975, 75 35018
Int. Cl.² B28B *7/06*
U.S. Cl. 425—64 **14 Claims**

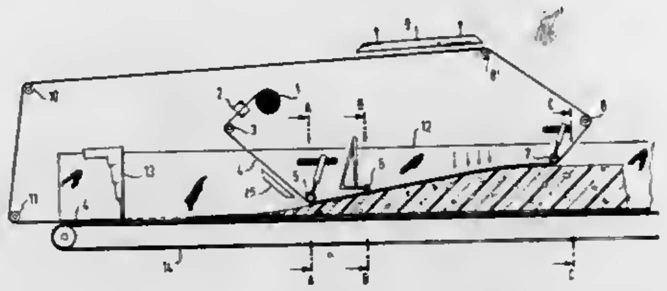


1. A manufacturing bench for molded construction elements comprising: a plurality of molds having lateral walls and a bottom wall, said lateral walls comprising flexible blades having upper and lower edge portions and said bottom wall comprising an elongated table, said lateral walls being arranged such that the lower edge portions of said blades contact said table to form each of said molds, said lateral walls being secured at one of their ends to a drum for moving said walls in a longitudinal direction, a winch operatively associated with said drum, said winch being connected to motive means for driving said winch, said drum said winch and said motive means being slidably mounted at one end of said bottom wall and being operatively connected to jack means for maintaining said lateral walls taut.

4,102,619
APPARATUS FOR PRODUCING FOAM SLABS OF RECTANGULAR CROSS-SECTION

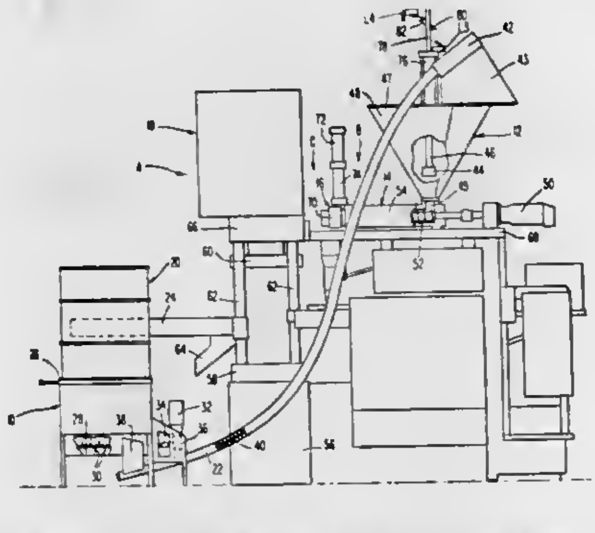
Horst Bokelmann, Bad Wildungen, Germany, assignor to Metzeler Schaum GmbH, Memmingen, Germany
Division of Ser. No. 676,603, Apr. 13, 1976, Pat. No. 4,056,595. This application May 25, 1977, Ser. No. 800,604
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517664
Int. Cl.² B29D *27/04*
U.S. Cl. 425—89 **6 Claims**

1. In the apparatus for the continuous production of rectangular foam slabs by foaming a reaction mixture, the apparatus having a conveyor belt for the reaction mixture, a system operatively associated with said conveyor belt for mixing the reaction mixture and feeding it to the belt, a pair of vertical webs as sidewalls for the lateral confinement of the rectangular foam slab resulting upon foaming of the reaction mixture while on the belt, a floor web on the conveyor belt and and a cover web for the foam slab, the improvement which comprises means operatively associated with said belt for removing said cover web from a foam surface downstream of the feeding system, means operatively associated with said conveyor belt for twice reversing the direction of advance of said removed cover so as to form a loop, and means operatively associated with said conveyor belt for advancing the twice reversed cover web to serve as the floor web for subsequently fed reaction mixture.



4,102,620
APPARATUS FOR MOLDING RIGID STRUCTURES FROM DRY FRICTION MATERIAL

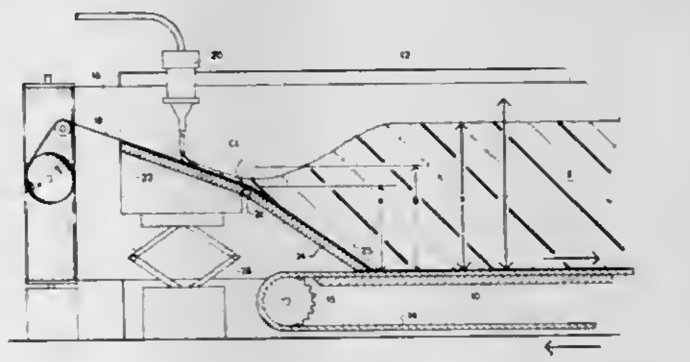
Edward Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.
Division of Ser. No. 637,914, Dec. 5, 1975, Pat. No. 4,003,498, which is a division of Ser. No. 633,054, Nov. 18, 1974. This application Dec. 27, 1976, Ser. No. 737,880
Int. Cl.² B29F *3/06*
U.S. Cl. 425—147 **6 Claims**



1. Apparatus for forming rigid structures such as disk brake pads from a dry mix of light and fluffy friction material, comprising in combination:
(a) a compression molding press having an openable mold with at least one mold cavity therein;
(b) a plasticizing screw, enclosed in a heated housing mounted on said press, for at least partially plasticizing a charge of dry friction material by extruding said charge at an elevated temperature through a nozzle at one end of said housing;
(c) a cup having an open end facing said nozzle, said cup being adjacent to said nozzle, for receiving the preheated extrusion from the nozzle as the charge of plasticized friction material is extruded through said nozzle and into said cup, said cup having a curved wall acting to shape the extrusion into a compact preformed mass as the extrusion enters the cup from the nozzle;
(d) a transfer chute, having inlet and outlet ends, for transferring the compact preformed mass from the cup into said mold cavity prior to closure of the mold, said chute inlet end communicating with said cup and said chute outlet end communicating with said mold cavity;
(e) a mixing hopper of air-tight construction, for storing and agitating said dry mix of friction material, at a position remote from said plasticizing screw;
(f) a stuffer hopper of closed construction disposed above said plasticizing screw housing, having a bottom outlet connected via a conduit to an inlet of said plasticizing screw housing, for temporary storage of a portion of said dry mix of friction material as said dry mix of friction material is fed thereinto intermediate to being fed into said plasticizing screw housing, said stuffer hopper including a reciprocable plunger, within said hopper, for displacing said dry mix of friction material from within said stuffer hopper downward through said bottom outlet and into said plasticizing screw housing on a plunger downstroke;
(g) a mechanical conveyor of closed construction from which substantially no friction material can escape to ambient air, operatively associated with said mixing hopper and said stuffer hopper to transport said dry mix of friction material along a closed path from said mixing hopper to said stuffer hopper; and
(h) first control means operably associated with said mechanical conveyor, for governing transport of material to said stuffer hopper by said mechanical conveyor whenever time for a downward portion of a reciprocation of said reciprocable plunger exceeds a first predetermined time.

4,102,621
APPARATUS FOR PRODUCING POLYURETHANE FOAM BUNS OF VARYING HEIGHTS

Miles E. Talbert, High Point, N.C., assignor to Thomasville Products, Inc., High Point, N.C.
Filed Oct. 8, 1976, Ser. No. 730,800
Int. Cl.² B29D *27/04*
U.S. Cl. 425—224 **1 Claim**



1. In foaming machines of the type where liquid foam reactants are poured onto a pour plate from above from whence they flow by gravity to a point where a creamline is formed and thence into an open top, closed side and bottom, channel-shaped conveyor, which carries the mixture away from the pour plate as it expands and cures into a bun, the improvement wherein said pour plate comprises
(a) an upper, planar inclined section onto which said liquid reactants are poured from nozzles above;
(b) a lower connecting wall having a planar surface and hingedly attached along the upper edge thereof to the lower edge of said upper section, said connecting wall having a lower edge lying supported on, but unattached to said conveyor;
(c) elevating means engagable with said upper section only for raising and lowering said upper section without changing the angle of inclination thereof;
(d) so that the bun height is altered responsive only to the activation of said elevating means without any change of inclination of the pour plate.--

4,102,622

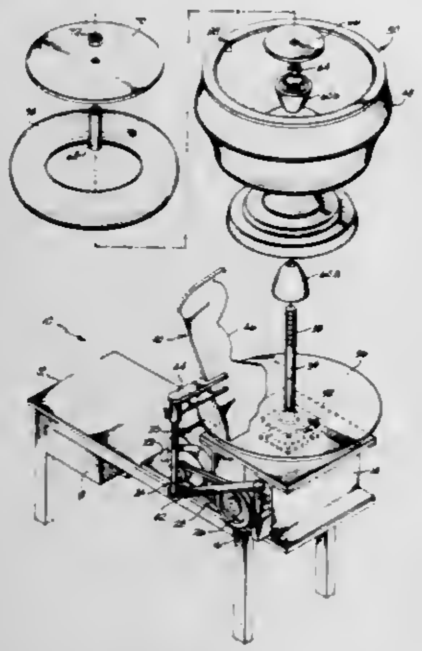
MACHINE FOR MAKING A PLANTER

Thomas Melvin Simpson, 10024 16 Ave. SW., Seattle, Wash. 98106

Filed Aug. 19, 1976, Ser. No. 715,717

Int. Cl.² B28B *1/29*; B29C *23/00*

U.S. Cl. 425—268 6 Claims



1. A machine for forming a planter comprising: a platform; an arbor extending through and connected to the platform; means on said arbor and said platform for fastening a work piece, making up parts of a planter, to the platform and arbor; a drive system means for rotating the arbor and platform with work piece at a few revolutions per minute; and means for adjustably positioning a shaper tool with respect to the work piece, said tool to remain stationary as the platform arbor and work piece rotate to shape the outside contour of the planter.

4,102,623

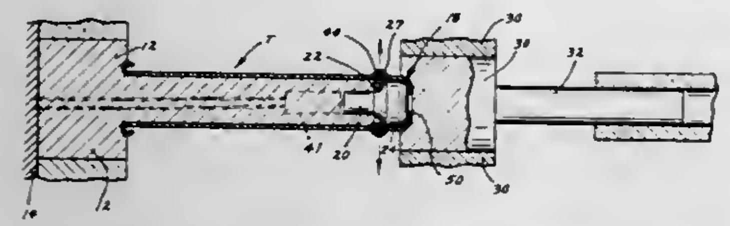
DEVICE FOR FORMING AN ANNULAR RAISED RIB ON A TUBULAR MEMBER

Donald W. Mathison, Minneapolis, Minn., assignor to Product Design & Engineering Inc., Minneapolis, Minn.

Filed Apr. 29, 1977, Ser. No. 792,356

Int. Cl.² B29C *17/00*

U.S. Cl. 425—393 4 Claims



1. A device for forming an annular raised rib on a tubular member comprising:

(a) a mandrel including a primary portion,

(b) a secondary mandrel portion,

(c) means slidably mounting said secondary mandrel portion upon the outer end of said primary mandrel portion axially thereof,

(d) the inner end of said primary mandrel portion carried by a base,

(e) an expandable member carried between said secondary mandrel and the outer end of said primary mandrel,

(f) a movable die,

(g) means for moving said movable die to contact and move said secondary mandrel,

(h) said secondary mandrel portion having means thereon for expanding said expandable member radially outwardly thereof to thereby form an annular raised rib on a tube of plastic mounted on said mandrels when said die is caused to move said secondary mandrel.

4,102,624

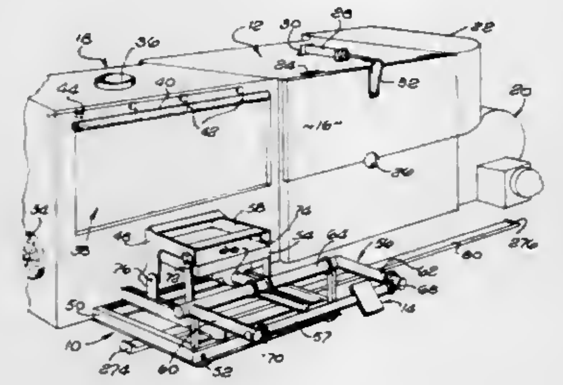
ROTATIONAL MOLDING APPARATUS

Peter J. Corona, Marina Del Rey, Calif., assignor to Windsurfing International, Inc., Marina Del Rey, Calif.

Filed Oct. 14, 1976, Ser. No. 732,267

Int. Cl.² B29C *5/04*

U.S. Cl. 425—429 16 Claims



1. A rotational molding apparatus which comprises:

a. a holding mechanism for receiving a mold;

b. a drive means for imparting rotational motion to said holding mechanism;

c. a support structure;

d. pivot means for attaching said holding mechanism and said drive means to said support structure;

e. an oven; and

f. means for rotating said holding mechanism and said drive means about said pivot means along a vertically disposed plane from a position wherein said molding mechanism and said drive means are external to said oven to a position wherein said molding mechanism is internal of said oven and said drive means is external to the oven.

4,102,625

SPINNERET HOLDER

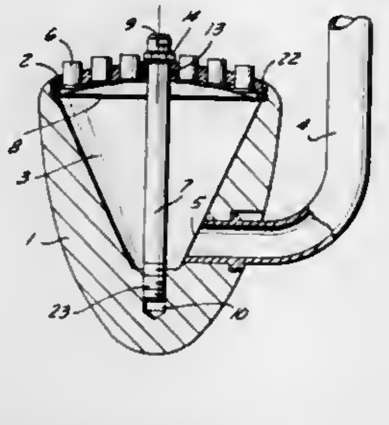
Fritz Lüthi, Kehrsatz, and Guido Bach, Ostermundigen, both of Switzerland, assignors to Ing. A. Maurer S.A., Bern, Switzerland

Filed Mar. 1, 1977, Ser. No. 773,191

Claims priority, application Switzerland, Mar. 2, 1976, 2576/76

Int. Cl.² B29F *3/04*

U.S. Cl. 425—464 12 Claims



1. A spinneret holder comprising:

a cupped base part having a rim centered on an axis;

a cover part having a periphery snugly interfittable with said rim and defining with said base part a generally closed chamber centered on said axis;

a plurality of spinnerets mounted on said cover part;

means for introducing a mass to be spun into said chamber and for expelling said mass as filaments from said chamber through said spinnerets;

a rod lying generally on said axis and having threads anchored in one of said parts, the other part being formed at said axis with a throughgoing hole through which said rod passes; and

an element on said rod bearing axially on said other part only immediately adjacent said hole thereof and pressing said rim and said periphery axially tightly together, said other part having an axial face turned away from said one part and engaged only by said element said parts being pressed axially together at said rim and periphery exclusively by means of said rod and element.

4,102,626

APPARATUS FOR MANIPULATING PARISONS IN BLOW MOLDING MACHINES

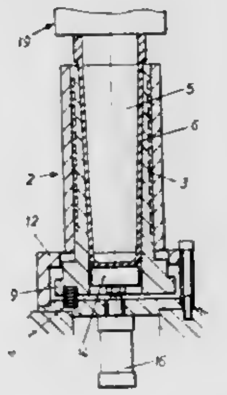
Helmut Scharrenbroich, Neunkirchen, Fed. Rep. of Germany, assignor to Voith-Fischer Kunststofftechnik GmbH & Co. KG, Lohmar, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,430

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610258; Apr. 3, 1976, 2614451

Int. Cl.² B29D *23/03*

U.S. Cl. 425—526 10 Claims



1. In a machine conversion of parisons into bottles or other hollow shaped articles wherein parisons are formed in a first mold at a parison forming station and wherein the parisons are transported from said forming station into a blow mold at a blowing station via a conditioning station, the improvement comprising a tempering mold at said conditioning station, said tempering mold including a tubular section having an open end for introduction of successive parisons, means for supporting said section at said conditioning station with freedom of axial movement with respect to said supporting means, and means for biasing said section to a predetermined axial position with respect to said supporting means so as to enable said section to yield against the opposition of said biasing means by moving substantially axially from said predetermined position in response to introduction of a parison by way of said open end; and means for introducing parisons into said section.

4,102,627

DRAFT TELL-TALE FOR FIRED FURNACES

Robert D. Reed; Hershel E. Goodnight, and Vern A. Street, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Oct. 7, 1976, Ser. No. 730,167

Int. Cl.² F23N *3/00*

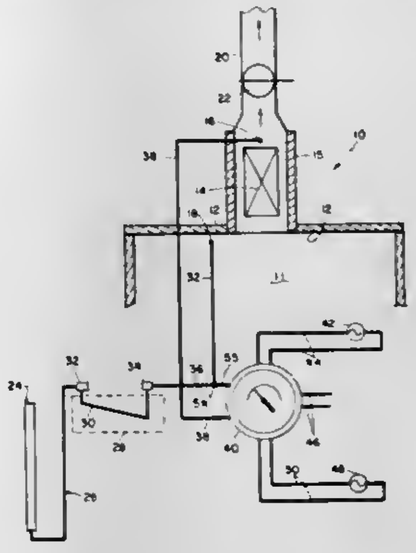
U.S. Cl. 431—16 6 Claims

1. In a fired furnace system in which combustion air is supplied to said furnace, said furnace having a roof, a convection section, a stack, and a stack flow control means, the improvement for monitoring the draft of said air inside the furnace comprising:

a. first pressure sensor means inside, at roof of said furnace, indicating the draft of said air P1 at that position;

b. second pressure sensor means inside said furnace downstream of the convection section, indicating the draft of said air P2 at that position;

c. differential pressure measuring means connected between said first and second pressure sensor means; and



d. alarm means connected to said differential pressure measuring means, set at a selected value of pressure drop; and in which

e. said first and second pressure sensor means each comprise a closed cavity contructed of a pipe closed at one end and having a plurality of substantially equally circumferentially spaced openings about the pipe near the closed end.

4,102,628

CONTROL APPARATUS FOR GAS BURNING APPLIANCE

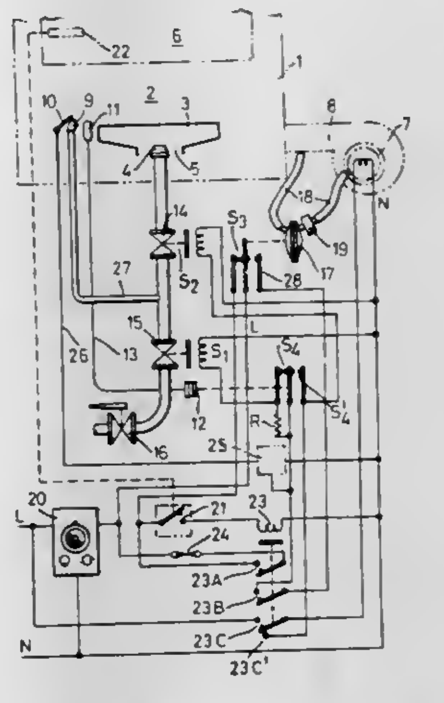
Paul Frederick Goff, Warwick; Bernard William Knight, Long Itchington, and Kenneth James Prentice, Southam, all of England, assignors to Potterton International Limited, Warwick, England

Filed Dec. 8, 1976, Ser. No. 748,571

Claims priority, application United Kingdom, Feb. 23, 1976, 7032/76

Int. Cl.² F23Q *9/12*

U.S. Cl. 431—43 4 Claims



1. A control apparatus for a fanned, gaseous fuel-burning appliance which comprises: a first gas valve for controlling

flow of gas to a lighting jet; an electrical ignition means for igniting gas at said jet; a main gas burner disposed adjacent said lighting jet; a second gas valve for controlling flow of gas to said main burner; a first sensor for detecting the existence or non-existence of a flame at said lighting jet; a second sensor for detecting the existence or non-existence of a predetermined air flow created by an electrically driven fan means; electrical circuitry for initiating a predetermined lighting-up sequence, said first and second sensors comprising, respectively, first and second change over switch means each having a normally-closed pair of contacts and a third, normally open contact; and, electromagnetic relay means having a third switch means arranged to close on a demand for heat being indicated to the apparatus, an operating coil serially-connected with a demand-for-heat switch means, said operating coil being serially connected to an electrical supply, a fourth switch means which, upon energization of said operating coil, completes a self-holding circuit, and a fifth switch means to energize said electrically driven fan means, the normally-open contact of the second switch means being connected to the common contact of the first switch means through the third switch means, the normally-closed contacts of the first switch means being connected, upon the passage of electrical current thereto, to actuate the first gas valve and the normally-open contact of the first switch means being connected, upon the passage of electrical current thereto, to actuate the second gas valve.

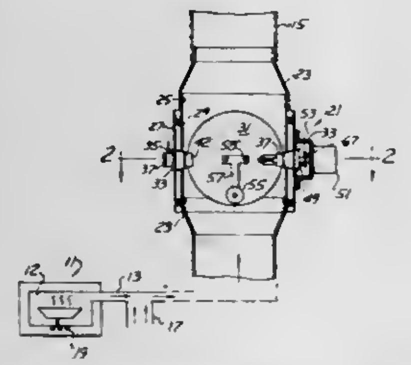
4,102,629
EXHAUST STACK DAMPER CONTROL

Emanuel Feinberg, Southfield, Mich., assignor to Paragon Resources, Inc., Southfield, Mich.

Filed Oct. 18, 1976, Ser. No. 733,260

Int. Cl.^{2} F23N *3/04*

U.S. Cl. 431—20 **10 Claims**



1. An automatic exhaust stack damper device for a combustion heating device of the type having a burner disposed in a combustion chamber and an exhaust stack for exhausting the products of combustion from said combustion chamber, said automatic exhaust stack damper device comprising:

a damper section mounted to form a section of said exhaust stack;

a damper movably mounted in said damper section and adapted to allow the passage of said combustion gases in an open position and upon moving to a closed position, adapted to substantially close said exhaust stack;

damper motor means operative when activated to move said damper to said closed position;

bias means urging said damper to said open position, said damper motor acting to overcome said bias means and move said damper to said closed position;

burner control means activating said damper motor means when said burner operation is discontinued;

fusible means mounted to be heated by said combustion gases exhausted through said exhaust stack, said fusible means comprising an element which melts upon reaching a predetermined temperature in said exhaust stack, said predetermined temperature corresponding to the operation of said burner with said damper in said closed position;

means for causing opening of said damper by said bias means upon melting of said fusible means element, not withstanding said damper motor being activated, whereby said automatic exhaust stack damper is fail safe in that in the event of burner operation with said damper motor activated due to system malfunction, said damper is opened by said bias means.

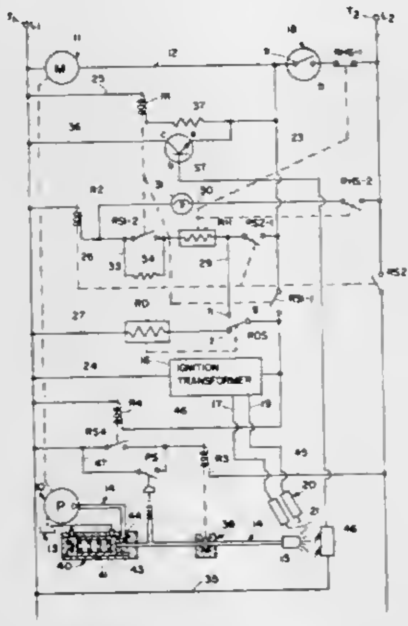
4,102,630
BURNER CONTROL SYSTEM

Hans Per Reinhold Edman, Stockholm, Sweden, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 23, 1976, Ser. No. 744,378

Int. Cl.^{2} F23N *5/00*

U.S. Cl. 431—29 **7 Claims**



1. A burner control system comprising a pump for supplying pressurized liquid fuel to a burner nozzle for atomization and combustion, a fuel line leading from said pump to the nozzle, a regulating valve connected within said line between said pump and said nozzle, a passage bypassing said regulating valve and communicating a portion of said line upstream of said regulating valve with a portion of said line downstream of said regulating valve, valve means disposed in said line downstream from said regulating valve and said passage for movement between a first position blocking flow of the fuel from said pump to the nozzle and a second position permitting the flow of fuel from the pump to the nozzle, a first circuit for controlling the ignition of the fuel in a burn cycle by means of a first signal including, a thermostat, igniter means for lighting the fuel discharged from the nozzle in response to a demand for heat sensed by the thermostat, means for de-actuating said igniter means in response to combustion of the fuel at the nozzle, and a second circuit operatively connected to said first circuit and including switch means movable from a first position to a second position for opening said valve means for purging air through said passage and said line at the beginning of the burn cycle in response to said first signal in said first circuit, before the pressurized fuel from said regulating valve is directed to flow through said line to the nozzle, said switch means being adapted for movement from said first position to said second position when said igniter is de-actuated, and means sensitive to the pressure of fuel in said fuel line for maintaining said valve means in its open position as long as the fuel pressure does not drop substantially below a predetermined high pressure during combustion and for causing said valve means to close when the pressure does drop substantially below said predetermined pressure.

4,102,631
BATTERY OPERATED LIGHTER EQUIPPED WITH A BATTERY OPERATED TIMEPIECE

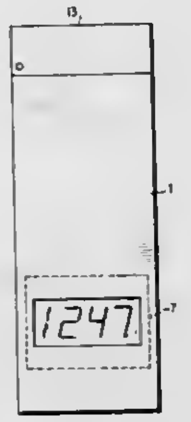
Kenjiro Goto, Urawa, Japan, assignor to Mansel Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Dec. 27, 1976, Ser. No. 754,003

Claims priority, application Japan, Dec. 27, 1975, 50-178952[U]

Int. Cl.^{2} F23Q *2/32*

U.S. Cl. 431—253 **18 Claims**



1. A battery operated lighter equipped with a battery operated timepiece comprising:

a casing;
a fuel tank for maintaining a gas fuel;
a burner nozzle for issuing the gas fuel from said fuel tank;
a lighter ignition circuit for generating a spark at said burner nozzle;
a timepiece circuit having a time indication unit;
a battery for supplying electric energy to said lighter ignition circuit and said timepiece circuit;
a switch used in common for manipulating said two circuits and including a first, second and third switch contacts;
and
a control means provided in mechanical connection with said switch, wherein said first and second switch contacts are adapted to close said lighter ignition circuit and wherein the positional relationship of these first and second switch contacts is controlled by said control means so that one of said first and second switch contacts may selectively brought into contact with said third switch contact to manipulate said timepiece circuit.

4,102,632
MODULAR HEAT RECUPERATOR

Phillip Hastings, 1819 S. 1100 East, Salt Lake City, Utah 84105

Filed Nov. 22, 1976, Ser. No. 743,826

Int. Cl.^{2} F28F *1/10*

U.S. Cl. 432—3 **2 Claims**

1. A heat recuperator system in combination with a high temperature combustion furnace for heating combustion air to the furnace comprising:

a plurality of recuperator modules adapted to be interconnected together to form a heat recuperator, each recuperator module having as an integral part thereof at least one septum for axially dividing the interior of the module so as to form at least first and second flow channels in heat exchange relationship, the recuperator modules each having means for aligning the ends of the septum with the ends of the septa of adjacent modules so as to maintain said first and second channels separated after the modules have been interconnected;

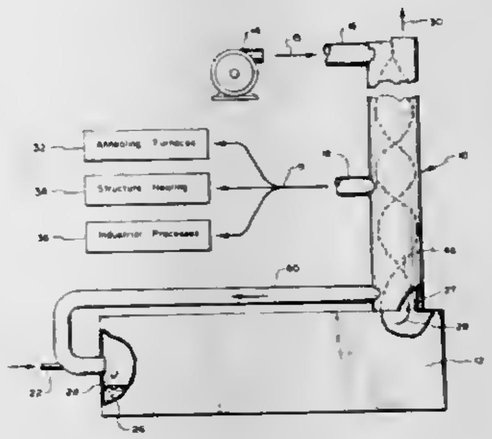
a plurality of gasket means interposed between the modules to inhibit leakage from the flow channels;

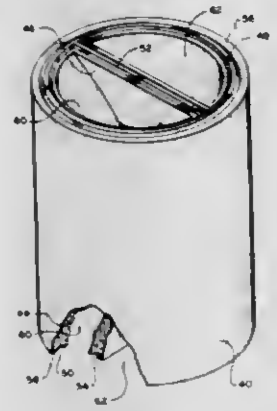
means for directing exhaust gases from the combustion furnace into the first flow channel;

means for forcing air into the second flow channel counter-directionally to the flow of exhaust gases in the first flow channel;

means for combining a portion of the air from the second flow channel with a fuel, the air serving as combustion air for the fuel in the combustion furnace;

means for placing the interconnected recuperator modules in axial alignment to compensate for dimensional variations in the heat recuperator caused by temperature fluctuations in the heat recuperator;





means for supporting the interconnected recuperator modules in a vertical orientation thereby placing the interconnected recuperator modules under axial compression from gravitational forces;

means for diverting a second portion of air from the second flow channel after it has been in heat exchange relationship with the exhaust gases in the first flow channel; and

means for supplementing the air in the second flow channel with the combustion-supporting gas.

4,102,633
CIGARETTE LIGHTER

Conrad Zellweger, Chêne-Bougeries, and André Guenin, Petit-Lancy, both of Switzerland, assignors to La Nationale S.A., Geneva, Switzerland

Filed Sep. 17, 1976, Ser. No. 724,228

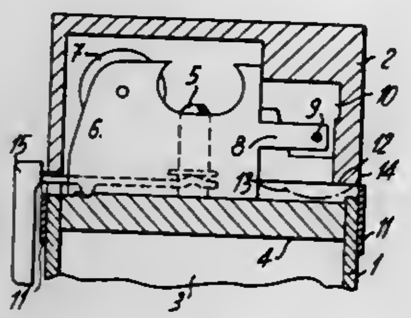
Claims priority, application Switzerland, Sep. 26, 1975, 12537/75

Int. Cl.^{2} F23Q *25/00*

U.S. Cl. 431—152 **3 Claims**

1. A cigarette lighter including, a body having an interior including a fuel container, partition means closing the top of said container, a fuel burner, ignition means for igniting fuel issuing from said burner, a hollow cap having an interior and a lower side edge and disposed atop said body, said cap when in a closed position covering said burner and ignition means when the lighter is not being used, said cap and body having an identical cross-section and respectfully having exposed edges juxtaposed when said lighter is closed, hinge means disposed within one said interior and joining said cap to said partition said hinge means spacing at least that portion of the edge of said cap adjacent the hinge means from the respective edge of

said body so that the cap can pivot open freely without hitting the respective edge of the body or the partition means, a collar mounted around the exterior of said body and surrounding the periphery of said exposed edge of said cap to cover the space between said cap and body, and said collar having an inner cross-section corresponding to the cross-section of said cap.



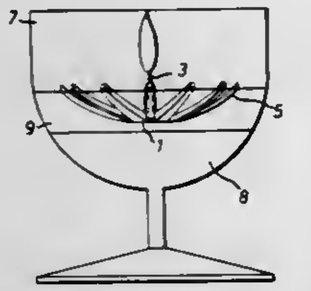
4,102,634
FLOATING WICK HOLDER
David Crisp, London, England, assignor to Rizla Limited, Wales

Continuation-in-part of Ser. No. 445,951, Feb. 26, 1974, abandoned. This application Feb. 22, 1977, Ser. No. 770,842

Claims priority, application United Kingdom, Feb. 26, 1973, 9447/73

Int. Cl.² F23D *3/02*

U.S. Cl. 431—298 **3 Claims**



1. A floating wick-holder for a lamp, said wick-holder being molded in one piece from a plastic material which has a density less than that of combustible oil and is naturally buoyant thereon, said wick-holder including a central portion defining a generally cylindrical hole for directly receiving and retaining a wick, a peripheral portion disposed around the central portion and offset axially therefrom, and at least one arm linking the central portion to the peripheral portion, the volume of said central portion relative to the entire volume of said wick-holder being such that said portion will displace less weight of oil than the total weight of said wick-holder causing said central portion and at least part of said linking arm to sink below the surface when said wick-holder is placed in oil thereby to preclude flame damage to said wick-holder when the wick is ignited.

4,102,635
METHOD OF AND AN ARRANGEMENT FOR PRE-HEATING COKING COAL
Kurt-Günther Beck, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

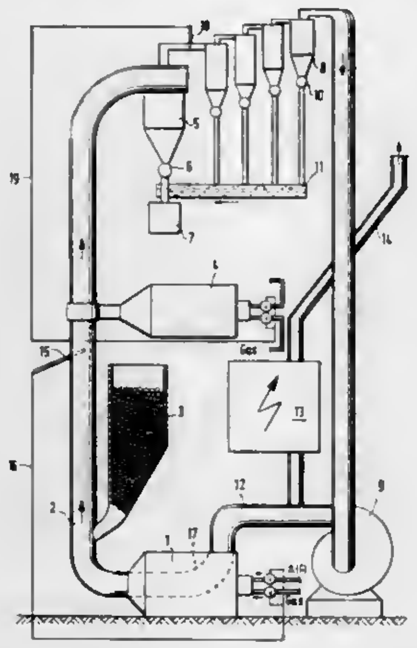
Filed Jun. 13, 1977, Ser. No. 806,277

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626653

Int. Cl.² F26B *3/08*

U.S. Cl. 432—14 **15 Claims**

1. A method of pre-heating coking coal, comprising the steps of entraining the coal in a stream of a gaseous carrier medium such is at a first temperature exceeding that of the coal; passing the stream through a pre-heating zone in which the carrier medium pre-heats the coal; and introducing into said pre-heating zone, at a region thereof at which the coal has already been pre-heated to a predetermined temperature by the carrier medium, a gaseous fluid at a second temperature exceeding that of the carrier medium at said region for additionally pre-heating the already partly pre-heated coal in said zone at and downstream of said region.

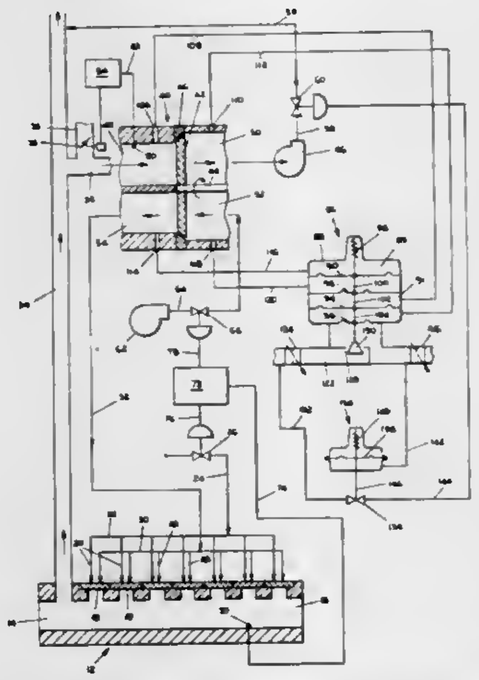


4,102,636
FURNACE WITH HEAT EXCHANGER FLOW CONTROL
William A. Phillips, Comstock Park, and David R. Dietz, Grand Rapids, both of Mich., assignors to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Dec. 3, 1976, Ser. No. 747,392

Int. Cl.² F28D *19/00*

U.S. Cl. 432—30 **13 Claims**



8. In a method of heating articles in an industrial heating zone comprising:

supplying heated gases to the heating zone;

removing heated exhaust gases from the heating zone and passing at least a portion of the heated gases through a first side of a rotary ceramic heat exchanger wheel to strip heat therefrom;

passing air through a second side of the rotary ceramic heat exchanger wheel to heat the air;

passing the air, thus heated, to the heating zone for heating the articles therein; and

controlling the temperature of the gases in the heating zone at least in part by controlling the flow of air through the second side of the rotary heat exchanger wheel and to the furnace to maintain the temperature within a predetermined range of temperatures;

the improvement which comprises:

maintaining the ratio of the flow of gases across the first side of the rotary heat exchanger wheel to the flow of gases across the second side of the rotary heat exchanger wheel at a predetermined value by measuring the flow of gases across the first and second sides of the rotary ceramic heat exchanger wheel and controlling the flow of gases across the first side of the rotary ceramic heat exchanger wheel independent of the control of the flow of gases across the second side of the rotary heat exchanger wheel to maintain the ratio at the predetermined value.

4,102,637
WORK SUPPORT FOR VACUUM ELECTRIC FURNACES
Benjamin A. Kreider, Richboro, and William J. Metalsky, Warminster, both of Pa., assignors to Abar Corporation, Feasterville, Pa.

Filed Sep. 16, 1976, Ser. No. 723,767

Int. Cl.² F27D *5/00*

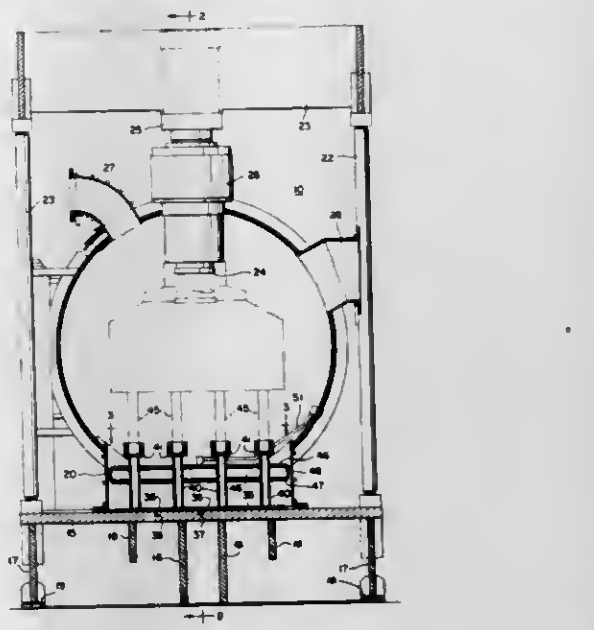
U.S. Cl. 432—227 **12 Claims**

1. A work support for vacuum electric furnaces which comprises

a flat base plate,

a plurality of pin members of the same length for load support by their upper end faces secured to and extending vertically upwardly from said plate,

heat sink means having an internal passage for circulating a liquid cooling medium above said base plate through which said pin members extend in heat exchange relation.

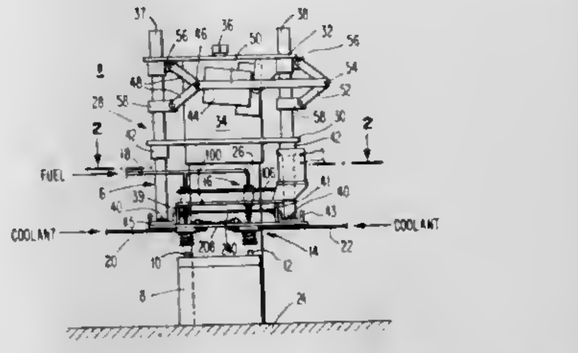


4,102,638
APPARATUS FOR BURNING TOGETHER LEAD STORAGE BATTERY POSTS AND HIGH PROFILE BUSHINGS
Eric G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Filed Nov. 24, 1976, Ser. No. 744,541

Int. Cl.² F24J *3/00*

U.S. Cl. 432—229 **19 Claims**



1. An apparatus for burning together a lead battery post and a lead bushing surrounding said battery post, comprising:

(a) an orbital torch burner means for applying heat in an orbital path between said post and said bushing; and

(b) a torch burner support plate for supporting a torch burner means immediately above said post and bushing, said orbitable torch burner means rotating in said support plate in close proximity to said battery post and bushing.

CHEMICAL

4,102,639

AMINE SALTS OF REACTIVE DYESTUFFS

Anton Zenhausern, Oberwil; Otto Reber, Basel, and Peter Aeschlimann, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 495,517, Aug. 7, 1974, Continuation-in-part of Ser. No. 201,560, Nov. 23, 1971. This application Sep. 30, 1976, Ser. No. 728,194

Claims priority, application Switzerland, Nov. 24, 1970, 17418/70

Int. Cl.² D06P *1/38*

U.S. Cl. 8—1 A **14 Claims**

1. A process for the dyeing of organic fibre material, comprising

(a) impregnating this material with a solution of at least one amine salt of reactive dyestuffs of Formula I

$$D - X \}_{n-1} SO_2\text{-}CH_2CH_2\cdot Z^{\ominus} [\, Y\text{-}H \,]\, H^{\oplus} \qquad (I)$$

wherein D represents the radical of an organic dyestuff selected from an azo, formazan, anthraquinone, phthalocyanine, nitro and triphenylmethane dyestuff containing no salt-forming, water-solubilising groups, X represents the bridge member $—CH_2—$, $—CH_2CH_2—$ or

$$-\overset{|}{N}-R,$$

wherein R represents hydrogen, an alkyl group having 1 to 5 carbon atoms, or a cycloalkyl group, $Z^{\ominus}$ represents the $—O\text{-}SO_3^{63}$, $—SSO_3^{\ominus}$ or $—OPO_3H^{\ominus}$ group, Y represents the radical of a primary or secondary amine Y-H, which amine is capable of salt formation, and is selected from the group consisting of

1. a mono- or dialkylamine having a total of from 2 to 20 carbon atoms in the alkyl groups which groups are unsubstituted or are substituted by hydroxy or methoxy;
2. a mono- or dicycloalkylamine which is unsubstituted or substituted by alkyl of from 1 to 8 carbon atoms or hydroxylower-alkyl;
3. a mononuclear, mono- or diaralkylamine which is unsubstituted or substituted by alkyl which is unsubstituted or substituted by hydroxy, methoxy or cyano;
4. a mononuclear aromatic amine;
5. benzamidine, or an alkylamidine having from 2 to 18 carbon atoms in the alkyl radical and which may be substituted by alkyl of from 1 to 4 carbon atoms, phenyl, benzyl or cyclohexyl;
6. an isothiourea S-substituted by benzyl or alkyl of from 1 to 18 carbon atoms;
7. an N-containing five- or six-membered heterocycle and
8. a condensed N-containing heterocycle; and n represents the number **1** or **2**,

(I) in a solvent which consists of non-polar aprotic organic solvent selected from unsubstituted or halogenated hydrocarbons having a boiling point above 30° C, or

(II) in a solvent mixture which consists of

(α) non-polar aprotic organic solvent selected from unsubstituted or halogenated hydrocarbon having a boiling point above 30° C, and

(β) a polar organic solvent selected from the group consisting of alkanols, cycloaliphatic alcohols, araliphatic alcohols, aliphatic or cycloaliphatic ketones, alkylene glycol monoalkyl ethers, furfuryl alcohol, tetrahydrofurfuryl alcohol, bivalent aliphatic alcohols, lower cyclic ethers, lower anhydrous monocarboxylic acids, N,N-dialkylamides of lower monocarboxylic acids, amides of carbonic acid, cyclic amides, lower carboxylic acid nitriles and mixtures thereof;

(b) removing a substantial part of excess dye liquor from the material and

(c) fixing the dyestuff by a subsequent heat treatment of the impregnated or printed fibre material at temperatures below the softening point of the fibre material, thereby obtaining a finished dyeing or print on the said fibre material.

4,102,640

PROCESS FOR THE PROCESSING OF ORGANIC TEXTILE MATERIALS

Jacques Zurbuchen, Prattelo, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 561,513, Mar. 24, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,274

Claims priority, application Switzerland, Mar. 29, 1974, 4424/74

Int. Cl.² D06P *5/02;* **B08B** *3/00*

U.S. Cl. 8—73 **9 Claims**

1. A dyeing or finishing process for organic textiles, consisting of the steps of applying a liquor which is an aqueous dispersion or solution of a dye or finishing agent, having affinity for the textile, in the substantial absence of surfactants, to a textile at a goods to liquor ratio of 1:0.3 to 1.2, subsequently applying saturated steam to the textile to heat the textile and to dilute the liquor by condensation of the steam so as to uniformly distribute the liquor over the textile before a temperature is reached which would fix the dye or finishing agent to the textile fibers, provided that the diluted liquor is completely absorbed by the textile, and finally fixing the dye or finishing agent by the continued application of saturated steam.

4,102,641

METHOD OF DYEING HUMAN HAIR WITH REACTIVE DYES

Fred M. Tuffile, Lakeville, Mass., and Andrew J. Cunningham, Highland Lakes, N.J., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Sep. 29, 1972, Ser. No. 293,473

Int. Cl.² A61K *7/13*

U.S. Cl. 8—10.1 **7 Claims**

1. A process of dyeing human hair comprising applying to the hair fibers in an aqueous solution and at a pH of about 4 to 6.5 an effective coloring amount of a halotriazinyl compound, which compound contains a dye residue group and a water solubilizing group for a period of time sufficient to allow good leveling of said dye, subsequently applying to the hair an aqueous solution containing sufficient amounts of an alkaline compound having an ionization constant sufficient to adjust the pH to from about 8 to 8.5 and maintaining said pH range of about 8 to 8.5 for a period of time sufficient to allow reaction of the dyestuff with the hair fibers, and then rinsing the hair fibers.

4,102,642

TREATMENT OF FABRIC COMPRISING COTTON OR KERATINOUS FIBERS FOR SHRINK RESISTANCE

John B. Banks, 4 Page St., Augusta, Me. 04330

Filed Apr. 30, 1976, Ser. No. 681,902

Int. Cl.² D06M *1/02, 3/04*

U.S. Cl. 8—125 **6 Claims**

1. A process for imparting wash and wear characteristics including dimensional stability to a fabric consisting essentially of cotton fiber comprising the steps of contacting said fabric with a solution consisting essentially of a metal sulfite selected from the group of aluminum sulfite, sodium sulfite, lithium sulfite, potassium sulfite, barium sulfite, calcium sulfite, magnesium sulfite, manganese sulfite, strontium sulfite and zinc sulfite, said metal sulfite being present in an amount of about 5% to 35% by weight, and 1 to 50 percent by weight of a soluble carbonate, selected from the group of alkali and alkaline earth carbonates, based on the weight of sulfite in said solution, said solution having a temperature of from 150° F. to its boiling point, drying the fabric thoroughly and thereafter washing the fabric, said fabric being contacted with said solution for a sufficient time to produce a fabric of dimensional stability such

that the maximum shrinkage during laundering does not exceed 4 percent.

4,102,643

DECATIZING OF FABRICS

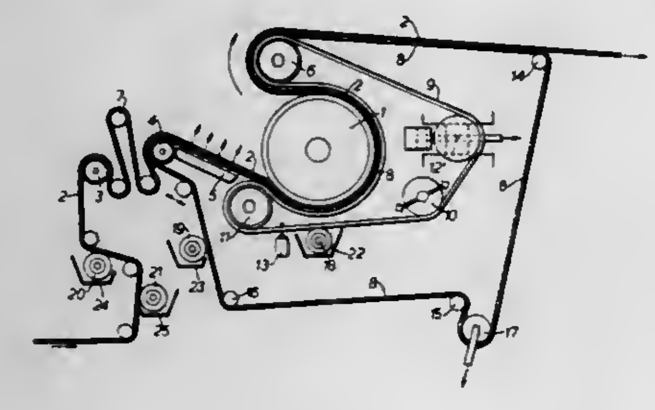
Dieter Riedel, 4952 Porta Westfalica-Hausberge, Turmblick 6, Fed. Rep. of Germany

Continuation of Ser. No. 637,051, Dec. 2, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,238

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1974, 2456921

Int. Cl.² D06C *15/06*

U.S. Cl. 8—149.3 **2 Claims**



1. A method of continuously decatizing and effectively pressing a fabric material said method comprising: providing a feed path for the fabric material; providing a rotatable, heated, decatizing cylinder on said feed path having a continuous mirror finish surface; providing a moisturizing device on said feed path upstream of said decatizing cylinder, continuously feeding a backing cloth having a dense and smooth surface across said moisturizing device and around said mirror finish surface of said decatizing cylinder, continuously feeding the fabric to be treated along said feed path whereby the fabric passes across said moisturizing device and across said mirror finish surface of said cylinder in direct contact with said mirror finish surface of the cylinder, with the fabric being located between said mirror finish surface of said cylinder and the adjacent said dense and smooth surface of said backing cloth; and providing a thrust belt under high tension to thrust said backing cloth and the fabric material towards said mirror finish surface of said cylinder, whereby elongation of the fabric does not occur throughout the period of said direct contact with said mirror finish surface of said cylinder and the fabric thus ironed and pressed has improved handling properties.

4,102,644

TINT COMPOSITIONS FOR NYLON HAVING IMPROVED FUGITIVITY PROPERTIES

Peter Jacob Hauser, Inman, S.C.; James Easton Hendrix, La Grange, Ga., and Hans Heinrich Kuhn, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 3, 1976, Ser. No. 720,213

Int. Cl.² D06P *3/00, 5/08*

U.S. Cl. 8—164 **9 Claims**

1. Fugitive tint compositions for amorphus, undrawn nylon or fully drawn cationic dyeable nylon comprising an admixture of a colorant having the formula

$$R - \{N - [(CH_2CH_2O)_nH]_2\}_x$$

wherein R is an organic dyestuff radical, x is an integer of 1 to 6, and the product of $2n$ times x is from about 200 to 300, and at least 30 weight percent of a water-soluble polymeric resin having a molecular weight of from about 4,000 to about 10,000.

4,102,645

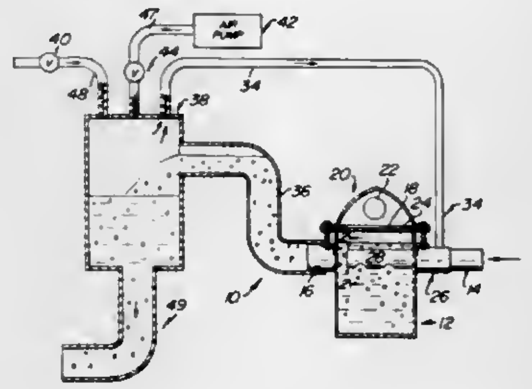
STERILIZATION APPARATUS

Thomas E. Meacham, Jr., Philadelphia, and David C. Johnson, Ambler, both of Pa., assignors to Refreshment Machinery Incorporated, Warminster, Pa.

Filed Jun. 23, 1976, Ser. No. 699,026

Int. Cl.² A61L *3/00*

U.S. Cl. 21—102 R **5 Claims**



1. Apparatus for sterilizing a liquid with radiation comprising a housing having a chamber provided with an inlet, an outlet in the side wall of the housing adjacent the upper end thereof and through which liquid may exit from said chamber, means for sterilizing a liquid by radiation while the liquid is in said chamber, a window transparent to radiation from said sterilizing means, means associated with said inlet for discharging the liquid downwardly into the chamber in a direction away from the window, said window being disposed below said sterilizing means so that radiation may enter said chamber, said window defining the upper limit of said liquid in said chamber, and means for producing and maintaining an air pocket between said window and the upper surface of any liquid in said chamber to prevent direct contact between the liquid and said window without using a barrier between the air pocket and the liquid.

4,102,646

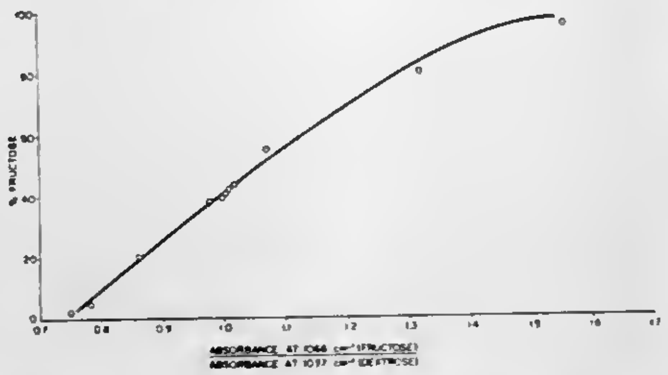
QUANTITATIVE ANALYSIS OF CARBOHYDRATES BY INFRARED SPECTROSCOPY

Ronald T. Sleeter, 1263 Semor Dr., Decatur, Ill. 62521

Filed Apr. 6, 1977, Ser. No. 785,163

Int. Cl.² G01N *21/30*

U.S. Cl. 23—230 R **6 Claims**



1. A proccess for qualitatively and quantitatively analyzing a chemical composition for its content of starch or sugars which comprises:

(a) subjecting a sample of said composition to infrared spectroscopy at wave lengths in the region of 1800–700 cm⁻¹ or the region of 700–50 cm⁻¹ to produce a spectrum;

(b) noting the amplitude of the absorbances at the known frequencies for each carbohydrate or family of carbohydrates, and

(c) comparing each noted amplitude with known amplitudes for standard samples of that same carbohydrate or family of carbohydrates to determine the amount of that carbohydrate or family of carbohydrates present in the composition.

4,102,647

REMOVAL OF CONDENSATES FROM LIGHT GASEOUS STREAMS

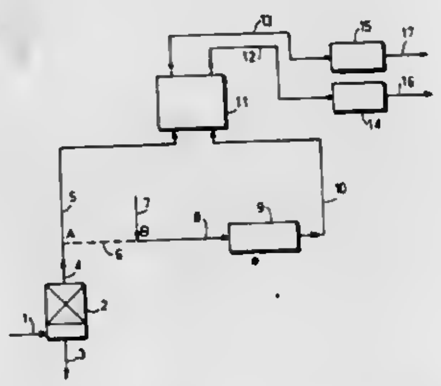
Adriaan Roelse, Domburg, and Barteld Hendrik van der Ley, Middelburg, both of Netherlands, assignors to Total Raffinaderij Nederland N.V., Rotterdam, Netherlands

Filed Nov. 15, 1976, Ser. No. 741,993

Claims priority, application Netherlands, Nov. 20, 1975, 7513573

Int. Cl.² G01N *31/08;* B01D *53/02*

U.S. Cl. 23—232 R **8 Claims**



1. In a process for the quantitative determination of water in a light gaseous stream the improvement comprising the removal of condensates from said gaseous stream by passing said gaseous stream over an oleophilic substance, said substance comprising a polystyrene which has been cross-linked with a mixture of divinylbenzene and ethylvinylbenzene.

4,102,648

MEASURING NON-METHANE HYDROCARBON CONTENTS IN GASES

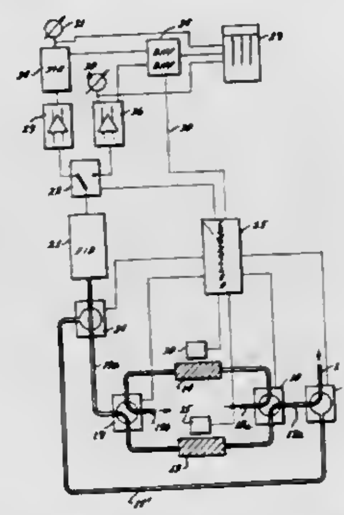
Karl Hartmann, Schöneck, and Wolfgang Treis, Bad Soden, am Taunus, both of Fed. Rep. of Germany, assignors to Hartmann & Brawn Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 15, 1977, Ser. No. 806,773

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626905

Int. Cl.² G01N *31/10, 31/12;* B01D *53/16*

U.S. Cl. 23—254 EF **5 Claims**



1. Apparatus for measuring the non-methane portion in the hydrocarbon content of gases comprising:

an unheated adsorbing device containing uncoated, active carbon and receiving a portion or sample of said gas, the carbon being exposed to the gas for removing the hydrocarbons therefrom, except the methane by adsorbing these hydrocarbons;

flame ionization means for measuring the total hydrocarbon content in said sample gas and for separately measuring said sample gas having passed through said adsorbing device to obtain a representation of the methane content only in the carbon gas; and

means for obtaining an indication of the measuring signals as provided by said flame ionization means from which to obtain an indication of the non-methane hydrocarbon content in said sample gas.

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METHOD AND DEVICE FOR AGITATING A LIQUID

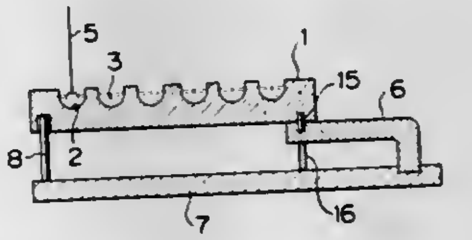
Toshio Sasaki, Tokyo, Japan, assignor to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,333

Claims priority, application Japan, May 25, 1976, 51-60282

Int. Cl.² G01N *1/18, 33/16;* B01F *11/00*

U.S. Cl. 23—259 **1 Claim**



1. In a serial dilution machine, the combination comprising:

a tray having a plurality of liquid receiving holes formed therein;

a horizontal support plate having a plurality of vertical props extending therefrom, said tray being slidably supported on said props;

a vertical pivot pin in an optional poition of said tray;

an L-shaped vibration rod having one end mounted to said pivot pin to rotationally couple said member to said tray; said rod having another end pivotally mounted to said support plate for rotation about a vertical axis;

means for causing nonlinear rotational vibration of said member in a circular arc in only a horizontal plane with respect to said support plate to vibrate said tray via said pivot pin to thereby agitate any liquid within said holes; and

spring means coupled between a point of said rod adjacent said pivot pin and said support plate.

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PROCESS FEED AND EFFLUENT TREATMENT SYSTEMS

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 489,449, Jul. 17, 1974, Pat. No. 3,984,518, which is a continuation of Ser. No. 126,498, Mar. 22, 1971, abandoned. This application Feb. 13, 1976, Ser. No. 658,059

Int. Cl.² B01D *11/04*

U.S. Cl. 23—270.5 W **13 Claims**

1. Apparatus for treatment of the liquid water feed and effluent of a gas and liquid system in which system flows of hydrogen sulfide gas saturated with water vapor and of liquid water saturated with hydrogen sulfide are contacted at elevated temperature and pressure, said system having a feed liquid inlet for said liquid water feed, an effluent liquid outlet for said liquid effluent, a gas inlet, and a purge gas outlet through which a purge stream of said gas is discharged, said apparatus comprising:

(a) delivery means connected for delivering a stream of said water feed to said feed liquid inlet, and

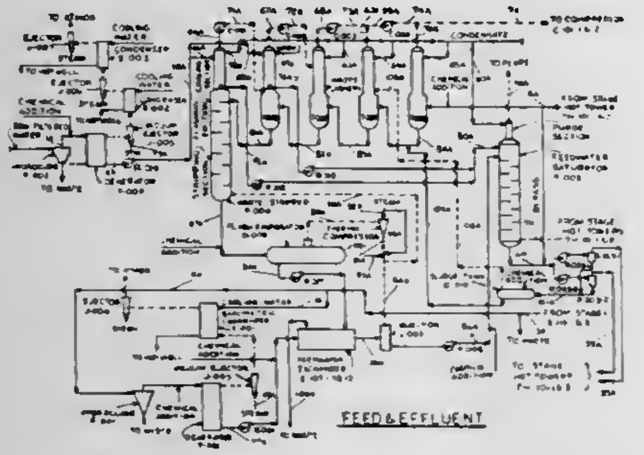
(b) means connected in said delivery means upstream of said feed liquid inlet for treating said water feed prior to its introduction into said system, including:

(1) heat transfer means having a heating fluid inlet connected to said effluent liquid outlet, a cooled heating fluid outlet, a liquid water inlet connected in said delivery means to receive said liquid water feed for heating the same, and a liquid water outlet connected in said delivery means to pass heated feed liquid to said feed liquid inlet, for thereby heating said water feed by transferring heat thereto from said effluent as said effluent is cooled,

(2) a countercurrent gas and liquid direct contact means, for absorbing into said heated liquid water feed hydrogen sulfide from said purge stream, and having gas inlet and outlet passages and liquid inlet and outlet passages, and having its gas inlet passage connected to receive said purge stream from said purge gas outlet, its liquid outlet passage connected to said feed liquid inlet, and its liquid inlet passage connected to the heating fluid outlet of said heat transfer means, and

(3) liquid pressurizing means connected in said delivery means for supplying liquid water feed to said gas and liquid contact means at essentially said elevated pressure,

whereby said liquid water feed is heated to approach said elevated temperature and saturated with hydrogen sulfide at essentially said elevated temperature and pressure.



4,102,651

ULTRASONIC ATOMIZER FOR WASTE SULFURIC ACID AND USE THEREOF IN ACID CRACKING FURNACES

Walter Kerner, Hermulheim; Friedrich Mahler, Koln-Nippes, and Heinrich Peters, Lowenich, all of Fed. Rep. of Germany, assignors to DAVY POWERGAS GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 579,207, May 20, 1975, abandoned, Division of Ser. No. 405,908, Oct. 12, 1973, Pat. No. 3,908,904. This application Sep. 2, 1976, Ser. No. 719,973

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1972, 2250521; Nov. 17, 1972, 2256442

Int. Cl.^{2} C01B *17/50;* **F27B** *15/02;* **F23D** *11/34*

U.S. Cl. 23—277 R **18 Claims**

1. A cracking furnace for waste sulfuric acid comprising:

a furnace chamber of substantially circular cross section having a ceiling and having a side wall;

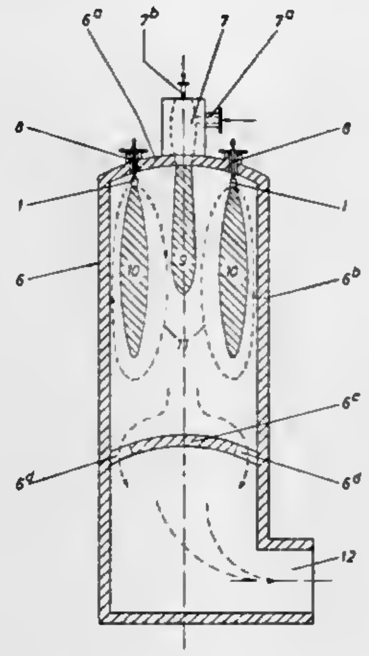
a burner centrally positioned in said ceiling;

a plurality of ultrasonic atomizer assemblies in said ceiling and distributed around said burner, each of said ultrasonic atomizer assemblies including:

(a) means for converting a feed stream of the waste sulfuric acid into a coarse spray, said means for converting including a cup in said assembly rotatable at a speed of about 4000 to 7000 rpm and means for forcing said feed stream against the inner surface of said cup, and

(b) means for generating a field of ultrasonic sound about said cup discharge and for further atomizing the coarse spray,

a gas flow constricting member transversing said chamber substantially perpendicular to the longitudinal axis thereof, located at a position from said ceiling at about 1–4 times the length of the diameter of said chamber below said burner,



outlet means at the bottom of said chamber below said gas flow constricting member, and

supply means for provision of fuel to said burner and second supply means for provision of said feed stream to said atomizer assemblies.

4,102,652

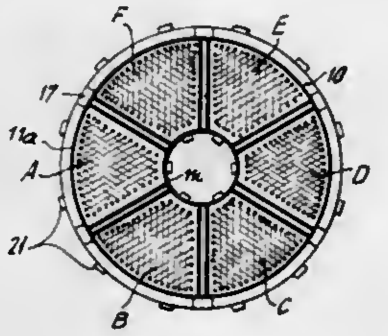
MODULAR CONSTRUCTION FOR A LARGE CATALYTIC REACTION APPARATUS

Rudolf Vogl, Deggendorf, Donau, Germany, assignor to Deggendorfer Werft and Eisenbau GmbH, Deggendorf, Donau, Germany

Filed Mar. 1, 1977, Ser. No. 773,161

Int. Cl.^{2} B01J *8/06;* **B21D** *53/06;* **B23P** *15/26*

U.S. Cl. 23—288 M **7 Claims**



2. Large catalytic reaction apparatus comprising a first tube sheet and a second tube sheet, said first and second tube sheets spaced apart and disposed in substantially parallel relation, each said tube sheet divided into an equal number of similarly shaped sector-like sections, a plurality of tubes extending between and connected to each pair of one sector-like section of said first tube sheet and one sector-like section of each said second tube sheet, said tubes sealingly connected to said sector-like sections of said tube sheets, each said sector-like section of said first and second tube sheets comprising a pair of angularly spaced radially extending edges, an inner edge extending circumferentially between the radially inner ends of said radially extending edges, and an outer edge extending circumferentially between the radially outer ends of said radially extending edges, a radially extending side wall connected to and extending between each corresponding radially extending edge of said pair of said sector-like sections joined by the plurality of said tubes, a radially inner circumferentially extending side wall connected to and extending between the inner edges of said pair of sector-like sections joined by the plurality of said tubes, and a radially outer circumferentially extending side wall connected to and extending between the outer edges of said pair of sector-like sections, the adjacent edges of said radially extending side walls, inner side wall and outer side wall sealingly connected together and said radially extending side walls, inner side wall and outer side wall sealingly connected to said sector-like sections of said first and second tube sheets for forming a sealingly enclosed pressure tight modular unit and a circumferentially extending heat transfer medium inlet conduit and a circumferentially extending heat transfer medium outlet conduit connected to the radially outer face of said circumferentially extending radially outer side wall in each said modular unit and means for interconnecting said inlet conduits on adjacent said modular units and for interconnecting said outlet conduits on adjacent said modular units, whereby each said modular unit provides a sealingly closed pressure tight unit capable of being tested at a production site at operating pressures before it is shipped to and assembled at a construction site for assembly with the completed apparatus.

4,102,653

AROMATIC WOOD FUEL BRIQUETTE AND METHOD OF MAKING AND USING THE SAME

Charles T. Simmons, 2452 Dorchester, Troy, Mich. 48084 and William B. Lampert, III, Ypsilanti, Mich., assignors to Charles T. Simmons, Troy, Mich.

Continuation-in-part of Ser. No. 649,142, Jan. 14, 1976, abandoned. This application May 2, 1977, Ser. No. 793,189

Int. Cl.^{2} C10L *5/12, 5/40, 5/00*

U.S. Cl. 44—16 R **6 Claims**

1. Smoke generating briquettes adapted to be used with a cooking heat source for generating aromatic smoke and vapors for smoking food during cooking with said heat source, said briquettes comprising: aromatic wood particles compressed with a combustion retardant binder into briquettes, said proportion of said combustion retardant binder being sufficient to produce self extinguishment of said briquettes in the absence of an external heat source to thereby prevent flaming by inhibiting combustion of emitted aromatic smoke and vapors, during substantially the entire combustion cycle of the briquettes, whereby, when subjected to the heat generated by said heat source, said briquettes will combust so as to generate said aromatic smoke and vapors over an extended time period and will not appreciably augment the heat generated by said heat source.

2. The articles of claim 1 in which the combustion retardant binder is chosen from the group consisting of alkali metal salts, ammonium salts, boric acid and phosphoric acids.

4,102,654

NEGATIVE IONIZER

Henri Maurice Pellin, Grenoble, France, assignor to Raymond Bommer, La Forteresse, France

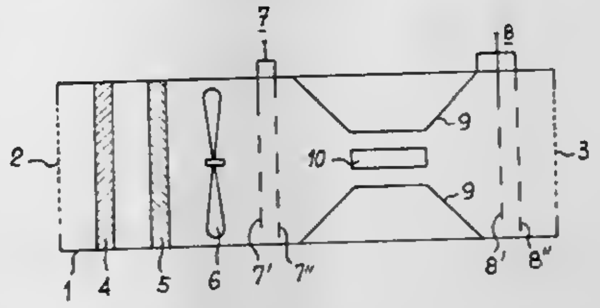
Filed Jul. 26, 1977, Ser. No. 819,117

Claims priority, application France, Jul. 27, 1976, 76 22831

Int. Cl.^{2} B03C *3/38*

U.S. Cl. 55—102 **6 Claims**

1. In a negative ioniser of the kind which comprises an active filter, means to create a forced flow of air, at least one grid which is raised to a high positive potential and is intended to trap harmful negative ions, means for generating negative ions, and at least one grid which is raised to a high negative potential and is intended to trap any positive ions which may be present, the improvement which consists in that the said means for generating negative ions comprise a venturi which is raised to a high negative potential and which is made of polished metal, and within which, in its narrowest area, is arranged, coaxially



with the said venturi, a germicidal tube for generating shortwave ultraviolet radiation.

4,102,655

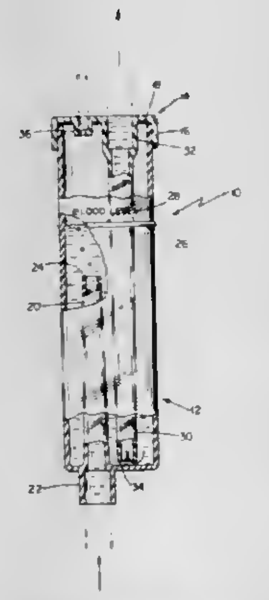
BUBBLE TRAP

Russell L. Jeffery, Littleton, Colo., and Lawrence V. Cote, Ronan, Mont., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed May 2, 1977, Ser. No. 792,793

Int. Cl.^{2} A61M *1/03*

U.S. Cl. 55—201 **7 Claims**



1. A bubble trap for blood comprising:

a closed transparent container for holding blood,

said container having a top and a bottom and indicium constituting a blood level indicator,

an inlet tube into said container,

said inlet tube entering through said container bottom and extending upward within said container to an inlet opening and said inlet opening having a cross-sectional area smaller than the flow cross-sectional area of said container,

said inlet opening being spaced below said container top and below said indicium to direct gas bubbles toward said indicium,

an outlet tube from said container exiting through said container top,

said outlet tube extending downward into said container to an outlet opening,

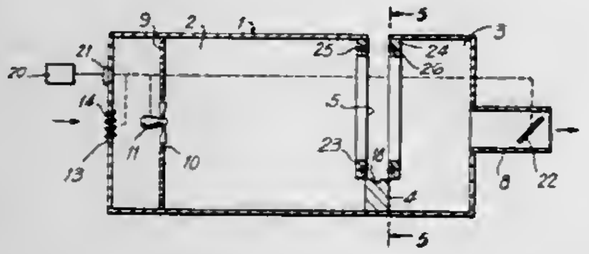
said outlet opening being lower in said container than said inlet opening whereby blood flowing upward through said inlet opening into said container must subsequently flow downward to reach said outlet opening, and

means positioned in the top of the container for removing gas from said container.

4,102,656

ODOR CONDITIONER

Bjorn R. Koritz, 1641 Third Ave., New York, N.Y. 10028
Filed Sep. 27, 1976, Ser. No. 726,721
Claims priority, application Switzerland, Sep. 25, 1975, 107516/75
Int. Cl.^{2} B01D *46/00*
U.S. Cl. 55—210 **10 Claims**

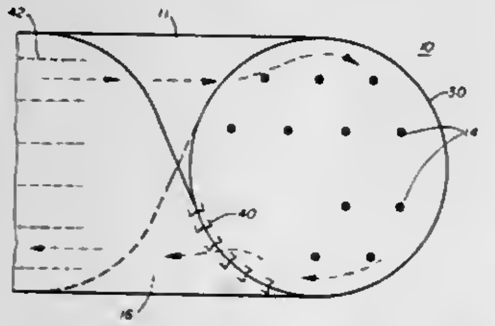


1. Apparatus for odor conditioning of ambient air by the introduction of a vapor of a selected liquid into a selected region or space, comprising a housing defining a chamber having an inlet end and an outlet end, a partition in said chamber, said partition having an opening therein, a first wall terminating said chamber at said inlet end, a second wall terminating said chamber at said outlet end, an electric fan for moving air from said inlet end to said outlet end, said fan being mounted in said opening in said partition, said housing having a slot therein dividing said chamber and separating said inlet from said outlet end, and a conditioning element for insertion fittingly in said slot, said conditioning element including a reservoir for said selected liquid, a frame having an opening therethrough and a wicking air-permeable filter element covering said opening, said frame holding said filter element and said reservoir so that said filter element dips into said reservoir and covers the slot between said inlet and outlet ends so that air moving from said inlet end to said outlet end of said chamber must pass through said filter element for accepting vapor of said selected liquid, said filter element holding said liquid by reason of its wicking characteristic, said first wall having therein a first opening for admitting air and first cover means for closing said first opening, and said second wall having therein a second opening for efflux of air containing the vapor of said selected liquid from said outlet end and second cover means for closing said second opening.

4,102,657

CENTRIFUGAL GAS SCRUBBER

Arun Kumar Mehta, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed May 9, 1977, Ser. No. 794,894
Int. Cl.^{2} B01D *47/00*
U.S. Cl. 55—222 **4 Claims**

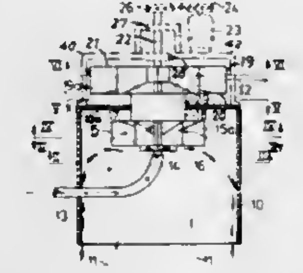


1. Contact structure within which gas to be treated is brought into contact with liquid which has the potential to remove contaminates from gas it contacts, including,
- a source of gas containing contaminates to be removed,
- a cylindrical housing extended vertically,
- an inlet duct substantially rectangular in cross-section and connected through the side wall of the housing and to the source of gas and arranged and directed to flow the gas on the internal wall of the housing to initiate a circular flow path for the gas,
- an outlet duct substantially rectangular in cross-section and connected through the side wall of the housing at a vertical elevation higher than the connection of the inlet duct and having a common wall with the inlet duct and flowing the gas from the upwardly spiralling flow path and into heat exchange relationship with the inlet gas through the common wall,
- a volume within the housing and below the spiral gas path for liquid with which to remove contaminates from gas,
- a body of liquid within the lower housing which has the potential to remove contaminates from gas,
- nozzles positioned above the gas path within the housing and arranged and directed to discharge liquid into the gas path,
- and conduit and pump means connecting the nozzles and body of liquid to supply the nozzles with liquid from the body.

4,102,658

APPARATUS FOR CONTACTING A GAS WITH A LIQUID

Viljo Juhana Jarvenpaa, Vellamontie 21 as 6, 04200 Kerava, Finland
Filed Aug. 17, 1976, Ser. No. 715,211
Claims priority, application Finland, Aug. 18, 1975, 752333
Int. Cl.^{2} B01D *47/00*
U.S. Cl. 55—230 **6 Claims**



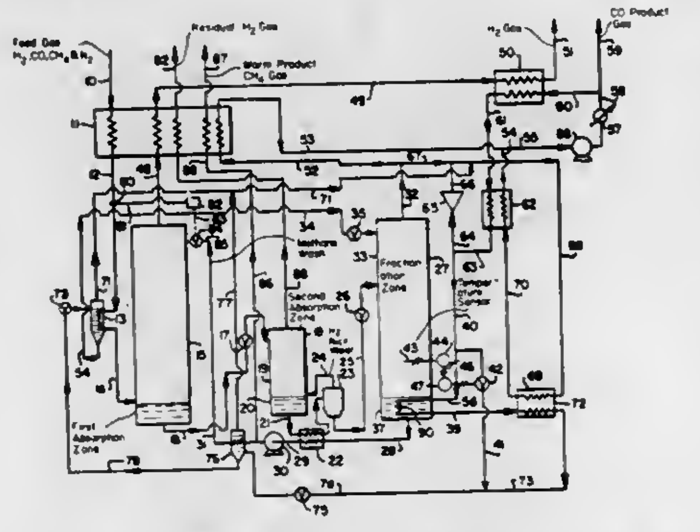
1. In a device wherein a gaseous fluid is brought into contact with a washing liquid for purposes such as removal of gaseous components and/or solid impurities from the gaseous fluid and/or cooling the gaseous fluid tubular receiving means for receiving the gaseous fluid and including means for placing the latter in contact with a washing liquid in the interior of said tubular receiving means, said tubular receiving means having an inlet through which the gaseous fluid enters into said tubular receiving means, and said tubular receiving means including an outer tubular wall and an end wall fixed to and extending across said outer tubular wall distant from said inlet and formed with an opening which passes through said end wall, said tubular receiving means placing said gaseous fluid in contact with the washing liquid as said gaseous fluid flows toward said end wall so that the gaseous fluid is in a wetted condition when reaching the region of said end wall, internal radial blower means situated in said tubular receiving means adjacent said end wall thereof for separating droplets from the wetted gaseous fluid in said tubular receiving means, external radial blower means situated outside of said tubular receiving means adjacent said end wall thereof for providing a flow of purified gas radially from said external blower means, said external blower means being coaxial with and having a diameter greater than that of said internal blower means, and both of said blower means having central suction regions while a common axis of both of said blower means is substantially perpendicular to said end wall, and connecting tubular means fluid-tightly connected with both of said blower means and passing through said opening in said end wall of said tubular receiving means, said connecting tubular means having a hollow interior communicating fluid-tightly with the interiors of both of said blower means at said central suction regions

thereof, so that gas from which droplets have been removed by said internal blower means flows from the latter through said connecting tubular means to said external blower means to be radially discharged thereby, said internal and external radial blower means respectively including outer end plates which are distant from each other and inner end plates which are situated between and spaced from said outer end plates, with said end wall of said tubular receiving means extending between said inner end plates and surrounding said connecting tubular means, each of said blower means including a plurality of blower vanes extending between and fixed to said inner and outer end plates thereof, said inner end plates of both of said blower means respectively being formed with central openings respectively situated at said central suction regions thereof, and said connecting tubular means being coaxial with said internal and external blower means while extending between and being fixed to said inner end plates for providing communication between said internal and external blower means from said central opening of said inner end plate of said internal blower means, through said connecting tubular means, and into said external blower means through said central opening of said inner end plate thereof, whereby said internal and external blower means and said connecting tubular means form a single rotary unit through which the gaseous fluid flows while being confined therein without being required to travel with respect to any surfaces with respect to which said unit rotates, and drive means operatively connected to said unit for rotating the latter about said axis.

4,102,659

SEPARATION OF H_2, CO, AND CH_4 SYNTHESIS GAS WITH METHANE WASH

Jay Robert Martin, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 692,749, Jun. 4, 1976, abandoned. This application Oct. 6, 1976, Ser. No. 730,287
Int. Cl.^{2} F25J *3/02*
U.S. Cl. 62—17 **28 Claims**

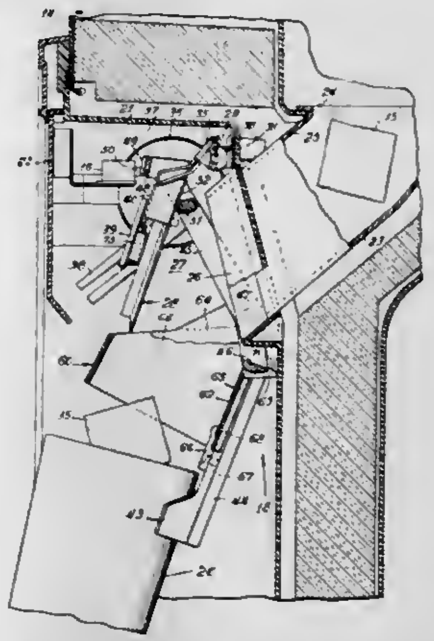


1. A process for the separation of a feed gas mixture containing hydrogen, carbon monoxide and methane comprising the steps of:
- (a) cooling the feed gas mixture;
- (b) countercurrently contacting the cooled feed gas mixture with a methane wash liquid in a first absorption zone to recover hydrogen gas as overhead and bottoms liquid comprising methane, carbon monoxide and residual hydrogen;
- (c) throttling the bottoms liquid from the first absorption zone to lower pressure;
- (d) countercurrently contacting the throttled bottoms liquid with hydrogen rich vapor in a second absorption zone for absorption of carbon monoxide from the hydrogen rich vapor by the throttled bottoms liquid therein to recover residual hydrogen gas as overhead and bottoms liquid enriched in carbon monoxide, and warming second absorption zone bottoms liquid to vaporize a gaseous fraction therefrom containing hydrogen and carbon monoxide, as said hydrogen rich vapor for said second absorption zone;
- (e) fractionating the bottoms liquid recovered from said second absorption zone in a fractionation zone to recover overhead gas comprising carbon monoxide and bottoms liquid comprising methane; and
- (f) recirculating at least part of the bottoms liquid recovered from the fractionation zone to the first absorption zone as the methane wash liquid therefor.

4,102,660

ICE GUIDE FOR REFRIGERATOR WITH EXTERNAL ICE SERVICE

Leo Gano Beckett, Henderson, Ky., and William J. Buchser, Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Aug. 26, 1976, Ser. No. 718,144
Int. Cl.^{2} F25C *1/00*
U.S. Cl. 62—344 **18 Claims**



1. In an ice dispensing apparatus having a wall provided with an opening, apparatus for delivering ice pieces outwardly through said opening, and actuating means carried by the wall for selectively actuating said apparatus, the improvement comprising:
- closure means for selectively closing said opening;
- guide means; and
- means for selectively positioning said closure means and said guide means separately of one another to cooperatively define directing means for directing the ice pieces away from said opening to a preselected delivery area concurrently with operation of said actuating means.

4,102,661

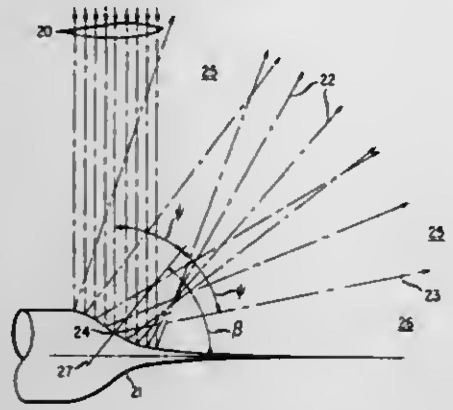
CAUSTIC RAY USE OF THE DRAWDOWN ZONE OF AN OPTICAL FIBER PREFORM TO CONTROL THE DRAWING OF THE FIBER

Thomas Dixon Dudderar, Meyersville, and Peter Gerald Simpkins, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 3, 1977, Ser. No. 774,139
Int. Cl.^{2} C03B *37/02*
U.S. Cl. 65—2 **12 Claims**

1. A method of fabricating an optical fiber comprising:
- heating a portion of an optical fiber preform thereby softening it sufficiently so as to enable drawing;
- drawing the optical fiber preform into an optical fiber while controlling one or more drawing parameters;
- illuminating the optical fiber preform during the drawing

process to yield at least one caustic ray emanating from the curved region of the drawdown zone;

detecting the at least one caustic ray emanating from the curved region of the drawdown zone;



monitoring variations in the propagation direction of the at least one caustic ray during the drawing process; and

controlling the physical characteristics of the drawdown zone, by controlling at least one drawing parameter in response to the monitoring of the at least one caustic ray.

4,102,662

METHOD AND APPARATUS FOR MAKING FIBERS FROM THERMOPLASTIC MATERIALS

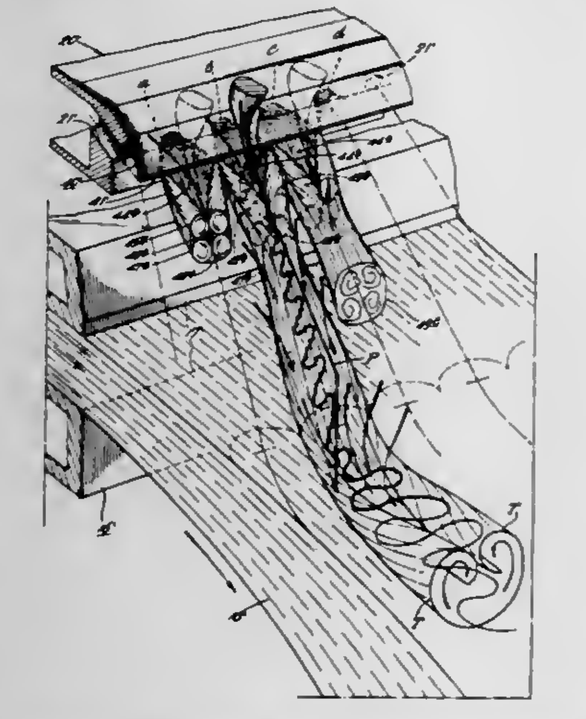
Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 676,755, Apr. 14, 1976, and Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, said Ser. No. 676,755, continuation-in-part of Ser. No. 557,282, is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Jan. 25, 1977, Ser. No. 762,789

Claims priority, application France, Dec. 16, 1976, 76 37884

Int. Cl.^{2} C03B *37/06*

U.S. Cl. 65—5 **42 Claims**



4. A method for forming fibers from attenuable material comprising establishing a series of spaced gaseous jets directed in side by side paths, deflecting the jets from said paths to alter the paths thereof and to cause lateral spreading of the jets, the jets being sufficiently close to each other to provide for impingement of adjoining deflected jets upon each other in zones intermediate the jets and thereby generate spaced tornadoes, and delivering a stream of attenuable material into the influence of each jet in a region along the path thereof between said tornadoes.

4,102,663

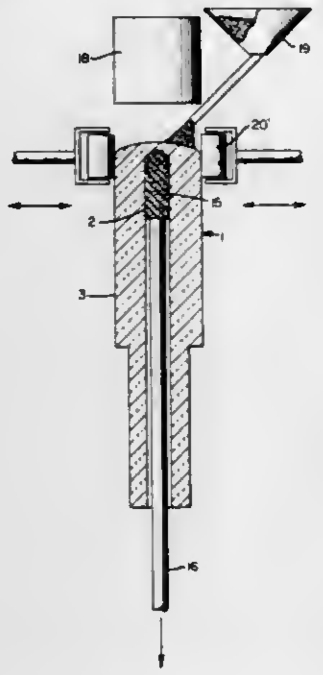
METHOD FOR MANUFACTURING HOLLOW AND SOLID INGOTS

Lothar Jung, 31 Lurline Dr., Millington, N.J. 07946

Filed Jul. 9, 1976, Ser. No. 703,919

Int. Cl.^{2} C03B *23/20, 37/02*

U.S. Cl. 65—18 **15 Claims**



1. A method for forming a cylindrical silica ingot from a silica melt comprising:

depositing silica initially onto the surface of a linearly movable cylindrical support of said silica and subsequently onto the surface of the ingot as the ingot is formed on said support;

heating the deposited material with a heat source to melt said deposited material on said support or ingot;

intermittently contacting the melt for predetermined time intervals, with at least one roller member forming tool to shape the melt into a cylinder having a smooth surface and a constant outer diameter without increasing said diameter during said forming, said deposited silica and said cylindrical silica support becoming an integral form as the melt solidifies; and

moving said support as the ingot is formed to maintain a constant distance between the deposition surface and the heat source.

4,102,664

METHOD FOR MAKING GLASS ARTICLES WITH DEFECT-FREE SURFACES

William H. Dumbaugh, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 18, 1977, Ser. No. 798,022

Int. Cl.^{2} C03C *19/00, 25/02*

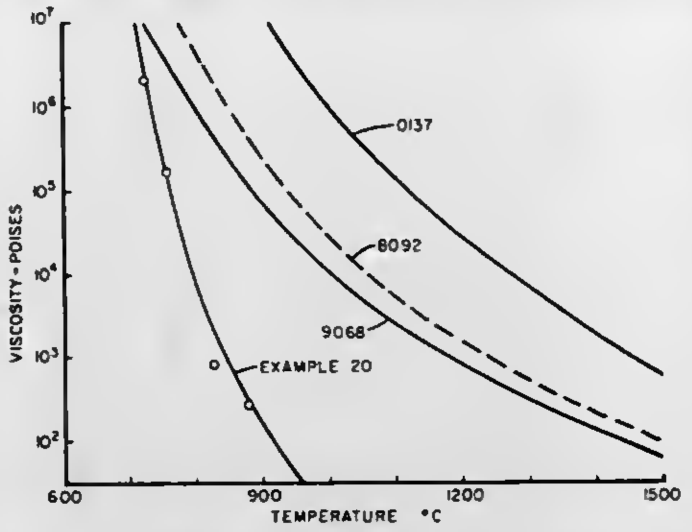
U.S. Cl. 65—23 **4 Claims**

1. A method for forming strengthened glass articles having surfaces which are essentially defect free and equivalent in smoothness to polished surfaces which comprises the steps:

(a) two glass-forming batches of different compositions are melted, one batch for a glass which is highly soluble in a given solvent and the second for a glass which is relatively insoluble in the same solvent;

(b) the molten batches are simultaneously brought together while in the fluid state, that is, having viscosities no greater than about 250,000 poises, to form a laminated glass body wherein the insoluble glass is essentially completely enclosed within the soluble glass;

(c) the laminae are fused together at a temperature where the melts are in fluid form to provide an interface therebetween which is defect free and to cause an exchange of ions to take place at said interface between said insoluble glass and said soluble glass, the composition of the soluble glass being selected such that there is essentially no composition gradient at said interface but the migratable ions thereof enhance the chemical durability of the insoluble glass and cause the production of a surface layer on the insoluble glass having a coefficient of thermal expansion lower than that of the insoluble glass, and the composition of the insoluble glass being selected such that the migratable ions thereof enhance the solubility of the soluble glass;



(d) the laminated article is cooled; and then

(e) the soluble glass layer is dissolved away in a solvent wherein it is at least 10 times more soluble than the insoluble glass.

4,102,665

DIFFUSION TREATMENTS FOR MODIFYING THE PROPERTIES OF GLASS AND VITROCRYSTALLINE MATERIALS

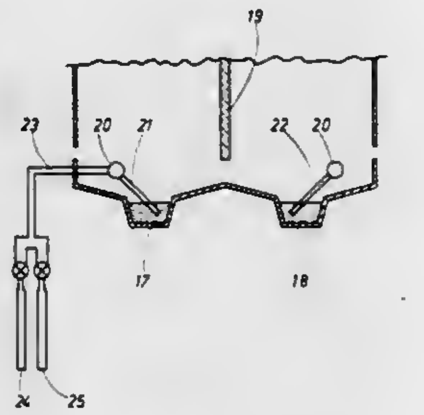
Emile Plumat, Gilly; Pol Baudin, Ransart; Robert Van Laethem, Loverval, and Jean Deliere, Montigny sur Sambre, all of Belgium, assignors to Glaverbel-Mecaniver, Watermael-Boltsfort, Belgium

Continuation of Ser. No. 111,493, Feb. 1, 1971, abandoned. This application May 28, 1976, Ser. No. 691,064

Claims priority, application United Kingdom, Feb. 3, 1970, 5123/70

Int. Cl.^{2} C03C *21/00*

U.S. Cl. 65—30 E **16 Claims**



1. In a process for chemically tempering at least part of a body of glass or vitrocrystalline material by diffusing ions into at least part of the body from a contacting medium composed of at least one molten metal salt and constituting a source of such ions, the body being disposed in an enclosure for the chemical tempering operation, the improvement comprising providing at least one pool of the medium within said enclosure, said pool being out of contact with and below the body bubbling gas through the pool in order to agitate the medium in the pool sufficiently to place said medium in the form of a mist composed of liquid droplets of such molten salt, which mist fills the enclosure and contacts the body; and continuously replenishing the medium contacting the body.

4,102,666

METHOD OF SURFACE CRYSTALLIZING QUARTZ

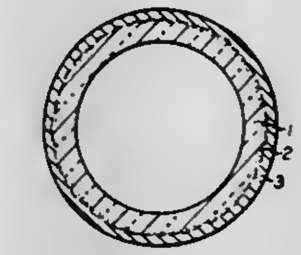
Peter Bäumler, Dörnigheim; Gerhard Höfer, Bruchköbel; Tassilo Körner, Erlensee; Heinrich Mohn, Hailer; Karl Seiler, Hanau-Hohe Tanne; Fritz Simmat, Meerholz, and Karlheinz Rau, Hanau, all of Fed. Rep. of Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Division of Ser. No. 383,432, Jul. 27, 1973, Pat. No. 3,927,697, which is a division of Ser. No. 166,844, Jul. 28, 1971, Pat. No. 3,776,809, which is a continuation of Ser. No. 793,755, Jan. 24, 1969, abandoned, and Ser. No. 810,713, Mar. 26, 1969, abandoned. This application Sep. 25, 1975, Ser. No. 616,522

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1968, 1696061; Mar. 30, 1968, 1771077; Mar. 30, 1968, 1988697

Int. Cl.^{2} C03C *21/00*

U.S. Cl. 65—33 **10 Claims**



1. Process for making a fused quartz glass tube capable of forming an outer layer of uniformly fine crystalline silica when heated to a temperature at which such crystalline silica forms which comprises forming a first tube from fused quartz glass *containing a crystallization promoting nuclei whose rate of diffusion in quartz glass is* less than that of sodium at elevated temperatures, inserting a second, snugly fitting fused quartz glass tube into said first tube and thereafter fusing said first and second tubes together at a temperature of at least 1200°C wherein the fused quartz glass recrystallizes.

4,102,667

ADDITIVE AND METHOD FOR REDUCING THE DRIFT OF AQUEOUS SPRAY COMPOSITIONS

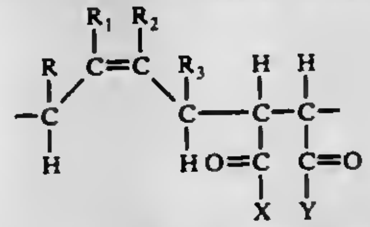
Robert Earl Robinson, Columbia, and John Alan Ernst, Lexington, both of S.C., assignors to Lindau Chemicals, Inc., Columbia, S.C.

Filed Jul. 16, 1976, Ser. No. 706,043

Int. Cl.^{2} C08L *9/00*

U.S. Cl. 71—3 **13 Claims**

1. A method for depositing an aqueous composition in a well defined pattern in an area on the ground from above the ground comprising the steps of providing a mixture of said aqueous composition and a drift-inhibiting amount of a substantially water-soluble copolymer of maleic acid and a conjugated diene, said copolymer having the structural formula



$$\begin{array}{ccccccc} & R_1 & R_2 & & & & \\ R & | & | & R_3 & H & H & \\ | & C{=}C & & | & | & | & \\ -C & / & \backslash & C- & C- & C- & \\ | & & & | & | & | & \\ H & & & H & O{=}C & C{=}O & \\ & & & & | & | & \\ & & & & X & Y & \end{array}$$

wherein R, R_1, R_2, and R_3 are members selected from the group consisting of hydrogen, halogen, aryl radicals and alkyl, cycloalkyl and alkoxy radicals having from 1 to 8 carbon atoms and wherein R, R_1, R_2, and R_3 are the same or different and wherein at least 75% of the carbon-to-carbon double bond structure is cis-1,4; and wherein X and Y are OZ and wherein Z is hydrogen, an alkali or alkaline earth metal, or an ammonium radical and wherein Z is the same or different; and dispensing the resulting admixture as aqueous droplets into the air above said area, said copolymer reducing drift of said aqueous droplets by increasing the droplet size.

4,102,668
β-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

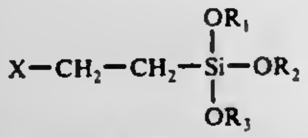
Division of Ser. No. 443,180, Feb. 15, 1974, Pat. No. 3,985,780, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Sep. 27, 1976, Ser. No. 727,313

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

Int. Cl.^{2} A01N *9/00, 9/12*

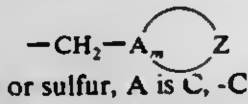
U.S. Cl. 71—90 **7 Claims**

1. A beta-halogen-ethyl silane corresponding to the formula



$$X-CH_2-CH_2-\overset{\displaystyle OR_1}{\underset{\displaystyle OR_3}{Si}}-OR_2$$

wherein X is chlorine or bromine, and R_1, R_2 and R_3 are the same and correspond to the heterocycle



wherein Z is oxygen or sulfur, A is C, -CH= or -CH_2-, and m is the integer 4 or 5.

7. A composition for the regulation of plant growth comprising a) an inert carrier and b) an active ingredient, an effective amount of a compound of the formula of claim 1.

4,102,669
HERBICIDAL BETA-PHENYL-4-PIPERIDINONES AND -DIHYDROPYRIDINONES

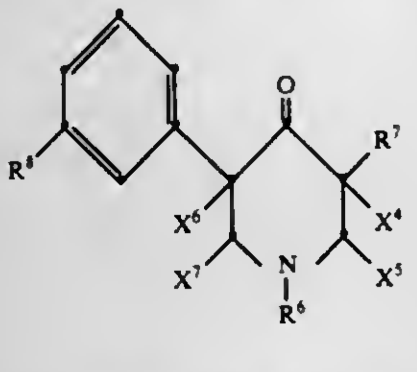
Harold Mellon Taylor, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 685,409, May 20, 1976, Pat. No. 4,065,290, and a continuation-in-part of Ser. No. 593,095, Jul. 3, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,616

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 71—94 **37 Claims**

1. A method of reducing the vigor of unwanted herbaceous plants which comprises contacting the plants with an herbicidally-effective amount of a compound of the formula



wherein

R^6 represents C_1-C_3 alkyl, C_2-C_3 alkenyl or propargyl;

R^7 represents hydrogen, phenoxy, phenylthio, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 alkylthio, phenyl or phenyl monosubstituted with chloro, bromo, fluoro, trifluoromethyl, C_1-C_3 alkyl or C_1-C_3 alkoxy;

R^8 represents chloro, bromo, fluoro, trifluoromethyl, C_1-C_3 alkyl or C_1-C_3 alkoxy;

each of X^4 and X^5 represents hydrogen, or X^4 and X^5 combine to form a carbon-carbon bond;

each of X^6 and X^7 represents hydrogen, or X^6 and X^7 combine to form a carbon-carbon bond;

provided that at least one of (X^4 and X^5) and (X^6 and X^7) form a bond.

4,102,670
BETA-HALOGENOETHYL-SILANES AS PLANT GROWTH REGULATORS

Werner Foery, Basel, and Hans Peter Fischer, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

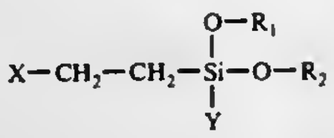
Division of Ser. No. 443,180, Feb. 15, 1974, Pat. No. 3,985,780, which is a continuation-in-part of Ser. No. 186,392, Oct. 4, 1971, abandoned. This application Sep. 27, 1976, Ser. No. 727,303

Claims priority, application Switzerland, Oct. 6, 1970, 14797/70; May 14, 1971, 7206/71

Int. Cl.^{2} A01N *9/00, 9/12, 9/20, 9/24*

U.S. Cl. 71—98 **21 Claims**

1. A beta-halogen-ethyl silane corresponding to the formula



$$X-CH_2-CH_2-\overset{\displaystyle O-R_1}{\underset{\displaystyle Y}{Si}}-O-R_2$$

wherein

X represents chlorine or bromine, Y represents chlorine or the radical —OR_3; R_1, R_2 and R_3 represent, independently of each other, alkyl radicals having 6 to 18 carbon atoms; alkyl radicals substituted by halogen, alkenyloxy, phenoxy, cycloalkyl, alkylthio, alkoxycarbonyl, or di- and trialkylammonio, alkenyl or halogenalkenyl; alkynyl; cycloalkyl; phenyl radicals optionally mono- or polysubstituted by cyano, alkyl, halogenalkyl, alkoxy alkylthio, or alkoxycarbonyl; benzyl radicals optionally mono- or polysubstituted by alkyl, alkoxy or halogen; one or more of the symbols R_1, R_2 and R_3 can also represent the group —CO—R_4 wherein R_4 stands for C_6—C_{18} alkyl, alkenyl or alkynyl radical; a halogenalkyl or halogenalkenyl radical; an alkyl or alkenyl radical substituted by cycloalkyl or phenyl, whereby phenyl can be substituted by alkyl, alkoxy or halogen; an alkoxyalkyl; an alkoxycarbonylalkyl; a phenyl radical optionally substituted by halogen, lower alkyl or lower alkoxy.

17. A composition for the regulation of plant growth comprising a) an inert carrier and b) as active ingredient, an effective amount of a compound of the formula of claim 1.

4,102,671
CONTROL OF WEEDS WITH N-SUBSTITUTED ALANINE COMPOUNDS

Ernest Haddock, Sheerness; Clive A. Raven, and Alan J. Sampson, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

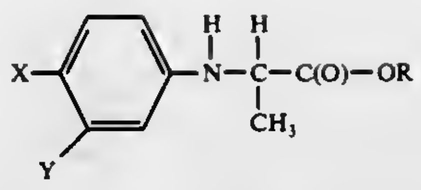
Division of Ser. No. 709,756, Jul. 29, 1976. This application Jul. 25, 1977, Ser. No. 819,014

Claims priority, application United Kingdom, Jul. 29, 1975, 31691/75

Int. Cl.^{2} A01N *9/12, 9/20*

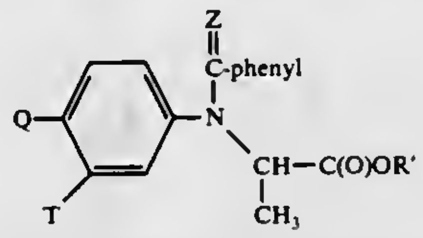
U.S. Cl. 71—98 **4 Claims**

1. A herbicidally active composition which comprises a carrier, optionally a surface-active agent, and as active ingredients: (a) a compound of the formula:



(I)

wherein X is chlorine of fluorine, Y is hydrogen, chlorine, or fluorine, and R is hydrogen, alkyl of from one to six carbon atoms, and when R is hydrogen, the alkali metal, alkaline earth metal, ammonium and mono- and di(C_1–C_6-alkyl)ammonium salts thereof and (b) a compound of the formula:



(II)

wherein Z is oxygen or sulfur, Q is chlorine or fluorine, T is hydrogen, chlorine or fluorine and R' represents one of the moieties represented by the symbol R, the weight ratio of the compound of formula (I) to the compound of formula (II) being within the range of from about 4:1 to about 1:2.

4,102,672
HERBICIDAL COMPOSITION OF AMINO ACID HIGHER ALKYL ESTER TYPE AND METHOD FOR CONTROLLING WEEDS

Takao Kida, Yokosuka; Hiroshi Mizuno, Yokohama, and Masaru Okutsu, Kawasaki, all of Japan, assignors to Ajinomoto Co. Inc., Tokyo, Japan

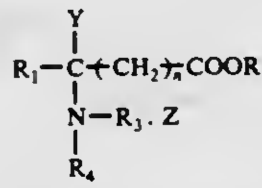
Division of Ser. No. 514,745, Oct. 15, 1974. This application Jul. 6, 1976, Ser. No. 702,501

Claims priority, application Japan, Oct. 19, 1973, 48-118316; Feb. 14, 1974, 49-18050

Int. Cl.^{2} A01N *9/02*

U.S. Cl. 71—106 **14 Claims**

1. A herbicidal composition in the form of dust, granule, pellet, wettable powder, emulsifiable concentrate, or dispersed liquid comprising a herbicidal amount of an admixture of an active compound (A) selected from compounds of the formula



$$R_1-\overset{\displaystyle Y}{\underset{\displaystyle \begin{array}{c}|\\ N-R_3\,.\,Z\\ |\\ R_4\end{array}}{C}}\!\left(CH_2\right)_n COOR_2$$

wherein R_1 is a hydrogen atom or alkyl of 1 to 4 carbon atoms, R_2 is an alkyl of 8 to 18 carbon atoms, each of Y, R_3 and R_4 is independently a member selected from the group consisting of a hydrogen atom or methyl group, Z is an inorganic or organic acid group selected from the group consisting of hydrochloric acid, oxalic acid and pyroglutamic acid, and *n* is 0, 1 or 2 and (B) 3,3'-dimethyl-4-methoxybenzophenone and a diluent or carrier wherein the weight ratio of (A) to (B) is 2:8 to 8:2.

4,102,673
1-PHENYL-HEXYL UREAS AS HERBICIDES

George A. Buntin, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 155,340, Jun. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 756,424, Aug. 30, 1968, abandoned. This application Feb. 28, 1973, Ser. No. 336,600

Int. Cl.^{2} A01N *9/20;* **C07C** *127/15, 127/19*

U.S. Cl. 71—120 **12 Claims**

1. A herbicidal composition comprising application aid material and an effective quantity of 1-phenyl-3-(2-hexyl)urea.

4,102,674
METHOD FOR HARDENING IRON ORE PELLETS

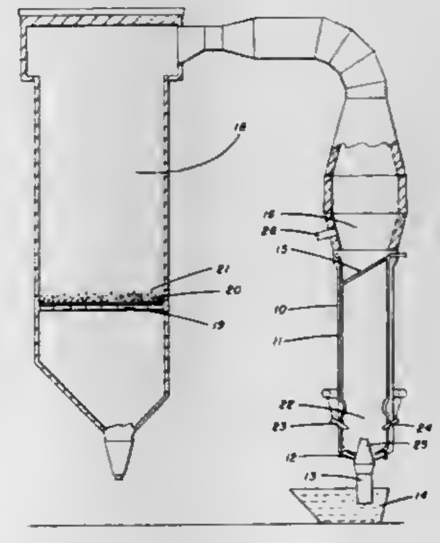
Kurt Osterloh; Karl Peter; Paul Gernhardt, all of Bochum; Wolfgang Grams, Herne; Christian Hundeshagen, Bochum; Wilhelm Danguillier, Bochum, and Siegfried Pohl, Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,262

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608003

Int. Cl.^{2} C22B *1/14*

U.S. Cl. 75—3 **7 Claims**



1. A process for hardening iron ore pellets, said process including the steps of:

generating low calorific gas in a gasification chamber of a slag bath generator,

extracting liquid slag from the stream of low calorific gas produced by the slag bath generator after passing from said gasification chamber,

thereafter heat treating the low calorific gas by admixture with air in a mixing chamber, and

contacting iron ore pellets in a treatment chamber with the heat treated, low calorific gas to harden the iron ore pellets.

4,102,675
METHOD OF TREATING MOLTEN SLAGS IN STEEL MAKING PROCESS

Yoshio Miyashita; Akira Masui; Kenzo Yamada, and Kenji Takahashi, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 676,937, Apr. 14, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,272

Claims priority, application Japan, Apr. 16, 1975, 50/45301

Int. Cl.^{2} C21B *3/04*

U.S. Cl. 75—24 **5 Claims**

1. A process of changing the composition of molten slag, comprising the steps of

(A) tapping molten steel from a converter to separate said molten steel from molten slag thereby substantially leaving molten slag remaining therein, said slag comprising CaO, SiO_2, MgO, MnO, FeO, and P_2O_5;

(B) adding solid carbon and flux to said molten slag remaining in said converter;

(C) blowing oxygen onto said carbon and flux on the surface of said molten slag to generate exothermic reaction and compensate for heat loss caused by said addition of carbon and flux without addition of any external heat, whereby said molten slag is regenerated to increase the amount of said CaO, SiO_2, MgO and to decrease the amount of MnO, Fe and P_2O_5; and

(D) removing said regenerated slag from said converter and thereby to prepare said converter for another steel making charge.

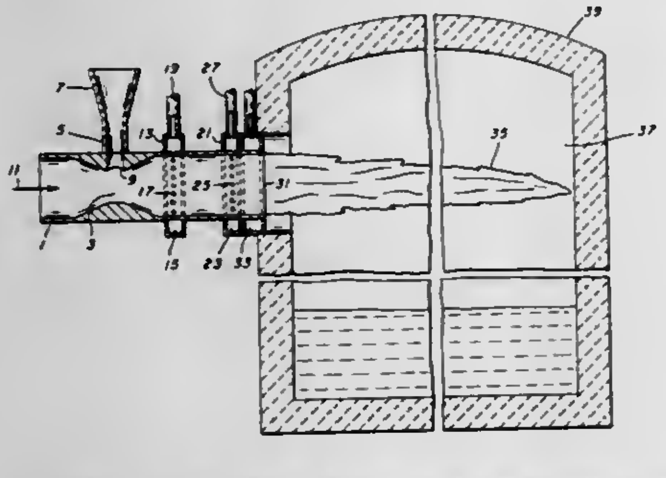
4,102,676
METHOD FOR RECOVERING LEAD FROM BATTERY MUD

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1977, Ser. No. 781,112

Int. Cl.² C22B *13/02*

U.S. Cl. 75—77 **3 Claims**



1. A method of producing metallic lead from battery mud comprising the steps of:

drying the battery mud to produce a fine particulate material;

entraining the fine particulate material in a stream of air;

injecting a reducing gas into the stream of air and fine particulate material around the periphery thereof to produce a reducing flame;

injecting oxygen into the fuel rich periphery of the stream of air and fine particulate material in sufficient quantity to ensure a stable flame and to maintain reducing temperature; and

collecting the droplets of lead which fall from the reducing flame.

4,102,677
AUSTENITIC STAINLESS STEEL

Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Dec. 2, 1976, Ser. No. 746,972

Int. Cl.² C22C *38/44*

U.S. Cl. 75—128 A **10 Claims**

1. A hot workable, pitting and crevice corrosion resistant austenitic stainless steel, consisting essentially of, by weight, from 18 to 20% chromium, 11 to 14% nickel, 3.25 to 3.75% molybdenum, up to 2% manganese, up to 0.01% sulfur, from 0.015 to 0.1% of at least one element from the group consisting of cerium, calcium and magnesium, nitrogen from 0.1% up to about 0.3%, up to 0.08% carbon, up to 1% silicon, up to 1% columbium, up to 0.3% vanadium, up to 0.3% titanium, balance essentially iron.

4,102,678
METAL COATING BY A POWDER METALLURGY TECHNIQUE

David Olen Gothard, and Gary Rudolph Strobel, both of Huntington, W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Oct. 1, 1976, Ser. No. 728,780

Int. Cl.² B22F *3/00*

U.S. Cl. 427—191 **8 Claims**

1. A process for producing a metal coated metal wire comprising: passing a metal wire through a coating material consisting of a metal flake powder located adjacent a drawing die, said metal flake powder characterized by an elongate flat shape; drawing said metal wire while in contact with said metal flake powder through said drawing die to mechanically adhere said metal flake powder to said wire to form a green-coat wire; and thereafter sintering said green-coat wire to metallurgically bond said metal flake powder to said metal wire to provide said metal coated metal wire.

4,102,679
POWDER METALLURGIC MANUFACTURING PROCESS

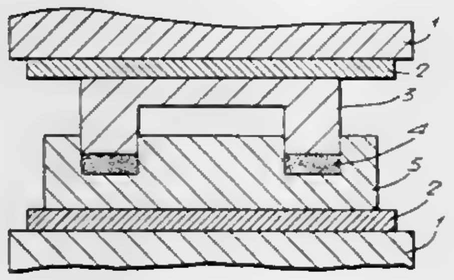
Aukusti Arvela, Helsinki, Finland, assignor to L.A. Levanto Oy, Pikkulinnunreitti, Finland

Filed Dec. 6, 1976, Ser. No. 747,925

Claims priority, application Finland, Dec. 23, 1975, 753648

Int. Cl.² B22F *3/14*; H05B *3/60*

U.S. Cl. 75—226 **4 Claims**



1. In a powder metallurgical manufacturing process, where metal powder or a metal powder mixture is compressed and heated in a mould and the mould and the metal powder are cold at the beginning of the process and where heat is produced by conducting electric current through the mould and the metal powder as well as through at least one electrically resistive fireproof body in outer contact with the mould, in which body the heat thus produced is transferred into the mould and into the metal powder the improvement wherein:

(a) the electric tension is between 2 and 200 V;

(b) the current efficiency per unit volume of the mould is between 20 and 200 W/cm³; and

(c) the resistivity of the electrically resistive fireproof body is between 0.03 and 100 ohm × cm.

4,102,680
DEVICE AND METHOD FOR SUPPRESSING ACTIVE SLAG

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

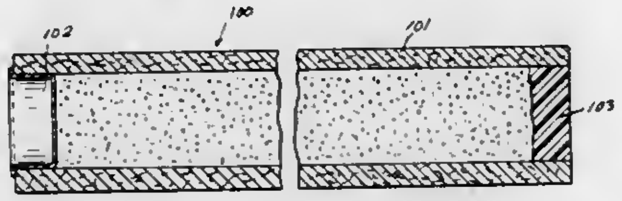
Continuation-in-part of Ser. No. 639,469, Dec. 10, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,916

Int. Cl.² C04B *7/14*

U.S. Cl. 75—257 **15 Claims**

1. A method which comprises filling a hollow burnable cellulosic body with a mixture of silaceous sand, elemental sulfur and sodium chloride, confining this mixture in the body

to provide a unitary device, and then immersing the device into a layer of active slag on a body of molten material



whereby to release gases from the slag and thereby quell the activity of the slag.

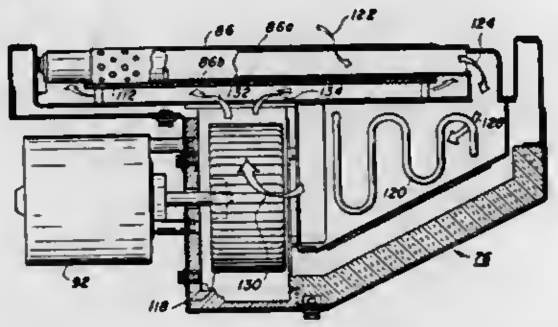
4,102,681
TRANSFER AND FUSING METHOD

Vaidevutis C. Draugelis; George N. Tsilibes, and John E. Vineski, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 300,531, Oct. 25, 1972, Pat. No. 3,826,892. This application Mar. 28, 1974, Ser. No. 455,701

Int. Cl.² G03G *13/20, 13/22*

U.S. Cl. 96—1.4 **3 Claims**



1. A method of electrophotographic printing including the steps of:

charging a photoconductive surface to a substantially uniform potential;

projecting a light image of an original document to be reproduced onto the photoconducive surface to record an electrostatic latent image thereon;

developing the electrostatic latent image with toner particles to create a toner powder image adhering electrostatically to the photoconductive surface;

transferring the toner powder image from the photoconductive surface to a sheet of support material;

transporting the sheet of support material with the toner powder image deposited on one surface thereof along a path of movement on an endless belt arranged to be in substantial contact with the other surface of the support material;

heating the surface of the endless belt contacting the support material;

energizing a radiant energy supply in response to a sheet of support material being positioned on the endless belt; and

controlling the radiant energy supply at a lower power level above a predetermined temperature, and a higher power level below the predetermined temperature.

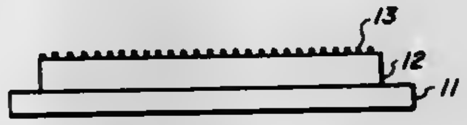
4,102,682
IMAGING MEMBER

William L. Goffe, Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 572,762, Apr. 29, 1975, abandoned, which is a division of Ser. No. 181,990, Sep. 20, 1971, Pat. No. 3,933,491, which is a continuation-in-part of Ser. No. 837,591, Jun. 30, 1969, Pat. No. 4,013,462, and Ser. No. 837,592, Jun. 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 553,837, May 31, 1966, abandoned. This application Jul. 19, 1976, Ser. No. 706,319

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 R **4 Claims**



1. An imaging member comprising a fracturable layer comprising migration material, wherein said fracturable layer is contiguous the surface of and at least partially embedded in and contacting one surface of a softenable layer comprising homogeneous photoconductive softenable material whereby said migration material is spaced apart from the opposite surface of said softenable layer.

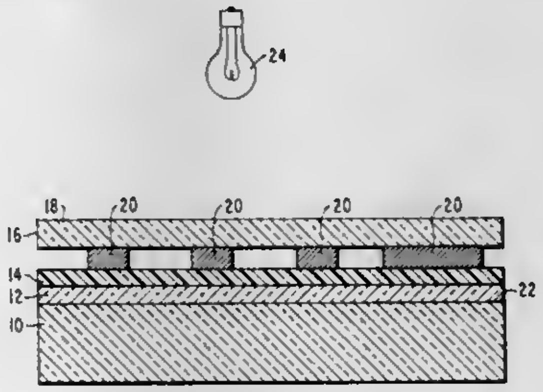
4,102,683
NONREFLECTING PHOTORESIST PROCESS

James John DiPiazza, Mt. Laurel, N.J., assignor to RCA Corp., New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,479

Int. Cl.² G03C *5/00*

U.S. Cl. 96—38.4 **1 Claim**



1. An improved photolithographic method for defining a pattern of a photoresist layer which overlies a material, said photoresist layer being sensitive to light of a particular peak wavelength, the method being of the type which includes the step of exposing said photosensitive layer to a pattern of light having a frequency distribution which includes said peak wavelength, wherein the improvement comprises:

applying a light absorbing layer comprising a fluorescent dye selected to absorb light of said particular peak wavelength and to emit light of a different wavelength which said photoresist layer is not sensitive to between said material and said photoresist layer prior to said step of exposing whereby light of said particular peak wavelength which passes through said photoresist layer during said step of exposing will be absorbed by said light absorbing layer and not reflected back into said photoresist layer.

4,102,684

4-HYDROXYPYRAZOLE DEVELOPING AGENTS

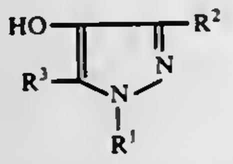
Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 671,741, Mar. 30, 1976, Pat. No. 4,049,450. This application Aug. 1, 1977, Ser. No. 820,761

Int. Cl.^{2} G03C *5/38, 5/30*

U.S. Cl. 96—61 M **9 Claims**

1. A photographic developer composition comprising an aqueous alkaline solution containing a silver halide developing agent of the formula



wherein R^1 is selected from hydrogen and hydroxy and R^2 and R^3 each is selected from phenyl, 2-thienyl and alkyl and a film-forming thickening agent.

9. A developer composition as defined in claim 1 which includes a silver halide solvent.

4,102,685

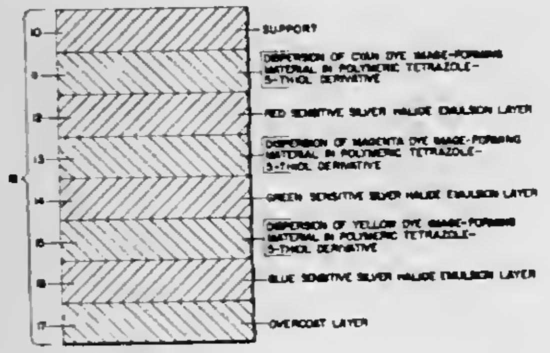
PHOTOGRAPHIC USES OF POLYVINYLPHENYLMERCAPTO-TETRAZOLE:MULTIVALENT METAL CATION COMBINATIONS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 26, 1976, Ser. No. 718,043

Int. Cl.^{2} G03C *1/40, 1/76, 1/48, 1/72*

U.S. Cl. 96—73 **68 Claims**



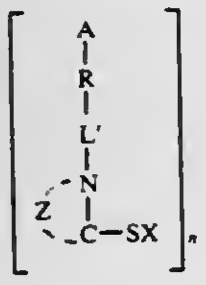
10
SUPPORT
DISPERSION OF CYAN DYE IMAGE-FORMING MATERIAL IN POLYMERIC TETRAZOLE-5-THIOL DERIVATIVE
RED SENSITIVE SILVER HALIDE EMULSION LAYER
13
DISPERSION OF MAGENTA DYE IMAGE-FORMING MATERIAL IN POLYMERIC TETRAZOLE-5-THIOL DERIVATIVE
14
GREEN SENSITIVE SILVER HALIDE EMULSION LAYER
DISPERSION OF YELLOW DYE IMAGE-FORMING MATERIAL IN POLYMERIC TETRAZOLE-5-THIOL DERIVATIVE
BLUE SENSITIVE SILVER HALIDE EMULSION LAYER
17
OVERCOAT LAYER

1. A diffusion transfer photosensitive element which comprises

(a) a support layer;

(b) at least two selectively sensitized silver halide emulsion layers each having associated therewith a dye image-forming material; and

(c) an interlayer intermediate said emulsion layers comprising a compound Serial No. 718,043



wherein A is an ethylenically unsaturated group which has been polymerized, R is a resonance stabilized group, L' is an optional linking group, X is alkali metal or primary, secondary, tertiary or quaternary ammonium, Z represents the atoms and bonds necessary to complete a 1, 2, 3, 4-tetrazole ring and n is an integer of at least 100; and

(d) a multivalent metal cation located in said interlayer in a sufficient concentration to increase the permeability of said interlayer to said dye image-forming material.

4,102,686

LITHOGRAPHIC PHOTOSENSITIVE COMPOSITIONS COMPRISING ACRYLONITRILE-BUTADIENE-STYRENE TERPOLYMER AND NOVOLAK RESIN

Lester Weinberger, Riverdale, and Robin Daskin, Levittown, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,054

Int. Cl.^{2} G03C *1/52*

U.S. Cl. 96—91 R **13 Claims**

1. A photosensitive composition which comprises the mixture of an acrylonitrile-butadiene-styrene terpolymer with a novolak resin and a lithographically suitable photosensitizer wherein the proportion of acrylonitrile-butadiene-styrene terpolymer in the blend of the acrylonitrile-butadiene-styrene terpolymer with the novolak resin is in the range of from 1% to 7% by weight and wherein the proportion of photosensitizer in the mixture of the photosensitizer with the acrylonitrile-butadiene-styrene blend with said novolak resin is in the range of from 20% to 70%.

4. A lithographic printing plate which comprises a metal sheet substrate having coated thereon a photosensitive composition which comprises the mixture of an acrylonitrile-butadiene-styrene terpolymer with a novolak resin and a lithographically suitable photosensitizer wherein the proportion of acrylonitrile-butadiene-styrene terpolymer in the blend of the acrylonitrile-butadiene-styrene terpolymer with the novolak resin is in the range of from 1% to 7% by weight and wherein the proportion of photosensitizer in the mixture of the photosensitizer with the acrylonitrile-butadiene-styrene blend with said novolak resin is in the range of from 20% to 70%.

4,102,687

UV CURABLE COMPOSITION OF A THERMOSETTING CONDENSATION RESIN AND GROUP VIA ONIUM SALT

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,074

The portion of the term of this patent subsequent to Nov. 11, 1994, has been disclaimed.

Int. Cl.^{2} G03C *1/68, 5/00;* **G08F** *2/46, 4/00*

U.S. Cl. 96—115 R **7 Claims**

1. UV curable organic resin compositions consisting essentially of

(1) a thermosetting organic condensation resin of formaldehyde and a member selected from the class consisting of urea, phenol and melamine,

(2) an effective amount of a Group VIa onium salt of the formula,

$$[(R)_a(R^1)_b(R^2)_cX]_d^+[MQ_e]^{-(e-f)},$$

and

(3) from 0 to 5 parts of filler per part of said thermosetting organic condensation resin,

where R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, X is a Group VIa element selected from sulfur, selenium and tellurium, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 to 3 inclusive, b is a whole number equal to 0 to 2 inclusive, c is a whole number equal to 0 or 1, where the sum of $a + b + c$ is a value equal to 3 or the valence of X,

$d=e\text{-}f$

f=valence of M and is an integer equal to from 2 to 7 inclusive

e is $>f$ and is an integer having a value up to 8.

4,102,688

METHINE DYES

Masatoshi Sugiyama; Hirosi Sawaguchi, and Akio Mitsui, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

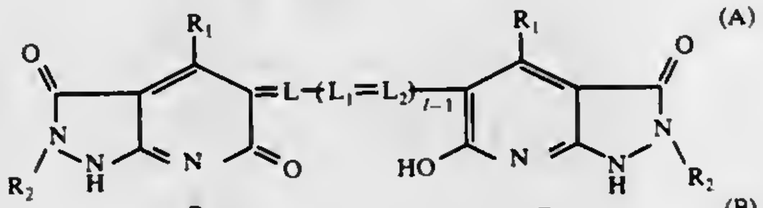
Filed May 9, 1977, Ser. No. 795,041

Claims priority, application Japan, May 10, 1976, 51-52994

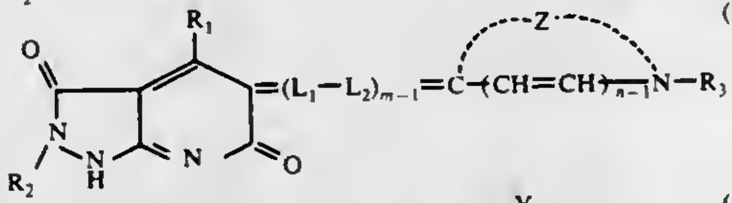
Int. Cl.^{2} G03C *1/14, 1/22*

U.S. Cl. 96—139 **24 Claims**

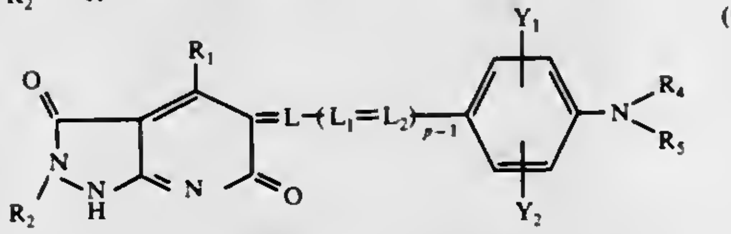
1. A methine dye represented by the following general formula (A), (B) or (C):



(A)



(B)



(C)

wherein R_1 represents an alkyl group, an aralkyl group, an aryl group, a 5- or 6-membered heterocyclic residue, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or an amino group; R_2, R_3, R_4 and R_5, which may be the same or different, each represents an alkyl group, an aralkyl group, an aryl group or a 5- or 6-membered heterocyclic residue; said 5- or 6-membered heterocyclic residue for R_1, R_2, R_3, R_4 and R_5 selected from the group consisting of a pyridyl group, a quinolinyl group, a benzoxazolyl group, a thiazolyl group, a benzothiazolyl group, an oxazolyl group or a selenazolyl group; and R_2 may additionally represent a hydrogen atom; Z represents an atomic group necessary to form a heterocyclic nucleus containing a 5- or 6-membered hetero ring, said ring selected from the group consisting of a thiazole ring, an oxazole ring, a selenazole ring, a pyridine ring, a quinoline ring or a tetrazole ring; Y_1 and Y_2, which may be the same or different, each represents a hydrogen atom, an alkyl group, a hydroxyl group, an alkoxy group, an amino group or a sulfo group; L, L_1 and L_2 each represents a methine group; l, n, and p each represents 1 or 2; and m represents 2 or 3.

4,102,689

MAGNESIA DOPED ALUMINA CORE MATERIAL

Marcus P. Borom, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,762

Int. Cl.^{2} B22C *9/10;* **B22D** *21/00;* **B28B** *7/34;* **C04B** *35/44*

U.S. Cl. 106—38.9 **4 Claims**

1. A sintered core of a ceramic material suitable for use in the casting and directional solidification of advanced superalloys consisting essentially of

a sintered magnesia doped alumina material composition wherein the magnesia content is from greater than about 1 mole percent to about 20 mole percent,

the microstructure of the sintered magnesia doped alumina is characterized by a matrix comprising an interconnecting network of magnesia doped alumina defining a plurality of interstices in which magnesium aluminate spinel is deposited, and the core material is removable from the solidified casting by autoclave leaching in leaching solutions selected from KOH and NaOH.

4,102,690

POWDER FOR CONTINUOUS CASTING

Janusz Koper, Hofherrgasse 6/27, 1100 Vienna, Austria

Filed Apr. 13, 1976, Ser. No. 676,428

Claims priority, application Austria, Apr. 16, 1975, 2892/75

Int. Cl.^{2} B28B *7/34*

U.S. Cl. 106—38.28 **10 Claims**

1. A flux powder having substantially uniform and reproducible properties for use in continuous casting, consisting essentially of an intimate mechanical mixture of:

silicon dioxide in an amount of 20–60% by weight,
calcium oxide source in an amount of 20–60% by weight,
calcium fluoride in an amount of 3–20% by weight,
alkali metal carbonate, in an amount of 3–20% by weight,
carbon source in an amount of 4–20% by weight and
aluminum oxide in an amount of 0–10% by weight, wherein the inorganic components of said mixture are present in a substantially pure state.

4,102,691

GELLABLE BINDERS

Ian Richard Walters, Huddersfield, and Harold Garton Emblem, Mirfield, both of England, assignors to Zirconal Processes Limited, Bromley, England

Continuation-in-part of Ser. No. 561,347, Mar. 24, 1975, Pat. No. 4,025,350. This application Mar. 23, 1977, Ser. No. 780,352

Claims priority, application United Kingdom, Mar. 28, 1974, 13834/74; Aug. 13, 1974, 35610/74

Int. Cl.^{2} B28B *7/34*

U.S. Cl. 106—38.35 **6 Claims**

1. A method of producing a shaped refractory object comprising the steps of coating a shaped pattern with a slurry made by combining a refractory powder, an aqueous solution of a zirconium salt which when dissolved in water yields an aqueous solution which is acidic, and a gellation-delaying agent selected from the group consisting of magnesium acetate, magnesium lactate, ammonium lactate, glycine, betaine, fructose and polyhydric alcohols, contacting the slurry with ammonia vapour thereby causing the zirconium salt to gell, and thereafter drying the coating, removing the pattern, and firing the produced article.

4,102,692

REINFORCING GLASS FIBERS OF MGO-CAO-ZNO-AL$_2$O$_3$-SIO$_2$-TIO$_2$

Wolfgang Schartau, Odenthal-Hahnenberg, and Friedrich Schwochow, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 4, 1976, Ser. No. 693,042

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1975, 2532842

Int. Cl.^{2} C03C *13/00, 3/04;* **C04B** *31/06*

U.S. Cl. 106—50 **3 Claims**

1. A glass fiber consisting essentially of MgO-CaO-ZnO-Al_2O_3-SiO_2-TiO_2 of the following approximate molar composition:

MgO	7–27.5 %
CaO	4.5–32.5 %
ZnO	3–15 %
Al_2O_3	5–13.5 %
SiO_2	36–56 %
TiO_2	[0–9] 2– 6 %

wherein the sum of the MgO and CaO contents is about 30 to 40 mole % and the sum of the ZnO and TiO_2 contents is less than about 15 mole %.

4,102,693

PHOTOCHROMIC BORO-SILICATE GLASS

Harry Owen, Parbold, and Thomas Barrow, Ormskirk, both of England, assignors to Pilkington Brothers Limited, Merseyside, England

Filed Jan. 31, 1977, Ser. No. 764,315

Claims priority, application United Kingdom, Jan. 30, 1976, 3785/76

Int. Cl.² C03C *3/10, 3/08, 3/26*

U.S. Cl. 106—54 **4 Claims**

1. A photochromic boro-silicate glass having a half fading time of not more than 60 seconds which has silver halide crystals dispersed throughout the glass, and which is free from barium, consisting essentially of, in weight percentages:

SiO_2	31 to 59%
B_2O_3	18 to 28%
Al_2O_3	8 to 20%
R_2O	6 to 16%
MgO	0 to 2.6%
P_2O_5	0 to 12%
ZrO_2	0 to 7%
TiO_2	0 to 5%
PbO	0 to 7%

where R_2O represents one or more of Li_2O, Na_2O and K_2O in amounts within the ranges 0 to 3% Li_2O, 0 to 8% Na_2O and 0 to 16% K_2O,
and, in weight percentages expressed as quantities over and above the 100% total of all the other components:

silver, expressed as Ag_2O	0.05 to 4%
halide	0.13 to 1%
CuO	0 to 1%.

4,102,694

REFRACTORY MATERIAL FOR REPAIRING BLAST FURNACES

Kantaro Sasaki, Ashiya; Hiroshi Yamaoka, Hirakata, and Takao Suzuki, Takarazuka, all of Japan, assignors to Sumitomo Metal Industries, Limited, Osaka, Japan

Division of Ser. No. 581,436, May 28, 1975, abandoned. This application Sep. 22, 1976, Ser. No. 725,468

Int. Cl.² C04B *35/02*

U.S. Cl. 106—56 **15 Claims**

1. A method for repairing linings on internal walls of blast furnaces within their operational cycle comprising the steps of forming a nonaqueous repair material which material is composed of 100 parts by weight of a base material chiefly composed of a powdery refractory material, 4 to 40 parts by weight of a bituminous material serving as a binder and 10 to 35 parts by weight of a liquid oil serving as a fluidity imparting agent, pouring the repair material into a blast furnace under pressure while said furnace is at a temperature elevated above a surrounding ambient temperature during the operational cycle of said furnace, and allowing the repair material to cure to thereby repair defects in the lining of the blast furnace.

4,102,695

REFRACTORY COMPOSITIONS WITH CERAMIC AND HYDRAULIC SETTING

André Claverie, Abbeville, France, assignor to E.F.S.I. Etablissements pour la Fabrication de Specialites Industrielles, Abbeville, France

Filed Sep. 9, 1974, Ser. No. 504,531

Claims priority, application France, Sep. 7, 1973, 73 32320

Int. Cl.² C04B *35/02*

U.S. Cl. 106—64 **3 Claims**

1. Moldable refractory composition for blast furnaces which consists of a mixture of 80 to 94 parts by weight of refractory aggregates having a granulometry of 50μ to 5 mm, 12 to 4 parts by weight of an aluminous hydraulic cement having a pH in the range of 8 to 12, 8 to 2 parts by weight of a refractory material of the kaolinite type having a granulometry lower than 50μ, 0.6 to 0.01 parts by weight of a substance capable of deflocculating and/or fluidizing kaolinite in an aqueous medium having a pH within the range of 6 to 9.2, and 0.6 to 0.01 parts by weight of a neutral or substantially neutral polyphosphate binder capable of retarding the hydraulic setting of the cement.

4,102,696

DIELECTRIC CERAMIC COMPOSITION FOR HIGH FREQUENCIES

Masayoshi Katsube, Youkaichi; Youbei Ishikawa, Kyoto; Hiroshi Tamura, Omihachiman, and Kunisabro Tomono, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jul. 28, 1976, Ser. No. 709,502

Claims priority, application Japan, Jul. 31, 1975, 50-93983; Jul. 31, 1975, 50-93984; Jul. 31, 1975, 50-93985; Jul. 31, 1975, 50-93986

Int. Cl.² C04B *35/00;* **H01B** *1/06, 3/02*

U.S. Cl. 106—73.2 **5 Claims**

1. A dielectric ceramic composition for high frequencies consisting essentially of 83 to 99.8 wt% of a basic composition composed of 22 to 43 wt% of titanium dioxide dioxide, 38 to 58 wt% of zirconium and 9 to 26 wt% of stannic oxide, and 0.2 to 17 wt% of one or two additives selected from the group consisting of lanthanum oxide and cobaltic oxide.

4,102,697

FLUID PLASTER COMPOSITION

Kozo Fukuba; Yasutomo Ogushi, both of Niihama, and Haruhisa Harada, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

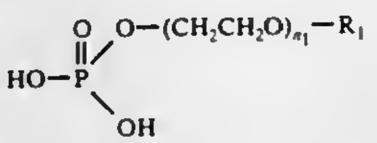
Filed Jul. 8, 1976, Ser. No. 703,376

Claims priority, application Japan, Jul. 9, 1975, 50-84807; Mar. 1, 1976, 51-22491

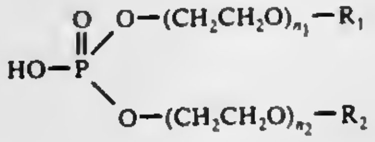
Int. Cl.² C04B *11/14*

U.S. Cl. 106—111 **23 Claims**

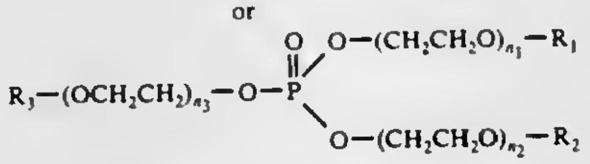
1. A plaster composition which comprises:
(1) gypsum containing gypsum hemihydrate of the α-form in an amount of not less than about 50% by weight of the total plaster content,
(2) about 0.01 to 10 parts by weight to 100 parts by weight of the gypsum of a surface reactive agent of a phosphoric ester of the formula:


(I)

or


(II)

or


(III)

wherein R_1, R_2, and R_3 are each alkyl, alkylaryl or aryl having 1 to 50 carbon atoms, and n_1, n_2, and n_3 are each an integer of 1 to 30,
(3) a sulfonic dispersing agent, and
(4) an alkali metal sulfate selected from the group consisting of sodium sulfate, potassium sulfate, rubidium sulfate and cesium sulfate.

4,102,698

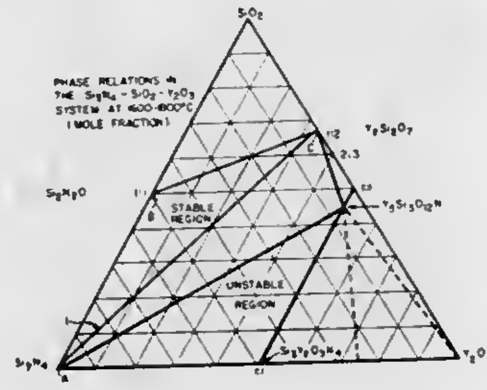
SILICON NITRIDE COMPOSITIONS IN THE SI_3N_4-Y_2O_3-SIO_2 SYSTEM

Frederick F. Lange, and Subhash C. Singhal, both of Franklin Twsp., Westmoreland County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,380

Int. Cl.² C04B *35/58*

U.S. Cl. 106—65 **2 Claims**



1. A sintered ceramic composition suitable for use as a high temperature structural material, said composition being within a triangular area defined by the points ABCA of the Si_3N_4-SiO_2-Y_2O_3 ternary diagram depicted in FIG. 2, and containing from about 0.03 to about 0.01 mol fraction Y_2O_3, from about 0.075 to about 0.40 mol fraction SiO_2, and the balance consisting of Si_3N_4.

4,102,699

STABLE AQUEOUS ALKALI METAL SILICATE/IRON OXIDE PIGMENT SUSPENSIONS

Hans-Joachim Scholl; Peter Markusch, both of Cologne, and Dieter Dieterich, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1977, Ser. No. 797,952

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624790

Int. Cl.² C09D *1/02*

U.S. Cl. 106—84 **9 Claims**

1. Aqueous, sedimentation-resistant alkali metal silicate/iron oxide pigment suspensions comprising:
A. from about 10 to about 40%, by weight, of iron oxide pigment,
B. from about 20 to about 40%, by weight, of alkali metal silicate and
C. from about 30 to about 70%, by weight, of water, wherein at least 95% by weight of the iron oxide pigment has a particle size equal to or less than 1 μ.

4,102,700

PROCESS FOR THE PRODUCTION OF A MIXTURE TO BE UTILIZED IN THE PRODUCTION OF BUILDING MATERIALS AND A DEVICE FOR CARRYING OUT THE PROCESS

Ludwig Kwech, Kaltenleutgeben, and Fritz Jung, Vienna, both of Austria, assignors to Perlmooser Zementwerke Aktiengesellschaft, Vienna, Austria

Filed Aug. 26, 1976, Ser. No. 717,884

Claims priority, application Austria, Aug. 27, 1975, 6604/75

Int. Cl.² C04B *7/02*

U.S. Cl. 106—100 **4 Claims**

1. In a method for the production of a mixture to be utilized in the production of building materials comprising at least two heated inorganic components of components of differing composition, the first component being subjected to a heating process and the other component or components being heated to a temperature below the heating temperature of the first component, the improvement comprising the steps of:
heating the first component to a first temperature, the component being selected from the group consisting of Portland cement clinker of conventional composition, conventional lime, argilliferous lime, and dolomitic lime; and,
adding the remaining components of the mixture sequentially to the first component to establish intimate contact between said remaining components and the first component while the first component is at or near said first temperature, said remaining components being heated to lower temperatures as compared to the first component,
said first component being a Portland cement clinker of conventional composition and at least one of the said other components to be heated to lower temperatures as compared to the temperature of said Portland cement clinker of conventional composition is selected from the group consisting of felspars, oil shale residues, bauxites, laterites, trasses, volcanic rocks, and glasses, the said materials having pozzuolana properties imparted to silicate and aluminate qualities thereof by heating.

4,102,701

PLASTER COMPOSITIONS CONTAINING OXO-POLYCARBOXYLIC ACIDS AS A SET RETARDER

Colin Dennis Campbell, Cheadle; Michael Anthony Finan, Macclesfield, and Kenneth William Shelton, Sale, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

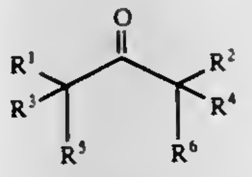
Filed Mar. 17, 1976, Ser. No. 667,777

Claims priority, application United Kingdom, Mar. 19, 1975, 11373/75

Int. Cl.² C04B *11/14*

U.S. Cl. 106—111 **17 Claims**

1. A plaster composition comprising a plaster derived from gypsum or phosphogypsum and 5 to 5000 parts by weight per million parts by weight of plaster of a compound or mixture of compounds having the formula: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in which R^1, R^2, R^3 and R^4 are hydrogen, C_1-C_4 alkyl or $-CH_2CH_2COOH$, R^5 and R^6 are hydrogen, $-CH_2CH_2COOH$ or together form a polymethylene chain which is unsubstituted or substituted by one or more alkyl groups and which contains a total of not more than 7 carbon atoms; provided that at least two of the groups R^1, R^2, R^3, R^4, R^5 and R^6 are $-CH_2CH_2COOH$; or the salts thereof with inorganic or organic bases.

4,102,702

COMPOSITION AND METHOD FOR APPLYING METALLIC SILVER TO A SUBSTRATE

Harry Bahls, Wayne, Pa., assignor to Peacock Industries, Inc., Philadelphia, Pa.

Division of Ser. No. 513,417, Oct. 9, 1974, Pat. No. 3,983,266. This application Jun. 7, 1976, Ser. No. 693,363

Int. Cl.² C23C *3/02*

U.S. Cl. 106—1.23 **12 Claims**

1. In an aqueous solution for use in precipitating metallic silver from an ionic solution on the surface of a substrate, the combination which comprises a water-soluble reducible silver salt, an alkali metal hydroxide, and ammonia, the improvement which comprises including a polyhydric alcohol of the formula $CH_2OH(CHOH)_nCH_2OH$, where n is an integer from 1 to 6.

4,102,703
WATER-REPELLENT COATING COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Paul Raymond Tully, Lowell, Mass., assignor to Tulco, Inc., N. Billerica, Mass.

Filed Nov. 8, 1976, Ser. No. 739,343

Int. Cl.² C09K *3/18;* B01J *13/00*

U.S. Cl. 106—287.14 **27 Claims**

1. A liquid water-repellent coating composition comprising a hydrophobic finely-divided particulate metal or metalloid oxide having a BET-N_2 surface area of at least about 50 m^2/gram suspended in a liquid component which does not wet said oxide chosen from the group consisting of liquid, water-soluble polyhydric alcohols and aqueous solutions thereof and an amount of gas colloidally dispersed in said liquid component at least sufficient to encapsulate the hydrophobic finely-divided particulate metal or metalloid oxide in a layer of said gas.

15. A method for preparing liquid water-repellent oxide-gas suspensoid coating compositions which comprises intensively mixing, in the presence of a gas, a hydrophobic finely-divided particulate metal or metalloid oxide and a liquid suspending component which does not wet said oxide, said liquid component being chosen from the group consisting of water-soluble liquid polyhydric alcohols and aqueous solutions thereof, and the amount of gas incorporated in the compositions being at least sufficient to encapsulate the finely-divided particulate metal or metalloid oxide in a layer of said gas.

4,102,704
PIGMENTARY COMPOSITIONS BASED ON ESTERS OF RESIN ACIDS AND AMINO-ALCOHOLS

Pierre Louis Edmood Fournier, Scotteville les Rouen, and Jean Paul Mayer, Saint Etienne du Rouvray, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 24, 1977, Ser. No. 761,571

Claims priority, application France, Feb. 4, 1976, 76 03040

Int. Cl.² C08K *5/23*

U.S. Cl. 106—288 Q **11 Claims**

1. A pigmentary composition comprising an intimate mixture of (a) an organic pigment and (b) one or more unmodified or modified resin acids esterified with an aminoalcohol, wherein the intimate mixture constituting the new pigmentary composition is obtained by incorporating in the pigment, which is in the form of an acid aqueous suspension, a solution of the ester in a solvent miscible with water, or a dispersion of the ester in acidulated water, then precipitating the said ester by making the aqueous reaction medium alkaline or by addition of a monocarboxylic acid having from 2 to 25 carbon atoms or dicarboxylic acid or an unmodified or modified resin acid, this addition resulting in the formation of a salt insoluble in water.

4,102,705
METHOD FOR REMOVING ACIDS FROM AN AQUEOUS ACID-CONTAINING XYLOSE SOLUTION

Hans Jorg Pfeiffer; Keller Rene, both of Winterthur, and Frank Erich, Raeterschen, all of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

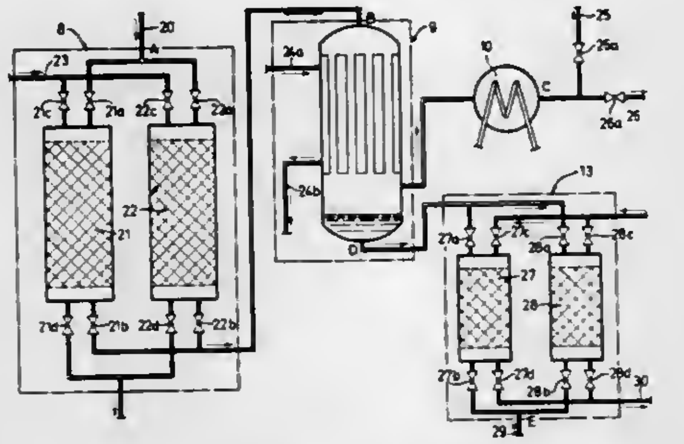
Filed Jun. 16, 1976, Ser. No. 696,855

Claims priority, application Switzerland, Jul. 2, 1975, 8594/75

Int. Cl.² C13K *1/02, 13/00*

U.S. Cl. 127—37 **4 Claims**

1. A method of producing an acid-free xylose solution comprising the steps of
- hydrolyzing a raw material containing xylane with a strong acid to obtain an aqueous acid-containing xylose solution;
- subjecting the solution to an ion-exchange to remove the strong acid;
- thereafter heating the remaining xylose solution to evaporate water, acetic acid and formic acid therefrom while concentrating the xylose solution; and
- subjecting the concentrated xylose solution to an ion-exchange to remove any traces of acetic acid and formic acid from the concentrated xylose solution and to produce an acid-free concentrated xylose solution.



4,102,706
REMOVING IRIDESCENT STAINS FROM VITREOUS SURFACES

Lazarus D. Thomas, Maumee, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Mar. 16, 1977, Ser. No. 777,897

Int. Cl.² B08B *3/08;* C03C *23/00*

U.S. Cl. 134—3 **4 Claims**

1. A method of removing iridescent stain from glass surfaces comprising contacting said surfaces with a solution consisting essentially of the following components in the indicated proportions: 2.5 to 7.5 grams of sodium fluoride, 2.5 to 7.5 milliliters of concentrated hydrochloric acid, and 250 milliliters of water; maintaining said contact for at least 30 seconds; and thereafter rinsing said solution from said surface with water.

4,102,707
REMOVAL OF MICROBIOLOGICAL DEPOSITS

K. Robert Lange, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 400,461, Sep. 24, 1973, abandoned. This application Jun. 10, 1976, Ser. No. 694,860

Int. Cl.² B08B *9/00*

U.S. Cl. 134—22 R **7 Claims**

1. A method of detaching slime adhered to a support in an aqueous medium which consists essentially of contacting said aqueous slime with a sufficient quantity for the purpose of an agent which possesses hydrogen-bonding characteristics and selected from the group consisting of ethanolamine and derivatives thereof to penetrate the strongly hydrated slime structure and modify such to the extent that the slime is detached from the support.

7. A composition for detaching slime adhered to a support in an aqueous medium which consists essentially of:
- (i) a member of the group consisting of ethanolamine, and derivatives thereof so long as the derivatives have hydrogen-bonding characteristics; and
- (ii) at least one member of the group consisting of ethanolamine, amine-epoxy compound reaction products and derivatives of each so long as the derivatives have hydrogen-bonding characteristics with the proviso that the member of (i) is different from the member of (ii) and wherein the members of (i) and (ii) are present in the composition in a weight ratio of from about 5 to 95% and 95 to 5% respectively.

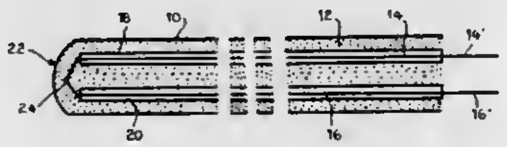
4,102,708
SELF-HEALING THERMOCOUPLE

Edna A. Dancy, Beaconsfield, Canada, assignor to Sidbec-Dosco Ltee, Montreal, Canada

Filed Jan. 18, 1977, Ser. No. 760,372

Int. Cl.² H01L *35/02*

U.S. Cl. 136—233 **18 Claims**



1. A device for continuously monitoring the internal surface temperature of a refractory lining in a metallurgical furnace, which comprises:
- an outer sheath;
- a pair of dissilimar, metallic wires within the outer sheath, each of said wires being separately insulated by a sleeving of a refractory material having a melting point higher than the normal working temperature of the furnace at the surface of the lining; and
- a powdered oxide material closely packed within the sheath and surrounding both insulated wires, said oxide material being electrically conductive at elevated temperatures and having a melting point higher than said normal working temperature; whereby said insulating refractory material and conductive oxide material, on exposure to said normal working temperature, react with each other to form a conducting bridge between the dissimilar wires at the surface of the lining, operative to provide a signal related to said internal surface temperature.

4,102,709
WORKABLE NICKEL ALLOY AND PROCESS FOR MAKING SAME

Berthold Wenderott, and Gerhard Kohiert, both of Altena, Fed. Rep. of Germany, assignors to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 542,932, Jan. 22, 1975, Pat. No. 3,998,663. This application Oct. 28, 1976, Ser. No. 736,598

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1974, 2404256; May 24, 1974, 2425271; Aug. 9, 1974, 2438381

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.² C22F *1/10*

U.S. Cl. 148—2 **9 Claims**

1. A process for producing a workable nickel composition, said process comprising the steps of:
- (a) forming a melt consisting of 0.01 to 0.15% by weight oxygen, the balance nickel;
- (b) casting said melt to form an ingot containing said oxygen in the form of nickel oxide, at least part of the nickel oxide being present as a nickel/nickel-oxide eutectic; and
- (c) hotforming said ingot to destroy the nickel/nickel-oxide eutectic thereof and finely distribute the nickel oxide uniformly in the metallic lattice structure of the hotformed body.

4,102,710
ADJUVANT COMPOSITION FOR SOLVENT PHOSPHATIZING SOLUTION

Edward A. Rowe, Jr., Mentor, and William H. Cawley, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 22, 1976, Ser. No. 753,435

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.² C23F *7/10*

U.S. Cl. 148—6.15 R **12 Claims**

1. In a methylene chloride and water-containing liquid composition having a continuous and homogeneous liquid phase suitable for phosphatizing metal with a coating of at least substantial water insolubility, with said liquid phase containing water in minor amount, which composition comprises methylene chloride, solubilizing solvent capable of solubilizing phosphoric acid in methylene chloride, a phosphatizing proportion of phosphoric acid, and water in an amount exceeding said proportion of phosphoric acid, while being sufficient for said composition to provide a phosphatized coating of substantial water insolubility, and while retaining liquid phase homogeneity, the improvement which comprises said composition being characterized by containing phenolic stabilizing substance in an amount above about 0.2 weight percent, basis total composition weight, wherein said phenolic stabilizing substance is selected from the group consisting of phenol, substituted phenols having one or more ring substituents selected from the group consisting of alkyl and alkoxy, bis-phenols, bis-phenols having connecting alkyl ring linkage, and any of said bis-phenols having one or more substituents on each ring which are selected from the group consisting of alkyl and alkoxy.

4,102,711
METHOD OF PRODUCING A TUBE OF ULTRA-HIGH STRENGTH STEEL HAVING REMARKABLY IMPROVED DUCTILITY AND TOUGHNESS

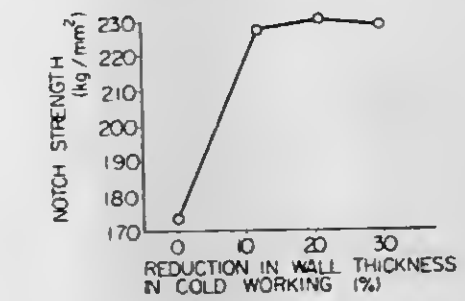
Tatsuro Kunitake, Toyonaka; Iwao Saito, Osaka; Kazuo Tsumura, Ibaraki; Masahiro Nishio, Amagasaki; Masaru Nishiguchi, Izumi, and Yasotaka Okada, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 26, 1977, Ser. No. 827,989

Claims priority, application Japan, Aug. 31, 1976, 51-105468

Int. Cl.² C21D *9/08*

U.S. Cl. 148—12.3 **3 Claims**



1. A method of producing a tube of an ultrs-high tensile steel having remarkably improved ductility and toughness and having tensile strength over 255 kg/mm^2, which comprises preparing a mother tube through the hot extrusion of a steel consisting essentially of 15.0 - 18.5% by weight of Ni, 12.5 - 15.0% by weight of Co, 5.0 - 6.9% by weight of Mo, 1.00 - 1.28% by weight of Ti, 0.01 - 0.20% by weight of Al and the balance essentially iron, cold working the mother tube with a reduction in wall thickness of 5 - 25%, then raising the temperature of the resulting tube to a temperature of 800°-950° C in a period of time of from 20 minutes to 2 hours, maintaining the heated tube at this temperature for from 30 minutes to 3 hours, and, after cooling to or below room temperature, ageing the resulting tube at a temperature of 450°-550° C for 1 - 10 hours.

4,102,712

HEADLAMP TILTING MECHANISM IN A MOTOR VEHICLE

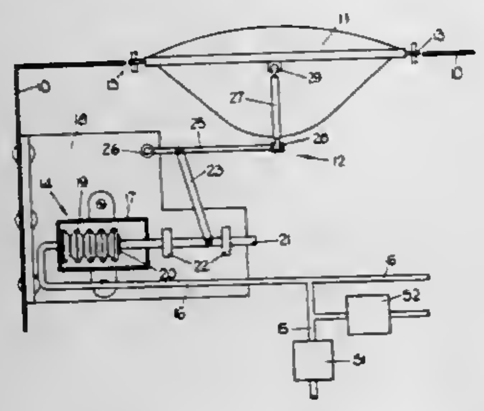
Frederick Raymond Patrick Martin, Bromley, England, assignor to C.I. Hayes Inc., Cranston, R.I.

Filed Mar. 26, 1975, Ser. No. 562,117

Claims priority, application United Kingdom, Mar. 30, 1974, 14210/74

Int. Cl.² B60Q *1/10*

U.S. Cl. 362—71 **4 Claims**



1. In a motor vehicle comprising a body and a headlamp mounted for tilting movement relative to said body, a mechanism for tilting said headlamp, said mechanism including an axially slidable drive member including means restraining the drive member to axial movement, a lever pivotally mounted relative to said body for pivotal movement transversely with respect to the direction of axial movement of said drive member and connected with said headlamp, said lever extending generally parallel to said drive member, and a single link extending transversely between and being pivotally connected to said lever and to said drive member, the arrangement of said lever, said single link, and said drive member causing movement of said lever through axial displacement of said drive member and said drive member opposes movement of said link and lever due to external forces imposed on said headlamp and transmitted through said lever and link to said drive member.

4,102,713

SILICON STEEL AND PROCESSING THEREFORE

Jack W. Shilling, Monroeville; Clarence L. Miller, Jr., and Amitava Datta, both of Pittsburgh, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1976, Ser. No. 696,967

Int. Cl.² H01F *1/04*

U.S. Cl. 148—113 **13 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1870 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, from 0.02 to to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, up to 1.0% copper, no more than 0.008% aluminum, from 2.5 to 4.0% silicon, balance iron; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel in a hydrogen-bearing atmosphere having a dew point of from +20° to +110° F; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement comprising the steps of coating the surface of said steel with a refractory oxide base coating consisting essentially of:

- (a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;
- (b) up to 100 parts, by weight, of other substances from the group consisting of boron and compounds thereof; said coating containing at least 0.1%, by weight, of boron;
- (c) from 0.5 to 100 parts, by weight, of at least one oxide less stable than SiO_2 at temperatures up to 2150° F, said oxide being of an element other than boron;
- (d) Up to 40 parts, by weight, of SiO_2;
- (e) up to 20 parts, by weight, of inhibiting substances or compounds thereof; and
- (f) up to 10 parts, by weight, of fluxing agents; and final texture annealing said steel with said coating thereon; said annealed steel having a substantially continuous reacted coating; the quality of the coating being, in part, attributable to the inclusion of an oxide less stable than SiO_2 at temperatures up to 2150° F; the steel's magnetic properties being, in part, attributable to the inclusion of boron in the base coating.

4,102,714

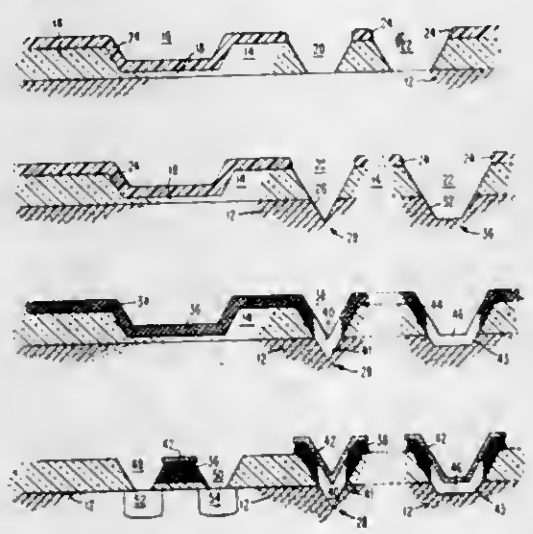
PROCESS FOR FABRICATING A LOW BREAKDOWN VOLTAGE DEVICE FOR POLYSILICON GATE TECHNOLOGY

David E. DeBar, Manassas, and Francisco H. De La Moneda, Reston, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,544

Int. Cl.² H01L *21/22, 21/302. 29/78*

U.S. Cl. 148—187 **5 Claims**



1. A process for simultaneously making a low voltage breakdown p-n junction protective device and a polycrystalline silicon gate FET device in a silicon semiconductor substrate of a first conductivity type, comprising the steps of:

forming a window in a field oxide layer on the surface of said substrate where said FET device is to be located and growing a thermal oxide layer on the surface of the portion of the silicon substrate exposed through said window;

etching a V-shaped groove in the silicon semiconductor substrate with an anisotropic etchant, at a location spaced from said window where said protective device is to be formed;

depositing a layer of epitaxial silicon semiconductor material of a second conductivity type in said V-shaped groove and a layer of polycrystalline silicon over said thermal oxide layer in said window;

etching source and drain openings through said polycrystalline silicon layer and thermal oxide layer in said window forming a polycrystalline gate electrode on a thermal oxide gate insulator;

diffusing source and drain regions of a second conductivity type through said source and drain openings;

forming an electrical contact with said epitaxial silicon layer in said V-shaped groove;

whereby an abrupt p-n junction protective device is formed having a small radius of curvature at the apex of the V-shaped groove with a corresponding low breakdown voltage, simultaneously with the formation of a polycrystalline gate FET device.

4,102,715

METHOD FOR DIFFUSING AN IMPURITY INTO A SEMICONDUCTOR BODY

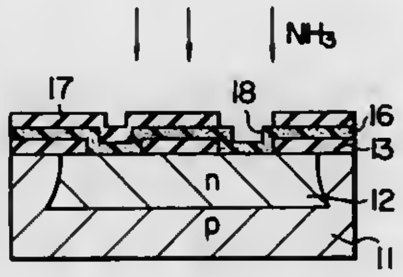
Ginjiro Kambara, Ashiya; Susumu Koike, Ibaraki, and Toshio Matsnda, Ohtsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,124

Claims priority, application Japan, Dec. 19, 1975, 50/152659; Dec. 19, 1975, 50/152660; Dec. 19, 1975, 50/152661; Dec. 19, 1975, 50/152662; Dec. 19, 1975, 50/152664; Dec. 19, 1975, 50/152668

Int. Cl.² H01L *21/225*

U.S. Cl. 148—188 **10 Claims**



1. A method for diffusing an impurity into a semiconductor body comprising the steps of

forming an impurity containing silicon oxide layer on a semiconductor substrate, and

heat treating the resultant substrate in an ammonia containing atmosphere, the impurity containing silicon oxide layer being selectively exposed to said atmosphere.

4,102,716

TWO-PART REACTIVE DIELECTRIC FILLER COMPOSITION

James D. Groves, St. Paul, Minn., and Deborah Sue Anne D'Zuro, Overland Park, Kans., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 11, 1976, Ser. No. 685,302

Int. Cl.² C08K *5/01;* **H01B** *17/34*

U.S. Cl. 156—48 **7 Claims**

1. A dielectric, thermally stable, hydrolytically stable, moisture-insensitive polyurethane gel comprising the reaction product of an admixture of:

- (a) at least one isocyanate compound having at least about 2.0 NCO groups per molecule and selected from the group consisting of aliphatic and cycloaliphatic isocyanate compounds;
- (b) a polyalkadiene polyol having an average equivalent weight of at least about 500 and containing at least about 2.0 terminal hydroxyl groups per molecule;
- (c) a hydrocarbon extender oil having less than about 35 percent by weight aromatic groups therein, said oil comprising about 5 to 75 percent by weight of said admixture; and
- (d) a catalyst comprising a dialkyl organotin compound and a trialkyl tin oxide; wherein said isocyanate compound is present in sufficient quantity to provide an NCO/OH ratio of from about 0.9 to 1.1 in said admixture.

4. A process for filling a polycarbonate connector-containing communication cable splice closure comprising pouring into said closure, at ambient temperature, an admixture of:

- (a) at least one isocyanate compound having at least about 2.0 NCO groups per molecule and selected from the group consisting of aliphatic and cycloaliphatic isocyanate compounds wherein said isocyanate compound is present in sufficient quantity to provide an NCO/OH ratio of from about 0.9 to about 1.1 in said admixture;
- (b) a polyalkadiene polyol having an average equivalent weight of at least about 500 and containing at least about 2.0 terminal hydroxyl groups per molecule;
- (c) a hydrocarbon extender oil having less than about 35 percent by weight aromatic groups therein, said oil comprising about 5 to 75 percent by weight of said admixture; and
- (d) a catalyst comprising a dialkyl organotin compound and a trialkyl tin oxide; and allowing said admixture to react to form a thermally and hydrolytically stable moisture-insensitive polyurethane gel, said gel being substantially inert toward said polycarbonate connector.

4,102,717

DIELECTRIC OPTICAL WAVEGUIDE COUPLINGS

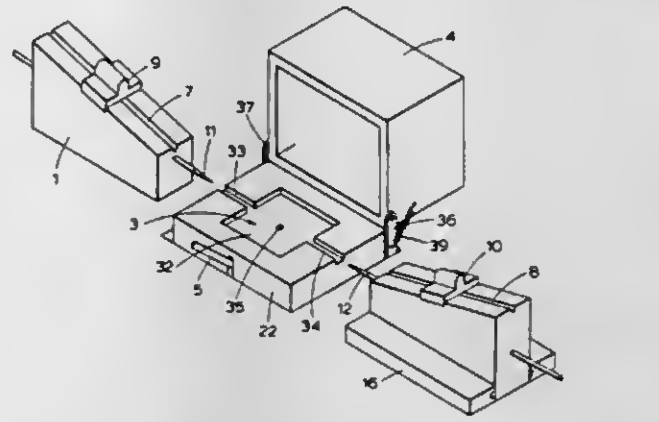
Paul Christopher Hensel, Suffolk, England, assignor to The Post Office, London, England

Filed Nov. 2, 1976, Ser. No. 737,907

Claims priority, application United Kingdom, Nov. 5, 1975, 45965/75

Int. Cl.² G01B *19/34*

U.S. Cl. 156—64 **21 Claims**



1. A method of making an optical coupling between two dielectric optical waveguides of the type in which two dielectric optical waveguides are aligned in a grooved plate and retained in said grooved plate, said method comprising the steps of:

- (a) locating an end of a first dielectric optical waveguide, and an end of a second dielectric optical waveguide in a groove in a grooved plate,
- (b) Launching light into one of said first or second dielectric optical waveguides so that light escapes from an end of said one dielectric optical waveguide,
- (c) Sliding said first dielectric optical waveguide longitudinally in said groove towards said second dielectric optical waveguide until said light that escapes is observed to have minimum intensity, and
- (d) Fixing said first and second dielectric optical waveguides to said grooved plate in such a manner that said ends of said first and second dielectric optical waveguides are rigidly held in position relative to each other.

4,102,718

METHOD AND DEVICES FOR APPLYING TAPE MARKING MATERIAL ON ROAD SURFACES

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Jan. 12, 1977, Ser. No. 758,693

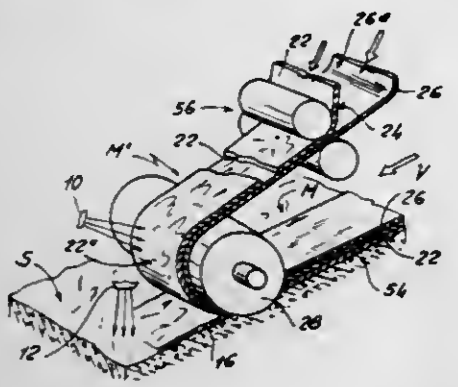
Claims priority, application Italy, Jan. 12, 1976, 19163A/76; Nov. 17, 1976, 29453A/76

Int. Cl.² E04B *2/00;* **B32B** *7/14;* **E01C** *23/16*

U.S. Cl. 156—71 **7 Claims**

1. A method of forming a traffic-regulating indicium on a road surface, comprising the sequential steps of melting an at least predominantly thermoplastic primer; firmly bonding the molten primer as a layer to a face of a tape to thereby form a two-layered indicium band; and pressing said indicium band down against the road surface while the primer layer is in an at least partially molten condition and with sufficient force to drive the primer layer into pores and cavities of the road, said

previous step of bonding being performed by spreading the molten priner over only a portion of the width of the face of the tape so as to retain substantially all of the primer layer under the face of the tape despite squeezing of the primer layer during said pressing step.



4,102,719
PROCESS FOR PRODUCING ARTIFICIAL LEATHER

Sadao Fujii; Hidehiko Maki, both of Kyoto; Toru Orisaka, Uji; Shoji Matsuda; Koichi Nishida, both of Kyoto; Tamio Ishiai; Tasaku Nishii, both of Wakayama, and Yuichi Ueda, Osaka, all of Japan, assignors to Dynic Corporation, Kyoto and Kao Soap Co., Ltd., both of, Japan

Filed Jul. 15, 1976, Ser. No. 705,514

Claims priority, application Japan, Dec. 20, 1975, 50-152460

Int. Cl.^{2} B29D *27/04;* B32B *5/20, 31/14*

U.S. Cl. 156—78 **10 Claims**

1. A process for producing an artificial leather, which comprises coating a composition, comprising as the essential component, a urethane prepolymer prepared from a polyol and an organic polyisocyanate in a ratio of the isocyanate group equivalent [NCO] to the hydroxy group equivalent [OH] of 2.0 to 4.0, a combination of an amine catalyst and a metallic catalyst and a foam stabilizer and including a plurality of extremely fine cells of an inert gas, onto a release paper in a thickness of 0.03 to 0.5 mm; expanding and resinifying the resultant under an atmosphere of a temperature of 40° to 95° C and a humidity of 60% or more until the coating layer becomes semisolid so that the number of the foams in the coating layer becomes 5,000 foams/inch^2 or more and the density of the coating layer becomes 80 - 700 g/liter; laminating a base sheet onto the coating layer under a pressure so that the thickness of the coating layer becomes about 0.95 to 0.4 times that before the laminating of the base sheet; heating the laminated product at a temperature of 90° to 180° C, and then peeling off the release paper.

4,102,720
PROCESS FOR PRODUCING SYNTHETIC RESIN LAMINATES

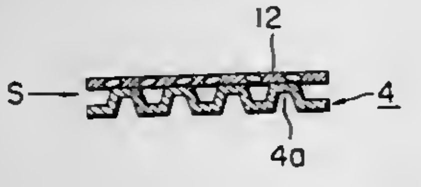
Takafumi Kaneko, Hiroshima; Shuzo Sasagawa, Iwakuni; Noriyuki Ishii, Tokyo; Takashi Hiraoka, Yamaguchi, and Shozo Hieda, Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,005

Claims priority, application Japan, Dec. 25, 1975, 50/153988

Int. Cl.^{2} B32B *5/18*

U.S. Cl. 156—78 **6 Claims**



1. A process for producing a laminate composed of a synthetic resin supporting plate possessing at least two protrusions in a traverse direction and a synthetic resin foamed sheet having fine through-holes and fusion-fixed to the protrusions of said synthetic resin supporting plate which comprises heating a synthetic resin supporting plate possessing at least two protrusions in a traverse direction to a temperature suitable for fusion-fixing, pressing an extruded synthetic resin foamed sheet on the protrusions to form a laminate, and applying a draft to the said laminate at a rate greater than but not exceeding five times the rate at which the synthetic resin foamed sheet is extruded to produce numerous fine through-holes in the synthetic resin foamed sheet.

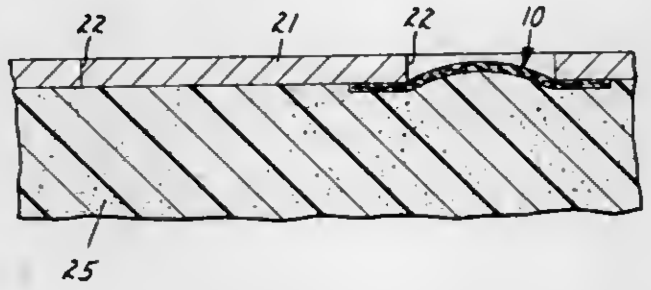
4,102,721
BARRIER TAPE CONSTRUCTION

Patrick H. Carey, Jr., Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1976, Ser. No. 731,540

Int. Cl.^{2} C09J *7/02;* B32B *7/10*

U.S. Cl. 156—79 **5 Claims**



1. A gas-permeable, foam-impermeable pressure-sensitive adhesive barrier tape consisting essentially of a thin, porous, nonwoven web formed from a mixture of hydrophobic staple length textile fibers and cellulosic paper length fibers unified with a pressure-sensitive adhesive resin composition which substantially coats the fibers to thereby bond them together at their crossing points while leaving the interstices of the web substantially unfilled, said barrier tape having air-flow resistance values to the passage of air at 100 ft./min., air face velocity of between about 0.10 to about 0.7 inch of water, and a porous, tacky, pressure-sensitive adhesive surface on one side thereof and a substantially non-tacky surface on the other.

5. The method of insulating a cabinet having spaced inner and outer walls enclosing a space comprising providing at least one filler opening of adequate size and a plurality of vent openings, covering said vent openings with a gas-permeable, foam-impermeable pressure-sensitive adhesive barrier tape according to claim 1 and introducing through said filler opening a foam-forming polyurethane composition.

4,102,722
METHOD OF MAKING HEATED LAMINATED WINDOW

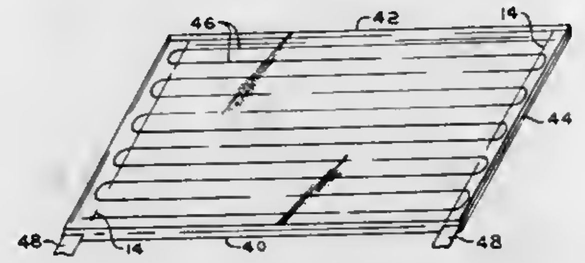
George W. Shoop, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 591,218, Jun. 27, 1975, Pat. No. 4,057,671. This application Jul. 28, 1977, Ser. No. 819,808

Int. Cl.^{2} B32B *17/00;* B60L *1/02*

U.S. Cl. 156—99 **11 Claims**

1. A method of making a transparent electroconductive window comprising assembling a plurality of assembly elements, which include a sheet of rigid transparent material and a layer of thermoplastic interlayer material, at least one of said assembly elements supporting electroconductive material over an area of said element to be heated to form an electroconductive circuit portion carried by said assembly element, applying to a pair of opposite edge portions of said electroconductive circuit portion long, narrow strips of electroconductive material consisting essentially of a mixture of 85-97 parts by weight of finely divided particles of a highly electroconductive metal selected from the group of silver, gold, platinum, copper and aluminum dispersed within 15-3 parts by weight of finely divided particles of an electroconductive metal alloy having a fusion point between about 70° C. and about 150° C. in a volatile carrier at a temperature below said fusion point, drying said long, narrow strips, assembling said one assembly element with said other assembly elements in such a manner that said dried narrow strips are disposed at an interfacial surface between said one assembly element and one of said other assembly elements to form a sandwich, and laminating said sandwich at an elevated pressure and at a temperature above the fusion point of said metal alloy and below a temperature at which said alloy flows excessively at said elevated pressure to fuse said metal alloy to said circuit portion and to form a transparent electroconductive window having bus bars consisting essentially of a mixture of 85-97 parts by weight of finely divided metal particles dispersed within 15-3 parts by weight of finely divided particles of a metal alloy having a fusion point between about 70° C. and about 150° C.



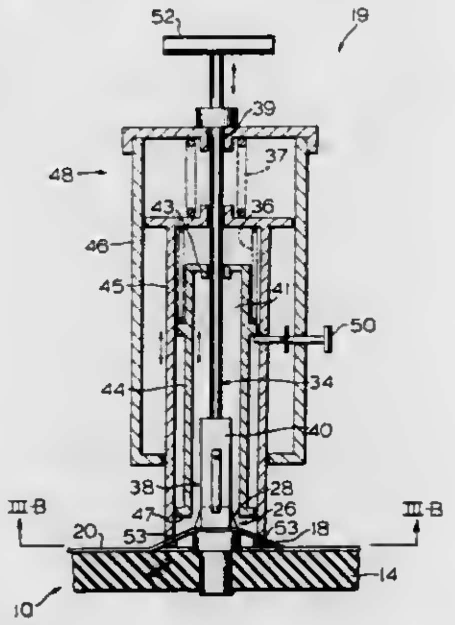
4,102,723
METHOD FOR FORMING A TIRE CARCASS HAVING AN OPENING

Herbert G. Pinkham, Minonk, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 21, 1977, Ser. No. 789,478

Int. Cl.^{2} B29H *15/00*

U.S. Cl. 156—120 **18 Claims**



1. A method for forming a tire carcass having a valve opening, comprising:

laying up a first tire forming material and forming a tire carcass base having a valve opening;

inserting a separating element into the valve opening and positioning an intermediate portion of the separating element adjacent the valve opening and overlaying the first tire forming material;

laying up reinforcing elements on the carcass base and over the intermediate portion of the separating element;

moving the reinforcing elements overlaying the intermediate portion of the separating element to a position immediately adjacent the intermediate portion of the separating element and valve opening and forming the valve opening through the reinforcing elements;

fixing said reinforcing elements immediately adjacent said separating element; and

removing the separating element from the resulting valve opening.

4,102,724
METHOD OF MAKING A HOSE HAVING AN IMPROVED SURFACE APPEARANCE

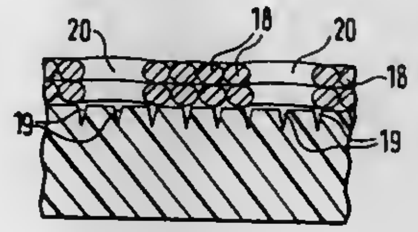
Challen E. Taylor, Portadown, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 30, 1976, Ser. No. 671,799

Claims priority, application United Kingdom, May 12, 1975, 19918/75

Int. Cl.^{2} F16L *1/04*

U.S. Cl. 156—149 **7 Claims**



1. A method of making a mandrel supported hose such as to accomodate expansion and contraction of various of the elements comprising the hose structure during vulcanization and prevent the elements from exuding to the outer surface and impairing the surface appearance thereof, comprising the steps of:

A. forming a plurality of regularly spaced longitudinal recesses in the outward facing surface of an uncured, mandrel-supported, rubber tube by extruding the tube through a die opening having a configuration of the recesses;

B. applying a layer of reinforcement filaments over the tube;

C. extruding a layer of uncured rubber over the reinforcement layer; and

D. vulcanizing the composite structure, said recesses providing necessary expansion space for the rubber as it tends to move radially outward upon being vulcanized.

4,102,725
METHOD OF MAKING A LAMINAR HOLLOW BODY OF ANGULAR CROSS-SECTION AND APPARATUS FOR PERFORMING THE METHOD

Richard Wolfgang Mosse, London, England, assignor to Corrugated Products GmbH, Frankfurt am Main, Germany

Filed Apr. 26, 1977, Ser. No. 791,014

Int. Cl.^{2} B31F *1/00;* B29D *23/10*

U.S. Cl. 156—200 **12 Claims**

1. A method of making a laminar body from a plurality of elongated sheet members, each sheet member having first and second, opposite major faces separated by the thickness of the sheet member, which method comprises:

(a) moving a first, a second, and a third sheet member continuously and longitudinally, said sheet members being moved sequentially through a coating zone, a forming zone, a securing zone, and a bending zone, said zones being offset from each other in the direction of sheet movement;

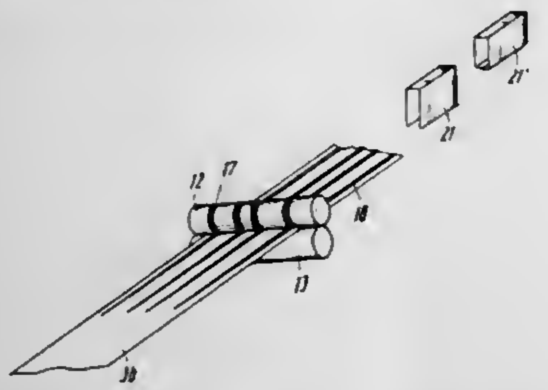
(b) coating two of said major faces of said first, second, and third sheet members in said coating zone with an adhesive composition over the respective full widths thereof;

(c) forming a plurality of transversely spaced, longitudinal, integral ribs in the first faces of said first and second sheet members and respective, coextensive, longitudinal grooves in the second faces of said first and second sheet members in said forming zone;

(d) adhesively securing the first face of said third sheet member to the second face of said second sheet member in said securing zone in fixed area contact in a position in which respective portions of the secured faces bound an elongated duct in each groove of the second sheet member, said two major faces including one of said secured faces;

(e) adhesively securing in said securing zone the first face of said second sheet member to the second face of said first sheet member in area contact in a position in which said ribs of said second sheet member are received in respective grooves of said first sheet member, and said ribs of the second sheet member and respective portions of said first sheet member bound an elongated duct in each receiving groove, said two major faces including one of the faces of said first and second sheet members secured to each other; and

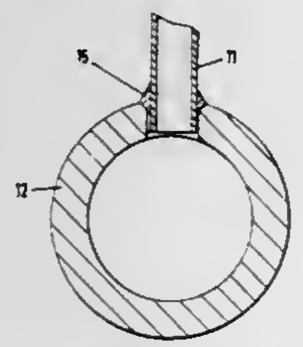
(f) angularly bending said first, second, and third sheet members while secured to each other in said area contact about a plurality of lines parallel to and adjacent respective grooves of said second sheet member, through respective angles smaller than 180°, said second face of the third sheet member bounding a corner of the angular laminar body resulting from said bending, and said first and second sheet members being offset outward of said corner from said third sheet member.



4,102,726

JOINING METHOD

Derek Samuel Brackman, Stanmore, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Jul. 22, 1976, Ser. No. 707,763
Claims priority, application United Kingdom, Aug. 4, 1975, 32488/75
Int. Cl.² B29F *3/04;* C09J *5/00*
U.S. Cl. 156—244.11 **2 Claims**



1. A method for manufacturing a heat exchanger of a kind through which a heat exchange fluid is circulated during use, comprising the steps of

forming a hollow board of plastic material, the board being internally subdivided into longitudinal tubular passages extending from one end of the board to the other;

locating at either end of the board a tubular header of plastics material having a wall thickness greater than that of the hollow board, each header having at least one aperture aligned with the ends of the tubular passages of the board so as to permit flow of a heat exchange fluid between the interior of the tubular header and said passages;

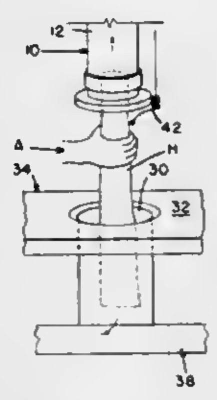
applying a heated tool to the surface of the parts of the headers which are adjacent to the board while avoiding contact between the board and the tool, thereby to preheat said parts of the header to a temperature higher than that of adjacent parts of the board; and

extruding into contact with both the preheated parts of the header and the adjacent parts of the board, a molten bead of compatible thermoplastic material at a temperature above the softening points of the headers and board so as to fuse with the parts contacted and on cooling form a weld, the weld extending completely round the adjacent parts of header and board so as to seal against loss of any fluid which may flow between the header and the board during use.

4,102,727

METHOD FOR CLOSING END PORTIONS OF TUBULAR FABRIC ARTICLES

Cecil R. Bell, Pinnacle, N.C., assignor to Hanes Corporation, Winston-Salem, N.C.
Filed Mar. 21, 1977, Ser. No. 779,720
Int. Cl.² B32B *31/18*
U.S. Cl. 156—251 **6 Claims**

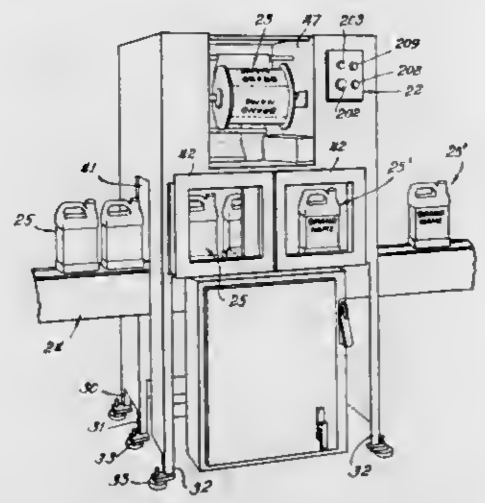


1. The method of closing the toe portion of a tubular fabric hosiery article formed at least partially of thermoplastic yarn and provided with a welt portion and a toe portion having an open end, comprising the steps of; picking up the article and holding a first segment of the hosiery article adjacent the toe portion, transferring the article to a toe-closing station in a selected manner, applying a continuous pneumatic force to the toe portion open end of the article for urging the toe portion open end away from the remainder of the article being held at the toe closing station, applying a gripping force to a second segment of the article spaced from the first segment and intermediate the first segment and the open end of the toe portion by circumferentially gathering and constricting the tubular hosiery article, releasing the first segment of the article, applying heat to the article intermediate the gripped segment and the open end of the toe portion to fuse the thermoplastic yarns together to close the toe portion and sever the toe end waste fabric therefrom, and automatically transferring the toe closed article to a predetermined location upon release of the gripping force.

4,102,728

LABEL APPLYING APPARATUS

Donald C. Smith, Melrose Park, Ill., assignor to Sterling Associates, Inc., Westmont, Ill.
Filed May 19, 1977, Ser. No. 798,652
Int. Cl.² B32B *31/00*
U.S. Cl. 156—362 **10 Claims**

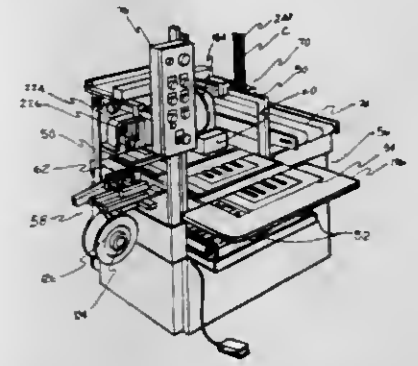


1. Apparatus for automatically applying flexible band labels about the exterior of containers, wherein labels are supplied in the form of an elongated tubular web having individual band labels separably connected in end-to-end relation, comprising: a horizontal labeling station, reciprocating loader means for moving containers horizontally to and from said station including relatively moveable spaced arm means operable to positively grip and move a container to and from said station and to hold the same thereat in upright label receiving position; label supply means comprising means for storing a supply web of labels and means for guiding the outer end portion of said web into overdisposed alignment with a container at said station; label opening means suspended within said outer end portion in coaxial vertical alignment with a container at said station and comprising a planar body portion engagable with the interior walls of said web and formed to separate said walls substantially across the full lateral dimension of said web, and rigid spaced skirt means extending outwardly along opposite sides of said body portion and operable to engage the separated walls of said web in response to movement of the same thereover; said skirt means serving to open the outer end portion of said web so that said walls thereof are stretched externally thereover and in general alignment with the exterior periphery of an underdisposed container at said station; such open outer end portion including laterally spaced wall portions engaging said skirt means in spaced symmetry outwardly of the plane of said body portion and interjoined by spaced intervening end wall portions extending transversely across the opposite ends of said spaced skirt means; a pair of selectively operable clamp means mounted on opposite sides of said opening means for linear horizontal movement toward and away from said skirt means thereof, said clamp means cooperating with said skirt means to firmly clamp said laterally spaced wall portions therebetween; a pair of gripper means adjacent said opposite ends of said skirt means comprising cooperating pairs of relatively movable finger means, engagable with the inside and outside faces of said intervening end wall portions and linearly movable to positively grip the latter; elevator means supporting said gripper means and operable to periodically elevate and lower the same vertically between said opening means and said station whereby to position said finger means for gripping engagement with said end wall portions and to transfer an opened label gripped thereby from said opening means downwardly over the exterior of a container positioned at said labeling station; means for periodically operating said gripper means to sequentially grip a label at said opening means and to release the same about the exterior of a container at said station; the lowering movement of said gripper means and a label gripped thereby serving to advance the next succeeding label onto said opening means; and additional means for periodically operating said clamp means to clamp each opened label to said skirt means thereby to disrupt its separable connection with a preceding label being moved downwardly with said gripper means.

4,102,729

APPARATUS FOR HANDLING STOCKINGS

Dulin Land Annas, Sr., Hickory, N.C., assignor to Speizman Industries, Inc., Charlotte, N.C.
Filed Apr. 29, 1977, Ser. No. 792,264
Int. Cl.² B23P *19/02, 11/00;* B65C *5/00*
U.S. Cl. 156—384 **24 Claims**

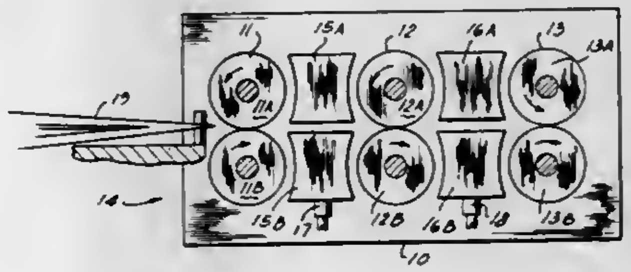


1. Apparatus for handling stockings to affix labels, transfers and hanger clips thereto comprising a carrier plate for supporting and conveying a pair of superposed stockings transversely from a loading station through label and transfer applying stations to a folding station, means for indexing said carrier plate through said stations, means at said label applying station engagable with an end portion of a pair of stockings at a side edge of said carrier plate and operable to fold an adhesive coated label over the end portion of said stockings and apply pressure thereto sufficient to cause the label to adhere to said end portion, means at said transfer applying station for transferring indicia from a transfer strip onto one of said stockings by a hot transfer iron, stocking folding means at said folding station engagable under said pair of stockings intermediate their ends to lift said stockings from said carrier plate and thereby support said stockings in folded condition, means for moving said stocking folding means to lift said stockings and to transport them to a hanger clip inserting station, means for inserting a hanger clip from a supply into said folded stockings, and means for discharging said stockings from said hanger clip inserting station to a collection station.

4,102,730

TWO STAGE OVEN LAMINATOR

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Division of Ser. No. 584,374, Jun. 6, 1975, Pat. No. 4,056,422.
This application Sep. 27, 1977, Ser. No. 837,295
Int. Cl.² B37B *31/00;* B31F *5/00;* B02C *11/08*
U.S. Cl. 156—499 **5 Claims**



1. An oven type plastic laminating apparatus for laminating

heat sensitive plastic material and discrete sheet of material comprising:
- a housing;
- a first pair of feed rollers rotatably mounted in said housing;
- a second pair of laminating rollers rotatably mounted in said housing and spaced from said first pair;
- a third pair of laminating rollers rotatably mounted in said housing and spaced from said second pair of rollers;
- first heater means disposed between said first and second pair of rollers;
- second heater means disposed between said second and third pair of rollers;
- said first heater means operating at a temperature providing only partial lamination between said materials and said second heater means operating at a higher temperature than said first heating means.

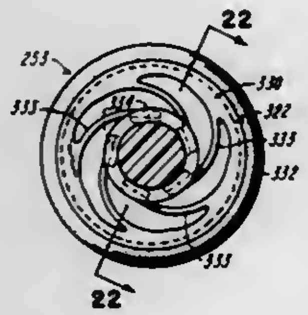
4,102,731
LABEL APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 449,111, Mar. 7, 1974, abandoned, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 23, 1976, Ser. No. 651,749

Int. Cl.² B32B *3/10*

U.S. Cl. 156—540 **11 Claims**



1. For a label applying machine: an applicator, means for advancing labels or the like into applying relationship with respect to the applicator, the applicator including at least one wheel having an annular rim, means for mounting the wheel, and means resiliently connecting the rim and the mounting means to provide resilient yielding of the wheel while the applicator applies a label to merchandise.

4,102,732
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

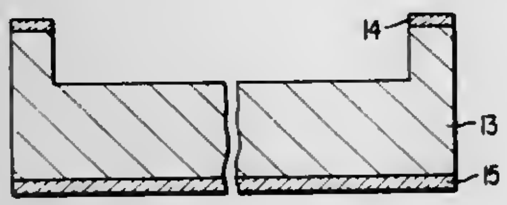
Taketoshi Kato; Masato Uchida, both of Yokohama, and Kenichi Goto, Sagamihara, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 8, 1976, Ser. No. 739,948

Claims priority, application Japan, Nov. 8, 1975, 50-133599

Int. Cl.² H01L *21/306*

U.S. Cl. 156—645 **1 Claim**



1. A method for manufacturing semiconductor devices comprising:
- coating the upper portion of a semiconductor wafer with a first thermal oxide layer and coating the lower portion of the semiconductor wafer with a second thermal oxide layer,
- removing a portion of the first thermal oxide layer to form a cavity therein,
- removing a portion of the upper portion of the semiconductor wafer to form a cavity surrounded by a peripheral frame,
- removing the second thermal oxide layer,
- forming a gate region in the cavity on the upper portion of the semiconductor wafer and forming an anode region on the lower portion of the semiconductor wafer,
- forming a third thermal oxide layer on the upper portion of the gate region and forming a fourth thermal oxide layer on the lower portion of the anode region,
- removing portions of the third thermal oxide layer to form apertures therein,
- forming diffused regions in the upper portion of the gate region below apertures in the third thermal oxide layer,
- forming gate electrodes above the diffused regions, forming cathode electrodes on the upper portion of the gate region within apertures in the third thermal oxide layer and forming an anode electrode on the bottom portion of the fourth thermal oxide layer, and
- separating the gate region, the semiconductor wafer, the anode region, the fourth thermal oxide layer and the anode electrode along a dicing line substantially perpendicular to the upper portion of the gate region.

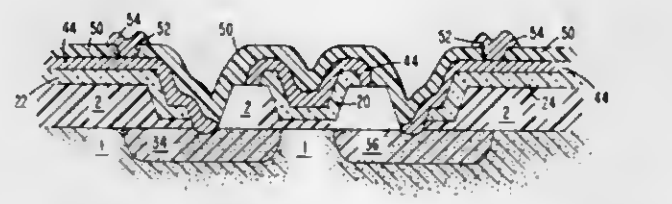
4,102,733
TWO AND THREE MASK PROCESS FOR IGFET FABRICATION

Francisco H. De La Moneda, Reston, and Harish N. Kotecha, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,278

Int. Cl.² H01L *21/22*

U.S. Cl. 156—653 **13 Claims**



1. A process for fabricating an IGFET device, comprising:
- masking with a first mask and etching to define gate, source and drain openings in a thick insulating layer on a silicon semiconductor substrate;
- coating all exposed surfaces with successive layers of thin insulating material and polysilicon;
- masking with a second mask and etching said polysilicon and thin insulating layer in said source and drain regions and dip etching to remove said thin insulating material polysilicon composite layer therein;
- introducing a conductivity enhancing dopant in the exposed source and drain regions;
- coating all exposed surfaces with a silicide forming metal layer;
- sintering said metal layer to form a silicide coating on said polysilicon layer in the gate region to form a gate electrode and on the exposed silicon in the source and drain regions to form source and drain contacts;
- preferentially etching the unreacted portions of said metal layer;
- whereby an IGFET device is fabricated.

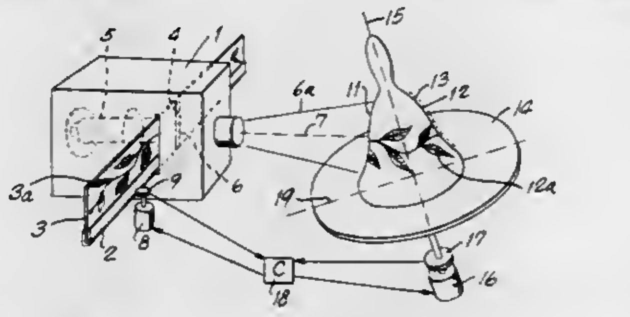
4,102,734
METHOD FOR PRODUCING A DESIGN ON AN ARCUATE SURFACE

Murray M. Schiffman, Westport, Conn., assignor to MBI, Inc., Westport, Conn.

Filed Oct. 5, 1976, Ser. No. 729,764

Int. Cl.² B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—659 **8 Claims**



1. A method of producing a design on an arcuate surface, comprising:
- (a) forming the design upon a relatively flat transparency;
- (b) progressively and sequentially exposing narrow areas of the transparency to a directional light source whereby images of the design are progressively and sequentially projected in the direction of the light;
- (c) providing the arcuate surface with a photosensitive coating;
- (d) disposing the arcuate surface spaced from the transparency such that narrow areas thereof are progressively and sequentially maintained substantially perpendicular to the direction of the light and substantially parallel with the projected images;
- (e) rotating the arcuate surface about its axis in synchronization with the progressive movement of the transparency such that the projected images of the design are progressively and sequentially received by said narrow areas of the arcuate surface such that all points within said narrow areas are within the sphere of focus and the design is exposed upon the photosensitive coated arcuate surface;
- (f) processing the exposed coating on the arcuate surface to selectively produce the design upon the surface.

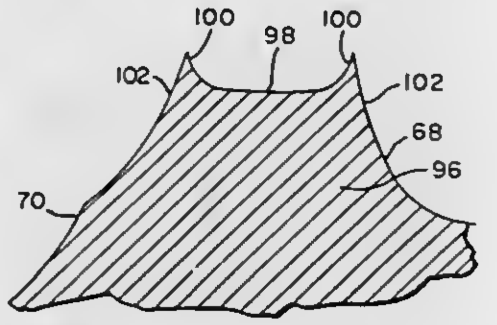
4,102,735
DIE AND METHOD OF MAKING THE SAME

Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 696,564, Jun. 16, 1976, Pat. No. 4,053,348. This application Jun. 13, 1977, Ser. No. 805,461

Int. Cl.² C23F *1/02*

U.S. Cl. 156—661 **20 Claims**



1. In a precision die comprising a die block having a working face with a plurality of die elements each having a surface area with delineating edge lines and recesses separating said die elements, a method of forming recesses in the surface areas of said die elements, said method comprising: p1 a. providing a plurality of modified reduced overlay patterns, each of which has a pattern area corresponding in configuration to that of the die elements, said reduced overlay patterns each having pattern figures having delineating edge lines spaced inwardly from those of the die elements of the die element configuration by a predetermined substantially uniform width dimension, said overlay patterns comprising at least a first and second reduced overlay pattern, with said first reduced overlay pattern having delineating edge lines spaced inwardly a greater distance, and the second reduced overlay pattern having delineating edge lines spaced inwardly a lesser distance,
- b. covering the working face of the die block with a first protective overlay corresponding to the first reduced overlay pattern, said first protective overlay having overlapping edge portions that overlap edge portions of the die elements to a greater extent, while leaving middle portions thereof exposed,
- c. exposing the working face of the die to an etching medium to form recessed areas in the die elements and form upstanding edge portions on said die elements,
- d. covering the working face of the die block with a second protective overlay corresponding to the second reduced overlay pattern, said second overlay having overlapping edge portions that overlap edge portions of the die elements to a lesser extent, while leaving middle portions thereof exposed, and
- e. again exposing the working face of the die to an etching medium to deepen and widen said recessed areas to form said upstanding edge portions of the die elements to a narrower configuration conforming with relatively high uniformity to the die element configuration.

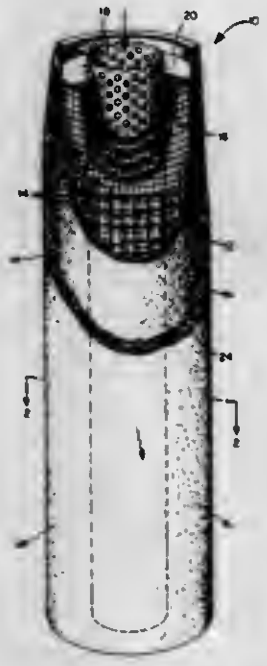
4,102,736
METHOD OF MANUFACTURING AN INSIDE-TO-OUTSIDE FLOW FILTER TUBE

Brian Arthur Head, Maidstone, England, and Philip C. Kimball, Andover, Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England

Division of Ser. No. 679,569, Apr. 23, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,407

Int. Cl.² D21D *3/00;* D21H *1/08*

U.S. Cl. 162—104 **33 Claims**



1. A process of preparing an inside-to-outside flow filter tube, which process comprises:
- (a) dispersing a plurality of glass fibers in water to form a water slurry of the fibers, the glass fibers having a diameter range of from about 0.001 to 10 microns;
- (b) forming a filter tube comprising a wet mat of the glass fibers from the water slurry on a cylindrical mandrel;
- (c) during the forming of the wet mat of fibers into a filter tube, encapsulating an open-scrim, reinforcing sheet material within the internal wall thickness of the wet mat of fibers forming the filter tube, the sheet material extending

generally the length of the filter tube and at least about one and one-half revolutions of the filter tube diameter;
(d) drying the filter tube containing the scrim sheet material within the filter tube wall;
(e) bonding the dried filter tube with a bonding agent at the junction of the glass-fiber crossover points and with and through the scrim sheet material; and
(f) recovering an integral filter tube having a high burst strength.

4,102,737

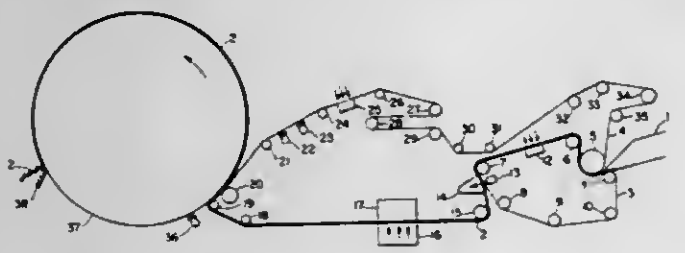
PROCESS AND APPARATUS FOR FORMING A PAPER WEB HAVING IMPROVED BULK AND ABSORPTIVE CAPACITY

Wendell J. Morton, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 16, 1977, Ser. No. 797,281

Int. Cl.^{2} D21F *9/02;* D21H *5/02, 5/06*

U.S. Cl. 162—113 **15 Claims**



1. A low-density papermaking process for the manufacture of a soft, bulky and absorbent paper sheet having a basis weight between about 5 and about 40 pounds per 3,000 square feet, as measured in an uncreped state, comprising the steps of:
(a) forming a moist paper web directly between a first traveling foraminous support member and a second traveling foraminous support member comprised of filaments which form knuckles at their points of intersection and having more open interstitial area than said first foraminous support member, said second foraminous support member having between about 100 and about 3,600 mesh openings per square inch;
(b) subjecting said moist paper web to a fluid pressure differential while said web is constrained between said first traveling foraminous support member and said second traveling foraminous support member while said web is at a fiber consistency sufficiently low to permit partially displacing at least one surface of said web in small discrete deflected areas corresponding to the mesh openings in said second foraminous support member; and
(c) drying said web to a fiber consistency of at least about 30 percent without disturbing the deflected areas in said web.

4,102,738

USE OF CHITOSAN IN CORRUGATING MEDIUM

John A. Dzurik, Bethel, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 17, 1977, Ser. No. 760,213

Int. Cl.^{2} D21H *3/20*

U.S. Cl. 162—117 **9 Claims**

1. A process for improving the flat crush resistance of a corrugating medium semi-chemical pulp which comprises:
(a) adding to said corrugating medium, at a pH of from about 5-9, a chitosan solution in an amount to provide therein from at least about 0.05% to about 0.6%, based on dry fiber weight, of chitosan, said medium containing from at least about 0.05% to about 32%, based on dry fiber weight, of spent semi-chemical pulping liquor;
(b) forming a web of said corrugating medium pulp;
(c) drying said web; and
(d) corrugating said web.

8. Corrugating medium manufactured by the process of claim 1.

4,102,739

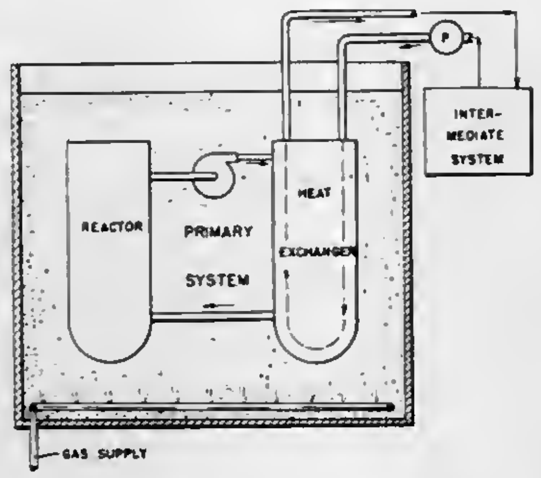
METHOD OF SHIELDING A LIQUID-METAL-COOLED REACTOR

Robert K. Sayre, Mt. Lebanon, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 30, 1976, Ser. No. 728,359

Int. Cl.^{2} G21C *9/00*

U.S. Cl. 176—38 **7 Claims**



1. A method of shielding the primary heat transport system of a sodium cooled nuclear reactor comprising establishing and maintaining a bed of powdered oxide particles closely and completely surrounding said system by passing a gas upwardly through the bed at a rate effective to slightly expand the bed whereby components of the system are able to expand without damage to themselves while the bed particles remain close enough so that the bed also serves as a guard vessel for the system, and maintaining the the depth of the powdered oxide at a level such that the bed also serves as a biological shield for the system.

4,102,740

MODERATOR STRUCTURE FOR THE CORE OF A MOLTEN SALT REACTOR

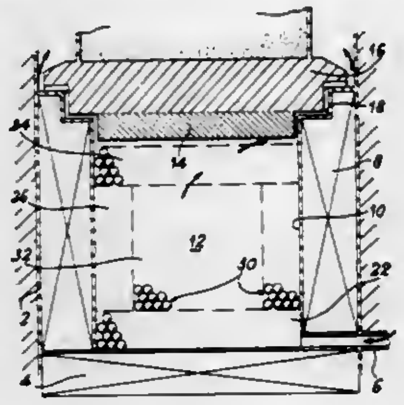
Jacques Marcel Blum, Levallois Perret, and Edmond Ventre, Le Vesinet, both of France, assignors to Electricite de France (Service National) and Pechiney Ugine Kuhlmann, both of Paris, France

Filed Jun. 17, 1976, Ser. No. 697,153

Claims priority, application France, Jun. 26, 1975, 75 20118; Oct. 9, 1975, 75 30981

Int. Cl.^{2} G21C *5/00*

U.S. Cl. 176—84 **14 Claims**



1. A moderator structure for the core of a nuclear reactor of the molten-salt type, comprising a core space defined by a bottom wall, a top wall and a lateral reflector, said structure being within said space and including a stack of separate nodules applied in mutual contact in the three dimensions of said space and a lattice of interstices in said stack through which the circulation of the molten salt takes place.

4,102,741

LOW VAPOR PRESSURE ORGANIC HEAT RETENTION MATERIALS KEPT AT ATMOSPHERIC PRESSURE USED AS HEAT STORAGE MEDIA

Robert P. Cahn, Millburn, and Edward W. Nicholson, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 533,263, Dec. 16, 1974, Pat. No. 3,998,695. This application Nov. 26, 1976, Ser. No. 745,007

Int. Cl.^{2} G21C *15/28*

U.S. Cl. 176—87 **8 Claims**

1. In a process for the storage of the excess energy output of a power plant in the form of heat in a low vapor pressure thermal energy retention material, kept at atmospheric pressure, using as the low vapor pressure (LVP) thermal energy retention material a petroleum hydrocarbon distillate having a boiling range of between 500° to 1300° F with a vapor pressure in the temperature range of 500°-650° F not exceeding 1 atm., wherein the hydrocarbon distillate used as the LVP thermal energy retention material is selected from the group consisting of 650° to 1050° vacuum pipestill cut, a 600° to 950° F catalytic cracking cycle stock, a 600° to 1000° F thermally cracked gas oil, a 600° to 900° F hydrocracking cut, and a 600° to 900° F coker gas oil.

4,102,742

PROCESS FOR ENZYMATIC ANALYSIS

Sigmar Klose, Berg, Starnberger, and Alexander Hagen, Tutzing, both of Germany, assignors to Boehringer Mannheim, GmbH, Mannheim-Waldhof, Germany

Filed Jun. 3, 1976, Ser. No. 692,701

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526558

Int. Cl.^{2} G01N *31/14*

U.S. Cl. 195—103.5 R **12 Claims**

1. Process for the enzymatic analysis of a substance to be determined involving at least one enzymatic reaction of the substance to be determined, which process comprises adding a sample solution containing the substance to be determined to an enzyme solution of at least one enzyme, solvent and other necessary reagents, causing at least one principal enzymatic reaction that produces a reaction product to occur, measuring said reaction product, then passing the enzyme solution containing said reaction product through a reactor containing an adsorbent which completely adsorbs and removes said reaction product from the solution, replenishing any used up reagents in the remaining enzyme solution to form a regenerated enzyme solution, and contacting the regenerated enzyme solution with fresh sample solution.

4,102,743

PROCESS FOR THE REMOVAL OF SUCROSE FROM A SUGAR MIXTURE

Koji Yokobayashi, Okayama; Tadashi Ikeda, Tokyo, and Akira Misaki, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 21, 1976, Ser. No. 753,104

Claims priority, application Japan, Dec. 31, 1975, 51-158801

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.^{2} C12D *13/02. 13/04*

U.S. Cl. 195—7 **4 Claims**

1. A process for the removal of sucrose from a sugar mixture without substantially affecting the remaining sugar of the mixture, comprising:
contacting an aqueous solution of a sugar mixture containing sucrose with a water-insoluble glucan produced by the process of cultivating *Streptococcus salivarius* TTL-LP$_1$, FERM-P No. 3310, on a sucrose containing medium and separating and recovering the water-insoluble glucan from the resulting culture broth, to effect reaction therebetween thereby forming a water insoluble glucan from the sucrose.

2. A process for the removal of sucrose from a sugar mixture without substantially affecting the remaining sugar of the mixture, comprising:
contacting an aqueous solution of a sugar mixture containing sucrose with a water-soluble glucan composed of non-reducing terminal residues, alpha-(1→3)-linkage residues, alpha-(1→6)-linkage residues, alpha (1→4)-linkage residues, and alpha-(1→3)-and alpha-(1→6)-branched linkage residues in the ratio of 2:4:3:1:2, to effect reaction therebetween thereby forming a water insoluble glucan from the sucrose, said flucan being produced by *Streptococcus salivarius* TTL-LP$_1$, FERM-P No. 3310.

4,102,744

TWO PHASE FERMENTATION

Carleton J. McCoy, Union, N.J., and Robert D. Schwartz, Charleston, W. Va., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 20, 1976, Ser. No. 752,277

Int. Cl.^{2} C12B *1/00, 1/20*

U.S. Cl. 195—28 R **28 Claims**

2. A process for conducting an oxidative enzymatic transformation of a linear hydrocarbon substrate comprising conducting the enzymatic transformation in a two-phase fermentation system containing an aqueous nutrient medium and an organic solvent comprising cyclohexane and obtaining an oxidative hydrocarbon conversion of said linear hydrocarbon substrate product from said enzymatic transformation.

4,102,745

PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES

Kenneth N. Thompson, Beach, N. Dak.; Norman E. Lloyd, and Richard A. Johnson, both of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 500,975, Aug. 26, 1974, Pat. No. 4,011,137. This application Mar. 2, 1977, Ser. No. 773,450

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.^{2} C12D *13/02*

U.S. Cl. 195—31 R **4 Claims**

1. A process for converting starch to dextrose comprising treating starch with alpha-amylase or acid or a combination thereof to obtain a partially hydrolyzed starch solution containing at least 10 percent hydrolyzed starch and then treating the partially hydrolyzed starch solution with an enzyme system comprising entrapped glucoamylase within a polymeric matrix and immobilized alpha-amylase selected from the group consisting of alpha-amylase covalently bonded to an insoluble carrier, alpha-amylase adsorbed on an insoluble carrier, and entrapped alpha-amylase under conditions whereby a hydrolysate containing at least about 92% dextrose on an ash free, dry basis is produced.

3. A process for converting starch to dextrose comprising treating starch with alpha-amylase or acid or a combination thereof to obtain a partially hydrolyzed starch solution containing at least 10 percent hydrolyzed starch and then treating the partially hydrolyzed starch solution with an enzyme system comprising entrapped alpha-amylase and immobilized glucoamylase selected from the group consisting of glucoamylase covalently bonded to an insoluble carrier and glucoamylase adsorbed on an insoluble carrier.

4,102,746
IMMOBILIZED PROTEINS

Bruce S. Goldberg, Clifton, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 609,077, Aug. 29, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,291

Int. Cl.² C07G *7/00, 7/02*

U.S. Cl. 195—63 **19 Claims**

1. An insoluble composite comprising a microporous member having at least a pair of opposed surfaces and a predetermined thickness, said microporous member comprising a polymeric resinous binder having finely divided filler particles dispersed throughout said binder and a network of substantially interconnected pores formed therein, said pores being formed within said resinous binder, between said filler particles and said resinous binder, and between neighboring filler particles, said dispersed filler particles being present in said microporous member in an amount by weight of at least about 25%, the size distribution of said pores varying non-uniformly across each of said surfaces and across said predetermined thickness through the range of about 0.01 micron to about 100 microns as determined porosimetrically by the Mercury Intrusion Method, and a proteinaceous substance bound to at least some of said filler particles dispersed throughout said binder, said microporous member being previous to the flow of a fluid through at least one of said surfaces wherein at least some of said filler particles to which said proteinaceous substance is bound is adapted to come into contact with such fluid.

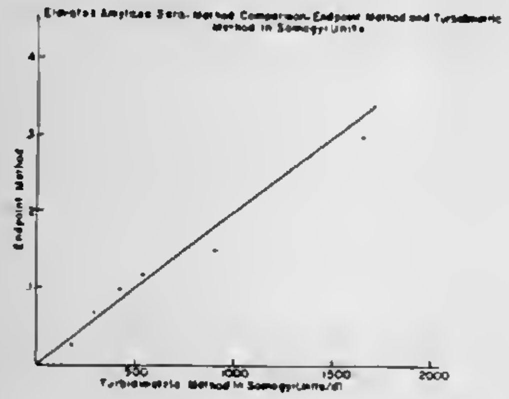
4,102,747
AMYLASE DETERMINATION

Richard Cornelius Driscoll, Lake Forest, Ill.; Robert James Gargiulo, and Joseph L. Giegel, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 28, 1977, Ser. No. 820,072

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 C **2 Claims**



1. A process for determining the α-amylase content of a sample comprising the steps of adding a chromogenic oligosaccharide substrate having 4–10 glucose units and a chromophore selected from the group of p-nitrophenol and 4-methylumbilliferone to a solution containing a measured amount of said sample and α and β glucosidase and determining amylase activity by the release of a chromophore selected from the group of p-nitrophenol and 4-methylumbelliferone.

4,102,748
DEVICE FOR PLATING AND STREAKING A MICROBIOLOGICAL SAMPLE

Mary Frances Vacanti, Omaha, Nebr.

Filed Nov. 9, 1977, Ser. No. 850,040

Int. Cl.² C12B *1/02;* **C12K** *1/04*

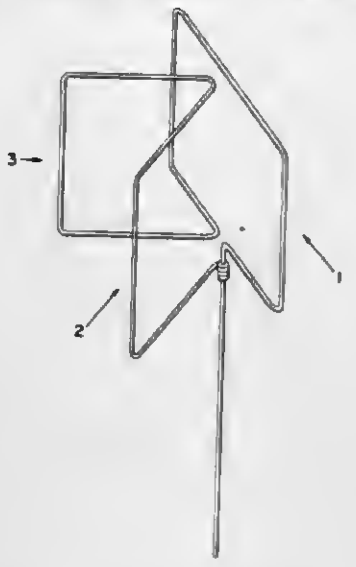
U.S. Cl. 195—127 **3 Claims**

1. A manually manipulable device for plating and streaking a microbiological sample comprising:

a stem element adapted to be hand held for manipulation thereof;

a generally closed planar loop, formed of a relatively thin gauge material and topping said stem, whereby a specimen of said microbiological sample may be obtained by dipping and whereby said specimen may be plated onto a substrste;

at least two partial planar loops, coextensive in height with the generally closed loop, and extending from one side of and without touching the plane of said generally closed loop, and at angles of about 60° from each other and said generally closed loop, and each partial loop having a generally vertical leg section of said coextensive height spaced from said closed loop; and



said partial loops being fabricated of a relatively thin gauge material;

whereby after said plating, the device may be rotated and said leg utilized to streak said specimen.

4,102,749
PROCESS FOR MAKING OIL FROM AQUEOUS REACTIVE SLUDGES AND SLURRIES

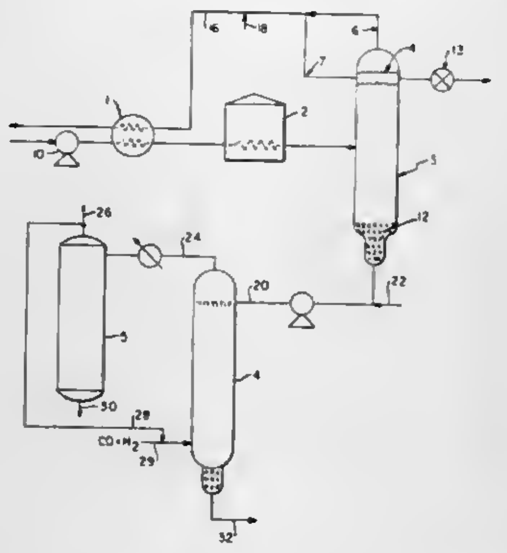
Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,967, Dec. 16, 1974, Pat. No. 4,030,981. This application Apr. 21, 1977, Ser. No. 789,380

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.² C10B *53/02, 57/04, 57/06;* **C10G** *1/00*

U.S. Cl. 201—2.5 **3 Claims**



1. A process for making low sulfur oil from an aqueous charge containing cellulose and other carbohydrates comprising coking said charge at a temperature in the range of 400° to 550° F under a pressure of 300 to 1200 psig for 5 minutes to 2 hours to form an aqueous slurry containing cokes solids; removing from 50 to 99 percent of the liquid from said slurry; contacting the thus concentrated slurry with hot pressurized synthesis gas at a pressure of between about 500 to 5000 psig at a temperature of between 500° to 750° F to form a low sulfur oil, gases and carbon and inorganic solids and separating said oil from said carbon and inorganic solids and gases.

4,102,750
PROCESS FOR PRODUCING FORMED COKE FOR METALLURGICAL USE

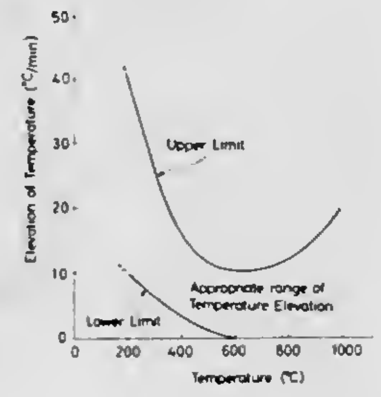
Nobuyoshi Nishibara; Toshiaki Okuhara; Tetu Nishi; Hiroyuki Nakama; Chikara Saito, and Kouichi Yuta, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,813

Claims priority, application Japan, Aug. 18, 1975, 50-99911

Int. Cl.² C10B *49/06, 53/08;* **C10L** *5/02*

U.S. Cl. 201—6 **1 Claim**



1. In a process for producing formed coke for metallurgical use wherein agglomerated coal is carbonized by passing it downwardly through an upright carbonizing oven while continuously heating the agglomerated coal with high temperature gases supplied through tuyeres provided at the middle and bottom parts of the carbonizing oven, said agglomerated coal being made from coal powders and binders, the improvement which comprises:

(a) adjusting the temperature of the gas supplied through the tuyeres at the middle part of the carbonizing oven to a temperature between 600° and 800° C;

(b) adjusting the supply rate of the gas supplied through the tuyeres at the middle part of the carbonizing oven so as to maintain the temperature of the gas leaving the top part of the carbonizing oven in the range between 300° and 500° C;

(c) regulating the gas supplied through the tuyeres at the bottom part of the carbonizing oven so that the heat supplied therefrom is less than 50 percent of the total heat supplied to the carbonizing oven; and

(d) controlling the temperature and feed rate of the heating gas such that the rate of temperature elevation of the agglomerated coal as it passes through the oven is within the upper and lower limit ranges of FIG. 1.

4,102,751
COKE OVEN BATTERY WITH CONTROL MEANS FOR CHANGING THE HEAT SUPPLY

Dieter Stalherm, Recklinghausen, and Volker Kolitz, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 15, 1976, Ser. No. 666,634

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2511940

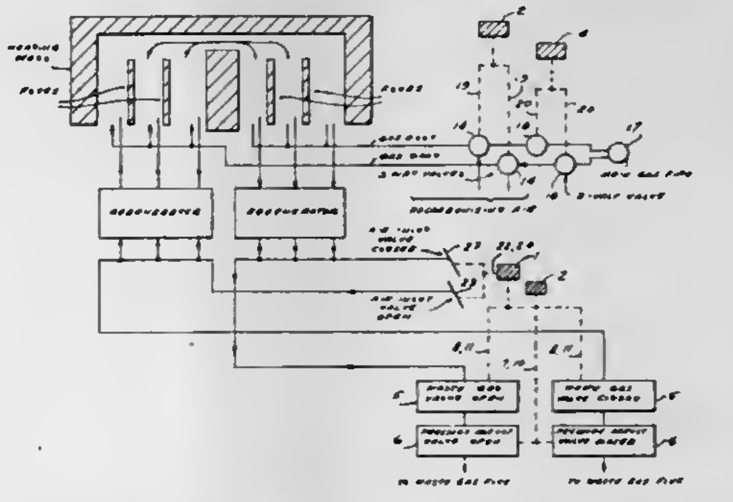
Int. Cl.² C10B *5/12;* **F16K** *11/00*

U.S. Cl. 202—151 **1 Claim**

1. In a battery of coke ovens of the type whose successive heating sections are each comprised of first and second parts, the first and second parts being each provided with respective first and second gas ducts for feeding combustion gas into the respective part from the main gas pipe, respective first and second decarbonizing-air ducts for the supply of decarbonizing air, respective first and second three-way valves connected in the respective gas ducts, each three-way valve having a decarbonizing setting in which it connects the respective decarbonizing-air duct to the respective gas duct while blocking the flow of combustion gas, each three-way valve having a combustion-gas setting in which it connects the respective gas duct to the main gas pipe while blocking the flow or decarbonizing air, first and second two-way valves in the respective gas ducts, each two-way valve being located intermediate the main gas pipe and the respective three-way valve, each two-way valve having an open setting and a closed setting,

a first air duct system including a respective first combustion-air-infeed branch and a respective first waste-gas-outfeed branch, a respective first air inlet valve in the combustion-air-infeed branch operative when open for admitting combustion air through the combustion-air-infeed branch into the first part of the heating section, a respective first waste gas valve in the waste-gas-outfeed branch operative when open for conveying waste gas from the first part of the heating section through the waste-gas-outfeed branch to the waste gas flue, and a respective first pressure valve in the waste-gas-outfeed branch downstream of the waste gas valve operative for controlling the flow of gas through the waste-gas-outfeed branch,

a second air duct system including a respective second combustion-air-infeed branch and a respective second waste-gas-outfeed branch, a respective second air inlet valve in the second combustion-air-infeed branch operative when open for admitting combustion air through the second combustion-air-infeed branch into the second part of the heating section, a respective second waste gas valve in the second waste-gas-outfeed branch operative when open for conveying waste gas from the second part of the heating section through the second waste-gas-outfeed branch to the waste gas flue, and a respective second pressure valve in the second waste-gas-outfeed branch downstream of the second waste gas valve operative for controlling the flow of gas through the second waste-gas-outfeed branch,



the battery of coke ovens being of the type operated with periodic reversal between first and second heating modes,

in the first heating mode the first air inlet valve being open and the second closed, the first two-way valve being open and the second closed, the first three-way valve being in the combustion-gas setting and the second in the decarbonizing setting, the first waste gas valve being closed and the second open, the first pressure valve being closed and the second open,

whereby combustion gas is fed into the first heating section part through the first gas duct, combustion air is fed into the first heating section part through the first combustion-air-infeed branch, waste gas is conveyed from the second heating section part through the second waste-gas-outfeed branch to the waste gas flue, and decarbonizing air is fed into the second gas duct through the second three-way valve, in the second heating mode the first air inlet valve being closed and the second open, the first two-way valve being closed and the second open, the first three-way valve being in the decarbonizing setting and the second in the combustion-gas setting, the first waste gas valve being open and the second closed, the first pressure valve being open and the second closed,

whereby combustion gas is fed into the second heating section part through the second gas duct, combustion air is fed into the second heating section part through the second combustion-air-infeed branch, waste gas is conveyed from the first heating section part through the first waste-gas-outfeed branch to the waste gas flue, and decarbonizing air is fed into the first gas duct through the first three-way valve,

the battery of coke ovens furthermore being of the type operated with periodic reversal between heating and non-heating modes,

the heating mode being constituted by the aforementioned periodic reversal between the first and second heating modes,

the non-heating mode being constituted by periodic reversal between first and second non-heating modes,

in the first non-heating mode the first and second air inlet valves, the first and second three-way valves, and the first and second waste gas valves all being in their first-heating-mode settings,

in the second non-heating mode the first and second air inlet valves, the first and second three-way valves, and the first and second waste gas valves all being in their second-heating-mode settings,

in both the first and second non-heating modes the first and second two-way valves both being closed, and the first and second pressure valves both being in settings intermediate their respective first-heating-mode and second-heating-mode settings,

the improvement comprising a control system having

a first control bar extending along the battery of coke ovens and shiftable between a first-heating-mode position and a second-heating-mode position and first mechanical linkage means mechanically linking the first control bar to the first and second air inlet valves and to the first and second waste gas valves for correspondingly moving those valves between their first-heating-mode and second-heating-mode settings;

a second control bar extending along the battery of coke ovens and shiftable between a first-heating-mode position and a second-heating-mode position and second mechanical linkage means mechanically linking the second control bar to the first and second three-way valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings,

a third control bar extending along the battery of coke ovens alongside the first control bar and shiftable between a first-heating-mode position and a second-heating-mode position and third mechanical linkage means linking the third control bar to the first and second pressure valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings;

a fourth control bar extending along the battery of coke ovens alongside the second control bar shiftable between a first-heating-mode position and a second-heating-mode position and fourth mechanical linkage means linking the fourth control bar to the first and second two-way valves for correspondingly moving the latter between their first-heating-mode and second-heating-mode settings; and

controllable coupling means coupling the first control bar to the third control bar and coupling the second control bar to the fourth control bar for causing the first and third control bars when coupled to share shifting movement and for causing the second and fourth control bars when coupled to share shifting movement, but activatable for disestablishing the coupling between the first and third control bars and for disestablishing the coupling between the second and fourth control bars,

whereby said control system is capable of effecting not only reversal between the first and second heating modes but also changeover from the heating mode to the non-heating mode and reversal between the first and second non-heating modes,

this capability resulting from the fact that the aforementioned controllable coupling means is activatable for disestablishing the coupling between the first and third control bars and for disestablishing the coupling between the secondand fourth control bars,

whereby for reversal between the first and second non-heating modes the first and second control bars can continue to be shifled between their first-heating-mode and second-heating-mode positions with the decoupled second and fourth control bars left in positions intermediate their respective first-heating-mode and second-heating-mode positions.

4,102,752

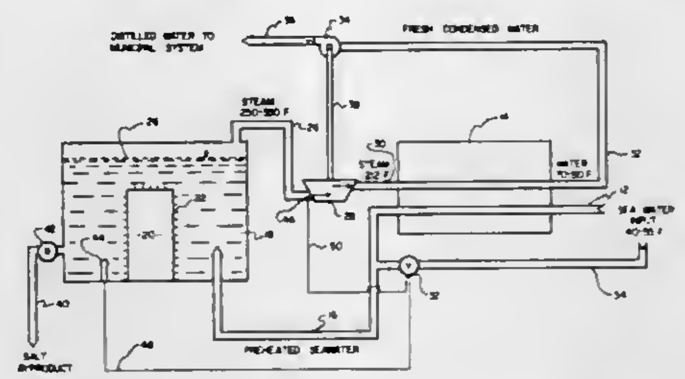
MUNICIPAL WATER SUPPLY SYSTEM

John L. Rugh, II, Box 128, R.D. #5, Johnstown, Pa. 15905

Filed Jul. 9, 1976, Ser. No. 703,777

Int. Cl.² B01D *3/00;* **G21C** *15/16*

U.S. Cl. 202—180 **2 Claims**



1. A water supply system for a water distribution system for providing potable water under pressure from sea water comprising:

(a) a boiler having a boiler chamber for raising the temperature of the sea water to generate high temperature steam of superatmospheric pressure

(b) a nuclear reactor core having top and sides having heat radiators thereon,

(c) said core being mounted within said boiler chamber for directly supply heat to said boiler chamber and having a height and width substantially less than the height and width of said boiler chamber to permit sea water to substantially completely surround and cover said top and sides of said core when said system is in operation,

(d) a sea water intake line connected to said boiler chamber,

(e) an expansion turbine including means connecting said turbine to said boiler chamber,

(f) a steam discharge line connected to said turbine,

(g) a heat exchange condenser,

(h) said sea water intake line and said steam discharge line connected to said heat exchange condenser,

(i) a fresh water discharge line connected to said heat exchange condenser,

(j) pump means driven by said turbine and connected to said fresh water discharge line and to a water distribution system,

(k) a sea water intake by-pass by-passing said heat exchange condenser and connected to said boiler chamber,

(l) valve means for automatically opening said by-pass for bringing cold sea water into said boiler,

(m) a pair of thermal sensors,

(n) one of said thermal sensors being positioned in said boiler chamber and the other of said thermal sensors being positioned adjacent said turbine and upstream of said turbine, and

(o) said valve means responsive to both of said pair of thermal sensors for controlling the flow of cold sea water into said boiler chamber thereby maintaining a proper temperature in said boiler chamber.

4,102,753

DISTILLATION OF META-CHLORONITROBENZENE IN THE PRESENCE OF A DISTILLATION ADJUVANT

Richard M. Stephenson, Storrs, Conn., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,256

Int. Cl.² B01D *3/34, 3/36*

U.S. Cl. 203—64 **14 Claims**

1. A distillation method comprising:

(a) distilling a mixture comprising

  (i) a mixture of chloronitrobenzene isomers containing a majority of meta-chloronitrobenzene in admixture with at least one of its isomers and

  (ii) a distillation adjuvant selected from the group consisting of lower alkylene glycols, lower oxyalkylene glycols or glycerol

said distillation adjuvant being present in an amount which provides a meta-chloronitrobenzene distillate having a boiling point lower than the boiling point of meta-chloronitrobenzene, and

(b) recovering a distillate comprising meta-chloronitrobenzene.

4,102,754

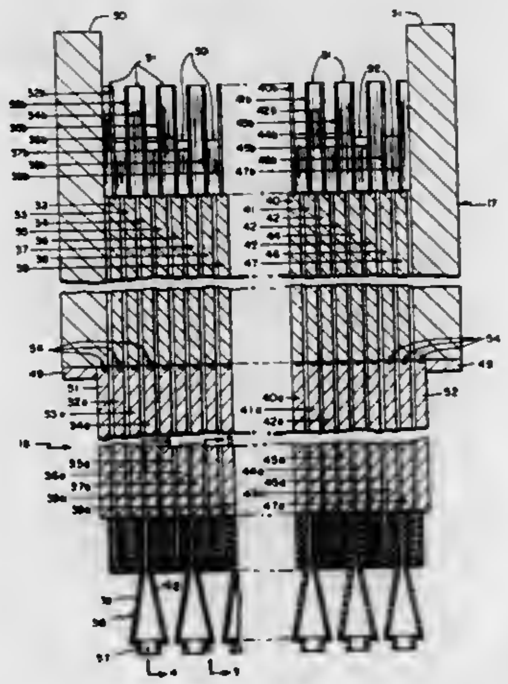
ORE TREATMENT ELECTROLYTIC CELL

Richard A. Hedges, and Maurice H. Pearl, both of Oakland, Calif., assignors to Electrooxidation Systems, Inc., Oakland, Calif.

Filed Oct. 6, 1976, Ser. No. 730,011

Int. Cl.² C25C *7/00, 7/06*

U.S. Cl. 204—275 **10 Claims**



1. In an electrolytic cell apparatus suitable for treatment of an ore slurry, means forming a plurality of electrolytic cells comprising a plurality of spaced electrode plates with cell slurry flowthrough passages therebetween, manifold means for feeding slurry in separate paths to the inlet side of each of said cell flowthrough passages, said manifold means including spaced adjacent non-conductive walls defining a plurality of elongated slots of generally rectangular cross-section transverse to flow, each slot including separate inlets and outlets, individual slurry feed pipes in communication with each of said slot inlets, a main slurry conduit, and stream-splitter means interconnecting said main conduit and feed pipes, the outlets of each of said slots being adajcent to and in communication with the inlets of said flowthrough passages, said manifold means including a flow area expansion section with a cross-section transverse to flow of progressively increasing slot length in the direction of flow.

4,102,755

METHOD OF AND ELECTROLYTIC BATH FOR THE ELECTRODEPOSITION OF SEMIBRIGHT NICKEL AND NICKEL-COBALT COATINGS UPON A METAL SURFACE

Robert Brugger, Bernhausen; Martin Köhl, Düsseldorf, and Horst Krause, Neuss, all of Germany, assignors to Langbein-Pfanhauser Werke AG, Neuss, Germany

Continuation of Ser. No. 625,095, Oct. 23, 1975, Pat. No. 4,010,084, which is a continuation of Ser. No. 475,264, May 31, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,518

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1973, 2327881

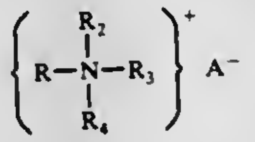
The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.² C25D *3/12, 3/16, 3/18, 3/56*

U.S. Cl. 204—43 T **11 Claims**

7. In an aqueous acidic bath for electroplating nickel or nickel-cobalt upon a metal substrate, the improvement which comprises an effective amount of a first component and a second component in said bath reactive to form a flocculate incorporated in the coating upon electrodeposition thereof, said first component having at least one C_7 to C_{20} alkyl group and being selected from the group which consists of:

(a) quaternary ammonium compounds of the formula



$$\left\{ R-\underset{R_4}{\overset{R_2}{N}}-R_3 \right\}^+ A^-$$

where A− is an anion, R_1, R_2, R_3 and R_4 groups are alkyl, aralkyl or aryl, or two of them are alkyl groups included in a heterocyclic ring with nitrogen as the heterocyclic atom, at least one of the groups R_1 to R_4 include a long chain alkyl having 7 to 20 carbon atoms, the alkyl groups being unsubstituted or include ether, carboxylamide or carboxylic acid groups;

(b) imidazolines;

(c) alkanolamine esters; and

(d) aminocarboxylic acid surfactants,

said second component being selected from the group which consists of:

(e) surface-active alkyl, aryl and alkylaryl, sulfates, sulfonates and phosphates;

(f) aliphatic, alicyclic, aromatic, heterocyclic substituted and unsubstituted sulfates, sulfonic acids and carboxylic acids; and

(g) sulfonamides and cyclic or noncyclic sulfonimides.

4,102,756

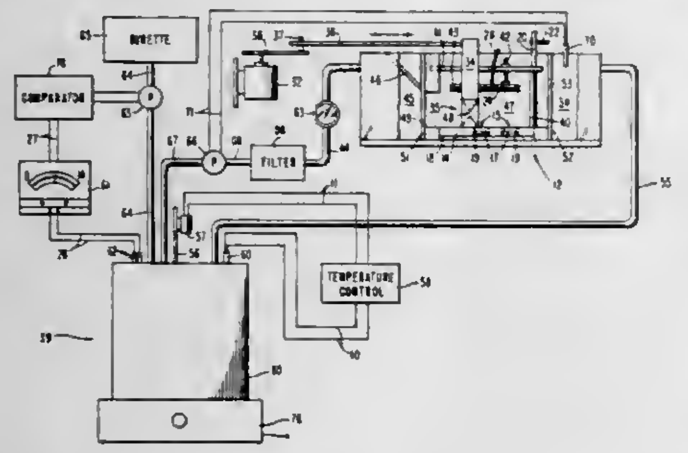
NICKEL-IRON (80:20) ALLOY THIN FILM ELECTROPLATING METHOD AND ELECTROCHEMICAL TREATMENT AND PLATING APPARATUS

Eugene Evans Castellani, Putnam Valley; John Vincent Powers, Shenorock, and Lubomyr Taras Romankiw, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,893

Int. Cl.^{2} C25D *3/56;* C25C *1/24;* C25D *21/14*

U.S. Cl. 204—43 T **26 Claims**



1. A nickel-iron electroplating method for coating a substrate having a mask deposited thereon including means for electroplating a nickel-iron film onto a sheet substrate of a metallic material,

said method including employing a plating current density of about 2 - 60 ma/cm^2,

a plating bath fluid having an Fe^{++} ion concentration of about 0.3 g/l to about 1.0 g/l,

an Ni^{++} ion concentration of about 17–44 g/l, a pH of about 1 - 3.6, and maintaining said fluid at a temperature of about 20° - 35° C,

wherein Fe^{++} ion concentration required for plating is inverse to circulation of said plating bath fluid across said substrate.

4,102,757

ELECTROCHEMICAL OXYGEN PRODUCTION METHOD

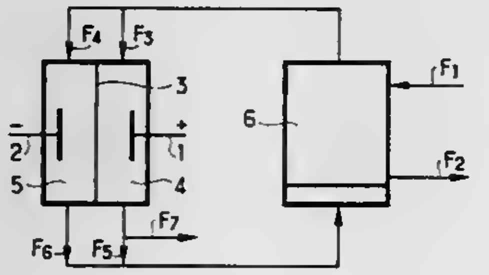
Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Meccaniques "Alsthom et Cie", Paris, France

Filed Oct. 12, 1976, Ser. No. 731,696

Claims priority, application France, Oct. 29, 1975, 75 33082

Int. Cl.^{2} C25B *3/04, 1/02*

U.S. Cl. 204—73 R **14 Claims**



10. Method according to claim 1, wherein said electrochemical oxidation and reduction are effected at a potential difference equal to the difference between the oxidation-reduction potential of said compound and the potential of the electrochemical oxidation of water.

4,102,758

METHOD OF ELECTROLYTICALLY FORMING SILVER HALIDE GRAINS UTILIZING A NOVEL CATHODE

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 7, 1977, Ser. No. 775,044

Int. Cl.^{2} C25B *1/24, 11/04, 11/08*

U.S. Cl. 204—94 **10 Claims**

1. In a method which comprises the electrolytic generation of silver ions and halide ions employing a silver anode and a cathode which is a source of halide ions and precipitation in the electrolyte of the ion pairs remote from the electrodes to provide photosensitive silver halide grains in the substantial absence of counterions in said electrolyte;

the improvement wherein said cathode comprises elemental halogen and electrically conductive carbon.

4,102,759

METHOD OF ELECTROLYTICALLY FORMING SILVER HALIDE GRAINS UTILIZING A NOVEL ANODE

Arthur M. Gerber, Boston, and Vivian K. Walworth, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 7, 1977, Ser. No. 775,045

Int. Cl.^{2} C25B *1/24, 11/04, 11/08*

U.S. Cl. 204—94 **9 Claims**

1. In a method which comprises the electrolytic generation of silver ions and halide ions employing a silver anode and a cathode which is a source of halide ions and precipitation in the electrolyte of the ion pairs remote from the electrodes to provide photosensitive silver halide grains in the substantial absence of counterions in said electrolyte;

the improvement wherein said anode comprises particulate silver.

4,102,760

CHLORINATION OF POLY (VINYLIDENE FLUORIDE) USING U-V RADIATION

Donald Nellis Robinson, Collegeville, Pa., and Adrian Samuel Fox, Framingham, Mass., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 21, 1977, Ser. No. 761,153

Int. Cl.^{2} C08F *8/18, 8/34*

U.S. Cl. 204—159.18 **7 Claims**

1. A method of chlorinating vinylidene fluoride polymer resin which comprises reacting said resin dispersed in carbon tetrachloride with chlorine at a pressure in the range of about 1 to about 15 atmospheres, a temperature in the range of from about 50° to about 150° C. in the presence of (a) a catalytic amount of triethanolamine and (b) a catalytic amount of an initiator compound selected from the group consisting of acyl peroxides and azo-compounds, and with accompanying exposure of the reaction to a catalytic amount of ultraviolet radiation.

4,102,761

RADIATION CURE OF SYNTHETIC RUBBERS

Georg Gustav Anton Böhm, Akron, Ohio, and Bolesh J. Skutnik, Milford, Conn., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 430,425, Jan. 3, 1974, abandoned, which is a continuation of Ser. No. 148,696, Jun. 1, 1971, abandoned. This application May 28, 1975, Ser. No. 581,493

Int. Cl.^{2} C08F *2/46*

U.S. Cl. 204—159.20 **10 Claims**

10. A method of curing synthetic rubber compositions the major component of which comprises a copolymer containing at least one diolefin polymer or copolymer with another monoolefin having a weight average molecular weight of at least 50,000, a molecular weight distribution of from 1.01 to 30, the distribution of monomer units affecting the total crosslinking rate being such that when the value of the fraction

$$\frac{G(\text{crosslink})_{Xi}}{\bar{G}(\text{crosslink})}$$

is greater than 1.5, from 50% to 100% of the monomer whose crosslinking rate contribution is represented by G(crosslink)$_{Xi}$ is in molecules having a molecular weight less than the weight average molecular weight of the synthetic rubber, and when the value is less than 0.5 up to 50% of the monomer whose crosslinking rate contribution is represented by G(crosslink)$_{Xi}$ is in molecules having a molecular weight less than the weight average molecular weight of the synthetic rubber; the value of said fraction in said composition being less than 0.5 or more than 1.5; said composition when substantially pure being radiation curable at an average radiation dose from about 0.5 to 7 megarads, which comprises subjecting said composition to high energy ionizing radiation to an average radiation dose of up to 15 megarads.

4,102,762

PROCESS OF PREPARING MICROSPHERES USING ELECTROMAGNETIC RADIATION

Wolfgang Herman Fritz Sasse, Malvern East, and Mervyn Benjamin Jackson, West Brunswick, both of Australia, assignors to ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia

Filed Mar. 28, 1975, Ser. No. 563,174

Claims priority, application Australia, Apr. 3, 1974, 7146/74

Int. Cl.^{2} C08F *2/46*

U.S. Cl. 204—159.22 **10 Claims**

1. A method of preparing microspheres of size less than 20 microns by polymerising a composition comprising up to about 25% of a mixture of monomers said monomer mixture containing a major proportion of an unsaturated carboxylic acid and a minor proportion of a cross-linking agent which method comprises irradiating the said mixture of monomers in a nonpolar and nonhydroxylic solvent with electro-magnetic radiation having a wavelength greater than 180 nanometers, at a temperature in the range from 10° to 90° C, the concentration of unsaturated carboxylic acid being less than 20% w/v, and isolating the polymer so formed.

4,102,763

PREPARATION OF 1-(3,3-DIMETHYL-2-NORBORNYL)-2-PROPANONE

William L. Schreiber, Jackson; James N. Siano, Keyport; Manfred Hugo Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 747,308, Dec. 3, 1976, Pat. No. 4,053,657. This application Jul. 28, 1977, Ser. No. 819,952

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—162 R **3 Claims**

1. A process for preparing 1-(3,3-dimethyl-2-norbornyl)-2-propanone comprising the step of intimately admixing camphene, acetaldehyde, and a 1,2-diketone photochemical hydrogen abstractor; then simultaneously irradiating the reaction mixture with ultraviolet light and adding additional quantities of said, 1,2-diketone photochemical hydrogen abstractor; and isolating said 1-(3,3-dimethyl-2-norbornyl)-2-propanone from the reaction mass.

4,102,764

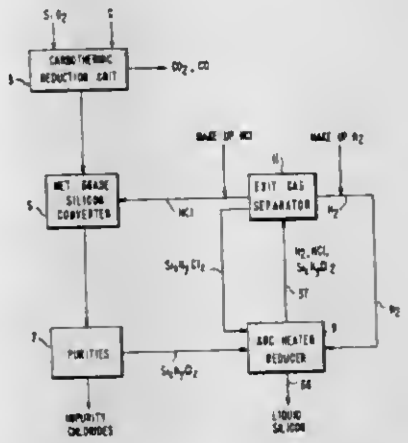
HIGH PURITY SILICON PRODUCTION BY ARC HEATER REDUCTION OF SILICON INTERMEDIATES

Francis J. Harvey, II, Murrysville, and Maurice G. Fey, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1976, Ser. No. 755,383

Int. Cl.^{2} B01K *1/00;* C01B *33/02*

U.S. Cl. 204—164 **6 Claims**



1. A process for the production of high purity silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream extending into the reaction chamber, and

(d) feeding into the arc stream a quantity of an intermediate silicon compound selected from the group consisting of SiH_a, SiH_bY_c and SiY_d, where Y is a halide including Cl, Br, I, F, and where a, b, c, and d are whole integers, to react with the arc gas to produce reaction products comprising liquid silicon.

4,102,765

ARC HEATER PRODUCTION OF SILICON INVOLVING ALKALI OR ALKALINE-EARTH METALS

Maurice G. Fey, Plum Borough; Francis J. Harvey, II, Murrysville, and Jack McDonald, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,546

Int. Cl.^{2} B01K *1/00;* C01B *33/02*

U.S. Cl. 204—164 **10 Claims**

1. A process for producing the high purity silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

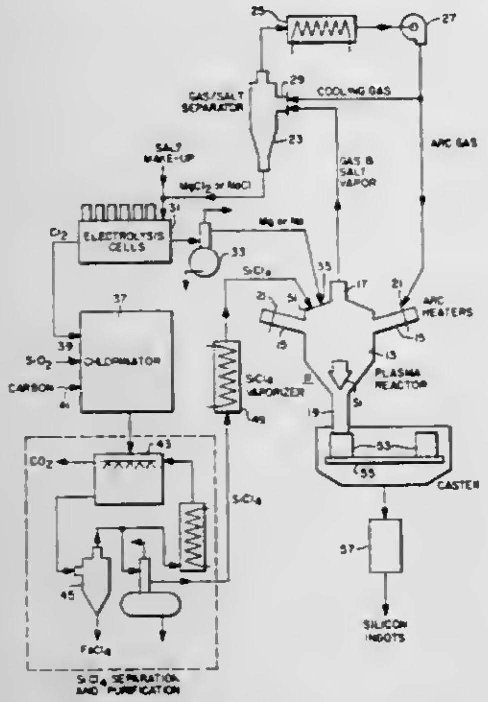
(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream extending into the reaction chamber,

(d) feeding into the arc stream a quantity of a metal reductant selected from the group consisting of an alkali metal and an alkaline-earth metal,

(e) feeding into the arc stream a quantity of silicon halide to react with the metal reductant to produce reaction products including liquid silicon and a salt of the metal reductant,

(f) projecting the reaction products into the reaction chamber tangentially to cause the liquid silicon to separate centrifugally from the gaseous co-product salt, and



(g) depositing the liquid silicon on a downwardly extending surface to permit the liquid silicon to flow into an associated receptacle.

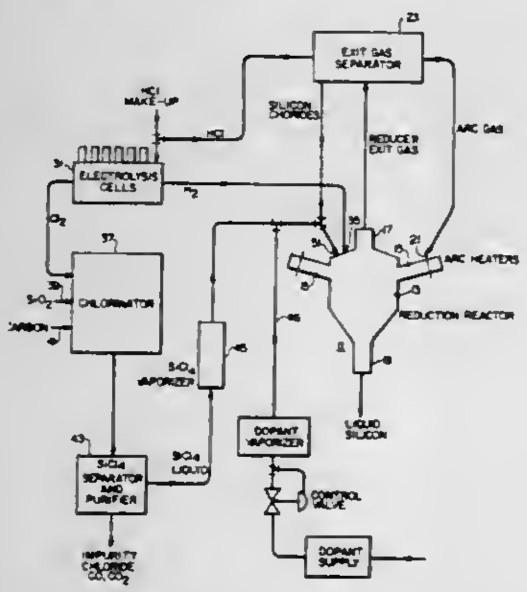
4,102,766
PROCESS FOR DOPING HIGH PURITY SILICON IN AN ARC HEATER

Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,634

Int. Cl.² B01K *1/00;* **C01B** *33/00;* **C04B** *35/00;* **H01L** *3/06*

U.S. Cl. 204—164 **5 Claims**



1. A method for doping solar grade silicon comprising the steps of:

(a) providing an arc heater having spaced tubular electrodes and forming an arc chamber communicating with a reaction chamber,
(b) striking an electric arc in a gap between the electrodes,
(c) feeding into the arc stream a quantity of a metal reductant selected from the group consisting of an alkali metal and an alkaline-earth metal,
(d) feeding into the arc stream a quantity of silicon halide and of a corresponding halide of a doping agent selected from the group consisting of arsenic, aluminum, antimony, boron, bismuth, copper, gallium, indium, iron, lithium, nickel, phosphorous, and zinc, to react with the metal reductant to produce reaction products including a salt of the metal reductant and a mixture of liquid silicon and doping agent, and
(e) separating centrifugally the mixture of liquid silicon and doping agent from the salt.

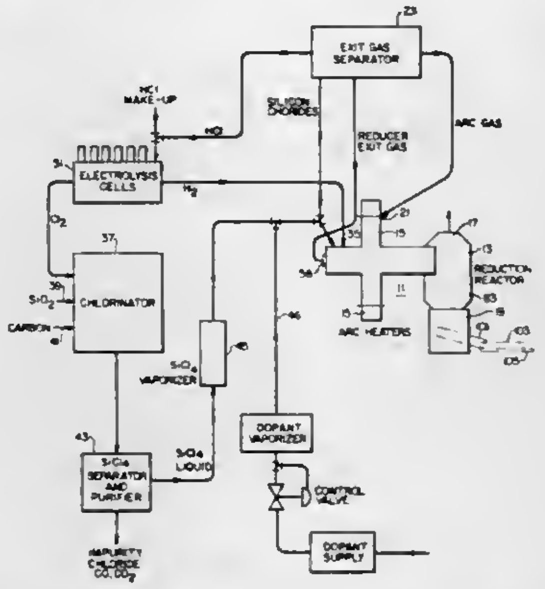
4,102,767
ARC HEATER METHOD FOR THE PRODUCTION OF SINGLE CRYSTAL SILICON

Robert Mazelsky, Monroeville; Maurice G. Fey, Plum Borough, and Francis J. Harvey, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,635

Int. Cl.² B01K *1/00;* **C01B** *33/02;* **C04B** *35/00;* **H01L** *3/00*

U.S. Cl. 204—164 **14 Claims**



1. A method for producing single crystal silicon comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,
(b) striking an electric arc in an axial gap between the electrodes,
(c) introducing an arc gas selected from the group consisting of hydrogen and a mixture of hydrogen and an inert gas through the gap to provide an elongated arc stream,
(d) feeding into the arc stream a quantity of a reductant selected from the group consisting of an alkali metal, an alkaline earth, hydrogen, and a mixture thereof,
(e) feeding into the arc stream a quantity of silicon halide to react with the reductant to produce reaction products including liquid silicon and a gaseous salt of the reductant,
(f) separating the liquid silicon from the gaseous salt of the reducant in the reactive chamber,
(g) depositing the liquid silicon on a downwardly inclined surface, and
(h) attaching a single seed crystal of silicon to the liquid silicon and withdrawing the single seed crystal from the liquid silicon so as to propagate a large single crystal.

4,102,768
METAL OXIDE COATINGS

Martin John Kearin, Redditch; Robert Hiscutt, Birmingham, and Peter Molineux, Bromsgrove, all of England, assignors to Triplex Safety Glass Company Limited, London, England

Continuation of Ser. No. 419,836, Nov. 28, 1973, abandoned.

This application Oct. 26, 1977, Ser. No. 845,771

Claims priority, application United Kingdom, Nov. 29, 1972, 55156/72

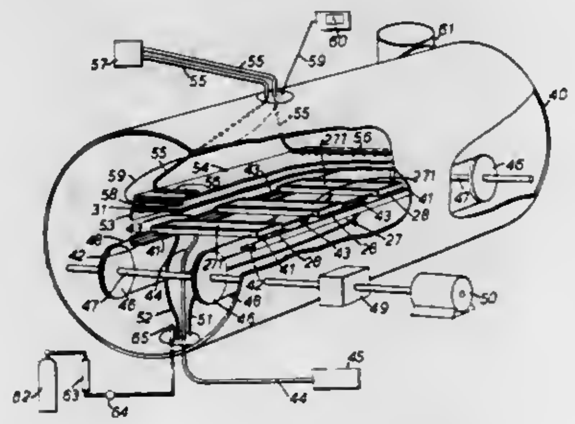
Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 P **56 Claims**

1. In apparatus for depositing a transparent, electrically conducting, metal oxide film on the surface of a substrate of extended lateral dimensions, said apparatus comprising:

(a) a vacuum chamber;
(b) means for supporting a substrate in the vacuum chamber;
(c) means for maintaining the substrate at a controlled elevated temperature in the vacuum chamber;
(d) means for supplying a sputtering atmosphere of oxygen and another non-reactive gas or gases at a controlled reduced pressure into the vacuum chamber;
(e) a cathode assembly whose overall lateral dimensions are not substantially less than those of the substrate, arranged substantially parallel to the substrate surface in the vacuum chamber and comprising a plurality of elongated, side-by-side strips of a metal capable of being reactively sputtered, said strips being spaced apart to define passages therebetween;
(f) means for applying a high negative potential to the cathode assembly so as to cause deposition of a metal oxide film on the substrate by reactive sputtering; and
(g) means for oscillating the cathode assembly back and forth in a direction substantially parallel to the substrate surface and transverse to the length of the strips through an amplitude substantially smaller than the overal length of the cathode assembly;

the improvement comprising:



(h) means for controllably varying the thickness of the deposited film over the area of the substrate by bringing different effective widths of the cathode strips into juxtaposition with different parts of the area of the substrate in accordance with the thickness of film which is required to be deposited on the different parts of the area of the substrate,

whereby the film has a controlled variation in resistance over the surface of the substrate.

29. A method of depositing a transparent electrically-conductive metal oxide film on a non-conducting substrate by reactive sputtering from a cathode assembly which is substantially parallel to the area of the substrate to be coated with the film, and whose overall lateral dimensions are not substantially less than those of the substrate, and which is formed of a plurality of elongated, side-by-side spaced-apart strips of the metal, and which is oscillated back and forth in a direction substantially parallel to the said area of the substrate and transverse to the length of the strips, through an amplitude substantially smaller than the overall length of the cathode assembly, but sufficient to cause all parts of the substrate surface to be coated by sputtering from at least one of the strips during the deposition process, wherein control of the thickness of the deposited film over the substrate area is effected by bringing different effective widths of the cathode strips into juxtaposition with different parts of the substrate area.

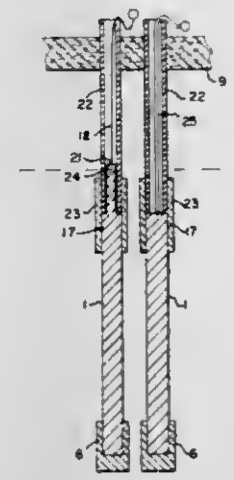
4,102,769
CORROSION PROBE

Robert G. Seyl, 1123 Mulford St., Evanston, Ill. 60202

Filed Apr. 7, 1977, Ser. No. 785,865

Int. Cl.² G01N *27/30, 27/08*

U.S. Cl. 204—195 C **7 Claims**



1. An electrode probe for positioning metal electrodes within an ionically conducting liquid comprising:

an electrode of a metal to undergo corrosion, having a cylindrical electrode surface of selected diameter and length;
an electrode mounting tube selected from a material that is corrosion resistant and electrically insulating, said tube positioned with the major axis thereof in alignment with the major axis of said electrode and with the bottom end thereof against the top end of said cylindrical electrode surface such that the length of said tube determines the depth of immersion of said electrode in said ionically conducting liquid; said tube of a diameter substantially equal to the diameter of said electrode for minimum disturbance of liquid flow past said electrodes and surfaces thereof;
electrode holder means for securing said electrode mounting tube in a manner which permits positioning of the electrode for immersion in said ionically conducting liquid;
an electrical conductor in electrical contact with said electrode and extending through said electrode mounting tube and said electrode holder to an electrical terminal;
top electrode shield means comprising a selected length of tubing of a corrosion resistant and electrically insulating material, said tubing positioned over the bottom end of said electrode mounting tube and over the top end of said electrode surface, said tubing having sufficient elasticity to hold said tubing firmly against the electrode and electrode mounting tube surfaces after adjustment of position thereabout;
bottom electrode shield means comprising a selected length of tubing of corrosion resistant and electrically insulating material, a top end of said tubing positioned over the bottom end of said electrode, said tubing having sufficient elasticity to hold said tubing firmly against the electrode surfaces after placement thereover, means for closing a bottom end of said tubing with a corrosion resistant and electrically insulating material;
a water-repellent inert viscous material applied in a thin film to an interface area between said bottom electrode shield means and the bottom end of said electrode and to another interface area between said top electrode shield means, said electrode surface and said electrode mounting tube, thereby substantially preventing crevice corrosion;
said top and bottom electrode shield means thereby accurately defining exposed electrode length and area and further providing substantially uniform current density between said electrodes; and
means for securing and releasing said electrode for weight measurement.

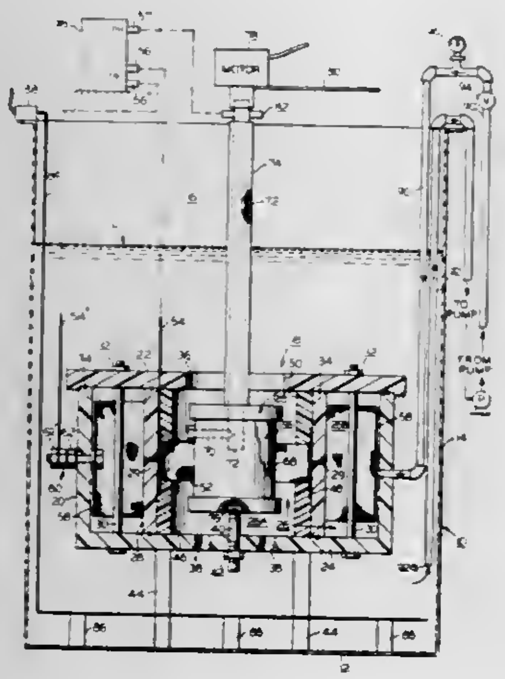
4,102,770
ELECTROPLATING TEST CELL

William L. Moriarty, South Meriden, and Robert G. Zobbi, Southbury, both of Conn., assignors to American Chemical and Refining Company Incorporated, Waterbury, Conn.

Filed Jul. 18, 1977, Ser. No. 816,285

Int. Cl.² G01N *27/26;* C25D *17/00*

U.S. Cl. 204—195 R **26 Claims**



1. An electroplating test cell comprising:

a. a tank having a bottom wall and a side wall defining a main chamber;

b. a housing within said main chamber and having an outer peripheral wall, a top and a bottom defining a housing chamber;

c. means for supporting said housing within said main chamber;

d. cathode support means carrying cathode connector means thereon and being disposed within said housing chamber and adapted to support a generally annular cathode thereon in electrical contact with said cathode connector means;

e. anode support means disposed within said housing chamber;

f. annular anode means carried by said anode support means outwardly of said cathode support means to define an annular space therewith;

g. rotation/support means for rotatably mounting and effecting rotation of said cathode support means, and thereby a cathode supported thereon, within said housing chamber, said rotation/support means including adjustable mounting means supported within said tank and being adjustable for movement within said cathode compartment to support said cathode support means for positioning thereof at a selected one of different positions within said housing chamber;

h. an inlet conduit disposed in liquid flow communication with said housing chamber to introduce a liquid electrolyte therein, and an outlet conduit disposed in liquid flow communication with said housing chamber to withdraw liquid electrolyte therefrom; and

i. electrical connector means adapted to connect said anode and said cathode connector means to respective terminals of an electrical source.

4,102,771
MEASURING DEVICE AND PROCESS FOR RECORDING ON ELECTRODEPOSITION PARAMETERS OF THROWING POWER

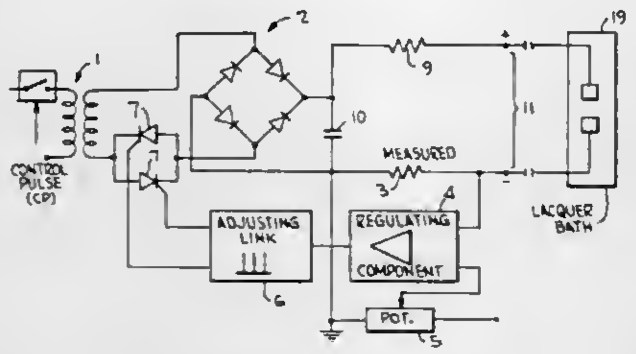
Helmut Honig, Graz, Austria, assignor to Vianova Kunstharz, A.G., Vienna, Austria

Filed Oct. 22, 1975, Ser. No. 624,982

Claims priority, application Austria, Oct. 28, 1974, 8660/74

Int. Cl.² C25D *13/00, 13/22*

U.S. Cl. 204—299 EC **10 Claims**



1. In an electrodeposition bath system including a bath of paint, anode and a cathode electrodes in said bath, and a constant current generating means for maintaining an essentially constant current between said electrodes, the combination of:

sensing means for sensing an increase in the voltage drop between said electrodes;

first time indicating means for recording elapsed time from the initiation of said constant current;

second time indicating means for recording elapsed time from the initiation of said constant current;

first detecting means connected to said sensing means and to said first time indicating means for causing said first time indicating means to record that elapsed time which represents the onset of a sharp rise of voltage drop between said electrodes; and

second detecting means connected to said sensing means and to said second time indicating means for causing said second time indicating means to record that elapsed time which represents attainment of a selected voltage drop between said electrodes which occurs subsequent to the onset of said sharp rise.

4,102,772
APPARATUS FOR CONTINUOUSLY ELECTROPLATING ON ONLY A SINGLE SURFACE OF RUNNING METAL STRIP

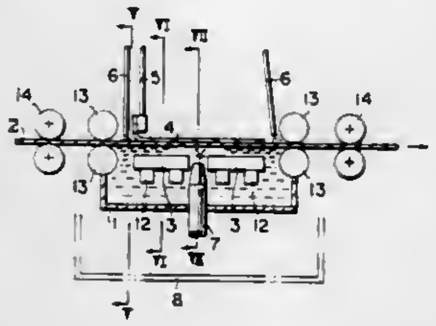
Masahiro Nakamura; Tetsuaki Tsuda, and Hajime Amakata, all of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 30, 1977, Ser. No. 783,024

Claims priority, application Japan, Mar. 31, 1976, 51/39731

Int. Cl.² C25D *17/00, 5/02*

U.S. Cl. 204—206 **6 Claims**



1. In a horizontal-type electroplating apparatus having a tank for containing electroplating bath for continuously electroplating a single surface of metal strip which runs therethrough, said apparatus including a multiplicity of anodes positioned within said tank along the direction of metal strip movement therethrough which have a width substantially equal to the width of the strip, said anodes being in spaced relation to and facing the lower surface of said strip, a pair of opposed dam rolls attached to opposite sides of said tank and in supporting relation to the strip so as to determine the direction of metal strip movement through said tank, and an electrically insulating sheet positioned in close proximity with the upper surface of said strip, the improvement wherein means are provided for maintaining the electroplating solution in said tank at a level substantially equal to the pass-line of said running strip in said tank; wherein means are provided at the bottom of the tank for supplying the plating solution thereto so as to be discharged against the lower surface of said strip; and wherein means are provided for preventing the plating solution from contacting the upper surface of said strip; said means for supplying the electroplating solution comprising a nozzle, and wherein said nozzle is positioned to extend through a floor of said tank and into said tank to a point approximately coincident with the positioning therein of said anodes, and between two adjacent anodes, and so as to discharge electroplating solution towards said strip passing beneath said insulator sheet at a point about midway of the width of said insulator sheet.

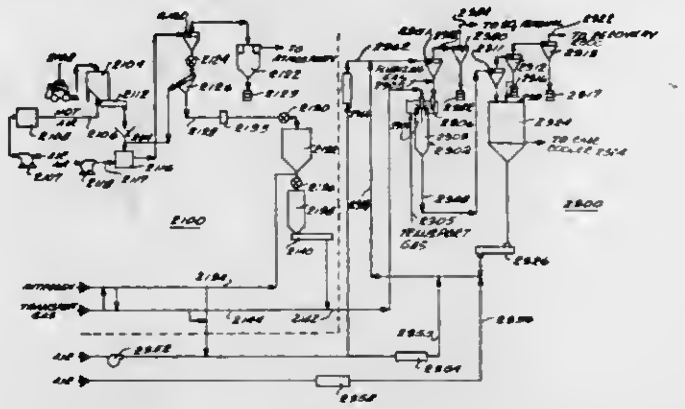
4,102,773
PYROLYSIS WITH CYCLONE BURNER

Norman W. Green, Upland, Calif.; Kandaswamy Duraiswamy, Sterling, Va., and Robert E. Lumpkin, Claremont, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,007

Int. Cl.² C10B *49/16, 55/08;* C10G *1/00*

U.S. Cl. 208—8 **31 Claims**



1. A continuous process for recovery of values contained in solid carbonaceous materials which comprises the steps of:

(a) providing a feed stream containing a particulate solid carbonaceous material, a substantial portion of the particulate solid carbonaceous material being of a particle size less than about 1000 microns in diameter;

(b) subjecting the particulate solid carbonaceous material to flash pyrolysis by continuously:

  (i) transporting the particulate solid carbonaceous material containing feed stream contained in a carrier gas which is substantially nondeteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material to a solids feed inlet of a substantially vertically oriented, descending flow pyrolysis reactor having a substantially vertically oriented pyrolysis zone operated at a pyrolysis temperature above about 600° F;

  (ii) feeding a particulate source of heat at a temperature above the pyrolysis zone temperature to a substantially vertically oriented chamber surrounding the upper portion of the pyrolysis reactor, the chamber having an inner peripheral wall forming an overflow weir to a vertically oriented mixing section of the vertically oriented descending flow pyrolysis reactor, the particulate heat source in said chamber being maintained in a fluidized state by the flow therewith of an aerating gas substantially nondeleteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material;

  (iii) discharging the particulate source of heat over said weir and downwardly into said mixing region at a rate sufficient to maintain said pyrolysis zone at the pyrolysis temperature;

  (iv) injecting the particulate solid carbonaceous material feed stream and carrier gas from the solids feed inlet into the mixing region to form a resultant turbulent mixture of the particulate source of heat, the particulate solid carbonaceous material particles and carrier gas;

  (v) passing the resultant turbulent mixture downwardly from said mixing zone to the pyrolysis zone of said pyrolysis reactor to pyrolyze the solid carbonaceous material particles and yield a pyrolysis product stream containing as particulate solids, the particulate source of heat and a carbon containing solid residue of pyrolysis of the particulate solid carbonaceous material, and a vapor mixture of carrier gas and pyrolytic vapors comprising volatilized hydrocarbons including tars;

(c) passing the pyrolysis product stream from said pyrolysis reactor to a separation zone to separate at least the bulk of the particulate solids from the vapor mixture; and

(d) forming the particulate source of heat by:

  (i) transporting the separated particulate solids from the separation zone to an oxidation-separation zone comprising at least two cyclone separation stages in series with a transport gas containing free oxygen with resultant carbon monoxide formation from the carbon in the particulate solids; and

  (ii) combining the transported particulate solids, carbon monoxide and transport gas in the first cyclone separation stage with a source of free oxygen in an amount at least equal to 50 mole percent of the carbon monoxide entering the oxidation stage, the total free oxygen in the transport gas and combined in the first cyclone separation stage being sufficient to raise the solids to a temperature above the temperature of the pyrolysis zone while simultaneously separating the bulk of the particulate source of heat from the gases in the first cyclone-separation stage to form the feed to the substantially vertically oriented chamber, the residence time in said first cyclone stage being less than about 5 seconds, and separating a fines fraction of the particulate source of heat from the gases in the remaining cyclone separation stages.

4,102,774
SEPARATION OF SOLIDS FROM COAL LIQUIDS USING AN ADDITIVE

Norman L. Carr, Allison Park, and Edgar L. McGinnis, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 4, 1977, Ser. No. 784,047

Int. Cl.² C10G *1/00*

U.S. Cl. 208—8 **17 Claims**

10. The process of claim 9 wherein said solids-liquid separation step is a filtration step.

4,102,775
CONVERSION PROCESS FOR SOLID, HYDROCARBONACEOUS MATERIALS

George J. Quarderer, Midland, and Norman G. Moll, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1977, Ser. No. 824,770

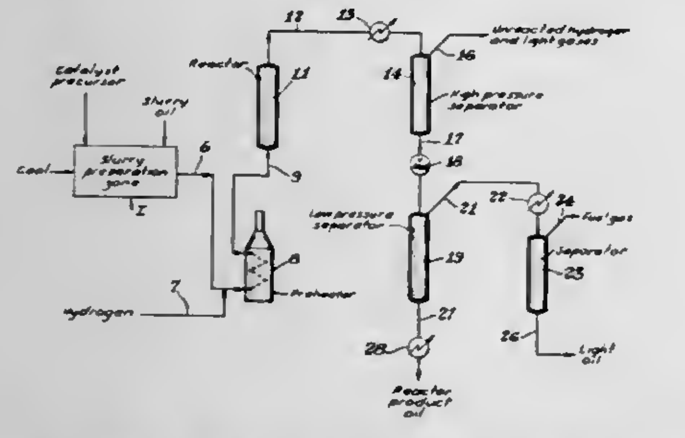
Int. Cl.² C10G *1/08*

U.S. Cl. 208—10 **9 Claims**

1. A process for the conversion of a solid, hydrocarbona-

ceous material to valuable liquid and gaseous products, the process comprising:

(a) preparing a slurry from a slurry oil, a hydrogenation catalyst and the hydrocarbonaceous material;
(b) admixing hydrogen with the slurry;
(c) hydrogenating the hydrocarbonaceous material to liquid and gaseous hydrogenation products, the liquid hydrogenation product containing suspended particles of ash and hydrogenation catalyst;
(d) gravitationally separating the liquid hydrogenation product into a first stream and a second stream, the first stream having both a lower ash concentration than the liquid hydrogenation product and a greater catalyst:ash ratio than the second stream;



(e) recycling at least a portion of the first stream for use as at least a portion of the slurry oil in the slurry preparation and thereby recycling at least a portion of the catalyst;
(f) extractively separating with a solvent the second stream into a third stream and a fourth stream, the third stream containing essentially no ash and the fourth stream containing essentially all of the ash of the second stream;
(g) recycling at least a portion of the third stream for use as at least a portion of the slurry oil in the slurry preparation; and
(h) recovering valuable liquid and gaseous products from the hydrogenation products.

4,102,776

MOVING BED CONTACTING PROCESS

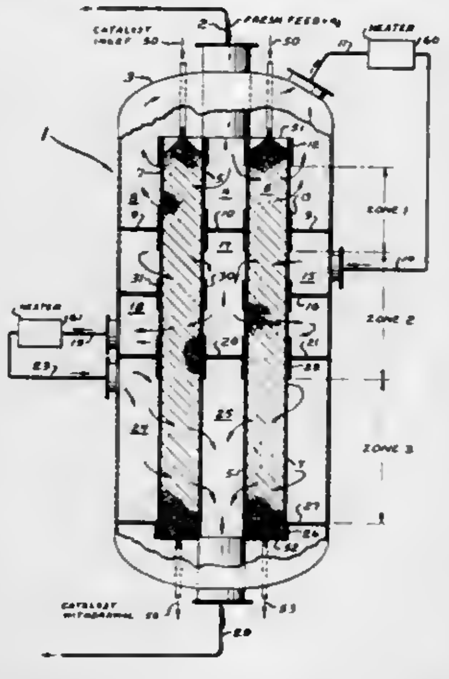
Richard D. Stone, Deerfield, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 625,418, Oct. 24, 1975, Pat. No. 4,040,794. This application Apr. 1, 1977, Ser. No. 783,923

Int. Cl.² C10G *35/10*

U.S. Cl. 208—64 **17 Claims**

1. A process for hydrocarbon conversion of a hydrocarbon comprising contacting said hydrocarbons at hydrocarbon conversion conditions with a single vertical moving bed of catalyst particles disposed as a plurality of reaction zones which are vertically spaced along the vertical length of the moving bed; said zones contained in an apparatus comprising a vertically elongated pressure tight vessel; a pair of vertical, concentric, inner and outer perforated screens positioned intermediate the axis of said vessel and the outer wall thereof and defining an annular conduit filled with catalyst, said conduit including a plurality of apertures at its upper and lower ends through which apertures active catlyst is added to the top of said catalyst bed and spent catalyst is removed from its bottom, said apertures being connected to tubes which pass through the top and bottom of said vessel, a plurality of vertical, tubular inner and outer baffle members arranged in opposed relation at spaced locations along the length of said conduit for preventing the radial flow of hydrocarbon through said catalyst bed; a plurality of inner and outer horizontal baffle members affixed to at least some of said vertical baffle members for limiting the extent of axial flow of fluid through inner flow chambers defined by the hollow cylindrical space within said inner perforated screen and outer flow chambers defined by the hollow annular space between said outer perforated screen and the outer wall of the vessel, said horizontal baffles and said vertical baffles cooperating with each other and with the wall of the vessel to divide said vessel into a plurality of separate zones; fluid inlet and outlet means for each of said zones passing through the walls of said vessel, the inlet means for each of said zones being connected to one of the inner and outer flow chambers for the zone and the outlet means for each of said zones being connected to one of the inner and outer flow chamber for the zone, whereby at least the major portion of fluid passing through each zone will be forced to travel radially through the catalyst bed.



2. Process of claim 1 wherein the fluid is a naphtha, reforming conditions and a reforming catalyst are used, and a reformate is recovered.

4,102,777

HYDROCARBON CONVERSION PROCESSES EMPLOYING PEROVSKITE CATALYSTS

Kenneth S. Wheelock, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 676,511, Apr. 13, 1976, Pat. No. 4,055,513. This application May 4, 1977, Ser. No. 793,854

Int. Cl.² C10G *11/04, 13/04;* B01J *8/24*

U.S. Cl. 208—121 **14 Claims**

1. A hydrocarbon conversion process conducted under hydrocarbon conversion conditions in the presence of a supported perovskite catalyst, which catalyst comprises a perovskite comprising at least one transition metal, and a support comprising a metal oxide and a spinel on the surface of said metal oxide, said spinel being selected from the group consisting of normal spinel and inverse spinel, said normal spinel having an empirical formula MY_2O_4 wherein M and Y in said normal spinel formula are cations of different metals and wherein one of said cations of said normal spinel formula is the metal of said metal oxide, said inverse spinel having an empirical formula $Y(XY)O_4$ wherein Y and X in said inverse spinel formula are cations of different metals, and wherein one of said cations of said inverse spinel formula is a metal of said metal oxide, said supported catalyst having a surface area of at least 65 m²/g.

4,102,778

METHOD AND APPARATUS FOR CARRYING OUT HYDROGENATION REACTIONS

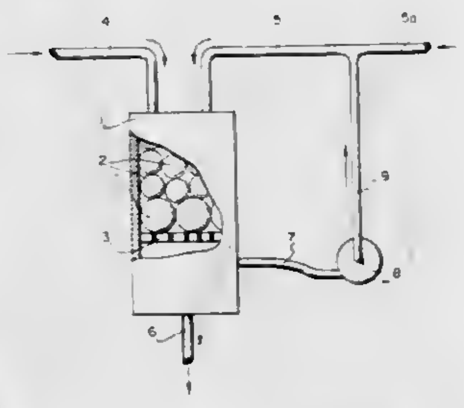
John A. Ruether, Les Bisets 153, Rue de Verviers, 54500 Vandoeuvre, France

Filed Apr. 9, 1976, Ser. No. 675,342

Claims priority, application Canada, Apr. 10, 1975, 224274

Int. Cl.² C10G *23/02, 23/16*

U.S. Cl. 208—143 **4 Claims**



1. A method for carrying out hydrogenation which comprises the steps of

introducing a liquid hydrocarbon material into a reactor at a first predetermined rate,
introducing hydrogen gas into the reactor at a second predetermined rate,
permitting the liquid hydrocarbon material and the hydrogen gas to mix,
causing the mixed liquid hydrocarbon material and hydrogen gas to pass in close association with a layer of solid catalyst particles held in place in said reactor,
the individual structure of solid catalyst particles characterized by providing an inert support member coated with a thin layer of catalytically active material, and
removing the hydrogenated product so produced from the reactor;
the said first predetermined rate being such that the superficial velocity of liquid hydrocarbon in the reactor is in the range of 0.5–6 cm/sec. and the liquid hourly space velocity, based on the volume by said catalytically active microporous solid, is in the range of 25 – 1000 hr^{-1}; and
the said second predetermined rate being such that the superficial velocity of hydrogen gas in the reactor is in excess of 30 cm/sec.

4,102,779

PROCESSES FOR TREATING A HEAVY PETROLEUM HYDROCARBON STREAM CONTAINING METALS AND ASPHALTENES

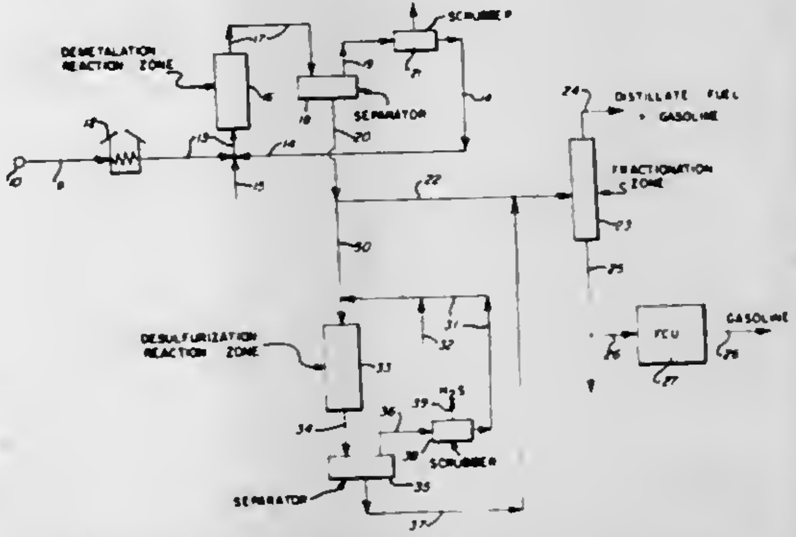
Albert L. Hensley, Jr., Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 13, 1976, Ser. No. 714,338

Int. Cl.² C10G *23/02*

U.S. Cl. 208—211 **12 Claims**

7. A process for treating a heavy hydrocarbon stream containing metals and asphaltenes and being a member selected from the group consisting of a petroleum hydrocarbon residuum, a hydrocarbon stream derived from tar sands, and a hydrocarbon stream derived from coal, which process comprises in sequence the steps of: (a) contacting in a first reaction zone said heavy hydrocarbon stream in the presence of hydrogen and under suitable operating conditions with a first catalyst existing as a particulate material of 1/32-inch or larger particles in a fixed bed or ebullated bed of said particles and comprising a hydrogenation component deposed on a large-pore, high-surface area silica gel to produce a first effluent that contains quantities of metals and asphaltenes that are smaller than those in said heavy hydrocarbon stream, said hydrogenation component of said first catalyst consisting essentially of a metal of Group VIB of the Periodic Table of Elements or a metal of Group VIII of the Periodic Table of Elements and being present in the elemental form, as an oxide, as a sulfide, or combinations thereof, the amount of said metal of Group VIB, when present, being about 0.1 wt.% to about 20 wt.% and the amount of said metal of Group VIII, when present, being about 0.1 wt.% to about 5 wt.%, calculated as the metal and based on the weight of the catalyst, said silica gel having a surface area of about 100 square meters per gram to about 600 square meters per gram, an average pore diameter of about 80 A to about 300 A, and a pore volume of about 0.5 cubic centimeter per gram to about 1.5 cubic centimeters per gram, said



surface area, said average pore diameter, and said pore volume being those of the fresh silica gel, said operating conditions comprising a temperature of about 700° to about 900° F., a hydrogen partial pressure of about 400 psia to about 2,500 psia, a LHSV of about 0.1 to about 5 volumes of hydrocarbon per hour per volume of catalyst, and a hydrogen recycle rate of about 1,000 SCFB to about 10,000 SCFB; and (b) contacting at least a portion of said first effluent in a second reaction zone at elevated temperature and elevated pressure and in the presence of hydrogen with a second catalyst to obtain a desulfurized effluent, said second catalyst being a suitable desulfurization catalyst.

4,102,780

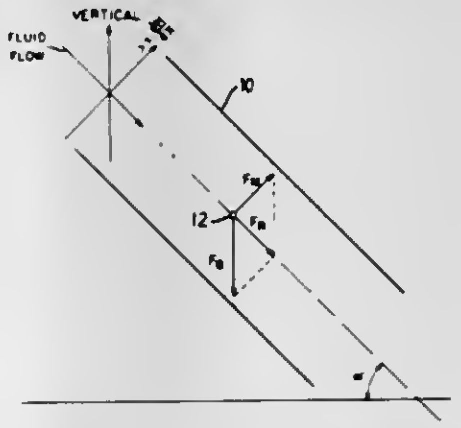
METHOD AND APPARATUS FOR MAGNETIC SEPARATION OF PARTICLES IN A FLUID CARRIER

Jack Ji-Nong Sun, and Dartrey Lewis, both of Trenton, N.J., assignors to S. G. Frantz Company, Inc., Trenton, N.J.

Filed Mar. 9, 1976, Ser. No. 665,265

Int. Cl.² B03C *1/30*

U.S. Cl. 209—39 **22 Claims**



1. A method for separating a mixture of diverse-size particles in accordance with the magnetic susceptibilities of the particles, comprising:

flowing a fluid carrier upward through a first flow path in opposition to the settlement of the particles suspended therein due to gravity;

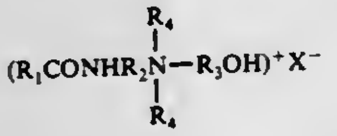
adjusting the upward rate of flow of the fluid carrier in said first path to select from said mixture a fraction of particles of a substantially uniform settling rate in the fluid carrier;
flowing said fraction suspended in the fluid carrier from the first flow path to a second flow path;
applying opposing magnetic and nonmagnetic forces to said fraction over at least a portion of said second flow path; and
in response to said flow adjustment in the first flow path, adjusting the fluid flow rate through the second flow path so as to pass said fraction through said portion of the second flow path at a velocity proportionally related to the settling rate of the fraction in the first flow path such that the residence time of the fraction in said portion of the second flow path is sufficient to enable the separation therein of the fraction into relatively magnetic and relatively nonmagnetic portions by said opposing forces.

4,102,781

FLOTATION PROCESS

Reichel A. Tenbergen, Hanmer, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.
Filed Jul. 8, 1976, Ser. No. 703,509
Claims priority, application Canada, Jan. 30, 1976, 244644
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **5 Claims**

1. In the flotation separation of a sulfide mineral from gangue employing a xanthate collector in an aqueous medium having a basic pH, the improvement comprising employing in association with said xanthate collector a material defined by the formula



$$(R_1CONHR_2\overset{\displaystyle R_4}{\underset{\displaystyle R_4}{N}}-R_3OH)^+X^-$$

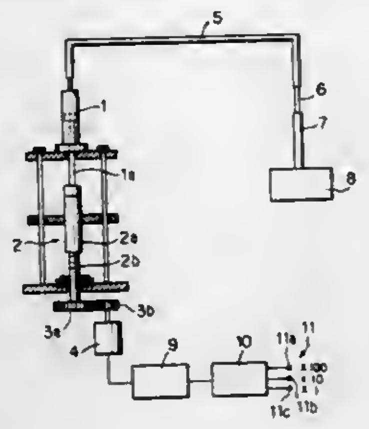
wherein
R_1 is an aliphatic or alicyclic radical containing at least 7 and up to about 20 carbon atoms
R_2 is a moiety selected from the group of methylene, ethylene, propylene and butylene radicals
R_3 is a moiety selected from the group of ethylene and propylene radicals
R_4 is an aliphatic radical containing from 1 to 3 carbon atoms and
X is a monavalent anion compatible in an ore pulp in an amount effective to enhance the separation of said sulfide mineral from said gangue.

4,102,782

METHOD OF SAMPLE INTRODUCTION IN THE MICRO LIQUID CHROMATOGRAPHY AND THE APPARATUS THEREFOR

Muneo Saito, and Hideki Konishi, both of Hachioji, Japan, assignors to Japan Spectroscopic Co., Ltd., Tokyo, Japan
Filed Aug. 31, 1977, Ser. No. 829,296
Claims priority, application Japan, Sep. 2, 1976, 51-105345
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **8 Claims**

7. In a chromatographic system including a syringe for retaining a mobile phase, a connecting tube which is connected to said syringe for transporting the mobile phase discharged from said syringe into a chromatographic column, and a sample retainer tube disposed between said connecting tube and said column, a sample introducing apparatus for a micro-liquid-chromatography comprising
(a) a detachable connection mechanism employed between said column and said sample retainer tube;
(b) a driving mechanism with a pulse-motor, being capable of positive and inverse rotation, for reciprocating a piston in said syringe in the axial direction thereof; and
(c) a mechanism for imparting predetermined number of pulses to said pulse-motor in order to inversely rotate said pulse-motor for causing predetermined amount of sample to be sucked into said sample retainer tube.



4,102,783

ADSORBENT PROCESS FOR OILY MATERIALS

Akira Zenno; Toshiaki Uebayashi, both of Himeji; Isamu Maruyama, Tatsuno, and Hidehiro Shiono, Himeji, all of Japan, assignors to Daicel Ltd., Sakai, Japan
Filed Dec. 8, 1976, Ser. No. 748,445
Claims priority, application Japan, Dec. 8, 1975, 50-146597; Mar. 27, 1976, 51-33833; Jun. 24, 1976, 51-75168
Int. Cl.² C02B *9/02*
U.S. Cl. 210—36 **20 Claims**

1. A process for treating oil-containing waste water which comprises treating the oil-containing waste water with an oil adsorbent comprising unrefined crude lints or crude linters, said crude lints and crude linters containing about 0.3 to about 3% by weight cotton wax.

4,102,784

COLLOID FREE PRECIPITATION OF HEAVY METAL SULFIDES

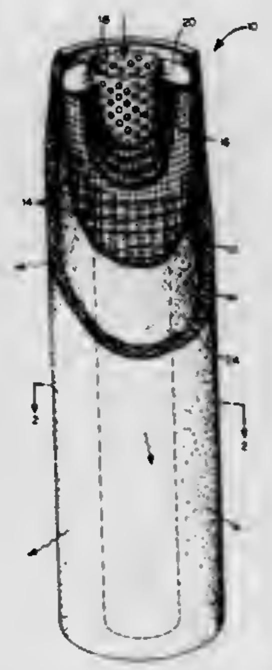
Richard M. Schlauch, 29 Gerard Rd., Yardville, N.J. 08620
Continuation-in-part of Ser. No. 680,553, Apr. 27, 1976, abandoned. This application May 23, 1977, Ser. No. 799,699
Int. Cl.² C02B *1/20*
U.S. Cl. 210—47 **8 Claims**

1. A method of precipitating heavy metal pollutant ions from aqueous solution, comprising:
(a) forming an aqueous solution of a water soluble sulfide;
(b) adding a water soluble ferrous salt in the presence of sufficient base to maintain the pH above 7 thru the entire precipitating process, to the thus formed sulfide solution, to form a large particle size slurry of ferrous sulfide precipitate having a higher equilibrium sulfide ion concentration than the sulfide of the heavy metal pollutant in said aqueous solution;
(c) adding said slurry of (b) in the presence of a polyelectrolyte, to the aqueous solution containing dissolved heavy metal pollutant ions to form a colloid free metal ion precipitate;
(d) removing said precipitate.

4,102,785

INSIDE-TO-OUTSIDE FLOW FILTER TUBE AND METHOD OF USING SAME

Brian Arthur Head, Maidstone, England, and Philip C. Kimball, Andover, Mass., assignors to Whatman Reeve Angel Limited, Maidstone, England
Continuation of Ser. No. 679,569, Apr. 23, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,408
Int. Cl.² B01D *37/00*
U.S. Cl. 210—65 **28 Claims**



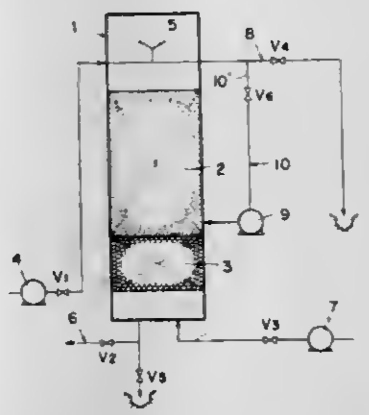
21. An inside-to-outside flow filter tube of improved burst strength, which filter tube comprises:
(a) a plurality of randomly disposed, nonwoven glass fibers having a diameter of from about 0.01 to 8 microns, and having interstices therebetween, the fibers bonded together into a self-supporting filter tube by a hardened resin bonding agent at the junction of the fiber crossover points to form a filter tube wall; and
(b) an open scrim sheet material of glass fibers having openings of about ¼ to 1 inch and embedded within said filter tube wall, with no scrim material extending to the external filter tube wall, the scrim material extending generally the length of the filter tube and from about one and one-half to five revolutions about the tube diameter, the scrim material formed into a generally noncontaining helical scroll, with a layer of glass fibers of selected depth separating each convoluted layer of scrim material, the glass fibers bonded cooperatively with and through the scrim material by the bonding agent, to form a continuous, integrally bonded filter tube wall of the glass fibers, said filter tube having an average burst strength of greater than about 52 P.S.I.

4,102,786

METHOD FOR CLEANING OF FILTER DEVICE

Hiroo Okada, Sagamihara; Moriyuki Hirota, Yamato, and Masaaki Uesugi, Yokohama, all of Japan, assignors to Kurita Water Industries Limited, Osaka, Japan
Filed Jan. 25, 1977, Ser. No. 762,280
Claims priority, application Japan, Jan. 26, 1976, 51-6607
Int. Cl.² B01D *23/24*
U.S. Cl. 210—80 **6 Claims**

1. In a process for the washing of a filter bed composed of an upper layer formed of filtering grains of synthetic resin and a lower layer formed of filtering grains of sand which layers retain insoluble matter therein in a filter device for causing a downward current of raw water to flow through the filter bed, the improvement which comprises:
(1) a first step of causing a current of washing water to flow upward from the lower portion of the filter bed at a velocity high enough for the current of water to entrain at least part of the filtering grains, then allowing the current of water entraining filtering grains to flow out of the filter device from the upper portion thereof, subsequently forwarding the discharged current of water in conjunction with the entrained filtering grains to the filter bed and repeating the circulation of the filtering grains for thereby stirring the filtering grains and freeing the filtering grains of the insoluble matter retained therein,

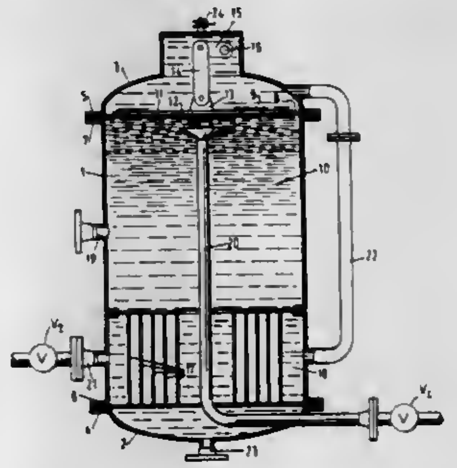


(2) a second step of passing a current of rinsing water from the lower portion of the filter bed to the upper portion of the same at a velocity not high enough for the current of water to entrain the filtering grains out of the filter device for thereby giving the filter bed a backwashing treatment for removing the insoluble matter and
(3) a third step of ceasing the backwashing treatment for thereby rearranging the upper and lower layers of the filter bed by the specific gravity difference therebetween.

4,102,787

APPARATUSES TO SEPARATE MIXTURES OF LIQUIDS OF DIFFERENT SPECIFIC GRAVITIES

Alfonsus Antonius Geurtsen, Schalkhaar, Netherlands, assignor to Machinefabriek Geurtsen Deventer, B.V., Deventer, Netherlands
Continuation of Ser. No. 548,905, Feb. 11, 1975, abandoned. This application Jul. 16, 1976, Ser. No. 705,924
Claims priority, application Netherlands, Feb. 18, 1974, 7402216
Int. Cl.² B01D *21/24*
U.S. Cl. 210—104 **5 Claims**



1. An apparatus to separate a mixture of non-miscible liquids of different specific gravities, e.g. oil and water, said apparatus comprising a closed vessel, a flexible diaphragm forming a partition within said vessel to provide a separation space in said vessel below said diaphragm and an upper chamber in said vessel above said diaphragm and said separation space and intended to be entirely filled, during operation, with the heavier liquid component of the mixture, said flexible dia-

phragm being mounted for vertical movement in said vessel between two end positions for controlling the flow of liquids through the apparatus a conduit for the supply of mixture to be separated opening into the separation space, a conduit for the discharge of lighter liquid connected to the separation space on a level just below the lowest position of the partition, a discharge conduit for the heavier liquid connected to the lower portion of said vessel and at least one filter provided between the lower part of the separation space and said discharge conduit to provide a collecting chamber for the heavier liquid between said filter and said discharge conduit, said filter being capable of letting through almost exclusively the heavier liquid, said diaphragm being imperforate and being attached in a liquid tight manner to the wall of the vessel thereby preventing said direct communication between said separating space and said upper chamber, and a pipe connecting the upper chamber with the collecting chamber whereby the separation space communicates with the upper chamber only through said filter.

4,102,788

PLATE FILTER PRESSES

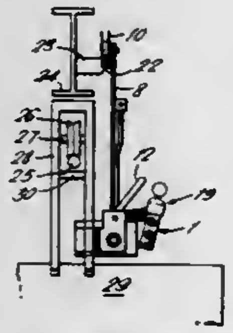
Bernard Henry Broad, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

Continuation of Ser. No. 433,703, Jan. 16, 1974, abandoned. This application Sep. 30, 1976, Ser. No. 728,290

Claims priority, application United Kingdom, Jan. 16, 1973, 2329/73

Int. Cl.² B01D *25/32;* **B30B** *9/04*

U.S. Cl. 210—230 **6 Claims**



1. An apparatus suitable for shifting the plates of a plate filter press, which apparatus comprises:

(a) a manually-operable, power-drivable device which includes (i) a piston and cylinder arrangement in which the piston is reciprocatable under power along a line of action within the cylinder, and (ii) first and second members capable of engaging plates of a plate filter press, the first member being rigidly mounted on a rod of the piston and the second member being rigidly mounted on the cylinder, and the first and second members being disposed perpendicularly or substantially perpendicularly to the line of action; and

(b) supporting means for supporting the device from an elongate support, the supporting means comprising (i) a plurality of wheels each having a groove around its periphery, for mounting on an elongate support, and (ii) means for holding the wheels in spaced relationship from the device whereby, in use, the device can hang below the elongate support and the apparatus can be pivoted around the elongate support;

the arrangement of the apparatus being such that, in use of the apparatus and with the supporting means supported from the elongate support disposed parallel to a plate filter press, the apparatus can be pivoted with respect to the elongate support to bring the first and second members into and out of engagement with plates of the plate filter press and, when so in engagement, the device can be operated to cause movement of the piston and first member relative to the cylinder and second member and hence movement of one or more plates of the plate filter press; and the arrangement of the supporting means being such that the supporting means is readily detachable from an elongate support, whereby the apparatus may be readily transferred to an elongate support associated with another plate filter press.

4,102,789

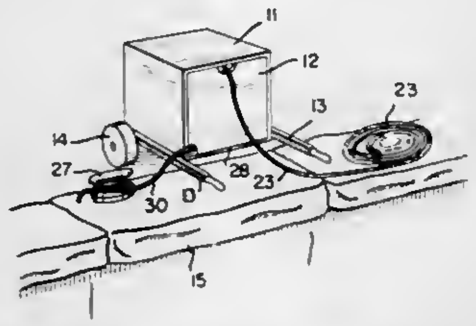
HYDRO-CARPET OIL SPILLAGE CONTAINMENT AND RECOVERY DEVICE

Richard W. Young, Edison, N.J., assignor to Amerada Hess Corporation, Woodbridge, N.J.

Continuation of Ser. No. 747,679, Dec. 6, 1976, abandoned, which is a continuation of Ser. No. 572,538, Apr. 28, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,570

Int. Cl.² C02B *9/02*

U.S. Cl. 210—252 AS **3 Claims**



1. A hydro-carpet apparatus for providing for the downstream containment and recovery of contaminants of oil spills and the like resulting from overflows when making a transfer of such oil materials between a floating vessel and storage means, with the transfer occurring after the vessel is brought substantially adjacent to a dock surface, said apparatus comprising:

a compactly storable and manually pullable and incrementally dispensable elongate floatable hydro-carpet for the downstream containment and recovery of contaminants of oil spills and permitting emergency deployment by only one person;

a manually pullable roller for maintaining said hydro-carpet in compact form and adapted to be turned under manual pulling force by only one person so that the hydro-carpet may be manually rapidly unrolled therefrom;

a container having an opening closed by an openable door and containing said hydro-carpet manually rapidly removably maintained therein in compact form on said roller, said door being pivotably operable by the force exerted by the outward removal thereat of the hydro-carpet and roller together from the container under manual pulling force by only one person;

a docking securing line secured to one end of said hydro-carpet for securing said one end of the hydro-carpet to the dock while the hydro-carpet is still maintained in compact form in said container, and

a vessel securing elongated manually pullable messenger line secured operatively to the other end of said hydro-carpet through said roller for securing said other end of the hydro-carpet to the downstream end of the vessel and of sufficient length for such securing while the hydro-carpet is still maintained in compact form on said roller in said container, so that the hydro-carpet and roller can be manually rapidly removed from the container and dropped together onto the surface upon which the vessel is floated by manually pulling on the messenger line by only one person and so that the hydro-carpet, after removal and while still being so secured, can in turn be rapidly unrolled from the roller on the surface upon which the vessel is floated and simultaneously be incrementally dispensed across such surface by further manual pulling on such messenger line by only one person, thereby to preclude thereat contaminants resulting from losses during the transfer from floating over the surface beyond the dock and the region where the hydro-carpet is secured to the vessel;

a yoke for operatively carrying the roller, said messenger line being secured to the roller through the yoke for pulling the roller via the yoke along the surface upon which the vessel is floated to unroll the hydro-carpet onto and across such surface as the roller is pulled along such surface.

4,102,790

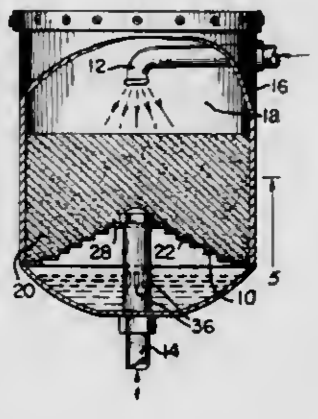
FILTER UNDERDRAIN

Raymond E. Portyrata, North Haven, Conn., assignor to Diaclear, Inc., Hamden, Conn.

Filed Aug. 18, 1976, Ser. No. 715,752

Int. Cl.² B01D *23/18*

U.S. Cl. 210—293 **7 Claims**



1. A filter underdrain especially for use with a granular filtering medium comprising:

(a) a plate having an inverted dished configuration, said plate defining a plurality of laterally facing slots arranged individually in a horizontally extending spiral array therein; and

(b) a plurality of upper edges and associated lower edges, each said upper edge and said lower edge cooperating to define one of said slots, said upper edges being positioned approximately directly above said associated lower edge to face said slot laterally horizontally outward from the center of said plate in order to impart a turbulent mixing action to a granular filtering medium during backwashing.

4,102,791

DOUBLE DRUM VACUUM FILTER

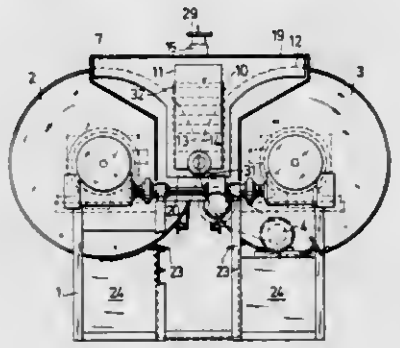
Wilhelm Otte, Bochum, Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Oct. 7, 1976, Ser. No. 730,679

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545030

Int. Cl.² B01D *33/06*

U.S. Cl. 210—326 **1 Claim**



1. A double drum filter assembly comprising:

a pair of oppositely rotating foraminous surfaced drums, means for adjusting the spacing between the drum axes, the foraminous surfaces being spaced to provide a slight gap therebetween which is capable of being bridged by solid particles from the suspension being filtered, and

baffle plates connecting the faces of said drums together, whereby said drums retain a constant operating diameter as filtration proceeds and the deposited particles form a seal between said drums.

4,102,792

DISPOSABLE FILTER ELEMENT

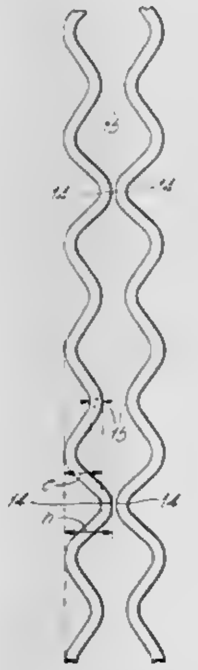
Frank John Turner Harris, Cheltenham, England, assignor to Evans, Adlard & Company Limited, Cheltenham, England

Filed Nov. 16, 1976, Ser. No. 742,173

Claims priority, application United Kingdom, Nov. 20, 1975, 47753/75

Int. Cl.² B10D *27/06*

U.S. Cl. 210—457 **12 Claims**



1. A disposable filter element for fluids comprising a ring of pleated permeable filter sheet material provided with continuous parallel lines of corrugations which extend continuously along the filter sheet material and at right angles to the fold lines of the pleats, wherein a proportion of the lines of corrugations have major corrugations with a height which is greater than that of the corrugations in the other lines of corrugations, whereby major corrugations in adjoining walls of adjacent pleats serve to space them apart.

4,102,793

HEAT-RESISTANT FIBER CONDITIONING AGENTS

Ulrich Cuntze, Hofheim, Taunus; Gustav Dollinger, Egelsbach; Rolf Kleber, Neu-Isenburg, and Hans-Jerg Kleiner, Kronberg, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

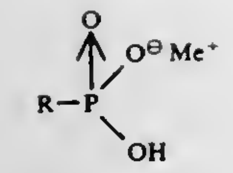
Filed Apr. 20, 1976, Ser. No. 678,700

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518124

Int. Cl.² C09K *3/28*

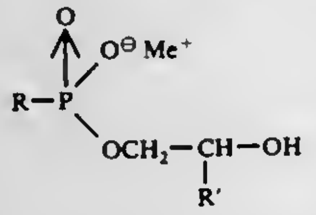
U.S. Cl. 252—8.1 **1 Claim**

1. Aqueous mixtures containing an alkane-phosphonic acid salt of the formula I



I

and an alkane-phosphonic acid-semi-ester salt of the formula II



II

in a molar ratio of from 19:1 to 5:1, R being an unbranched saturated alkyl radical having from 6 to 12 carbon atoms, R' being hydrogen or methyl, and Me^+ standing for Li, Na or K.

4,102,794

FIREPROOFING MATERIALS

Giuseppe Gandini, Brescia, and Luigi Frignoli, Milan, both of Italy, assignors to Luigi Frignoli, Brescia; Ermanno Savio, Milan; Sergio Calamani, Milan and Eugenio Turri, Milan, all of Italy

Filed Jul. 20, 1977, Ser. No. 817,213

Claims priority, application Italy, Jul. 21, 1976, 25563 A/76; Sep. 17, 1976, 27324 A/76

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **10 Claims**

1. A composition for fireproofing materials of various kind, consisting of an aqueous solution containing in the solution at least three ions selected from the group including ammonium, zinc, bromine, chlorine ions, alkaline-earth metal ions and phosphate ions.

4,102,795

SOFTENER COMPOSITION FOR FABRICS OR HAIR

Yutaka Minegishi, Miyashiro, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,408

Claims priority, application Japan, Apr. 30, 1976, 51-50363

Int. Cl.² D06M *13/18*

U.S. Cl. 252—8.9 **9 Claims**

1. A composition for softening fabrics or hair, said composition being an aqueous solution or dispersion consisting essentially of (A) from 3 to 20 percent by weight of a cationic amine derivative or mixture of said derivatives, said derivatives having in the molecule one or two alkyl groups having 11 to 22 carbon atoms, or one or two β-hydroxyalkyl groups having 13 to 24 carbon atoms, said derivatives being capable of softening fabric or hair, (B) 0.005 to 1.0% by weight of a water-soluble polyoxyalkylene derivative obtained by reacting an adduct of 20 to 300 moles of ethylene oxide, propylene oxide or mixture thereof to a compound selected from the group consisting of monohydric alcohols, monothiol mercaptans and alkylphenols each having a total carbon atom number of from 12 to 26, with a diepoxide compound in an amount of 0.5 to 5 equivalents of said diepoxide compound per one equivalent of said adduct and (C) the balance of the composition is essentially water.

4,102,796

LUBRICATING OIL ANTIOXIDANT ADDITIVE COMPOSITION

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 672,805

Int. Cl.² C10M *1/12;* C09K *15/02*

U.S. Cl. 252—47.5 **2 Claims**

1. An additive composition for use in crankcase lubricating oils comprising:

1. an oil-soluble antioxidant selected from aromatic and alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and
2. dicocoamine.

2. The composition of claim 1 comprising an oil of lubricating viscosity, from 0.25 to 10% weight of said antioxidant and from 0.001 to 5% weight of said dicocoamine.

4,102,797

COMPOUNDS CONTAINING BOTH UREA AND URETHANE GROUPS

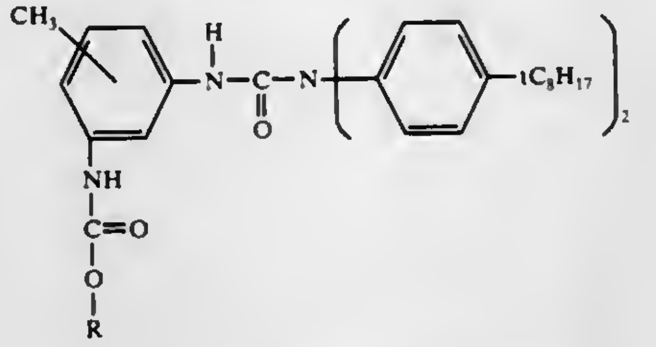
Hendrik Schadenberg, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 3, 1976, Ser. No. 682,539

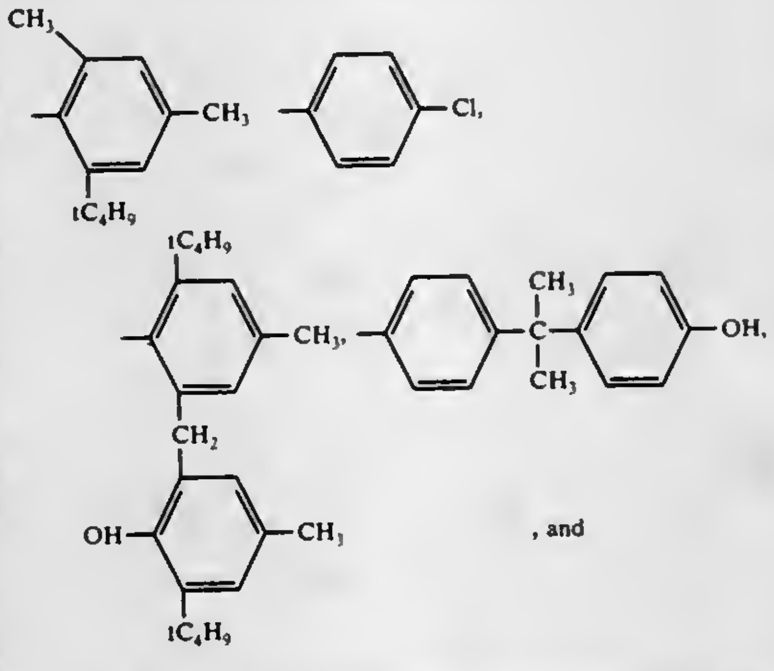
Int. Cl.² C07C *127/19*

U.S. Cl. 252—51.5 A **8 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of:



7. A composition comprising a major proportion of a lubricating oil and an oxidation stabilizing amount of a compound as in claim 1.

4,102,798

OXAZOLINE ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

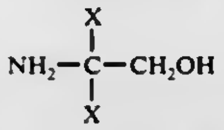
Jack Ryer, East Brunswick; James Zielinski, Somerset; Harold N. Miller, Millington, and Stanley J. Brois, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 455,250, Mar. 27, 1974, abandoned. This application Jul. 27, 1976, Ser. No. 708,925

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **31 Claims**

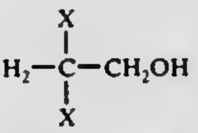
1. A lubricating oil composition comprising: a major amount of lubricating oil and 0.01 to 20 wt. % of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having more than 50 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



$$\mathrm{NH_2-\overset{\displaystyle X}{\underset{\displaystyle X}{C}}-CH_2OH}$$

wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140° to 240° C for about ½ to 24 hours with the removal of about three molar proportions of water.

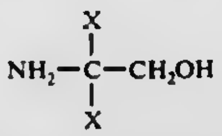
5. An additive concentrate comprising: a major amount of mineral lubricating oil in the range of 98 to 45 parts by weight, 2 to 45 parts by weight of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4–C_{10} dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having more than 50 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



$$\mathrm{NH_2-\overset{\displaystyle X}{\underset{\displaystyle X}{C}}-CH_2OH}$$

wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140° to 240° C for about ½ to 24 hours with the removal of about three molar proportions of water.

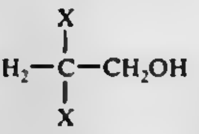
9. An oil-soluble, oxazoline reaction product obtained from heating together a molar equivalent of a hydrocarbon substituted C_4–C_{10} dicarboxylic acid material having more than 50 carbon atoms per dicarboxylic acid group, and two molar equivalents of a 2,2-disubstituted-2-amino-1-alkanol having the formula



$$\mathrm{NH_2-\overset{\displaystyle X}{\underset{\displaystyle X}{C}}-CH_2OH}$$

wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3 at a temperature of from 140°–240° C. until cessation of water evolution indicating completion of the oxazoline reaction.

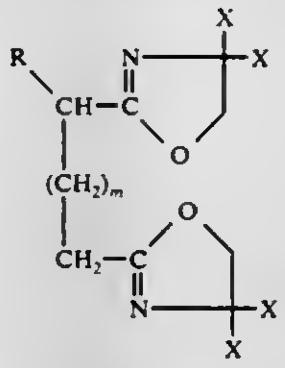
14. A bisoxazoline reaction product prepared by the reaction of a molar proportion of a hydrocarbon substituted C_4–C_{10} dicarboxylic acid material having more than 50 carbon atoms per dicarboxylic acid group and two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having the formula



$$\mathrm{NH_2-\overset{\displaystyle X}{\underset{\displaystyle X}{C}}-CH_2OH}$$

wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $—(CH_2)_nOH$ where n is 1 to 3 at a temperature of from 140°–240° C. until cessation of water evolution indicating completion of the oxazoline reaction.

18. A bis-oxazoline of the general formula



where X is an alkyl or hydroxy alkyl group said alkyl groups having 1 to 3 carbon atoms with at least one of the X substituents on each ring being a hydroxy alkyl group of the structure $—(CH_2)_nOH$ wherein n is 1 to 3 and R is a substantially saturated hydrocarbyl group containing at least 50 carbon atoms and m is from 0 to 6.

4,102,799

AUTOMATIC DISHWASHER DETERGENT WITH IMPROVED EFFECTS ON OVERGLAZE

Patricia A. Finck, Bayonne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 501,720, Aug. 29, 1974, abandoned, which is a continuation of Ser. No. 335,461, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 133,337, Apr. 12, 1971, abandoned. This application Mar. 5, 1976, Ser. No. 664,337

The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.

Int. Cl.² C11D *7/54*

U.S. Cl. 252—99 **3 Claims**

1. An alkaline dishwahser detergent capable of inhibiting overglaze attack and essentially free of inorganic phosphates consisting essentially of, (A) as the sole builder components, about 35–60% by weight of a water soluble hydrated citrate compound, alone or in admixture with a water soluble anhydrous citrate compound and about 30–65% by weight of at least one water soluble inorganic builder salt selected from the group consisting of silicates having an SiO_2 to Na_2O ratio from 1:1 to 3.2:1, carbonates and sulfates, (B) about 2.46 to 6% by weight of boric acid and (C) about 0.5 to 5% by weight of bleaching agent capable of liberating hypochlorite or hypobromite, said composition having a pH in water of from 9.5 to 12.

4,102,800

MICROENCAPSULATED VULCANIZING AGENTS

Ivan Christoff Popoff, Ambler, Pa., and Chester Blair DeSavigny, Bryan, Tex., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 1, 1973, Ser. No. 402,215

Int. Cl.² B01J *3/00*

U.S. Cl. 252—182 **4 Claims**

1. An improved vulcanizing agent comprising alkylated

phenol sulfides wherein the alkyl groups of the sulfide are from 1 to 18 carbon atoms contained within a microcapsule in which the capsule wall is crosslinked polyamide, polyurea, or polyamide-polyurea resin, said resin being formed in situ by condensation of reactive intermediates therefor during encapsulation of said alkylated phenol sulfides.

4,102,801

PROCESS FOR MAKING POLYAMINE CARBAMATES

Nicolas Brodoway, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 24, 1977, Ser. No. 780,908
Int. Cl.² C09K *3/00;* **C01B** *21/12;* **B01J** *31/02*
U.S. Cl. 252—182 **13 Claims**

1. In a process for preparing a polyamine carbamate which comprises reacting an aliphatic or cycloaliphatic polyamine having 2-14 carbon atoms and two primary amino groups with gaseous carbon dioxide, the improvement which comprises mixing said polyamine and a particulate carrier capable of adsorbing the polyamine and selected from the group consisting of an inorganic material inert to the reaction of polyamine with carbon dioxide or a polyamine carbamate that is the same as the carbamate being produced and reacting the polyamine on the carrier with at least 1 mole carbon dioxide per mole polyamine in the absence of solvent for the reactants at a temperature less than about 90° C to obtain the free-flowing, corresponding polyamine carbamate-carrier mixture.

2. A process of claim 1 wherein the carrier is a polyamine carbamate that is the same as the carbamate being produced.

3. A process of claim 1 wherein the carrier is an inorganic material inert to the reaction of polyamine with carbon dioxide.

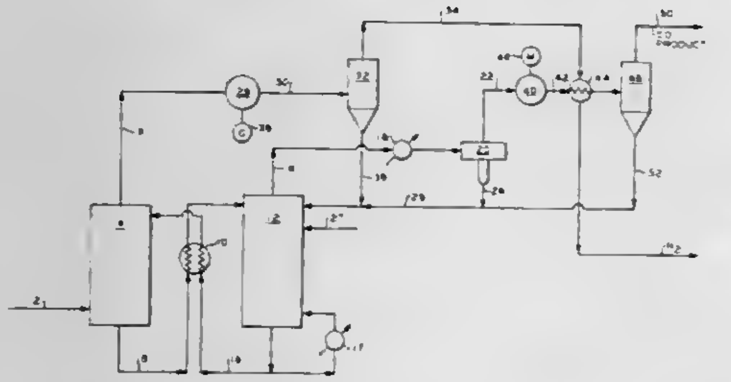
4. A process of claim 3 wherein the carrier is silica.

13. A process of claim 1 wherein the reaction is carried out in the presence of an anti-dusting agent for the resulting carbamate that is a hydrocarbon oil or fibrillated poly(tetrafluoroethylene).

4,102,802

PROCESS FOR SEPARATION AND RECOVERY OF CARBON MONOXIDE

Marvin M. Johnson, and Donald C. Tabler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 618,721, Oct. 1, 1975, Pat. No. 4,042,669. This application Apr. 27, 1977, Ser. No. 791,443
Int. Cl.² C10K *1/32;* **B01D** *19/04*
U.S. Cl. 252—184 **12 Claims**



1. A composition of matter suitable for the absorption of carbon monoxide from a gas mixture containing same which consists essentially of a normally liquid hydrocarbon diluent having a boiling point in the approximate range of 60° to 150° C and at least one copper(I) salt selected from the group consisting of

(a) the copper(I) salt of an alkane sulfonic acid having from 4 to 20 carbon atoms per molecule;
(b) an aromatic sulfonic acid having from 6 to 22 carbon atoms per molecule;
(c) the copper(I) salt of a petroleum sulfonate acid; and
(d) the copper(I) salt of a dialkyl phosphoric acid having from 1 to 12 carbon atoms per alkyl member; wherein said copper(I) salt is present in said diluent in an amount ranging from 0.1 to 2 moles per liter of said diluent.

4,102,803

OXYGEN-CONSUMING COMPOSITION

Daishiro Fujishima, and Shinichiro Fujishima, both of Sagamihara, Japan, assignors to Mitsubishi Shoji Kaisha, Ltd., Tokyo, Japan
Continuation of Ser. No. 524,987, Nov. 18, 1974, abandoned. This application Oct. 27, 1976, Ser. No. 736,245
Claims priority, application Japan, Dec. 27, 1973, 49-144482; Jan. 7, 1974, 49-5177
Int. Cl.² C01B *17/66;* **B01D** *53/14*
U.S. Cl. 252—188 **11 Claims**

1. An oxygen-consuming composition comprising a substantially dry homogeneous mixture of a particulate porous gas absorbing filler and an alkaline material having a dithionite uniformly dispersed therethrough, said alkaline material being present in a stoichiometric ratio of at least about 7.5:1 and being selected from the group consisting of alkaline hydroxides and carbonates.

4,102,804

INHIBITOR FOR GAS CONDITIONING SOLUTIONS

Robert C. Clouse, and Robert G. Asperger, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Mar. 28, 1977, Ser. No. 782,156
Int. Cl.² C09K *3/00*
U.S. Cl. 252—189 **13 Claims**

1. A sour gas conditioning solution inhibited against CO_2 promoted corrosion of iron and steel by having dissolved therein an inhibiting concentration of a combination of one part by weight of a quaternary pyridinium salt and about 0.001-10 parts of a thio compound which is a water-soluble thiocyanate, a water-soluble sulfide, or an organic thioamide.

4,102,805

CATHODOLUMINESCENT AND PHOTOLUMINESCENT GLASSES

Mary S. Mizzoni, and Richard F. Reade, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Mar. 1, 1977, Ser. No. 773,201
Int. Cl.² C03C *3/28, 3/04*
U.S. Cl. 252—301.4 F **5 Claims**

1. An essentially crystal-free, transparent glass article emitting a strong bluish luminescence when excited by ultraviolet or cathode rays consisting essentially, in terms of mole percent on the oxide basis, of about 15-30% Al_2O_3 and 45-70% SiO_2, the sum of those two components constituting at least 75 mole percent, but not more than about 95 mole percent of the total composition, 0.025-2% europium, expressed as Eu_2O_3 but present in the glass as Eu^{+2} ions, and at least about 3% of compatible metal oxides which improve the melting and forming characteristics of the glass and/or modify the physical properties thereof.

4,102,806

METHOD OF PRODUCING MICROCAPSULES AND RESULTING PRODUCT

Sadao Kondo, Kawanishi, and Hidehiko Nakano, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan
Filed Aug. 17, 1976, Ser. No. 715,192
Claims priority, application Japan, Aug. 18, 1975, 50-100363
Int. Cl.² B01J *13/02*
U.S. Cl. 252—316 **32 Claims**

1. A method of producing a microencapsulated product, which comprises

(a) dissolving an oil-and-fat in an organic solvent by heating at a temperature within the range from 50° C to 100° C, said oil-and-fat being solid at room temperature, and melting at a temperature not lower than 30° C, said organic solvent being hardly or not capable of dissolving a core material to be encapsulated but capable of dissolving not less than 1 percent (weight/volume) of said oil-and-fat when hot and capable of coacervating not less than 50 percent of the dissolved oil-and-fat when cold,
(b) dispersing said core material in the resultant solution, said dispersion having the oil-and-fat at the ratio of 0.1-10:1 relative to the core material by weight basis and having the organic solvent at the ratio of at least 3:1 relative to the core material by volume/weight basis,
(c) cooling the dispersion to a temperature lower than 60° C with stirring to coacervate the oil-and-fat on the core material, and
(d) separating and drying the resultant encapsulated particulate product.

32. A microencapsulated product which is obtainable by the method of claim 1.

4,102,807

HYDROUS GEL AND PROCESS FOR ITS PREPARATION

Akio Iwama, and Isao Mune, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan
Filed Apr. 23, 1976, Ser. No. 679,611
Claims priority, application Japan, Apr. 24, 1975, 50-50300
Int. Cl.² B01J *13/00*
U.S. Cl. 252—316 **22 Claims**

1. A hydrous gel consisting essentially of a heat-moldable w/o emulsion composed of about 15 to about 95% by weight of a continuous phase consisting of an A-B-A type teleblock copolymeric elastomer which consists of a hard polymer block A of vinyl compound and a soft polymer block B of a conjugated diene and an oil component and about 85 to about 5% by weight of a dispersed water phase resulting from the emulsification of water particles by an emulsifier having the property of forming a dispersed phase of innumerable emulsified water particles in the continuous phase consisting of the teleblock elastomer and the oil component and maintaining the form of the w/o emulsion in a stable fashion, said hydrous gel being capable of providing a gel product containing emulsified water particles stable at room temperature.

4,102,808

LATEX FROTHING AGENT

Daniel Charles Straka, Sewickley, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.
Division of Ser. No. 728,687, Oct. 1, 1976, Pat. No. 4,049,587. This application Jun. 1, 1977, Ser. No. 802,229
Int. Cl.² B01F *17/42, 17/32*
U.S. Cl. 252—354 **2 Claims**

1. A latex frothing agent useful for entraining air in a froth of aqueous latex dispersion of an elastomer, said latex frothing agent consisting essentially of an aqueous solution containing about 70% water and about 25% magnesium di(lauryl sulfate), about 2.5% polyalkoxyglycerol having about eight alkoxy groups per hydroxyl group and about 2.5% of a quaternary dihydroimidazole derivative, there being a fatty acid carbon chain attached as the only carbon-carbon linkage for the carbon between the nitrogens of the dihydroimidazole ring, the quaternary nitrogen partaking of the nature of a quaternary sodium glycinate having at such quaternary nitrogen both an alkhydroxy group and said dihydroimidazole ring.

4,102,809

MALONIC ACID COMPOSITION FOR THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Division of Ser. No. 390,284, Aug. 21, 1973, Pat. No. 3,973,438. This application Mar. 23, 1976, Ser. No. 669,554
Int. Cl.² C09K *3/00;* **C08K** *5/09;* **C08L** *63/00*
U.S. Cl. 252—408 **9 Claims**

1. A composition curable at room temperature comprising malonic acid and a solution of an air-dryable epoxy a resinous carrier stable and solid at 80° C when cured.

4,102,810

STABILIZED HEMATOLOGICAL REAGENT SOLUTIONS

Douglas Armstrong, Coral Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Continuation-in-part of Ser. No. 540,584, Jan. 13, 1975, Pat. No. 3,962,125. This application Mar. 26, 1976, Ser. No. 670,924
The portion of the term of this patent subsequent to Jun. 8, 1993, has been disclaimed.
Int. Cl.² C09K *3/00;* **G01N** *33/16*
U.S. Cl. 252—408 R **6 Claims**

1. An osmotically balanced reagent for calibrating instruments utilized in hematological studies utilizing electronic particle analysis study methods, including a composition for stabilization of the mean cell volume of blood cells in the reagent consisting essentially of a mixture of 2-phenoxyethanol and sodium fluoride.

4,102,811

CATALYST DEMETALLIZATION BY OXIDATION IN A DEFINED TEMPERATURE RANGE

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.
Filed Jun. 14, 1976, Ser. No. 695,687
Int. Cl.² C10G *11/18;* **B01J** *8/24, 29/38*
U.S. Cl. 252—411 R **16 Claims**

1. A process for treating a metal contaminated catalyst which has been poisoned in a hydrocarbon conversion process by a feedstock containing metal poison to remove at least a portion of the metal contaminants and to produce a catalyst with improved catalytic activity which comprises

contacting at least a portion of said metal contaminated catalyst with at least one sulfur containing compound to provide a catalyst containing sulfur containing metal compounds;
contacting said catalyst containing sulfur containing metal compounds with an oxygen-containing gas at a temperature maintained within the range of from 550° F. to 725° F. for a time sufficient to promote subsequent metals removal by converting at least a portion of said catalyst metals to a dispersible form;
removing at least a portion of the metal poisons from the oxygen treated catalyst by contacting said oxygen treated catalyst with a reductive wash medium; and
recovering a catalyst of reduced metal poison content and improved catalyst activity.

4,102,812

PRODUCTION OF CARBON FROM COAL GRANULES PREPARED IN A FLUID ENERGY MILL

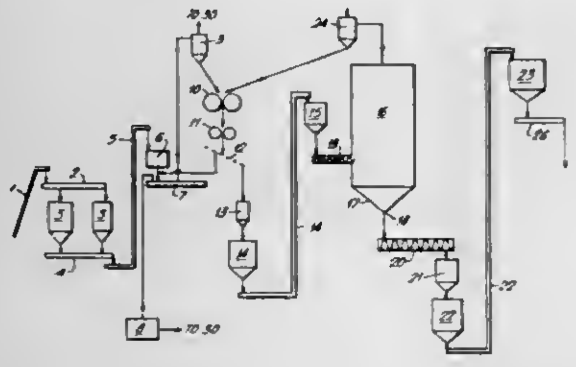
Michael Robinson, Healing; David Barry Mobbs, Grimsby, and Kirit Talati, Immingham, all of England, assignors to Laporte Industries, Limited, Luton, England

Filed Sep. 21, 1976, Ser. No. 725,278

Claims priority, application United Kingdom, Oct. 2, 1975, 40231/75

Int. Cl.^{2} C01B *31/10, 31/14;* **B01J** *21/18*

U.S. Cl. 252—421 **15 Claims**



1. A process for the production of active carbon comprising the steps of

- a. milling a medium to high caking coal in a superheated steam atmosphere in a fluid energy mill to produce a milled product in which less than 10% by weight of the particles have diameters below 1 microns and at least 90% by weight have diameters not below 1 micron and not above 10 microns and not more than 1% by weight of the particles have diameters above 38 microns
- b. compacting the product from the milling step, in the absence of binders, while the temperature of the product is at least 50° C and not more than 250° C to produce agglomerates
- c. reducing the agglomerates in size to produce granules
- d. oxidising the granules to a non-swelling non-caking form
- e. carbonising the oxidised granules
- f. steam activating the carbonised granules
- g. recovering the resulting active carbon.

4,102,813

CATALYST FOR PURIFYING EXHAUST GASES

Sadahiro Kimura; Kiyoshi Uchida, and Hiroyuki Akizuki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 16, 1975, Ser. No. 568,549

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Claims priority, application Japan, Apr. 22, 1974, 49-04529

Int. Cl.^{2} B01J *31/02*

U.S. Cl. 252—430 **10 Claims**

1. A catalyst for purifying exhaust gases, which comprises a catalyst carrier composed at least mainly of alumina, which has an α-alumina layer near the surface of the carrier said α alumina, layer having a larger pore diameter than the interior portion of said carrier under said layer, said carrier being impregnated with an active catalytic component for purifying exhaust gases which extends more deeply into the carrier than said α-alumina layer.

4. The catalyst of claim 1, wherein the active catalytic component with which the carrier is impregnated comprises palladium.

4,102,814

OXYGEN SCAVENGER IN ELEMENTAL COMBUSTION ANALYSES

Grant M. Gustin, Oxford, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,563

Int. Cl.^{2} C09K *3/00*

U.S. Cl. 252—408 **1 Claim**

1. A copper reagent useful in combustion analyses consisting of a granular mixture of copper and a porous, inert, diatomaceous earth of a fineness greater than 100 USP mesh in which the ratio of copper to said earth is 6:1 w/w.

4,102,815

ALPHA HALO SUBSTITUTED ASYMMETRICAL DIACYL PEROXIDES IN CO-INITIATOR SYSTEMS

Ronald L. Friedman, deceased, late of San Rafael, Calif. (by Patty R. Friedman, executor), and Roger N. Lewis, Martinez, Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

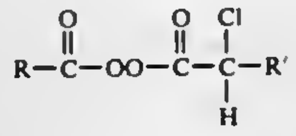
Filed Nov. 8, 1976, Ser. No. 739,416

Int. Cl.^{2} B01J *31/02*

U.S. Cl. 252—426 **16 Claims**

1. An organic peroxide polymerization co-initiator composition consisting essentially of:

(a) an alpha halo substituted diacyl peroxide of the structure



$$R-\overset{\overset{\displaystyle O}{\|}}{C}-OO-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle H}{|}}{\overset{\overset{\displaystyle Cl}{|}}{C}}-R'$$

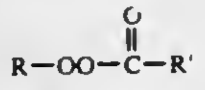
where

R = alkyl group of 1-11 carbon atoms and

R′ = alkyl group of 2-10 carbon atoms; and

(b) a coperoxide selected from

(1) t-alkyl peresters of t-hydroperoxides of the structure



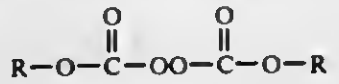
$$R-OO-\overset{\overset{\displaystyle O}{\|}}{C}-R'$$

where

R = t-alkyl of 4–20 carbon atoms and

R′ = t-alkyl of 4–20 carbon atoms

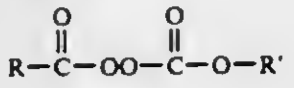
(2) peroxydicarbonates of the structure



$$R-O-\overset{\overset{\displaystyle O}{\|}}{C}-OO-\overset{\overset{\displaystyle O}{\|}}{C}-O-R$$

where each R = alkyl or cycloalkyl of 1–18 carbon atoms

(3) acyl peroxycarbonic esters of the structure



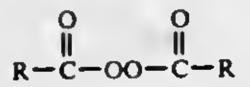
$$R-\overset{\overset{\displaystyle O}{\|}}{C}-OO-\overset{\overset{\displaystyle O}{\|}}{C}-O-R'$$

where

R = alkyl or aryl of 1–11 carbon atoms and

R′ = alkyl of 1–18 carbon atoms

(4) aliphatic diacyl peroxides of the structure



$$R-\overset{\overset{\displaystyle O}{\|}}{C}-OO-\overset{\overset{\displaystyle O}{\|}}{C}-R$$

where each R = alkyl of 2-11 carbon atoms; and wherein the weight ratio of alpha halo substituted diacyl peroxide to coperoxide is about 3:1 to 1:3.

4,102,816

ADSORBENT FOR POLYNUCLEAR AROMATIC COMPOUNDS

David L. Stalling; James N. Hockins, and William Allen Smith, all of Columbia, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,500

Int. Cl.^{2} B01J *31/02, 21/18;* **C07C** *319/14, 307/00*

U.S. Cl. 252—428 **4 Claims**

1. An adsorbent comprising powdered charcoal coated on a support material consisting essentially of polyurethane foam.

4,102,817

CATALYST COMPOSITION FOR THE PREPARATION OF BUTADIENE

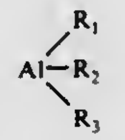
Morford C. Throckmorton, and William M. Saltman, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,176, Jul. 18, 1973, Pat. No. 3,856,764, which is a continuation-in-part of Ser. No. 202,024, Nov. 24, 1971, abandoned. This application Oct. 10, 1974, Ser. No. 513,629

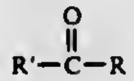
Int. Cl.^{2} C08F *4/70*

U.S. Cl. 252—429 B **1 Claim**

1. A catalyst composition consisting essentially of (1) an organoaluminum compound of the formula



wherein R_1 is selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, arylalkyl, alkoxy, hydrogen and fluorine, R_2 and R_3 being selected from the group consisting of alkyl, including cycloalkyl, aryl, alkaryl and arylalkyl, (2) organonickel compound selected from the class consisting of nickel salts of carboxylic acids, organic complex compounds of nickel, nickel tetracarbonyl and mixtures thereof and (3) at least one hydrogen fluoride complex (HFC) prepared by complexing hydrogen fluoride with a member of the class consisting of ketones of the formula



$$R'-\overset{\overset{\displaystyle O}{\|}}{C}-R$$

wherein R and R′ represent alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms and R and R′ may be the same or dissimilar, alcohols of the formula ROH where R represents alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms, nitriles represented by the formula RCN where R represents alkyl, cycloalkyl, aryl, alkaryl or arylalkyl radicals containing from 1 to about 30 carbon atoms, and water, in which the mole ratio of the organoaluminum compound to the organonickel compound ranges from about 0.3/1 to about 300/1, the mole ratio of the hydrogen fluoride complex to the organonickel compound ranges from about 2/1 to about 300/1, and the mole ratio of the hydrogen fluoride complex to the organoaluminum compound ranges from about 0.2/1 to about 15/1, said catalyst is preformed in the presence of a conjugated diolefin, said conjugated diolefin being present in a mole ratio of conjugated diolefin to organonickel compound from about 5/1 to about 500/1.

4,102,818

HYDROTREATING CATALYST AND PROCESS UTILIZING THE SAME

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 706,217, Jul. 19, 1976, Pat. No. 4,038,177. This application Feb. 4, 1977, Ser. No. 765,821

Int. Cl.^{2} B01J *27/02, 23/16;* **C01F** *7/02*

U.S. Cl. 252—439 **13 Claims**

1. A catalyst comprising alumina and hydrogenation components composited with said alumina, said hydrogenation components being selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a Group VIB element of the Periodic Table of Elements and at least one elemental metal, metal oxide and metal sulfide of a Group VIII element of the Periodic Table of Elements, said alumina having been prepared by the steps which comprise reacting a solution of an aluminate selected from the group consisting of alkali metal aluminate and ammonium aluminate with an aqueous solution of an aliphatic dicarboxylic acid selected from the group consisting of C_2 to C_6 saturated aliphatic dicarboxylic acid and C_2 to C_6 unsaturated aliphatic dicarboxylic acids to precipitate a hydrous aluminum oxide, said dicarboxylic acid being present in an amount of at least one mole of said acid per 2 moles of said aluminate.

4,102,819

FINELY PARTICULATED COLLOIDAL PLATINUM, COMPOUND AND SOL FOR PRODUCING THE SAME, AND METHOD OF PREPARATION

Henry G. Petrow, Cambridge, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech, Inc., Burlington, Mass.

Division of Ser. No. 430,190, Dec. 28, 1973, abandoned, which is a continuation of Ser. No. 153,824, Jun. 16, 1971, abandoned. This application May 9, 1977, Ser. No. 794,802

The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.

Int. Cl.^{2} B01J *23/42*

U.S. Cl. 252—460 **4 Claims**

1. A process for preparing a conversion catalyst characterized by substantially improved conversion of hydrocarbons consisting essentially of the following steps:

- a. preparing a solution from a platinum complex compound comprising the radical $Pt(SO_3)_4$ or $Pt(SO_3)_2$,
- b. impregnating a base selected from the group consisting of alumina, silica and zirconia with said solution,
- c. drying said solution, and decomposing and reducing said radical,
- d. recovering the catalyst product.

4,102,820

SILVER CATALYST FOR ETHYLENE EPOXIDATION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,704

Int. Cl.^{2} B01J *21/04, 23/66*

U.S. Cl. 252—463 **22 Claims**

1. A process for preparing a supported silver containing catalyst for the vapor phase epoxidation of ethylene with an oxygen containing epoxidizing agent comprising the steps of:

contacting a porous, inorganic, catalyst support material with an impregnating solution comprising a silver carboxylate amine complex; and,

heating the impregnated support material at temperatures from about 50° C to 300° C to evaporate volatiles, decompose said complex and activate sand catalyst,

wherein said silver carboxylate/amine complex comprises a silver carboxylate dissolved in a solubilizing amount of an amine-containing complexing agent selected from the group consisting of

(A) aliphatic polyamines containing at least three amino moieties wherein at least one is primary or secondary; and

(B) aliphatic amino ethers containing at least one ether linkage and at least one amino moiety which is primary or secondary.

4,102,821
METHOD FOR PREPARING AN ALUMINA AS A SUPPORT FOR A HYDROTREATING CATALYST

George N. Pessimisis, Berwyn, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 662,498, Mar. 1, 1976. This application May 31, 1977, Ser. No. 801,878

Int. Cl.² B01J *21/04*

U.S. Cl. 252—463 **3 Claims**

1. An improvement in a method for the preparation of an alumina useful as a support for a hydrotreating catalyst, said method generally comprising of:

A. Precipitating an alumina;
B. Reducing the moisture content of said alumina;
C. Washing and purifying said alumina;
D. Forming said alumina;
E. Drying said alumina; and then,
F. Calcining said alumina; the improvement consisting essentially of adding to the alumina prior to step D and after step C above an aqueous solution containing from 0.1 to 15.0% by weight based on the dry weight of the alumina of a water-soluble polycarboxylic acid having 2–22 carbon atoms whereby a catalyst support having substantially diminished pore volume in the range of 100–1200A is prepared.

4,102,822
HYDROCARBON HYDROCONVERSION CATALYST AND THE METHOD FOR ITS PREPARATION

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 26, 1976, Ser. No. 708,804

Int. Cl.² B01J *21/04, 23/84, 23/64, 27/04*

U.S. Cl. 252—465 **29 Claims**

1. A catalyst composition comprising a rigidly interconnected pack of irregularly shaped particles of which (1) less than 5 weight percent thereof have average diameters in the range 0.15 to 1.3 mm, (2) at least 10 weight percent thereof have average diameters in the range above 0.1 micron and (3) the remainder thereof have average diameters in the range below 0.15 mm, said pack having a pore volume of at least 0.065 cc per cc of the pack and having access channels among said particles throughout the pack, said channels comprising interconnected macropores having diameters as measured by mercury porosimetry in the range 0.1 to 15 microns, and said macropores contributing a fraction of said pore volume, which is in the range from about 3 to 45 percent of said pore volume; said particles comprising pulverable materials selected from the group consisting of at least one refractory oxide component and at least one hydrogenating component, said refractory oxide component being further selected from the group consisting of the oxides of the metals of Groups II, III and IV, said hydrogenating component being further selected from the group consisting of the metals, oxides and sulfides of the elements of Groups VIB and VIII; and said composition containing, in parts by weight, for each 100 parts of said refractory oxide component an amount of said hydrogenating component, calculated as metal, in the range from about 0.1 to 50 parts.

4,102,823
LOW AND NON-PHOSPHATE DETERGENT COMPOSITIONS

J. Neal Matheson, Burlington, Canada, and David L. Richardson, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 313,317, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 302,446, Oct. 31, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,991

Int. Cl.² C11D *1/83, 3/04, 3/10, 11/03*

U.S. Cl. 252—533 **14 Claims**

1. A granular spray-dried detergent composition consisting essentially of:

(A) from about 10% to 30% by weight of a surfactant system consisting essentially of
  (i) an anionic surfactant selected from the group consisting of
    (a) the sodium and potassium salts of sulfated fatty alcohols, said alcohols containing from about 8 to 18 carbon atoms;
    (b) the sodium and potassium salts of alkyl benzene sulfonic acids in which the alkyl group contains from 9 to 20 carbon atoms; and,
    (c) mixtures thereof; and
  (ii) a nonionic surfactant produced by the reaction of one mole of a higher fatty alcohol containing from 10 to 15 carbon atoms with from about 3 to 10 moles of ethylene oxide, said nonionic surfactant having a hydrophilic-lipophilic balance of from about 10 to 13.5;

the weight ratio of anionic surfactant to nonionic surfactant within said surfactant system varying between 2.8:1 and 5:1;

(B) from about 10% to 90% by weight of a mixture of salts comprising from about 40% to 50% by weight of said salt mixture of alkali metal carbonates; from about 40% to 50% by weight of said salt mixture of alkali metal silicates having M_2O/SiO_2 weight ratios of from about 1:2.0 to 1:2.4, and from about 5% to 20% by weight of said salt mixture of an electrolyte salt selected from the group consisting of sodium acetate, potassium acetate, alkali metal sulfosuccinate, and magnesium sulfate; and

(C) from about 3% to 6% by weight of water.

4,102,824
NON-AQUEOUS DETERGENT COMPOSITION

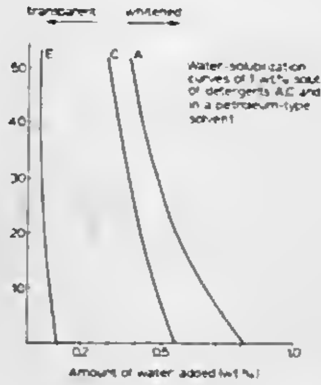
Hiroshi Mizutani, Yachiyo; Masaru Tamura, Sakura, and Katsumi Saegusa, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1977, Ser. No. 807,182

Claims priority, application Japan, Jun. 25, 1976, 51-75346

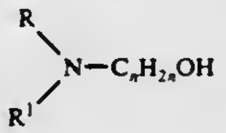
Int. Cl.² C11D *1/22, 3/30, 7/50*

U.S. Cl. 252—545 **8 Claims**



1. A dry cleaning detergent composition consisting essentially of

(A) from 5 to 50 percent by weight of a salt, or a mixture of salts, of a linear long-chain alkylbenzenesulfonic acid having 10 to 16 carbon atoms in the alkyl group, with a dialkylalkanolamine having the formula (I):



(I)

wherein R and R¹, which can be the same or different, are linear or branched alkyls having 2 to 4 carbon atoms and *n* is 2 or 3;

(B) from 30 to 60 percent by weight of one or a mixture of surface active agents soluble in the organic solvent C and effective for dry cleaning selected from the group consisting of polyoxyethylene nonylphenyl ethers having 2 to 20 moles of added ethylene oxide units, polyoxyethylene alkyl ethers having 2 to 20 moles of added ethylene oxide units and C_{10} to C_{20} alkyl group, fatty acid sorbitan esters, fatty acid alkylolamides derived from C_{10} to C_{20} fatty acids and an alkylolamine selected from the group consisting of monoethanolamine, diethanolamine, monoisopropanolamine and diisopropanolamine, dialkylsulfosuccinic acid salts in which the alkyl group has 6 to 10 carbon atoms, alkylbenzenesulfonic acid salts and petroleum sulfonates wherein the counter ion of said salts is sodium, potassium or lower alkanolamine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine and triisopropanolamine, the sum of A and B being from about 35 to about 80 percent by weight, based on the total weight of the composition, and

(C) the balance is essentially an organic solvent effective for dry cleaning selected from the group consisting of benzine, mineral spirit, perchloroethylene, trichloroethane and carbon tetrachloride.

4,102,825
LIQUID LIGHT-DUTY DETERGENT COMPOSITION

Moriyasu Murata, Chiba, and Kimie Ide, Tokyo, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 831,954

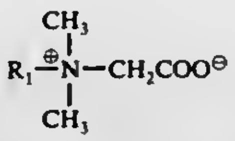
Claims priority, application Japan, Oct. 1, 1976, 51-118332

Int. Cl.² C11D *1/38, 3/26, 7/32*

U.S. Cl. 252—547 **5 Claims**

1. A liquid light-duty detergent composition consisting essentially of

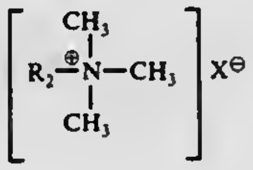
(1) from one to 5% by weight of a mixture of
  (a) a fatty acid diethanolamide derived from a saturated fatty acid having 10 to 14 carbon atoms and
  (b) an amphoteric surface active agent having the formula (I):



$$R_1-\overset{\oplus}{N}(CH_3)_2-CH_2COO^{\ominus} \qquad (I)$$

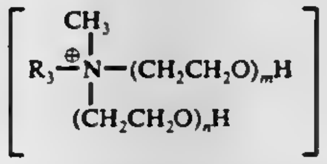
wherein R_1 is alkyl having 10 to 14 carbon atoms, wherein the weight ratio of the fatty acid diethanolamide (a) to the amphoteric surface active agent (b) is in the range of from 90/10 to 10/90,

(2) from 0.5 to 5% by weight of a mixture of
  (c) a cationic surface active agent having the formula (II):



$$\left[R_2-\overset{\oplus}{N}(CH_3)_2-CH_3\right]X^{\ominus} \qquad (II)$$

wherein R_2 is alkyl or alkenyl having 14 to 20 carbon atoms, and X is cl or Br, and
  (d) a cationic surface active agent having the formula (III):



$$\left[R_3-\overset{\oplus}{N}(CH_3)(CH_2CH_2O)_nH-(CH_2CH_2O)_mH\right]X^{\ominus} \qquad (III)$$

wherein R_3 is alkyl or alkenyl having 14 to 20 carbon atoms, *m* and *n* each is an integer of at least one, with the proviso that the sum of *m* and *n* is in the range of from 2 to 8, and *x* is Cl or Br, wherein the weight ratio of the cationic surface active agent (c) to the cationic surface active agent (d) is in the range of from 90/10 to 10/90,

(3) from 15 to 30% by weight of an alkyl ethoxylate formed by adding 3 to 12 moles of ethylene oxide to one mole of an alcohol having 12 to 15 carbon atoms, and

(4) the balance is essentially water.

4,102,826
LIQUID DETERGENT

Jean Renaud, Bougival, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 418,288, Nov. 23, 1973, abandoned. This application Dec. 18, 1976, Ser. No. 750,097

Claims priority, application France, Dec. 6, 1972, 72 43324

Int. Cl.² C11D *3/26*

U.S. Cl. 252—548 **9 Claims**

1. A liquid detergent composition consisting essentially of 10% to 40% by weight of a water-soluble paraffin monosulfonate salt wherein the paraffin is a mixture of 14 carbon atoms and and 15 carbon atoms in a weight ratio of C_{14} monosulfonate to C_{15} monosulfonate of from 1:3 to 3:1 and the salt forming ion is selected from the group consisting of sodium, potassium, ammonium and C_2–C_4 alkanolammonium, 2 to 30% by weight of a corresponding water-soluble salt of a disulfonate of said paraffin mixture, 0 to 15% by weight of said paraffin mixture and 0 to 20% by weight of a corresponding water-soluble salt of an inorganic sulfate, the weight proportions of said disulfonate salt, said paraffin and said sulfate salt being based upon the weight of said monosulfonate salt, solubilized in an aqueous medium, said paraffin monosulfonate being the principal detergent component and said composition containing no significant quantities of paraffin monosulfonate of other carbon contents.

4,102,827
NOVEL POLYELECTROLYTES

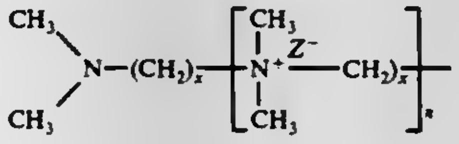
Alan Rembaum, and Shiao-Ping Siao Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 427,917, Dec. 26, 1973, Pat. No. 4,036,808, which is a division of Ser. No. 280,649, Aug. 14, 1972, Pat. No. 3,898,188. This application Jan. 21, 1976, Ser. No. 650,910

Int. Cl.² C08G *73/00*

U.S. Cl. 260—823 **8 Claims**

1. A polyelectrolyte having an intrinsic viscosity molecular weight of at least 30,000 as determined by light scattering in 0.4M K Br consisting essentially of the adduct of linear polymeric segments of the formula:



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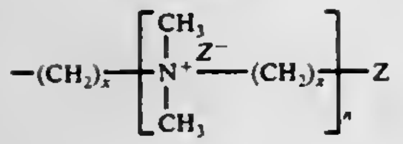
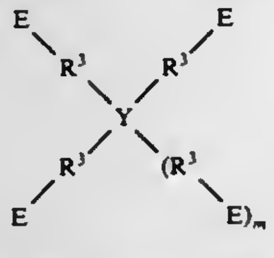


$$-(CH_2)_x-\left[\overset{\overset{CH_3}{|}\ \ Z^-}{\underset{\underset{CH_3}{|}}{N^+}}-(CH_2)_x\right]_n-Z$$

where Z is chloro, bromo or iodo, *n* is an integer and *x* is 3 or 7 to 10 linked directly by means of the quaternization reaction between the $(CH_3)_2N$— or Z terminal groups of the segments to the tertiary amine or Z groups of a polyfunctional central monomer or polymeric substrate, said central monomer being selected from compounds of the formula:



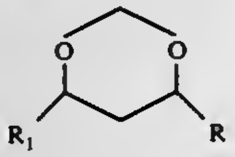
where Y is a polyvalent low molecular weight organic group having a valence of $3+m$. *m* is an integer from 0–3, R^3 is selected from alkylene, phenylene or alkyl ester and E is Z or $(R^4)_3N$— where R^4 is alkyl, aryl or aralkyl and said polymeric substrates are selected from the group consisting of polyvinylpyridine, polyethyleneimine, polyvinylbenzylchloride, poly-(dialkylaminoalkyl acrylate), poly-(dialkylamino alkyl acrylamide, polyepichlorohydrin and polydialkylaminoalkylethylene oxide.

4,102,828
POLYURETHANES DERIVED FROM NOVEL NOVOLAK POLYOLS

Howard P. Klein, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Apr. 28, 1976, Ser. No. 681,005
Int. Cl.^{2} C08G *18/28*
U.S. Cl. 521—174 **18 Claims**

10. A polyurethane comprising the reaction product of an organic polyisocyanate and a polyol comprising an alkoxylated novolak, which novolak is the condensation product of a monohydric phenol having at least two reactive hydrogens, and a 1,3-dioxane having the formula:



where R is selected from the group consisting of phenyl, substituted phenyl and gem dialkyl, and R_1 is selected from the group consisting of hydrogen, alkyl, phenyl, and substituted phenyl.

4,102,829
FOAMED THERMOPLASTIC RESIN COMPRISING A MIXTURE OF IONOMER AND POLYOLEFIN

Seizaburo Watanabe; Eiji Hattori, and Kanan Mori, all of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jun. 4, 1976, Ser. No. 692,875
Claims priority, application Japan, Jun. 21, 1975, 50/75809
Int. Cl.^{2} C08G *18/14*
U.S. Cl. 521—81 **15 Claims**

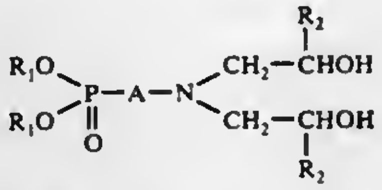
1. A thermoplastic foamed resin product characterized by low density, high thermal resistance, good adhesion properties and uniform cell size which comprises a mixture containing from 35% to 95% ionomer characterized by the presence of a monomer unit based on an unsaturated carboxylic acid and 5% to 65% polyolefin polymer or copolymer, based on the total weight of resin; the ethylene monomer unit and unsatursted carboxylic acid ester monomer unit values of the ionomer being from 50 to 97 mol% and up to 30 mol%; respectively, the neutrality value of the ionomer being up to 50%, the saponification value of the ionomer being at least 50%, and the melt index of the ionomer being from 0.1 to 50 g/10 min.; the melt index of the polyolefin being from 0.1 to 30 g/10 min.

4,102,830
DIOL-PHOSPHONATES AS FLAME-RETARDANTS IN POLYURETHANE FOAM

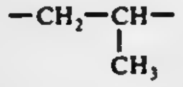
Georges L. Sturtz, Brest; Serge L. Lecolier, Janville sur Juine; Jean-Clande Clement, Brest, and Jean Marie Blehler, Brunstatt, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 570,413, Apr. 22, 1975, Pat. No. 4,052,487. This application May 31, 1977, Ser. No. 801,837
Claims priority, application France, May 13, 1974, 74 16477
Int. Cl.^{2} C08G *18/32*
U.S. Cl. 521—165 **7 Claims**

1. A polyurethane foam obtained by reaction of a compound of the formula:



in which R_1 is an alkyl group with 1 to 4 carbon atoms, R_2 is hydrogen, methyl, or ethyl, and A is $—CH_2—CH_2—CH_2—$, or



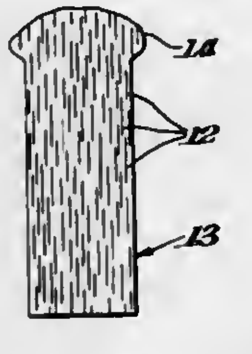
$$-CH_2-\underset{\underset{CH_3}{|}}{CH}-$$

as at least part of the polyol component with a diisocyanate; said reaction is performed in the presence of a pore-forming agent.

4,102,831
IMPARTING ANLSOTROPY TO FOAMS BY ORIENTING ADDED FIBERS WHEREBY SAID FIBERS BECOME PARALLELY ALIGNED

Alan A. Osgood, 32 Woodhill Dr., Newark, Del. 19711

Filed Oct. 12, 1976, Ser. No. 731,742
Int. Cl.^{2} C08G *18/14*
U.S. Cl. 521—99 **10 Claims**



1. A process for imparting anisotropy to foams which comprises mixing in liquid form the components of the foam which are to react during the foaming step to produce said foam by the action of a foaming agent to effect foam expansion, mixing therewith an amount of about 0.008% to about 10% by weight based on the weight of the foam to be produced of fibers having a length no greater than about 0.5 inch, and a length to diameter ratio not less than 4/1, and then effecting foaming, orienting said fibers by the action of the foaming agent whereby said fibers become substantially parallelly aligned to the direction of said foam expansion.

4,102,832
METHOD OF HARDENING AND FOAMING LIQUID RESOLS USING A MIXTURE OF DILUENT AND AROMATIC SULFONIC ACID

Franz Weissenfels, Slegburg am Grafenkreuz, and Hans Jünger, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 616,539, Sep. 25, 1975, which is a continuation of Ser. No. 386,675, Aug. 8, 1973, abandoned, which is a continuation of Ser. No. 201,244, Nov. 22, 1971, abandoned, which is a division of Ser. No. 830,865, Jun. 5, 1969, abandoned. This application Oct. 22, 1976, Ser. No. 734,847
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1968, 1769535
Int. Cl.^{2} C08J *9/00*
U.S. Cl. 521—103 **2 Claims**

1. A process for hardening a resol which consists essentially of the reaction product of a phenol with an aldehyde in admixture with a foaming agent, which comprises premixing a solid aromatic sulfonic acid selected from the group consisting of p-toluenesulfonic acid, a non-dyeing solid phenolsulfonic acid, o-, m- or p-cresolsulfonic acid, chlorobenzene-3,5-disolfonic acid, bromobenzene-4-sulfonic acid, aniline-2,5-disulfonic acid, naphthalenesulfonic acid and naphthylaminesulfonic acid with a diluent having a particle size between 10 and 50 millimicrons, which diluent is selected from the group consisting of silica, activated charcoal, bentonite, boric acid and boron trioxide to thereby form a free-flowing hardener mixture consisting essentially of said sulfonic acid and said diluent, said acid being present in an amount of 5–50% by weight based upon the combined weight of the solid sulfonic acid and diluent and, thereafter, introducing said hardener mixture in an amount of 2–20% by weight based upon the weight of resol into a liquid-form resol containing foaming agent, said resol prepared by condensing 1 mol of a phenol with 1–3 mols of an aldehyde in an alkaline medium followed by water removal until the resol has a solid content between 60 and 80% and maintaining the resultant admixture for a time sufficient to harden such liquid-form resol.

4,102,833
COLD IMPACT RESISTANT URETHANE FOAM

Wayne C. Salisbury, Middleton, N.H., assignor to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 642,559, Dec. 19, 1975, Pat. No. 4,048,105. This application Mar. 16, 1977, Ser. No. 778,001
Int. Cl.^{2} C08J *9/00*
U.S. Cl. 521—159 **8 Claims**

1. A urethane foam quasi-prepolymer having a free isocyanate content in the range of 27 to 31% and consisting essentially of the reaction product of (parts by weight):

Pure MDI	80 to 90
LMW Polyol	3 to 20

wherein said pure MDI is 99%+ methylene bis (4-phenyl isocyanate) and said LMW Polyol is selected from the group consisting of a polyether polyol and polyether polyol blends and has a molecular weight in the range of 240 to 1500 and a functionality in the range of 2.6 to 3.3 on the average for all polyol present, said quasi-prepolymer being made by blending together said pure MDI and LMW polyol and allowing the blend to react at an elevated temperature.

4,102,834
HYDROCARBON RESINS AND PROCESS FOR PREPARING SAME

Teijiro Morimoto, Iwakuni; Isao Hashimoto, Waki, and Yoshiyuki Iwase, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,824
Claims priority, application Japan, Nov. 5, 1974, 49-126543
Int. Cl.^{2} C08F *240/00;* **C09J** *3/14*
U.S. Cl. 260—4 AR **25 Claims**

1. A process for preparing a hydrocarbon resin which comprises copolymerizing (A) a hydrocarbon fraction boiling within the range of 135° to 280° C which is obtained by cracking, reforming and/or refining petroleum and contains, based on the weight of the fraction, 20 to 80% of polymerizable unsaturated hydrocarbons comprising, based on the weight thereof, 60 to 90% of cationically polymerizable aromatic hydrocarbons, 5 to 15% of olefins and 0 to 10% of diolefins, with (B) dicyclopentadiene in the presence of a Friedel-Crafts catalyst in a proportion such that the resulting hydrocarbon resin contains, based on the total weight thereof, 20 to 80% of a unit derived from the dicyclopentadiene (B).

4,102,835
HIGH STRENGTH ADHESIVES, FILMS AND COATINGS

Charles R. Freeman, Lincoln Township, Washington County, and Charlotte I. Sauer, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 172,590, Aug. 17, 1971, abandoned, Continuation-in-part of Ser. No. 856,145, Sep. 8, 1969, abandoned, which is a continuation of Ser. No. 592,268, Nov. 7, 1966, abandoned. This application Jan. 29, 1976, Ser. No. 653,385
Int. Cl.^{2} C08L *7/00, 53/02*
U.S. Cl. 260—5 **6 Claims**

1. A thin, self-supporting, tacky, clean-breaking, pressure-sensitive adhesive transfer film including an internal reinforcing polymer additive, said film having a thickness of up to about 2 mils and comprising the following admixed components:

(1) a crosslinked, tackifiable rubbery polymer having properties suitable for use in a rubber-resin adhesive, said tackifiable rubbery polymer being a homopolymer or random sequence polymer,
(2) a tackifier resin component capable of imparting aggressive tack to said tackifiable rubbery polymer, and
(3) 5 – 30 parts by weight, per 100 parts of the total weight of components (1)and (2), but in no event more than about 80 parts by weight per 100 parts by weight of said component (1), alone, of a block copolymer reinforcing component, said block copolymer reinforcing component being compatible with said components (1) and (2) and comprising at least three polymer blocks of the type

- A - B - A -

wherein each A is a plastic polymer block, which, as a homopolymer, has a glass transition temperature above 20° C., the average molecular weight of each block A being between about 5,000 and about 125,000; B is a polymer block of a conjugated diene, the average molecular weight of each block B being between about 15,000 and about 250,000; the total blocks A being less than about 80% by weight of the block copolymer.

4,102,836
WATER-DISPERSIBLE OLEORESINOUS PAINT BINDERS

Norman Walter Johnson, Orpington, England, assignor to Coates Brothers & Co., Ltd., London, England

Filed Apr. 7, 1977, Ser. No. 785,566

Claims priority, application United Kingdom, Apr. 7, 1976, 14125/76

Int. Cl.² C09D *3/64, 3/72*

U.S. Cl. 260—22 TN **6 Claims**

1. A process for the preparation of a water-dispersible oleoresinous film-forming material which comprises reacting a first hydroxyl group-containing alkyd resin with an organic diisocyanate in an amount such that the ratio of isocyanate groups in the diisocyanate to hydroxyl groups in the alkyd resin is about 2:1, to produce an adduct containing free isocyanate groups and subsequently reacting the adduct with a second hydroxyl group-containing alkyd resin to form a diadduct containing the first alkyd resin and the second alkyd resin, in which one of said first and second alkyd resins is a relatively hydrophilic alkyd resin and the other is a relatively hydrophobic alkyd resin and in which the relatively hydrophilic alkyd resin forms a minor proportion by weight of the total of relatively hydrophobic and relatively hydrophilic alkyd resin .

4,102,837
UNSATURATED POLYESTER RESIN COMPOSITION COMPRISING POLYPROPYLENE ADIPATE

David Hamilton Thomas, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, England

Filed May 23, 1977, Ser. No. 799,160

Claims priority, application United Kingdom, Jun. 3, 1976, 22952/76; Sep. 14, 1976, 38003/76

Int. Cl.² C08G *63/46, 63/52;* **C08L** *91/06*

U.S. Cl. 260—22 CB **8 Claims**

1. An unsaturated polyester resin composition which comprises an ethylenically unsaturated polyester, an ethylenically unsaturated monomer copolymerisable therewith and polypropylene adipate, the ethylenically unsaturated polyester being made from a polyhydric alcohol containing up to 20 carbon atoms, terephthalic acid, and an ethylenically unsaturated polybasic acid containing up to 20 carbon atoms, the molar ratio of terephthalic acid to said polybasic acid being in the range 1:10 to 3:1.

4,102,838
COMPOSITION AND METHOD FOR SELECTIVE BORONIZING

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 23, 1977, Ser. No. 799,799

Int. Cl.² C09D *3/64;* **C23C** *11/10;* **C21D** *1/48*

U.S. Cl. 260—22 CB **17 Claims**

1. A paint adapted for resisting boronizing a predetermined surface area on which it is painted and forming a part of a larger surface area at least a portion of which is to boronized, comprising:

a. a concentration within the range of 10–50 percent by weight of finely divided titanium dioxide;
b. a concentration within the range of 20–70 percent by weight of finely divided carbonaceous material;
c. a concentration within the range of 5–20 percent by weight of organic resin that will burn away at a temperature greater than 1400° F; and
d. sufficient solvent to dissolve said resin and effect a predetermined viscosity; said viscosity being low enough to allow painting onto the predetermined surface area and being high enough to form a coating that will form a boronizing resist at said temperature greater than 1400° F;

such that when said paint is applied to the predetermined surface area that is not to be boronized and that forms a part of the larger surface, at least a portion of which is to be boronized, said paint forms at said temperature a readily removable boronizing resist that protects the predetermined surface area against said boronizing and facilitates removal of said boronizing resist.

11. A method of selectively boronizing the surfaces of a ferrous metal that comprises applying to such area as is not to be boronized a coating consisting essentially of finely divided titanium dioxide, finely divided carbonaceous material and an anhydrous binding agent that will burn away at a temperature greater than 1400° F; said titanium dioxide, said carbonaceous material and said anhydrous binding agent being in effective amounts to form a boronizing resist having a boronizing resistance during boronizing and forming a readily removable boronizing resist following heating to said temperature in excess of 1400° F; then heating said area and said coating to at least said temperature above 1400° F and boronizing said ferrous metal at a temperature at least as great as said temperature at which said coating forms said boronizing resist and subsequently removing said readily removable boronizing resist.

4,102,839
STABILIZATION OF VINYL CHLORIDE POLYMERS

Michel Crochemore, Oullin, and Michel Gay, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 645,937, Dec. 31, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 754,232

Claims priority, application France, May 10, 1976, 76 14863; May 20, 1976, 76 15869; May 10, 1975, 75 00765; Sep. 22, 1975, 75 29466

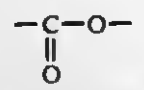
Int. Cl.² C08K *5/07*

U.S. Cl. 260—23 XA **15 Claims**

1. In a composition of matter consisting essentially of a vinyl chloride polymer and [1] a divalent metal salt of a member selected from the group consisting of a lower aliphatic carboxylic acid, a fatty carboxylic acid and an aromatic carboxylic acid, the improvement comprising including [2] a dicarbonyl compound selected from the group consisting of β-diketones and β-keto-aldehydes having the structural formula:

$$R_1-CO-CHR_2-CO-R_3$$

in which each of R_1 and R_3, which may be the same or different, represents a linear or branched alkyl or alkenyl radical having from 1 to 36 carbon atoms, an aralkyl radical having from 7 to 36 carbon atoms or an aryl or cycloaliphatic radical having less than 14 carbon atoms, said cycloaliphatic radical optionally containing one or more carbon-carbon double bonds, the aliphatic chains of said radicals optionally containing one

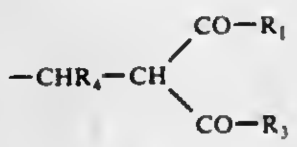


$$-\underset{\underset{\displaystyle O}{\|}}{C}-O-$$

radical, wherein one of R_1 or R_3 can represent a hydrogen atom; R_2 represents a hydrogen atom, a radical of the formula

$$-CO-R_4 \text{ or } -CO-O-R_4,$$

wherein R_4 represents an alkyl radical having 1 to 30 carbon atoms or an aryl radical if R_1 and R_3 are not aromatic, or a radical of the formula:



wherein R_1, R_3 and R_4 are as defined above; or R_1 and R_2, together represent a divalent radical selected from the group consisting of an alkylene radical having from 1 to 12 carbon atoms and a cycloalkylene radical having less than 14 carbon atoms, said radicals being unsubstituted or substituted by an aliphatic radical having from 1 to 18 carbon atoms; wherein in R_1, R_2 and R_3 the carbon atoms adjacent to the indicated carbonyl groups are not doubly bonded to carbon atoms and no more than one of said carbon atoms is contained in an aromatic ring; and, wherein said dicarbonyl compound [2] and said divalent metal salt [1] are present in heat stabilizing amounts, with the proviso that said dicarbonyl compound is other than diaroylmethane.

4,102,840
PROCESS FOR THE MANUFACTURE OF UREA-HCHO-ISOBUTYRALDEHYDE CONDESNATION PRODUCTS AND COMPOSITIONS THEREOF

Günter Pusch, Leitersbofen, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,912

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639754

Int. Cl.² C08G *12/42;* **C08L** *61/24*

U.S. Cl. 260—29.4 R **11 Claims**

1. A process for the manufacture of a curable, textile-finishing condensation product, comprising the sequential steps of

(a) reacting 2 to 3 moles of urea with 0.9 to 1.1 moles of formaldehyde and 1 mole of isobutyraldehyde, at 50° C to 90° C, in the presence of 0.2 to 1.0 equivalent of strong acid and 4 to 18 moles of water, to give a condensate,
(b) adjusting the ph to a value in the range of 7 to 9.5 and removing at least part of the water,
(c) treating the condensate with 3 to 4 moles of formaldehyde to methylolate the condensate and
(d) etherifying the methylolated condensate with an alcohol of 1 to 3 carbon atoms.

4,102,841
HEAT SENSITIVE LATICES

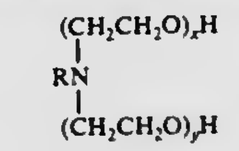
George John Antlfinger, Avon Lake, and Peter Dresel Seletzky, Berea, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 28, 1975, Ser. No. 635,575

Int. Cl.² C08L *9/10*

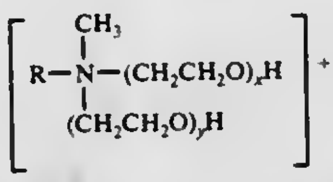
U.S. Cl. 260—29.6 N **7 Claims**

1. A heat sensitive polymeric synthetic anionic latex consisting essentially of polymerized vinylidene monomers having at least one terminal $CH_2C<$ group, said polymers having a Tg° of about −80° C. to 150° C. containing a heat sensitizing amount of an ethoxylated amine selected from the group consisting of compounds having the formula



$$\underset{\underset{\displaystyle (CH_2CH_2O)_yH}{|}}{\overset{\overset{\displaystyle (CH_2CH_2O)_xH}{|}}{RN}} \tag{1}$$

and



$$\left[R-\underset{\underset{\displaystyle (CH_2CH_2O)_yH}{|}}{\overset{\overset{\displaystyle CH_3}{|}}{N}}-(CH_2CH_2O)_xH\right]^{+}Cl^{-} \tag{2}$$

wherein R is an alkyl group containing 10 to 22 carbon atoms and the total of *x* and *y* is greater than 5 to about 50 and a heat sensitizing amount of a silicone polyether of the formula

$$[C_4H_9(OC_nH_{2n})_aOOCNH(CH_2)_3]_b(CH_3)_cSiO_{\frac{4-b-c}{2}}$$

wherein *n, a, b* and *c* are integers.

4,102,842
WATER-INSOLUBLE, HYDROPHILIC GELS AND A METHOD FOR THE PREPARATION OF THE SAME

Masanori Fujimoto, Ibaraki; Kozo Tsuji, and Tsuneyuki Nagase, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 22, 1976, Ser. No. 707,768

Claims priority, application Japan, Jul. 24, 1975, 50-90850; Mar. 4, 1976, 51-23761

Int. Cl.² C08L *29/02*

U.S. Cl. 260—29.6 PT **34 Claims**

1. A method for the preparation of a water-insoluble hydrophilic gel comprising drying the saponified product of a copolymer of (1) a vinyl ester and (2) an ethylenically unsaturated carboxylic acid or derivative thereof, which is in a hydrated state, said saponified copolymer having at least one hydroxyl group and at least one carboxylato group, the degree of saponification of said vinyl ester (1) being at least 50 mole %, said ethylenically unsaturated carboxylic acid or derivative thereof (2) being present in an amount of 5 to 95 mole % of the copolymer and the saponification degree of (2) being at least 30 mole %, said hydrated state product having a water content of more than 100% by weight and said drying being to a water content of at most 50% by weight.

4,102,843
DISPERSING PAINT PIGMENTS

Peter Reeves Sperry, Doylestown; Richard J. Wiersema, North Wales, and Kayson Nyi, Sellersville, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 7, 1977, Ser. No. 757,718

Int. Cl.² C08L *31/00*

U.S. Cl. 260—29.6 RW **29 Claims**

1. An improved aqueous emulsion paint comprising a mixture of a film-forming latex polymer and a pigment dispersion, containing as dispersant, from about 0.01 to about 5%, based on pigment weight, of a water-soluble alkali metal, ammonium, or amine salt of a copolymer having a number average molecular weight in the range of about 500 to about 15,000 consisting essentially of polymerized units of (A) 45 to 90 weight percent of hydroxyalkyl ester of acrylic acid or methacrylic acid, wherein the alkyl group of the ester moiety has from two to six carbon atoms; and (B) 10 to 55 weight percent of acrylic acid, methacrylic acid, itaconic acid, or the half ester or half amide of itaconic acid.

4,102,844
DIPPED ARTICLES OF RUBBER

Ernst Schwinum, Leichlingen; Heinz Hornig, Cologne, and Martin Matner, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 506,986, Sep. 18, 1974, abandoned. This application May 20, 1976, Ser. No. 688,236

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1973, 2347755

Int. Cl.² B28B *1/38*

U.S. Cl. 260—29.7 T **5 Claims**

1. A dipped article produced by the process which comprises dipping a mould in a coagulant and then in a rubber latex to thereby form a film of precipitated rubber on the surface of the coagulant coated mould and subsequently vulcanizing said precipitated rubber to form a dipped article, said rubber latex having an average rubber particle diameter of up to 200 nm, a solids content of 35 to 60% by weight, and a Defo value of less than 2,000 and having been prepared by polymerizing a monomer mixture consisting of

(a) 85 to 50 parts by weight of at least one member selected from the group consisting of butadiene and isoprene,
(b) 10 to 40 parts by weight of acrylonitrile or methacrylonitrile,
(c) 0 to 40 parts by weight of styrene,
(d) 0 to 10 parts by weight of at least one member selected

from the group consisting of acrylamide, methacrylamide and their methylol derivatives and

(e) 0.1 to 10 parts by weight of an α,β-unsaturated carboxylic acid, in aqueous emulsion in the presence of
  (i) 0.5 to 6.0% by weight, based on the monomer mixture weight, of an alkarylsulphonate and
  (ii) 0 to 5% by weight, based on the monomer mixture weight, of at least one surface active substance, at a pH below 7 and then adding on completion of polymerization of said monomer mixture, alkali metal hydroxide to adjust the pH to above 8.

4,102,845

SPREAD-COATING COMPOSITIONS FOR PAPER COMPRISING AN AQUEOUS DISPERSION OF STYRENE/BUTADIENE POLYMER AND POLYETHYLENE OXIDE

Georg Schröder, and Edgar Brehmer, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 610,768, Sep. 5, 1975, abandoned. This application May 2, 1977, Ser. No. 792,624

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1974, 2442704

Int. Cl.² C08L *9/08*

U.S. Cl. 260—29.7 NR **6 Claims**

1. In a spread-coating composition adapted for coating paper to improve the surface characteristics thereof, comprising about 94% to about 79% by weight of pigment or filler, and binder, said binder consisting of an aqueous dispersion of a styrene/butadiene-polymer, the improvement wherein the coating composition contains from about 5% to about 20% by weight, calculated on the total polymeric solids of the coating composition, of polyethylene oxides of a molecular weight of from about 6,000 to about 50,000.

4,102,846

STABLE DISPERSIONS OF POLYMER PARTICLES CONTAINING SUB-PARTICLES OF A SOLID MODIFYING AGENT AND PROCESS FOR MAKING SAME

John Bentley, and Morice William Thompson, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, England

Filed Feb. 9, 1977, Ser. No. 767,148

Claims priority, application United Kingdom, Feb. 19, 1976, 6613/76

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.2 N **22 Claims**

1. A process for the manufacture of a stable dispersion in an inert organic liquid medium of particles consisting of (a) a polymer which is insoluble in that medium, the polymer being obtained by the polymerisation of one or more reactive monomers at least one of which (hereinafter referred to as an insoluble solid monomer) has a melting point above the temperature at which the polymerisation reaction takes place and is insoluble in the liquid medium at that temperature, and from 0.1% to 90% by weight, based on the polymer, of (b) sub-particles within the polymer of a modifying agent for the polymer which is solid at the polymerization temperature, the process comprising the steps of (1) dispersing the solid monomer or each solid monomer and the modifying agent together in the inert organic liquid medium in the presence of 0.1% to 20%, based on the total volume of the dispersed phase, of a dispersing agent for the monomer or monomers so as to produce a stable dispersion of particles of the monomer or monomers and of the modifying agent having a mean diameter not greater than 50μ, the dispensing agent being soluble in the inert organic liquid and incorporating (i) a polymeric component which is solvatable by the liquid and (ii) a grouping which is capable of becoming associated with the surface of the particles of solid monomer or monomers and (2) heating the dispersion of solid monomer or monomers and modifier at the polymerisation temperature so as to bring about the polymerisation reaction, in the presence of a polymer-stabilising agent which is soluble in the inert organic liquid and incorporates (a) a polymeric component which is solvatable by the liquid and (b) a grouping which is capable of effecting association with the surface of the particles of the resulting polymer as the polymer is formed.

4,102,847

BAKING FINISHES OF LOW SOLVENT CONTENT

Heinrich Hartmann, Limburgerhof, and Hans Sander, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1976, Ser. No. 713,785

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539104

Int. Cl.² C08K *5/10*

U.S. Cl. 260—31.4 R **26 Claims**

1. A baking finish which comprises a reaction mixture of

(A) from 40 to 85% by weight of hydroxyl-containing polymers,

(B) from 10 to 55% by weight of amine/formaldehyde resins, and

(C) from 5 to 35% by weight of at least one aliphatic or cycloaliphatic polyisocyanate selected from the group consisting of tris-(isocyanatohexyl)-biuret, tris-(isocyanatohexyl)-isocyanurate, bis-(isocyanathohexyl)-uretdione and the biuret groups-containing reaction product of hexamethylenediisocyanate with 3,3'-dimethyl-4,4'-diaminodicyclohexylmethane, the sum of the above percentages being 100, and the viscosity of the baking finish of low solvent content being from 20 to 300 DIN seconds, measured in a DIN cup No. 4.

4,102,848

INCORPORATION OF FOOD GRADE DYESTUFFS INTO RESINOUS COMPOSITIONS AND ARTICLES PREPARED THEREFROM

Louis Koch, Yonkers, N.Y.; Michael Dunn, New Milford, and Charles Lumpkin, Ridgewood, both of N.J., assignors to H. Kohnstamm & Company Inc., New York, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,486

Int. Cl.² C08J *3/20;* **C08K** *5/00*

U.S. Cl. 260—31.6 **11 Claims**

1. A colored, non-toxic, resinous molding composition which comprises a major amount of a liquid containing thermoplastic or thermosetting resin solids and a minor amount of a color additive complex comprising an edible water soluble resin liquid insoluble food grade dye, a polyhydric alcohol and a polyglycerol higher fatty acid ester.

4,102,849

OIL-EXTENDED HYDROGENATED DIBLOCK COPOLYMER

Thomas Chester Bouton, Akron, and Shingo Futamura, Seville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 668,161, Mar. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 542,340, Jan. 20, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 775,123

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **11 Claims**

1. An oil-extended diblock copolymer composition comprising 10–200 parts by weight of oil and 100 parts by weight of a hydrogenated diene-styrene diblock copolymer consisting essentially of 20–70 percent by weight of a block of hydrogenated polybutadiene and 30–80 percent by weight of a block of hydrogenated random copolymer of 20–50 percent by weight of a vinyl arene substantially uniformly distributed throughout said block and 50–80 percent by weight of 1,3-butadiene, said diblock copolymer having an average molecular weight of

15,000–1,000,000 determined by viscosity measurement, the amount of residual aliphatic unsaturation in said hydrogenated diblock copolymer being less than 20% of the original aliphatic unsaturation, and the 1,2-microstructure content of the butadiene in the copolymer is 5–30 percent.

4,102,850

HIGH IMPACT POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING MINERAL OIL

Glenn Dale Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1977, Ser. No. 787,250

Int. Cl.² C08L *71/04, 23/16*

U.S. Cl. 260—33.6 AQ **33 Claims**

1. An improved thermoplastic molding composition which comprises:

(a) from 20 to 65% by weight of a polyphenylene ether resin and

(b) from 35 to 80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene by polymerizing an alkenyl aromatic monomer in the presence of the rubbery interpolymer, the rubbery interpolymer being comprised of particles having a median diameter less than about two microns, wherein the improvement comprises the modified alkenyl aromatic resin containing a small, effective, impact resistance-enhancing amount of mineral oil.

4,102,851

ALUMINA-THICKENED CYCLOALIPHATIC EPOXY MATERIALS FOR USE IN ATMOSPHERES OF ARCED SULFUR HEXAFLUORIDE AND ARTICLES THEREOF

Russell M. Luck, Monroeville, and Gordon C. Gainer, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1977, Ser. No. 780,146

Int. Cl.² C08L *63/00*

U.S. Cl. 260—37 EP **18 Claims**

1. Thixotropic compositions of matter consisting essentially of:

(a) 100 parts by weight of a monomeric cycloaliphatic epoxy containing at least one cycloaliphatic ring,

(b) about 30 to about 150 parts by weight of a flexibilizing agent selected from the group consisting of a polyazelaic polyanhydride, hexahydrophthalic anhydride and mixtures thereof,

(c) about 120 to about 250 parts by weight of a material selected from the group consisting of aluminum trihydrate, naturally occurring magnesite and mixtures thereof acting as the filler, and

(d) about 10 parts to about 75 parts by weight of Al_2O_3 having an average particle size of between about 0.0005 micron to about 0.10 micron, acting as the thixotroping agent, said thixotropic composition having chemical resistance to arced SF_6 upon cure.

4,102,852

SELF-EXTINGUISHING ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

Pearline DeLaTorre, Elnora, and Melvin D. Beers, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Mar. 23, 1977, Ser. No. 780,379

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **28 Claims**

1. A self-extinguishing room temperature vulcanizable silicone rubber composition comprising (a) 100 parts of a silanol end-stopped diorganopolysiloxane having a viscosity varying from 100 to 500,000 centipoise at 25° C where the organo groups are monovalent hydrocarbon radicals; (b) from 5 to 200 parts by weight of a filler selected from reinforcing and extending fillers; (c) from 0.1 to 10 parts by weight of a metal oxide filler; (d) from 1 to 15 parts by weight of a cross-linking agent having the formula,

$$R\ SI\ (OR^1)_3$$

where R and R^1 are monovalent hydrocarbon radicals; (e) from 0.5 to 10 parts by weight of carbon black; (f) from 1 to 100 parts per million of platinum; and (g) from 0.01 to 5 parts by weight of a titanium chelate catalyst wherein the composition must contain from 0.01 to 10 mole percent of vinyl substitution based on the silanol end-stopped polymer.

4,102,853

FIRE-RETARDANT THERMOPLASTIC POLYESTER RESIN COMPOSITIONS AND METHOD FOR IMPARTING FIRE RETARDANCY TO POLYESTER RESINS

Takeo Kawamura; Noritsugu Saiki; Yoshitugu Nakamura, and Michiyuki Tokashiki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 15, 1975, Ser. No. 622,498

Claims priority, application Japan, Oct. 17, 1974, 49-118706

Int. Cl.² C08K *3/22, 3/26, 5/03, 3/40*

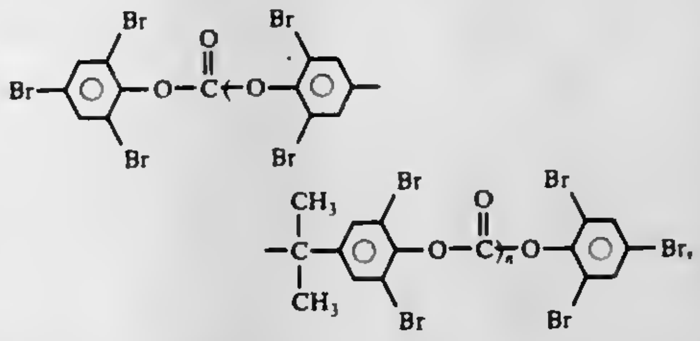
U.S. Cl. 260—40 R **14 Claims**

1. A fire-retardant thermoplastic polyester resin composition which consists essentially of:

(A) 100 parts by weight of an aromatic polyester selected from the group consisting of polyethylene terephthalate, polytrimethylene, terephthalate, polytetramethylene terephthalate, polyhexamethylene terephthalate, polyethylene-2,6-naphthalate, polytetramethylene-2,6-naphthalate and mixtures thereof,

(B) from 20 to 100 parts by weight of an alkaline earth metal carbonate,

(C) from 0.5 to 30 parts by weight of a fire-retardant, selected from the group consisting of (1) a compound selected from the group consisting of halogen-substituted benzene compounds, halogen-substituted hydroxybenzene compounds, halogen-substituted biphenyl ether compounds, a compound of the following formula:



or a nuclearly brominated product of a low polymer of 2,2-bis[4-(2,3-epoxypropoxy) phenyl] propane, and bis-halogenated aralkyl compounds wherein the alkyl has from 1 to 6 carbon atoms and each of two hydrogen atoms, on the same or different carbon atom, is substituted by a halophenyl or halonaphthyl group and wherein, when the alkyl is methyl, one hydrogen atom may be substituted by a phenyl or cyclohexyl group and the halophenyl and halonaphthyl groups may include an inert substituent selected from the group consisting of nitro, hydroxyl and methoxy, (2) a combination of a compound of a metal of Group V*b* of the periodic table with a compound selected from (1), or (3) red phosphorous, and

(d) glass fibers present in not more than 120 parts by weight.

4,102,854

MULTICOMPONENT POLYOLEFIN-BLOCK COPOLYMER POLYCARBONATE BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,174, Feb. 7, 1977, Pat. No. 4,081,424, which is a continuation-in-part of Ser. No. 693,463, Jun. 7, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,383

Int. Cl.^{2} C08K *7/14*

U.S. Cl. 260—42.18 **30 Claims**

1. A composition comprising the admixture obtained by intimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of a polycarbonate, and a polyolefin in a weight ratio of polyolefin to polycarbonate of at least 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

a. said block copolymer comprises at least two monoalkenyl arene/polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of betwen about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

b. said polyolefin has a molecular weight in excess of about 10,000 and an apparent crystalline melting point of between about 100° C and about 250° C.

4,102,855

COMPOSITIONS COMPRISING EPDM, E/VA AND POLY-ALPHA-METHYLSTYRENE

Tiong Ho Kuan, Akron, and John George Sommer, Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,166

Int. Cl.^{2} C08L *23/16*

U.S. Cl. 260—42.33 **18 Claims**

1. A curable processable composition comprising a blend of 100 parts by weight of an ethylene-propylene-diene rubbery polymer (EPDM) having a raw Mooney viscosity ML (1+4) at 121.1° C. of from about 25 to 100, a crystallinity at room temperature without stretching of from about 1.5 to 16% and an ethylene content of at least about 65 mole %; from about 5 to 30 parts by weight of an ethylene vinyl acetate copolymer having from about 25 to 62.5% crystallinity, from about 2 to 15 mol % of vinyl acetate, and a melt index ASTM D-1238 of from about 0.3 to 20; and from about 2 to 10 parts by weight of solid poly alpha methylstyrene having a number average molecular weight of from about 500 to 1200.

4,102,856

DENTAL RESTORATIVE COMPOSITIONS AND PROCESS OF USING THEM

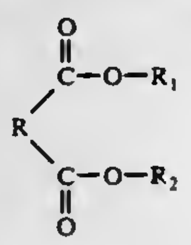
Henry L. Lee, Jr., Pasadena, Calif., assignor to Lee Pharmaceuticals, S. El Monte, Calif.

Filed Feb. 15, 1977, Ser. No. 768,765

Int. Cl.^{2} C08K *3/36, 9/06*

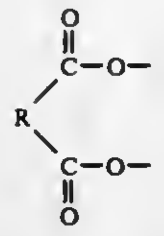
U.S. Cl. 260—42.53 **23 Claims**

1. A dental restorative composition comprising a finely divided filler admixed with a binder that can be activated to set and that comprises an adduct of the formula:



-continued

where:



is the residual moiety of an organic alicyclic o-dicarboxylic acid selected from the group consisting of substituted hydrogenated phthalic acids, lower alkyl-substituted hydrogenated phthalic acids, hexahydrophthalic acid, a maleic acid adduct of methylcyclopentadiene, and tetrahydrophthalic acid; and where, R_1 consists essentially of the residual moiety of a hydroxyalkyl ester of acrylic or methacrylic acid and R_2 consists essentially of the residual moiety of an epoxyalkyl ester of acrylic or methacrylic acid, the linkage of each of R_1 and R_2 to the adjacent respective oxygen on the residual moiety of the dicarboxylic acid being an ester linkage.

4,102,857

PYRAZOLE DERIVATIVES

Lajos Ávár, Biel-Benken; Kurt Hofer, Munchenstein, and Martin Preiswerk, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

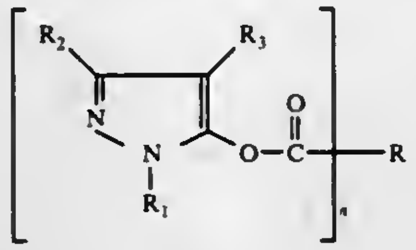
Continuation-in-part of Ser. No. 486,345, Jul. 8, 1974, Pat. No. 3,976,658. This application Aug. 20, 1976, Ser. No. 716,345

Claims priority, application Switzerland, Jul. 13, 1973, 10248/73

Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—45.8 N **16 Claims**

3. A method of stabilizing an organic natural or synthetic polymeric material susceptible to degradation under the effect of ultraviolet light which comprises treating said material with a stabilizing effective amount of a compound of the formula,



wherein

R_1 is C_{1-22} alkyl, uninterrupted or interrupted by 1 or 2 sulfur atoms or by —COO—; C_{5-12} cycloalkyl; C_{6-12} cycloalkyl-alkyl, of which the alkyl moiety is uninterrupted or interrupted by 1 or 2 sulfur atoms or by —COO—; C_{7-12} aralkyl, of which the aryl nucleus is unsubstituted, monosubstituted by hydroxy, monosubstituted by C_{1-12} alkyl, disubstituted by C_{1-12} alkyl, monosubstituted by hydroxy and monosubstituted by C_{1-12} alkyl, or monosubstituted by hydroxy and disubstituted by C_{1-12} alkyl; unsubstituted phenyl; or phenyl substituted by one or more substituents independently selected from halo, cyano, hydroxy, C_{1-12} alkyl, C_{1-12} alkoxy, unsubstituted phenyl, R_4—O— and R_4—SO_2—, wherein R_4 is unsubstituted phenyl, phenyl monosubstituted by C_{1-8} alkyl or phenyl disubstituted by C_{1-8} alkyl, with the proviso that the maximum number of each substituent selected from cyano, hydroxy, unsubstituted phenyl, R_4—O— and R_4—SO_2— is one and the maximum number of each substituent selected from halo, C_{1-12} alkyl and C_{1-12} alkoxy is two;

R_2 is cyano; —$COOR_5$, wherein R_5 is C_{1-12} alkyl, C_{5-12} cycloalkyl, C_{6-12} cycloalkyl-alkyl, unsubstituted phenyl, phenyl monosubstituted by hydroxy, phenyl monosubstituted by C_{1-8} alkyl, phenyl disubstituted by C_{1-8} alkyl, phenyl monosubstituted by hydroxy and monosubstituted by C_{1-8} alkyl, or phenyl monosubstituted by hydroxy and disubstituted by C_{1-8} alkyl; or one of the significances of R_1;

R_3 is hydrogen; —COR_1; —$COOR_5$; or one of the significances of R_1;

n is 1, 2 or 3; and

R, when n is 1, is unsubstituted phenyl; phenyl substituted by 1 to 3 substitutents independently selected from hydroxy, halo, unsubstituted phenyl, unsubstituted benzyl, unsubstituted phenoxy, C_{1-8} alkyl and C_{1-22} alkoxy, with the provisos that: a) the maximum number of each substitutent selected from hydroxy, unsubstituted phenyl, unsubstituted benzyl and unsubstituted phenoxy is one; b) when phenyl is di- or trisubstituted by C_{1-8} alkyl, the sum of the carbon atoms of the alkyl substitutents does not exceed 12; and c) when phenyl is di- or trisubstituted by C_{1-22} alkoxy, the sum of the carbon atoms of the alkoxy substitutents does not exceed 22; monovalent naphthalene; monovalent thiophene; monovalent benzothiophene; monovalent dibenzothiophene; monovalent furan; monovalent benzofuran; or monovalent dibenzofuran; and when n is 2, is unsubstituted phenylene; phenylene monosubstituted by C_{1-4} alkyl; phenylene monosubstituted by halo; phenylene monosubstituted by C_{1-4} alkyl and monosubstituted by halo; divalent naphthalene; divalent thiophene; or divalent dibenzofuran; and when n is 3, is 1,3,5-trivalent benzene.

4,102,858

2,2,6,6-TETRAMETHYL-4-PIPERIDYL THIOCARBOXYLATES AND AMINOCARBOXYLATES AND SYNTHETIC RESIN COMPOSITIONS CONTAINING THE SAME

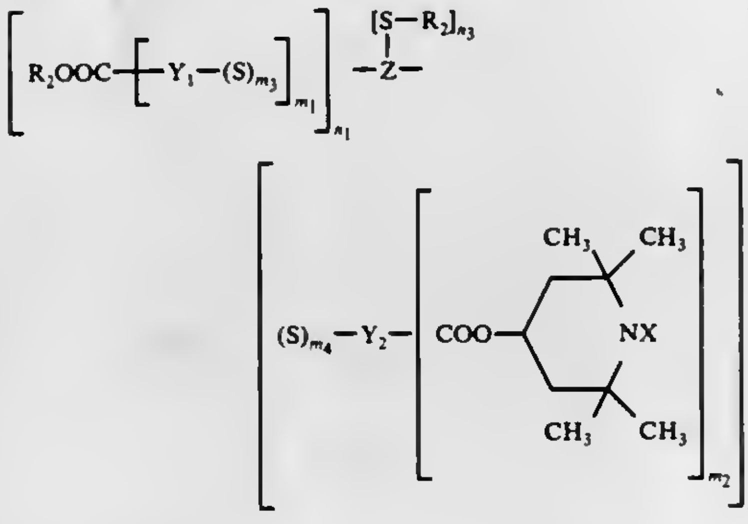
Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,793

Int. Cl.^{2} C07D *211/06;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **58 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidyl thiocarboxylates are provided having the general formula:



I.

wherein:

m_1, m_3, and m_4 are numbers from 0 to 1;

m_2 is a number from 1 to 2;

n_1 is a number from 0 to 2;

n_2 is a number from 0 to 3;

n_3 is a number from 0 to 2;

R_1 is selected from the group consisting of alkyl, aralkyl, cycloalkyl and 2,2,6,6-tetramethyl-4-piperidyl;

R_2 is selected from the group consisting of alkyl, cycloalkyl, alkaryl, aralkyl, and hydroxy-substituted such radicals;

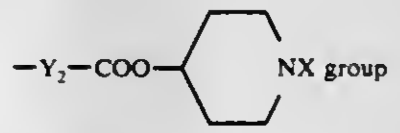
R_1 and R_2 have from one to about twenty carbon atoms;

X is hydrogen or O;

Y^1 and Y_2 are bivalent linking radicals having from one to about twenty carbon atoms, and selected from the group consisting of alkylene and cycloalkylene; and amino-substituted such radicals;

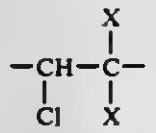
Z is an organic radical having a valence from 2 to 4 and from one to about twenty carbon atoms, and selected from the group consisting of alkylene, alkylidene, aralkylene, aralkylidene, alkarylene, alkarylidene, heterocycloalkylene, heterocycloalkylidene, cycloalkylene and cycloalkylidene; amino-substituted such radicals and 2,2,6,6-tetramethyl-4-piperidylidene;

there being from one to four sulfur-containing such groups and at least one



attached to the Z radical.

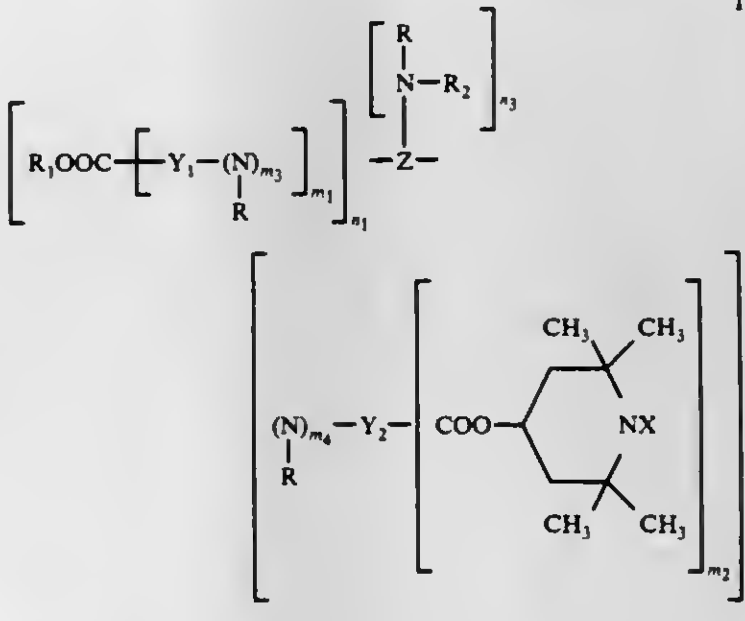
19. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group



$$-\underset{\text{Cl}}{\text{CH}}-\overset{\text{X}}{\underset{\text{X}}{\text{C}}}-$$

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a compound in accordance with claim 1.

29. A 2,2,6,6-tetramethyl-4-piperidyl aminocarboxylate having the formula:



II.

wherein:

m_1, m_3 and m_4 are numbers from 0 to 1;

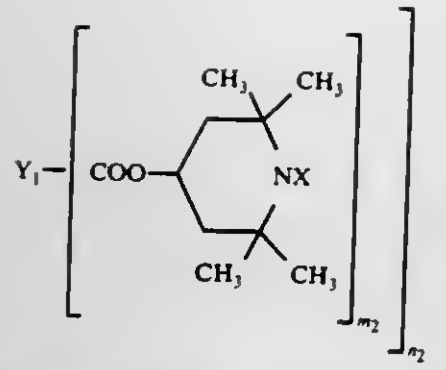
m_2 is a number from 1 to 2;

n_1 is a number from 0 to 2;

n_2 is a number from 0 to 3;

n_3 is a number from 0 to 2;

R is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, aralkyl, cycloalkyl, alkaryl, 2,2,6,6-tetramethyl-4-piperidyl, R_1OOCY_2, phenyl, hydroxy phenyl and



R_1 is selected from the group consisting of hydrogen, alkyl, aralkyl, cycloalkyl and 2,2,6,6-tetramethyl-4-piperidyl;

R_2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, alkaryl, aralkyl, and hydroxy-substituted such radicals;

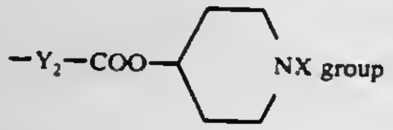
R (when other than hydrogen), R_1 and R_2 have from one to about twenty carbon atoms;

X is hydrogen or O;

Y_1 and Y_2 are bivalent linking radicals having from one to about twenty carbon atoms, and selected from the group consisting of alkylene and cycloalkylene; and

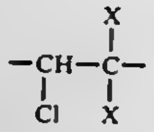
Z is an organic radical having a valence from 2 to 4 and having from one to about twenty carbon atoms, and selected from the group consisting of alkylene, alkylidene, arylene, aralkylene, aralkylidene, alkarylene, alkarylidene, heterocycloalkylene, heterocycloalkylidene, cycloalkylene and cycloalkylidene;

there being from one to four nitrogen-containing such groups, and at least one



attached to the Z radical.

47. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 35C° F, comprising a polyvinyl chloride resin formed at least in part of the recurring group



$$-\underset{Cl}{CH}-\overset{X}{\underset{X}{C}}-$$

and having a chlorine content in excess of 40 percent, where X is either hydrogen or chlorine; and an amount to improve resistance to deterioration of the resin of a compound in accordance with claim 29.

4,102,859
STABILIZER MIXTURES

Erich Eimers; Rolf Dheim, and Wolfgang Cohnen, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

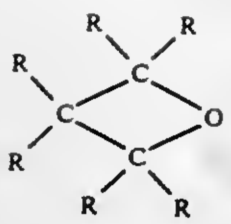
Continuation-in-part of Ser. No. 659,385, Feb. 19, 1976, abandoned. This application Jul. 22, 1976, Ser. No. 707,748

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1975, 2510463; Mar. 18, 1975, 2511730

Int. Cl.² C08K *5/52, 5/15*

U.S. Cl. 260—45.8 A **33 Claims**

1. A mixture comprising an oxetanyl free neutral ester of phosphorous acid and an oxetane compound and containing from 2 to 10 oxetane groups per phosphorus atom and wherein the oxetane compound is a compound of the formula



wherein each of the six groups R independently represents a hydrogen atom or a (C_1-C_{18})-alkyl, (C_3-C_{12})-cycloalkyl, (C_6-C_{15})-aryl, (C_7-C_{15})-aralkyl group or a group of the formula CH_2O-R^1 in which

R^1 represents a (C_1-C_{18})-alkyl, (C_6-C_{12})-cycloalkyl, (C_6-C_{15})-aryl, (C_7-C_{15})aralkyl, an acyl radical of a mono- or polybasic carboxylic acid, or the ester residue of an inorganic acid selected from the group consisting of boric, silicic, alkylboric, arylboric, stannoic, stibonic, orthophosphoric, pyrophosphoric, polyphosphoric, alkanephosphonic, arylphosphonic, dialkylphosphinic acids and of diarylphosphinic acids.

4,102,860
SILICON-TIN COMPOUNDS AS CONDENSATION CATALYSTS IN THE PREPARATION OF ORGANOPOLYSILOXANE ELASTOMERS

Ernst Wohlfarth; Wolfgang Hechtl, and Paul Hittmair, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Division of Ser. No. 690,683, May 27, 1976. This application Dec. 30, 1976, Ser. No. 755,532

Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524000

Int. Cl.² C08G *77/04*

U.S. Cl. 528—18 **8 Claims**

1. An organopolysiloxane composition capable of being cured to an elastomeric solid at room temperature in atmospheric moisture comprising a hydroxyl-terminated diorganopolysiloxane, a silicon compound capable of crosslinking with the diorganopolysiloxane and from 0.01 to 10 percent by weight based on the total weight of the composition of a silicon-tin compound of the formula

$R_a\,Si(OSn\,R^1R^2OOCR^3)_{4-a}$

which is obtained from the reaction of a silane having the formula

$R_a\,Si(OR^4)_{4-a}$

with a dialkyltin salt of the formula

$R^1R^2\,Sn(OOCR^3)_2$

in a mol ratio of (4-a) mols of dialkyltin salt per mol of silane, R is selected from the group consisting of an alkyl and phenyl radical, R^1, R^2 and R^3 each represent an alkyl radical, R^4 is a monovalent hydrocarbon radical having up to 4 carbon atoms and *a* is 0 or 1.

4,102,861
EXTRUSION STABILIZATION OF POLYPYRROLIDONE BY HYDROQUINONES

Carroll J. Wedel, Walnut Creek, and Phillip H. Parker, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 29, 1976, Ser. No. 745,891

Int. Cl.² C08K *5/13*

U.S. Cl. 260—45.95 E **14 Claims**

1. A composition of matter comprising a major amount of normally solid poly-2-pyrrolidone and a thermal stabilizing amount of a hydroquinone compound selected from the group consisting of hydroquinone; C_1–C_{25} alkylhydroquinone; and mixtures thereof, effective to reduce the thermal degradation of said poly-2-pyrrolidone to its monomer.

4,102,862
APPLICATION OF CUMYLPHENOL AND DERIVATIVES THEREOF IN PLASTIC COMPOSITIONS

Salvatore J. Monte, Staten Island, N.Y., and Gerald Sugerman, Allendale, N.J., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed Mar. 31, 1976, Ser. No. 672,425

Int. Cl.² C08G *59/56*

U.S. Cl. 528—88 **14 Claims**

1. In a process for curing epoxy resins with an amine curing system, the improvement of polymerizing the resin in the presence of an accelerating amount of cumylphenol or a carboxylic acid ester thereof.

12. The product obtained by curing a mixture comprising (A) 100 parts by weight of an epoxy resin, (B) 10 to 200 parts by weight of cumylphenol or a carboxylic acid ester or glycidyl ether thereof, and (C) and epoxy resin curing agent.

4,102,863
CATIONIC ELECTRODEPOSITION USING AQUEOUS DISPERSIONS OF QUATERNARY AMMONIUM CARBONATE-CONTAINING POLYMERS

Stephen L. Buchwalter, Allison Park; Joseph F. Bosso, Lower Burrell, and Roger M. Christenson, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,533

Int. Cl.² C08G *65/26, 59/00*

U.S. Cl. 528—111 **4 Claims**

1. A water-dispersible, quaternary ammonium salt-containing resin comprising the reaction product of:

(A) a polyglycidyl ether of à polyphenol, and

(B) an amine carbonate salt.

4,102,864
POLYESTERS OF 1,2-BIS(HYDROXYPHENYL) ETHANES AND AROMATIC DICARBOXYLIC ACIDS

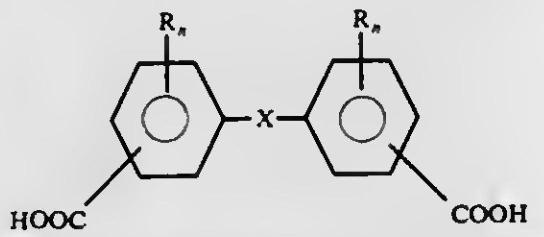
Oliver D. Deex, Clayton, and Virgil W. Weiss, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 654,127, Feb. 2, 1976, abandoned, and Ser. No. 654,128, Feb. 2, 1976, abandoned. This application Jul. 28, 1976, Ser. No. 709,469

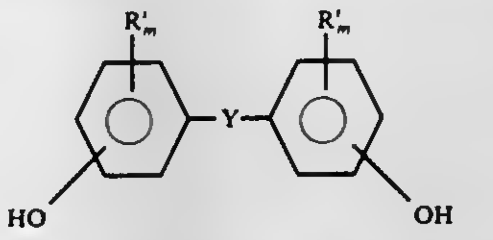
Int. Cl.² C08G *63/18*

U.S. Cl. 528—173 **37 Claims**

1. A polyester consisting essentially of the condensation product of an aromatic dicarboxylic acid and a diphenol; wherein the aromatic dicarboxylic acid comprises at least one acid selected from the group consisting of isophthalic acid, terephthalic acid, 5-alkylisophthalic acid, wherein the alkyl radical contains from 1 to 6 carbon atoms, 3,3'-, 3,4'- and 4,4'-bibenzoic acids, 1,3-, 1,4-, 1,5-, 1,6-, 1,7-, 1,8-, 2,6- and 2,7-naphthalene dicarboxylic acids, and acids represented by the formula:



wherein the carboxyl groups are in the 3- or 4- positions, X is O, S, SO_2, C═O, CH_2, CH_2CH_2, $CH(CH_3)$ or $C(CH_3)_2$, R is H or a C_1 to C_6 alkyl radical, R groups ortho to a carboxyl are small enough to permit esterification, R substituents ortho to X are limited to one ring and $n = 0$ to 2; wherein the diphenol comprises from about 60 to 100 mol percent of a 1,2-bis(hydroxyphenyl)ethane in which the hydroxyl groups are in the 3- or 4- positions and from about 40 to 0 mol percent of a diphenol selected from the group consisting of resorcinol, hydroquinone, 3,3'-, 3,4'- and 4,4'-diphenols, 1,3-, 1,4-, 1,5-, 1,6-, 1,7-, 1,8-, 2,6- and 2,7-dihydroxynaphthalenes, and diphenols represented by the formula:



wherein the hydroxyl groups are in the 3- or 4- positions, Y is O, S, SO_2, C═O, CH_2, $CH(CH_3)$, $C(CH_3)_2$ or $(CH_2)_3$, R' is H or a C_1 to C_6 alkyl radical, R' substituents ortho to Y are limited to one ring, R' substituents ortho to hydroxyl are small enough to permit esterification and $m = 0$ to 4; and wherein the melt viscosity of the polyester at 320° C. determined at a shear rate of 100 $sec.^{-1}$ with a capillary rheometer is less than about 10^5 poise.

4,102,865
MODERATION OF MANGANESE CHELATE CATALYZED POLYMERIZATION OF PHENOLIC MONOMERS WITH POLYFUNCTIONAL ALKANOLAMINES

Walter Karl Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 21, 1976, Ser. No. 753,544

Int. Cl.² C08G *65/44*

U.S. Cl. 528—215 **17 Claims**

1. In a process for the preparation of a polyphenylene oxide resin which comprises the step of oxidatively coupling a phenolic monomer to form a polyphenylene oxide resin in the presence of an organic solvent and a manganese (II) chelate catalyst of the formula

$(L)_x\,Mn$

wherein L is a ligand derived from an ω-hydroxyoxime in a conventional manner, Mn is the transition metal manganese (II) and *x* is at least equal to about 0.5; the improvement which comprises adding, at a point in the reaction when the polyphenylene oxide resin has reached an intrinsic viscosity of about 0.15 dl/g, as measured in chloroform at 30° C., a sufficient amount to retard the rate of reaction of a polyfunctional alkanolamine of the formula:

$R^1_r—N—C_nH_{2n}—OH)_m)_p$

wherein R^1 is hydrogen, straight or branched chain alkylene of from 1 to 6 carbon atoms, alkylenehydroxy of from 2 to 4 carbon atoms, aminoalkylene of from 1 to 6 carbon atoms; *r* is 0 or 1; *n* is a whole number of from 2 to 4; *m* is a whole number of from 1 to 3; and *p* is the whole number 1 or 2, with the proviso that when *p* is 2, *m* is 1, and *r* is 1, *m* is 2.

4,102,866
METHOD OF MAKING GLYCIDYL ETHERS OF NOVOLAK RESINS

George P. Speranza, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

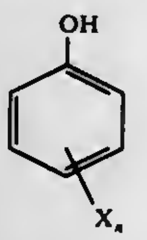
Filed Oct. 29, 1976, Ser. No. 736,809

Int. Cl.² C08G *59/08*

U.S. Cl. 528—135 **6 Claims**

1. A glycidyl ether composition useful as an epoxy resin which comprises the reaction product of an epihalohydrin and a novolak resin containing 5–25 weight percent of phenol or

substituted phenol based on the weight of said novolak resin said phenol or substituted phenol having the structure:



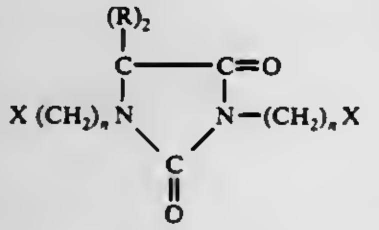
wherein X is hydrogen, hydroxy, chlorine, bromine or an alkyl radical having from 1 to 12 carbon atoms; *n* is an integer from 1 to 2.

4,102,867
COPOLYESTERS OF PHTHALIC ACIDS AND HYDANTOINS

Harold Roy Penton, Jr., and Kenneth Boone Wagener, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 15, 1976, Ser. No. 742,161
Int. Cl.² C08G *63/68*
U.S. Cl. 528—289 13 Claims

1. A disperse dyeable, water-absorbent polyethylene phthalate copolyester comprising units randomly spaced in its chain obtained by esterification of a phthalic acid or diester thereof and ethylene glycol with a hydantoin of the formula



wherein R is hydrogen, lower alkyl, aryl, aralkyl, alkaryl or heterocyclic group which may be the same or different, X is —OH, —COOH or —COOR, R_1 is lower alkyl, *n* is an interger of 1 to 6 when X is —COOH or —$COOR_1$ and *n* is an integer of 2 to 6 when X is —OH.

6. A method for improving the disperse dyeability of a polyethylene phthalate based polyester which comprises simultaneously esterifying a phthalic acid monomer or diester thereof, ethylene glycol and a monomeric hydantoin diacid, hydantoin diester of hydantion diol to form a copolyester containing in its chain randomly spaced units derived from the hydantoin.

4,102,868
COMPOSITION AND PROCESS FOR THE PREPARATION OF SEGMENTED POLYESTER-URETHANE POLYMERS

Ralph A. Genetti, Copley, and Chester D. Trivette, Jr., Akron, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1976, Ser. No. 714,626
Int. Cl.² C08G *18/08, 18/42*
U.S. Cl. 260—858 37 Claims

1. A process for the preparation of elastoplastic urethane polymer comprising heating a slurry of

(a) about 10 to about 90 parts by weight of at least one liquid polydiol having a melting or softening point of about 100° C or below and a molecular weight of from about 500 to about 12,000 selected from the group consisting of dihydroxy polyether and dihydroxy polyester,
(b) about 90 to about 10 parts by weight of a pulverulent solid dihydroxy polyester having a melting point of at least 200° C and a molecular weight of from about 500 to about 12,000, per 100 total parts by weight of (a) and (b) and
(c) an organic diisocyanate in the quantity such that the number of NCO groups is equal to or exceeds the number of OH groups of (a) and (b), to a temperature sufficient to melt (b) for a time sufficient to form an essentially linear segmented urethane polymer, and cooling the polymer before substantial degradation occurs.

4,102,869
FAST-CURING COATING COMPOSITIONS

Michael Allan Tobias, Bridgewater, and Conrad Linden Lynch, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,386
Int. Cl.² C08G *63/18*
U.S. Cl. 427—178 13 Claims

1. A process for preparing a linear polyester resin suitable for making water-reducible, heat-curable fluid coating composition which comprises performing a linear polyester resin terminated with carboxyl groups and reacting said preformed linear polyester resin with an amount of hydrocarbyl glycidyl ether sufficient to cap 5 to 49 percent of said terminal carboxyl groups, thereby increasing the curing rate of said linear polyester resin.

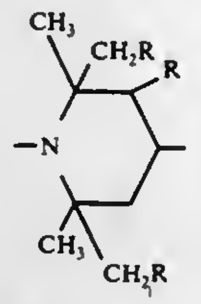
6. A water-reducible, heat-curable fluid coating composition comprising a linear polyester resin terminated with a major fraction of carboxyl groups and a minor fraction of carboxyl esters of a hydrocarbyl glycidyl ether, and an amount of cross-linking agent effective to cross-link said linear polyester resin.

4,102,870
MODIFIED POLYURETHANES WITH INCREASED LIGHT STABILITY

Peter Hofmann, Basel; Helmut Müller, Binningen, and Jean Rody, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 4, 1977, Ser. No. 793,707
Claims priority, application Switzerland, May 11, 1976, 5891/76
Int. Cl.² C08G *18/38*
U.S. Cl. 528—73 9 Claims

1. Polyurethanes which are stabilised against light degradation and contain in the polymer molecule the grouping



in which R denotes hydrogen or alkyl with 1-5 C atoms.

4,102,871
COPOLYAMIDES FROM LACTAM AND DIAMINE SALTS OF TWO DIFFERENT DICARBOXYLIC ACIDS

Peter Horn, Ludwigshafen; Hanns-Dietmar Haertl, Bruebl, and Karl Heinz Illers, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 17, 1976, Ser. No. 658,527
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1975, 2509791
Int. Cl.² C08G *69/14*
U.S. Cl. 528—324 2 Claims

1. A copolyamide hot-melt adhesive consisting essentially of the polymeric condensation product of

A. from 20 to 60 percent by weight based on the weight of copolyamide, of caprolactam and

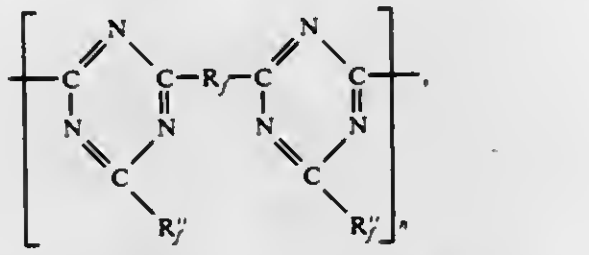
B. from 80 to 40 percent by weight based on the weight of copolyamide, of a mixture of
  (a) the piperazine salt of adipic acid and
  (b) a salt chosen from the group consisting of the piperazine salt of dodecanedicarboxylic acid, the 2,2-bis-4-aminocyclohexyl-propane salt of dodecanedicarboxylic acid and the bis-hexamethylenetriamine salt of dodecanedicarboxylic acid, wherein the weight ratio of constituent (a) to constituents (b) in component B) is from 25 to 35 : 35 to 45.

4,102,872
FLUOROCARBON TRIAZINE POLYMERS

Warren R. Griffin, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,561
Int. Cl.² C08G *73/06, 73/00*
U.S. Cl. 528—362 7 Claims

1. A linear fluorocarbon triazine polymer consisting essentially of recurring units having the following formula:



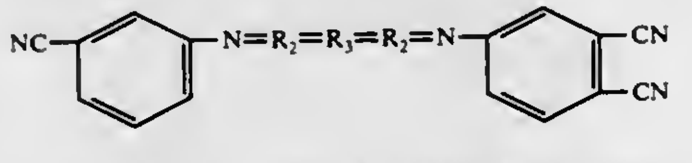
in which R_f is —$(CF_2)_4OCH_2(CF_2)_3CH_2O(CF_2)_4$— or —$(CF_2)_4OCH_2(CF_2)_4OCH_2$— $(CF_2)_3CH_2O(CF_2)_4CH_2O(CF_2)_4$—; R_f' is a perfluoroalkyl radical containing 1 to 12, inclusive, carbon atoms; and *n* is an integer equal to the number of recurring units.

4,102,873
ELECTRICAL CONDUCTING PHTHALONITRILE POLYMERS

James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 681,087, Apr. 28, 1976, Pat. No. 4,057,569. This application Oct. 20, 1977, Ser. No. 843,907
Int. Cl.² C08G *73/00*
U.S. Cl. 528—331 9 Claims

1. A cyano-condensation resin obtained by heating one or more bisorthodinitriles of the general formula



wherein R_2 is an isomer of an aromatic dialdehyde selected from the class consisting of phthalaldehyde, napthalene dialdehyde, phenanthrene dialdehyde, anthracene dialdehyde, diphenyl dialdehyde and terphenyl dialdehyde; and R_3 is an isomer of an aromatic diamine selected from the class consisting of benzene diamine, napthalene diamine, phenanthrene diamine, biphenyl diamine, terphenyl diamine to a temperature above the melting point thereof.

4,102,874
PREPARATION OF ORGANIC POLYSULFIDE POLYMERS USING HEAVY RESIDUES FROM VINYLCHLORIDE MANUFACTURE

Fernand Peerts, Heverlee, and Yvon Delannois, Tessenderlo, both of Belgium, assignors to Tessenderlo Chemie S.A., Tessenderlo, Belgium

Continuation-in-part of Ser. No. 593,385, Jul. 7, 1975, Pat. No. 4,025,495. This application May 10, 1977, Ser. No. 795,600
Claims priority, application France, Jul. 11, 1974, 74 24082
Int. Cl.² C08G *75/16*
U.S. Cl. 528—387 13 Claims

1. In a process for abating a waste disposal problem in the manufacture of vinyl chloride wherein 1,2 dichloroethane is an intermediate and a heavy residue is recovered as still bottoms, from the purification by distillation of dichloroethane and/or vinyl chloride having an organic-origin chloride content ranging between 55 and 80% by weight, said process comprising reacting said heavy residue at 50° to 100° C., in aqueous medium with an alkali metal or an alkaline earth metal polysulfide, the proportion of polysulfide being equal at least to 30% by weight of the molar theoretical quantity, the average sulfur rank of polysulfide being more than 1 and up to and including 5, the pH of the reaction medium not exceeding 10.5 when the reaction is completed, and the obtained precipitate being separated from the reaction mother liquor, said precipitate being organic polysulfide polymers containing 4–80% by weight of sulfur

wherein the improvement comprises the intermediate steps prior to the separation of the precipitate from the mother liquor of:
  (a) at the end of the reaction, adding an additional quantity of heavy residue amounting to 10–80% by weight of the quantity of the initially added heavy residue; and
  (b) acidifying the reaction medium to a pH lower than 5 to coagulate the resultant polymer precipitate.

4,102,875
AROMATIC SULFIDE/SULFONE POLYMER PRODUCTION

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 22, 1976, Ser. No. 698,576
Int. Cl.² C08G *75/16*
U.S. Cl. 528—388 8 Claims

1. A process for the production of aromatic sulfide/sulfone polymers of increased molecular weight which comprises contacting without a prior dehydration step to remove water a mixture consisting essentially of

(a) at least one dihalo aromatic sulfone,
(b) at least one at least partially hydrated alkali metal sulfide selected from the group consisting of sodium sulfide, potassium sulfide, rubidium sulfide, and cesium sulfide, and
(c) at least one organic amide under polymerization conditions for a period of time sufficient to form a high molecular weight aromatic sulfide/sulfone polymer.

4,102,876
QUATERNARY PHOSPHONIUM IONOMERS

Douglas Brenner, Livingston, and Alexis A. Oswald, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 18, 1977, Ser. No. 788,312
Int. Cl.² C08G *75/00;* **C08L** *19/00*
U.S. Cl. 526—19 24 Claims

1. Ionomers having the general formula

$$C—A^-(F)^+$$

wherein C is one of a plurality of carbon atoms comprising a portion of the polymer backbone chain of carbon atoms or is in an acyclid, alicyclic or aromatic radical which is pendant to the backbone chain and wherein said ~C~ is (1) in a single polymer molecule, (2) in the same polymer molecule, and (3) in different polymer molecules; A is one or more anionic acid radicals covalently bonded to one or more of said ~C~ carbon atoms; and (F)+ is one or more mono or polyvalent quaternary phosphonium cationic counterions partially or completely neutralizing said anionic acid radicals.

4,102,877

CYCLIZATION OF PEPTIDES

Ruth F. Nutt, Green Lane, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 28, 1976, Ser. No. 709,568

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. The process which comprises dissolving one part of a peptide, selected from the group consisting of the linear hexapeptide L-leu-gly-L-pro-L-phe-L-ala-gly, and the protected linear decapeptide L-val-(tos)-L-orn-L-leu-D-phe-L-pro-L-val-(tos)-L-orn-L-leu-D-phe-L-pro in a substantially anhydrous polar organic solvent comprising dimethylformamide adjusted to a pH of about 6–8 with triethylamine; suspending in this solution about one to fifteen parts of isopropylcarbodiimide bound to an insoluble polystyrene resin-support; stirring the resulting mixture at a temperature of about 25° C. for a period of about 15 to 36 hours, whereupon a peptide-cyclizing reaction occurs to produce a reaction mixture consisting of the insoluble resin-support (having bound thereon substantially all by-products formed in the reaction) suspended in a solution of the corresponding cyclic peptide, selected from the group consisting of cyclo-(L-leu-gly-L-pro-L-phe-L-ala-gly) and cyclo-(L-val-(tos)-L-orn-L-leu-D-phe-L-pro-L-val-(tos)-L-orn-L-leu-D-phe-L-pro), substantially free of said by-product impurities; separating the insoluble resin-support from the solution of said cyclic peptide; and evaporating this solution to produce the said cyclic peptide in substantially pure form, and in substantially quantitative yield.

4,102,878

PROCESS FOR THE PREPARATION OF THE CHOLECYSTOKININ-PANCREOZYMIN OCTAPEPTIDE AMIDE SULFATE ESTER

Botond Penke; Lajos Balaspiri, both of Szeged, Hungary; Péter Pallai, Rockville, Md.; Kálmán Kovács, Szeged, Hungary; Vince Varró, Szeged, Hungary; János Lonovics, Szeged, Hungary; László Varga, Szeged, Hungary; György Dobó, Budapest, Hungary; Géza Iványi, Taksony, Hungary; Lajos Kovács, Budapest, Hungary; Miklós Lów, Budapest, Hungary, and Judit Lów, née Kaloczy, Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

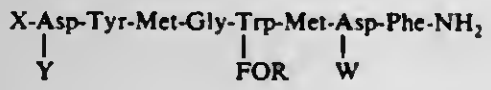
Filed Apr. 28, 1977, Ser. No. 792,043

Claims priority, application Hungary, May 5, 1976, RI 589

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. A process for the preparation of L-aspartyl-(O-sulfato-L-tyrosyl)-L-methionyl-glycyl-L-tryptophyl-L-methionyl-L-aspartyl-L-phenylalanine amide, which comprises treating the protected octapeptide amide of the formula



$$\underset{\displaystyle Y}{\text{X-Asp}}\text{-Tyr-Met-Gly-}\underset{\displaystyle FOR}{\text{Trp}}\text{-Met-}\underset{\displaystyle W}{\text{Asp}}\text{-Phe-NH}_2$$

wherein

X is BOC, Cbz or Ddz,

Y is O^{t}Bu, OBzl or OH and

W is O^{t}Bu, OBzl or OH,

a catalytically effective ether solvent in the presence of an ether with excess of a complex compound sulfur trioxide and a tertiary amine containing at least one alkyl group, converting the obtained sulfate ester of the protected octapeptide amide into an alkali metal salt and simultaneously removing the formyl group from the tryptophan unit by reacting the sulfate ester with an alkali metal hydroxide, and then splitting off the remaining protective groups by acidolysis.

4,102,879

UNSYMMETRICAL AZOMETHINE 1:2-CHROMIUM COMPLEX DYES

Hans Baumann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

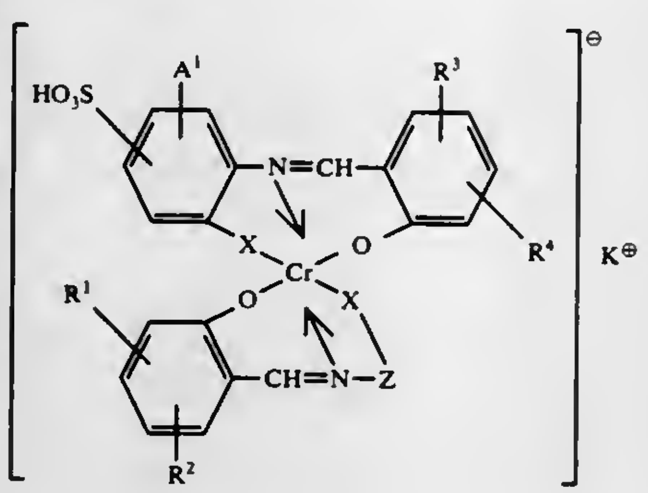
Filed Dec. 29, 1975, Ser. No. 644,958

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1975, 2501469

Int. Cl.² C09B *45/16, 55/00;* **C07F** *11/00*

U.S. Cl. 260—149 **6 Claims**

1. an unsymmetric azomethine 1:2-chromium complex dye of the formula



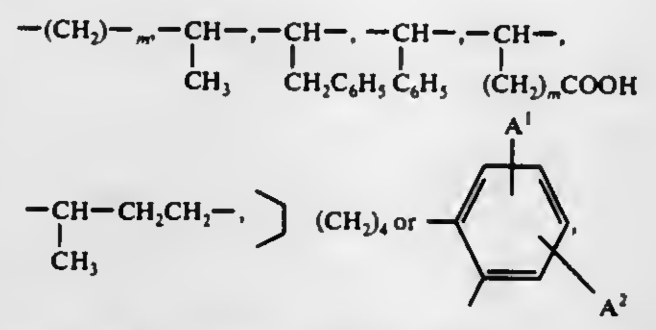
Ia

wherein the anion is shown in its free acid form,

A^1 is hydrogen, hydroxysulfonyl, chlorine, bromine, methyl, methoxy, ethoxy, nitro, alkanoylamino of 1 to 4 carbon atoms or benzoylamino, R^1 is hydrogen, chlorine, bromine, nitro, hydroxysulfonyl, phenylazo, phenylazo substituted by chlorine, bromine, methyl, methoxy, ethoxy, nitro or hydroxysulfonyl, or naphthylazo substituted by hydroxysulfonyl, R^2 is hydrogen, chlorine, bromine or nitro, R^1 and R^2 together are a fused benzene ring, R^3 and R^4 independently of one another have the meanings given for R^1 and R^2,

X is —O— or —COO—,

Z is



A^2 is hydrogen, chlorine, bromine, sulfamoyl or sulfamoyl substituted once or twice by C_1— to C_4-alkyl, phenyl, tetra-, penta- or hexamethylene or —CH_2—$CH_2OCH_2CH_2$—, m is 1, 2 or 3, and

K is a cation.

4,102,880

BENZOYLATED DEHYDROTHIO-P-TOLUIDINE SULFONIC ACID-AZO-PYRIDONE DYES

Karl Seitz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

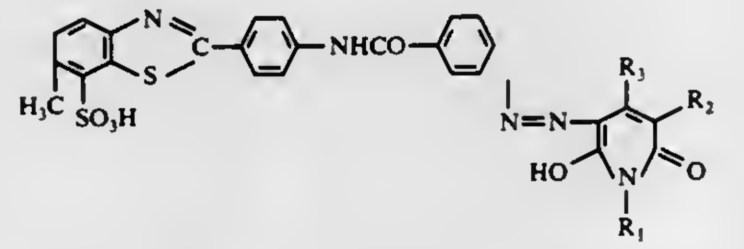
Filed May 5, 1977, Ser. No. 794,286

Claims priority, application Switzerland, May 21, 1976, 6446/76

Int. Cl.² C09B *29/36;* **D06P** *1/06, 3/16, 3/24*

U.S. Cl. 260—156 **3 Claims**

1. An azo dye of the formula



wherein R_1 is hydrogen, alkyl, cyclohexyl, β-aminoethyl or β-hydroxyethyl;

R_2 is hydrogen, cyano, chloro, sulfo, carbamoyl, sulfoalkyl, nitro, acetylamino or chloroacetylaminomethyl; and

R_3 is alkyl, 4'-methoxy-3'-sulfophenyl, or sulfomethyl.

4,102,881

BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto; Hideaki Natsugari, Osaka; Kanji Meguro, and Yutaka Kuwada, both of Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

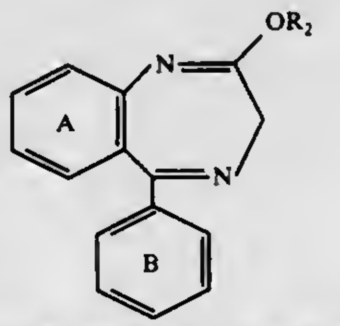
Continuation of Ser. No. 128,507, Mar. 26, 1971, abandoned. This application Jun. 12, 1974, Ser. No. 478,823

Claims priority, application Japan, Mar. 27, 1970, 50-25804; Mar. 27, 1970, 50-25805; Apr. 23, 1970, 50-34950; May 28, 1970, 50-46637

Int. Cl.² C07D *243/48*

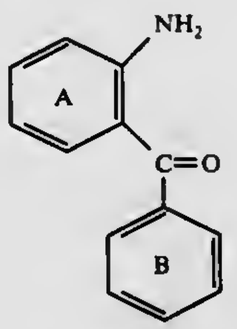
U.S. Cl. 260—239 BD **3 Claims**

1. A process for producing a compound of the formula



wherein R_2 is lower alkyl and each of rings A and B is unsubstituted or substituted by a member selected from the group consisting of nitro, trifluoromethyl, halogen, alkyl having up to 4 carbon atoms and alkoxy having up to 4 carbon atoms, which consists essentially of

reacting a compound of the formula

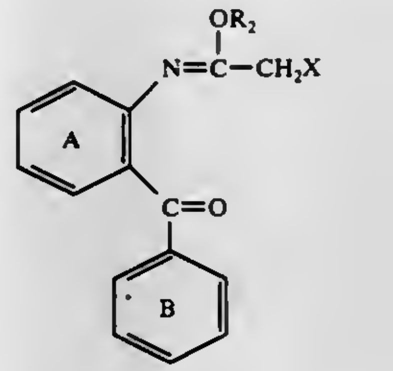


wherein rings A and B are as defined above, with a compound of the formula

$XCH_2C(OR_2)_3$

wherein X is halogen and R_2 is as defined above,

isolating and reacting the resultant compound of the formula

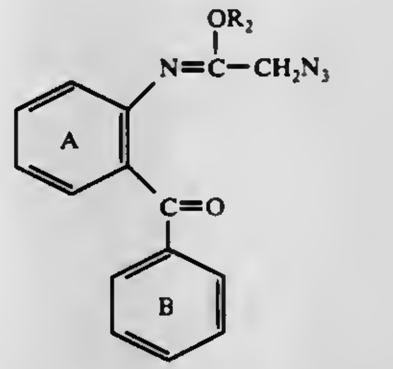


wherein X, R_2 and rings A and B are as defined above, with a compound of the formula

MN_3

wherein M is an alkali metal, and

isolating and subjecting the resultant compound of the formula



wherein R_2 and rings A and B are as defined above, to reductive ring-closure in the presence of a solvent and a reducing agent selected from the group consisting of (1) a compound of the formula

$P(R_4)_3$

wherein R_4 is alkyl having 1–4 carbon atoms, benzyl or phenyl, and (2) a combination of zinc powder and aqueous ammonium chloride, at a temperature of from room temperature to the boiling point of the solvent.

4,102,882

PROCESS TO PREPARE NOVEL ANTIBIOTIC COMPOUNDS

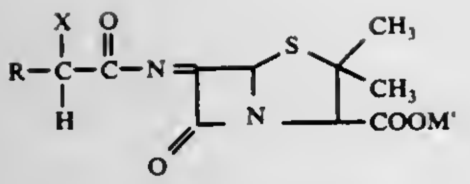
Raymond A. Firestone, Fanwood; Lovji D. Cama, and Burton G. Christensen, both of Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 615,856, Sep. 23, 1975, Pat. No. 4,041,029, which is a division of Ser. No. 340,803, Mar. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 203,056, Nov. 29, 1971, abandoned. This application Feb. 14, 1977, Ser. No. 768,234

Int. Cl.² C07D *499/68, 499/70, 499/02*

U.S. Cl. 260—239.1 **2 Claims**

1. The compound



wherein R is a phenyl or thienyl or furyl;
X is hydrogen, amino, or carboxyl;
M' is benzyl, benzhydryl, trimethylsilyl, trichloroethyl, methoxymethyl, benzoylmethyl, or methoxybenzyl.

4,102,883

19,8-LACTONE STEROID DERIVATIVES AND PROCESSES OF PREPARATION THEREOF

Gunther Kruger, St. Laurent, Canada, assignor to Steele Chemicals Co. Ltd., Pointe Claire, Canada

Continuation-in-part of Ser. No. 497,724, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 215,669, Jan. 5, 1972, Pat. No. 3,849,402. This application Jul. 9, 1976, Ser. No. 703,824

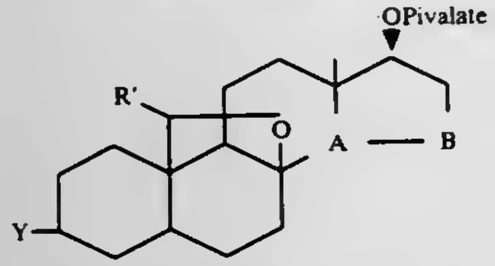
Claims priority, application Canada, Jan. 4, 1972, 131674

Int. Cl.² C07J *71/00*

U.S. Cl. 260—239.55 R **23 Claims**

1. A compound of the formula

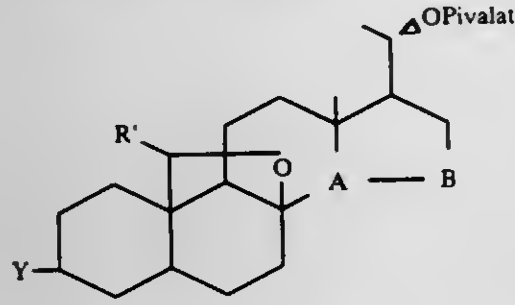
(I)



wherein A and B represent 14- and 15-carbon atoms, respectively, which are either linked by a double bond, or which carry an α- or β-oxido or a 14α- or β-hydroxy group in which case B is a methylene group; Y is =O, 3α or 3β-OH, ^2H, ^3H, O-alkyl, O-acyl or H; R' is OH, =O or acetoxy; the 5-hydrogen atom is either in the α or β position; and the Δ4, Δ5(6) and Δ6 dehydro derivatives thereof.

2. A compound of the formula

(II)



wherein A and B represent 14- and 15-carbon atoms, respectively, which are either linked by a double bond, or which carry an α- or β-oxido or a 14α- or β-hydroxy group in which case B is a methylene group; Y is =O, 3α or 3β-OH, ^2H, ^3H, O-alkyl, O-acyl or H; R' is OH, =O or acetoxy; the 5-hydrogen atom is either in the α or β position; and the Δ4, Δ5(6) and the Δ7 derivatives thereof.

4,102,884

14 β-HYDROXY 3-DEOXYCARDENOLIDES

Gunther Kruger, St. Laurent, Canada, assignor to Steele Chemicals Co. Ltd., Pointe Claire, Canada

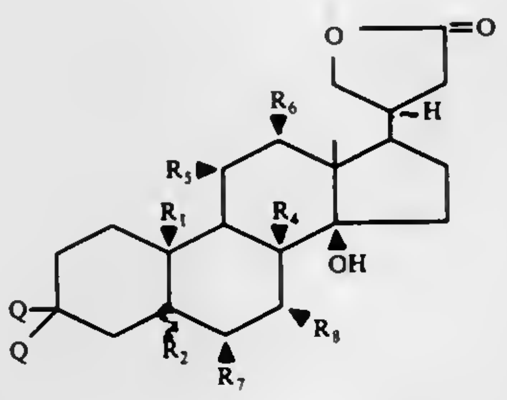
Filed May 5, 1976, Ser. No. 683,843

Claims priority, application United Kingdom, May 7, 1975, 19144/75

Int. Cl.² C07J *17/00*

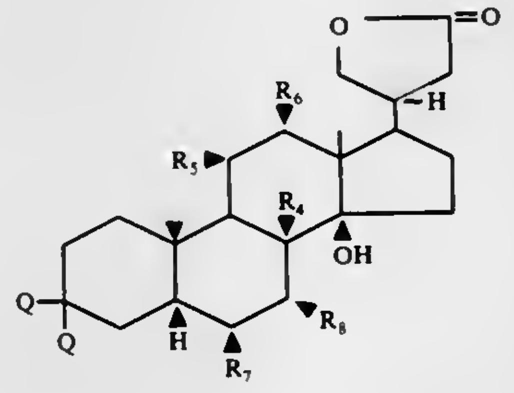
U.S. Cl. 260—239.57 **51 Claims**

1. A 19-oxygenated steroid compound of the formula



wherein
Q is selected from the group consisting of hydrogen, deuterium and tritium;
R_1 is selected from the group consisting of CH_2OH, the tetrahydropyranyl ether of CH_2OH, the p-toluenesulfonate of CH_2OH, CHO, CH_2Br, COOH, $COOCH_3$ and CH_2O-acyl, wherein acyl is formyl, acetyl, heptafluoropropionyl, pivalyl, heminalonyl or hemisuccinyl;
R_2 is α or β—H;
R_4, R_5, R_7 and R_8 are each selected from the group consisting of H and OH;
R_6 is H, OH or =O; and
the Δ1, Δ2, Δ3, Δ4, Δ5(6), Δ6, Δ7, Δ9(11), Δ11 and Δ20(22) dehydro analogues thereof.

3. A 19-methyl steroid compound of the formula



wherein
Q is selected from the group consisting of deuterium and tritium;
R_4, R_5, R_7 and R_8 are each selected from the group consisting of H and OH; and
R_6 is selected from the group consisting of H, OH, =O, acetoxy and formyloxy with the proviso that when R_6 is H, Q is other than H; and
the Δ1, Δ2, Δ3, Δ4, Δ5(6), Δ6, Δ7, Δ9(11), Δ11 and Δ20(22) dehydro analogues thereof.

4,102,885

PROCESS FOR PREPARING 2,4-DIHALOQUINAZOLINES

Ronnie Ray Crenshaw, Dewitt; George Michael Luke, Lafayette, and Richard Anthony Partyka, Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

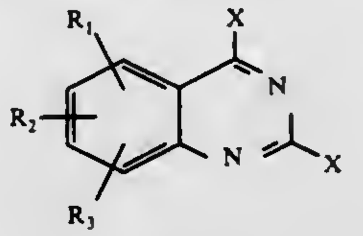
Filed Jun. 20, 1977, Ser. No. 807,938

Int. Cl.² C07D *239/95*

U.S. Cl. 544—283 **10 Claims**

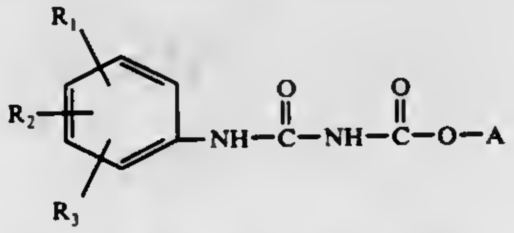
1. A process for preparing a compound of formula I

(I)



wherein
X is halogen selected from the group consisting of chlorine and bromine; and
R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms inclusive and lower alkoxy of 1 to 4 carbon atoms inclusive;
which comprises treating a compound of formula II

(II)



wherein R_1, R_2 and R_3 are as above and A is methyl or phenyl with a reagent selected from the group consisting of (a) hydrogen chloride in phosphorus oxychloride, (b) hydrogen bromide in phosphorus oxybromide, (c) phosphorus oxychloride and N,N-dimethylaniline, and (d) phosphorus oxybromide and N,N-dimethylaniline and thereafter completing the cyclization and halogenation reaction by heating at reflux temperature to produce the quinazoline compound of formula I.

4,102,886

PROCESS FOR THE PREPARATION OF BENZO(a)QUINOLIZIDINE DERIVATIVES

Csaba Szantay; Lajos Szabo; Laszlo Toke; Istvan Toth; Sandor Virag; Erzsebet Kanyo, and Agoston David, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Oct. 21, 1975, Ser. No. 624,470

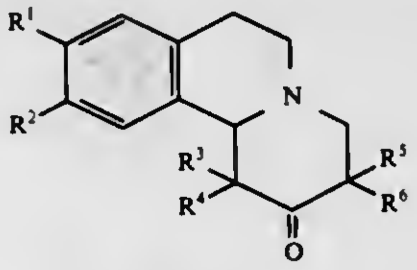
Claims priority, application Hungary, Oct. 23, 1974, CI 1514; Sep. 11, 1975, CI 1603

Int. Cl.² C07D *455/06*

U.S. Cl. 260—287 CF **3 Claims**

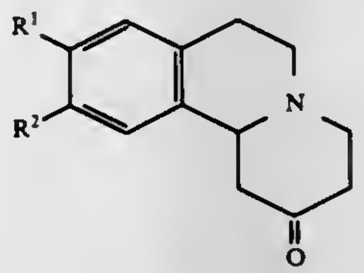
1. A process for the preparation of a compound of the formula

(I)



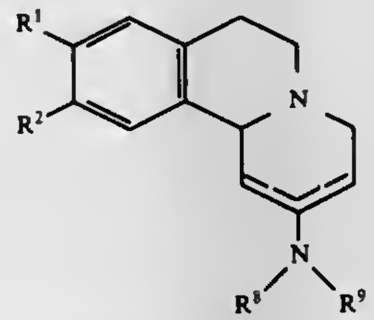
or a salt thereof wherein
R^1 and R^2 are each hydrogen or a C_1 to C_4 alkoxy group, or together form a methylenedioxy group;
one of R^3, R^4, R^5 and R^6 is $—(CH_2)—(CH_2)_n—R^7$ and each remaining moiety is a hydrogen;
R^7 is cyano, carboxy or alkoxycarbonyl wherein the alkoxy group has 1 to 7 carbon atoms; and
n is 0,1 or 2; which comprises the steps of
(a) reacting a compound of the formula

(II)



with an organic secondary amine;
(b) reacting in a predetermined solvent the resulting enamine

(III)



thus obtained, wherein R^8 and R^9 each represent a C_1 to C_5 alkyl group, or together with the adjacent nitrogen atom form a 5- or 6- membered heterocyclic ring, with a compound of the formula:

$$CH_2{=}CH—(CH_2)_n—R^{10} \qquad (IV)$$

wherein R^{10} is a cyano group, carboxy or alkoxycarbonyl wherein the alkoxy group has 1 to 7 carbon atoms; and
(c) treating the reaction mixture of step (b) with water to yield the compound of Formula I or said salt thereof, wherein the position of substitution in step (b) is determined by the use of a polar protic solvent for causing substitution at R^5 or R^6 and an apolar solvent for causing substitution at R^3 or R^4.

4,102,887

INTERMEDIATES USED IN THE PREPARATION OF PHENYL-PYRIDYLAMINE DERIVATIVES

Per Arvid Emil Carlsson, Torild Wulffsgatan 50, S-143 19 Göteborg; Bernt Sigfrid Emanuel Carnmalm, Tornrosavagen 14; Svante Bertil Ross, Hedvagen 8, both of, S-151 52 Södertalje, and Carl Bengt Johan Ulff, Agardevagen 9, S-151 47 Sodertalje, all of Sweden

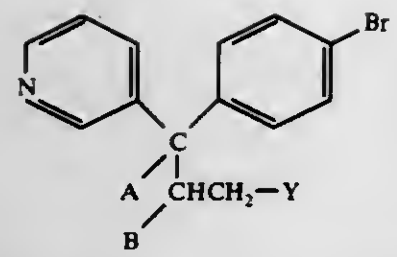
Continuation-in-part of Ser. No. 632,698, Nov. 17, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,056

Claims priority, application Sweden, Nov. 21, 1974, 7414622

Int. Cl.² C07D *213/26, 213/52*

U.S. Cl. 260—290 HL **5 Claims**

1. A compound useful as an intermediate for the preparation of therapeutically valuable phenyl-pyridyl derivatives, which compound is characterized by the formula



or an acid addition salt thereof, wherein Y is a member selected from the group consisting of a halogen, a methanesulfonyloxy group, a toluenesulfonlyloxy group and a benzenesulfonyloxy group and A and B together form a second bond or A is OH and B is H.

4,102,888
3-THIAZOLIDINYL HEPTANOIC ACIDS

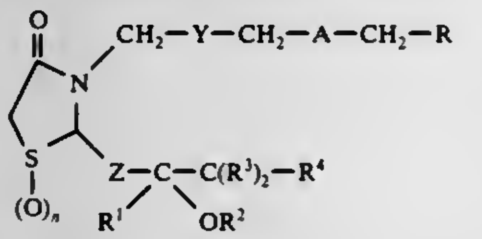
Robert L. Smith, Lansdale; Ta-Jyh Lee, Hatfield, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 689,311, May 24, 1976, Pat. No. 4,059,587. This application Apr. 20, 1977, Ser. No. 789,047

Int. Cl.² C07D *277/14*

U.S. Cl. 260—294.8 D **16 Claims**

1. The compound of the formula



wherein

- R is carboxy, a carboxy salt having the formula -COO^-M^+ in which M is a pharmaceutically acceptable cation derived from a metal or an amine, or derivatized carboxy in which R is selected from alkoxycarbonyl (—$COOR^5$ wherein R^5 is alkyl having 1–10 carbon atoms), carbamoyl (—CO_2NH_2), substituted carbamoyl (—$CONR^6R^7$ wherein R^6 and R^7 are selected from the group consisting of hydrogen, lower alkyl having 1–4 carbon atoms, and diloweralkylaminoalkyl having 4–7 carbon atoms), and carbazoyl (—$CONHNH_2$);
- A is selected from the group consisting of methylene and oxygen;
- Y is selected from the group consisting of ethylene, vinylene, and ethynylene;
- n is 0, 1, or 2;
- Z is selected from the group consisting of ethylene and vinylene;
- R^1 is hydrogen or methyl;
- R^2 is hydrogen or lower alkanoyl of from 1–5 carbon atoms;
- R^3 is hydrogen or methyl; and
- R^4 is OR^{4a} wherein R^{4a} is alkyl of from 2–5 carbon atoms or branched alkyl of from 3–5 carbon atoms, 3,3,3-trifluoropropyl, 5- or 6-membered heterocyclic ring selected from pyridyl, furyl, or furfuryl, or phenyl in which the phenyl ring can be substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy, or trifluoromethyl;

or when R^1 and R^3 are hydrogen, R^2 and R^4 together are 1,2-ethylene or 1,3-propylene.

4,102,889
1,2,4-TRIAZOLES

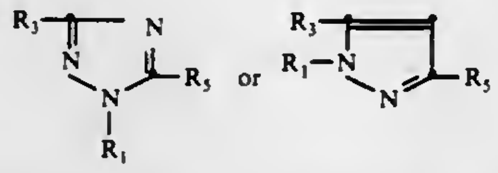
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 543,563, Jan. 23, 1975, abandoned, which is a division of Ser. No. 392,842, Aug. 29, 1973, Pat. No. 3,879,404, which is a division of Ser. No. 269,685, Jul. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,785, Sep. 25, 1970, abandoned. This application Nov. 9, 1976, Ser. No. 740,290

Int. Cl.² C07D *401/04*

U.S. Cl. 260—296 R **6 Claims**

1. A compound of the formula



and the amine oxides and non-toxic salts thereof, wherein

- R_1 is hydrogen, lower alkyl, lower alkanoyl, benzyl, carbamoyl or di- lower alkylcarbamoyl;
- R_3 is napthyl, halophenyl, dihalophenyl, aminophenyl, diloweralkylaminophenyl, loweralkanoylaminophenyl, monoloweralkoxyphenyl, or diloweralkoxyphenyl and
- R_5 is pyridyl.

4,102,890
2-AMINO OXAZOLINES AND PROCESS FOR MAKING THE SAME

Charles Malen, Fresnes; Monique Desnos, Issy Les Moulineaux; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures S/Yvette, all of France, assignors to Science-Union et Cie, Societe Francaise de Recherche Medicale, Neuilly-sur-Seine, France

Division of Ser. No. 427,999, Dec. 26, 1973, Pat. No. 3,988,464. This application Aug. 11, 1976, Ser. No. 713,381

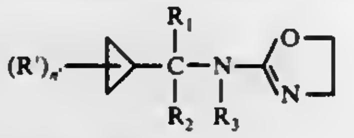
Claims priority, application France, Dec. 28, 1972, 72 59886

Int. Cl.² C07D *263/28*

U.S. Cl. 260—307 F **3 Claims**

1. A compound selected from the group consisting of:

a. cyclopropylmethylamines of the formula



wherein each of

- R_1 and R_2 independently represents a hydrogen atom, a lower-alkyl radical, a cyclopropyl radical, or an alkyl cyclopropyl radical;
- R' represents a hydrogen atom or a lower-alkyl radical;
- R_3 represents a hydrogen atom or a lower-alkyl radical;
- n' represents 0, 1, or 2; **and**

b. physiologically acceptable acid addition salts thereof with a mineral or organic acid.

4,102,891
1-(2-HALOGENO-2-PHENYL-ETHYL)-TRIAZOLES

Helmut Timmler; Karl Heinz Büchel, both of Wuppertal; Wilsen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

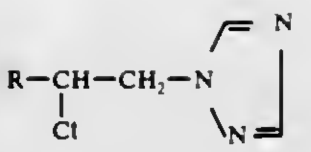
Filed Oct. 6, 1976, Ser. No. 729,930

Claims priority, applicatioo Fed. Rep. of Germany, Oct. 27, 1975, 2547954

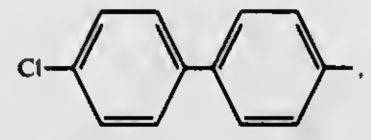
Int. Cl.² A01N *9/22;* A61K *31/41;* C07D *249/08*

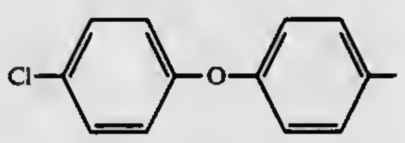
U.S. Cl. 260—308 R **4 Claims**

1. A compound of the formula

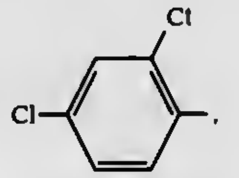


in which R is





or



or a salt thereof with a physiologically tolerated acid.

4,102,892
PROCESS FOR THE PREPARATION OF COPPER PHTHYLOCYANINE

Heinz-Ewald Baurecht, and Reinbold Hörnle, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 16, 1977, Ser. No. 778,117

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611545

Int. Cl.² C09B *47/06*

U.S. Cl. 260—314.5 **4 Claims**

1. In the process for the preparation of copper phthalocyanine from (a) phthalic anhydride, its reaction products with ammonia or the dehydration products thereof, (b) urea, (c) a copper salt and (d) a catalyst by the baking process; the improvement which comprises feeding components (a) and (b) separately in liquid form to the reaction vessel.

4,102,893
PROCESS FOR THE MANUFACTURE OF COLOR FORMERS OF INDOLES AND ANHYDRIDES OF AROMATIC OR HETEROAROMATIC, VICINAL DICARBOXYLIC ACIDS, NEW COLOR FORMERS OF THESE CLASSES OF SUBSTANCE AND THEIR USE

Robert Garner, Ramsbottom Bury, England, and Max Dunnenberger, Frenkendorf, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

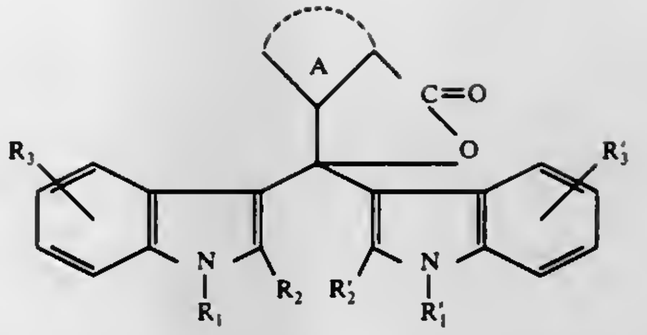
Continuation of Ser. No. 558,598, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 306,670, Nov. 15, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,012

Claims priority, application Switzerland, Nov. 26, 1971, 17239/71; Oct. 12, 1972, 14961/72

Int. Cl.² C07D *209/20*

U.S. Cl. 260—326.14 R **8 Claims**

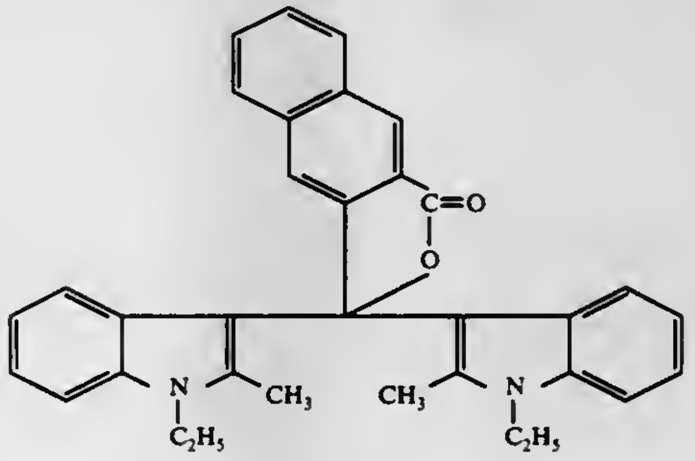
1. A compound of the formula



wherein the ring A is benzene or benzene substituted with halogen or nitro,

- R_2 and R_2' each independently represent hydrogen, lower alkyl, or phenyl,
- R_3 and R_3' each independently represent hydrogen, lower alkyl or lower alkoxy, and
- R_1 and R_1' each independently represent alkyl of 6 to 18 carbon atoms.

8. A compound of the formula:



4,102,894
15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

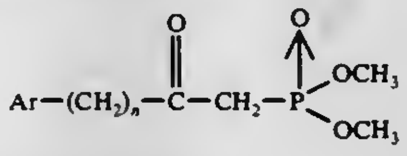
Hans-Jürgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 633,374, Nov. 19, 1975, Pat. No. 3,980,642, which is a division of Ser. No. 485,596, Jul. 3, 1974, Pat. No. 3,956,284, which is a continuation-in-part of Ser. No. 425,517, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,220, Jul. 13, 1972, abandoned. This application Jul. 15, 1976, Ser. No. 705,768

Int. Cl.² C07D *333/22;* A01N *9/36;* C07F *9/40*

U.S. Cl. 260—332.3 R **4 Claims**

1. A compound of the structure:



$$\mathrm{Ar{-}(CH_2)_n{-}\overset{\overset{O}{\|}}{C}{-}CH_2{-}\overset{\overset{O}{\uparrow}}{P}\begin{matrix}OCH_3\\OCH_3\end{matrix}}$$

wherein Ar is α- or β-thienyl;
and n is an integer from 1 to 5.

4,102,895
OXEPANES

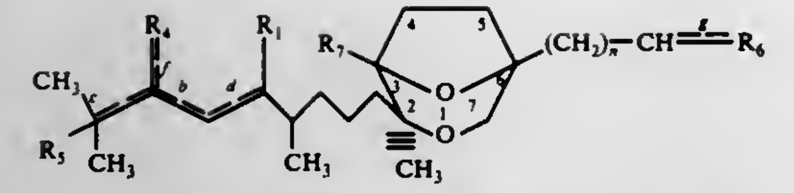
Ramesh M. Kanojla, Somerville; Michael P. Wachter, Bloomsbury, and Robert H. K. Chen, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 18, 1976, Ser. No. 742,940

Int. Cl.² C07D *319/10*

U.S. Cl. 260—340.6 **25 Claims**

1. A compound selected from the group consisting of:



wherein R_1 is -XY wherein X is hydrogen or hydroxy provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy; trialkylsilyloxy; -OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl, and substituted phenyl; a sulfate, nitrate or phosphate radical; thiol; alkylthio; arylthio; halo; amino; alkylamino; dialkylamino; arylamino; and the quaternary ammonium and acid addition salts thereof; acylamino; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl; substituted benzyl; phenyl; substituted phenyl; provided that when d is unsaturated R_1 is either X or V; and R_1 is oxo; thioxo; hydroxyimino; alkoxyimino; aryloxyimino; acyloxyimino; hydrazono; alkylhydrazono; arylhydrazono; arylsulfonylhydrazono; carbamoylhydrazono; ethylenedioxy; dialkoxy; methylenyl; alkyldenyl; alkylimino; or arylimino;

R_4 is hydrogen; methyl or methylenyl;

R_5 is hydrogen; hydroxy; hydroperoxy or —OCOR‴. wherein R‴ is lower alkyl;

R_6 is methylenyl when g is unsaturated, and when g is saturated R_6 is -CHXY wherein X is hydrogen or hydroxy, provided that when X is hydrogen, Y is hydrogen; methyl; hydroxy; lower alkoxy; cycloalkoxy; phenoxy; substituted phenoxy: trialkylsilyloxy; —OCOR′ wherein R′ is lower alkyl, cycloalkyl, phenyl or substituted phenyl; a sulfate, nitrate or phosphate radical; thiol; alkylthio; arylthio; halo; amino; alkylamino; dialkylamino; arylamino; and the quaternary ammonium and acid addition salts thereof; acylamino; —OCONHR wherein R is hydrogen or lower alkyl; and when X is hydroxy, Y is cyano; lower alkyl; lower alkenyl; lower alkynyl; propadienyl; benzyl; substituted benzyl; phenyl; substituted phenyl; and R_6 is —CHZ wherein Z is oxo; thioxo; hydroxyimino; alkoxyimino; aryloxyimino; acyloxyimino; hydrazono; alkylhydrazono; arylhydrazono; arylsulfonylhydrazono; carbamoylhydrazono; ethylenedioxy; dialkoxy; methylenyl; alkylidenyl; alkylimino; or arylimino; or R_6 is carboxy; —COOR′ wherein R′ is lower alkyl or cycloalkyl; phenyl or substituted phenyl; —COR″ wherein R″ is amino, alkylamino, dialkylamino, arylamino, halo, hydrazino, alkylhydrazino, dialkylhydrazino, arylhydrazino, arylsulfonylhydrazino; cyano; and ammonium, alkali metal and alkaline earth metal salts thereof where R_6 is carboxy;

R_7 is hydrogen; hydroxy; lower alkoxy; or —OCOR‴ wherein R‴ is lower alkyl;

and *n* is an integer from 0–5 provided that when b is unsaturated, C, d, & f are saturated.

4,102,896

PREPARATION OF A 5-(2,2-DIHALOVINYL)-4,4-DIMETHYL-2-OXOTETRAHYDROFURAN

Ralph Alexander Raphael, Cambridge, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 25, 1976, Ser. No. 689,934

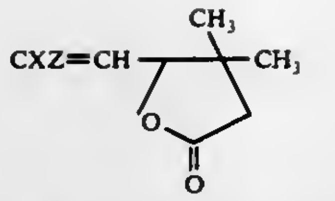
Claims priority, application United Kingdom, May 27, 1975, 23153/75

Int. Cl.² C07D *307/32*

U.S. Cl. 260—343.6 **8 Claims**

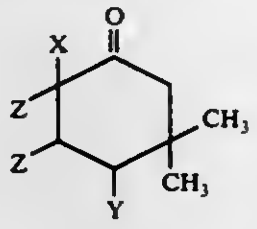
1. A process for the preparation of a compound of formula:

(I)



wherein X and Z are each either chlorine or bromine, which comprises the step of treating a compound of formula:

(II)



wherein Y is chlorine or bromine with either (A) an excess of an alkali metal hydroxide or (B) an excess of an alkali metal hydride followed by bringing the product of alkali metal hydride treatment in contact with water.

4,102,897

DIALKYLACETAL-CONTAINING THROMBOXANE B, 1,9-LACTONE INTERMEDIATES

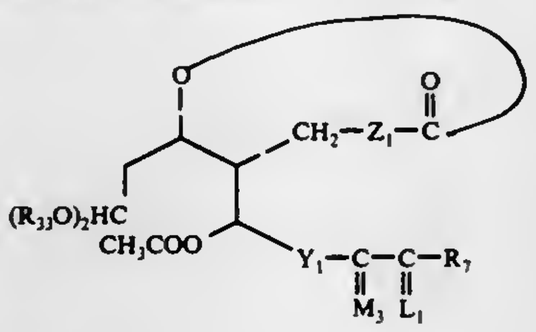
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 716,473, Aug. 20, 1976, Pat. No. 4,070,384, which is a continuation-in-part of Ser. No. 676,894, Apr. 14, 1976, Pat. No. 4,018,804. This application Sep. 6, 1977, Ser. No. 830,538

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **2 Claims**

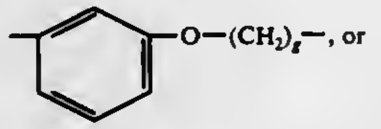
1. A thromboxane intermediate of the formula:



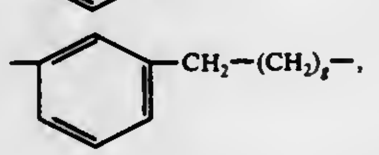
wherein Z_1 is

(1) cis—$CH{=}CH{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(2) cis—$CH{=}CH{-}CH_2{-}(CH_2)_g{-}CF_2$—,
(3) cis—$CH_2{-}CH{=}CH{-}(CH_2)_g{-}CH_2$—,
(4) —$(CH_2)_3{-}(CH_2)_g{-}CH_2$—,
(5) —$(CH_2)_3{-}(CH_2)_g{-}CF_2$—,
(6) —$CH_2{-}O{-}CH_2{-}(CH_2)_g{-}CH_2$—,

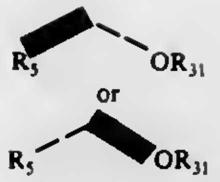
(7)



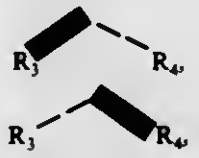
(8)



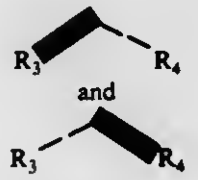
wherein *g* is one, 2, or 3;
wherein Y_1 is trans-CH═CH- or -CH_2-CH_2-;
wherein M_3 is



wherein R_5 is hydrogen or methyl and R_{31} is a hydroxyhydrogen replacing group; wherein L_1 is



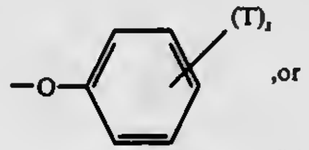
or a mixture of



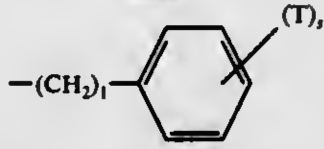
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and wherein R_7 is

(1) —$(CH_2)_m{-}CH_3$,

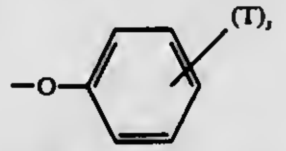
(2)



(3)



wherein *l* is zero, one, two, or three, where *m* is one to 5, inclusive, T is alkyl of one to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is one, two, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_{33} is alkyl of one to 5 carbon atoms inclusive.

4,102,898

ALDEHYDE-CONTAINING THROMBOXANE B, 1,9-LACTONE INTERMEDIATES

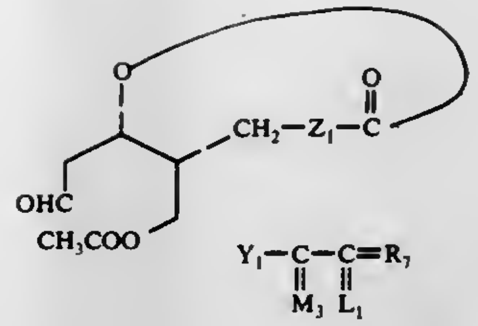
William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 716,473, Aug. 20, 1976, Pat. No. 4,070,384, which is a continuation-in-part of Ser. No. 676,894, Apr. 14, 1976, Pat. No. 4,018,804. This application Sep. 6, 1977, Ser. No. 830,539

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **2 Claims**

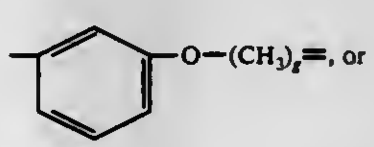
1. A thromoboxane intermediate of the formula:



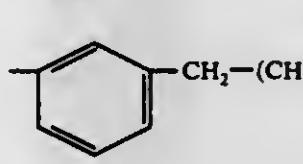
wherein Z_1 is

(1) cis—$CH{=}CH{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(2) cis—$CH{=}CH$ —$CH_2{-}(CH_2)_g{-}CF_2$—,
(3) cis—$CH_2{-}CH{=}CH{-}(CH_2)_g{-}CH_2$—,
(4) —$(CH_2)_3{-}(CH_2)_g{-}CH_2$—,
(5) —$(CH_2)_3{-}(CH_2)_g{-}CF_2$—,
(6) —$CH_2{-}O{-}CH_2{-}(CH_2)_g{-}CH_2$—,

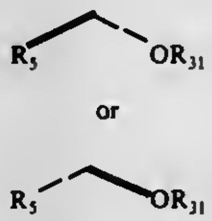
(7)



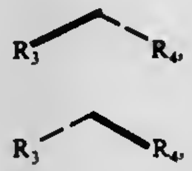
(8)



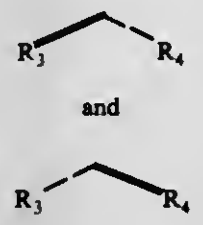
wherein *g* is one, 2, or 3;
wherein Y_1 is trans—CH═CH— or —CH_2—CH_2—;
wherein M_3 is



wherein R_5 is hydrogen or methyl and R_{31} is a hydroxyhydrogen replacing group;
wherein L_1 is

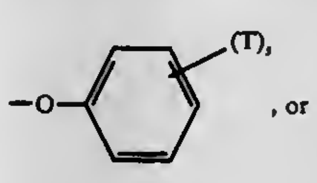


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; and
wherein R_7 is

(2)



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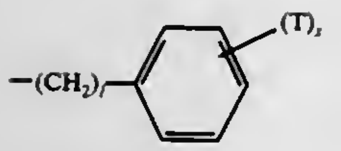
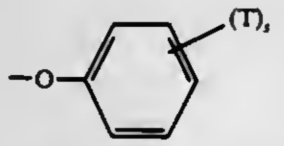


(3)

wherein l is zero, one, two, or three,
wherein *m* is one to 5, inclusive, T is alkyl of one to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is one, two, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is



only when R_3 and R_4 are hydrogen or methyl, being the same or different; and
wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

4,102,899

3-(1'-SILYLOXY-2'-HYDROXYETHYL)-4-HYDROXY-6-OXOHEXANOIC ACID γ LACTONE DERIVATIVES

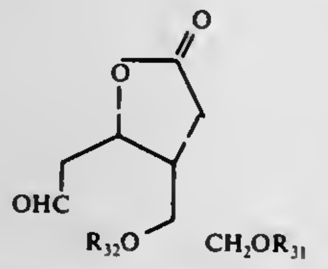
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,089

Int. Cl.² C07D *307/20*

U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_{32} is $-Si(G_1)_3$, wherein G_1 is alkyl of one to four carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one or two fluoro, chloro, or alkyl of one to four carbon atoms, inclusive, with the proviso that the various G_1's are the same or different;
wherein R_9 is an acyl protecting group selected from the group consisting of
- (a) benzoyl;
- (b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different;
- (c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;
- (d) naphthoyl;
- (e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
- (f) alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of
- (a) tetrahydropyranyl;
- (b) tetrahydrofuranyl; and
- (c) a group of the formula

$-C(OR_{11})(R_{12})-CH(R_{13})(R_{14})$,

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c$, wherein *a* is 3, 4, or 5, and *b* is one, 2, or 3, and *c* is one, 2, or 3, with the proviso that *b* plus *c* is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;

wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
- (a) benzyl,
- (b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
- (c) benzhydryl,
- (d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (e) trityl, and
- (f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,102,900

3-(1'-SILYLOXY-3'-HYDROXYETHYL)-4-HYDROXY-6-SILYLOXYHEXANOIC ACID γ LACTONE DERIVATIVES

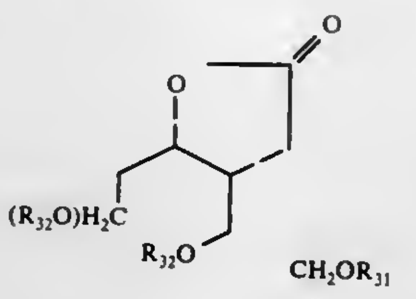
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,096

Int. Cl.² C07D *307/20*

U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_{32} is $-Si(G_1)_3$, wherein G_1 is alkyl of one to four carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one or two fluoro, chloro, or alkyl of one to four carbon atoms, inclusive, with the proviso that the various G_1's are the same or different;

wherein R_9 is an acyl protecting group selected from the group consisting of
- (a) benzoyl;
- (b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different;
- (c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;
- (d) naphthoyl;
- (e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
- (f) alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of
- (a) tetrahydropyranyl;
- (b) tetrahydrofuranyl; and
- a group of the formula

$-C(OR_{11})(R_{12})-CH(R_{13})(R_{14})$,

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c$, wherein a is 3,4, or 5, and b is one, 2, or 3, and c is one, 2, or 3, with the proviso that b plus c is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl; wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of
- (a) benzyl,
- (b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
- (c) benzhydryl,
- (d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,
- (e) trityl, and
- (f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,102,901

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John Peter Clayton, Horsham, and Norman Harold Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

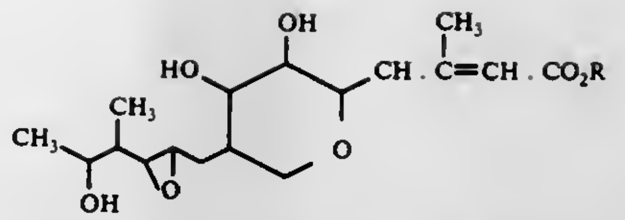
Filed Jun. 6, 1977, Ser. No. 803,466

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.² C07D *309/06;* A61K *31/35*

U.S. Cl. 260—345.8 R **6 Claims**

1. A compound of formula (II):



(II)

wherein R is C_{1-20} alkyl, C_{2-8} alkenyl or C_{2-8} alkynyl.

4,102,902

STEREOSELECTIVE PREPARATION OF HEXAHYDRO DIBENZOPYRANONES AND INTERMEDIATES THEREFOR

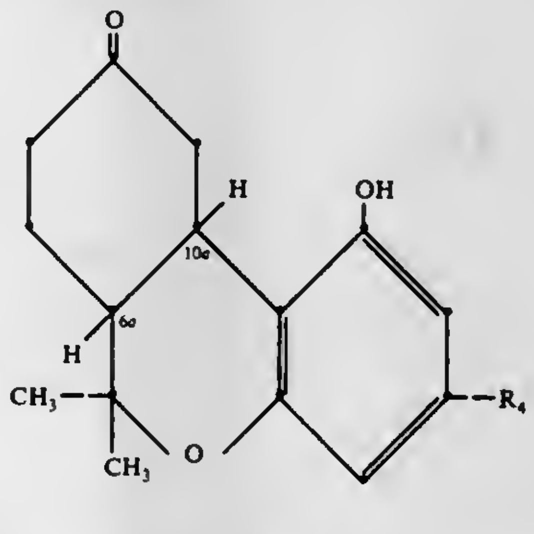
Robert A. Archer, and William A. Day, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 10, 1976, Ser. No. 740,502

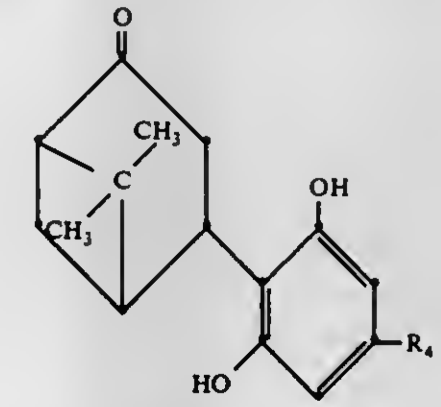
Int. Cl.² C07D *311/80*

U.S. Cl. 260—345.3 **6 Claims**

1. A process for preparing an optically active 6a,10a-cis compound of the formula



wherein:
R_4 is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl and C_5–C_{10} cycloalkenyl; comprising reacting a compound of the formula



with a protonic acid selected from hydrochloric acid, sulfuric acid, phosphoric acid, and para-toluenesulfonic acid in an unreactive organic solvent.

4,102,903

TETRAHYDROPYRAN AND 1,4-DIOXANE POLYCARBOXYLATE COMPOUNDS, METHODS FOR MAKING SUCH COMPOUNDS AND COMPOSITIONS AND METHODS EMPLOYING SAME

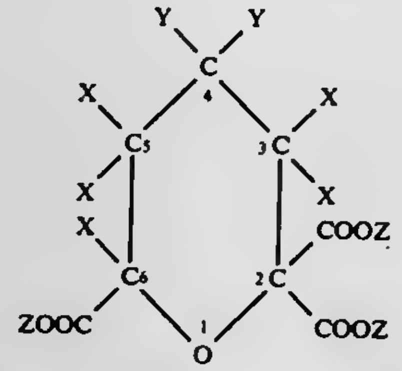
Marvin M. Crutchfield, Creve Coeur, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Flied Jan. 5, 1977, Ser. No. 756,947

Int. Cl.^{2} C07D *309/06;* C11D *3/20*

U.S. Cl. 260—345.7 R **8 Claims**

1. A compound of the molecular structure represented by the formula:



wherein Y is H or lower alkyl (C_1 to C_4), X is selected from the group consisting of H, lower alkyl ($C_1$to C_4), or COOZ, Z is selected from the group consisting of hydrogen, alkali metal, ammonium, and an alkyl group (branched or straight chain) having up to about 20 carbon atoms in the chain.

4,102,904

INTERMEDIATES FOR THE PREPARATION OF ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John Peter Clayton, Horsham, and Norman Harold Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

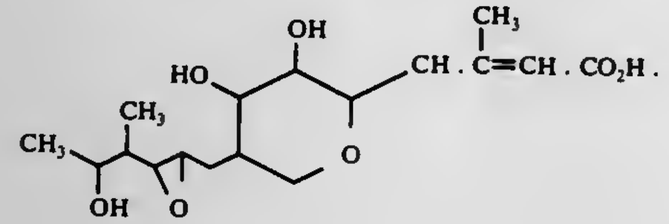
Filed Jan. 6, 1977, Ser. No. 803,467

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.^{2} C07D *309/06;* A61K *31/35*

U.S. Cl. 260—345.7 R **3 Claims**

1. A compound of formula (II), or a salt thereof:



4,102,905

AROMATIC DISULFONE DIANHYDRIDES

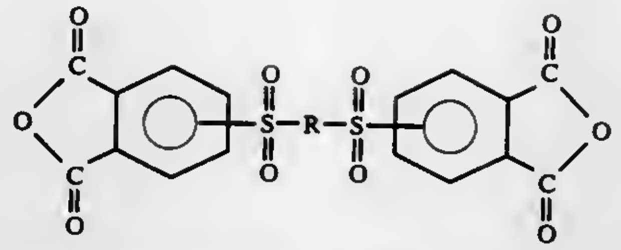
Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,113

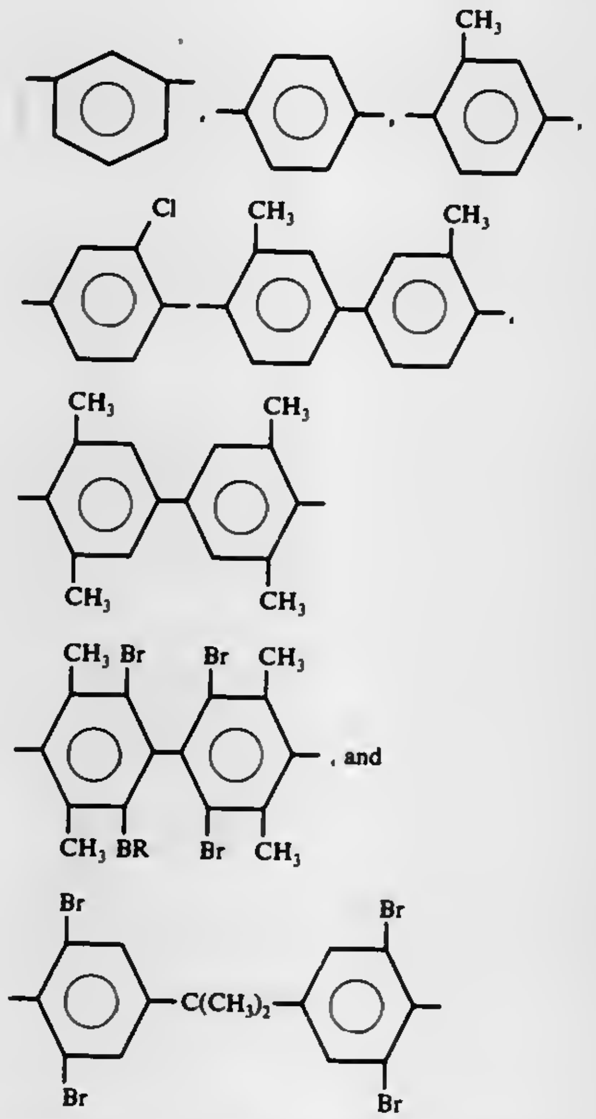
Int. Cl.^{2} C07D *307/89*

U.S. Cl. 260—346.3 **4 Claims**

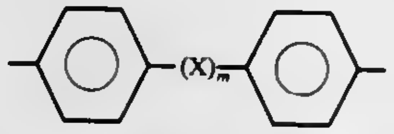
1. A disulfone dianhydride having the general formula



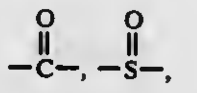
where R is a radical selected from the class consisting of



and divalent organic radicals of the general formula



where X is a member selected from the class consisting of divalent radicals of the formulas, $-C_yH_{2y}-$,



$-\overset{O}{\overset{\|}{C}}-, -\overset{O}{\overset{\|}{S}}-,$

—O—, and —S—, where *m* is 0 or 1, *y* is a whole number from 1 to 5.

4,102,906

PROCESS FOR PREPARING α-AMINO-β′-NITROANTHRAQUINONES

Wolfgang Auge, Odenthal-Hahnenberg; Karl-Werner Thiem, Cologne, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 485,284, Jul. 2, 1974, abandoned. This application May 7, 1976, Ser. No. 684,412

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1973, 2334991

Int. Cl.^{2} C07C *97/24*

U.S. Cl. 260—382 **11 Claims**

1. Process for preparing an α-amino-β′-nitroanthraquinone which comprises reacting an α,β′-dinitroanthraquinone with ammonia in an ether, an aliphatic, a cycloaliphatic or an optionally alkyl-substituted aromatic hydrocarbon, or a mixture of these.

4,102,907

DESULFINYLATION PROCESS FOR PREPARING ANDROSTA-4,9(11)-DIENE-3,17-DIONE

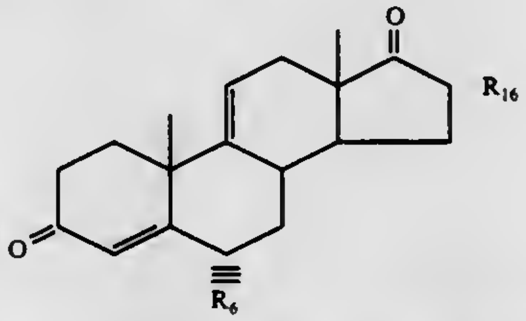
Kenneth P. Shephard, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 7, 1977, Ser. No. 775,128

Int. Cl.^{2} C07J *5/00*

U.S. Cl. 260—397.3 **25 Claims**

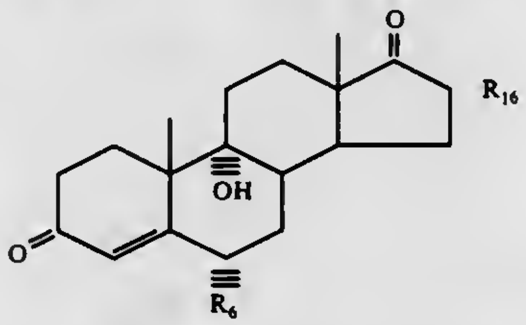
1. A chemical process for the preparation of a steroid of the formula:



III

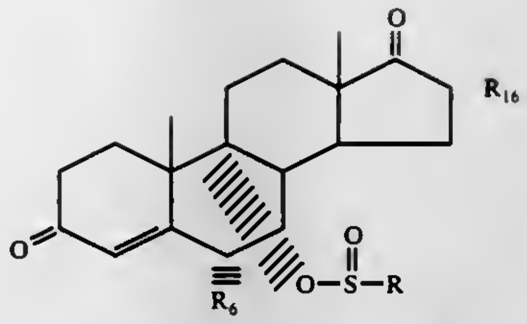
where R_6 is a hydrogen or fluorine atom or methyl group; R_{16} is a hydrogen atom or methyl group and where ~ indicates the attachment of the R_{16} group is in the α or β configuration which comprises

(1) sulfinylating a 9α-hydroxy steroid of the formula:



I

where R_6, R_{16}, and ~ are defined above with a sulfinylating agent of the formula R—SO—X where R is alkyl of 1 through 4 carbon atoms, or phenyl substituted with 0–3 substituents which may be the same or different and are selected from the group consisting of halogen atoms, or methyl, ethyl or nitro groups and where X is a chlorine or bromine atom to form a sulfinate ester of the formula:



II

and

(2) desulfinylating the sulfinate ester (II) by heating to at least 40° in the presence of a support catalyst selected from the group consisting of silica gel or alumina and an acid whose pKa is less than or equal to 5.0.

4,102,908

PROCESS FOR THE PREPARATION OF PREGNANE DERIVATIVES

Helmut Hofmeister; Klaus Annen; Henry Laurent, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,329

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2625306

Int. Cl.^{2} C07J *5/00*

U.S. Cl. 260—397.4 **8 Claims**

1. In a process for the conversion of a 17α-ethynyl-17β-hydroxy steroid to a 17-methyl or ethyl ether or a 17-formyl or acetyl ester of a 17α-hydroxy-17β-acetyl steroid, the improvement which comprises reacting the 17-nitrate ester of the 17α-ethynyl-17β-hydroxy steroid in the presence of a catalytic amount of a mercury salt (a) with formic acid or acetic acid in a dipolar aprotic or basic solvent to produce the 17-formate or 17-acetate ester, respectively, or (b) with methanol or ethanol in a protonic water-miscible solvent in the presence of a mineral acid to produce the 17-methyl or 17-ethyl ether, respectively.

4,102,909

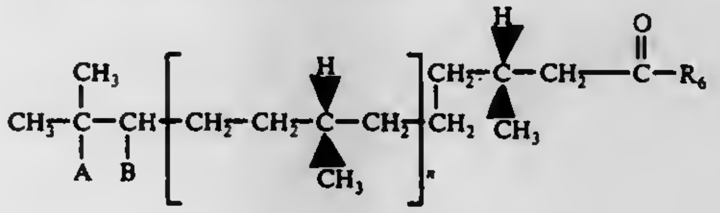
OPTICALLY ACTIVE ESTERS AND AMIDES

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J. Division of Ser. No. 723,401, Sep. 15, 1976, Pat. No. 4,045,475, which is a division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application May 16, 1977, Ser. No. 796,922

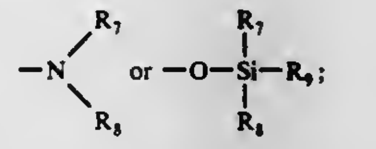
Int. Cl.^{2} C09F *5/00*

U.S. Cl. 260—404 **3 Claims**

1. A compound of the formula:



wherein *n* is an integer of from 0 to 1;
R_6 is lower alkoxy,



n is an integer of from 0 to 1; A and B are hydrogen or taken together form a carbon to carbon bond; and R_7, R_8 and R_9 are lower alkyl.

2. The compound of claim 1 wherein said compound is 3(R),7(R),11-trimethyl-dodecanoic acid dimethyl amide.

4,102,910
DERIVATIVES OF CYCLOPROPANE

Walter Ost, Bingen; Klaus Thomas, Gau-Algesheim, and Ricarda Prokic-Immel, Mainz, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG., Ingelheim am Rhein, Fed. Rep. of Germany

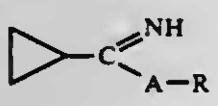
Filed Jun. 20, 1977, Ser. No. 808,435

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2627779

Int. Cl.² C07C *119/18, 123/00*

U.S. Cl. 260—453 RW **4 Claims**

1. A compound of the formula



wherein

A is oxygen or —NH—, and

R is alkyl of 3 to 22 carbon atoms when A is oxygen, or alkyl of 2 to 22 carbon atoms when A is —NH—, or alkenyl of 3 to 18 carbon atoms,

or an acid addition salt thereof.

4,102,911
SULFONATING OR SULFATING METHOD

Kanji Majima; Kensuke Takei, and Keiichi Tsutoo, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 739,010, Jun. 21, 1968, abandoned. This application Apr. 13, 1972, Ser. No. 243,874

Claims priority, application Japan, Jun. 26, 1967, 42-40928

Int. Cl.² C07C *139/04*

U.S. Cl. 260—458 R **6 Claims**

1. In a continuous gas-liquid reaction process for sulfating or sulfonating liquid organic reactant capable of being sulfated or sulfonated by reaction with gaseous sulfur trioxide and being selected from the group consisting of (1) straight chain or branched chain alcohol having 8 to 20 carbon atoms or mixtures thereof, (2) alkyl benzene whose alkyl chain has from 8 to 25 carbon atoms or mixtures thereof, (3) straight or branched chain olefin having 6 to 25 carbon atoms or mixtures thereof, (4) addition product of an alcohol, phenol or fatty acid having 8 to 20 carbon atoms and 1 to 30 mols of alkylene oxide, (5) fatty acid alkylolamide having 10 to 20 carbon atoms, (6) fatty acid having 8 to 20 carbon atoms, esters thereof with a lower alcohol or mixtures thereof, and (7) polyhydric alcohol ester of a fatty acid having 8 to 20 carbon atoms or its alkylene oxide derivatives, wherein said organic reactant is reacted with gaseous sulfur trioxide to obtain a corresponding sulfated or sulfonated reaction product, the improvement which comprises continuously flowing (A) an outer annular stream consisting of said liquid organic reactant upwardly through and substantially filling an annular space of small radial thickness defined between an outer cylindrical member and an inner cylindrical member and thence vertically into the lower end of an elongated vertical cylindrical reaction zone , and continuously flowing upwardly through said inner cylindrical member (B) an inner gaseous stream consisting of a mixture of about 2 to 20% by volume of sulfur trioxide and the balance a gaseous inert diluent, said streams flowing in concurrent substantially parallel vertically upwardly directed flow into and through said elongated vertical cylindrical reaction zone, the entirety of said gaseous stream being disposed within said inner cylinder and isolated from said organic reactant stream prior to entry of said streams into said reaction zone;

said streams flowing upwardly through said reaction zone in gas-liquid contact, said stream of liquid reactant forming a continuous thin annular upwardly rising outer liquid film of substantially uniform thickness on the wall of said reaction zone and extending the entire length thereof, said gaseous stream flowing inside of said liquid film upwardly through the entire length of the reaction zone and having a flow velocity in the range of from about 20 m./sec. to about 130 m./sec., said gaseous stream uniformly contacting said annular liquid film over its entire inner surface in said reaction zone to effect upward movement and mixing of said liquid film whereby the organic reactant and the gaseous sulfur trioxide are mixed and contacted with each other to effect the reaction, and rapidly extracting heat from the resultant reaction mixture as it passes upwardly through the reaction zone;

separating the liquid phase from the gaseous phase after same have left the top of the reaction zone and recovering the reaction product from the liquid phase.

4,102,912
PROCESS TO PREPARE POLYHALODIPHENYL CARBONATES

Dennis James Carr, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 14, 1977, Ser. No. 768,179

Int. Cl.² C07C *68/02*

U.S. Cl. 260—463 **5 Claims**

1. In a method of preparing a polyhalodiphenyl carbonate containing 6 to 10 halogen atoms by reacting a polyhalophenol and a carbonate precursor in the presence of a catalyst in a basic aqueous medium, the improvement comprising carrying out the reaction in a continuous, single stage at a pH in the range of about 10.5 to 11.5 and in the presence of a chlorinated hydrocarbon solvent in which the polyhalodiphenyl carbonate is essentially insoluble and in which color bodies associated with the polyhalophenol starting material are soluble and retained.

4,102,913
PROCESS FOR THE CONTINUOUS MANUFACTURE OF α-CYANO-ETHYLATED ALIPHATIC ALDEHYDES

Boy Cornils; Hans Felchtinger, both of Dinslaken; Willi Nöllen, Oberhausen, and Wolfgang Payer, Wesel, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Apr. 25, 1977, Ser. No. 790,202

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619580

Int. Cl.² C07C *120/00, 121/20, 121/34*

U.S. Cl. 260—465.1 **10 Claims**

1. In the α-cyanoethylation of an aliphatic aldehyde by contacting acrylonitrile with an aliphatic aldehyde capable of cyanoethylation in the presence of an alkali metal hydroxide, the improvement which comprises carrying out the process continuously in a tubular reaction zone at a temperature of 20° to 120° C while maintaining the reactants therein in contact with the alkali metal hydroxide for between 5 and 200 seconds and thereafter removing reaction product and separating the same immediately from the alkali metal hydroxide.

4,102,914
PROCESS FOR PREPARING ACRYLONITRILE

Harold Beuther, Gibsonia; Robert A. Innes, Pittsburgh, and Harold E. Swift, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 20, 1977, Ser. No. 798,755

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **17 Claims**

1. A process for preparing acrylonitrile which comprises passing a gaseous mixture comprising propylene, ammonia and molecular oxygen and a solid ammoxidation catalyst, said catalyst being a catalyst capable of producing acrylonitrile at a rate of at least about 0.1 gram of acrylonitrile per gram of catalyste per hour, through a reaction zone at an elevated temperature while maintaining a solids density of about 16 to about 240 kilograms per cubic meter and a superficial linear gas velocity of about 1.5 to about 7.5 meters per second wherein the resulting mixture of gases and solids is removed from the reaction zone and is introduced into a separator within a time interval of less than about 1 second.

4,102,915
DIMERIZATION PROCESS

James Robert Jennings, and Philip John Hogan, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

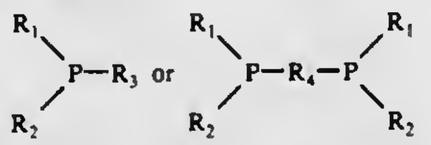
Filed May 3, 1977, Ser. No. 793,272

Claims priority, application United Kingdom, May 10, 1976, 19108/76

Int. Cl.² C07C *120/00, 121/30*

U.S. Cl. 260—465.8 D **9 Claims**

1. In a process for the dimerisation of acrylonitrile to predominantly 1,4-dicyanabutene straight-chain C_6 dimers, in which an organic phosphorus compound of the formula:



where R_1 is a hydrocarbyl group, R_2 is an alkoxy or cycloalkoxy group, R_3 is a hydrocarbyl, alkoxy or cycloalkoxy group and R_4 is a divalent hydrocarbyl or hydrocarbyloxy group, is brought into contact with acrylonitrile dissolved in an organic solvent capable of donating protons and substantially unreactive with respect to acrylonitrile and the dimeric reaction products, optionally with a non-hydroxylic co-solvent, at a temperature from 0° to 120° C, the concentrations of acrylonitrile and phosphorus compound being in the range 5 to 75% and 0.01 to 5% by volume, respectively, the acrylonitrile and solvent or solvents being substantially dry and free from acrylonitrile stabilizers, the improvement which comprises selecting one or both of said solvents to have a boiling point higher than that of acrylonitrile and being capable of rapid phase separation with respect to the dimeric products, to enable the unreacted acrylonitrile to be removed from the reacted mixture by distillation to leave the said high boiling solvent or solvents and dimeric products as a readily separable two-phase mixture.

4,102,916
PERFLUOROALKYLTHIOAMINIMIDE DERIVATIVES

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 2, 1976, Ser. No. 747,112

Int. Cl.² C07C *143/155, 143/08*

U.S. Cl. 260—501.12 **8 Claims**

1. A perfluoroalkylthioaminimide of the formula

$$R_fR_1SCH_2CH(R_2)\ CON^-N^+(R_3)(R_4)\ R_5$$

wherein

R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 atoms;

R_1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms;

R_2 is hydrogen or straight or branched chain alkyl of 1 to 6 carbon atoms;

R_3 and R_4 each is independently straight or branched chain alkyl of 1 to 22 carbon atoms and

R_5 is straight or branched chain alkyl of 1 to 22 carbon atoms that may also contain 1 or 2 hydroxyl groups.

4,102,917
SUBSTITUTED PHENYL NAPHTHALENESULFONIC ACIDS

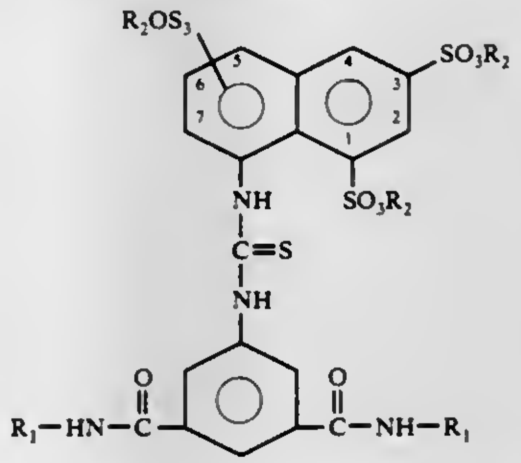
Ransom Brown Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,340

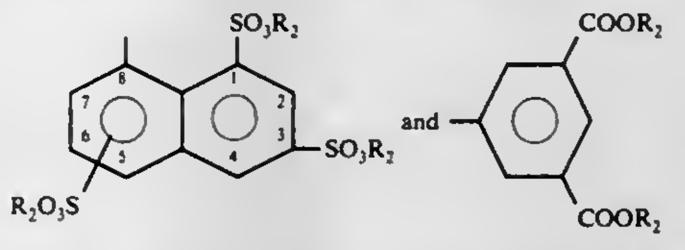
Int. Cl.² C07C *143/36;* A61K *31/185*

U.S. Cl. 260—506 **4 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of



wherein R_2 is selected from the group consisting of alkali metal; and the pharmaceutically acceptable salts thereof.

4,102,918
ANIONIC PHENYLCARBOXAMIDE COMPLEMENT INHIBITORS

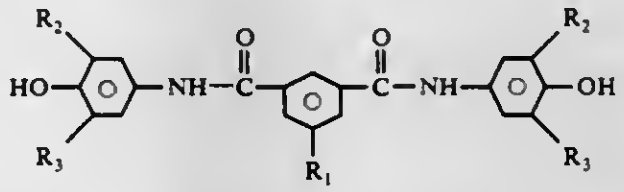
Gerald Joseph Siuta, Yonkers, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,339

Int. Cl.² C07C *143/44, 101/74, 65/14;* A61K *31/19*

U.S. Cl. 260—507 R **5 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of nitro and amino; R_2 is selected from the group consisting of hydrogen and carboxy; R_3 is selected from the group consisting of carboxy and $—SO_3X$, wherein X is selected from the group consisting of alkalimetal; with the proviso that when R_3 is carboxy, then R_2 must be hydrogen; and the pharmaceutically acceptable salts thereof.

4,102,919

ISOMERIC DICARBOXY, DI (HYDROXYMETHYL), DIPHENYLMETHANES AS NEW COMPOUNDS

Anatoli Onopchenko, Monroeville; Johann G. Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 8, 1976, Ser. No. 748,687

Int. Cl.^{2} C07C *65/14*

U.S. Cl. 260—520 E **4 Claims**

1. Diphenylmethanes selected from the group consisting of 3,3'-dicarboxy, 4,4'-di(hydroxymethyl), diphenylmethane, 4,4'-dicarboxy, 3,3'-di(hydroxymethyl), diphenylmethane and 4,3'-dicarboxy, 3,4'-di(hydroxymethyl) diphenylmethane.

4,102,920

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

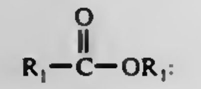
Charles M. Bartish, Bethlehem, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jan. 13, 1977, Ser. No. 759,082

Int. Cl.^{2} C07C *51/10, 51/12, 67/36, 67/37*

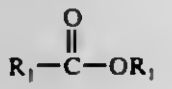
U.S. Cl. 260—532 **10 Claims**

1. In a carbonylation process which comprises contacting a reactant selected from the group having the formula (a) ROH where R is a saturated hydrocarbyl radical having from about 1 to 20 carbon atoms, (b) $R_1—O—R_1$ or



$$R_1-\overset{\overset{\displaystyle O}{\|}}{C}-OR_1:$$

wherein R_1 is a saturated hydrocarbyl radical having from about 1 to 19 carbon atoms and wherein the total number of carbon atoms in formulas $R_1—O—R_1$ or



$$R_1-\overset{\overset{\displaystyle O}{\|}}{C}-OR_1$$

does not exceed about 20 and (c) R—X where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen atom selected from the group consisting of bromine, chlorine and iodine, with carbon monoxide, in the presence of a catalyst consisting essentially of (1) a rhodium compound and (2) a halogen component, the improvement which comprises

employing as the rhodium compound a rhodium complex formed between a rhodium component and a phosphorus or arsenic ligand of the formula:

$(R_1R_2P_1A\ P_2R_3\ R_4)$

in which the molar ratio of chelating ligand to rhodium is at least 1

wherein:

R_1 and R_3 are alkenyl groups having from 1 to 6 carbon atoms, alkyl groups having from 1 to 6 carbon atoms, hydrogen atoms, phenyl, and substituted phenyl derivatives where the substituent is nitro or fluorine;

R_2 and R_4 are phenyl and substituted phenyl groups where the substituent is nitro or fluorine;

P_1 and P_2 are phosphorus or arsenic;

A is an aryl group, an alkenyl group having from 2 to 4 carbon atoms and $(CH_2)_n$ where *n* is from 1-3 when P_1 and P_2 are phosphorus and 2-4 when P_1 or P_2 is arsenic and carrying out said process at a temperature of from about 160° to about 250° C.

4,102,921

PRODUCTION OF CARBOXYLIC ACIDS AND ESTERS

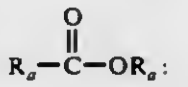
Charles M. Bartish, Bethlehem, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Apr. 26, 1977, Ser. No. 791,121

Int. Cl.^{2} C07C *51/10, 51/12, 67/36, 67/37*

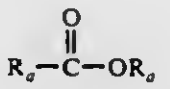
U.S. Cl. 260—532 **12 Claims**

1. In a carbonylation process which comprises contacting a reactant selected from the group having the formula (a) ROH where R is a saturated hydrocarbyl radical having from about 1 to 20 carbon atoms, (b) $R_a—O—R_a$ or



$$R_a-\overset{\overset{\displaystyle O}{\|}}{C}-OR_a:$$

wherein R_a is a saturated hydrocarbyl radical having from about 1 to 19 carbon atoms and wherein the total number of carbon atoms in formulas $R_a—O—R_a$ or



$$R_a-\overset{\overset{\displaystyle O}{\|}}{C}-OR_a$$

does not exceed about 20 and (c) R—X where R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen atom selected from the group consisting of bromine, chlorine and iodine, with carbon monoxide, in the presence of a catalyst consisting essentially of (1) an iridium compound and (2) a halogen component, the improvement which comprises

employing as the iridium compound an iridium complex formed between an iridium compound and a phosphorus or arsenic ligand of the formula:

$(R_1R_2P_1A\ P_2R_3\ R_4)$

in which the molar ratio of chelating ligand to iridium is at least 1

wherein:

R_1 and R_3 are alkenyl groups having from 2 to 6 carbon atoms, alkyl groups having from 1 to 6 carbon atoms, hydrogen atoms, phenyl groups, and substituted phenyl, said substituents selected from the group consisting of nitro and fluorine groups;

R_2 and R_4 are phenyl groups and substituted phenyl groups, said substituents selected from the group consisting of nitro and fluorine groups;

P_1 and P_2 are phosphorus or arsenic;

A is a phenylene group, an alkenyl group having from 2 to 4 carbon atoms and $(CH_2)_n$ where *n* is from 1–4; and

carrying out said process at a temperature of from about 160° C to about 250° C.

4,102,922

PURIFICATION OF CARBONYLATION PRODUCTS

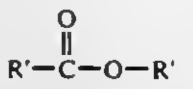
Jerry L. Price, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 537,500, Dec. 30, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,594

Int. Cl.^{2} C07C *51/10, 51/12, 51/44, 67/36*

U.S. Cl. 260—532 **7 Claims**

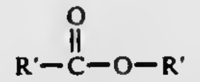
1. In a carbonylation process for the production of carboxylic acids wherein a compound selected from the group consisting of compounds having the formulas: ROH wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms, R'—O—R' wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon atoms and wherein the total number of carbon atoms in the compound does not exceed 20,



$$R'-\overset{\overset{\displaystyle O}{\|}}{C}-O-R'$$

wherein R' is a saturated hydrocarbyl radical of 1 to 19 carbon

atoms and wherein the total number of carbon atoms in the compound does not exceed 20, and R—X wherein R is a saturated hydrocarbyl radical of 1 to 20 carbon atoms and X is a halogen selected from the group consisting of chlorine, bromine and iodine, is reacted with carbon monoxide or with carbon monoxide and water when said compound has the formula R'—O—R',



$$R'-\overset{\overset{\displaystyle O}{\|}}{C}-O-R'$$

or R—X in the liquid phase in a reaction zone in the presence of a catalytic system which contains a rhodium or iridium component and an iodine or bromine component, and wherein a portion of the liquid reaction mass is passed to a separation zone without the addition of heat, said separation zone having a pressure of at least 20 psi less than the pressure in said reaction zone, to vaporize at least a portion of the carbonylation products, the remaining liquid reaction mass is recycled to the reaction zone and the vaporized carbonylation products are withdrawn and subjected to distillation for purification thereof, the improvement which comprises removing alkanes from the vaporized carbonylation products by introducing said vaporized carbonylation products into the lower half of a first distillation zone and distilling therein under conditions to provide an overhead product containing substantially all the alkanes introduced into said zone, and a bottoms product, removing said overhead product, condensing it, and separating it into a light phase and a heavy phase containing substantially all of said alkanes, withdrawing a slipstream constituting from about 0.1 to about 1% by weight of said heavy phase, introducing said slipstream into the upper section of a second distillation zone while introducing a stripping gas into the lower part of said second distillation zone and distilling therein to provide an overhead stream substantially free of alkanes and a bottoms stream consisting substantially of alkanes, recycling said alkane-free overhead stream from said second distillation zone to said separation zone, and removing said alkane-containing stream for disposal.

4,102,923

TRIS(UREIDOMETHYL)PHOSPHINE OXIDES

Armand B. Pepperma[illegible]Jr., Metairie; Donald J. Daigle, New Orleans, and Sidney[illegible]. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 8, 1975, Ser. No. 611,460

Int. Cl.^{2} C07C *127/00*

U.S. Cl. 260—553 R **6 Claims**

1. Tris(4-methylureidomethyl)phosphine oxide.

4,102,924

PROCESS FOR THE PREPARATION OF DIARYL COMPOUNDS

Walter Kalk, Opladen; Hans Samuel Bien, Burscheid, and Karl Heinz Schundehutte, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

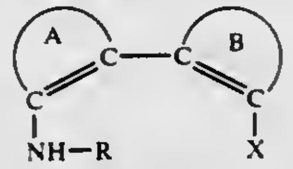
Division of Ser. No. 515,222, Oct. 16, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,314

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1973, 2353580

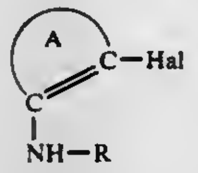
Int. Cl.^{2} C07C *103/34*

U.S. Cl. 260—562 P **8 Claims**

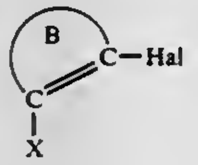
1. Process for preparing diaryl compounds of the formula



by reacting acylamino-aryl compound of the formula



with an aryl compound of the formula



wherein

X is —NHR;

A and B are benzene; naphthalene; or benzene or naphthalene substituted by chloro, bromo, nitro methyl, trifluoromethyl, acetylamino, hydroxy, methoxy or diethylamino;

R is acetyl, propionyl, butyryl, formyl or benzoyl;

the o-position relative to Hal is free of activating substituents selected from the group consisting of nitro, nitrile and carbonyl Hal is chloro or bromo.

4,102,925

STEROID TOTAL SYNTHESIS PROCESS UTILIZING ASYMMETRIC INDUCTION

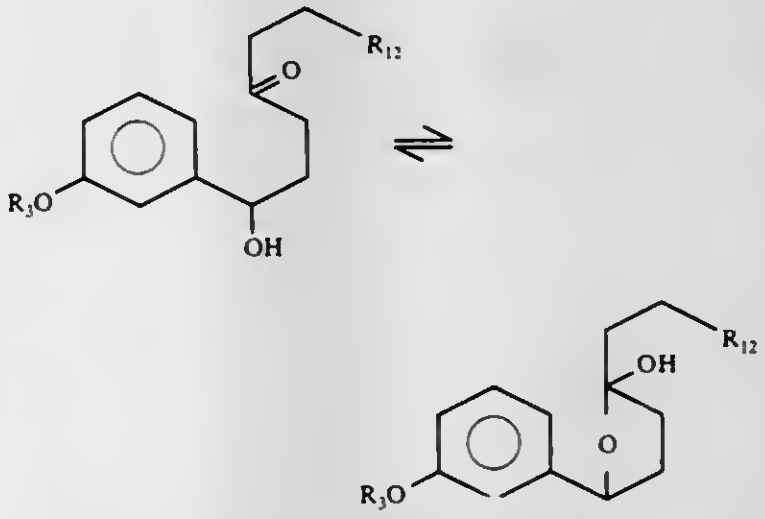
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 616,344, Sep. 24, 1975, abandoned, which is a division of Ser. No. 406,980, Oct. 16, 1973, Pat. No. 3,932,519, which is a division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Dec. 22, 1976, Ser. No. 753,340

Int. Cl.^{2} C07C *91/18*

U.S. Cl. 260—570.6 **4 Claims**

1. A compound of the formula



wherein R_3 is a cycloalkyl group, or a primary alkyl group of from 1 to 8 carbon atoms and R_{12} is lower hydrocarbylamino or di(lower hydrocarbyl)amino.

4,102,926
METHOD FOR PRODUCING 4-NITROSODIPHENYLAMINE

Aldan Alexandrovich Usvyatsov, ulitsa Remizova, 15; Dmitry Mikhailovich Popov, ulitsa Sumskaya, 6, korpus 4, kv. 92; Alevtina Semenovna Slavnova, ulitsa Uralskaya, 6, korpus 6, kv. 64; Elena Vladimirovna Genkina, 2 Schukinsky proezd, 19, kv. 13, all of Moscow; Nikolai Mikhailovich Vdovin, ulitsa Ordzhonikidze, 5, kv. 5, Kemerovo; Mikhail Grigorievich Pleshkov, Sovetsky prospekt, 79, kv. 22, Kemerovo; Ravil Safinovich Safin, prospekt Lenina, 63, kv. 54, Kemerovo; Sergel Nikolaevich Naumov, ulitsa Vesennaya, 24, kv. 98, Kemerovo; Felix Georgievich Kokoulin, Sevastopolsky prospekt, 65/15, kv. 69, Moscow; Georgy Borisovich Manelis, ulitsa Dmitria Ulyanova, 4, korpus B, kv. 339, Moscow; Valentina Petrovna Trofilkina, ulitsa letchika Babushkina, 33, korpus 1, kv. 38, Moscow; Ljudmila Ilinichna Te, Sovetsky prospekt, 110, kv. 23, Kemerovo; Olga Nikolaevna Voronkova, Sovetsky prospekt, 87, kv. 36, Kemerovo, and Galina Alexandrovna Formenova, ulitsa Vesennaya, 22, kv. 33, Kemerovo, all of U.S.S.R.

Filed Jan. 6, 1977, Ser. No. 757,348
Int. Cl.^{2} C07C *87/60*
U.S. Cl. 260—576 **9 Claims**

1. A method for producing 4-nitrosodiphenylamine, wherein diphenylamine is nitrosated with a nitrosating agent selected from the group consisting of nitrates of alkali metals and ammonium nitrite in the presence of an acid and an organic solvent immiscible with water; followed by rearrangement of the resultant N-nitrosodiphenylamine with anhydrous hydrogen chloride in an inert gas atmosphere in the presence of an alkyl 4-aminodiphenylamine in an amount of 0.5–1% of N-nitrosodiphenylamine by weight; the forming 4-nitrosodiphenylamine hydrochloride being then neutralized and the desired product isolated.

4,102,927
PROCESS FOR THE PREPARATION OF 2,4-DINITROANILINE

Gert Voikwein, Kelkheim, Taunus, and Konrad Baessler, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 10, 1976, Ser. No. 713,141
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536454
Int. Cl.^{2} C07C *85/04*
U.S. Cl. 260—581 **6 Claims**

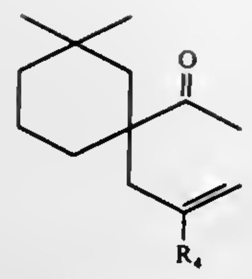
1. In a process for the preparation of 2,4-dinitroaniline by reacting 4-chloro-1,3-dinitrobenzene with aqueous ammonia at an elevated temperature and under pressure the improvement comprising introducing at a temperature of 60° to 90° C 4-chloro-1,3-dinitrobenzene into at least 300% of the theoretical amount of an aqueous ammonia solution of a concentration of 15 to 40% by weight.

4,102,928
PROCESS FOR PRODUCING SUBSTITUTED-1-ACETYL-3,3-DIMETHYLCYCLOHEXANE

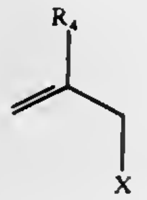
John B. Hall, Rumson; Mark A. Sprecker, Sea Bright; Frederick Louis Schmitt, Holmdel, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 713,429, Aug. 11, 1976, Pat. No. 4,021,488. This application Dec. 22, 1976, Ser. No. 753,453
Int. Cl.^{2} C07C *45/00*
U.S. Cl. 260—586 C **6 Claims**

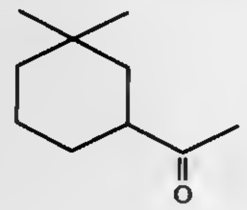
1. A process for preparing a compound having the structure:



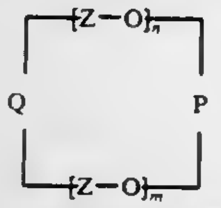
comprising the step of reacting an allylic halid having the structure:



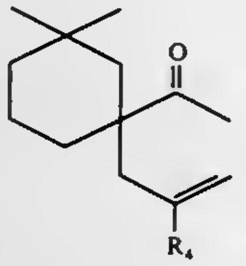
with 1-acetyl-3,3-dimethylcyclohexane having the structure:



in the presence of a crown ether having the structure:



and potassium hydroxide and toluene, and heating the resulting mixture to reflux for a period of time sufficient to cause conversion to said compound having the structure:



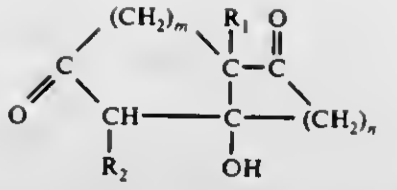
wherein R_4 is methyl or hydrogen; X is chloro or bromo; Z is C_1–C_4 lower alkylene; *n* is an integer of from 3 up to 8; *p* and *q* are the same or different and each represents C_1–C_4 lower alkylene or orthophenylene.

4,102,929
ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 14, 1976, Ser. No. 723,130
Int. Cl.^{2} C07C *49/76*
U.S. Cl. 260—590 FA **3 Claims**

1. Compounds of the formula



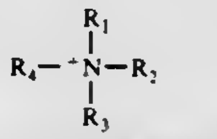
where R_1 is lower alkyl, lower alkenyl, lower alkynyl or halogen; R_2 is phenyl, phenyl substituted with halogen, lower alkyl, lower alkoxy and nitro, benzyl, metamethoxybenzyl, phenethyl or meta-methoxyphenethyl; *n* is an integer between 1 and 5 inclusive and *m* is an integer between 1 and 4 inclusive.

4,102,930
ALDOL REACTIONS CATALYZED BY ALKYLENE OXIDE-SALT COMPLEXES

Mary Lease Deem, Bernardsville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,542
Int. Cl.^{2} C07C *49/04, 49/08*
U.S. Cl. 260—593 R **16 Claims**

1. Method of condensing organic carbonyl compounds, selected from the group consisting of aliphatic aldehydes and ketones, in an aldol reaction which comprises contacting said carbonyl compounds in the absence of a solvent at a temperature of about 30° to about 125° C. with a catalytic amount of a complex of (a) an alkylene oxide having 2 or more carbon atoms and (b) a salt or a salt plus an oligomeric derivative of ethylene oxide, said salt having the formula MZ wherein M is a cation selected from the group consisting of alkali metal, substituted organic onium, ammonium, arsenonium, and phosphonium cations, where the ammonium cation has the formula:



$$R_4-{}^{+}\overset{\displaystyle R_1}{\underset{\displaystyle R_3}{N}}-R_2$$

wherein each of R_1, R_2, R_3 and R_4 is an alkyl group having 1 to about 18 carbon atoms, and wherein Z is an anion selected from the group consisting of halides, carboxylates having 1 to about 4 carbon atoms, and sulfonates.

4,102,931
MANUFACTURE OF TERTIARY MERCAPTANS USING ZEOLITE CATALYSTS

Bernard Buchholz, Whitpain, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed May 17, 1977, Ser. No. 797,704
Int. Cl.^{2} C07C *148/00*
U.S. Cl. 260—609 B **14 Claims**

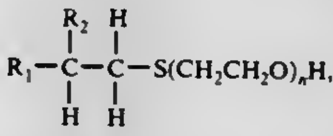
1. A method for preparing tertiary mercaptans having from 4 to 18 carbon atoms comprising reacting hydrogen sulfide with a branched, unsymmetrical olefin or oligomer thereof, said olefin having the formula $R_1R_2C{=}CR_3R_4$ where R_1 and R_2 are the same or different alkyl radicals, and R_3 and R_4 are independently either hydrogen or the same or different alkyl radicals, in the presence of a catalytic amount of a synthetic zeolite of the X or Y type having an alkali metal content, expressed as Na_2O, of less than 10 percent by weight.

4,102,932
BETA, BETA-DIALKYLETHYLMERCAPTOETHOXYLATES AS NEW COMPOUNDS

Anatoli Onopchenko, Monroeville, and Johann G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

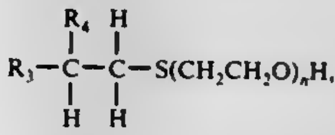
Continuation-in-part of Ser. No. 600,150, Jul. 29, 1975, Pat. No. 4,009,211. This application Jan. 14, 1977, Ser. No. 759,420
The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.
Int. Cl.^{2} C07C *149/18*
U.S. Cl. 260—609 R **13 Claims**

1. Novel beta,beta-dialkylethylmercaptoethoxylates selected from the group of dialkylethylmercaptoethoxylates of the following structural formulas:



$$R_1-\overset{\displaystyle R_2}{\underset{\displaystyle H}{C}}-\overset{\displaystyle H}{\underset{\displaystyle H}{C}}-S(CH_2CH_2O)_nH,$$

wherein R_1 and R_2, the same or different, are alkyl substituents having from one to ten carbon atoms, with the number of carbon atoms in $R_1 + R_2$ totaling 10, 14 or 16, and



$$R_3-\overset{\displaystyle R_4}{\underset{\displaystyle H}{C}}-\overset{\displaystyle H}{\underset{\displaystyle H}{C}}-S(CH_2CH_2O)_nH,$$

wherein R_3 and R_4, the same or different, are alkyl substituents having from two to ten carbon atoms, with the total number of carbon atoms in $R_3 + R_4$ totaling 12, and *n* is an integer greater than 3.

4,102,933
PROCESS FOR PREPARING A S-TRIALKOXY BENZENE

Barrie D. Howarth, Hexthorte Doncester, England, and Ryszard J. Kobylecki, Princeton, N.J., assignors to Oce-Andeno B.V., Venlo, Netherlands

Continuation of Ser. No. 527,525, Nov. 27, 1974, abandoned. This application Jul. 23, 1976, Ser. No. 708,025
Int. Cl.^{2} C07C *41/04*
U.S. Cl. 260—613 D **15 Claims**

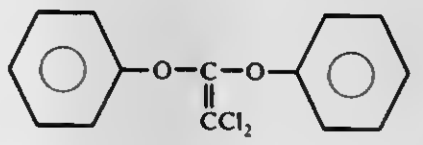
1. A process for preparing a s-trialkoxy benzene having one or two carbon atoms in each of the alkoxy groups, which comprises reacting 1, 3, 5-tribromo benzene with an alkali metal alcoholate having one or two carbon atoms in the molecule in the presence of a copper salt catalyst and an aprotic solvent and recovering formed s-trialkoxy benzene, said catalyst being a cuprous or cupric halogenide and said solvent being a tertiary amide.

4,102,934
PREPARATION OF DICHLOROKETENE-KETALS

Clayton B. Quinn, Mt. Vernon, Ind., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,020
Int. Cl.^{2} C07C *41/04*
U.S. Cl. 260—613 R **8 Claims**

1. The process for making a compound having the formula



which comprises effecting reaction between an alkali-metal phenate selected from the class consisting of potassium and sodium phenates and tetrachloroethylene in an aprotic solvent and thereafter isolating the formed compound.

4,102,935

CATALYST AND PROCESS FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

William Joseph Kroenke, Brecksville; Richard Tobey Carroll, Cuyahoga Falls, and Angelo Joseph Magistro, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1976, Ser. No. 669,896
Int. Cl.² C07C *21/02*

U.S. Cl. 260—656 R **5 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising contacting ethane, oxygen, and hydrogen chloride in the presence of a solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3, said catalyst stabilized with lanthanum, a lanthanide, or mixtures thereof, at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and hydrogen chloride are employed at a mole ratio of 1 mole of ethane to 0.1 to 10 moles of hydrogen chloride to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, a total lanthanum and lanthanide content of from about 0.1 percent to about 20 percent by weight expressed as the oxide, and an X-ray diffraction pattern having peak positions different than that of its host lattice.

4,102,936

CATALYST AND PROCESS FOR THE PREPARATION OF ETHYLENE AND VINYL CHLORIDE FROM ETHANE

Angelo Joseph Magistro, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 24, 1976, Ser. No. 669,895
Int. Cl.² C07C *21/02*

U.S. Cl. 260—656 R **5 Claims**

1. A process for the reaction of ethane to ethylene and vinyl chloride comprising contacting ethane, oxygen, and hydrogen chloride in the presence of a solid solution catalyst consisting essentially of iron cations substituted for aluminum cations in a host lattice of α-Al_2O_3, said catalyst stabilized with lanthanum, a lanthanide, or mixtures thereof, and modified with cobalt cations, at a temperature from about 400° C. to about 650° C. wherein the ethane, oxygen, and hydrogen chloride are employed at a mole ratio of 1 mole of ethane to 0.1 to 10 moles of hydrogen chloride to 0.1 to 1.5 moles of oxygen, said solid solution catalyst having an iron content of from about 0.1 percent to 20 percent by weight expressed as the oxide, a total lanthanum and lanthanide content of from about 0.1 percent to about 20 percent by weight expressed as the oxide, a total modified metal cation content of from about 0.05 percent to about 3 percent by weight, and an X-ray diffraction pattern having peak positions different than that of its host lattice, all weights based upon the total weight of the catalyst.

4,102,937

CYCLOPARAFFIN ISOMERIZATION USING A CATALYTICALLY ACTIVE ALUMINUM HALIDE INTERCALATED IN GRAPHITE

Jesse R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 3, 1976, Ser. No. 747,126
Int. Cl.² C07C *5/28*

U.S. Cl. 260—666 P **9 Claims**

1. A method for preparing a catalytic composition comprising contacting a compound of aluminum halide intercalated in graphite with a hydrogen halide in the presence in the liquid state of an isomerizable cycloparaffin for a time and at a temperature sufficient to form a composition catalytically active for isomerization of said cycloparaffin.

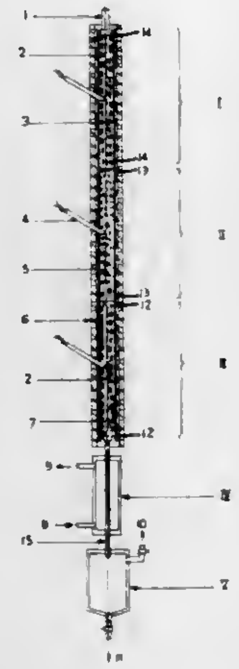
4,102,938

PRODUCTION OF HYDROCARBONS BY THERMOLYSIS OF VEGETABLE OILS

Kalur Vijaya Chandra Rao, Head, PSC Division, CMG, VSSC, Trivandrum-695022, India

Filed Mar. 2, 1977, Ser. No. 773,544
Int. Cl.² C07C *1/20*

U.S. Cl. 260—676 R **15 Claims**



1. A process for producing hydrocarbons from vegetable oils which comprises thermolyzing the said oils in the presence of a silica-alumina catalyst impregnated with any one of the oxides of the transition metals of groups IIA, IIIB, IVB, VB, VIB, VIIB and VIII of the Periodic Table at temperatures ranging between 300° and 700° C under atmospheric pressure in a fluidized bed, moving bed or fixed bed continuous tubular reactor, separating and purifying the resulting hydrocarbons.

4,102,939

OLEFIN DISPROPORTIONATION OVER SILICA-RARE EARTH METAL OXIDE CATALYSTS

John W. Myers, and Jesse R. Harris, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,765
Int. Cl.² C07C *3/62*

U.S. Cl. 260—683 D **21 Claims**

1. A process for conversion of monoolefins in accordance with the olefin reaction which comprises contacting said monoolefins under reaction conditions with an effective amount of a rare earth metal oxide catalyst supported on silica, wherein said rare earth metal oxide catalyst consists essentially of the oxides of yttrium, lanthanum, cerium, praseodymium, dysprosium, or mixture thereof, on silica.

4,102,940

WORKING UP POLYSILOXANE/POLYCARBONATE COPOLYMERS

Karl-Friedrich Thom; Günther Maass, both of Cologne, and Manfred Beck, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1976, Ser. No. 747,264

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555746

Int. Cl.² C08L *43/04*

U.S. Cl. 260—824 R **3 Claims**

1. In the preparation and working up of a SiOC-linked polysiloxane/polycarbonate copolymer comprising reacting an α,ω-dihydroxy-oligocarbonate in the presence of a tertiary amine and a solvent, and subsequently separating off the resulting copolymer from the reaction mixture additionally containing the amine, amine hydrochloride and organic solvent, the improvement which comprises subjecting the reaction mixture to steam distillation at a pH of about 7 to 8 whereby the copolymer remains behind.

4,102,941

METHOD FOR MAKING SILARYLENESILOXANE-POLYDIORGANOSILOXANE BLOCK POLYMERS

Ronald W. LaRochelle, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,779
Int. Cl.² C08L *83/10*

U.S. Cl. 260—825 **6 Claims**

1. A method for making silarylenesiloxane-polydiorsanosiloxane block polymer which comprises

(1) refluxing a mixture comprising a silarylene-silanediol, a silanol terminated polydiorganosiloxane, and an inert organic solvent and an effective amount of an amine-carboxylic acid catalyst,

(2) adding from 0.01% to 100% by weight of water, based on the weight of the mixture,

(3) heating the resulting mixture of (2) to effect the separation of an azeotrope of water and the substantially inert organic solvent until the mixture is substantilaly free of water,

(4) adding an amount of an organic carbonyl compound to the mixture of (3), which is effective to facilitate the removal of amine-carboxylic acid catalyst residues, and

(5) devolatilizing the mixture of (4) at a temperature of up to 175° C.

4,102,942

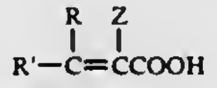
COMPOSITIONS OF HIGH SOLIDS CONTENT COMPRISING CARBOXYLIC POLYMER AND ALIPHATIC DIEPOXIDE

Oliver Wendell Smith, South Charleston; Robert Arthur Taller, and Joseph Victor Koleske, both of Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,816
Int. Cl.² C08G *59/42;* C08L *63/10*

U.S. Cl. 260—836 **7 Claims**

1. A high solids composition comprising (I) from 10 to 60 weight percent of a low molecular weight carboxylic-containing copolymer and (II) from 40 to 90 weight percent of an aliphatic polyepoxide, said percentages based on the combined weights of (I) and (II); and wherein said low molecular weight copolymer (I) has a molecular weight of from about 500 to about 10,000 and is the copolymer of (A) a monocarboxylic acid or dicarboxylic acid of the structure:



$$R'-\overset{\displaystyle R}{\overset{|}{C}}=\overset{\displaystyle Z}{\overset{|}{C}}COOH$$

wherein Z is hydrogen or methyl or carboxymethyl; R is hydrogen or methyl and R' is hydrogen or carboxyl; and (B) from 30 to 80 weight percent of a polymerizable ethylenically unsaturated monomer whose polymers have a glass transition temperature below 0° C.

4,102,943

POWDER COATING RESIN PROCESS

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 511,953, Oct. 4, 1974, Pat. No. 3,980,733, which is a continuation-in-part of Ser. No. 317,901, Dec. 26, 1972, abandoned. This application Aug. 18, 1976, Ser. No. 715,488

Int. Cl.² C08L *61/32, 61/24, 67/02*

U.S. Cl. 260—850 **4 Claims**

1. A curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120 to 220° C., comprising:

(A) from about 15 to 30 parts by weight of a condensate of a methylolamino compound, an aliphatic alcohol containing from 1 to 4 carbon atoms and a reactive aromatic carboxylic acid amide of number average molecular weight less than 500; wherein the methylolamino compound is a methylolurea or methylolaminotriazine containing no more than one unmethylolated N—H bond per molecule, wherein the molar ratio of aliphatic alcohol to methylolamino compound is at least 2, wherein the molar ratio of the methylolamino compound to the aromatic amide is from about 1:0.5 to about 1:2 when the aromatic amide contains one reactive group per molecule and is from about 1:0.5 to about 1:1.5 when the aromatic amide contains 2 or more reactive groups per molecule, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aromatic amide and wherein the glass transition temperature of the condensate is in the range of from −10° C. to 100° C.; and

(B) from about 85 to 70 parts by weight of a polyester resin or an acrylic resin wherein the resin has a glass transition temperature in the range of from 60° to 100° C., and a number average molecular weight in the range of 500 to 25,000, and contains alcoholic hydroxyl groups, carboxyl groups or amide groups, heat reactive with the condensate of the methylolamino compound, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 percent by weight of hydroxyl, carboxyl, or amide groups.

4,102,944

LOW PROFILE UNSATURATED POLYESTER RESIN COMPOSITION

Yoshiya Fukuyama, Hirakata; Katsuo Akagane, and Takao Miwa, both of Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 16, 1976, Ser. No. 723,934

Claims priority, application Japan, Sep. 25, 1975, 50/116070

Int. Cl.² C08L *67/06*

U.S. Cl. 260—861 **13 Claims**

1. An unsaturated polyester resin composition which comprises (A) a reaction product between (1) a saturated polyester having a molecular weight of about 3,000 - 50,000 obtained from a saturated polycarboxylic acid and a polyhydric alcohol and (2) an unsaturated monoglycidyl compound, (B) an unsaturated polyester, and (C) an unsaturated monomer copolymerizable with the reaction product (A) and the unsaturated polyester (B).

4,102,945

FILLED CYANOACRYLATE ADHESIVE COMPOSITIONS

Edward Roger Gleave, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Dublin, Ireland

Filed Jul. 11, 1977, Ser. No. 814,582

Claims priority, application Ireland, Jul. 14, 1976, 1554/76

Int. Cl.^{2} C08L *9/00*

U.S. Cl. 260—879 **4 Claims**

1. A thickened, curable adhesive composition comprising:
(a) a monomeric ester of 2-cyanoacrylic acid,
(b) for each 100 parts by weight of monomeric ester, about 3 to about 30 parts by weight of an organic material which is an acrylo-nitrile-butadiene-styrene terpolymer
said composition having improved peel strength over the corresponding unthickened adhesive.

4,102,946

PROCESS FOR CARBOXYLATION OF ETHYLENE-VINYL ACETATE COPOLYMERS OR SAPONIFIED COPOLYMERS

Shinichi Imura; Mitsutaka Saito, and Nobuo Morishita, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

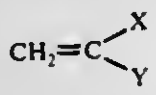
Filed Jan. 4, 1977, Ser. No. 756,869

Claims priority, application Japan, Mar. 19, 1976, 51/29338

Int. Cl.^{2} C08F *263/04*

U.S. Cl. 260—878 R **10 Claims**

1. A process for the carboxylation of ethylene-vinyl acetate copolymers or saponified copolymers comprising:
copolymerizing an alpha, beta-unsaturated carboxylic acid and/or anhydride thereof with or without at least one vinylidene monomer having the formula:



$$\mathrm{CH_2{=}C}\begin{array}{l}\diagup\mathrm{X}\\ \diagdown\mathrm{Y}\end{array}$$

wherein X and Y can be the same or different, and each represents hydrogen, chlorine, alkyl acetoxy, carboxylic acid ester group or cyano; with a solid particulate ethylene-vinyl acetate copolymer or a saponified copolymer in the presence of a polymerization initiator in a reaction medium of an acetic acid ester or a mixture of an acetic acid ester and a lower alcohol, wherein the reaction is conducted in such manner that the copolymer retains its particulate form throughout the reaction.

4,102,947

RUBBER-MODIFIED ACRYLONITRILE COPOLYMERS PREPARED IN AQUEOUS SUSPENSION

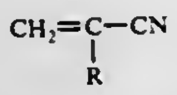
Bruce O. Budinger, Macedonia, and June T. Duke, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 11, 1977, Ser. No. 786,236

Int. Cl.^{2} C08F *279/04*

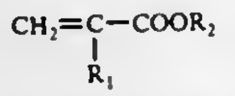
U.S. Cl. 260—879 **5 Claims**

1. The process comprising polymerizing in an aqueous suspension in the substantial absence of molecular oxygen at a temperature in the range of from 0° to 100° C and in the presence of a free radical initiator and an alcohol containing from 1 to 4 carbon atoms 100 parts by weight of
(A) at least 50% by weight of at least one nitrile having the structure



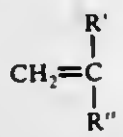
$$\mathrm{CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}CN}$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and
(B) up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of
(1) a vinyl aromatic monomer selected from the group consisting of styrene, alpha-methyl styrene, the vinyl toluenes, and the vinyl xylenes;
(2) an ester having the structure



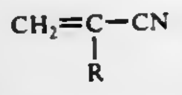
$$\mathrm{CH_2{=}\underset{\displaystyle R_1}{\underset{|}{C}}{-}COOR_2}$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms;
(3) an alpha-olefin having the structure



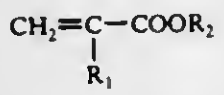
$$\mathrm{CH_2{=}\overset{\displaystyle R'}{\overset{|}{\underset{\displaystyle R''}{\underset{|}{C}}}}}$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms;
(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers;
(5) a vinyl ester selected from the group consisting of vinyl acetate, vinyl propionate, and the vinyl butyrates; and
(6) at least one member selected from the group consisting of indene and coumarone,
in the presence of from 1 to 40 parts by weight of
(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile having the structure



$$\mathrm{CH_2{=}\underset{\displaystyle R}{\underset{|}{C}}{-}CN}$$

wherein R has the foregoing designation, and an ester having the structure



$$\mathrm{CH_2{=}\underset{\displaystyle R_1}{\underset{|}{C}}{-}COOR_2}$$

wherein R_1 and R_2 have the foregoing designations,
said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

4,102,948

ω-AMINOCARBOXYLIC ACID AMIDE PHOSPHATES

László Fener; Árpád Furka; Ferenc Sebestyén; Anikó Horváth, and Jolán Hercsel nee Szepespataki, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

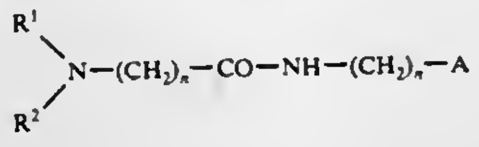
Filed May 2, 1977, Ser. No. 792,917

Claims priority, application Hungary, May 6, 1976, CI 1662

Int. Cl.^{2} C07F *9/09;* **A01N** *9/36*

U.S. Cl. 260—944 **8 Claims**

1. A compound of the formula:



$$\begin{array}{l}\mathrm{R^1}\diagdown\\ \qquad\mathrm{N{-}(CH_2)_n{-}CO{-}NH{-}(CH_2)_n{-}A}\\ \mathrm{R^2}\diagup\end{array}$$

or a pharmaceutically acceptable salt thereof, wherein:
A is $-OPO(OH)_2$;
R^1 is hydrogen, acetyl or benzoyl;
R^2 is hydrogen; and
n is 2 or 3.

4,102,949

PRODUCTION OF 3,4-DIHYDROXY PHOSPHOLANE OXIDES

Reinhard Schllebs, and Hans-Dieter Block, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

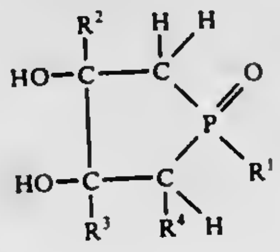
Filed Jan. 11, 1977, Ser. No. 758,527

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602646

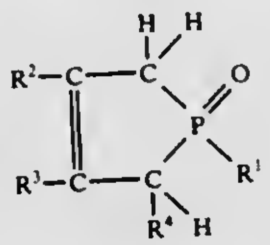
Int. Cl.^{2} C07F *9/32, 9/53*

U.S. Cl. 260—985 **2 Claims**

1. A process for the preparation of a 3,4-dihydroxy phospholane oxide of the formula



in which
R^1 represents an alkyl, alkoxy, alkenyl, alkenyloxy, alkinyl or alkinyloxy with up to 18 carbon atoms and substitution products thereof; aryl and aryloxy having up to 14 carbon atoms and substitution products thereof; cycloalkyl and cycloalkoxy having up to 6 ring carbon atoms and substitution products thereof; dialkylamino having up to 6 carbon atoms per alkyl radical and substitution products thereof; and N-hetero-radicals, and
R^2, R^3 and R^4 independently of one another represent a C_1–C_4-alkyl radical or hydrogen,
comprising reacting a phospholene oxide of the formula



with hydrogen peroxide in the presence of a catalytic amount of an osmium compound at a temperature in the range of about 20° to 150° C.

4,102,950

METHOD FOR PRODUCING SINGLET MOLECULAR OXYGEN

Donald Pilipovich, Agoura; Ira B. Goldberg, Thousand Oaks, and Ross I. Wagner, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

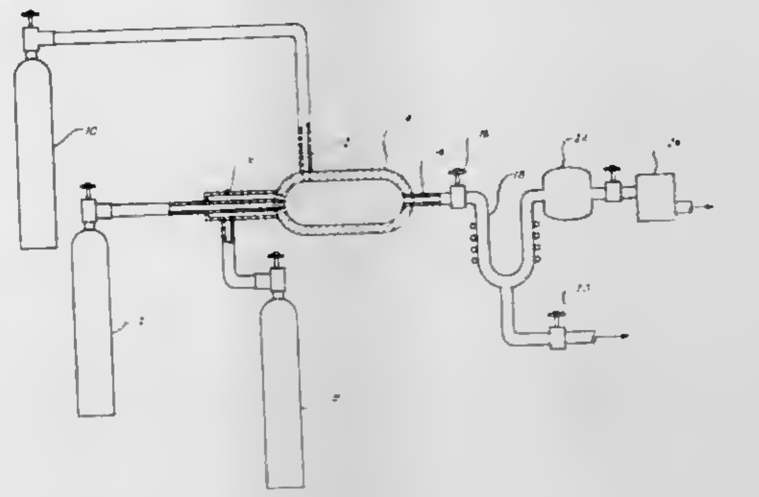
Filed Aug. 12, 1977, Ser. No. 823,910

Int. Cl.^{2} C01B *13/02*

U.S. Cl. 423—579 **19 Claims**

1. A method of producing a mixture of gases containing singlet molecular oxygen comprising the steps of:
providing chlorine fluorosulfate;
providing a solution of hydrogen peroxide and a base;
mixing said chlorine fluorosulfate and said hydrogen peroxide whereby singlet molecular oxygen is formed by a reaction between said chlorine fluorosulfate and said hydrogen peroxide;
running products of said reaction through a cold trap to remove condensables from said products; and
withdrawing said singlet molecular oxygen and noncondensed gases.

11. A method of producing a mixture of singlet molecular oxygen and reactant constituents and products, comprising the steps of:



providing $ClNO_3$;
providing hydrogen peroxide; and
mixing said $ClNO_3$ and said hydrogen peroxide, whereby singlet molecular oxygen is formed by a reaction between said $ClNO_3$ and said hydrogen peroxide.

4,102,951

CALCINATION OF BASIC FERRIC SULPHATES

Frank Lawson, Glen Waverley, Australia, assignor to Monasb University, Clayton, Australia

Filed May 7, 1976, Ser. No. 684,004

Claims priority, application Australia, May 14, 1975, 1584/75

Int. Cl.^{2} C01G *49/02;* **H01F** *1/10*

U.S. Cl. 423—594 **11 Claims**

1. Process for the calcination of at least one basic ferric sulfate containing the hydroxide radical while avoiding the production of a corrosive acidic mist in the off-gases from said calcination, said process comprising treating the said basic ferric sulfate in at least two stages consisting essentially of driving off all water contained as hydroxide in said basic ferric sulfate in the substantial absence of SO_3 in a given stage by heating said basic ferric sulfate to a relatively low temperature in the range of about 500°0 to 550° C to produce a dehydrated product which is a compound of Fe_2O_3 and SO_3, and thereafter decomposing said dehydrated product in a further stage to form SO_3 in the substantial absence of water vapor to produce Fe_2O_3, by heating said dehydrated product to a higher temperature above 600° C.

4,102,952

FUEL BURNING CONTROL APPARATUS

Thayer Soipes, 5828 Swallow, El Paso, Tex. 79924

Filed Jul. 25, 1977, Ser. No. 818,826

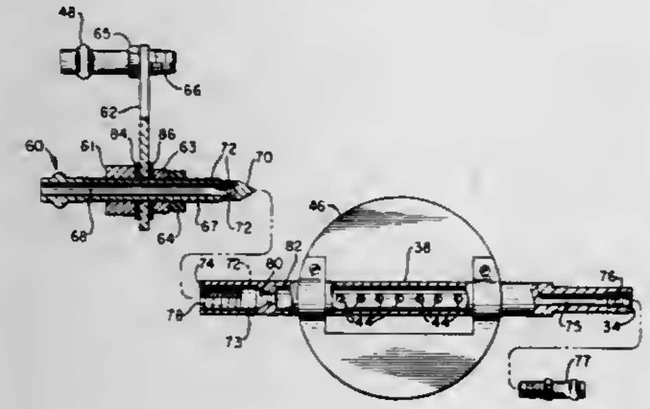
Int. Cl.^{2} F02M *17/12*

U.S. Cl. 261—44 A **7 Claims**

1. A fuel control apparatus comprising a main hollow body having one end open to atmosphere and adapted to be connected at the other end to the intake manifold of an internal combustion engine;
a hollow shaft mounted transversely in said hollow body with opposed marginal ends extending therefrom, a butterfly valve element mounted on said hollow shaft within said main body and arranged to that axial rotation of said shaft moves said butterfly valve element from a closed to an opened position, and vice versa, thereby controlling flow through said main hollow body;
a marginal end of said hollow shaft being threaded, fuel flow ports drilled laterally into a medial part of said shaft in

proximity of said butterfly valve, a valve seat formed within said hollow shaft between said threaded end and said fuel flow ports;

a needle valve assembly having a valve element on one end, a fuel inlet end, a radial fuel port, and a threaded marginal area which threadedly engages the threaded end of said shaft while said valve element engages said seat to thereby preclude fuel flow when said shaft is rotated one direction, and progressively increases fuel flow therethrough when said shaft is rotated an opposite direction;



a bracket affixed to said main body and extending therefrom and into engagement with said needle valve assembly;

and means by which the needle valve assembly can be adjustably positioned respective to said bracket and seat so that the fuel flow through said seat is proportional to the flow of air across the butterfly valve.

4,102,953
METHOD FOR MAKING EXTRUDED, SOLVENTLESS, COMPOSITE-MODIFIED DOUBLE BASE PROPELLANT

Craig E. Johnson, Indian Head; Paul F. Dendor, Temple Hills, and Elmer R. Csanady, Forest Heights, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,763

Int. Cl.^{2} C06B *21/00*

U.S. Cl. 264—3 B **19 Claims**

1. A method for formulating an extrudable composite-modified double-base propellant having an appreciable quantity of ballistic solids, which comprise the steps of:

preparing a first solution comprising a liquid aliphatic hydrocarbon solvent selected from the group consisting of heptane, hexane, and octane, a first portion of active plasticizers selected from the group consisting of nitroglycerin, metroil trinitrate, triethylene glycol dinitrate, pentaerythritol trinitrate and mixtures thereof, a first portion of relatively non-active plasticizers selected from the group consisting of dinormal propyl adipate, dibutyl phthalate, dimethyl phthalate, diethyl phthalate, dioctyl phthalate, diisobutyl azelate, dimethyl sebacate, dibutyl sebacate, and mixtures thereof, and a first portion of filler ingredients selected from the group consisting of ethyl centralite, resorcinol, candelilla wax, 2-nitro diphenyl amine, aluminum lead oxide, lead stamate, lead salicylate, copper salicylate, lead β resorcylate, copper β resorcylate, and mixtures thereof;

mixing a solid binder ingredient selected from the group consisting of from 12 to 14.14% nitrogen nitrocellulose, into said first solution so as to form a first slurry;

agitating said first slurry for from about 30 to about 60 minutes at a rate from about 3500 to about 5000 revolutions per minute, so as to deagglomerate and bruise the surface of the selected solid binder ingredient;

mixing into said first slurry a second portion of the selected relatively non-active plasticizers so as to coat said deagglomerated solid binder ingredient;

separating and saving said first liquid aliphatic hydrocarbon solution from said coated solid binder;

drying said coated solid binder to remove any remaining liquid aliphatic hydrocarbon and any traces of water;

determining the amount of the selected liquid aliphatic hydrocarbon lost in separating and drying;

forming a second slurry by re-slurrying said dry coated solid binder in a second solution comprising a mixture of said saved solution and enough of the selected liquid aliphatic hydrocarbon to replace that lost in separating and drying;

mixing a solid oxidizer selected from group consisting of nitroquanidine, ammonium perchlorate, ammonium nitrate, cyclotetramethylenetetranitramine, and cyclotrimethylenetrinitramine into said second slurry to obtain a uniform dispersion of said solid oxidizer and said coated solid binder;

forming a solid composition by mixing into said dispersion a second portion of the selected active plasticizer ingredients and the selected fillers, and a third portion of the selected relatively non-active plastizers, so as to evenly coat said solid oxidizer and begin to penetrate said coated solid binder;

separating and saving the resulting liquid aliphatic hydrocarbon solution from said solid composition;

drying and curing said solid composition until it is fully plasticized; and

extruding the dried cured composite-modified double-base propellant composition.

4,102,954
CASTING OF PPS FILM

Harold D. Coaie, deceased, late of Bartlesville, Okla. (by Geneva N. Coaie, executrix), assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 29, 1977, Ser. No. 782,461

Int. Cl.^{2} B29C *1/04*

U.S. Cl. 264—24 **9 Claims**

1. A process for producing a poly(arylene sulfide) film comprising the steps of:

(a) applying a metal oxide release agent consisting essentially of at least one member of the group consisting of copper oxide and iron oxide to a metal substrate;

(b) applying a layer of a poly(arylene sulfide) resin over said release agent;

(c) curing said poly(arylene sulfide) resin; and

(d) removing the resulting poly(arylene sulfide) film from said substrate.

4,102,955
APPARATUS FOR AND METHOD OF HEAT CURING ELECTRICAL INSULATION PROVIDED ON A CENTRAL ELECTRICAL CONDUCTOR OF AN ELECTRICAL CABLE

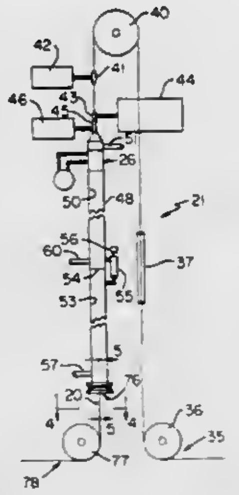
John E. Baker, Wilmington, Del., and Charles C. Shackford, West Chester, Pa., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 575,943, May 9, 1975, Pat. No. 4,043,722. This application May 23, 1977, Ser. No. 799,610

Int. Cl.^{2} B29H *5/26*; B29G *7/00*

U.S. Cl. 264—25 **7 Claims**

1. A method of continuously heat curing heat-curable electrical insulation provided on an electrical conductor comprising the steps of, passing the conductor with uncured heat-curable electrical insulation thereon through a tubular electrical induction coil supported concentrically within an outer housing made of an electrically conductive material and substantially avoiding detrimental induction heating of said outer housing by use of a magnetic flux shield arranged within said housing and surrounding said induction coil, and flowing an alternating electrical current through said coil at a frequency ranging between 7,500 and 30,000 Hertz while passing the insulated structure therethrough to thereby heat said conductor which in turn transmits heat to the inner portion of the insulation to provide heat curing thereof from said inner portion radially outwardly, said shield providing a path of least resistance for lines of magnetic flux generated by said coil to thereby prevent said housing from being heated excessively and assuring precision heating of said conductor.



4,102,956
BUILDING METHOD AND EQUIPMENT FOR USE THEREWITH

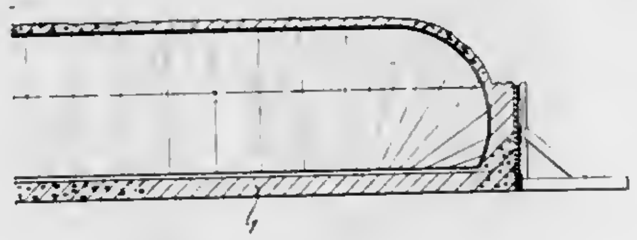
Haim Heifetz, 3 Bustanai Str., Ramat Hasharon, Israel

Filed Jan. 29, 1976, Ser. No. 653,509

Claims priority, application Israel, Jan. 29, 1975, 46523

Int. Cl.^{2} E04B *1/16*

U.S. Cl. 264—32 **2 Claims**



1. A building method of the kind wherein an inflatable former, made of a flexible, substantially inextensible material, is sealingly anchored to a base and is inflated to a predetermined pressure and, whilst maintaining said pressure substantially constant, cementitious material is applied to the outer surface of the former to a required thickness and after the material has set the former is deflated, released from the base and removed for reuse, including the steps of:

(a) pneumatically inflating the former to a predetermined initial inflation pressure;

(b) surrounding substantially vertical or steeply sloping portions of said former with shuttering walls spaced from said portions by a predetermined wall thickness;

(c) casting cementitious material in the space between said shuttering walls and said former;

(d) applying successive layers of cementitious material to remaining portions of said former; and

(e) continuously or intermittently raising said inflation pressure from an external source to an extent substantially equivalent to the oppositely directed successive loads applied to said former as a consequence of the increasing thickness of said layers;

whereby side wall bulging is eliminated.

2. In a building method of the kind wherein an inflatable former, made of a flexible, substantially inextensible material, is sealingly anchored to a base and is inflated to a predetermined pressure and, whilst maintaining said pressure substantially constant, a cementitious material is applied to the outer surface of the former to a required thickness and after the material has set the former is deflated, released from the base and removed for reuse, the improvement comprising anchoring the former to a continuous vertical base ring anchored to the base, surrounding the former, by clamping a peripheral portion of said former adjacent a rim of said former, said rim being of flexible material of enlarged thickness as compared with the former walls, between the interior of said ring and appropriate clamping strips with said rim directed in the direction of inflation of said former and contacting said base ring above said clamping strips, said peripheral portion being bent back with respect to the former walls, such that leakage between said rim and said base ring is substantially eliminated.

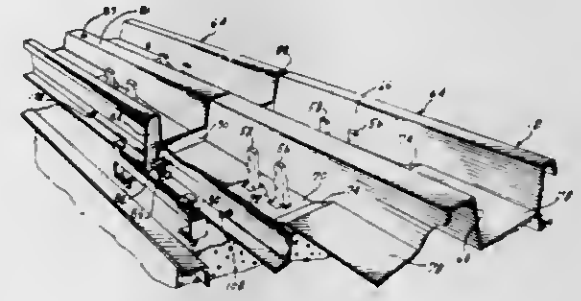
4,102,957
APPARATUS AND METHOD FOR MANUFACTURING PRESTRESSED CONCRETE RAILWAY TIES

Cipriano Da Re, Laval-sur-le-Lac, Canada, assignor to Canfarge LTD (Francon Division), Montreal, Canada

Filed Nov. 20, 1975, Ser. No. 633,816

Int. Cl.^{2} B28B *11/12, 23/04*

U.S. Cl. 264—39 **7 Claims**



1. A method of manufacturing multiple prestressed concrete railway ties with a longitudinal casting mold which is formed of a series of interconnected, individually movable mold sections, comprising the steps of:

(a) exerting a pull at opposite ends of the casting mold to provide a gap to a predetermined extent between each of said interconnected movable mold sections,

(b) securing in a series of openings appropriately located in the bottom wall of said longitudinal casting mold, a corresponding number of rail anchor devices,

(c) placing longitudinally in said mold a series of prestressing wires,

(d) anchoring said wires at opposite ends of said mold and exerting on said wires a predetermined prestressing force,

(e) pouring concrete in said mold around said anchor devices and said wires to form a continuous piece of prestressed concrete,

(f) curing said piece of concrete,

(g) transferring said prestressing force to said piece of concrete whereby movement of the mold sections tending to close said gap is permitted,

(h) effecting a first cutting of said piece of concrete to form a plurality of sections, each section having a given number of individual railway ties,

(i) removing said sections from said mold and depositing said sections on conveyor means, and

(j) effecting a second cutting in said sections to provide a plurality of individual railway ties.

4,102,958

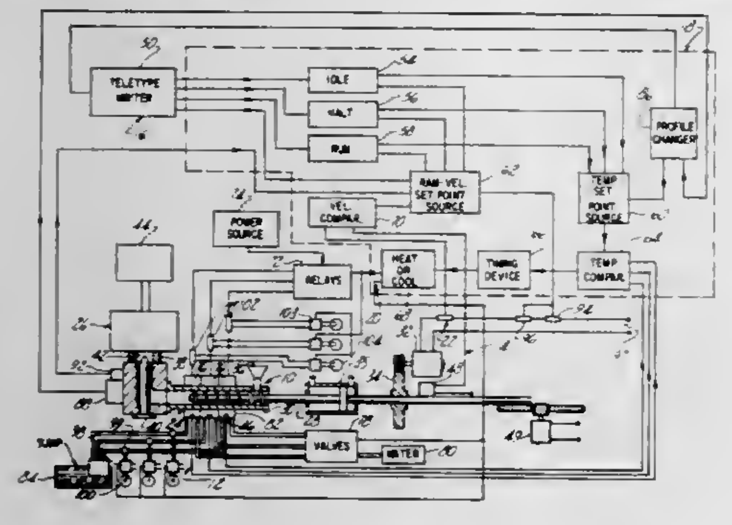
METHOD OF CONTROLLING AN EXTRUDER

James B. Wertz, Setanket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 466,489, May 2, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,426

Int. Cl.² B30B *15/14, 15/20;* B29F *3/00*

U.S. Cl. 264—40.6 **2 Claims**



1. In an improved method of controlling an extrusion apparatus of the type having an extruder chamber and a movable extruder ram mounted in said extruder chamber for moving extrusion material through a series of zones extending along the extrusion chamber and out an extrusion chamber outlet, the improvement comprising:

sensing the temperature of the extrusion material in each of the series of zones along the extrusion chamber;

generating a series of temperature signal quantities each corresponding to the temperature of one of said series of zones;

sensing a rotational velocity of said extruder ram;

generating a rotational velocity signal quantity corresponding to the rotational movement of said extruder ram;

generating as electrical signal quantities mode operating command signal quantities, each corresponding to a selected one of plural operating modes;

generating as an electrical signal quantity a rotational velocity command signal quantity corresponding to a desired rotational velocity of said extruder ram;

selecting one of said plural operating modes;

electronically developing a series of temperature set point signal quantities for the selected operating mode such that each temperature set point signal quantity corresponds to a desired temperature for a respective zone of said series of zones;

electronically developing a rotational velocity set point signal quantity corresponding to the desired rotational velocity of said extruder ram for the selected operating mode;

electronically comparing the series of temperature set point signal quantities with the series of sensed temperature signal quantities;

electronically generating a series of temperature error signal quantities corresponding to the variation between the set point temperature and the sensed temperature for each of the series of zones and presenting said temperature error signal quantities as an output from said controller;

electronically comparing the rotational velocity set point signal quantity with the sensed rotational velocity signal quantity;

electronically generating a rotational velocity error signal quantity corresponding to the difference between the rotational velocity set point and the sensed rotational velocity and presenting said rotational velocity error signal quantity as an output from said controller;

adjusting the temperature of said series of zones to correspond to said set point temperatures in response to said temperature error signal quantities; and

adjusting the rotational velocity of said extruder ram to correspond to said rotational velocity set point in response to said rotational velocity error signal quantity.

4,102,959

PROCESS FOR PREPARING FILM BY WET METHOD

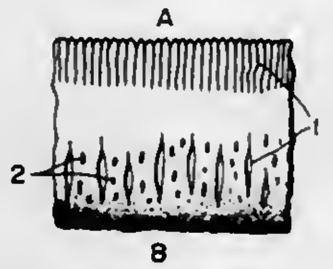
Junichiro Maebara, Sodegaura, Japan, assignor to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 701,795, Jul. 1, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,436

Claims priority, application Japan, Jul. 31, 1975, 50/92535

Int. Cl.² B05D *3/00;* D02G *3/22*

U.S. Cl. 264—41 **18 Claims**



1. A process for preparing a film having asymmetric cross-sectional structure by wet method from a starting solution for a film, which comprises:

forming a coagulation bath containing an upper liquid phase and a lower liquid phase, said liquid phases being immiscible with each other, defining an interface area with each other, and at least one of the two liquid phases having a sufficient coagulating ability to make the starting solution into a gel,

feeding the starting solution for film to said interface area in the bath,

and forming the starting solution into film in the course of traveling in the interface area through the coagulation bath,

the relationship between coagulating values and specific gravities of said liquid phases and the specific gravity of said starting solution being

(A) $G_2 > G_1 \geqq G_0$ when $P_1 \leqq 20 \leqq P_2$,

(B) $G_0 \geqq G_2 > G_1$ when $P_2 \leqq 20 \leqq P_1$, and

(C) $G_2 \geqq G_0 \geqq G_1$ when $P_1 \leqq 20 \leqq P_2$,

wherein

G_0 is the specific gravity of the starting solution,

G_1 is the specific gravity of the upper of said two liquid phases in said bath,

G_2 is the specific gravity of the lower of said two liquid phases in said bath,

P_1 is the coagulation value of said upper phase, and

P_2 is the coagulation value of said lower phase.

4,102,960

PROCESS FOR MAKING HIGH STRENGTH FLEXIBLE GRAPHITE FOIL

John W. Borkowski, Ridgway, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Filed Dec. 15, 1976, Ser. No. 750,906

Int. Cl.² C04B *35/52*

U.S. Cl. 264—42 **11 Claims**

1. A process for making a high strength flexible graphite foil, comprising heating finely divided graphite flake in the presence of boron to a temperature between about 1700° C and 3000° C until the boron has substantially completely permeated the crystal structure of the graphite flake, then subjecting the graphite flake to an intercalating agent and rapidly heating to

a temperature between 300° C and 1100° C to expand the flake until it has a bulk density substantially lower than expanded flake not pretreated with boron, compressing the expanded graphite to make a preform, and further compressing the preform to form a flexible graphite foil.

4,102,961

METHOD FOR THE PRODUCTION OF LARGE-SIZE DENSELY SINTERED CERAMIC PLATES WITH A LOW WALL THICKNESS

Gottfried Cremer, Steyrer Weg 6, 5000 Köln-Junkersdorf, Germany

Filed Mar. 18, 1977, Ser. No. 779,247

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613400

Int. Cl.² B28B *11/00*

U.S. Cl. 264—57 7 Claims

1. A method of producing large format, densely sintered thin walled ceramic plates, comprising the steps of:

extruding a ceramic composition by means of an extruder to form a billet;

rolling out the billet in a direction generally perpendicular to the direction of extrusion;

rolling out the billet in the direction of extrusion after said perpendicular rolling out to form a thin walled plate;

cutting the plate with a knife with a pressing action perpendicular to the plane of the plate to form a plate of a desired size and format; and

drying and firing said plate.

4,102,962

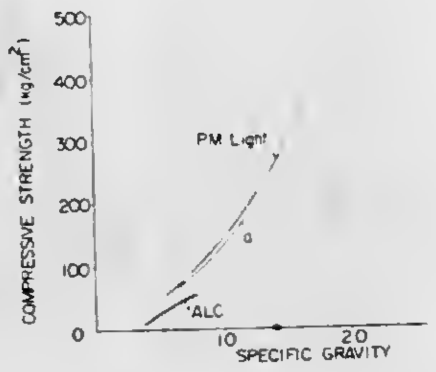
PROCESS FOR MANUFACTURING CONCRETE ARTICLES OF IMPROVED INITIAL STRENGTH AND LONG-TERM STRENGTH

Fumio Matsui; Shigeo Hayashi, both of Yokohama, and Eiji Komada, Kawasaki, all of Japan, assignors to Showa Denko K.K. and Misawa Homes Institute of Research and Development, both of Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,376

Int. Cl.² C04B *15/12*

U.S. Cl. 264—82 5 Claims



1. A process for manufacturing concrete articles of improved initial strength and long-term strength from a mixture containing a hydraulic cement composition capable of forming predominantly tobermorite group crystalline calcium silicate hydrate, which comprises the steps of:

(a) setting initially in a mold at a temperature of not higher than 40° C said mixture containing the hydraulic cement composition, 10 to 35% by weight, based on the weight of said hydraulic cement composition, of alumina cement, and 5 to 30% by weight, based on the weight of the alumina cement and expressed in terms of the weight of calcium hydroxide or calcium oxide;

(b) after demolding the concrete so formed, allowing the concrete to stand at a temperature of not higher than approximately 40° C for a period of 2 hours to 5 days, and then

(c) curing the concrete in an autoclave at a temperature of 150° to 200° C and saturated steam pressure for a period of 3 to 10 hours.

4,102,963

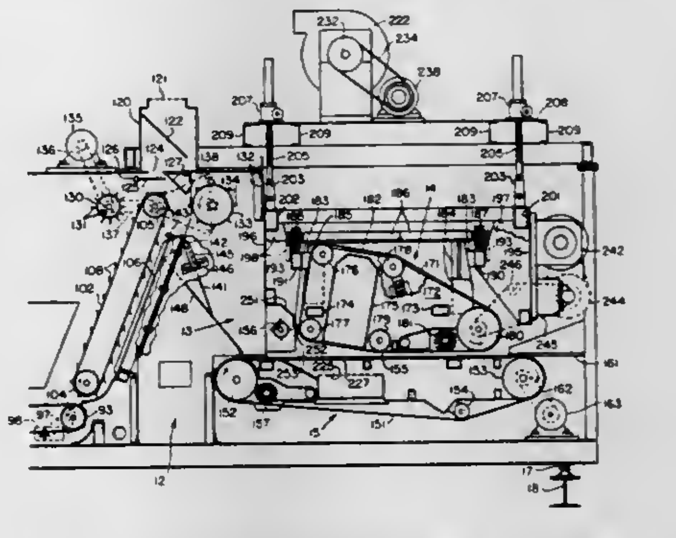
METHOD OF FORMING LIGNOCELLULOSIC FIBER MATS

Dennis E. Wood, Rochester, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Division of Ser. No. 661,350, Feb. 25, 1976, Pat. No. 4,035,121. This application Aug. 2, 1976, Ser. No. 711,097

Int. Cl.² B29J *5/00*

U.S. Cl. 264—91 **4 Claims**



1. A method of forming a lignocellulosic fiber mat, comprising

feeding resin treated lignocellulosic fibers into the upper end of an upright expansion chamber and beneath a stream of air which blows into the upper end of said chamber to direct the fibers downwardly in said chamber,

guiding the falling fibers into an air bridge defined by a wedge-shaped section formed adjacent the lower end of said chamber, said wedge shaped section having a relatively wide end opening on said expansion chamber, and a relatively narrow end being in communication with a condenser chamber, which is located adjacent said expansion chamber,

drawing the fibers by vacuum through said wedge-shaped section and into a mat-forming space formed between the confronting runs of a pair of endless belt members which are mounted one above the other in said condenser chamber, and

causing said confronting runs of said members to travel in the same direction and away from said wedge-shaped section, whereby the fibers entering said space between said runs are progressively advanced and compacted between said runs into a fiber mat.

4,102,964

METHOD FOR MANUFACTURING RIGID ARTICLES HAVING A CUSHIONED SURFACE

Louis H. Ridgeway, Jonesville, S.C., assignor to Facetglas, Inc., Rock Hill, S.C.

Continuation-in-part of Ser. No. 535,678, Dec. 23, 1974, Pat. No. 4,069,523. This application Jun. 17, 1976, Ser. No. 696,879

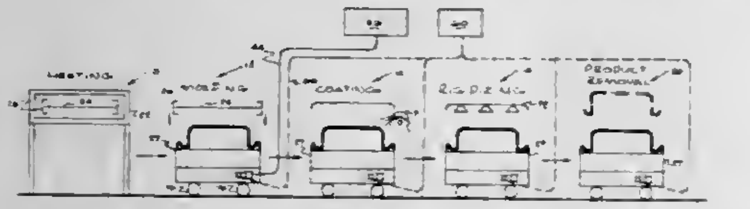
Int. Cl.² B29C *17/04;* B29D *3/02, 9/00*

U.S. Cl. 264—92 **5 Claims**

1. A method of manufacturing a large rigid article having a cushioned surface employing an assembly line having spaced treating stations including a molding station for shaping cushioned sheet material in a vacuum forming operation, a coating station for applying a flowable, rigidizable material to an exposed surface of the shaped cushioned sheet, and a rigidizing station for rigidizing and bonding the flowable material to the exposed surface of the shaped sheet, comprising the steps of

a. providing a formable, drapable sheet of resiliently deform-

able cushioning material which does not become self-supporting in shape after forming;
b. applying the sheet to the exposed shaping surface of a portable, vacuum forming mold while drawing a vacuum on the mold to intimately conform the sheet to the shaping surface;
c. transporting the mold containing the sheet under vacuum thereon to the spaced coating station;
d. coating the exposed surface of the sheet on the mold with a bondable, rigidizable layer of resinous material while continuously maintaining vacuum on the mold to retain the sheet in intimate contact with the molding surface of the mold;



e. transporting the mold with the sheet and rigidizable layer while the mold remains under vacuum to the spaced rigidizing station to solidify the rigidizable layer and bond it to the surface of the sheet;
f. removing the vacuum from the mold; and
g. thereafter removing the rigid article from the molding surface of the mold.

4,102,965

PROCESS FOR THE PRODUCTION OF POLYAMIDE-6-FILAMENTS OF THE γ-MODIFICATION

Harry Kubitzek; Karlheinz Feltgen, and Friedrich-Karl Rosendahl, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 10, 1976, Ser. No. 665,852

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1975, 2510917; Nov. 11, 1975, 2550551

Int. Cl.^{2} D02G *1/20*

U.S. Cl. 264—103 **5 Claims**

1. A process for the production of continuous polyamide-6-filaments present in the γ-modification both before and after stretching at room temperature wherein polyamide-6 with a relative solution viscosity of from 2.3 to 3.1, preferably of from 2.6 to 2.85, as measured on a 1% solution in m-cresol as spun and wherein the resulting filaments
a. after leaving the spinneret, are air-cooled and preoriented up to an elongation at break of from 50 to 80% by being run off at a speed of 3700 to 4500 m/minute,
b. before winding into package form and during take-off, the filaments are prepared with an aqueous preparation oil in such a way that they contain less than 3.0% by weight of water, and
before winding into package form the filaments are subjected to interlacing.

4,102,966

METHOD OF MOLDING POLYTETRAFLUOROETHYLENE

Gilbert Duperray, Lozanne; André Monnet, Lyon, and Claude Tournut, Francbeville, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

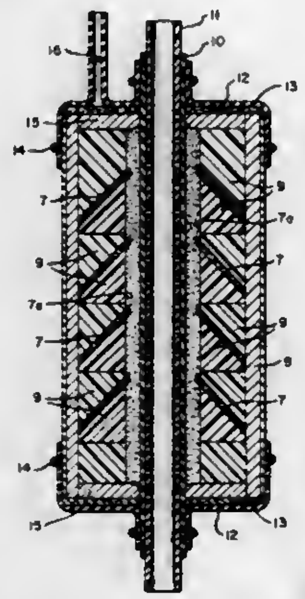
Filed Mar. 29, 1976, Ser. No. 671,042

Claims priority, application France, Apr. 16, 1975, 75 11770

Int. Cl.^{2} B29C *3/00*

U.S. Cl. 264—112 **13 Claims**

1. A method for making a composite, complex, molded structure from granular polytetrafluoroethylene powder comprising:
a. compressing granular polytetrafluoroethylene powder at a pressure between about 10 and 50 bars to cohere the granules into a consolidated preform,
b. placing the preform in contact with additional polytetrafluoroethylene granules in an isostatic mold, and



c. subjecting the preform in step (b) to isostatic molding at a pressure between about 100 and 1000 bars to cohere the preform and the additional granules into a complex, molded, composite structure.

4,102,967

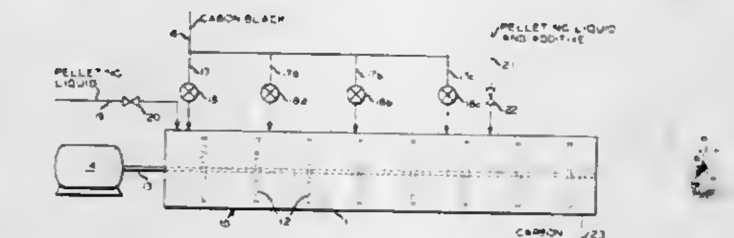
PELLETING OF CARBON BLACK

John W. Vanderveen, and Harold R. Hunt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 9, 1976, Ser. No. 713,073

Int. Cl.^{2} B01J *2/10*

U.S. Cl. 264—113 **9 Claims**



1. A method of pelleting carbon black which comprises:
(a) introducing an aqueous pelleting liquid and loose carbon black in a weight ratio of about 2:3 to about 2:1, respectively, into one end of an elongated continuous pellet mill having agitating means disposed between the said one end and a second end of the mill;
(b) actuating said agitating means to mix said liquid and carbon black to form pellets and to move said pellets toward the second end of the mill;
(c) introducing additional loose carbon black into the mill through at least one inlet positioned between said one end and said second end so that the average residence time of the pellets between said one end and the inlet is at least one minute, the amount of carbon black introduced through each of said at least one inlet being about 10 to about 50 percent by weight of the carbon black introduced into said one end and the total amount of carbon black introduced through said at least one inlet being in the range of about 50 to about 150 percent by weight of the carbon black introduced into said one end;
(d) introducing additional liquid into said mill between the last inlet and said second end of the mill, said additional liquid being selected from the group consisting of (1) a aqueous liquid containing a carbohydrate, a surface active agent or a hydrocarbon oil and (2) a hydrocarbon oil, the amount of additional liquid so added being in the range of about 5 to about 50 percent by weight of the amount of liquid introduced into said one end, the amount of carbohydrate, surface active agent or hydrocarbon oil being in the range of about 0.02 to about 0.5 weight percent of the total amount of carbon black introduced into the mill, and the location at which the additional liquid is added being spaced from said second end of the mill so that agitation is imparted to the pellets after the additional liquid is added, thereby forming layered pellets containing the additional liquid substantially only in an outer layer of the layered pellets; and
(e) removing said layered pellets from the second end of the mill.

4,102,968

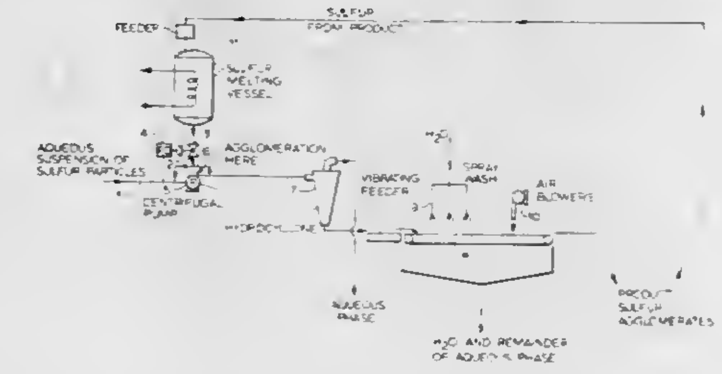
AGGLOMERATION OF FINELY DIVIDED SULFUR PARTICLES IN A LIQUID SUSPENSION

Bruce F. Caswell, Green Oaks Township, Livingston County, Mich., assignor to Arcanum Corporation, Ann Arbor, Mich.

Filed Jul. 11, 1977, Ser. No. 814,486

Int. Cl.^{2} B01J *2/28*

U.S. Cl. 264—117 **7 Claims**



1. A process for preparing agglomerates of finely divided sulfur particles, which comprises the steps of continuously feeding into an agglomeration system (1) a first stream of a suspension of finely divided sulfur particles suspended in an aqueous liquid medium, and (2) a second stream consisting essentially of molten sulfur, continuously agitating the contents of the agglomeration system to effect collisions between said sulfur particles and contacts between said sulfur particles and said molten sulfur so that the surfaces of said sulfur particles are wetted with said molten sulfur so as to cause said particles to stick together and to cause said molten sulfur to solidify, in situ, while it is undergoing agitation and is in contact with the sulfur particles whereby to form solid sulfur agglomerates, and then recovering said sulfur agglomerates from the liquid phase.

4,102,969

METHOD FOR MANUFACTURING CRIMPED TEXTILE ELEMENTS BY FIBRILLATION OF FILMS

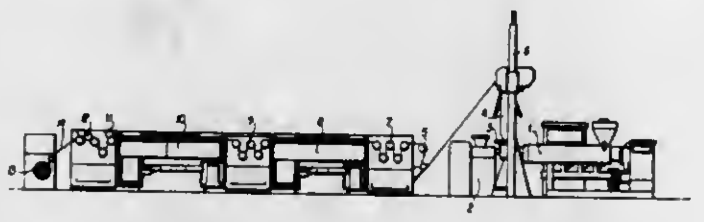
Jean-Louis Neveu, Lozanne; Gerard Berliet, and Angelo Dervissoglou, both of Lyons, all of France, assignors to Institut Textile de France and Agence Nationale de Valorisation de la Recherche, both of France

Filed Apr. 5, 1976, Ser. No. 673,471

Claims priority, application France, Apr. 10, 1975, 75 11489

Int. Cl.^{2} B29H *7/18*

U.S. Cl. 264—147 **5 Claims**



1. In a process for producing crimped textile elements such as fibers and continuous filaments, by fibrillation of a bicomponent film comprising:
extruding a bilaminate film wherein the first face comprises a copolyolefin polymer based predominantly of polypropylene and the second face another polyolefin polymer different from the first,
orienting the extruded film by stretching, and
fibrillating the oriented film;
the improvement wherein the second face comprises a mixture of at least:
a homopolyolefin polymer,
an acidic vinyl terpolymer in an amount by weight of less than about 20% of the weight of the mixture, and
a polyamide in an amount by weight of less than about 10% of the weight of said mixture.

4,102,970

THERMOSETTING COMPOSITIONS WHICH CAN BE CURED TO FORM MOLDED OBJECTS OR COATINGS

Bernward Deubzer, and Werner Graf, both of Burghausen, Germany, assignors to Wacker-Chemie BmbH, Munich, Germany

Continuation of Ser. No. 607,724, Aug. 25, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 780,576

Int. Cl.^{2} B28B *3/20*

U.S. Cl. 264—176 R **9 Claims**

5. A method for preparing a molded article which comprises preparing a composition consisting essentially of (1) an organopolysiloxane containing at least 40 mol percent of monoorganosiloxane units and having at least 0.1 percent by weight of condensable groups, (2) a filler, (3) a condensation catalyst and (4) a diorganopolysiloxane which is incompatible with organopolysiloxane (1) and has a viscosity of at least 30 cSt at 25° C in which the diorganopolysiloxane (4) is present in an amount of from 15 to 30 percent by weight based on the weight of the organosiloxane (1) and the resultant mixture consisting essentially of organopolysiloxanes (1) and (4) forms two phases and thereafter introducing the composition into a mold having the desired configuration and thereafter curing the molded article.

6. The method of claim 5 wherein the composition is introduced into an extrusion molding device.

4,102,971

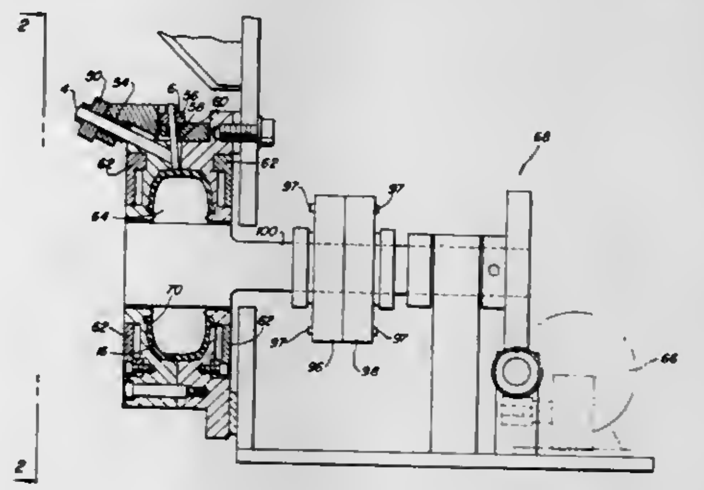
CAST ANNULAR LAMINATES AND METHOD AND APPARATUS FOR MAKING SAME

Sundar L. Aggarwal, Akron; Leon F. Marker, Cuyahoga Falls; Thomas J. Dudek, Tallmadge, and Robert J. Herold, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 14, 1977, Ser. No. 777,200

Int. Cl.^{2} B29C *5/04;* **B29D** *23/08;* **B29H** *3/00, 5/02*

U.S. Cl. 264—255 **6 Claims**



1. A method of making an annular laminar structure of cured

resinous material by a molding process, the steps of the process comprising:

(a) injecting at least two separate streams of different chemically extendable liquid materials into at least two different circumferential segments of a mold cavity, without mixing the at least two materials and without movement of the mold surface, the annular mold cavity having an outer surface which defines the outer surface of the liquid materials and an inner surface which defines the inner surface of the liquid materials;

(b) moving one mold surface relative to the second mold surface while maintaining the two surfaces at the same distances from each other to form alternating layers of different liquid materials;

(c) terminating the relative movement; and

(d) allowing the liquid materials to cure to form an annular laminate of alternating materials having different moduli of elasticity.

4,102,972

REFRACTORY PIPE FITTINGS AND PRODUCTION THEREOF

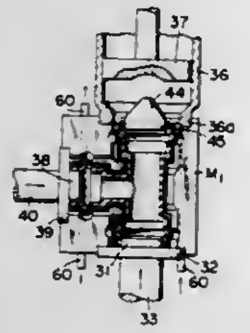
Tomiji Tarukawa, and Hideaki Tarukawa, both of 51-7, Higashiyama-Cho, Itabashi-Ku, Tokyo-To, Japan

Continuation of Ser. No. 594,185, Jul. 8, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 854,575

Claims priority, application Japan, Jul. 19, 1974, 49-82781

Int. Cl.^{2} B28B *1/16*

U.S. Cl. 264—256 **5 Claims**



1. A method for producing a refractory pipe fitting having a hollow and rigid inner layer made of a synthetic resin, an outer layer made of a refractory material comprising non-metallic inorganic fibers and inorganic binder material, and an intermediate layer made of a flexible foamed synthetic resin interposed between the inner and outer layers for securing these layers and for permitting displacement and deformation of the inner and outer layers relative to each other, comprising the steps of preparing an outer mold internally formed with a molding cavity conforming to the outer configuration of the outer layer, preparing a composite body made up of a shell of the synthetic resin, which is to form said inner layer, and a thin layer of the flexible foamed synthetic resin, which is attached to the outer surface of the shell and is to form said intermediate layer, placing the composite body in said molding cavity to provide a mold gap between the inner surface of the outer mold and the outer surface of the thin layer of the composite body, preparing a mixture of said inorganic fibers and said binder material, kneaded with water, forcibly supplying the kneaded mixture under pressure into said mold gap to carry out a molding operation in which the mixture is adhered to the layer of the flexible foamed synthetic resin, heating the outer mold internally during the molding operation to cause the water in the mixture being molded to be evaporated to form a thin lubricating film of water vapor between the mold and the outer surface of the pipe fitting being molded, and opening the outer mold, after the completion of the molding operation, to take out the molded pipe fitting with said shell attached to the inner surface of the molded outer layer through said thin layer of the flexible foamed synthetic resin.

4,102,973

METHOD OF PRODUCING AN EXCITATION COIL FOR SHADED POLE ELECTRIC MOTORS

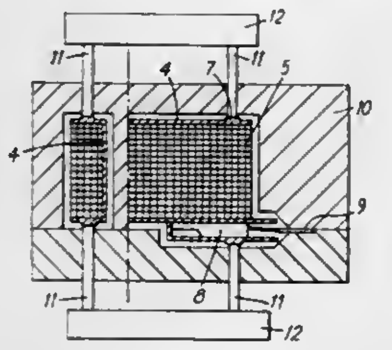
Robert Hanning, Campione d'Italia, Italy, assignor to Hanning Elektro-Werke, Fed. Rep. of Germany

Continuation of Ser. No. 537,372, Oct. 30, 1974, abandoned. This application Jun. 23, 1976, Ser. No. 698,920

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1974, 2400379

Int. Cl.^{2} B29F *1/10*

U.S. Cl. 264—272 **8 Claims**



1. A method of producing an excitation coil for a shaded pole electric motor comprising the steps of

applying a coil winding to a thin walled coil former, said coil former having a plurality of projections thereon,

placing said assembled coil winding and coil former in an injection mold having a plurality of pins extending from the walls thereof, said plurality of pins corresponding to the plurality of projections on said coil former,

supporting said assembled coil winding and coil former within said injection mold by engaging said plurality of pins extending from the walls of the injection mold with the corresponding projections on said coil former, said pins providing the sole support for said assembled coil winding and coil former,

injecting into said injection mold a thermoplastics synthetic material having a solid filler therein, said filler having a higher melting point than said thermoplastics material,

allowing said thermoplastics synthetic material to become partially set but still flowable,

retracting said pins into the walls of said injection mold thereby allowing said partially set thermoplastics synthetic material to flow into spaces left by the retraction of said pins,

allowing said thermoplastics synthetic material to set completely, and

removing the formed excitation coil from said injection mold, said coil having a dampness-resisting homogeneous envelope and being non-self-igniting, said thermoplastics synthetic material and solid filler dissipating heat from a short circuit occurring in the interior of the coil by allowing gases generated within said coil to escape through the filler lattice without permitting oxygen to enter the coil.

4,102,974

POLYOLEFIN CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Kenneth A. Boni, Wheaton, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 791,091

Int. Cl.^{2} B29D *23/01*

U.S. Cl. 264—294 **9 Claims**

1. A method of forming a thermoplastic container having increased resistance to gas permeability which comprises preparing a billet comprised of a mixture of a moldable polyolefin resin, an inorganic filler and at least about 13.5 volume percent of a vinylidene chloride polymer resin having a median particle diameter greater than 150 microns and then molding the billet into a hollow container at a temperature of about 25° to about 40° F greater than the melt temperature of the vinylidene chloride polymer.

4,102,975

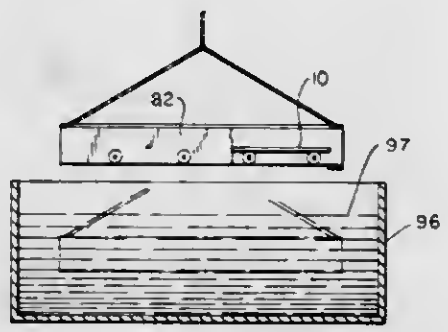
METHOD OF TREATING AND FORMING A PANEL

Richard P. Doerer, Grosse Pointe, Mich., assignor to Van Dresser Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 344,869, Mar. 26, 1973, Pat. No. 3,948,708. This application Mar. 1, 1976, Ser. No. 661,387

Int. Cl.^{2} B29J *1/02*

U.S. Cl. 264—322 **6 Claims**



1. A method of forming a curved flexible substantially self-supporting sheetlike structure, comprising the steps of providing a panel comprising a sheet of fibrous material formed of wood fibers in a resin binder and having a substantial resistance to bending and being capable of being softened and made sufficiently ductile to permit forming compound curvatures in it without tearing or blowing by the application thereto of water at a temperature in the range of 180° F. to 212° F., providing a body of water at a temperature in said range, totally immersing said panel in said body of water for from 3 seconds to 40 seconds, thereafter placing the panel between heated dies and forming a compound curvature in the same by the application of heat and pressure to the opposite sides thereof by said dies, and holding the panel between said dies until sufficiently dry to hold its shape.

4,102,976

TREATMENT OF ORES OR METALLURGICAL BY-PRODUCTS CONTAINING ARSENIC AND ANTIMONY

Jozef Hiemeleers, Olen; Achille De Schepper, Lichtarrt, and Antoine Van Peteghem, Olen, all of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Mar. 18, 1976, Ser. No. 667,933

Claims priority, application Luxembourg, Apr. 1, 1975, 72186; May 14, 1975, 72477

Int. Cl.^{2} C01B *27/00, 29/00*

U.S. Cl. 423—87 **38 Claims**

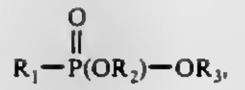
1. In a process for treating a metal bearing material containing arsenic and antimony by leaching in an acid solution with an oxygen containing gas under pressure at a temperature of between 20° and 200° C, the improvement which consists in adding at least one element chosen from the group consisting of arsenic and phosphorus in such an amount to the leach mixture that the molar ratio (As + 4P):Sb therein shall be at least equal to 8, thus dissolving at least the major part of the arsenic and antimony contained in the starting material.

36. A process for separating simultaneously arsenic and antimony from an aqueous acid solution having a molar ratio (As + 4P) : Sb at least equal to 8, which process comprises bringing the aqueous solution into contact with an organic phase comprising

(a) 2-30% by volume of an alkylated 8-hydroxyquinoline,

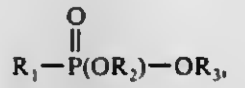
(b) 5-80% by volume of a substance selected from the group of substances consisting of

(a') phosphonic acid esters having the general formula



$$R_1-\overset{\overset{\displaystyle O}{\|}}{P}(OR_2)-OR_3,$$

phosphonous acid esters having the general formula $R_1-P(OR_2)-OR_3$, phosphinic acid esters having the general formula



$$R_1-\overset{\overset{\displaystyle O}{\|}}{P}(OR_2)-OR_3,$$

and phosphinous acid esters having the general formula $R_1-P(R_2)-OR_3$, wherein R_1, R_2 and R_3 represent the same or different, unsubstituted or substituted hydrocarbon groups, and

(b') organophosphoric compounds having the general formula $(RO)_3P = 0$, wherein R represents an unsubstituted or substituted alkyl, aryl or aralkyl group, and

(c) an inert organic diluent,

while maintaining the acid content of the aqueous phase at at least 1N, whereby arsenic and antimony are extracted from the aqueous phase to the organic phase, and separating the resultant arsenic and antimony-charged organic phase from the aqueous phase.

37. A process for separating selectively antimony from an aqueous acid solution containing antimony and arsenic and having a molar ratio (As + 4 P) : Sb at least equal to 8, which process comprises bringing the aqueous solution into contact with an organic phase comprising

(a) 2-30% by volume of an alkylated 8-hydroxyquinoline, and

(b) an inert organic diluent,

while maintaining the acid content of the aqueous phase at at least 1N, whereby antimony is selectively extracted from the aqueous phase to the organic phase, and separating the resultant antimony-charged organic phase from the resultant antimony-barren aqueous phase.

4,102,977

PROCESS FOR THE PREPARATION OF ALKALI ALUMINOSILICATE DETERGENT BUILDER

Yujiro Sugahara, Tokyo; Koichi Usui, Shibata; Masahide Ogawa, Nakajo; Hideaki Kurosaki, Shibata, and Shigehisa Imafuku, Nakajo, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 12, 1976, Ser. No. 741,365

Claims priority, application Japan, Nov. 18, 1975, 50-137814; Nov. 27, 1975, 50-141141; Oct. 13, 1976, 51-121795

Int. Cl.^{2} C01B *33/28;* C11D *9/18*

U.S. Cl. 423—118 **22 Claims**

1. A process for the preparation of detergent builders which comprises acid-treating a smectite clay mineral under such conditions that at least the X-ray diffraction peak of the plane index (001) substantially disappears and removing a basic metal component in the reaction product by extraction to thereby prepare activated silica or activated alumina-silica, treating the so prepared activated silica or activated alumina-silica with an alkali metal hydroxide or a water-soluble alkali metal silicate to prepare an alkali metal polysilicate or alkali metal polyaluminosilicate having a composition in which the Na_2O/SiO_2 molar ratio is in the range of from 1/3.5 to 1/500, mixing said alkali metal polysilicate or alkali metal polyaluminosilicate with additional amounts of alumina and alkali metal components and water to prepare a homogeneous mixture having a composition capable of forming zeolite of the type A, and heating said homogeneous mixture to crystallize out fine zeolitic particles having a maximum primary particle size smaller than 1 μ.

4,102,978

PROCESS FOR PRODUCING ALUMINA CATALYST CARRIERS

Joseph R. Klovsky, Kent, Ohio, assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 630,317, Nov. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 393,801, Sep. 4, 1973, abandoned. This application May 20, 1977, Ser. No. 798,887

Int. Cl.^{2} C01F *7/02*

U.S. Cl. 423—626 **1 Claim**

1. A method of making a high purity alumina body consisting of providing a mix of

(1) 30 to 80 parts of gibbsite fired to an L.O.I. of less than 8%, said fired material containing chi alumina or its thermal transition products

(2) 20 to 40 parts of microcrystalline boehmite

(3) 0 to 50 parts of desensitized microcrystalline boehmite adding to said mix from 2 to 10% by weight of acid selected from the monobasic acids having an anion no larger than that of propanoic acid, and from 80 to 120 parts of water per 100 parts by weight of mix, mixing to provide a free flowing mix, forming shapes by pressure from said mix, drying said shapes to remove at least 80% of the added water, and firing said shapes at a temperature of from 625° to 1200° C, whereby the body has a surface area of from 70 to 220 square meters per gram and a crushing strength for 0.1 inch diameter pellets of greater than 7 pounds.

4,102,979

RADIOIMMUNOASSAY FOR BENZOYLECGONINE

James Gordon Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 22, 1976, Ser. No. 725,912

Int. Cl.^{2} A61K *43/00;* **G01N** *33/16*

U.S. Cl. 424—1 **5 Claims**

1. A method for the radioimmunoassay of benzoylecgonine and cocaine in a sample, which method comprises mixing said sample with a known amount of a radiolabeled benzoylecgonine compound selected from the group consisting of benzoylecgonine - ^{3}H having a specific activity suitable for radioimmunoassay procedures and ^{125}I-4-hydroxybenzoylecgonine thereof and an antibody which will selectively complex with said benzoylecgonine or cocaine, measuring the degree of binding of said radio-labeled benzoylecgonine compound, and determining the amount of benzoylecgonine and cocaine present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of benzoylecgonine or cocaine with fixed amounts of labeled benzoylecgonine compound and said antibody and determining the degree of binding for each known amount of said benzoylecgonine or cocaine.

4,102,980

METHOD FOR REMOVAL OF DUST DEPOSITED ON CONTACT APPARATUS INTERIOR

Takashi Sasaki, and Michio Saima, both of Yokohama, Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,839

Claims priority, application Japan, Sep. 25, 1975, 50-114903

Int. Cl.^{2} B01J *37/00*

U.S. Cl. 423—239 **21 Claims**

1. A method for removal of dust deposited on the interior of a contact apparatus which is used to remove harmful components from waste gas emanating from a stationary source and which has a gas-solid contact zone with a plurality of parallel gas channels formed between a plurality of solid bodies that contain an active component for removing harmful components from said waste gas, comprising flowing in free motion through the interior of said apparatus solid particles of average particle diameter of 50 to 2000 μm suspended in a current of a carrier gas at a concentration of solid particles from 20 to 100 g/m^3, the actual linear velocity of said carrier gas within said contact apparatus and in said gas-solid contact zone being from 2 to 15 m/sec and removing the particles and dust with the gas leaving the apparatus.

4,102,981

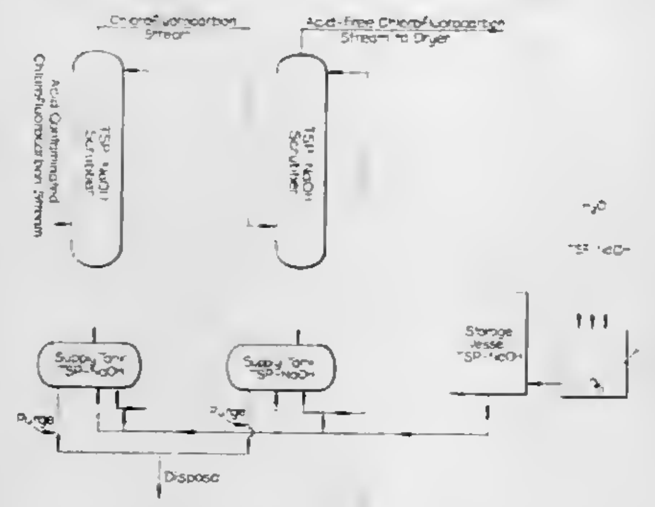
REMOVAL OF ACIDIC IMPURITY FROM CHLOROFLUOROMETHANES

Elias A. Woychesin, Livermore, Calif., and Clovis P. Leglen, III, Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 22, 1977, Ser. No. 826,595

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—240 **6 Claims**



1. In the process of removing acidic contaminants from streams containing aliphatic fluorocarbons of the formula $CHCl_nF_{3-n}$, where n is 1 or 2, and the acidic impurity is HCl, by scrubbing the stream with an aqueous solution of trisodium phosphate in a scrubber system, the improvement which comprises scrubbing the HCl-contaminated stream in at least one scrubber with an aqueous solution containing a mixture of trisodium phosphate and sodium hydroxide, the solution having a trisodium phosphate content from about 3% to about 7% by weight and a sodium hydroxide concentration from about 1% to about 6% by weight, at least periodically purging a portion of the aqueous solution after contact with the acid-contaminated fluorocarbon streams, replenishing the purged portion with a substantially equal volume of fresh aqueous scrubbing solution containing essentially the concentration of sodium hydroxide and trisodium phosphate as the scrubbing solution prior to contact with the acid-contaminated fluorocarbon streams, recycling the replenished scrubbing solution to the scrubbing step and disposing of the purged portion.

4,102,982

PROCESS FOR TREATING STACK GASES

Alexander Weir, Jr., 8229 Billowvista Dr., Playa Del Rey, Calif. 90291

Continuation-in-part of Ser. No. 237,812, Mar. 24, 1972. This application Jun. 13, 1974, Ser. No. 478,871

Int. Cl.^{2} C01B *17/00, 21/00*

U.S. Cl. 423—242 **6 Claims**

1. A process for removing gaseous and particulate pollutants from stack gases, wherein the steps comprise:

passing the stack gases through a defined substantially horizontally extending flow path having a substantially unrestricted cross-sectional flow area throughout the length thereof to avoid any substantial pressure drop; and

spraying a sulfur dioxide reactive calcium hydroxide and a nitrogen oxide reactive acid-alkali metal dichromate or permanganate ion containing liquid reagent at a plurality of stages along said flow path and spraying said reagent into said flow substantially perpendicular thereto and substantially cross-current to the flow of stack gases passing therethrough to substantially cover at least at one stage the cross-sectional flow area of said flow path with a sheet of spray droplets of said liquid reagent and thereby effect by said droplets of reagent removal of pollutants from the stack gases.

4,102,983

METHOD OF PURIFYING A GAS CONTAINING VOLATILE ORGANIC MATERIALS

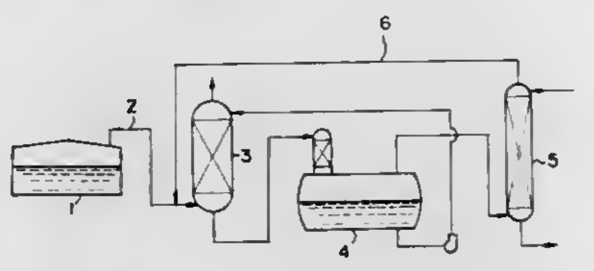
Osamu Yamase, Kanagawa; Tetsuya Iida, Yokohama, and Ichizo Hara, Hiratsuka, all of Japan, assignors to Showa Oil Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,480

Claims priority, application Japan, Sep. 19, 1975, 50-113285

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—245 **3 Claims**



1. A method of purifying a gaseous mixture containing air and vapors of volatile organic materials selected from the group consisting of low boiling petroleum products (e.g. gasoline, naphtha and jet fuel), low boiling liquid products (e.g. aliphatics, naphthenics and aromatics), and also low boiling liquid alcohols, aldehydes, ketones, and chlorine-containing organic materials which comprises contacting said gaseous mixture with an absorption liquid prepared by blending a refined mineral oil with at least one compound selected from the group consisting of methyl ethyl phthalate, diethyl phthalate, dioctyl phthalate, didecyl phthalate, dibutyl phthalate, dimethyl phthalate, dilauryl phthalate, decyl isooctyl phthalate, butyl benzyl phthalate and butyl lauryl phthalate; tetraoctyl silicate and tetranonyl silicate; trioctyl phosphate, tricresyl phosphate, tributyl phosphate, tributoxyethyl phosphate, trixylenyl phosphate, tricresyl diphenyl phosphate, and octyl diphenyl phosphate; dioctyl adipate, dibutyl adipate, dioctyl azelate, dibutyl sebacate, dioctyl sebacate, and butyl oleate; n-dodecyl benzene and isododecyl benzene; α-olefin oligomers having an average molecular weight of 300 to 400 and a kinematic viscosity of 10 to 20 cSt, at 37.8° C,

said mineral oil having an average molecular weight of 200 to 350, **a kinematic viscosity** of 5 to 20 cSt at 37.8° C, and boiling range of 250° C to 450° C under normal pressure, and absorbing said volatile organic materials therefrom into said absorption liquid.

4,102,984

PHOTOLYSIS METHOD FOR PRODUCING NF_4PF_6

Karl O. Christe, Calabasas, and Carl J. Schack, Chatsworth, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1976, Ser. No. 732,244

Int. Cl.^{2} C01B *25/10*

U.S. Cl. 423—301 **1 Claim**

1. A process for the production of NF_4PF_6 characterized by photolyzing a mixture of NF_3,F_2 and PF_5 having an approximate mol ratio of 3:1:3 at −196° C and removing unreacted volatile starting materials from the non-volatile NF_4PF_6 product by pumping at ambient temperature.

4,102,985

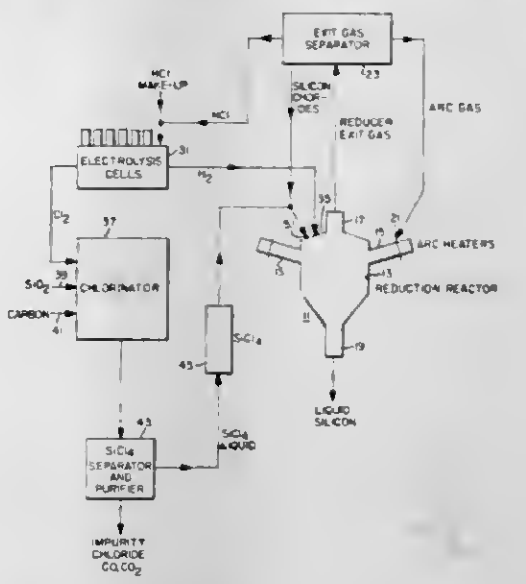
ARC HEATER PRODUCTION OF SILICON INVOLVING A HYDROGEN REDUCTION

Francis J. Harvey, II, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,545

Int. Cl.^{2} C01B *33/02, 7/08*

U.S. Cl. 423—350 **6 Claims**



1. A process for producing high purity silicon by reduction of a silicon halide comprising the steps of:

(a) providing an arc heater having spaced electrodes and forming an arc chamber communicating with a reaction chamber,

(b) striking an electric arc in an axial gap between the electrodes,

(c) introducing an arc gas selected from the group consisting of hydrogen, an inert gas, silicon halides, and mixtures thereof through the gap to provide an elongated arc stream extending into the reaction chamber,

(d) feeding into the arc stream a quantity of hydrogen,

(e) feeding into the arc stream a quantity of the halide of silicon to produce reaction products including liquid silicon and hydrogen halides,

(f) projecting the reaction products tangentially into a cyclonic reaction chamber to cause the liquid silicon to separate centrifugally from the gaseous co-products, and

(g) depositing the liquid silicon on a downwardly extending surface to permit the liquid silicon to flow into an associated receptacle.

4,102,986

PROCESS FOR THE CONTINUOUS MANUFACTURE OF NITROUS OXIDE

Jakob Van Rouendal Smit; Panayiotis Hassiotis, and Robert Armistead Hasty, all of Johannesburg, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Continuation-in-part of Ser. No. 542,965, Jan. 22, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,910

Int. Cl.^{2} C01B *21/22*

U.S. Cl. 423—402 **16 Claims**

1. In a process for the manufacture of nitrous oxide comprising the decomposition of ammonium and nitrate ions in the presence of chloride ion and high hydrogen ion concentration in an aqueous reaction liquor in a reaction space in a continuous process.

the improvement comprising process conditions:

(a) the concentration of chloride ions being maintained between 0.05 and 0.45 M, the concentration of hydrogen ions being maintained between 3 M and 7 M; the concentration of ammonium ions being maintained between 1 M and the maximum solubility of ammonium ions in the presence of nitrate ions at the reaction temperature and the concentration of nitrate ions being maintained between 4M and 16M;

(b) as said decomposition proceeds, feeding ammonium and nitrate ions and hydrogen and chloride ions into the aqueous reaction liquor contained in the reaction space,

(c) maintaining in the reaction liquor a temperature above 80° C, said temperature being the boiling temperature of the reaction liquor at the ambient pressure inside the reaction space;

(d) withdrawing from the reaction space, as the decomposition proceeds, water formed by said decomposition and such excess water as may be introduced into the reaction space in the course of step (b) above by distilling such water together with the nitrous oxide in the form of an a acidic aqueous vapour containing free nitric acid and hydrochloric acid from the reaction space into a fractionation space;

(e) producing an overhead condensate consisting essential of water over said fractionation space;

(f) removing and discarding part of said water condensate

(g) returning another part of said water condensate to the fractionation space, said condensate washing downwardly the upwardly flowing nitric and hydrochloric acid vapours of step (d);

(h) recovering said hydrochloric and nitric acids as free acids in aqueous solution as bottoms liquor and recycling the bottomsliquor to the reaction space; and

(i) removing overhead from said fractionation space the nitrous oxide in a form essentially depleted of nitric acid and hydrochloric acid.

4,102,987

PROCESS FOR PREPARING SULFURYL-FLUORIDE AND -CHLOROFLUORIDE PRODUCTS

David M. Cook, Pittsburgh, and Douglas C. Gustafson, Antioch, both of Pa., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 616,517, Sep. 25, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,311

Int. Cl.² C01B *7/24, 17/45*

U.S. Cl. 423—466 **7 Claims**

1. A process for removing chlorine from a product reaction mixture comprising sulfuryl fluoride and prepared by the reaction of an anhydrous gaseous mixture of sulfur dioxide, chlorine and hydrogen fluoride in the presence of a catalyst comprising activated carbon, said process comprising reacting the product reaction mixture at a temperature of from about 35° to about 145° C. and at a pressure of from about atmospheric to about 65 psi in the presence of a catalyst comprising activated carbon, thereby reducing the free chlorine content of said mixture and converting free chlorine present in said product reaction mixture to sulfuryl chlorofluoride and thereafter separating SO_2F_2 from the product reaction mixture.

4,102,988

CYANO COMPOUNDS AS FUELS FOR HF OR DF LASERS

Pasquale Martignoni; James A. Murfree, Jr.; William M. Chew, and Orval E. Ayers, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1977, Ser. No. 838,519

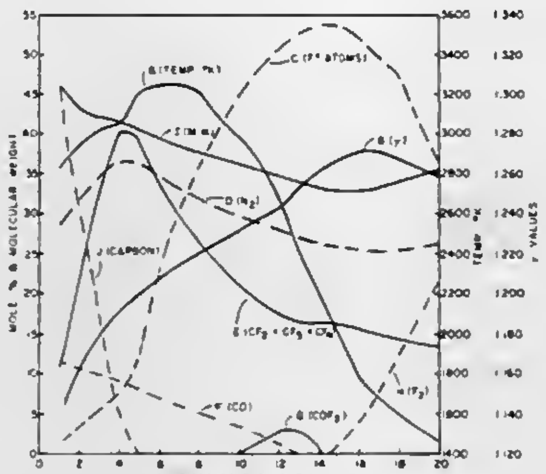
Int. Cl.² C01B *7/22*

U.S. Cl. 423—483 **6 Claims**

1. A method of forming vibrationally excited HF or DF molecules which produces lasing, said method comprising:

(i) providing a predetermined molar quantity of a cyano compound fuel selected from the group consisting of dicyanoacetylene, tetracyanoethylene, and tetracyanoethylene oxide and a predetermined molar quantity of an oxidizer compound dispersed in a predetermined molar quantity of a diluent gas selected from the group consisting of helium and nitrogen, said oxidizer selected from the group consisting of fluorine, nitrogen trifluoride, chlorine trifluoride, chlorine pentafluoride, and tetrafluorohydrazine;

(ii) reacting under a predetermined pressure in the range of several atmospheres said cyano compound fuel with said oxidizer in a combustor wherein the oxidizer to fuel ratio is maintained from about 6 to 1 about 14 to 1 by adjusting said predetermined molar ratio of said oxidizer, said fuel, and said diluent gas to produce F atoms, and reacting the F atoms with hydrogen or deuterium to form vibrationally excited HF or DF molecules which produces lasing.



4,102,989

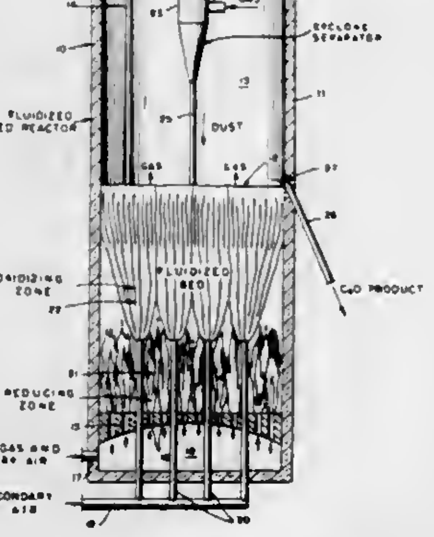
SIMULTANEOUS REDUCTIVE AND OXIDATIVE DECOMPOSITION OF CALCIUM SULFATE IN THE SAME FLUIDIZED BED

Thomas D. Wheelock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 470,053, May 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 583,608, Jun. 4, 1975, abandoned. This application May 17, 1976, Ser. No. 686,727

Int. Cl.² C01B *17/50, 13/14;* **C04B** *11/02*

U.S. Cl. 423—541 R **8 Claims**



1. The continuous process of converting $CaSO_4$ to a solid CaO product and a gaseous SO_2 product by high temperature treatment of finely-divided $CaSO_4$ in a circulating fluidized bed of solid particles into which is introduced a hydrogen-containing carbonaceous fuel and air for combustion thereof to form in said bed a reducing gas containing CO and H_2, wherein the improvement comprises: maintaining a reducing zone in a lower portion of said fluidized bed by introducing a feed to said reducing zone portion consisting essentially of said hydrogen-containing carbonaceous fuel and primary air, controlling the quantity of said primary air so that the reducing conditions in said lower reducing zone portion are effective to convert said $CaSO_4$ therein to a mixture of CaO and CaS, concurrently introducing secondary air into an upper portion of said bed above the level at which said fuel is introduced to provide an oxidizing zone within said bed capable of converting CaS to CaO, the solid particles of said bed during said treatment continuously circulating between and through said reducing and oxidizing zones, the total amount of O_2 supplied in said primary and secondary air plus the O_2 produced by calcium sulfate decomposition being at least equal to the stoichiometric quantity of O_2 required for complete combustion of the said fuel to CO_2 and H_2O, removing the CaO product from the upper portion of said bed, and removing the gaseous SO_2 product from above the bed substantially free of CO, H_2 and said fuel.

4,102,990

ELECTROPHORETIC ASSAY FOR ANTIGEN-ANTIBODY REACTION BASED ON PARTICLE-PARTICLE COUPLING

Egidijus E. Uzgiris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,420

Int. Cl.² G01N *27/26, 33/16*

U.S. Cl. 424—12 **8 Claims**

1. A method of detecting a reaction between antigenic protein molecules and antibody protein molecules, comprising:

preparing a first suspension of particles of high electrophoretic mobility with a first type of said protein molecules bonded thereto;

preparing a second suspension of particles of low electrophoretic mobility with said first type of protein molecules bonded thereto;

forming a mixture of said first and second suspensions in a solution to be tested for a second type of protein specific to said first type of protein on said particles; and

detecting electrophoretic mobility of particles intermediate said high and low electrophoretic mobilities as an indication that an antigen-antibody reaction has occurred.

4,102,991

PROCESS FOR CONTROLLING COCKROACHES AND OTHER CRAWLING INSECTS

Agis F. Kydonieus, New York, N.Y., assignor to Herculite Protective Fabrics Corporation, New York, N.Y.

Filed Aug. 8, 1975, Ser. No. 603,052

Int. Cl.² A01N *17/12*

U.S. Cl. 424—27 **4 Claims**

1. A process for the control of cockroaches in structures comprising

deploying in the harborages and crawlpaths of the cockroaches a plurality of solid polymeric controlled release dispenser strips consisting essentially of

a barrier layer having on the first side thereof a pressure-sensitive adhesive and on the second side thereof

a polyvinyl chloride plastisol layer containing the insecticide propoxur and on the side thereof opposite said barrier layer,

a polyvinyl chloride layer, wherein

said controlled release is effected by molecular migration of said propoxur through and to the exposed surface of the polyvinyl chloride layer,

said strips have an insecticidally effective surface concentration of propoxur on said exposure surface,

said deploying of the strips is by means of said pressure-sensitive adhesive, and

the cumulative surface area of propoxur bearing surface of the strips is from about ⅓ to about 3 square feet per from about 100 to 150 square feet of floor area of the structure in which control of said cockroaches is sought.

4,102,992

DENTIFRICE

Walter Bryan Davis, Newdigate, England, assignor to Beecham Group Limited, England

Continuation-in-part of Ser. No. 541,423, Jan. 16, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,595

Claims priority, application United Kingdom, Feb. 8, 1974, 5983/74

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **11 Claims**

1. A dentifrice toothpaste composition with minimum abrasion of tooth surface which contains as the cleaning agent 35–45% w/w of particulate coarse grade calcium carbonate weight median diameter 10–15 microns, which concentration otherwise adversely scratches dental enamel, and from 5–25% w/w of 40–100 micron organic thermoplastic water-insoluble particulate polymeric material having a Moh hardness of 3 or less in the form of particles which are not substantially agglomerated, which material is (a) less abrasive than and (b) of lower average density than the calcium carbonate and which reduces the scratch depth of the calcium carbonate on dental enamel.

4,102,993

ANTIBACTERIAL ORAL COMPOSITION

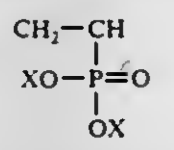
Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,783

Int. Cl.² A61K *7/22*

U.S. Cl. 424—54 **17 Claims**

1. An oral composition comprising an oral vehicle, a nitrogen containing antibacterial antiplaque agent tending to stain dental surfaces selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of 12 to 18 carbon atoms and a water soluble polymeric polyphosphonic compound antistain additive having the recurring group:



$$\begin{array}{c} CH_2{-}CH \\ | \\ XO{-}P{=}O \\ | \\ OX \end{array}$$

wherein X is selected from the group consisting of hydrogen and an orally acceptable cation and the unphosphonated recurring groups of said compound have a total molecular weight of at least about 3,500.

4,102,994

ALIPHATIC AMIDO-QUATERNARY AMMONIUM ANTI-MICROBIAL COMPOUNDS

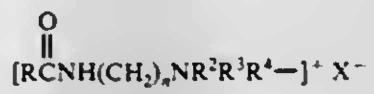
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 445,713, Feb. 25, 1974, Pat. No. 4,046,873, which is a continuation-in-part of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application May 31, 1977, Ser. No. 801,975

Int. Cl.² A61K *7/22;* **C09F** *5/00, 7/00*

U.S. Cl. 424—54 **6 Claims**

1. A chemical compound having the structural formula:



$$[R\overset{O}{\overset{\|}{C}}NH(CH_2)_nNR^2R^3R^4{-}]^+\ X^-.$$

wherein R is an aliphatic group containing 7–13 carbon atoms, R^2 and R^3 are independently a methyl or ethyl group, R^4 is an aliphatic chain containing 10–18 carbon atoms, *n* is the integer 2 or 3, and X is a compatible anion.

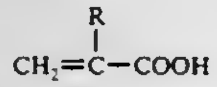
2. A chemical compound as set forth in claim 1, wherein R is a decane radical.

4,102,995
TAR GEL FORMULATION

Peter Hebborn, Clarence, N.Y., assignor to Westwood Pharmaceuticals Inc., Buffalo, N.Y.
Filed May 13, 1976, Ser. No. 685,844
Int. Cl.^{2} A61K *31/78*
U.S. Cl. 424—81 **12 Claims**

1. A therapeutic aqueous gel composition suitable for treating skin comprising:

(a) from about 1 to about 10% by weight of an organic solvent extract of Crude Coal Tar;
(b) from about 25% to about 65% by weight of propylene glycol;
(c) from about 20% to 35% by weight of ethyl alcohol;
(d) from about 0.5% to about 5% by weight of a gelling agent; and
(e) from about 5% to 35% water; said gelling agent being a neutralized carboxyl interpolymer of a monomeric monoolefinic acrylic acid of the structure:


$$CH_2{=}\overset{R}{\overset{|}{C}}{-}COOH$$

where R is a substituent selected from the class consisting of hydrogen and lower alkyl groups, and from about 0.1 to about 10% by weight based on the total monomers of a monomeric polyether of an oligosaccharide in which the hydroxyl groups which are modified are etherified with allyl groups, said polyether containing at least two allyl ether groups per oligosaccharide molecule and said interpolymer having a molecular weight of the order of about 1,000,000.

4,102,996
METHOD OF PREPARING HEPATITIS B CORE ANTIGEN

William J. McAleer, Ambler; William J. Miller, North Wales, and Edward H. Wasmuth, Telford, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Apr. 20, 1977, Ser. No. 789,033
Int. Cl.^{2} A61K *39/12;* **C12K** *7/00*
U.S. Cl. 424—89 **7 Claims**

1. A method of preparing hepatitis B core antigen which comprises treating Dane particles with a nonionic surfactant having from about 15 to about 35 oxyethylene units in the presence of a mercaptan reducing agent.

4,102,997
ACID DEGRADATION PRODUCTS OF BOROMYCIN

Irving Putter, Martinsville, and Lucille J. Cole, Roselle Park, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Nov. 22, 1976, Ser. No. 744,020
Int. Cl.^{2} A61K *35/00*
U.S. Cl. 424—115 **6 Claims**

1. A mixture of boromycin acid degradation products prepared by the process comprising:

(a) treating boromycin or a salt of boromycin dissolved in a suitable solvent with approximately 10 equivalents of acid selected from the group consisting of mineral acids, aromatic sulfonic acids, Lewis acids and strong cation exchange resins for approximately 2 to 4 hours at about room temperature wherein said mineral acids are selected from the group consisting of sulfuric acid, nitric acid and hydrochloric acid; said aromatic sulfonic acids are selected from the group consisting of sulfosalicylic acid and p-toluenesulfonic acid; said Lewis acid is titanium tetrachloride and said strong cation exchange resin is a sulfonic acid resin in the hydrogen form having a styrenedivinylbenzene matrix;
(b) neutralizing the reaction solution by adjusting the pH to about neutral with inorganic base or neutralizing by passage through a column packed with a polystyrene amine anion exchange resin and concentrating the eluate in vacuo to a syrup containing the degradation products; and
(c) in the case wherein the reaction solution is neutralized with inorganic base, removing the precipitated salts by centrifugation and decanting and concentrating the supernatant in vacuo to a syrup.

4,102,998
PROCESS FOR THE PREVENTION OF VENEREAL DISEASE

Morton Gutnick, 8329 Fairview Rd., Elkins Park, Pa. 19117
Continuation-in-part of Ser. No. 621,958, Oct. 4, 1975, Pat. No. 3,996,933, and Ser. No. 515,574, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 294,200, Oct. 2, 1972, abandoned, said Ser. No. 621,958, is a continuation-in-part of Ser. No. 432,435, Jan. 11, 1975, abandoned, which is a continuation-in-part of said Ser. No. 294,200. This application Jul. 1, 1976, Ser. No. 701,889
Int. Cl.^{2} A01N *9/00, 9/22, 9/24;* **A01K** *35/00*
U.S. Cl. 424—115 **15 Claims**

1. A process for preventing contraction of vaginal venereal disease by inhibiting or killing a venereal disease causing organism comprising the steps of:

inserting into the female genitalia tract a container containing a medication; and

substantially continuously releasing in the vagina said medication from said container in an amount and at a rate sufficient to establish and substantially continuously maintain a minimum inhibitory concentration of said medication such that the venereal disease causing organism entering the vagina will be inhibited or killed upon contact with said medication.

4,102,999
PROCESS FOR PRODUCING STABLE MACROMOMYCIN POWDER

Hamao Umezawa, and Tomio Takeuchi, both of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan
Continuation of Ser. No. 653,873, Jan. 30, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,348
Claims priority, application Japan, Feb. 10, 1975, 50-17163
Int. Cl.^{2} A61K *35/00*
U.S. Cl. 424—123 **15 Claims**

1. A process for producing stable macromomycin powder which comprises (a) forming a solution by mixing in an aqueous medium one part by weight of solid macromomycin and at least 10 parts by weight of a stabilizer selected from the group consisting of maltose, lactose, sucrose, cellobiose, melibiose and raffinose and (b) dehydrating the resulting solution to form a powder.

4,103,000
METHOD FOR PREPARING COPPER ARSENATE COMPOSITIONS

Winslow H. Hartford, Charlotte, N.C., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 331,126, Feb. 9, 1973, abandoned. This application May 23, 1974, Ser. No. 472,535
Int. Cl.^{2} A01N *11/08*
U.S. Cl. 424—133 **4 Claims**

1. A method for making copper arsenate compositions which consist essentially of a slurry of water insoluble copper arsenate in an aqueous solution of soluble copper arsenate wherein the mole ratio of arsenic measured as As_2O_5 to copper measured as CuO of the overall copper arsenate composition is within the range of from about 0.3:1.0 to 0.9:1.0 and wherein the copper arsenate composition is soluble in chromic acid comprising reacting copper metal with arsenic acid in the presence of an oxidizing agent and an acid catalyst selected from the group consisting of nitric acid, hydrochloric acid and sulfuric acid wherein the copper and arsenic acid are proportioned to produce a copper arsenate composition having a mole ratio of As_2O_5 to CuO of from about 0.3:1.0 to 0.9:1.0.

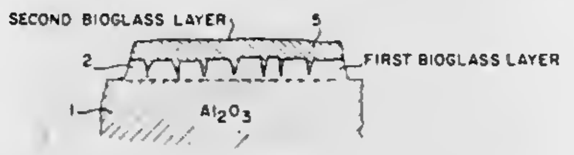
4,103,001
BUFFERED PHENOL-GLUTARALDEHYDE STERILIZING COMPOSITIONS

Robert I. Schattner, 4000 Massachusetts Ave., NW., Washington, D.C. 20007
Filed Aug. 30, 1976, Ser. No. 718,579
Int. Cl.^{2} A01N *11/00, 9/00, 9/24, 9/26*
U.S. Cl. 424—148 **10 Claims**

1. An aqueous sporicidal composition comprising by wt. from 0.75–4.0% glutaraldehyde and from 4–15% of a mixture of phenol and a metal phenate, the phenol content being from 3–10% and the metal phenate being from 0.5–5%, said composition further characterized in having a pH of about 7–10 and an active sterilizing life of at least 30 days.

4,103,002
BIOGLASS COATED A1203 CERAMICS

Larry Leroy Hench, and David Charles Greenspan, both of Gainesville, Fla., assignors to Board of Regents, University of Florida, Tallahassee, Fla.
Filed Feb. 8, 1977, Ser. No. 766,749
Int. Cl.^{2} B32B *17/06, 31/24, 31/26*
U.S. Cl. 428—155 **20 Claims**



1. A method of coating a compacted Al_2O_3 ceramic surface with a biologically active glass, said ceramic and glass having different thermal coefficients of expansion, comprising:

(1) contacting said glass with said ceramic surface at a temperature and for a time sufficient to bond said glass to said ceramic surface by ion diffusion,
(2) cooling said coated substrate to a temperature sufficient to produce interconnected micro-cracks in said glass coating as a result of the thermo-mechanical stresses induced by the differential in thermal coefficients of expansion of said ceramic and glass, and
(3) overcoating said micro-cracked glass coating with at least one additional coating of biologically active glass.

14. A product of manufacture comprising a compacted Al_2O_3 ceramic surface coated with at least two layers of biologically active glass having a thermal coefficient of expansion different from that of said Al_2O_3 ceramic, said first layer being bonded to said ceramic surface through ion-diffusion and characterized by having interconnected thermo-mechanical stress induced micro-cracks therein, and said subsequent layer or layers being successively bonded thereover.

4,103,003
COMPOSITION FOR IMPROVING BIOLOGIC DEVELOPMENT

Harvey H. Ashmead, 719 E. Center St., Kaysville, Utah 84037
Continuation-in-part of Ser. No. 293,268, Sep. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 872,734, Oct. 30, 1969, abandoned. This application Apr. 26, 1976, Ser. No. 680,078
Int. Cl.^{2} A61K *37/02, 31/70*
U.S. Cl. 424—177 **10 Claims**

1. A composition of matter for improving biological development by increasing the availability of essential polyvalent metals in readily assimilable form to the cells of an animal organism comprising effective amounts of (1) a metal chelate with ligands consisting of the polypeptides, peptides and naturally occurring amino acids and (2) a metal chelate with ligands consisting of hydrolyzed carbohydrates.

4,103,004
CARDIOTONIC AGENT

Ted R. Norton; Midori Kashiwagi, and Shoji Shibata, all of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.
Filed Aug. 29, 1977, Ser. No. 828,712
Int. Cl.^{2} A61K *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **9 Claims**

1. A peptide designated anthopleurin-C having the amino acid sequence:

Gly-Val-Pro-Cys-Leu-Cys-Asp-Ser-Asp-Gly-Pro-Ser-Val-Arg-Gly-Asn-Thr-Leu-Ser-Gly-Ile-Leu-Trp-Leu-Ala-Gly-Cys-Pro-Ser-Gly-Trp-His-Asn-Cys-Lys-Ala-His-Gly-Pro-Thr-Ile-Gly-Trp-Cys-Cys-Lys-Gln.

4,103,005
NOVEL-ENKEPHALIN ANALOGS

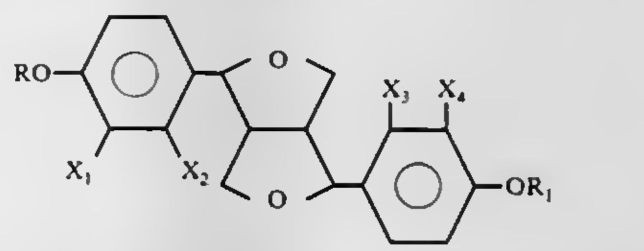
Choh Hao Li, Berkeley, Calif., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Oct. 20, 1977, Ser. No. 843,778
Int. Cl.^{2} A61K *37/00;* **C08L** *37/00;* **C07C** *103/52*
U.S. Cl. 424—177 **9 Claims**

1. A [Thz^5]-analog of enkephalinamide selected from [D-Met^2,Thz^5]-enkephalinamide and [D-Thr^2,Thz^5]-enkephalinamide.

4,103,006
GLYCOSIDES OF 2,6-BIS(HYDROXY-PHENYL)-3,7-DIOXABICYCLO [3,3,0] OCTANE

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed May 20, 1976, Ser. No. 688,275
Int. Cl.^{2} A61K *31/70;* **C07H** *15/00*
U.S. Cl. 424—181 **25 Claims**

23. A method of treating hypertension in a mammal comprising administering to said mammal an effective amount of pinoresinol glycoside of the formula



where R and R_1 are selected from the group consisting of hydrogen, a monosaccharide and a disaccharide, with at least one of R and R_1 being a monosaccharide or disaccharide, and X_1, X_2, X_3 and X_4 are each selected from the group consisting of hydrogen, lower alkyl, chlorine, amino and OR_2 where R_2 is hydrogen or lower alkyl, together with a pharmaceutical excipient.

4,103,007
PESTICIDAL SYNERGISTIC MIXTURE OF A DIOXATHIEPIN AND A FORMAMIDINE

Hartmut Jopplen, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,593

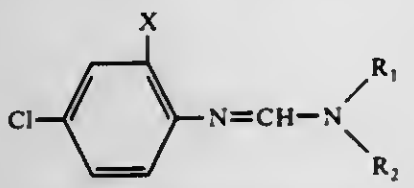
Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619834

Int. Cl.^{2} A01N *9/12, 9/28*

U.S. Cl. 424—244 **14 Claims**

1. A pesticide of high insecticidal and acaricidal activity comprising, as active ingredients, a mixture of

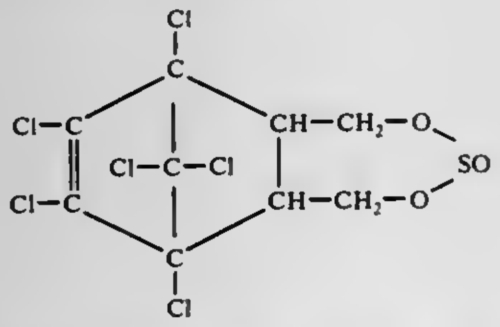
A. a formamidine derivative of the formula



in which R_1 is hydrogen or methyl R_2 is alkyl of 1 to 4 carbon atoms and X is hydrogen or methyl, or a salt thereof having insecticidal and acaricidal activity

with

B. A dioxathiepin of the formula



the ratio of compounds A and B being between about 200 : 1 and 1 : 5.

4,103,008
7[2(2,3 DIOXOPIPERAZIN-1-YL-CARBONYLAMINO)SUBSTITUTED 2 PHENYLACETAMIDO]-3-2'-THIADIAZOLYL CEPHALOSPORANIC ACID DERIVATIVES

Ishimaru Toshiyasu, D-14, 2-7, Momoyamadai, Suita; Hatanaka Minoru, 2-11-25, Tenjincho, Takatsuki; Hatamura Mariko, 4-34, Zuikodori, Higashiyodogawa-ku, Osaka, and Nitta Hazime, Towaso, 5-23-2, Izumicho, Suita, all of Japan

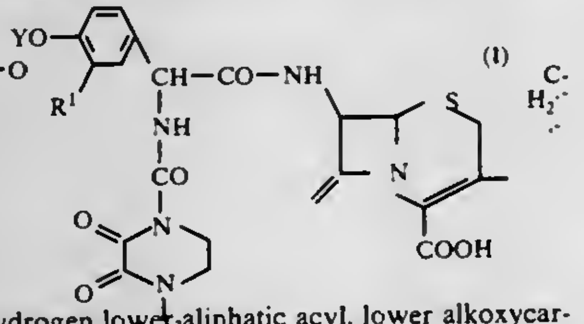
Filed Mar. 28, 1977, Ser. No. 781,834

Claims priority, application Japan, Apr. 7, 1976, 51-39549; Sep. 15, 1976, 51-111125

Int. Cl.^{2} A61K *31/545;* **C07D** *501/36*

U.S. Cl. 424—246 **17 Claims**

1. A D(−)-isomer of a compound of the formula (1):



wherein Y is hydrogen lower aliphatic acyl, lower alkoxycarbonyl or acetylmethylcarbonyl, R^1 is hydrogen or halogen, R^2 is lower alkyl and R^3 is hydrogen or lower alkyl, and pharmaceutically acceptable salts thereof.

17. A pharmaceutical composition having antibacterial activity which comprises an effective amount of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,103,009
BENZOGUANAMINE DERIVATIVES

Hiromu Murai, Otsu; Katsuya Ohata, Uji; Yoshiaki Aoyagi, Kyoto; Fusao Ueda, Shiga; Masahiko Kitano, Kyoto, and Shinichi Tada, Joyo, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

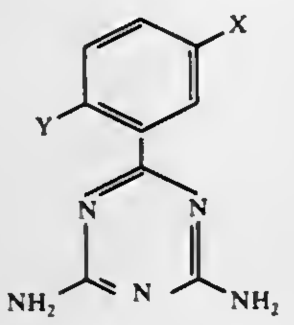
Filed Feb. 14, 1977, Ser. No. 768,091

Claims priority, application Japan, Mar. 29, 1976, 51-34948

Int. Cl.^{2} C07D *251/48;* **A61K** *31/53*

U.S. Cl. 424—249 **14 Claims**

1. A compound selected from the group consisting of a benzoguanamine of the formula:



wherein

X is lower alkylthio, lower alkylsulfonyl, sulfamyl, N,N-di(-lower alkyl)sulfamyl, trifluoromethyl or trifluoromethylthio; and

Y is hydrogen, halogeno, lower alkoxy or lower alkoxy(-lower alkoxy), and

the pharmaceutically acceptable acid addition salts thereof.

13. The method of achieving an anti-ulcer effect in humans and other animals which comprises administering to a human or animal in need thereof an anti-ulcer effective amount of a compound according to claim 1.

4,103,010
(3-PIPERAZINOCARBONYLIMINO-QUANIDINO)-ISOXAZOLES

Jean-Jacques Sterne, Suresnes, France, assignor to Aron S.A.R.L., Suresnes, France

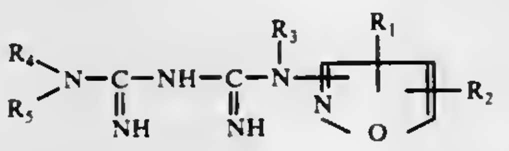
Continuation-in-part of Ser. No. 646,928, Jan. 6, 1976. This application Sep. 20, 1977, Ser. No. 834,976

Claims priority, application United Kingdom, Jan. 16, 1975, 1948/75

Int. Cl.^{2} C07D *413/12*

U.S. Cl. 424—250 **11 Claims**

1. A compound selected from the group consisting of a compound having the formula:



(1)

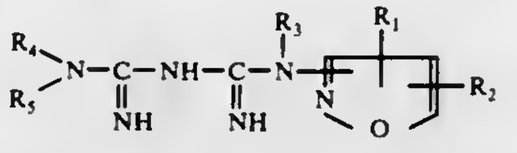
in which:

R_1 and R_2, which may be the same or different, are each selected from the group consisting of hydrogen, $C_1 - C_6$ alkyl and $C_3 - C_6$ cycloalkyl;

R_3 is selected from the group consisting of hydrogen and $C_1 - C_4$ alkyl;

R_4 and R_5, taken together with the nitrogen atom to which they are attached, are selected from the group consisting of piperazinyl and $C_1 - C_4$ alkyl piperazinyl, and a pharmaceutically acceptable acid addition salt thereof.

4. A therapeutic composition for regulation of the blood pressure comprising a therapeutically effective quantity of a compound selected from the group consisting of a compound having the formula:



(1)

in which:

R_1 and R_2, which may be the same or different, are each selected from the group consisting of hydrogen, $C_1 - C_6$ alkyl and $C_3 - C_6$ cycloalkyl;

R_3 is selected from the group consisting of hydrogen and $C_1 - C_4$ alkyl;

R_4 and R_5, taken together with the nitrogen atom to which they are attached, are selected from the group consisting of piperazinyl and $C_1 - C_4$ alkyl piperazinyl, and a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

4,103,011
NOVEL PENICILLIN COMPOUNDS AND PROCESS FOR PREPARATION THEREOF

Shinsaku Minami, Yamatokouriyama, and Yoshiyuki Takase, Amagasaki, both of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

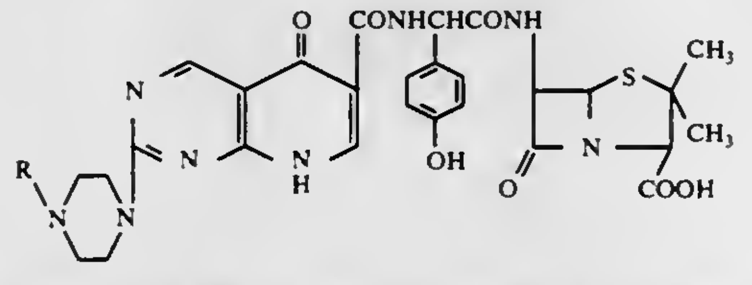
Filed Jun. 29, 1977, Ser. No. 811,445

Claims priority, application Japan, Jun. 30, 1976, 51-78085; Aug. 12, 1976, 51-96713

Int. Cl.^{2} A61K *31/43;* **C07D** *499/68*

U.S. Cl. 424—251 **13 Claims**

1. A member selected from the group consisting of a penicillin compound of the formula



wherein R is a formyl or acetyl group, and a non-toxic pharmaceutically acceptable salt thereof.

4,103,012
INDOLIZINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS CONTAINING SAME

Jean Gubin, Brussels, and Gilbert Rosseels, Meise, both of Belgium, assignors to Labaz, Paris, France

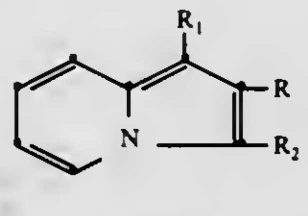
Filed Feb. 16, 1977, Ser. No. 769,332

Claims priority, application United Kingdom, Feb. 19, 1976, 06680/76; Aug. 10, 1976, 33314/76

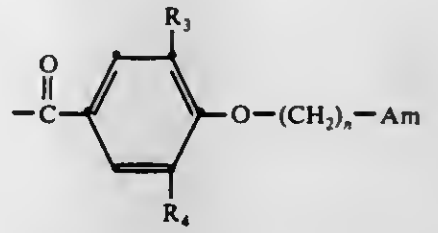
Int. Cl.^{2} A61K *31/44;* **C07D** *221/22*

U.S. Cl. 424—263 **16 Claims**

1. An indolizine derivative corresponding to the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R represents a branched- or straight-chain alkyl radical having from 1 to 5 carbon atoms, phenyl, a mono-fluoro-, mono-chloro- or mono-bromo-phenyl, a di-fluoro-, di-chloro- or di-bromo-phenyl radical, a methoxy-phenyl radical or a methyl-phenyl radical optionally substituted on the aromatic moiety by an atom of fluorine, chlorine or bromine and R_1 and R_2, which are different, represent a hydrogen atom or a group of the formula:



wherein R_3 and R_4, which are identical, each represent a hydrogen atom or a methyl radical, Am represents dimethylamino, diethylamino, di-n-propylamino di-n-butylamino, and *n* is an integer in the range of from 2 to 6 inclusive.

4,103,013
SUBSTITUTED HYDROXY PYRIDONES

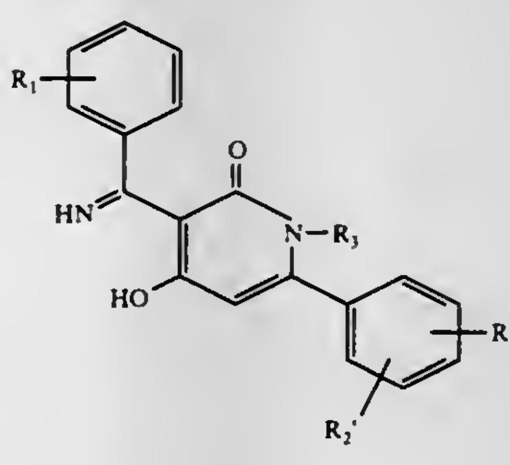
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 719,231, Aug. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,817, Oct. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 584,764, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 558,419, Mar. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,818

Int. Cl.^{2} A61K *31/44;* **C07D** *213/44*

U.S. Cl. 424—263 **22 Claims**

1. A compound of the formula



where

R_1, R_2 and R_2' each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, lower alkoxy or trifluoromethyl, and

R_3 represents lower alkyl,

or a pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition for use in the treatment of tension which comprises a tranquilizing effective amount of a compound according to claim 1 and a pharmaceutically acceptable diluent or carrier therefor.

4,103,014
USE OF 4aRS,5SR,9bRS-2-ETHYL-1,3,4,4a,5,9b-HEXAHYDRO-7-METHYL-5-p-TOLYL-2H-INDENO[1,2-C]PYRIDINES IN INHIBITING SPERMATOGENESIS

Christian Hodel, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jul. 18, 1977, Ser. No. 817,418

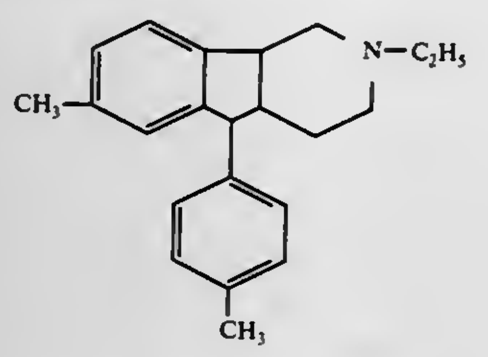
Claims priority, application United Kingdom, Jul. 16, 1976, 29691/76

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **6 Claims**

1. A method of inhibiting spermatogenesis in male animals, which comprises administering to a male animal in need of

such treatment a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt form thereof.

4,103,015

ANTIALLERGIC CYCLIC SULPHUR COMPOUNDS

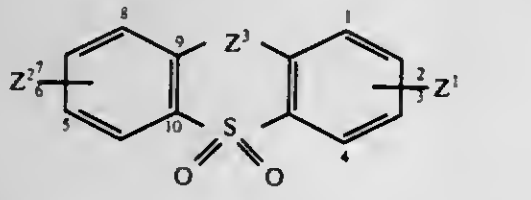
Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 12, 1975, Ser. No. 586,427

Int. Cl.² A61K *31/41*

U.S. Cl. 424—269 **32 Claims**

1. A method of preventing the symptoms of allergic conditions consisting of asthma, allergic rhinitis, conjunctivitis, urticaria or eczema of a mammal in need thereof comprising administration to the mammal of a prophylactically effective amount of a tricyclic compound of formula I



(I)

wherein Z^1 is a substituent in the 1-, 2-, 3-, or 4- position and is 5-tetrazolyl, 5-(1-alkyl)tetrazolyl, or 5-(2-alkyl)tetrazolyl in which the alkyl has 1 to 6 carbon atoms and are each optionally substituted by hydroxyl; Z^2 is hydrogen when (a) Z^1 is in the 1-, 2-, or 4-position and has the same meaning as above and (b) when Z^1 is in the 3-position and is 5-(1-alkyl)tetrazolyl or 5-(2-alkyl)tetrazolyl in which the alkyl has 1 to 6 carbon atoms and are each optionally substituted by a hydroxyl or carboxyl; or Z^2 is a substituent in the 5-, 6-, 7-, or 8-position selected from the group consisting of Z^1 as defined above, carboxyl, alkylsulphonyl, alkylsulphinyl, thioalkyl, amino, nitro, cyano, halogen, alkyl or alkoxy wherein the "alkyl" moiety of each of the alkyl, alkoxy, thioalkyl, alkylsulphinyl and alkylsulphonyl has 1 to 6 carbon atoms; and Z^3 is carbonyl; or a pharmaceutically acceptable salt thereof.

4,103,016

ANTIINFLAMMATORY IMIDAZOTHIAZOLES AND THIAZOLOPYRIMIDINES

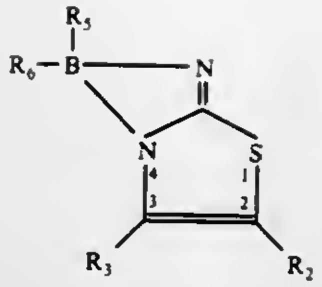
Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Dec. 22, 1976, Ser. No. 753,350

Int. Cl.² A61K *31/425;* C07D *277/00*

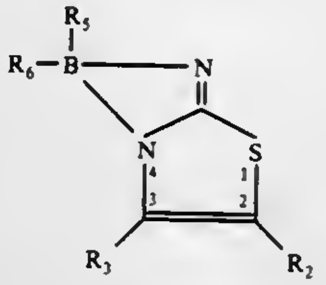
U.S. Cl. 424—270 **10 Claims**

1. A compound of the formula



wherein B is 1′,2′-cyclohexylene, R_2 is hydrogen and R_3 is C_1–C_4 alkyl or phenyl and R_5 and R_6 are each hydrogen or when R_3 is methyl the bond of unsaturation at the 2,3-position of the thiazole ring is saturated and the C-3 carbon atom thereof optionally substituted by a hydroxyl group and R_5 and R_6 are each hydrogen or the pharmaceutically acceptable inorganic or organic acid addition or quaternary salt thereof.

7. A method of preventing and inhibiting the formation of granuloma tissue in an animal subject, which method comprises administering to said animal a nontoxic antiinflammatory amount of a compound of the formula



wherein B is 1′,2′-cyclohexylene, R_2 is hydrogen and R_3 is C_1–C_4 alkyl or phenyl and R_5 and R_6 are each hydrogen or when R_3 is methyl the bond of unsaturation at the 2,3-position of the thiazole ring is saturated and the C-3 carbon atom thereof optionally substituted by a hydroxyl group and R_5 and R_6 are each hydrogen or the pharmaceutically acceptable inorganic or organic acid addition or quaternary salt thereof.

4,103,017

PESTICIDAL 2-IMINOTHIAZOLINE DERIVATIVES

John H. Davies, Boughton; Jack Wood, and Michael Pearson, both of Sittingbourne, all of England, assignors to Shell Oil Company, Houston, Tex.

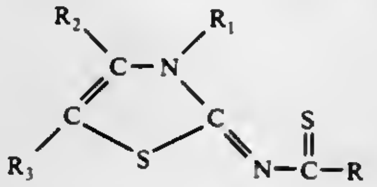
Filed Mar. 8, 1977, Ser. No. 775,500

Claims priority, application United Kingdom, Mar. 9, 1976, 9335/76

Int. Cl.² C07D *277/18;* A61K *31/425*

U.S. Cl. 424—270 **3 Claims**

1. A 2-iminothiazoline derivative of the formula:



wherein R is hydrogen, alkyl of one to six carbon atoms, or phenyl; R_1 is alkyl or alkenyl of up to twelve carbon atoms, or is benzyl; R_2 and R_3 each is hydrogen, chlorine, bromine, alkyl or alkylthio of one to six carbon atoms, or is phenyl.

2. A method for killing insects and acarids which comprises subjecting them to an effective amount of a compound of claim 1.

3. A composition adapted to killing insects and acarids which comprises an effective amount of a compound of claim 1 together with a carrier, optionally containing in addition thereto a surface-active agent.

4,103,018

2-[4-(POLYHALO-2-HYDROXY-2-PROPYL)ANILINO]-2-OXAZOLIN-4-ONES AND THIAZOLIN-4-ONES CORRESPONDING THERETO

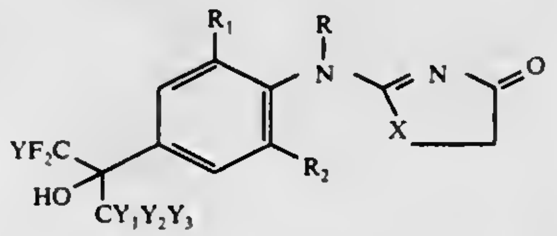
Bernard R. Neustadt, West Orange, and Nicola Zampaglione, Fairfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Oct. 12, 1976, Ser. No. 731,236

Int. Cl.² C07D *263/40;* A61K *31/42*

U.S. Cl. 424—272 **10 Claims**

1. A compound of the formula



(I)

wherein X is oxygen; R is hydrogen or lower alkyl; R_1 and R_2 are independently hydrogen, lower alkyl, lower alkoxy or halogen; and Y, Y_1, Y_2 and Y_3 are independently hydrogen, chlorine or fluorine.

7. A pharmaceutical composition in unit dosage form adapted for oral administration for the treatment of hypertension which comprises, per dosage unit, a quantity to obtain an antihypertensive effect of a compound of claim 1 together with a pharmaceutical carrier compatible with said compound.

4,103,019

TRITERPENE DERIVATIVES

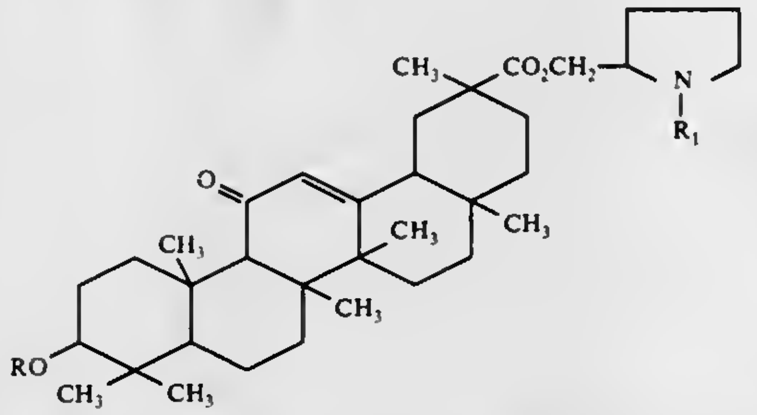
Jose E. Acosta Mira, Madrid, Spain, assignor to Laboratorios Landerlan, S. A., Madrid, Spain

Filed Oct. 7, 1975, Ser. No. 620,417

Int. Cl.² C07D *207/08;* A61K *31/40*

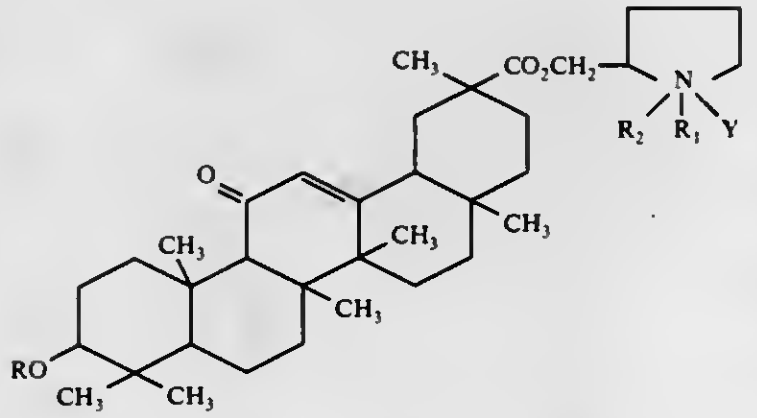
U.S. Cl. 424—274 **11 Claims**

1. Compounds of the formula



wherein R is hydrogen or a carboxylic acyl group of 2 to 20 carbon atoms and R_1 is a lower alkyl group.

2. Compounds of the formula



wherein R is hydrogen or a carboxylic acyl group of 2 to 20 carbon atoms, R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms and Y is a pharmaceutically acceptable anion.

6. A process for treating gastroduodenal ulcers comprising administering a therapeutically effective amount of the compound defined by claim 1.

4,103,020

SULFIDE COMPOUNDS AS ANTIDEPRESSANTS

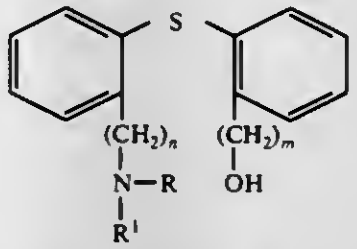
Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, Jul. 21, 1975, Pat. No. 3,997,540. This application Sep. 24, 1976, Ser. No. 726,489

Int. Cl.² A61K *31/40;* C07D *207/12, 207/24*

U.S. Cl. 424—274 **12 Claims**

6. The method of treating depression is in a mammal which comprises administering to a depressed mammal an effective antidepressant amount of a compound of the formula



or a pharmaceutically acid addition salt thereof where R and R^1 taken together are $(CH_2)_X$ whee X is 4 and *n* and *m* are the same or different and are each 1, 2 or 3.

4,103,021

METHOD OF LOWERING BLOOD LIPID LEVELS IN MAMMALS

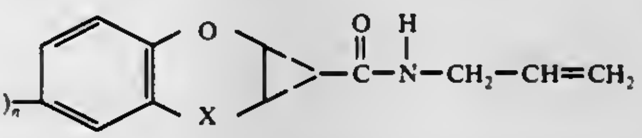
John B. Carr, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 21, 1977, Ser. No. 779,648

Int. Cl.² A61K *31/335, 31/35*

U.S. Cl. 424—278 **1 Claim**

1. A method for reducing the levels of cholesterol and triglycerides in the blood of a mammal which comprises administering orally or parenterally to a mammal having an elevated blood cholesterol level, or an elevated blood triglyceride level, or both, an effective amount of a compound of the formula:



(I)

wherein *n* is zero or one, R is lower halogen, and X is —O— or —CH_2—.

4,103,022

COMBATING ARTHROPODS WITH 3-(2,2,4,4-TETRAFLUORO-BENZ-1,3-DIOXIN-6-YL)-1-(SUBSTITUTED BENZOYL)-UREAS

Wilhelm Sirrenberg, Sprockhoevel; Hans-Ulrich Alles, Odenthal-Blecher; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

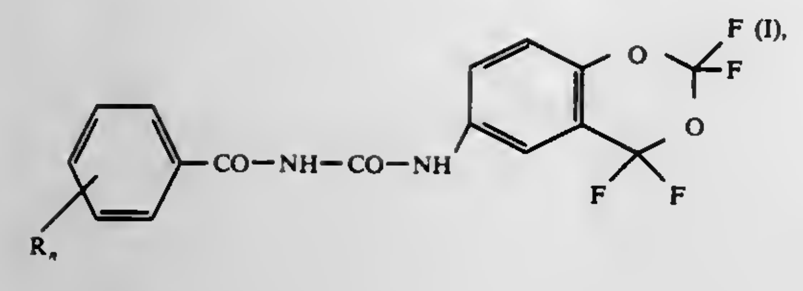
Filed Aug. 3, 1977, Ser. No. 821,445

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637947

Int. Cl.² A01N *9/28;* C07D *319/08*

U.S. Cl. 424—278 **10 Claims**

1. A 3-(2,2,4,4-tetrafluoro-benz-1,3-dioxin-6-yl)-1-benzoylurea of the formula



in which

R is halogen, alkyl or nitro, and

n is 1, 2, 3, 4 or 5.

8. An anthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,103,023
PHARMACEUTICAL COMPOSITIONS

David Cecil Aldridge; Graham Charles Crawley, and Colin John Strawson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

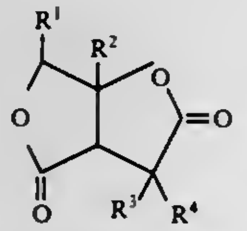
Continuation-in-part of Ser. No. 612,531, Sep. 11, 1975, Pat. No. 4,032,651. This application Mar. 24, 1977, Ser. No. 780,991

Claims priority, application United Kingdom, Sep. 27, 1974, 42040/70

Int. Cl.² C07D *493/04*

U.S. Cl. 424—279 **6 Claims**

1. A 3,3a,6,6a-tetrahydrofuro[3,4-b]furan-2,4-dione having the formula:-



wherein R^1 is a phenyl radical, R^2 is hydrogen, R^3 is hydrogen or a C_{1-10}-alkyl radical, and R^4 is hydrogen or a C_{2-10}-alkoxycarbonyl radical, or R^3 and R^4 together form the methylene ($=CH_2$) radical.

4,103,024
NEMATICIDALLY AND ARTHROPODICALLY ACTIVE N-METHYL-N-(2-TOLUENESULPHONIC ACID METHYLAMIDE-N'-SULPHENYL)-2,2-DIMETHYL-2,3-DIHYDROBENZOFURANYL-(7)-CARBAMATE

Peter Siegle, Cologne; Engelbert Kühle, Berg.-Gladbach; Alfons Hartmann, Beckingen; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

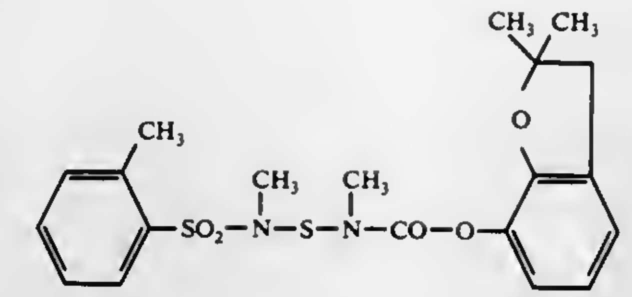
Filed Feb. 28, 1977, Ser. No. 773,108

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609830

Int. Cl.² A01N *9/28*

U.S. Cl. 424—285 **3 Claims**

1. N-Methyl-N-(2-toluenesulphonic acid methylamide-N'-sulphenyl)-2,2-dimethyl-2,3-dihydrobenzofuranyl-(7)-carbamate, of the formula



4,103,025
NOVEL TERPENES

Giuseppe Mustich, Milan, Italy, assignor to Inverni Della Beffa S.p.A., Milan, Italy

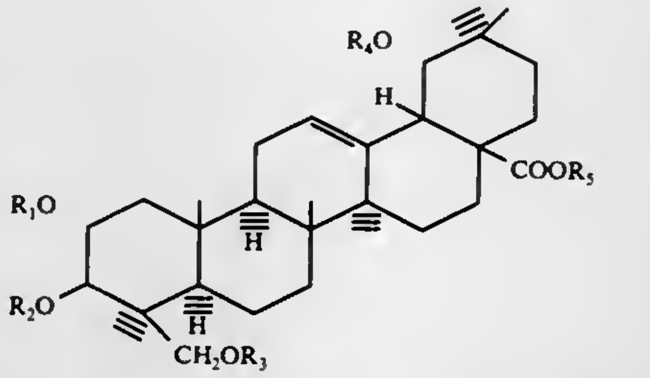
Continuation of Ser. No. 541,588, Jan. 16, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,458

Claims priority, application United Kingdom, Jan. 29, 1974, 4042/74

Int. Cl.² A61K *31/215, 31/22;* C07C *69/74, 69/78*

U.S. Cl. 424—305 **46 Claims**

1. A derivative of sericic acid, having anti-inflammatory and cicatrizing properties, comprising a compound of the general formula



in which the hydrogen atom attached to C_{18} is in the beta configuration, and in which R_1, R_2, R_3 and R_4 each represent a hydrogen atom or a substituted or unsubstituted aliphatic or aromatic mono- or polycarboxylic acid acyl radical, wherein when more than one of R_1, R_2, R_3 and R_4 are acyl radicals, they are the same acyl radical, and R_5 represents a hydrogen atom or a substituted or unsubstituted aliphatic radical, and in which R_1 to R_5 are not all hydrogen.

4,103,026
TREATMENT OF PERIPHERAL VASCULAR DISEASE BY NON-INTRAARTERIAL ADMINISTRATION OF PROSTAGLANDIN E_1

Lars A. Carlson, Stora Malmgatan 19 S-190 30, Sigtuna, Sweden

Continuation-in-part of Ser. No. 716,737, Aug. 23, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,175

Int. Cl.² A61K *31/215, 31/19*

U.S. Cl. 424—305 **14 Claims**

1. In the method of treating peripheral vascular disease in the extremities of humans who have circulatory insufficiencies in said extremities; which consists essentially of systemic administration to said humans of PGE_1 in a pharmaceutical dosage form in an amount effective to decrease said circulatory insufficiencies, whereby relief of rest pain or induction of healing of ulcers in said extremities occurs; the improvement which comprises:

administering PGE_1 non-intraarterially in a dosage which does not exceed

(a) about 10 µg per hour, when administered intravenously; or

(b) the dosage by any other route which is equivalent to a 10 µg per hour dose intravenously, when administered by said other route.

4,103,027
AMINO SUBSTITUTED ARYLTHIO-ALKANOIC ACIDS HAVING HYPOLIPIDEMIC ACTIVITY

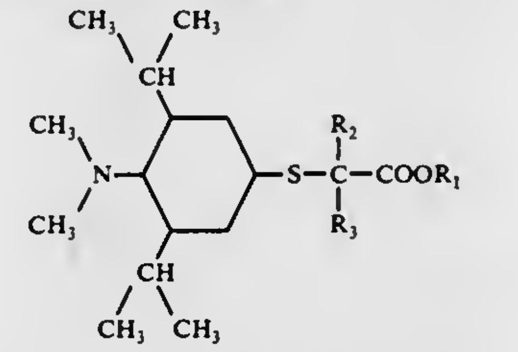
Eugene R. Wagner, Midland, and Bobbie J. Allen, Detroit, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 671,909, Mar. 29, 1976, Pat. No. 4,062,975. This application Aug. 12, 1977, Ser. No. 823,299

Int. Cl.² A61K *31/24;* C07C *149/43*

U.S. Cl. 424—309 **4 Claims**

1. A compound of the formula:

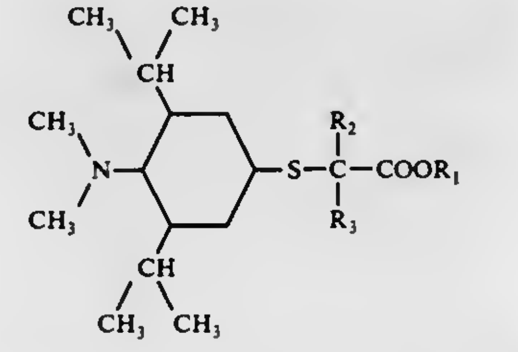


wherein

R_1 represents a lower alkyl having from 1 to about 5 carbon atoms

and R_2 and R_3 independently represent hydrogen or an alkyl having from 1 to about 10 carbon atoms.

3. A method for lowering elevated serum lipids in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound having the formula:



wherein

R_1 represents a lower alkyl having from 1 to about 5 carbon atoms

and R_2 and R_3 independently represent hydrogen or an alkyl having from 1 to about 10 carbon atoms.

4,103,028
COMPLEMENT INHIBITORS

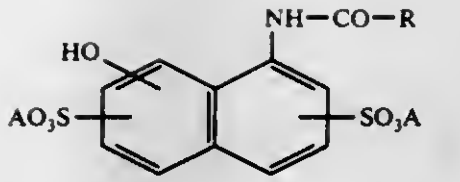
Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Milton David Heller, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 684,598, May 10, 1976, Pat. No. 4,046,805. This application Mar. 25, 1977, Ser. No. 781,235

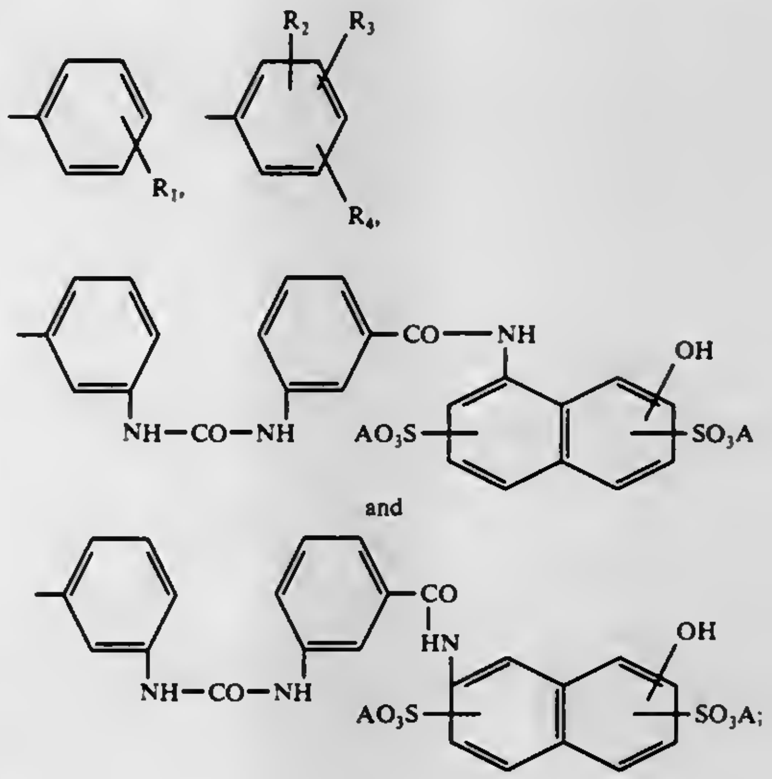
Int. Cl.² A61K *31/185*

U.S. Cl. 424—315 **16 Claims**

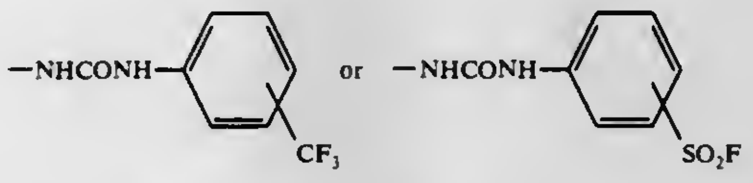
1. A method of inhibiting the complement system in a warm-blooded animal which comprises internally administering to said animal an effective complement inhibiting amount of a compound of the formula:



wherein R is selected from the group consisting essentially of

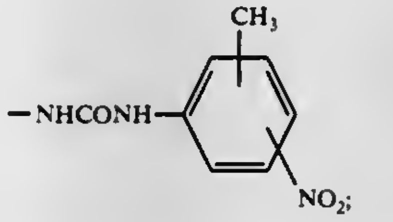


R_1 is



R_2 is hydrogen or —CH_3; R_3 is hydrogen, —NO_2, —NH_2, or —CH_3;

R_4 is hydrogen, —NO_2, —NH_2, —CH_3 or



and A is hydrogen, alkali metal or alkaline earth with the proviso that each A is identical in the same compound.

4,103,029
AMINO SUBSTITUTED ARYLTHIO-ALKANOIC ACIDS HAVING HYPOLIPIDEMIC ACTIVITY

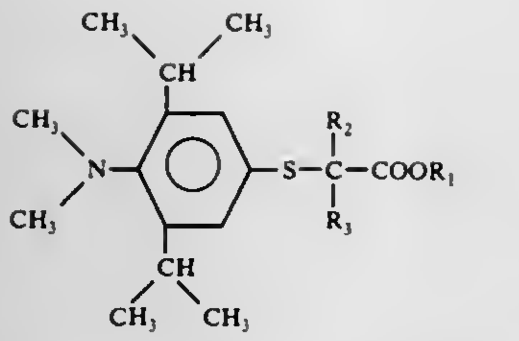
Eugene R. Wagner, Midland, and Bobbie J. Allen, Detroit, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 671,909, Mar. 29, 1976, Pat. No. 4,062,975. This application Aug. 10, 1977, Ser. No. 823,298

Int. Cl.² A61K *31/20;* C07C *149/43*

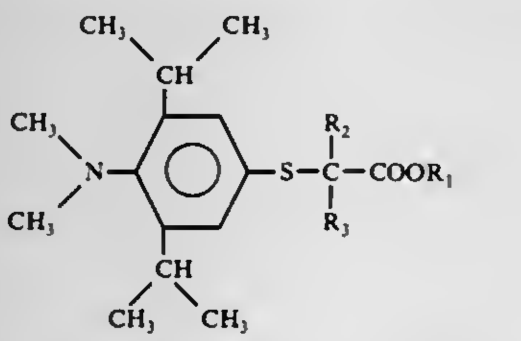
U.S. Cl. 424—318 **4 Claims**

1. A compound of the formula



wherein R_1 represents hydrogen and R_2 and R_3 independently represent hydrogen or an alkyl having from 6 to about 10 carbon atoms with the proviso that both R_2 and R_3 cannot be hydrogen and the pharmaceutically acceptable salts thereof.

3. A method for lowering elevated serum lipids in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound having the formula



wherein R_1 represents hydrogen and R_2 and R_3 independently represent hydrogen or an alkyl having from 6 to about 10 carbon atoms with the proviso that both R_2 and R_3 cannot be hydrogen and the pharmaceutically acceptable salts thereof.

4,103,030

NOVEL CYCLOPROPYLMETHYLAMINE DERIVATIVES

Atsuyuki Kojima, Nishinomiya; Yoshito Kameno, Minoo; Junki Katsube, Toyonaka; Shigebo Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

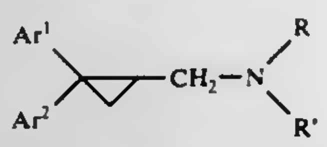
Filed Nov. 26, 1975, Ser. No. 635,331

Claims priority, application Japan, Dec. 11, 1974, 49-142899; May 16, 1975, 50-58929

Int. Cl.^{2} A01N *9/20, 9/24;* **C07C** *91/16, 91/28*

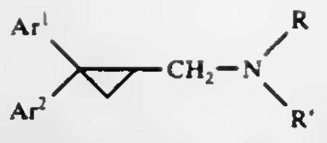
U.S. Cl. 424—330 **6 Claims**

1. A compound of the formula:



wherein Ar^1 represents a phenyl group having one or more substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl, said substituents being present at the o- or m-positions, Ar^2 represents an unsubstituted phenyl group or a phenyl group substituted with one or more substituents selected from the group consisting of halogen and C_1–C_4 alkyl, R represents hydrogen, C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl and R' represents C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl, or a non-toxic salt thereof.

5. A pharmaceutical composition comprising as an active ingredient an effective antidepessant or anorexic amount of at least one of the compounds of the formula:



wherein Ar^1 represents a phenyl group having one or more substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl, said substituents being present at the o- or m-positions, Ar^2 represents an unsubstituted phenyl group or a phenyl group substituted with one or more substituents selected from the group consisting of halogen and C_1–C_4 alkyl, R represents hydrogen, C_1–C_4 alkyl or C_2–C_4 hydroxy-alkyl and R' represents C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl, or a non-toxic salt thereof, with at least one pharmaceutically acceptable inert carrier or diluent.

4,103,031

CONTROL OF PLANT PESTS WITH BIS(4-CHLOROPHENYL)METHYL METHYL SULFOXIDE

George G. Ecke, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 701,383, Jun. 30, 1976, Pat. No. 4,064,178, which is a continuation-in-part of Ser. No. 578,598, May 19, 1975, abandoned. This application Dec. 9, 1977, Ser. No. 858,993

Int. Cl.^{2} A01N *9/14*

U.S. Cl. 424—337 **11 Claims**

1. A method of controlling plant pests of the genera Epilichona, Spodoptera, Phytophthora, Fusarium, or Xanthomonas, upon plants which comprises:

contacting the plant with bis(4-chlorophenyl)methyl methyl sulfoxide in a pesticidally effective amount.

4,103,032

METHOD OF COMBATTING FUNGI AND *PSEUDOMONAS SOLANACERUM*

Saleem Farooq, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 25, 1977, Ser. No. 771,865

Claims priority, application Switzerland, Mar. 4, 1976, 2700/76

Int. Cl.^{2} A61K *31/09*

U.S. Cl. 424—341 **2 Claims**

1. A method for combatting Pseudomonas solanacearum on growing plants comprising applying thereto a bactericidally effective amount of 4-isobornyloxy-allyloxybenzene.

4,103,033

METHOD OF CONTROLLING INSECTS

Victor M. Thomas, Jr., San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 19, 1977, Ser. No. 760,785

Int. Cl.^{2} A01N *9/24*

U.S. Cl. 424—343 **1 Claim**

1. A method for controlling the growth of insects selected from *Oncopeltus fasciatus* or *Trichloplusia ni* at a pre-adult stage of the life cycle which comprises applying to the locus where such control is desired, an insecticidally effective amount of 2-bromo-8-chloro-1,1,9-trimethyl-4-methylene-spiro[5.5]undec-8-en-3-ol.

4,103,034

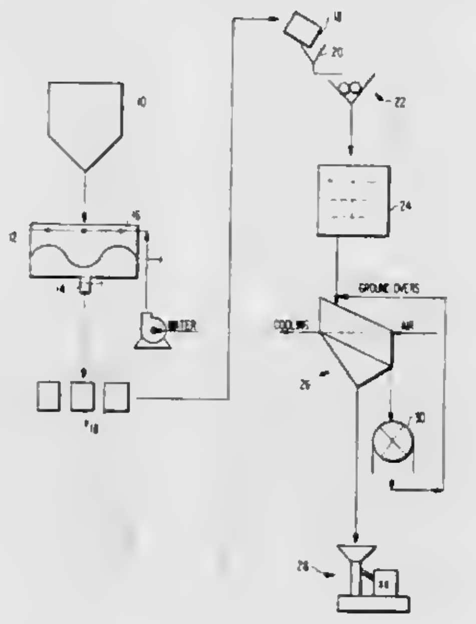
PROCESS FOR PRODUCTION OF TEXTURED PROTEIN FLAKES

Kenneth S. Ronai, Ridgewood; Henry C. Spanier, Ramsey; Felice Scaglione, Lodi, and Edward F. Wisniewski, Roselle, all of N.J., assignors to Nabisco, Inc., New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 516,136

Int. Cl.^{2} A23J *3/00;* **A23L** *1/27*

U.S. Cl. 426—250 **21 Claims**



21. A method for preparing dried, flaked, textured, high protein material which instantly hydrates, has a protein content of 30 percent or more, and has an improved flavor which comprises:

- (i) texturizing protein material selected from the class consisting essentially of deoiled vegetable protein material, animal protein material and fish protein material by subjecting said protein material containing moisture to a pressure of at least 1,800 pounds per square inch for a time and at a temperature sufficient to convert said moisture into steam whereby said protein is toasted without scorching, and is compacted into a hard and substantially fused mass having textured characteristics;
- (ii) fragmenting said fused mass into particles;
- (iii) sizing said textured protein material,
- (iv) increasing the moisture content of and tempering said textured protein material to raise the moisture content of said textured protein material to between about 12 and about 25 percent;
- (v) flaking said textured protein material; and
- (vi) drying said flaked textured protein material.

4,103,035

METHOD FOR RETAINING SOFTNESS IN RAISINS

Charles V. Fulger, Battle Creek, Mich., and Thomas D. Morfee, Gig Harbor, Wash., assignors to Kellogg Company, Battle Creek, Mich.

Continuation-in-part of Ser. No. 171,011, Aug. 11, 1971, abandoned. This application Jul. 11, 1973, Ser. No. 378,124

Claims priority, application United Kingdom, Aug. 10, 1972, 37270/72

Int. Cl.^{2} A23B *7/08, 7/14*

U.S. Cl. 426—321 **17 Claims**

1. The method for improving softness retention characteristics of whole dried fruits having an essentially intact surface skin which comprises first contacting the surface skin of said dried fruits with a hot, weak acid solution for a period of time to cause said fruits to become more acceptable to subsequent humectant absorption, and then, as a separate step, contacting the skin of said dried fruits with an edible polyalcohol humectant until in excess of 3% humectant has been absorbed by said fruit, and thereafter drying the treated fruit to a moisture content of from about 12% to about 20%.

4,103,036

FLAVORING WITH DERIVATIVES OF 1-ACETYL-3,3-DIMETHYLCYCLOHEXANE, AND PROCESSES FOR USING SAME AND PROCESSES FOR PREPARING SAID 1-ACETYL-3,3-DIMETHYLCYCLOHEXANE DERIVATIVES

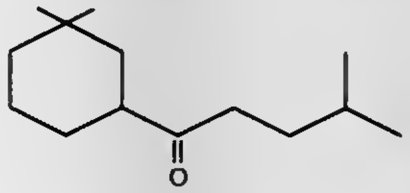
Mark A. Sprecker, Sea Bright; Manfred Hugo Vock, Locust; Frederick Louis Schmitt, Holmdel; John B. Hall, Rumson, and James Milton Sanders, Eatontown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 713,357, Aug. 11, 1976, Pat. No. 4,062,894. This application Jul. 28, 1977, Ser. No. 819,955

Int. Cl.^{2} A23L *1/226, 1/235*

U.S. Cl. 426—538 **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff which comprises adding thereto from 0.5 parts per million up to about 100 parts per million based on the total composition of a compound having the structure:



4,103,037

LOW FAT SPREAD

Janos Bodor, Voorburg; Jan van Heteren, and Laurentius Adrianus Maria Verhagen, both of Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,933

Claims priority, application United Kingdom, Nov. 7, 1975, 46215/75

Int. Cl.^{2} A23L *1/04*

U.S. Cl. 426—575 **4 Claims**

1. Process for preparing a proteinaceous low fat spread of the water-in-oil type which comprises:

- (i) preparing a proteinaceous substantially neutral aqueous medium which is substantially free from undissolved protein particles of an average major dimension of more than 5 microns.
- (ii) dissolving a gelling agent of a melting point of 25°–35° C in a substantially protein-free aqueous medium of a temperature of 60°–100° C and a pH value of 1–7.
- (iii) combining the aqueous media obtained to obtain an aqueous phase having a weight ratio of proteins: gelling agent of (1–6):(8–1), and optionally adjusting the pH value to 3.0–6.8.
- (iv) dispersing the aqueous phase of a temperature of no more than 40° C in a fatty phase of a hardness value at 5° C of 100–3000 g/cm^2.
- (v) passing the mixture through one or more cooled surface scraped heat-exchangers and resting tubes.

4,103,038

EGG REPLACER COMPOSITION AND METHOD OF PRODUCTION

W. L. Roberts, Mequon, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Sep. 24, 1976, Ser. No. 726,187

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—601 **22 Claims**

1. An egg replacer composition which is low in cholesterol, high in the ratio of polyunsaturated fats to saturated fats, avidin free and which is heat settable or coagulable, comprising:

(a) from 30 to 75% by weight of ultrafiltered whey protein;
(b) from 5 to 65% by weight of fats having a polyunsaturated to saturated ratio of 1:1 to 2.8:1, and
(c) from 0.2 to 17.0% by weight of a food grade emulsifier;

and wherein the cholesterol content is less than 0.5 mg. per gram of composition.

4,103,039

METHOD FOR PRODUCING IMPROVED SHEA FAT

Akio Mandai, Izumiotsu; Yoshinori Hirukawa, Sennan; Hayato Kubota, Izumi, and Yukiya Iwanaga, Sennan, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Aug. 18, 1976, Ser. No. 715,669

Int. Cl.² A23D *5/00*

U.S. Cl. 426—607 **5 Claims**

1. A method for producing an improved shea fat suitable for hard butter, which comprises heating a raw shea fat with ethanol having a concentration of at least 85% by weight ethanol in an amount of 1 to 20 parts by weight to 1 part by weight of the raw shea fat to a temperature to provide a mixture consisting of an alcohol insoluble portion and an alcohol soluble portion allowing the mixture to stand at the temperature of said heating for a time sufficient to allow the alcohol insoluble portion to separate, removing the alcohol-insoluble portion from the mixture at said temperature of heating, cooling the remaining solution to a temperature of 20° to 60° C. thereby causing said solution to separate into two separate and distinct liquid layers, the upper layer being oil-poor and the lower layer being oil-rich, and collecting the latter oil-rich layer.

4,103,040

LOW CHOLESTEROL EGG PRODUCT AND PROCESS

Joseph A. Fioriti, Hastings-on-Hudson; Howard D. Stahl, Tarrytown; Rex J. Sims, Pleasantville, all of N.Y., and Clifford H. Spotholz, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 888,608, Dec. 29, 1967, Pat. No. 3,717,474. This application Nov. 16, 1972, Ser. No. 307,309

Int. Cl.² A23L *1/32*

U.S. Cl. 426—614 **2 Claims**

1. A process of producing a low cholesterol egg product which resembles the unmixed contents of a natural egg comprising:

cooling to a plastic condition the wet egg yolk of a product obtained from natural egg yolk and wherein the natural water content of the natural egg yolk is substantially retained and wherein the egg yolk has a ratio of polyunsaturated fat content to saturated fat content equal to or greater than 1, and a cholesterol content lower than that of natural egg yolk, and

forming said yolk into a round shape, and combining the thus formed yolk with liquid egg white.

4,103,041

PROCESS FOR COATING SLIDES

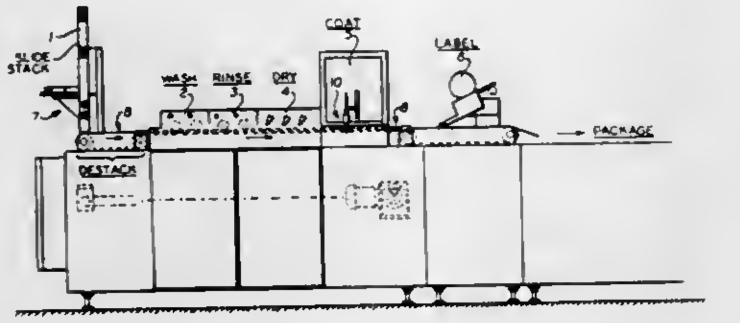
Heinz Macho, Mannheim-Neuostheim; Hans Lange, Lampertheim; Dieter Berger, Viernheim, and Wolfgang Werner, Mannheim-Vogelstang, all of Germany, assignors to Boehringer Mannsheim GmbH, Mannheim, Germany

Filed Mar. 31, 1976, Ser. No. 672,574

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2515869

Int. Cl.² A01N *1/02*

U.S. Cl. 427—2 **6 Claims**



1. Process for the large-scale production of pre-coated microscope slides which comprises spraying dyestuff solution on to microscope slides in the form of individual microfine dyestuff droplets thereon which do not flow together.

4,103,042

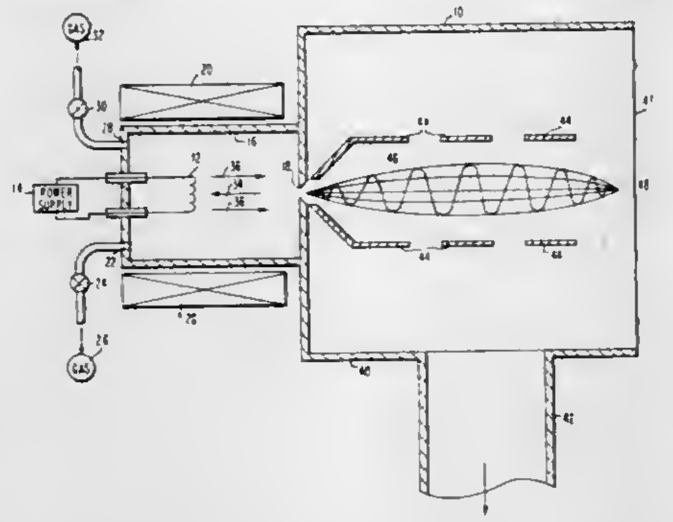
HOT FILAMENT, ARC TYPE ION SOURCE AND METHOD

Harold Franklin Winters, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 631,986, Nov. 14, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,464

Int. Cl.² B32B *35/00;* C23C *11/10*

U.S. Cl. 427—38 **6 Claims**



1. A method of extending the lifetime of a hot filament in an arc type ion source device of the type wherein said hot filament is exposed to ion bombardment during operation of said device comprising the steps of:

providing said hot filament with a carburized surface layer; and

revitalizing said carburized layer by exposing said hot filament to a carbon containing gas while said hot filament is subjected to ion bombardment from said device.

4,103,043

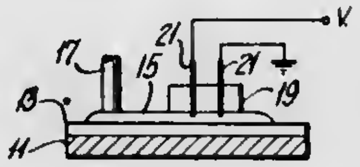
THERMOGRAPHIC PRINTING METHOD

Paul Y. Hsieh, Ridgewood, N.J., and Eugene W. Rogall, Huntington Station, N.Y., assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy

Division of Ser. No. 655,795, Feb. 6, 1976, Pat. No. 4,017,366, which is a continuation of Ser. No. 454,653, Mar. 25, 1974, abandoned, which is a continuation of Ser. No. 323,583, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 64,395, Aug. 17, 1970, abandoned. This application Sep. 22, 1976, Ser. No. 725,812

Int. Cl.² B05D *3/14*

U.S. Cl. 427—49 **1 Claim**



1. A method of producing visible printing on a receiving medium coated with a heat-sensitive coating including thermographic materials which undergo a chemical colored marking reaction when heated comprising the steps of:

superimposing immediately before printing an electrically conductive path on a given portion of the coated medium by dispensing a liquid electrolyte on said given portion;

contacting the superimposed liquid electrolyte with at least one pair of closely spaced electrodes made of material electrolytically non-corrodable by said liquid electrolyte; and

applying an electrical potential difference across the pair of electrodes to effect a current to pass therebetween and only through the liquid electrolyte to heat the superimposed liquid electrolyte to a temperature higher than the temperature required to trigger the reaction of the thermographic materials, said heating causing a chemical reaction to effect a change in color in the given portion of the coated medium.

4,103,044

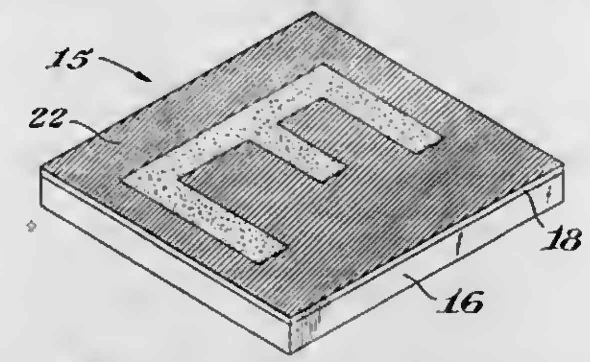
METHOD FOR STORAGE OF RETRIEVABLE INFORMATION DISPERSION IMAGING MATERIAL AND METHOD

Adi Eisenberg, Montreal, Canada, and Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignors to Energy Conversion Systems, Inc., Troy, Mich.

Division of Ser. No. 227,962, Feb. 22, 1972, abandoned. This application Nov. 26, 1976, Ser. No. 745,455

Int. Cl. G03g *13/00*

U.S. Cl. 427—56 **4 Claims**



1. A method of storing and retrieving information comprising the steps of (1) providing an imaging structure consisting essentially of an electromagnetic energy transmissive or reflective substrate having adhered on a surface thereof a continuous, opaque layer of mechanically flattened small, individual particles formed of a cross-linked organic polymeric material having a memory for a physical shape which normally is different from the mechanically flattened condition of said particles on the surface of the substrate, said particles being present on said surface of the substrate in a quantity to provide at least a single, continuous, opaque layer of said particles in their mechanically flattened condition on said surface and being characterized in that they are capable upon being subjected to imaging energy above a certain threshold of changing their physical shape from a flattened condition to a shape which will provide in the imaging structure an information retrievable characteristic determined at least in part by particles of cross-linked organic polymeric material in said layer which have undergone a change in physical shape due to exposure to imaging energy above a certain threshold and particles in said layer of the material which have not been exposed to imaging energy above said certain threshold and which have not as a result thereof undergone a change in physical shape from their original mechanically flattened condition, (2) applying imaging energy above said certain threshold

in a preselected pattern to the layer of flattened particles of cross-linked organic polymeric material to effect a change in physical shape in the particles comprising said layer in the areas thereof corresponding to said pattern of image energy and (3) detecting the change in condition of the layer of particles of cross-linked organic polymeric material due to the change in physical shape of the imaging energy exposed particles in the layer by directing electromagnetic energy upon the imaging structure to determine visually or otherwise the change in said layer.

4,103,045

PROCESS FOR IMPROVING THE ADHESION OF COATINGS MADE OF PHOTORESISTANT POLYMERS TO SURFACES OF INORGANIC OXIDES

Andre Lesaicherre, Lesigny, and Louis Linguenheld, St. Genis Laval, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 383,507, Jul. 30, 1973, Pat. No. 3,911,169. This application Mar. 6, 1975, Ser. No. 555,889

Claims priority, application France, Jul. 31, 1972, 72.27581; May 7, 1973, 73.16286

The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.

Int. Cl.² B05D *5/10, 5/12*

U.S. Cl. 427—82 **5 Claims**

1. A process for bonding a photoresistant polymer to a layer of inorganic oxides, wherein prior to the deposition of the polymer on the oxide layer, the layer is treated with an organosilicon compound having silicon-nitrogen bonds which is a polysilazane of the formula

$R_3SiNH(R_2SiNH)p'SiR_3$ in which *p'* is zero or a number from 1 to 15, and each R group may independently represent methyl, phenyl, or ethoxy, at least one of the symbols R representing a methoxy group when *p'* is zero.

4,103,046

METHOD OF IMPREGNATING CARBON ELECTRODES

Toru Taniguchi, Kyoto, Japan, assignor to Nikku Industry Co., Ltd., Itami and Nippon Carbon Co., Ltd., Tokyo, both of, Japan

Filed Nov. 16, 1976, Ser. No. 742,084

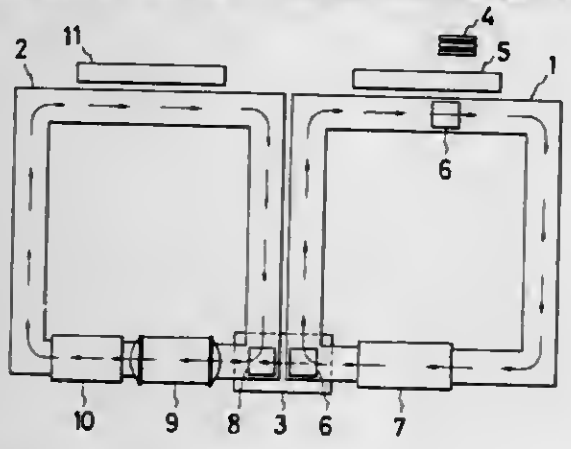
Claims priority, application Japan, Nov. 29, 1975, 50-143241

Int. Cl.² C25B *11/14*

U.S. Cl. 427—113 **1 Claim**

1. A method of impregnating carbon electrodes with pitch comprising the steps of (1) loading pre-sintered and burned electrodes onto a first palette means; (2) passing said electrodes and first palette means along a first palette transporting course; (3) heating and drying said electrodes as they pass along said first palette transporting course; (4) transferring the electrodes from (3) to a second palette means; (5) passing said electrodes and second palette means along a second palette transporting course; (6) impregnating the electrodes with pitch as they pass along said second palette transporting course; (7) quenching the impregnated electrodes to produce pitch-impregnated

electrodes, and (8) unloading said pitch-impregnated electrodes from said second palette means; said first and second palette transporting courses each defining a closed path separate and independent of each other.



4,103,047

FABRIC TREATMENT COMPOSITIONS

Wahib Nassif Zaki, Brussels, Belgium, and Alan Pearce Murphy, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 543,606, Jan. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,311, Apr. 16, 1974, abandoned. This application Sep. 3, 1976, Ser. No. 720,176

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

Int. Cl.^{2} B05D *3/12;* B32B *3/10*

U.S. Cl. 427—242 **26 Claims**

1. A method for imparting a softening and anti-static effect to fabrics in an automatic laundry dryer comprising commingling pieces of damp fabrics by tumbling said fabrics under heat in an automatic clothes dryer with an effective amount of a fabric softening composition, said composition having a melting point greater than about 38° C and being flowable at dryer operating temperature, said composition comprising from about 50% to about 90% of a fatty alkyl sorbitan ester component and from about 10% to about 50% of a cationic antistatic/fabric softener component.

4,103,048

LOW TEMPERATURE VAPOR SEALING OF ANODIZED ALUMINUM

Andrew Alexander, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 642,894, Dec. 22, 1975, Pat. No. 4,031,275. This application Dec. 27, 1976, Ser. No. 754,130

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.^{2} C25D *11/24*

U.S. Cl. 427—248 R **8 Claims**

1. A method of forming a low temperature seal on anodized aluminum which comprises exposing said anodized aluminum to ammonia vapors to provide a seal thereon such that immersing said sealed anodized aluminum for a period of 15 minutes in a solution containing 2.0 wt.% chromic and 3.5 wt.% phosphoric acid at a temperature of 100° F produces a weight loss of not more than 3 mg./in.^{2}.

4,103,049

PROCESS FOR APPLYING RESINOUS COATING TO METAL SURFACE

Takao Nishida, and Kiyoshi Tonoike, both of Osaka, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 446,032, Feb. 26, 1974, abandoned. This application Sep. 2, 1976, Ser. No. 720,033

Claims priority, application Japan, Mar. 2, 1973, 48-25469

Int. Cl.^{2} B05D *1/18, 3/02*

U.S. Cl. 427—341 **32 Claims**

1. A process for applying a resinous coating to a metal surface comprising immersing the surface in an acidic aqueous coating composition comprising about 5 to about 550 g/l of solid resin particles, and of pH within the range of about 1.6 to about 5 and prepared from hydrofluoric acid, and about 0.025 to about 50 g/l of a metal-containing compound which is soluble in said composition, the metal of said compound selected from the group consisting of silver, iron in its divalent state, copper in its divalent state, cobalt in its divalent state, chromium in its trivalent state, cadmium, tin in its divalent state and lead in its tetravalent state, said composition being effective in forming on said metal surface a resinous coating which increases in weight or thickness the longer said surface is immersed in said composition, and withdrawing the resinous coated surface from said composition.

4,103,050

AQUEOUS COIL COATING PRIMER

Charles L. Laskin, Cleveland, and Timothy I. Memmer, Strongsville, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,063

Int. Cl.^{2} B05D *1/38, 3/02;* B32B *15/08;* C08L *75/06*

U.S. Cl. 427—379 **14 Claims**

1. A heat-curable coil coating primer in aqueous dispersion for priming metal coil stock comprising:

a. a film-forming binder phase of a heat-curable, water-dispersed polyurethane polymer and a water-dispersed, heat-curable resinous latex in synergistic combination; and

b. a pigment phase of corrosion-inhibiting pigment, said synergistic combination of said polyurethane polymer and said resinous latex improving one or more of the following properties of said primer when said primer is applied to metal coil stock, topcoated, and heat cured: flexibility and impact resistance, adhesion to said coil stock and to a topcoat applied over said primer, humidity and water resistance, and chemical and corrosion resistance.

4,103,051

PILLING REDUCTION IN TEXTILES

Larry B. Farmer, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 3, 1975, Ser. No. 628,268

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—394 **8 Claims**

1. A method for reducing the pilling tendency of textiles containing polyester fibers which consists essentially of treating the textile with an effective amount of an aliphatic diamine having at least 10 carbon atoms to provide a concentration of the diamine on the textile of from about 0.5 to about 10 weight percent, based on the dry weight of the textile.

4,103,052

TWO-WAY WINDOW GRID

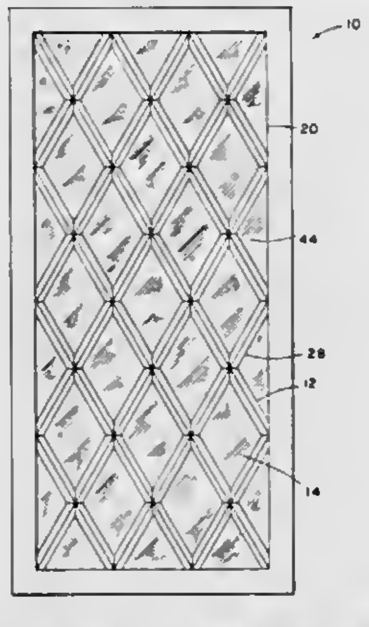
John J. Summers, and Larry G. Willis, both of Vincennes, Ind., assignors to National Gypsum Company, Dallas, Tex.

Continuation of Ser. No. 672,149, Mar. 31, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,742

Int. Cl.^{2} B32B *3/00, 17/06*

U.S. Cl. 428—38 **7 Claims**

1. A single sheet of glass having the appearance of a plurality of parallelogram panes of clear glass with real cross-bars therebetween, said sheet of glass consisting essentially of a flat backing sheet of clear glass and a pigmenting opaque coating on portions of only one face of said backing sheet, said coating being disposed in a pattern consisting of cross-bar designs defining the edges of said parallelogram panes, each said cross-bar design consisting of a pair of spaced, parallel truncated triangles, each said truncated triangle having two parallel long sides of uneven length and two short sides each forming an acute angle with the longer of the two long sides, said two short sides having respective directions of 90° relative to the opposite short side, said cross-bars having junctions whereat four cross-bars substantially meet, said cross-bars having short sides of said truncated triangles spaced from short sides of truncated triangles of adjacent cross-bars, said spacing between cross-bars being substantially equal to the spacing between the truncated triangles of each said cross-bar, and said spacings all being free of any coating and each being substantially less than the width of said truncated triangles.



7. The method of making a glass sheet having the appearance of a plurality of panes of clear glass with real cross-bars therebetween, comprising the steps of applying an opaque coating to preselected areas of an otherwise clear glass backing, applying said coating on only one face of said glass backing, using only one coating composition for said application of said coating, forming said preselected areas for coating to represent a three-dimensional element of non-uniform height from the plane of the said one face, providing said three-dimensional appearance by forming the appearance of a highlight line, forming said highlight line appearance by omitting coating along a narrow line with coating disposed on the two sides of said narrow uncoated line wherein said three dimensional element is a grid of cross-bars and wherein a highlight line as defined therein is formed along the center of said cross-bars and at the ends of said cross-bars where said cross-bars abut the ends of adjacent cross-bars.

4,103,053

PRESSURE SENSITIVE LAMINATE AND METHOD OF FORMING SAME

Myron Barebas, 280 First Ave., New York, N.Y. 10009

Filed Apr. 9, 1976, Ser. No. 675,648

Int. Cl.^{2} B32B *3/24, 3/30, 5/18*

U.S. Cl. 428—40 **14 Claims**

1. A labelling laminate comprising:

a carrier layer

a pigmenting layer adhesively connected to one side of said carrier layer,

a transparent, adhesively backed, covering layer which is aggressively adhesive on one side thereof, over substantially the entire area thereof,

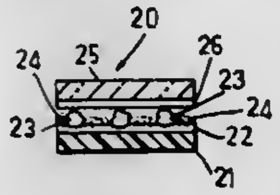
and spacing means disposed on said one side of said carrier layer and between said one side and said adhesive side of said covering layer for normally maintaining said one side of said carrier layer and said adhesive side of said covering layer in slightly spaced apart relationship so that the application of a predetermined pressure on said layers causes said adhesive side of said covering layer to be disposed into intimate contact with said pigmenting means permitting said pigmenting means to adhere to said adhesive side of said covering layer in the area of intimate contact therebetween and rendered releaseable therewith when said covering layer is stripped from said carrier layer whereby said covering layer can thereafter be adhesively secured as a label to an article.

13. A method of making a pressure sensitive transfer laminate comprising the steps of:

bonding spacer elements to a substrate laminate,

releaseably bonding a pigment coating to said substrate between said spacer elements whereby the thickness of said pigmented coating is less than the thickness of said spacer elements,

disposing a transparent covering layer having one surface thereof entirely coated with a layer of adhesive onto said spacer elements so that said adhesive contacts said spacer elements whereby the adhesive surface of said covering layer is normally spaced from said pigment coating.



applying a predetermined amount of pressure onto said layers whereby the adhesive backed layer is pressed into intimate contact with said pigment coating in the area of said applied pressure,

and separating said transparent covering layer whereby the portion of the pigmented coating in contact with the adhesive back of said covering layer is removed therewith,

and adhereing said separated layer to a supporting surface whereby the adhered pigmented coating is rendered readily visible through said transparent covering layer.

14. A method of making a pressure sensitive transfer laminate comprising the step of forming a substrate laminate with a series of embossments,

releaseably bonding a coloring pigment to said substrate in the voids defined by said embossments whereby the embossments extend beyond the surface of said coloring pigment,

disposing a laminate having one side entirely coated with an adhesive layer onto said embossments so that said adhesive contacts said embossments whereby the adhesive layer of said laminate is normally spaced from said coloring pigment.

4,103,054

SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR PREPARATION THEREOF

Miyoshi Okamoto, Takatsuki, and Syusuke Yoshida, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 13, 1977, Ser. No. 805,873

Claims priority, application Japan, Jun. 17, 1976, 51-70379

Int. Cl.^{2} B32B *33/00;* D06C *11/00*

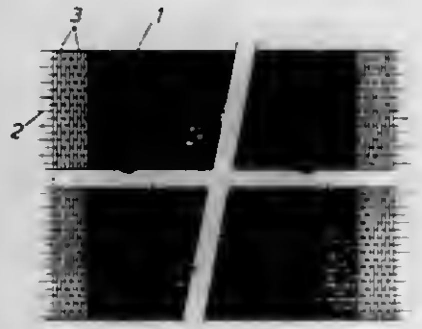
U.S. Cl. 428—91 **30 Claims**

1. A suede-like raised woven fabric of combination weave construction having raised fibers covering the surface thereof, comprising a warp yarn of 30 to 300 denier consisting mainly of fibers each having a thickness of 1.0 to 8.0 denier; a first weft spun yarn of 50 to 1,000 denier consisting of plural staple fibers, each staple consisting of a bundle of extra fine component fibers of 0.0001 to 0.4 denier; a second weft yarn of 30 to 300 denier consisting mainly of fibers having a thickness in a range

between 1.0 and 8.0 denier, at least one of said warp and said second weft being substantially free from crimps, each thread of said first weft floating over the adjoining three to seven threads of said warp, said raised fiber consisting of said extra fine component fibers of said first weft.

4,103,055
POROUS STRUCTURE

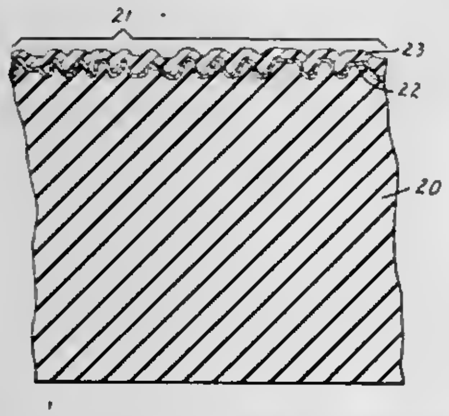
Fernand Jacques Levy, Paris, France, assignor to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France
Filed May 24, 1976, Ser. No. 689,042
Claims priority, application France, May 26, 1975, 75 16307
Int. Cl.^{2} B32B *5/12, 7/14;* **D04H** *1/58*
U.S. Cl. 428—113 **4 Claims**



1. A high-strength panel structure of accurately predetermined porosity comprising an assembly of at least about 5 superposed fabric layers each composed of basic boron monofilaments maintained in parallel closely-adjacent relationship by non-boron transverse yarns interwoven therewith, the number of boron mono-filaments in each said layer ranging from about 18 to about 40 per centimeter and the spacing between said transverse yarns being substantially larger than the spacing between said boron filaments, the lenghwise direction of the boron filaments of each layer extending at an angle with the lengthwise direction of the parallel boron filaments of the next successive layer so that the boron filaments of adjacent layers intersect each other at a multiplicity of pinpoint crossing points, and a bonding material external to said boron filaments for holding said layers in said assembly, said bonding material being essentially confined to said pinpoint crossing points.

4,103,056
RESILIENT WOOD REPLICATION

Eugene L. Baratto, White Bear Township, Ramsey County, Minn., and Eugene J. Dupre, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Jul. 14, 1976, Ser. No. 705,161
Int. Cl.^{2} D06N *7/04*
U.S. Cl. 428—142 **7 Claims**

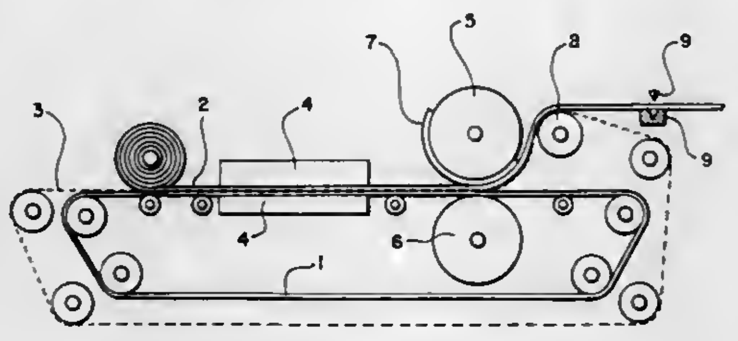


1. A resilient wood replication especially suited for use as floor covering comprising in combination:

(1) a resilient polyurethane elastomeric base at least 30 mils thick and having a molded textured wood-grain surface, said polyurethane elastomer being formed of a precursor material which has an initial liquid state permitting it to be poured into a mold having the negative of a wood grain pattern and being capable of nearly perfectly reproducing a counterpart of the mold's surface upon curing, forming an elastomeric product which is flexible, durable and tough, resilient, water-resistant and resistant to permanent deformation at temperatures in the range of about −30° to +70° C and having an elongation at break of at least 50%, a tensile strength of at least about 100 psi, a hardness value within the range of about 20 to 90 Shore A durometer, a compressive strength in the range of about 150 to 4000 psi at 50% deflection and a tear strength which exceeds 20 lbs. per inch thickness;
(2) sufficient wood stain applied over said molded textured wood-grain surface to make it resemble stained wood; and
(3) a layer at least 1 mil thick of a clear, tough, abrasion-resistant, flexible, adherent polyurethane material overcoating the stained molded textured wood-grain surface.

4,103,057
DUPLICATE THERMOPLASTIC PLATES, MATRICES USEFUL THEREFOR AND METHODS OF MANUFACTURING THE SAME

Yasuyuki Takimoto, Takatsuki, and Toshikazu Yoshikawa, Hirakata, both of Japan, assignors to Nippon Paint Company, Osaka, Japan
Continuation-in-part of Ser. No. 458,855, Apr. 8, 1974, abandoned. This application Jun. 24, 1976, Ser. No. 699,213
Claims priority, application Japan, Apr. 8, 1973, 48-39941
Int. Cl.^{2} B41D *7/02*
U.S. Cl. 428—156 **11 Claims**

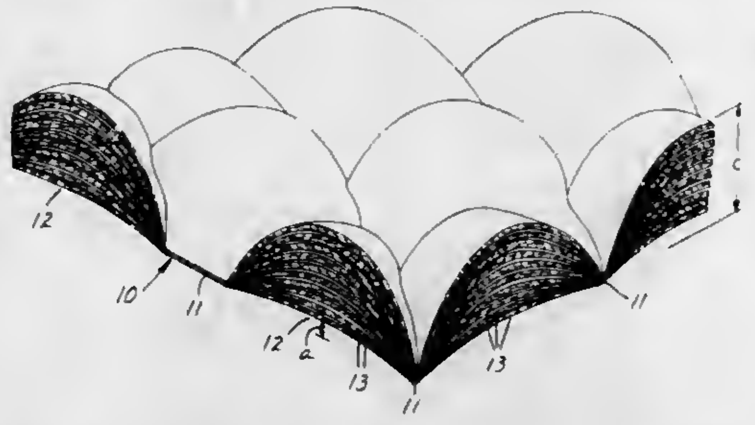


1. A duplicate thermoplastic printing plate bearing a printing relief pattern theron, said printing plate comprising a sheet having a thickness of 1.0 to 10 mm, said sheet comprising syndiotactic 1,2-polybutadiene having a crystallinity of approximately 10 to 30% and an intrinsic viscosity of greater than approximately 0.7 when measured in toluene at 30° C.

4,103,058
PILLOWED WEB OF BLOWN MICROFIBERS

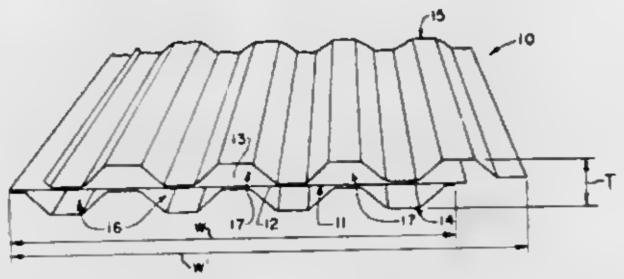
Larry D. Humlicek, Rice Lake, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation of Ser. No. 507,879, Sep. 20, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,089
Int. Cl.^{2} B32B *3/00, 27/02*
U.S. Cl. 428—171 **15 Claims**

1. A low-density web comprising a coherent mass of blown microfibers arranged into compacted high-density regions and pillowed low-density regions, the pillowed regions spanning the space between adjacent compacted regions, with the microfibers arching outwardly from their level in a compacted region into a pillowed region, whereby in a free-standing condition of the mass the pillowed regions are displaced to one side of a plane defined by the base of the compacted regions are anchored at their edges by the compacted regions and have an expanded and arched configuration in which the span length from compacted region to compacted region of the most highly arched microfibers is greater than that of less highly arched microfibers.



4,103,059
LIGHT TRANSMITTING BUILDING PANEL

Glenn E. Kautz, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Division of Ser. No. 624,275, Oct. 20, 1975, Pat. No. 4,020,989. This application Sep. 14, 1976, Ser. No. 723,148
Int. Cl.^{2} B32B *3/12, 3/28*
U.S. Cl. 428—178 **7 Claims**



1. In a light transmitting building panel, the combination consisting essentially of:

a flat central sheet having a first face and opposite thereto a second face;

lower and upper corrugated sheets confronting, respectively, said first face and said second face, and each being secured to said flat central sheet along contiguous portions thereof by means of a light transmitting adhesive, said corrugated sheets cooperating with said flat central sheet to provide plural upper cells and plural lower cells;

said upper corrugated sheet being laterally offset relative to said lower corrugated sheet such that each upper cell is presented intermediate of adjacent ones of said lower cells; and

said flat central sheet and said lower and upper corrugated sheets being formed from a light transmitting glass fiber reinforced plastic;

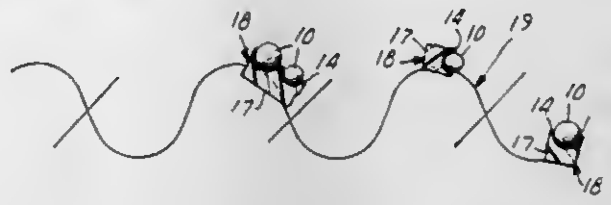
said flat central sheet presenting opposite first and second longitudinal edges;

said lower corrugated sheet being presented intermediate of said first and second longitudinal edges; and

said upper corrugated sheet having one longitudinal side inwardly offset from said first longitudinal edge to expose a face strip of said flat central sheet and an opposite longitudinal side presented beyond and spaced-apart from the second longitudinal edge of said flat central sheet.

4,103,060
AREA-RETROREFLECTORIZATION OF FABRICS

Wallace Karl Bingham, North Saint Paul, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Continuation-in-part of Ser. No. 540,286, Jan. 10, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 766,332
Int. Cl.^{2} B32B *5/16, 17/06*
U.S. Cl. 428—241 **35 Claims**



1. Fabric treated on at least one surface with a discontinuous sparse retroreflective treatment that has low visibility in daylight but provides a bright retroreflection at night, said treatment comprising discrete separated retroreflective areas that each include a thin layer of binder material adhered to the fabric and separated from the binder material of other retroreflective areas, and one or more glass microspheres that average no more than about 200 micrometers in diameter supported as a monolayer in said layer of binder material; at least about one-third of the microspheres adhered to the fabric in said retroreflective areas having specular reflective means in optical connection between them and the fabric and having their outwardly facing surface optically exposed for receiving and returning light rays, whereby they retroreflect incident light that is normal to the fabric; there being no more than about 2000 microspheres in any square centimeter of said treatment; and the maximum surface dimension of said retroreflective areas being no greater than about 1 millimeter.

8. Fabric treated on at least one surface with a discontinuous sparse retroreflective treatment that provides in aggregate at least about one candella per square meter of the fabric per lux of light incident on the fabric but leaves the fabric with nearly its full original hand, breathability, and appearance whereby the fabric may be made into comfortable garments having an inconspicuous daytime appearance, said treatment comprising discrete separated retroreflective areas that each include a thin layer of binder material adhered to the surface of the fabric and separated from the binder material of other retroreflective areas, and one or more transparent microspheres that average less than about 100 micrometers in diameter supported as a monolayer in said layer of binder material; at least about one-third of the microspheres adhered to the fabric in said retroreflective areas having specular reflective means in optical connection between them and the fabric and having their outwardly facing surface optically exposed for receiving and returning light rays, whereby they retroreflect incident light that is normal to the fabric; the maximum surface dimension of said retroreflective areas being no more than about one millimeter and there being no more than about 500 microspheres per square centimeter of said treatment.

15. A method for providing a retroreflective treatment on a fabric comprising

A. depositing onto the fabric a free-flowing mass of retroreflectorization particles that comprise (1) on the average no more than about fifty transparent microspheres arranged in a closely packed monolayer; (2) a solid binder layer in which the microspheres are supported and which may at least in part be softened to adhere the particles to the fabric; and (3) specular reflective means underlying the monolayer of microspheres and supported by the binder layer in optical connection with the microspheres whereby the microspheres are made retroreflective; the surface of the microspheres opposite from the reflective means being optically exposed to receive and return light rays; and

B. providing conditions to soften said binder layer, whereby at least a portion of said retroreflectorization particles become adhered to the fabric with the optically exposed surfaces of the microspheres facing away from the fabric.

18. A free-flowing mass of minute discrete retroreflectorization particles useful for forming a retroreflective coating on a substrate, said particles individually comprising on the average one up to about 50 transparent microspheres supported as a closely packed monolayer by a solid binder layer which may at least in part be softened to adhere the particles to a substrate; and specular reflective means underlying the microspheres and supported by the binder layer in optical connection with the microspheres to make the microspheres retroreflecting; the surface of the microspheres opposite from the reflective means being optically exposed whereby, when the particles are adhered to a substrate with said optically exposed surface facing away from the substrate, the microspheres will retroreflect light incident on the substrate.

4,103,061

PROTECTIVE MEMBRANE FLASHING

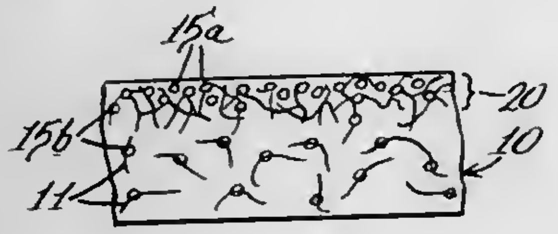
Harry Chomes, 29 Jameson Rd., Newton, Mass. 02158
Continuation of Ser. No. 440,650, Feb. 8, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,588
Int. Cl.^{2} B32B *7/12*
U.S. Cl. 428—247 **4 Claims**

1. A protective membrane flashing for a building structure, formed by shaping a water-resistant sheet characterized as having substantial resistance to flexure, cutting and low temperature and being further characterized as being sufficiently flexible and free-forming so as to drape into desired form; said sheet comprising a thin polyester film held between fibrous glass mesh sheets with a resinous adhesive layer, said resinous adhesive layer adhering substantially to the back portions but not penetrating substantially into the mesh openings, whereby the mesh opening volumes are substantially unfilled and the outer surface of the mesh is uncoated by the adhesive.

4,103,062

ABSORBENT PANEL HAVING DENSIFIED PORTION WITH HYDROCOLLOID MATERIAL FIXED THEREIN

Gerhard M. Aberson, Downers Grove, and Emily M. Stulgate, Oak Park, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Jun. 14, 1976, Ser. No. 695,683
Int. Cl.^{2} B32B *5/16*
U.S. Cl. 428—283 **8 Claims**



1. An absorbent fibrous structure suitable for use as an absorbent component in absorbent products comprising: a cellulosic fibrous batt having a first portion which is a highly porous, loosely compacted, region of relatively low cohesive strength, relatively low capillarity, relatively poor shape and volume stability and relatively low fluid retentivity, and a second portion which is a densified, compacted, porous, absorbent fibrous region having relatively high cohesive strength, relatively good capillarity, relatively good shape and volume stability and relatively high fluid retentivity, said second portion being integrally connected to said first portion of said batt, and a particulate hydrocolloid material distributed in at least one of said portions of said fibrous batt and fixed therein by bonding to cellulosic fibers in said batt.

4,103,063

CERAMIC-METALLIC EUTECTIC STRUCTURAL MATERIAL

Charles Orcutt Hulse, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Mar. 23, 1976, Ser. No. 669,432
Int. Cl.^{2} C04B *35/76;* **F01D** *5/78;* **F04D** *7/06, 29/02*
U.S. Cl. 415—212 R **6 Claims**

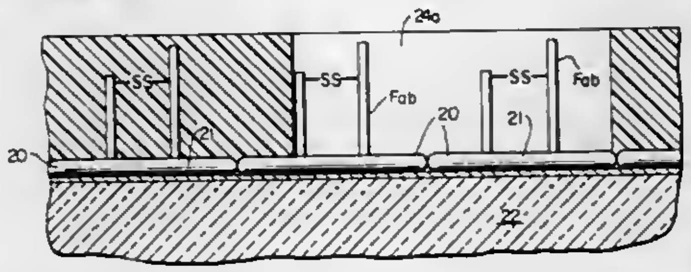
1. A directionally solidified gas turbine airfoil having
a. an oxide ceramic matrix having an oxygen diffusivity of less than about 10^{-10} cm^2/sec at 1400° C,
b. a fibrous reinforcing second phase having a diameter of from about 1 to about 10 microns and a length to diameter ratio of greater than about 10, with said fibrous phase having the characteristic of forming a stable protective oxide layer upon exposure to oxygen containing atmospheres at elevated temperatures, with the overall composition of the total system being that of eutectic.

2. An oxidation resistant structural ceramic composite material suited for use at elevated temperatures which comprises
a. an oxide ceramic matrix having an oxygen diffusivity of less than about 10^{-10} cm^2/sec at 1400° C,
b. a metallic fibrous reinforcing second phase having a diameter of from about 1 to about 10 microns and a length to diameter ratio of greater than about 10, with said fibrous phase having the characteristic of forming a stable protective oxide layer upon exposure to oxygen containing atmospheres at elevated temperatures,
with overall composition of the total system being that of a eutectic.

4,103,064

MICRODEVICE SUBSTRATE AND METHOD FOR MAKING MICROPATTERN DEVICES

James H. McAlear, Gaithersburg, and John M. Wehrung, Potomac, both of Md., assignors to Dios, Inc., Potomac, Md.
Filed Jan. 9, 1976, Ser. No. 647,871
Int. Cl.^{2} B05D *5/00;* **B32B** *9/02*
U.S. Cl. 428—333 **52 Claims**



1. A microsubstrate for the production of micropatterns, comprising
a substrate base;
a protein layer overlying said substrate base and comprising
a compresseed monolayer of denatured non-fibrous protein adhered to said base,
said denatured protein having a maximum molecular dimension not greater than 500 Angstrom units and a ratio of greatest molecular dimension to smallest molecular dimension of at least 2:1;
the molecules of said denatured protein having a hydrophilic side and a hydrophobic side facing in generally opposite directions and separated by a dimension which is small relative to the maximum dimension of the molecule; and
a film of masking material overlying and adhered to said protein layer.

31. In the fabrication of articles exhibiting a micropattern carried by a surface of a support, the method comprising
establishing on the surface of the support a compressed monolayer of denatured nonfibrous protein,
said denatured protein having a maximum molecular dimension not greater than 500 Angstrom units and a ratio of greatest molecular dimension to smallest molecular dimension of at least 2:1, the molecules of said denatured protein having a hydrophilic side and a hydrophobic side facing in generally opposite directions and separated by a dimension which is small relative to the maximum dimension of the molecule;
establishing a film of masking material which overlies said compressed monolayer and is characterized by being so modified by radiant energy as to be removable;
directing radiant energy on said film in an area predetermined by the micropattern desired; and
removing said film from only said predetermined area to expose said monolayer for further treatment.

4,103,065

COATED POLYCARBONATES AND ACRYLICS

Donald W. Gagnon, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 12, 1976, Ser. No. 713,730
Int. Cl.^{2} B32B *27/42;* **C08L** *43/04, 83/04;* **B32B** *27/16*
U.S. Cl. 428—336 **13 Claims**

1. In a coated polycarbonate or acrylic article having an externally disposed surface layer of a heat cured reaction product obtained by
I. combining
(a) a solvent-soluble, further-curable organopolysiloxane partial condensate product resin, said resin consisting essentially of the product obtained by the acid hydrolysis of a compound of the formula $CH_3Si(OR')_3$ or a mixture of compounds of the formula $CH_3Si(OR')_3$ and $C_6H_5Si(OR')_3$ in a mole ratio of the former to the latter of between about 1:10 to about 10:1 and wherein R' is an alkyl of 1-6 carbon atoms,
(b) about 3 to about 15 parts by weight per 100 parts by weight of (a) an alkylated melamine formaldehyde partial condensate resin in an organic solvent solution,
II. applying said organic solvent solution onto a polycarbonate, or acrylic article, and
III. evaporating said organic solvent and heat curing the residue to form said reaction product, the improvement wherein said surface layer consists essentially of the heat cured reaction product obtained by combining said (a) and (b) constituents and about 25 to about 400 parts by weight per 100 parts by weight of (a) of
(c) a composition containing (1) from about 5 to about 62 percent by weight of a linear diol, (2) from about 8 to about 35 percent by weight of a thermosetting acrylic containing about 10 percent by weight of the acrylic of an unsaturated carboxylic acid, from about 4 to about 10 percent by weight of the acrylic of a hydroxyalkyl ester of an alpha, beta-unsaturated carboxylic acid, with the remainder comprising at least one alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and (3) from about 17 to about 87 percent by weight of a crosslinking agent, and
(d) an effective ultraviolet stabilizing amount of an ultraviolet stabilizer, said surface layer having a thickness of about 0.3 mils to about 1.8 mils.

8. An organic solvent solution consisting essentially of
(a) a solvent soluble, further-curable organopolysiloxane partial condensate product resin, said resin consisting essentially of the product obtained by the acid hydrolysis of a compound of the formula $CH_3Si(OR')_3$ or a mixture of compounds of the formula $CH_3Si(OR')_3$ and $C_6H_5Si(OR')_3$ in a mole ratio of the former to the latter of between about 1:10 to about 10:1 and wherein R' is an alkyl of 1-6 carbon atoms, and
(b) about 3 to about 15 parts by weight per 100 parts by weight of (a) an alkylated melamine formaldehyde partial condensate resin in an organic solvent solution, and
(c) about 25 to about 400 parts by weight per 100 parts by weight of (a) of a composition containing (1) from about 5 to about 62 percent by weight of a linear diol, (2) from about 8 to about 35 percent by weight of a thermosetting acrylic containing about 10 percent by weight of the acrylic of an unsaturated carboxylic acid, from about 4 to about 10 percent by weight of the acrylic of a hydroxyalkyl ester of an alpha, beta-unsaturated carboxylic acid, with the remainder comprising at least one alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and (3) from about 17 to about 87 percent by weight of a crosslinking agent, and
(d) an effective ultraviolet stabilizing amount of an ultraviolet stabilizer.

4,103,066

POLYCARBONATE RIBBON FOR NON-IMPACT PRINTING

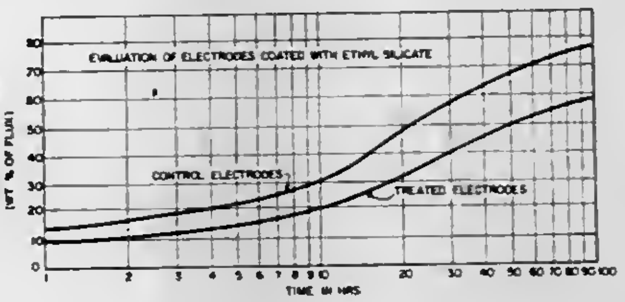
Gary Fred Brooks, San Jose; Walter Crooks, and William Joseph Weiche, both of Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 17, 1977, Ser. No. 842,652
Int. Cl.^{2} B32B *9/04*
U.S. Cl. 428—337 **6 Claims**

6. A ribbon for non-impact printing comprising a transfer layer and a substrate of about 15 microns thickness which is a polycarbonate resin containing about 30% by weight of electrically conductive carbon black.

4,103,067

LOW HYDROGEN WELDING ELECTRODES

Clarence E. Jackson, 866 Mission Hills La., Worthington, Ohio 43085, and Albert A. Freeman, 17015 Hillview La., Spring, Tex. 77373
Continuation-in-part of Ser. No. 646,930, Jan. 6, 1976, abandoned, which is a continuation of Ser. No. 535,822, Dec. 23, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,602
Int. Cl.^{2} B23K *35/365*
U.S. Cl. 428—387 **17 Claims**



1. In an arc welding electrode for producing ferrous weld metal having low amounts of hydrogen therein so that hydrogen-assisted cracking is minimized, said electrode having a ferrous filler wire core and flux covering thereon of predetermined constituents, said flux covering having a moisture level of less than about 0.6 percent, the improvement comprising:
a binder of hydrolyzed organic silicate for binding said constituents together, said binder being characterized by the fact that it makes substantially no contribution to said moisture level and makes said flux covering resistant to hygroscopic moisture pickup before said electrode is used for welding, said binder thereby minimizing the amount of hydrogen from said flux covering which may be poten-

tially introduced into said ferrous weld metal during welding, and

one of said constituents being a source of barium, said barium being present in an amount from about 0.1% to about 5% by weight and being effective to reduce the slag/metal reaction temperature during welding, whereby the amount of hydrogen introduced into said ferrous weld metal from said flux covering and binder is minimized.

6. In an arc welding electrode for producing ferrous weld metal having low amounts of hydrogen therein so that hydrogen-assisted cracking is minimized, said electrode having a ferrous filler wire core and flux covering thereon of predetermined constituents, said flux covering having a moisture level of less than about 0.6 percent, the improvement comprising:

a binder of hydrolyzed organic silicate for binding said constituents together, said binder being characterized by the fact that it makes substantially no contribution to said moisture level and makes said flux covering resistant to hygroscopic moisture pickup before said electrode is used for welding, said binder thereby minimizing the amount of hydrogen from said flux covering which may be potentially introduced into said ferrous weld metal during welding, and

one of said constituents being a source of cesium, said cesium being present in an amount from about 0.1% to about 5% by weight and being effective to reduce the slag/metal reaction temperature during welding, whereby the amount of hydrogen introduced into said ferrous weld metal from said flux covering and binder is minimized.

4,103,068
POLYESTER FILAMENTARY YARNS

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 653,974, Jan. 30, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,913

Int. Cl.² B32B *27/00;* D02G *3/00*

U.S. Cl. 428—395 **4 Claims**

1. A synthetic filamentary yarn comprised of polyethylene terephthalate filaments which are first treated with from about 0.3 to about 0.6 weight percent based on the weight of the yarn of a liquid composition consisting essentially of about 10 to about 20 weight percent of said composition of refined coconut oil, about 10 to about 20 weight percent of said composition of a stearic acid ester of a branched chain alcohol having 14–15 carbon atoms, about 3.0 to about 6.0 weight percent of said composition of ethoxylated tallow amine, about 10 to about 20 weight percent of said composition of ethoxylated lauryl alcohol, about 8.0 to about 12.0 weight percent of said composition of sodium salt of alkylarylsulfonate, about 1.0 to about 3.0 weight percent of said composition of dinonyl-sodium-sulfosuccinate, and about 35 to 50 weight percent of said composition of white mineral oil having a boiling point of between 510° and 620° F., wherein at least about 0.15 to about 0.30 weight percent is retained on said yarn; and then treated with from about 0.7 to about 1.2 weight percent on said yarn of a liquid composition consisting essentially of about 13 to about 25 weight percent of said composition of a compound selected from the group consisting of glycerol monooleate and decaglycerol tetraoleate with ethoxylated tall oil fatty acids, about 12 to about 20 weight percent of said composition of a compound selected from the group consisting of sulfated glycerol trioleate and ethoxylated tallow amine, and about 55 to about 75 weight percent of said composition of a stearic acid ester of a branched chain alcohol having 14–15 carbon atoms.

4,103,069
COATED SILVER ACTIVATED ZINC SULFIDE CATHODE RAY TUBE

Harry O. Schulze, Wyalusing; Robert E. Dodds, and Raymond F. Herner, both of Towanda, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 6, 1976, Ser. No. 729,905

Int. Cl.² B32B *9/00;* C09K *11/10*

U.S. Cl. 428—403 **10 Claims**

1. Cathode ray phosphor compositions consisting essentially of discrete particles of a cathodoluminescent material having an average particle size of from about 5 to about 20 micrometers and consisting essentially of a core of a conventional silver-activated zinc sulfide and an adherent relatively uniform coating of magnesium pyrophosphate, aluminum pyrophosphate, and silicon dioxide, with said phosphates being in an equal molar relationship, said coating being at a sufficient level to provide a PO_4 content of from about 0.05% to about 0.2% by weight of the total composition and the silicon dioxide content of the total composition is from about 0.02% to about 0.07% by weight of the total composition.

4,103,070
SAFETY GLASS LAMINATES WITH ALIPHATIC/CYCLOALIPHATIC POLYCARBONATE URETHANES

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 681,013, Apr. 28, 1976, Pat. No. 4,024,113. This application Feb. 11, 1977, Ser. No. 767,936

Int. Cl.² B32B *17/10, 27/36, 27/40*

U.S. Cl. 428—412 **3 Claims**

1. A safety glass laminate comprising:

a. a ply of glass; and

b. bonded to said ply of glass a ply of transparent, energy absorbing polyurethane which is the reaction product of:

(1) an organic diisocyanate:

(2) an organic compound having two isocyanate-reactive hydrogens and a molecular weight less than about 250; and

(3) a polycarbonate diol prepared from a mixture of linear aliphatic and cycloaliphatic diols wherein the aliphatic diol has at least 4 carbon atoms comprising (a) at least 30 mole percent linear aliphatic diol and (b) at least 10 mole percent cycloaliphatic diol.

4,103,071
THERMOPLASTIC RECORDING MEMBERS CONTAINING SILICONE OIL, FLUOROCARBON OIL OR CHLOROFLUOROCARBON OIL HAVING IMPROVED DEFORMATION PROPERTIES OF SURFACE

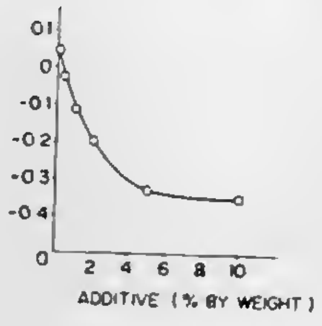
Michiharu Abe, Kawasaki, and Akiyoshi Oride, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1976, Ser. No. 674,372

Claims priority, application Japan, Apr. 11, 1975, 50-43426

Int. Cl.² G03G *16/00;* G03C *5/04;* B32B *27/00*

U.S. Cl. 428—421 **4 Claims**



1. Thermoplastic recording member for use in recording information by deformation of a surface recording layer; said member comprising a support which is electrically conductive or photoconductive and a surface recording layer comprising a thermoplastic resin film containing from 0.1 to 10% by weight, based on the weight of the film, of at least one member selected from the group consisting of silicone oils, fluorocarbon oils and chlorofluorocarbon oils.

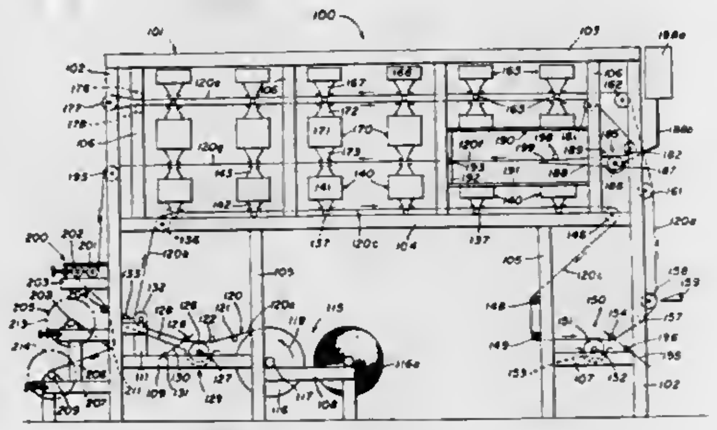
4,103,072
METHOD OF PRODUCING DIAZOTYPE PHOTOPRINTING MATERIAL

Irving R. Valentine, Chicago, Ill., assignor to Weber-Valentine Company, Inc., Elk Grove Village, Ill.

Division of Ser. No. 621,129, Oct. 9, 1975, abandoned. This application Jul. 9, 1976, Ser. No. 703,970

Int. Cl.² D21H *5/08*

U.S. Cl. 428—425 **5 Claims**



3. A translucent water absorbent natural fiber material comprising a water absorbent natural fiber material having absorbed therein an effective amount of a water emulsion of a water clear synthetic organic resin, said water emulsion containing an emulsifier present in the range of from about 0.5% of about 2% by weight selected from the class consisting of polyoxethylated fatty acids, simple fatty esters, sorbitan esters, ethoxylated fatty acids, ethoxylated fatty amines, ethoxylated sorbitan esters, ethoxylated vegetable oils, ethoxylated alcohols and alkylphends, said water clear resin being present in the range of from about 6% to about 17% by weight selected from the class consisting of polypropylene, polystyrene, polyvinyl chloride, styrene butadiene, carboxylated styrene butaliene, silicone resins and urethanes.

4,103,073
MICROSUBSTRATES AND METHOD FOR MAKING MICROPATTERN DEVICES

James H. McAlear, Gaithersburg, and John M. Webrung, Potomac, both of Md., assignors to Dios, Inc., Potomac, Md.

Filed Jan. 9, 1976, Ser. No. 647,872

Int. Cl.² B05D *5/12;* B32B *9/02*

U.S. Cl. 428—474 **17 Claims**

1. A microsubstrate comprising

a support presenting a supporting surface; and

a thin film overlying said supporting surface and adhered thereto;

said film comprising at least one active enzyme selected from the group consisting of transferases and oxidoreductases,

said enzyme being present in the form of macromolecules uniformly distributed throughout the film.

2. The method for forming a micropattern, comprising

establishing a solid film containing at least one enzyme selected from the group consisting of the transferases and the oxidoreductases,

said at least one enzyme being present in the form of macromolecules retaining their enzymatic activity and which are uniformly distributed throughout said film;

treating said film to restrict said at least one enzyme in its active state to the predetermined areas of said film which are defined by the desired micropattern; and

treating said predetermined areas of said film to carry out throughout said predetermined areas at least one chemical reaction which depends upon presence of said at least one enzyme in active state and which produces a particular reaction product operatively suitable for the purpose of the desired micropattern.

4,103,074
PROCESS FOR COAGULATING POLYMER LATICES USING SCREW-TYPE EXTRUDER

Douglas Leo Hertel, Strongsville, and Robert Wen Lee, North Ridgeville, both of Ohio, assignors to International Basic Economy Corporation, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,077

Int. Cl.² C08C *1/14*

U.S. Cl. 528—487 **16 Claims**

1. The process of coagulating a polymer latex comprising mixing and mechanically working the polymer latex and a coagulant under pressure in an extruder to produce a coagulated polymer having moisture content less than 25% by weight, the extruder including an elongated chamber, an axial rotating interrupted worm flight disposed in the chamber for initially contacting and mixing the polymer latex and coagulant in the worm flight to form a coagulating mixture and for advancing the coagulating mixture through the chamber to an extruder exit, and a plurality of stationary breakers projecting into the interior of the chamber intermediate at least some of the segments of the interrupted worm flight, the interrupted worm flight and the breakers cooperating to maintain the coagulating mixture under pressure in the worm flight at least until coagulation of the polymer latex is substantially complete, the segments of the interrupted worm flight and the breakers also cooperating to turbulently mix and mechanically work the constituents of the pressurized coagulating mixture in the worm flight and to break up any coagulated polymer encapsulating uncoagulated polymer latex and release the encapsulated polymer latex for mixture with coagulant, and extruding the coagulated polymer from the extruder exit with a moisture content less than 25% by weight.

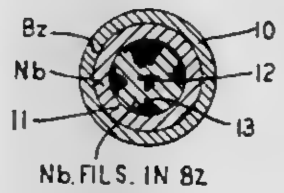
4,103,075
COMPOSITE MONOLITHIC LOW-LOSS SUPERCONDUCTOR FOR POWER TRANSMISSION LINE

Erik Adam, Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Oct. 28, 1976, Ser. No. 736,611

Int. Cl.² H01B *5/00, 7/34*

U.S. Cl. 428—614 **14 Claims**



1. A composite superconductive tape having:

(a) a rectangular central matrix element having a pair of wider faces and a pair of narrower faces when viewed in cross-section of a nonsuperconductive material in which are embedded a plurality of superconductive filaments;

(b) a pair of layers of superconductive material bonded to said wider pair of faces of said matrix;

(c) a pair of layers of a superconductive precursor material, selected such that it forms a superconductive compound when interreacted with the material of the matrix, bonded to said pair of layers of superconductive material;

(d) a second pair of layers of superconductive material bonded to said pair of layers of superconductor precursor material; and

(e) a pair of layers of a second nonsuperconductive material bonded to said second pair of layers of superconductive material.

11. A composite superconductive tape having:

(a) a rectangular matrix having a pair of wider faces and a pair of narrower faces when viewed in cross-section comprising a plurality of superconductive filaments embedded in a matrix of normally conductive material; and

(b) at least one layer of superconductive material bonded to each of the wider pair of faces of said rectangular matrix.

4,103,076

CLAD METAL PRODUCT OF Cu, Al AND STAINLESS STEEL

John B. Ulam, McMurray, Pa., assignor to Clad Metals, Inc., Canonsburg, Pa.

Continuation-in-part of Ser. No. 572,732, Apr. 29, 1975, Pat. No. 4,004,892, which is a division of Ser. No. 423,253, Dec. 10, 1973, Pat. No. 3,952,938. This application Nov. 22, 1976, Ser. No. 744,043

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² B32B *15/20*

U.S. Cl. 428—653 **3 Claims**

1. A clad metal product consisting essentially of a core having a member from the group consisting of copper and copper alloys and at least one layer of a member from the group consisting of aluminum and aluminum alloys, said core forming a major thickness portion of said composite and at least one outer cladding layer of stainless steel bonded to said aluminum opposite the copper and copper alloy group member, said product having been made by the steps of mechanically cleaning the contact surfaces of at least the copper and aluminum alloys, joining said sheets under pressure sufficient to reduce the total thickness of said sheets an amount between about 20% to 70% and stress relieving the joined sheets at a temperature in the range about 600° F. to 800° F. to cause diffusion between the sheets.

4,103,077

GREEN STRENGTH OF SYNTHETIC ELASTOMERS

Joseph F. O'Mahoney, Jr., Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 13, 1976, Ser. No. 685,832

Int. Cl.² C08F *8/30, 8/32*

U.S. Cl. 526—51 **13 Claims**

1. A process for improving the green strength of synthetic elastomers, comprising:

mixing a synthetic elastomer with a small amount of from about 0.25 to about 2.0 parts by weight per 100 parts of said elastomer of a dihydrazide compound having the formula $NH_2—NH—CO—R—CO—NH—NH_2$ where R is an alkyl group having from 2 to 10 carbon atoms to form a mixture,

said synthetic elastomer made from the solution polymerization of monomers selected from the class consisting of dienes having from 4 to 10 carbon atoms, comonomers of dienes having from 4 to 10 carbon atoms to form copolymers, and comonomers of dienes having from 4 to 10 carbon atoms with olefin monomers having from 2 to about 14 carbon atoms to form copolymers,

producing an improved green strength elastomer by partially cross-linking said elastomer to effect less than a vulcanized elastomer, and

heating said elastomer dihydrazide mixture at a temperature of from about 125° F to about 300° F.

4,103,078

METHOD FOR PRODUCING POLYMERS OF ALPHA-OLEFIN

Akihiro Sato, Yokosuka; Shiro Konotsune, Yokohama; Atsuyuki Kachi, Yokohama, and Hiroshi Shimizu, Yokohama, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 54,865, Jul. 14, 1970, abandoned. This application Mar. 13, 1973, Ser. No. 340,854

Claims priority, application Japan, Ang. 1, 1969, 44-60798

Int. Cl.² C08F *4/02*

U.S. Cl. 526—115 **7 Claims**

1. A method for producing polymers of α-olefins which comprises:

(a) mill-mixing together

(1) 1 mol of a metal oxide or non-metal oxide selected from the group consisting of Cu_2O, CuO, Ag_2O, Ag_2O_3, MgO, CaO, SrO, BaO, ZnO, CdO, Ga_2O_3, SnO, SnO_2, PbO, Pb_2O_3, Pb_3O_4, ZrO_2, Bi_2O_3, V_2O_5, WO_3, MnO, Mn_2O_3, FeO, Fe_2O_3, Fe_3O_4, CoO, Co_3O_4, NiO, $NaAlO_2$, $CaAl_2O_4$, $MgAl_2O_4$, Mg_2SiO_4, $MgWO_4$ and Mg_6MnO_8 or SiO_2 or B_2O_3 with

(2) 0.01–2 mols of a trivalent metal halide from the group consisting of $AlCl_3$, $AlBr_3$ and $FeCl_3$,

(b) reacting the resultant mixture at a temperature between room temperature and 300° C with a transition metal compound selected from the group consisting of titaniumtetrachloride, vanadiumtetrachloride and vanadiumoxytrichloride in the presence of an aromatic compound selected from the group consisting of benzene, naphthalene, pyridine, toluene, xylene, mesitylene, durene, ethylbenzene, isopropylbenzene, 2-ethylnapthalene, 1-phenylnaphthalene, dimethylaniline, N-methyl-diphenylamine, triphenylamine, nitrobenzene, p-nitrosotoluene, anisole, phenylether, xylenol, and 2, 6-di-t-butyl-4-methylphenol, and

(c) activating the product of step (b) with an organoaluminum compound selected from the group consisting of trimethylaluminum, triethylaluminum, diethylaluminumchloride, ethylaluminumsesquichloride, and ethylaluminumdichloride so as to thereby form a polymerization catalyst,

(d) introducing into a polymerization zone that contains said polymerization catalyst

(1) a monomer selected from the group consisting of ethylene, propylene, and butene-1, or

(2) said monomer set forth in (d) (1) and a monomer different therefrom consisting of ethylene, propylene, butene-1, hexene1, octene-1, decene-1, 3-methyl-1-butene, 4-methyl-1-pentene, and styrene,

(e) effecting polymerization under polymerization conditions, and

(f) recovering the resulting polymerization product.

4,103,079

HALOGENATED ORGANOALUMINUM COMPOUNDS AND METHOD OF PREPARATION

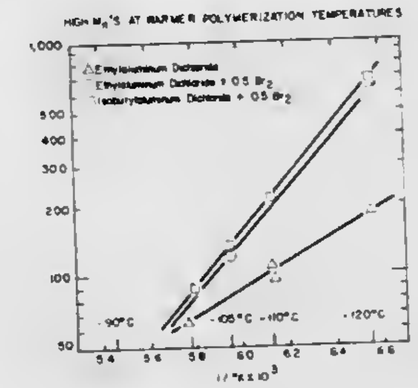
Warren A. Thaler, Matawan, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 635,695, Nov. 26, 1975. This application Nov. 1, 1976, Ser. No. 737,917

Int. Cl.² C08F *4/52, 36/06, 36/08*

U.S. Cl. 526—185 **4 Claims**

1. An improved process for preparing homopolymers from isoolefins having from 4 to about 20 carbon atoms, said isoolefin being selected from the group consisting essentially of isobutylene, 2-methylbutene, 3-methyl-butene-1, 4-methylpentene-1 or β-pinene, which consisting essentially of contacting the isoolefin at a temperature of or less than about −15° C with a catalyst, the improvement of which consisting essentially of using a ctalyst which comprises a mixture of material of the formula R_mAlX_{3-m} wherein m ranges from 1 to 3 inclusive, R is the same or different alkyl radical of straight or branched chain structure of from 1 to 7 carbon atoms, and X is the same or different halogen selected from the group consisting of Cl and Br premixed with Y moles of halogen, halogen acid, mixed halogen or organo-halide per mole of aluminum compound wherein the halogen is selected from the group consisting of Cl and Br and the organo group is an alkyl group of straight or ranched chain structure of from 2 to 20 carbon atoms, an allylic group of 3–20 carbon atoms or a benzylic group of 7–20 carbon atoms yielding a catalytic composition such that (m-Y) ranges from less than 0.7 to about 0.2.



4,103,080

AUXILIARY AGENT FOR IMPROVING RETENTION, DRAINAGE AND TREATMENT ESPECIALLY IN PAPERMAKING, AND USE OF THE AUXILIARY AGENT

Branislav Böhmer, and Lutz Hoppe, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Oct. 4, 1976, Ser. No. 729,852

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2545007

Int. Cl.² C08F *2/10, 120/56*

U.S. Cl. 526—303 **6 Claims**

1. A high-molecular weight, water-soluble homopolymer of acrylamide obtained by aqueous solution polymerization of acrylamide monomer in an amount of 3 20% by weight of monomer based on the total solution, at a pH value of 8 to 13 and with the addition of radical initiators in at least three steps at intervals during the polymerization, said initiators being added in a total amount of 0.02 to 1.0% by weight based on the amount of monomer and with the addition of polymerization regulators in an amount of at most 20 g per mol of monomer said regulators being at least one member selected from the group consisting of alkylene glycols, aliphatic dicarboxylic acids, lower aliphatic chlorinated hydrocarbons, acetic acid, metal acetates, citric acid, glycerol, mannitol, taurine and tetrahydrofuran, said homopolymer of acrylamide being in the form of a storage stable homopolymer which has a molecular weight of 30.6 to 98.5 million.

4,103,081

STABILIZED ANAEROBIC ADHESIVES

Stephen Repetto, Vernon, Conn., assignor to Loctite Corporation, Newington, Conn.

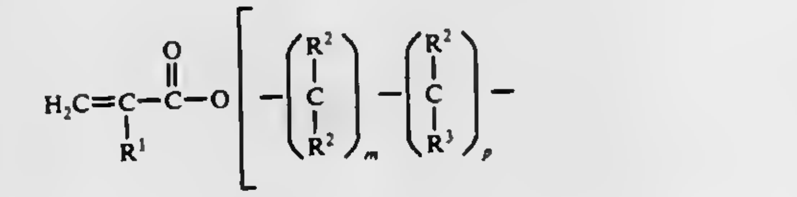
Filed Sep. 3, 1976, Ser. No. 720,458

Int. Cl.² C08F *120/20*

U.S. Cl. 526—323.1 **7 Claims**

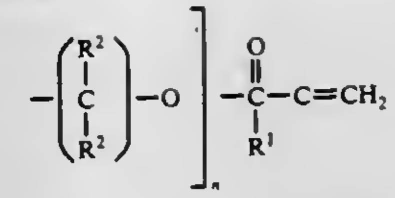
1. An anaerobic adhesive system comprising

(a) a polyacrylate monomer of the following general formula:



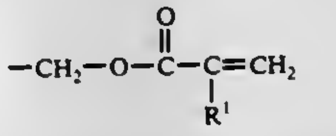
$$H_2C=\underset{R^1}{\underset{|}{C}}-\overset{O}{\overset{\|}{C}}-O\left[-\left(\begin{array}{c}R^2\\|\\C\\|\\R^2\end{array}\right)_m-\left(\begin{array}{c}R^2\\|\\C\\|\\R^3\end{array}\right)_p-\right.$$

-continued



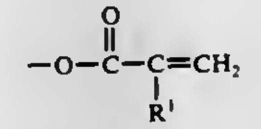
$$\left.-\left(\begin{array}{c}R^2\\|\\C\\|\\R^2\end{array}\right)-O\right]_n-\underset{R^1}{\underset{|}{\overset{\overset{O}{\|}}{C}}}-C=CH_2$$

wherein R^2 represents a radical selected from the group consisting of hydrogen, lower alkyl of from 1 to about 4 carbon atoms, hydroxy alkyl of from 1 to about 4 carbon atoms, and



$$-CH_2-O-\overset{O}{\overset{\|}{C}}-\underset{R^1}{\underset{|}{C}}=CH_2$$

R^1 is a radical selected from the group consisting of hydrogen, halogen, and lower alkyl of from 1 to about 4 carbon atoms; R^3 is a radical selected from the group consisting of hydrogen, hydroxyl, and



$$-O-\overset{O}{\overset{\|}{C}}-\underset{R^1}{\underset{|}{C}}=CH_2$$

m is an integer equal to at least 1, *n* is an integer equal to at least 1, and *p* is 0 or 1,

(b) a free radical initiator in an amount sufficient to initiate polymerization of the monomer,

(c) an accelerator, and

(d) a nitrobenzene stabilizer having from zero to five substituent groups thereon, said groups being selected from chlorine, bromine and methyl, and from one to two nitro groups.

4,103,082

AMINOCYCLITOL DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Tetsuo Suami, No. 5-8, Naka-machi 3-chome, Musashino-shi, Tokyo, Japan

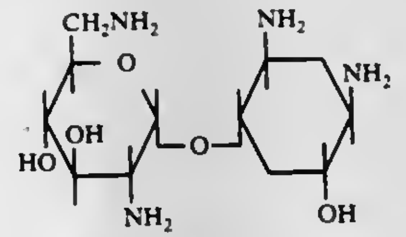
Filed Oct. 7, 1976, Ser. No. 730,396

Claims priority, application Japan, Oct. 7, 1975, 50-120286; Nov. 17, 1975, 50-137222

Int. Cl.² C07H *15/22*

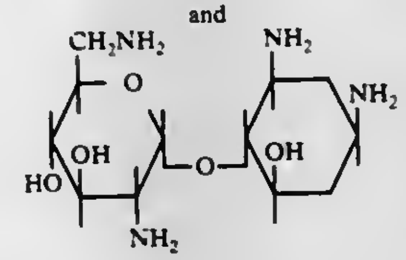
U.S. Cl. 536—17 **4 Claims**

1. 5-Deoxyneamine and 6-deoxyneamine having the formulae (1*a*) and (1*b*):



(Ia)

and



(Ib)

4,103,083

NOVEL ANTIBIOTICS DERIVATIVES AND PROCESS FOR PREPARING THE SAME

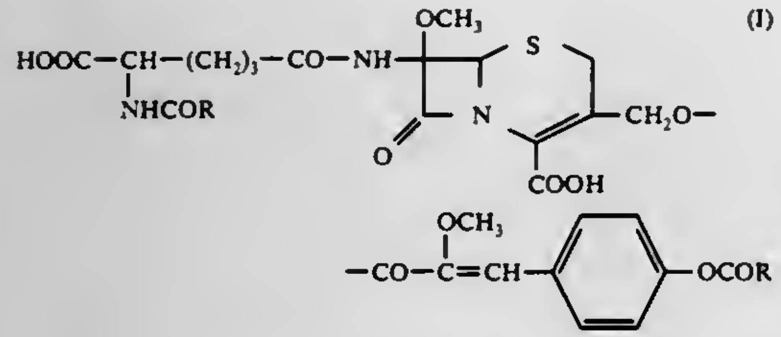
Yasuaki Ogawa; Yasumitsu Kondo; Takashi Shomura, all of Yokohama; Takashi Tsuruoka, Kawasaki; Shigeharu Inouye, Yokohama, and Taro Niida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 553,710, Feb. 27, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,877

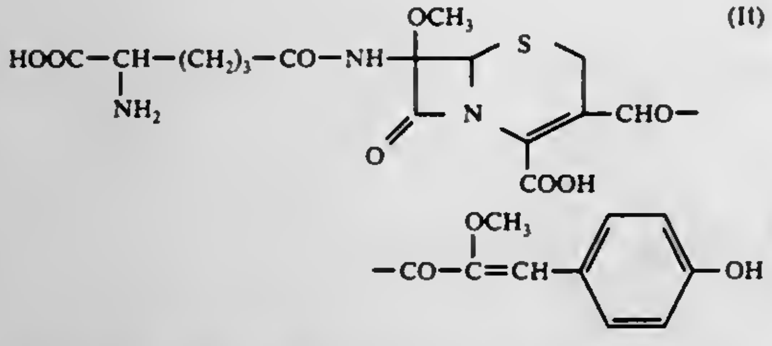
Int. Cl.² C07D *501/20*

U.S. Cl. 542—427 **3 Claims**

1. A process for isolating a 7-(5-acylamido-5-carboxyvaleramido)-3-(α-methoxy-p-acyloxycinnamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid represented by the formula


(I)

wherein R represents alkoxy group having 1 to 4 carbon atoms which may be substituted with halogen atoms; or an arylalkoxy group having 1 to 4 carbon atoms in the alkoxy moiety; the aryl moiety being optionally substituted with halogen atoms, and the salt thereof, from a fermentation broth which comprises cultivating streptomyces viridochromogenes SF-1584 strain which is capable of producing 7-(5-amino-5-carboxyvaleramido)-3-(α-methoxy-p-hydroxycinnamoyloxymethyl)-7-methoxy-3-cephem-4-caboxylic acid of the formula (II)


(II)

in a culture medium, adding an acylating agent of the formula (III)

RCOX (III)

wherein R is as defined above and X represents a halogen atom, in a molar ratio of 2 to 40 moles of said acylating agent per mole of the compound of the formula (II) at a temperature below about 50° C at a pH of from about 7.5 to 8.0 and separating the thus obtained acylate of the formula (I) from said fermentation broth by precipitating and/or extracting with a solvent.

4,103,084

7-(CARBOXY SUBSTITUTED α-ETHERIFIED OXIMINO ARYLACETAMIDO) CEPHALOSPORINS HAVING A 3-VINYL OR SUBSTITUTED VINYL GROUP

Janice Bradshaw, Harrow; Martin Christopher Cook, Liverpool, and Gordon Ian Gregory, Chalfonte St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

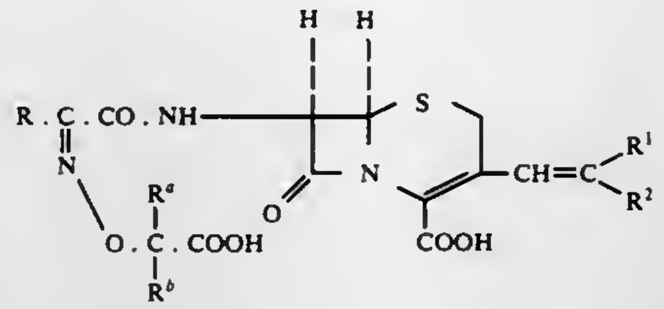
Continuation of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,529

Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73

Int. Cl.² C07D *501/16;* A61K *31/545*

U.S. Cl. 544—22 **8 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula:



wherein

R is thienyl or furyl;

R^a is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

R^b is hydrogen, carboxy, C_2-C_5 alkoxycarbonyl, methyl, ethyl, propyl, isopropyl, butyl, allyl, cyclohexyl or phenyl;

or R^a and R^b together with the carbon atom to which they are attached form a cyclobutylidene, cyclopentylidene or cyclohexylidene group; and

wherein R^1 and R^2 are each hydrogen, carboxy, cyano, C_2–C_7 alkoxycarbonyl, $C_{1\text{-}6}$ alkyl, $C_{5\text{-}7}$ cycloalkyl, phenyl $C_{1\text{-}4}$ alkyl, phenyl, nitrophenyl, tolyl or naphthyl, and physiologically acceptable salt, ester or 1-oxide thereof.

4,103,085

7-(SYN-α-ALKOXY-IMINOFURYLACETAMIDO-3-(2-CARBOXYALKYL-2,3-DIHYDRO-S-TRIAZOLO[4,3-b] PYRIDAZIN-3-ON-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

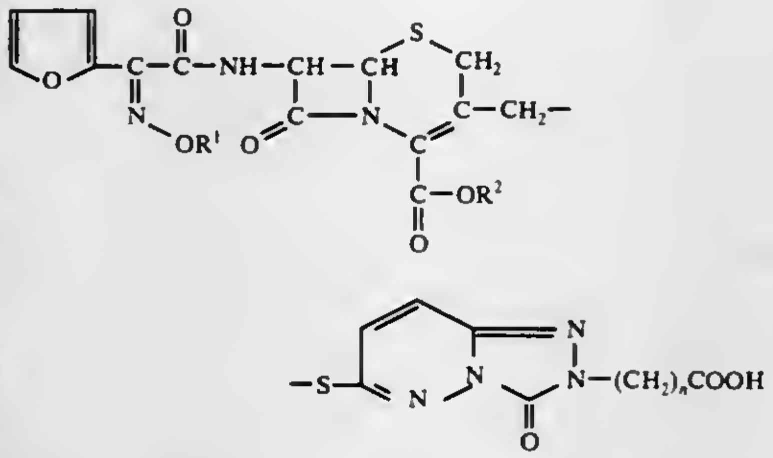
Takayuki Naito, Kawasaki; Jun Okumura, Yokohama, and Seiji Iimura, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,859

Int. Cl.² C07D *501/36*

U.S. Cl. 544—27 **9 Claims**

1. A compound having the formula



wherein R^1 is alkyl of 1–4 carbon atoms, *n* is 1 or 2 and R^2 is hydrogen or pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl, phenacyl, p-nitrobenzyl, β,β,β-trichloroethyl, 3phthalidyl or 5-indanyl or a nontoxic, pharmaceutically acceptable salt thereof, said compound being a least 75% by weight in the form of its syn isomer.

4,103,086

8-OXO-4-THIA-1-AZABICYCLO (4.2.0)-OCT-2-ENE DERIVATIVES

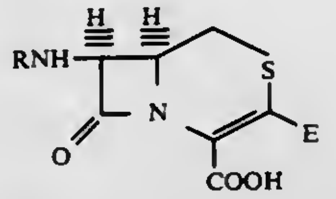
John G. Gleason, Delran; Kenneth G. Holden, Haddonfield, both of N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 626,686, Oct. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 574,225, May 5, 1975, abandoned. This application Jun. 8, 1976, Ser. No. 693,992

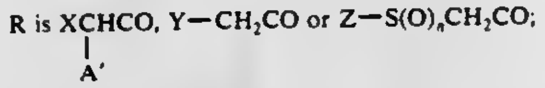
Int. Cl.² C07D *279/08*

U.S. Cl. 544—47 **58 Claims**

1. A compound of the formula



where


R is $X\underset{A'}{\underset{|}{C}}HCO$, $Y{-}CH_2CO$ or $Z{-}S(O)_nCH_2CO$;

X is thienyl; cyclohexyl, cyclohexenyl, cyclohexdienyl, phenyl, or phenyl substituted with one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, hydroxymethyl, halo, nitro, amino, aminomethyl, mercapto, lower alkylthio, trifluoromethyl, ureido, formamido and carboxymethylamino;

A′ is amino, hydroxy, formyloxy, carboxyl or sulfonic acid;

Y is cyano, azido, phenyl, thienyl, furyl, thiazoyl, isothiazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, sydnone, pyridyl, or pyrimidyl, each heterocyclic ring being unsubstituted or substituted with one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, halo, nitro, hydroxy, amino and phenyl;

Z is phenyl, pyridyl, lower alkyl, trifluoromethyl, trifluoroethyl or cyanomethyl;

n is 0, 1, or 2; and

E is hydrogen, methyl, bromomethyl, or lower alkanoyloxymethyl, or a pharmaceutical acceptable salt thereof.

4,103,087

PRODUCTION OF DI-(N,N-DISUBSTITUTED AMINO) ALKANES

Michael E. Brennan, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

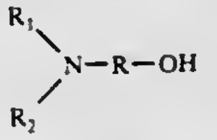
Filed Apr. 1, 1977, Ser. No. 783,594

Int. Cl.² C07D *295/12, 295/00, 265/30*

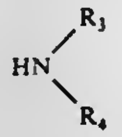
U.S. Cl. 544—78 **13 Claims**

1. A process for producing a di-(N,N-disubstituted amino)alkane compound comprising the steps of:

contacting a tertiary aminoalkanol wherein the hydroxy moiety is either primary or secondary of the formula



wherein R is a normal or branched chain alkylene radical of from 2 to 10 carbon atoms and, R_1 and R_2, independently, are straight or branched chain alkyl radicals of from 1 to 18 carbon atoms, or R_1 and R_2, taken together with the nitrogen atom to which each is attached, form a 4 or 5 membered heterocyclic ring; and a secondary amine of the formula



wherein R_3 and R_4 are defined as R_1 and R_2 above, in the presence of a catalytically effective amout of aluminum phosphate having phosphorus content of from about 20 to about 30 wt. % and a surface area of from about 20 m^2/g to about 50 M^2/g at a temperature of from about 240° C to 320° C under a pressure sufficient to maintain the mixture substantiall in liquid phase; and

recovering from the resultant reaction mixture said di-(N,N-substituted amino)alkane compound.

4,103,088

FORMATION OF CRYSTALLINE [(MONO-TRICHLORO) TETRA-(MONOPOTASSIUM DICHLORO)] PENTA-ISOCYANURATE

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 8, 1976, Ser. No. 721,296

Int. Cl.² C07D *251/36*

U.S. Cl. 544—190 **10 Claims**

1. A process for preparing crystalline [(mono-trichloro) tetra-(monopotassium dichloro)] penta-isocyanurate and mixtures containing the same, which comprises:

reacting an unsubstituted or amino substituted triazine selected from the group consisting of purified cyanuric acid, melamine, ammeline, ammelide, ammeline:ammelide complex, cyanuric acid:melamine complex, crude cyanuric acid, and mixtures thereof with at least stoichiometric amounts of potassium hypochlorite in an aqueous medium at a temperature of 35° to 70° C, and at a pH value of 3.2 to 5.7 for less than about five minutes to completely N-chlorinate all of the available sites on the triazine molecule that can be N-chlorinated and to remove any N,N-dichloro exocyclic nitrogens;

cooling the reaction medium to precipitate [(monotrichloro) tetra-(monopotassium dichloro)] penta-isocyanurate; and

recovering crystalline [(mono-trichloro) tetra(monopotassium dichloro)] penta-isocyanurate.

4,103,089

α-ACETYLENE AND α-VINYL DERIVATIVES OF AMINO ACIDS

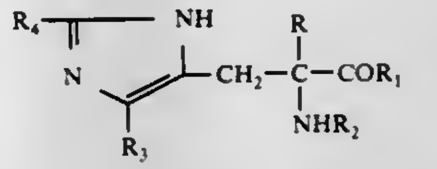
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,268

Int. Cl.² C07D *233/64*

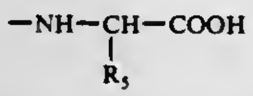
U.S. Cl. 548—344 **10 Claims**

1. A compound of the formula



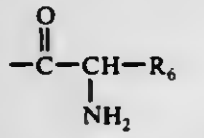
wherein R is $-CH{=}CH_2$ or $-CH{\equiv}CH$; each of R_3 and R_4 is hydrogen, halogen selected from fluorine, chlorine, bromine and iodine or a straight or branched lower alkyl group of from 1 to 4 carbon atoms and can be the same or different with the proviso that when both R_3 and R_4 are halogen R_3 and R_4 are the same; R_1 is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $-NR_{11}R_{12}$ wherein each of R_{11} and

R_{12} is hydrogen or a straight or branched lower alkyl group of from 1 to 4 carbon atoms or



$$-NH-\underset{R_5}{\underset{|}{CH}}-COOH$$

wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



$$-\overset{O}{\overset{\|}{C}}-\underset{NH_2}{\underset{|}{CH}}-R_6$$

wherein R_6 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; with the proviso that when R is $-CH{=}CH_2$, R_1 is hydroxy and R is hydrogen; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,103,090

STABILIZATION WITH ALKALI METAL ACETATE MATERIAL OF CERTAIN THERMALLY UNSTABLE DMT

Horace Edward Hood, Cecil County, Md., assignor to Hercofina, Wilmington, Del.

Filed Mar. 2, 1976, Ser. No. 663,171

Int. Cl.² C07C *67/50*

U.S. Cl. 560—3 **8 Claims**

1. A thermally stable composition consisting essentially of (1) thermally unstable fresh dimethyl terephthalate of extremely high purity, free of alkali metal compound material, having no significant concentration of either phosphonic acid moiety or phosphite moiety, and produced by the cooxidation-esterification process, and (2) dispersed therein at a stabilizing concentration, alkali metal acetate material.

4,103,091

METHOD FOR THE PREPARATION OF PROSTAGLANDIN INTERMEDIATES FROM A MOLD METABOLITE

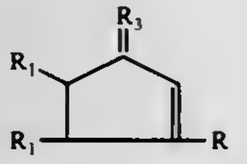
Lester Allen Mitscher; George Winfred Clark, III, both of Lawrence, Kans., and Gordon Herman Bokelman, Vancouver, Canada, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 611,468, Sep. 8, 1975, abandoned. This application Jul. 22, 1976, Ser. No. 707,726

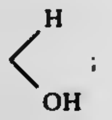
Int. Cl.² C07C *69/38, 69/78*

U.S. Cl. 560—106 **5 Claims**

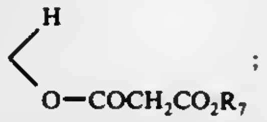
1. A cyclopentene of the formula:



wherein R is $-Ch{=}CHCHO$, $-CHOH-CHOH-CH_3$, $-CH{=}CHCH_3$ or $-CH{=}Ch-CR_5(CH_2)_4CH_3$ with R_5 being $=O$ or



both R_1 are benzoyloxy or acetoxy; R_3 is



and R_7 is a loweralkyl moiety.

4,103,092

WATER-SOLUBLE QUATERNARY AMMONIUM NON-HETEROCYCLIC AZO DYESTUFFS

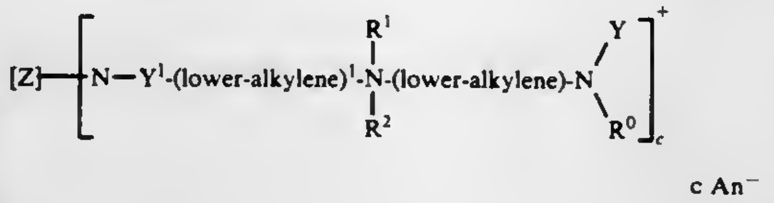
Patrick J. Jefferies, Erlanger, Ky., and Nathan N. Crounse, Cincinnati, Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 332,511, Feb. 14, 1973, Pat. No. 3,935,182, and Ser. No. 486,180, Jul. 5, 1974, Pat. No. 3,996,282, which is a continuation-in-part of Ser. No. 51,690, Jul. 1, 1970, Pat. No. 3,839,426, said Ser. No. 332,511, is a continuation-in-part of Ser. No. 201,153, Nov. 22, 1971, Pat. No. 3,784,599, which is a continuation-in-part of Ser. No. 51,676, Jul. 1, 1970, Pat. No. 3,709,903, said Ser. No. 51,676, and Ser. No. 51,690, each is a continuation-in-part of Ser. No. 777,884, Nov. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 531,868, May 23, 1966, abandoned. This application Jul. 14, 1975, Ser. No. 595,864

Int. Cl.² C09B *35/08, 35/22, 35/24, 35/26*

U.S. Cl. 260—175 **153 Claims**

1. A compound of the formula



$$[Z]\!\left[-N-Y^1\text{-(lower-alkylene)}^1\text{-}\underset{R^2}{\underset{|}{\overset{R^1}{\overset{|}{N}}}}\text{-(lower-alkylene)-}N\begin{matrix}Y\\ \\ R^0\end{matrix}\right]^+_c \qquad c\ An^-$$

wherein:

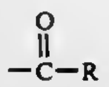
c is an integer from one to two;

R^0 is hydrogen, lower-alkyl or hydroxy-lower-alkyl;

R^1 is lower-alkyl, lower-alkenyl or hydroxy-lower-alkyl;

R^2 is lower-alkyl; lower-alkenyl, hydroxy-lower-alkyl or —(lower-alkylene)—NR^0Y;

Y is hydrogen or

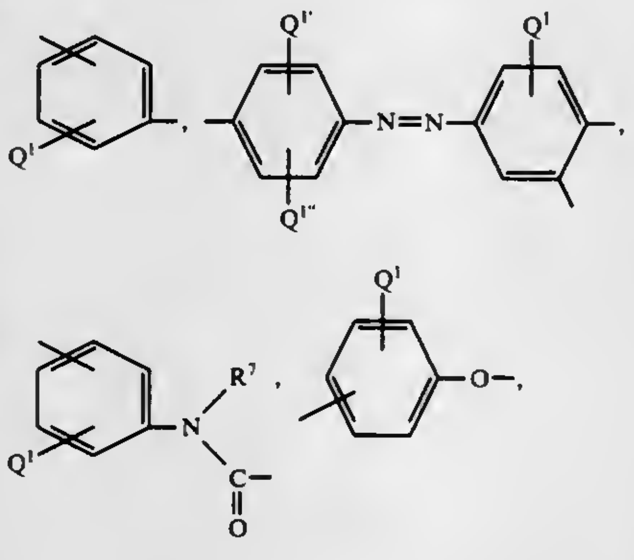


$$-\overset{O}{\overset{\|}{C}}-R$$

wherein R is hydrogen, lower-alkyl, lower-alkenyl, phenyl or phenyl-lower-alkyl;

An is an anion;

Y^1 is a divalent radical of the formula



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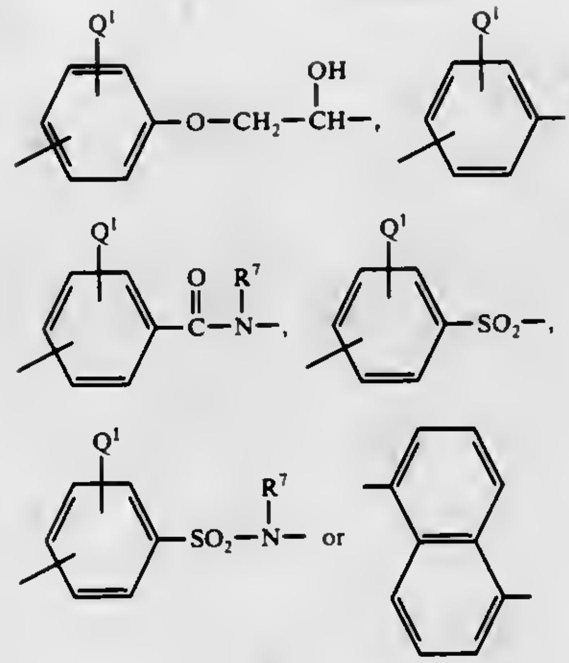
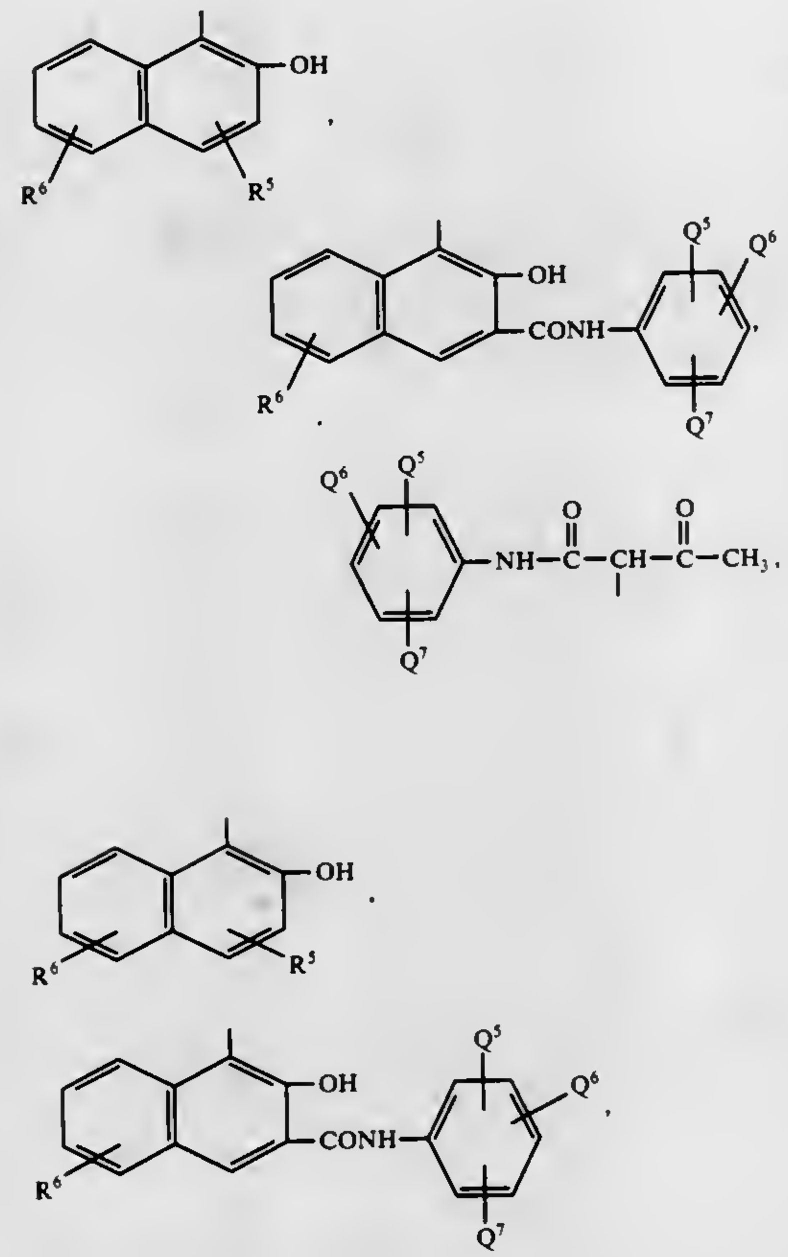


in which

Q^1, $Q^{1''}$ and $Q^{1''}$ are each hydrogen, lower-alkyl, lower-alkoxy or halogen, and R^7 is hydrogen, lower-alkyl or cyano-lower-alkyl; and

Z is an azoic coupling radical which, when c is one, is selected from the class having the formulas



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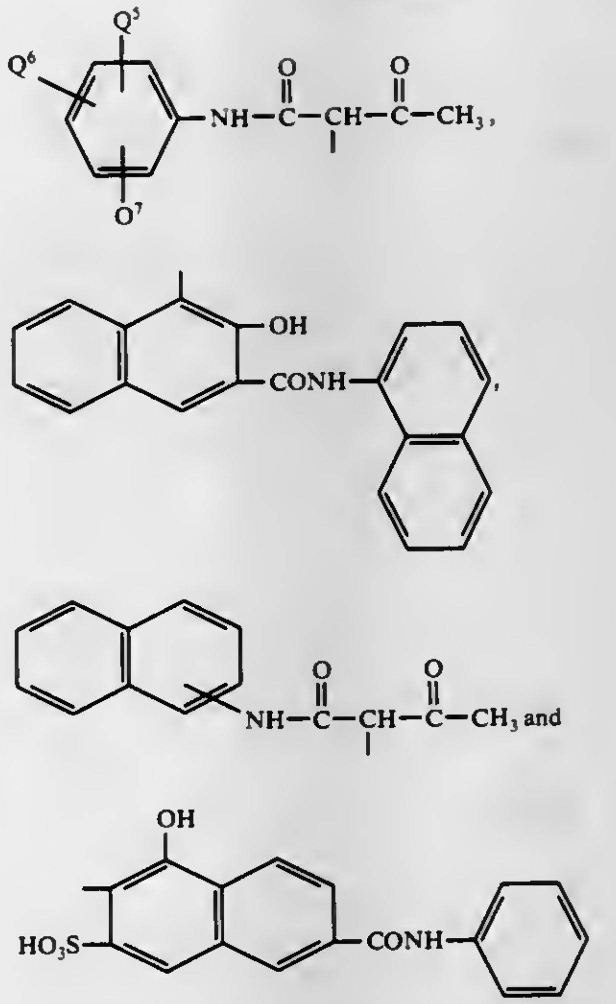
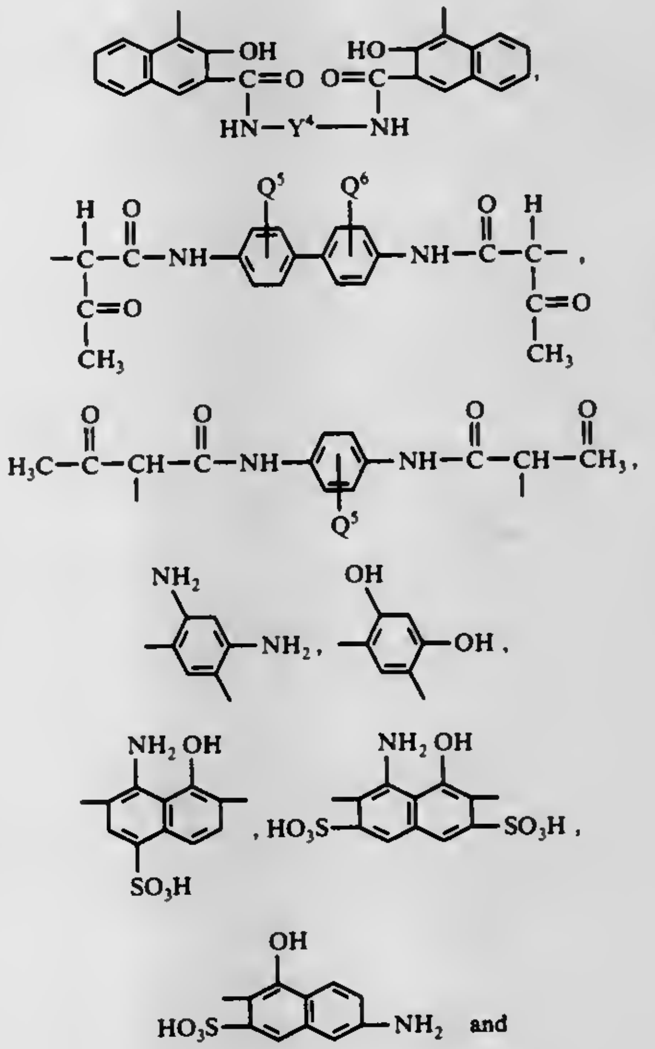


and, when c is 2, is selected from the class having the formulas



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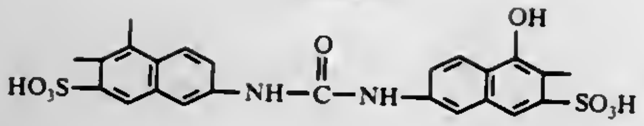


in which

Q^5 and Q^6 are each hydrogen, lower-alkyl, loweralkoxy or halogen;

Q^7 is hydrogen, lower-alkyl, lower-alkoxy, nitro or halogen; R^5 and R^6 are each hydrogen, lower-alkyl or halogen; and Y^4 is 1,4-phenylene or (lower-alkylene)^1.

4,103,093

NOVEL METHACRYLIC POLYMERS HAVING CONDENSATION-CROSSLINKABLE FUNCTIONALITY

Sheldon N. Lewis, Willow Grove, and Richard A. Haggard, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 371,921, Jun. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 137,057, Apr. 23, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,337

Int. Cl.^{2} C07C *69/54*

U.S. Cl. 560—205 **26 Claims**

1. An anionically-polymerized addition polymer of at least one ester of methacrylic acid, the polymer comprising mers having condensation-crosslinkable functionality, wherein the average chain length of the polymer, *n*, is about 6 to about 50 mers.

4,103,094

CYCLOHEXANETETROL ALKANOATES

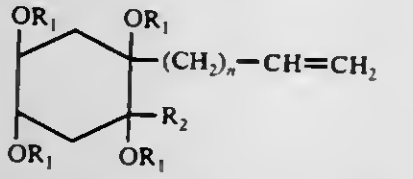
Frederic P. Hauck, Somerville, and Rita T. Fox, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1977, Ser. No. 795,465

Int. Cl.^{2} C07D *69/12*

U.S. Cl. 560—231 **2 Claims**

1. A compound having the formula



wherein R_1 is alkanoyl having 1 to 7 carbon atoms; R_2 is alkyl having 1 to 6 carbon atoms; and *n* is 1, 2 or 3.

4,103,095

CYCLITOLAMINES

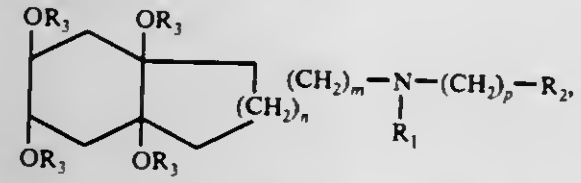
Frederic P. Hauck, Somerville, and Joyce Reid, Highland Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 735,855, Oct. 26, 1976, Pat. No. 4,065,485. This application Jul. 5, 1977, Ser. No. 813,196

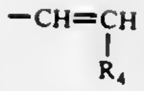
Int. Cl.^{2} C07C *93/00, 93/24*

U.S. Cl. 560—252 **15 Claims**

1. A compound having the formula



or a pharmaceutically acceptable acid-addition salt thereof, wherein R_1 is alkyl or arylalkyl; R_2 is $-C{\equiv}CH$ or



$$-CH{=}\underset{\substack{|\\ R_4}}{CH}$$

wherein R_4 is hydrogen, alkyl, aryl, or arylalkyl; R_3 is alkanoyl of 1 to 7 carbon atoms; *m* is 1, 2, 3, or 4; *n* is 1, 2, or 3; and *p* is 0, 1, 2, or 3; wherein aryl is phenyl or phenyl substituted with one or two halogen, alkyl or alkoxy groups; and alkyl and alkoxy are groups having 1 to 6 carbon atoms.

4,103,096

PREPARATION OF META-ALKYLPHENOLS

Silvio L. Glolito, Whitestone, N.Y., and Stanley B. Mirviss, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 13, 1977, Ser. No. 841,626

Int. Cl.^{2} C07C *39/06*

U.S. Cl. 568—783 **9 Claims**

1. A method for preparing a meta-monoalkylphenol from a nonmeta-monoalkylphenol wherein said meta-monoalkylphenol is a meta-monoalkylphenol having an alkyl group which contains from about 2 to about 12 carbon atoms which comprises contacting said nonmeta-monoalkylphenol with trifluoromethane sulfonic acid at a concentration ranging from about 0.01 to about 5% by weight of alkylphenol at a temperature ranging from about 120° C to about the reflux temperature of said meta-monoalkylphenol for a period of time sufficient to convert at least a portion of said nonmeta-monoalkylphenol to meta-monoalkylphenol.

4,103,097

ω-ARYL-2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

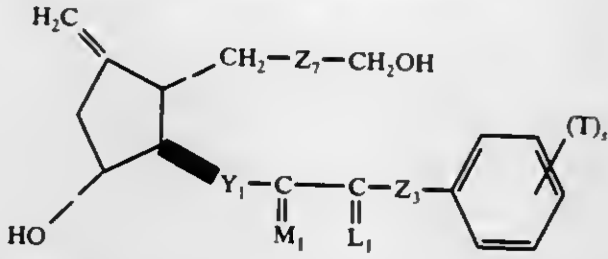
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuation-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,241

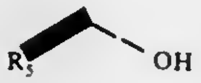
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 568—807 **211 Claims**

1. A prostaglandin analog of the formula



wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—,
wherein Z_3 is oxa or methylene, *s* is zero, one, two or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to three carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl, the various T's being the same or different, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein M_1 is



or

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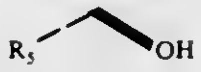
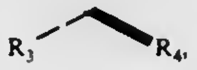
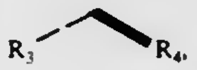
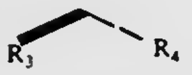


wherein R_5 is hydrogen or methyl;
wherein L_1 is

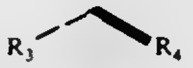




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, and
wherein Z_7 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—, and
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,
wherein *g* is one, 2, or 3.

4,103,098

2-DECARBOXY-2-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-PGF-TYPE COMPOUNDS

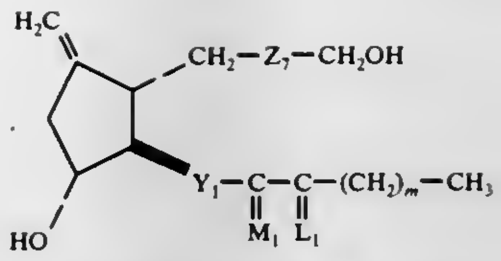
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 682,848, May 4, 1976, Pat. No. 4,060,534, which is a continuatino-in-part of Ser. No. 651,622, Jan. 23, 1976, Pat. No. 4,021,467, which is a division of Ser. No. 556,768, Mar. 10, 1975, Pat. No. 3,950,363. This application Sep. 12, 1977, Ser. No. 832,247

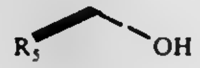
Iot. Cl.^{2} C07C *177/00*

U.S. Cl. 568—838 **211 Claims**

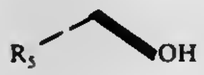
1. A prostaglandin analog of the formula



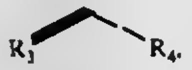
wherein Y_1 is trans—CH=CH—, —C≡C—, or —CH_2CH_2—,
wherein M_1 is

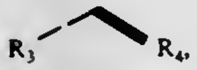


or

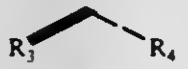


wherein R_5 is hydrogen or methyl;
wherein L_1 is

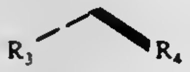




or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro, and
wherein Z_7 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
(7) —C≡C—CH_2—$(CH_2)_g$—CH_2—, or
(8) —CH_2—C≡C—$(CH_2)_g$—CH_2—,
wherein
g is one, 2, or 3.
wherein *m* is one to 5, inclusive.

4,103,099
ELECTRIC FURNACES

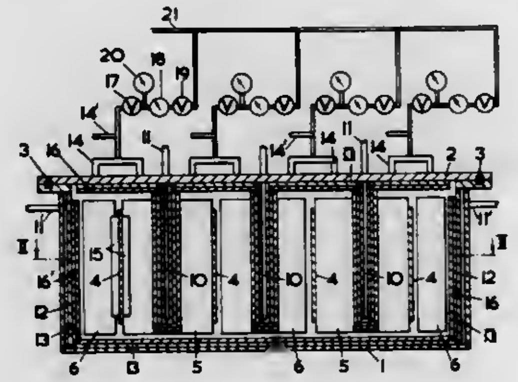
Peter James Allsopp, Streatley, England, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 24, 1976, Ser. No. 669,970

Claims priority, application United Kingdom, Mar. 25, 1975, 12505/75

Int. Cl.² F27D *11/04*

U.S. Cl. 13—7 **11 Claims**



1. An electric furnace for impregnating a porous carbon body by deposition of carbon from a gas comprising a heater element which, in use, the body is adapted to contact, a surface arranged to be cooled facing said heater element, and a layer of insulating material covering the cooled surface and facing the heater element in order to reduce the thermal gradient across the body.

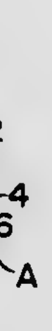
4,103,100
CELL ADAPTED FOR PRODUCING HIGH TEMPERATURES AND HIGH PRESSURES

Takahiko Kabayama, Kamakura; Masaru Ogata, Hatano, and Tetsuro Ikezawa, Isehara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,855

Int. Cl.² F27D *11/02*

U.S. Cl. 13—20 **6 Claims**



1. A cell adapted for producing high temperatures and high pressures comprising, an electrically insulating inner cylinder;

a pair of electrically insulating discs disposed at the upper and lower ends of said inner cylinder, respectively, thereby forming a sealed chamber for containing samples therein;

a heater means including a conductive intermediate cylinder disposed on said inner cylinder, and a pair of conductive discs disposed on said pair of electrically insulating discs at both ends of said intermediate cylinder, the diameter of said conductive discs being equal to the outside diameter of said intermediate cylinder;

an electrically and thermally insulating outer cylinder disposed on said intermediate cylinder;

a pair of electrically and thermally insulating discs, each having an electric contact, disposed on said pair of conductive discs, respectively, the diameter of said electrically and thermally insulating discs being equal to the inside diameter of said outer cylinder; and

means for supplying electric current flow through the electric contacts of said pair of electrically and thermally insulating discs.

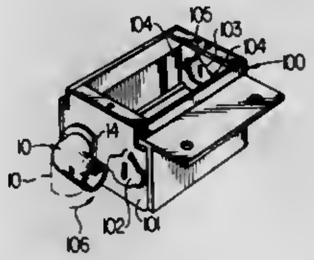
4,103,101
OUTLET BOX CONNECTOR AND COMBINATION

William Maier, 409 Bishop Ave., Bridgeport, Conn. 06610

Filed Mar. 28, 1977, Ser. No. 781,862

Int. Cl.² H05K *5/02*

U.S. Cl. 174—65 R **16 Claims**



9. An electrical outlet box cable connector for use with an electrical outlet box having a wall provided with a substantially circular opening and with diametrically opposed arcuate recesses in the edge of the opening, said connector comprising a tubular body, an annular shoulder provided on said body for abutting the outer surface of the box wall, a pair of arcuate lugs provided at diametrically opposite sides of the connector for passage through the recesses of the box when the connector is inserted in the opening, said lugs being axially spaced from said annular shoulder so that said lugs will engage the inner surface of the box wall when the connector is rotated in the opening to a fastened position to retain the connector and box in assembled relation, portions of said tubular body between said lugs and said annular shoulder being raised to exceed the diameter of the opening in the box wall, whereby said raised portions may become wedged against the edge of the opening when the connector is rotated to its fastened position, the improvement wherein said raised portions include a pair of diametrically opposed arcuate raised portions and a pair of diametrically opposed flat raised portions, the flat raised portions being continuations of said arcuate raised portions and providing a raised surface of increasing diameter as the connector is rotated in the opening toward its fastened position to limit rotation of the connector in the opening.

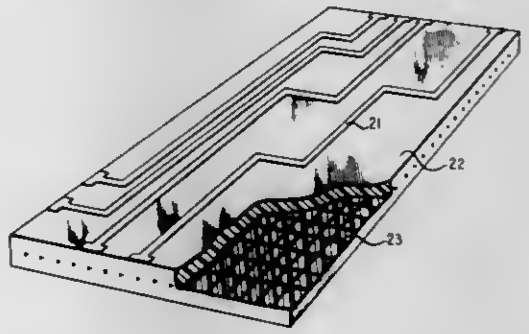
4,103,102
REINFORCED FLEXIBLE PRINTED WIRING BOARD

Theodore Harold Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 1, 1976, Ser. No. 701,591

Int. Cl.² H05K *1/00*

U.S. Cl. 174—68.5 **4 Claims**



1. A reinforced flexible printed wiring board comprising a

resin impregnated woven fabric upon which a metallic circuit configuration is defined:

(a) said woven fabric comprising a yarn of at least one continuous glass fiber twisted relatively about at least one continuous polyester fiber with a periodicity between 0.1 and 10 twists per inch, said glass fiber coated with a lubricant;

(b) said resin being a flexible resin which is at least partially cured, said resin impregnated fabric having insulation resistance greater than 1 × 10^9 ohms, propagation tear strength greater than 0.5 pounds, and dimensional stability greater than 2 mils per inch; and

(c) said metallic circuit configuration having a peel strength greater than three pounds per inch of conductor width.

4,103,103
ELECTRICAL INSULATORS HAVING SEMI-CONDUCTING GLAZE AND CONDUCTIVE PORTLAND CEMENT CONTAINING A SPECIFIED AMOUNT OF CARBON BLACK

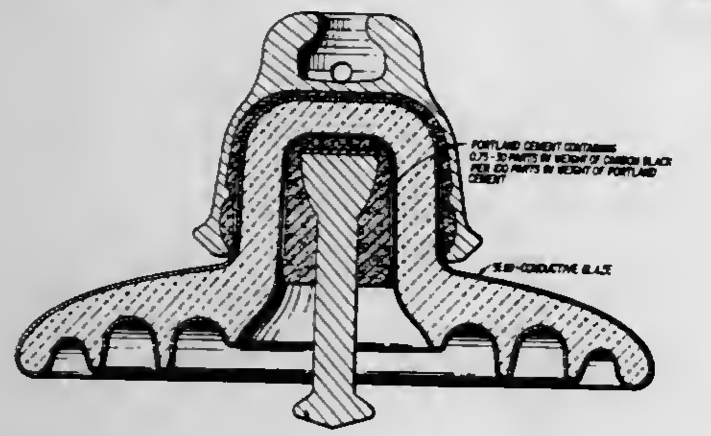
Tosihiko Hizikata, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 18, 1976, Ser. No. 733,171

Claims priority, application Japan, Aug. 10, 1976, 51/94548

Int. Cl.^{2} H01B *17/42, 17/50*

U.S. Cl. 174—140 C **6 Claims**



1. An electrical insulator having a semi-conducting glaze, which comprises an insulating body with its surface coated with a semi-conducting glaze, metal fittings and conductive cement composition filled between said insulating body and said metal fittings and in electrical contact with both said semi-conducting glaze and said metal fittings, said conductive cement composition containing 0.75 – 3.0 parts by weight of carbon black having bulk density, carbon purity and specific gravity which correspond to those of acetylene black per 100 parts by weight of Portland cement, the conductivity of the cement composition being substantially given by the carbon black only.

4,103,104
ANCHOR ASSEMBLY FOR A SUBMARINE CABLE COUPLING

Francis Joseph Spollen, Middletown Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

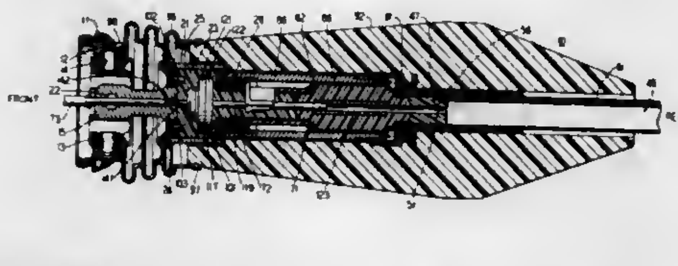
Filed Jul. 14, 1977, Ser. No. 815,601

Int. Cl.^{2} H02G *15/14*

U.S. Cl. 174—70 S **7 Claims**

1. In a coupling between a repeater and a front end of a submarine cable, an improved arrangement for terminating the front end of the cable inner conductor within the coupling, which comprises:

anchor means comprising, in combination, front and rear discs disposed in axially abutting relation and having aligned central apertures extending axially therethrough, each of the discs being formed from a first insulating material, an elongated conductive element extending coaxially through the central apertures of the discs for receiving the front end of the inner conductor, and a conductive nut coaxially secured to the front end of the conductive element and having a rear surface abutting the front surface of the front disc; and



means disposed in surrounding relation to the discs and the nut for encapsulating the anchor means within the coupling.

4,103,105
SWITCHING SIGNAL GENERATOR

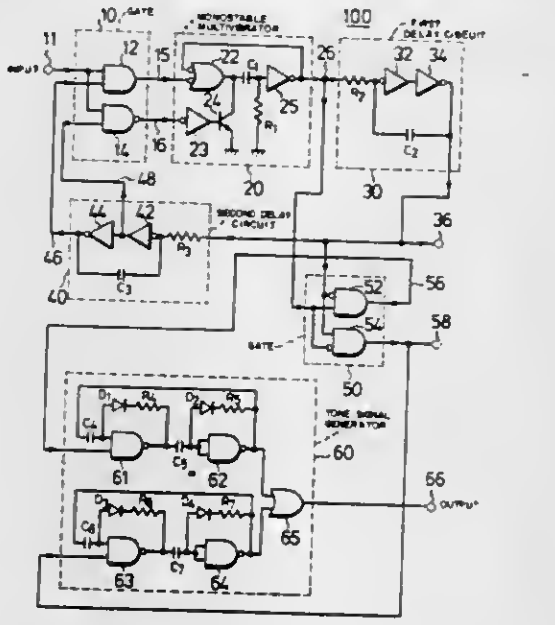
Masaki Akiyama, and Okie Tani, both of Tokyo, Japan, assignors to Tani Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,332

Claims priority, application Japan, Dec. 26, 1975, 50-178160[U]; Dec. 26, 1975, 50-157459; Dec. 26, 1975, 50-157460; Dec. 26, 1975, 50-157461

Int. Cl.^{2} H04H *1/04;* **H04M** *1/60;* **H04B** *1/00*

U.S. Cl. 179—1 VC **3 Claims**



1. Switching signal generator for transmit-receive circuit changing of radio telephone equipment comprising:

an electroacoustic transducer for generating an electric pulse signal from an acoustic pulse signal produced by a particular vocalization of said operator;

regenerative switching circuit means, the output logic state of said regenerative switching circuit means being changed from one logic state to another logic state by said electric pulse signal; and

tone signal generator means for generating two characteristic tone signals for a predetermined duration indicating the changeover of said output logic state, said tone signals being of two mutually different frequencies, one frequency being generated for indicating the changeover of said regenerative switching circuit from the first logic state to the second logic state and the other frequency being generated for indicating the changeover of said regenerative switching circuit from the second logic state to the first logic state.

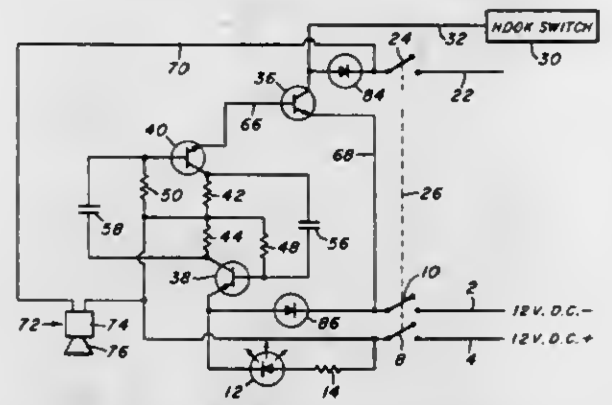
4,103,106
MOBILE RADIOTELEPHONE APPARATUS AND METHOD

Charles J. Sechan, 814 Grandview Ave., Pittsburgh, Pa. 15211

Filed Sep. 13, 1976, Ser. No. 722,772

Int. Cl.^{2} H04Q *7/04;* **H04B** *7/26*

U.S. Cl. 179—2 EB **25 Claims**



1. A mobile radiotelephone device comprising

telephone control means for controlling operation of a mobile radiotelephone including supervisory logic means,

channel finding means for initiating through said supervisory logic means operation of channel seeking action,

said channel finding means including

signal generating means for cyclically emitting a signal,

signal communication means responsive to said signal generating means to cyclically deliver a reduced voltage signal to said supervisory logic means, said supervisory logic means having means for emitting a reduced voltage signal responsive to simultaneous receipt of said reduced voltage signal from said signal communication means and a signal indicating that an idle channel is available,

channel available means for initiating an audible or visual signal responsive to a signal from said supervisory logic means indicating that an idle channel has been seized,

whereby said channel finding means will cyclically deliver a reduced voltage signal to said supervisory logic means and thereby provide an indication that an effort to initiate a call is to be made and if said telephone has locked in an available channel said supervisory logic means will emit a low voltage signal to said channel available signal means and said channel finding will have been initiated and completed without the need to remove the telephone handpiece from its cradle.

4,103,107
PAGING ENCODER SYSTEM UTILIZING A TELEPHONE LINE LINK

Thomas Victor D'Amico, Lauderhill; Mark Henry Rackin; Victor Jensen, both of Sunrise; Norman Eugene Schultz, North Lauderdale; John Joseph Cady, Sunrise; William John Macko, Lauderdale Lakes; Carl Raymond Steinbach, and Nicholas Petrakos, both of Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 9, 1977, Ser. No. 776,023

Int. Cl.^{2} H04M *11/00*

U.S. Cl. 179—2 EC **3 Claims**

1. In a system for transmitting dual tone, multi-frequency encoded paging signals and audio frequency signals over a voice-pair of telephone lines to a remote terminal, an encoder comprising:

transducer means for two-way audio signal conversion;

keyboard means for inserting data and command signals;

memory means for storing data signals inserted by said keyboard means;

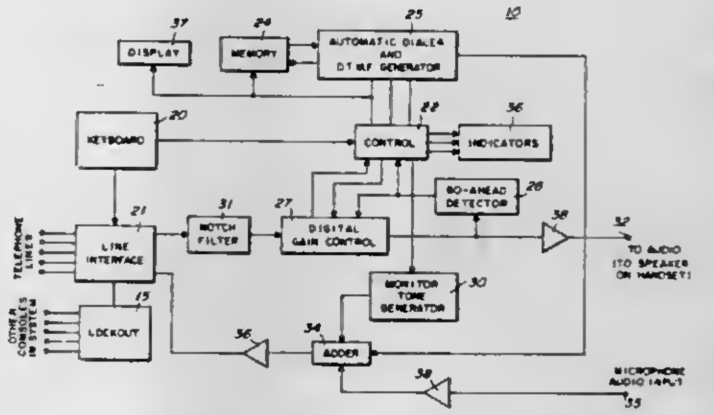
interface means coupled to said telephone lines;

first logic circuit means for encoding the inserted data signals into dual tone, multil-frequency output signals for transmission over said telephone lines;

digital gain the interface means for controlling means coupled to control the level of the audio signals received from the telephone lines, the controlled signals being coupled to the transducer means;

tone generator means for providing a monitor signal in response to a predetermined received signal, said monitor signal being higher in frequency than any of said dual tone frequencies;

adder means for combining the output signals of the transducer, the first logic circuit means and the tone generator means, said combined signals being coupled to the input of said interface means;



detect means coupled to the digital control means for detecting the predetermined frequency signal in said received audio signal; and

control circuitry coupled for receiving the output of the keyboard means, coupled for storing said inserted data signals in the memory means, and coupled to the detect means for receiving the predetermined received signal and in response thereto activating the tone generator means, for controlling access to said inserted data signals in response to said inserted command signals from the keyboard means, and coupled to the first logic circuit means for enabling the transmission of the output signals thereof.

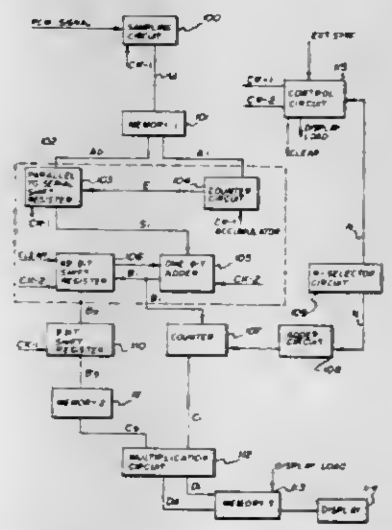
4,103,108
CIRCUIT AND METHOD FOR DIGITALLY MEASURING SIGNAL LEVELS OF PCM ENCODED SIGNALS

Ernst August Munter, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 4, 1977, Ser. No. 774,381

Int. Cl.^{2} H04J *3/14*

U.S. Cl. 179—15 BF **7 Claims**



1. A digital circuit for measuring the level of a PCM signal representing an analogue signal and encoded in accordance with a predetermined companding law, comprising:

a selector means having positions 0–*n*;

- a sampling circuit for successively sampling said PCM signal 2^n times, n being determined by said selector means;
- means for converting each of said samples to its normalized power representation;
- means for computing the average power of said samples; and
- means for determining the power level number of said average power.

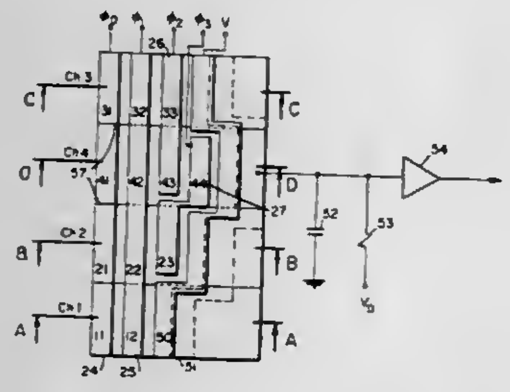
4,103,109
CCD MULTIPLEXER

Dale G. Maeding, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 30, 1977, Ser. No. 782,813

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 A **9 Claims**



1. A CCD multiplexing device for converting individual signals fed simultaneously to a plurality of parallel channels into a serial output, said parallel channels being isolated from each other so as to prevent the transfer of charge between contiguously adjacent ones of said parallel channels, comprising the combination:

- delay means comprising said plurality of parallel channels, for delaying charge packets fed into said device at predetermined time durations;
- clocking means, coupled to the delay means, for providing transfer capability to said charge packets between said delay means; and
- summing means, coupled to said plurality of channels, for converting a plurality of charge packets fed to said device in parallel mode to a sequential output of said charge packets without inter-transfer of any of the charge packets between the paralled channels.

4,103,110
TELEPHONE TRANSMISSION SYSTEM COMPRISING DIGITALLY PROCESSING FREQUENCY MULTIPLEXOR AND DEMULTIPLEXOR

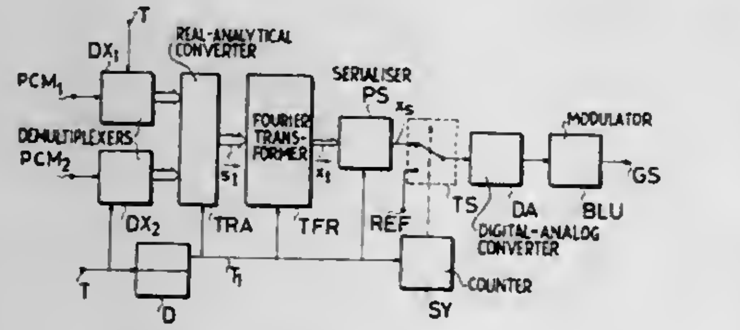
Jean-Edgar Picquendar, and Boris Sokoloff, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 28, 1976, Ser. No. 727,540

Claims priority, application France, Oct. 2, 1975, 75 30234

Int. Cl.² H04J *1/18*

U.S. Cl. 179—15 FD **12 Claims**



1. An apparatus for multiplexing a set of n incoming signals arriving respectively on n input telephone channels into an output frequency division multiplex signal going out on an output channel, said apparatus comprising:

- means for processing said incoming signals, providing every T μs n complex signals S_p, $m = \frac{1}{2}[(f_p, k+f_t+T, k) + j(F_p, k - f_p, k - f_t + T, k)]$ and n conjugate complex signals S_t^*, $m = \frac{1}{2}[(f_p, k + f_t + T, k) - j(f_p, k - f_t + T, k)]$, and delivering said signals S_p, m and S_t^*, m;
- means for receiving said signals S_p, m and S_t^*, m, ditigally computing every 2T μs the Fourier Transform of order 2N × 2N ($N < n$) of said signals $S_p m$ and S_t^*, m, and delivering the result of said computation as 2N real signals in parallel;
- means for serializing according to a given order and during an interval of 2T μs said real signals, delivering a serial digital signal; and
- means for converting said serial digital signal into said output division frequency multiplex signal.

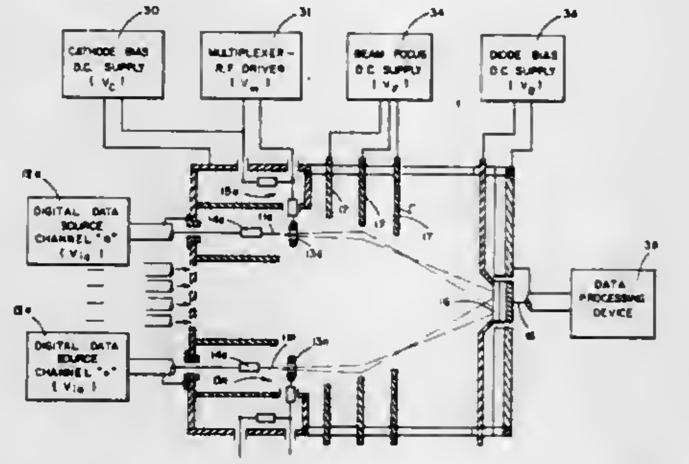
4,103,111
HIGH SPEED ELECTRON BEAM SEMICONDUCTOR DIGITAL MULTIPLEXER

Ali Bahraman, Redondo Beach, and Walter E. Crandall, Malibu, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed May 26, 1977, Ser. No. 800,935

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 A **16 Claims**



30
CATHODE BIAS D.C. SUPPLY (Vc)
31
MULTIPLEXER - R.F. DRIVER (Vm)
34
BEAM FOCUS D.C. SUPPLY (Vf)
36
DIODE BIAS D.C. SUPPLY (Vd)
DIGITAL DATA SOURCE CHANNEL "a"
DIGITAL DATA SOURCE CHANNEL "n"
DATA PROCESSING DEVICE
38

1. A system for time multiplexing together the digital signal outputs of a plurality of digital data sources comprising:

- means for generating a plurality of electron beams, each of said beams providing a carrier for a separate data channel,
- means for modulating each of said beams with a separate one of said digital data source outputs,
- an electron sensitive target,
- means for sequentially gating said beams, and
- means for focusing each beam onto said target at times when each such beam is being gated and a predetermined digital output is modulating such beam,
- whereby said target receives the digital data source outputs in time multiplexed form.

4,103,112
TELEPHONE LINE CIRCUIT WITH DIFFERENTIAL LOOP CURRENT SENSING AND COMPENSATION

Vincent Viacheslav Korsky, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 17, 1977, Ser. No. 842,420

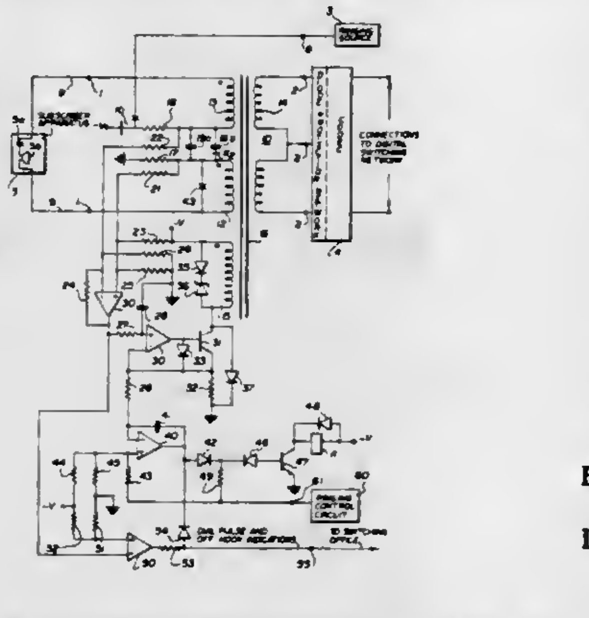
Int. Cl.² H04Q *1/28*

U.S. Cl. 179—18 FA **5 Claims**

1. A telephone line circuit for interfacing a subscriber loop to an associated telephone switching facility, the telephone line circuit comprising:

- power and ground terminals for connection to a source of power;

- a transformer including a core of saturable magnetic material, a first winding for connection across the tip and ring leads of the subscriber loop and to said terminals, a second winding for connection to the switching facility and a balancing winding, the core material being limited in bulk to that sufficient to transmit typical alternating current voice signals between the first and second windings and to saturate in the presence of larger alternating current signals;



- a current sensing circuit responsive to current flow in the subscriber loop for generating a signal proportional to the sum of the direct current components in the tip and ring leads;
- current regulation means connected in series with the balancing winding and the power and ground terminals, and responsive to the signal from the current sensing circuit to conduct current via the terminals and the balancing winding in an amount sufficient to substantially cancel the direct current flux of the first winding;
- whereby abnormally large pulse signals and the like cause the core material to saturate and impede transmission of signals between the first and second windings.

4,103,113
ATTENDANT CONSOLE CONTROL SYSTEM

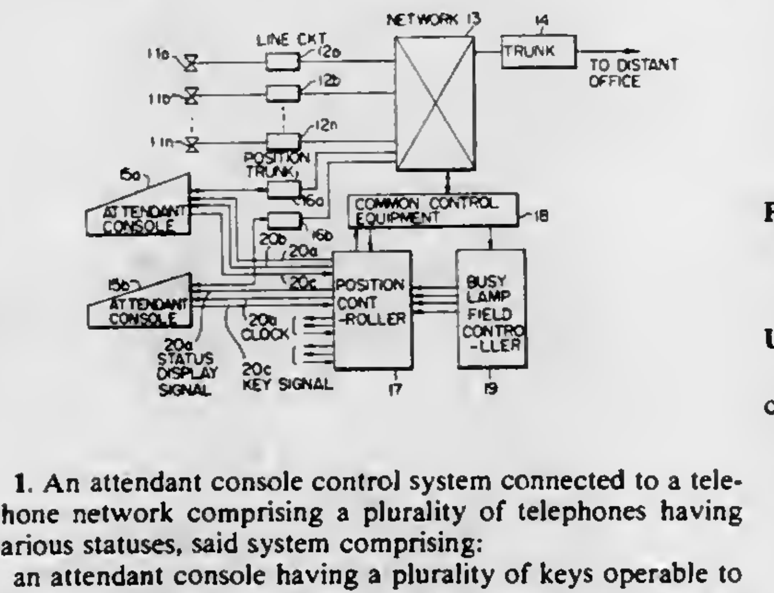
Kazuhiro Sato, Yokohama; Nobuyuki Yasoshima, Zama; Toru Masuda, Fujisawa, all of Japan; Makoto Fujisawa, Montebello, Calif., and Yasuo Satake, Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 19, 1977, Ser. No. 788,972

Claims priority, application Japan, Apr. 24, 1976, 51-46900

Int. Cl.² H04M *3/22*

U.S. Cl. 179—27 CA **28 Claims**



1. An attendant console control system connected to a telephone network comprising a plurality of telephones having various statuses, said system comprising:

- an attendant console having a plurality of keys operable to enter key information into said attendant console, and an indicative portion for visually displaying status information as to said telephones, said attendant console including means for passing said key information in bit serial form;
- a position controller for receiving and passing said key information;
- a common control equipment connected to said telephone network and responsive to changes in the status of each of said plurality of telephones for providing corresponding update information; and
- a busy lamp field controller for maintaining status information as to each of said plurality of telephones, responsive to said update information for updating said status information, and responsive to said key information for providing status display signals for displaying said status information corresponding to said key information;
- said position controller including means for providing lamp display information, means for combining said lamp display information and said status display signals from the busy lamp field controller in a time-shared manner to form a combined, time-shared signal, and means for transmitting said combined, time-shared signal to the attendant console in bit serial form.

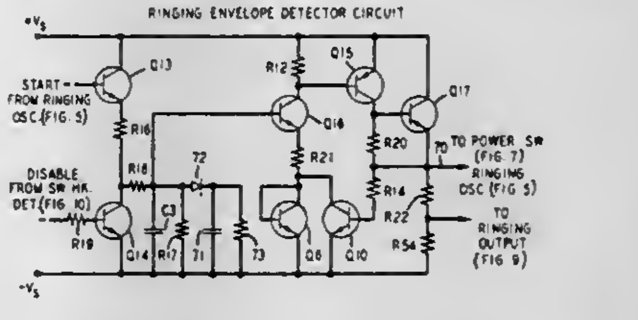
4,103,114
VARIABLE DELAY RINGING DETECTOR

Barry Sheldon Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 638,164, Dec. 5, 1975, Pat. No. 4,048,551. This application Jun. 6, 1977, Ser. No. 803,554

Int. Cl.² H04M *1/00*

U.S. Cl. 179—84 R **2 Claims**



RINGING ENVELOPE DETECTOR CIRCUIT
+Vs
Q13
START - FROM RINGING OSC (FIG. 5)
R16
R12
Q15
Q17
Q14
R20
70
TO POWER SW (FIG. 7)
RINGING OSC (FIG. 5)
R21
72
R18
DISABLE FROM SW HK. DET (FIG. 10)
C3
R14
R22
TO RINGING OUTPUT (FIG. 9)
R19
Q14
R17
71
73
Q8
Q10
R54
-Vs

1. A variable delay ringing detector comprising

- switching means responsive to ringing signals for supplying a charging current,
- a first capacitor connected to receive said charging current directly,
- a second capacitor connected to receive said charging current through a unilateral conducting device,
- a high impedance discharge path for said second capacitor, and
- a ringing threshold detector responsive to the voltage on said first capacitor for indicating the presence of ringing signals.

4,103,115
MEMORY TONE DIALER

Paul Milkes, Encino, Calif., assignor to American Communication Systems, Inc., Encino, Calif.

Filed Jan. 3, 1977, Ser. No. 756,288

Int. Cl.² H04M *1/51*

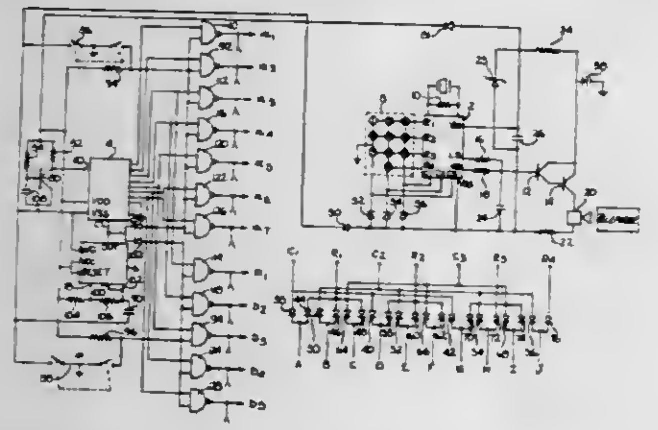
U.S. Cl. 179—90 B **1 Claim**

1. A memory tone dialer for use with a telephone system comprising:

- a keyboard, said keyboard comprising a plurality of push button key switches;
- a means for generating tones which correspond to said switches of said keyboard;
- a programmable means for remembering at least two sequences of numbers, said programmable means further causing said generating means to generate a sequence of tones

corresponding to one of said two sequences of numbers when at least one of said plurality of push button switches of said keyboard is operated and to generate a sequence of tones corresponding to another one of said two sequences of numbers when at least another one of said plurality of pusb button switches of said keyboard is operated; and

a means for coupling said generated tones to said telephone system, wherein said programmable means includes a clock circuit coupled to sequencing means for serially activating an ordered sequence of outputs of said sequencing means in response to said clock circuit, each said output being coupled to a logic gate with at least one of said outputs being coupled to more than one logic gate, said logic gates coupled to said outputs forming a plurality of sets of logic gates wherein each set corresponds to one of said sequences of numbers, each logic gate having an output selectively coupled by a temporary plug board connection to said means for generating tones through a diode matrix, said diode matrix having a plurality of inputs coupled through a plurality of diodes to predetermined pairs of inputs to said means for generating tones, each said set of logic gates being selectively enabled by activation of one of said push button switches of said keyboard,



whereby one of a plurality touch tone number sequences is automatically dialed, said number sequence being mechanically user programmable by selectively a one-to-many mapping from said sequence to said sets of logic gates and a many-to-one mapping from said sets of logic gates to said tone generating means.

4,103,116
PICKUP CARTRIDGE WITH MOVING MAGNET ARMATURE

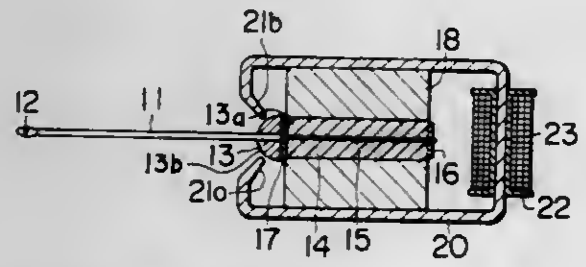
Hitosbi Misbima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 3, 1975, Ser. No. 637,149

Claims priority, application Japan, Dec. 5, 1974, 49-140345; Dec. 5, 1974, 49-140346; Dec. 5, 1974, 49-140347; Dec. 5, 1974, 49-140348

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 M **17 Claims**



1. A pickup cartridge comprising:

an armature formed as a permanent magnet;

a supporting member for supporting said armature magnet;

a damping member made with an elastic material for damping the movement of said armature magnet and positioned between said supporting member and a first surface of said armature magnet, which first surface facing said damping member;

a cantilever secured to said armature magnet and having its foremost end provided with a stylus tip and having its base end positioned at substantially the center of said first surface of the armature magnet;

position insuring means for insuring the position of the base end of said cantilever relative to said supporting member and permitting the free movement of said cantilever centering around said base end thereof;

pole pieces facing a second surface of said armature magnet at positions close to this second surface and arranged symmetrically with respect to said cantilever so that an area of each of said pole pieces facing said second surface of the armature magnet is constant irrespective of vibration of the armature magnet, which second surface does not face said damping members;

a yoke magnetically coupled to said pole pieces for constituting a closed magnetic path for the passage of the magnetic flux emitting from said armature magnet, said yoke being arranged at a specific position relative to said supporting member; and

a coil applied around said yoke for inducing a signal corresponding to the variation of the magnetic flux passing through said yoke,

said second surface of the armature magnet being a surface having a substantially constant radius of curvature centering around the base end of said cantilever,

said pole pieces pointing to the base end of said cantilever and having end faces thereof facing said second surface of the armature magnet at postions close to this second surface.

4,103,117
PICK-UP CARTRIDGE

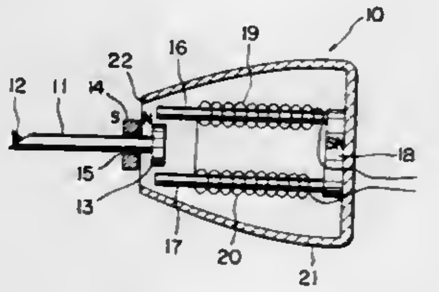
Mistuyoshi Morinaga, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,449

Claims priority, application Japan, Dec. 25, 1975, 50-157236

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 Z **2 Claims**



1. A pick-up cartridge comprising:

a plate-like first magnet having a central through hole therein;

a cantilever extending through said central through hole and having a reproducing stylus mounted at one end of said cantilever;

an armature made of a high permeability material and of a size and shape substantially the same as said first magnet, connected at its center to the other end of said cantilever, located adjacent to said first magnet, and supported by a damper so as to be vibratable with vibration of said cantilever;

a first pair of spaced coil-carrying elongated pole pieces each having a first end and a second end opposite said first end, wherein their respective first ends are located in the vicinity of and slightly spaced radially from said armature to define gaps therebetween; and

a plate-like second magnet connected to the respective second ends of said first pair of pole pieces, said first and second magnets being arranged to have the same polarities oriented in the same directions.

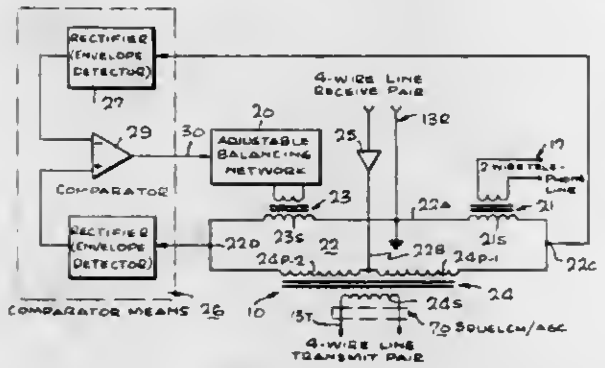
4,103,118
AUTOBALANCE HYBRID CIRCUIT

Jay Richard Bergman, Santa Monica, Calif., assignor to Synanon Fouodatioo, Inc., San Francisco, Calif.

Filed May 2, 1977, Ser. No. 792,817

Int. Cl.² H04B *1/58*

U.S. Cl. 179—170 D **4 Claims**



1. An autobalance hybrid circuit for connecting a 4-wire telephone line having separate receive and transmit pairs to a 2-wire line, comprising:

a balancing network having an impedance that is adjustable in response to a control signal,

a bridge formed of (a) a 2-wire telephone line coupling transformer connected to said 2-wire line, (b) a balancing network coupling transformer connected to said network, and (c) the two sides of the center-tapped primary of an output transformer, the secondary of said output transformer being connected to the 4-wire line transmit pair,

the 4-wire line receive pair being connected across two nodes of said bridge, between the center tap of said output transformer primary and the junction connecting said coupling transformers, and

comparator means, connected to the other two nodes of said bridge at the junctions connecting the ends of said center-tapped primary with the respective coupling transformers, for comparing the envelope voltages developed across said two coupling transformers in the bridge, and for providing a control signal to said balancing network which causes adjustment thereof so as to equalize said voltages, said hybrid circuit in this manner compensating for changes in the impedance of said 2-wire telephone line and preventing any audio input from said 4-wire line receive pair from being returned via said output transformer onto said 4-wire line transmit pair, said comparator means comprising:

a first rectifier circuit having a low threshold, said first rectifier circuit being connected across the secondary of said 2-wire telephone line coupling transformer and developing a first voltage signal indicative of the magnitude of the envelope of an audio signal appearing across that 2-wire telephone line coupling transformer,

a second rectifier circuit having a low threshold, said second rectifier circuit being connected across the secondary of said balancing network coupling transformer and developing a second voltage signal indicative of the magnitude of the envelope of an audio signal appearing across that balancing network coupling transformer, and

a differential amplifier having two comparison inputs connected respectively to said first and second rectifier circuits, said differential amplifier comparing said first and second voltage signals and producing a control signal indicative of the difference therebetween, the output of said differential amplifier being connected to said balancing network so as to provide said control signal therto, together with

a squelch circuit connected between the secondary of said output transformer and said 4-wire line transmit pair, the threshold of said squelch circuit being set so that squelch occurs whenever the audio signals across said 2-wire telephone line coupling transformer and said balancing network coupling transformer both are below the threshold of the respective first and second rectifier circuits.

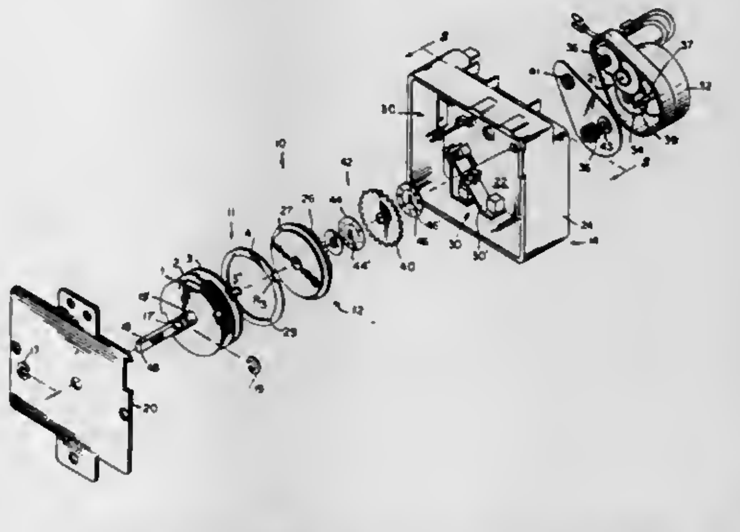
4,103,119
TIMING MECHANISM HAVING INDEPENDENTLY OPERATED PLURAL CAM ASSEMBLIES

William N. Homan, Plainfield, and Steve W. Smock, Indianapolis, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 12, 1976, Ser. No. 731,622

Int. Cl.² H01H *43/10*

U.S. Cl. 200—35 R **7 Claims**



1. In a timing mechanism wherein at least two separate cam means are carried by a shaft and wherein a single motor drive means causes rotation of said two separate cam means, an improvement characterized by:

(a) a first cam means fixedly connected to said shaft and a first switch means engaging same to be opened and closed in response to a rotation of said cam means,

(b) a second cam means freely rotatably carried about said shaft and a second switch means engaging both said first and second cam means,

(c) a gear train coupled to said motor drive means, said gear train including first and second output pinions at separate stages thereof to provide two separate outputs at different speeds, and

(d) first coupling means coupling said first output pinion to said shaft and second coupling means coupling said second output pinion to said second cam means whereby said shaft and said first cam means are rotated at one speed and said second cam means is rotated simultaneously about said shaft at a different speed.

4,103,120
AUXILIARY MECHANISM FOR IMPARTING ROTATIONAL ENERGY TO ELECTRICAL COMPONENTS

Jobn M. Jarosz, Chicago, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,742

Int. Cl.² H01H *31/00*

U.S. Cl. 200—48 R **20 Claims**

1. A mechanism for imparting rotational energy comprising:

an output shaft mounted for rotation between a first and second position;

lever means mounted on the shaft for applying rotational forces to said shaft;

overcenter toggle linkage means connected to the lever means for preventing rotation of said output shaft from its first position when said overcenter toggle linkage is in an overcenter toggle position and for causing said lever means to rotate said shaft to its second position when moved out of the overcenter toggle position;

force applying means for causing the overcenter toggle linkage means to move out of the overcenter toggle position and rotate said lever means and output shaft rapidly to its second position in such a manner that increased mechanical advantage is applied by said overcenter toggle linkage means during initial operation so that high initial torque forces are applied to said output shaft;

bias means for returning the overcenter toggle linkage means to the overcenter toggle position after said force applying means ceases applying a force thereby returning the output shaft to its first position.

9. A mechanism for imparting rotational energy to electrical switch components comprising:

a housing;

a shaft mounted for rotation in the housing and having an end extending through an opening in the housing;

insulator means for connecting the electrical switch components to the end of said shaft extending through the opening in the housing;

a lever member mounted on the shaft including a first end extending therefrom radially with respect to said shaft;

a first link member pivotably mounted at one end to said first end of said lever member;

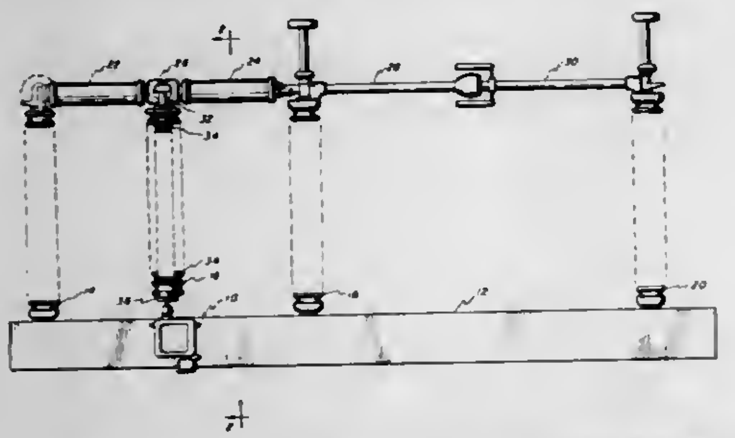
a bellcrank member mounted for rotation including first and second arms extending outwardly therefrom, said first arm being pivotably connected at its extended end to the other end of said first link member;

force applying means for applying a force;

means for connecting said force applying means to the extended end of said second arm;

bias means for urging said bellcrank member to rotate so that said first link and said first arm are normally positioned in an overcenter toggle position;

said force applying means applying the force to said means for connecting so that said bellcrank member rotates causing said first link member and said first arm to move out of the overcenter toggle position and pivot said lever member and shaft rapidly thereby imparting high initial torque rotational energy through said insulator means to the electrical switch components; and said bias means causing said bellcrank member to rotate in the opposite direction until said first link and said first arm are positioned in an overtoggle position thereby preventing accidental rotation of said shaft when said force applying means ceases to apply a force.



4,103,121
SWITCH OPERATING MECHANISM

Edward J. Rogers, Chicago, and Roy T. Swanson, North Riverside, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,743
Int. Cl.² H01H *31/00*

U.S. Cl. 200—48 A **21 Claims**

1. In a high voltage switch arrangement, the switch arrangement comprising a base, supporting insulators mounted on the base, a first and a second current interrupter mounted on the supporting insulators, each current interrupter including main contact rods connected to separable main contacts that carry continuous high voltage current when closed and interrupting contact rods connected to separable interrupting contacts that interrupt high voltage current when separated, a rotatable insulator mounted on the base adapted for rotation by a driven mechanism; an improved switch operating mechanism comprising:

a housing;

a shaft rotatably mounted in the housing and extending through an opening in the housing, said shaft being connected for rotation with said rotatable insulator;

a main drive lever mounted on the shaft for rotation with the shaft, said main drive lever including cam means;

a main rod arm assembly mounted for rotation around the shaft independent of the rotation of said main drive lever and said shaft, said main rod arm assembly being operably connected to the main contact rods;

a fast rod arm assembly mounted for rotation around the shaft independent of the rotation of said main drive lever and said shaft, said fast rod arm assembly being operably connected to the interrupting contact rods;

first bias means urging said main rod arm assembly to rotate in a direction to cause the main contact rods to move to open the main contacts;

second bias means urging said fast rod assembly to rotate in a direction to cause the interrupting contact rods to move to open the interrupting contacts;

first overcenter toggle linkage means operably connected to said main rod arm assembly for preventing rotation of said main rod assembly when said first overcenter toggle linkage means is in an overcenter toggle position;

second overcenter toggle linkage means operably connected to said fast rod arm assembly for preventing rotation of said fast rod arm assembly when said second overcenter toggle linkage means is in an overcenter toggle position;

latch means mounted on said first overcenter toggle linkage means for engaging said cam means on said main drive lever when said main drive lever is rotated by said shaft and for moving said first overcenter toggle linkage means out of the overcenter toggle position so that said main rod arm assembly is rotated under the urging of said first bias means to open the main contacts;

means associated with said main rod arm assembly and positioned for engaging said second overcenter toggle linkage means after a predetermined amount of rotation of said main rod arm assembly when rotated to open the main contacts and for moving said second overcenter toggle linkage means out of the overcenter toggle position so that said fast rod arm assembly is rotated under the urging of said second bias means to open the interrupting contacts.

4,103,122
HIGH VOLTAGE GROUNDING SWITCH REQUIRING LOW OPERATING EFFORT

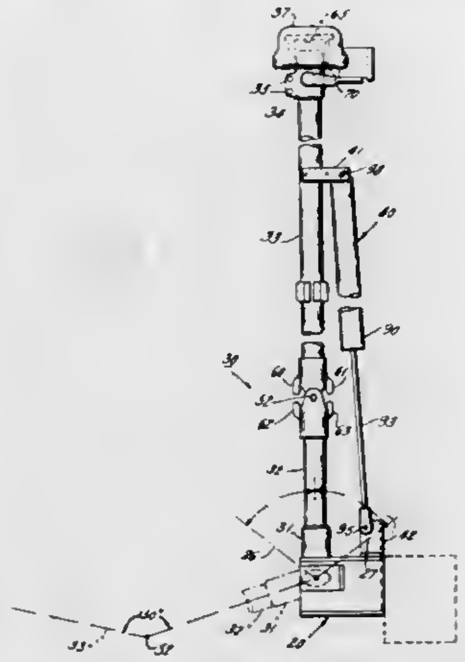
Roy H. Albright, Greensburg, and Walter B. Kelly, Laughlintown, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 24, 1976, Ser. No. 699,578
Int. Cl.² H01H *31/00*

U.S. Cl. 200—48 P **10 Claims**

1. A high voltage grounding switch comprising, in combination: a support base; a rotatable switch blade consisting of first and second elongated blade sections pivotally connected to one another at adjacent ones of their ends; a fixed jaw contact spaced from said support base by a fixed distance; the opposite end of said first blade section being rotatably mounted on said support base; a telescoping contact means connected to the opposite end of said second blade section and adapted to slidingly axially engage and disengage said jaw contact when said rotatable switch blade is operated between an engaged and

disengaged position; blade rotating means connected to said first blade section for rotating said blade between an engaged and disengaged position relative to said fixed jaw contact; stop means connected to said first and second blade sections to define a minimum included angle between their axes of less than about 170° and more than about 120°; second stop means on said jaw contact for receiving and stopping the angular movement of said blade as said blade approaches said fixed jaw contact; and biasing means connected between said first and second blade sections for holding said blade sections in a collapsed-toggle position relative to one another.

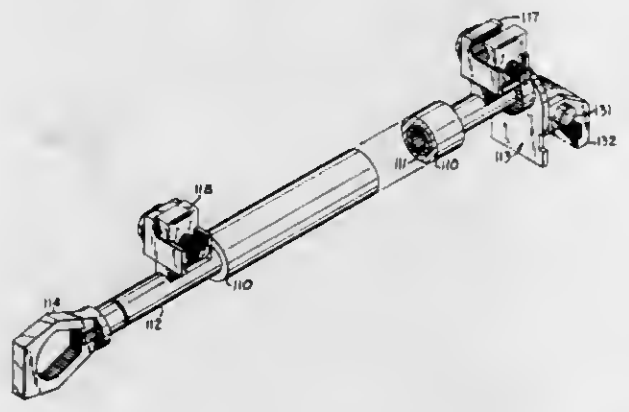


4,103,123
GROUNDING DEVICE

Lloyd B. Marquardt, Jr., Aberdeen, S. Dak., assignor to Northwestern Public Service Company, Huron, S. Dak.

Filed Jun. 27, 1977, Ser. No. 810,191
Int. Cl.² H01H *31/00*

U.S. Cl. 200—48 R **4 Claims**



1. A grounding device dimensionally interchangeable with a switch blade in high voltage electrical distribution systems comprising, in combination:

an elongated member of electrically insulating material;

a first electrically conductive member, at one end of said elongated member, configured like the lower terminal of a switch blade;

a second electrically conducting member, at the other end of said elongated member, configured like the upper terminal of a switch blade;

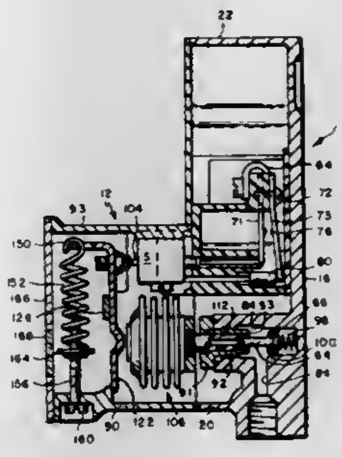
and means carried by each of said conducting members for connecting an electrical conductor thereto.

4,103,124
PLUG-IN PRESSURE SWITCH

Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.

Filed Dec. 20, 1976, Ser. No. 752,028
Int. Cl.² B65D *35/32*

U.S. Cl. 200—51 R **23 Claims**



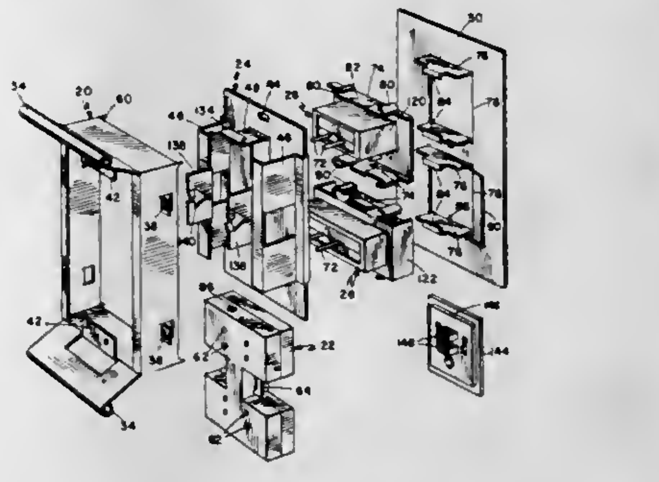
1. An instrument comprising a base receptacle adapted to be connected to air pressure and electric lines, a plug-in receptacle embodying pressure-sensitive and switch means operable thereby, and means operable by mounting the plug-in receptacle to the base receptacle to automatically connect the pressure-sensing means to the pressure line and, when dismounted therefrom, to automatically close the pressure line and disconnect the electric line.

4,103,125
MODULAR ELECTRICAL SWITCH/OUTLET ASSEMBLY

Louis Marrero, 1209 Via Ramon, Escondido, Calif. 92025

Filed Apr. 15, 1977, Ser. No. 788,514
Int. Cl.² H01R *13/70*

U.S. Cl. 200—51 R **12 Claims**



1. A modular electrical switch/outlet assembly comprising:

(a) a wiring box having connections for incoming power wires and having a plurality of spaced contact pairs coupled to said connections;

(b) mounting means for said wiring box to mount same to a building member;

(c) at least one switch module having contacts dimensioned and positioned to mate alternatively with any of said contact pairs;

(d) at least one receptacle module having contacts positioned and dimensioned to mate alternatively with any of said contact pairs, whereby said assembly can provide a plurality of different switch and receptacle combination;

(e) a face plate having a plurality of openings and each of said openings having mounting means to alternatively engage a selected one of a plurality of said modules in any desired combination; and

(f) said mounting means for said modules being brackets extending rearwardly from said face plate and which cooperate with complimentary means on said modules such that the latter make a snap-on connection with said module mounting brackets.

4,103,126

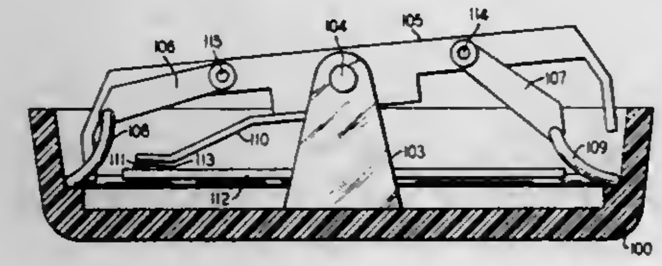
SNAP ACTION SWITCH

Ernest Gerard DeNigris, Colts Neck, and Merle Victor Olsen, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1976, Ser. No. 687,694

Int. Cl.^{2} H01H ***5/14***

U.S. Cl. 200—67 C **14 Claims**



1. A switch mechanism comprising:

a frame element;

a switch actuator pivotally attached to said frame element;

first arm means one end of which is connected to said switch actuator and laterally displaced to one side of said pivotal attachment;

second arm means one end of which is connected to said switch actuator and laterally displaced to the other side of said pivotal attachement from said first arm means connection and in force opposition to said first arm means;

first torsion spring means pivotally connected to the other end of said first arm means for applying a first force to said switch actuator through said first arm means;

second torsion spring means pivotally connected to the other end of said second arm means for applying a second force opposing said first force to said switch actuator through said second arm means; and

said switch actuator having two stable positions, each stable position having one arm means extended in a straight line relationship with respect to the associated said torsion spring means and one arm means flexed in an angular relationship with respect to the associated said torsion spring means and wherein said applied forces in said two stable positions are unequal serving to maintain said switch actuator in an established stable position.

4,103,127

SNAP-ACTION OVERCENTER SWITCH HAVING AN APEXED PLUNGER DEPRESSIBLE IN A ROCKABLE ACTUATOR BLOCK AND OPERATED BY A TOGGLE LEVER HAVING A POSITIVE OFF CAM

Harold W. Hults, New Berlin, and Werner B. Halbeck, Mequon, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jun. 9, 1976, Ser. No. 694,387

Int. Cl.^{2} H01H ***5/10***

U.S. Cl. 200—67 G **3 Claims**

1. A snap-action electric toggle switch comprising:

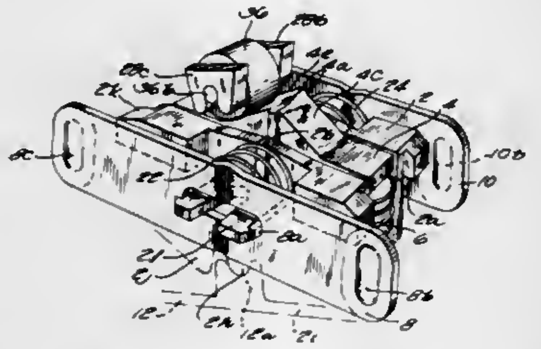
housing means;

an actuator block pivotally mounted in said housing means;

an apexed plunger carried by said actuator block for pivotal movement therewith and depressible therein transversely of the pivotal axis thereof;

means biasing said plunger outwardly of said actuator block;

a toggle lever pivotally mounted to said housing means about an axis parallel to said pivotal axis of said actuator block and having first cam means engaging said plunger against the bias of said biasing means and translationally movable across the apex thereof to cause snap-action overcenter pivoting of said actuator block when said first cam means crosses said apex in response to pivoting of said toggle lever, and having second cam means engageable with said actuator block when said first cam means has crossed said apex and said actuator block has not pivoted, whereby to positively force said actuator block to pivot in response to pivoting of said toggle lever; and



contact means actuated by said actuator block;

wherein said second cam means forces said actuator block to pivot counterclockwise when said first cam means has rightwardly crossed said apex and said actuator block has not pivoted.

4,103,128

TANK-TYPE COMPRESSED-GAS CIRCUIT-BREAKER HAVING CAPACITANCE-SUPPORTING MEANS

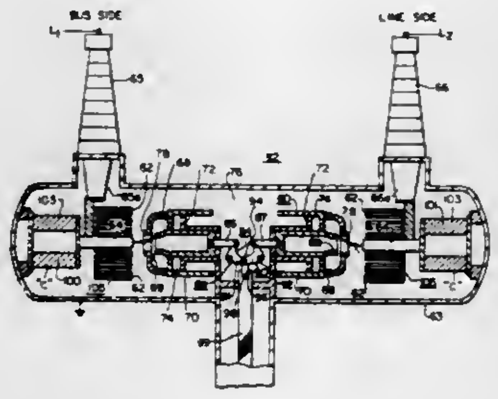
Itai Kosakn, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,796

Claims priority, application Japan, Jun. 13, 1974, 49-67750

Int. Cl.^{2} H01H ***33/16***

U.S. Cl. 200—144 AP **6 Claims**



1. A tank-type compressed-gas circuit-breaker including a grounded metallic tank structure, a terminal-bushing extending into said tank structure and supporting a relatively-stationary contact structure adjacent its interior end, a movable contact structure movable relative to said stationary contact structure and cooperable therewith to establish an arc, and capacitance-supporting means disposed within said tank structure and adjacent one interior end of the tank structure to assist the terminal-bushing in supporting the relatively-stationary contact structure against the impact forces involved during the closing operation of the circuit-breaker and also providing a desirable line-to-ground capacitance for the circuit-breaker itself.

4,103,129

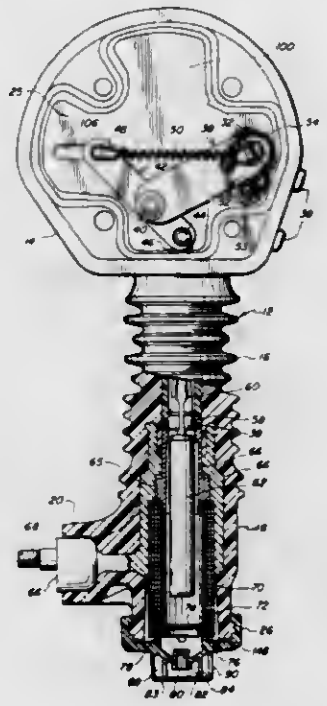
HIGH VOLTAGE CIRCUIT INTERRUPTER SWITCH ARRANGEMENT

David M. Evans, Palatine, and Joel A. Ramos, Chicago, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Mar. 9, 1977, Ser. No. 775,904

Int. Cl.^{2} H01H ***33/02***

U.S Cl. 200—144 R **15 Claims**



1. In a high voltage circuit interrupter arrangement for interrupting current flow in an electrical circuit including an integrally-formed hollow unitary housing formed of an insulating material, the housing including an operating mechanism enclosing portion having a hollow interior, and an interrupter portion having a hollow interior, the hollow interiors communicating with one another, a stationary contact mounted within the hollow interior of said interrupter portion, a movable contact normally engaging the stationary contact, an improvement comprising:

a cover for closing an access opening in a side wall of the operating mechanism-enclosing portion of the housing, said cover having a circular opening formed therethrough and a groove formed in an interior surface of said cover;

a groove formed on an interior surface of the operating mechanism enclosing portion of the housing opposite said groove in said cover when said cover is in place over said access opening in the housing;

a circular opening through a side wall of the operating mechanism enclosing portion of the housing opposite said circular opening in said cover when said cover is in place over said access opening;

a shaft, said shaft positioned so that one end thereof is located in said circular opening in said cover, and the other end is located in said circular opening in the housing;

at least one trigger member, said at least one trigger member being attached to an end of said shaft so that when said trigger member is pivoted, said shaft rotates;

a first lever arm assembly locked at one end thereof to said shaft;

a second lever arm assembly pivotably connected to the other end of said first lever arm assembly intermediate the ends of said second lever assembly; said second lever arm assembly being pivotably connected at one end to the movable contact;

a guide pin attached to the other end of said second lever arm assembly said guide pin dimensioned to engage and slidably ride in said grooves in said housing and said cover, whereby motion of the other end of said second lever is defined by said grooves in said housing and said cover.

4,103,130

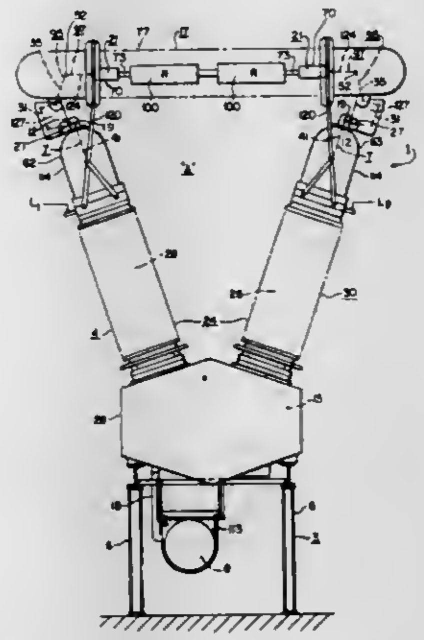
RESISTOR APPLICATIONS FOR HIGH-POWER CIRCUIT BREAKERS

Winthrop M. Leeds, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 29, 1975, Ser. No. 544,992

Int. Cl.^{2} H01H ***33/70***

U.S. Cl. 200—148 A **21 Claims**



1. A dual-pressure gas-blast type of high-power circuit-interrupter including a main-power high-voltage interrupter assemblage having a pair of separable power contacts, a high-voltage piston operator (10) for effecting opening and closing movements of said separable power contacts, an electrically-shunting puffer-type resistance interrupting unit disposed at high-voltage and electrically shunting said main-power interrupting assemblage, said shunting puffer-type resistor unit at high voltage including a pair of separable resistor contacts and an electrically serially-related resistance element, and direct connecting linkage means directly connected to said high-voltage piston operator (10) for causing the opening of the separable resistance contacts following the prior separation of the main power-interrupting contacts in the main-power interrupting assemblage.

4,103,131

PUFFER INTERRUPTER WITH MAIN AND AUXILIARY PISTONS AND COMMON CYLINDER

Rudolf Graf, Oberentfelden; Ernst Lang, Schlossrued; Viktor Stephanides, Zurich; Richard Thaler, Uotereotfelden, and Hans-Rudolf Wüethrich, Oberentfelden, all of Switzerland, assignors to Sprecher & Schuh Ltd. (SSA), Aarau, Switzerland

Filed Sep. 20, 1976, Ser. No. 724,617

Claims priority, application Switzerland, Sep. 26, 1975, 12542/75

Int. Cl.^{2} H01H ***33/88***

U.S. Cl. 200—148 A **7 Claims**

1. A puffer-type circuit interrupter comprising, in combination:

a main stationary piston member supported on an elongated stationary support rod,

an auxiliary piston mounted concentrically with said main piston and slidably mounted on said support rod,

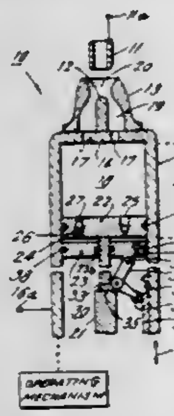
an axially movable cylinder slidably receiving both said main and auxiliary pistons and relatively movable with respect thereto,

a main pressure volume disposed between said main piston and one end of said cylinder,

an auxiliary pressure volume disposed between said main and auxiliary pistons,

contact means and nozzle means disposed at said one end of said cylinder and channel means communicating between said main pressure volume and said nozzle means and said contact means to produce a gas blast past said contact means when said cylinder moves to compress said main volume,

pressure-limiting valve means connected between said main and auxiliary pressure volumes to maintain no greater than a given pressure differential between said volumes,



and connection means for connecting said auxiliary piston to said main piston when said cylinder is initially moved to compress said main volume, and thereafter disconnecting said main and auxiliary volumes, and connecting said auxiliary piston to said cylinder.

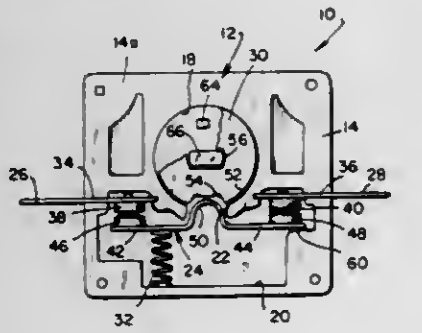
4,103,132
ROTARY SWITCH

Daniel Schwarzkopf, Hamden, Conn., assignor to Unimax Switch Corporation, Wallingford, Conn.

Filed Oct. 5, 1976, Ser. No. 729,662

Int. Cl.² H01H *3/42, 19/62*

U.S. Cl. 200—153 LB **18 Claims**



1. An electrical switch comprising a housing member of electrically insulating material having an interior cavity bounded by a guide wall surface of circular configuration, said guide wall surface having an opening therein, a cam member of electrically insulating material comprising a disc having a generally circular peripheral camming surface with a dwell portion, the circular peripheral surface of said cam member being of slightly smaller size than said cavity, and being closely received and rotatably mounted in said cavity with said guide wall surface serving as the bearing surface for said cam member, a fixed contact within the interior of said housing member, switch contact means including a movable contact mounted in said housing member adjacent said fixed contact for movement between a switch-closed operating position in engagement with said fixed contact and a switch-open-operating position out of engagement with said fixed contact, said switch contact means having a portion thereof extending through the opening in said guide wall surface into engagement with said cam member, means for rotating said cam member within said cavity between a first position in which said switch contact means engages the circular peripheral surface of said cam member to provide one of said operating positions, and a second position in which said switch contact means engages the dwell portion of said cam member to provide the other of said operating positions.

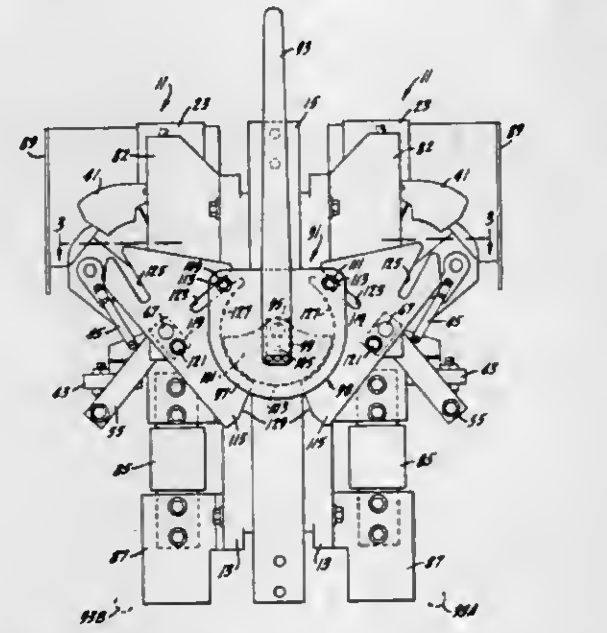
4,103,133
DUAL SWITCH OPERATOR USING MODIFIED GENEVA MOVEMENT

John Walter Erickson, and John W. Erickson, both of Crystal Lake, Ill., assignors to Boltswitch, Inc., Crystal Lake, Ill.

Filed Jul. 14, 1977, Ser. No. 815,543

Int. Cl.² B65D *3/44*

U.S. Cl. 200—153 N **12 Claims**



1. A dual switch actuator mechanism for coordinated actuation of two high-current switches, each switch including a switch operator mechanism for opening and closing the switch in response to rotation of a switch operator shaft in opposed directions, the switches being mounted adjacent each other with the switch operator shafts in aligned paraxial spaced relation to each other, the dual switch actuator mechanism comprising:

a rotatable main shaft, positioned between and in aligned paraxial relation to the two switch operator shafts;

a Geneva drive plate affixed to the main shaft for rotation therewith and having an arcuate bearing surface;

a pair of drive pins mounted in spaced relation to each other on the drive plate;

two modified Geneva follower plates, each affixed to the switch operator shaft of a respective switch operator mechanism, each follower plate having a drive slot for receiving one of the drive pins and each follower plate further having an arcuate bearing surface complementary to the drive plate bearing surface;

the follower plates being aligned, relative to the main shaft and drive plate, so that for a given neutral position of the main shaft, each drive pin is positioned in the entrance of a follower plate drive slot and the bearing surfaces of both follower plates engage the drive plate bearing surface,

rotation of the main shaft through a predetermined arc in either direction from the neutral position causing one guide pin to move inwardly of the drive slot of one follower plate to rotate that follower plate and its associated switch operator shaft and thereby actuate one of the switches between open and closed conditions without actuation of the other switch.

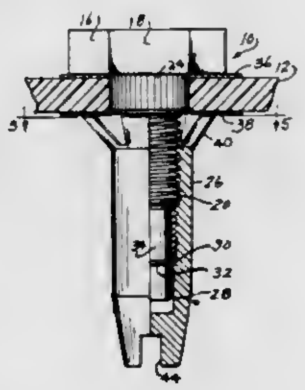
4,103,134
SWITCH ASSEMBLY FOR CONNECTING OPPOSING CIRCUITS ON A PRINTED CIRCUIT BOARD

Peter P. Urgero, 542 Hickok, Park Forest South, Ill. 60466

Filed Oct. 7, 1976, Ser. No. 730,578

Int. Cl.² H01B *3/40*

U.S. Cl. 200—158 **7 Claims**



1. Apparatus for connecting an electrical circuit on one side of a dielectric circuit board with a circuit on the opposite side of the circuit board comprising a switch assembly received in an opening in the circuit board and having a threaded electrically conductive male member provided with a flat head, an electrically conductive female member internally threaded for reception of said male member, said female member being provided with at least one radially angularly extending contact, said female member being rotatable with respect to said male member to effect energization of the circuit on said other side of said board.

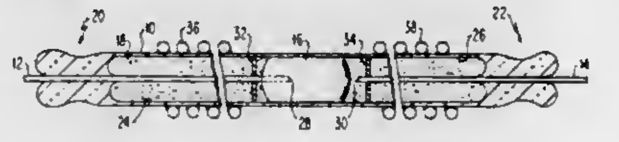
4,103,135
GAS OPERATED SWITCHES

Richard Santiago Gomez, Jericho, and Eugene James Scray, Jr., Burlington, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 1, 1976, Ser. No. 701,936

Int. Cl.² H01H *29/00*

U.S. Cl. 200—185 **24 Claims**



1. A switch comprising

a capillary tube having first and second ends and a substantially uniform internal diameter between said ends, said ends being closed to form a hermetically sealed chamber within said tube,

a non-oxidizing gas disposed within said chamber,

a pair of electrical conductors, each having a contact point disposed within said chamber,

a globule of conductive liquid disposed within said chamber so as to form first and second compartments containing said gas,

first and second barrier members disposed within said first and second compartments, respectively, in the vicinity of said globule of conductive liquid so as to confine said globule within a predetermined volume, and

means disposed between said first and second ends of said capillary tube for heating said gas in said first and second compartments to position at selected intervals said globule of liquid in contact with the contact points of said pair of conductors simultaneously.

18. A switch comprising:

a unitary capillary tube having first and second closed ends and made of electrically non-conducting material forming an elongated chamber, said tube having a substantially uniform cross-section along the axis of said tube between said ends,

first and second conductive members each having one end disposed within said chamber,

first, second and third fluids disposed within said chamber, said first fluid being conductive and at least one of said second and third fluids being insulative, said first fluid being disposed further so as to isolate said second and third fluids from each other,

means disposed within each of said second and third fluids for preventing said first fluid from passing therethrough while permitting said fluid in which each of said means is disposed to pass therethrough, and

means disposed between the first and second ends of said capillary tube for controlling the pressure exerted by said second and third fluids against said first fluid so as to selectively move said first fluid into and out of simultaneous contact with said one ends of said first and second conductive members.

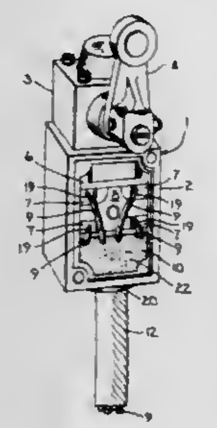
4,103,136
SWITCH HOUSING WITH CABLE SEAL

Thomas G. Karakis, Greendale, and Clayton J. Klotz, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 797,612, May 17, 1977. This application Aug. 4, 1977, Ser. No. 821,881

Int. Cl.² H01H *9/04*

U.S. Cl. 200—302 **10 Claims**



1. A prewired electrical switch including a housing providing a cable seal, said housing having an electrical cable receiving section which includes a plurality of conductor receiving pockets, at least one of said pockets containing a folded portion of an individual electrical conductor, said folded portion including both insulated and uninsulated sections of said conductor, said pocket further containing a non-conductive potting compound which forms fluid-tight seals with the portions of the conductor within the pocket thereby preventing fluid from the outside from traveling along the conductor into the switch.

4,103,137
CUTTING OF MATERIALS BY SPARK EROSION

Charlie Maurice Levitt, 208 Sunvalley Lodge, Johannesburg; Samuel Chatterley, 1 Riethaan St., Florida Lake, and Peter John Livsey Flinn, 115, St. Audley Rd., Transvaal, all of South Africa

Filed Aug. 30, 1976, Ser. No. 718,472

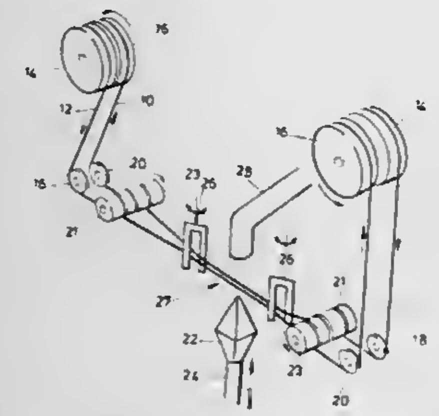
Claims priority, application South Africa, Sep. 4, 1975, 75/5666; Mar. 22, 1976, 76/1744

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 W **19 Claims**

1. A method of cutting a material in a given direction of cut utilizing a pair of spaced electrodes presenting generally parallel, elongate and spaced edges, including the steps of

placing the electrode edges adjacent the material, applying a voltage across the electrodes to produce a spark between the edges, and



effecting relative movement between the edges and the material in the direction of cut to effect cutting.

4,103,138
APPARATUS FOR BUILD-UP WELDING WITH COOLING OF A SEALED AND LUBRICATED TRACK LINK

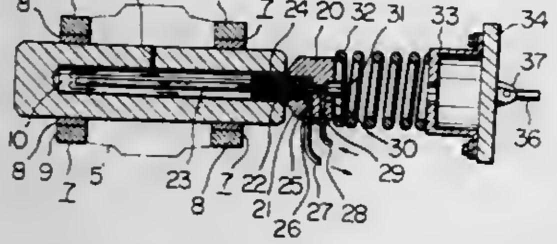
Y. Moriki, Tokyo, Japan, assignor to Maruma Jyusharyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,869

Claims priority, application Japan, Mar. 25, 1975, 50-34940

Int. Cl.^{2} B23K *9/04*

U.S. Cl. 219—76.11 **14 Claims**



1. An apparatus for feeding and draining coolant through the interior of a connecting pin of a sealed and lubricated track link assembly, during a build-up welding operation thereon, comprising:

an adapter having first fluid passage means therein for introducing said coolant into said connecting pin interior and second fluid passage means disposed between said connecting pin interior and said first fluid passage means and extending parallel to said first fluid passage means for directly discharging said coolant from said first fluid passage means and from said connecting pin interior;

means for resiliently biasing said adapter toward said connecting pin in water tight contact with said connecting pin; and

means for performing said build-up welding operation associated with said connecting pin.

4,103,139
WELDING APPARATUS

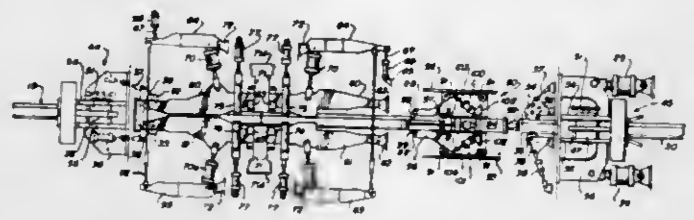
Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Switzerland

Division of Ser. No. 514,396, Oct. 15, 1974, Pat. No. 3,982,091. This application May 12, 1976, Ser. No. 685,681

Int. Cl.^{2} B23K *11/02*

U.S. Cl. 219—101 **6 Claims**

1. Welding apparatus for welding rail sections together in end to end relationship to form a continuous rail comprising, in combination: a pair of vertical clamping assemblies for vertically clamping and aligning the respective ones of a pair of rail sections to be welded together to form a continuous rail, said vertical clamping assemblies including electrodes engageable with adjacent ends of a pair of rail sections to be welded together; means for causing current flow between said electrodes and through the ends of said rail sections in order to make a weld; a pair of horizontal clamping assemblies for horizontally clamping and aligning the respective ones of said pair of rail sections; said pair of vertical clamping assemblies each comprising a pair of upper and a pair of lower level arms, the lever arms of each pair being spaced on opposite sides of a rail section and being pivotally affixed for rotation in a vertical plane at one end thereof, the opposite ends of the lever arms of each pair having one of said electrodes connected between them so that each of said electrodes engages one of the upper and lower surfaces of said rail section when the respective pairs of said lever arms are pivotally rotated, said upper and lower pairs of lever arms being rigid in the vertical plane thereof and being flexible within limits in a horizontal plane, whereby no undue stress is placed on said lever arms during horizontal alignment of said rail sections, and means for pivotally rotating the respective pairs of lever arms to engage said electrodes with said rail section to vertically clamp said rail section between them; said means for causing current flow between said electrodes comprising rectifier means and three monophase transformers having separate cores and two secondary windings coupled with said rectifier means to provide a six-phase rectifying of the welding current, whereby the welding current never goes to zero and voltage peaks induced by large current fluctuations are avoided, thereby providing a smoother flash operation in forming a weld.



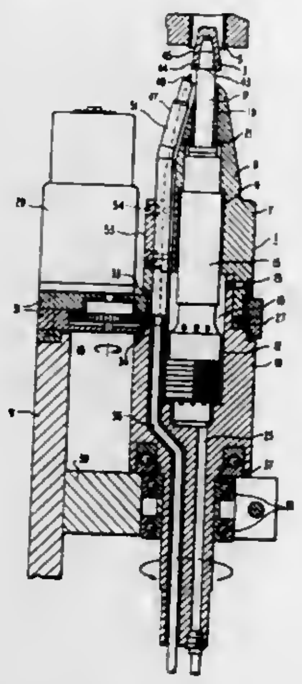
4,103,140
PNEUMATIC HAMMER AND WELDER

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 8, 1977, Ser. No. 775,675

Int. Cl.^{2} B23K *9/12*

U.S. Cl. 219—125.11 **10 Claims**



1. Apparatus for driving a tapered plug into a tube and forming a seal weld therebetween, said apparatus comprising a spindle having a axially located cavity, a pneumatic hammer disposed in said cavity, a chisel adapted to receive said tapered plug, said chisel extending through a portion of said spindle and being received by said pneumatic hammer, a welding torch eccentrically disposed on said spindle, and means for rotating said spindle, whereby said apparatus can drive the tapered plug into the tube and form a peripheral seal weld at the outer juncture of the plug and tube in serial operations.

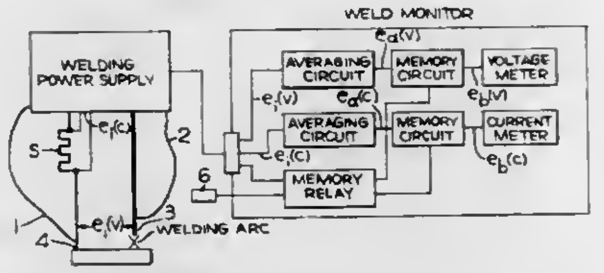
4,103,141
WELD MONITOR

Cecil C. Wristen, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 643,319, Dec. 22, 1975, abandoned. This application May 23, 1977, Ser. No. 799,386

Int. Cl.^{2} B23K *9/10*

U.S. Cl. 219—130.01 **1 Claim**



1. A weld monitor for utilization with a welding apparatus having an arc torch and provided with a meter having a current indicating section including a dial and a voltage indicating section including a dial to permit an operator to check the output of the welding apparatus by himself;

a power supply for the welding apparatus;

a voltage averaging circuit electrically connected to receive an instantaneous arc voltage from the power supply as supplied to the arc torch, said voltage averaging circuit being operable to integrate the instantaneous arc voltage and provide an average voltage signal;

circuit means electrically connecting said voltage averaging circuit to the voltage indicating section of said meter;

a current averaging circuit electrically connected to receive an instantaneous arc current signal, said instantaneous arc current being obtained from a shunt connected across the torch, said current averging circuit being operable to integrate the instantaneous arc current and provide an average current signal;

circuit means electrically connecting said current averaging circuit to the current indicating section of the meter;

an average arc current memory circuit and an average arc voltage memory circuit electrically connected to receive the average arc current signals and average voltage signals from their respective averaging circuits, said memory circuits being identical and each comprising a capacitor electrically connected to receive the average signal, a field effect transistor interposed between the capacitor and the average signal input thereto, said transistor serving as a switch to connect and disconnect the capacitor from the averaging circuit; a measurement circuit including an operational amplifier electrically connected to permit the charge on said capacitor to be measured without the capacitor being discharged; and

switch means to activate said memory circuits including a relay having a normally closed contact in circuit with said field-effect transistor; said relay when energized by the closing of said switch operating to open its normally closed contact to thereby interrupt the reactive bias voltage on the field-effect transistor so that the field-effect transistor switches to an open state, said capacitor in said memory circuit remaining charged at the voltage which existed at the moment that the field effect transistor of said memory circuit was switched to an open state and said operational amplifier provides a voltage output which is equal to the voltage on the capacitor, and a feed back loop in the memory circuit operable to cause the amplifier to have a high input impedance so that voltage on the capcitor is not discharged when the amplifier is measuring the voltage on the capacitor to thereby maintain the memory.

4,103,142
APPARATUS AND METHOD FOR USE IN ONE-SIDED WELDING

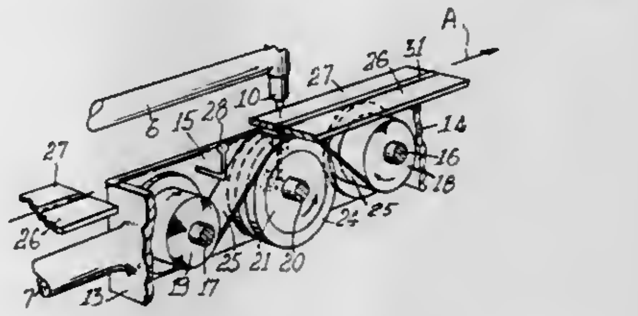
Frederick D. Cartwright, 506 Lake Club Apts., Lake Rd., Germiston, 1401, South Africa

Filed Mar. 17, 1975, Ser. No. 559,367

Claims priority, application South Africa, Mar. 28, 1974, 74/0803; May 9, 1974, 74/2953; Aug. 9, 1974, 74/5099; Aug. 23, 1974, 74/5410

Int. Cl.^{2} B23K *9/02*

U.S. Cl. 219—136 **5 Claims**



1. Apparatus for positioning a flexible backing strip in one-sided welding together of workpieces along a weld line comprising:

(a) an elongated strip of flexible disposable backing material;

(b) first means from which the strip is passed to the workpieces;

(c) second means to which the strip passes from the workpieces; and

(d) means positioned between said first and said second means for holding the strip to underlie the weld line and against the workpieces, said means comprising circular roller means having round, concentric, resilient outer means for pressing against the side of the strip opposite the weld line to form a landing which bears against the strip.

4,103,143
ELECTRODES FOR TUNGSTEN INERT GAS WELDING

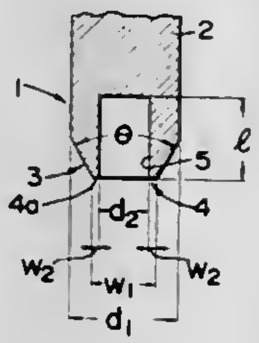
Nobuyuki Yamauchi, and Takao Taka, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed May 24, 1977, Ser. No. 800,010

Claims priority, application Japan, May 28, 1976, 51-62547

Int. Cl.^{2} B23K *35/00*

U.S. Cl. 219—145.21 **7 Claims**



1. Tungsten electrode for TIG welding comprising a body of substantially circular cross-section having a diameter not less than 3 mm, said body having a tip end formed in a frustoconical shape having a cone angle less than 120° and having an axial recess of substantially circular cross-section having a depth not less than 2 mm, said recess being substantially co-axial with the

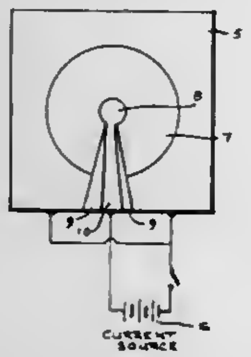
the body to leave an annular tip area having a radial width not greater than 3 mm.

4,103,144

LOW INDUCTANCE HEATER CONFIGURATION FOR SOLID STATE DEVICES AND MICROCIRCUIT SUBSTRATES

Frank A. Pizzarello, Yorba Lioda, and Theodore J. LaChapelle, Jr., Orange, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,471
Int. Cl.² H05B *1/00*
U.S. Cl. 219—209 **4 Claims**



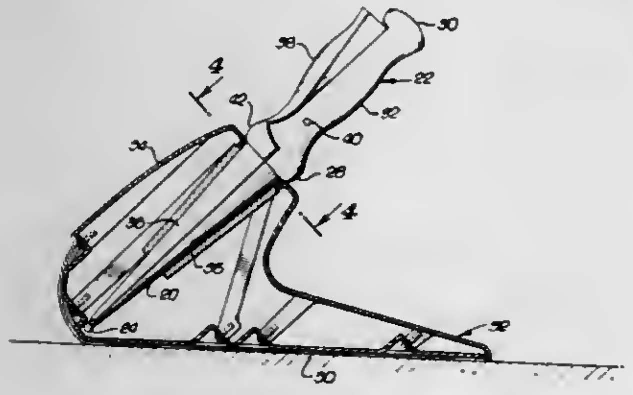
1. A solid state device heater comprising
a ceramic substrate sheet member having one plane surface adapted to permit eutective bonding of a photodetector device thereto and a resistance heater element deposited on the opposite plane surface thereof, said heater element comprising a disc of electrically conductive material, an annular region of resistive material encompassing and in electrical contact with said disc, and a peripheral region of electrically conductive material encompassing and in electrical contact with said region of resistive material,
a source of electrical current. and
means connecting said source of electrical current between said disc and said peripheral region of electrically conductive material.

4,103,145

HAIR CURLING IRON AND OVEN

Joseph T. Oliveri, 6520 Palos Verdes Dr., East, Rancho Palos Verdes, Calif. 90274

Filed Jul. 24, 1975, Ser. No. 598,800
Int. Cl.² H05B *1/00;* A45D *1/20, 4/12*
U.S. Cl. 219—222 **11 Claims**



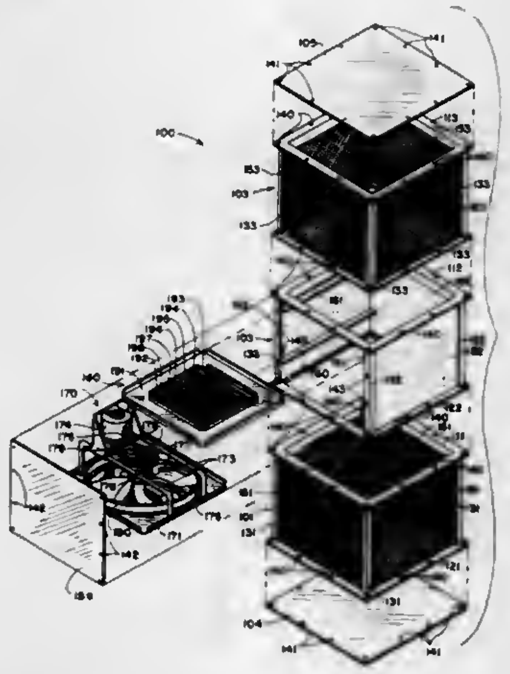
1. A hair styling iron comprising in combination:
a curling iron including a heat conductive cone mounted at a first junction to an insulated handle, and tapered from a first large diameter rear portion adjacent said handle to a second smaller diameter front portion;
a stop member on the forward end of the cone including hair positioning means diametrically larger than and extending outwardly from said smaller diameter front portion for preventing small diameter curls from slipping off the cone during the curling process;
a clamp including a heat conductive forward end shaped to fit against the outside of said cone, and connected through a second junction to a rear insulated actuating arm; and
attachment means coupled between said curling iron and said clamp for movably connecting said clamp to said curling iron such that manual manipulation of said arm moves said forward end of said clamp between a closed position against said cone to an open position displaced from said cone to position the hair rearwardly of said stop member and between said clamp and said cone.

4,103,146

METHODS AND APPARATUS FOR DUCTLESSLY CIRCULATING AND SELECTIVELY SUPPLEMENTALLY HEATING LARGE VOLUMES OF AIR IN INDUSTRIAL FACILITIES

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Continuation-in-part of Ser. No. 609,142, Sep. 2, 1975, abandoned. This application Jan. 19, 1976, Ser. No. 649,983
Int. Cl.² F24H *3/02;* H05B *1/00*
U.S. Cl. 219—368 **3 Claims**



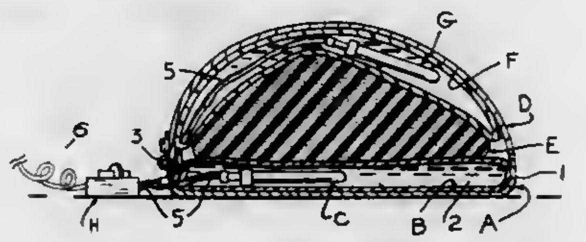
1. An apparatus positionable at a central location within a heated industrial building and the like to promote improved circulation of heated air within the walls of the building and thereby improve the efficiency of operation of existing heater units, comprising:
(a) an upstanding structure of substantially right parallelepiped configuration including an assembly of lower and upper modules with at least one intermediate module arranged one atop the other and releasably secured together to define a vertical chamber extending through the assembled modules;
(b) each of said lower and upper modules having planar, multi-perforated perimetral faces over substantially the entire lateral surface area thereof to define air inlets and air outlets, respectively, for said apparatus;
(c) said air inlets and said air outlets each being of a height of from about 2 to 3 feet to draw in and discharge air in stratified layers and at a velocity sufficient to establish a generally toroidal flow of air toward the walls of said building;
(d) said toroidal flow being sufficient to establish a counter toroidal flow in the air above said apparatus so as to recirculate heated air which accumulates adjacent the ceiling of said building;
(e) each of said at least one intermediate module having sidewalls imperforate to air to inhibit the passage of air therethrough;
(f) a blower assembly housed entirely within said at least one intermediate module and including a fan for drawing ambient air through said air inlet, ducting said air upwardly through the chamber and discharging said air through said air outlet at a velocity sufficient to establish a toroidal flow toward the walls of said building;
(g) and said upper and lower modules being devoid of any encumbrance to air flow therethrough.

4,103,147

DEVICE FOR HEATING A BREAST PROSTHESIS

Birttie L. Carvalho, 15200 Wiley St., San Leandro, Calif. 94579

Filed Nov. 26, 1976, Ser. No. 745,043
Int. Cl.² H05B *1/00*
U.S. Cl. 219—524 **1 Claim**



1. A breast prosthesis heater comprising:
(a) a base;
(b) a first flexible waterproof thermally conductive and electrically non-conductive material sealed and liquid containing bag supported by said base and adapted to support a breast prosthesis, the upper surface of said bag conforming to the under surface of the prosthesis so as to have uniform contact therewith;
(c) a dome-shaped cover for said base and being hingedly connected thereto;
(d) a second flexible, waterproof, thermally conductive and electrically non-conductive material, sealed and liquid containing bag secured to the inner surface of said dome-shaped cover, the undersurface of said second bag conforming to the irregular upper surface of the prosthesis when the prosthesis rests on said first bag and said cover is in closed position; whereby substantially the entire exterior surface of the prosthesis is uniformly contacted by both bags;
(e) an electric heating element submerged in the liquid in each bag for heating said liquids; and
(f) an electric insulated cord interconnecting said heating elements with an electric outlet and having temperature control means for controlling the heat delivered by said heating elements to maintain the breast prothesis at the temperature of the human body.

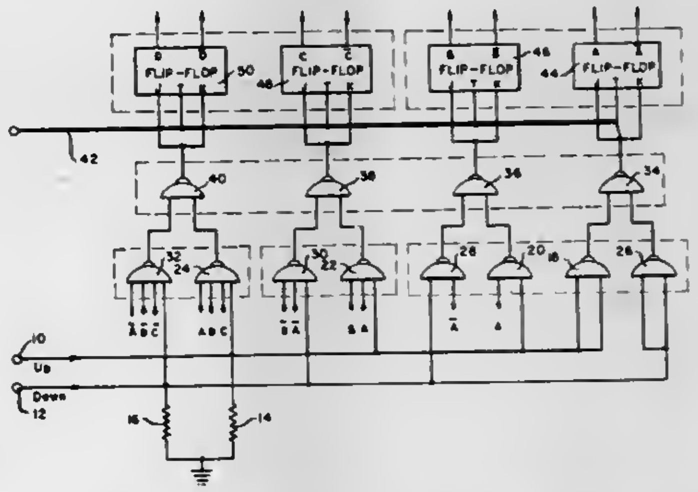
4,103,148

DYNAMIC PULSE DIFFERENCE CIRCUIT

Gerald L. Erickson, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,500
Int. Cl.² G06M *3/14;* G01T *1/00*
U.S. Cl. 235—92 PC **1 Claim**

1. A digital electronic circuit for producing pulses proportional to a continuously running net count of the difference between gamma pulses and a background of gamma pulses, the circuit comprising:
a first terminal (10) receiving the input signal pulse;
a second terminal (12) receiving the proportional background pulse;
a first NAND gate (18) connected to the first terminal (10) to invert the total count;
a second NAND gate (26) connected to the second terminal (12) to invert the background count;
a third NAND gate (34) connected to the first and second NAND gates (18 and 26) to receive outputs therefrom;
a first flip-flop (44) connected to the third NAND gate (34) to receive therefrom a clock pulse and triggering pulses and to generate therefrom a first count pulse and a second count pulse;
a fourth NAND gate (20) connected to the first terminal (10) and the first flip-flop (44) and receiving the first count pulse therefrom;
a fifth NAND gate (28) connected to the second terminal (12) and the first flip-flop (44) and receiving the second count pulse therefrom;
a sixth NAND gate (36) connected to the fourth and fifth NAND gates (20 and 28) and responsive to outputs therefrom;
a clock bus (42) connected to the third NAND gate (34) to receive and couple a clock pulse therefrom;
a second flip-fllp (46) connected to the sixth NAND gate (36) and the clock bus (42) and receiving inputs therefrom to generate a third count pulse and a fourth count pulse;
a seventh NAND gate (22) connected to the first terminal (10), the first flip-flop (44), and the second flip-flop (46) and receiving a first count pulse from the first flip-flop (44) and a third count pulse from the second flip-flop (46);
an eighth NAND gate (30) connected to the second terminal (12), the first flip-flop (44), and the second flip-flop (46) and receiving a second count pulse from the first flip-flop (44) and a fourth count pulse from the second flip-flop 46;



a ninth NAND gate (38) connected to the seventh and eighth NAND gates (22 and 30) and responsive to outputs therefrom;
a third flip-flop (48) connected to the ninth NANd gate (38) and the clock bus (42) and receiving inputs therefrom to generate a fifth count pulse and a sixth count pulse;
a tenth NAND gate (24) connected to the first terminal (10), the first, second, and third flip-flops (44, 46, and 48) and receiving a first count pulse from the first flip-flop (44), a third count pulse from the second flip-flop (46), and a fifth count pulse from the third flip-flop (48);
an eleventh NAND gate (32) connected to the second terminal (12) and to the first, second, and third flip-flops (44, 46, and 48) and receiving a second count pulse from the first flip-flop (44), a fourth count pulse from the second flip-flop (46) and a sixth count pulse from the third flip-flop (48);
a twelfth NAND gate (40) connected to the tenth and eleventh NAND gates (24 and 32) to receive an input therefrom;
a fourth flip-flop (50) connected to the twelfth NAND gate (40) and the clock bus (42) and receiving inputs therefrom to generate a seventh count pulse and an eighth count pulse;
a thirteenth NAND gate (52) connected to the first, second,

third, and fourth flip-flops (44, 46, 48 and 50) and receiving a first count pulse from the first flip-flop (44), a fourth count pulse from the second flip-flop (46), a sixth count pulse from the third flip-flop (48), and an eighth count pulse from the fourth flip-flop (50);

a fifth flip-flop (58) connected to the thirteenth NAND gate (52), the clock bus (42) and to an electrical ground and generating an output;

a fourteenth NAND gate (54) connected to the first, second, third, and fourth flip-flops (44, 46, 48, and 50) and receiving a first count pulse from the first flip-flop (44), a third count pulse from the second flip-flop (46), a sixth count pulse from the third flip-flop (48), and an eighth count pulse from the fourth flip-flop (50);

a first AND gate (62) connected to the fourteenth NAND gate (54) and the fifth flip-flop (58) and receiving inputs therefrom;

a sixth flip-flop (60) connected to the first AND gate (62), the thirteenth NAND gate (52), and the clock bus (42), receiving inputs therefrom, and generating an output in response to the inputs;

a fifteenth NAND gate (56) connected to the first, second, third, and fourth flip-flops (44, 46, 48, and 50) and receiving a first count pulse from the first flip-flop (44), a third count pulse from the second flip-flop (46), a fifth count pulse from the third flip-flop (48), and a seventh count pulse from the fourth flip-flop (50);

a second AND gate (64) connected to the fifteenth NAND gate (56) and the sixth flip-flop (60) and receiving inputs therefrom;

a seventh flip-flop (66) connected to the second AND gate (64) and the clock bus (42) and receiving inputs therefrom, the seventh flip-flop (66) generating as outputs an up pulse and a down pulse, the down pulse coupled to the fifth flip-flop (58) and the sixth flip-flop (60);

a third AND gate (68) connected to the seventh flip-flop (66) and to electrical ground, receiving as inputs the up pulse from the seventh flip-flop (66) and the electrical ground, and producing an output that is supplied as an input to the seventh flip-flop (66);

a NOR gate (70) connected to the seventh flip-flop (66), receiving as input therefrom the down pulse, and producing an inverted pulse; and

a binary (72) connected to the NOR gate (70) and receiving the inverted pulse therefrom to produce a positive output pulse,

which pulse is proportional to a continuously running net count of the difference between the input count and the background count.

4,103,149

ARRANGEMENT FOR THE PERFORMING SEIZURE STATISTICS FOR A DEVICE BELONGING TO A GROUP OF DEVICES

Lars Kalle Lindén, Hästveda, and Kjell Stellan Persson, Skärbolmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericssoo, Stockholm, Sweden

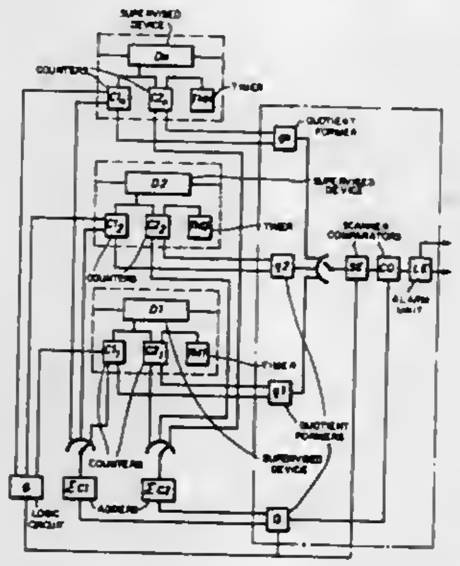
Filed Mar. 28, 1977, Ser. No. 782,063

Claims priority, application Sweden, Apr. 13, 1976, 7604340

Int. Cl.^{2} G07C *3/10;* H04M *15/18*

U.S. Cl. 235—92 TE **1 Claim**

1. Arrangement for the statistical supervision of a number of devices belonging to a group of devices in a telecommunication system with respect to seizure conditions, i.e. the ratio between the number of normal seizures and the total number of seizures, which devices being alternately seized and released, said arrangement comprising two counters associated with each individual device, a first counter for counting the total number of seizures of the device, a second counter for counting the number of seizures exceeding a certain minimum time, means associated with each individual device for measuring said minimum time, dividing means connected to outputs of said counter for the periodic calculation of the ratio between the numbers accumulated by said second and said first counter, first adding means for adding of the numbers obtained from all said first counter belonging to the group of devices, second adding means for adding of the values obtained from all said second counters belonging to the group of devices, dividing means connected to outputs of said adding means for periodically calculating the quotient between the sums obtained from said second counters and said first counters, a gate circuit means for the periodical transfer of the quotient belonging to an individual device as well as the quotient belonging to the whole group of devices a comparison means connected to said gate circuit means, said comparison means including means for comparing the quotient between the number of seizures exceeding a certain time and the total number of seizures for each individual device with the corresponding quotient for the whole group of devices, and alarm means connected to said comparison means for producing alarm signals for certain differences between the values of said quotients.



4,103,150

ARRANGEMENT FOR CONTROLLING THE ACCESS TO AN ESTABLISHMENT AND ENTRY CARD SUITABLE FOR SUCH AN ARRANGEMENT

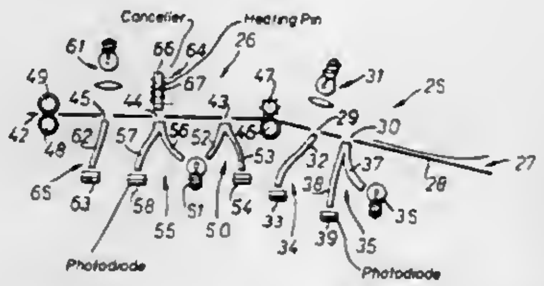
Fritz von Ballmoos, Horgen, Switzerland, assignor to Guhl & Scheibler AG, Aesch, Switzerland, a part interest

Filed Mar. 5, 1976, Ser. No. 664,312

Claims priority, application Switzerland, Mar. 10, 1975, 2987/75; Feb. 19, 1976, 2017/76

Int. Cl.^{2} G06K *5/00, 7/14, 19/06*

U.S. Cl. 235—419 **19 Claims**



1. An access control system for selectively controlling entry to an establishment comprising an entry card and a device for scanning said entry card and determining access to the establishment, said entry card including at least a first region having machine-readable information applied prior to issue of the card and a second region having at least one cancellable value field, said field intended to be cancelled before releasing entry to the establishment, a canceller for cancelling said field, said device including at least a first reader provided for the reading of said information, and a second reader for reading the condition of said value field, and means responsive to the read information and the read condition for determination of the validity of the card, for activating said canceller and for releasing entry to the establishment if said information coincides with a predetermined comparison value, said validity determination indicating at least one non-cancelled value field and said canceller functioning to cancel said non-cancelled value field.

4,103,151

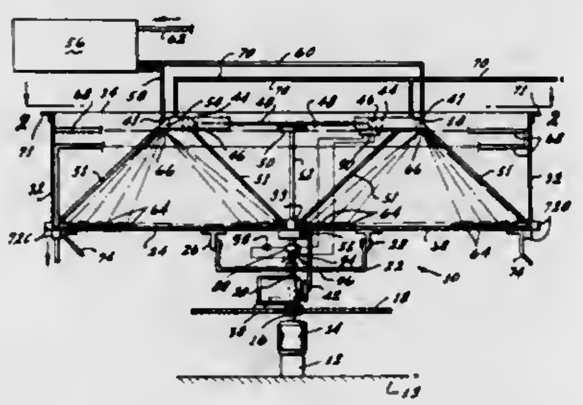
SOLAR TRACKING SYSTEM

Edsel Chromle, 6720 Belle Glade, San Diego, Calif. 92119

Divislon of Ser. No. 735,593, Oct. 26, 1976. This application Jul. 5, 1977, Ser. No. 812,526

Int. Cl.^{2} G01J *1/20*

U.S. Cl. 250—203 R **2 Claims**



1. A system for tracking the relative movement of the sun and earth comprising:

a base member;

a positionable platform carried by said base member;

a plurality of light sensors, each light sensor providing a control signal when exposed to the direct rays of the sun, said sensors being positioned in a spaced apart relationship about the periphery of said positionable platform providing a first and second pair of diagonally opposed light sensors;

shielding means positioned adjacent each of said plurality of light sensors for preventing the direct rays of the sun from striking more than one light sensor of each pair of light sensors at any given time;

a first positioning means responsive to said control signals from said first pair of light sensors for providing directional rotation of said positionable platform with respect to said base member along a first path of travel between physical restraints; and

a second positioning means responsive to the control signals from said second pair of light sensors for providing directional rotation of said positionable platform with respect to said base member along a second path of travel between the physical restraints;

said first and second positioning means include control signal interruption means for stopping the movement of said positionable platform along said first and second paths of travel prior to reaching said physical restraints.

4,103,152

DISTANCE DETERMINING AND AUTOMATIC FOCUSING APPARATUS WITH FALSE PEAK DISCRIMINATION

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1976, Ser. No. 700,963

Int. Cl.^{2} G01J *1/36*

U.S. Cl. 250—204 **5 Claims**

1. Apparatus for providing a measure of the distance between the apparatus and an object, comprising a plurality of radiation responsive elements in two image correlation arrays,

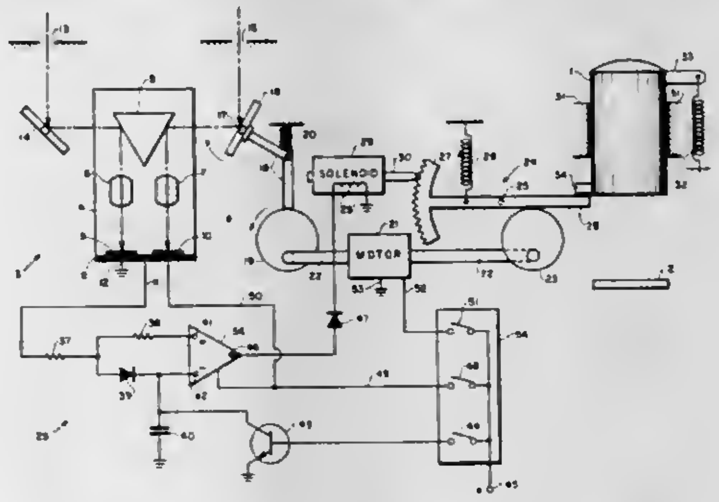
optical means for imaging said object on said image correlation arrays,

scanning means for relatively moving at least a portion of said optical means and said image correlation arrays through a range of relative positions during a scanning period,

signal processing means connected to said image correlation arrays to produce a correlation signal which peaks in a given direction at a one of said positions which is unique for the existing object distance, and which tends to peak in said direction to a lesser extent at others of said positions,

selective means connected to receive said correlation signal for producing a predetermined control effect upon the occurrence of each of said peaks in said period which is greater than all previous ones of said peaks occurring during said period, and

responsive means responsive to said control effect to effectively identify the one of said positions at which said control effect is finally produced in said period as a measure of the existing object distance, said responsive means including first means coupled to said scanning means for providing a ramp signal of a value which changes in synchronism with said relative movement such that, at any time in said period, the value of said ramp signal represents the concurrent one of said relative positions, and second means connected to said first means to receive said ramp signal, and connected to said selective means to receive said control effect, for providing an output signal of a value which represents the value had by said ramp signal at the time of the latest production of said control effect in said period, the value of said output signal at the end of said period thus being a measure of the existing object distance.



4,103,153

DEVICE FOR MEASURING LIGHT INCIDENT ON AN IMAGE FORMING OPTICAL SYSTEM

Kazuya Matsumoto, Yokohama; Susumu Matsumura, Kawasaki; Aiichiro Koyama, Hokkaido; Youichi Okuno, Yokohama; Tokulchi Tsunekawa, Yokohama, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1976, Ser. No. 691,628

Claims priority, application Japan, Jun. 6, 1975, 50-68765; Jun. 6, 1975, 50-68766; Jun. 6, 1975, 50-68767; Jun. 6, 1975, 50-68768; Jun. 6, 1975, 50-68769; Jun. 6, 1975, 50-68770; Jun. 6, 1975, 50-68771; Jun. 6, 1975, 50-68772; Jun. 6, 1975, 50-68773; Jun. 6, 1975, 50-68774; Jun. 6, 1975, 50-68775; Jun. 6, 1975, 50-68776; Jun. 6, 1975, 50-68777; Jun. 6, 1975, 50-68778; Jun. 6, 1975, 50-68779; Jun. 6, 1975, 50-68780; Jun. 6, 1975, 50-68781; Jun. 6, 1975, 50-68782; Jun. 6, 1975, 50-68783

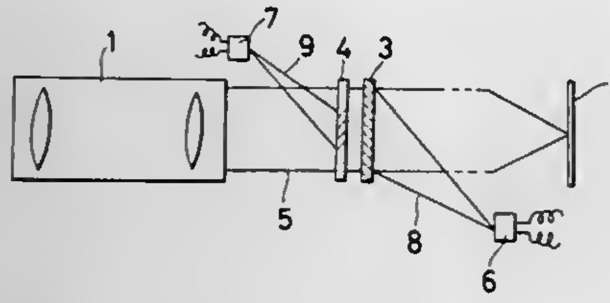
Int. Cl.^{2} G02B *5/14*

U.S. Cl. 250—227 **2 Claims**

1. A device for measuring light incident on an image forming optical system, comprising:

an image forming optical system for forming an image of an object on an image plane with which an optical path is formed;

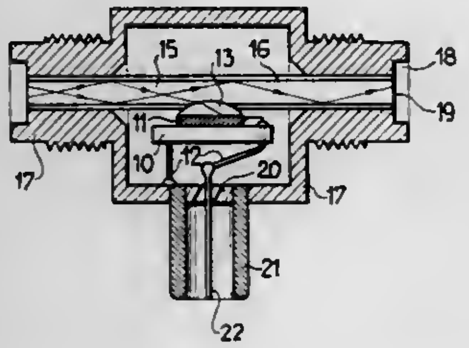
a plurality of diffraction lattice elements arranged in the optical path, each of which being carried by a transparent member, each having constant predetermined size and being substantially different from each other in area; and



a photo detector means to which diffraction light from said plurality of diffraction lattice elements is directed.

4,103,154
ELECTRO-OPTICAL BRANCHING DEVICE AND METHOD OF MANUFACTURING THE SAME

Luigi d'Auria; André Jacques, and Philippe Maillot, all of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Jan. 26, 1977, Ser. No. 762,509
Claims priority, application France, Jan. 27, 1976, 76 02191
Int. Cl.^{2} G02B *5/14*
U.S. Cl. 250—227 **2 Claims**



1. An electro-optical branching device for picking up a fraction of optical radiation and converting the latter into an electrical signal, said device comprising a casing, a single optical fibre comprising an inner core and an outer cladding and having two ends, said outer cladding comprising a lateral opening, said casing surrounding said fibre and forming around said two ends mechanical connecting ferrules for connection to complementary ferrules, said device further comprising a photodetector element placed in said casing, said element having a sensitive area facing said opening and being fixed to said core through said opening by a sealing material to transmit said fraction of optical radiation; the refractive index of said sealing material being at least equal to that of said cladding.

4,103,155
POSITIONAL SENSOR-OPERATOR SYSTEM

Malcolm D. Clark, 4 St. Ronans Dr., Glascow G413 SJ, Scotland
Filed Oct. 14, 1976, Ser. No. 732,348
Claims priority, application United Kingdom, Oct. 16, 1975, 42406/75
Int. Cl.^{2} G01D *5/34*
U.S. Cl. 250—231 SE **24 Claims**

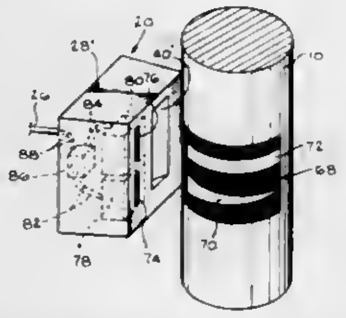
1. In combination with a rotary member, a positional sensor-operator system comprising:

a light reflective program area carried by said rotary member to rotate therewith, the length of said program area extending in a circumferential direction with respect to said rotary member and the width of said program area varying along the length of said program area as a function of lengthwise distance from one end of said program area so as to be indicative of the angular position of said rotary member and the light reflective characteristics being substantially uniform over said program area;

a reference area having light reflective characteristics substantially identical to those of said program area and carried by said rotary member to rotate therewith, the length of said reference area extending in a circumferential direction with respect to said rotary member and the width of said reference area being substantially uniform along its length;

means for projecting light onto at least a part of said program area over an extent transverse to said program area at least as broad as the maximum width of said program area and further operative to project light onto at least a part of said reference area over an extent transverse to said reference area at least as broad as the width of said reference area;

primary detector means operative to detect the amount of light being reflected from the entire width of a limited lengthwise portion of said program area aligned with said primary detector means, said primary detector means being disposed opposite said program area whereby successive lengthwise portions of said program area will pass and primary detector means as said rotary member is rotated, said primary detector means further being operative to produce an output signal which is a function of the width of said program area;



auxiliary detector means disposed opposite said reference area and operative to detect the amount of light being reflected from a limited lengthwise portion of said reference area aligned with said auxiliary detector means, said auxiliary detector means further being operative to produce an output signal which is proportional to the amount of light being reflected from the aligned portion of said reference area;

means for producing a net output signal which is a function of the difference between the output signal of said primary detector means and the output signal of said auxiliary detector means;

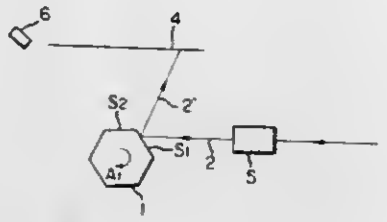
and operator means operably connected to said means for producing said net output signal to receive said net output signal and produce a programmed response thereto.

4,103,156
LIGHT SCANNING DEVICE

Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama, and Yasushi Sato, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1976, Ser. No. 746,832
Claims priority, application Japan, Dec. 12, 1975, 50-147862
Int. Cl.^{2} H01J *3/14*
U.S. Cl. 250—236 **4 Claims**

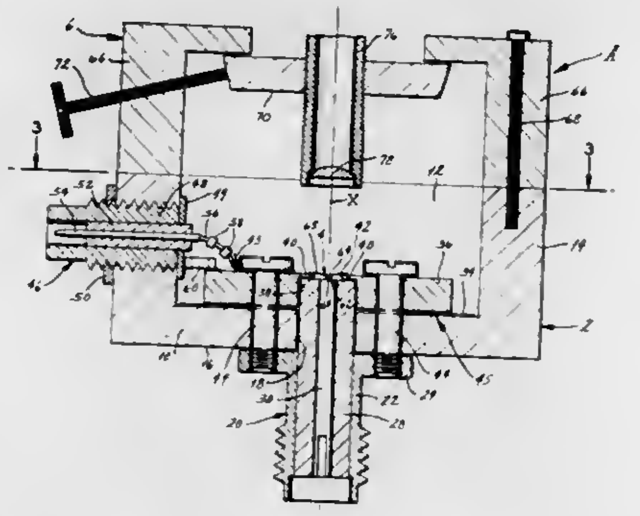
1. A scanning device for reflecting a light beam, comprising:

a. a light source for emitting a light beam;
b. a deflector having a reflecting surface which receives the light beam from said light source;
c. means to detect the incidence position of the light beam on the reflecting surface of said deflector; and
d. light intercepting means to interrupt the incidence of the light beam on said reflecting surface in accordance with a detection signal from said detector means indicating that the incidence position of said light beam has shifted to the corner of said reflecting surface.



4,103,157
HIGH SPEED PHOTODETECTOR AND SYSTEM

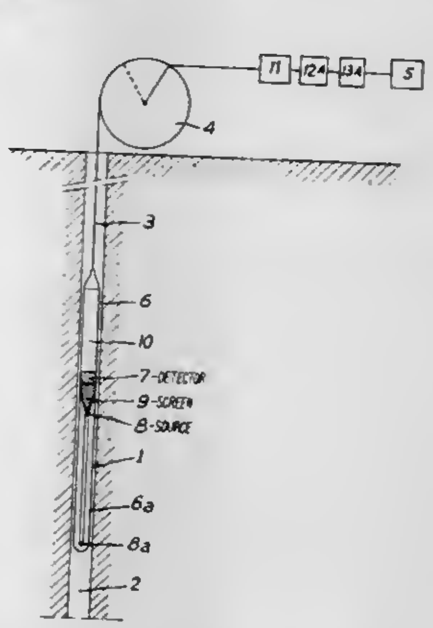
Samuel I. Green, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Feb. 4, 1977, Ser. No. 765,728
Int. Cl.^{2} H01J *5/02*
U.S. Cl. 250—239 **14 Claims**



1. A detector for sensing light pulses, said detector comprising: a metal base; a metal coverplate overlying the base and having a forwardly presented aperture therein; a dielectric material interposed between the coverplate and the base such that the dielectric material together with the base and coverplate form a parallel plate capacitor; a conductor extended through the base and into the coverplate and having its forward end at the aperture in the coverplate; a photosensitive diode in unpackaged chip form mounted on the forward end of the conductor and having a forwardly presented photosensitive surface which is exposed through the aperture, the diode further having first and second terminals with the first terminal being electrically connected directly to the conductor and the second terminal being electrically connected to the cover plate, a reversely biasing potential being applied to the diode across the parallel plate capacitor, whereby when a light beam illuminates the photosensitive surface of the diode, the diode will produce a signal in the form of an electrical current which may be analyzed with an oscilloscope connected to the conductor and base.

4,103,158
METHOD AND APPARATUS FOR GEOPHYSICAL PROSPECTING BY RADIOACTIVE DIAGRAPHY

André J. Kermabon, Marseille, France, assignor to Syminex, Marseilles, France
Filed Oct. 15, 1976, Ser. No. 732,601
Claims priority, application France, Oct. 31, 1975, 75 34024
Int. Cl.^{2} G01V *5/00*
U.S. Cl. 250—269 **9 Claims**



1. A prospecting method using radioactive diagraphy in a drill-hole comprising the steps of:

vertically displacing in the said drill-hole, at a slow speed, a probe including a radioactive source, at least one particle detector and one screen placed between said radioactive source and said detector;

periodically and rapidly displacing said source within the probe from a first position close to said at least one detector and at which the source bombards the terrain to be tested to a second position remote from said at least one detector;

periodically and rapidly displacing said at least one detector and the screen placed between said detector and the source, within the probe, in synchronism with the source from a first position adjacent the first position of said source to a second position corresponding substantially to the first position of said source, whereby when the source is in the second position remote from said at least one detector said at least one detector is surrounded by the terrain which has been bombarded by the source when the source was in its first position close to said detector;

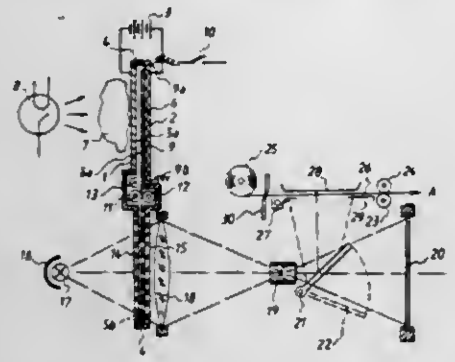
and measuring with said detector, when the source is in said second position, the delayed radiation having a specific energy, which is emitted by the terrain surrounding the detector in its second position which was previously bombarded by the source.

4,103,159
RADIOGRAPHIC METHOD AND APPARATUS

Jürgen Orthmann, Grunwald, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Mar. 4, 1977, Ser. No. 774,411
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610514
Int. Cl.^{2} G03B *41/16*
U.S. Cl. 250—315 R **17 Claims**

1. A method of making X-rays images, comprising the steps of confining a high Z gas in the interelectrode gap of an ionography imaging chamber; introducing into the gap a dielectric receptor sheet having a film consisting of thermoplastic material; heating said film to the softening point of said material; exposing the thus softened film to object-modulated X-rays

whereby the film develops a relief image of the object; and rendering said relief image visible in accordance with the schlieren optical effect, including transferring the sheet from said interelectrode gap into a second gap which communicates with said interelectrode gap and which is also filled with said high Z gas whereby the pressure of such gas in said second gap equals the pressure in said interelectrode gap, and directing a beam of light against the sheet in said second gap.



4,103,160
OPTICAL SCANNING EQUIPMENT

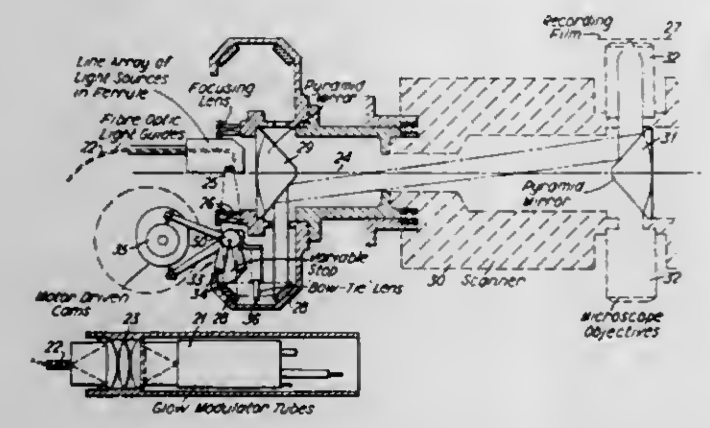
Colin Roy Moss, Dunstable, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Nov. 17, 1970, Ser. No. 97,401

Claims priority, application United Kingdom, Nov. 19, 1969, 46391/69

Int. Cl.^{2} H01J *31/49;* G02B *13/08*

U.S. Cl. 250—334 **8 Claims**



1. Line-scanning equipment for scanning a scene over a wide angle, especially in connection with obtaining a photographic record of a terrestrial scene passing beneath an aerial vehicle, wherein the scene is scanned repeatedly in a direction at right angles to the direction of travel of the equipment relative to the scene being scanned and the angle θ of the scanning beam relative to a line generally perpendicular to the nominal plane of the scene being scanned repeatedly varies between zero and a maximum, whereby the area scanned during each complete scan has a "bow-tie" shape, characterized in that a correcting optical lens is employed having a curvature varying in accordance with a secant function of the angle θ, in conjunction with shutter means operative to restrict the recorded image to that part of the recording beam information which is derived from a parallel-sided ground area within the "bow-tie" area.

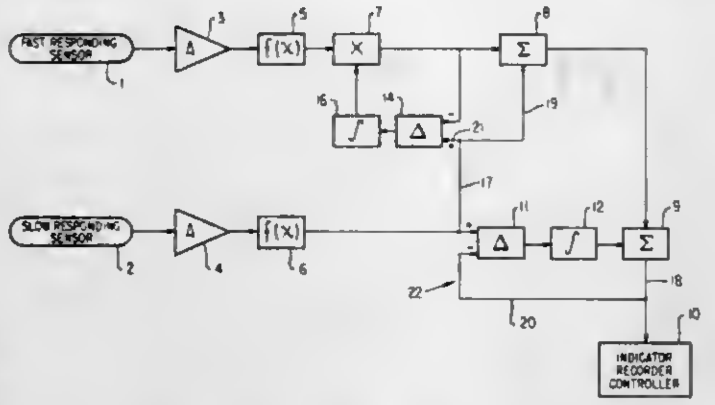
4,103,161
COMPOSITE TRANSDUCER

Frederick Young Thomasson, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,638

Int. Cl.^{2} G01T *1/16, 3/00*

U.S. Cl. 250—336 **8 Claims**



1. A transducer generating an output signal proportional to the magnitude of a physical condition, comprising, a first prompt responding sensor generating a signal corresponding to the magnitude of the physical condition, a second slow responding sensor generating a signal corresponding to the magnitude of the physical condition of high accuracy relative to the accuracy of the first sensor but having a long time constant relative to the time constant of the first sensor, a circuit responsive to the signals generated by the first and second sensors generating an output signal varying in accordance with changes in the signal generated by the first sensor and including means adjusting the circuit output signal to correspond to the signal generated by the second sensor at a controlled rate.

4,103,162
APPARATUS FOR THE CONTINUOUS MEASUREMENT OF THE CONCENTRATION OF OIL

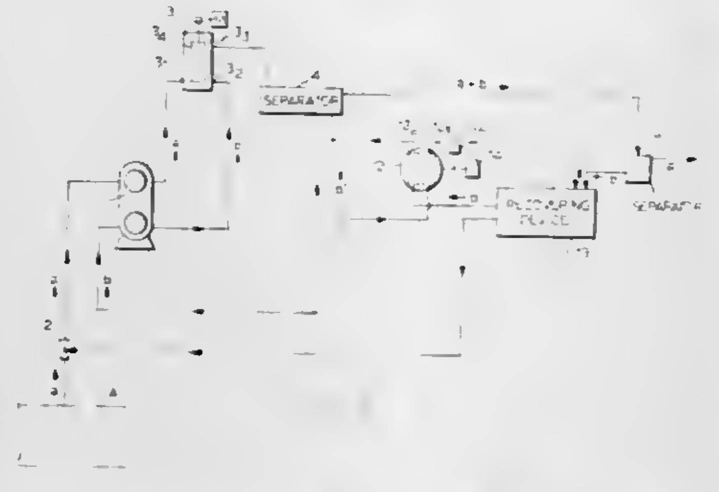
Michinori Iwamoto, and Toshiyuki Nomura, both of Kyoto, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 10, 1976, Ser. No. 749,618

Claims priority, application Japan, Jan. 12, 1976, 51-2642

Int. Cl.^{2} G01N *21/34*

U.S. Cl. 250—343 **3 Claims**



1. An apparatus for the continuous measurement of the concentration of oil in a water sample, comprising a supplying device which supplies an oil-containing water sample and a supplying device which supplies a solvent for extracting the oil in the sample, each of said water sample and solvent being supplied in a controlled and continuous amount, an extractor connected to said supplying devices having an agitator therein, which extractor receives said oil-containing water sample and solvent and serves to extract the oil component in the water sample with the solvent; a first separator connected to said extractor and which receives the mixture of oil-containing solvent and extracted water sample from the extractor and serves to quickly but incompletely separate the oil-containing solvent and extracted water sample, said first separator containing an inlet to receive the mixture of oil-containing solvent and extracted sample from the extractor, a hydrophobic filter to separate the oil-containing solvent from the extracted water sample, one outlet for removing the oil-containing solvent and another outlet for removing a mixture of the extracted water sample and oil-containing solvent which have not been separated; an infra-red analyzer containing two cells for measuring the concentration of oil, one cell being connected directly to the outlet of the first separator for removing the separated oil-containing solvent therefrom and which cell receives said oil-containing solvent and measures the concentration of oil in said oil-containing solvent and a second reference cell; a second separator connected to said first separator for receiving the sample water and the oil-containing solvent not separated in the first separator and which serves to separate the oil-containing solvent from the water sample, said second separator containing an outlet to remove and discard the separated water sample, and an outlet to remove the separated oil-containing solvent; a solvent recovery device connected to both the second separator and the first cell in the infra-red analyzer and which receives the oil-containing solvents from both the second separator and first cell, and which contains an adsorbent to remove the oil from the oil-containing solvent so as to recover the solvent with the oil removed therefrom.

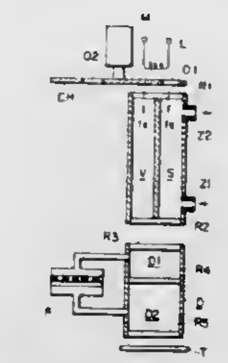
4,103,163
INFRARED GAS ANALYZING APPARATUS

Toshiyoshi Hamada, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 3, 1977, Ser. No. 793,343

Int. Cl.^{2} G01N *21/26*

U.S. Cl. 250—344 **14 Claims**



1. In an infrared ray gas analyzing apparatus including a measuring vessel for containing a sample or a reference gas and arranged to be intermittently exposed to and transmit therethrough infrared light energy, first and second gas-filled detecting chambers disposed in ordered series after said vessels and axially aligned therewith for absorbing infrared light energy transmitted therethrough, and detecting means coupled between said first and second chambers for sensing pressure variation differences therebetween, the improvements characterized by:

(a) the end of said second chamber most remote from said vessels being transparent to infrared light energy, and
(b) adjustable reflecting means disposed after said second chamber end for reflecting a portion of the infrared light energy transmitted through said end back into said second chamber, whereby the degree of reflection may be suitably adjusted such that any interference gas component in a gas sample being analyzed has an equal influence on the absorbtion characteristics of both the first and second chambers, to thereby render its effects self-cancelling.

4,103,164
RADIACMETER WITH NULL DEFLECTION SYSTEM

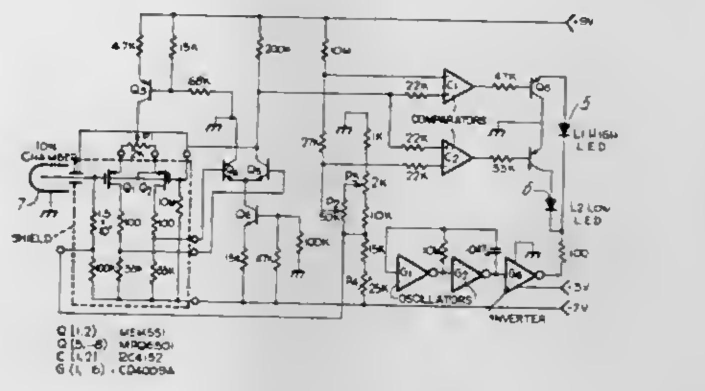
Philip C. East, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Jan. 14, 1977, Ser. No. 759,580

Claims priority, application Canada, Mar. 9, 1976, 247484

Int. Cl.^{2} G01T *1/18*

U.S. Cl. 250—374 **9 Claims**



1. A hand held self contained gamma radiation dose-rate meter comprising: a substantially rigid, pocket sized casing which contains:

(a) power supply means;
(b) radiation detection means which generates an output voltage in the presence of an ionizing radiation and quasi-logarithmically proportional thereto, operatively connected to said power supply means;
(c) means to amplify said output voltage;
(d) linear potentiometer means to compare a reference voltage provided thereby with said output voltage; and
(e) visual means to indicate high and low comparison readings, viewable externally of said casing, thereby defining a null deflection readout system.

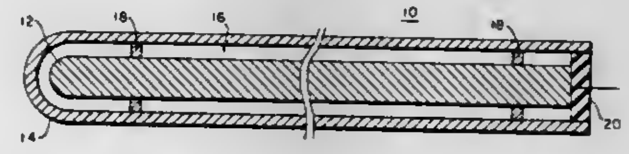
4,103,165
NEUTRON RESPONSIVE SELF-POWERED RADIATION DETECTOR

Donald P. Brown, Richland, and Collins P. Cannon, Kennewick, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,625

Int. Cl.^{2} G01T *3/00*

U.S. Cl. 250—390 **1 Claim**



1. A neutron responsive self-powered radiation detector comprising a neutron absorptive, low density, conductive emitter of beryllium, and a substantially neutron transmissive conductive collector sheath of ferro-alloy spaced from and disposed about the emitter, with the space between the emitter and the collector sheath being evacuated.

4,103,166

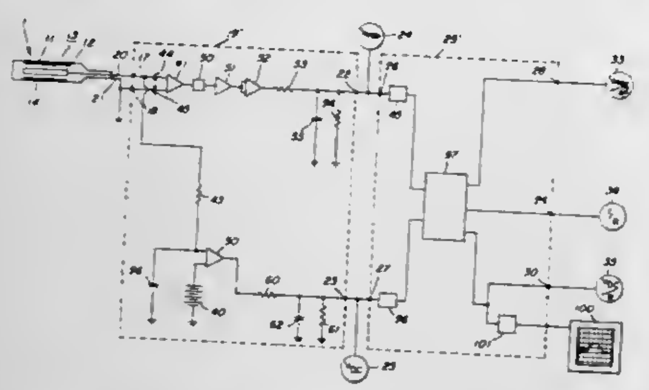
METHOD AND APPARATUS FOR MONITORING THE OUTPUT OF A NEUTRON DETECTOR

John P. Niessel, San Jose; Walter K. Green, Gilroy, and Yogeshwar Dayal, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 14, 1977, Ser. No. 768,551

Int. Cl.^{2} G01T *3/00*

U.S. Cl. 250—391 **21 Claims**



1. A method for monitoring a neutron detector of the type having a chamber filled with an ionizable gas producing an alternating and a direct current both representative of the neutron flux in the chamber and a direct current representative of the gamma radiation in the chamber comprising the steps of:

forming an AC signal, V_{MSV}, proportional to the alternating current in said chamber,

forming a DC signal, V_{DC}, proportional to the direct current in said chamber,

forming a ratio, R, of said AC signal to said DC signal, and monitoring said ratio, to detect a change in gas density in said chamber.

4,103,167

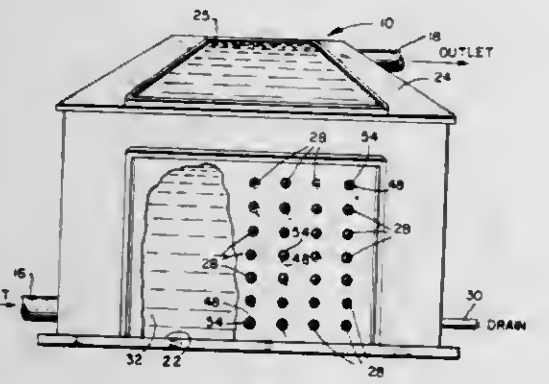
ULTRAVIOLET LIQUID PURIFICATION SYSTEM

Sidney Ellner, 6 Tudor Pl., Hartsdale, N.Y. 10530

Filed Aug. 16, 1976, Ser. No. 714,777

Int. Cl.^{2} G01N *21/24*

U.S. Cl. 250—432 R **12 Claims**



1. An ultraviolet liquid purification system comprising an ultraviolet purification chamber having liquid inlet and outlet ports; a plurality of ultraviolet lamps located within said chamber and operative to irradiate liquid in said chamber; a plurality of ultraviolet sensors located to detect ultraviolet radiation transmitted through said liquid from said ultraviolet lamps; a plurality of light conducting fibers for monitoring the operation of said ultraviolet lamps, each of said light conducting fibers having its endface located in close proximity with a corresponding ultraviolet lamp to directly receive light radiation therefrom; ultraviolet transmission indicator means operative in response to said ultraviolet sensors to produce an ultraviolet transmission indicator signal corresponding to the detected ultraviolet radiation transmitted through said liquid; and lamp condition indicator means associated with said light conducting fibers and operative to produce a lamp condition indicator signal corresponding to the light emitted by said lamps.

4,103,168

ELECTRON BEAM MICROFABRICATION APPARATUS

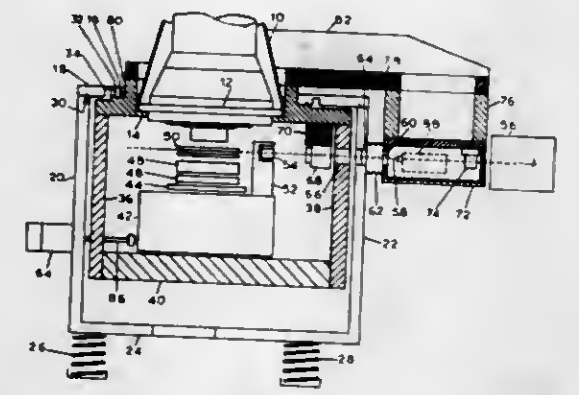
John Monro Sturrock, Cambridge, and Bernard Allan Wallman, Harston, both of England, assignors to Cambridge Scientific Instruments Limited, England

Filed Jul. 13, 1977, Ser. No. 815,302

Claims priority, application United Kingdom, Jul. 14, 1976, 29204/76

Int. Cl.^{2} G21K *5/06*

U.S. Cl. 250—442 **16 Claims**



1. Apparatus for electron beam microfabrication in which a substrate is located on a stage below the final lens of an electron microscope column which includes the final lens at its lower end and in which the stage is moved relative thereto for exposing different fabricated detail on the surface of the substrate comprising:

(a) a mounting in the form of a rigid member having an aperture within which the final lens can be located,

(b) first rigid support means which extends downwardly from the rigid apertured member,

(c) a moveable stage,

(d) at least one reflecting device, both the moveable stage and the reflecting device being carried by the first rigid support means,

(e) second rigid support means for carrying remote interferometer means,

(f) a laser source and receiver means which are mounted in alignment with the remote interferometer means whereby at least the stage, the final lens, the remote interferometer means and the reflecting device form a unitary sub-assembly all the component parts of which are rigidly mounted with respect to the single rigid apertured member.

4,103,169

APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION

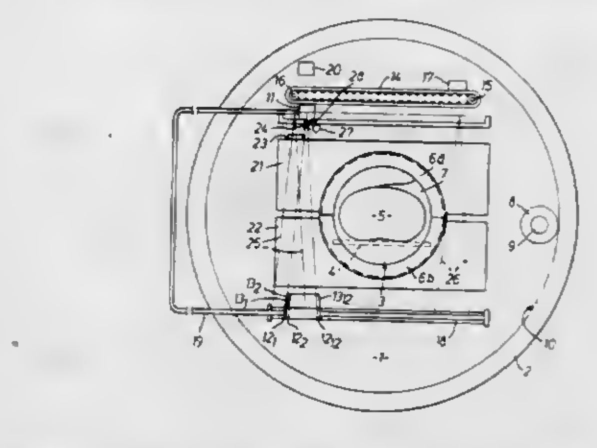
Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 502,080, Aug. 30, 1974, Pat. No. 3,946,234. This application Jan. 23, 1976, Ser. No. 651,813

Int. Cl.^{2} G01N *23/00*

U.S. Cl. 250—445 T **5 Claims**

1. Medical radiographic apparatus for investigating a substantially planar region of the body of a patient for the purpose of evaluating the absorption coefficient, with respect to penetrating radiation, at a plurality of elemental locations distributed over said region, the apparatus comprising a rotatable support member having an aperture adapted to receive the part of said body in which said region is located, a motor for causing said support member to rotate about an axis which intersects said region and passes through said aperture, a source of said penetrating radiation, said source being supported by said member and being disposed to project said radiation through said aperture with said radiation fanning out from said source and in alignment with said region, a bank of radiation-sensitive detectors supported by said support member and disposed to intercept radiation which has traversed said aperture; said detectors being positioned to intercept radiation projected along respective beams of said radiation and arranged to provide output signals indicative of the amount of radiation transmitted along the paths, through the aperture, followed by said beams, the beams diverging as they proceed away from the source, lateral scanning means for moving said source laterally in alignment with said region so as to scan said radiation laterally across said region; the lateral movement of the source being emulated by the bank of detectors so that, during each lateral scanning motion, each detector provides a group of output signals indicative of the amount of radiation transmitted through said aperture along a respective set of substantially parallel beam paths; the sets being orientated with respect to each other in accordance with the angular separation of the beams, the motor and the lateral scanning means being operatively connected to produce a plurality of lateral scans in which said diverging beams are rotated as a whole by an angle corresponding to the number of beams and their angular separation.



4,103,170

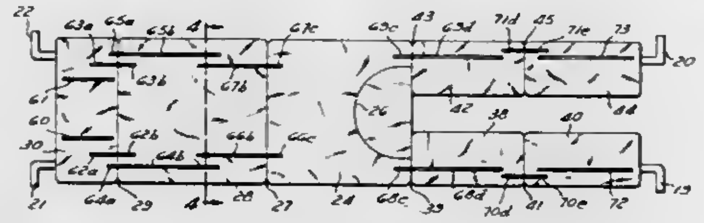
PORTABLE MEDICAL TABLE

Richard V. Spradlin, R.D. 1 Gurda La., Pine Island, N.Y. 10969

Filed Sep. 22, 1977, Ser. No. 835,822

Int. Cl.^{2} A61G *1/00, 13/00;* **G21K** *5/08*

U.S. Cl. 250—451 **4 Claims**



1. In a portable medical table having a rigid base, and a plurality of top sections for supporting different parts of the body overlying the base and positioned in succession along the length of the base and individually adjustable to different positions with respect to each other, each of said support sections having downwardly extending slots which are open at the top for the slidable insertion and removal of X-ray plates, at least certain of said top sections each having a pair of said downwardly extending slots spaced apart laterally to be located on opposite sides of the part of the body supported by that top section,

the improvement wherein successive top sections have downwardly extending, adjoining slots that register with and open toward each other for together receiving a single X-ray plate.

4,103,171

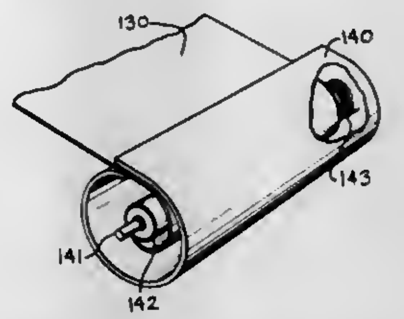
PORTABLE CARTRIDGE CONTAINED ELECTROLUMINESCENT SHEET FOR READING AND WRITING IN THE DARK

Becky J. Schroeder, 2317 Valleybrook Dr., Toledo, Ohio 43615

Continuation-in-part of Ser. No. 639,200, Dec. 9, 1975, which is a continuation-in-part of Ser. No. 567,397, Apr. 11, 1975, Pat. No. 3,978,340, which is a continuation-in-part of Ser. No. 498,705, Aug. 19, 1974, Pat. No. 3,879,611, which is a continuation-in-part of Ser. No. 428,339, Dec. 23, 1973, Pat. No. 3,832,556, which is a continuation of Ser. No. 288,148, Sep. 11, 1972, abandoned. This application May 13, 1977, Ser. No. 796,694

Int. Cl.^{2} F21K *7/00, 2/00;* **H01J** *1/66;* **H05B** *41/16*

U.S. Cl. 250—458 **10 Claims**



6. A portable containerized electroluminescent light unit comprising an electroluminescent sheet wound into a cylindrical configuration and a cartridge holding said sheet in its wound condition, a power source for said unit being in general centrally contained within said cartridge with said sheet being wound spirally around said power source, said cartridge having an opening from which an edge of the sheet can be withdrawn to extend the sheet for exposure of light emitted therefrom.

4,103,172

NUCLEAR LIGHT SOURCE

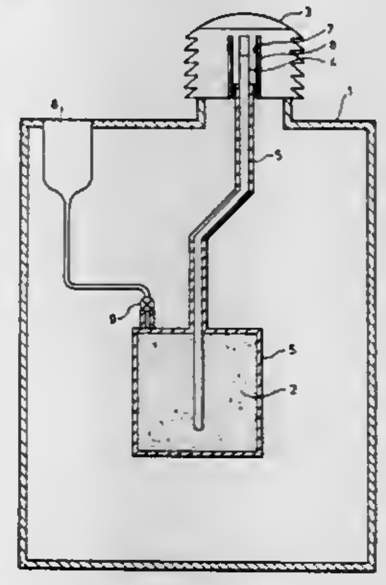
Nigel Lawrence Spottiswoode, Bala, Wales, and David John Ryden, Nr. Wantage, England, assignors to AGA Navigation Aids Ltd., England

Filed Mar. 26, 1976, Ser. No. 670,688

Claims priority, application United Kingdom, Mar. 26, 1975, 12661/75

Int. Cl.^{2} F21K *2/02*

U.S. Cl. 250—462 **31 Claims**



1. A light source comprising:

a radio isotope fuel source;

thermal insulation against heat loss surrounding said fuel source;

a biological shield against the escape of ionizing radiation surrounding said fuel source and said thermal insulation;

a material having a surface which attains incandescence when subject to isotope decay heat;

means for transferring energy from said insulated fuel source to produce incandescence of said surface and thereby emit light; and

a filter associated with said surface permitting a relatively high transmission of radiation from the fuel source in the visible spectrum and a relatively high reflectance in the infra red spectrum thereby increasing the luminous efficiency of said light source.

4,103,173
FLUORESCENT SCREEN

Hans-Günter Danielmeyer, Wedel, and Werner Hartmann, Esslingen-Berkheim, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur Forderung der Wissenschaften e. V., Göttingen, Fed. Rep. of Germany

Filed Feb. 19, 1976, Ser. No. 659,469

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1975, 2507877

Int. Cl.² G01J ***1/58;*** **G01N** ***21/38***

U.S. Cl. 250—483 **11 Claims**

1. Apparatus for producing a visible image in response to invisible radiation comprising:

(a) a source of ultraviolet rays, X-rays, δ-rays, or rays of charged particles; and

(b) a fluorescent screen exposed to rays from said source and including a layer of fluorescent material, said material being a compound having a formula selected from the group consisting of $(A_2O)_a(Ln_2O_3)_b(P_2O_5)_c$, $(Ln_2O_3)_p(Al_2O_3)_q(B_2O_3)_r$, and $LnZrF_7$

wherein

a is zero or a positive integer not greater than 100, *b, c, p, g,* and *r* are positive integers not greater than 100,

A is at least one alkali metal, and

Ln is at least one rare earth metal, the ions of said rare earth metal being spaced apart in said compound more than 5 Angstrom units.

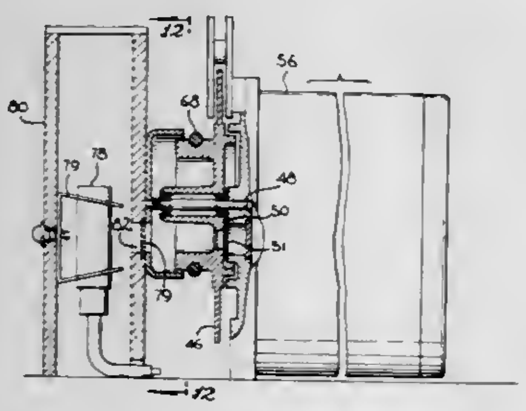
4,103,174
INFRARED SOURCE FOR USE IN AN INFRARED GAS DETECTOR

Edward A. McClatchie; Dean A. Watson, both of Berkeley, and Irvin G. Burough, Walnut Creek, all of Calif., assignors to Andros, Incorporated, Berkeley, Calif.

Division of Ser. No. 509,838, Sep. 27, 1974, Pat. No. 4,013,260. This application Dec. 13, 1976, Ser. No. 749,836

Int. Cl.² G21G ***4/00;*** **G21K** ***1/00;*** **H05B** ***3/10***

U.S. Cl. 250—493 **6 Claims**



1. For use in an infrared gas detector, an infrared source comprising:

an infrared radiation emitting element having first and second electrical connections,

an enclosure for said element having a predetermined transmissive area which is substantially transmissive to infrared radiation to allow infrared radiation from said element to proceed along an optical path, said enclosure including means for supporting said element, in fixed disposition with respect to said transmissive area, the outer surface of said element and the inner surface of said enclosure each having an emissivity of at least 0.7 with respect to infrared radiation.

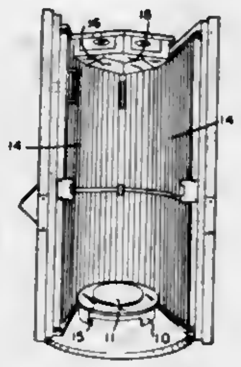
4,103,175
PHOTOTHERAPY IRRADIATION CHAMBER

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 22, 1976, Ser. No. 743,873

Int. Cl.² G01J ***1/00***

U.S. Cl. 250—504 **8 Claims**



1. A phototherapy irradiation chamber having substantial uniformity of irradiance of 320–380 nanometer radiation therewithin comprising an array of vertical fluorescent lamps surrounding the irradiation space, a bottom reflector and a top reflector disposed within the array at the bottom and top respectively of the irradiation space, the ends of the lamps extending beyond the reflectors for the purpose of obtaining said substantial uniformity of irradiance.

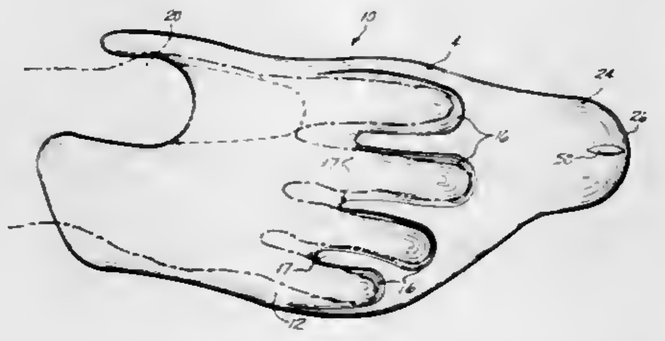
4,103,176
HAND-HELD COMPRESSOR FOR USE BY RADIOLOGIST

Maurice J. Coyle, 3326 Wesleyan Dr., Anchorage, Ak. 99504

Filed Jan. 6, 1977, Ser. No. 757,220

Int. Cl.² G21F ***3/02***

U.S. Cl. 250—516 **7 Claims**



1. A hand-held compression device for use by radiologists or the like for manipulating or compressing the abdomen to flatten selected portions of the intestinal tract of a patient into whom radiopaque solution of barium sulfate or the equivalent has been injested in order that abnormalities situated in the intestinal tract such as tumors or polyps are visible on a fluoroscope, said compression device comprising:

a relatively strong and broad body portion having first and second opposed, generally parallel faces and being sized to have a width at least equivalent to the palm portion of the user's hand and contoured on at least one face to accommodate the user's fingers thereon and be gripped between the thumb and fingers of the hand with the hand palm open,

a relatively strong and small rounded protrusion projecting forwardly from the front of said body portion and of a width less than said body portion, said protrusion coacting with said body portion during use and including a generally rounded contact portion situated at the end of said protrusion, and adapted to be used to manipulate the patient's abdomen when the user's hand is gripping said body portion, and wherein at least said contact portion is formed of a radiolucent material so that when the user's hand gripping said body portion is fully enclosed in a radiopaque covering, such as a glove or the like, the contact portion situated forwardly of the user's hand can be used to manipulate and depress the patient's abdomen without blocking or otherwise interfering with the radiated signals of the fluoroscope through the area being evaluated, and wherein said contact portion has a contact surface and said contact surface and one of said first and second faces are on the same side of said compression device and lie generally in the same plane whereby the protrusion being of small area is generally more pliable than the main body and acts as an extension of the fingers of the user.

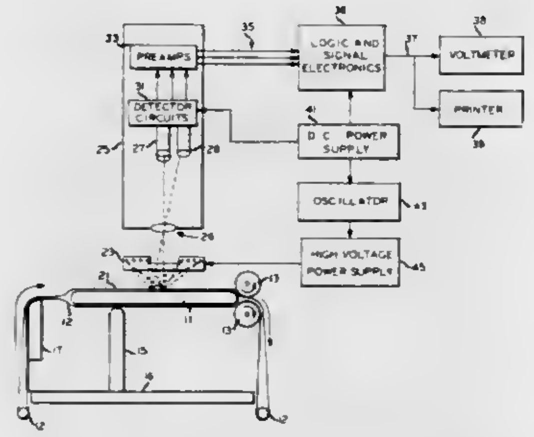
4,103,177
SURFACE QUALITY ANALYSIS

Richard A. Sanford, and Edwin K. Clardy, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 1, 1975, Ser. No. 636,490

Int. Cl.² G01N ***21/30, 21/32***

U.S. Cl. 250—562 **61 Claims**



1. Apparatus comprising:

light source means for illuminating at least a portion of a surface;

detector assembly means for directing reflected light from said surface to a plurality of detector means for producing a plurality of reflectance signals responsive to the reflected light impinging thereon, said detector means being located within said detector assembly means, said detector assembly means being supported in a fixed position relative to said light source means;

drive means for effecting relative motion between said detector assembly means and said surface to provide scanning of said surface by said detector means; and

means for generating, in response to said plurality of reflectance signals, at least one surface quality signal responsive to the reflective characteristics of said surface;

wherein said detector assembly means comprises a lens and wherein the operative surface of each said detector means is located at the focal plane of said lens, said plurality of detector means being positioned in a preselected array to provide substantially simultaneous detection of reflected light from a plurality of preselected locations past which relative movement of said surface is accomplished during scanning of said surface; wherein said preselected locations comprise a substantially straight line positioned generally perpendicular to the direction of relative motion between the detector assembly means and said surface during scanning of said surface;

wherein there are two said detector means and wherein said means for generating said at least one surface quality signal comprises:

differentiating means associated with each said detector means for differentiating each said reflectance signal to produce a differential signal representative of the rate of change of its associated reflectance signal; and

discriminator means for generating, in response to said differential signals, a discriminatory signal which is proportional to the magnitude of the smaller of said differential signals when said differential signals are of the same polarity and which is equal to zero when said differential signals are of opposite polarity.

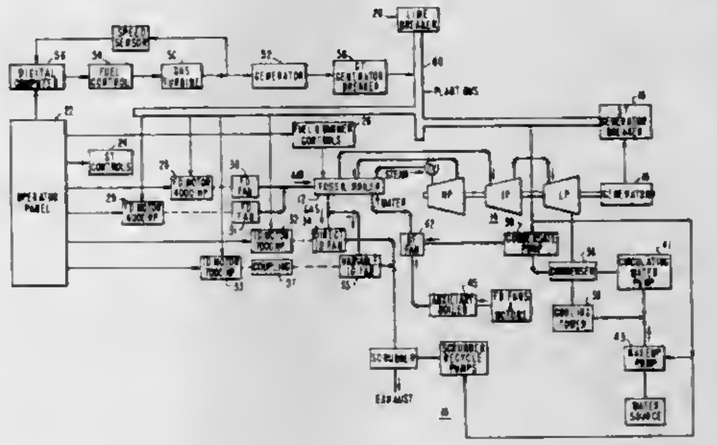
4,103,178
BLACK START SYSTEM FOR LARGE STEAM POWERED ELECTRIC GENERATION PLANTS

Robert A. Yannone, Aldan, and John F. Reuther, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,688

Int. Cl.² F02N ***11/06***

U.S. Cl. 290—40 R **7 Claims**



1. A system for black starting a large fossil fired electric power plant having a boiler and a steam turbine-generator and large electric motors and other smallar auxiliary loads which must be energized electrically before the steam turbine-generator can become operational, said system comprising a gas turbine-generator having a fuel system with a fuel valve, means for operating said fuel valve to control the gas turbine speed during and after startup to a predetermined limit speed higher than rated and higher than the normal limit speed, means for setting said fuel valve control in a black start mode in which a load rate limit is applied to the fuel valve operation only if an actual load step exceeds a predetermined limit amount, means for applying the auxiliary plant loads to said gas turbine-generator in accordance with a predetermined sequence after the latter has been started, and means for connecting the steam and gas turbine generators to a common bus after the steam turbine-generator has been started.

4,103,179
APPARATUS FOR STIMULATED EMISSION OF COHERENT, CONTINUOUSLY TUNABLE RAMAN RADIATION

Werner Schmidt, Aalen, Germany, assignor to Lambda Physik GmbH & Co. KG, Germany

Continuation of Ser. No. 314,462, Dec. 12, 1972, abandoned. This application Jul. 15, 1974, Ser. No. 488,404

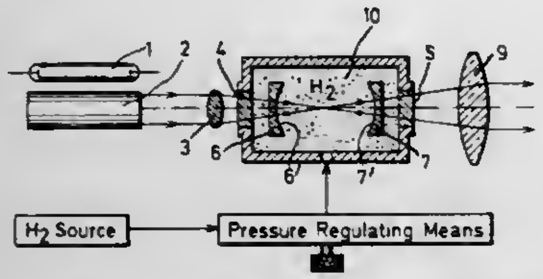
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1971, 2161743

Int. Cl.² H03F ***7/00***

U.S. Cl. 307—88.3 **9 Claims**

1. Apparatus for producing coherent radiation which is

continuously tunable over the wavelength range from the UV to the far IR, said apparatus comprising a resonator including wavelength-selection means and filled with a Raman-active medium which will displace stimulating radiation from a frequency ν by a fixed amount

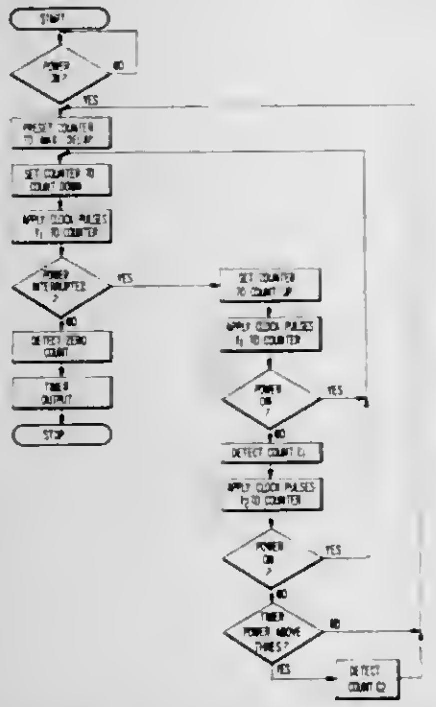


$\Delta\nu$, an optical stimulator for said resonator comprising at least one dye laser and having an output radiation characteristic which is continuously tunable with small-line width over the frequency range $\Delta\nu$, and selectively operable means for tuning within said range and with small-line width the transmission of light from said laser to said medium.

4,103,180
PROPORTIONAL WARMUP TIMER FOR POWER LINE OUTAGES USING STORED CHARGE FOR POWER

Nelson Mortimer Jacobus, Jr., Kensington, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,206
Int. Cl.² H03K *17/28*
U.S. Cl. 307—141 **10 Claims**

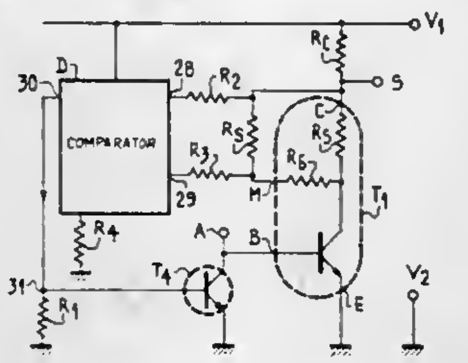


1. A proportional warmup timer responsive to power line outages for proportioning the warmup delay for equipment supplied by said power line to the time of power loss, said timer comprising:
- means connected to said power line for detecting a power line outage,
- an up/down counter,
- means responsive to said detecting means for controlling said up/down counter to count in a first direction at a first rate when a power line outage is detected and to count in a second direction at a second rate when power is restored, and
- means for decoding the output of said up/down counter and generating a timer output when a first predetermined count is reached.

4,103,181
MONOLITHIC INTEGRATED TRANSISTOR AND PROTECTIVE CIRCUIT THEREFOR

Jean Michel Moreau, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 2, 1976, Ser. No. 710,880
Claims priority, application France, Aug. 5, 1975, 75 24427
Int. Cl.² H03K *17/00*
U.S. Cl. 361—86 **9 Claims**

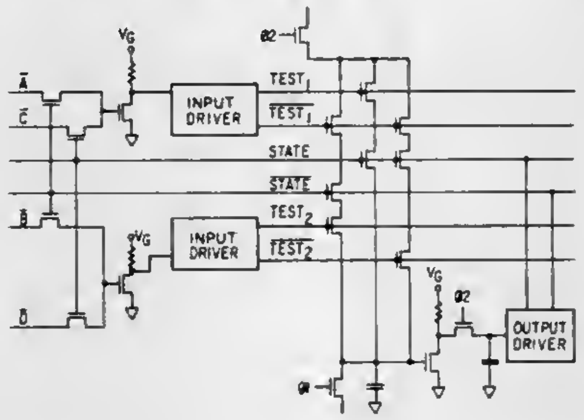


1. A protective device for a monolithic integrated transistor formed on a semi-conductive substrate of a first conductivity type and having a first collector region of a second conductivity opposite to said first conductivity formed on said substrate, a second base region of said first conductivity type formed on said first region, a third emitter region of said second conductivity type formed on said second region, and a fourth buried region of low resistivity and of said second type of conductivity between said collector region and said substrate, comprising:
- means for electrically connecting, through first and second wells of said high conductivity, to at least two separated points of said buried layer, thus defining inside this layer two resistive portions arranged in a two-resistor bridge, the common terminal of which being opposite to the emitter region, and the other terminals being said separated points;
- means connected to said connecting means for comparing the voltage between said points, and producing a control signal; and
- control means connected to said comparing and producing means and to said base region for controlling the base voltage as a function of said control signal, to thus protect said transistor against overload.

4,103,182
PROGRAMMABLE TRANSFER GATE ARRAY

Havyn E. Bradley, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 1, 1976, Ser. No. 719,541
Int. Cl.² H03K *19/20, 19/08;* G06F *7/38*
U.S. Cl. 307—203 **1 Claim**

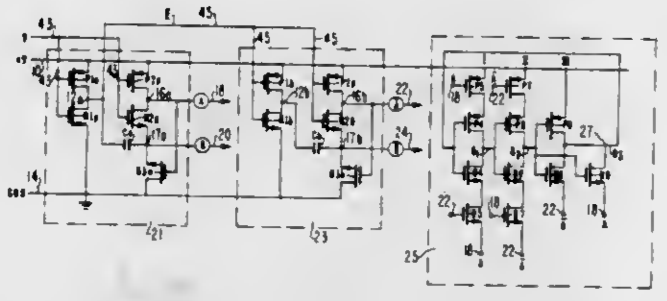


1. Apparatus for generating a digital control signal as a function of a plurality of digital input signals having first and second logic states, the apparatus comprising:
- storage means for storing a signal applied thereto;
- a pre-driver connected to said storage means for selectively applying a first signal thereto;
- a line driver for selectively generating a second signal;
- first and second transfer lines each connected between said line driver and said storage means and responsive to a selected first and second set of digital input signals respectively, each for transferring the second signal to said storage means in response to all of the selected digital input signals having the first value and said line driver generating the second signal;
- input means having a first output coupled to said first transfer line for generating a digital input signal of the first set having a logic state representative of a signal applied thereto and having a second output coupled to said second transfer line for generating a digital input signal of the second set having a logic state representative of the complement of the signal applied thereto;
- means for generating third and fourth signals;
- a third transfer line connected for selectively applying the third signal to said input means in response to a selected subset of the first set of digital input signals attaining the first logic state;
- a fourth transfer line connected for selectively applying the fourth signal to said input means in response to a selected subset of the second set of digital input signals attaining the first logic state; and
- output means connected to said storage means for selectively detecting the value stored by said storage means and for generating a digital control signal in response thereto.

4,103,183
QUASI-STATIC INVERTER CIRCUIT

Bruce David Rosenthal, Highland Park, and Andrew Gordon Francis Dingwall, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 578,913, May 19, 1975, Pat. No. 4,000,412. This application Oct. 15, 1976, Ser. No. 732,785
Claims priority, application United Kingdom, Jun. 5, 1974, 24898/74
Int. Cl.² H03K *19/40, 19/08*
U.S. Cl. 307—214 **2 Claims**

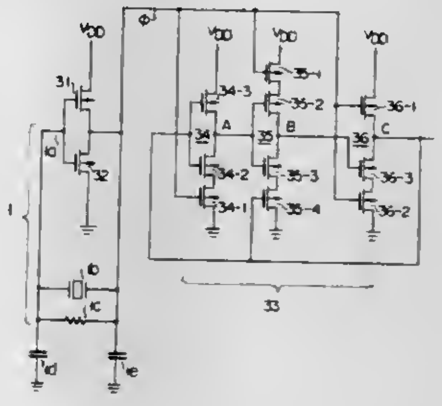


1. The combination comprising,
- a first conductor adapted to receive a first potential;
- second and third conductors adapted to receive complementary pulsating potentials;
- first, second and third transistors, each transistor having first and second electrodes defining the ends of a conduction path and a control electrode; said first transistor being of one conductivity type and said second and third transistors being of opposite conductivity type;
- an output terminal;
- means connecting the conduction path of said first transistor between said first conductor and said output terminal;
- means connecting the conduction paths of said second and third transistors between said output terminal and said second and third conductors, respectively;
- an input terminal for the application thereto of a signal to be inverted; and
- means for connecting the control electrodes of said first, second and third transistors to said input terminal.

4,103,184
FREQUENCY DIVIDER WITH ONE-PHASE CLOCK PULSE GENERATING CIRCUIT

Yasoji Suzuki, Ayase, and Tadashi Kuroda, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,102
Claims priority, application Japan, Sep. 12, 1975, 50-109942
Int. Cl.² H03K *21/00, 23/08*
U.S. Cl. 307—225 C **8 Claims**



1. A frequency divider comprising a one-phase clock pulse generating circuit and at least one counter for counting output clock pulses of the one-phase clock pulse generating circuit, wherein said counter comprises a plurality of cascade connected complementary unit circuits, each formed of at least three IGFETs connected in series across power supply terminals and supplied with said output clock pulses, said complementary unit circuits including a first stage complementary unit circuit having an inverter consisting of a first IGFET of one conductivity type and a second IGFET of the opposite conductivity type and a third IGFET connected between one of said power supply terminals and one of said first and second IGFETs and having a gate to receive said output pulses, and a last stage complementary unit circuit having fourth and fifth IGFETs having gates connected to the output of the one-phase clock pulse generating circuit and a sixth IGFET connected between the fourth and fifth IGFETs, said sixth IGFET having a gate connected to an output of a preceding complementary unit circuit, and the output of the last stage complementary unit circuit being supplied to an input of the inverter of the first stage complementary unit circuit and to at least one IGFET of each complementary unit circuit other than said first and last stage complementary unit circuits.

4,103,185
MEMORY CELLS

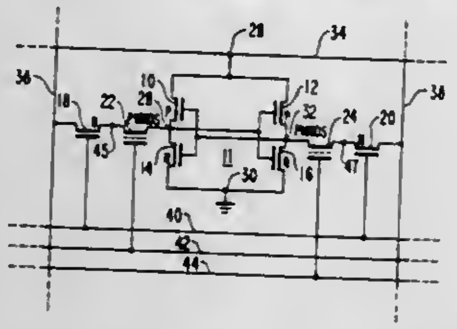
George Denes, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 663,752, Mar. 4, 1976. This application Dec. 16, 1977, Ser. No. 861,365
Int. Cl.² G11C *11/40;* H03K *3/286, 3/353*
U.S. Cl. 307—238 **4 Claims**

1. A memory cell comprising, in combination:
- first and second digit lines;
- first, second and third control lines;
- a first inverter utilizing complementary conductor-insulator-semiconductor (CIS) transistors having input and output points, said input point connected to a first cell node and said output point connected to a second cell node;
- a second inverter utilizing complementary CIS transistors having input and output points, said second inverter input

point connected to said second cell node and said second inverter output point connected to said first cell node;

a conductor-insulator-semiconductor (CIS) transistor and a variable threshold transistor of opposite conductivity types, each transistor having a control electrode and a conduction path, said CIS transistor and said variable threshold transistor conduction paths serially connected between said first digit line and said first cell node, said CIS transistor control electrode connected to said first control line and said variable threshold transistor control electrode connected to said second control line; and



a second CIS transistor and a second variable threshold transistor of opposite conductivity types, each transistor having a control electrode and a conduction path, said second CIS transistor and said second variable threshold transistor conduction paths serially connected between said second digit line and said second cell node, said second CIS transistor connected to said first control line and said second variable threshold transistor connected to said third control line.

4,103,186

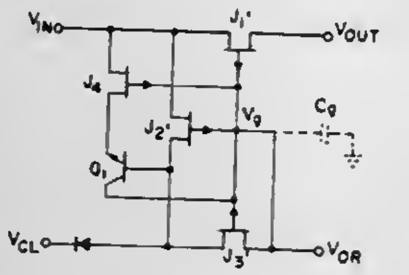
LOW POWER JFET SWITCH

José F. Albarrán, Mexico City, Mexico, and Adib R. Hamade, Cupertino, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 24, 1977, Ser. No. 780,932

Int. Cl.² H03K *17/04, 17/68;* H01L *29/80*

U.S. Cl. 307—251 **2 Claims**



1. In a transistor switching circuit comprising a pass transistor, having source, gate, and drain, with its source connected to an input and its drain connected to an output; a fist turn-on transistor, having source, gate, and drain, with its drain connected to a clamping circuit and its source connected to a source of drive current; and a second turn-on transistor, having source, gate, and drain, with its source connected to the source of said pass transistor and its drain connected to the drain of said first turn on transistor; said pass and said first and second turn on transistors having a common gate connection; the improvement for obtaining a low idle power consumption comprising:

a bipolar transistor, having emitter, base, and collector, wherein said collector is connected to said common gate connection and said base is connected to the drain of said first turn on transistor such that said bipolar transistor turns on only during the transition from the open to closed condition of said first and second turn on transistors to thereby discharge the common gate capacitance of said transistors.

4,103,187

POWER-ON RESET SEMICONDUCTOR INTEGRATED CIRCUIT

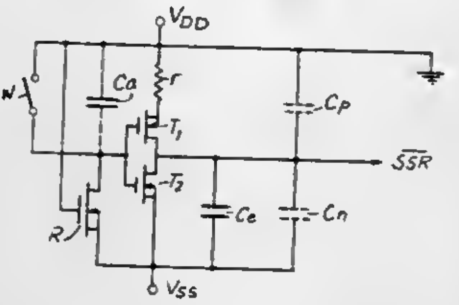
Yoichi Imamura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Sep. 20, 1976, Ser. No. 724,496

Claims priority, application Japan, Sep. 19, 1975, 50-113269

Int. Cl.² H03K *17/22, 17/20, 17/60, 21/32*

U.S. Cl. 307—251 **14 Claims**



1. In a semiconductor integrated circuit chip having digital circuit means formed of MOS transistors constructed and arranged on a substrate to define a predetermined parasitic capacitance, the improvement comprising a voltage supply means including a reference terminal and a supply voltage terminal for selectively applying to said digital circuit means a supply voltage for operating said digital circuit means at said supply voltage, and reset circuit means disposed intermediate said supply voltage terminal and said reference terminal, said reset circuit means including at least first and second complementary coupled opposite polarity MOS transistor means coupled to define an output terminal having said predetermined parasitic capacitance thereat, said first transistor means being further coupled to said reference terminal and said second transistor means being further coupled to said supply voltage terminal so that said first transistor means is turned ON and defines a predetermined resistance between said reference terminal and said output terminal when said supply voltage is initially applied to said reset circuit means and defines in series with at least said parasitic capacitance between said output terminal and said supply voltage terminal an RC constant so that a reset signal is applied at said output terminal to said digital circuit means a predetermined interval of time after said supply voltage is initially applied to said reset circuit means and digital circuit means.

4,103,188

COMPLEMENTARY-SYMMETRY AMPLIFIER

George Ira Morton, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,694

Int. Cl.² H03K *17/60*

U.S. Cl. 307—251 **12 Claims**

12. A complementary-symmetry amplifier comprising:

a first voltage source;

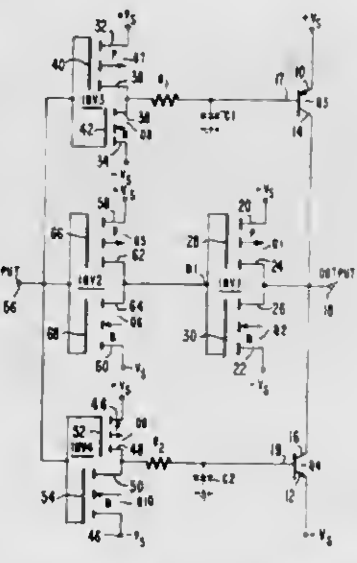
a second voltage source;

an input terminal for receiving an input signal potential which alternates between first and second levels, which first level is closer to the potential of the first voltage source than the potential of the second voltage source, and which second level is closer to the potential of the second voltage source than the potential of the first voltage source;

an output terminal;

first and second inverter means, each having a respective input connection to which the input terminal connects for applying the input signal potential thereto, each having a respective first power supply connection connected to the first voltage source, each having a respective second power supply connection connected to the second voltage source, each having a respective output connection at which appears respective potentials substantially equal to that of the first voltage source responsive to the second level of the input signal potential and substantially equal to that of the second voltage source responsive to the first level of the input signal potential;

a bipolar transistor having a base electrode to which the output connection of the first inverter means is connected, having an emitter electrode connected to the first voltage source, having a collector electrode connected to the output terminal, and being of a conductivity type switched into conduction whenever the potential at the output connection of the first inverter means is substantially equal to that of the second voltage source in response to the first level of the input signal potential, for relatively rapidly pulling the potential at the output terminal towards the potential at its emitter electrode; and



an enhancement-mode FET having a gate electrode to which the output connection of the second inverter means is connected, having a source electrode connected to the first voltage source, having a drain electrode connected to the output terminal, and being of a conductivity type switched into conduction whenever the potential at the output connection of the second inverter means is substantially equal to that of the second voltage source in response to the first level of the input signal potential, for pulling the potential at the output terminal to a potential substantially the same as the potential at its source electrode.

4,103,189

MOS BUFFER CIRCUIT

George Perlegos, Santa Clara, and Phillip J. Salsbury, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 728,789, Oct. 1, 1976. This application Jul. 25, 1977, Ser. No. 818,447

Int. Cl.² H03K *3/353, 19/08, 19/40*

U.S. Cl. 307—270 **3 Claims**

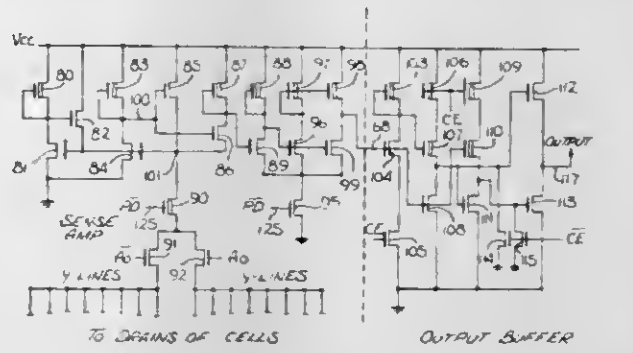
1. A stage for a metal-oxide-semiconductor (MOS) buffer comprising:

an enhancement mode, field-effect transistor having a gate coupled to receive an input signal for said stage;

a load coupled in series with said enhancement mode transistor for providing an output signal from said stage between said enhancement mode transistor and said load;

a second field-effect transistor having a threshold voltage approximately equal to zero volts, said second transistor coupled in series with said enhancement mode transistor and said load, the gate of said second transistor coupled to receive a timing signal;

whereby, by the application of said timing signal to said gate of said second transistor, substantially no voltage drop loss occurs in said stage across said second transistor, and whereby, when said timing signal is removed from said gate of said second transistor, current flow in said stage is reduced, thereby reducing the power consumed by said stage.



4,103,190

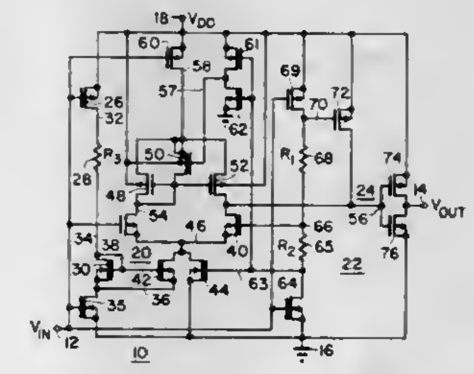
COMPLEMENTARY POWER SAVING COMPARATOR/INVERTER CIRCUITS

Robert Russel Beutler, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1977, Ser. No. 781,076

Int. Cl.² H03K *17/30, 17/60;* H03F *3/45;* H03K *17/04*

U.S. Cl. 307—362 **6 Claims**



1. A circuit having a precise transition point comprising: input means for receiving an input signal; first and second voltage conductors; reference means coupled between said first and second voltage conductors for producing a reference voltage; first amplifier means coupled to said reference means for producing an amplified signal in response to said input signal, said amplified signal having a first transition point determined by said reference voltage; second amplifier means coupled to said first amplifier means for producing an amplified inverted output signal having a second transition point determined by said first transition point in response to said amplified signal; and first power control means for selectively electrically coupling said reference means to said first or second power conductors in response to said input signal.

4,103,191

STEP MOTOR

Yoshikazu Kawamura, Shimosuwa, and Hiroshi Eguchi, Suwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jun. 3, 1974, Ser. No. 476,011

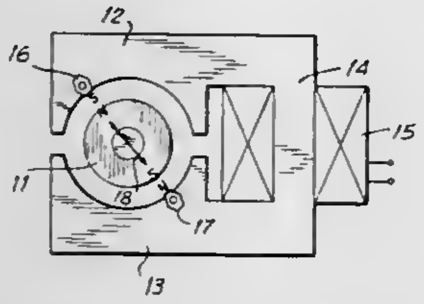
Claims priority, application Japan, Jun. 1, 1973, 48-61522; Jun. 5, 1973, 48-63127

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **9 Claims**

1. In a step motor having a rotor magnetized to have a pair of magnetically opposed circumferentially spaced poles said rotor being adapted to rotate a complete revolution in response to each pulse applied to said motor, the improvement comprising magnetic positioning means adapted to produce a first flux field for magnetically positioning said rotor in a rest position,

and two stator poles surrounding said rotor and defining a substantially uniform gap between said stator poles and said rotor, said stator pole portions in facing relationship defining a gap therebetween, said stator poles in response to a pulse applied thereto being adapted to produce a second flux field sufficient to overcome the flux field positioning said rotor in a rest position, said second flux field effecting a complete rotation of said rotor.



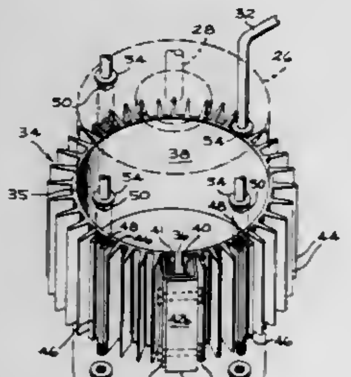
4,103,192
HEAT DISSIPATING MOTOR MOUNTING ARRANGEMENT

Michael E. Wendt, and Danny D. Beaver, both of Tyler, Tex., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 14, 1976, Ser. No. 695,940

Int. Cl.^{2} H02K *5/18*

U.S. Cl. 310—64 **2 Claims**



1. In a mounting arrangement for supporting a fan motor, a housing having an opening in a wall portion for passing air between said housing and the ambient surroundings, means for dissipating heat from said motor, comprising:

- a split ring mounting member having an inner wall portion dimensioned to embrace the outer wall surface of said motor;
- a plurality of parallel circumferentially spaced heat dissipating means being formed integral with said split ring mounting member projecting radially outwardly and extending substantially the full axial dimension of said support member;
- circumferentially spaced support elements being formed integral with said split ring mounting member and arranged substantially parallel to said heat dissipating means, said support elements including wall portions providing a channel extending through said support elements;
- support arms equal in number to said support elements having a first end secured in a channel of a corresponding support element and having their other end attached to the wall portion adjacent said housing opening so as to center the rotational axis of said motor relative to said opening;
- said first end of said support arm and said channel defined by said wall portion of said support element having mating cross-sectional configurations sufficient to prevent relative axial rotation therebetween;
- holding means for securing said split ring to said motor including flange members formed integral with said split ring member being arranged on the end portions of said ring adjacent substantially the full length of said split; and
- clamping means dimensioned to engage said flange members including means for urging said flange members toward each other so that the inner wall portion of said split ring member is maintained in engagement with the outer surface of said motor with sufficient pressure to prevent relative movement therebetween; and to provide a low resistance thermal conductive path between the motor and the motor support member.

4,103,193
RECTIFIER ASSEMBLY FOR VEHICULAR ALTERNATOR-RECTIFIER

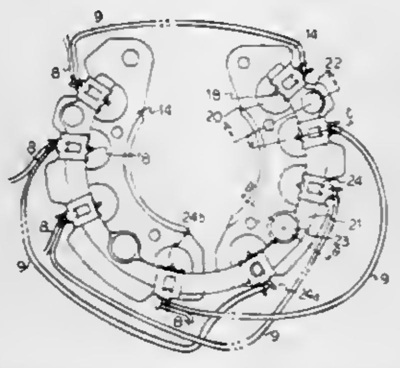
Nobuo Ito, Kariya, Japan, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 10, 1976, Ser. No. 740,510

Claims priority, application Japan, Nov. 28, 1975, 50/161734[U]

Int. Cl.^{2} H02K *11/00*

U.S. Cl. 310—68 D **10 Claims**



1. A rectifier assembly for mounting in a three-phase alternator of a motor vehicle to form an alternator-rectifier unit and comprising at least six diodes and also:

- an insulating mounting-base member (21) substantially in circularly arcuate shape with a circumferential dimension not less than 240° nor more than 320° of arc about an axis and with a radial dimension, not counting integral collars provided for assembly purposes, not greater than 25% of its average radius;
- two heat-sink plates (14,14′) fastened to said mounting-base member (21) substantially on opposite sides of said axis, insulated from each other thereby and serving as connecting busses having means for connection to the d.c. output terminals of said alternator-rectifier unit, said heat-sink plates and mounting-base member being mechanically mountable on said connection means;
- at least six diodes, each mounted on one of said heat-sink plates with one electrode of said diode connected to the heat-sink plate and each having an axial connection lead for its other electrode extending away from said diode, said diodes being mounted in radially off set relation to said base-member so that their respective axial leads are parallel to each other and, because of said off set relation, pass by rather than through said insullating member;
- a multiplicity of circuit connection members (24) running at least in part radially with respect to said axis and having lugs for connection of connecting leads thereto, said connection members being distributed circumferentially on and affixed to said mounting-base member and said lugs including lugs respectively for connection to a lead of each of said diodes and lugs for connection to at least three leads of a stator winding of said alternator, the lugs for connection to said stator winding leads being provided on said connection member at a radial distance from said axis different from the radial distance of said lugs for connection to said diode leads.

4,103,194
VOLTAGE GENERATORS

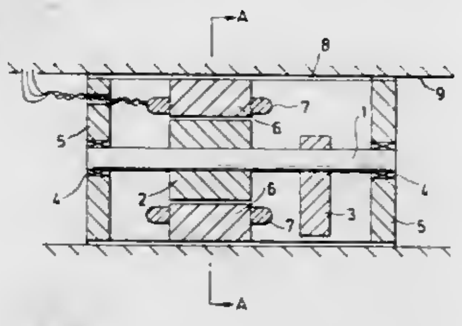
Antony Faithfull Anderson, Newcastle upon Tyne, England, assignor to Reyrolle Parsons Limited, England

Filed May 10, 1977, Ser. No. 795,547

Claims priority, application United Kingdom, May 13, 1976, 19830/76

Int. Cl.^{2} H02K *13/14*

U.S. Cl. 310—68 D **5 Claims**



1. In a battery replacement system for providing direct current to electrical equipment, an improvement comprising:

- a voltage generator incorporating first and second mechanical systems, said first system including a shaft supported by bearings mounted in said second system whereby said systems are arranged for relative motion to one another, and off-axis biasing weight carried on said shaft and having sufficient magnitude to restrain, by gravitational force, th first system from rotation when the shaft is horizontally oriented and the second system is rotated about an axis coincident with the shaft axis, a permanent magnet forming part of one of the systems, and an armature winding carried by the other whereby rotation of the second system about the first causes an alternating current to be induced in the armature winding; and
- a bridge rectifier circuit electrically connected to the armature winding for rectifying the alternating current into an unregulated direct current; and
- a voltage regulator electrically connected to said d.c. current of said bridge rectifier, said regulator providing a regulated direct current supply for said electrical equipment.

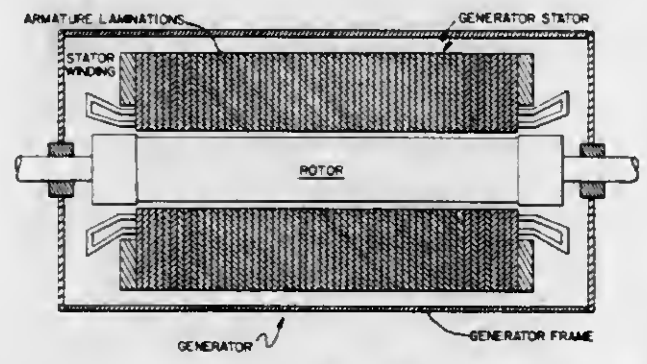
4,103,195
BONDED LAMINATIONS FORMING A STATOR CORE

Kevork A. Torossian, Schenectady, and Alexander L. Lynn, Duanesburg, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 713,440, Oct. 7, 1976. This application Mar. 25, 1977, Ser. No. 781,439

Int. Cl.^{2} H02K *1/12, 1/06*

U.S. Cl. 310—259 **9 Claims**



1. A bonded stator core, for a dynamoelectric machine, which comprises

(a) a multiplicity of steel segments stacked in the configuration of said core, each segment of at least a portion of said core being bonded to and insulated from the adjacent segment and

(b) an interlayer between said segments for bonding and insulating said segments, said interlayer comprising a cured epoxy resin and a fiber spacer filler,

said filler comprising cylindrical fibers having a diameter of 0.45–0.55 mil and a length of about 1/64–1/32 inch to provide uniform separation between the individual segments.

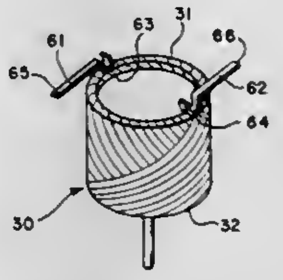
4,103,196
CORELESS MOTOR

Yutaka Saito, Takatsuki; Youichi Yamamoto, Kyoto, and Hajime Kojima, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Continuation-in-part of Ser. No. 615,116, Sep. 19, 1975, abandoned. This application Oct. 17, 1977, Ser. No. 843,038

Int. Cl.^{2} H02K *1/22*

U.S. Cl. 310—266 **1 Claim**



1. A miniature coreless motor comprising a stator including a cylindrical yoke and permanent magnet centrally positioned in said yoke providing an annular air gap between the magnet and the yoke having pole-pitch zones of alternate polarity, a cylindrical rotor comprising an insulated coil winding mounted rotatably within the annular air gap, the convolutions of the winding being wound progressively so as to be turned back alternately at the respective end edges to form axially re-entrant bends, with the convolutions of the winding forming an inner layer of wire and an outer layer of wire, each convolution being made up of elements which are angularly related so that each convolution passes through pole-pitch zones of different polarity, the elements forming the inner and outer layers crossing one another at an angle to form a thin cylindrical two-ply construction in which the end edges are rigid and occupy parallel planes, one of the end edges having the axially facing insulation superficially removed to expose a conductive surface at the outer periphery of each re-entrant bend, and a pair of brushes of resilient spring metal providing localized axial contact with the exposed conductive surfaces of the winding at peripherally spaced points on the one end edge for feeding electric current to the winding.

4,103,197
CYLINDRICAL CORE WITH TOROIDAL WINDINGS AT ANGULARLY SPACED LOCATIONS ON THE CORE

Keisuke Ikegami, Tokyo, and Susumu Hoshimi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 666,672

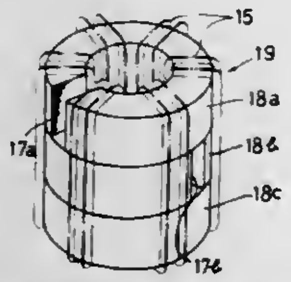
Claims priority, application Japan, Mar. 19, 1975, 50-37043[U]

Int. Cl.^{2} H02K *1/22*

U.S. Cl. 310—267 **4 Claims**

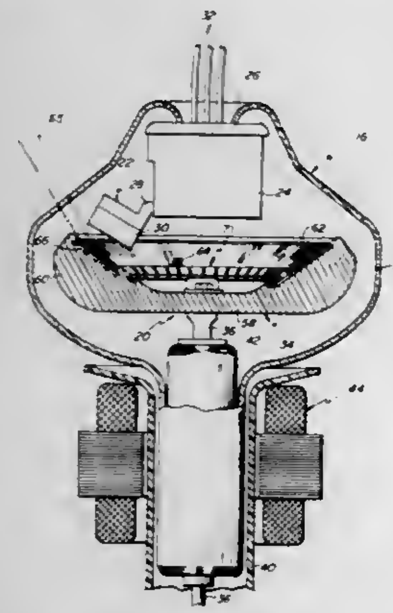
1. An electrical device having a cylindrical magnetic core of magnetic material, said core being provided with an axial slot extending radially therethrough to provide said core with a corresponding slot extending along the entire axial length of the core for receiving pre-wound toroidal coils through said slot; a plurality of pre-wound toroidal coils being dimensioned

to pass through said slot of said core and defining a passage through which said core passes, said pre-wound cores extending about said core at angularly spaced locations thereon; and in which said core includes a plurality of annular core elements axially superposed on each other to form said core and each having an axial slot so that, with said core elements arranged axially to align their respective slots, the latter define said corresponding slot of the core along the entire axial length of the core through which said pre-wound toroidal coils can pass for installation on said core; said core elements being rotatable with respect to each other so as to be arranged their respective slots circumferentially displaced from each other with said pre-wound toroidal coils extending about said elements for reducing the magnetic flux turbulence that may occur as a result of said axially aligned slots.



4,103,198
ROTATING ANODE X-RAY TUBE

Martin Braun, Stamford, Conn., assignor to Raytheon Company, Lexington, Mass.
Filed Jul. 5, 1977, Ser. No. 813,043
Int. Cl.² H01J *35/08*
U.S. Cl. 313—60 **18 Claims**

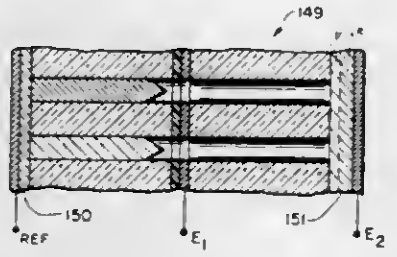


1. A target for rotating anode x-ray tubes comprising an annular body adapted to be rotated about its axis and having one surface inclined to the horizontal and having an annular groove in said inclined surface, and a focal track ring disposed on said inclined surface of said body, said ring comprising an array of pinlike elements located within said groove and extending in side-by-side relation throughout the length of the groove and adapted to be urged toward the bottom surface of the groove by centrifugal force during rotation of the body, said body having an integral annular raised land portion along the inner side of the groove and overlying one end of a majority of said elements, and said body having an integral lip portion which overlies the other ends of said elements.

10. An x-ray tube comprising an envelope, an anode structure rotatably supported in the envelope, a cathode structure supported within the envelope in spaced relation to the anode structure, said anode structure including an axially extending shaft, a target supported by said shaft for rotation therewith, and a connecting portion securing said target to the shaft, the target comprising an annular wall portion extending angularly from the periphery of the connecting portion and having one surface inclined to the horizontal and having an annular groove in said inclined surface, and a focal track ring disposed on said inclined surface of said wall portion, said ring comprising an array of pinlike elements located within said groove and extending in side-by-side relation throughout the length of the groove and each extending substantially radially of the target and adapted to be urged toward the bottom surface of the groove by centrifugal force during rotation of the target, said wall portion having an integral raised annular land portion along the inner side of the groove and overlying one end of a majority of said elements, and said wall portion having an integral lip along the opposite side of the groove, which lip overlies the other ends of said elements.

4,103,199
ELECTRONIC DEVICE FOR PROCESSING SIGNALS IN THREE DIMENSIONS

Charles Redman, 2020 Huntington Dr., Los Cruces, N. Mex. 88001, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 556,525, Mar. 7, 1975, Pat. No. 3,982,147.
This application Jan. 14, 1976, Ser. No. 695,489
Int. Cl.² H01J *39/06, 31/49*
U.S. Cl. 313—101 **4 Claims**

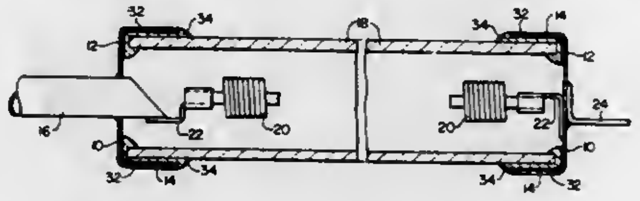


1. An area and time processing electronic device comprising:
an electrical insulator having opposed input and output faces;
a planar control grid, intermediate the input and output faces and substantially parallel thereto being integral with and traversing the electrical insulator, the combination of electrical insulator and control grid providing a plurality of parallel evacuated chambers which are continuous between the input and output faces;
a plurality of conducting fibers occupying the parallel evacuated chambers extending from the input face and terminating short of the control grid;
a layer of pyroelectric material deposited on the input face so as to seal the evacuated chambers;
a thin film conductor deposited on the pyroelectric material so as to sandwich the pyroelectric between the input face and the thin film conductor; and
output means, including an output face seal, electrically coupled to the output face.

4,103,200
ARC TUBE END SEAL AND METHOD OF FORMING

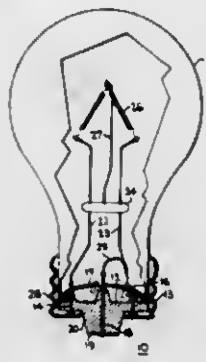
Ranbir S. Bhalla, West Paterson, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 13, 1977, Ser. No. 796,579
Int. Cl.² H01J *61/30*
U.S. Cl. 313—221 **4 Claims**

3. An arc tube for a high pressure sodium discharge lamp comprising:
an elongated tubular ceramic arc tube body member;
a pair of refractory metal end caps having a silicon metal coating on the interior surface thereof sealed to and closing off the ends of said elongated tubular ceramic arc tube body member.



4,103,201
CEMENTLESS BASE INCANDESCENT LAMP

Frederick A. Mosby, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 8, 1976, Ser. No. 730,799
Int. Cl.² H01J *5/48, 5/50*
U.S. Cl. 313—318 **15 Claims**

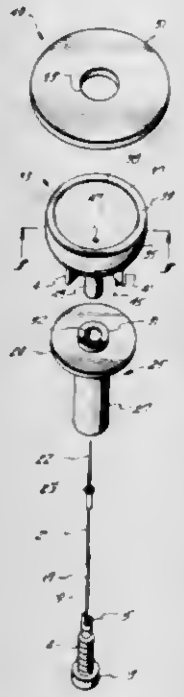


1. A cementless base incandescent lamp comprising:
a mount comprising an electrically non-conductive disc having a plurality of conductive pins, some of which extend through said disc;
a glass envelope having a neck portion;
a solder glass seal joining said disc to the end of said neck portion to form a gas-tight enclosure; and
a base having a plurality of holes corresponding to the pins extending through said disc, said pins being inserted into said holes and fastened, thereby attaching the base to said lamp without the use of cement.

4,103,202
ION PROJECTOR HEAD

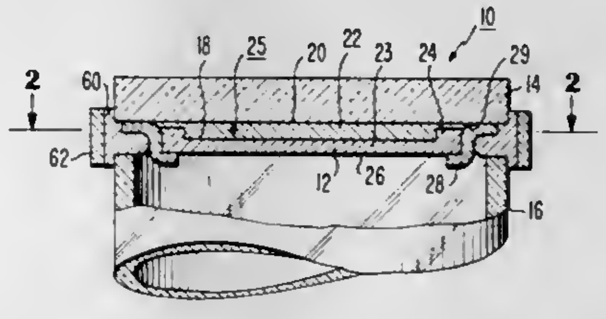
Richard H. Finger, Hollywood, and Thomas J. Michel, Miami Lakes, both of Fla., assignors to Klykon, Inc., Miami, Fla.
Filed Dec. 3, 1976, Ser. No. 747,377
Int. Cl.² H01J *1/16, 19/10*
U.S. Cl. 313—336 **18 Claims**

1. An ion cloud projection head for use with free-air ion-cloud generating apparatus utilizing a point electrode, the projector head comprising:
an ion cup, said cup containing said point electrode therein pointed towards the mouth of the cup; and
an iris plate having an aperture therethrough overlaying the mouth of said ion cup; a cylinder with an aperture therethrough attached to the closed end of said cup; support means fastened externally to the closed end of said cup; and cylindrical stem means having an aperture therethrough sufficent to recieve said cylinder therein.



4,103,203
WAFER MOUNTING STRUCTURE FOR PICKUP TUBE

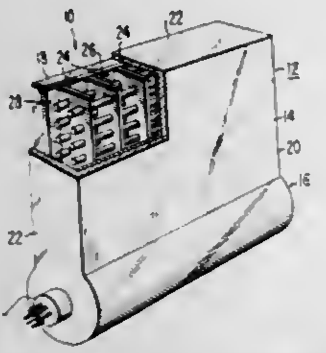
Stefan Albert Ochs, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Sep. 9, 1974, Ser. No. 504,355
Int. Cl.² H01J *31/38, 29/02*
U.S. Cl. 313—390 **8 Claims**



1. A pickup tube comprising:
(a) an evacuated glass envelope having a transparent glass faceplate closing one end of said envelope;
(b) a wafer including a light receiving surface portion mounted to an inner surface of said faceplate by an intermediate layer of highly transparent adhesive, said layer of adhesive including a peripheral surface portion, not in contact with said wafer and faceplate, and extending about said light receiving surface portion of said wafer; and
(c) a low vapor pressure sealant material extending over and substantially covering said peripheral surface portion of said adhesive to substantially prevent outgassing of said adhesive within the evacuated interior of said envelope, said sealant material being conductive and extending across a surface portion of said wafer to an electrical connector extending external to said envelope.

4,103,204
FLAT DISPLAY DEVICE WITH BEAM GUIDE

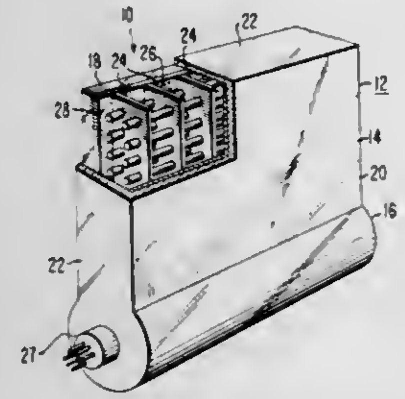
Thomas Lloyd Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Aug. 25, 1975, Ser. No. 607,490
Int. Cl.² H01J *29/72, 31/00*
U.S. Cl. 313—422 **29 Claims**



1. An electron display device comprising:
an evacuated envelope having a front wall,
a phosphor screen on the inner surface of said front wall,
means in said device for generating a beam of electrons and directing said beam in a path generally parallel to and across said front wall, and
means along said beam path for causing said beam to travel in a substantially confined undulating path with the undulations thereof toward and away from said screen, and for selectively deflecting said beam out of said path toward said phosphor screen at selected points along said path.

4,103,205
FLAT DISPLAY DEVICE WITH BEAM GUIDE

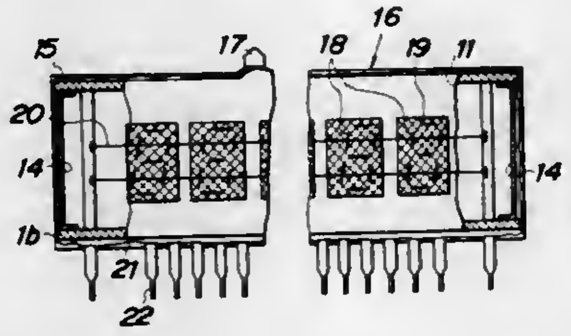
Thomas Lloyd Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 607,490, Aug. 25, 1975. This application Dec. 1, 1976, Ser. No. 746,213
Int. Cl.² H01J *29/70, 29/08*
U.S. Cl. 313—422 **25 Claims**



1. An electron display device comprising:
an evacuated envelope having a front wall, a phosphor screen on the inner surface of said front wall,
means in said device for generating a beam of electrons and directing said beam in a path generally parallel to and across said front wall,
means along said beam path for causing said beam to travel in a substantially undulating path with the undulations thereof toward and away from said screen and for selectively deflecting said beam out of said path toward said phosphor screen at selected points along said path, and
means along said path for laterally confining the electrons to a relatively narrow beam.

4,103,206
FLAT TYPE MULTI-DIGIT INDICATING APPARATUS

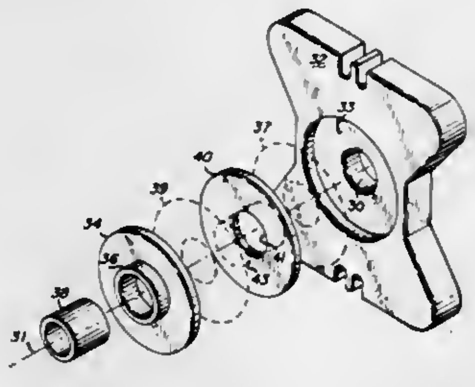
Goro Eto, and Chuichi Hikida, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Chiba, Japan
Filed May 6, 1976, Ser. No. 683,934
Claims priority, application Japan, May 8, 1975, 50-61046[U]
Int. Cl.² H01J *5/02, 5/20, 63/02*
U.S. Cl. 313—513 **6 Claims**



1. A flat type multi-digit indicating apparatus comprising:
a base plate on which a plurality of indicia forming means are arranged in a row in spaced side-by-side relation along the width of said base plate,
means for applying voltage to said indicia forming means for effecting multi-digit indication;
a channel plate having a flat transparent upper viewing window and a pair of side walls provided in face-to-face relation along upper and lower side lengths of said viewing window, said viewing window and said side walls being integrally formed, said channel plate being provided with open side ends,
a pair of strips for blocking the open side ends of said channel plate, each said strip being formed in a flattened U-shape and inlaid between said side walls of said channel plate wherein the legs of each of said U-shape strips ared connected to said side walls.
said channel plate and said strips being bonded together thereby to form a cover having said upper viewing window and said side walls, and
said cover mounted on a front surface of said base plate and forming an hermetically sealed chamber with said base plate which contains said indicia forming means.

4,103,207
COUPLED CAVITY TYPE TRAVELING WAVE TUBE HAVING IMPROVED POLE PIECE STRUCTURE

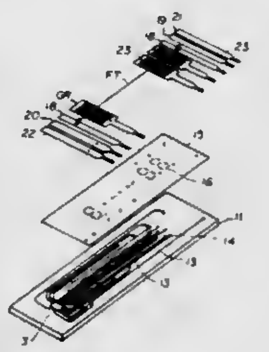
Edwin George Chaffee, Redwood City, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.
Filed Mar. 11, 1977, Ser. No. 776,497
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 **4 Claims**



1. In a coupled cavity type traveling wave tube of the type containing a plurality of serially spaced interaction cavities defined in the space between adjacent pole piece walls of ferromagnetic material and nonmagnetic metal spacers between pole pieces forming a wall about a centrally defined electron beam path through the pole pieces and with microwave energy coupling holes located off axis of the electron beam path through each pole piece for electromagnetically coupling adjacent interaction cavities and means for producing a predetermined magnetic flux through said pole piece, the improvement therein in which the pole pieces comprise:
a pair of walls of a magnetic electrically conductive metal material having a predetermined thermal conductivity characteristic;
each of said walls containing a central cylindrical passage and a protruding lip surrounding said passage, said walls being oriented with said lip portions facing in opposite directions;
a washer-shaped metal member sandwiched in between said walls, and having a passage therein axially aligned with said passages of said walls to define an extended passage;
each of the portions of said walls sandwiching said member being of substantially equal thickness;
a hollow cylindrical metal member defining a cylindrical passage drift tube located within and joined to the walls of said extended passage;
said washer-shaped metal member and said hollow cylindrical member being of a nonmagnetic electrically conductive metal material having a thermal conductivity characteristic greater than said thermal conductivity characteristic of said walls,
said members being in a thermal conductive relationship with one another and with said walls,
said walls being of sufficient thickness to jointly pass said predetermined flux without magnetically saturating.

4,103,208
FLUORESCENT TUBE DISPLAY CALCULATORS

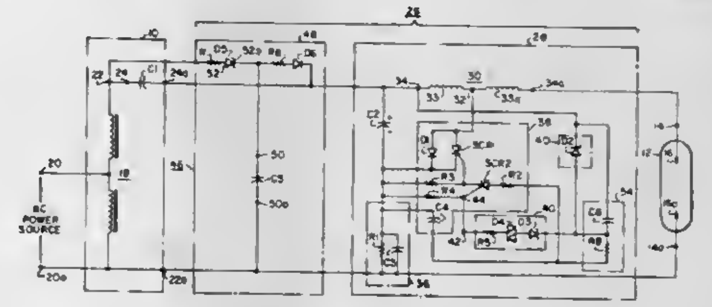
Isamu Washizuka, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 29, 1976, Ser. No. 737,057
Claims priority, application Japan, Oct. 31, 1975, 50/131671
Int. Cl.² H05B *41/36*
U.S. Cl. 315—51 **6 Claims**



1. A fluorescent tube display calculator comprising:
an electrical insulator substrate;
segmented electrodes deposited on the insulator substrate, each of the segmented electrodes being coated with fluorescent material;
a plurality of grids deposited above the segmented electrodes;
a filament deposited above the grids; said segmented electrodes, said grids and said filament in combination constituting the fluorescent tube display;
an LSI semiconductor chip mounted on the insulator substrate;
a package deposited on the insulator substrate for surrounding the fluorescent tube display; and
connections provided between the fluorescent tube display and the LSI semiconductor chip and deposited on the insulator substrate.

4,103,209
ADD-ON INSTANT RESTRIKE DEVICE FOR AN HID LAMP

Robert T. Elms, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 26, 1977, Ser. No. 800,662
Int. Cl.² H05B *41/04*
U.S. Cl. 315—207 **2 Claims**



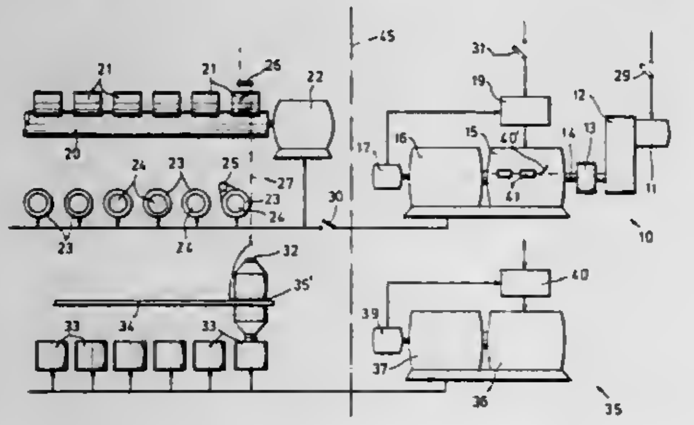
1. In combination with a ballast for a high-intensity discharge lamp having two input terminals and two electrodes operatively disposed within the lamp, said ballast including a constant output voltage transformer having transformer input terminals and transformer output terminals, said transformer input terminals adapted to be connected to an AC power source, and a ballasting capacitor means having one terminal connected to one of said transformer output terminals and the other terminal of said ballasting capacitor means and the other of said transformer output terminals constituting the normal ballast output terminals across which the terminals of said high-intensity discharge lamp are normally adapted to be connected, the improvement which comprises an add-on instant restrike device for initiating an operating discharge in said lamp when it is still hot from previous operation, said restrike device comprising:
(a) high-voltage pulse-generating means connected across said normal ballast output terminals, said pulse-generating means comprising autotransformer means having a tap defining the primary and secondary thereof and said autotransformer means connected at its end portions in circuit between said other ballasting capacitor means terminal and one of said lamp input terminals, storage capacitor means connected in circuit across said normal ballast output terminals, gate-controlled solid-state switching means connected between said tap of said autotransformer means and said storage capacitor means to form a series loop comprising the primary of said autotransformer means and said storage capacitor means and said switching means, and first voltage responsive conduction means connected in circuit across said storage capacitor means and having an output connected to gate means of said solid-state switching means, and when said pulse-generating means is energized said storage capacitor means has applied thereacross an increasing potential which causes said first voltage responsive conduction means to conduct when a predetermined value of voltage is applied across said storage capacitor means which gates said switching means to discharge said storage capacitor means through said series loop to generate a short duration high-voltage pulse across said autotransformer means and create through said high-intensity discharge lamp an ionized discharged path;
(b) intermediate voltage generating means which coacts with said ballasting capacitor means to charge said ballasting capacitor means to an intermediate voltage through a plurality of half cycles of energizing potential when said ballast is energized, said intermediate voltage generating means comprising charging means including a charging capacitor means having one terminal thereof in circuit with said one transformer output terminal and the other terminal thereof connected to said other transformer output terminal, second voltage responsive conduction means having an anode and a cathode, said anode of said second

voltage responsive conduction means connecting to said one transformer output terminal and said cathode of said second voltage responsive conduction means connecting to said one terminal of said charging capacitor means, whereby when said ballast is energized while said lamp is still hot, said storage capacitor means charges while said ballasting capacitor means simultaneously charges to an intermediate voltage, and when said storage capacitor means is discharged through said loop, there is created through said lamp an ionized discharge path which permits said ballasting capacitor means to discharge through said lamp and form an operating hot spot on one of said lamp electrodes which is adequate to permit sustained operation of said lamp thereafter.

4,103,210
DRAW TWISTING MACHINE

Horst Wolf, Albershausen, and Rolf Seher, Denkendorf, both of Fed. Rep. of Germany, assignors to Zinser-Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation of Ser. No. 409,010, Oct. 23, 1973, abandoned.
This application Oct. 21, 1975, Ser. No. 624,389
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1972, 2251843
Int. Cl.² H07K *17/34*
U.S. Cl. 318—46 7 Claims



1. In a draw twisting machine having an electrical drive means for simultaneously supplying power to a plurality of synchronous motors which drive fiber transport rollers of the draw twisting machine and which are to start, run and stop in synchronism, the electrical drive means including a variable frequency A.C. generator whose output frequency is proportional to the shaft speed of a driven shaft and a D.C. motor, whose speed can be steplessly varied, coupled to the driven shaft, the improvement comprising: auxiliary drive means including an electric motor of a type whose operational speed of rotation is substantially unaffected by changes in load.

4,103,211
DYNAMIC DRAG ARRANGEMENT FOR ELECTRICALLY PROPELLED TRACTION VEHICLES

Alvin Leonard Gardner, and Barry Jay Turley, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Jan. 26, 1977, Ser. No. 762,692
Int. Cl.² H02P *3/14*
U.S. Cl. 318—87 12 Claims

1. In a propulsion system for traction vehicles utilizing separately excited electric traction motor means, the improvement comprising:

a. at least one direct current electric traction motor having an armature and a field winding;

b. a first controllable electrical power source;

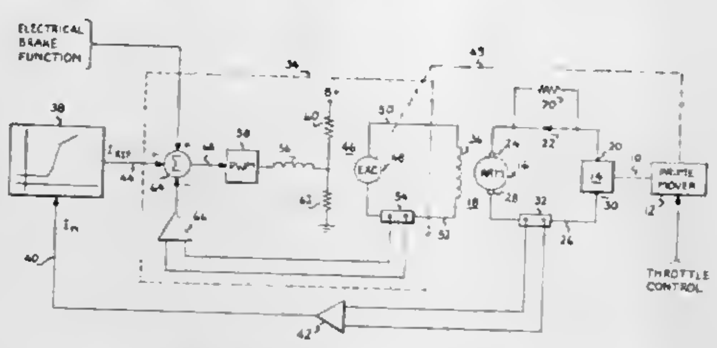
c. control means associated with said first source for increasing and decreasing the magnitude of its output voltage as desired;

d. conducting means for interconnecting said motor armature and said first source in a closed armature current circuit, said conducting means including means for introducing current limiting impedance means into said armature current circuit when the voltage of said first source is less than the CEMF of said armature;

e. means for providing a first signal representative of the magnitude and polarity of current through said motor armature;

f. function generator means for providing a field current reference signal having a predetermined minimum value and varying above said minimum value as a predetermined function of a signel applied to a signal input terminal thereof;

g. means for coupling said first signal to said signal input terminal of said function generator;



h. a second controllable electrical power source for providing a variable output excitation at output terminals thereof in response to a signal applied to a signal input terminal thereof;

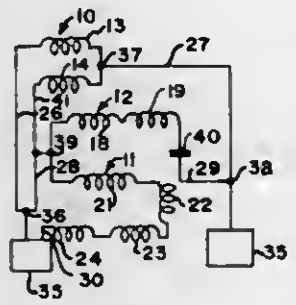
i. means for coupling said field current reference signal to said signal input terminal of said second source; and

j. means for interconnecting said output terminals of said second source to said motor field winding whereby the magnitude of current in said motor field winding is controlled in response to said current reference signal and said predetermined minimum value of said current reference signal results in a level of motor torque that effects a dynamic drag on said vehicle when decelerating in response to a decrease in the magnitude of the output voltage of said first source.

4,103,212
TWO SPEED SINGLE PHASE INDUCTION MOTOR

Gene V. Spradling, Glendale, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 16, 1976, Ser. No. 723,990
Int. Cl.² H02K *17/08*
U.S. Cl. 318—224 A 10 Claims



1. An induction motor, comprising:

a rotor assembly;

a stator assembly including a core of magnetic material formed from a stack of individual laminations, said core having a central, bore opening in it adapted to receive slots formed in said core, and windings in said slots, said windings including:

a single main winding defining a first physical motor pole and a second physical motor pole;

a first auxiliary winding defining a first physical and electrical motor pole and a second physical and electrical motor pole, said first and said second physical motor poles of said first auxiliary winding being rotated physically with respect to the first and second physical poles of said first main winding;

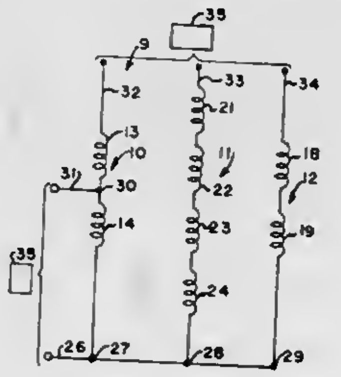
a second auxiliary winding having twice the number of physical and electrical motor poles as said main winding; and

means for operatively interconnecting respective ones of said first and said second auxiliary windings with said main winding, said interconnecting means including switch means for electrically connecting said entire main winding and said second auxiliary winding such that the polarity of said main winding produces two consequent physical poles resulting in four electrical poles.

4,103,213
TWO SPEED SINGLE PHASE INDUCTION MOTOR

Robert A. Landgraf, Ferguson, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 16, 1976, Ser. No. 723,989
Int. Cl.² H02K *17/08*
U.S. Cl. 318—224 A 10 Claims



1. A dynamoelectric machine, comprising:

a rotor assembly;

a stator assembly including a core constructed from a stack of individual laminations of magnetic material, said laminations having a central opening which defines a rotor receiving bore opening in the stacked relationship of the laminations, said laminations also having a plurality of closed bottom receptacles formed in them, said receptacles opening onto said bore and defining winding receiving slots in the stacked relationship of the laminations, and windings in said slots, said windings comprising:

a first main winding having at least a first physical motor pole and a second physical motor pole;

a second main winding having at least first, second, third and fourth physical motor poles;

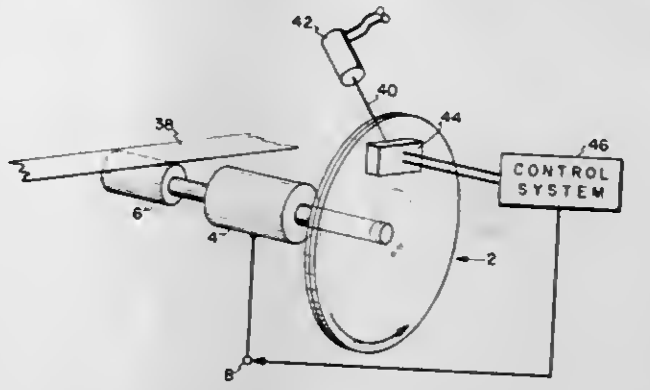
an auxiliary winding, said auxiliary winding having a first physical motor pole and a second physical motor pole, said auxiliary winding being physically displaced with respect to said first main winding; and

means for operatively interconnecting selective ones of said first main winding, said auxiliary winding and said second main winding to give two-speed motor operation, said interconnecting means electrically connecting said first main winding and said auxiliary winding to provide a first motor speed capability, said interconnecting means connecting said first main winding and said second main winding so that said first main winding acts as an auxiliary winding for said second main winding to give a second motor speed capability, the polarity of said first main winding in said second speed capability condition being chosen so as to form two consequent physical poles producing four electrical motor poles.

4,103,214
ERROR CANCELLING SYNC-OFF-TACH TAPE DRIVE SYSTEM

Michael F. Braitberg, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 12, 1975, Ser. No. 557,792
Int. Cl.² H02P *5/16*
U.S. Cl. 318—326 13 Claims



1. A tape drive control system comprising:

a drive motor means,

a tape drive capstan arranged to be driven by said motor means,

tone wheel means arranged to be driven by said motor means, said tone wheel means having a holographic recording of successive holograms thereon,

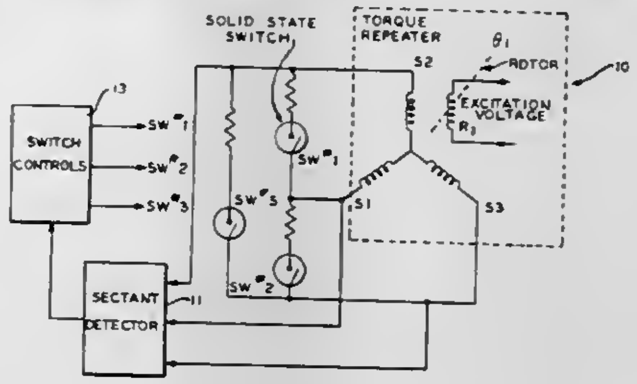
hologram reading means arranged to detect the successive holograms on said tone wheel means to produce a representative output signal, and

control means connected to said motor means and being responsive to said output signal to produce a control signal for controlling the speed of said motor means.

4,103,215
TORQUE REPEATER SELF-DRIVER

Bob Nicholas Naydan, Wyckoff, and Arnold Joseph Brand, Parsippany, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 22, 1976, Ser. No. 743,733
Int. Cl.² G05B *1/06*
U.S. Cl. 318—654 5 Claims



1. A torque repeater system comprising:

a synchro converter having three stator windings,

said synchro having inherent rotor sectant positions of 60° when discrete stator windings are short-circuited,

switching means comprising three electronic switching circuits connected across said stator windings,

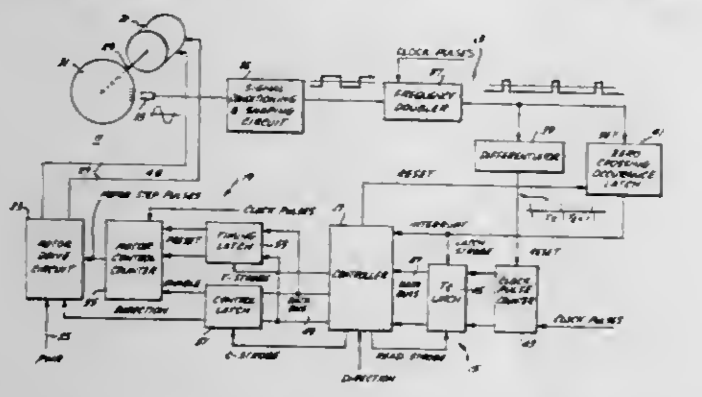
a programmable switch control connected to said switching means, and

a sectant detector connected to said switching means said stator windings and said programmable switch control said detector sensing the sectant of the angle of rotation of said synchro converter.

4,103,216
STEPPING MOTOR CLOSED LOOP CONSTANT VELOCITY CONTROL SYSTEM

Carlos F. Hayes, Redmond, Wash., assignor to Tally Corporation, Kent, Wash.

Filed May 28, 1976, Ser. No. 690,900
Int. Cl.² G05B *19/40*
U.S. Cl. 318—685 12 Claims



1. A stepping motor closed loop constant velocity control system comprising:

(A) a time measuring means, suitable for connection to a stepping motor, for producing measured time data (T_i) related to the elapsed time occurring between step increments of movement of the shaft of said stepping motor;

(B) a controller including a memory for storing nominal time data (T_{nom}) and time delay data (D_{i-1}) produced as a result of an immediately preceding step increment of movement of said shaft, said controller connected to said time measuring means for receiving said measured time data (T_i), said controller suitable for developing new time delay data (D_i) for each step increment of movement of said shaft of said stepping motor by:

(1) comparing said measured time data (T_i) with said nominal time data (T_{nom}) so as to obtain velocity error data;

(2) summing the time delay data (D_{i-1}) produced as a result of an immediately preceding step increment of movement of said shaft with said velocity error data to produce new time delay data (D_i); and,

(3) storing said new time delay data for subsequent use as the time delay data of an immediately preceding step increment of movement of said shaft; and,

(C) an output subsystem connected to said controller to receive said new time delay data and, in accordance therewith, develop a delay motor step pulse suitable for application to a motor drive circuit adapted to drive said stepping motor.

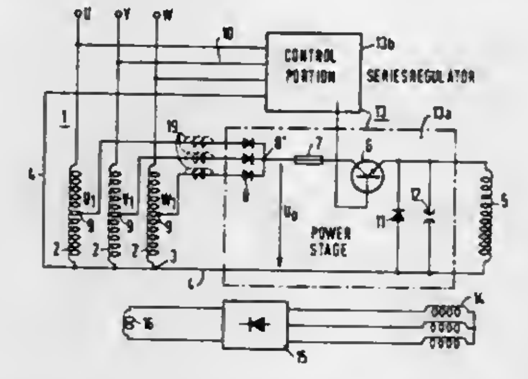
4,103,217
BRUSHLESS SYNCHRONOUS GENERATOR WITH AN EXCITER

Herbert Auinger; Walter Lang, and Manfred Mader, all of Nüremberg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 5, 1977, Ser. No. 784,842
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615117
Int. Cl.² H02H *3/20*
U.S. Cl. 322—28 8 Claims

1. In a brushless synchronous generator, with an exciter, the synchronous generator have three phase armature windings in its stator and a rotating field winding which is fed through a rectifier circuit by the co-rotating armature winding of the exciter, the outputs of the stator windings of the generator being coupled through a rectifier and series regulator having a control element to the stationary field winding of the exciter, the series regulator regulating the generator so as to maintain a constant output voltage, a bypass diode being shunted across the field winding of the exciter, an improved arrangement for protecting consumers of the output of the synchronous generator against over-voltages occurring because of a defective regulator comprising:

(a) an overvoltage arrester for shorting the exciter field winding shunted in parallel across the exciter field winding and in parallel with the bypass diode, said overvoltage arrester having a response voltage causing it to respond if the operationally permissible overvoltage is exceeded; and

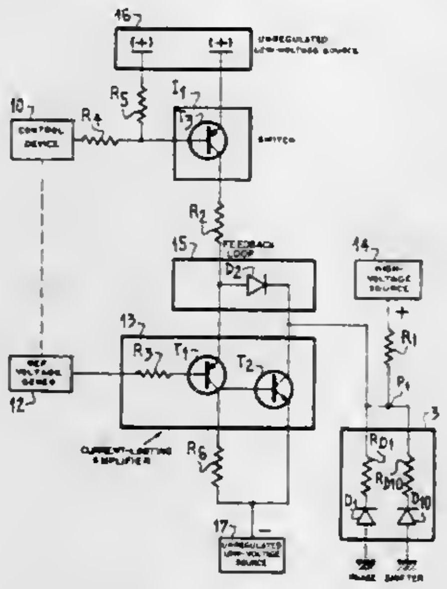


(b) a protective device in the regulator circuit, whereby when said permissible overvoltage is exceeded said overvoltage regulator arrester responds shorting the field winding it causes a short circuit current to flow in the regulator to result in a response of the protective device to permanently interrupt current to the generator excitation circuit to shut it down.

4,103,218
PHASE-SHIFTING SYSTEM FOR ELECTRONICALLY SCANNING ANTENNAS

Michel Chevalier; Jean-Claude Lucas, and Gerard Lacoste, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 5, 1976, Ser. No. 729,800
Claims priority, application France, Oct. 7, 1975, 75 30694
Int. Cl.² H01Q *3/26*
U.S. Cl. 323—1 6 Claims

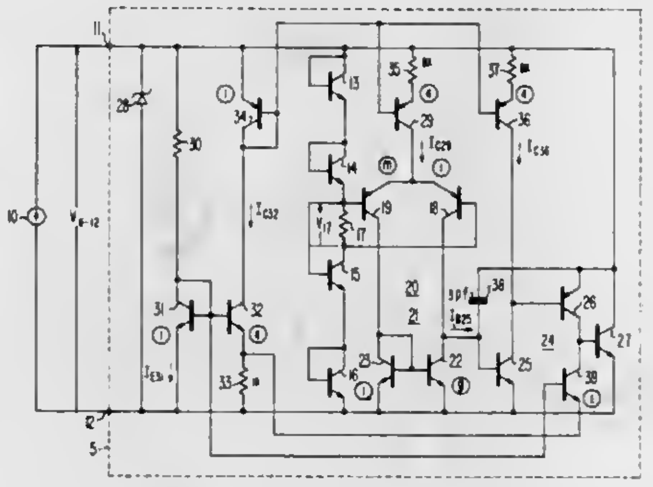


1. In a system for controlling a set of phase shifters associated with respective radiators of an electronically scanning antenna, each phase shifter including at least one phase-shifting diode connected through a series resistor to a source of back-biasing voltage normally blocking conduction therethrough, there being further provided an amplifier individual to each phase shifter with an input stage connected to a signal-responsive energizing circuit and an output stage connected to said source of back-biasing voltage through said series resistor whereby said phase-shifting diode is rendered conductive upon conduction of said output stage, the improvement wherein said amplifier is provided with a negative-feedback loop between said stages including a further diode poled to stabilize the current drawn through said phase-shifting diode upon conduction of said output stage.

4,103,219
SHUNT VOLTAGE REGULATOR

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,765
Int. Cl.² G05F *1/60*
U.S. Cl. 323—8 16 Claims



1. In a shunt regulator having first and second terminals linked by means for determining the potential appearing between them, improved said means for determining the potential appearing between said first and second terminals, including:

a transistor having first and second electrodes and a controlled conduction path therebetween and having a third electrode, the conduction of said controlled conduction path being controlled responsive to potential appearing between the first and third electrodes;

a resistance having first and second ends;

first direct current conductive means connecting the first electrode of said transistor to said first terminal;

second direct current conductive means connecting the second electrode of said transistor to the first end of said resistance;

third direct current conductive means connecting the second end of said resistance to said second terminal;

means providing direct coupling between the second end of said resistance and the third electrode of said transistor; and

means responsive to potential drop appearing across said resistance for shunt regulating the current flow through said means for determining the potential appearing between said first and second terminals.

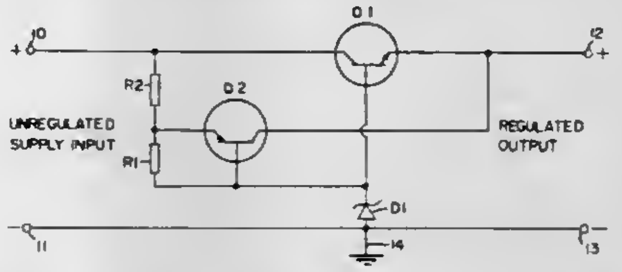
4,103,220
LOW DISSIPATION VOLTAGE REGULATOR

Christopher Ryland Huntley, Burnaby, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Flied Apr. 4, 1977, Ser. No. 784,552
Int. Cl.² G05F *3/08*
U.S. Cl. 323—19 2 Claims

1. A DC voltage regulator having first and second input terminals and first and second output terminals, the second input terminal and second output terminal being in common, and the output terminals having developed therebetween a constant direct output voltage unaffected by variations in direct input voltage applied between the input terminals, said regulator comprising:

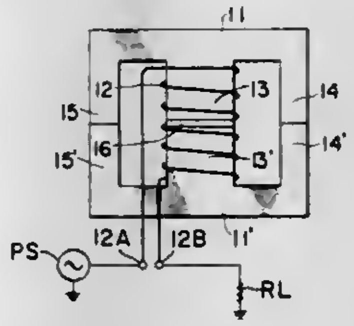
a first transistor having a base, emitter and collector, the collector of the first transistor being connected to the first output terminal; a first resistor connected between the base-emitter of the first transistor; a second transistor having a base, emitter, and collector, the collector of the second transistor being connected to the first input terminal, the base of the first transistor being connnected to the base of the second transistor and the emitter of the second transistor being connected to the first output terminal; a second resistor connecting the first transistor emitter to the first input terminal; and a voltage reference device connecting the two bases to the second terminals.



4,103,221
INDUCTOR WITH PLURALITY OF MAGNET PIECES IN AIR GAP

Masahiko Fukni, Kumagaya; Hiromi Sako, Fukaya, and Masao Ogata, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 471,157, May 17, 1974, Pat. No. 3,968,465. This application Apr. 26, 1976, Ser. No. 680,539
Claims priority, application Japan, May 18, 1973, 48/54624; Jul. 23, 1973, 48/80924; Jul. 23, 1973, 48/80925; Jul. 20, 1973, 48/80588; Jan. 30, 1974, 49/12060; Feb. 22, 1974, 49/20817
Int. Cl.² G05F *1/22;* H01F *21/00*
U.S. Cl. 323—92 5 Claims



5. An inductor device comprising:

a magnetic circuit comprising a first iron core made of soft magnetic material having at least two legs, and a second iron core made of soft magnetic material having at least two legs, said legs of said second iron core having end faces which oppose end faces of the legs of said first iron core, and at least one air gap formed between the end faces of the first and the second iron cores;

coil means wound around a portion of said magnetic circuit having terminals connected in series with a power source and a load; and

a plurality of rare earth-cobalt magnet pieces insulated one from the other, disposed in said at least one air gap between said end faces, said permanent magnet pieces being substantially disposed in a common plane.

4,103,222
PHASE DISPLACED MEASUREMENT OF CONTIGUOUS SPHERICAL BALLS

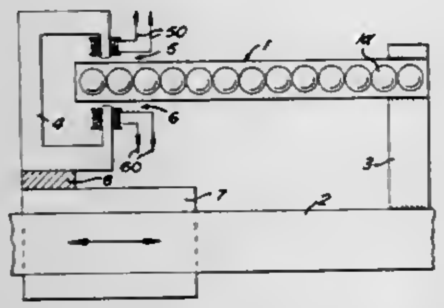
James Hugh Phillips; Curt Ludwig David, and Michael James Rogers, all of Peterborough, England, assignors to The Newall Engineering Company, Ltd., England

Filed Jul. 27, 1976, Ser. No. 709,072

Claims priority, application United Kingdom, Aug. 5, 1975, 32724/75

Int. Cl.² G01R *33/00*

U.S. Cl. 324—207 **4 Claims**



1. A position detector comprising a first member, a plurality of identical steel balls housed in a longitudinal row on the first member and disposed in a linear array in side by side point contact and constrained against movement relative to one another, a second member, a transducer carried by said second member, said first and second members being relatively movable in a rectilinear path parallel to the longitudinal row of balls with said members being capable of relative displacement in a direction parallel to the line of point contact of the balls, said transducer comprising means positioned on one side of the balls for producing a periodically varying magnetic field through the balls in a direction extending across the row thereof and perpendicular to the longitudinal line of contact of the balls, and separate means positioned on the other side of said balls for sensing phase-displaced variations produced in the magnetic field by said relative movement of the members and for producing signals denoting the relative positions of the first and second members, said sensing means comprising at least two pick-up coils coupled by mutual inductance only with the signal producing transducer and disposed adjacent to and spaced apart along the row of balls and along the line of contact thereof.

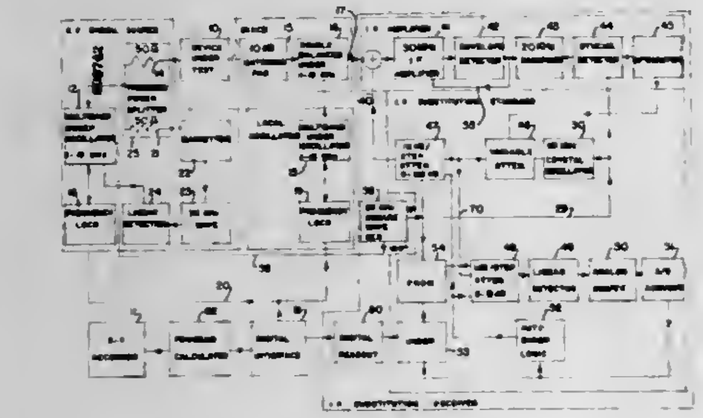
4,103,223
CLOSED LOOP FOR AUTOMATIC SUBSTITUTION OF A SIGNAL OF EQUAL AMPLITUDE

Fritz K. Weinert, Gaithersburg, Md., assignor to Weinschel Engineering Company, Gaithersburg, Md.

Filed Jun. 21, 1977, Ser. No. 808,742

Int. Cl.² G01R *27/00*

U.S. Cl. 324—57 R **26 Claims**



12. Apparatus for automatically substituting the amplitude of an I.F. signal comprising:

a signal source for producing said substitution at said I.F. frequency signal,

closed loop means, including attenuator means for receiving the output of said substitution signal source and for controlling the amplitude of said substitution signal,

a branch attenuating system connected to said closed loop and for measuring the amplitude of said substitution signal at one point in said closed loop,

said branch attenuating system including control means for controlling the attenuation of at least a part of said attenuator means.

4,103,224
MICRO-WAVE HYGROMETER

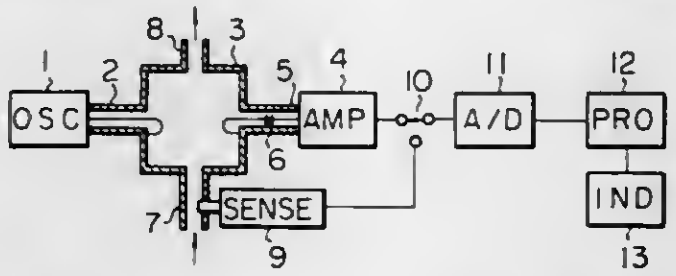
Miura Taro, Tokyo; Yamamoto Takahiro, Yachiyo; Suzuki Makoto, Tokyo, and Nakai Shinya, Ichikawa, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 31, 1977, Ser. No. 802,210

Claims priority, application Japan, Jul. 7, 1976, 51/79863

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 C **6 Claims**



1. A micro-wave hygrometer comprising a shield housing having a small hole for the flow of the air but preventing the radiation of the micro-wave energy, a dielectric resonator mounted in the housing, a support for supporting said dielectric resonator in said housing at the portion where the electric field is weak, a pair of antennae provided in said housing for transmitting and receiving the micro-wave energy through said dielectric resonator.

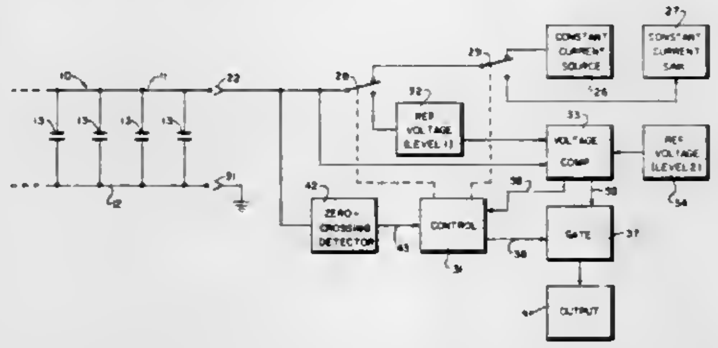
4,103,225
SYSTEM AND METHOD FOR DETERMINING CAPACITANCE AND CABLE LENGTH IN THE PRESENCE OF OTHER CIRCUIT ELEMENTS

Berton H. Stephens, Los Altos, Calif., assignor to Dynatel Corporation, Sunnyvale, Calif.

Filed Jan. 5, 1977, Ser. No. 757,030

Int. Cl.² G01R *27/26, 31/08*

U.S. Cl. 324—60 CD **12 Claims**



11. In apparatus for determining the capacitance of an electrical element: means for applying a charging current of constant magnitude to the element to increase the voltage across the same from a first predetermined level to a second predetermined level, a constant current load, means for connecting the load to the element to effect a constant current discharge of the element to decrease the voltage from the second level to the first level, means for monitoring the level of the voltage across the element, and means for delivering an output signal corresponding to the time required to increase the voltage from the first level to the second level and to return the voltage back to the first level, said output signal being proportional to the capacitance of the element.

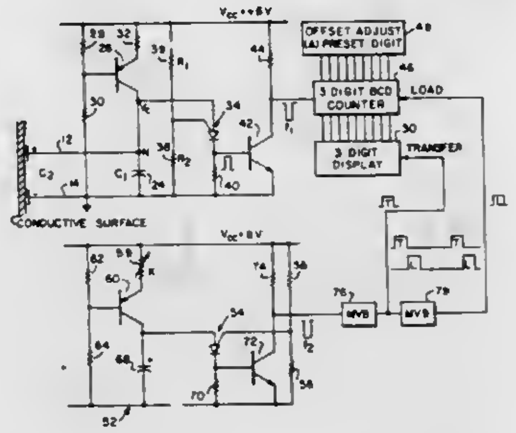
4,103,226
APPARATUS FOR GAUGING THE TEXTURE OF A CONDUCTING SURFACE

Robert E. Fromson, Wilkins Township, Allegheny County; James N. Brecker, Mt. Lebanon, and Lanson Y. Shum, Delmont, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1976, Ser. No. 723,269

Int. Cl.² G01R *27/26*

U.S. Cl. 324—61 R **20 Claims**



1. Apparatus for gauging the texture of a conductive surface comprising:

(a) capacitance means arranged in spaced relationship to an incremental area of said conductive surface and forming with said conductive surface a variable capacitance when said means is in spaced insulated relationship thereto for gauging the texture of said conductive surface;

(b) means for energizing said capacitance means;

(c) means coupled to said energizing means for providing a datum potential;

(d) means coupled with said capacitance means and said datum potential means, for deriving a discharge pulse each time said datum potential is exceeded by the charge on said capacitance means; and

(e) means coupled with said deriving means for counting said pulses over a time period, with the summed number of pulses received during said time period being a function of the texture of said incremental area.

14. Apparatus for gauging a predetermined characteristic of a conductive surface, said apparatus comprising

capacitance means including a conductive plate member arranged in a spaced relationship with an incremental area of said surface and capacitivety coupled to said surface, which incremental area is determined by said plate member and provides a variable capacitance as determined by said surface characteristic for gauging said characteristic of the surface, and

dielectric means resting on said surface and positioned between said plate member and said surface for determining said spaced relationship.

4,103,227
ION-CONTROLLED DIODE

Jay N. Zemel, Jenkintown, Pa., assignor to University of Pennsylvania, Philadelphia, Pa.

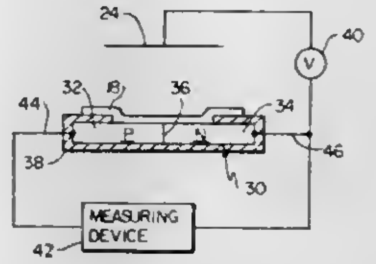
Filed Mar. 25, 1977, Ser. No. 781,474

Int. Cl.² G01R *27/02*

U.S. Cl. 324—65 R **12 Claims**

1. An ion sensor for sensing the presence and/or concentration of an ion in a fluid, said sensor comprising:

an insulated semiconductor diode having a P/N junction; and



an ion-sensitive membrane, separating said junction from said fluid and juxtaposed with said junction.

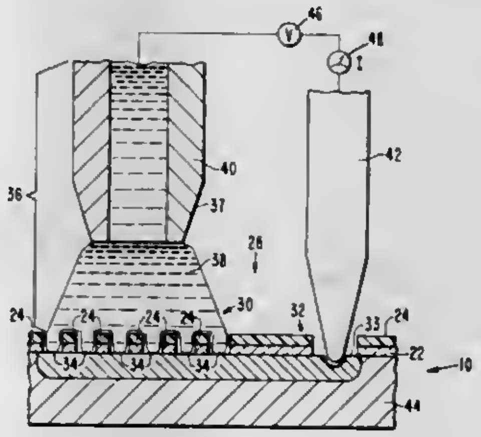
4,103,228
METHOD FOR DETERMINING WHETHER HOLES IN DIELECTRIC LAYERS ARE OPENED

William Edward Ham, Mercerville, N.J., assignor to RCA Corp., New York, N.Y.

Filed May 16, 1977, Ser. No. 797,401

Int. Cl.² G01R *27/02*

U.S. Cl. 324—65 R **7 Claims**



1. A method of determining whether holes formed in a dielectric layer on a surface of a semiconductor wafer are open to communicate with said surface comprising the steps of:

(a) selecting a portion of said dielectric layer for a test area;

(b) forming at least one specimen hole in said dielectric layer within said test area;

(c) electrically contacting said wafer through said specimen hole with an electrolytic input probe;

(d) electrically contacting said wafer with an output probe;

(e) applying a voltage between said input probe and said output probe; and

(f) measuring the current flow between said input probe and said output probe to determine whether any dielectric remains between said input probe and said surface.

4,103,229
CONTINUOUS-FLOW, RESISTIVE-PARTICLE COUNTING APPARATUS

Adrian R. L. Gear, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Jan. 28, 1977, Ser. No. 763,630

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 CP **4 Claims**

1. Continuous-flow resistive-particle counting apparatus comprising:

container means for housing a bulk electrolyte;

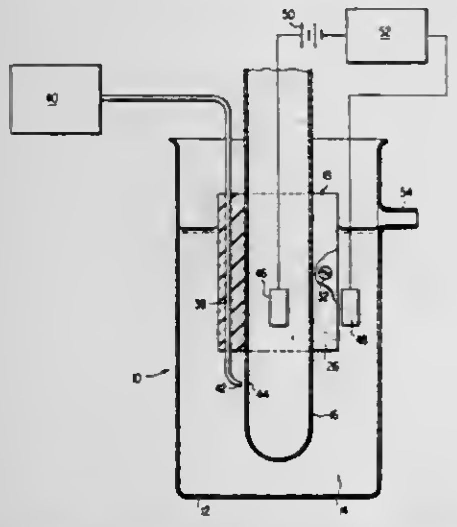
an orifice tube closed at the lower end thereof and having a sensing orifice defined within a side wall portion thereof, a portion of said electrolyte thereby being disposed within said tube;

a first electrode disposed within said electrolyte disposed within said orifice tube;

a second electrode disposed within said bulk electrolyte disposed within said container;

electric circuit means including a power source, electrically connecting said first and second electrodes;

fluid pumping means having a down-stream tube equipped with an injection jet, said down-stream tube disposed within the electrolyte in said container at a position radially outwardly of said orifice tube and within the vicinity of said sensing orifice of said orifice tube for forcefully injecting a fluid jet of said particles to be counted toward said sensing orifice at a flow rate which is at least ten-fold the normal flow rate of said electrolyte from said container through said sensing orifice into said orifice tube; and



means disposed within said electrical circuit for counting said particles passing through said sensing orifice.

4,103,230

APPARATUS FOR ANALYZING ELECTRICAL SIGNALS OF VARIABLE AMPLITUDE

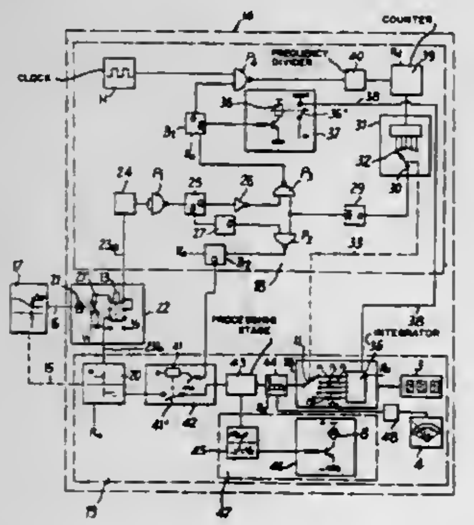
Robert Dubernet, Chatillon; Lucien Janvier, Monthlhery; Roger Tirilly, Verrieres-Le-Buisson, and Patrick O'Connolly, Clamart, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 8, 1976, Ser. No. 703,375

Claims priority, application France, Jul. 8, 1975, 75.21355

Int. Cl.² G01R *23/16*

U.S. Cl. 324—77 H **11 Claims**



1. Apparatus for analyzing at least one electrical signal of variable amplitude, comprising:

a processing assembly for receiving an electrical signal, said processing assembly (including) comprising:
  - (a) a rectifier for rectifying the signal;
  - (b) means for maintaining the peak voltage of the rectified signal;
  - (c) a controllable integrator electrically connected to the output of said rectifier for integrating the rectified signal; and
  - (d) a controllable switch for checking the admission of the signal into said rectifier;

a first display element for displaying said peak voltage;

a second display element for displaying the integrated signal output of said integrator;

a control switch arrangement; and a logic assembly for controlling said processing assembly comprising:
  - (a) first means actuable by said control switch arrangement for switching said controllable switch of said processing assembly after a first time delay for admitting the signal to said rectifier;
  - (b) second means actuable by said control switch arrangement for actuating said controllable integrator to begin integrating, after a second time delay; and
  - (c) counter means actuable by said control switch arrangement after said second time delay for transmitting the integration after a predetermined length of time.

4,103,231

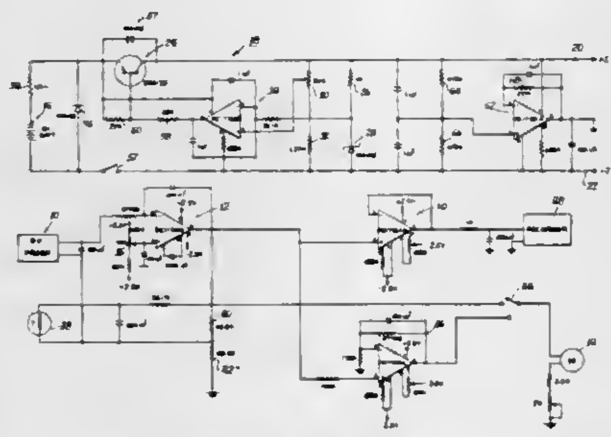
ELECTROMETRIC APPARATUS

Donald Stephen Nemcek, Sr., Roselle, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Apr. 29, 1977, Ser. No. 792,270

Int. Cl.² G01R *1/30*

U.S. Cl. 324—123 R **4 Claims**



1. Electrometric apparatus comprising a measuring device for providing a high impedance dc signal which varies in accordance with the variable to be measured, at least one amplifier means for amplifying said high impedance dc signal, indicating means connected to said amplifier means for indicating the amplitude of said amplified dc signal, a transistor radio battery, and regulating means having a low quiescent current connecting said battery to the supply terminals of said amplifier means for regulating the current supplied to said amplifier means, said regulating means including a transistor having its emitter-collector circuit connected in series with said battery and the supply terminals of said amplifier means, a resistor connected by one end to one of said supply terminals, a low current type Zener diode connected by one end to the other end of said resistor and by its other end to the other supply terminal of said amplifier means, a pair of series connected resistors shunt connected between said supply terminals, a programmable operational amplifier having one input connected to the junction between said resistor and said Zener diode and the other input connected to the junction between said series connected resistors, the output of said operational amplifier being connected to the base of said transistor.

4,103,232

WAFER TRANSFER DEVICE

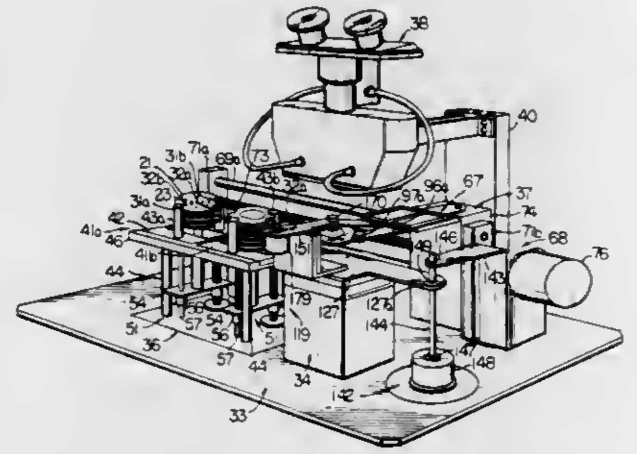
Kazuhiro Sugita, and Chiyobide Kon, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,020

Claims priority, application Japan, Dec. 28, 1974, 50-3370; Dec. 29, 1974, 50-2140; Dec. 28, 1974, 50-3368; Dec. 28, 1974, 50-3369; Dec. 28, 1974, 50-3574

Int. Cl.² G01R *31/22;* B65G *47/24*

U.S. Cl. 324—158 F **10 Claims**



2. Apparatus comprising:

a plurality of individual disc-shaped pallets each having a wafer-shaped article secured at a precisely predetermined position on a face of the pallet;

storage means for supporting said pallets in first and second stacks;

holding means for holding one of said disc-shaped pallets at opposed portions of the edge thereof, said holding means including a pair of arms movable relative to each other with one of said arms determining a precise position of the held pallet relative to said holding means and the other of said arms moving to effect the gripping and releasing of a pallet;

pallet support means at a testing station spaced from said stacks;

driving means for moving said holding means so as to pick-up the uppermost of said pallets from said first stack and transport the same to a precisely predetermined position on said pallet support means and, thereafter, to pick up the pallet from said support means and transport the same to the top of said second stack; and

a measuring device at said testing station for measuring the wafer-shaped article on a pallet at said precisely predetermined position on said support means.

4,103,233

INSTALLATION FOR THE MEASURING OF AN ESSENTIALLY LINEAR DISPLACEMENT

Armand Timmermans; Eduard Selleslagh, both of Haasdonk, and José N. E. Deneyer, Petit-Enghien, all of Belgium, assignors to Verenigde Energiebedrijven van bet Scbeldeland, Antwerp, Belgium

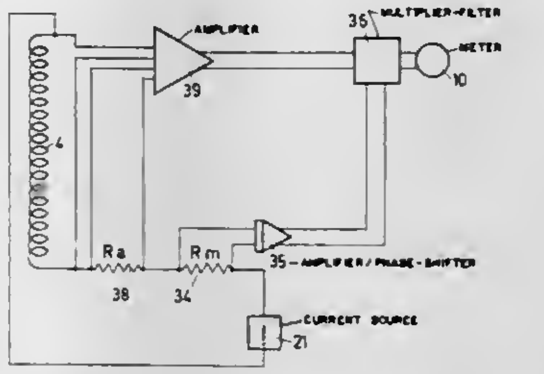
Filed Aug. 12, 1976, Ser. No. 713,835

Claims priority, application Belgium, Aug. 13, 1975, 159166; Jul. 10, 1976, 169417

Int. Cl.² G01R *33/12*

U.S. Cl. 324—208 **22 Claims**

1. Installation for the measuring of an essentially linear displacement of a body, with a fixed coil the axial direction of which corresponds to the direction of the displacement to be measured, a rod the magnetic permeability of which differs from the magnetic permeability of the medium which is surrounded by the coil, means for connecting said rod along the axis of the coil to that body the displacement of which should be measured, an A.C. source with constant amplitude and pulsation (angular frequency) causing a voltage drop in the coil, means electrically connected to the coil and generating a voltage signal dependent of and in phase with the voltage drop in the coil, means electrically connected in series with the AC current source, generating a signal proportional to and in phase with the current through the coil, means for phase shifting by 90° one of said signals, which means are electrically connected to the means which generates the signal, a device which operates as a multiplier for multiplying the phase-shifted signal and the other signal which device is electrically connected to the means for phase shifting and to the means for generating the non-shifted signal and a meter electrically connected to the device which operates as a multiplier measuring the signal obtained by the multiplication performed in the device.



4,103,234

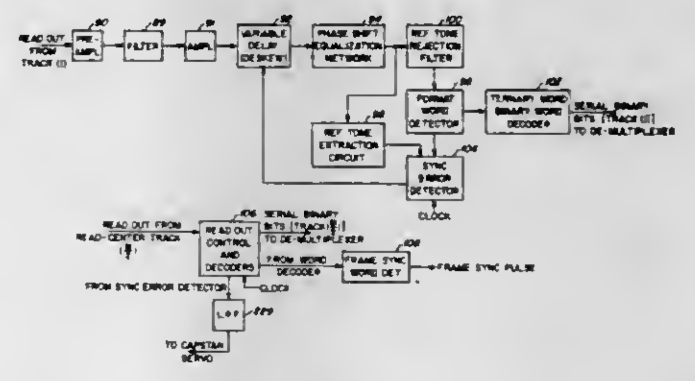
SYSTEM FOR TRANSMISSION STORAGE AND/OR MULTIPLEXING OF INFORMATION

William R. Frazier, Jr., Indialantic, Fla., assignor to General Dynamics Corp., St. Louis, Mo.

Division of Ser. No. 685,353, Nov. 24, 1967, Pat. No. 3,588,836. This application Feb. 2, 1971, Ser. No. 111,919

Int. Cl.² H04B *1/00*

U.S. Cl. 325—38 A **19 Claims**


READ OUT FROM TRACK (I)
PRE-AMPL
FILTER
AMPL
VARIABLE DELAY (DESKEW)
PHASE SHIFT EQUALIZATION NETWORK
REF TONE REJECTION FILTER
FORMAT WORD DETECTOR
TERNARY WORD BINARY WORD DECODER
SERIAL BINARY BITS (TRACK (I)) TO DE-MULTIPLEXER
REF TONE EXTRACTION CIRCUIT
SYNC ERROR DETECTOR
CLOCK
READ OUT FROM READ-CENTER TRACK
READ OUT CONTROL AND DECODERS
SERIAL BINARY BITS (TRACK) TO DE-MULTIPLEXER
FROM WORD DECODER
FRAME SYNC WORD DET
FRAME SYNC PULSE
FROM SYNC ERROR DETECTOR
CLOCK
L.P.F
TO CAPSTAN SERVO

1. The method of processing digital information for high density data transmission via an information carrying medium which comprises the steps of translating said information into a series of successive data words each having a given number of binary bits, and successively encoding each of said data words into a format word selected from an alphabet of format words, each having a series of signals equal in number to said given number and having zero average amplitude,

controlling the reception of said format words from said medium in accordance with their zero average amplitude characteristic that each of said words is segregated, and

retranslating said format words into data words corresponding thereto.

4,103,235

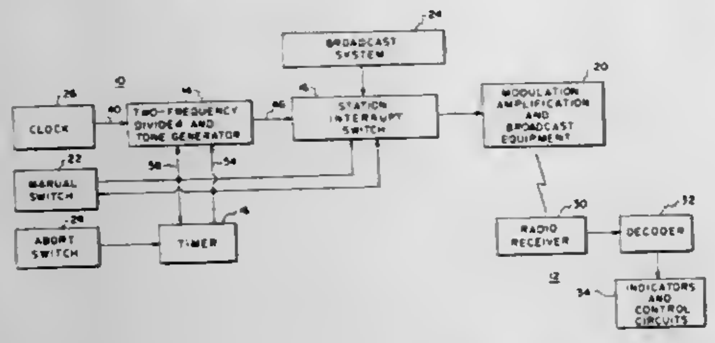
TWO-TONE ATTENTION SIGNAL BROADCASTING SYSTEM

Patrick Doyle Bryant, 2310 Garfield, Apt. 5, Lincoln, Nebr. 68502

Filed Aug. 4, 1976, Ser. No. 711,486

Int. Cl.^{2} H04H *9/00*

U.S. Cl. 325—64 **19 Claims**



1. A signaling system for broadcast by broadcast equipment on carrier frequencies normally used for other broadcasts comprising:

an encoder;

a timer;

a source of audio signals for broadcasting at a carrier frequency;

an interrupt switch means for electrically operatively connecting said source of audio signals to said broadcast equipment for transmission at one time and for electrically operatively connecting said encoder to said broadcast equipment at other times;

said encoder including means for generating digital signals at two predetermined frequencies, converting said digital signals to sine waves and combining said sine waves for application to said interrupt switch;

said timer including means for switching said interrupt switch means from said encoder back to said source of said audio signals a predetermined time after said interrupt switch means has been switched from audio signals to said encoder; and

switch means for actuating said interrupt switch means to connect said encoder to said broadcast equipment and for starting said timer;

said encoder including a source of clock pulses, a first frequency divider, and a second frequency divider;

said first and second frequency dividers each having a different input terminal;

each of said input terminals being connected to a source of clock pulses;

said first and second frequency dividers including counters each of which has a different reset input terminal; and

means for applying a signal to at least one of said reset input terminals to energize said counters.

4,103,236

ELECTRONIC JAMMING SYSTEM

Peter Deserno, Munich, and Hans Prost, Munich-Solln, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

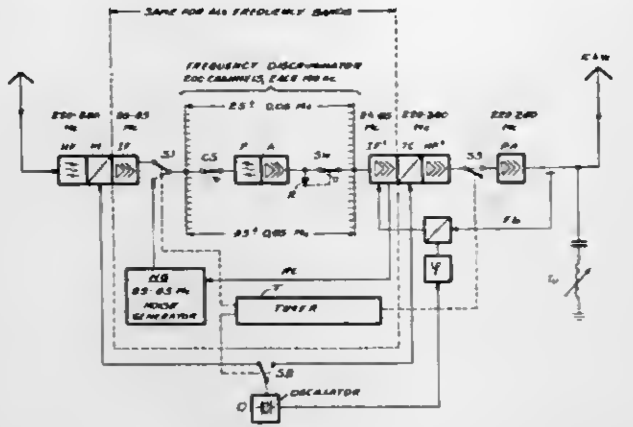
Filed Sep. 18, 1961, Ser. No. 154,913

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1960, 70474

Int. Cl.^{2} H04K *3/00*

U.S. Cl. 325—132 **16 Claims**

1. A method of jamming wireless communications having a frequency falling within a predetermined frequency band, by means of a powerful jamming transmission, comprising the steps of separating out from the predetermined frequency band, by an electrical filtering operation, a suspect transmission signal falling therein, producing an interference signal band having a band width sufficient to include all filtered frequencies, separating out, by an electrical filtering operation, a signal having a frequency corresponding to the frequency of the previously filtered suspect signal, from said interference signal band, and utilizing said last filtered signal at the interference frequency in the wireless transmission of a jamming signal, the frequency of which corresponds to the frequency of the suspect transmission signal so detected.



4,103,237

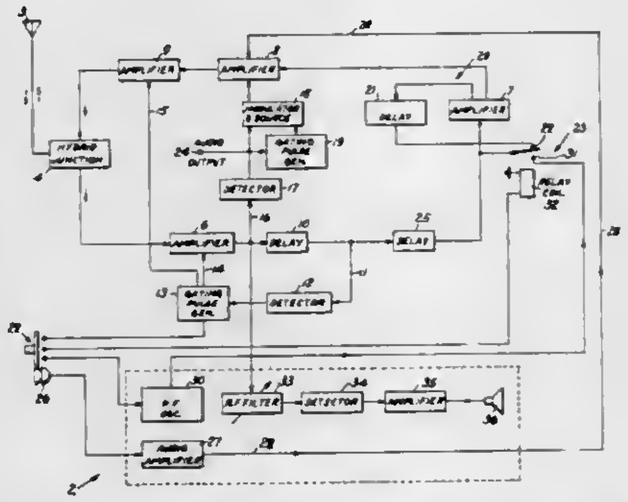
RADIO JAMMING SYSTEM

Laurin G. Fischer, Glen Rock, N.J., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Dec. 15, 1955, Ser. No. 553,352

Int. Cl.^{2} H04K *3/00*

U.S. Cl. 325—132 **7 Claims**



1. A repeater comprising an antenna system, a repeater loop consisting solely of broadband elements for coupling the input signal from the input to the output thereof without changing the frequency of the signal at any place in the loop, said elements including at least one broadband translation device, means coupling the input and output of said repeater loop to said antenna system to receive incoming signals and for retransmitting said signals, and means for communicating through said repeater including a source of local intelligence signals, a source of a local carrier wave, means coupling said wave source to said loop at a point ahead of said translation device and means coupling the source of local intelligence signals to said translation device to modulate said local carrier wave.

4,103,238

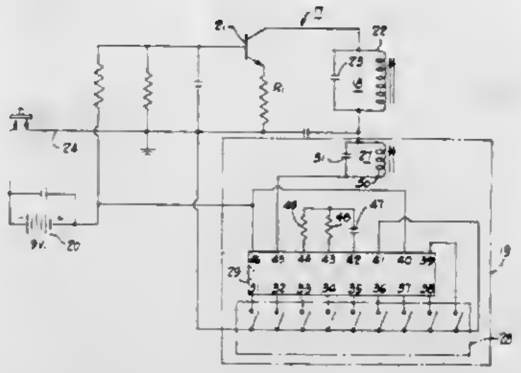
TRANSMITTER MODULATED WITH THREE MODULATION PATTERNS

Andrew F. Deming, Alliance, Ohio, and James B. Russell, Glenshaw, Pa., assignors to The Alliance Manufacturing Company, Alliance, Ohio

Filed Nov. 26, 1976, Ser. No. 744,976

Int. Cl.^{2} H04B *1/04*

U.S. Cl. 325—141 **23 Claims**



1. A modulated carrier wave transmitter comprising in combination;

a carrier generator to generate a carrier wave;

means establishing first and second different modulation frequencies;

means establishing time sequential control signals;

modulation means connected to modulate said carrier wave by said first and second modulation frequencies in first, second and third modulation patterns, comprising;

first means connected to modulate said carrier wave with said first modulation frequency in accordance with said sequential control signals to establish said first modulation pattern of said carrier wave for at least one bit period, a bit period being the time period required for the transmission of one complete interval of the first, second or third modulation pattern,

second means connected to modulate said carrier wave with said second modulation frequency in accordance with said sequential control signals to establish said second modulation pattern of said carrier wave for at least one bit period,

and third means connected to modulate said carrier wave with said first modulation frequency and sequentially with said second modulation frequency in accordance with said sequential control signals to establish said third modulation pattern of said carrier wave for at least one bit period, the signal being transmitted containing all three modulation patterns.

4,103,239

COMPRESSOR FOR BOTH SPEECH AND CARRIER SIGNALS

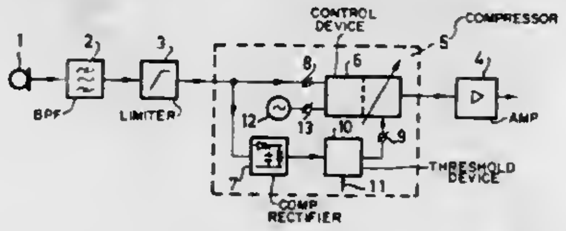
Willem Douwe Meewezen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 616,628, Sep. 25, 1975, abandoned. This application May 2, 1977, Ser. No. 792,647

Claims priority, application Netherlands, Oct. 1, 1974, 7412916

Int. Cl.^{2} H04B *1/04*

U.S. Cl. 325—144 **5 Claims**



1. A transmitter comprising a dynamic compressor having a dynamic control device and a compression rectifier fed by the signals to be transmitted, a threshold device coupled between said rectifier and said control device, a carrier signal source which supplies a pilot signal, the signal to be transmitted and the pilot signal being supplied to the dynamic control device, the dynamic control device comprising an input circuit including an amplitude modulator coupled to said signal source, the signal to be transmitted being applied to said modulator for generating at an angle a double-sideband signal with suppressed carrier, said input circuit including a combination device means coupled to the modulator output and to said signal source for combining the double-sideband modulated signal said control device further comprises amplitude control means coupled to said combination and threshold devices and the pilot signal.

4,103,240

FM TUNING INDICATOR

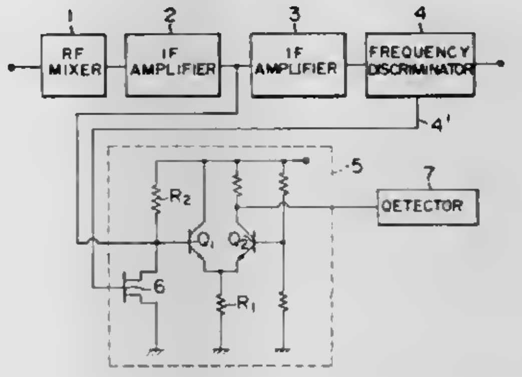
Nobuyuki Sakabe, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corp., Nagoya, Japan

Continuation of Ser. No. 661,504, Feb. 26, 1976, abandoned. This application Aug. 2, 1977, Ser. No. 821,075

Claims priority, application Japan, Jun. 17, 1975, 50-73337

Int. Cl.^{2} H04B *1/16*

U.S. Cl. 325—349 **5 Claims**



1. An FM tuner including means for producing an intermediate frequency signal; frequency discriminator means with "S" characteristics for frequency-discriminating said intermediate frequency signal; differential amplifier means responsive to a substantially rectilinear portion of said "S" characteristics to produce an output signal whose amplitude becomes maximum at a frequency position corresponding to the center frequency position of said intermediate frequency signal, said differential amplifier means comprising a first transistor and a second transistor connected to each other so as to constitute a differential amplifier, and a variable resistance element connected to said frequency discriminator means in such a manner that the internal resistance is variable depending on a d.c. component output which is provided by said frequency discriminator means, said variable resistance element being associated with said differential amplifier, wherein said intermediate frequency signal is imparted to the base of said first transistor; and detector means responsive to said out-put signal provided by said differential amplifier means to produce an indication as to whether said tuner is in a tuned state or not.

4,103,241

RF AMPLIFIER AND ANTENNA

Jack Najork, Lexington, Nebr., assignor to Reach Electronics, Inc., Lexington, Nebr.

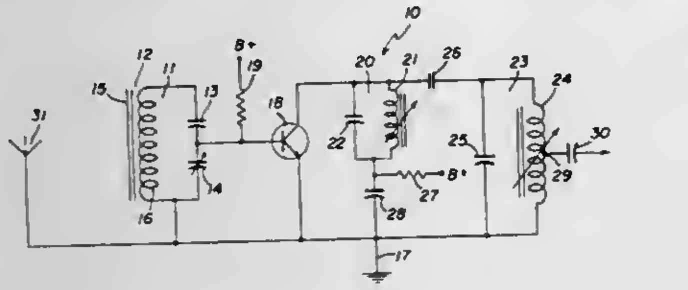
Filed Aug. 11, 1975, Ser. No. 603,350

Int. Cl.^{2} H04B *1/18*

U.S. Cl. 325—373 **3 Claims**

1. In a receiver for RF signals, the combination comprising an RF amplifier for amplifying RF signals and having a point of ground reference potential, an internal antenna adapted to receive RF signals and having an output on which such RF

signals appear, said output being coupled to said RF amplifier, and means defining an input for RF signals from an external antenna, said means being connected to said ground reference



potential, said internal antenna being tunable and having been tuned while said input means is connected to said ground reference potential to maximize the sensitivity of said receiver.

4,103,242
WAVEFORM CONVERTER FOR ALTERING THE FREQUENCY SPECTRUM OF AN OUTPUT SIGNAL

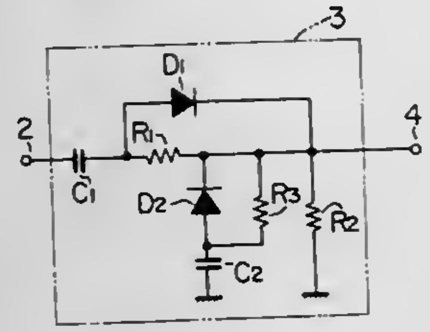
Junnosuke Shigeta, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1976, Ser. No. 685,134

Claims priority, application Japan, May 15, 1975, 50-58015

Int. Cl.^{2} H03K *5/08;* G06G *7/18*

U.S. Cl. 328—35 **4 Claims**



1. A waveform converter comprising:
an input terminal, an output terminal and a ground,
a first capacitor having one end connected to said input terminal and the other end connected to one end of a first resistor, the other end of said first resistor being connected to said output terminal,
a first switching device connected between said one end of said first resistor and said output terminal,
a second resistor connected between said output terminal and said ground,
a second switching device connected in parallel with a third resistor, one end of said parallel connection being connected to said output terminal,
a second capacitor connected between the other end of said parallel connection and ground,
one of said first and second switching devices being rendered conductive and the other being rendered non-conductive in response to a change of a square wave signal applied to said input terminal from a first to a second potential and said other of said switching devices being rendered conductive and said one of said switching devices being rendered non-conductive in response to a change of said square wave input signal from said second to said first potential, whereby said first capacitor and said second resistor substantially constilutes a differentiating circuit and said first resistor and said seacond capacitor substantially constitutes an integration circuit.

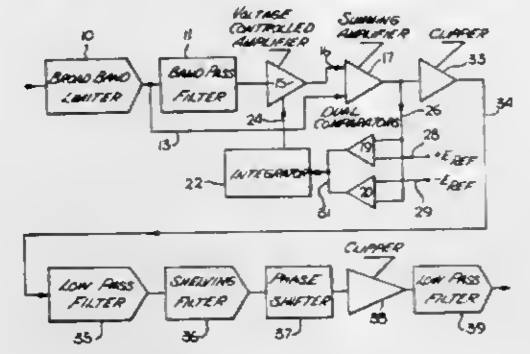
4,103,243
METHOD AND SYSTEM FOR CONTROLLING PEAK SIGNAL LEVELS IN A BANDLIMITED RECORDING OR TRANSMISSION SYSTEM EMPLOYING HIGH-FREQUENCY PRE-EMPHASIS

Robert A. Orban, Menlo Park, Calif., assignor to Orban Associates, Inc., San Francisco, Calif.

Continuation of Ser. No. 602,981, Aug. 8, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,193

Int. Cl.^{2} H03B *3/02;* H03K *5/08;* H03G *11/04*

U.S. Cl. 328—169 **15 Claims**



1. In a system for controlling peak signal levels in recording or transmission system, or the like which employs high frequency pre-emphasis the combination of:
input means for receiving an input signal;
high frequency pre-emphasis means coupled to said input means, for emphasizing high frequencies of said input signal;
clipping means for clipping a signal, coupled to said pre-emphasis means; and,
a shelving filter coupled to said clipping means having a transfer function which includes a factor in the general form:

$$(aS+1)/(bS+1)$$

where *a* and *b* are non-zero constants and where S is a complex variable;
whereby peak levels of an output of said shelving filter are readily controlled.

4,103,244
FSK DEMODULATOR

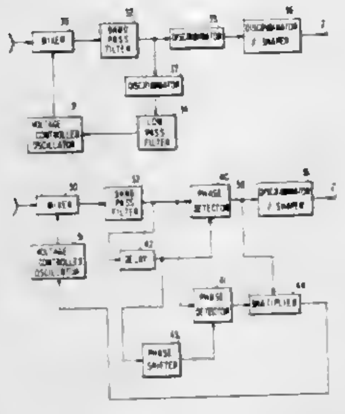
Yoichi Tan, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,702

Claims priority, application Japan, Apr. 9, 1976, 51-40656

Int. Cl.^{2} H03D *3/00*

U.S. Cl. 329—122 **12 Claims**



1. An FSK demodulator apparatus for receiving and demodulating an FSK-modulated signal that is transmitted with *n* transmitting frequencies made to correspond to *n*-level (*n* being a positive integer equal to or larger than 2) information signals, respectively, comprising a variable frequency oscillator whose frequency is variable in response to a control signal,

a frequency converter circuit for converting said FSK-modulated signal into an intermediate frequency signal by means of an output of said oscillator, and means responsive to the output of said converter circuit for generating said *n*-level information signals and said control signal having at least *n* frequency-stable points which correspond to said *n* transmitting frequencies.

4,103,245
TRANSISTOR AMPLIFIER FOR LOW LEVEL SIGNAL

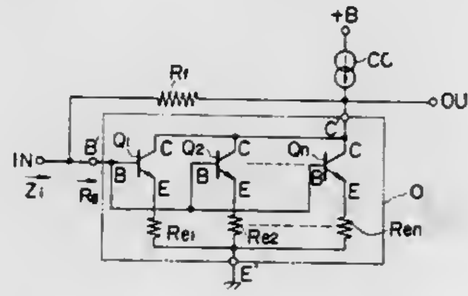
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 17, 1976, Ser. No. 715,200

Claims priority, application Japan, Aug. 29, 1975, 50-104081; Aug. 29, 1975, 50-104082; Aug. 29, 1975, 50-104083; Aug. 29, 1975, 50-118310[U]; Aug. 29, 1975, 50-118311[U]

Int. Cl.^{2} H03F *3/183, 3/68*

U.S. Cl. 330—265 **7 Claims**



5. An audio amplifier circuit for amplifying a signal of low voltage level supplied by a moving coil-type cartridge source, said amplifier comprising:
an input terminal adapted to be connected to said signal source;
an output terminal;
a power source;
transistor means including a plurality of transistors each having base, emitter and collector electrodes, said transistor means having an input resistance of a value less than the value of impedance of said signal source and the transistors being interconnected whereby corresponding electrodes of each transistor are connected, respectively, to the input terminal, the output terminal, and the power source; and
a resistor connected between the output terminal and said input terminal.

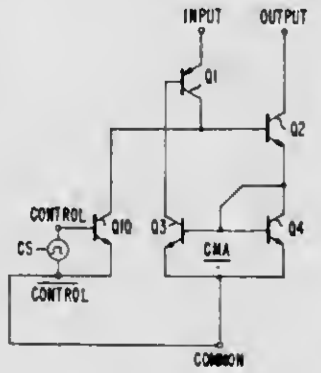
4,103,246
SWITCHABLE CURRENT AMPLIFIER

Allen LeRoy Limberg, Lambertville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,916

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—278 **10 Claims**



1. A switchable current amplifier comprising:
first and second transistors respectively of first and second complementary conductivity types, each having base and emitter and collector electrodes;
an input terminal connected to the emitter electrode of said first transistor;
an output terminal to which the collector electrode of said second transistor connects;
an inverting current amplifier having an input connection to the emitter electrode of said second transistor and having an output connection to the base electrode of said first transistor;
a source of control signals; and
means connected to an interconnection between the collector electrode of said first transistor and the base electrode of said second transistor for selectively diverting, responsive to a control signal from said source, collector current flow from said first transistor away from flowing as base current to said second transistor.

4,103,247
VARIABLE GAIN AMPLIFIERS

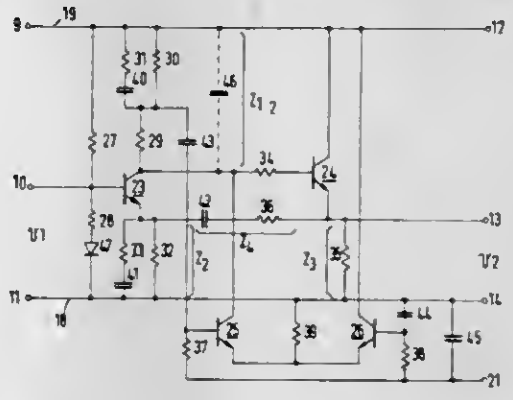
Jean Victor Martens, Deurne-Antwerp, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,266

Claims priority, application Netherlands, Jun. 18, 1976, 7606626

Int. Cl.^{2} H03G *3/30*

U.S. Cl. 330—284 **20 Claims**



1. Automatic active equalizer for a signal pulse transmission cable, said equalizer including:
at least one amplifier means including at least two amplifying devices;
feedback circuit means for intercoupling said amplifying devices, said amplifier having a predetermined closed loop gain versus frequency function;
a gain control output;
means for controlling a variable of said function with a gain control signal derived from said gain control output of said equalizer such that said feedback circuit provides positive feedback.

4,103,248
VOLTAGE FOLLOWER CIRCUIT

Gijuo Idei, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1976, Ser. No. 713,244

Claims priority, application Japan, Aug. 12, 1975, 50-97982

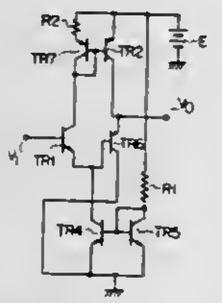
Int. Cl.^{2} H03F *3/18, 1/34*

U.S. Cl. 330—288 **10 Claims**

1. A voltage follower circuit comprising:
an input terminal,
an output terminal,
first and second power supply terminals,
a first transistor of one conductivity type having a base connected to said input terminal,
a second transistor, opposite in conductivity type to said first transistor, and having a base connected to the collector of said first transistor, an emitter connected to said first

power supply terminal, and a collector connected to said output terminal,

a third transistor, opposite in conductivity type to said first transistor, and having an emitter connected to said output terminal, a base connected to the emitter of said first transistor, and a collector coupled to said second power supply terminal, and

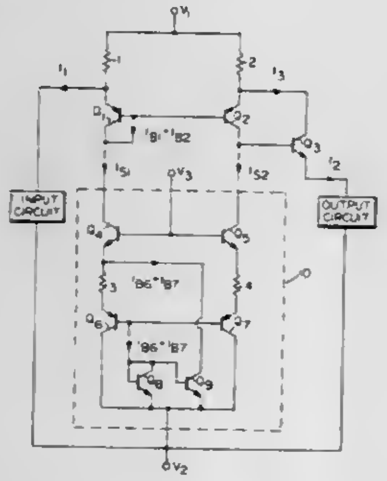


a current source connected between the emitter of said first transistor and said second power supply terminal.

4,103,249
PNP CURRENT MIRROR

Kenneth John Burdick, Trumansburg, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 31, 1977, Ser. No. 846,834
Int. Cl.^{2} H03F *3/18*
U.S. Cl. 330—288 **7 Claims**



1. A controlled current source circuit for connection between an input circuit and an output circuit comprising:

first and second PNP transistors, each having an emitter-base junction, and each having a base terminal, an emitter terminal and a collector terminal, said base terminals connected to a first common connection, said collector terminal of said first transistor also connected to said first common connection;

an NPN output transistor having a base terminal, an emitter terminal and a collector terminal, said base terminal connected to said collector terminal of said second PNP transistor, said collector terminal connected to said emitter terminal of said second PNP transistor;

first and second resistors, the value of said first resistor having a ratio with respect to the value of said second resistor, said resistors each having first and second terminals, said first terminal of each of said first and second resistors connected to a first source of D.C. potential, said second terminal of each of said first and second resistors respectively connected to the emitter terminal of each of said first and second transistors;

current bias means with a first terminal connected to said first common connection, with a second terminal connected to said collector terminal of said second transistor and with at least a third terminal connected to a second source of D.C. potential, the magnitude of current flowing through said second terminal having a fixed relationship with respect to the magnitude of current through said first terminal;

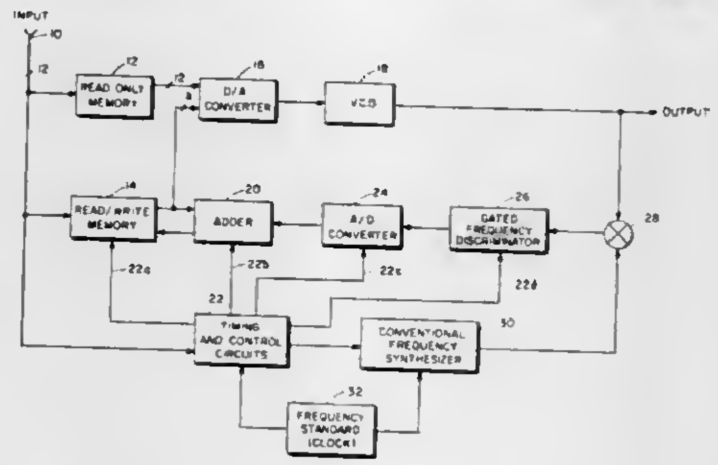
said input circuit also connected to said emitter terminal of said first transistor and to at least one source of D.C. potential; and

said output circuit connected to said emitter terminal of said output transistor and to at least one source of D.C. potential.

4,103,250
FAST FREQUENCY HOPPING SYNTHESIZER

Harold Wofford Jackson, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 23, 1977, Ser. No. 836,122
Int. Cl.^{2} H03B *3/08*
U.S. Cl. 331—1 A **10 Claims**



6. A fast frequency hopping synthesizer which responds to a pseudo random series of command words comprising:

an addressable memory means containing a plurality of individually addressed error signals;

a variable frequency oscillator means for generating an output in response to a combination of a first command signal and an associated error signal, said addressable memory means being addressed by said first command signal to recall said associated error signal;

a frequency synthesizer employing indirect synthesis techniques and responsive to second command signals for generating a sequence of frequency signals, the range of said second command signals encompassing at least the range of said first command signals;

means comparing said first command signals with said second command signals for generating a qualification signal when the comparison is proper;

means responsive to said qualification signal for comparing said sequence of frequency signals with said variable frequency oscillator means output to generate a second error signal; and,

means for adjusting said associated error signal in response to said second error signal.

4,103,251
STABILIZED DELAY LINE OSCILLATOR

Alvin L. Glick, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1977, Ser. No. 793,984
Int. Cl.^{2} H03B *3/04*
U.S. Cl. 331—1 A **14 Claims**

1. A stabilized pulse generating circuit comprising:

a delay line clock constructed to provide a repetitive alternating waveform clock output in response to an input signal; and

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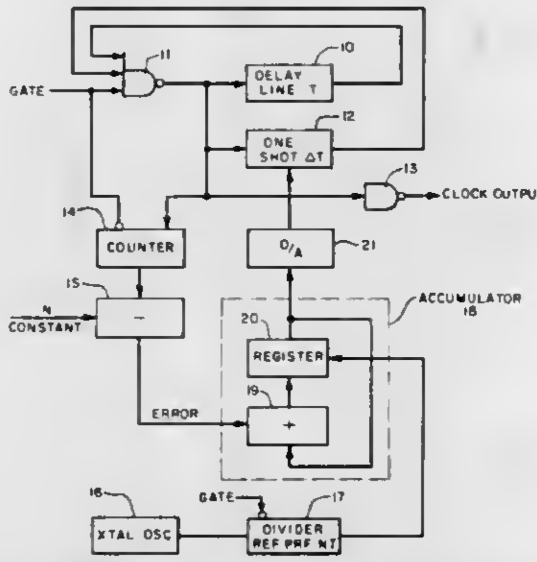
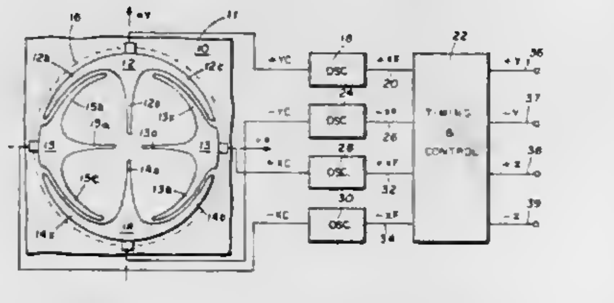
means coupled to said delay line clock for compensating for changes in the delay line timing period of the clock in order to stabilize the period of the clock output at a selected value.



4,103,252
CAPACITIVE TOUCH-ACTIVATED TRANSDUCER SYSTEM INCLUDING A PLURALITY OF OSCILLATORS

Thomas W. Boblck, Richardson, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,907
Int. Cl.^{2} Q01D *21/04;* **H01G** *7/00;* **H03K** *3/72*
U.S. Cl. 331—48 **19 Claims**



1. A capacitive activated transducer, comprising:

a sensor responsive to a touch by a human operator to generate a change in capacitance,

an oscillator connected to said sensor and generating a signal at a frequency varying with the capacitance of said sensor, and

means for gating a pulse train signal to an output terminal, said means connected to said oscillator and responsive to a time window varying with the frequency of said oscillator.

11. A sensor for a capacitive activated transducer, comprising:

a first pair of opposed electrodes positioned along a first of two orthogonal axes and spaced an equal and predetermined distance from the intersection of said orthogonal axes, each electrode of said first pair having a shape symmetrical with said first orthogonal axis, and

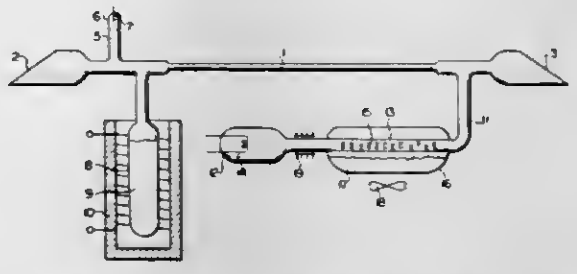
a second pair of opposed electrodes positioned along the second of said two orthogonal axes and spaced an equal and predetermined distance from the intersection of said orthogonal axes, each electrode of said second pair having a shape symmetrical with said second orthogonal axis and positioned with respect to the adjacent electrodes of said first pair such that a predetermined portion of the periphery of said electrode is spaced a predetermined distance from a corresponding portion of said adjacent electrodes,

whereby a change in capacitance may be sensed with respect to the two orthogonal axes when the sensor is touched by a human operator.

4,103,253
METAL VAPOR LASER GENERATING APPARATUS

Katbumi Tokudome, Hidaka; Michio Ishikawa, Kawagoe, and Noboru Kamide, Tokyo, all of Japan, assignors to The Kimmon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,521
Claims priority, application Japan, Dec. 24, 1975, 50-153430
Int. Cl.^{2} H01S *3/03*
U.S. Cl. 331—94.5 G **15 Claims**



1. A metal vapor laser generating apparatus comprising:

a laser fine tube including a peripheral side wall having first and second ends and containing rare gas;

Brewster windows provided at said first and second ends of said fine tube, respectively;

a first branch tube having an open end connected near but spaced from the first end of said fine tube to the peripheral side wall of said fine tube, and a sealed end through which is inserted an anode;

a second branch tube including a peripheral side wall having an open end connected near but spaced from the second end of said fine tube to the peripheral side wall of said fine tube, and a sealed end through which is inserted a cathode for effecting discharge with said anode;

a sealed vessel housing metal and connected to the peripheral side wall of said fine tube near said connection of said first branch tube to the peripheral side wall of said fine tube, said metal being evaporated by heating and being introduced into said fine tube so as to be ionized by said discharge and provide an active medium for laser;

a plurality of fine apertures provided over a given length of the peripheral side wall of said second branch tube at a central portion thereof between said sealed end thereof and said fine tube, said apertures having a size such that the evaporated metal passes through the apertures, but without causing leakage of the discharge current passing through said second branch tube and passing by said apertures, said apertures being provided over a length of said second branch tube which is greater than the inner diameter dimension of said second branch tube; and

a sealed outer tube surrounding the apertured portion of said second branch tube and housing an adsorbent for adsorbing the evaporated metal passing through said apertures into said sealed outer tube.

4,103,254
TUNABLE FREQUENCY LASER

Leslie F. Chikami, 114-19th St., Hermosa Beach, Calif. 90254

Filed Nov. 10, 1976, Ser. No. 740,350
Int. Cl.^{2} H01S *3/13*
U.S. Cl. 331—94.5 S **9 Claims**

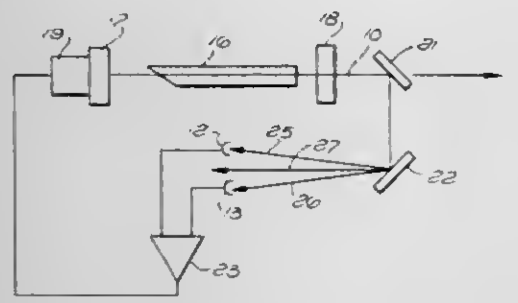
1. A stabilization system for stabilizing a laser beam to a desired frequency, which laser beam is produced between the longitudinal ends of a laser cavity, comprising:

control means adapted to adjust the longitudinal length of the laser cavity;

means for dispersing at least a portion of said laser beam into separate frequency components;

means for receiving the dispersed frequency components and detecting the occurance of those components having frequencies which are above and below a desired frequency component;

means for producing an error signal in response to the detection of frequency components having frequencies which are above or below the desired frequency and,



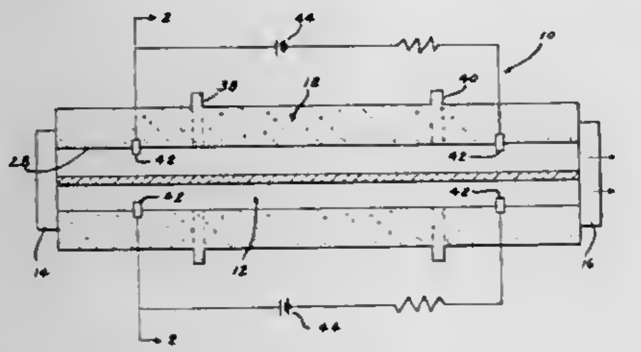
means for transmitting said error signal to said control means whereby the longitudinal length of the laser cavity is adapted to be adjusted by the control means in proportion to the error signal to stabilize the laser beam at the desired frequency.

4,103,255
HIGH POWER, COMPACT WAVEGUIDE GAS LASER

Howard R. Schlossberg, 9 Turning Mill Rd., Lexington, Mass. 02173

Filed Mar. 10, 1977, Ser. No. 776,388
Int. Cl.² H01S *3/03*

U.S. Cl. 331—94.5 C **10 Claims**



1. A high power compact waveguide laser comprising a resonant cavity, an elongated housing located within said resonant cavity, a longitudinal chamber located within said housing and containing a lasing medium, means for dividing said longitudinal chamber into a plurality of longitudinal waveguides, said dividing means being transmissive to the emission wavelength of said lasing medium, means for admitting said lasing medium into said waveguides and means for causing a lasing action to take place within said lasing medium located within each of said waveguides whereby leakage of laser radiation between adjacent waveguides through said dividing means causes the coupling of the phases of the waveguide modes and thereby produces a laser output of high power.

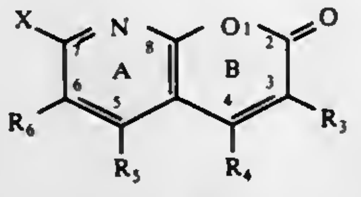
4,103,256
AZACOUMARIN DYE LASERS

Peter R. Hammond, Livermore; Ronald L. Atkins, Ridgecrest; Ronald A. Henry, China Lake, and Aaron N. Fletcher, Ridgecrest, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,889
Int. Cl.² H01S *3/20*

U.S. Cl. 331—94.5 L **11 Claims**

1. A dye laser comprising a laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration in a non-interfering solvent, of a dye having the following formula



wherein R_3 is hydrogen; R_4 is hydrogen, methyl, or trifluoromethyl; R_5 and R_6 are hydrogen; and X is hydroxy, dimethylamino, or morpholino.

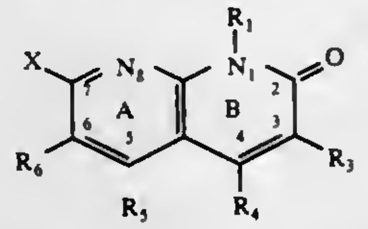
4,103,257
AZAQUINOLONE DYE LASERS

Peter R. Hammond, Livermore; Ronald L. Atkins, Ridgecrest; Ronald A. Henry, China Lake, and Aaron N. Fletcher, Ridgecrest, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,764
Int. Cl.² H01S *3/20*

U.S. Cl. 331—94.5 L **17 Claims**

1. A dye laser comprising a laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said solution comprising a lasing concentration in a non-interfering solvent, of a dye having the following formula:



wherein R_1 is hydrogen or methyl; R_3 is hydrogen or methyl; R_4 is hydrogen, hydroxy, methoxy, methyl, or trifluoromethyl; R_5 and R_6 are hydrogen; and X is hydroxy, amino, methylamino, or dimethylamino,.

4,103,258
PULSE GENERATOR INCLUDING A CAPACITOR WHICH IS DISCHARGED THROUGH A THYRISTOR

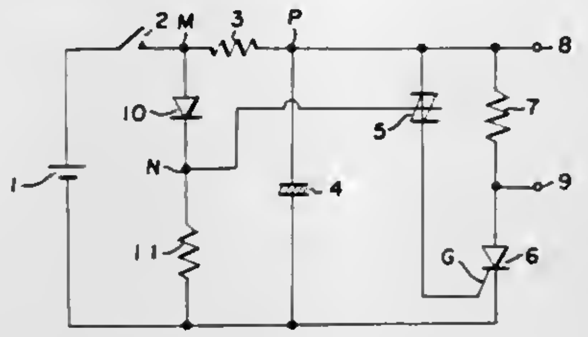
Takahiko Iida, and Yasunobu Arita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,217

Claims priority, application Japan, Mar. 18, 1976, 51-32788[U]; Mar. 25, 1976, 51-36223[U]; Mar. 25, 1976, 51-36224[U]; Jun. 22, 1976, 51-82580[U]; Jul. 9, 1976, 51-91968[U]; Aug. 5, 1976, 51-105335[U]

Int. Cl.² H03K *3/35*

U.S. Cl. 331—111 **11 Claims**



1. A pulse generating circuit which comprises:

- a DC power source having a positive terminal and a negative terminal;
- a capacitor having a positive terminal and a negative terminal connected in series through a resistor for charge to said DC power source;
- a series connection of a load and a main thyristor which is connected between both ends of said capacitor
- a shunt circuit for generating a predetermined shunt potential at a shunt point and said shunt circuit being connected between both ends of said DC power source;
- a three terminal trigger element whose main terminals are connected between the positive terminal of said capacitor and the gate terminal of said main thyristor and whose control terminal is connected to the shunt point of said shunt circuit;
- said shunt circuit comprising a series connection of a diode and a resistor;
- said three terminal trigger element comprising a silicon unilateral switch (SUS).

4,103,259
SEMICONDUCTOR OSCILLATOR FOR VERY SHORT WAVES

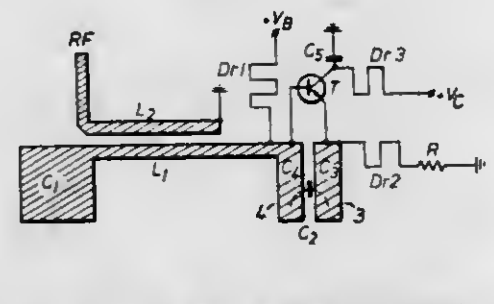
Kurt Lindner, Ulm, Donau, and Werner Wiesbeck, Neu-Ulm, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Mar. 28, 1977, Ser. No. 782,090

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613119

Int. Cl.² H03B *5/18*

U.S. Cl. 331—117 D **15 Claims**



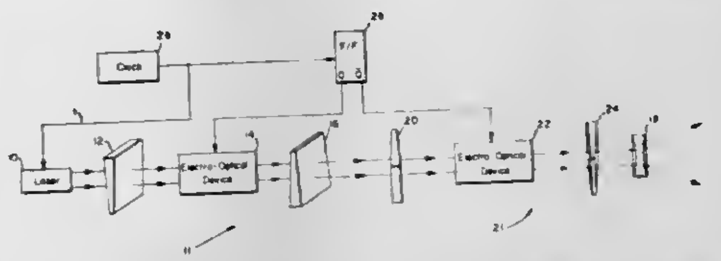
1. In a semiconductor Clapp oscillator circuit for very short waves, particularly for UHF, including a series resonant circuit connected to an active semiconductor device and to a capacitive voltage divider, including first and second series connected capacitors, whose output is connected to said active semiconductor device for providing the feedback signal for the oscillator circuit; the improvement wherein: at least all of the discrete frequency determining capacitive and inductive components of said oscillator circuit are formed according to the stripline technique; a third capacitor whose capacitance is of the same order of magnitude as said first capacitance is connected in parallel with said capacitive voltage divider; and said first, second and third capacitors are formed according to the stripline technique, said first and third capacitors being formed by first and second conductor electrodes respectively which are arranged parallel to one another at a mutual spacing which is very small with respect to their geometrical dimensions and which are associated with a spaced common return electrode, said first and second conductor electrodes having a length and width corresponding to their associated capacitances, and said mutual spacing of said first and second parallel conductor electrodes is selected according to the desired capacitance of said second capacitor so that said second capacitor is formed by said first and second parallel conductor electrodes.

4,103,260
SPATIAL POLARIZATION CODING ELECTRO-OPTICAL TRANSMITTER

William W. Buchman, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 3, 1977, Ser. No. 756,292
Int. Cl.² G02F *1/26*

U.S. Cl. 332—7.51 **18 Claims**



1. A transmitter for producing an energy beam which has encoded thereon as a polarization state of the energy, position along a selected one of a plurality of dimensions across the beam, said transmitter comprising:

- a !aser unit which provides a beam of linearly polarized energy;
- a plurality of switchable modulators arranged relative to said laser unit and to one another so that the laser energy passes sequentially through each of said modulators; and
- with said modulators each comprising an electro-optical device coupled between a pair of birefringent wedges, with said electro-optical device including means for switching between a selected one of two states, with the polarization of the energy passing through said electro-optical device being transformed by a first amount when said electro-optical device is in its first state and transformed by a second amount when it is in its second state, and with said wedges having their fast and slow axes oriented at approximately 45 degress to the polarization of the energy provided by said laser unit and having their optical axes substantially perpendicular to the energy beam, and with said wedges being configured and oriented so that energy everywhere within the beam, in passing through said pair of wedges, passes through substantially the same amount of birefringent material and so that when said electro-optical device is in said first state the birefringence of said wedges combines so as to cause no substantial polarization encoding across the beam of energy at the output of said modulator and when said electro-optical device is in said second state the birefringence of said wedges combines so that the energy at the output of said modulator is polarization encoded along a preselected dimension across the beam.

4,103,261
LASER BEAM SHUTTER AND BEAM INDICATOR

John M. Carr, Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

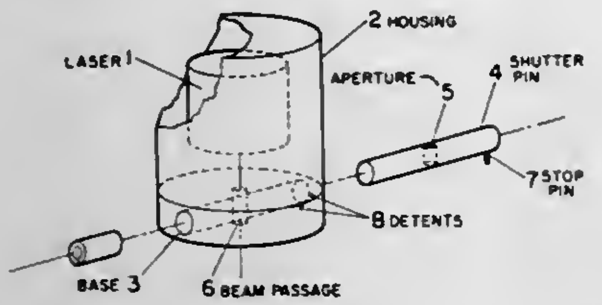
Filed Jun. 25, 1976, Ser. No. 699,784
Int. Cl.² H01S *3/10*

U.S. Cl. 332—7.51 **5 Claims**

1. A unitary laser beam shutter and laser "on-off" indicator for use with a laser beam source comprising:

- a unitary shutter and "on-off" indicator means movable between beam passing and beam interrupting position;
- said unitary shutter and "on-off" indicator means being adapted, when in the beam interrupting position, to direct

reflected light from the laser beam to a visually observable position from which position light is emitted from said unitary means whereby the "on" condition of the laser is positively indicated.



4,103,262

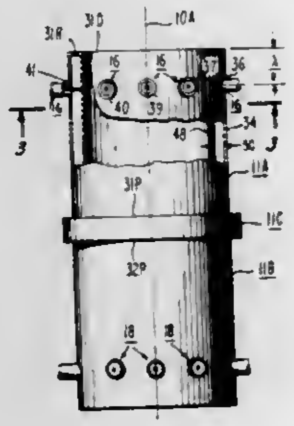
DUAL CHANNEL TRANSMISSION OF MICROWAVE POWER THROUGH AN INTERFACE OF RELATIVE ROTATION

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,333

Int. Cl.² H01P *5/12*

U.S. Cl. 333—6 **6 Claims**



1. Apparatus that provides an interface of relative rotation for a transmission therethrough of microwave power from first and second signal sources, comprising:

similar first and second outer tubular conductors;

similar first and second inner tubular conductors coaxially disposed within said first and second outer conductors, respectively;

a substantially hollow coupling assembly that provides a noncontacting electrical coupling between proximal ends of said outer conductors and between proximal ends of said inner conductors with said first and second conductors in axial alignment and rotatable with respect to each other;

a number of ports disposed with equal arcuate spacing therebetween within each outer conductor approximately one-quarter of a wavelength associated with a voltage provided by one of said sources from the distal ends of said conductors, the number of said ports being in accordance with a relationship which is given as:

$N = 4H$

where N is the number of said ports; and

H is an integer greater than one; and

an electrically conductive ring connected to the distal ends of said first conductors.

4,103,263

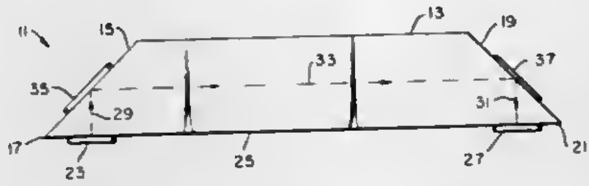
TRIPLE-TRANSIT-SUPPRESSED BULK ACOUSTIC WAVE DELAY LINE

Rolf D. Weglein, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 7, 1977, Ser. No. 785,374

Int. Cl.² H03H *9/30*

U.S. Cl. 333—30 R **3 Claims**



1. A triple transit signal-suppressed bulk acoustic wave delay line comprising:

a body of material capable of supporting propagating longitudinal and shear wave modes of acoustic energy, said body including at least one longitudinal-shear wave mode converting wall defining a relatively long but relatively low-attenuation per unit time, shear wave mode propagation path within said body angularly disposed with respect to the plane of said mode converting wall;

transducer means disposed on said body for converting electromagnetic wave energy to acoustic wave energy and the converse thereof, and for directing and receiving propagating longitudinal wave mode acoustic energy to and from said mode converting wall along relatively short but relatively higher attenuation per unit time, longitudinal wave mode propagation paths within said body angularly disposed with respect to said plane of said mode converting wall and to said shear wave mode propagation path; and

shear wave mode attenuation means in the form of a disc is disposed on said mode converting wall in said shear wave mode propagation path for absorbing a predetermined amount of propagating shear wave mode energy and thereby increase insertion loss.

4,103,264

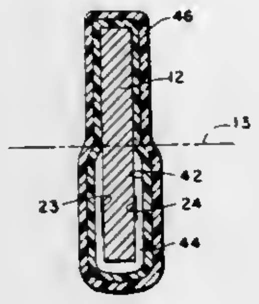
WAVE FILTER AND PROCESS FOR MAKING SAME

Glenn N. Howatt, Metuchen, N.J., and Murray Leonard, Mayfield Village, Ohio, assignors to Vernitron Corporation, Bedford, Ohio

Filed Jan. 30, 1976, Ser. No. 653,715

Int. Cl.² H03H *9/04, 9/10, 9/20;* **H01L** *41/22*

U.S. Cl. 333—72 **7 Claims**



1. In a process of producing electronic components such as filters, comprising the steps of providing a polarized wafer body having piezoelectrically active regions;

depositing a disposable material selected from the group consisting of 1,4-dichlorobenzene and iodine on at least said active regions;

subsequently applying to the wafer and on the disposable material ; porous protective coating;

heat treating the wafer to sublimate or evaporate said disposable material through said coating establishing a cavity between the wafer body and said coating;

said disposable material being sublimatable at elevated temperatures and in a solid state at temperatures below 80° F.

4,103,265

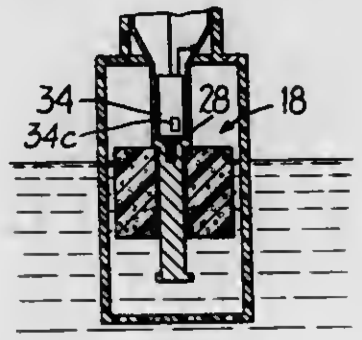
FLUID BILEVEL SENSOR

Hemming G. Silberg, Summit, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Sep. 10, 1976, Ser. No. 722,023

Int. Cl.² H01H *9/00*

U.S. Cl. 335—205 **6 Claims**



1. A fluid level sensor comprising:

(a) a chamber;

(b) a magnetically actuatable switch having at least one pair of contacts in said chamber;

(c) differential float means guidingly contained within said chamber;

(d) said differential float means having a float body containing an axial bore;

(e) said float body having a specific gravity lower than said fluid;

(f) said float body being adapted to floatable displacement upon said fluid within said chamber;

(g) a rod slideable in said axial bore and passing completely therethrough;

(h) a collar at each end of said rod, said collars being larger than said axial bore for preventing the withdrawal of said rod from said axial bore;

(i) a magnet affixed to the upper end of said rod;

(j) said rod and magnet having a combined specific gravity greater than said fluid;

(k) said differential float, including said float body, rod and magnet, having a combined specific gravity lower than said fluid;

(l) said differential float means being operative to move said magnet within actuating distance of said magnetically actuatable switch upon the recurrence of a first predetermined fluid level;

(m) a mass of magnetically attractable material near said magnetically actuatable switch;

(n) the attraction of said magnetically actuatable material for said magnet being sufficient to support said rod but insufficient to support both said rod and said float body; and

(o) said rod and float body being operative to detach said magnet from said magnetically attractable material upon the occurrence of a second predetermined fluid level lower than said first predetermined fluid level.

4,103,266

COOLED LIFTING MAGNET WITH DAMPED EDDY CURRENTS AND METHOD FOR ITS FABRICATION

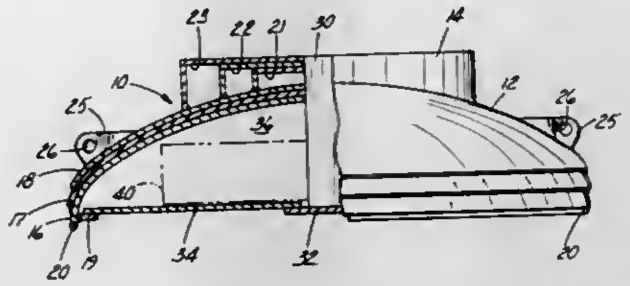
Charles A. Schwartz, 23366 Commerce Park, Beachwood, Ohio 49122

Filed Sep. 3, 1976, Ser. No. 720,256

Int. Cl.² H01F *7/20*

U.S. Cl. 335—289 **9 Claims**

1. In an electromagnet for lifting magnetizable material, said electromagnet having an electrical winding connected to a power source, said winding being disposed on a central core, and a dome-shaped metal case within which said electrical winding is disposed, the improvement comprising said dome-shaped metal case including plural arcuate steel shells in nesting relationship one with another each of said shells being in unimpeded magnetic communication with the other shells, and with said central core, said dome-shaped metal case and said central core having a radial slot extending from near the center of said core and longitudinally therethrough, to near the periplery of said dome-shaped metal case.



4,103,267

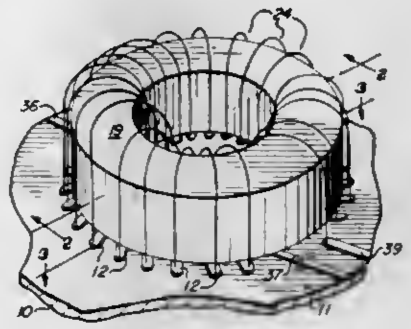
HYBRID TRANSFORMER DEVICE

Wilfred W. Olscbewski, Tucson, Ariz., assignor to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Jun. 13, 1977, Ser. No. 806,053

Int. Cl.² H01F *15/02, 27/30*

U.S. Cl. 336—65 **18 Claims**



1. A hybrid transformer device for use in a hybrid integrated circuit, said hybrid transformer device comprising in combination:

(a) a non-conductive substrate having a planar surface;

(b) a plurality of metalized coating conductors formed on said planar surface, each of said conductors having a predetermined length with first and second ends;

(c) a closed loop magnetic core unit adhesively mounted on said substrate over said metal conductors, said closed loop magnetic core unit being an integral unit formed prior to being adhesively mounted on said substrate, said closed loop magnetic core unit having substantially elevated sides to increase the inductance and power handling capability and lower the losses of said hybrid transformer device;

(d) insulating means electrically insulating said closed loop magnetic core unit from said metal conductors; and

(e) a plurality of metal wire bonding conductors of predetermined length each having first and second ends and looping over said closed loop magnetic core unit to form transformer windings, the first end of each of said metal wire bonding conductors being wire bonded to the first end of a different one of said metal conductors, the second end of each of said metal wire bonding conductors being wire bonded to the second end of a different one of said metal conductors.

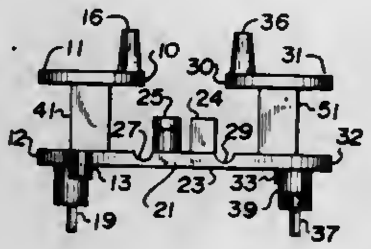
4,103,268
DUAL COIL HINGED BOBBIN ASSEMBLY

Raymond H. Anders, Madison; William F. Wernet, Huntsville; Gerald W. Foster, Somerville, and Ronald C. Ward, Huntsville, all of Ala., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jun. 29, 1977, Ser. No. 811,027

Int. Cl.² H01F *27/30, 41/06*

U.S. Cl. 336—208 **8 Claims**



1. A dual bobbin assembly comprising: first and second spool like bobbin elements normally positioned parallel to each other, each including a first flange at a first end of said bobbin element and a second flange at a second end of said element; hinge means flexibly connecting said second flange of said first element to said second flange of said second element; and engaging means included in the exterior side of each of said second flanges; whereby said bobbin elements may be further manually positioned axi-symmetrically and releasably retained in said axi-symmetric position by said hinge means and said engaging means.

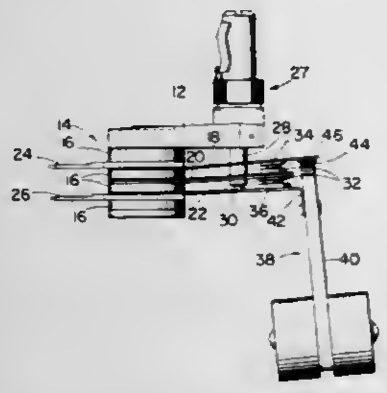
4,103,269
THERMOSTAT AND TIP SWITCH ASSEMBLY

Jack W. Grable, and Steven A. Willeke, both of Mansfield, Ohio, assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jan. 21, 1977, Ser. No. 761,505

Int. Cl.² H01H *71/16*

U.S. Cl. 337—67 **6 Claims**



1. A combination thermostat tip switch assembly, comprising:

a rigid base member;
a stack mounted upon said base member;
three elongated resilient leaves mounted co-extensively with one another upon said stack;
one of said leaves being thermally responsive;
means for making electrical contact to the outer leaves;
a thermally responsive contact set comprising an electrical contact mounted upon said thermally responsive leaf and a cooperating electrical contact mounted upon an adjacent leaf;
a position sensitive contact set comprising an electrical contact mounted upon the third leaf and a cooperating electrical contact mounted upon an adjacent leaf;
said thermally responsive contact set and said position sensitive contact set together being capable of completing the circuit between said outer leaves; and
position sensitive means for operating said position sensitive contact set.

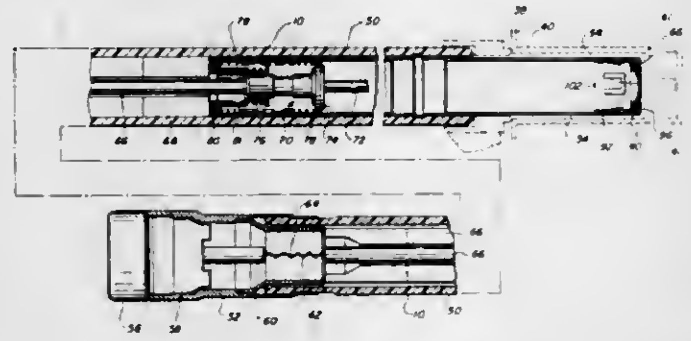
4,103,270
SEALING ARRANGEMENT FOR HIGH VOLTAGE FUSE

Hiram Soloman Jackson, Jr., Northbrook, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,015

Int. Cl.² H01H *71/20*

U.S. Cl. 337—178 **8 Claims**



1. In a high voltage fuse of the type having a moveable spring biased arcing rod with a striker pin on the end of the arcing rod, an improved sealing arrangement comprising a round metal plate mounted at one end of the fuse, said metal plate having a round annular outer portion and a center portion machined to reduce the thickness of the center portion, said center portion having been subjected to a pressing operation to further reduce the thickness of said center portion and to also increase the hardness and smoothness of said center portion so that said center portion can be reliably punctured by the striker pin during fuse operation.

4,103,271
THERMOSTATS

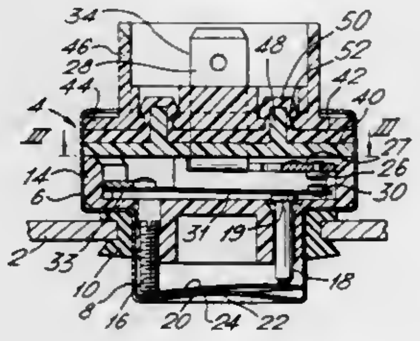
John Crawshaw Taylor, Edge Lee, Bishops La., and Richard Antony Phillips, Ruabon, 145 Light Wood Rd., both of Buxton, Derbyshire, England

Filed Apr. 6, 1977, Ser. No. 785,096

Claims priority, application United Kingdom, Apr. 8, 1976, 14331/76

Int. Cl.² H01H *37/04, 37/52*

U.S. Cl. 337—372 **10 Claims**



1. A thermostat including an electrical switch and a switch actuator comprising a bimetallic disc movable between oppositely dished configurations with a snap action, a stop engageable with one edge portion of the disc, a switch contact operating member engaging with a generally diametrically opposite disc edge portion, a fulcrum engageable with said disc and about which said disc moves during its snap-action, the fulcrum being disposed intermediate said disc edge portions and at or near the centre of the disc.

4,103,272
COMBINATION FUSE, ESPECIALLY FOR FIRE PROTECTION INSTALLATIONS

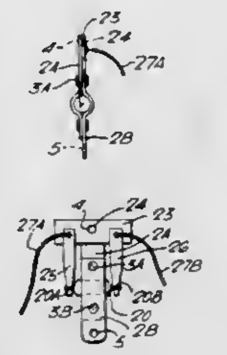
Ole Arvid Larsen, Micheletveien 38A, Oslo 10, Norway

Filed Feb. 7, 1977, Ser. No. 766,201

Claims priority, application Norway, Feb. 13, 1976, 760479

Int. Cl.² H01H *37/76;* A62C *37/30*

U.S. Cl. 337—411 **8 Claims**



1. A combination fuse, especially for fire protection installations, comprising two metal pieces (2A, 2B) which normally are bonded together by means of a fusible metal (3A, 3B) and during normal condition prevent a trip mechanism to be operated, whereas at a temperature above normal ambient temperature the fusible metal loses its binding ability and releases the trip mechanism, and a heat dissipating means adapted to dissipate heat to raise the temperature of the fusible metal for releasing the combination fuse, the dissipation of heat being initiated in response to a signal generated by the sensing of local or remote ambient conditions, characterized in that the heat dissipating means is an electric resistance element (20) incorporated in a circuit which is electrically separated from the two said metal pieces (2A, 2B) and the other components included in the fire protection installation, and that the resistance element (20) is connected in the circuit by members which upon tripping of the combination fuse ensure that the resistance element is disconnected from the circuit for the breaking thereof.

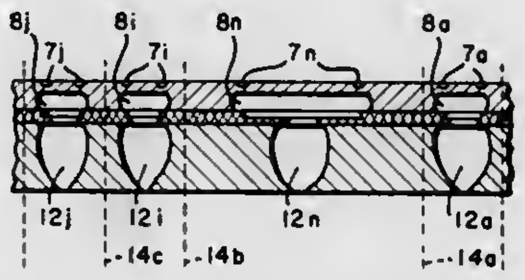
4,103,273
METHOD FOR BATCH FABRICATING SEMICONDUCTOR DEVICES

Hans W. Keller, Excelsior, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 354,589, Apr. 26, 1973, which is a division of Ser. No. 128,420, Mar. 26, 1971, Pat. No. 3,757,414. This application Sep. 30, 1974, Ser. No. 510,279

Int. Cl.² G01L *1/22*

U.S. Cl. 338—2 **31 Claims**



1. A method for batch fabricating semiconductor material stress sensors comprising:

forming access holes at selected locations through a first major surface of a first wafer of said semiconductor material,
bonding a second wafer of said semiconductor material to said first wafer having said access holes therein,
forming electrical elements in said second wafer at locations corresponding to said access holes through a second major surface of said second wafer, and
partitioning said joined wafers to form said stress sensors.

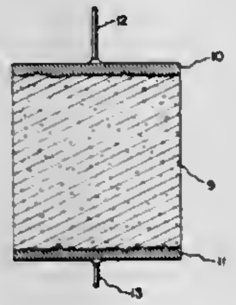
4,103,274
RECONSTITUTED METAL OXIDE VARISTOR

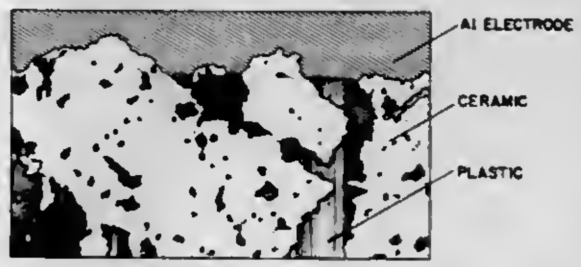
James F. Burgess, Schenectady; Roland T. Girard, Scotia; Francois D. Martzloff, and Constantine A. Neugebauer, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,388

Int. Cl.² H01C *7/10*

U.S. Cl. 338—21 **25 Claims**





1. A reconstituted metal oxide varistor comprising a composite of metal oxide varistor ceramic particles in a plastic resin matrix.

4,103,275
RESISTANCE ELEMENT FOR RESISTANCE THERMOMETER AND PROCESS FOR ITS MANUFACTURING

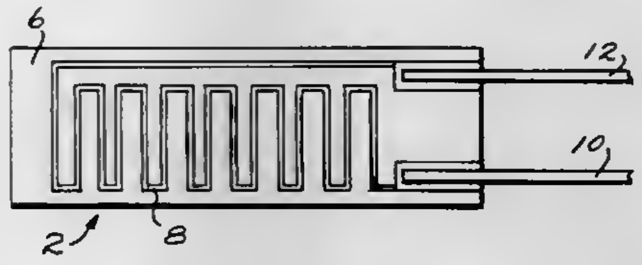
Walter Diehl, Hanau, and Wolfgang Koehler, Hörstein, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Feb. 18, 1976, Ser. No. 659,144

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507731

Int. Cl.² H01C *3/04*

U.S. Cl. 338—25 **32 Claims**



1. A resistance element for a resistance thermometer consisting essentially of an insulating body as a support and a thin platinum layer thereon as the resistance material, said support being made of a material having a greater thermal coefficient of expansion greater than platinum between the range of 0° to 1000° C.

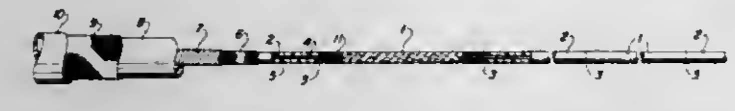
4,103,276
RESISTOR CORE CABLE

James L. Kennon, Avon, and Robert E. Sandorf, West Richfield, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 14, 1976, Ser. No. 705,363

Int. Cl.^{2} H01C *3/06*

U.S. Cl. 338—214 **15 Claims**



1. An elongated electric cable for use in connecting an electrostatic spray coating gun to a source of high voltage electrical power comprising:

an electrical path comprising a core of a series of rigid elongated non-brittle resistors joined end to end by means of flexible elongated conductive links electrically connected between separate resistors;

a uniform continuous dielectric sheath which is substantially less flexible than the conductive links, which is flexurally elastic, which surrounds the core for its length and which will not permanently deform under normal flexing of the cable;

wherein the length of the resistor is longer than the shortest length of resistor which could remain at the midpoint of a loop when such a loop is pulled from the ends of the cable in normal use.

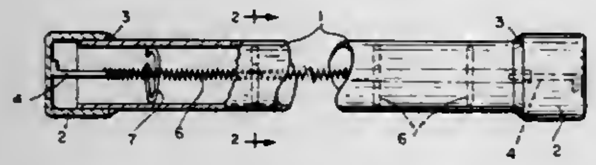
4,103,277
CERAMIC ENVELOPED ELECTRICAL HEATING ELEMENT

Robert M. Griffin, South Hamilton; Max E. Oberlin, Lynn, and Robert P. Bonazoli, Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 17, 1976, Ser. No. 751,660

Int. Cl.^{2} H01C *1/024*

U.S. Cl. 338—237 **2 Claims**



1. An electrical resistance heating element comprising:

an elongate hollow translucent envelope of 99% pure alumina ceramic,

end caps bonded at opposite ends of the envelope to hermetically seal the envelope from the atmosphere,

an elongate coiled refractory metal conductor dimensioned to carry a linear power loading rating of at least one hundred watts per inch,

refractory means engaging the conductor and envelope at spaced locations along their lengths for holding the conductor spaced from the envelope substantially coaxially therewith, and

conductive means for supplying electrical current to the conductor at said power loading so as to ohmically heat the conductor and transmit heat externally of the envelope.

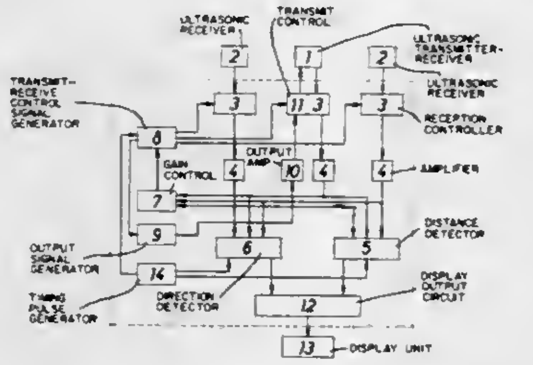
4,103,278
OBSTACLE DETECTING APPARATUS USING ULTRASONIC WAVES

Kanje Satake, No. 1075-9, Amanuma, Chigasaki-shi, Kanagawa-ken; Yasuo Shimazu, No. 1748-1, Kagawa, Chigasaki-shi, Kanagawa-ken; Masaru Kasahara, 2-4-2-206, Suwa, Tama-shi, Tokyo, and Seya Adachi, 3-14-20, Higashiterao, Tsurumi-ku, Kawasaki-shi, Kanagawa-ken, all of Japan

Filed Dec. 6, 1976, Ser. No. 747,539

Int. Cl.^{2} G01S *9/68, 7/54, 7/56*

U.S. Cl. 340—1 R **4 Claims**



1. An obstacle-detecting apparatus using ultrasonic waves comprising, in combination, an ultrasonic transmitter-receiver having a transmit and a receive mode; an ultrasonic receiver spaced a predetermined distance from the transmitter-receiver; control means operative for causing the transmitter-receiver to assume its transmit mode and transmit an ultrasonic wave into space for impingement upon and reflection back from an obstacle to be located and then to assume its receive mode so that both the transmitter-receiver and the receiver will receive an ultrasonic wave reflected from the obstacle; distance-determining means operative for determining the distance to the obstacle and generating a corresponding distance signal at least in dependence upon the travel distance of the wave transmitted by and then received by the transmitter-receiver; and direction-determining means operative for determining the direction in which the obstacle is located relative to the transmitter-receiver and generating a corresponding direction signal by determining a circular distance-locus whose radius is dependent upon at least the travel distance of the wave transmitted by and then received by the transmitter-receiver, by determining an elliptical distance-locus whose focalradii-sum is dependent upon at least the travel distance of the wave transmitted by and then received by the transmitter-receiver and the travel distance of the wave transmitted by the transmitter-receiver and received by the receiver, and by determining the intersection of these two loci.

4,103,279
DIVER NAVIGATION SYSTEM

Clell A. Dildy, Jr., and Lyles C. Adair, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 25, 1977, Ser. No. 818,643

Int. Cl.^{2} G01S *9/66;* **G01C** *23/00*

U.S. Cl. 340—3 D **12 Claims**

1. An underwater navigation device for use in making good a predetermined course over the bottom, said device comprising in combination:

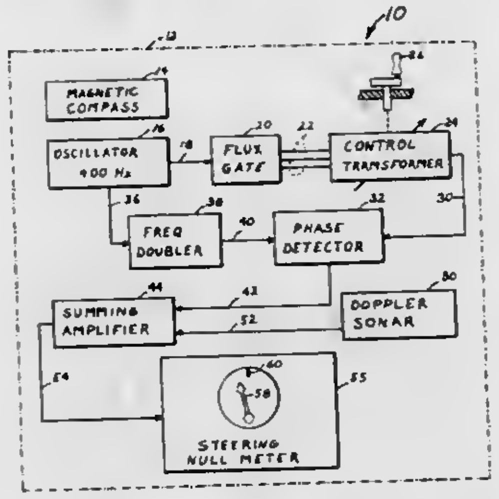
a steerable support structure;

at least a first compass means, carried by said structure, for providing a first analog signal representative of heading differences between the actual heading and said predetermined course;

doppler sonar means, carried by said support structure and responsive to travel over the bottom, for providing a second analog signal representative of drift angle relative to said actual heading;

summing means, responsive to said first and second analog signals, for providing a third analog signal representative of steering corrections required to make good said predetermined course; and

indicator means, responsive to said third analog signal, for providing a sensible indication of said steering corrections.



4,103,280
DEVICE FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM

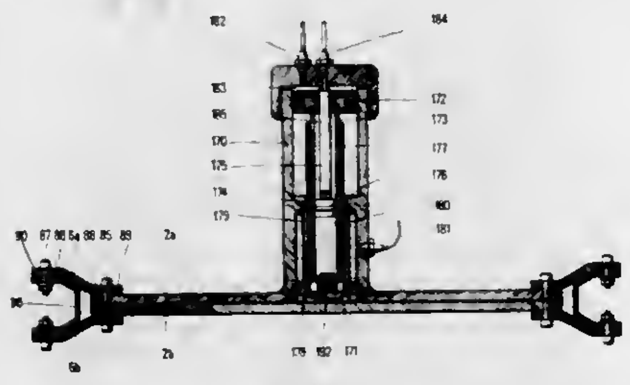
Jacques Cholet, Rueil-Malmaison; Jean Laurent, Saint Germain-En-Laye; Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, France

Filed Nov. 20, 1973, Ser. No. 417,570

Claims priority, application France, Nov. 29, 1972, 72.42515

Int. Cl.^{2} H04R *23/02*

U.S. Cl. 340—12 R **11 Claims**



1. In a device for emitting acoustic waves in a liquid medium of the type having at least two oppositely facing elements movable towards and away from each other, said elements being made of a rigid material and connected by a tightening membrane forming a tight enclosure therewith, each of said elements comprising at least one area for intermittent contact with a corresponding area of the opposite element, means for moving said contact areas apart from each other comprising jack means and means for supplying fluid under pressure thereto, and releasable means for locking said movable elements in spaced apart relationship, the improvement comprising:

(a) said jack means including first and second cylinders and first and second pistons movable relative to said first and second cylinders respectively, said first cylinder having an open end connected with a first of said movable elements;

(b) a push-member displaceable by action of said jack means from a first position entirely within said first cylinder to a second position wherein said push-member extends from said open end into contact with a surface of the other of said oppositely facing elements so as to displace said other element relative to said first element;

(c) releasable pressure actuated means for maintaining said push-member in said second position without said jack means acting upon said push-member; and

(d) means for releasing said means for maintaining so as to permit said push-member to return to its first position independent of said jack means, thereby producing an acoustic wave by the return of said elements to their non-displaced position.

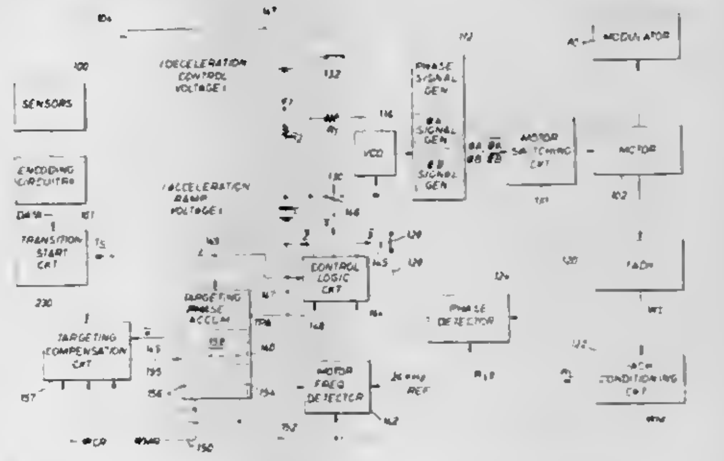
4,103,281
MEASURING-WHILE-DRILLING SYSTEM HAVING MOTOR SPEED DETECTION DURING ENCODING

Gerald A. Strom, Dayton, and James I. Bernard, Houston, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,687

Int. Cl.^{2} G01V *1/40*

U.S. Cl. 340—18 LD **25 Claims**



19. In a measuring-while-drilling system including a motor driven acoustic generator for imparting to well fluid an acoustic signal having an intermittently constant frequency, the method of momentarily changing the speed of the motor to effect a desired amount of change in the phase state of the signal thereby to provide modulated data states to the signal, comprising the steps of:

(a) generating a motor speed signal representative of the instantaneous speed of the motor;

(b) changing the speed of the motor in a first direction;

(c) stopping said motor speed change in the first direction when a value of phase shift which is less than the desired change in phase has been accumulated;

(d) changing the speed of the motor in a second direction to accumulate at least partially the remainder of said desired amount;

(e) generating an end-of-return signal in response to the motor speed signal when the speed of the motor has been returned to the speed corresponding to said constant frequency; and

(f) stopping said speed change in response to said end-of-return signal.

4,103,282
ACOUSTICAL TIRE PRESSURE VALVE

Edward J. Cook, South Hamilton, Mass., assignor to Safety Research & Engineering Corporation, North Reading, Mass.

Filed Nov. 3, 1975, Ser. No. 627,959

Int. Cl.^{2} B60C *23/02*

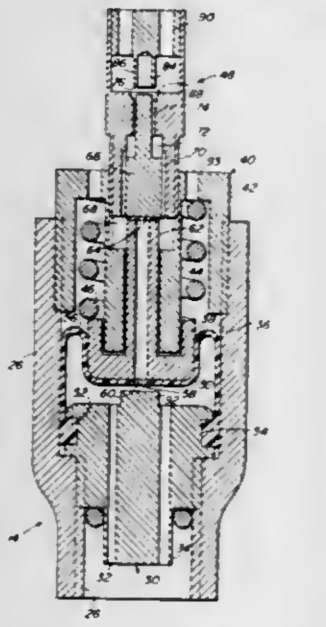
U.S. Cl. 340—58 **8 Claims**

1. A device for monitoring the internal pressure in a normally pressurized hollow pneumatic tire having an interior and an exterior, comprising:

(a) a body formed with a cavity therein defining cylindrical inner sidewalls and mountable to a wheel adapted to carry a pneumatic tire,

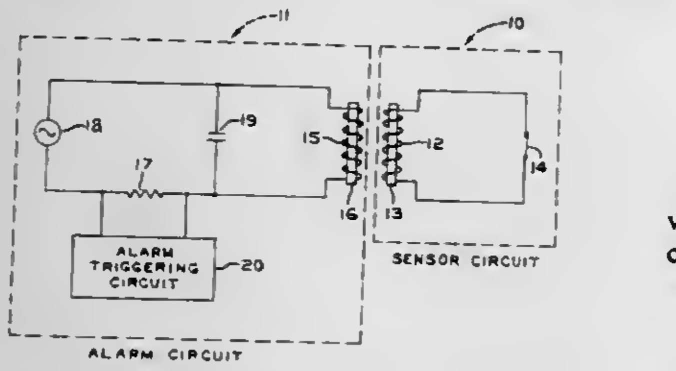
(b) a piston having a pair of ends and mounted for limited reciprocation in said cavity,

(c) a flexible air-impervious rolling seal annular diaphragm connecting said piston to the walls of said cavity, said diaphragm extending across one end of said piston and being formed with a central opening, said diaphragm extending along a portion of the sides of said piston and formed with an annular reverse bend between the sides of said piston and the sidewalls of said cavity,
(d) said body being formed with a passage communicating with the interior of said tire and one end of said cavity on one side of said piston and diaphragm,
(e) spring means engaging said piston and urging it toward said one end of said cavity,
(f) acoustical signal generating means mounted in fixed relative position to one of said body or said piston and responsive to the flow of gas therethrough,



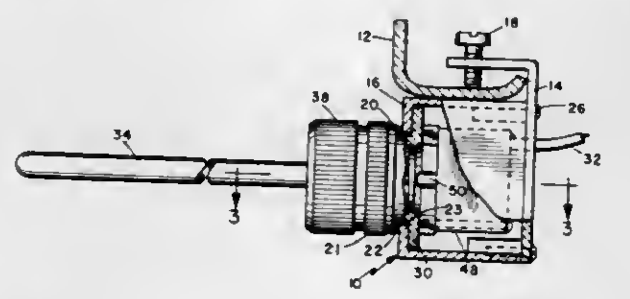
(g) said piston being formed with a piston passage extending from said one end of said piston in register with the diaphragm opening to the other end of said piston and communicating with said signal generating means, said piston being formed with a passage opening at both ends of said piston,
(h) said body being formed with at least a pair of seating surfaces, one on either side of said diaphragm and in position to close said piston passage whenever said piston is at either end of its path of travel, said piston passage being open at intermediate positions of said piston whereby a flow of pressurized gas is delivered from said tire through said body passage and said piston passage to said signal generating means.

4,103,283
TIRE INFLATION MONITORING SYSTEM
Maw-Huei Lee, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Oct. 6, 1976, Ser. No. 730,052
Int. Cl.² B60C *23/00*
U.S. Cl. 340—58 **9 Claims**



1. A system for monitoring the inflation of a tire mounted on the wheel of a vehicle comprising a sensor circuit mounted to rotate with said vehicle wheel and an alarm circuit associated with the vehicle body, said sensor circuit including an inductor coil means wound on a powder core and mounted to rotate with said vehicle wheel and a pressure switch responsive to a change in pressure within said tire from an acceptable pressure to an unacceptable pressure, said pressure switch being in serial electrical connection with said inductor coil means, said alarm circuit including in electrical connection an inductor coil means wound on a powder core, capacitance means, resistor means, oscillator means for generating an alternating current signal of constant frequency and an alarm triggering circuit responsive to a change in the voltage pattern across said second-mentioned inductor coil means occurring when said pressure switch responds to a change in pressure within said tire from an acceptable pressure to an unacceptable pressure, said sensor circuit exhibiting an effective distributed capacitance characteristic at the frequency of the signal generated by said oscillator means with said pressure switch in an open condition and said first-mentioned inductor coil being in relatively close proximity to said second-mentioned inductor coil, said second-mentioned inductor coil means being mounted to said vehicle body at a position so that said first-mentioned inductor coil means mounted with said vehicle wheel passes in close proximity to said second-mentioned inductor coil means during each rotation of said vehicle wheel, said second-mentioned inductor coil means and said capacitance means of said alarm circuit being in a "primary circuit" that is in electrical resonance at the frequency of the signal generated by said oscillator means, said first-mentioned inductor coil means containing a number of turns of wire in the coil to cause said first-mentioned inductor coil means to be in electrical resonance with its said effective distributed capacitance at the frequency of the signal generated by said oscillator means with said pressure switch in the open position and during the time said first-mentioned inductor coil means passes in close proximity to said second-mentioned inductor coil means and to cause the circuit that includes said first-mentioned inductor coil means and said switch means to be in matched resonance with the said "primary circuit" of said alarm circuit when said pressure switch is in the open position and during the time said first-mentioned inductor coil means passes in close proximity to said second-mentioned inductor coil means.

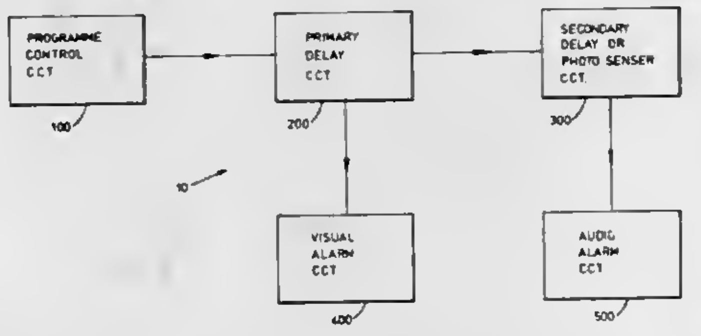
4,103,284
BUMPER MOUNTED VEHICLE OBSTACLE DETECTOR
Raymond John Blake, 311 Shoemaker La., Solana Beach, Calif. 92075
Filed Aug. 25, 1977, Ser. No. 827,602
Int. Cl.² B60Q *5/00*
U.S. Cl. 340—61 **3 Claims**



1. A vehicle mounted obstacle detector to provide positive warning of the close approach of the vehicle to obstacles comprising:
a resilient cylindrical probe for contacting obstacles, of selected length rounded on one end and with an attached disc on the opposite end,
a follower housing shaped as a hollow cylindrical element with a mounting flange at one end and having exterior threads,

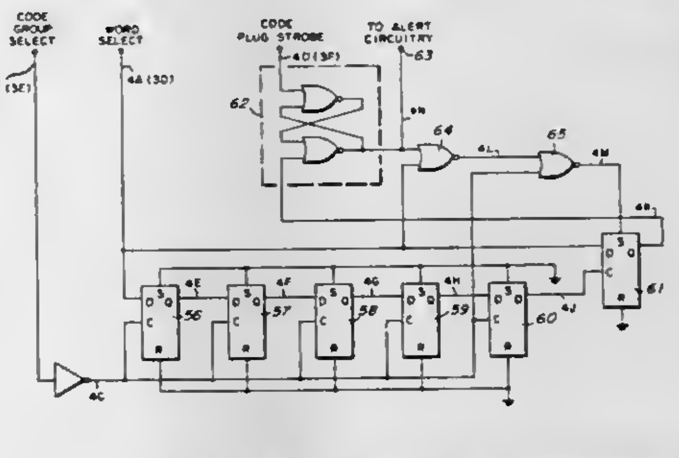
a probe cap with a centered hole through which said cylindrical probe passes and having an internal recess into which said probe disc fits loosely to permit the displacement of said disc when said probe encounters an obstacle,
said probe cap being provided with internal threads to engage the external threads on said follower housing and closing one end of said follower housing when threaded thereon,
a probe follower formed as a cup shaped piece with a recessed interior column and having a closed end bearing against said probe disc to transmit any displacement of said probe disc,
a follower push rod attached at one end in said probe follower column recess and provided with a flange at the opposite end,
a circular spring backing plate with a centered hole through which said push rod passes, said backing plate being forced fitted into and closing the other end of said follower housing,
a positioning spring placed between the interior base of said probe follower, surrounding said probe follower internal column, and compressed against said spring backing plate,
a cubical detector housing having a removable access cover forming one side thereof and with a circular opening in the opposite side permitting the passage of said follower housing through said detector housing,
an internally threaded locking ring engaging said exterior threads of said follower housing and securing said follower housing mounting flange against the interior face of said detector housing, said locking ring being provided with an external seal skirt to overlap the threaded end of said probe cup,
a detector housing seal positioned between said locking ring and the adjacent detector housing exterior face,
a normally open electrical control switch mounted within said detector housing and positioned to be in cooperative alignment with said follower push rod flange for closure by movement of said push rod,
means for electrically connecting said control switch in parallel connection in the vehicle horn circuitry for sounding the vehicle horn when said switch is closed,
and means for mounting said detector housing on the vehicle.

4,103,285
VEHICLE ANTI-THEFT ALARM SYSTEM
William Lloyd; Geoffrey John Lloyd, both of The Alamo Powder Works La., Melling, Liverpool, and David Dawson, 14 Thorndale Rd., Waterloo, Liverpool, all of England
Filed Dec. 7, 1976, Ser. No. 748,350
Int. Cl.² B60R *25/10*
U.S. Cl. 340—65 **23 Claims**



1. An alarm system for a vehicle or trailer comprising:
input means adapted for connection to an electrical power source;
time delay means having an input and an output for applying electrical power to said output after electrical power has been applied to said input for a preset time;
a vibration-responsive switch coupled to said time delay means input and to said input means and responsive to vibration for coupling said time delay means input to said input means; and
a first alarm circuit connected to said time delay means output and adapted for connection to a first alarm device for applying electrical power from said time delay means output to the first alarm device.

4,103,286
DIGITAL BINARY GROUP CALL CIRCUITRY ARRANGEMENT
John Dominic Nicolini, Margate, and David Frank Willard, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 22, 1977, Ser. No. 770,327
Int. Cl.² G06F *7/02;* H04M *11/02*
U.S. Cl. 340—146.2 **8 Claims**



1. In a detector for detecting first and second predetermined words within a train of signals, each word comprising a plurality of binary bits and said words being spaced apart by a first predetermined time period, including timing means for providing first and second control pulses within each bit period, word select means for providing a first signal in response to a first detection of the first word, said first signal presetting the detector for detection of the second word, counter means for counting a second predetermined time period substantially equal to the period of the second word and for providing a signal enabling the detection of the second word at the end of said second period, for counting a third predetermined time period subsequent to the second time period and equal to at least two bit periods, then providing a signal enabling the detection of the first word, group call detect circuitry for detecting said first word twice in sequence and spaced apart by the third predetermined time period, said third period being longer than said first time period, and comprising:
delay means coupled to the timing means and to the counter means for delaying the first word enabling signal for a period at least equal to the third time period; and
bistable means coupled to the delay means for being clamped by the delayed signal, and to the timing means for being triggered by the next first control pulse and reset by the end of the subsequent second control pulse for providing a group call detect signal.

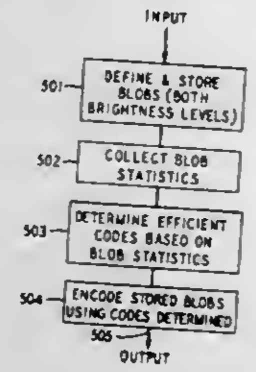
4,103,287
VARIABLE LENGTH CODES FOR HIGH QUALITY IMAGE ENCODING
Amalie Julianna Frank, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 17, 1973, Ser. No. 425,506
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 H **13 Claims**

1. Apparatus for encoding a two-dimensional graphic image comprising
(A) means for generating an electrical signal representing successive scans of said graphic image,
(B) means for sampling said electrical signal to derive sam-

ples of said signal, each sample representing a picture element (pel) of said two-dimensional scanned image,

(C) means for associating ordered subsequences of said sequence of samples to define a plurality of like-valued geometrically related image areas (blobs),

(D) means for extracting and storing electrical representations of values for each of a plurality of parameters for each of said blobs,


INPUT
501
DEFINE & STORE BLOBS (BOTH BRIGHTNESS LEVELS)
502
COLLECT BLOB STATISTICS
503
DETERMINE EFFICIENT CODES BASED ON BLOB STATISTICS
504
ENCODE STORED BLOBS USING CODES DETERMINED
505
OUTPUT

(E) means for determining the relative frequency of each particular value for each of said parameters, and

(F) means for assigning electrical code words to each of said parameter values in accordance with the relative frequency of occurrence of respective values of each of said parameters.

4,103,288

METHOD FOR DATA TRANSMISSION AND A SYSTEM FOR CARRYING OUT THE METHOD

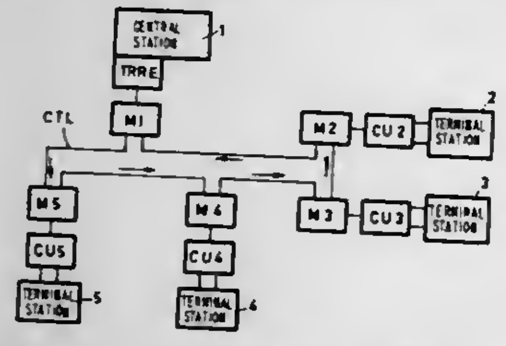
Kjell Harry Westman, Vallingby, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1976, Ser. No. 723,155

Claims priority, application Sweden, Sep. 18, 1975, 7510432

Int. Cl.² H04Q *5/00*

U.S. Cl. 340—152 R **16 Claims**



1. A method for transmission of data between a central station and a number of terminal stations which are connected to a closed series transmission loop provided between the output and the input of the central station, in which the transmission is carried out bit-by-bit in one and the same direction through the loop under control of the central station and in which all data is transferred in the form of a transmission block having an output data phase, a general polling character and in input data phase, each output and input data phase having a data message, which comprises the steps of providing the data message with an address portion comprising a predetermined number of bits indicating in a binary code the address of the terminal station associated with the data message; providing the data message during an output data phase, at least one data message with an address portion comprising a predetermined stations to which the central station has output data to send during the output data phase; providing the transmission block with a general polling character from the central station at the end of the output data phase for preparing the terminal stations having input data to send for transmission; and providing the transmission block with an input data phase after the general polling character, at least one data message being transmitted to the central station during the input data phase by each of the terminal stations prepared in this manner; and providing a subsequent transmission block, also comprising an output data phase, a general polling character and an input data phase, the subsequent transmission block being initiated by the central station when the end of the earlier input data phase is sensed, the lengths of the output and the input phases always being adapted to the actual data transfer need.

4,103,289

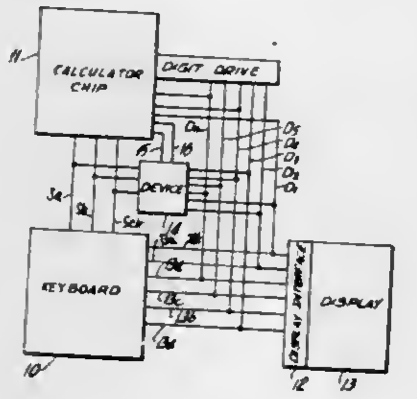
CALCULATOR THEFT PREVENTION DEVICE

Steven Kolber, 59 Hillside Ter., Wayne, N.J. 07470

Filed Apr. 27, 1976, Ser. No. 680,899

Int. Cl.² G08B *13/06;* **H04Q** *1/00*

U.S. Cl. 340—164 R **8 Claims**



1. A security device for a keyboard electronic instrument, in which instrument the keyboard has a plurality of cross-points and a plurality of sense lines and a plurality of digit lines connected thereto, said instrument having scanning means to interrogate the cross-points of said keyboard, the security device being connected to at least some of the digit lines and all of the sense lines, said device including a selection matrix connected to a plurality of the said sense lines and a plurality of the said digit lines, valid actuation discriminator means connected to said selection matrix, a sequence counter means connected to said valid actuation discriminator means to provide a sequence of pulses provided by the sequencing of the keys of said keyboard, and alarm meaos actuated unless inhibited by said validity means, said alarm means producing a pulse train to cause malfunction of said instrument.

4,103,290

DIGITAL FREQUENCY DISPLAY DEVICE

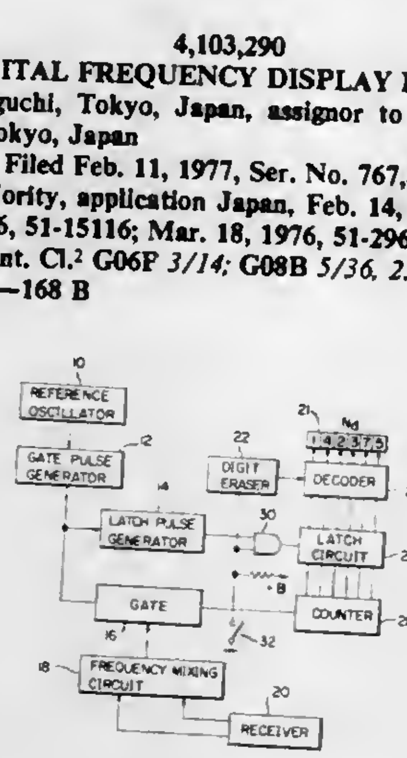
Tadao Sekiguchi, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1977, Ser. No. 767,830

Claims priority, application Japan, Feb. 14, 1976, 51-15115; Feb. 14, 1976, 51-15116; Mar. 18, 1976, 51-29606

Int. Cl.² G06F *3/14;* **G08B** *5/36, 23/00*

U.S. Cl. 340—168 B **11 Claims**



1. A digital frequency display device comprising:

first means for obtaining a count representative of a signal frequency to be displayed;

second means operably connected to said frist means for storing a count provided by said first means and adapted to be placed in a memorizing condition;

third means operably connected to said first and second means for displaying digits and adapted to display digits representative of a count; and

fourth means operably connected to said second means for altering the display of digits provided by said third means when said second means is in the memorizing condition as compared to the display of digits which would be provided were said second means not in said memorizing condition to indicate that said second means is in the memorizing condition.

4,103,291

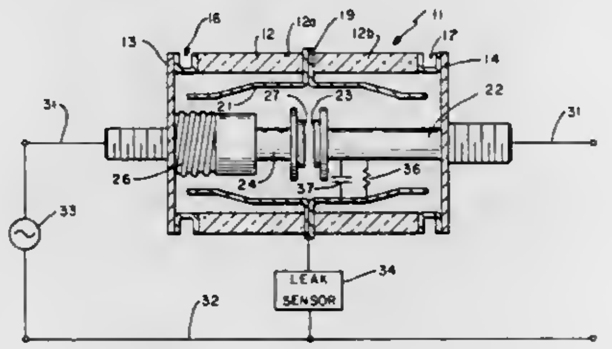
LEAK SENSOR AND INDICATING SYSTEM FOR VACUUM CIRCUIT INTERRUPTERS

Francis M. Howe, 2741 Calle La Cruz, Carmel, Calif. 93921, and Simon Yin, 40934 Camero Pl., Fremont, Calif. 94538

Filed Sep. 30, 1976, Ser. No. 728,198

Int. Cl.² G08B *21/00*

U.S. Cl. 340—522 **15 Claims**



1. A leak sensor for vacuum circuit interrupters of the type which include an evacuated envelope, a pair of separable electrodes within the envelope adapted to be connected in series with the circuit, and a metal shield surrounding the electrodes and shielding the envelope against metal deposits comprising a bridge circuit including four arms and four terminals, the impedance in one of said arms being the resistance and leakage stray capacitance between the shield and at least one of said electrodes, said electrode and said shield connected to adjacent bridge terminals, the impedance in the remaining arms being selected to balance the bridge when the vacuum circuit interrupter is operating with normal vacuum, a pair of opposite terminals of said bridge including said electrode bridge terminal being connected to the circuit in which the interrupter is connected to derive its operating voltage directly and continuously therefrom, and means connected to the other pair of terminals serving to sense bridge unbalance and provide an output signal indicative of loss of vacuum in the vacuum circuit interrupter.

4,103,292

MATERIAL SENSING DEVICE

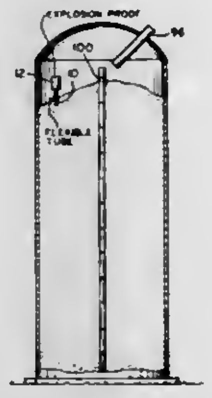
James R. Haas, Old State Rd. N., Norwalk, Ohio 44857

Filed Jun. 16, 1976, Ser. No. 696,768

Int. Cl.² G08B *21/00*

U.S. Cl. 340—603 **10 Claims**

1. A material sensing device comprising: a flexible light conducting tube having first and second ends, a light emitting device at said first end, a light sensitive device at said second end, said light emitting device providing both direct illumination of said light sensitive device and light which impinges on the internal walls of said tube in the straight line position of said tube, said light sensitive device being sensitive to both the direct illumination of said light emitting device and light reflected from the internal walls of said tube, one end of said flexible tube being received in a support receptacle and the other end being free, said free end of said tube being sealed off,



and whereby lateral deflection of said tube from the straight line position quickly attenuates the direct transfer of light and thereafter more gradually attenuates the reflected light.

4,103,293

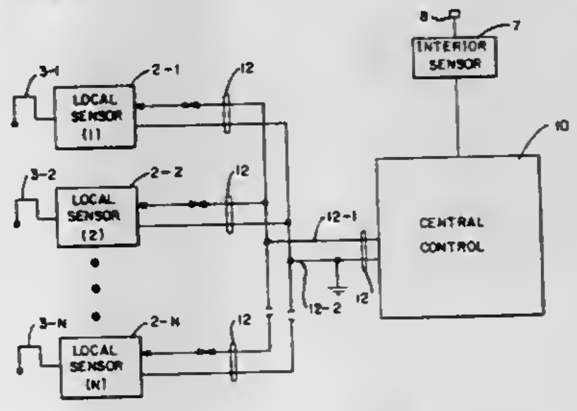
INTRUSION ALARM APPARATUS

Louis H. La Forge, Jr., San Mateo, Calif., assignor to Tri-Century Industries, Inc., San Mateo, Calif.

Filed Nov. 21, 1975, Ser. No. 634,062

Int. Cl.² G08B *13/14*

U.S. Cl. 340—514 **27 Claims**



1. An intrusion detection apparatus for detecting intrusions into an enclosure comprising:

first sensor means for detecting intrusions within a first portion of said enclosure and responsively providing a first sensor output signal,

second sensor means, having a different type of detection operaton than said first sensor means, for detecting intrusions within a second portion of said enclosure and responsively providing a second sensor output signal, where said second portion is in close proximity to said first portion,

control means for detecting said first and second sensor output signals, said control means including means for sensing when said first and second sensor output signals occur within a predetermined time relationship, and said control means including means for generating an alarm signal when said first and second sensor output signals occur within said predetermined time relationship.

4,103,294

INTRUDER DETERRENT APPARATUS AND METHOD

Joseph C. Stettner, and James H. Ott, both of Akron, Ohio, assignors to Novar Electronics Corporation, Barberton, Ohio

Division of Ser. No. 145,134, May 20, 1971, Pat. No. 3,761,912. This application Feb. 26, 1973, Ser. No. 335,832

Int. Cl.² G08B *13/22*

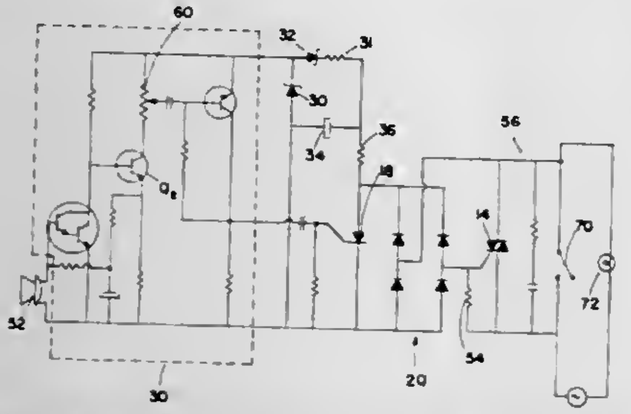
U.S. Cl. 340—566 **2 Claims**

1. A burglar deterrent comprising:

(a) an electrically powered illumination means for ordinarily illuminating a building region to aid human use of the building and for at times illuminating a region of a building in response to sound;

(b) a sound actuable electronic timing switch means connected to said illumination means and a source of power for switching the current in said illumination means to continuously illuminate said illumination means for a first selected period of time in response to a sufficient sound and for subsequently blocking the current through the illumination means for a second selected period of time; and

(c) a lighting control switch electrically connected parallel to said timing switch and positioned to facilitate manual control of said illumination means for continuously energizing said illumination means when its switch contacts are made and for permitting control of said illumination means by said timing switch when its switch contacts are open.



4,103,295
APPARATUS FOR SIGNALING AN UNAUTHORIZED REMOVAL OF A GARMENT FROM A PREMISES

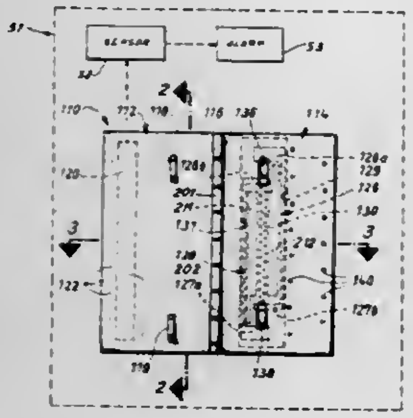
Reinhard Doerre, Oberboihingen, Fed. Rep. of Germany, assignor to Firma E. Breuninger KG., Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,838

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554051

Int. Cl.^{2} G08B *13/14*

U.S. Cl. 340—572 **6 Claims**



1. In an apparatus for signalling a removal of a garment from an area provided with a sensing element, first and second elongated plates having corresponding first and second longitudinal edges, one of the plates having signal-transmitting means for emitting an indication detectable by the sensing element when the garment is moved past the sensing element with the one plate affixed to the garment, means joining the respective first longitudinal edges of the first and second plates for pivotal movement between a first closed position in which corresponding first surfaces of the plates are disposed in confronting relation for engaging a portion of the garment and a second closed position in which the first surfaces are disengaged from the garment, the first plate having a plurality of first recesses disposed in the first surface thereof and distributed along the second longitudinal edge thereof, the second plate having a correspondingly distributed plurality of first garment-piercing projections extending outwardly from the first surface thereof for penetrating the garment portion and entering the first recesses of the first plate when the plates are pivoted into their first position, the first plate having a pair of longitudinally spaced second recesses disposed on its first surface, the second recesses being situated in transversely spaced relation to the first recesses; and in which the apparatus further comprises, in combination, a pair of second locking projections individually extending from the first surface of the second plate in aligned relation with the second recesses of the second plate when the plates are brought into the first position, the second projections individually extending into the respective second recesses when the first projections extend into the first recesses, and means for releasably locking the second projections in the associated second recesses.

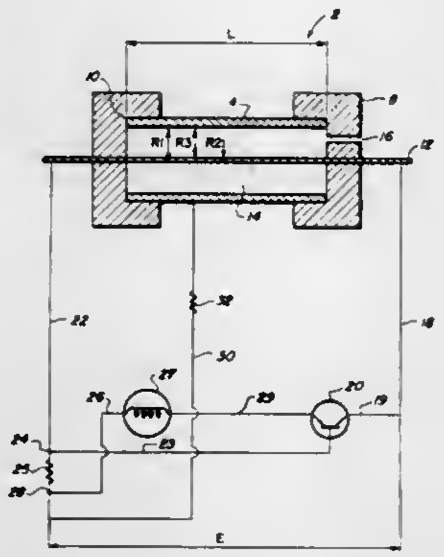
4,103,296
COULOMETRIC ELECTROLYTIC TIMING DEVICE WITH COAXIALLY ALIGNED ELECTRODES

William A. Hart, Allentown, and James J. Klinikowski, Whitehall, both of Pa., assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 18, 1977, Ser. No. 816,611

Int. Cl.^{2} G08B *1/00*

U.S. Cl. 340—309.1 **7 Claims**



1. In a coulometric electrolytic timing device adapted for use in electrical circuits for detecting the rupture of a circuit conductive path after a predetermined time period, said rupture caused by the electroplating away of an electrode in said conductive path the improvement which comprises:

(a) an electrically conductive cylindrical sleeve,

(b) an electrically conductive, solid, cylindrical rod coaxially aligned and disposed within said sleeve,

(c) nonconductive support means for engaging said rod and maintaining said rod in coaxial alignment within said sleeve;

(d) an electrolyte disposed between said rod and said sleeve;

(e) sealing means for retaining said electrolyte within said sleeve.

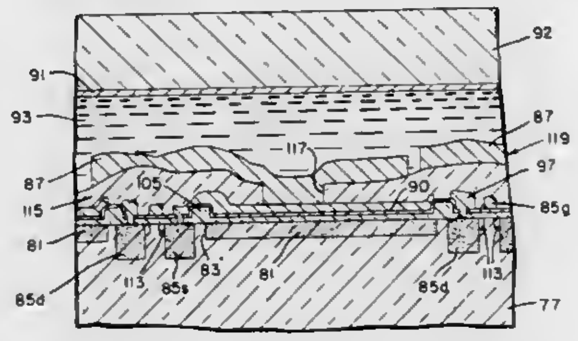
4,103,297
LIGHT-INSENSITIVE MATRIX ADDRESSED LIQUID CRYSTAL DISPLAY SYSTEM

Denis J. McGrelvy, Laguna Beach; Henry T. Peterson, Irvine, and Alex M. Leupp, Costa Mesa, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 20, 1976, Ser. No. 752,037

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—324 M **8 Claims**



1. A liquid crystal display panel for providing a pictorial display comprising in combination:

(a) a semiconductor backplate having a major surface;

(b) a doped layer extending along said surface, said layer having an array of openings arranged in a plurality of columns and rows;

(c) a switching device formed in said semiconductor backplate surface entirely within each said opening;

(d) a coplanar array of closely spaced, reflective back electrodes, each extending entirely over a respective one of said openings;

(e) means for electrically connecting each of said switching devices to the back electrode extending over it;

(f) a transparent front electrode spaced from said coplanar array of back electrodes;

(g) liquid crystal material confined between said front and back electrodes; and

(h) means for applying an actuating voltage between selected ones of said back electrodes and said front electrode through said switching devices.

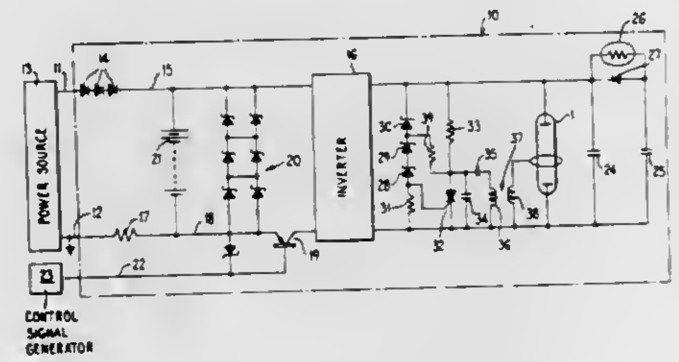
4,103,298
ALARM DEVICE

Robert J. Redding, Maidenhead, England, assignor to Browne-Davies Electronic Corporation, Houston, Tex.

Filed Jul. 20, 1976, Ser. No. 707,110

Int. Cl.^{2} H05B *41/00*

U.S. Cl. 340—331 **11 Claims**



1. An intrinsically safe strobe system comprising,

a high voltage strobe unit comprising,

a gas flash tube having a trigger circuit, a capacitor connected in series with the flash tube, a charging power supply whose output is connected in parallel with the flash tube and capable of charging the capacitor to a potential sufficient to ionize the gas in the flash tube and whose input is low voltage, low current intrinsically safe power; said strobe unit being contained in an intrinsically safe enclosure in a hazardous area;

an intrinsically safe power supply located in a safe area whose intrinsically safe power output is electrically connected to the input of said charging power supply in said hazardous area, and

triggering means in said enclosure connected to said flash tube's trigger circuit for controllably allowing an electrical signal having an intrinsically safe power level to actuate the flash tube.

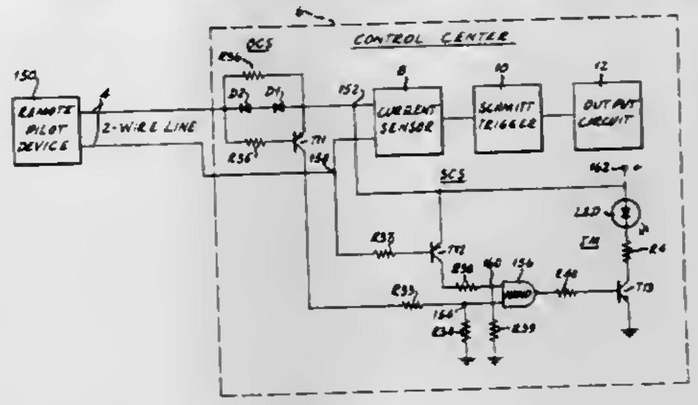
4,103,299
TWO-WIRE PILOT DEVICE SOLID STATE CONTROL SYSTEM

Merle R. Swinehart, Brookfield, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 12, 1976, Ser. No. 731,509

Int. Cl.^{2} G08B *21/00*

U.S. Cl. 340—506 **12 Claims**



1. A solid state pilot system comprising:

a remote station comprising pilot means operable to provide a change in current level from a first level to a second level in response to operation thereof;

a control center comprising current sensor means;

a two-wire line connecting said pilot means to said current sensor means;

solid state means in said current sensor means for providing a change in control voltage value in response to said change in current level;

a solid state voltage level sensor responsive to said change in control voltage value for providing a switched output signal;

and means responsive to said switched output signal for operating a load device;

said solid state means in said current sensor means comprising a transistor and means biasing said transistor for conduction;

and said two-wire line being connected in the collector circuit of said transistor thereby to cause a change in conduction in response to said change in current level.

4,103,300
AIR NAVIGATION AND LANDING AID SYSTEM

Robert Gendreu, and Maurice Chabah, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,686

Claims priority, application France, Dec. 14, 1973, 73 44802; Mar. 28, 1974, 74 10898

Int. Cl.^{2} G01S *9/56, 9/60*

U.S. Cl. 343—6 R **18 Claims**

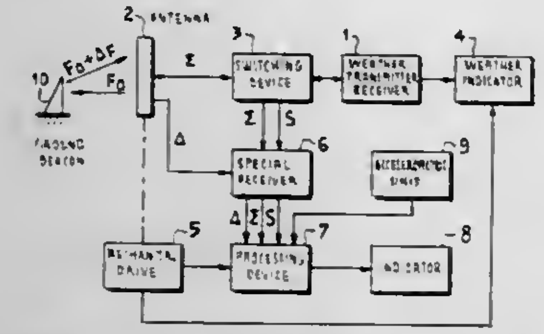
1. An air navigation and landing aid system comprising on the ground: at least one transponder beacon for receiving pulses having a predetermined frequency and retransmitting said pulses with at least one frequency which is different from said predetermined frequency, each beacon being located at a predetermined position with respect to a landing runway, and in an aircraft;

an antenna;

a mechanical drive device for the antenna;

a weather transmitter-receiver coupled to the antenna, for emitting pulses at said predetermined frequency, for receiving echo signals having said predetermined frequency in response to said emitted pulses and for furnishing information affording a navigation aid during the flight stage;

a special receiver for receiving the pulses re-transmitted by each beacon in response to the interrogation of the weather transmitter during the landing stage;



switching means, inserted between said antenna and the weather transmitter-receiver, for switching, during the landing stage, the received pulses, relating to each beacon, to said special receiver, and

a process circuit connected to said special receiver and to the mechanical drive device for the antenna, for furnishing information about at least the relative position and the relative path of the aircraft with respect to the landing runway, for affording a landing aid.

4,103,301

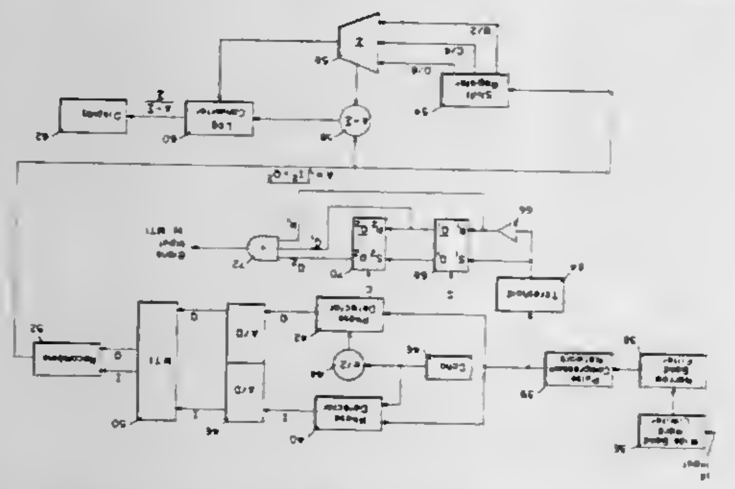
CONSTANT FALSE ALARM RATE MOVING TARGET INDICATION RADAR SYSTEM (CFAR-MTI)

Norol T. Evans, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 20, 1975, Ser. No. 588,577

Int. Cl.² G01S *9/42*

U.S. Cl. 343—7.7 **21 Claims**



1. A constant false alarm rate, moving target indicator radar system comprising in combination:

a recombining network responsive to both in-phase and quadrature signal outputs from a moving target indicator and forming therefrom output signal functionally related to said in-phase and quadrature signals;

a shift register responsive to output signal from the recombining network and forming functionally related output signals therefrom;

a summing circuit responsive to output signals developed in the shift register and forming a functionally related output signal therefrom;

a subtractor circuit responsive to output signals from the summing circuit and the recombining network and forming a functionally related output signal therefrom;

a log converter circuit responsive to output signal from said summing circuit and said subtractor circuit and furnishing input signals functionally related thereto to display processing elements of the radar system.

4,103,302

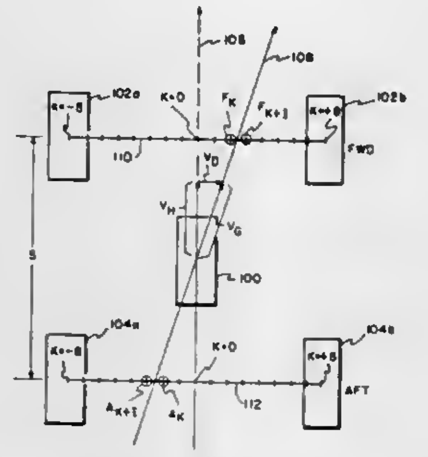
VELOCITY AND DRIFT ANGLE TRACKING SYSTEM USING ALTIMETRY SIGNALS

Allan W. Roeder, Whitesboro; Richard M. Kimball, and Richard F. Koschmeder, both of New Hartford, all of N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Jul. 16, 1976, Ser. No. 705,881

Int. Cl.² G01S *9/48;* H04B *7/04*

U.S. Cl. 343—9 **8 Claims**



1. A system for determining the drift angle of a fluid-born vehicle, said drift angle being defined as the angle between the vehicle heading direction and the direction said vehicle is moving relative to an adjacent stationary reflecting surface, said system comprising, in combination:

transmitting means provided on said vehicle for illuminating said surface with a train of wave energy pulses;

receiving means on said vehicle for receiving said wave energy after reflection from said surface, said receiving means having forward and aft energy-receiving phase centers spaced apart from one another in said vehicle heading direction;

offset means for electronically intermittantly shifting said forward and aft phase centers by selected amounts in directions lateral to said heading direction;

correlating means responsive to reflected wave energy pulses received at said forward and aft phase centers for processing selected pairs of said forward and aft received pulses to generate a crosscorrelation output indicative of the crosscorrelation of a plurality of said selected pairs, said correlating means further operating to generate a crosscorrelation difference output indicative of the difference between crosscorrelation outputs generated for different lateral positions of said phase centers and to generate an offset control signal in response to said crosscorrelation difference output, and wherein said correlating means includes means for sampling the amplitude of each of said received pulses and for storing an amplitude value F for each said forward pulse and an amplitude value A for each said aft pulse; and crosscorrelation output means for generating said crosscorrelation outputs in accordance with the algorithm

$$pFA = \frac{E\{FA\} - \eta_F \eta_A}{\sigma_F \sigma_A}$$

where E {FA} represents the expected value of the products of said amplitude values for a predetermined number of said selected pairs of pulses; $\eta_F \eta_A$ represents the product of the mean values for the F and A values, respectively, in said predetermined number of selected pairs of pulses and $\sigma_F \sigma_A$ represents the product of the standard deviation values for the F and A values, respectively, in said predetermined number of selected pairs of pulses;

electronic control means responsive to said offset control signal for controlling said offset means to alter the amount of lateral displacement of said phase centers so as to minimize said crosscorrelation difference output; and

calculating means responsive to the amount of said phase center displacement for generating a representation of drift angle.

4,103,303

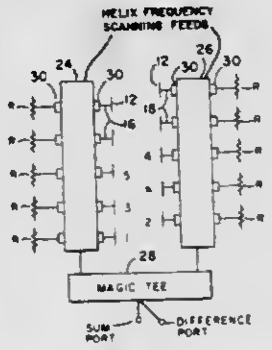
FREQUENCY SCANNED CORNER REFLECTOR ANTENNA

Keaneth M. Regenos, Palo Alto, and Normand Barbano, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1976, Ser. No. 735,478

Int. Cl.² H01Q *3/26, 19/16*

U.S. Cl. 343—100 SA **5 Claims**



1. A frequency scanned corner reflector antenna comprising: first and second planar microwave reflector surfaces disposed for forming a throat at an acute angle therebetween, a plurality of dipole antennas uniformly disposed in columns in said throat for radiating and receiving microwave energy, a first helix frequency scanning feed coupled to a first portion of said dipole antennas for coupling microwave energy thereto, a second helix frequency scanning feed coupled to a second portion of said dipole antennas for coupling microwave energy thereto, signal dividing means coupled to both of said helix feeds for simultaneously coupling microwave energy to and from said feeds for providing antenna frequency scanning in a clockwise or a counterclockwise direction when input signal frequency is increased or decreased respectively.

4,103,304

DIRECTION LOCATING SYSTEM

Fred E. Burnham, Silver Spring, and William H. Clark, College Park, both of Md., assignors to Litton Systems, Inc., College Park, Md.

Filed Apr. 20, 1973, Ser. No. 352,892

Int. Cl.² G01S *3/48*

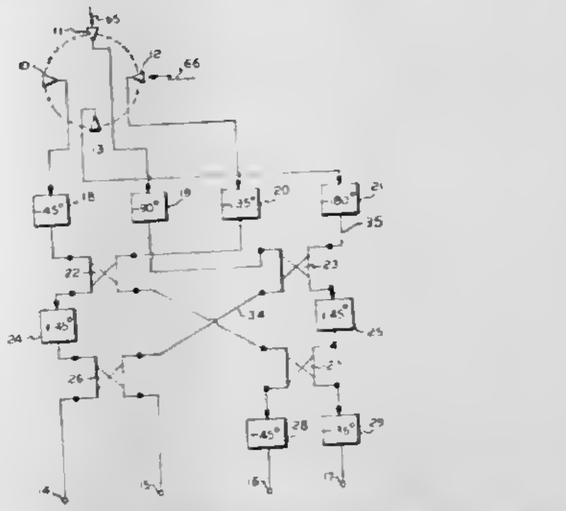
U.S. Cl. 343—113 R **16 Claims**

1. In an instantaneous direction finding system for determining the spatial direction of an incoming wave,

an arcuately disposed antenna array of elements for observing over an extended arc in space,

a network means having plural outputs, and plural inputs continuously coupled to plural elements of said array to provide at one of the outputs a progressively different time phase displaced signal for each different spatial direction of an incoming wave,

said network providing at a different output a second signal that differs in time phase from that produced for each different spatial direction of the wave,



and means comparing the signal and second signals, to determine the spatial direction of an incoming wave referenced to said array.

4,103,305

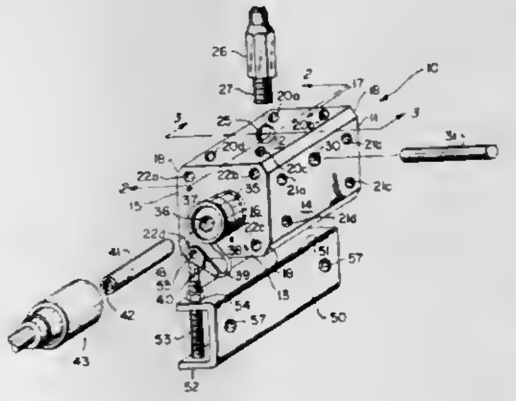
UNIVERSAL ANTENNA MOUNT

Emil V. Gualano, P.O. Box 902, Huntington Park, Calif. 90255

Filed Jul. 26, 1976, Ser. No. 708,383

Int. Cl.² H01Q *1/32, 1/12*

U.S. Cl. 343—715 **16 Claims**



1. A mount for an antenna or the like comprising:

a body in the form of a substantially rectangular block, said block being formed of an electrically insulative material having a first pair of opposed surfaces forming the top and bottom of the block, respectively, said first opposed surfaces including flat substantially parallel portions, and a second pair of opposed surfaces forming lateral sides of the block and having opposed flat substantially parallel portions which are essentially perpendicular to the first said pair of opposed flat parallel portions,

apertures in said block in at least one of said pairs of flat substantially parallel portions for receiving means for mounting said block,

a first opening in the top of the block forming a first passageway into the block and including means for receiving an antenna base,

and a second opening extending into a second surface of the block and forming a second passageway intersecting the first passageway, a nipple associated with the second opening for receiving an antenna wire coupling, and means in the second passageway for communicating a signal from the antenna base to the antenna wire.

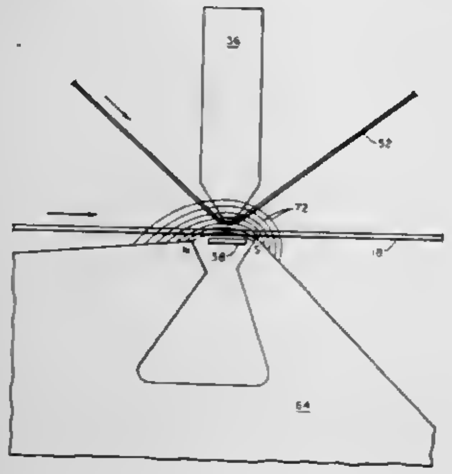
4,103,306
NON-IMPACT PRINTER WITH MAGNETIC INK REORIENTATION

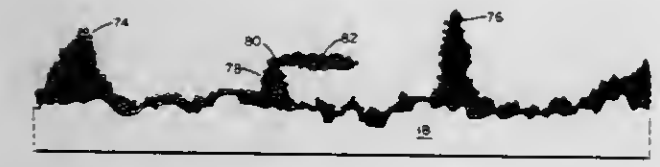
Roger E. Clapp, Cambridge, Mass., assignor to Epp Corp., Boston, Mass.

Filed Jul. 30, 1976, Ser. No. 710,281

Int. Cl.² G03G *19/00, 15/06*

U.S. Cl. 346—153 **17 Claims**





1. Printing means comprising, in combination,
- a print electrode having a shaped portion for printing,
- an ink source comprising a support with a surface facing said shaped portion, a quantity of ink particles loosely distributed on said surface in mutually spaced aggregates of irregular height, the particles comprising a magnetic material, and means to move the support to cause said surface to pass through a print position in predetermined spaced relation to said shaped portion,
- means to move an ink recipient sheet past the print position between said shaped portion and said surface,
- means to cause an electrical field of short duration to extend between said shaped portion and the support at the print position, and
- means to cause a magnetic field to pass through the aggregates approaching the print position, said magnetic field being fixed in relation to the print position, having a substantial component perpendicular to the direction of the electrical field at said print position, and being of sufficient strength to reorient a number of said aggregates.

4,103,307
EXPOSURE CONTROL DEVICE

Nobuhiko Shinoda, Tokyo; Tadashi Ito, Yokohama; Soichi Nakamoto, Machida, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

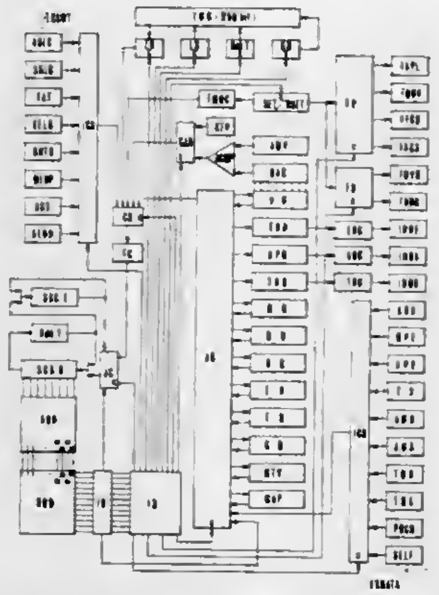
Continuation of Ser. No. 611,806, Sep. 9, 1975, which is a continuation of Ser. No. 488,849, Jul. 15, 1974. This application May 23, 1977, Ser. No. 799,568

Claims priority, application Japan, Jul. 16, 1973, 48-80087; Aug. 27, 1973, 48-95916; Aug. 28, 1973, 48-96502

Int. Cl.² G03B *7/08*

U.S. Cl. 354—23 D **97 Claims**

1. An exposure control device for a camera comprising:
- (a) exposure information means for entering exposure information values into the exposure control device;
- (b) first control means having a plurality of actuating means for controlling a plurality of individual camera elements including a shutter screen;
- (c) a sequence control circuit means having at least one input terminal and at least one output terminal to supply first control signals for controlling said actuating means, wherein the sequence control circuit means produces in sequence from the output terminal control signals which correspond to the input values applied to the input terminal, said actuating means being thereby selectively driven corresponding to the first control signals;
- (d) a calculating circuit connected to said exposure information means and to said sequence control circuit means and responsive to the sequential control signals from the sequence control circuit means, wherein the calculating circuit has at least one output terminal and automatically performs a mathematical calculation employing the adjusted exposure information values from exposure information means to determine various values in relation with the control signals;



- (e) a second control means connected to the output terminal of said calculating circuit and to the input terminal of said sequence control circuit means, wherein the second control means applies second control signals which correspond to the values determined by the calculating means to the sequence control circuit means so that control signals which correspond to the values determined by the calculating circuit are generated from the sequence control circuit means; and
- (f) means for entering instantaneous values representing operating conditions of various individual camera elements of said first control means into said sequence control circuit means.

4,103,308
DIGITAL INFORMATION INPUT METHOD

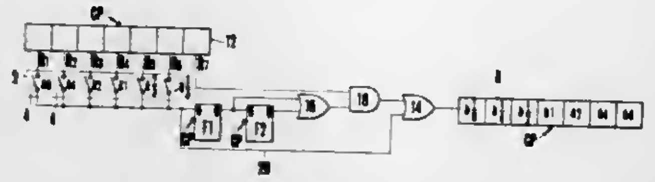
Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Hino; Nobuhiko Shinoda, Tokyo; Tadashi Ito, Yokohama; Hiroyashu Murakami, Tokyo, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,908

Claims priority, application Japan, Apr. 30, 1975, 50-53043

Int. Cl.² G03B *7/08*

U.S. Cl. 354—23 D **4 Claims**



1. A digital information input circuit arrangement comprising:
- a plural number of switches arranged parallel to each other so as to be selectively opened and closed, said plural number of switches including a first switch corresponding to the weight $\frac{2}{3}$ in APEX value and a second switch corresponding to the weight $\frac{1}{3}$ in APEX value;
- an *n* bit register, said register including a first bit with the weight $\frac{1}{3}$ in APEX value, a second bit with the weight $\frac{2}{3}$ in APEX value and a third bit with the weight $\frac{1}{3}$ in APEX value;
- a signal producing means being connected to the plural number of switches so as to produce closing signals by means of the selective closing of the plural number of switches to be transferred to the register, and
- a transfer means from transferring to the register the closing signals due to the closing of the plural number of switches, said means including a first transfer means for transferring the closing signal of the first switch to the first bit, the closing signal of the second switch to the second bit and the closing signal of the first and the second switch to the third bit.

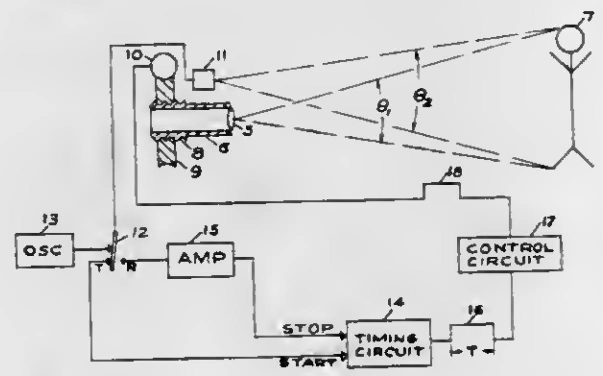
4,103,309
AUTOMATIC CAMERA FOCUSING MEANS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass., Trustees of The Stoneleigh Trust

Filed May 11, 1976, Ser. No. 685,429

Int. Cl.² G03B *7/08*

U.S. Cl. 354—25 **2 Claims**



1. In combination in a photographic camera, a lens characterized in that its field of view is defined by the angle θ_1, a directional electroacoustic transducer characterized in that its main beam angle is defined by the angle θ_2, means for attaching said transducer to said camera with the axis of maximum sensitivity of said transducer mounted parallel to the axis of said lens, said transducer further characterized in that its beam angle θ_2 is not greater than θ_1, a first electrical circuit means for operating said electroacoustic transducer as an echo-ranging system and generating a first reference electrical signal which varies as a function of the distance between the transducer and the subject toward which the lens is facing, a second electrical circuit means for generating a second reference electrical signal which varies as a function of the focus setting position of the lens, automatic focus-adjusting means including an electrically-operated drive system adapted for adjusting the position of said lens, control signal means for operating said automatic focus-adjusting means, means for continually comparing said first and second reference signals, said signal comparison means characterized in that said control signal is generated whenever said first and said second reference signals are not equal, said electrically-operated drive system characterized in that it is responsive to said control signal, whereby said electrically-operated drive system is activated to adjust the position of said lens until said first and second reference signals are equal, whereby said lens is automatically kept in focus on the subject toward which the lens is facing, and further characterized in that the beam angle of said electroacoustic transducer lies within the approximate range 10° to 30°.

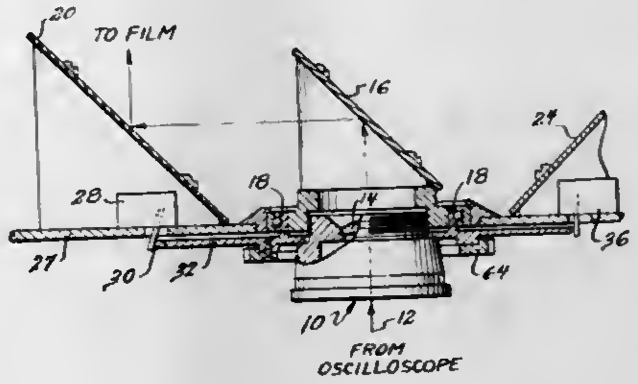
4,103,310
MULTIPLE-IMAGE OSCILLOSCOPE CAMERA

Nicholas J. Yasillo, Tinley Park, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 763,166

Int. Cl.² G03B *29/00, 35/00*

U.S. Cl. 354—120 **3 Claims**



1. An apparatus for placing on a single photographic film a plurality of images of discreet views of displays of an oscilloscope, the apparatus comprising:
- an enclosing frame connected to the oscilloscope and adapted to receive and hold the film and forming therewith a light-tight inner region;
- a lens mounted within the inner region and coupled optically to the oscilloscope display to focus light therefrom;
- a rotating mirror disposed within the inner region and coupled optically to the oscilloscope display and the lens to reflect light from the display at an angle of approximately 90°;
- a plurality of fixed mirrors, each one of said plurality mounted within the inner region and disposed to reflect the light reflected by the rotating mirror in one of a plurality of predetermined positions to a predetermined location on the film, the distance of light travel from the lens to the rotating mirror, to each fixed mirror and to the film being chosen to focus light from the display on the film;
- a bearing connected to the enclosing frame and to the rotating mirror to permit rotation of the mirror with respect to the enclosing frame;
- a stepping motor connected to the rotating mirror to rotate the rotating mirror to one of a plurality of predetermined positions;
- a switch actuator coupled mechanically to the rotating mirror and responsive to the position thereof;
- a plurality of switches equal in number to the plurality of fixed mirrors, each of the switches disposed to respond to the switch actuator to provide a signal indicating position of the rotating mirror;
- means for producing a signal to start rotation of the mirror; and
- an electronic circuit connected to the plurality of switches, to the means for producing a signal to start rotation, and to the stepping motor to start the stepping motor in response to a signal from the means for producing a signal and to stop the stepping motor in response to a signal from any one of the plurality of switches.

4,103,311
METHOD AND APPARATUS FOR ADJUSTING THE VIEW FINDER OF A SINGLE-LENS REFLEX CAMERA

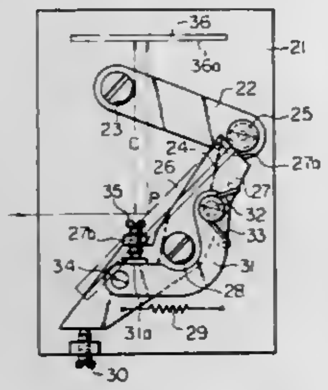
Hirofumi Horigome, Kawasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 2, 1977, Ser. No. 792,970

Claims priority, application Japan, May 10, 1976, 51-52185

Int. Cl.² G03B *19/12*

U.S. Cl. 354—152 **5 Claims**



1. Method for adjusting the view finder system of a single-lens reflex camera characterized in that it comprises:

providing a mirror frame having upper and lower arms jointed together, the free end of said upper arm being rotatably fixed to the mirror box, said lower arm bearing the swingable mirror;

adjusting the position of said lower arm so as to set the swingable mirror at an angle of 45° with respect to the optical axis of the taking lens; and

raising or lowering the joint between said upper and lower arms of said mirror frame and at the same time raising or lowering the free end of said lower arm so as to translate the swingable mirror with respect to the focusing screen, whereby the optical distance from the taking lens to the focusing screen via the swingable mirror is adjusted.

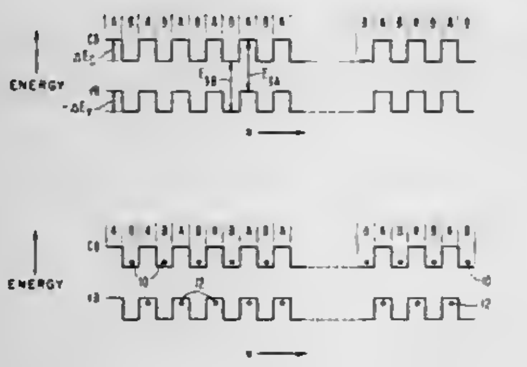
4,103,312
SEMICONDUCTOR MEMORY DEVICES

Leroy Ligong Chang, Mohegan Lake; Leo Esaki, Chappaqua, and George Anthony Sai-Halasz, Mohegan Lake, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,068

Int. Cl.² H01L *29/161*

U.S. Cl. 357—16 **50 Claims**



1. A semiconductor storage device, comprising:

semiconductor means for producing spatially separated potential wells for electrons and holes,

write means for generating electrons and holes in said wells, and

read means for detecting the presence of said electrons and holes in said wells.

4,103,313
CIRCUIT FOR THE AUTOMATIC SCANNING ADJUSTMENT OF A VIDEO TAPE IN A VIDEO RECORDER

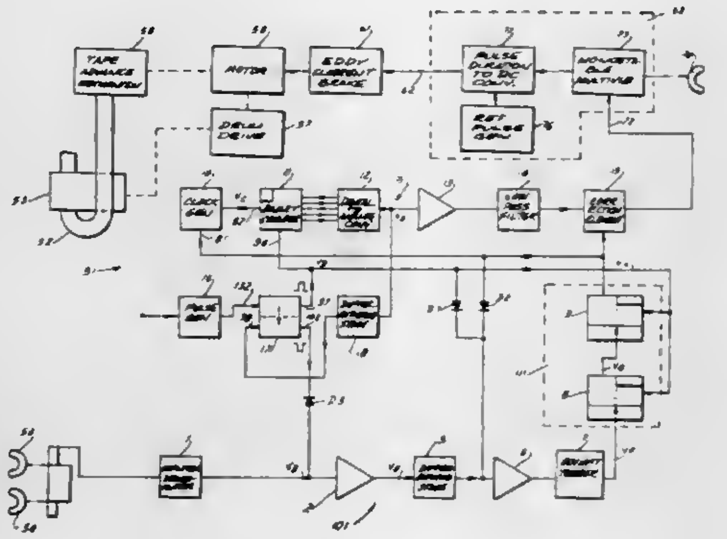
Egon Frank, Theisenort, Fed. Rep. of Germany, assignor to Loewe-Opta GmbH, Kronach, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,870

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549579

Int. Cl.² G11B *21/10*

U.S. Cl. 360—70 **9 Claims**



1. In a helical scan video recorder adapted for reproducing video signals modulated on a highfrequency carrier and fixed on at least one track of an elongated magnetic tape, the tape being wrappable helically about a rotatably mounted drum, detecting means including a magnetic pick-up head rotatable in a scanning path on the periphery of the drum for detecting video signals modulated on an associated track of the tape as the tape is advanced along a helical path about the periphery of said drum, means for longitudinally advancing the tape, means responsive to the detecting means for generating a tracking control signal, and tape velocity regulation means coupled to the output of the tracking control signal generating means and cooperable with the tape advancing means for varying the velocity of advance of the tape in accordance with variations of the tracking control signal to correspondingly vary the amplitude of the detected video signal, the improvement wherein the tracking control signal generating means comprises, in combination, clock pulse generating means cyclically operable with a first repetition interval and having a first control input, the clock pulse generating means being disabled upon the application of a pulse to the first control input, resettable stepping means coupled to the output of the clock pulse generating means for normally generating, as the tracking control voltage, a repetitive DC staircase voltage over a second repetition interval long with respect to the first interval while the clock pulse generating means remains enabled, the staircase voltage normally progressing from a first relatively low level to a second relatively high level in increments determined by the first repetition interval and the dropping abruptly from the second level to the first level at the end of the second repetition interval, the stepping means being adapted to store the staircase voltage level attained at the instant that the clock pulse generating means is disabled, pulse forming means coupled to the output of the detecting means and responsive to the successive passage of the detected video pulse amplitude through a minimum and a following maximum during the second interval for generating a stop pulse, and means for coupling the output of the stop pulse generating means to the first control input of the clock pulse generating means.

4,103,314
MOTION CONTROL SYSTEM

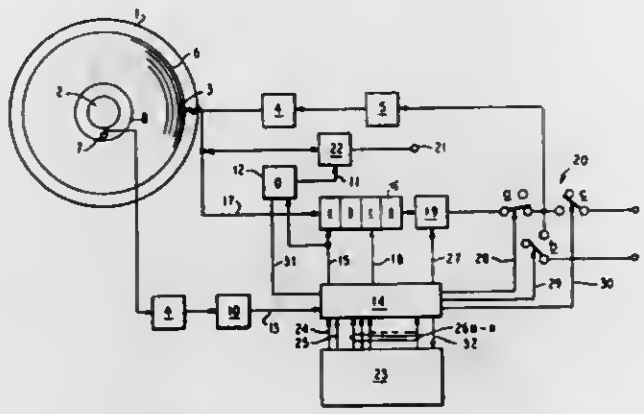
William John Philip Case, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,566

Claims priority, application United Kingdom, Jun. 30, 1976, 27317/76

Int. Cl.² G11B *21/08, 21/10;* G05B *19/24*

U.S. Cl. 360—78 **13 Claims**



1. A motion control system for controlling relative motion between two objects along a predetermined path of travel according to a predetermined nominal velocity profile, said system comprising:

a motor for producing said relative motion in response to motor control signals;

motor control signal connecting means for connecting motor control signals to said motor;

position transducer means, associated with said objects, for defining a plurality of reference positions along said predetermined path and for producing an incremental position signal indicative of the magnitude and direction of the displacement of said objects from successive ones of said reference positions;

a timing means for generating timing signals nominally indicative of the arrival of said objects at predetermined ones of said reference positions when moving according to said predetermined nominal velocity profile;

sampling means responsive to said timing signals to generate sample values of said incremental position signal representative of any error between the actual position of said objects and said predetermined reference positions;

feedback signal deriving means for deriving a feedback signal from said sample values of said incremental position signal and for providing said feedback signal to said connecting means as a motor control signal.

4,103,315
ANTIFERROMAGNETIC-FERROMAGNETIC EXCHANGE BIAS FILMS

Robert Douglas Hempstead, Morgan Hill, Calif.; Sol Krongelb, Katonah, N.Y.; Daniel Andrew Nepela, Saratoga, Calif.; David Allen Thompson, Somers, N.Y., and Erich Philipp Valstyn, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,598

Int. Cl.² G11B *5/12, 5/30*

U.S. Cl. 360—110 **53 Claims**

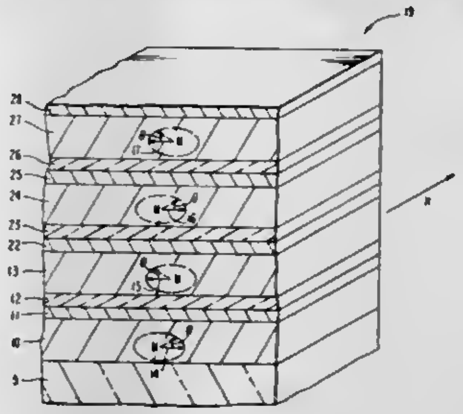
1. A magnetic thin film structure including a sandwich composed of layers including

a first layer comprising a ferromagnetic material in direct atomic contact with a second layer of an antiferromagnetic material,

said first layer having a coercivity of less than about 10 Oersteds

and a unidirectional magnetic bias sustained by an exchange interaction relationship with said second layer provided by alignment of spins in said antiferromagnetic material, and

an exchange coupling field H_e greater than the coercivity H_c in the presence of said exchange interaction.



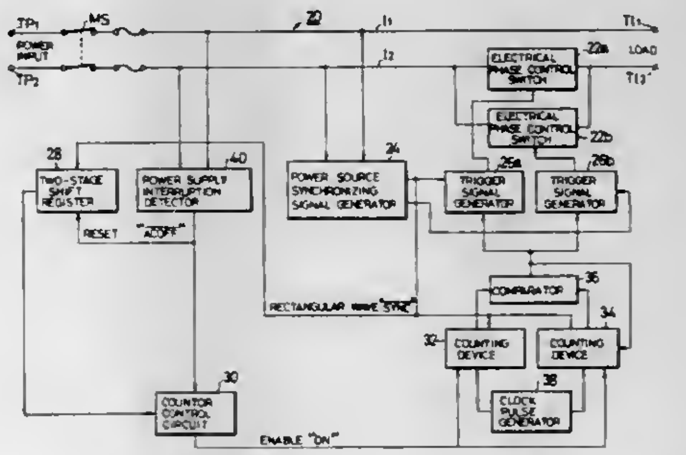
4,103,316
APPARATUS FOR PREVENTING THE OCCURRENCE OF POSSIBLE TRANSIENT PHENOMENA IN AN ELECTRIC POWER TRANSMISSION CIRCUIT

Yoshiaki Kaneko, Kawasaki, Japan, assignor to Sanki Denshi Kogyo Kabushiki Kaisha, Yokohama, Japan

Filed May 12, 1977, Ser. No. 796,484

Int. Cl.² H01H *33/59*

U.S. Cl. 361—3 **12 Claims**



1. Apparatus for preventing occurrence of possible transient phenomena in a circuit including an alternating current power source and a load connected thereto when the supply of electric power from said power source to said load, which has been interrupted, is restarted, said apparatus comprising:

(a) switching means provided in said circuit between said power source and said load;

(b) means for generating trigger signals to operate said switching means in synchronization with the voltage or current of said power source for supplying power from said power source to said load in a smooth manner;

(c) means for detecting a possible occurrence of interruption of the power supply;

(d) means responsive to the detecting of the interruption of the power supply by said detecting means for memorizing the phase angle of the current or voltage of said power source at the time of the occurrence of the interruption of the power supply to stop the operation of said trigger signal generating means and to turn off said switching means; and

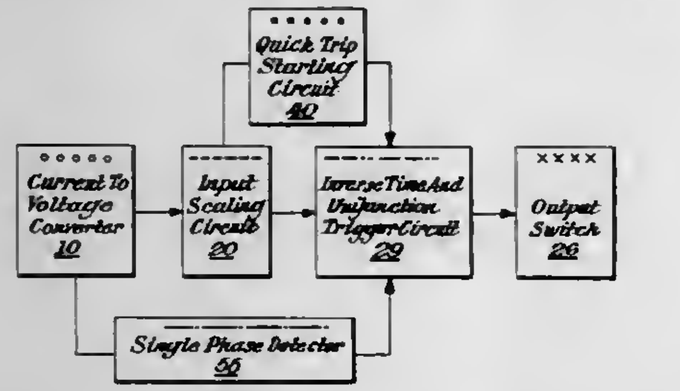
(e) means for detecting the coincidence of the phase angle memorized in said memorizing means with a changing phase angle of the voltage or current of said power source after the power supply from said power source to said load becomes again possible to restart the operation of said trigger signal generating means and therefore said switching means at the time of detecting the coincidence.

4,103,317

MOTOR PROTECTOR PROVIDING PHASE FAILURE AND OVERLOAD CUTOFF FOR THREE-PHASE VARIABLE VOLTAGE VARIABLE FREQUENCY MOTOR

John B. Krick, Newark, Del., assignor to Val Tech Inc., Newark, Del.

Filed Jun. 7, 1976, Ser. No. 693,421
Int. Cl.² H02H *3/08*
U.S. Cl. 361—31 **6 Claims**


Quick Trip Starting Circuit 40
Current To Voltage Converter 10
Input Scaling Circuit 20
Inverse Time And Unijunction Trigger Circuit 29
Output Switch 26
Single Phase Detector 56

1. A circuit for protecting motor windings of a 3-phase motor with a unijunction transistor energized by a DC voltage to activate an interruption of the operation of the motor, wherein the motor has a continuous motor rating which comprises

current-to-voltage converter comprised of current transformers, resistors, and full-wave bridge rectifiers providing a rectified full-wave DC voltage proportional to the current flowing in the motor windings and a time delay circuit consisting of a Resistor-Capacitor network and a unijunction transistor detector which functions in conjunction with the current sensitive voltage to provide an inverse time response characteristic to the voltage applied to the anode of the unijunction transistor which triggers into a conducting state whenever the anode voltage exceeds the reference voltage in the gate terminal of the unijunction transistor,

wherein the improvement consists of incorporation of a fast timing inrush timer with said time delay circuit, said inrush timer being activated by the current sensitive DC voltage whenever the motor current exceeds the continuous motor rating by a predetermined percentage to charge said timing capacitor in accordance with said current sensitive voltage,

and including means for adjusting the elapsed time period within which said DC voltage sensitive to said excessive motor current provides the charge to said capacitor.

4,103,318

ELECTRONIC MULTICHIP MODULE

Otto G. Schwede, Los Altos, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 6, 1977, Ser. No. 794,586
Int. Cl.² H05K *7/20*
U.S. Cl. 361—388 **4 Claims**

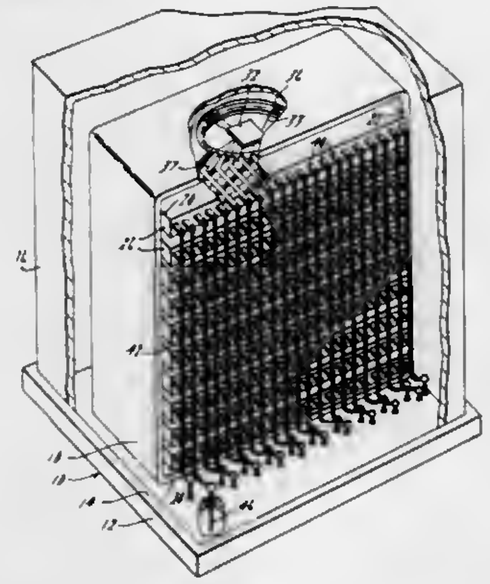
1. An electronic multichip module, which comprises, in combination:

a metallic base member;

a metallic cover hermetically sealed to said base member, said base member and said cover together forming an enclosure;

at least one metallic support member within said enclosure and attached thereto;

a plurality of integrated circuit units, each of said units comprising: a metal plate supported by said support member and in heat conductive relation with said support member; an integrated circuit chip mounted on said metal plate to permit heat transfer from said integrated circuit chip to said metal plate; an insulator on said metal plate; a plurality of electrically-conductive elements insulated from said metal plate by said insulator and having terminal portions extending beyond said insulator and metal plate, said conductive elements being electrically isolated from said metal plate by said insulator; and means for electrically connecting said conductive elements to said integrated circuit chip;



means for electrically interconnecting said terminal portions of said conductive elements of said integrated circuit units; and

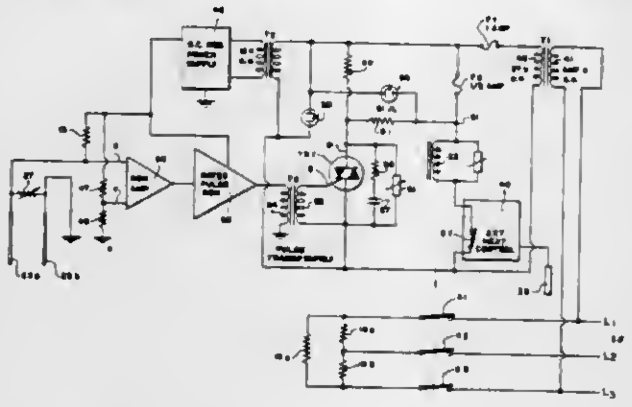
electrically conductive means, extending through said enclosure and electrically isolated thereform, for permitting electrical connection of circuitry external of said enclosure to be made to said means for electrically interconnecting said terminal portions of said conductive elements of said integrated circuit units.

4,103,319

HAZARD PREVENTION CIRCUIT FOR IMMERSION HEATERS

N. Robert Crain, Huntington Beach; Joseph S. Romance, Diamond Bar, and Carson T. Richert, Buena Park, all of Calif., assignors to Radiant Technology Corporation, Cerritos, Calif.

Filed Jun. 27, 1977, Ser. No. 810,183
Int. Cl.² H02H *5/04*
U.S. Cl. 361—106 **10 Claims**



1. A hazard prevention control circuit for an immersion heater having heating elements enclosed in an envelope immersed in a tank of solution to be heated, said control circuit comprising:

a circuit breaker;

a contactor having a contactor coil and a set of contacts for connecting an a.c. supply to said heating elements;

power supply means connected to supply current through said circuit breaker to energize said contactor coil;

a load circuit including a normally non-conducting thyristor having a gate input, said load circuit connected in parallel with said contactor coil;

a sensing circuit including sensing means responsive to a malfunctioning of said immersion heater to generate an a.c. signal;

a power transformer coupled to said power supply means to supply power for operating said sensing circuit; and

a pulse transformer for coupling said a.c. signal to the gate input of said thyristor to thereby draw an excess current through said load circuit which blows said circuit breaker and deenergizes said contactor coil.

4,103,320

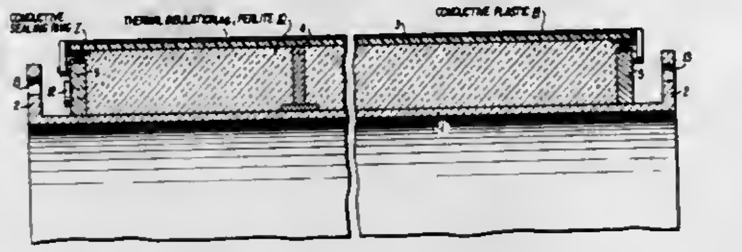
THERMALLY INSULATED PIPE WITH ELECTRICALLY CONDUCTING PORTIONS FOR DISSIPATING STATIC ELECTRICITY

Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B. V., Zwolle, Netherlands

Filed Nov. 22, 1976, Ser. No. 743,658

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552349; Mar. 20, 1976, 2611848; Mar. 20, 1976, 2611849

Int. Cl.² F16L *11/12;* **H05F** *3/02;* **F16L** *9/14, 59/14*
U.S. Cl. 361—215 **17 Claims**



1. A thermally insulated pipe, in particular a pipe for mining industries, comprising a plastic outer pipe and an inner pipe, the pipes being concentrically positioned with respect to each other, and a thermally insulating layer of heat resistant material between the inner and the outer pipe, said outer pipe having an electrically conductive outer surface layer which is electrically conductively connected with the inner pipe.

4,103,321

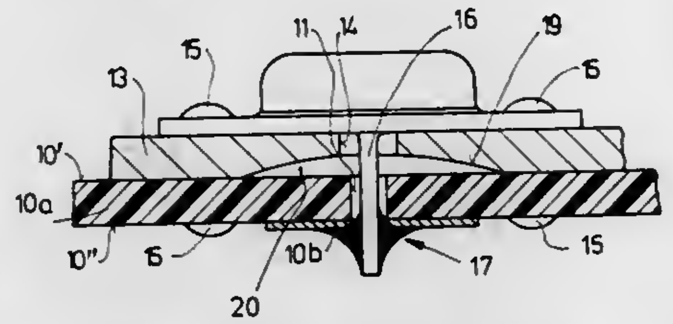
COMPOSITE ELECTRIC CIRCUIT STRUCTURE OF A PRINTED CIRCUIT AND HEAT GENERATING DISCRETE ELECTRICAL COMPONENT

Willi Gansert, Kornwestheim, and Martin Zipperer, Hildesheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,669

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1976, 2601035

Int. Cl.² H05K *7/20*
U.S. Cl. 361—388 **4 Claims**



1. Composite electric circuit structure comprising

a printed circuit (10) having a substrate plate (10*a*) of insulating material, formed with an opening (11) therethrough;

a conductive layer or coating (10*b*) on at least one surface (10") of said substrate plate;

a discrete electrical component (12) located at the side of the other surface (10') of the substrate (10*a*) plate and having a connecting pin (16) passing through said opening (11);

a cooling plate (13) located between the other substrate plate surface (10') and the electrical component (12) to dissipate heat generated in said component during passage of current therethrough and formed with an opening (14) therethrough for passage, with clearance, of the connecting pin;

attachment means (15) passing through said component (12), the cooling plate (13) and the substrate plate (10*a*) and clamping the electrical component, the cooling plate and the substrate plate together;

a solder connection (17) between the connecting pin (16) extending from the electrical component (12) and the conductive layer or coating (10*b*);

a relief (19) formed in said cooling plate (13) reducing the thickness of said cooling plate in the region of the opening (14) surrounding said pin (16),

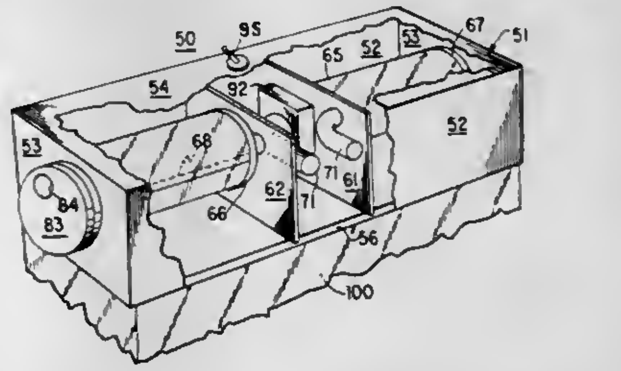
extending in the direction of the pin (16) and laterally thereof beneath the electrical component and located between the other surface (10') of the substrate plate (10*a*) and the surface of the electrical component (12) facing said other surface (10') to form a chamber between said other surface (10') of the substrate plate (10*a*) and the facing surface of the cooling plate (13).

4,103,322

LIGHTING DEVICE

Gerald Price Thompson, 3509 W. Lyndale, Chicago, Ill. 60647

Filed Sep. 27, 1976, Ser. No. 727,258
Int. Cl.² F21V *33/00, 29/00*
U.S. Cl. 362—101 **3 Claims**



1. A device providing single color lighting to a fish tank or the like, said device comprising a cylindrical enclosure containing a light source and having an angular air inlet tube at one end thereof and an air outlet at the other end thereof, each of said air inlet and outlet being constructed to restrict light from entering said enclosure with said air outlet being at an elevation higher than said air inlet, masking means for restricting the escape of light from said enclosure to a predetermined area and for absorbing reflected or refracted light, filter means having an area at least as large as said predetermined area associated with said masking means that said light escaping said enclosure passes through said filter means, and means for mounting said enclosure on the top of a fish tank or the like with said predetermined area in registry with the top of the tank, whereby activation of said light source results in light having a single color corresponding to the color of said filter means shining into the fish tank to provide a color effect to water contained therein without reflected or refracted light comingling with said single color to alter same.

4,103,323

LAMP WITH RESILIENT RETAINER RING

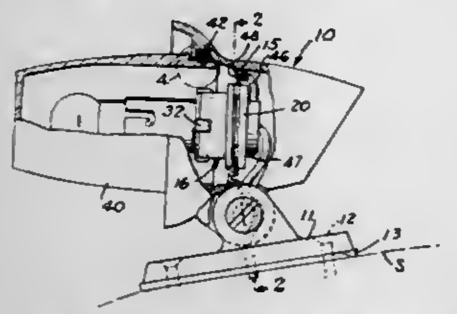
Karel Urbanek, Weston, Canada, assignor to Dominion Anto Accessories Limited, Toronto, Canada

Division of Ser. No. 724,522, Sep. 20, 1976. This application Aug. 11, 1977, Ser. No. 823,747
Int. Cl.² F21V *7/00*
U.S. Cl. 362—306 **24 Claims**

1. In a lamp, the combination comprising

a housing having a hollow portion,

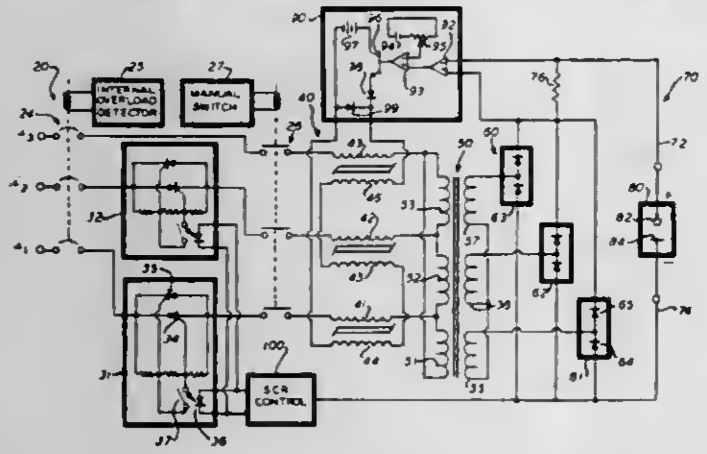
a bracket engaging the interior of said hollow portion of said housing,
said bracket having an opening therein,
a shock mounting member extending through said opening,
said member being made of resilient material and having spaced annular flanges extending along opposite sides of said retainer and forming a groove in which said retainer is positioned,
means in said groove extending axially and engaging one surface of said retainer for holding the opposite surface of said retainer against said opposite flange,



said shock mounting member having an axially extending opening therein,
a socket retainer having a planar surface engaging said inwardly turned flange of said spacer and the end of said shock mounting member,
said socket retainer having portions thereof crimped into engagement with the periphery of said shock mounting member,
and a socket member having an end with a reduced diameter extending through the opening defined by said inwardly turned flange of said spacer,
said reduced end being crimped outwardly.

4,103,324
SATURABLE REACTOR-TYPE POWER SUPPLY

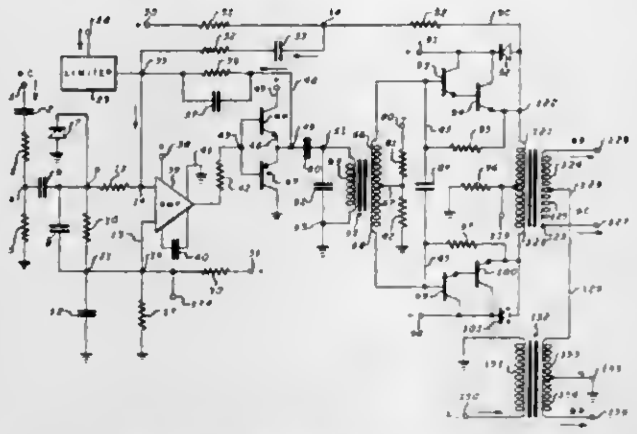
C. Keith Vandervelden, Oakland, and William P. Blake, Palo Alto, both of Calif., assignors to Airco, Inc., Montvale, N.J.
Filed Dec. 22, 1976, Ser. No. 753,404
Int. Cl.^{2} H02P *13/24*
U.S. Cl. 363—89 **16 Claims**



1. A power supply which is operated from a source of three-phase alternating input current and which provides a direct current output to an external load, comprising:
first, second, and third saturable reactors, each comprising a current winding and a control winding;
first pair of opposed semiconductor controlled rectifiers connected in series with the current winding of the first saturable reactor;
second pair of opposed semiconductor controlled rectifiers connected in series with the current winding of the second saturable reactor;
a transformer comprising three primary windings connected to the current windings of the three saturable reactors, and three secondary windings;
a rectification means connected to the three secondary windings of the transformer for obtaining direct current;
first control circuit for establishing normal output current of the power supply by providing an adjustable control current to the control windings of the saturable reactors;
second control circuit for monitoring an operating parameter of the external load and for altering the firing of the semiconductor controlled rectifiers to change the output current in response to a change in the operating parameter.

4,103,325
AIRCRAFT POWER AND PHASE CONVERTER

Charles E. Hyman, and Alfred C. Setter, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.
Filed Mar. 18, 1977, Ser. No. 779,214
Int. Cl.^{2} H02M *5/293*
U.S. Cl. 363—148 **7 Claims**

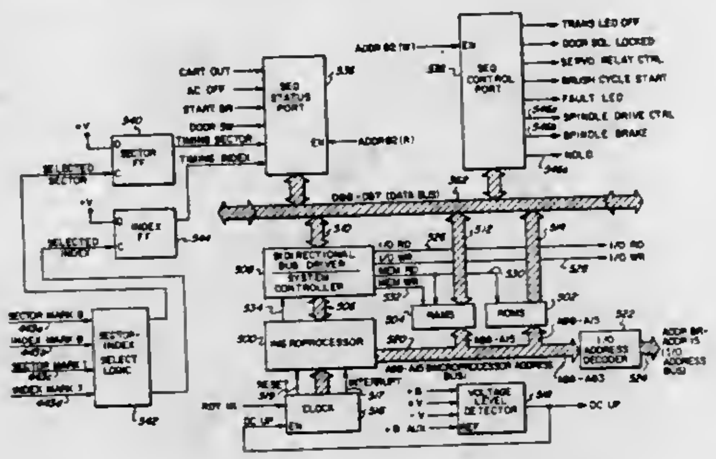


1. Power conversion apparatus adapted to be responsive jointly to aircraft single-phase alternating current power supply means and to aircraft direct current power supply means for generating three-phase alternating current aboard an aircraft of substantially greater power level than the power level of said aircraft single-phase power supply means, comprising:
network means for shifting the phase of said single phase alternating current by substantially 90°,
first amplifier means having an input responsive to said network means,
push-pull power amplifier means responsive to said first amplifier means,
first transformer means having first primary and first secondary means,
said first primary means being responsive to said push-pull power amplifier means,
said first secondary means having first center tap means,
second transformer means having second primary and second secondary means,
said second primary means being responsive to said single phase alternating current,
said second secondary means having neutral tap means,
said first center tap means being coupled to a first end of said second secondary means,
said neutral tap means providing neutral output coupling means,
a second end of said second secondary means providing a first phase output signal,
a first end of said first secondary means providing a second phase output signal, and
a second end of said first secondary means providing a third phase output signal.

4,103,326
TIME-SLICING METHOD AND APPARATUS FOR DISK DRIVE

Leonard R. Shenfield, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 28, 1977, Ser. No. 772,691
Int. Cl.^{2} G06F *9/18, 13/00*
U.S. Cl. 364—200 **8 Claims**

1. Time slicing apparatus for a disk drive comprising:
first memory means for storing microcoded program routines and subroutines for carrying out predetermined disk drive operations, one of said routines being a main program routine that is comprised of a plurality of service routines, at least one of said service routines including a plurality of service subroutines;
second memory means including at least one register respectively associated with said at least one service routine for storing the addresses of locations in said first memory means at which the program instructions for said at least one service routine are stored;
a data processor coupled to said first and second memory means and including means for executing said plurality of service routines in sequence during a respective plurality of time slots of the main program routine processing cycle, means for executing said plurality of service subroutines in sequence with only one being executed each processing cycle during the time slot of said at least one service routine, and means including a program counter for supplying first address signals to said first memory means and second address signals to said second memory means;
means responsive to said first address signals for accessing program instructions in said first memory means and forwarding said accessed program instructions to said data processor for execution;
means responsive to said second address signals for loading the contents of said at least one register into said program counter during the time slot of said at least one service routine; and
means for changing the contents of said at least one register each processing cycle to the address of the first program instruction in said first memory means for the service subroutine next in sequence to be executed.



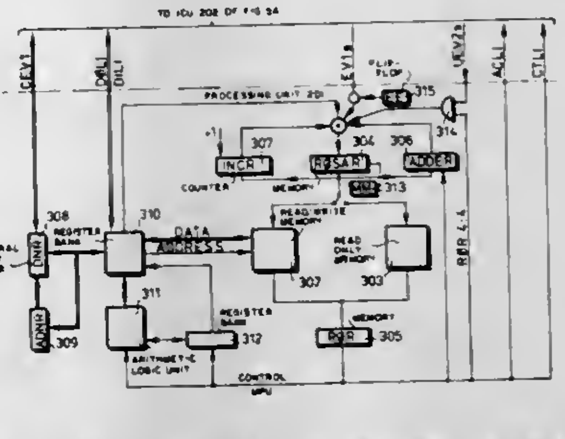
4,103,327
INTERRUPT CONTROL CIRCUIT

James Owen Dimmick, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 18, 1977, Ser. No. 779,142
Int. Cl.^{2} G06F *9/18*
U.S. Cl. 364—200 **9 Claims**

1. In a processor system,
a memory having at least one plural word program subroutine,
a memory address register,
means for receiving an interrupt request,
means including a normally enabled gating means responsive to the receipt of a request for continuously applying a first address word to said register to set it to a predetermined address specifying a unique location in said memory, said location containing the first program word of a subroutine associated with said interrupt request,
means controlled by said address register upon said application of said first address word for reading out said first program word from said memory location,
means for disabling said gating means in response to said readout of said first program word, and
means responsive to the disabling of said gating means for terminating the application of said first address word to said register,
said gating means being ineffective when disabled to respond to any subsequently received interrupt requests.

4,103,328
CONTROL APPARATUS FOR CONTROLLING DATA FLOW BETWEEN A CONTROL PROCESSING UNIT AND PERIPHERAL DEVICES

Ginette Dalmasso, Bagnolet, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France
Filed Apr. 7, 1975, Ser. No. 566,024
Claims priority, application France, Feb. 20, 1974, 74 05792
Int. Cl.^{2} G06F *3/04, 9/16, 13/00*
U.S. Cl. 364—200 **5 Claims**



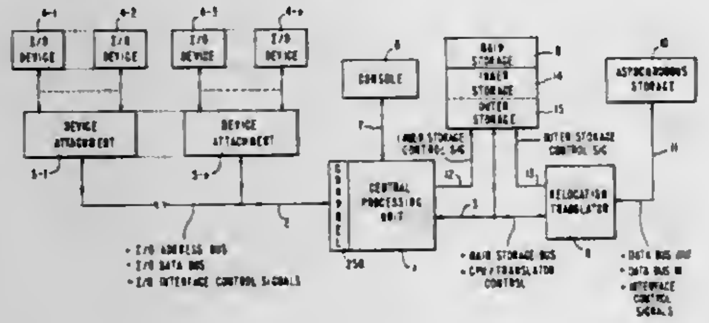
1. In a data processing system, a peripheral control apparatus for controlling the flow of data between a control processing unit and a plurality of peripheral devices, said peripheral control apparatus comprising:
1. interface channel means coupled to said control processing unit and to the plurality of peripheral devices for transmitting data between said peripheral control apparatus, said control processing unit and said plurality of peripheral devices;
2. interface control means coupled to said interface channel means for enabling a predetermined one of said plurality of peripheral devices or said control processing unit to communicate with said peripheral control apparatus;
3. memory means coupled to said interface control means for storing microprograms for controlling the data flow between said control processing unit and said one peripheral device, and for storing data derived from the said interface control means; and
4. processing means connected to said memory means and said interface control means for administering the sharing of processing time of said peripheral control apparatus between said plurality of peripheral devices and said control processing unit, and for processing data derived from said interface control means.

4,103,329
DATA PROCESSING SYSTEM WITH IMPROVED BIT FIELD HANDLING

Michael Ian Davis, Kings Worthy near Winchester, England; Robert Allen Hood, and Gary Wayne Mayes, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 28, 1976, Ser. No. 755,105
Int. Cl.^{2} G06F *9/06*
U.S. Cl. 364—200 **4 Claims**

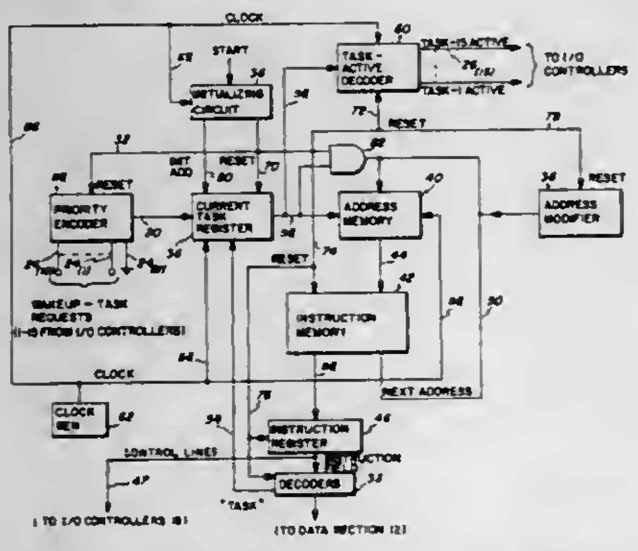
1. A method of operating an electronic data processing system so as to permit a single bit-field instruction to cause access of variable length bit fields in a storage of said system without requiring any special relation between the boundaries of addressable elements within said storage and the beginning and end of the bit fields, comprising the steps of:

initializing a base register RB of said system to contain a base address of an addressable element;
initializing a displacement register R7 to contain (1) the element displacement, from said base address, of the addressable element containing the first bit of a desired bit field, and (2) the bit displacement, from a boundary of the last recited addressable element, of said first bit; reading into an instruction register of said system a bitfield instruction which contains (1) an operation code identifying it as a load instruction or a store instruction for causing access of a bit field, (2) an identification of which register in said system shall be used as RB, (3) an identification of another register R in said system which is to be used as the destination of a bit field to be loaded into R from storage or the source of a bit field to be stored from R into storage and (4) a number L indicating the number of bits in said particular bit field;
adding said element displacement to the contents of register RB;
concatenating said bit displacement to the result of said addition, thereby providing an indication of the location in storage of said first bit; and
beginning with said first bit, either loading said number of bits into R from storage or storing said number of bits from R into storage depending upon whether said bit-field instruction is a load instruction or a store instruction, respectively.



4,103,330
TASK HANDLING IN A DATA PROCESSING APPARATUS

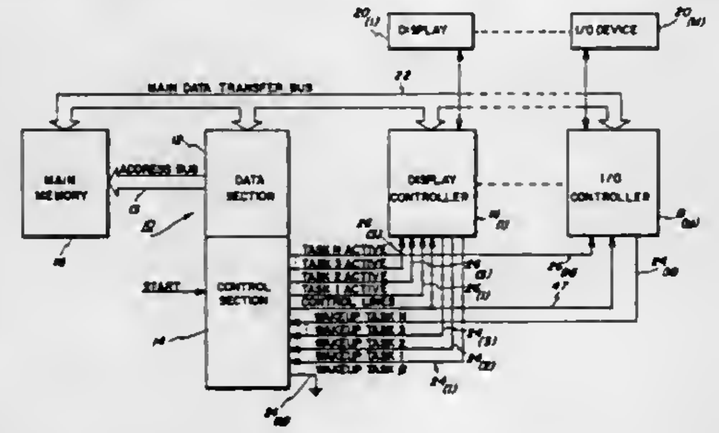
Charles P. Thacker, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 518,679, Oct. 29, 1974. This application Feb. 16, 1977, Ser. No. 769,254
Int. Cl.² G06F *9/20, 9/18*
U.S. Cl. 364—200 **11 Claims**



1. A data processing apparatus for processing digital data in accordance with a plurality of predetermined tasks of preassigned priority values and identified by a respective plurality of task request signals in order to service a respective plurality of devices connected to said apparatus, each device capable of generating the respective one of said task request signals when requiring service by said apparatus, said apparatus comprising:
first memory means for storing a plurality of executable instructions each containing the address of a successor instruction;
means for addressing said first memory means to provide for the execution of selected instructions, said addressing means including second memory means organized to contain next addresses of said first memory means in respective locations thereof, each of said locations being dedicated to one of said predetermined tasks;
means for executing said selected instructions;
means coupled to said addressing means for selecting said locations in said second memory means whereby a particular next address is selected for addressing said first memory means;
means coupled to said first memory means for loading the address of a successor instruction contained in an addressed instruction into the dedicated location in said second memory means such that the successor instruction may be subsequently selected for execution; and
priority determining means responsive to said task request signals for providing a control signal to said selecting means enabling said selecting means to select the location in said second memory means dedicated to the task with the highest current priority value.

4,103,331
DATA PROCESSING DISPLAY SYSTEM

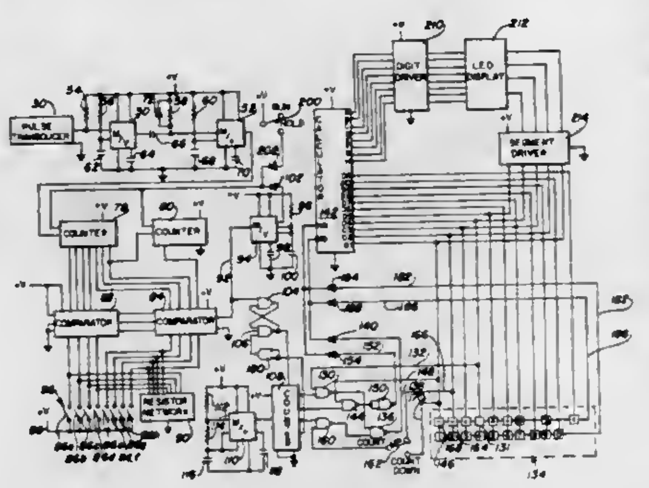
Charles P. Thacker, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 733,552, Oct. 18, 1976, which is a continuation of Ser. No. 519,153, Oct. 29, 1974, abandoned. This application May 25, 1977, Ser. No. 800,370
Int. Cl.² G06F *3/14*
U.S. Cl. 364—200 **7 Claims**



1. A data processing display system comprising:
a display device capable of displaying a desired image, said display device including a plurality of points each capable of being selectively illuminated;
a main memory storage device including a plurality of addressable storage locations capable of being addressed by predetermined address signals, each location capable of storing a multi-bit display word therein, at least some of said addressable storage locations including in the aggregate a number of display bits at least equal to said plurality of points of said display device whereby a display bit map of said desired image is capable of being stored and defined in said at least some addressable storage locations;
a display controller connected to said display device and responsive to predetermined instructions for controlling the illumination of said plurality of points of said display device;
a central processing unit including first means for generating said predetermined instructions for application to said display controller, and second means for generating said predetermined address signals for application to said main memory storage device;
an address bus connected between said main memory storage device and said central processing unit for supplying said predetermined address signals to said main memory storage device;
a main data transfer bus connected to said main memory storage device, said central processing unit and said display controller, said main data transfer bus capable of supplying to said display controller the display words addressed from said at least some addressable storage locations of said memory storage device and said predetermined instructions;
said central processing unit including a data section and a control section, said control section including said first means for generating and means for supplying instructions to said data section, and said data section including said second means for generating and means for executing instructions supplied it from said control section; and
said display controller including third means for generating at least one display task request signal, said system further comprising means for supplying said at least one display task request signal to said control section, and said control section including means responsive to said at least one display task request signal for causing said means for supplying instructions to said data section to supply instructions relating to the display of said desired image by said display device.

4,103,332
MILE POST LOCATION DISPLAY SYSTEM

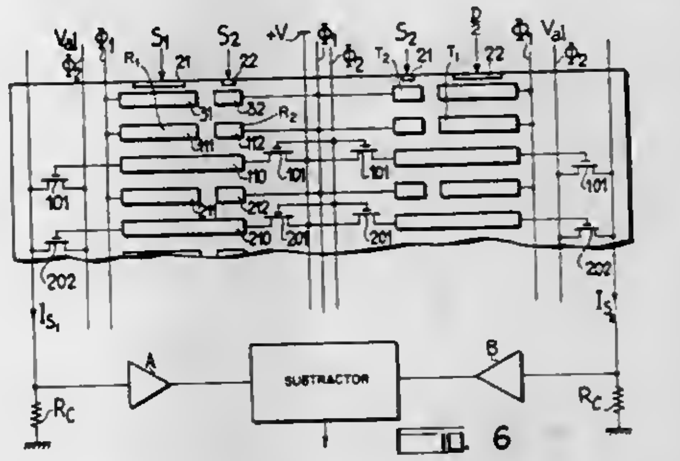
Robert D. Floyd, Dallas; Lee V. Gorman, Garland, and David L. Thummel, Dallas, all of Tex., assignors to David Floyd, Dallas, Tex.
Filed Jun. 20, 1977, Ser. No. 808,350
Int. Cl.² G06F *15/20*
U.S. Cl. 364—449 **12 Claims**



1. A location display system for a vehicle comprising:
means for generating a distance signal representative of rotation of a wheel of the vehicle;
switch means accessible to the vehicle operator for generating a predetermined reference signal dependent upon the diameter of a tire of the vehicle and being representative of a predetermined distance traveled by the vehicle;
comparator means for comparing said distance signal with said reference signal and for generating an output signal representing said predetermined distance traveled by the vehicle when said distance signal equals said reference signal;
mileage setting means accessible to the vehicle operator and including numerical digit keys operable for generating input signals representative of an initial mile post designation;
calculator means responsive to said input signals and said comparator output signal for performing arithmetic calculations on said signals and for generating an electrical output signal representing the position of the vehicle relative to subsequent mile post designations; and
display means coupled to said calculator means for visually displaying to the vehicle operator said electrical output signal generated by said calculator means.

4,103,333
CHARGE COUPLED CORRELATOR DEVICE

Raymond Poirier; Yves Hubert, and Noureddine Lakhoua, all of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Jan. 25, 1977, Ser. No. 762,795
Claims priority, application France, Jan. 30, 1976, 76 02584
Int. Cl.² G06G *7/19*
U.S. Cl. 364—824 **6 Claims**



1. A charge coupled correlator device comprising at least a first and a second register, each of these registers comprising a succession of stages and, in each stage at least one phase electrode and an output electrode means for connecting to a fixed potential said output electrode at the instant at which the charges pass from this stage to the next, and for disconnecting the same otherwise, said first register containing at each of said stages the charges corresponding to a first signal which is fixed as a function of time after storage, the second receiving a second signal varying as a function of time and sampled at the rate determined by a clock, the electrodes of said second register having small dimensions compared with those of the first, the output electrodes of each stage in each of the two registers being common and means connected to each of said common output electrodes for generating a third signal which is a function of the correlation product of said first and said second signals.

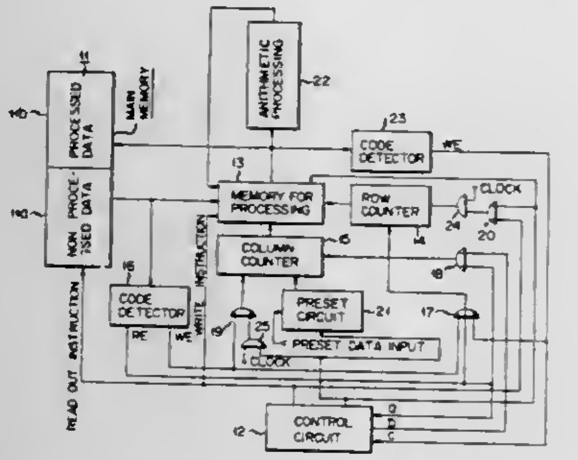
4,103,334
DATA HANDLING SYSTEM INVOLVING MEMORY-TO-MEMORY TRANSFER

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Oct. 19, 1976, Ser. No. 733,776
Claims priority, application Japan, Oct. 21, 1975, 50-125870
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **2 Claims**

1. A device for controlling the handling of data which comprises:
main memory means for storing a large number of record data items in a state marked off by record data-positioning codes, said record data items being formed of series-arranged word data items of variable word length, each word data item containing at least one character marked off by word-positioning codes;
processing memory means for storing at least one record data item read out of the main memory, said processing memory means including columns containing words each having a certain number of characters falling within a specified range, a plurality of rows, and address control

means for effecting the shifting of characters through a column and also the shifting of a row itself; and

means for writing a record data item read out from the main memory means in the processing memory means, said writing means including word-positioning code detecting means for successively writing with shifting the characters of the foremost word data item of a record data item in the first or specified row, starting with the first character of said word data, and also to effect the shifting of a row after writing the word-positioning code, a command means for supplying the address control means with an instruction for the shifting of a row, and record positioning code-detecting means and control means associated therewith for enabling a plurality of word data items included in a record data item to be continuously written, until the record data-positioning code is detected.



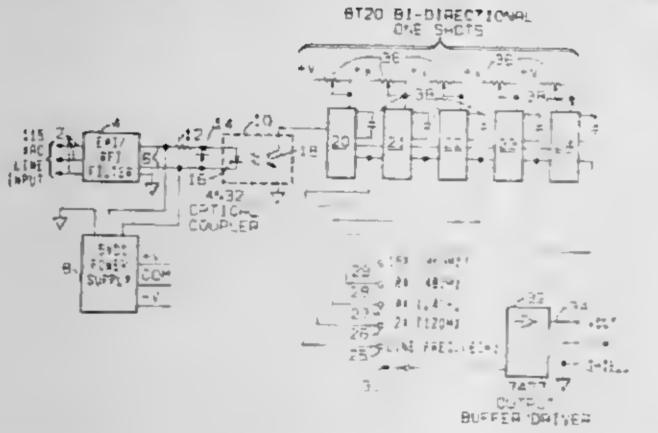
4,103,335

LINE SYNCHRONIZED INTERRUPT GENERATOR

Joseph D. Vitali, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 28, 1977, Ser. No. 763,744
Int. Cl.^{2} H03K *5/00*

U.S. Cl. 364—900 **5 Claims**



4. Apparatus for generating indications of the zero crossings of an alternating current powerline signal and a harmonic of said powerline signal comprising

a solid state optical coupler having an input coupled to the powerline and an output for providing a square wave signal synchronized with said powerline signal, and

a first bidirectional one shot coupled to the output of the optical coupler and having an output for providing a square wave signal at twice the powerline frequency and synchronized with the powerline signal.

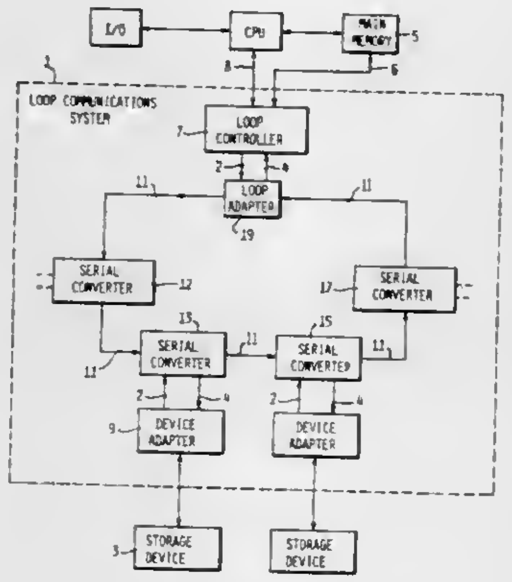
4,103,336

METHOD AND APPARATUS FOR ALLOCATING BANDWIDTH ON A LOOP SYSTEM COUPLING A CPU CHANNEL TO BULK STORAGE DEVICES

Abraham M. Gindi, San Jose, and Donald John Lang, Cupertino, both of Calif., assignors to International Business Machines Incorporated, Armonk, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,509
Int. Cl.^{2} G06F *3/00, 9/00*

U.S. Cl. 364—900 **6 Claims**



1. In a system having a primary terminal (7, 19) and secondary terminals (12, 13, 9; 15) and a path (11) coupling the primary and secondary terminals to form a loop, the primary terminal attaching a CPU channel (6, 8) to the loop with the secondary terminals (9) attaching independently actuable storage devices (3), each terminal (FIGS. 2-19, 25, 27, 29, 31; FIGS. 3-21, 25, 31) being adapted to selectively generate repetitive framing intervals of duration less than the loop latency, each frame having address, control, and data portions thereof, the control portion containing a code indicative of frame type and frame status such as available or unavailable, empty or full; data being accessed by commands (RD or WR) originating from the CPU channel (6, 8) and transmitted through the primary terminal (45, 55, 69, 71, 2, 19, 11) to the secondary terminals during selected frames; the method comprising the steps of:

sending (FIGS. 4-101 to 111; FIGS. 5-127, 129, 137, 139, 141, 143, 135) a full frame of data by the primary terminal to an assigned secondary terminal each time said primary terminal receives a frame from any given secondary terminal requesting service;

sending (FIGS. 4-111, 113, 101, 103, 105, 121, 125; FIGS. 5-127, 129, 131, 133, 135) an unassigned empty frame by the primary terminal each time said primary terminal receives a full frame of data from an assigned secondary terminal; and

sending (FIGS. 4-111, 113, 101, 114, 115, 117; FIGS. 5-127, 129, 131) a frame containing at least one command of status indication by the primary terminal to an assigned secondary terminal, there being a queue of commands (FIGS. 2-55; FIGS. 4-115) in the primary terminal of at least one, said command frame being sent in response to receipt of an unassigned empty frame, or otherwise regenerating by the primary of the unassigned empty frame.

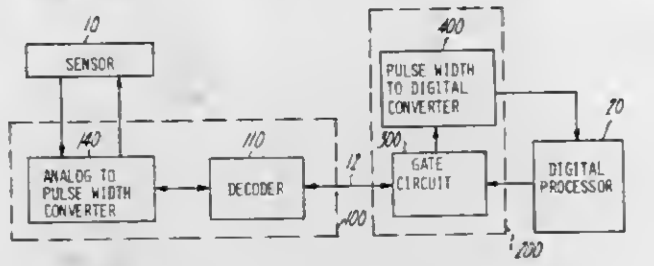
4,103,337

DATA TRANSMISSION SYSTEM USING ANALOG TO PULSE WIDTH TO DIGITAL CONVERSION

Arliss Eugene Whiteside, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 17, 1976, Ser. No. 742,972
Int. Cl.^{2} G06F *3/00;* G08B *26/00;* G08C *15/00*

U.S. Cl. 364—900 **30 Claims**



1. A data transmission system comprising:

digital processor means for processing digital data to produce an output, said digital processor means further including means for periodically generating data request signals having a predetermined pulse duration indicative of a request for new digital data;

sensor means for generating analog data having a value indicative of a sensed condition;

sensor interface means powered by said data request signals for generating a ground signal a determinable time after the beginning of said data request signal in response to said analog data, said ground signal being a low impedance to ground and said determinable time between the beginning of said data request signal and said ground signal being indicative of the value of said analog data;

processor interface means, receiving said data request signals from said digital processor means and said ground signal from said sensor interface means for generating digital data indicative of said determinable time between the beginning of said data request signal and said ground signal; said processor interface means further including means for gating said data request signals to said sensor interface means and means for transmitting said digital data to said digital processor means:

a single data transmission line interconnecting said sensor interface means and said processor interface means for transmitting said data request signal and said ground signal back and forth between said sensor interface means and said processor interface means.

4,103,338

SELF-DIAGNOSTIC METHOD AND APPARATUS FOR DISK DRIVE

Stipe Cizmic, San Mateo; Martin O. Halfhill, San Jose; James O. Jacques, Tracy; Douglas K. Mahon, Boulder Creek; Leonard R. Shenfield, Santa Clara, and Ronald W. Votaw, Morgan Hill, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1977, Ser. No. 773,022
Int. Cl.^{2} G06F *11/00. 13/08*

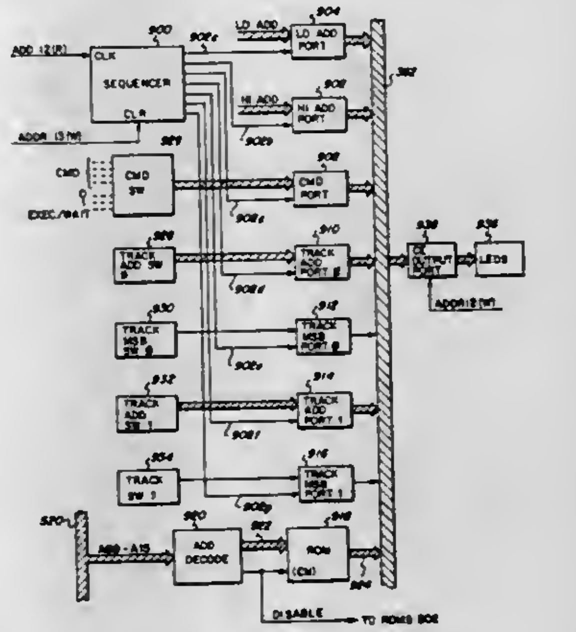
U.S. Cl. 364—900 **4 Claims**

1.

The combination comprising:

a disk drive including a recording disk rotatable about its axis, an electromagnetic read/write head, actuator means for moving said head with respect to the axis of rotation of said disk, servo control means responsive to a set of instructions for controlling the speed and direction of movement of said head by said actuator means, and programmed data processing means including a microprocessor, first memory means for storing microcoded control programs for said disk drive, second memory means for storing some of said set of instructions for said servo control means therein, an address bus for supplying address signals from said microprocessor to said first and second memory means, and a data bus for supplying program instructions from said first memory means to said microprocessor, and for supplying said some instructions of said set of instructions from said second memory means to said servo control apparatus; and

an excerciser for said disk drive including means for developing test track address signals, means capable when enabled of supplying said test track address signals onto said data bus for application to said microprocessor, third memory means for storing microcoded diagnostic programs for said excerciser, first decoder means coupled to said address bus and to said third memory means for decoding an address signal on said address bus in order to generate a new address signal for said third memory means, and means for supplying program instructions accessed from said third memory means in response to said new address signal onto said data bus for application to said microprocessor for initiating disk drive diagnostic operations.



4,103,339

ACOUSTIC SURFACE WAVE BUBBLE SWITCH

Wayne C. Hubbell, Richardson, and Christopher T. Chang, Dallas, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1976, Ser. No. 679,268
Int. Cl.^{2} G11C *19/08*

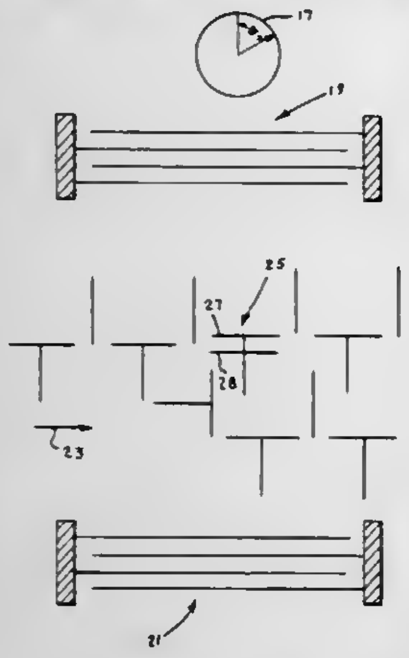
U.S. Cl. 365—1 **5 Claims**

1. A system for switching the direction of movement of magnetic bubble domains in a sheet of material in which magnetic bubble domains can propagate, comprising:

a. a rotating in-plane magnetic field;

b. an array of magnetic overlay elements in said magnetic field for guiding the bubble domains, said array of magnetic overlay elements including a switching element positioned to present alternative paths for the bubble, said array of magnetic overlay elements forming a pattern of magnetic bars comprising respectively a single verticl bar in combination with a vertical bar and a horizontal bar in combination to form a T configuration, and

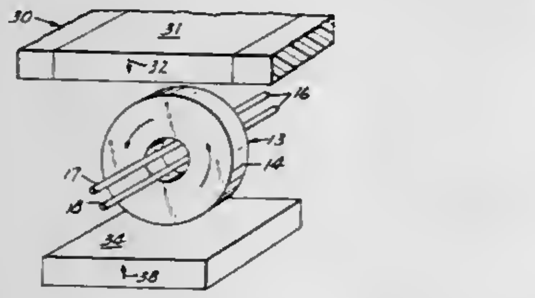
c. a pair of acoustic surface wave transducers for generating acoustic surface waves perpendicular to the switching element whereby acoustic surface waves control selection of the paths of the bubble domains, said acoustic surface wave and said magnetic field cooperating to provide a



binary switch, said binary switch controlling said array of magnetic overlay elements.

4,103,340
ELECTROMAGNETIC SENSOR AND MEMORY DEVICE

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Division of Ser. No. 451,994, Mar. 18, 1975. This application Dec. 22, 1975, Ser. No. 643,014
Int. Cl.² G11C *17/02*
U.S. Cl. 365—97 **4 Claims**



1. An electromagnetic sensor system for detecting data magnetically encoded in a document, said system comprising:

a housing with at least one planar surface area;

a two dimensional planar array of bit indicators disposed in said housing in a parallel relationship to said surface area, which bit indicators each include:

at least one ferromagnetic core that is magnetizable to one of two alternate stable remanent magnetized states; and

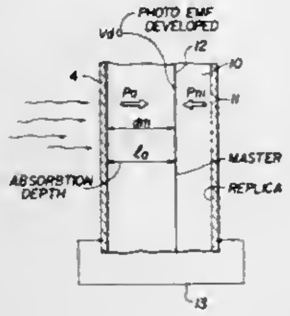
a control member centrally disposed through said core and including drive means that provides a magnetic field for switching the magnetization of said ferromagnetic core from one stable remanent state to the other and also including sense means in which an electrical signal is induced during each stable state transition;

a plurality of magnetized bias field sources, each field source being associated with one of said cores and having a magnetic field to magnetize said associated core in a magnetized state that prevents the inducement of the stable remanent magnetized states and transitions therebetween; and

a magnetically encoded document disposed in surface-to-surface contact with the planar surface of said housing and containing data represented by a plurality of magnetic data bits some of which have a magnetic field substantially opposite in magnitude and direction to that of each of said bias field sources, said data bits located in various bit regions arranged in a two dimensional pattern that includes at least one bit region aligned with each of said bit indicators so that the magnetic fields of some of said data bits substantially cancel the magnetic fields of the bias field sources magnetizing the bit indicators aligned with the bit regions in which said data bits are located.

4,103,341
FERROELECTRIC PHOTOVOLTAIC METHOD AND APPARATUS FOR TRANSFERRING INFORMATION

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. No. 533,365, Dec. 16, 1974, Pat. No. 4,015,465, which is a continuation-in-part of Ser. No. 411,853, Nov. 1, 1973, Pat. No. 3,855,004. This application Aug. 15, 1977, Ser. No. 824,896
Int. Cl.² G11C *13/00, 11/22, 11/42*
U.S. Cl. 365—117 **17 Claims**



1. A method of transferring information from at least a portion of a photovoltaic ferroelectric storage means to at least another portion of a polarizable storage means comprising the steps of

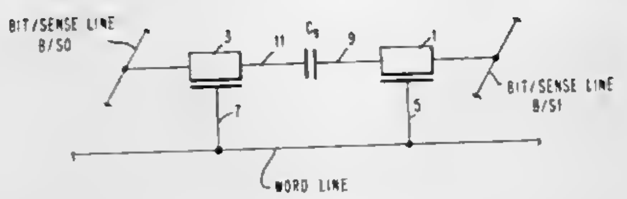
providing at least a portion of a photovoltaic ferroelectric storage means already having a remanent polarization corresponding to said information therein and providing at least another portion of a polarizable storage means,

illuminating said at least a portion which already has said remanent polarization therein, whereby a photovoltage is produced, and,

applying said photovoltage across said at least another portion to which said information is to be transferred, whereby said photovoltage causes a remanent polarization to be effected in said at least another portion, and said information is transferred.

4,103,342
TWO-DEVICE MEMORY CELL WITH SINGLE FLOATING CAPACITOR

Ekkehard Fritz Miersch, Mahopac, and Dominic Patrick Spampinato, Ozone Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 17, 1976, Ser. No. 697,188
Int. Cl.² G11C *11/24, 11/40, 7/02*
U.S. Cl. 365—149 **9 Claims**



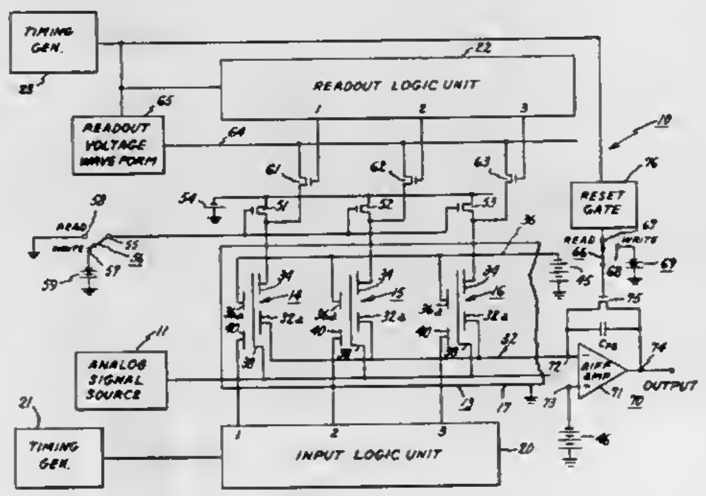
1. A two-device memory cell for a memory array, comprising:

a pair of field-effect transistor devices each having a source, drain and gate electrode with the said source and drain electrode of respective ones of said field-effect transistor devices forming a series path the conduction of which is controlled by the gate electrode of respective ones of said devices, said devices being arranged so that one end of each of the respective source-drain paths is adapted to be connected to respective bit/sense line means for said memory array and so that each of the gate electrodes of said devices is adapted to be coupled to word line means for said memory array; and

a single capacitor directly connected between the other ends of the respective source-drain paths of said field-effect transistor devices so as to float between said respective bit/sense line means in series with each of the respective source-drain paths to thereby provide a differential sense signal.

4,103,343
CHARGE TRANSFER APPARATUS

William E. Engeler, Scotia, and Howard S. Goldberg, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jul. 6, 1976, Ser. No. 702,944
Int. Cl.² G11C *11/34*
U.S. Cl. 365—183 **12 Claims**



1. Charge transfer apparatus comprising

a substrate of semiconductor material having a major surface,

a plurality of charge storage cells in said substrate adjacent said major surface, each including a first charge storage region, a second charge storage region, and an intermediate region separating said regions,

a plurality of first storage electrodes, each electrode insulatingly overlying a respective first charge storage region, said electrodes being interconnected,

a plurality of second storage electrodes, each electrode insulatingly overlying a respective second charge storage region,

a plurality of first gating electrodes, each insulatingly overlying a respective intermediate region, said gating electrodes being interconnected,

means for applying a fixed first potential to said interconnected first gating electrodes to establish a depletion surface potential in each of said intermediate regions of a fixed first value,

means for applying a second potential to said first storage electrodes to establish a depletion surface potential of a second value in each of said first storage regions less in absolute magnitude than said first value,

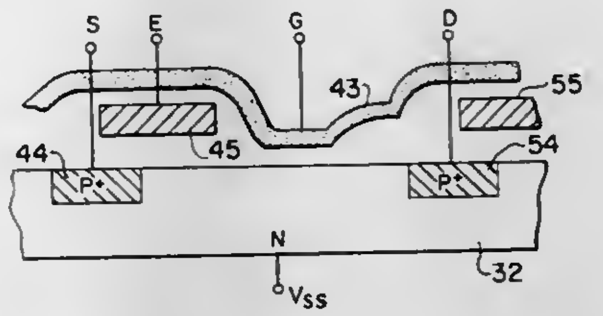
means for introducing into each of said charge storage cells a respective quantity of charge representing a respective sample of a first signal,

transfer means for transferring a first portion of charge from one storage region to the other storage region in each cell of a selected plurality of cells,

output means connected in circuit with said first electrodes for sensing the net total charge transferred to and from the first charge storage regions of said selected cells.

4,103,344
METHOD AND APPARATUS FOR ADDRESSING A NON-VOLATILE MEMORY ARRAY

John Lee Fagan, Pasadena; Marvin Hart White, Laurel, and Donald Ross Lampe, Elicott City, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 30, 1976, Ser. No. 653,760
Int. Cl.² G11C *11/40*
U.S. Cl. 365—184 **16 Claims**



1. A method of charge addressing a dual dielectric MNOS memory cell having diffusion regions which function as both source and drain regions having a corresponding plurality of gates, comprising the steps of:

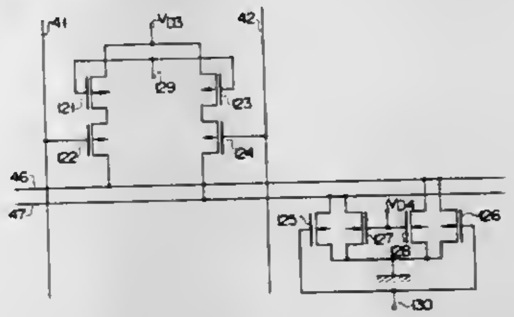
setting a charge in an interface between the two dielectrics of the charge storage device;

providing a conducting path for said stored charge from said charge storage device to a diffusion region of said memory cell;

activating said plurality of corresponding gates with predetermined voltages; and said corresponding plurality of gates comprise a memory gate and an enable gate adjacent each other, and said step of activating is performed by gating predetermined values of voltage with a predetermined relationship to said respective memory gate and enable gate to effect the dual source/drain function of the diffusion regions.

4,103,345
SEMICONDUCTOR MEMORY WITH DATA DETECTION CIRCUIT

Yasoji Suzuki, Kanagawa, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Apr. 26, 1976, Ser. No. 680,236
Claims priority, application Japan, Apr. 28, 1975, 50/50792; Dec. 3, 1975, 50/144522
Int. Cl.² G11C *7/06*
U.S. Cl. 365—190 **12 Claims**



1. A semiconductor memory device comprising a pair of data input lines; at least one pair of data lines associated with said pair of input lines; memory cells disposed in the form of a matrix having columns, the memory cells of each column being connected between a corresponding pair of said data lines; a first data output line; a data detection circuit including a first

series circuit comprising first and second switching elements provided for each column and each said first series circuit being connected between a first-voltage receiving terminal for receiving a first specified voltage and said data output line, said first switching element for each column being responsive to a column selection signal for said column and said second switching element for each column having a control terminal connected to one data line of said pair of data lines for said column, and a third switching element commonly provided for said memory cells and connected between said data output line and a second voltage receiving terminal for receiving a second specified voltage lower than said first specified voltage.

4,103,346

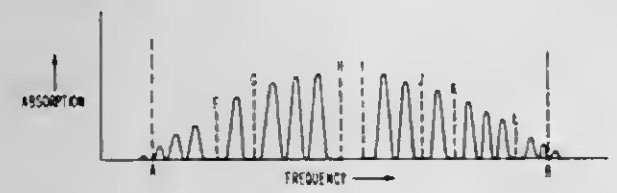
NON-DESTRUCTIVE READOUT SCHEME FOR HOLOGRAPHIC STORAGE SYSTEM

Dietrich Haarer; Robert Vladimir Pole, and Silvia Leonor Voelker, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,150

Int. Cl.² G11C *13/04, 7/00*

U.S. Cl. 365—216 **11 Claims**



1. A non-destructive readout scheme suitable for use with a holographic storage system having information stored in three spatial dimensions and one frequency dimension comprising

a material exhibiting inhomogeneous absorption line broadening, said material adapted to undergo a photochromic reaction involving information stored in the non-volatile ground state of molecules upon exposure to a light source having a wavelength bandwidth narrower than the inhomogeneous line width, said broadened line having information stored at one or more first frequencies within said broadened line, and

means to sense the spatial variations of the refractive index changes at one or more second frequencies adjacent said first frequencies, said second frequencies being in the vicinity of one line width from said first frequency and being within said broadened line.

4,103,347

ZIG-ZAG SPS CCD MEMORY

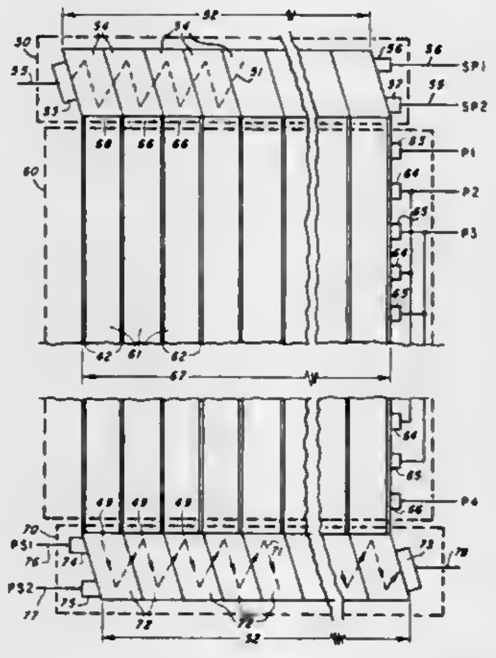
James Brockman Barton, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1976, Ser. No. 736,904

Int. Cl.² G11C *19/28, 11/34, 9/00*

U.S. Cl. 365—219 **14 Claims**

8. A charge coupled device memory comprised of a serial-parallel-serial memory block; said block including an N-stage serial-parallel charge coupled device register, an M-stage charge coupled device stack, and an N-stage parallel-serial charge coupled device register; said stack having N inputs coupled to N parallel outputs of said serial-parallel register, and having N outputs coupled to N parallel inputs of said parallel-serial register thereby forming a serial-parallel-serial charge transfer path; wherein each of said registers have a zig-zag shaped serial charge transfer path to decrease their linear dimension and the width of said stack.



4,103,348

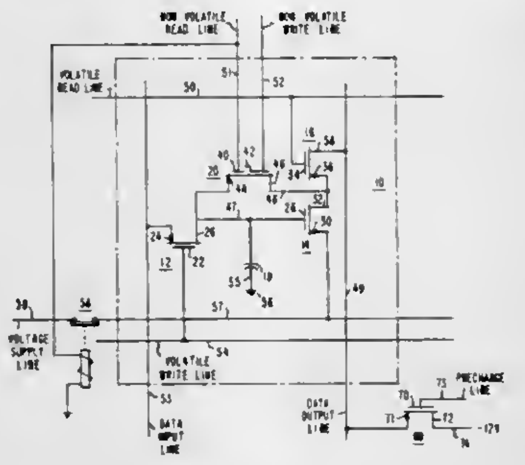
VOLATILE AND NONVOLATILE RANDOM ACCESS MEMORY CELL

John L. Fagan, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,577

Int. Cl.² G11C *11/40*

U.S. Cl. 365—228 **9 Claims**



1. A random access memory cell for storing information in both volatile and nonvolatile form utilizing at least a volatile read line, nonvolatile read line, nonvolatile write line, first voltage supply line, volatile write line, data input line and data output line comprising:

first, second and third field effect transistors each having a gate, source and drain electrode,

a capacitor means having a first and second terminal,

a dual gate variable threshold transistor means having at least a first and second gate, first source and first drain electrode,

said drain electrode of said first transistor coupled to said gate electrode of said second transistor, said first terminal of said capacitor means and said source electrode of said variable threshold transistor,

said drain electrode of said second transistor coupled to said source electrode of said third transistor and said drain electrode of said variable threshold transistor,

said second terminal of said capacitor means coupled to a reference potential,

said volatile read line coupled to said gate electrode of said third transistor, said nonvolatile read line coupled to said first gate electrode of said variable threshold transistor,

said nonvolatile write line coupled to said second gate electrode of said variable threshold transistor for coupling a polarizing voltage and at other times a read voltage to said second gate electrode,

said first voltage supply line coupled at times to said source electrode of said second transistor,

said volatile write line coupled to said gate electrode of said first transistor,

said data input line coupled to said source electrode of said first transistor, and

said data output line coupled to said drain electrode of said third transistor.

4,103,349

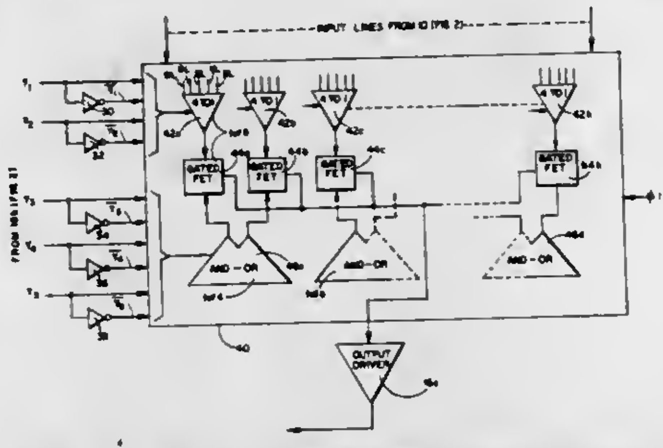
OUTPUT ADDRESS DECODER WITH GATING LOGIC FOR INCREASED SPEED AND LESS CHIP AREA

Melvin L. Marmet, Corona, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 16, 1977, Ser. No. 807,460

Int. Cl.² G11C *8/02*

U.S. Cl. 365—231 **6 Claims**



2. A circuit responsive to an address code represented by a plurality of address signals applied thereto for selecting an input line from a plurality of signal lines and for applying the signal on a selected bit line to an output line, the circuit comprising:

a plurality of selectors, each of said selectors having an output terminal to which one of said input lines is connected in response to at least one of said address signals,

a plurality of gate-signal controlled switches, each of said switches having a gate electrode, a source electrode, and a drain electrode, said source electrodes of said switches connected respectively to the output terminals of said selectors, the drain electrodes of said switches connected to each other and to said output line, and

at least one AND/OR circuit for generating a gate signal in response to a particular address code and for applying said gate signal to a gate terminal of a gate-signal controlled switch.

4,103,350

METHOD OF REDUCING EMISSION OF PARTICULATE MATTER

James Donald Brock, and Erbie Gail Mize, both of Chattanooga, Tenn., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Division of Ser. No. 685,087, May 10, 1976. This application Mar. 22, 1977, Ser. No. 780,173

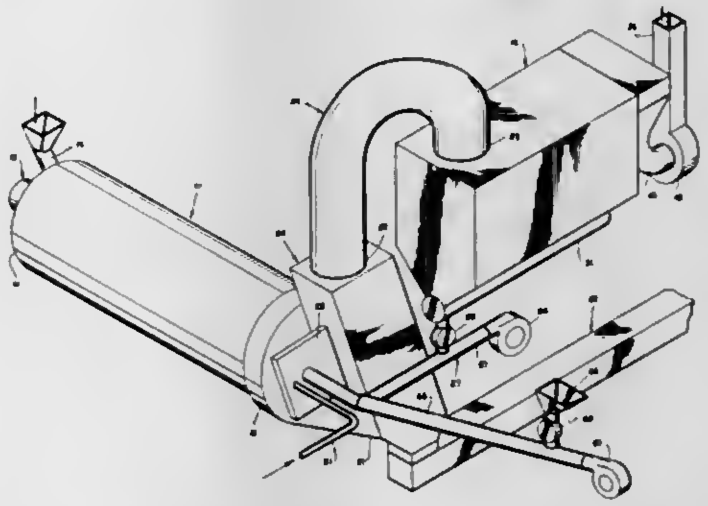
Int. Cl.² B28C *1/22, 5/46*

U.S. Cl. 366—22 **6 Claims**

1. Method of reducing the emission of particulate matter during the preparation of asphalt aggregate mixture in a rotating mixing drum, comprising the steps of:

introducing aggregate material at a first region in the mixing drum whereby airborne particulate matter is present in the mixing drum;

introducing a quantity of liquid asphalt material to said mixing drum for mixture with said aggregate material at a second region in said mixing drum;



passing said airborne particulate matter through a porous filter medium which is external of said mixing drum to separate said airborne particulate matter from air; and

combining said separated particulate matter with said liquid asphalt material being introduced to said second region in said mixing drum so as to return said separated particulate matter to said mixing drum.

4,103,351

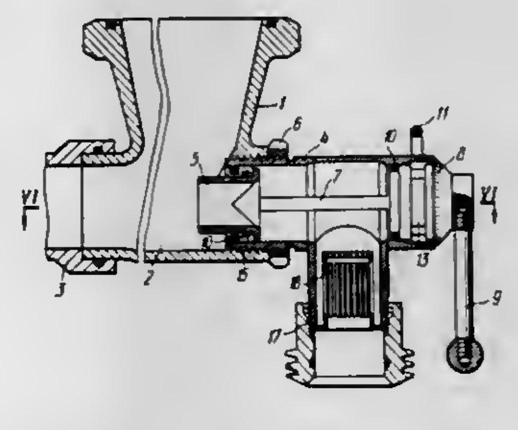
APPARATUS FOR CONTROLLING THE DENSITY OF A PLUGGING FLUID

Alexandr Sergeevich Mamvriisky, prospekt Revoljutsii, 26/36, kv. 7, and Alexandr Mikhailovich Lapchenko, ulitsa Moskovskaya, 68, both of Grozny, U.S.S.R.

Division of Ser. No. 598,550, Jul. 24, 1975, Pat. No. 4,027,860. This application Mar. 14, 1977, Ser. No. 777,071

Int. Cl.² B01F *15/02*

U.S. Cl. 366—30 **8 Claims**



1. An hydraulic mixing apparatus for the preparation of a fluid, such as a plugging fluid, comprising a feed hopper for a dry cementing material, a unit for charging a carrier liquid and a mixing chamber, wherein the outlet of the charging unit is positioned on a common axis with the inlet of a discharge conduit; said charging unit including a rotatable sleeve sealingly mounted in the charging unit, a nozzle member, having a slot-shaped outlet, adapted to be accommodated within said sleeve, and means for rotating said sleeve jointly with said nozzle member about the common longitudinal axis thereof.

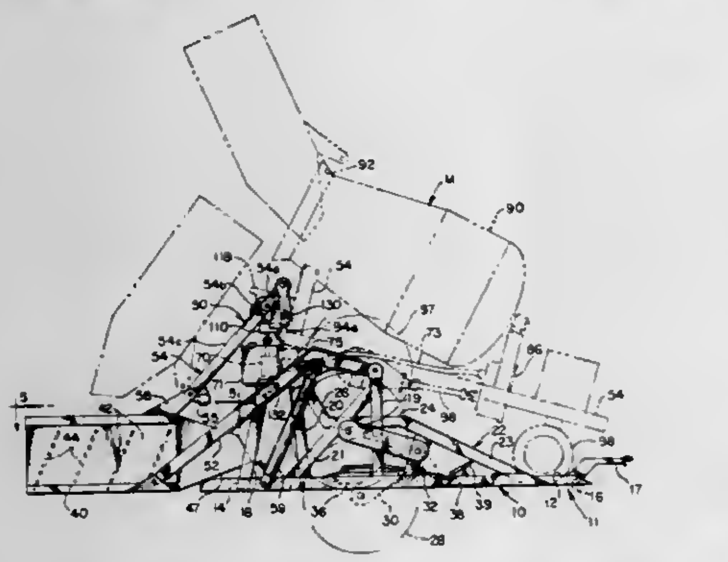
4,103,352
TRANSPORTER AND LOADING BOX FOR CONCRETE MIXER

Charles J. Cratty, Seattle, Wash., assignor to Astro Development Corporation, Seattle, Wash.

Filed Jun. 28, 1976, Ser. No. 700,463

Int. Cl.² B23C *7/08*

U.S. Cl. 366—39 **8 Claims**



6. A mixer loading mechanism comprising a frame, means on said frame for guiding a portable mixer onto the frame into a load position, said mixer having an inlet, a loading box coupled to said frame and movable between an elevated dump position above the mixer inlet and a fill position close to the ground, means for moving the box between said fill position and said raised dump position, the box having an outlet positioned over the mixer inlet when in said dump position whereby the mixer can be loaded by dumping the contents of the box into said inlet, said mixer being self-propelled and having wheels and a power takeoff, said means for moving the box including a pump, hydraulic actuators and a valve movable into box raising and box lowering positions, means for coupling said pump to said power takeoff when the mixer is driven into said load position, and means for moving the valve into the raise box position when the mixer is in said load position.

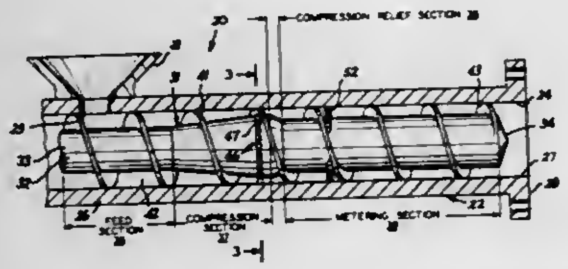
4,103,353
APPARATUS FOR WORKING EXPANDABLE THERMOPLASTIC MATERIALS

Timothy Stephen Dougherty, Roswell, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 557,728, Mar. 12, 1975, abandoned. This application Sep. 8, 1976, Ser. No. 721,643

Int. Cl.² B29B *1/06*

U.S. Cl. 366—81 **3 Claims**



1. An apparatus for extruding expandable thermoplastic materials, which comprises:

means for compressing and heating an expandable thermoplastic material to progressively melt portions of successive sections of the expandable thermoplastic material, said means including a core having a channel formed by an uninterrupted helical flight extending about an axis of rotation of the core in a downstream direction from a supply end to an output end with a compression section of the channel which decreases in cross-sectional area continuously in the downstream direction, said compression section being such as to cause unmelted portions of the expandable thermoplastic material to fragment at a predetermined location along its length;

a plurality of pins connected to the core at the predetermined location within the compression section for subjecting the thermoplastic material to forces with each of the pins having at least some portion thereof lying in a plane which is perpendicular to the axis of rotation and with the flight being continuous through the plane to cause the fragmentation of the unmelted portions of successive sections of the thermoplastic material to be continuous; and

means for moving rotatably the core to advance the thermoplastic material along the channel to provide a melt at the output end with corresponding portions of successive sections having substantially identical thermal histories.

4,103,354
PROCESS AND APPARATUS FOR VACUUM TREATMENT OF VISCOPLASTIC MATERIALS

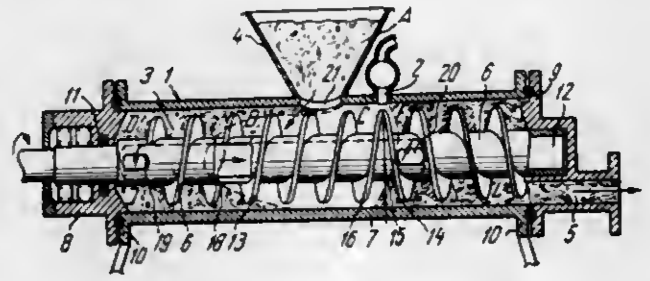
Vasily Matveevich Gorbatov, prospekt Mira, 74, kv. 70, Moscow; Taras Filippovich Demchenko, Pselskaya ulitsa, 8, kv. 37, Sumy; Semen Mikhailovich Bobylev, ulitsa Salvadora Aliende, 5, kv. 63; Valery Semenovich Bobylev, Proletarsky prospekt, 1, kv. 36, both of Moscow; Leonid Filippovich Zhilkin, ulitsa Kirova, 122, kv. 65, Sumy; Evgeny Timofeevich Spirin, ulitsa Usacheva, 29, korpus 3, kv. 203, and Genrikh Grigorievich Shirinian, Kantimirovakaya ulitsa, 3, korpus 2, kv. 251, both of Moscow, all of U.S.S.R.

Filed Dec. 17, 1976, Ser. No. 751,950

Claims priority, application U.S.S.R., Dec. 19, 1975, 2301129

Int. Cl.² B29B *1/06*

U.S. Cl. 366—88 **4 Claims**



1. An apparatus for vacuum treatment of viscoplastic materials comprising: a container; a pipe connected to said container and communicating with a vacuum system for providing a vacuum zone in the container; a feed hopper connected to said container for continously feeding viscoplastic material to the vacuum zone of the container for first vacuum treatment of the material; an outlet opening for feeding the viscoplastic material from the container to a subsequent production stage; an auger located within said container and having main turns which continuously cause the viscoplastic material to move from the vacuum zone of the container and form a first higher pressure zone from the material; said auger having auxiliary turns running opposite to the direction of the main turns of the auger and conjugated with the main turns along a line extending at the same elevation as said pipe communicating with the vacuum system; said container having means for returning the viscoplastic material from the first higher pressure zone back to the vacuum zone for a secondary vacuum treatment thereof and feeding the material to said auxiliary turns of the auger which cause the material to move in the vacuum zone in a thin layer and form a second higher pressure zone from the material prior to its leaving through said outlet opening to the subsequent production stage.

4,103,355
MIXING EXTRUDER

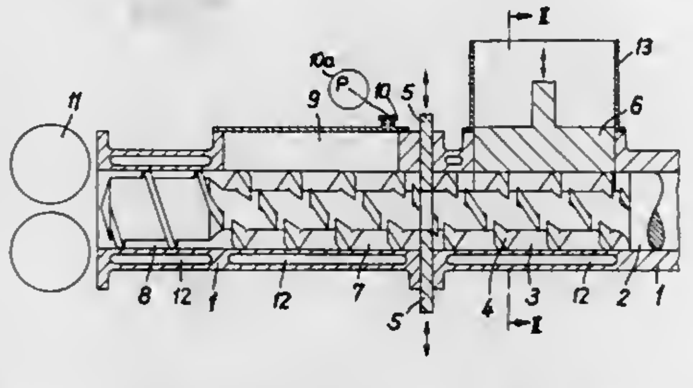
Dietmar Weber, Hamburg, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 565,213, Apr. 4, 1975, abandoned. This application Sep. 1, 1976, Ser. No. 719,816

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1974, 2417116

Int. Cl.² B29B *1/06*

U.S. Cl. 366—90 **6 Claims**



1. A mixing extruder for mixing successive batches of material and for ejecting material continuously through an outlet, comprising in combination a single housing having a passage therethrough to said outlet, a unitary extruder worm formed with spiral webs and extending through said passage to said outlet at one end, a material inlet at the opposite end of said passage from said outlet to form with said passage a mixing chamber zone, an ejecting zone at the end of said passage adjacent said outlet in which said extruder worm feeds material through said outlet, a storing zone between said ejecting zone and said mixing chamber zone including a space opening to said passage to receive and store material from said mixing chamber zone, blocking means between said mixing chamber zone and said storing zone operable to block completely movement of material from said mixing chamber zone and alternately to open said passage to allow such movement fully to said storing zone, said mixing chamber zone having a closure member for said material inlet to exert pressure on said material and to confine said material in said mixing chamber zone and by said blocking member, the spiral webs of said worm in said mixing chamber zone being interrupted to provide spaces between successive portions of said web for mixing said material, said space in said storing zone receiving material from a batch mixed in said mixing chamber zone when said blocking means is operated to open said passages, said worm extending as a unit over three zones including the mixing chamber, storing and ejecting zones for continuously feeding material in said storing zone through said outlet, whereby successive batches of material may be mixed discontinuously in said mixing chamber zone while preceding batches are fed continuously uniformly from said storing zone through said outlet.

4,103,356
SYNCHRONIZED PUSH-PULL INVERTER

John Reid Finlay, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 23, 1976, Ser. No. 744,274

Int. Cl.² H02M *7/537*

U.S. Cl. 363—22 **4 Claims**

1. In a push-pull free-running inverter comprising:

a pair of switching transistors connected in a push-pull configuration to the primary of an output transformer;

means for coupling the secondary of said output transformer to the primary of a saturable transformer;

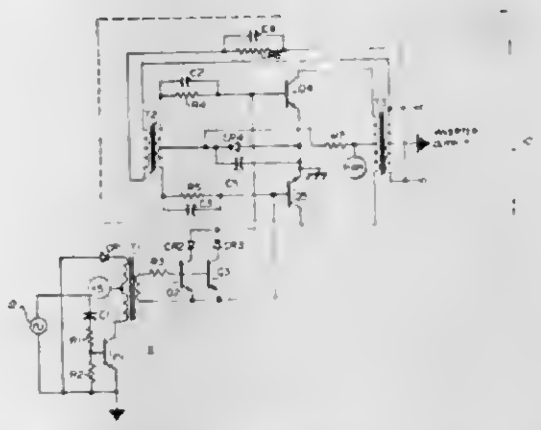
means for coupling opposed ends of the secondary of said saturable transformer to the respective bases of the pair of switching transistors;

the improvement comprising:

a pair of control transistors;

means including a diode connecting the emitter-collector of each control transistor between the bases of the pair of switching transistors;

means for applying a square-wave signal having a frequency



at least as great as the free-running frequency of the inverter between the base-emitter of each of the control transistors to alternately gate said control transistors on during alternate half-cycles of the square-wave signal,

whereby the inverter is synchronized to the square-wave signal.

4,103,357
PROCESS AND DEVICE FOR CONTINUOUS METERING AND MIXING

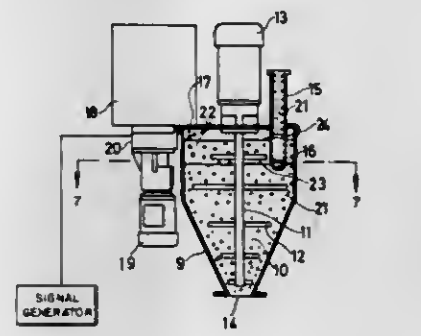
Haruo Noguchi, Yokohama, Japan, and Max Reinhard, Bad Homburg, Fed. Rep. of Germany, assignors to Colortronic Reinhard & Co., KG, Friedrichsdorf-Koppern, Fed. Rep. of Germany and Colortronic Co., Ltd., Tokyo, Japan

Division of Ser. No. 529,064, Dec. 3, 1974, Pat. No. 3,989,229. This application Aug. 3, 1976, Ser. No. 711,422

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1973, 2360644

Int. Cl.² B01F *15/04*

U.S. Cl. 366—152 **4 Claims**



1. A mixing vessel for mixing a main material and complemental raw materials in a fixed ratio comprising:

(a) walls defining a substantially vertical mixing vessel and an outlet port at the bottom of the vessel such that the mixture in the vessel moves downwardly by its owns weight at the rate it is withdrawn through the outlet port,

(b) a feed conduit for delivering synthetic materials under their own weight to the vessel, said conduit opening into the vessel below the top thereof and said conduit having an opening disposed such that it assumes an angle of impingement relative to the line of flow whereby the vessel will not accept main material from the feed conduit when the vessel already contains a mixture at or exceeding the height of the feed conduit opening,

(c) means for feeding complemental raw material above the level of the mixture therein in metered amounts proportional to the mass rate of flow of the material withdrawn from the vessel, and

(d) rotating agitator means disposed in the vessel for mixing and distributing the materials uniformly therein.

4,103,358
FLUID MIXING AND DISPENSING SYSTEM

Leonard W. Gacki, White Plains, and Robert E. Daly, Farmingdale, both of N.Y., assignors to Picker Corporation, Cleveland, Ohio

Filed Sep. 3, 1975, Ser. No. 609,957
Int. Cl.² B01F *15/02, 15/04*

U.S. Cl. 366—153 **57 Claims**

1. A fluid mixing system, comprising:

(a) a reservoir;

(b) a first fluid supply in communication with the reservoir, the first fluid supply including a container for carrying a plurality of vessels, the container having an opening associated with each vessel;

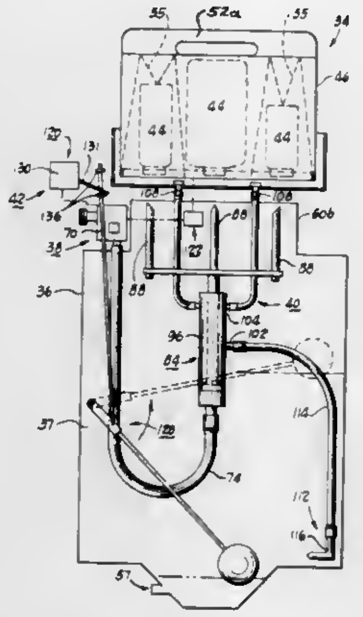
(c) a fluid release assembly disposed intermediate the first fluid supply and the reservoir, the fluid release assembly including a piercing assembly for puncturing the vessels to release the first fluid into the reservoir through the openings;

(d) a second fluid supply in communication with the reservoir and the fluid release assembly, the flow of the second fluid controlling operation of the fluid release assembly;

(e) a valve disposed intermediate the second fluid supply and the reservoir upstream of the fluid release assembly;

(f) a valve control to control the valve and therefore the flow of the second fluid to the fluid release assembly and the reservoir;

(g) a liquid level control means responsive to the level of fluid in the reservoir to activate the valve control when the fluid in the reservoir reaches a predetermined level; and



(h) an interlock switch control means responsive to the presence of the first fluid supply to actuate the valve control when the vessels in the container contain a predetermined amount of fluid.

DESIGN PATENTS

GRANTED JUL. 25, 1978

ERRATA

For CLASS	See PATENT NO.
D8-313	248,624
D8-339	248,625

DESIGNS

JULY 25, 1978

248,596

COMBINED SAFETY HARNESS AND LIGHT

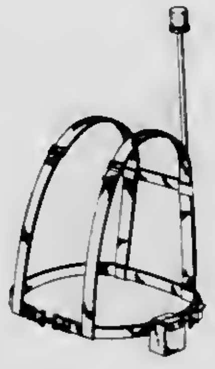
Hubert King Neyman, 8825 N. Hickory Valley Rd., Chattanooga, Tenn. 37416

Filed Apr. 23, 1976, Ser. No. 679,822

Term of patent 14 years

Int. Cl. D2—*99*

U.S. Cl. D2—27



248,597

AFTER SKI BOOT

Paolo Sinigaglia, Legnaro, Italy, assignor to Simod S.a.s. di Sinigaglia Paolo & C., Legnaro (Padova), Italy

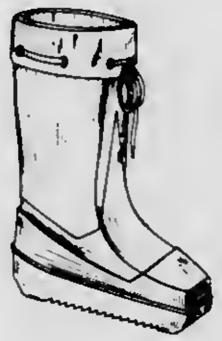
Filed Oct. 1, 1976, Ser. No. 728,639

Claims priority, application Italy, Apr. 1, 1976, 61910 B/76

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—272



248,598

THUMB GUARD

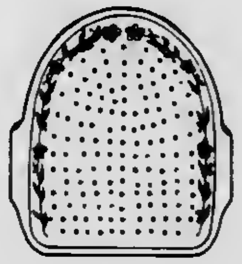
Melvin Herman Bahmer, 11257 Allegheny, Sun Valley, Calif. 91352

Filed Jun. 11, 1976, Ser. No. 695,316

Term of patent 14 years

Int. Cl. D2—*99*

U.S. Cl. D3—19 E



248,599

BABY SEAT

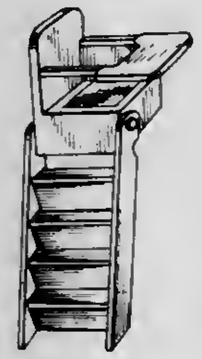
George L. Mears, 14432 Valverde Ct., San Diego, Calif. 92129

Filed May 20, 1976, Ser. No. 688,272

Term of patent 7 years

Int. Cl. D6—*01*

U.S. Cl. D6—8



248,600

CHAIR

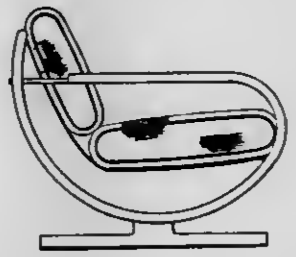
José A. Lopez, Miami, Fla., assignor to Camilo Muebles, Inc., Coral Gables, Fla.

Division of Ser. No. 581,699, May 28, 1975, Pat. No. Des. 242,404. This application Jun. 30, 1976, Ser. No. 701,423

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—31



248,601

FOLDABLE BLEACHER SEAT

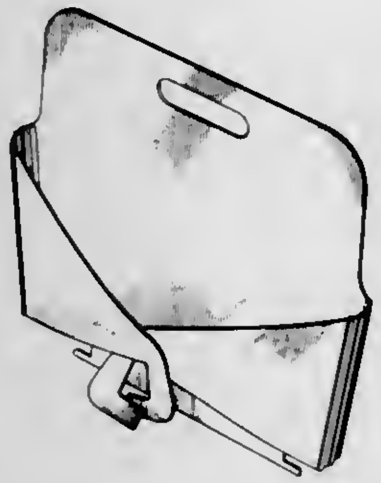
James E. Pierce, 25675 Avenida Jolita, and Max E. Goodwin, 25333 Via Dona Christa, both of Valencia, Calif. 91355

Filed Apr. 28, 1976, Ser. No. 680,975

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—47



248,602

SEAT

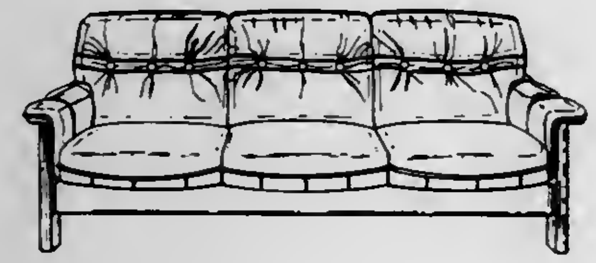
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.

Filed Feb. 4, 1977, Ser. No. 765,858

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—63



248,603

SEAT

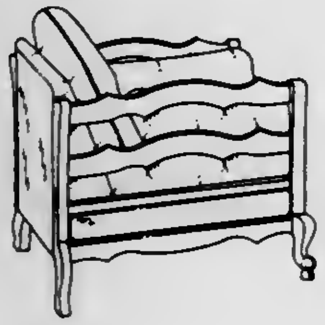
Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Hickory, N.C.

Filed Apr. 21, 1976, Ser. No. 678,834

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—68



248,604

PAPER ROLL HOLDER FOR TOILET PAPER OR SIMILAR ARTICLE

Lars Lander, Zug, Switzerland, assignor to Cepasy AG, Zug, Switzerland

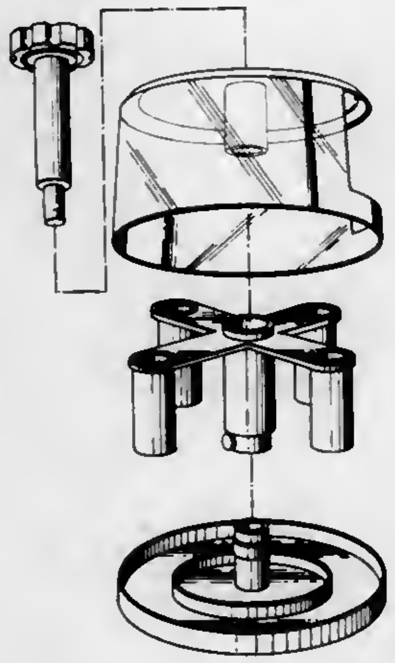
Filed May 27, 1977, Ser. No. 801,297

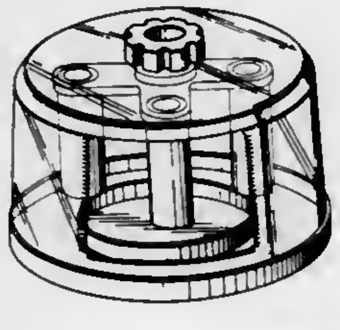
Claims priority, application Switzerland, Dec. 9, 1976, 64176/76

Term of patent 14 years

Int. Cl. D23—*02;* D7—*01*

U.S. Cl. D6—97





248,605

PICTURE FRAME

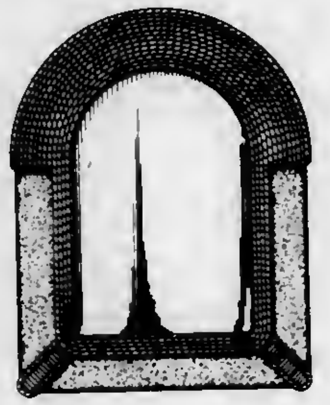
David Tougas, Santa Monica; Peter Adler, and Mark Liszt, both of Los Angeles, all of Calif., assignors to Lucid Lines, Inc., Culver City, Calif.

Filed Mar. 31, 1977, Ser. No. 783,293

Term of patent 14 years

Int. Cl. D6—*07*

U.S. Cl. D6—232



248,606

MICROWAVE OVEN

Daisaku Mori, Yamato Kouriyama; Masamichi Yamamura, Osaka; Yoichi Takahashi, Yamato Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

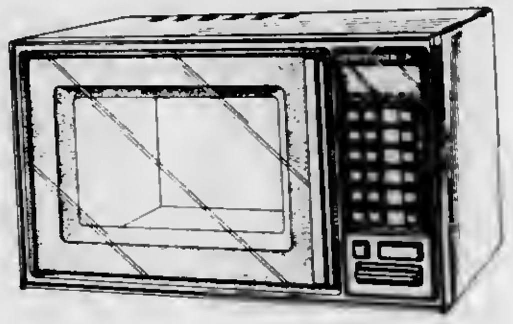
Filed Apr. 28, 1977, Ser. No. 791,918

Claims priority, application Japan, Feb. 4, 1977, 52-3640

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—128



248,607

MICROWAVE OVEN

Masamichi Yamamura, Osaka; Daisaku Mori; Yoichi Takahashi, both of Yamato Kouriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

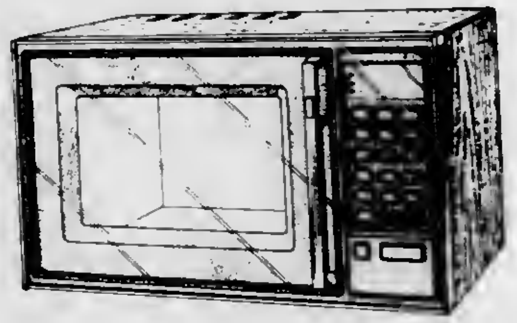
Filed Apr. 28, 1977, Ser. No. 791,915

Claims priority, application Japan, Nov. 19, 1976, 51-45634

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—128



248,608

SPOON OR SIMILAR ARTICLE

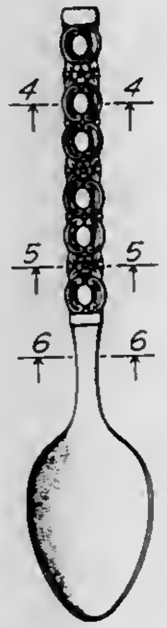
Frank R. Perry, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,705

Term of patent 14 years

Int. Cl. D7—*03*

U.S. Cl. D7—137



248,609

POTATO PEELER HANDLE

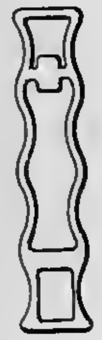
Kenneth F. Fischer, Roseland, N.J., assignor to Acme Metal Goods Mfg. Co., Newark, N.J.

Filed Feb. 10, 1977, Ser. No. 767,654

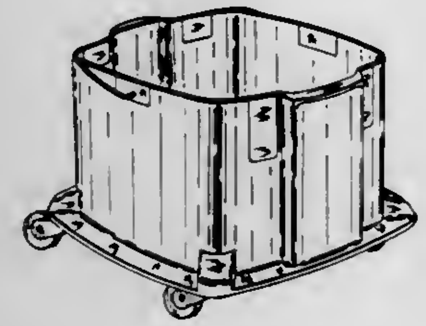
Term of patent 3 years

Int. Cl. D7—*04*

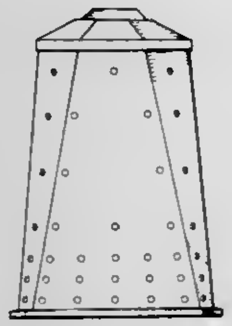
U.S. Cl. D7—152



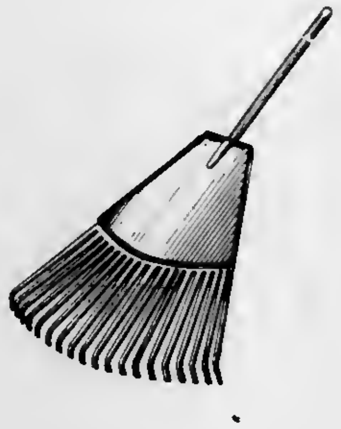
248,610
BUCKET
Daniel A. Schwartz, Long Beach, Calif., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Dec. 1, 1976, Ser. No. 746,311
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187

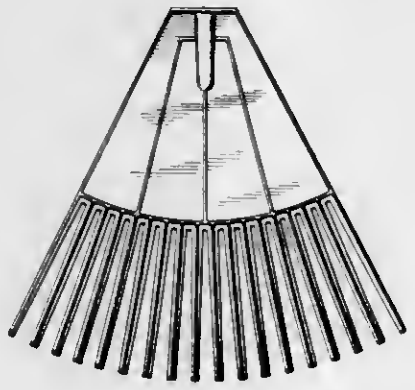


248,611
COMPOST CONTAINER
John Lindsay Dingwall, Randburg, Transvaal, South Africa, assignor to Moulded Components and Roto Moulding South Africa (Proprietary) Limited, Edenvale, South Africa
Filed Nov. 26, 1976, Ser. No. 745,422
Claims priority, application South Africa, Jan. 17, 1976, 76/0800
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194

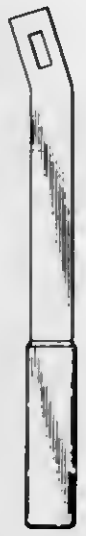


248,612
LEAF RAKE
David B. Oas, Girard, Pa., assignor to Tantera, Inc., Girard, Pa.
Filed Jun. 9, 1976, Ser. No. 694,200
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13

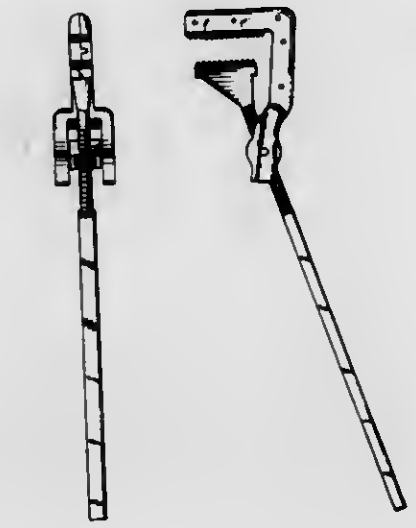




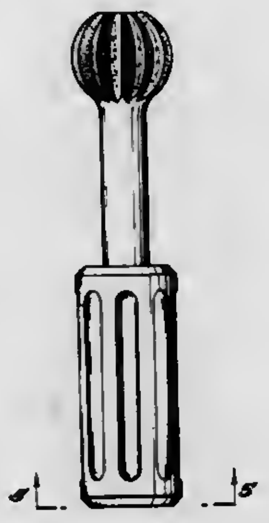
248,613
GAS MAIN VALVE WRENCH
Thomas Pace, 2426 Beechwood Ave., San Jose, Calif. 95128, and Keith R. Grammer, 809 Nebin Way, San Jose, Calif. 95113
Filed Mar. 17, 1977, Ser. No. 778,489
Term of patent 3 years
Int. Cl. D8—*05*
U.S. Cl. D8—17



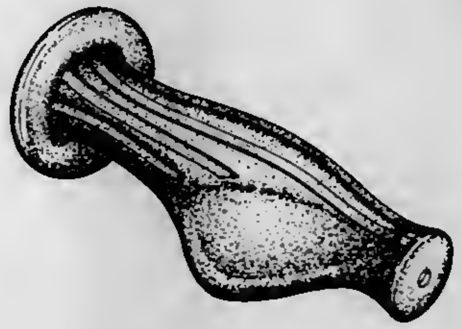
248,614
WRENCH
John J. Dohias, 1212 Sumach Dr., Windsor, Ontario, Canada N8S 2S4
Filed Jan. 3, 1977, Ser. No. 756,383
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—23



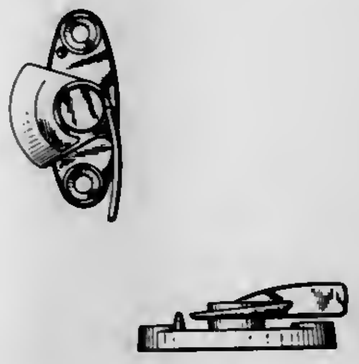
248,615
DRIVE TOOL
Bosko Grabovac, Mission Viejo, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.
Filed Aug. 25, 1976, Ser. No. 717,865
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82



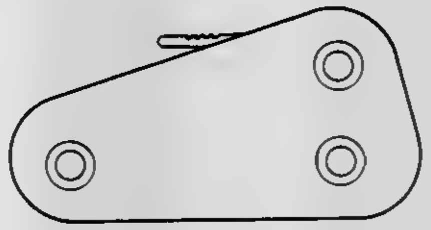
248,616
CONTOURED MOTORCYCLE HAND GRIP OR THE LIKE
George A. Johnson, 27239 Barada Ave., Saugus, Calif. 91350
Filed Jun. 14, 1976, Ser. No. 695,860
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D8—303



248,617
SASH LOCK
Ralph Cavalucci, New York, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.
Filed Jan. 3, 1977, Ser. No. 756,370
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—337



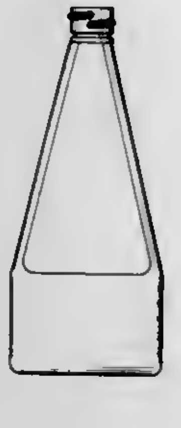
248,618
BUCKLE
James R. Anthony, Indianapolis, Ind., assignor to Indiana Mills & Manufacturing, Inc.
Filed Oct. 27, 1976, Ser. No. 736,000
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



248,619
BOTTLE

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 8, 1976, Ser. No. 730,904
Term of patent 14 years
Int. Cl. D9—*01*

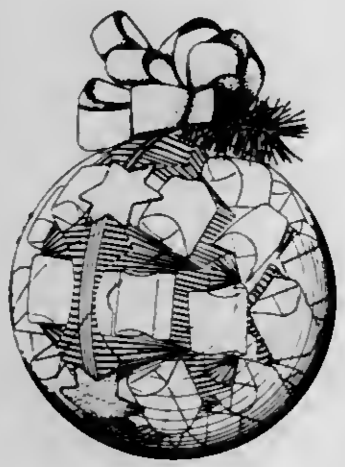
U.S. Cl. D9—149



248,620
PACKAGE OF CANDY OR THE LIKE

Amilcare Dogliotti, Neive (Cuneo), assignor to P. Ferrero and C.-S.p.A., Cuneo, Italy
Filed Aug. 31, 1976, Ser. No. 719,292
Term of patent 14 years
Int. Cl. D9—*03*

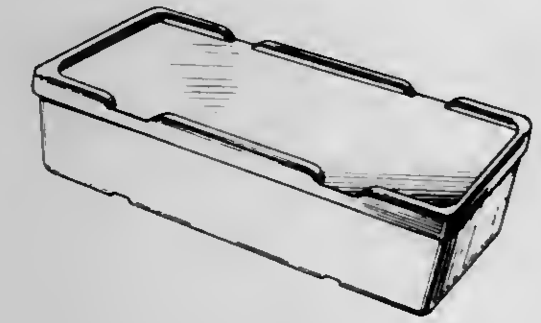
U.S. Cl. D9—182



248,621
COVERED CONTAINER FOR MAIL OR THE LIKE

David Stewart Hay, Ottawa, and Alfred Weston Bennett, Gatineau, both of Canada, assignors to Postmaster General of Canada, Canada
Filed Feb. 12, 1976, Ser. No. 657,634
Term of patent 14 years
Int. Cl. D9—*03*

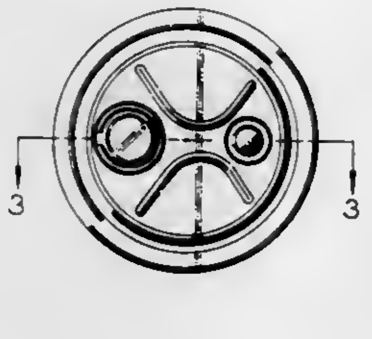
U.S. Cl. D9—219



248,622
END CLOSURE FOR A CONTAINER

Gordon R. Gane, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation
Filed Aug. 9, 1976, Ser. No. 712,973
Term of patent 14 years
Int. Cl. D9—*07*

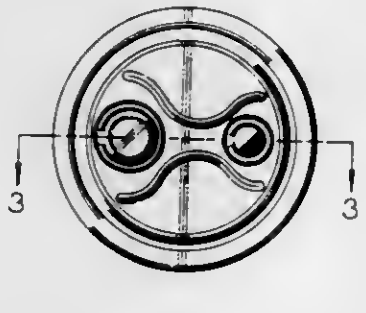
U.S. Cl. D9—253



248,623
END CLOSURE FOR A CONTAINER

Gordon R. Gane, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation
Filed Aug. 9, 1976, Ser. No. 712,974
Term of patent 14 years
Int. Cl. D9—*07*

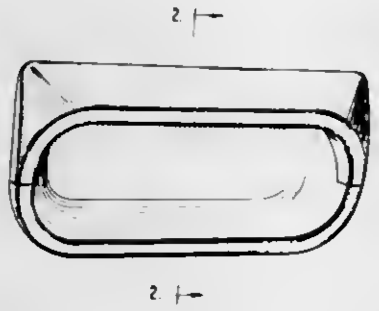
U.S. Cl. D9—253



248,624
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE

Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany
Filed May 12, 1976, Ser. No. 685,568
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 6 AR 220/75
Term of patent 14 years
Int. Cl. D8—*06*

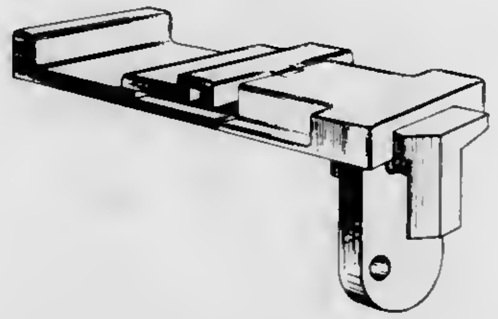
U.S. Cl. D8—313



248,625
COMBINED GUIDE AND LOCK FOR A SLIDING WINDOW SASH

Edgar B. Roesch, Pennington, N.J., assignor to The Roesch Trust of which Lesley B. Roesch and Robert Patterson are trustees, Pennington, N.J.
Filed Jan. 10, 1977, Ser. No. 757,848
Term of patent 14 years
Int. Cl. D8—*07*

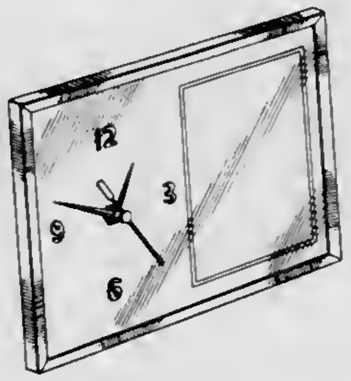
U.S. Cl. D8—339



248,626
PICTURE CLOCK

John C. Lucich, 12835 Sundance Ave., San Diego, Calif. 92129
Filed Apr. 5, 1976, Ser. No. 673,621
Term of patent 14 years
Int. Cl. D10—*01*

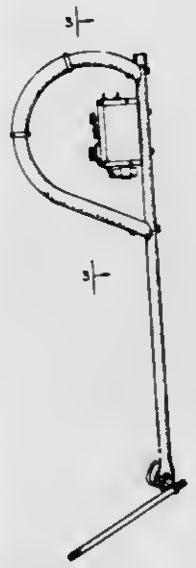
U.S. Cl. D10—2



248,627
DETECTOR OR THE LIKE

Jerry C. Tyndall, 907 Denise Ave., Coats, N.C.
Filed Sep. 7, 1976, Ser. No. 720,949
Term of patent 14 years
Int. Cl. D10—*04*

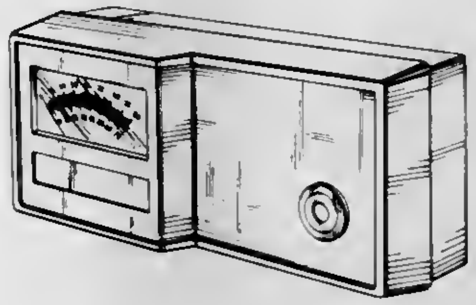
U.S. Cl. D10—46



248,628
TRANSMITTER MONITORING METER

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corp., Los Angeles, Calif.
Filed Aug. 19, 1976, Ser. No. 716,005
Term of patent 14 years
Int. Cl. D10—*04*

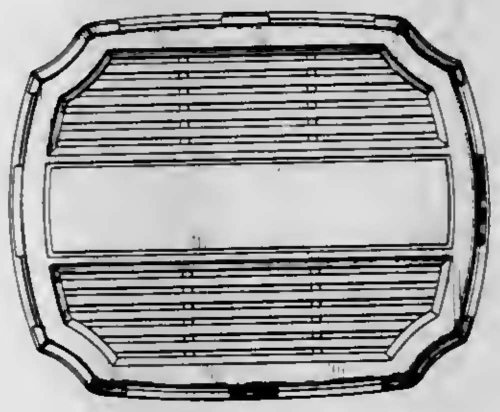
U.S. Cl. D10—75



248,629
HOUSING FOR FIRE AND SMOKE DETECTOR

Frederick J. Conforti, Aurora; Roy C. A. Robertson, Bolingbrook, and Harvey Hanig, North Aurora, all of Ill., assignors to Pittway Corporation, Northbrook, Ill.
Filed Jul. 5, 1977, Ser. No. 812,511
Term of patent 7 years
Int. Cl. D10—*06*

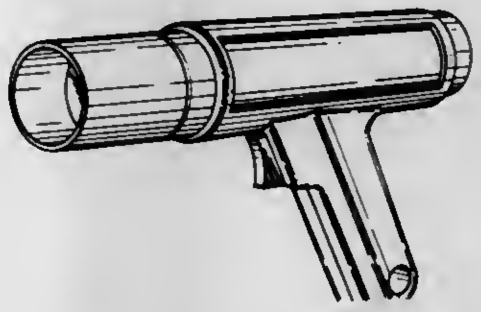
U.S. Cl. D10—121



248,630
TIMING LIGHT

David E. Maxwell, Cary; James R. Shaffer, Mt. Prospect, and Lee Radtke, Lake Zurich, all of Ill., assignors to Sun Electric Corporation, Chicago, Ill.
Filed Nov. 24, 1976, Ser. No. 744,698
Term of patent 14 years
Int. Cl. D10—*04*

U.S. Cl. D10—112



248,631

END CONNECTOR FOR BRACELET OR THE LIKE

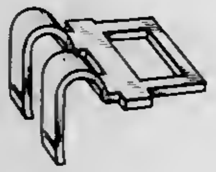
Elio Lossini, Johnston, R.I., assignor to Raybeth Tool & Die Co., Inc., Providence, R.I.

Filed Apr. 19, 1976, Ser. No. 678,419

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—94



248,632

VISUAL DISPLAY APPARATUS

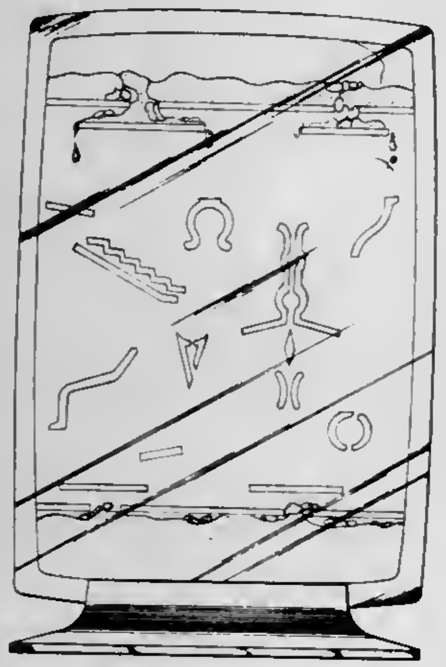
Richard Lee Gillespie; Arthur Kelso Melin, both of San Gabriel, and Elliot Everett Dalton, Los Angeles, all of Calif., assignors to Wham-O Mfg. Co.

Filed Nov. 1, 1976, Ser. No. 737,662

Term of patent 14 years

Int. Cl. D11—*02;* D21—*01*

U.S. Cl. D11—131



248,633

PLANTER

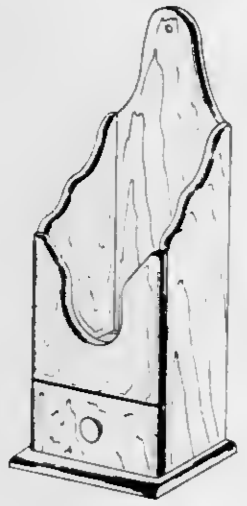
Ronald W. Wood, North Easton, Mass., assignor to Masta Associates, Arlington, Va.

Filed Oct. 12, 1976, Ser. No. 731,201

Term of patent 7 years

Int. Cl. D11—*02;* D6—*06*

U.S. Cl. D11—155



248,634

BICYCLE

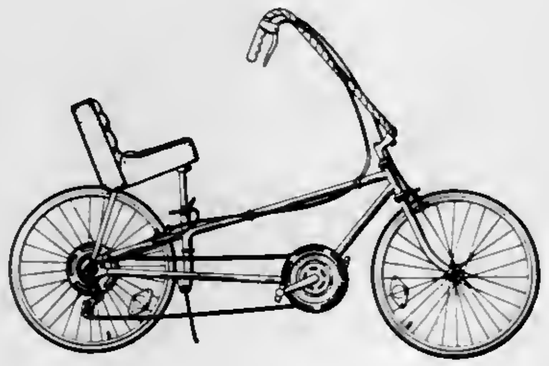
Robert Souza, 8270-68th St. North, Pinellas Park, Fla. 33565, and Richard E. Thompson, 10793-49th St. North, Clearwater, Fla. 33515

Filed Oct. 29, 1976, Ser. No. 737,143

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—111



248,635

BICYCLE PEDAL

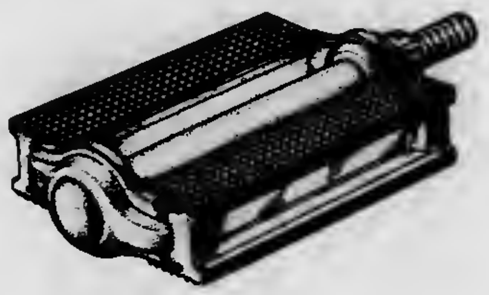
Carlton P. Pawsat, and Robert F. Humlong, both of Maysville, Ky., assignors to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Sep. 27, 1976, Ser. No. 727,314

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—125



248,636

AUTOMOBILE ACCESSORY MOUNT

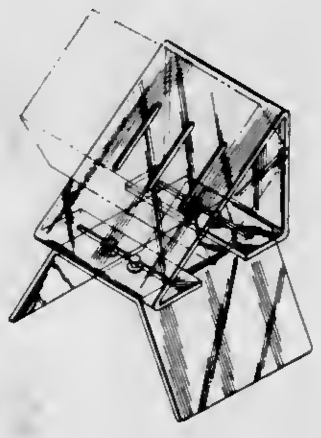
Harvey L. Stanley, 3312 Lancelot, Dallas, Tex. 75229

Filed Sep. 18, 1975, Ser. No. 614,543

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—155



248,637

TRANSMISSION DRAIN PAN

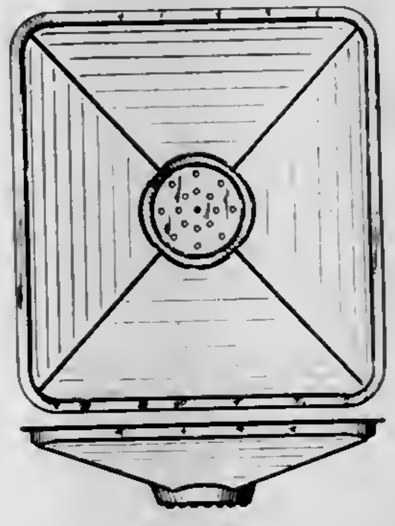
Philip F. Bishop, Stanhope, N.J., assignor to Transpan Products, Inc., Stanhope, N.J.

Filed Nov. 13, 1975, Ser. No. 631,466

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—155



248,638

WIND DEFLECTOR FOR BICYCLES

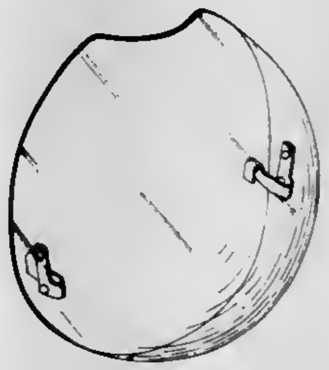
Glen J. Brown, 386 E. Poppyfields Dr., Altadena, Calif. 91001

Filed Dec. 20, 1976, Ser. No. 752,275

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—182

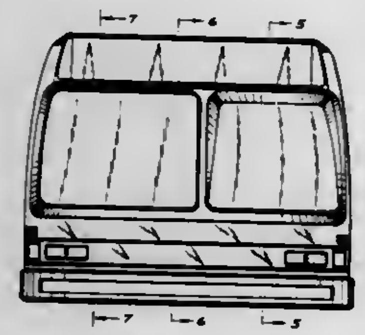


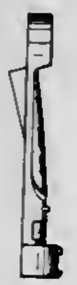
248,639
FRONT PANEL UNIT FOR A BUS

Norman J. James, Bonita, and Larry G. Hickey, Chula Vista, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Mar. 19, 1976, Ser. No. 668,482
Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—196



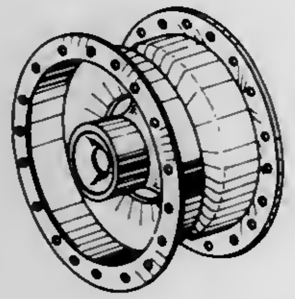


248,640
HUB FOR BICYCLE

Chin-Hou Hsieh, Feng Yuan, Taiwan, assignor to Valisum Industries Ltd., Taiwan, Taiwan

Filed May 4, 1977, Ser. No. 793,793
Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—207

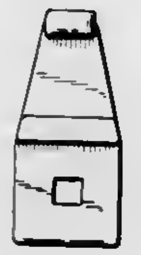


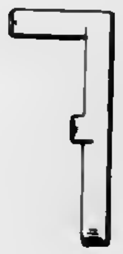
248,641
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT

Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 12, 1976, Ser. No. 731,327
Term of patent 14 years
Int. Cl. D13—*99*

U.S. Cl. D13—17



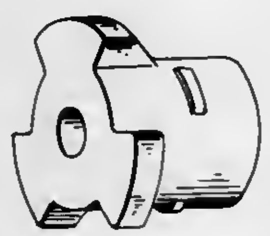


248,642
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT

Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 12, 1976, Ser. No. 731,329
Term of patent 14 years
Int. Cl. D13—*99*

U.S. Cl. D13—17

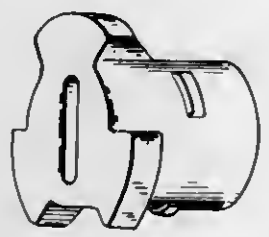


248,643
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT

Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 12, 1976, Ser. No. 731,330
Term of patent 14 years
Int. Cl. D13—*99*

U.S. Cl. D13—17

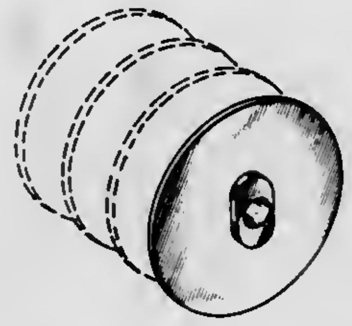


248,644
FRONT PANEL FOR KNOB-TYPE ELECTRIC FENCE INSULATOR

Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026

Filed May 14, 1976, Ser. No. 686,283
Term of patent 14 years
Int. Cl. D8—*08;* D13—*03*

U.S. Cl. D13—18

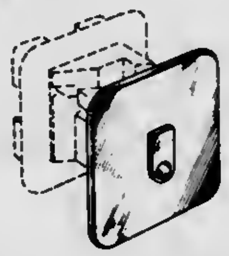


248,645
FRONT PANEL FOR ALL-PURPOSE ELECTRIC FENCE INSULATOR

Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026

Filed May 14, 1976, Ser. No. 686,311
Term of patent 14 years
Int. Cl. D13—*03;* D8—*08*

U.S. Cl. D13—18

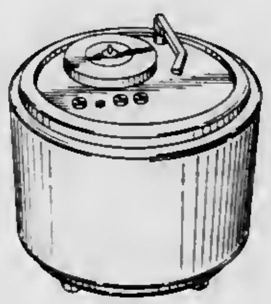


248,646
CONSOLE RECORD PLAYER

James F. Rebert, 3143 Pinehurst, and John W. Rebert, 1850 Burning Tree, both of Decatur, Ill. 62521

Filed Apr. 21, 1976, Ser. No. 671,178
Term of patent 14 years
Int. Cl. D14—*01*

U.S. Cl. D14—17

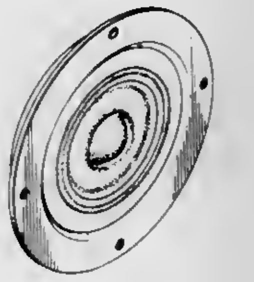


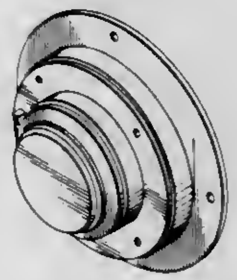
248,647
LOUDSPEAKER

Dale A. Nussdorfer, Anaheim, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Apr. 14, 1976, Ser. No. 676,851
Term of patent 14 years
Int. Cl. D14—*01*

U.S. Cl. D14—30



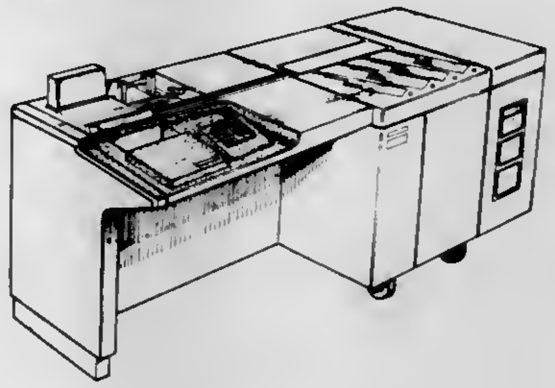


248,648
MODULAR DOCUMENT PROCESSING ENCODER

Richard G. Clayton, Detroit, and Robert C. Schade, Farmington Hills, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 574,723, May 5, 1975, abandoned. This application Jun. 24, 1976, Ser. No. 699,430
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D14—40



248,649

TELEPHONE INSTRUMENT

Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

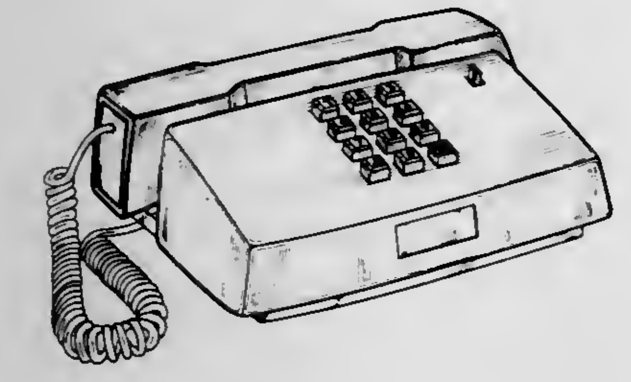
Filed Mar. 22, 1976, Ser. No. 669,184

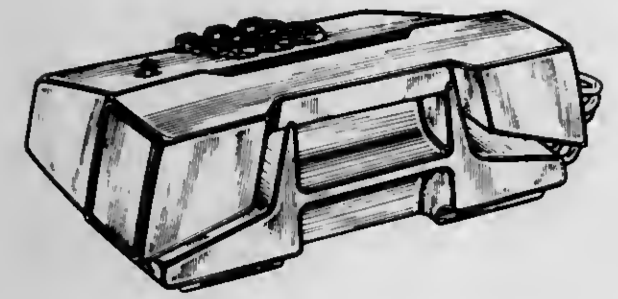
Claims priority, application Sweden, Sep. 24, 1975, 1866/75

Term of patent 7 years

Int. Cl. D14—*03*

U.S. Cl. D14—53





248,650

TELEPHONE MOUTHPIECE KEYBOARD

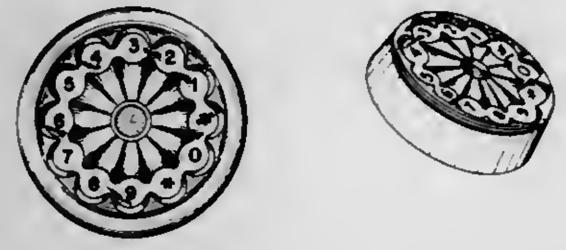
Donald M. Bellenger, San Francisco, and Paul David Major, Oakland, both of Calif., assignors to Telephone Electronics Corporation

Filed Oct. 8, 1976, Ser. No. 730,762

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—66



248,651

RADIO CABINET

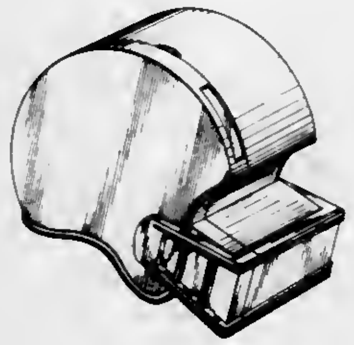
Robert F. Zivica, Walnut Creek, Calif., assignor to Pro Sports Marketing, Inc., Concord, Calif.

Filed Apr. 28, 1976, Ser. No. 681,254

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—69



248,652

PORTABLE RADIO

Shuhei Taguchi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

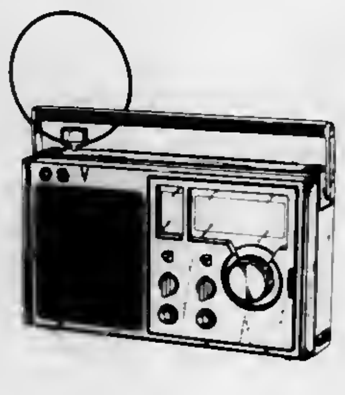
Filed Mar. 18, 1976, Ser. No. 668,119

Claims priority, application Japan, Sep. 19, 1975, 50-38365

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



248,653

RADIO COMMUNICATION TRANSMITTER

Hiroshi Hirasa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

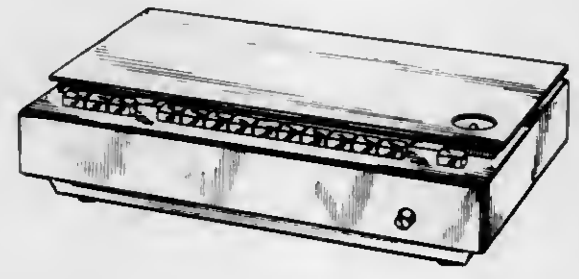
Filed Mar. 18, 1976, Ser. No. 668,001

Claims priority, application Japan, Sep. 19, 1975, 50-38364

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—95



248,654

CULTIVATOR

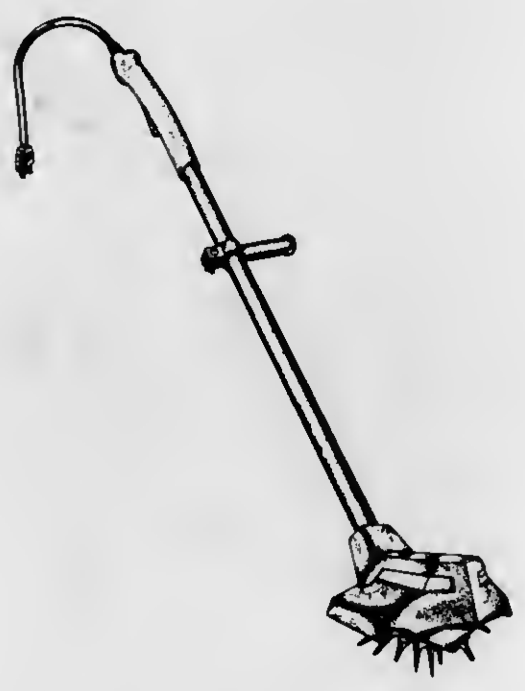
Walter F. Ruhl, Greenville, and Robert R. Yeager, Union City, both of Ohio, assignors to Lambert Corporation, Dayton, Ohio

Filed Jun. 3, 1977, Ser. No. 803,392

Term of patent 14 years

Int. Cl. D15—*03*; D8—*01*

U.S. Cl. D15—12



248,655

LAWN MOWER-TRACTOR

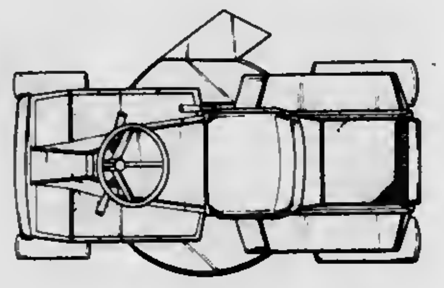
Edward Klein, Wilmette, Ill., assignor to J. I. Case Company, Racine, Wis.

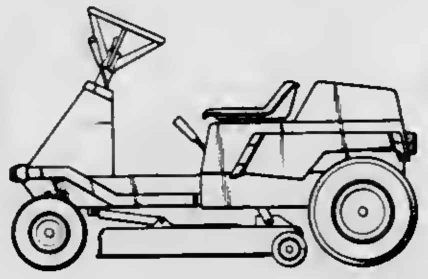
Filed Dec. 16, 1976, Ser. No. 751,515

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—15





248,656

HOT-WATER EXTRACTION UNIT

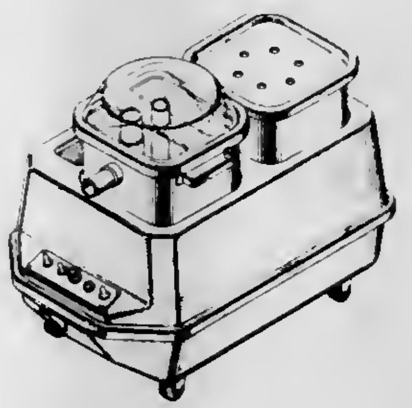
Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.

Filed Apr. 7, 1976, Ser. No. 674,461

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—52



248,657

HOME VACUUM/WATER EXTRACTION CLEANING UNIT

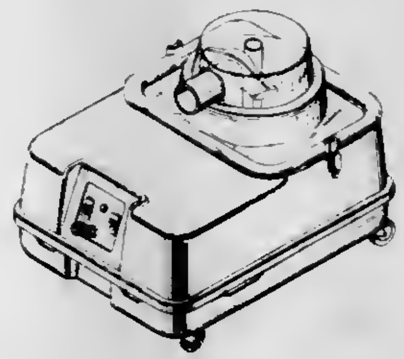
Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.

Filed Apr. 6, 1977, Ser. No. 785,151

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—52



248,658

WINE CASK

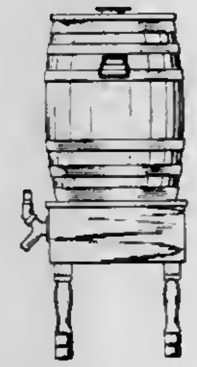
Herman L. Buffington, 4372 NE. 11th Ave., Ft. Lauderdale, Fla. 33334

Filed Sep. 7, 1976, Ser. No. 720,791

Term of patent 14 years

Int. Cl. D15—*08*; D9—*02*

U.S. Cl. D15—114



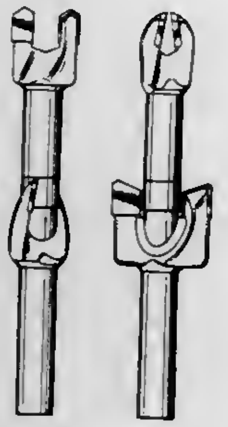
248,659

BORING BIT

Michael Schneider, Sr., 1120 S. Union Ave., Alliance, Ohio 44601

Filed Sep. 27, 1976, Ser. No. 727,151
Term of patent 14 years
Int. Cl. D15—*09*

U.S. Cl. D15—139



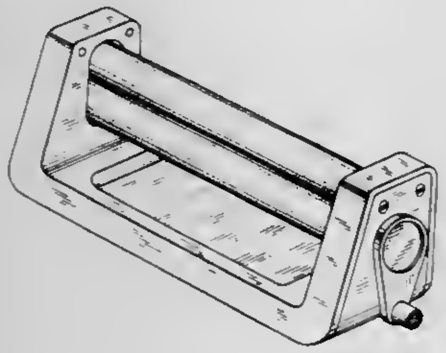
248,660

PHOTOGRAPHIC PRINT DRYING APPARATUS

Morris Gary Grossman, Wyckoff, N.J., and Edward D. Levy, Spring Valley, N.Y., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Filed Jul. 1, 1976, Ser. No. 701,625
Term of patent 14 years
Int. Cl. D16—*04;* D27—*99*

U.S. Cl. D16—33



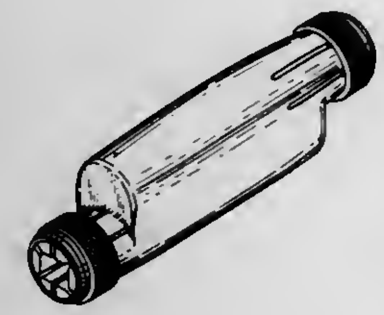
248,661

COMBINED TOOL FOR HOLDING A KEEL AND A LAYOUT PENCIL

Donald S. Kanawyer, 2603 Elliot St., Santa Clara, Calif. 95051

Filed Jul. 26, 1976, Ser. No. 708,411
Term of patent 14 years
Int. Cl. D19—*06*

U.S. Cl. D19—36



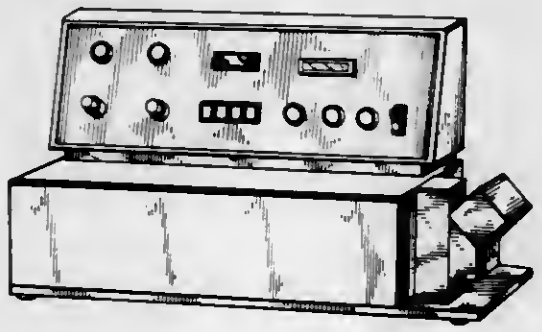
248,662

NEPHELOMETER

James G. Bruni, 736 B Center Pl., Manhattan Beach, Calif. 90266; George M. Coker, Jr., 1324 Chilton Dr., Silver Spring, Md. 20904; Stephen G. Hauser, 4133 Aleman Dr., Tarzana, Calif. 91356; Keith S. Keith, 21566 Summit Trail, Topanga, Calif. 90290; Paul Priarone, 3106 Gumwood Dr., West Hyattsville, Md. 20783, and Rodolfo R. Rodriguez, 5482 Greathead Ct., Columbia, Md. 21045

Filed Dec. 11, 1975, Ser. No. 640,103
Term of patent 14 years
Int. Cl. D24—*01*

U.S. Cl. D24—8



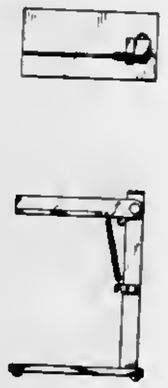
248,663

MANUAL DENTAL MODEL REMOVER

Edward Gorrell Apple, Box. 1155, Burlington, N.C. 27215

Filed Mar. 15, 1976, Ser. No. 666,659
Term of patent 14 years
Int. Cl. D24—*02, 99*

U.S. Cl. D24—10



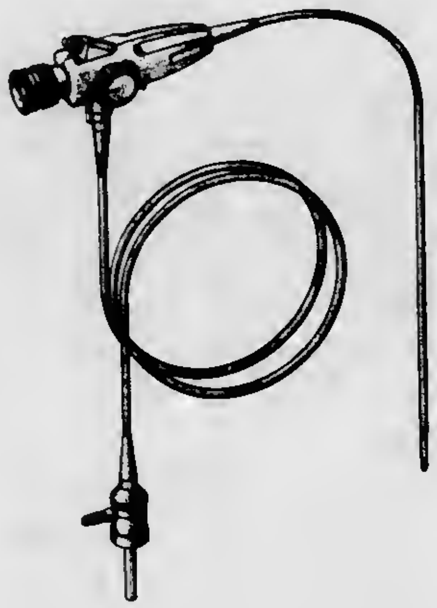
248,664

ENDOSCOPE

Nagashige Takahashi, No. 28-10, 3-chome, Tokiwadai, Itabashi-ku, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,480
Claims priority, application Japan, Apr. 22, 1976, 51-14809
Term of patent 14 years
Iot. Cl. D24—*02*

U.S. Cl. D24—18



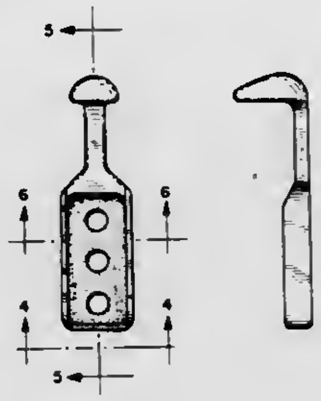
248,665

TEMPOROMANDIBULAR JOINT PROSTHESIS

Charles Albert Homsy, 11526 Raintree Cir., Houston, Tex. 77024, and John N. Kent, 5901 Wheeler, Metaire, La. 70003

Filed Jul. 12, 1976, Ser. No. 704,135
Term of patent 14 years
Int. Cl. D24—*03*

U.S. Cl. D24—33



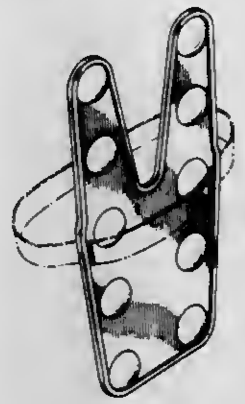
248,666

BACK MASSAGER ATTACHMENT

Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.

Filed Mar. 24, 1976, Ser. No. 669,980
Term of patent 14 years
Int. Cl. D28—*03;* D21—*02;* D24—*99*

U.S. Cl. D24—36



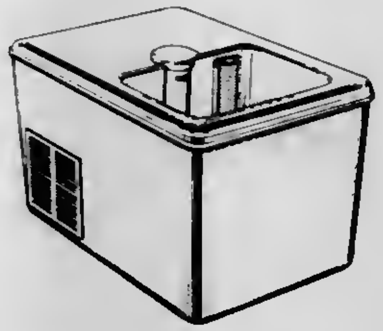
248,667

HYDROTHERAPEUTIC APPARATUS

Jerome R. Plugge, Rte. 50, Skipton, Cordova, Md. 21625

Filed Aug. 13, 1976, Ser. No. 704,435
Term of patent 14 years
Int. Cl. D24—*02*

U.S. Cl. D24—38



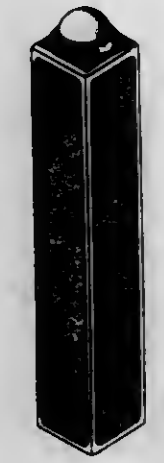
248,668

ACUPRESSURE THERAPEUTIC MESSAGE DEVICE

John Baptist Brehm, 918 W. Culver, Phoenix, Ariz. 85007

Filed Jul. 22, 1977, Ser. No. 818,276
Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D24—41



248,669
ELECTRONIC SOUND CONDITIONING DEVICE

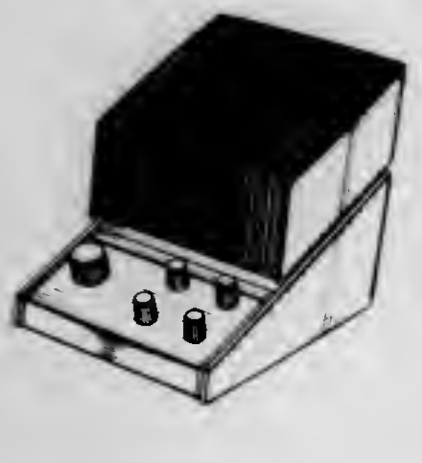
Roger Ramsey, Akron, Ohio assignor to Marpac Corporation, Wilmington, N.C.

Filed Jun. 27, 1977, Ser. No. 810,021

Term of patent 14 years

Int. Cl. D24—*99*

U.S. Cl. D24—99



248,670
VITREOUS PANEL FOR A STORM DOOR OR THE LIKE

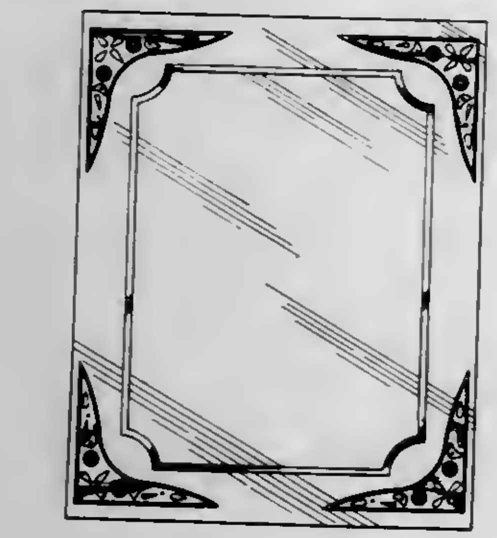
Michael March, 2594 Fernwood Ave., Roslyn, Pa. 19001

Filed Jan. 5, 1976, Ser. No. 646,635

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—72



248,671
SMOKING DEVICE

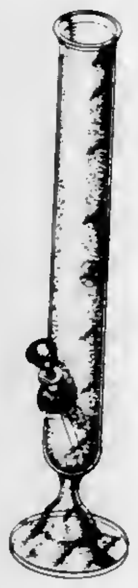
Roger Graham, 931 Selim Rd., Silver Spring, Md. 20910

Filed Jan. 16, 1976, Ser. No. 649,702

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—03



248,672
MOUTHPIECE FOR A SMOKING DEVICE

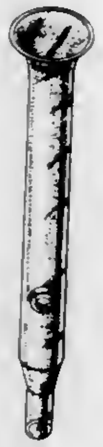
Roger Graham, 931 Selin Rd., Silver Spring, Md. 20910

Filed Jan. 16, 1976, Ser. No. 649,722

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—05



248,673
FILTER ELEMENT FOR A CIGARETTE HOLDER OR THE LIKE

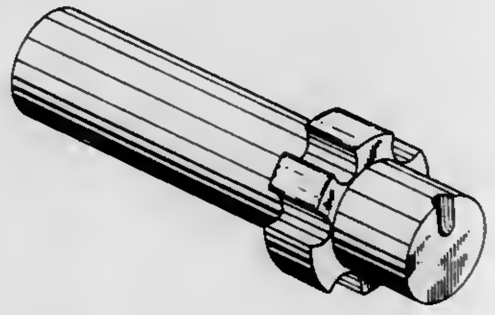
Leslie N. Aikman, 3628 Ocean Blvd., Corona Del Mar, Calif. 92625

Filed Oct. 7, 1976, Ser. No. 730,539

Term of patent 14 years

Int. Cl. D27—*02*

U.S. Cl. D27—7



248,674
FACE SHIELD

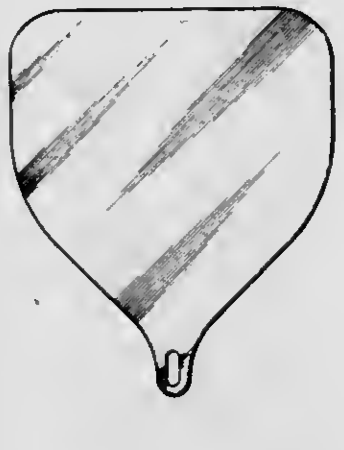
Thomas Hannon, Rte. 5, Walnut Rd., Lockport, Ill. 60441

Filed Oct. 6, 1975, Ser. No. 620,178

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—9



248,675
POWDER-BOX

Xavier C. M. Gaudiche, Paris, France, assignor to Reboul-Sofra S.A., Paris, France

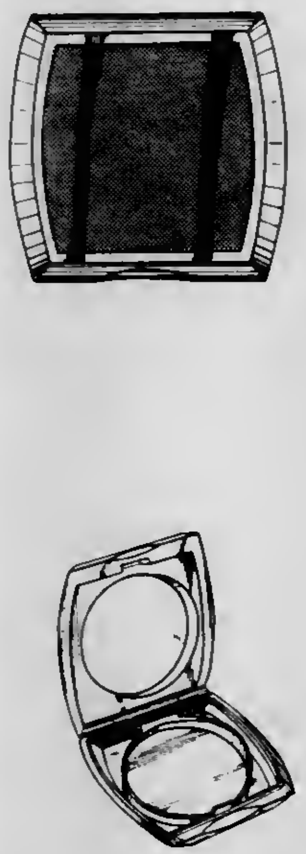
Filed Apr. 20, 1976, Ser. No. 678,491

Claims priority, application France, Oct. 24, 1975, 75 38623

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D28—78



248,676
OUTDOOR RECEPTACLE FOR RECEIVING UTILITY BILLS AND THE LIKE

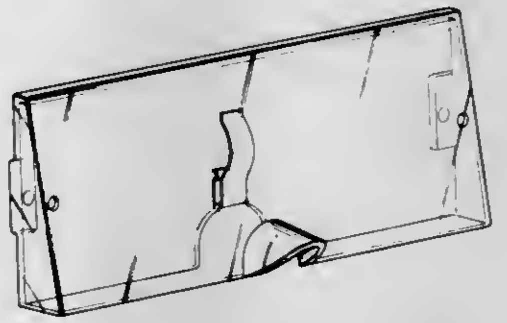
Harold F. Elchacker, 23 Churchill Rd., Wethersfield, Conn. 06109, and Richard F. Elchacker, 5 Claire Rd., Vernon, Conn. 06066

Filed Feb. 17, 1977, Ser. No. 769,427

Term of patent 14 years

Int. Cl. D31—*00*

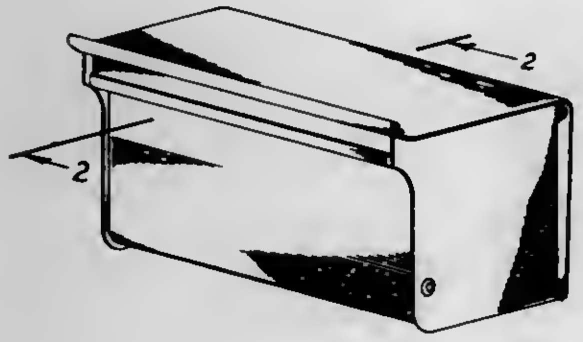
U.S. Cl. D31—24



248,677

MAIL BOX

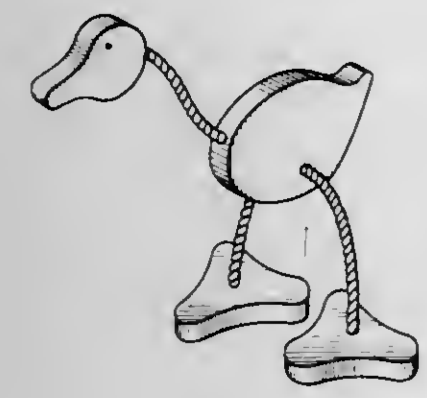
Charles A. Masso, 450 Erie St., Edinboro, Pa. 16412
Filed May 2, 1977, Ser. No. 792,816
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24



248,678

MARIONETTE

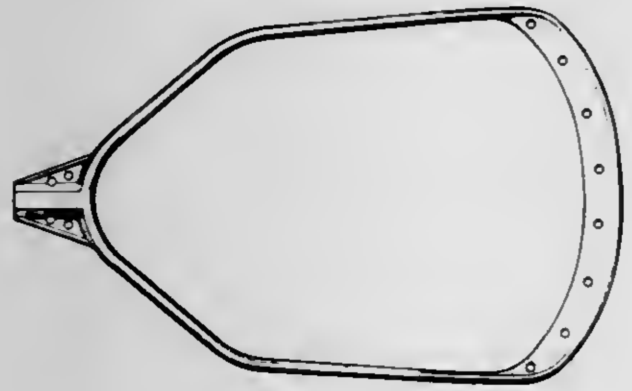
Charles R. Nagy, 750 Pleasant Ave., Kalamazoo, Mich. 49008
Filed Nov. 8, 1976, Ser. No. 739,422
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 A



248,679

LACROSSE STICK HEAD

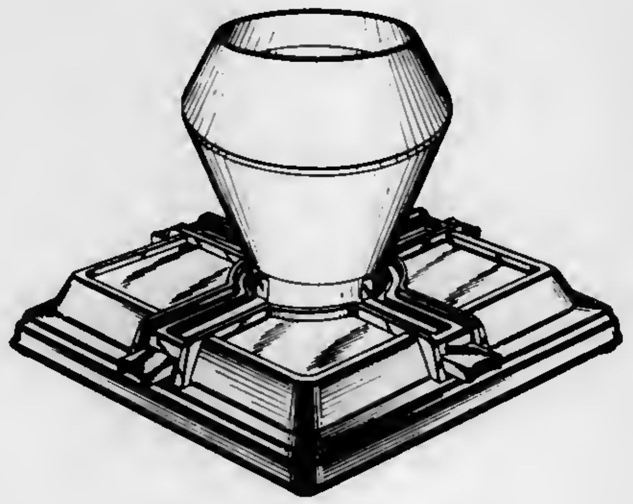
Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Co., Needha, Mass.
Filed Dec. 6, 1976, Ser. No. 747,950
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CT



248,680

MARBLE DISPENSING GAME APPARATUS

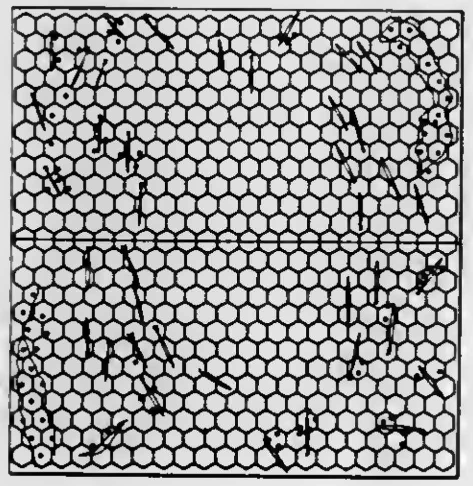
Jane Waski, New York, N.Y., assignor to Janys Designs Limited, New York, N.Y.
Filed Dec. 16, 1976, Ser. No. 751,764
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,681

GAME BOARD

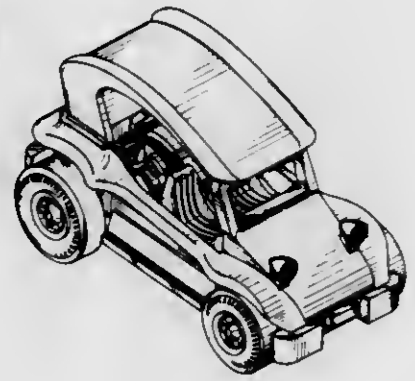
James Neal Harvey, 73 Malthie Ave., Stamford, Conn. 06905
Filed Dec. 9, 1976, Ser. No. 748,728
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



248,682

TOY AUTO

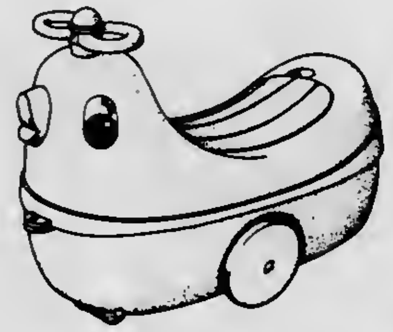
Helmut Darda, 7712 Blumberg, Im Tal, Germany
Filed Dec. 17, 1975, Ser. No. 641,571
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



248,683

TOY VEHICLE

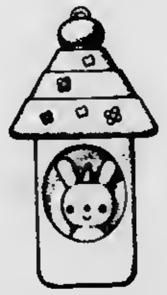
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jun. 16, 1976, Ser. No. 696,651
Claims priority, application Japan, Feb. 19, 1976, 51/5375
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM



248,684

TOY MUSIC BOX

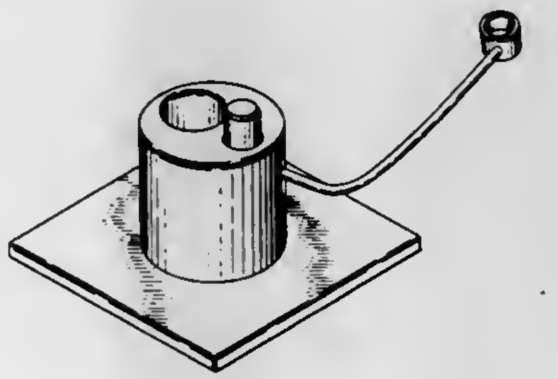
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1976, Ser. No. 748,854
Claims priority, application Japan, Jul. 29, 1976, 51/29702
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



248,685

MANUALLY OPERABLE BALL TOSSING GAME APPARATUS

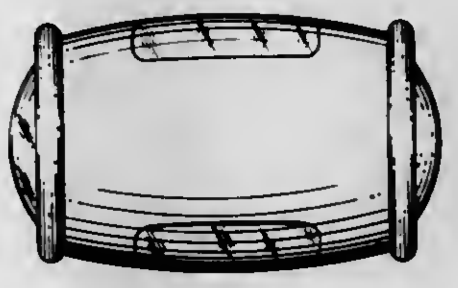
Rex K. Brown, 1611 Fallen Leaf La., Los Altos, Calif. 94022
Filed Dec. 17, 1976, Ser. No. 751,315
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP



248,686

INFLATABLE EDUCATIONAL TOY

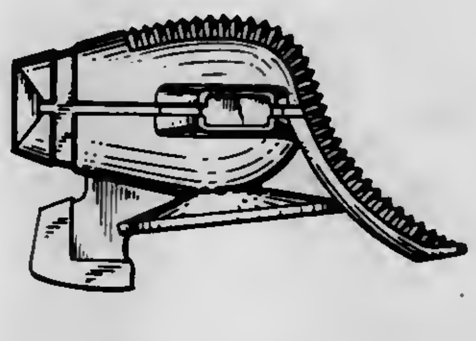
Sheldon Greenberg, 1107 Broadway, New York, N.Y. 12204
Filed Jan. 3, 1977, Ser. No. 756,185
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 DD



248,687

TOY ROBOT HEAD

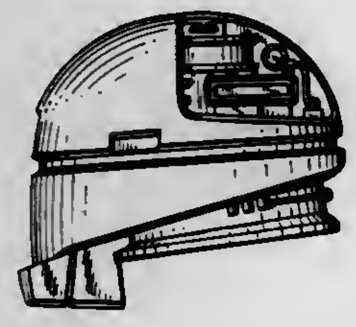
Edward B. Bretschger, Cos Cob, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 10, 1977, Ser. No. 767,417
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD



248,688
TOY ROBOT HEAD

John A. Vernon, Jr., Bethel, Conn., assignor to Louis Marx & Co., Inc., Stamford, Conn.
Filed Feb. 10, 1977, Ser. No. 767,419
Term of patent 14 years
Int. Cl. D21—*01*

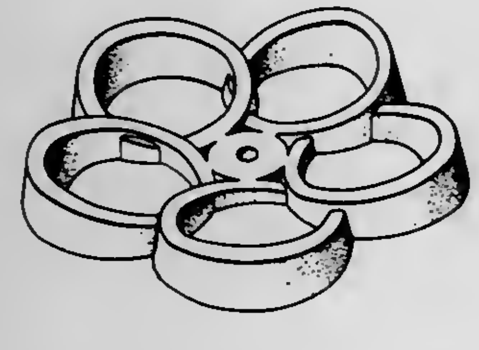
U.S. Cl. D34—15 AD



248,689
BUOYANT WICK HOLDER

Donald James Maxwell, London, England, assignor to Rizla Limited, Pontypridd, Wales
Filed Sep. 20, 1976, Ser. No. 724,938
Claims priority, application United Kingdom, Jul. 13, 1976, 97645007/76
Term of patent 14 years
Int. Cl. D26—*01*

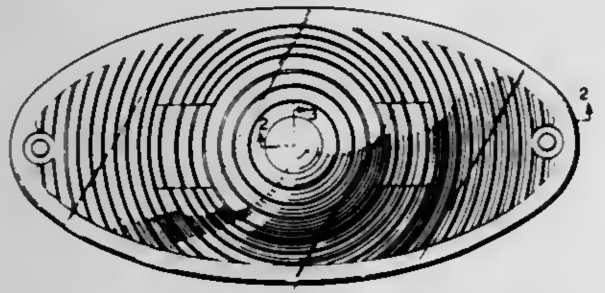
U.S. Cl. D48—2



248,690
COMBINED STOP AND TAIL LAMP LENS

Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada
Continuation of Ser. No. 430,200, Jan. 2, 1974, abandoned. This application Jun. 17, 1975, Ser. No. 587,609
Term of patent 14 years
Int. Cl. D26—*06*

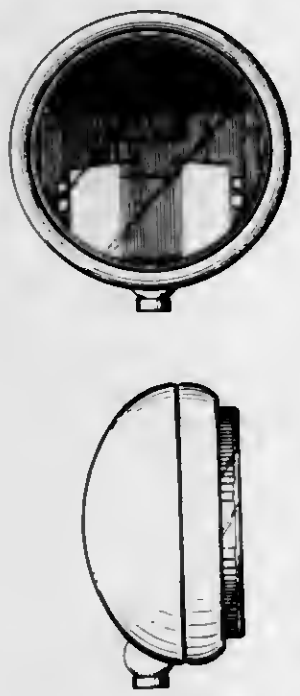
U.S. Cl. D48—32 A



248,691
HEADLIGHT

Pierre Cible, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Jul. 15, 1976, Ser. No. 705,387
Claims priority, application France, Apr. 15, 1976, 76 39135
Term of patent 14 years
Int. Cl. D26—*06*

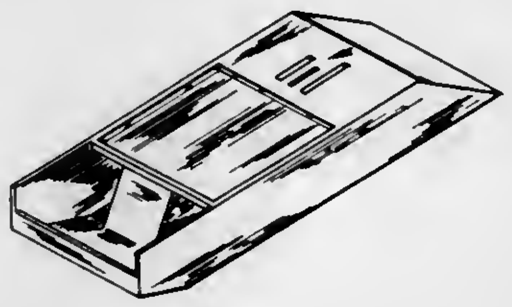
U.S. Cl. D48—32 R



248,692
COIN ACCEPTOR OR SIMILAR ARTICLE

Henry Charles Kovar, Anoka, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Dec. 5, 1975, Ser. No. 638,025
Term of patent 14 years
Int. Cl. D20—*01*

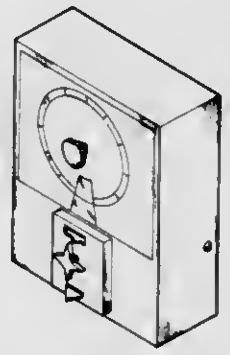
U.S. Cl. D52—3 R



248,693
VENDING MACHINE

Richard W. Housman, 3416 Manning Ave., Los Angeles, Calif. 90064
Filed Aug. 12, 1976, Ser. No. 713,944
Term of patent 14 years
Int. Cl. D20—*01*

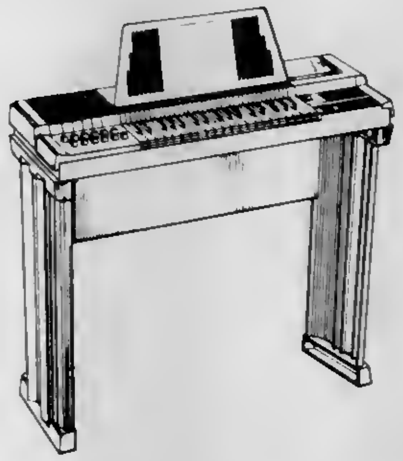
U.S. Cl. D52—3 R



248,694
ELECTRIC ORGAN

Marisa Bontempi, Montelupone (Macerata), Italy, assignor to COMUS S.p.A., Potenza Picena (Macerata), Italy
Filed May 4, 1976, Ser. No. 683,154
Claims priority, application Italy, Oct. 2, 1975, 22396-B/75
Term of patent 14 years
Int. Cl. D17—*01*

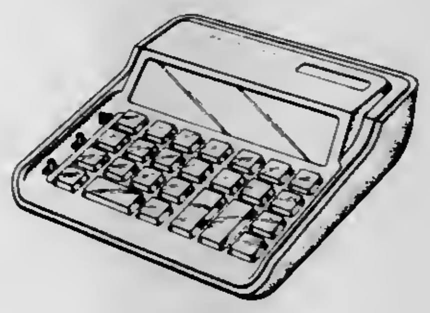
U.S. Cl. D56—2



248,695
ELECTRONIC CALCULATOR

Teisuke Kurosu, Chofu; Eiji Fujita, Yokohama; Hisatoshi Matsushima, Yokohama, and Hiroshi Yonekura, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 26, 1977, Ser. No. 828,116
Claims priority, application Japan, Mar. 15, 1977, 52/9413
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B



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PATENTS WERE ISSUED ON THE 25TH DAY OF JULY, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A-Jer Engineering, Inc.: *See—*
  - Shulman, Abe; and Willing, Jere J., 4,102,367, Cl. 141-231.000.
- A-T-O Inc.: *See—*
  - Puskarz, Stanley J., 4,102,366, Cl. 141-150.000.
- Abar Corporation: *See—*
  - Kreider, Benjamin A.; and Metalsky, William J., 4,102,637, Cl. 432-227.000.
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  - Benson, William Joseph, 4,102,607, Cl. 417-222.000.
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- Abler, Norman Christian, to Bunker Ramo Corporation. Contour shear device for pile fabrics. 4,102,023, Cl. 26-16.000.
- Abrahamsson, Axel B.: *See—*
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- Acosta Mira, Jose E., to Laboratorios Landerlan, S. A. Triterpene derivatives. 4,103,019, Cl. 424-274.000.
- Acuity Systems, Incorporated: *See—*
  - Lapornik, Edward F.; and Rife, Douglas D., 4,102,575, Cl. 356-125.000.
- Adachi, Seya: *See—*
  - Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya, 4,103,278, Cl. 340-1.00R.
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  - Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.
- Adair, Lyles C.: *See—*
  - Dildy, Clell A., Jr.; and Adair, Lyles C., 4,103,279, Cl. 340-3.00D.
- Adam, Erik, to Airco, Inc. Composite monolithic low-loss superconductor for power transmission line. 4,103,075, Cl. 428-614.000.
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  - Bernard, Jean-Paul; and Meningand, Paul Albert, 4,102,518, Cl. 244-110.00C.
- Aeschlimann, Peter: *See—*
  - Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, 4,102,639, Cl. 8-1.00A.
- AGA Navigation Aids Ltd.: *See—*
  - Spottiswoode, Nigel Lawrence; and Ryden, David John, 4,103,172, Cl. 250-462.000.
- Agence Nationale de Valorisation de la Recherche: *See—*
  - Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.
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  - Orthmann, Jurgen, 4,103,159, Cl. 250-315.00R.
- Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., to General Tire & Rubber Company, The. Cast annular laminates and method and apparatus for making same. 4,102,971, Cl. 264-255.000.
- Air Industrie: *See—*
  - Cordier, Andre Guy; and Stockholm, John George, 4,102,303, Cl. 118-326.000.
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  - Bartish, Charles M., 4,102,920, Cl. 260-532.000.
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  - Hart, William A.; and Klinikowski, James J., 4,103,296, Cl. 340-309.100.
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  - Adam, Erik, 4,103,075, Cl. 428-614.000.
  - Vandervelden, C. Keith; and Blake, William P., 4,103,324, Cl. 363-89.000.
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  - Wood, William H., 4,102,440, Cl. 188-72.700.
- Ajax Tool Works, Inc.: *See—*
  - Benedict, Neil W.; and White, Robert J., 4,102,534, Cl. 173-137.000.
- Ajinomoto Co. Inc.: *See—*
  - Kida, Takao; Mizuno, Hiroshi; and Okutsu, Masaru, 4,102,672, Cl. 71-106.000.
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- Aktiebolaget Atomenergi: *See—*
  - Margen, Peter Heinrich Erwin, 4,102,134, Cl. 61-1.00F.
- Aktieselskabet Niro Atomizer: *See—*
  - Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, 4,102,056, Cl. 34-10.000.
- Akzona Incorporated: *See—*
  - Penton, Harold Roy, Jr.; and Wagener, Kenneth Boone, 4,102,867, Cl. 528-289.000.
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- Albarran, Jose F.; and Hamade, Adib R., to National Semiconductor Corporation. Low power JFET switch. 4,103,186, Cl. 307-251.000.
- Albright, Roy H.; and Kelly, Walter B., to Gould Inc. High voltage grounding switch requiring low operating effort. 4,103,122, Cl. 200-48.00P.
- Alcorn, Arnold B., to Warner & Swasey Company, The. Cutting tool. 4,102,591, Cl. 407-100.000.
- Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, to Imperial Chemical Industries Limited. Pharmaceutical compositions. 4,103,023, Cl. 424-279.000.
- Alexander, Andrew, to Aluminum Company of America. Low temperature vapor sealing of anodized aluminum. 4,103,048, Cl. 427-248.00R.
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  - Ihlen, Jacob, 4,102,063, Cl. 36-117.000.
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  - Deverell, Harry E., 4,102,677, Cl. 75-128.00A.
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- Allen, Archelaius Dawson, to Gullick Dobson Limited. Self-advancing mine roof supports. 4,102,140, Cl. 61-45.00D.
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  - Wagner, Eugene R.; and Allen, Bobbie J., 4,103,027, Cl. 424-309.000.
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  - Karakis, Thomas G.; and Klotz, Clayton J., 4,103,136, Cl. 200-302.000.
- Allen, Robert J.: *See—*
  - Petrow, Henry G.; and Allen, Robert J., 4,102,819, Cl. 252-460.000.
- Alles, Hans-Ulrich: *See—*
  - Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.
- Alliance Manufacturing Company, The: *See—*
  - Deming, Andrew F.; and Russell, James B., 4,103,238, Cl. 325-141.000.
- Allied Chemical Corporation: *See—*
  - Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,103,068, Cl. 428-395.000.
- Allis-Chalmers Corporation: *See—*
  - Wristen, Cecil C., 4,103,141, Cl. 219-130.010.
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- Aluminum Company of America: *See—*
  - Alexander, Andrew, 4,103,048, Cl. 427-248.00R.
- Amakata, Hajime: *See—*
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  - Copping, John R.; and Foerstner, Richard A., 4,102,041, Cl. 29-600.000.
- Amberg, Stephen W.; and Spicer, John F., to Owens-Illinois, Inc. Adhesive applicator device. 4,102,302, Cl. 118-239.000.

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- Amchem Products, Inc.: *See—*
  - Nishida, Takao; and Tonoike, Kiyoshi, 4,103,049, Cl. 427-341.000.
- Amerace Corporation: *See—*
  - Goldberg, Bruce S., 4,102,746, Cl. 195-63.000.
  - Johnson, Glenn W., Jr.; and Lindlau, Paul F., 4,102,286, Cl. 113-119.000.
- Amerada Hess Corporation: *See—*
  - Young, Richard W., 4,102,789, Cl. 210-252.0AS.
- American Can Company: *See—*
  - Meyers, George Leroy, 4,102,457, Cl. 206-611.000.
- American Chemical and Refining Company Incorporated: *See—*
  - Moriarty, William L.; and Zobbi, Robert G., 4,102,770, Cl. 204-195.00R.
- American Communication Systems, Inc.: *See—*
  - Milkes, Paul, 4,103,115, Cl. 179-90.00B.
- American Cyanamid Company: *See—*
  - Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,103,028, Cl. 424-315.000.
  - Conrow, Ransom Brown; and Bernstein, Seymour, 4,102,917, Cl. 260-506.000.
  - Dzurik, John A., 4,102,738, Cl. 162-117.000.
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- American Hoist & Derrick Company: *See—*
  - Crook, Edward J., Jr.; and Garrett, Charles R., 4,102,295, Cl. 116-114.00R.
  - Thompson, Wallace M.; and Beeland, William D., 4,102,259, Cl. 100-3.000.
- American Hospital Supply Corporation: *See—*
  - Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., 4,102,747, Cl. 195-103.50C.
- American Optical Corporation: *See—*
  - Cannon, Robert Lee, III, 4,102,345, Cl. 128-419.0PT.
  - Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., 4,102,567, Cl. 351-160.000.
- Ammons, Vernon G., to PPG Industries, Inc. Safety glass laminates with aliphatic/cycloaliphatic polycarbonate urethanes. 4,103,070, Cl. 428-412.000.
- Amortegui, Carlos. Force transmitting means. 4,102,211, Cl. 74-66.000.
- Anderka, Gerold, to Koh-I-Noor Rapidograph, Inc. Capillary tube pen point. 4,102,584, Cl. 401-259.000.
- Anders, Edward O., to Global Marine, Inc. Method and apparatus for protecting offshore structures against forces from moving ice sheets. 4,102,144, Cl. 61-103.000.
- Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., to GTE Automatic Electric Laboratories Incorporated. Dual coil hinged bobbin assembly. 4,103,268, Cl. 336-208.000.
- Anderson, Antony Faithfull, to Reyrolle Parsons Limited. Voltage generators. 4,103,194, Cl. 310-68.00D.
- Anderson, James Hilbert. Multiple well dual fluid geothermal power cycle. 4,102,133, Cl. 60-641.000.
- Anderson, James Ralph. Roll holder means. 4,102,510, Cl. 242-55.200.
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- Andre, William L., to United States of America, Army. Counting device impulse activator with torque limiter. 4,102,074, Cl. 42-1.00E.
- Andros, Incorporated: *See—*
  - McClatchie, Edward A.; Watson, Dean A.; and Burough, Irvin G., 4,103,174, Cl. 250-493.000.
- Angarola, Barry R.: *See—*
  - Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., 4,102,364, Cl. 141-4.000.
- Angelo, Peter Aage Rorby; Klingest, Ole; and Schwarzbach, Christian, to Aktieselskabet Niro Atomizer. Method and apparatus for introducing a particulate or pulverulent material into a flow of gas. 4,102,056, Cl. 34-10.000.
- Anglin, Noah L.; and Berry, Robert H., to Information Terminals Corporation. Tensioning means for belt driven tape cassette. 4,102,516, Cl. 242-199.000.
- Anguish, Jerry Lee, to Butler Ventamatic Corp. Roof flange for horizontal pipes. 4,102,090, Cl. 52-58.000.
- Annas, Dulin Land, Sr., to Speizman Industries, Inc. Apparatus for handling stockings. 4,102,729, Cl. 156-384.000.
- Annen, Klaus: *See—*
  - Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, 4,102,908, Cl. 260-397.400.
- Antlfinger, George John; and Seletzky, Peter Dresel, to B. F. Goodrich Company, The. Heat sensitive latices. 4,102,841, Cl. 260-29.60N.
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  - Murai, Hiromu; Ohata, Katsuya; Aoyagi, Yoshiaki; Ueda, Fusao; Kitano, Masahiko; and Tada, Shinichi, 4,103,009, Cl. 424-249.000.
- Apfelbaum, Jerome G.: *See—*
  - John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., 4,102,256, Cl. 99-372.000.
- Arai, Haruhiko: *See—*
  - Minegishi, Yutaka; and Arai, Haruhiko, 4,102,795, Cl. 252-8.900.
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  - Caswell, Bruce F., 4,102,968, Cl. 264-117.000.
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  - Straka, Daniel Charles, 4,102,808, Cl. 252-354.000.
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  - Friedman, Ronald L., deceased; and Lewis, Roger N., 4,102,815, Cl. 252-426.000.
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,102,858, Cl. 260-45.80N.
- Arita, Yasunobu: *See—*
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- Ariyan, Zaven S.: *See—*
  - Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,103,016, Cl. 424-270.000.
- Armco Steel Corporation: *See—*
  - Taylor, Donald M.; and Ward, Donald H., 4,102,105, Cl. 52-520.000.
- Armstrong, Douglas, to Coulter Electronics, Inc. Stabilized hematological reagent solutions. 4,102,810, Cl. 252-408.00R.
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  - Sterne, Jean-Jacques, 4,103,010, Cl. 424-250.000.
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  - Brock, James Donald; and Mize, Erbie Gail, 4,103,350, Cl. 366-22.000.
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- Auriemma, Robert Sinbad. Underground drainage pipe. 4,102,135, Cl. 61-10.000.
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- Avon Products, Inc.: *See—*
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  - Antlfinger, George John; and Seletzky, Peter Dresel, 4,102,841, Cl. 260-29.60N.

  - Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, 4,102,935, Cl. 260-656.00R.
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- Barbush, Joseph F., to Taradash, Allen. Theft prevention apparatus for a motor vehicle. 4,102,164, Cl. 70-241.000.
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- Baumann, Friedrich; and Ulrich, Max Bernhard. Hip-joint prosthesis. 4,101,985, Cl. 3-1.912.
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  - Schliebs, Reinhard; and Block, Hans-Dieter, 4,102,949, Cl. 260-985.000.
  - Scholl, Hans-Joachim; Markusch, Peter; and Dieterich, Dieter, 4,102,699, Cl. 106-84.000.
  - Schwinum, Ernst; Hornig, Heinz; and Matner, Martin, 4,102,844, Cl. 260-29.70T.
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- Benson, William Joseph, to Abex Corporation. Fluid energy translating device. 4,102,607, Cl. 417-222.000.
- Bentley, John; and Thompson, Morice William, to Imperial Chemical Industries Limited. Stable dispersions of polymer particles containing

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- Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, to Ciba-Geigy Corporation. Plaster compositions containing oxo-polycarboxylic acids as a set retarder. 4,102,701, Cl. 106-111.000.
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  - Matsumura, Isao; Kuwayama, Takeshi; and Kohayakawa, Yoshimi, 4,102,563, Cl. 351-7.000.
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- Carman, Edward W. Golf sand-trap smoothing implement. 4,102,405, Cl. 172-378.000.
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- Caron, LaVerne A., to Chrysler Corporation. Electronic circuit for use in a variety of engine control systems. 4,102,310, Cl. 123-117.00R.
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- Carr, Dennis James, to General Electric Company. Process to prepare polyhalodiphenyl carbonates. 4,102,912, Cl. 260-463.000.
- Carr, John B., to Shell Oil Company. Method of lowering blood lipid levels in mammals. 4,103,021, Cl. 424-278.000.
- Carr, John M., to Duncan Electric Company, Inc. Laser beam shutter and beam indicator. 4,103,261, Cl. 332-7.510.
- Carr, Norman L.; and McGinnis, Edgar L., to Gulf Research & Development Company. Separation of solids from coal liquids using an additive. 4,102,774, Cl. 208-8.000.
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  - Greever, James E.; and Schafer, James P., 4,102,027, Cl. 29-157.3AH.
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  - Maes, Richard J., 4,102,129, Cl. 60-403.000.
  - Marsden, Howard A.; and Haak, Willard J., 4,102,425, Cl. 180-66.00F.
  - Pinkham, Herbert G., 4,102,723, Cl. 156-120.000.
  - Schexnayder, Lawrence F., 4,102,250, Cl. 91-412.000.
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- Chen, Robert H. K.: *See—*
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- Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, to Institut Francais du Petrole des Carburants et Lubrifiants. Device for emitting acoustic waves in a liquid medium. 4,103,280, Cl. 340-12.00R.
- Chomes, Harry. Protective membrane flashing. 4,103,061, Cl. 428-247.000.
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  - Kramer, Daniel; Kramer, Israel; Kramer, Harold; Board, Lawrence; Chopra, Ram; and Micai, William, 4,102,151, Cl. 62-278.000.
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- Christensen, Burton G.: *See—*
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- Christenson, James Gordon, to Hoffmann-La Roche Inc. Radioimmunoassay for benzoylecgonine. 4,102,979, Cl. 424-1.000.
- Christenson, Roger M.: *See—*
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- Christiansson, Per Lennart, to Telub AB. Device for measuring loads, especially transient loads. 4,102,422, Cl. 177-210.00C.
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- Chromie, Edsel. Solar tracking system. 4,103,151, Cl. 250-203.00R.
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  - Garner, Robert; and Dunnenberger, Max, 4,102,893, Cl. 260-326.14R.
  - Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, 4,102,368, Cl. 141-250.000.
- Ciba-Geigy Corporation: *See—*
  - Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, 4,102,701, Cl. 106-111.000.
  - Falk, Robert A., 4,102,916, Cl. 260-501.120.
  - Farooq, Saleem, 4,103,032, Cl. 424-341.000.
  - Foery, Werner; and Fischer, Hans Peter, 4,102,668, Cl. 71-90.000.
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  - Hofmann, Peter; Muller, Helmut; and Rody, Jean, 4,102,870, Cl. 528-73.000.
  - Loeffler, Herbert H., 4,102,476, Cl. 222-209.000.
  - Pusch, Gunter, 4,102,840, Cl. 260-29.40R.
  - Seitz, Karl, 4,102,880, Cl. 260-156.000.
  - Zenhausern, Anton; Reber, Otto; and Aeschlimano, Peter, 4,102,639, Cl. 8-1.00A.
  - Zurbuchen, Jacques; and Dussy, Paul, 4,102,640, Cl. 8-73.000.
- Cicatelli, Rodolfo, to Autovox S.p.A. Tape driving apparatus for tape play-back and/or recording devices. 4,102,517, Cl. 242-201.000.
- Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., to Xerox Corporation. Self-diagnostic method and apparatus for disk drive. 4,103,338, Cl. 364-900.000.
- Clack, Frederick Argles, Jr., to United Technologies Corporation. Hinged door quick release. 4,102,011, Cl. 16-149.000.
- Clad Metals, Inc.: *See—*
  - Ulam, John B., 4,103,076, Cl. 428-653.000.
- Clapp, Roger E., to Epp Corp. Non-impact printer with magnetic ink reorientation. 4,103,306, Cl. 346-153.000.
- Clardy, Edwin K.: *See—*
  - Sanford, Richard A.; and Clardy, Edwin K., 4,103,177, Cl. 250-562.000.
- Clark, George Winfred, III: *See—*
  - Mitscher, Lester Allen; Clark, George Winfred, III; and Bokelman, Gordon Herman, 4,103,091, Cl. 560-106.000.
- Clark, Malcolm D. Positional sensor-operator system. 4,103,155, Cl. 250-231.0SE.
- Clark, William E.: *See—*
  - Coleman, Milton H.; and Clark, William E., 4,102,494, Cl. 236-1.00B.
- Clark, William H.: *See—*
  - Burnham, Fred E.; and Clark, William H., 4,103,304, Cl. 343-113.00R.
- Clarke, John W.; and Miller, Galer J., to Eli Lilly and Company. Mixing vial. 4,102,451, Cl. 206-219.000.
- Clarkson, Owen: *See—*
  - Chapman, Christopher P.; and Clarkson, Owen, 4,102,450, Cl. 198-774.000.
- Claverie, Andre, to E.F.S.I. Establissements pour la Fabrication de Specialites Industrielles. Refractory compositions with ceramic and hydraulic setting. 4,102,695, Cl. 106-64.000.
- Clay, Robert B.: *See—*
  - Cook, Merrill A.; and Clay, Robert B., 4,102,240, Cl. 86-20.00C.
- Clayton, John Peter: *See—*
  - Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,901, Cl. 260-345.80R.
  - Luk, Kong; Clayton, John Peter; and Rogers, Norman Harold, 4,102,904, Cl. 260-345.70R.
- Clement, Jean-Claude: *See—*
  - Sturtz, Georges L.; Lecolier, Serge L.; Clemeot, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.
- Clopay Corporation: *See—*
  - Gossling, Robert C.; and Miller, Gerald W., 4,102,384, Cl. 160-263.000.
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- Clouse, Robert C.; and Asperger, Robert G., to Dow Chemical Company, The. Inhibitor for gas conditioning solutions. 4,102,804, Cl. 252-189.000.
- Cluett, Peabody & Co., Inc.: *See—*
  - Rockerath, John L.; and Blum, John H., 4,102,283, Cl. 112-131.000.
- Clunis, Kenneth, to Minnesota Mining and Manufacturing Company. Phonograph pickup device. 4,102,536, Cl. 274-23.00R.
- Coale, Geneva N., executrix: *See—*
  - Coale, Harold D., deceased, 4,102,954, Cl. 264-24.000.
- Coale, Harold D., deceased (by Coale, Geneva N., executrix), to Phillips Petroleum Company. Casting of PPS film. 4,102,954, Cl. 264-24.000.
- Coates Brothers & Co., Ltd.: *See—*
  - Johnson, Norman Walter, 4,102,836, Cl. 260-22.0TN.
- Cobe Laboratories, Inc.: *See—*
  - Jeffery, Russell L.; and Cote, Lawrence V., 4,102,655, Cl. 55-201.000.
- Cody, David L., to Symons Corporation. Leg brace assembly for adjustable shoring apparatus. 4,102,096, Cl. 52-122.000.
- Cody, David L., to Symons Corporation. Fastening means for a load-bearing structure. 4,102,108, Cl. 52-693.000.
- Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing asymmetric induction. 4,102,925, Cl. 260-570.600.
- Cohnen, Wolfgang: *See—*
  - Eimers, Erich; Dheim, Rolf; and Cohnen, Wolfgang, 4,102,859, Cl. 260-45.80A.
- Cohrs, Gary D., to Flow Technology, Inc. Turbine flowmeter with overspeed protection. 4,102,189, Cl. 73-230.000.
- Cole, Edward L.: *See—*
  - Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,102,749, Cl. 201-2.500.
- Cole, Lucille J.: *See—*
  - Putter, Irving; and Cole, Lucille J., 4,102,997, Cl. 424-115.000.
- Cole-Parmer Instrument Company: *See—*
  - Nemcek, Donald Stephen, Sr., 4,103,231, Cl. 324-123.00R.
- Coleman, Milton H.; and Clark, William E., to Carrier Corporation. Air distribution system. 4,102,494, Cl. 236-1.00B.
- Colgate-Palmolive Company: *See—*
  - Bauman, Robert Andrew, 4,102,994, Cl. 424-54.000.
  - Finck, Patricia A., 4,102,799, Cl. 252-99.000.
  - Gaffar, Abdul, 4,102,993, Cl. 424-54.000.
  - Renaud, Jean, 4,102,826, Cl. 252-548.000.
- Collbrunn, Harald; Breitinger, Hermann; and Diekmann, Herbert, to Durkoppwerke GmbH. Workpiece guide device for sewing machines. 4,102,281, Cl. 112-121.260.
- Collins, William J. Device and method for suppressing active slag. 4,102,680, Cl. 75-257.000.
- Colortronic Co., Ltd.: *See—*
  - Noguchi, Haruo; and Reinhard, Max, 4,103,357, Cl. 366-152.000.
- Colortronic Reinhard & Co., KG: *See—*
  - Noguchi, Haruo; and Reinhard, Max, 4,103,357, Cl. 366-152.000.

Colpaert, James J., to Bendix Corporation, The. Drum brake. 4,102,442, Cl. 188-206.00A.

Colwell, Stephen Earl. Removable rifle sight. 4,102,053, Cl. 33-233.000.

Combustion Engineering, Inc.: *See—*

Mehta, Arun Kumar, 4,102,657, Cl. 55-222.000.

Commissariat a l'Energie Atomique: *See—*

Perdijon, Jean, 4,102,206, Cl. 73-644.000.

Commonwealth Scientific and Industrial Research Organization: *See—*

Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, 4,102,608, Cl. 417-242.000.

Communications Satellite Corporation: *See—*

Jacobus, Nelson Mortimer, Jr., 4,103,180, Cl. 307-141.000.

Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See—*

Dalmasso, Ginette, 4,103,328, Cl. 364-200.000.

Compressor Controls Corporation: *See—*

Rutshtein, Alexander; and Staroselsky, Naum, 4,102,604, Cl. 417-19.000.

Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., to Westinghouse Electric Corp. Variable capacity multiple compressor refrigeration system. 4,102,149, Cl. 62-196.00A.

Conrow, Ransom Brown; and Bernstein, Seymour, to American Cyanamid Company. Substituted phenyl naphthalenesulfonic acids. 4,102,917, Cl. 260-506.000.

Container Corporation of America: *See—*

Kipp, Michael A.; and Walter, Richard T., 4,102,484, Cl. 229-16.00A.

Continental Disc Corporation: *See—*

Shegrud, Donald M.; and Shaw, Kenneth R., 4,102,469, Cl. 220-89.00A.

Continental Group, Inc., The: *See—*

Boni, Kenneth A., 4,102,974, Cl. 264-294.000.

Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, 4,102,350, Cl. 134-130.000.

Control Devices, Inc.: *See—*

Flynn, M. Rutledge; and Schultz, Raymond P., 4,102,495, Cl. 236-46.00R.

Conway, Christopher J.; and Glover, Eugene G., to Mentor Corporation. Stimulator apparatus for internal body organ. 4,102,344, Cl. 128-419.00E.

Cook, David M.; and Gustafson, Douglas C., to Dow Chemical Company, The. Process for preparing sulfuryl-fluoride and -chlorofluoride products. 4,102,987, Cl. 423-466.000.

Cook, Edward J., to Safety Research & Engineering Corporation. Acoustical tire pressure valve. 4,103,282, Cl. 340-58.000.

Cook, Martin Christopher: *See—*

Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.

Cook, Merrill A.; and Clay, Robert B. Blasting slurry pump truck. 4,102,240, Cl. 86-20.00C.

Cooper, Glenn Dale; and Katchman, Arthur, to General Electric Company. High impact polyphenylene ether resin compositions containing mineral oil. 4,102,850, Cl. 260-33.6AQ.

Copping, John R.; and Foerstner, Richard A., to Amana Refrigeration, Inc. Method of making microwave oven seal structure. 4,102,041, Cl. 29-600.000.

Cordier, Andre Guy; and Stockholm, John George, to Air Industrie. Process and paint spray booth using a washing liquid and reuse thereof. 4,102,303, Cl. 118-326.000.

Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, to Ruhrchemie Aktiengesellschaft. Process for the continuous manufacture of α-cyano-ethylated alipbatic aldehydes. 4,102,913, Cl. 260-465.100.

Corning Glass Works: *See—*

Dumbaugh, William H., Jr., 4,102,664, Cl. 65-23.000.

Hawk, Robert M.; and Thiel, Frank L., 4,102,561, Cl. 350-96.210.

Mizzoni, Mary S.; and Reade, Richard F., 4,102,805, Cl. 252-301.40F.

Corona, Peter J., to Windsurfing International, Inc. Rotational molding apparatus. 4,102,624, Cl. 425-429.000.

Corrugated Products GmbH: *See—*

Mosse, Richard Wolfgang, 4,102,725, Cl. 156-200.000.

Costello, Michael. Burglarproof guard for window lock. 4,102,546, Cl. 292-346.000.

Cote, Lawrence V.: *See—*

Jeffery, Russell L.; and Cote, Lawrence V., 4,102,655, Cl. 55-201.000.

Coulter Electronics, Inc.: *See—*

Armstrong, Douglas, 4,102,810, Cl. 252-408.00R.

Courtaulds Limited: *See—*

Robinson, Frank; and Whatmough, Nigel Stephen, 4,102,155, Cl. 66-176.000.

Cousins, James R., to Hallmor, Inc. Door frame truing apparatus. 4,102,245, Cl. 90-12.00R.

Couston, Frederick Robert; and Bannock, Roy Robert, to Bell & Howell Limited. Pressure transducers. 4,102,210, Cl. 73-727.000.

Coutin, Pierre Fernand: *See—*

Hasquenoph, Jean H.; and Coutin, Pierre Fernand, 4,102,520, Cl. 244-137.00R.

Covault, Darrell W. Heat exchange device for air conditioners. 4,102,152, Cl. 62-428.000.

Coyle, Maurice J. Hand-held compressor for use by radiologist. 4,103,176, Cl. 250-516.000.

Cragoe, Edward J., Jr.: *See—*

Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., 4,102,888, Cl. 260-294.80D.

Crain, N. Robert; Romance, Joseph S.; and Richert, Carson T., to Radiant Technology Corporation. Hazard prevention circuit for immersion heaters. 4,103,319, Cl. 361-106.000.

Crall, Frederick William; Tomczak, Lawrence William; and Caron, LaVerne Andrew, to Chrysler Corporation. Circuit for generating a sawtooth engine crank angle signal and an analog engine speed signal. 4,102,311, Cl. 123-117.00R.

Crandall, Walter E.: *See—*

Bahraman, Ali; and Crandall, Walter E., 4,103,111, Cl. 179-15.00A.

Cratty, Charles J., to Astro Development Corporation. Transporter and loading box for concrete mixer. 4,103,352, Cl. 366-39.000.

Crawley, Graham Charles: *See—*

Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, 4,103,023, Cl. 424-279.000.

Credelle, Thomas Lloyd, to RCA Corporation. Flat display device with beam guide. 4,103,204, Cl. 313-422.000.

Credelle, Thomas Lloyd, to RCA Corporation. Flat display device with beam guide. 4,103,205, Cl. 313-422.000.

Cremer, Gottfried. Method for the production of large-size densely sintered ceramic plates with a low wall thickness. 4,102,961, Cl. 264-57.000.

Cremona, Angelo. Device to fix the wood-stock with hooks of different length and for remote controlled extension or retraction of said hooks from or in the vertical or almost vertical supporting table of a veneer slicing machine. 4,102,372, Cl. 144-178.000.

Crenshaw, Ronnie Ray; Luke, George Michael; and Partyka, Richard Anthony, to Bristol-Myers Company. Process for preparing 2,4-dihaloquinazolines. 4,102,885, Cl. 544-283.000.

Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., to Dow Chemical Company, The. Method of controlling fluid loss from thixotropic cement. 4,102,400, Cl. 166-283.000.

Cripe, Gerald Edwin. Combined log skidder and loader. 4,102,528, Cl. 254-139.100.

Crisp, David, to Rizla Limited. Floating wick holder. 4,102,634, Cl. 431-298.000.

Crivello, James V., to General Electric Company. UV Curable composition of a thermosetting condensation resin and Group VIa onium salt. 4,102,687, Cl. 96-115.00R.

Crochemore, Michel; and Gay, Michel, to Rhone-Poulenc Industries. Stabilization of vinyl chloride polymers. 4,102,839, Cl. 260-23.0XA.

Crook, Edward J., Jr.; and Garrett, Charles R., to American Hoist & Derrick Company. Load indicating apparatus. 4,102,295, Cl. 116-114.00R.

Crooks, Walter: *See—*

Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, 4,103,066, Cl. 428-337.000.

Crosby, Edward L., Jr., to United States of America, Air Force. Variable lift inflatable airfoil for tethered balloons. 4,102,519, Cl. 244-125.000.

Crounse, Nathan N.: *See—*

Jefferies, Patrick J.; and Crounse, Nathan N., 4,103,092, Cl. 260-175.000.

Crutchfield, Marvin M.; and Upton, Charles J., to Monsanto Company. Tetrahydropyran and 1,4-dioxane polycarboxylate compounds, methods for making such compounds and compositions and methods employing same. 4,102,903, Cl. 260-345.70R.

Cruz, Herbert, to Raymond Lee Organization, Inc., The. Washing machine. 4,102,159, Cl. 68-132.000.

Csanady, Elmer R.: *See—*

Johnson, Craig E.; Dendor, Paul F.; and Csanady, Elmer R., 4,102,953, Cl. 264-3.00B.

Cser, Gyula; Mizser, Geza; Rausnitz, Peter; and Szekely, Zoltan, to Autoipari Kutato Intezet. Procedure for determining the starting point of fuel injection especially for running internal-combustion engines. 4,102,181, Cl. 73-119.00A.

Cseri, Zoltan, to United States Gypsum Company. Pipe anchor bracket. 4,102,524, Cl. 248-56.000.

Cuffe, Patricia M.; LeBoeuf, Albert R.; and Travnicek, Edward A., to American Optical Corporation. Material for fabrication of artificial intraocular lenses and hard contact lenses. 4,102,567, Cl. 351-160.000.

Cummings, Richard D., to Daystar Corporation. Temperature control in solar-to-thermal energy converters. 4,102,325, Cl. 126-270.000.

Cunningham, Andrew J.: *See—*

Tuffile, Fred M.; and Cunningham, Andrew J., 4,102,641, Cl. 8-10.100.

Cunningham, Wesley B. Drilling device. 4,102,415, Cl. 175-96.000.

Cuntze, Ulrich; Dollinger, Gustav; Kleber, Rolf; and Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Heat-resistant fiber conditioning agents. 4,102,793, Cl. 252-8.100.

Currie, Matthew Porter, to Currie, Matthew Porter; and Malarkey, John Victor, part interest to each. Frame member. 4,102,104, Cl. 52-494.000.

Currie, Richard Kenneth, to Blaser, Anton J. Optical encoder assembly and centering fixture. 4,102,028, Cl. 29-281.500.

Curtis & Marble Corporation: *See—*

Rose, Henry B., 4,102,112, Cl. 53-228.000.

Cusick, Richard D.; and Wall, Larry W., to Kansas Stall Company, Inc. Portable livestock stall. 4,102,307, Cl. 119-16.000.

Cutler-Hammer, Inc.: *See—*

Hults, Harold W.; and Halbeck, Werner B., 4,103,127, Cl. 200-67.00G.

Swinehart, Merle R., 4,103,299, Cl. 340-506.000.

Dahlstrand, Josef, Jr. Torque disconnect safety coupling. 4,102,154, Cl. 64-29.000.

Daicel Ltd.: *See—*

Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.

Daigle, Donald J.: *See—*

Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., 4,102,923, Cl. 260-553.00R.

Dainippon Pharmaceutical Co., Ltd.: *See—*

Minami, Shinsaku; and Takase, Yoshiyuki, 4,103,011, Cl. 424-251.000.

Dallas, Charles M. Washer. 4,102,239, Cl. 85-50.00R.

Dalmasso, Ginette, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Control apparatus for controlling data flow between a control processing unit and peripheral devices. 4,103,328, Cl. 364-200.000.

Daly, Robert E.: *See—*

Gacki, Leonard W.; and Daly, Robert E., 4,103,358, Cl. 366-153.000.

D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, to Motorola, Inc. Paging encoder system utilizing a telephone line link. 4,103,107, Cl. 179-2.0EC.

Dancy, Edna A., to Sidbec-Dosco Ltee. Self-healing thermocouple. 4,102,708, Cl. 136-233.000.

Danguillier, Wilhelm: *See—*

Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.

Danielmeyer, Hans-Gunter; and Hartmann, Werner, to Max Planck Gesellschaft zur Forderung der Wissenschaften e. V. Fluorescent screen. 4,103,173, Cl. 250-483.000.

Danszky, Istvan; and Szecska, Dezso, to Erdeszeti Tudomanyos Intezet. Reforestation tillage mechanism. 4,102,407, Cl. 172-611.000.

D'Arcy, James A. Automatic page turning apparatus. 4,102,071, Cl. 40-531.000.

Dardoufas, Kimon Constantine: *See—*

Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,103,068, Cl. 428-395.000.

Da Re, Cipriano, to Canfarge LTD (Francon Division). Apparatus and method for manufacturing prestressed concrete railway ties. 4,102,957, Cl. 264-39.000.

Daskin, Robin: *See—*

Weinberger, Lester; and Daskin, Robin, 4,102,686, Cl. 96-91.00R.

Dataproducts Corporation: *See—*

Guarderas, Fernando V.; and Leon, Luis, 4,102,268, Cl. 101-399.000.

Datascope Corporation: *See—*

Grayzel, Joseph; and Terrell, William, 4,102,331, Cl. 128-2.10E.

Datta, Amitava: *See—*

Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, 4,102,713, Cl. 148-113.000.

d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, to Thomson-CSF. Electro-optical branching device and method of manufacturing the same. 4,103,154, Cl. 250-227.000.

David, Agoston: *See—*

Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.

David, Curt Ludwig: *See—*

Phillips, James Hugh; David, Curt Ludwig; and Rogers, Michael James, 4,103,222, Cl. 324-207.000.

Davies, John H.; Wood, Jack; and Pearson, Michael, to Shell Oil Company. Pesticidal 2-iminothiazoline derivatives. 4,103,017, Cl. 424-270.000.

Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, to International Business Machines Corporation. Data processing system with improved bit field handling. 4,103,329, Cl. 364-200.000.

Davis, Neil M.: *See—*

Wieder, Herman H.; and Davis, Neil M., 4,102,574, Cl. 356-117.000.

Davis, Ronald Percival, to Interlock Industries Limited. Sliding and swinging window stays. 4,102,012, Cl. 16-179.000.

Davis, Walter Bryan, to Beecham Group Limited. Dentifrice. 4,102,992, Cl. 424-49.000.

Davison, Sol: *See—*

Gergen, William P.; and Davison, Sol, 4,102,854, Cl. 260-42.180.

DAVY POWERGAS GmbH: *See—*

Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, 4,102,651, Cl. 23-277.00R.

Dawson, David: *See—*

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Day, William A.: *See—*

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Dayal, Yogeshwar: *See—*

Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.

Dayco Corporation: *See—*

Hopkins, Carl E., 4,102,360, Cl. 138-127.000.

Daystar Corporation: *See—*

Cummings, Richard D., 4,102,325, Cl. 126-270.000.

De La Moneda, Francisco H.; and Kotecha, Harish N., to International Business Machines Corporation. Two and three mask process for IGFET fabrication. 4,102,733, Cl. 156-653.000.

De La Moneda, Francisco H.: *See—*

DeBar, David E.; and De La Moneda, Francisco H., 4,102,714, Cl. 148-187.000.

de la Roche Kerandraon, Olivier Geoffroy, to Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.". Device for propelling ships. 4,102,293, Cl. 115-28.00R.

DeBar, David E.; and De La Moneda, Francisco H., to International Business Machines Corporation. Process for fabricating a low breakdown voltage device for polysilicon gate technology. 4,102,714, Cl. 148-187.000.

Debenham, Michael, to Broken Hill Proprietary Company, Limited, The. Apparatus for application of sealant. 4,102,304, Cl. 118-421.000.

Deborde, Albert Henri, to Saurer Diederichs (Societe Aoonyme). Needles for shuttle-less looms. 4,102,363, Cl. 139-449.000.

Deem, Mary Lease, to Union Carbide Corporation. Aldol reactions catalyzed by alkylene oxide-salt complexes. 4,102,930, Cl. 260-593.00R.

Deere & Company: *See—*

Fox, Robert Eugene; and Reece, Wendell Dale, 4,102,540, Cl. 280-5.00H.

Stover, David Emmert; and Menzel, Alvin Lewis, 4,102,153, Cl. 64-28.00R.

Deetz, David R., to Xerox Corporation. Hammer driver controller for impact printers. 4,102,265, Cl. 101-93.030.

Deex, Oliver D.; and Weiss, Virgil W., to Monsanto Company. Polyesters of 1,2-bis(hydroxyphenyl) ethanes and aromatic dicarboxylic acids. 4,102,864, Cl. 528-173.000.

De Gelder, Jacob; Hill, William Harvey; and Englhard, Ronald F., to Leisure Group, The. Deflector assembly for a spray gun. 4,102,501, Cl. 239-511.000.

Deggendorfer Werft und Eisenbau GmbH: *See—*

Vogl, Rudolf, 4,102,652, Cl. 23-288.00M.

DeLaTorre, Pearline; and Beers, Melvin D., to General Electric Company. Self-extinguishing room temperature vulcanizable silicone rubber compositions. 4,102,852, Cl. 260-37.0SB.

Delaunois, Yvon: *See—*

Peerts, Fernand; and Delaunois, Yvon, 4,102,874, Cl. 528-387.000.

Deliere, Jean: *See—*

Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.

Dellorfano, Fred M., Jr.: *See—*

Massa, Frank, 4,103,309, Cl. 354-25.000.

Del Sarto, Franco, to Inox Industria E. Comercio de Aco S/A. Pulp refining disk. 4,102,505, Cl. 241-297.000.

DeMasi, Ralph G. Stripper bar for rolling pin. 4,102,026, Cl. 29-110.500.

Demchenko, Taras Filippovich: *See—*

Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Deming, Andrew F.; and Russell, James B., to Alliance Manufacturing Company, The. Transmitter modulated with three modulation patterns. 4,103,238, Cl. 325-141.000.

Dendor, Paul F.: *See—*

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Fanberg, Victor Vincent. Depth key set. 4,102,247, Cl. 90-62.00R.
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Farese, Frank: *See—*
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  Balkau, Guenter Karl Willi; Bez, Eckhard; and Farrant, John Lascelles, 4,102,608, Cl. 417-242.000.
Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Electromagnetic sensor and memory device. 4,103,340, Cl. 365-97.000.
Feary, Steven L.; and Boesel, Bradley W., to Carriers Securement Systems, Inc. Cylindrical cargo securement apparatus and method therefore. 4,102,274, Cl. 105-367.000.
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  Cornils, Boy; Feichtinger, Hans; Nollen, Willi; and Payer, Wolfgang, 4,102,913, Cl. 260-465.100.
Feinberg, Emanuel, to Paragon Resources, Inc. Exhaust stack damper control. 4,102,629, Cl. 431-20.000.
Felix, Harold E. Marine safety signal device. 4,102,296, Cl. 116-124.00B.
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Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, to Westinghouse Electric Corp. Arc heater production of silicon involving alkali or alkaline-earth metals. 4,102,765, Cl. 204-164.000.
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Finck, Patricia A., to Colgate-Palmolive Company. Automatic dishwasher detergent with improved effects on overglaze. 4,102,799, Cl. 252-99.000.
Finger, Richard H.; and Michel, Thomas J., to Klykon, Inc. Ion projector head. 4,103,202, Cl. 313-336.000.
Finlay, John Reid, to Northern Telecom Limited. Synchronized push-pull inverter. 4,103,356, Cl. 363-22.000.
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  Bohm, Georg Gustav Anton; and Skutnik, Bolesh J., 4,102,761, Cl. 204-159.200.
  Bouton, Thomas Chester; and Futamura, Shingo, 4,102,849, Cl. 260-33.6AQ.
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Fischer, Laurin G., to International Telephone & Telegraph Corp. Radio jamming system. 4,103,237, Cl. 325-132.000.
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Flaig, Hans; and Assmus, Friedrich, to Gebruder Junghans GmbH. Electronic alarm clock with a servicing arrangement for time adjustment. 4,102,120, Cl. 58-38.00R.
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  Weber, Bernhard Georg; and Flury, Beat, 4,102,339, Cl. 128-92.00E.
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  Knight, Houston W., 4,102,356, Cl. 137-614.060.
  Nack, Michael R.; and Le Tourneau, Gary M., 4,102,111, Cl. 53-182.00R.
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Fors, Henry, to Fors & Forss AB. Device in racks for sales packages and the like. 4,102,458, Cl. 211-4.000.
Forsberg, Robin R. Garbage recycling system. 4,102,263, Cl. 100-74.000.
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Foster Grant Corporation: *See—*
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  MacKinnon, Alan G., 4,102,094, Cl. 52-116.000.
Fournier, Pierre Louis Edmond; and Mayer, Jean Paul, to Produits Chimiques Ugine Kuhlmann. Pigmentary compositions based on esters of resin acids and amino-alcohols. 4,102,704, Cl. 106-288.00Q.
Fox, Adrian Samuel: *See—*
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Fox, Robert Eugene; and Reece, Wendell Dale, to Deere & Company. Tank suspension. 4,102,540, Cl. 280-5.00H.
Fradeneck, Ronald J.; and Biancarelli, Edmund J., to Bethlehem Steel Corporation. Method and apparatus for determining the weight of slag on a bath of molten metal. 4,102,190, Cl. 73-302.000.
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Frank, Amalie Julianna, to Bell Telephone Laboratories, Incorporated. Variable length codes for high quality image encoding. 4,103,287, Cl. 340-146.30H.
Frank, Egon, to Loewe-Opta GmbH. Circuit for the automatic scanning adjustment of a video tape in a video recorder. 4,103,313, Cl. 360-70.000.
Franz, William F.: *See—*
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., to Westinghouse Electric Corp. Apparatus for gauging the texture of a conducting surface. 4,103,226, Cl. 324-61.00R.
Frost, Harold M.; and Szabo, Thomas L., to United States of America, Air Force. Electromagnetic ultrasound transducer. 4,102,207, Cl. 73-643.000.
Fuchs, Henry O., to Metal Improvement Company, Inc. Method and apparatus for measuring intensity of peening of small surfaces. 4,102,176, Cl. 73-12.000.
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Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, to Dynic Corporation; and Kao Soap Co., Ltd. Process for producing artificial leather. 4,102,719, Cl. 156-78.000.
Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Water-insoluble, hydrophilic gels and a method for the preparation of the same. 4,102,842, Cl. 260-29.6PT.
Fujisawa, Makoto: *See—*
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Fukui, Masahiko; Sako, Hiromi; and Ogata, Masao, to Hitachi Metals, Ltd. Inductor with plurality of magnet pieces in air gap. 4,103,221, Cl. 323-92.000.
Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, to Sumitomo Chemical Company, Limited. Low profile unsaturated polyester resin composition. 4,102,944, Cl. 260-861.000.
Fulger, Charles V.; and Morfee, Thomas D., to Kellogg Company. Method for retaining softness in raisins. 4,103,035, Cl. 426-321.000.
Fulker, Mabel H., to Raymond Lee Organization, Inc., The, a part interest. Heart pacemaker monitor, alarm and auxiliary power supply. 4,102,346, Cl. 128-419.0PS.
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Gacki, Leonard W.; and Daly, Robert E., to Picker Corporation. Fluid mixing and dispensing system. 4,103,358, Cl. 366-153.000.
GAF Corporation: *See—*
  Golder, Michael D.; and Bernat, William M., 4,102,106, Cl. 52-533.000.
Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,102,993, Cl. 424-54.000.
Gagnon, Donald W., to Owens-Illinois, Inc. Coated polycarbonates and acrylics. 4,103,065, Cl. 428-336.000.
Gagnon, Real. Damage preventive device for swimming pools. 4,101,987, Cl. 4-172.000.
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Gandini, Giuseppe; and Frignoli, Luigi, to Frignoli, Luigi; Savio, Ermanno; Calamani, Sergio; and Turri, Eugenio. Fireproofing materials. 4,102,794, Cl. 252-8.100.
Gannicott, David James H. Counting and stacking unit. 4,102,253, Cl. 93-93.00C.
Gansert, Willi; and Zipperer, Martin, to Robert Bosch GmbH. Composite electric circuit structure of a printed circuit and heat generating discrete electrical component. 4,103,321, Cl. 361-388.000.
Gardner, Alvin Leonard; and Turley, Barry Jay, to General Electric Company. Dynamic drag arrangement for electrically propelled traction vehicles. 4,103,211, Cl. 318-87.000.
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Garner, Robert; and Dunnenberger, Max, to Ciba-Geigy AG. Process for the manufacture of color formers of indoles and anhydrides of aromatic or heteroaromatic, vicinal dicarboxylic acids, new color formers of these classes of substance and their use. 4,102,893, Cl. 260-326.14R.
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Gasparrini, Luigi. High pressure household coffee machine. 4,102,255, Cl. 99-303.000.

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Gendron, George J.: *See—*
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General Electric Company: *See—*
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Carr, Dennis James, 4,102,912, Cl. 260-463.000.
Cooper, Glenn Dale; and Katchman, Arthur, 4,102,850, Cl. 260-33.6AQ.
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Engeler, William E.; and Goldberg, Howard S., 4,103,343, Cl. 365-183.000.
Gardner, Alvin Leonard; and Turley, Barry Jay, 4,103,211, Cl. 318-87.000.
Hatch, Burton D., 4,102,221, Cl. 74-572.000.
LaRochelle, Ronald W., 4,102,941, Cl. 260-825.000.
Moshy, Frederick A., 4,103,201, Cl. 313-318.000.
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.
Noland, Joseph R.; and McCarty, William M., 4,102,391, Cl. 165-29.000.
Olander, Walter Karl, 4,102,865, Cl. 528-215.000.
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Roeder, Allan W.; Kimball, Richard M.; and Koschmeder, Richard F., 4,103,302, Cl. 343-9.000.
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Torossian, Kevork A.; and Lynn, Alexander L., 4,103,195, Cl. 310-259.000.
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Wendt, Michael E.; and Beaver, Danny D., 4,103,192, Cl. 310-64.000.
Wibbelsman, Robert C., 4,102,595, Cl. 415-1.000.
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Genkina, Elena Vladimirovna: *See—*
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Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.

Gessman, Lawrence J. Remote, telephonic cardiac resuscitation device. 4,102,332, Cl. 128-2.10A.

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Geyer, Manvel A.: *See—*
Kernick, Andress; Ravas, Richard J.; and Geyer, Manvel A., 4,102,436, Cl. 187-29.00R.

Giegel, Joseph L.: *See—*
Driscoll, Richard Cornelius; Gargiulo, Robert James; and Giegel, Joseph L., 4,102,747, Cl. 195-103.50C.

Gillette Company, The: *See—*
Downing, Keith Stanley; and Johnston, Richard, 4,102,046, Cl. 30-346.530.

Gindi, Abraham M.; and Lang, Donald John, to International Business Machines Incorporated. Method and apparatus for allocating bandwidth on a loop system coupling a CPU channel to bulk storage devices. 4,103,336, Cl. 364-900.000.

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Chelton, Raymond G.; Ginther, Elmer C.; and Djordjevic, Mihailo, 4,102,350, Cl. 134-130.000.

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Plumat, Emile; Baudin, Pol; Laethem, Robert Van; and Deliere, Jean, 4,102,665, Cl. 65-30.00E.

Glaxo Laboratories Limited: *See—*
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.

Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., to SmithKline Corporation. 8-Oxo-4-thia-1-azabicyclo (4.2.0)-oct-2-ene derivatives. 4,103,086, Cl. 544-47.000.

Gleave, Edward Roger, to Loctite (Ireland) Limited. Filled cyanoacrylate adhesive compositions. 4,102,945, Cl. 260-879.000.

Glick, Alvin L., to United States of America, Navy. Stabilized delay line oscillator. 4,103,251, Cl. 331-1.00A.

Global Marine, Inc.: *See—*
Anders, Edward O., 4,102,144, Cl. 61-103.000.

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Iizuka, Nobuhiro; and Hatanaka, Yoshihiro, 4,102,110, Cl. 53-59.00R.

Glover, Eugene G.: *See—*
Conway, Christopher J.; and Glover, Eugene G., 4,102,344, Cl. 128-419.00E.

Goetsch, Henry E.: *See—*
Mercik, Henry J., Jr.; and Goetsch, Henry E., 4,102,178, Cl. 73-49.700.

Goff, Paul Frederick; Knight, Bernard William; and Prentice, Kenneth James, to Potterton International Limited. Control apparatus for gas burning appliance. 4,102,628, Cl. 431-43.000.

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Gold, Bernard. Machines for generating motion. 4,102,614, Cl. 418-59.000.

Gold, Joseph; and Farese, Frank, to Valcor Engineering Corp. Universal programmable process control apparatus. 4,102,492, Cl. 235-375.000.

Goldberg, Bruce S., to Amerace Corporation. Immobilized proteins. 4,102,746, Cl. 195-63.000.

Goldberg, Howard S.: *See—*
Engeler, William E.; and Goldberg, Howard S., 4,103,343, Cl. 365-183.000.

Goldberg, Ira B.: *See—*
Pilipovich, Donald; Goldberg, Ira B.; and Wagner, Ross I., 4,102,950, Cl. 423-579.000.

Golder, Michael D.; and Bernat, William M., to GAF Corporation. Siding panel. 4,102,106, Cl. 52-533.000.

Goldman, Robert Ivan. Stackable paint tray. 4,102,468, Cl. 220-69.000.

Golia, Salvatore. Below knee orthosis. 4,102,337, Cl. 128-80.00E.

Gomez, Richard Santiago; and Scray, Eugene James, Jr., to International Business Machines Corporation. Gas operated switches. 4,103,135, Cl. 200-185.000.

Gonzalez, Clemente Del Ser. Stuffing apparatus. 4,102,257, Cl. 99-494.000.

Goodlaxson, John D., to Maytag Company, The. Retaining ring assembly for faucet coupler. 4,102,544, Cl. 285-8.000.

Goodnight, Hershel E.: *See—*
Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., 4,102,627, Cl. 431-16.000.

Goodyear Tire & Rubber Company, The: *See—*
O'Mahoney, Joseph F., Jr., 4,103,077, Cl. 526-51.000.
Taylor, Challen E., 4,102,724, Cl. 156-149.000.
Throckmorton, Morford C.; and Saltman, William M., 4,102,817, Cl. 252-429.00B.

Goranson, Paul L.: *See—*
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,102,262, Cl. 100-53.000.

Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich. Process and apparatus for vacuum treatment of viscoplastic materials. 4,103,354, Cl. 366-88.000.

Gorman, Lee V.: *See—*
Floyd, Robert D.; Gorman, Lee V.; and Thummel, David L., 4,103,332, Cl. 364-449.000.

Gossling, Robert C.; and Miller, Gerald W., to Clopay Corporation. Window shade. 4,102,384, Cl. 160-263.000.

Gothard, David Olen; and Strobel, Gary Rudolph, to Huntington Alloys, Inc. Metal coating by a powder metallurgy technique. 4,102,678, Cl. 427-191.000.

Goto, Kenichi: *See—*
Kato, Taketoshi; Uchida, Masato; and Goto, Kenichi, 4,102,732, Cl. 156-645.000.

Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Battery operated lighter equipped with a battery operated timepiece. 4,102,631, Cl. 431-253.000.

Gould Inc.: *See—*
Albright, Roy H.; and Kelly, Walter B., 4,103,122, Cl. 200-48.00P.

Goupy, Marcel: *See—*
Dera, Alain; and Goupy, Marcel, 4,101,983, Cl. 2-412.000.

Grable, Jack W.; and Willeke, Steven A., to Essex Group, Inc. Thermostat and tip switch assembly. 4,103,269, Cl. 337-67.000.

Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, to Sprecher & Schuh Ltd. (SSA). Puffer interrupter with main and auxiliary pistons and common cylinder. 4,103,131, Cl. 200-148.00A.

Graf, Werner: *See—*
Deubzer, Bernward; and Graf, Werner, 4,102,970, Cl. 264-176.00R.

Grams, Wolfgang: *See—*
Osterloh, Kurt; Peter, Karl; Gernhardt, Paul; Grams, Wolfgang; Hundeshagen, Christian; Danguillier, Wilhelm; and Pohl, Siegfried, 4,102,674, Cl. 75-3.000.

Gran-A-Stone Company, The: *See—*
Koopmeiners, Linus J., 4,102,319, Cl. 126-121.000.

Granco Equipment, Inc.: *See—*
Phillips, William A.; and Dietz, David R., 4,102,636, Cl. 432-30.000.

Grant, James L. Exhaust disposal system. 4,102,254, Cl. 98-115.00R.

Grayzel, Joseph; and Terrell, William, to Datascope Corporation. Device for transmitting electrical energy. 4,102,331, Cl. 128-2.10E.

Grecksch, Hans: *See—*
Raasch, Hans; and Grecksch, Hans, 4,102,506, Cl. 242-18.0DD.

Green, Norman W.; Duraiswamy, Kandaswamy; and Lumpkin, Robert E., to Occidental Petroleum Corporation. Pyrolysis with cyclone burner. 4,102,773, Cl. 208-8.000.

Green, Samuel I., to McDonnell Douglas Corporation. High speed photodetector and system. 4,103,157, Cl. 250-239.000.

Green, Walter K.: *See—*
Niessel, John P.; Green, Walter K.; and Dayal, Yogeshwar, 4,103,166, Cl. 250-391.000.

Greenspan, David Charles: *See—*
Hench, Larry Leroy; and Greenspan, David Charles, 4,103,002, Cl. 428-155.000.

Greenwald, Richard B., to Polaroid Corporation. 4-Hydroxypyrazole developing agents. 4,102,684, Cl. 96-61.00M.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 4,102,465, Cl. 220-3.000.

Greever, James E.; and Schafer, James P., to Carrier Corporation. Spine finned tube. 4,102,027, Cl. 29-157.3AH.

Gregory, Gordon Ian: *See—*
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,103,084, Cl. 544-22.000.

Greulich, Thomas A. Nonwelded metal grating. 4,102,102, Cl. 52-338.000.

Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., to GTE Sylvania Incorporated. Ceramic enveloped electrical heating element. 4,103,277, Cl. 338-237.000.

Griffin, Warren R., to United States of America, Air Force. Fluorocarbon triazine polymers. 4,102,872, Cl. 528-362.000.

Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Electrical conducting phthalonitrile polymers. 4,102,873, Cl. 528-331.000.

Griner, Donald B.: *See—*
United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.

Groschl, Johann: *See—*
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Groschl, Josef: *See—*
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Groschl, Ludwig: *See—*
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, to Hahn, Stefan; Drescher, Norbert; and Johann Groschl, Firma. Furnace plant. 4,102,279, Cl. 110-234.000.

Gross, Frank Robert; and Gross, Rubie Cook. Insulating panel. 4,102,099, Cl. 52-171.000.

Gross, Rubie Cook: *See—*
Gross, Frank Robert; and Gross, Rubie Cook, 4,102,099, Cl. 52-171.000.

Groves, James D.; and D'Zuro, Deborah Sue Anne, to Minnesota Mining and Manufacturing Company. Two-part reactive dielectric filler composition. 4,102,716, Cl. 156-48.000.

Growden, Norman Wills: *See—*
Modra, Theodor Victor; and Growden, Norman Wills, 4,102,109, Cl. 53-24.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Anders, Raymond H.; Wernet, William F.; Foster, Gerald W.; and Ward, Ronald C., 4,103,268, Cl. 336-208.000.

GTE Lenkurt Electric (Canada) Ltd.: *See—*
Huntley, Christopher Ryland, 4,103,220, Cl. 323-19.000.

GTE Sylvania Incorporated: *See—*
Andrade, Ralph W.; and Duncan, Alexander W., 4,102,043, Cl. 29-739.000.
Burdick, Kenneth John, 4,103,249, Cl. 330-288.000.
Griffin, Robert M.; Oberlin, Max E.; and Bonazoli, Robert P., 4,103,277, Cl. 338-237.000.
Levin, Robert E., 4,103,175, Cl. 250-504.000.
Schulze, Harry O.; Dodds, Robert E.; and Herner, Raymond F., 4,103,069, Cl. 428-403.000.

Gualano, Emil V. Universal antenna mount. 4,103,305, Cl. 343-715.000.

Gualillo, Silvio P.; Hopping, Russell L.; Tuhy, Ivan E.; Barker, Charles L.; and Buschers, Herbert H., to Martin Marietta Corporation. Disposable booster. 4,102,270, Cl. 102-49.500.

Guard, Twyman. Film wrapping dispenser. 4,102,513, Cl. 242-75.400.

Guarderas, Fernando V.; and Leon, Luis, to Dataproducts Corporation. Impact printer type character. 4,102,268, Cl. 101-399.000.

Gubin, Jean; and Rosseels, Gilbert, to Labaz. Indolizine derivatives, pharmaceutical compositions and methods containing same. 4,103,012, Cl. 424-263.000.

Guenin, Andre: *See—*
Zellweger, Conrad; and Guenin, Andre, 4,102,633, Cl. 431-152.000.

Guhl & Scheibler AG: *See—*
von Ballmoos, Fritz, 4,103,150, Cl. 235-419.000.

Guignard, Claude: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Guillerm, Jean; and Fondronnier, Jacques, to Centre Technique du Bois. Apparatus for cutting various materials. 4,102,371, Cl. 144-162.00R.

Gulf Research & Development Company: *See—*
Beuther, Harold; Innes, Robert A.; and Swift, Harold E., 4,102,914, Cl. 260-465.300.
Carr, Norman L.; and McGinnis, Edgar L., 4,102,774, Cl. 208-8.000.
Onopchenko, Anatoli; Schulz, Johann G.; and Sabourin, Edward T., 4,102,919, Cl. 260-520.00E.
Onopchenko, Anatoli; and Schulz, Johann G., 4,102,932, Cl. 260-609.00R.

Gullick Dobson Limited: *See—*
Allen, Archelaius Dawson, 4,102,140, Cl. 61-45.00D.

Gustafson, Douglas C.: *See—*
Cook, David M.; and Gustafson, Douglas C., 4,102,987, Cl. 423-466.000.

Gustin, Grant M., to Morton-Norwich Products, Inc. Oxygen scavenger in elemental combustion analyses. 4,102,814, Cl. 252-408.000.

Gutnick, Morton. Process for the prevention of venereal disease. 4,102,998, Cl. 424-115.000.

Gylland, Ernest F., Jr.: *See—*
Conley, Thomas F.; Gylland, Ernest F., Jr.; and Steele, George E., 4,102,149, Cl. 62-196.00A.

H. A. Schlatter AG: *See—*
Zollinger, Hans R., 4,103,139, Cl. 219-101.000.

H. B. Fleming, Inc.: *See—*
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H. H. Robertson Company: *See—*
Kautz, Glenn E., 4,103,059, Cl. 428-178.000.

H. Kohnstamm & Company Inc.: *See—*
Koch, Louis; Dunn, Michael; and Lumpkin, Charles, 4,102,848, Cl. 260-31.600.

Haak, Willard J.: *See—*
Marsden, Howard A.; and Haak, Willard J., 4,102,425, Cl. 180-66.00F.

Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, to International Business Machines Corporation. Non-destructive readout scheme for holographic storage system. 4,103,346, Cl. 365-216.000.

Haas, Helmut; and Baulig, Klaus-Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method of and means for safely releasably tensioning structural parts such as clamping members. 4,102,589, Cl. 403-373.000.

Haas, James R. Material sensing device. 4,103,292, Cl. 340-603.000.

Haberle, Friedrich: *See—*
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Hackbarth, Richard W.; and Puariea, Douglas A., to Maxson Corporation, The. Railway flat car hand brake system. 4,102,212, Cl. 74-89.220.

Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., to Shell Oil Company. Control of weeds with N-substituted alanine compounds. 4,102,671, Cl. 71-98.000.

Haertl, Hanns-Dietmar: *See—*
Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, 4,102,871, Cl. 528-324.000.

Hagen, Alexander: *See—*
Klose, Sigmar; and Hagen, Alexander, 4,102,742, Cl. 195-103.50R.

Haggard, Richard A.: *See—*
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Hahn, Stefan: *See—*
Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.

Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,102,929, Cl. 260-590.0FA.

Halbeck, Werner B.: *See—*
Hults, Harold W.; and Halbeck, Werner B., 4,103,127, Cl. 200-67.00G.

Halfhill, Martin O.: *See—*
Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.

Hall, Guy E.: *See—*
Yates, Chester Robert; and Hall, Guy E., 4,101,993, Cl. 5-267.000.

Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Process for producing substituted-1-acetyl-3,3-dimethylcyclohexane. 4,102,928, Cl. 260-586.00C.

Hall, John B.: *See—*
Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.

Hall, John Matthew, to Rolls Royce (1971) Limited. Gas turbine powerplants. 4,102,499, Cl. 239-265.270.

Hallmor, Inc.: *See—*
Cousins, James R., 4,102,245, Cl. 90-12.00R.

Ham, William Edward, to RCA Corporation. Method for determining whether holes in dielectric layers are opened. 4,103,228, Cl. 324-65.00R.

Hamada, Toshiyoshi, to Fuji Electric Co., Ltd. Infrared gas analyzing apparatus. 4,103,163, Cl. 250-344.000.

Hamade, Adib R.: *See—*
Albarran, Jose F.; and Hamade, Adib R., 4,103,186, Cl. 307-251.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Label applying apparatus. 4,102,731, Cl. 156-540.000.

Hammann, Ingeborg: *See—*
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.
Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,103,022, Cl. 424-278.000.

Hammarlund, Gudmar, to ASEA AB. Resistance thermometer measuring system. 4,102,198, Cl. 73-362.0AR.

Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Energy. Azacoumarin dye lasers. 4,103,256, Cl. 331-94.50L.

Hammond, Peter R.; Atkins, Ronald L.; Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Energy. Azaquinolone dye lasers. 4,103,257, Cl. 331-94.50L.

Hancu, Theodore, to Societe d'Exploitation de Brevets J.B. Wiper blade structure for vehicles. 4,102,003, Cl. 15-250.420.

Hanes Corporation: *See—*
Bell, Cecil R., 4,102,727, Cl. 156-251.000.

Hanlon & Wilson Company: *See—*
Lowerre, Ralph T., 4,102,497, Cl. 238-14.800.

Hannah, Bruce R.: *See—*
Morrison, Andrew I.; and Hannah, Bruce R., 4,102,549, Cl. 297-383.000.

Hannemann, Franz, to Durkoppwerke GmbH. Feed device for flexible workpieces, especially for a sewing machine. 4,102,280, Cl. 112-121.260.

Hanning Elektro-Werke: *See—*
Hanning, Robert, 4,102,973, Cl. 264-272.000.

Hanning, Robert, to Hanning Elektro-Werke. Method of producing an excitation coil for shaded pole electric motors. 4,102,973, Cl. 264-272.000.

Hansen, Albert Frederick. Diaphragm multi-port valve assembly. 4,102,355, Cl. 137-596.150.

Hansen, Lowell D.: *See—*
Huber, Melvin F.; and Hansen, Lowell D., 4,102,606, Cl. 417-204.000.

Hara, Ichizo: *See—*
Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, 4,102,983, Cl. 423-245.000.

Hara, Katsuaki: *See—*
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Hara, Shoji: *See—*
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Harada, Haruhisa: *See—*
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Hardwick, John R.: *See—*
Martin, James W.; and Hardwick, John R., 4,102,285, Cl. 113-54.00R.

Hargraves, Donald E. Solenoid valve. 4,102,526, Cl. 251-139.000.

Harnee Pty. Ltd.: *See—*
Nielsen, Carl Philip; and Wood, Noel Sydney Davidson, 4,102,101, Cl. 52-263.000.

Harnish, James Ranck; and Raffensberger, Larry Allan, to Borg-Warner Corporation. Control system for heat pump and furnace combination. 4,102,390, Cl. 165-29.000.

Harnsberger, Bobby G., to Texaco Inc. Method of forming gravel packs. 4,102,398, Cl. 166-276.000.

Harnsberger, Bobby G., to Texaco Inc. Consolidated sand control pack. 4,102,399, Cl. 166-276.000.

Harper, James H.; and Smith, Linda S., to Minnesota Mining and Manufacturing Company. Retroreflective transfer sheet material. 4,102,562, Cl. 350-105.000.

Harris, Frank John Turner, to Evans, Adlard & Company Limited. Disposable filter element. 4,102,792, Cl. 210-457.000.

Harris, Jesse R., to Phillips Petroleum Company. Cycloparaffin isomerization using a catalytically active aluminum halide intercalated in graphite. 4,102,937, Cl. 260-666.00P.

Harris, Jesse R.: *See—*
Myers, John W.; and Harris, Jesse R., 4,102,939, Cl. 260-683.00D.

Harris, Roger J. Digital fuel gauge. 4,102,191, Cl. 73-313.000.

Harris, William F. Insect control system. 4,102,093, Cl. 52-101.000.

Hart, William A.; and Klinikowski, James J., to Air Products & Chemicals, Inc. Coulometric electrolytic timing device with coaxially aligned electrodes. 4,103,296, Cl. 340-309.100.

Hartco Company: *See—*
Pearson, Kenneth Carlton; and Lingle, Harrison Church, 4,102,586, Cl. 403-188.000.

Hartford, Winslow H., to Koppers Company, Inc. Method for preparing copper arsenate compositions. 4,103,000, Cl. 424-133.000.

Harth, Carl A. Grip measuring device. 4,102,049, Cl. 33-1.00B.

Hartmann, Alfons: *See—*
Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, 4,103,024, Cl. 424-285.000.

Hartmann & Brawn Aktiengesellschaft: *See—*
Hartmann, Karl; and Treis, Wolfgang, 4,102,648, Cl. 23-254.0EF.

Hartmann, Heinrich; and Sander, Hans, to BASF Aktiengesellschaft. Baking finishes of low solvent content. 4,102,847, Cl. 260-31.40R.

Hartmann, Karl; and Treis, Wolfgang, to Hartmann & Brawn Aktiengesellschaft. Measuring non-methane hydrocarbon contents in gases. 4,102,648, Cl. 23-254.0EF.

Hartmann, Werner: *See—*
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Harvey, Francis J.: *See—*
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Harvey, Francis J., II; and Fey, Maurice G., to Westinghouse Electric Corp. High purity silicon production by arc heater reduction of silicon intermediates. 4,102,764, Cl. 204-164.000.

Harvey, Francis J., II, to Westinghouse Electric Corp. Arc heater production of silicon involving a hydrogen reduction. 4,102,985, Cl. 423-350.000.

Harvey, Francis J., II: *See—*
Fey, Maurice G.; Harvey, Francis J., II; and McDonald, Jack, 4,102,765, Cl. 204-164.000.

Hashimoto, Isao: *See—*
Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, 4,102,834, Cl. 260-4.0AR.

Hasquenoph, Jean H.; and Coutin, Pierre Fernand, to R. Alkan & Cie. Dual-purpose ejector for aircraft load jettisoning mechanism. 4,102,520, Cl. 244-137.00R.

Hassiotis, Panayiotis: *See—*
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- Christenson, James Gordon, 4,102,979, Cl. 424-1.000.
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- Hajos, Zoltan George; and Parrish, David Richard, 4,102,929, Cl. 260-590.0FA.
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- Hofmann, Dionys, to Gebr. Hofmann KG. Mechanical safety unit on spindle-driven lifts. 4,102,435, Cl. 187-8.500.
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- Hofmeister, Helmut; Annen, Klaus; Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of pregnane derivatives. 4,102,908, Cl. 260-397.400.
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- Hogervorst, Johannes R.: *See—*
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- Holder, Charles B., to Sumrall, James A. Tire bead breaker machine. 4,102,380, Cl. 157-1.260.
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- Howatt, Glenn N.; and Leonard, Murray, to Vernitron Corporation. Wave filter and process for making same. 4,103,264, Cl. 333-72.000.
- Howe, Francis M.; and Yin, Simon. Leak sensor and indicating system for vacuum circuit interrupters. 4,103,291, Cl. 340-522.000.
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- Hubbell, Wayne C.; and Chang, Christopher T., to United States of America, Air Force. Acoustic surface wave bubble switch. 4,103,339, Cl. 365-1.000.
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- ICI Australia Limited and Commonwealth Scientific and Industrial Research Organization: *See—*
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  - Horn, Peter; Haertl, Hanns-Dietmar; and Illers, Karl Heinz, 4,102,871, Cl. 528-324.000.
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  - Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, 4,102,977, Cl. 423-118.000.
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  - Magnusson, Erik Borje; and Karlsson, Erik Inge Bertil, 4,102,230, Cl. 83-835.000.
- Imperial Chemical Industries Limited: *See—*
  - Aldridge, David Cecil; Crawley, Graham Charles; and Strawson, Colin John, 4,103,023, Cl. 424-279.000.
  - Bentley, John; and Thompson, Morice William, 4,102,846, Cl. 260-31.20N.
  - Brackman, Derek Samuel, 4,102,726, Cl. 156-244.110.
  - Jennings, James Robert; and Hogan, Philip John, 4,102,915, Cl. 260-465.80D.
  - Raphael, Ralph Alexander, 4,102,896, Cl. 260-343.600.
  - Reade, Grahame Melvin; and Viney, Alan Charles, 4,102,301, Cl. 118-67.000.
  - Thomas, David Hamilton, 4,102,837, Cl. 260-22.0CB.
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  - Terry, Ruel C., 4,102,397, Cl. 166-259.000.
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  - Katsumi, Yasuo; Matsuda, Shoei; and Inano, Toyojiro, 4,102,082, Cl. 51-101.00R.
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  - Anglin, Noah L.; and Berry, Robert H., 4,102,516, Cl. 242-199.000.
- Ing. A. Maurer S.A.: *See—*
  - Luthi, Fritz; and Bach, Guido, 4,102,625, Cl. 425-464.000.
- Ing. C. Olivetti & C., S.p.A.: *See—*
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  - Del Sarto, Franco, 4,102,505, Cl. 241-297.000.
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  - Cholet, Jacques; Laurent, Jean; Magneville, Pierre; and Duconge, Claude, 4,103,280, Cl. 340-12.00R.
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  - Neveu, Jean-Louis; Berliet, Gerard; and Dervissoglou, Angelo, 4,102,969, Cl. 264-147.000.
- Instrumentation Engineering, Inc.: *See—*
  - DeVito, Louis; and Esser, Albert H., 4,102,491, Cl. 235-302.000.
- Intel Corporation: *See—*
  - Perlegos, George; and Salsbury, Phillip J., 4,103,189, Cl. 307-270.000.
- Interlock Industries Limited: *See—*
  - Davis, Ronald Percival, 4,102,012, Cl. 16-179.000.
- International Basic Economy Corporation: *See—*
  - Hertel, Douglas Leo; and Lee, Robert Wen, 4,103,074, Cl. 528-487.000.
- International Business Machines Corporation: *See—*
  - Brooks, Gary Fred; Crooks, Walter; and Weiche, William Joseph, 4,103,066, Cl. 428-337.000.
  - Case, William John Philip, 4,103,314, Cl. 360-78.000.
  - Castellani, Eugene Evans; Powers, John Vincent; and Romankiw, Lubomyr Taras, 4,102,756, Cl. 204-43.00T.
  - Chang, Leroy Ligong; Esaki, Leo; and Sai-Halasz, George Anthony, 4,103,312, Cl. 357-16.000.
  - Davis, Michael Ian; Hood, Robert Allen; and Mayes, Gary Wayne, 4,103,329, Cl. 364-200.000.
  - De La Moneda, Francisco H.; and Kotecha, Harish N., 4,102,733, Cl. 156-653.000.
  - DeBar, David E.; and De La Moneda, Francisco H., 4,102,714, Cl. 148-187.000.
  - Gomez, Richard Santiago; and Scray, Eugene James, Jr., 4,103,135, Cl. 200-185.000.
  - Haarer, Dietrich; Pole, Robert Vladimir; and Voelker, Silvia Leonor, 4,103,346, Cl. 365-216.000.
  - Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
  - Miersch, Ekkehard Fritz; and Spampinato, Dominic Patrick, 4,103,342, Cl. 365-149.000.
  - Winters, Harold Franklin, 4,103,042, Cl. 427-38.000.
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  - Gindi, Abraham M.; and Lang, Donald John, 4,103,336, Cl. 364-900.000.
- International Flavors & Fragrances Inc.: *See—*
  - Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.
  - Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
  - Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, 4,103,036, Cl. 426-538.000.
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  - Michels, Harold Thomas, 4,102,225, Cl. 75-124.000.
  - Tenbergen, Reichel A., 4,102,781, Cl. 209-166.000.
- International Standard Electric Corporation: *See—*
  - Martens, Jean Victor, 4,103,247, Cl. 330-284.000.
- International Telephone & Telegraph Corp.: *See—*
  - Fischer, Laurin G., 4,103,237, Cl. 325-132.000.
- Inventing S.A.: *See—*
  - Wallsten, Hans Ivar, 4,102,299, Cl. 118-50.000.
- Inverni Della Beffa S.p.A.: *See—*
  - Mustich, Giuseppe, 4,103,025, Cl. 424-305.000.
- Invicta Plastics Limited: *See—*
  - Kindred, Michael, 4,102,535, Cl. 273-282.000.
- IOG Industrie-Ofenbau GmbH: *See—*
  - Wilkening, Hermann; and Loges, Hans-Joachim, 4,102,170, Cl. 72-147.000.
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  - Wheelock, Thomas D., 4,102,989, Cl. 423-541.00R.
- Irgens, Finn T. Internally cooled rotary combustion engine. 4,102,615, Cl. 418-86.000.
- Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin process. 4,102,943, Cl. 260-850.000.
- Isenson, Raymond S.: *See—*
  - Magardo, Robert F.; Ambrosini, Leonard R.; and Isenson, Raymond S., 4,102,241, Cl. 89-155.000.
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  - Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
- Ishidoshiro, Hiroshi: *See—*
  - Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,102,158, Cl. 68-5.00E.
- Ishii, Noriyuki: *See—*
  - Kaneko, Takafumi; Sasagawa, Shuzo; Ishii, Noriyuki; Hiraoka, Takashi; and Hieda, Shozo, 4,102,720, Cl. 156-78.000.
- Ishikawa, Michio: *See—*
  - Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, 4,103,253, Cl. 331-94.50G.
- Ishikawa, Yoshikazu, to Nissan Motor Company, Ltd. Rotary piston internal combustion engine and rotor thereof. 4,102,616, Cl. 418-91.000.
- Ishikawa, Youhei: *See—*
  - Katsube, Masayoshi; Ishikawa, Youhei; Tamura, Hiroshi; and Tomono, Kunisabro, 4,102,696, Cl. 106-73.200.
- Itayama, Shinichi, to Teizo Sakai. Ventilating suction and exhaust fan device of sirocco type. 4,102,596, Cl. 415-101.000.

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  - Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
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- Ito, Kazuo, to Kabushiki Kaisha Daini Seikosha. Miniature tape cassettes. 4,102,514, Cl. 242-199.000.
- Ito, Nobuo, to Robert Bosch GmbH. Rectifier assembly for vehicular alternator-rectifier. 4,103,193, Cl. 310-68.00D.
- Ito, Tadashi: *See—*
  - Matsumoto, Kazuya; Matsumura, Susumu; Koyama, Aiichiro; Okuno, Youichi; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,103,153, Cl. 250-227.000.
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  - Penke, Botond; Balaspiri, Lajos; Pallai, Peter; Kovacs, Kalman; Varro, Vince; Lonovics, Janos; Varga, Laszlo; Dobo, Gyorgy; Ivanyi, Geza; Kovacs, Lajos; Low, Miklos; and Low, Judit, nee Kaloczy, 4,102,878, Cl. 260-112.50R.
- Iwama, Akio; and Mune, Isao, to Nitto Electric Industrial Co., Ltd. Hydrous gel and process for its preparation. 4,102,807, Cl. 252-316.000.
- Iwamoto, Michinori; and Nomura, Toshiyuki, to Horiba, Ltd. Apparatus for the continuous measurement of the concentration of oil. 4,103,162, Cl. 250-343.000.
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  - Mandai, Akio; Hirukawa, Yoshinori; Kubota, Hayato; and Iwanaga, Yukiya, 4,103,039, Cl. 426-607.000.
- Iwase, Yoshiyuki: *See—*
  - Morimoto, Teijiro; Hashimoto, Isao; and Iwase, Yoshiyuki, 4,102,834, Cl. 260-4.0AR.
- J. G. Sylvester Associates, Inc.: *See—*
  - Sylvester, Bruce J.; and Sylvester, Roger P., 4,102,203, Cl. 73-620.000.
- J. M. Voith GmbH: *See—*
  - Merkle, Theodor; and Meyer, Paul, 4,102,273, Cl. 104-34.000.
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- Jackson, Harold Wofford, to Bendix Corporation, The. Fast frequency hopping synthesizer. 4,103,250, Cl. 331-1.00A.
- Jackson, Hiram Soloman, Jr., to S & C Electric Company. Sealing arrangement for high voltage fuse. 4,103,270, Cl. 337-178.000.
- Jackson, Mervyn Benjamin: *See—*
  - Sasse, Wolfgang Herman Fritz; and Jackson, Mervyn Benjamin, 4,102,762, Cl. 204-159.220.
- Jacobus, Nelson Mortimer, Jr., to Communications Satellite Corporation. Proportional warmup timer for power line outages using stored charge for power. 4,103,180, Cl. 307-141.000.
- Jacques, Andre: *See—*
  - d'Auria, Luigi; Jacques, Andre; and Maillot, Philippe, 4,103,154, Cl. 250-227.000.
- Jacques, James O.: *See—*
  - Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
- Jadatz, Harald B., to Slater Electric Co. Weatherproof receptacle cover and shield. 4,102,466, Cl. 220-3.800.
- Jagers, Leopold. Circular saw blades. 4,102,231, Cl. 83-854.000.
- James, Wallace D. Agitator for washing machines. 4,102,156, Cl. 68-4.000.
- Janson, Richard W. Curtain suspension assembly. 4,102,007, Cl. 16-94.00R.
- Janson, Richard W. Curtain suspension assembly. 4,102,008, Cl. 16-96.00R.
- Jansz, Joost W., to Hollandsche Beton Groep NV. Submersible positioning and guiding apparatus for pile driving. 4,102,147, Cl. 61-53.500.
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  - Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.
- Japan Gasoline Co., Ltd.: *See—*
  - Sasaki, Takashi; and Saima, Michio, 4,102,980, Cl. 423-239.000.
- Japan Spectroscopic Co., Ltd.: *See—*
  - Saito, Muneo; and Konishi, Hideki, 4,102,782, Cl. 210-31.00C.
- Jaquay, Louis H., to Dravo Corporation. Method for recovering lead from battery mud. 4,102,676, Cl. 75-77.000.
- Jarosz, John M.; and Swanson, Roy T., to S & C Electric Company. Auxiliary mechanism for imparting rotational energy to electrical components. 4,103,120, Cl. 200-48.00R.
- Jarvenpaa, Viljo Juhana. Apparatus for contacting a gas with a liquid. 4,102,658, Cl. 55-230.000.
- Jarvis, Barry Michael Frank, to Exhibition Showplace Services Limited. Stand construction system. 4,102,087, Cl. 52-9.000.
- Jay, Melvin C., to Elgin-Macor, Inc. Sliding door locking system. 4,102,545, Cl. 292-57.000.
- Jayson, Richard N.: *See—*
  - Calderazzo, Franklin James, 4,102,439, Cl. 188-24.000.
- Jeavons, Philip Swingewood, to Wilmot-Breeden Limited. Pivot mounting of levers. 4,102,588, Cl. 403-245.000.
- Jefferies, Patrick J.; and Crounse, Nathan N., to Sterling Drug Inc. Water-soluble quaternary ammonium non-heterocyclic azo dyestuffs. 4,103,092, Cl. 260-175.000.
- Jeffery, Russell L.; and Cote, Lawrence V., to Cobe Laboratories, Inc. Bubble trap. 4,102,655, Cl. 55-201.000.
- Jendrichowski, Klaus: *See—*
  - Wiendahl, Joachim; Jendrichowski, Klaus; and Sushradt, Wolfgang, 4,102,351, Cl. 134-129.000.
- Jenkins, Albert Edward, to Perkins & Powell Limited. Door closer. 4,102,006, Cl. 16-51.000.
- Jennie, Fred LeRoy, to Weatherby, Inc. Gas regulator for gas operated firearms. 4,102,243, Cl. 89-193.000.
- Jennings, James Robert; and Hogan, Philip John, to Imperial Chemical Industries Limited. Dimerization process. 4,102,915, Cl. 260-465.80D.
- Jensen, Victor: *See—*
  - D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
- Jerobee Industries, Inc.: *See—*
  - Weglin, Walter, 4,102,735, Cl. 156-661.000.
- Jester, John P.: *See—*
  - Schnarr, Raymond H.; and Jester, John P., 4,102,005, Cl. 16-49.000.
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  - Groschl, Rupert; Groschl, Josef; Groschl, Ludwig; and Groschl, Johann, 4,102,279, Cl. 110-234.000.
- John, Raymond; Apfelbaum, Jerome G.; and Moore, Robert L., to Engineering Inventions Inc.; and Multisensors Inc. Cooking apparatus. 4,102,256, Cl. 99-372.000.
- John Zink Company: *See—*
  - Reed, Robert D.; Goodnight, Hershel E.; and Street, Vern A., 4,102,627, Cl. 431-16.000.
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- Johnson, David C.: *See—*
  - Meacham, Thomas E., Jr.; and Johnson, David C., 4,102,645, Cl. 21-102.00R.
- Johnson, Glenn W., Jr.; and Lindlau, Paul F., to Amerace Corporation. Method of making louvered connectors and contact elements thereof. 4,102,286, Cl. 113-119.000.
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  - Aberson, Gerhard M.; and Stulgate, Emily M., 4,103,062, Cl. 428-283.000.
  - Mesek, Frederick K.; and Repke, Virginia L., 4,102,340, Cl. 128-287.000.
- Johnson, Lewis T.: *See—*
  - Carroll, James C.; and Johnson, Lewis T., 4,102,453, Cl. 206-507.000.
- Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Process for separation and recovery of carbon monoxide. 4,102,802, Cl. 252-184.000.
- Johnson, Michael R.: *See—*
  - Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,102,894, Cl. 260-332.30R.
- Johnson, Norman Walter, to Coates Brothers & Co., Ltd. Water-dispersible oleoresinous paint binders. 4,102,836, Cl. 260-22.0TN.
- Johnson, Richard A.: *See—*
  - Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., 4,102,745, Cl. 195-31.00R.
- Johnsson, Sven, to Pacfex Aktiebolag. Transport box. 4,102,485, Cl. 229-23.00R.
- Johnston, Frederick Eric. Rock drilling apparatus and method. 4,102,413, Cl. 175-53.000.
- Johnston, Richard: *See—*
  - Downing, Keith Stanley; and Johnston, Richard, 4,102,046, Cl. 30-346.530.
- Johnston, Richard Paul: *See—*
  - Smith, James; and Johnston, Richard Paul, 4,102,603, Cl. 416-244.00A.
- Jones, Germaine T., to Raymond Lee Organization, Inc., The, a part interest. Self-wringing map. 4,102,002, Cl. 15-119.00A.
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  - Bailey, Edward A.; and Ordway, James F., 4,102,414, Cl. 175-85.000.
- Jung, Fritz: *See—*
  - Kwech, Ludwig; and Jung, Fritz, 4,102,700, Cl. 106-100.000.
- Jung, Lothar. Method for manufacturing hollow and solid ingots. 4,102,663, Cl. 65-18.000.
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  - Metcalf, Brian Walter; and Jung, Michel, 4,103,089, Cl. 548-344.000.
- Junger, Hans: *See—*
  - Weissenfels, Franz; and Junger, Hans, 4,102,832, Cl. 521-103.000.
- K & B Innovations, Inc.: *See—*
  - Morris, Betty Jean, 4,102,456, Cl. 206-575.000.
- K. Bratschi, Silent Gliss: *See—*
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- K. & V. Sorensen Engineering Ltd.: *See—*
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- Kabushiki Kaisha Daini Seikosha: *See—*
  - Hayamizu, Mamoru; and Tanigaki, Yasushi, 4,102,571, Cl. 356-1.000.
  - Ito, Kazuo, 4,102,514, Cl. 242-199.000.
  - Tabata, Junichi, 4,102,119, Cl. 58-23.00R.
  - Tanaka, Kojiro, 4,102,122, Cl. 58-58.000.
  - Tatsumi, Yoshio; Matsuura, Eiichi; Takahashi, Keikichi; and Tsukada, Nobuo, 4,102,123, Cl. 58-140.00R.
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  - Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, 4,102,743, Cl. 195-7.000.
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  - Kabayama, Takahiko; Ogata, Masaru; and Ikezawa, Tetsuro, 4,103,100, Cl. 13-20.000.
- Kabushiki Kaisha Nippon Coinco: *See—*
  - Hihara, Sokichi; Horiuchi, Mikio; and Ohe, Takeshi, 4,102,348, Cl. 128-422.000.
- Kabushiki Kaisha Suwa Seikosha: *See—*
  - Imamura, Yoichi, 4,103,187, Cl. 307-251.000.
  - Kawamura, Yoshikazu; and Eguchi, Hiroshi, 4,103,191, Cl. 310-49.00R.
- Kachi, Atsuyuki: *See—*
  - Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.
- Kaiser Aluminum & Chemical Corporation: *See—*
  - Woychesin, Elias A.; and Legleu, Clovis P., III, 4,102,981, Cl. 423-240.000.
- Kaiser, John J.: *See—*
  - Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.
- Kalart Victor Corporation: *See—*
  - Schwartz, Morris, 4,102,569, Cl. 353-120.000.
- Kalk, Walter; Bien, Hans Samuel; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Process for the preparation of diaryl compounds. 4,102,924, Cl. 260-562.00P.
- Kalvaitis, Arvydas J., to S & C Electric Company. Tamper-resistant enclosure for electrical equipment. 4,102,475, Cl. 220-366.000.
- Kaman Sciences Corporation: *See—*
  - Church, Peter K.; and Phillips, Alan G., 4,102,085, Cl. 51-295.000.
- Kambara, Ginjiro; Koike, Susumu; and Matsuda, Toshio, to Matsushita Electric Industrial Co., Ltd. Method for diffusing an impurity into a semiconductor body. 4,102,715, Cl. 148-188.000.
- Kameno, Yoshito: *See—*
  - Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
- Kamide, Noboru: *See—*
  - Tokudome, Kathumi; Ishikawa, Michio; and Kamide, Noboru, 4,103,253, Cl. 331-94.50G.
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  - Cusick, Richard D.; and Wall, Larry W., 4,102,307, Cl. 119-16.000.
- Kanyo, Erzsebet: *See—*
  - Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
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  - Fujii, Sadao; Maki, Hidehiko; Orisaka, Toru; Matsuda, Shoji; Nishida, Koichi; Ishiai, Tamio; Nishii, Tasaku; and Ueda, Yuichi, 4,102,719, Cl. 156-78.000.
  - Majima, Kanji; Takei, Kensuke; and Tsutoo, Keiichi, 4,102,911, Cl. 260-458.00R.
  - Minegishi, Yutaka; and Arai, Haruhiko, 4,102,795, Cl. 252-8.900.
  - Mizutani, Hiroshi; Tamura, Masaru; and Saegusa, Katsumi, 4,102,824, Cl. 252-545.000.
  - Murata, Moriyasu; and Ide, Kimie, 4,102,825, Cl. 252-547.000.
- Karakis, Thomas G.; and Klotz, Clayton J., to Allen-Bradley Company. Switch housing with cable seal. 4,103,136, Cl. 200-302.000.
- Karalashvili, Archil Levanovich: *See—*
  - Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich, 4,102,016, Cl. 19-159.00R.
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  - Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.
- Karevaara, Juhani, to Huhtamaki Oy. Conical disposable mug. 4,102,454, Cl. 206-514.000.
- Karhu-Titan Oy: *See—*
  - Saaristo, Seppo, 4,102,061, Cl. 36-28.000.
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  - Magnusson, Erik Borje; and Karlsson, Erik Inge Bertil, 4,102,230, Cl 83-835.000.
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- Kashio, Toshio, to Casio Computer Co., Ltd. Data handling system involving memory-to-memory transfer. 4,103,334, Cl. 364-900.000.
- Kashiwagi, Midori: *See—*
  - Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, 4,103,004, Cl. 424-177.000.
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- Katchman, Arthur: *See—*
  - Cooper, Glenn Dale; and Katchman, Arthur, 4,102,850, Cl. 260-33.6AQ.
- Kato, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal means in a rotary piston engine. 4,102,617, Cl. 418-142.000.
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  - Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
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- Kautz, Glenn E., to H. H. Robertson Company. Light transmitting building panel. 4,103,059, Cl. 428-178.000.
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  - Baba, Takashi; Hunahashi, Susumu; and Kawabata, Toshihiko, 4,102,001, Cl. 15-104.10C.
- Kawahara, Akira, to Ryusyo Industrial Co., Ltd. Clasping device. 4,102,018, Cl. 24-68.0CD.
- Kawamura, Masaharu: *See—*
  - Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
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  - Emi, Toshihiko; Kawana, Masashi; Kinoshita, Katsuo; and Adachi, Shinichiro, 4,102,033, Cl. 29-527.300.
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- Kawata, Koichi: *See—*
  - Nakao, Kaname; Ikeda, Tanejiro; Kawata, Koichi; and Hara, Shoji, 4,102,021, Cl. 29-25.420.
- Kay, Kenneth R.: *See—*
  - Wagner, Anthony S.; and Kay, Kenneth R., 4,102,075, Cl. 43-17.100.
- Kearin, Martin John; Hiscutt, Robert; and Molineux, Peter, to Triplex Safety Glass Company Limited. Metal oxide coatings. 4,102,768, Cl. 204-192.00P.
- Keller, Gustav; and Enssle, Gerhard. Manhole-pit lining and method of making and installing same. 4,102,088, Cl. 52-20.000.
- Keller, Hans W., to Honeywell Inc. Method for batch fabricating semiconductor devices. 4,103,273, Cl. 338-2.000.
- Kellner, Jackson M., to Smith International, Inc. Tandem eccentric roller stabilizer for earth boring apparatus. 4,102,552, Cl. 308-4.00A.
- Kellogg Company: *See—*
  - Fulger, Charles V.; and Morfee, Thomas D., 4,103,035, Cl. 426-321.000.
- Kelly, Donald V. Roller assembly for sliding doors and windows. 4,102,009, Cl. 16-100.000.
- Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., to Ensign-Bickford Company. No-flash seismic cord. 4,102,428, Cl. 181-116.000.
- Kelly, Walter B.: *See—*
  - Albright, Roy H.; and Kelly, Walter B., 4,103,122, Cl. 200-48.00P.
- Kelsch, Joseph R., Jr. Temperature indicator. 4,102,200, Cl. 73-371.000.
- Kennon, James L.; and Sandorf, Robert E., to Nordson Corporation. Resistor core cable. 4,103,276, Cl. 338-214.000.
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  - Monte, Salvatore J.; and Sugerman, Gerald, 4,102,862, Cl. 528-88.000.
- Kermabon, Andre J., to Syminex. Method and apparatus for geophysical prospecting by radioactive diagraphy. 4,103,158, Cl. 250-269.000.
- Kern, Evan J. Upright harpsichord action. 4,102,233, Cl. 84-258.000.
- Kerner, Walter; Mahler, Friedrich; and Peters, Heinrich, to DAVY POWERGAS GmbH. Ultrasonic atomizer for waste sulfuric acid and use thereof in acid cracking furnaces. 4,102,651, Cl. 23-277.00R.
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- Key, Michael David; and McNee, William Gordon, to Lever Brothers

Company. Manufacture of detergent compositions. 4,102,057, Cl. 34-10.000.
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Kilham, Peter, to Droll Yankees, Inc. Bird feeder. 4,102,308, Cl. 119-52.00R.
Kimball, Philip C.: *See—*
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Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst for purifying exhaust gases. 4,102,813, Cl. 252-430.000.
Kindred, Michael, to Invicta Plastics Limited. Board game. 4,102,535, Cl. 273-282.000.
King, John O., Jr. Method of forming a sealing sleeve joint construction. 4,102,030, Cl. 29-458.000.
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Kiovsky, Joseph R., to Norton Company. Process for producing alumina catalyst carriers. 4,102,978, Cl. 423-626.000.
Kipp, Michael A.; and Walter, Richard T., to Container Corporation of America. Leakage resistance carton. 4,102,484, Cl. 229-16.00A.
Kirkham, Arthur J. Insulated tent. 4,102,352, Cl. 135-1.00R.
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Klein, Fred Godfrey. Jig and template apparatus and method for preparing a corner insert for a laminated plastic countertop. 4,102,374, Cl. 144-314.00B.
Klein, Howard P., to Texaco Development Corporation. Polyurethanes derived from novel novolak polyols. 4,102,828, Cl. 521-174.000.
Klein, Theodore Harold, to Bell Telephone Laboratories, Incorporated. Reinforced flexible printed wiring board. 4,103,102, Cl. 174-68.500.
Kleiner, Hans-Jerg: *See—*
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Klima, Frank J. Rolling cutter drill bit with annular seal rings. 4,102,419, Cl. 175-371.000.
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Korsky, Vincent Viacheslav, to Northern Telecom Limited. Telephone line circuit with differential loop current sensing and compensation. 4,103,112, Cl. 179-18.0FA.
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Kretz, Carl. Ultrasonic section plane examination and display. 4,102,204, Cl. 73-626.000.
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Krimsky, Leonard C.; and Van Rietschoten, Henk, to Worldwide Converting Machinery, Inc. Turret for winders and unwinders. 4,102,511, Cl. 242-64.000.
Kroenke, William Joseph; Carroll, Richard Tobey; and Magistro, Angelo Joseph, to B. F. Goodrich Company, The. Catalyst and process for the preparation of ethylene and vinyl chloride from ethane. 4,102,935, Cl. 260-656.00R.
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Kruger, Gunther, to Steele Chemicals Co. Ltd. 14 β-Hydroxy 3-deoxycardenolides. 4,102,884, Cl. 260-239.570.
Kuan, Tiong Ho; and Sommer, John George, to General Tire & Rubber Company, The. Compositions comprising EPDM, E/VA and polyalpha-methylstyrene. 4,102,855, Cl. 260-42.330.
Kubitzek, Harry; Feltgen, Karlheinz; and Rosendahl, Friedrich-Karl, to Bayer Aktiengesellschaft. Process for the production of polyamide-6-filaments of the γ-modification. 4,102,965, Cl. 264-103.000.
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  - Bergh, Eugene H., 4,102,045, Cl. 30-287.000.
  - Bingham, Wallace Karl; and Bailey, Terry R., 4,103,060, Cl. 428-241.000.
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  - Clunis, Kenneth, 4,102,536, Cl. 274-23.00R.
  - Fayling, Richard E., 4,103,340, Cl. 365-97.000.
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  - Groves, James D.; and D'Zuro, Deborah Sue Anne, 4,102,716, Cl. 156-48.000.
  - Harper, James H.; and Smith, Linda S., 4,102,562, Cl. 350-105.000.
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  - Tobias, Michael Allan; and Lynch, Conrad Linden, 4,102,869, Cl. 427-178.000.
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  - Lawson, Frank, 4,102,951, Cl. 423-594.000.
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  - Crutchfield, Marvin M.; and Upton, Charles J., 4,102,903, Cl. 260-345.70R.
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  - Kelly, Stanley R.; O'Brien, John P.; and Morrow, William C., 4,102,428, Cl. 181-116.000.
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- Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., to Diamond Shamrock Corporation. Antiinflammatory imidazothiazoles and thiazolopyrimidines. 4,103,016, Cl. 424-270.000.
- Moskowitz, Seymour. Fluid pumping device. 4,102,605, Cl. 417-98.000.
- Moss, Colin Roy, to Hawker Siddeley Dynamics Limited. Optical scanning equipment. 4,103,160, Cl. 250-334.000.
- Mosse, Richard Wolfgang, to Corrugated Products GmbH. Method of making a laminar hollow body of angular cross-section and apparatus for performing the method. 4,102,725, Cl. 156-200.000.
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  - D'Amico, Thomas Victor; Rackin, Mark Henry; Jensen, Victor; Schultz, Norman Eugene; Cady, John Joseph; Macko, William John; Steinbach, Carl Raymond; and Petrakos, Nicholas, 4,103,107, Cl. 179-2.0EC.
  - Henrickson, David L.; Kaiser, John J.; Koehn, William C.; and Raven, David P., 4,102,039, Cl. 29-593.000.
  - Nicolini, John Dominic; and Willard, David Frank, 4,103,286, Cl. 340-146.200.
  - Ollenbach, Ernest C., 4,102,481, Cl. 228-6.00R.
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  - Campbell, John A. L.; and Moynihan, Daniel J., 4,102,550, Cl. 299-11.000.
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  - Plamper, Gerhard R., 4,102,219, Cl. 74-502.000.
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- Mulaskey, Bernard F., to Chevron Research Company. Hydrocarbon hydroconversion catalyst and the method for its preparation. 4,102,822, Cl. 252-465.000.
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- Muller, David. Panty hose garment and method of manufacture thereof. 4,101,982, Cl. 2-409.000.
- Muller, Helmut: *See—*
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- Murata, Moriyasu; and Ide, Kimie, to Kao Soap Co., Ltd. Liquid light-duty detergent composition. 4,102,825, Cl. 252-547.000.
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- Murphy, Alan Pearce: *See—*
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  - Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.
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- Nadelson, Jeffrey, to Sandoz, Inc. Substituted hydroxy pyridones. 4,103,013, Cl. 424-263.000.
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  - Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.
- Nagase, Toshiro, to Tokico Ltd. Door closer. 4,102,004, Cl. 16-49.000.
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- Najork, Jack, to Reach Electronics, Inc. RF amplifier and antenna. 4,103,241, Cl. 325-373.000.
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- Natale, Michele. Self-regulating fluid pressure and temperature valve and assembly. 4,102,354, Cl. 137-98.000.
- Natale, Rocco J.: *See—*
  - Shonnard, John R.; and Natale, Rocco J., 4,102,317, Cl. 126-25.00B.
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- National Semiconductor Corporation: *See—*
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- Neblung, Werner H.; and Petrich, Gerhard O. Railing system. 4,102,529, Cl. 256-70.000.
- Nederman, Bill Peter Philip: *See—*
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- Nelson, Arvid L., to Gardner-Denver Company. Profile cutter. 4,102,583, Cl. 407-25.000.
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- Nepela, Daniel Andrew: *See—*
  - Hempstead, Robert Douglas; Krongelb, Sol; Nepela, Daniel Andrew; Thompson, David Allen; and Valstyn, Erich Philipp, 4,103,315, Cl. 360-110.000.
- Netherton, Oliver E. Solar heating assembly. 4,102,324, Cl. 126-270.000.
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- Newlon, Robert L., to Lawrence Brothers, Inc. Tamper-proof spring hinge. 4,102,013, Cl. 16-189.000.
- Ng, Walter C.; and Wilgus, Conrad A. Regulatable flush valve for tank flush toilets. 4,101,986, Cl. 4-325.000.
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- Nikku Industry Co., Ltd.: *See—*
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  - Taniguchi, Toru, 4,103,046, Cl. 427-113.000.
- Nippon Electric Co., Ltd.: *See—*
  - Tan, Yoichi, 4,103,244, Cl. 329-122.000.
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  - Yokoyama, Kenji, 4,103,245, Cl. 330-265.000.
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- Nippon Steel Corporation: *See—*
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- Nishida, Takao; and Tonoike, Kiyoshi, to Amchem Products, Inc. Process for applying resinous coating to metal surface. 4,103,049, Cl. 427-341.000.
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  - Tanaka, Shigenori; and Tojo, Akio, 4,102,361, Cl. 139-435.000.
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  - Finlay, John Reid, 4,103,356, Cl. 363-22.000.
  - Korsky, Vincent Viacheslav, 4,103,112, Cl. 179-18.0FA.
  - Munter, Ernst August, 4,103,108, Cl. 179-15.0BF.
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- Olschewski, Wilfred W., to Burr-Brown Research Corporation. Hybrid transformer device. 4,103,267, Cl. 336-65.000.
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- Paccar Inc.: *See—*
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- Paepke, Horst. Filament feeding apparatus and method. 4,102,509, Cl. 242-47.040.
- Paisley, John C. Partition structure. 4,102,089, Cl. 52-36.000.
- Pak, Ivan Dmitrievich; Tjukov, Boris Alexeevich; Karalashvili, Archil Levanovich; and Denisov, Jury Nikolaevich. Sliver placing device for draw frames and like machine. 4,102,016, Cl. 19-159.00R.
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  - Popoff, Ivan Christoff; and DeSavigny, Chester Blair, 4,102,800, Cl. 252-182.000.
  - Robinson, Donald Nellis; and Fox, Adrian Samuel, 4,102,760, Cl. 204-159.180.
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- Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., to United States of America, Agriculture. Tris(ureidomethyl)phosphine oxides. 4,102,923, Cl. 260-553.00R.
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- Pfeiffer, Hans Jorg; Rene, Keller; and Erich, Frank, to Sulzer Brothers Ltd. Method for removing acids from an aqueous acid-containing xylose solution. 4,102,705, Cl. 127-37.000.
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  - Sanford, Richard A.; and Clardy, Edwin K., 4,103,177, Cl. 250-562.000.
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- Plummer, William T., to Polaroid Corporation. Unicell photoelectric photometer. 4,102,581, Cl. 356-225.000.
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  - Greenwald, Richard B., 4,102,684, Cl. 96-61.00M.
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  - Taylor, Lloyd D., 4,102,685, Cl. 96-73.000.
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- Portyrata, Raymond E., to Diaclear, Inc. Filter underdrain. 4,102,790, Cl. 210-293.000.
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  - Buchwalter, Stephen L.; Bosso, Joseph F.; and Christenson, Roger M., 4,102,863, Cl. 528-111.000.
  - Ecke, George G., 4,103,031, Cl. 424-337.000.
  - Shoop, George W., 4,102,722, Cl. 156-99.000.
  - Simko, Gabriel, 4,102,227, Cl. 83-7.000.
  - Stephenson, Richard M., 4,102,753, Cl. 203-64.000.
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- Puskarz, Stanley J., to A-T-O Inc. Drive mechanism for container filling machine. 4,102,366, Cl. 141-150.000.
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- Rao, Kalur Vijaya Chandra. Production of hydrocarbons by thermolysis of vegetable oils. 4,102,938, Cl. 260-676.00R.
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- Raque, Glenn F.; and Robinson, Edward A., to Raque Food Systems Inc. Cover feeding apparatus. 4,102,113, Cl. 53-366.000.
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  - Wolf, Horst; and Seher, Rolf, 4,103,210, Cl. 318-46.000.
- Seiler, Karl: *See—*
  - Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.
- Seitz, Karl, to Ciba-Geigy Corporation. Benzoylated dehydrothio-p-toluidine sulfonic acid-azo-pyridone dyes. 4,102,880, Cl. 260-156.000.
- Sekiguchi, Tadao, to Trio Kabushiki Kaisha. Digital frequency display device. 4,103,290, Cl. 340-168.00B.
- Selden, Boynton, to Selden, Michele R., Trustee. Adjustable stand for needlework and the like. 4,102,065, Cl. 38-102.100.
- Selden, Michele R., Trustee: *See—*
  - Selden, Boynton, 4,102,065, Cl. 38-102.100.
- Seletzky, Peter Dresel: *See—*
  - Antlfinger, George John; and Seletzky, Peter Dresel, 4,102,841, Cl. 260-29.60N.
- Selleslagh, Eduard: *See—*
  - Timmermans, Armand; Selleslagh, Eduard; and Deneyer, Jose N. E., 4,103,233, Cl. 324-208.000.
- Service Master Industries, Inc.: *See—*
  - Beach, Rex E.; and Blomgren, Roland A., 4,102,462, Cl. 214-301.000.
- Setter, Alfred C.: *See—*
  - Hyman, Charles E.; and Setter, Alfred C., 4,103,325, Cl. 363-148.000.
- Seyl, Robert G. Corrosion probe. 4,102,769, Cl. 204-195.00C.
- Shackford, Charles C.: *See—*
  - Baker, John E.; and Shackford, Charles C., 4,102,955, Cl. 264-25.000.
- Shafer, Jon L.; and LeBlanc, William K., to Shafer Valve Company, a part interest. Hand pump system for hydraulic motor. 4,102,128, Cl. 60-400.000.
- Shafer Valve Company: *See—*
  - Shafer, Jon L.; and LeBlanc, William K., 4,102,128, Cl. 60-400.000.
- Shakertown Corporation: *See—*
  - Barker, Frank S.; and Pehl, Willis G., 4,102,107, Cl. 52-553.000.
- Sharp, David E. Fruit picking receptacle. 4,102,376, Cl. 150-2.000.
- Sharp Kabushiki Kaisha: *See—*
  - Washizuka, Isamu, 4,103,208, Cl. 315-51.000.
- Sharpe, James R.: *See—*
  - Crinkelmeyer, Oliver W.; Root, Roland L.; and Sharpe, James R., 4,102,400, Cl. 166-283.000.
- Shaw, Kenneth R.: *See—*
  - Shegrud, Donald M.; and Shaw, Kenneth R., 4,102,469, Cl. 220-89.00A.
- Shegrud, Donald M.; and Shaw, Kenneth R., to Continental Disc Corporation. Protected molded rupture disc. 4,102,469, Cl. 220-89.00A.
- Shell Oil Company: *See—*
  - Blytas, George C., 4,102,388, Cl. 165-1.000.
  - Carr, John B., 4,103,021, Cl. 424-278.000.
  - Davies, John H.; Wood, Jack; and Pearson, Michael, 4,103,017, Cl. 424-270.000.
  - Gergen, William P.; and Davison, Sol, 4,102,854, Cl. 260-42.180.
  - Haddock, Ernest; Raven, Clive A.; and Sampson, Alan J., 4,102,671, Cl. 71-98.000.
  - Schadenberg, Hendrik, 4,102,797, Cl. 252-51.50A.
  - van Steveninck, Johannes; and Hogervorst, Johannes R., 4,102,145, Cl. 61-105.000.
- Shelton, Glenn B.: *See—*
  - United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.
- Shelton, Kenneth William: *See—*
  - Campbell, Colin Dennis; Finan, Michael Anthony; and Shelton, Kenneth William, 4,102,701, Cl. 106-111.000.
- Shelton, Robert N., to Foster Grant Corporation. Rimless spectacle. 4,102,566, Cl. 351-131.000.
- Shenfield, Leonard R., to Xerox Corporation. Time-slicing method and apparatus for disk drive. 4,103,326, Cl. 364-200.000.
- Shenfield, Leonard R.: *See—*
  - Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
- Shephard, Kenneth P., to Upjohn Company, The. Desulfinylation process for preparing androsta-4,9(11)-diene-3,17-dione. 4,102,907, Cl. 260-397.300.
- Sherock, Duane. Pipe thawing device. 4,102,358, Cl. 138-35.000.
- Shibata, Shoji: *See—*
  - Norton, Ted R.; Kashiwagi, Midori; and Shibata, Shoji, 4,103,004, Cl. 424-177.000.
- Shibata, Toshihiro: *See—*
  - Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,102,858, Cl. 260-45.80N.
- Shigeta, Junnosuke, to Matsushita Electric Industrial Co., Ltd. Waveform converter for altering the frequency spectrum of an output signal. 4,103,242, Cl. 328-35.000.
- Shilling, Jack W.; Miller, Clarence L., Jr.; and Datta, Amitava, to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,102,713, Cl. 148-113.000.
- Shima, Masao: *See—*
  - Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.
- Shimano Industrial Company Limited: *See—*
  - Nagano, Masashi; and Sonoi, Koya, 4,102,215, Cl. 74-243.0DR.
  - Nagano, Masashi, 4,102,216, Cl. 74-245.00R.
- Shimazu, Yasuo: *See—*
  - Satake, Kanje; Shimazu, Yasuo; Kasahara, Masaru; and Adachi, Seya, 4,103,278, Cl. 340-1.00R.
- Shimizu, Hiroshi: *See—*
  - Sato, Akihiro; Konotsune, Shiro; Kachi, Atsuyuki; and Shimizu, Hiroshi, 4,103,078, Cl. 526-115.000.
- Shimoda, Kazuho, to Konishiroku Photo Industry Co., Ltd. Transfer type copier. 4,102,570, Cl. 355-16.000.
- Shin-Shirasuna Electric Corp.: *See—*
  - Sakabe, Nobuyuki, 4,103,240, Cl. 325-349.000.
- Shinoda, Nobuhiko; Ito, Tadashi; Nakamoto, Soichi; and Ito, Fumio, to Canon Kabushiki Kaisha. Exposure control device. 4,103,307, Cl. 354-23.00D.
- Shinoda, Nobuhiko: *See—*
  - Sakurada, Nobuaki; Kawamura, Masaharu; Shinoda, Nobuhiko; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,103,308, Cl. 354-23.00D.
- Shinya, Nakai: *See—*
  - Taro, Miura; Takahiro, Yamamoto; Makoto, Suzuki; and Shinya, Nakai, 4,103,224, Cl. 324-58.50C.
- Shiono, Hidehiro: *See—*
  - Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, 4,102,783, Cl. 210-36.000.
- Shirinian, Genrikh Grigorievich: *See—*
  - Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.
- Shomura, Takashi: *See—*
  - Ogawa, Yasuaki; Kondo, Yasumitsu; Shomura, Takashi; Tsuruoka, Takashi; Inouye, Shigeharu; and Niida, Taro, 4,103,083, Cl. 542-427.000.
- Shonnard, John R.; and Natale, Rocco J. Apparatus for igniting charcoal briquettes. 4,102,317, Cl. 126-25.00B.
- Shoop, George W., to PPG Industries, Inc. Method of making heated laminated window. 4,102,722, Cl. 156-99.000.
- Short, Edward H., III: *See—*
  - Wood, Loren E.; and Short, Edward H., III, 4,102,167, Cl. 72-54.000.
- Showa Denko K.K.: *See—*
  - Matsui, Fumio; Hayashi, Shigeo; and Komada, Eiji, 4,102,962, Cl. 264-82.000.
- Showa Oil Co., Ltd.: *See—*
  - Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, 4,102,983, Cl. 423-245.000.
- Shufran, Steve, to United States Steel Corporation. Walking beam conveying apparatus and method. 4,102,449, Cl. 198-774.000.
- Shulman, Abe; and Willing, Jere J., to A-Jer Engineering, Inc. Automatic filling device. 4,102,367, Cl. 141-231.000.
- Shum, Lanson Y.: *See—*
  - Fromson, Robert E.; Brecker, James N.; and Shum, Lanson Y., 4,103,226, Cl. 324-61.00R.
- Shuster, Edward J.: *See—*
  - Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
- Siano, James N.: *See—*
  - Schreiber, William L.; Siano, James N.; Vock, Manfred Hugo; and Shuster, Edward J., 4,102,763, Cl. 204-162.00R.
- Sickler, Fred H.: *See—*
  - Sommers, Richard L.; and Sickler, Fred H., 4,102,264, Cl. 101-77.000.
- Sidbec-Dosco Ltee: *See—*
  - Dancy, Edna A., 4,102,708, Cl. 136-233.000.

Sidro GmbH & Co. Ludwig Moller: *See—*
Koser, Rolf, 4,102,169, Cl. 72-128.000.

Siegle, Peter; Kuhle, Engelbert; Hartmann, Alfons; Homeyer, Bernhard; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Nematicidally and arthropodically active N-methyl-N-(2-toluenesulphonic acid methylamide-N'-sulphenyl)-2,2-dimethyl-2,3-dihydrobenzofuranyl-(7)-carbamate. 4,103,024, Cl. 424-285.000.

Siemens Aktiengesellschaft: *See—*
Auinger, Herbert; Lang, Walter; and Mader, Manfred, 4,103,217, Cl. 322-28.000.
Deseroo, Peter; and Prost, Hans, 4,103,236, Cl. 325-132.000.
Dietze, Wolfgang; and Stut, Hans, 4,102,298, Cl. 118-5.000.

Sierant, Stanley Leslie. Baths. 4,101,988, Cl. 4-173.00R.

Signode Corporation: *See—*
Leslie, John H.; Angarola, Barry R.; and Nocom, A. L., 4,102,364, Cl. 141-4.000.

Sih, Charles J., to Wisconsio Alumni Research Foundation. Glycosides of 2,6-bis(hydroxy-phenyl)-3,7-dioxabicyclo [3.3.0] octane. 4,103,006, Cl. 424-181.000.

Siiberg, Hemming G., to Wagner Electric Corporation. Fluid bilevel sensor. 4,103,265, Cl. 335-205.000.

Simerl, R. A. Portable anemometer with collapsible rotors. 4,102,188, Cl. 73-170.00R.

Simko, Gabriel, to PPG Industries, Inc. Method of and apparatus for aligning a scoring wheel with a support wheel. 4,102,227, Cl. 83-7.000.

Simmat, Fritz: *See—*
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 4,102,666, Cl. 65-33.000.

Simmons, Charles T.; and Lampert, William B., III, to Simmons, Charles T. Aromatic wood fuel briquette and method of making and using the same. 4,102,653, Cl. 44-16.00R.

Simon, Virgil S., to Thomas A. Schutz Co., Inc. Flip card display. 4,102,070, Cl. 40-498.000.

Simpkins, Peter Gerald: *See—*
Dudderar, Thomas Dixon; and Simpkins, Peter Gerald, 4,102,661, Cl. 65-2.000.

Simpson, Thomas Melvin. Machine for making a planter. 4,102,622, Cl. 425-268.000.

Sims, Rex J.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Sindermann, Siegmar: *See—*
Jordan, Heinrich; and Sindermann, Siegmar, 4,102,365, Cl. 141-39.000.

Singer Company, The: *See—*
Ferriss, Lincoln Stark, 4,102,202, Cl. 73-517.00B.
Naydan, Bob Nicholas; and Brand, Arnold Joseph, 4,103,215, Cl. 318-654.000.

Singhal, Subhash C.: *See—*
Lange, Frederick F.; and Singhal, Subhash C., 4,102,698, Cl. 106-65.000.

Sirrenberg, Wilhelm; Alles, Hans-Ulrich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 3-(2,2,4,4-tetrafluoro-benz-1,3-dioxin-6-yl)-1-(substituted benzoyl)-ureas. 4,103,022, Cl. 424-278.000.

Siuta, Gerald Joseph; and Bernstein, Seymour, to American Cyanamid Company. Anionic phenylcarboxamide complement inhibitors. 4,102,918, Cl. 260-507.00R.

SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschweski, Armin, 4,102,553, Cl. 308-6.00C.
Fischer, Wilhelm, 4,102,447, Cl. 192-110.00B.

Skutnik, Bolesh J.: *See—*
Bohm, Georg Gustav Anton; and Skutnik, Bolesh J., 4,102,761, Cl. 204-159.200.

Slater Electric Co.: *See—*
Jadatz, Harald B., 4,102,466, Cl. 220-3.800.

Slavnova, Alevtina Semenovna: *See—*
Usvyatsov, Aldan Alexandrovich; Popov, Dmitry Mikhailovich; Slavnova, Alevtina Semenovna; Genkina, Elena Vladimirovna; Vdovin, Nikolai Mikhailovich; Pleshkov, Mikhail Grigorievich; Safin, Ravil Safinovich; Naumov, Sergei Nikolaevich; Kokoulin, Felix Georgievich; Manelis, Georgy Borisovich; Trofilkina, Valentina Petrovna; Te, Ljudmila Ilinichna; Voronkova, Olga Nikolaevna; and Formenova, Galina Alexandrovna, 4,102,926, Cl. 260-576.000.

Sleeter, Ronald T. Quantitative analysis of carbohydrates by infrared spectroscopy. 4,102,646, Cl. 23-230.00R.

Sloan, Paul H., Jr., to Stant Manufacturing Company, Inc. O-rings for vehicle fuel tank filler neck caps. 4,102,472, Cl. 220-295.000.

Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, to South African Inventions Development Corporation. Process for the continuous manufacture of nitrous oxide. 4,102,986, Cl. 423-402.000.

Smith, Arthur V., Jr. System for collecting solar energy. 4,102,329, Cl. 126-271.000.

Smith, Donald C., to Sterling Associates, Inc. Label applying apparatus. 4,102,728, Cl. 156-362.000.

Smith International, Inc.: *See—*
Kellner, Jackson M., 4,102,552, Cl. 308-4.00A.
Webb, Daniel R.; Steinke, John F.; Berry, Robert W.; and Funsten, Stanard R., 4,102,411, Cl. 173-164.000.

Smith, James; and Johnston, Richard Paul, to General Electric Company. Multiple section rotor disc. 4,102,603, Cl. 416-244.00A.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Metallic carboxylate composition for forming thermoparticulating coating. 4,102,192, Cl. 73-339.00R.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Method for protecting electrical apparatus and thermal detection system using sulfonic acid thermoparticulating coating. 4,102,193, Cl. 73-339.00R.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Malonic acid composition for thermoparticulating coating. 4,102,809, Cl. 252-408.000.

Smith, John L.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.

Smith, Linda S.: *See—*
Harper, James H.; and Smith, Linda S., 4,102,562, Cl. 350-105.000.

Smith, Lynn C., to Design & Manufacturing Corporation. Door lock actuator unit. 4,102,213, Cl. 74-110.000.

Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, to Union Carbide Corporation. Compositions of high solids content comprising carboxylic polymer and aliphatic diepoxide. 4,102,942, Cl. 260-836.000.

Smith, Robert L.; Lee, Ta-Jyh; and Cragoe, Edward J., Jr., to Merck & Co., Inc. 3-Thiazolidinyl heptanoic acids. 4,102,888, Cl. 260-294.80D.

Smith, Samuel C. Bridge scoring device. 4,102,543, Cl. 283-49.000.

Smith, William Allen: *See—*
Stalling, David L.; Huckins, James N.; and Smith, William Allen, 4,102,816, Cl. 252-428.000.

SmithKline Corporation: *See—*
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,103,086, Cl. 544-47.000.

Smock, Steve W.: *See—*
Homan, William N.; and Smock, Steve W., 4,103,119, Cl. 200-35.00R.

Snell, James B., to Phillips Petroleum Company. Liquid column chromatographic separation. 4,102,179, Cl. 73-61.10C.

Snipes, Thayer. Fuel burning control apparatus. 4,102,952, Cl. 261-44.00A.

Societe Anonyme de Recherche et d'Etudes Techniques: *See—*
Augier, Robert Joseph Ernest; and Eliche, Jean Marc, 4,102,618, Cl. 425-64.000.

S.A. des Cableries & Trefileries de Cossonay: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Societe Anonyme dite: S I C O F: *See—*
Farge, Herve, 4,102,091, Cl. 52-79.700.

Societe Anonyme Francaise du Ferodo: *See—*
Rist, Michel, 4,102,446, Cl. 192-91.00A.

Societe Anonyme pour l'Equipement Electrique des Vehicules s.E.V. Marchal: *See—*
Rich, Bernard J., 4,102,040, Cl. 29-598.000.

Societe d'Etude et de Gestion des Brevets de la Roche Kerandraon et de Saulces de Freycinet "S.E.G.": *See—*
de la Roche Kerandraon, Olivier Geoffroy, 4,102,293, Cl. 115-28.00R.

Societe d'Exploitation de Brevets J.B.: *See—*
Hancu, Theodore, 4,102,003, Cl. 15-250.420.

Societe d'Exploitation des Cables Electriques: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Societe Generale de Constructions Electriques et Meccaniques "Alsthom et Cie": *See—*
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,102,757, Cl. 204-73.00R.

Societe Internationale pour l'Innovation: *See—*
Moreno, Roland, 4,102,493, Cl. 235-419.000.

Societe Nationale des Poudres et Explosifs: *See—*
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,102,830, Cl. 521-165.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Dubernet, Robert; Janvier, Lucien; Tirilly, Roger; and O'Connolly, Patrick, 4,103,230, Cl. 324-77.00H.

Sofec, Inc.: *See—*
Dietrich, David S., 4,102,146, Cl. 61-110.000.

Sokoloff, Boris: *See—*
Picquendar, Jean-Edgar; and Sokoloff, Boris, 4,103,110, Cl. 179-15.0FD.

Sommer, John George: *See—*
Kuan, Tiong Ho; and Sommer, John George, 4,102,855, Cl. 260-42.330.

Sommer, Warren T. Central receiver solar collector using mechanically linked mirrors. 4,102,326, Cl. 126-270.000.

Sommers, Richard L.; and Sickler, Fred H., to Didde-Glaser, Inc. Numbering throw-off for collator. 4,102,264, Cl. 101-77.000.

Sonoi, Koya: *See—*
Nagano, Masashi; and Sonoi, Koya, 4,102,215, Cl. 74-243.0DR.

Sonomura, Roy N. Apparatus and method for placing explosives in submerged rock. 4,102,412, Cl. 175-5.000.

Sony Corporation: *See—*
Ikegami, Keisuke; and Hoshimi, Susumu, 4,103,197, Cl. 310-267.000.
Sugita, Kazuhiro; and Kon, Chiyohide, 4,103,232, Cl. 324-158.00F.

Sorensen, Keld Torben Schneider, to K. & V. Sorensen Engineering Ltd. Fluid pressure drill feeding device. 4,102,593, Cl. 408-130.000.

Soto, Ricardo Hurtado. Disposable resealable container. 4,102,487, Cl. 229-54.00R.

South African Inventions Development Corporation: *See—*
Smit, Jakob Van Rouendal; Hassiotis, Panayiotis; and Hasty, Robert Armistead, 4,102,986, Cl. 423-402.000.

Soyland, Ingebret. Excavator with low center of gravity. 4,102,461, Cl. 214-132.000.

Spampinato, Dominic Patrick: *See—*
Miersch, Ekkehard Fritz; and Spampinato, Dominic Patrick, 4,103,342, Cl. 365-149.000.

Spanier, Henry C.: *See—*
Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.

Speaker, Richard L.: *See—*
Wolbrink, David W.; and Speaker, Richard L., 4,102,448, Cl. 198-365.000.

Speakman Company: *See—*
Lagarelli, Carmen J., 4,101,989, Cl. 4-191.000.

Speizman Industries, Inc.: *See—*
Annas, Dulin Land, Sr., 4,102,729, Cl. 156-384.000.

Speranza, George P.; and Waddill, Harold G., to Texaco Development Corporation. Method of making glycidyl ethers of novolak resins. 4,102,866, Cl. 528-135.000.

Sperry, Peter Reeves; Wiersema, Richard J.; and Nyi, Kayson, to Rohm and Haas Company. Dispersing paint pigments. 4,102,843, Cl. 260-29.6RW.

Sperry Rand Corporation: *See—*
Hyman, Charles E.; and Setter, Alfred C., 4,103,325, Cl. 363-148.000.

Spevack, Jerome S., to Deuterium Corporation. Process feed and effluent treatment systems. 4,102,650, Cl. 23-270.50W.

Spicer, John F.: *See—*
Amberg, Stephen W.; and Spicer, John F., 4,102,302, Cl. 118-239.000.

Spirin, Evgeny Timofeevich: *See—*
Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.

Spitz, George T.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,102,943, Cl. 260-850.000.

Spollen, Francis Joseph, to Bell Telephone Laboratories, Incorporated. Anchor assembly for a submarine cable coupling. 4,103,104, Cl. 174-70.00S.

Spotholz, Clifford H.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Spottiswoode, Nigel Lawrence; and Ryden, David John, to AGA Navigation Aids Ltd. Nuclear light source. 4,103,172, Cl. 250-462.000.

Spound, Albert M.; and Horowitz, Richard D. Adjustable modular bookcase. 4,102,275, Cl. 108-92.000.

Spradlin, Richard V. Portable medical table. 4,103,170, Cl. 250-451.000.

Spradling, Gene V., to Emerson Electric Co. Two speed single phase induction motor. 4,103,212, Cl. 318-224.00A.

Sprecher & Schuh Ltd. (SSA): *See—*
Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.

Sprecker, Mark A.; Vock, Manfred Hugo; Schmitt, Frederick Louis; Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. Flavoring with derivatives of 1-acetyl-3,3-dimethylcyclohexane, and processes for using same and processes for preparing said 1-acetyl-3,3-dimethylcyclohexane derivatives. 4,103,036, Cl. 426-538.000.

Sprecker, Mark A.: *See—*
Hall, John B.; Sprecker, Mark A.; Schmitt, Frederick Louis; and Vock, Manfred Hugo, 4,102,928, Cl. 260-586.00C.

Staats, Henry N., to General Binding Corporation. Two stage oven laminator. 4,102,730, Cl. 156-499.000.

Stackpole Carbon Company: *See—*
Borkowski, John W., 4,102,960, Cl. 264-42.000.

Stagoll, Francis: *See—*
Robert, Philippe; Guignard, Claude; and Stagoll, Francis, 4,102,300, Cl. 118-67.000.

Stahl, Howard D.: *See—*
Fioriti, Joseph A.; Stahl, Howard D.; Sims, Rex J.; and Spotholz, Clifford H., 4,103,040, Cl. 426-614.000.

Stalherm, Dieter; and Kolitz, Volker, to Bergwerksverband GmbH. Coke oven battery with control means for changing the heat supply. 4,102,751, Cl. 202-151.000.

Stalling, David L.; Huckins, James N.; and Smith, William Allen, to United States of America, Interior. Adsorbent for polynuclear aromatic compounds. 4,102,816, Cl. 252-428.000.

Standard Brands Incorporated: *See—*
Thompson, Kenneth N.; Lloyd, Norman E.; and Johnson, Richard A., 4,102,745, Cl. 195-31.00R.

Standard Oil Company, The: *See—*
Budinger, Bruce O.; and Duke, June T., 4,102,947, Cl. 260-879.000.

Standard Oil Company (Indiana): *See—*
Hensley, Albert L., Jr., 4,102,779, Cl. 208-211.000.
Vitali, Joseph D., 4,103,335, Cl. 364-900.000.

Stant Manufacturing Company, Inc.: *See—*
Sloan, Paul H., Jr., 4,102,472, Cl. 220-295.000.

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Kruger, Gunther, 4,102,884, Cl. 260-239.570.

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Stegelman, Albert F., to Phillips Fibers Corporation. Yarn supply package and method and apparatus for the winding thereof. 4,102,508, Cl. 242-18.0PW.

Steidinger, Donald J., to Wallace Business Forms, Inc. Method of making a continuous envelope. 4,102,251, Cl. 93-63.00M.

Steinbach, Carl Raymond: *See—*
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Steinberg, Richard W., to Vibra-King, Inc. Subsoiler. 4,102,402, Cl. 172-40.000.

Steinberg, Richard W., to Vibra-King, Inc. Apparatus for making a slit trench. 4,102,403, Cl. 172-40.000.

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Stepan, Walter; and Hennecke, Klaus, to UVEX Winter Optik GmbH. Protective device having a shield for protecting the face of a user. 4,101,980, Cl. 2-9.000.

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Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.

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Stephenson, Richard M., to PPG Industries, Inc. Distillation of meta-chloronitrobenzene in the presence of a distillation adjuvant. 4,102,753, Cl. 203-64.000.

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Sterling Drug Inc.: *See—*
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Stettner, Joseph C.; and Ott, James H., to Novar Electronics Corporation. Intruder deterrent apparatus and method. 4,103,294, Cl. 340-566.000.

Stewart, William James, to Plessey Handel und Investments A.G. Optical apparatus. 4,102,579, Cl. 356-201.000.

Stiff, John E. Solar heating and control system. 4,102,328, Cl. 126-271.000.

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Stock, Alvin L.; Roddis, Gravatt K.; and Nygren, William C., to Westinghouse Electric Corp. Single case low pressure turbine. 4,102,598, Cl. 415-135.000.

Stockholm, John George: *See—*
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Stone, Richard D., to UOP Inc. Moving bed contacting process. 4,102,776, Cl. 208-64.000.

Storz, Karl. Head mounted lamp with joint observation eyepiece. 4,102,333, Cl. 128-6.000.

Stover, David Emmert; and Menzel, Alvin Lewis, to Deere & Company. Non-Jamming shear pin assembly. 4,102,153, Cl. 64-28.00R.

Straka, Daniel Charles, to Arco Polymers, Inc. Latex frothing agent. 4,102,808, Cl. 252-354.000.

Strandine, Eldon J.; and Koonz, Carl H., to Swift & Company. Apparatus for injecting a liquid additive into poultry flesh. 4,102,258, Cl. 99-532.000.

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Stricklin, Harry Charles. Converting an internal combustion engine to a single acting engine driven by steam or compressed air. 4,102,130, Cl. 60-407.000.

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Strom, Gerald A.; and Bernard, James I., to Schlumberger Technology

Corporation. Measuring-while-drilling system having motor speed detection during encoding. 4,103,281, Cl. 340-18.0LD.

- Structural Instrumentation, Inc.: *See*—
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- Stulgate, Emily M.: *See*—
  - Aberson, Gerhard M.; and Stulgate, Emily M., 4,103,062, Cl. 428-283.000.
- Sturrock, John Monro; and Wallman, Bernard Allan, to Cambridge Scientific Instruments Limited. Electron beam microfabrication apparatus. 4,103,168, Cl. 250-442.000.
- Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, to Societe Nationale des Poudres et Explosifs. Diol-phosphonates as flame-retardants in polyurethane foam. 4,102,830, Cl. 521-165.000.
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  - Dietze, Wolfgang; and Stut, Hans, 4,102,298, Cl. 118-5.000.
- Suami, Tetsuo. Aminocyclitol derivatives and process for producing the same. 4,103,082, Cl. 536-17.000.
- Suess, Frank A.: *See*—
  - Suess, Richard R.; and Suess, Frank A., 4,102,237, Cl. 84-421.000.
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- Sugahara, Yujiro; Usui, Koichi; Ogawa, Masahide; Kurosaki, Hideaki; and Imafuku, Shigehisa, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of alkali aluminosilicate detergent builder. 4,102,977, Cl. 423-118.000.
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- Sugita, Kazuhiro; and Kon, Chiyohide, to Sony Corporation. Wafer transfer device. 4,103,232, Cl. 324-158.00F.
- Sugiyama, Masatoshi; Sawaguchi, Hirosi; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Methine dyes. 4,102,688, Cl. 96-139.000.
- Sulzer Brothers Ltd.: *See*—
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- Sumitomo Chemical Company, Limited: *See*—
  - Fujimoto, Masanori; Tsuji, Kozo; and Nagase, Tsuneyuki, 4,102,842, Cl. 260-29.6PT.
  - Fukuba, Kozo; Ogushi, Yasutomo; and Harada, Haruhisa, 4,102,697, Cl. 106-111.000.
  - Fukuyama, Yoshiya; Akagane, Katsuo; and Miwa, Takao, 4,102,944, Cl. 260-861.000.
  - Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
- Sumitomo Metal Industries, Ltd.: *See*—
  - Kunitake, Tatsuro; Saito, Iwao; Tsumura, Kazuo; Nishio, Masahiro; Nishiguchi, Masaru; and Okada, Yasutaka, 4,102,711, Cl. 148-12.300.
  - Nakamura, Masahiro; Tsuda, Tetsuaki; and Amakata, Hajime, 4,102,772, Cl. 204-206.000.
  - Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, 4,102,694, Cl. 106-56.000.
  - Yamauchi, Nobuyuki; and Taka, Takao, 4,103,143, Cl. 219-145.210.
- Summers, John J.; and Willis, Larry G., to National Gypsum Company. Two-way window grid. 4,103,052, Cl. 428-38.000.
- Sumrall, James A.: *See*—
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- Sun, Jack Ji-Nong; and Lewis, Dartrey, to S. G. Frantz Company, Inc. Method and apparatus for magnetic separation of particles in a fluid carrier. 4,102,780, Cl. 209-39.000.
- Sun, Jui-Yuan: *See*—
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- Sun Oil Company Limited: *See*—
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- Sundstrand Corporation: *See*—
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  - Huber, Melvin F.; and Hansen, Lowell D., 4,102,606, Cl. 417-204.000.
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- Sushradt, Wolfgang: *See*—
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- Suzuki, Kiyoshi: *See*—
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- Suzuki, Masane; and Suzuki, Kiyoshi, to Fuji Photo Optical Co., Ltd. Method of forming moire contour lines. 4,102,577, Cl. 356-169.000.
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- Suzuki, Yasoji; and Kuroda, Tadashi, to Tokyo Shibaura Electric Co., Ltd. Frequency divider with one-phase clock pulse generating circuit. 4,103,184, Cl. 307-225.00C.
- Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor memory with data detection circuit. 4,103,345, Cl. 365-190.000.
- Swager, William E. Locking clevis or the like. 4,102,124, Cl. 59-86.000.
- Swanson, Roy T.: *See*—
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  - Rogers, Edward J.; and Swanson, Roy T., 4,103,121, Cl. 200-48.00A.
- Swift & Company: *See*—
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- Swift, Harold E.: *See*—
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- Swinehart, Merle R., to Cutler-Hammer, Inc. Two-wire pilot device solid state control system. 4,103,299, Cl. 340-506.000.
- Sylvester, Bruce J.; and Sylvester, Roger P., to J. G. Sylvester Associates, Inc. Underwater inspection and communication apparatus. 4,102,203, Cl. 73-620.000.
- Sylvester, Roger P.: *See*—
  - Sylvester, Bruce J.; and Sylvester, Roger P., 4,102,203, Cl. 73-620.000.
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- Symons Corporation: *See*—
  - Cody, David L., 4,102,096, Cl. 52-122.000.
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  - Szantay, Csaba; Szabo, Lajos; Toke, Laszlo; Toth, Istvan; Virag, Sandor; Kanyo, Erzsebet; and David, Agoston, 4,102,886, Cl. 260-287.0CF.
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- Szecska, Dezso: *See*—
  - Danszky, Istvan; and Szecska, Dezso, 4,102,407, Cl. 172-611.000.
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- Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,102,119, Cl. 58-23.00R.
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- Takahashi, Teizo; Matsumoto, Toshiyuki; Nakamura, Tadashi; and Kuroiwa, Ryozo, to Kubota Ltd. Seated-operator type tractor. 4,102,537, Cl. 296-102.000.
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  - Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 4,102,881, Cl. 260-239.0BD.
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- Takimoto, Yasuyuki; and Yoshikawa, Toshikazu, to Nippon Paint Company. Duplicate thermoplastic plates, matrices useful therefor and methods of manufacturing the same. 4,103,057, Cl. 428-156.000.
- Takizawa, Shiro; and Nishimura, Shinichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Slit lamp microscope. 4,102,565, Cl. 351-14.000.
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- Talbert, Miles E., to Thomasville Products, Inc. Apparatus for producing polyurethane foam buns of varying heights. 4,102,621, Cl. 425-224.000.

- Taller, Robert Arthur: *See*—
  - Smith, Oliver Wendell; Taller, Robert Arthur; and Koleske, Joseph Victor, 4,102,942, Cl. 260-836.000.
- Tally Corporation: *See*—
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- Tamura, Hiroshi: *See*—
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- Tan, Yoichi, to Nippon Electric Co., Ltd. FSK demodulator. 4,103,244, Cl. 329-122.000.
- Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,102,122, Cl. 58-58.000.
- Tanaka, Shigenori; and Tojo, Akio, to Nissan Motor Company, Ltd. Fluid supplying and discharging apparatus for shuttleless weaving loom. 4,102,361, Cl. 139-435.000.
- Tanaka, Yutaka: *See*—
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- Tani Denki Kogyo Kabushiki Kaisha: *See*—
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- Tarrant, Fred A. Combined greeting card and music box structure. 4,102,067, Cl. 40-455.000.
- Tarrone, Eugenio. Welding mask with automatic obscuring of the visual field. 4,101,979, Cl. 2-8.000.
- Tarukawa, Hideaki: *See*—
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- Taylor, Challen E., to Goodyear Tire & Rubber Company, The. Method of making a hose having an improved surface appearance. 4,102,724, Cl. 156-149.000.
- Taylor, Donald M.; and Ward, Donald H., to Armco Steel Corporation. Interlocked channel section panels and connectors therefor. 4,102,105, Cl. 52-520.000.
- Taylor, Harold Mellon, to Eli Lilly and Company. Herbicidal beta-phenyl-4-piperidinones and -dihydropyridinones. 4,102,669, Cl. 71-94.000.
- Taylor, John Crawshaw; and Phillips, Richard Antony. Thermostats. 4,103,271, Cl. 337-372.000.
- Taylor, Lloyd D., to Polaroid Corporation. Photographic uses of polyvinylphenylmercapto-tetrazole:multivalent metal cation combinations. 4,102,685, Cl. 96-73.000.
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- Tenbergen, Reichel A., to International Nickel Company, Inc., The. Flotation process. 4,102,781, Cl. 209-166.000.
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- Terry, Ruel C., to In Situ Technology, Inc. Sealing an underground coal deposit for in situ production. 4,102,397, Cl. 166-259.000.
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  - Brennan, Michael E., 4,103,087, Cl. 544-78.000.
  - Cavitt, Stanley B., 4,102,820, Cl. 252-463.000.
  - Klein, Howard P., 4,102,828, Cl. 521-174.000.
  - Speranza, George P.; and Waddill, Harold G., 4,102,866, Cl. 528-135.000.
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  - Harnsberger, Bobby G., 4,102,398, Cl. 166-276.000.
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- Thacker, Charles P., to Xerox Corporation. Task handling in a data processing apparatus. 4,103,330, Cl. 364-200.000.
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- Thaler, Richard: *See*—
  - Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.
- Thaler, Warren A., to Exxon Research & Engineering Co. Halogenated organoaluminum compounds and method of preparation. 4,103,079, Cl. 526-185.000.
- Thenander, Rune, to ASEA Aktiebolag. Method of minimizing errors in measuring of tension in moving strip. 4,102,183, Cl. 73-144.000.
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  - Hawk, Robert M.; and Thiel, Frank L., 4,102,561, Cl. 350-96.210.
- Thiem, Karl-Werner: *See*—
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- Thomas A. Schutz Co., Inc.: *See*—
  - Simon, Virgil S., 4,102,070, Cl. 40-498.000.
- Thomas, David Hamilton, to Imperial Chemical Industries Limited. Unsaturated polyester resin composition comprising polypropylene adipate. 4,102,837, Cl. 260-22.0CB.
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  - Chevalier, Michel; Lucas, Jean-Claude; and Lacoste, Gerard, 4,103,218, Cl. 323-1.000.
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  - Herbenar, Edward John, 4,102,585, Cl. 403-138.000.
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    - Pizzarello, Frank A.; and LaChapelle, Theodore J., Jr., 4,103,144, Cl. 219-209.000.
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  - Westman, Kjell Harry, 4,103,288, Cl. 340-152.00R.
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  - Shufran, Steve, 4,102,449, Cl. 198-774.000.
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  - Clack, Frederick Argles, Jr., 4,102,011, Cl. 16-149.000.
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  - Shulman, Abe; and Willing, Jere J., 4,102,367, Cl. 141-231.000.
- Willis, Larry G.: *See—*
  - Summers, John J.; and Willis, Larry G., 4,103,052, Cl. 428-38.000.
- Wills, Frank Eugene, to Borg-Warner Corporation. Heat pump control system. 4,102,389, Cl. 165-29.000.
- Wilmot-Breeden Limited: *See—*
  - Jeavons, Philip Swingewood, 4,102,588, Cl. 403-245.000.
- Wilson, George T., to Tenneco, Inc. Peripheral return flow muffler. 4,102,430, Cl. 181-265.000.
- Windsurfing International, Inc.: *See—*
  - Corona, Peter J., 4,102,624, Cl. 425-429.000.
- Winiasz, Michael Edward. Semi-automatic logsplitter. 4,102,373, Cl. 144-193.00A.
- Winters, Harold Franklin, to International Business Machines Corporation. Hot filament, arc type ion source and method. 4,103,042, Cl. 427-38.000.
- Winther, John L. Pump system providing selective directional flow across fluid barrier. 4,102,136, Cl. 61-29.000.
- Wire Rope Corporation of America, Inc.: *See—*
  - Wheeler, Claud Ray, 4,102,118, Cl. 57-144.000.
- Wisconsin Alumni Research Foundation: *See—*
  - Sih, Charles J., 4,103,006, Cl. 424-181.000.
- Wisjo, Bjorn Alvar: *See—*
  - Ebbeson, Bengt Ebbe Oscar; and Wisjo, Bjorn Alvar, 4,102,289, Cl. 114-104.000.
- Wisniewski, Edward F.: *See—*
  - Ronai, Kenneth S.; Spanier, Henry C.; Scaglione, Felice; and Wisniewski, Edward F., 4,103,034, Cl. 426-250.000.
- Withers, James G., Jr., to UOP Inc. Heat exchange apparatus. 4,102,393, Cl. 165-95.000.
- Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, to Wacker-Chemie GmbH. Silicon-tin compounds as condensation catalysts in the preparation of organopolysiloxane elastomers. 4,102,860, Cl. 528-18.000.
- Wolbrink, David W.; and Speaker, Richard L., to S I Handling Systems, Inc. Conveying apparatus including tilting support structures. 4,102,448, Cl. 198-365.000.
- Wolf, Horst; and Seher, Rolf, to Zinser-Textilmaschinen GmbH. Draw twisting machine. 4,103,210, Cl. 318-46.000.
- Wolff Walsrode Aktiengesellschaft: *See—*
  - Bohmer, Branislav; and Hoppe, Lutz, 4,103,080, Cl. 526-303.000.
- Wood, Dennis E., to Rando Machine Corporation. Method of forming lignocellulosic fiber mats. 4,102,963, Cl. 264-91.000.
- Wood, Howard L., to Wood's Powr-Grip Co., Inc. Valve control system for air powered vacuum pump. 4,102,609, Cl. 417-399.000.
- Wood, Jack: *See—*
  - Davies, John H.; Wood, Jack; and Pearson, Michael, 4,103,017, Cl. 424-270.000.
- Wood, Loren E.; and Short, Edward H., III, to Black, Sivalls & Bryson, Inc. Method of manufacturing integral fluid pressure rupturable apparatus. 4,102,167, Cl. 72-54.000.
- Wood, Noel Sydney Davidson: *See—*
  - Nielsen, Carl Philip; and Wood, Noel Sydney Davidson, 4,102,101, Cl. 52-263.000.
- Wood, William H., to Airheart Products, Inc. Cam operated disc brake. 4,102,440, Cl. 188-72.700.
- Woodley, Keith R., to Wescan, Inc. Tapered plastic container with seamed metal end and method for making it. 4,102,467, Cl. 220-67.000.
- Wood's Powr-Grip Co., Inc.: *See—*
  - Wood, Howard L., 4,102,609, Cl. 417-399.000.
- Woodward, Oakley McDonald, to RCA Corporation. Dual channel transmission of microwave power through an interface of relative rotation. 4,103,262, Cl. 333-6.000.
- Woodward, Robert John; and O'Connell, Walter. Male potency device. 4,102,335, Cl. 128-68.100.
- Worldwide Converting Machinery, Inc.: *See—*
  - Krimsky, Leonard C.; and Van Rietschoten, Henk, 4,102,511, Cl. 242-64.000.
- Woychesin, Elias A.; and Legleu, Clovis P., III, to Kaiser Aluminum & Chemical Corporation. Removal of acidic impurity from chlorofluoromethanes. 4,102,981, Cl. 423-240.000.
- Wright, James L. Grinding machine with means for advancing a saw. 4,102,224, Cl. 76-79.000.
- Wristen, Cecil C., to Allis-Chalmers Corporation. Weld monitor. 4,103,141, Cl. 219-130.010.
- Wuethrich, Hans-Rudolf: *See—*
  - Graf, Rudolf; Lang, Ernst; Stephanides, Viktor; Thaler, Richard; and Wuethrich, Hans-Rudolf, 4,103,131, Cl. 200-148.00A.
- Wyatt Engineers, Inc.: *See—*
  - McManama, Gerald P., 4,102,278, Cl. 110-105.000.
- Wyman, Charles L.: *See—*
  - United States of America, National Aeronautics and Space Administration; Wyman, Charles L.; Griner, Donald B.; Hurd, William A.; Shelton, Glenn B.; Hunt, Gary H.; Fannin, Bill B.; Brealt, Robert P.; and Hawkins, Charles A., 4,102,580, Cl. 356-210.000.
- Xerox Corporation: *See—*
  - Bobick, Thomas W., 4,103,252, Cl. 331-48.000.
  - Cizmic, Stipe; Halfhill, Martin O.; Jacques, James O.; Mahon, Douglas K.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,103,338, Cl. 364-900.000.
  - Deetz, David R., 4,102,265, Cl. 101-93.030.
  - Draugelis, Vaidevutis C.; Tsilibes, George N.; and Vineski, John E., 4,102,681, Cl. 96-1.400.
  - Goffe, William L.; and Mammino, Joseph, 4,102,682, Cl. 96-1.50R.
  - Schwarz, William M., 4,102,305, Cl. 118-651.000.
  - Shenfield, Leonard R., 4,103,326, Cl. 364-200.000.
  - Thacker, Charles P., 4,103,330, Cl. 364-200.000.
  - Thacker, Charles P., 4,103,331, Cl. 364-200.000.
- Yaegashi, Takehisa: *See—*
  - Saiki, Junichi; Watanabe, Syouzi; Yaegashi, Takehisa; and Nagano, Tetsuro, 4,102,127, Cl. 60-284.000.
- Yamada, Kenzo: *See—*
  - Miyashita, Yoshio; Masui, Akira; Yamada, Kenzo; and Takahashi, Kenji, 4,102,675, Cl. 75-24.000.
- Yamamoto, Hisao: *See—*
  - Kojima, Atsuyuki; Kameno, Yoshito; Katsube, Junki; Inaba, Shigeho; and Yamamoto, Hisao, 4,103,030, Cl. 424-330.000.
- Yamamoto, Yoshimi; Ikawa, Kazuo; and Ogawa, Naoki, to Nissan Motor Company, Ltd.; and Fuji Kiko Company, Ltd. Support assembly of a collapsible steering column. 4,102,217, Cl. 74-492.000.
- Yamamoto, Youichi: *See—*
  - Saito, Yutaka; Yamamoto, Youichi; and Kojima, Hajime, 4,103,196, Cl. 310-266.000.
- Yamaoka, Hiroshi: *See—*
  - Sasaki, Kantaro; Yamaoka, Hiroshi; and Suzuki, Takao, 4,102,694, Cl. 106-56.000.
- Yamase, Osamu; Iida, Tetsuya; and Hara, Ichizo, to Showa Oil Co., Ltd. Method of purifying a gas containing volatile organic materials. 4,102,983, Cl. 423-245.000.
- Yamatake-Honeywell Co., Ltd.: *See—*
  - Okada, Mitsuyoshi; Okuno, Tetsuya; Sato, Takehiko; and Shima, Masao, 4,102,177, Cl. 73-32.00R.
- Yamauchi, Nobuyuki; and Taka, Takao, to Sumitomo Metal Industries, Ltd. Electrodes for tungsten inert gas welding. 4,103,143, Cl. 219-145.210.
- Yannone, Robert A.; and Reuther, John F., to Westinghouse Electric Corp. Black start system for large steam powered electric generation plants. 4,103,178, Cl. 290-40.00R.
- Yasillo, Nicholas J., to United States of America, Energy. Multiple-image oscilloscope camera. 4,103,310, Cl. 354-120.000.
- Yasoshima, Nobuyuki: *See—*
  - Sato, Kazuhiro; Yasoshima, Nobuyuki; Masuda, Toru; Fujisawa, Makoto; and Satake, Yasuo, 4,103,113, Cl. 179-27.0CA.
- Yates, Chester Robert; and Hall, Guy E., to Steadley Company, Inc. Wire spring assembly and components. 4,101,993, Cl. 5-267.000.
- Yen, Shiao-Ping Siao: *See—*
  - Rembaum, Alan; and Yen, Shiao-Ping Siao, 4,102,827, Cl. 260-823.000.
- Yin, Simon: *See—*
  - Howe, Francis M.; and Yin, Simon, 4,103,291, Cl. 340-522.000.

- Yokobayashi, Koji; Ikeda, Tadashi; and Misaki, Akira, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Process for the removal of sucrose from a sugar mixture. 4,102,743, Cl. 195-7.000.
- Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Transistor amplifier for low level signal. 4,103,245, Cl. 330-265.000.
- Yoo, Jin S.: *See—*
  - Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,102,811, Cl. 252-411.00R.
- Yoon, Jong Un. Sugar dispensing apparatus. 4,102,477, Cl. 222-438.000.
- Yoshida Kogyo K.K.: *See—*
  - Aoki, Tsunetaka, 4,102,022, Cl. 24-205.14R.
  - Okamoto, Taiichi, 4,102,246, Cl. 90-13.200.
- Yoshida, Syusuke: *See—*
  - Okamoto, Miyoshi; and Yoshida, Syusuke, 4,103,054, Cl. 428-91.000.
- Yoshikawa, Toshikazu: *See—*
  - Takimoto, Yasuyuki; and Yoshikawa, Toshikazu, 4,103,057, Cl. 428-156.000.
- Young, Joseph L.: *See—*
  - Vaplon, Gary Gene; Erickson, Edwin; and Young, Joseph L., 4,102,502, Cl. 241-4.000.
- Young, Richard W., to Amerada Hess Corporation. Hydro-carpet oil spillage containment and recovery device. 4,102,789, Cl. 210-252.0AS.
- Yugen Kaisha Iiyoshi Seisakusho: *See—*
  - Iiyoshi, Shuichiro, 4,102,172, Cl. 72-254.000.
- Yukl, Tex N. Electronic pain control system. 4,102,347, Cl. 128-421.000.
- Yuta, Kouichi: *See—*
  - Nishihara, Nobuyoshi; Okuhara, Toshiaki; Nishi, Tetu; Nakama, Hiroyuki; Saito, Chikara; and Yuta, Kouichi, 4,102,750, Cl. 201-6.000.
- Zahid, Abduz, to Greer Hydraulics, Inc. Locking ring for pressure vessel and method of making the same. 4,102,465, Cl. 220-3.000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
  - Umezawa, Hamao; and Takeuchi, Tomio, 4,102,999, Cl. 424-123.000.
- Zaki, Wahib Nassif; and Murphy, Alan Pearce, to Procter & Gamble Company, The. Fabric treatment compositions. 4,103,047, Cl. 427-242.000.
- Zalotay, Elemer. Construction for supporting space units installed in a building especially a multi-storey building. 4,102,097, Cl. 52-167.000.
- Zampaglione, Nicola: *See—*
  - Neustadt, Bernard R.; and Zampaglione, Nicola, 4,103,018, Cl. 424-272.000.
- Zanzie, Edward A., to Paving Products, Inc. Pull type asphalt paver. 4,102,590, Cl. 404-110.000.
- Zellweger, Conrad; and Guenin, Andre, to La Nationale S.A. Cigarette lighter. 4,102,633, Cl. 431-152.000.
- Zemel, Jay N., to University of Pennsylvania. Ion-controlled diode. 4,103,227, Cl. 324-65.00R.
- Zenhausern, Anton; Reber, Otto; and Aeschlimann, Peter, to Ciba-Geigy Corporation. Amine salts of reactive dyestuffs. 4,102,639, Cl. 8-1.00A.
- Zenno, Akira; Uebayashi, Toshiaki; Maruyama, Isamu; and Shiono, Hidehiro, to Daicel Ltd. Adsorbent process for oily materials. 4,102,783, Cl. 210-36.000.
- Zhilkin, Leonid Filippovich: *See—*
  - Gorbatov, Vasily Matveevich; Demchenko, Taras Filippovich; Bobylev, Semen Mikhailovich; Bobylev, Valery Semenovich; Zhilkin, Leonid Filippovich; Spirin, Evgeny Timofeevich; and Shirinian, Genrikh Grigorievich, 4,103,354, Cl. 366-88.000.
- Ziegler, Gerhard, to Verinigte Osterreichische Bisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Turbine-generator assembly, installation and housing. 4,102,599, Cl. 415-219.00R.
- Zielinski, James: *See—*
  - Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,102,798, Cl. 252-51.50A.
- Zinser-Textilmaschinen GmbH: *See—*
  - Wolf, Horst; and Seher, Rolf, 4,103,210, Cl. 318-46.000.
- Zipperer, Martin: *See—*
  - Gansert, Willi; and Zipperer, Martin, 4,103,321, Cl. 361-388.000.
- Zirconal Processes Limited: *See—*
  - Walters, Ian Richard; and Emblem, Harold Garton, 4,102,691, Cl. 106-38.350.
- Zobbi, Robert G.: *See—*
  - Moriarty, William L.; and Zobbi, Robert G., 4,102,770, Cl. 204-195.00R.
- Zollinger, Hans R., to H. A. Schlatter AG. Welding apparatus. 4,103,139, Cl. 219-101.000.
- Zumwalt, Glen W.: *See—*
  - Lehl, Elvest L.; and Zumwalt, Glen W., 4,102,272, Cl. 104-23.0FS.
- Zurbuchen, Jacques; and Dussy, Paul, to Ciba-Geigy Corporation. Process for the processing of organic textile materials. 4,102,640, Cl 8-73.000.
- Zurrer, August: *See—*
  - Marfurt, Hans Rudolf; Zurrer, August; and Gartner, Felix, 4,102,368, Cl. 141-250.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF JULY, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Cory Food Services, Inc.: *See—*
  - Schlegel, Norman H., Re. 29,708, Cl. 222-465.000.
- Expert, N.V.: *See—*
  - Vissers, Herbert, deceased, Re. 29,709, Cl. 209-86.000.
- Findeisen Brothers: *See—*
  - Findeisen, Kurt Ernst, Re. 29,706, Cl. 66-173.000.
- Findeisen, Kurt Ernst, to Findeisen Brothers. Hosiery support. Re. 29,706, Cl. 66-173.000.
- Loeffler, Herbert H. Product pressurized air dispenser having improved product control valve actuator. Re. 29,707, Cl. 222-193.000.
- Schlegel, Norman H., to Cory Food Services, Inc. Decanter handle structure. Re. 29,708, Cl. 222-465.000.
- Spisak, Edward G. Wheel and grease cap assembly. Re. 29,710, Cl. 301-37.00P.
- Vissers, Herbert, deceased (by Vissers, Hermanus H.), to Expert, N.V. Apparatus for cooling castings and for cooling and drying moulding sand. Re. 29,709, Cl. 209-86.000.
- Vissers, Hermanus H.: *See—*
  - Vissers, Herbert, deceased. Re. 29,709, Cl. 209-86.000.
- W. R. Grace & Co.: *See—*
  - Wood, Louis L., Re. 29,711, Cl. 260-29.2TN.
- Wood, Louis L., to W. R. Grace & Co. Polyureas and preparation thereof. Re. 29,711, Cl. 260-29.2TN.

LIST OF PLANT PATENTEES

- Conard-Pyle Company, The: *See—*
  - Lindquist, Robert V., Sr., 4,283, Cl. 11.000.
  - Lindquist, Robert V., Sr., 4,284, Cl. 19.000.
- Lindquist, Robert V., Sr., to Conard-Pyle Company, The. Rose plant. 4,283, 7-25-78, Cl. 11.000.
- Lindquist, Robert V., Sr., to Conard-Pyle Company, The. Hybrid tea rose plant. 4,284, 7-25-78, Cl. 19.000.
- Moling, LeRoy I. Cherry plum bush. 4,285, 7-25-78, Cl. 38.000.

LIST OF DESIGN PATENTEES

- Acme Metal Goods Mfg. Co.: *See—*
  - Fischer, Kenneth F., 248,609, Cl. D7-152.000.
- Adler, Peter: *See—*
  - Tougas, David; Adler, Peter; and Liszt, Mark, 248,605, Cl. D6-232.000.
- Aikman, Leslie N. Filter element for a cigarette holder or the like. 248,673, 7-25-78, Cl. D27-7.000.
- Allen-Stevens Corp.: *See—*
  - Cavalucci, Ralph, 248,617, Cl. D8-337.000.
- Altec Corporation: *See—*
  - Nussdorfer, Dale A., 248,647, Cl. D14-30.000.
- Anderson, Victor F., to Shell Oil Company. Bottle. 248,619, 7-25-78, Cl. D9-149.000.
- Anthony, James R., to Indiana Mills & Manufacturing, Inc. Buckle. 248,618, 7-25-78, Cl. D8-395.000.
- Apple, Edward Gorrell. Manual dental model remover. 248,663, 7-25-78, Cl. D24-10.000.
- Associated Mills, Inc.: *See—*
  - Grube, Clifford E., 248,666, Cl. D24-36.000.
- Bahmer, Melvin Herman. Thumb guard. 248,598, 7-25-78, Cl. D3-19.00E.
- Beall, Lester, Jr., to Trend Line Furniture Corporation. Seat. 248,603, 7-25-78, Cl. D6-68.000.
- Beatrice Foods Co.: *See—*
  - Schwartz, Daniel A., 248,610, Cl. D7-187.000.
- Bellenger, Donald M.; and Major, Paul David, to Telephone Electronics Corporation. Telephone mouthpiece keyboard. 248,650, 7-25-78, Cl. D14-66.000.
- Bennett, Alfred Weston: *See—*
  - Hay, David Stewart; and Bennett, Alfred Weston, 248,621, Cl. D9-219.000.
- Berg, Albert T., Jr.; and Langlie, Howard. Front panel for knob-type electric fence insulator. 248,644, 7-25-78, Cl. D13-18.000.
- Berg, Albert T., Jr.: *See—*
  - Langlie, Howard; and Berg, Albert T., Jr., 248,645, Cl. D13-18.000.
- Berkline Corporation, The: *See—*
  - Long, Stapleton, 248,602, Cl. D6-63.000.
- Bishop, Philip F., to Transpan Products, Inc. Transmission drain pan. 248,637, 7-25-78, Cl. D12-155.000.
- Bontempi, Marisa, to COMUS S.p.A. Electric Organ. 248,694, 7-25-78, Cl. D56-2.000.
- Breger, Carl-Arne, to Telefonaktiebolaget L M Ericsson. Telephone instrument. 248,649, 7-25-78, Cl. D14-53.000.
- Brehm, John Baptist. Acupressure therapeutic message device. 248,668, 7-25-78, Cl. D24-41.000.
- Bretschger, Edward B., to Louis Marx & Co., Inc. Toy robot head. 248,687, 7-25-78, Cl. D34-15.0AD.
- Brown, Glen J. Wind deflector for bicycles. 248,638, 7-25-78, Cl. D12-182.000.
- Brown, Rex K. Manually operable ball tossing game apparatus. 248,685, 7-25-78, Cl. D34-15.0PP.
- Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R. Nephelometer. 248,662, 7-25-78, Cl. D24-8.000.
- Buffington, Herman L. Wine cask. 248,658, 7-25-78, Cl. D15-114.000.
- Burroughs Corporation: *See—*
  - Clayton, Richard G.; and Schade, Robert C., 248,648, Cl. D14-40.000.
- Camilo Muebles, Inc.: *See—*
  - Lopez, Jose A., 248,600, Cl. D6-31.000.
- Cavalucci, Ralph, to Allen-Stevens Corp. Sash lock. 248,617, 7-25-78, Cl. D8-337.000.
- Cepasy AG: *See—*
  - Lander, Lars, 248,604, Cl. D6-97.000.
- Cibie, Pierre, to Cibie Projecteurs. Headlight. 248,691, 7-25-78, Cl. D48-32.00R.
- Cibie Projecteurs: *See—*
  - Cibie, Pierre, 248,691, Cl. D48-32.00R.
- Clayton, Richard G.; and Schade, Robert C., to Burroughs Corporation. Modular document processing encoder. 248,648, 7-25-78, Cl. D14-40.000.
- Coker, George M., Jr.: *See—*
  - Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.
- Combi Co., Ltd.: *See—*
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,683, Cl. D34-15.0AM.
  - Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 248,684, Cl. D34-15.00C.
- COMUS S.p.A.: *See—*
  - Bontempi, Marisa, 248,694, Cl. D56-2.000.
- Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, to Pittway Corporation. Housing for fire and smoke detector. 248,629, 7-25-78, Cl. D10-121.000.
- Consolidated Devices, Inc.: *See—*
  - Grabovac, Bosko, 248,615, Cl. D8-82.000.

- Cornelius Company, The: *See—*
  - Kovar, Henry Charles, 248,692, Cl. D52-3.00R.
- Dalton, Elliot Everett: *See—*
  - Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, 248,632, Cl. D11-131.000.
- Darda, Helmut. Toy auto. 248,682, 7-25-78, Cl. D34-15.0AJ.
- Dingwall, John Lindsay, to Moulded Components and Roto Moulding South Africa (Proprietary) Limited. Compost container. 248,611, 7-25-78, Cl. D7-194.000.
- Dobias, John J. Wrench. 248,614, 7-25-78, Cl. D8-23.000.
- Dogliotti, Amilcare, to P. Ferrero and C.-S.p.A. Package of candy or the like. 248,620, 7-25-78, Cl. D9-182.000.
- Dominion Auto Accessories Limited: *See—*
  - Nagel, Robert I., 248,690, Cl. D48-32.00A.
- Eichacker, Harold F.; and Eichacker, Richard F. Outdoor receptacle for receiving utility bills and the like. 248,676, 7-25-78, Cl. D31-24.000.
- Eichacker, Richard F.: *See—*
  - Eichacker, Harold F.; and Eichacker, Richard F., 248,676, Cl. D31-24.000.
- Emerson Electric Co.: *See—*
  - Thweatt, Carlisle, Jr., 248,641, Cl. D13-17.000.
  - Thweatt, Carlisle, Jr., 248,642, Cl. D13-17.000.
  - Thweatt, Carlisle, Jr., 248,643, Cl. D13-17.000.
- Falcon Safety Products, Inc.: *See—*
  - Grossman, Morris Gary; and Levy, Edward D., 248,660, Cl. D16-33.000.
- Fischer, Kenneth F., to Acme Metal Goods Mfg. Co. Potato peeler handle. 248,609, 7-25-78, Cl. D7-152.000.
- Fujita, Eiji: *See—*
  - Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, 248,695, Cl. D64-11.00B.
- Gane, Gordon R., to Kaiser Aluminum & Chemical Corporation. End closure for a container. 248,622, 7-25-78, Cl. D9-253.000.
- Gane, Gordon R., to Kaiser Aluminum & Chemical Corporation. End closure for a container. 248,623, 7-25-73, Cl. D9-253.000.
- Gaudiche, Xavier C. M., to Reboul-Sofra S.A. Powder-box. 248,675, 7-25-78, Cl. D28-78.000.
- Gillespie, Richard Lee; Melin, Arthur Kelso; and Dalton, Elliot Everett, to Wham-O Mfg. Co. Visual display apparatus. 248,632, 7-25-78, Cl. D11-131.000.
- Goodwin, Max E.: *See—*
  - Pierce, James E.; and Goodwin, Max E., 248,601, Cl. D6-47.000.
- Grabovac, Bosko, to Consolidated Devices, Inc. Drive tool. 248,615, 7-25-78, Cl. D8-82.000.
- Graham, Roger. Smoking device. 248,671, 7-25-78, Cl. D27-03.000.
- Graham, Roger. Mouthpiece for a smoking device. 248,672, 7-25-78, Cl. D27-05.000.
- Grammer, Keith R.: *See—*
  - Pace, Thomas; and Grammer, Keith R., 248,613, Cl. D8-17.000.
- Greenberg, Sheldon. Inflatable educational toy. 248,686, 7-25-78, Cl. D34-15.0DD.
- Grossman, Morris Gary; and Levy, Edward D., to Falcon Safety Products, Inc. Photographic print drying apparatus. 248,660, 7-25-78, Cl. D16-33.000.
- Grube, Clifford E., to Associated Mills, Inc. Back massager attachment. 248,666, 7-25-78, Cl. D24-36.000.
- Hanig, Harvey: *See—*
  - Conforti, Frederick J.; Robertson, Roy C. A.; and Hanig, Harvey, 248,629, Cl. D10-121.000.
- Hannon, Thomas. Face shield. 248,674, 7-25-78, Cl. D28-9.000.
- Harada, Toshio: *See—*
  - Mori, Daisaku; Yamamura, Masamichi; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,606, Cl. D7-128.000.
  - Yamamura, Masamichi; Mori, Daisaku; Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 248,607, Cl. D7-128.000.
- Harvey, James Neal. Game board. 248,681, 7-25-78, Cl. D34-5.0SS.
- Hauser, Stephen G.: *See—*
  - Bruni, James G.; Coker, George M., Jr.; Hauser, Stephen G.; Keith, Keith S.; Priarone, Paul; and Rodriguez, Rodolfo R., 248,662, Cl. D24-8.000.
- Hay, David Stewart; and Bennett, Alfred Weston, to Postmaster General of Canada. Covered container for mail or the like. 248,621, 7-25-78, Cl. D9-219.000.
- Hickey, Larry G.: *See—*
  - James, Norman J.; and Hickey, Larry G., 248,639, Cl. D12-196.000.
- Hirasa, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Radio communication transmitter. 248,653, 7-25-78, Cl. D14-95.000.
- Homsy, Charles Albert; and Kent, John N. Temporomandibular joint prosthesis. 248,665, 7-25-78, Cl. D24-33.000.
- Housman, Richard W. Vending machine. 248,693, 7-25-78, Cl. D52-3.00R.
- Hsieh, Chin-Hou, to Valisum Industries Ltd. Rub for bicycle. 248,640, 7-25-78, Cl. D12-207.000.
- Humlong, Robert F.: *See—*
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- Indiana Mills & Manufacturing, Inc.: *See—*
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- J. I. Case Company: *See—*
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- James, Norman J.; and Hickey, Larry G., to Rohr Industries, Inc. Front panel unit for a bus. 248,639, 7-25-78, Cl. D12-196.000.
- Janys Designs Limited: *See—*
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  - Gane, Gordon R., 248,622, Cl. D9-253.000.
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- Kovar, Henry Charles, to Cornelius Company, The. Coin acceptor or similar article. 248,692, 7-25-78, Cl. D52-3.00R.
- Kurosu, Teisuke; Fujita, Eiji; Matsushima, Hisatoshi; and Yonekura, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Electronic calculator. 248,695, 7-25-78, Cl. D64-11.00B.
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- Lander, Lars, to Cepasy AG. Paper roll holder for toilet paper or similar article. 248,604, 7-25-78, Cl. D6-97.000.
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Neyman, Hubert King. Combined safety harness and light. 248,596, 7-25-78, Cl. D2-27.000.

Nussdorfer, Dale A., to Altec Corporation. Loudspeaker. 248,647, 7-25-78, Cl. D14-30.000.

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Takahashi, Nagashige. Endoscope. 248,664, 7-25-78, Cl. D24-18.000.

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Thweatt, Carlisle, Jr., to Emerson Electric Co. Insulator for an open coil electric heating unit. 248,642, 7-25-78, Cl. D13-17.000.

Thweatt, Carlisle, Jr., to Emerson Electric Co. Insulator for an open coil electric heating unit. 248,643, 7-25-78, Cl. D13-17.000.

Tougas, David; Adler, Peter; and Liszt, Mark, to Lucid Lines, Inc. Picture frame. 248,605, 7-25-78, Cl. D6-232.000.

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Yamamura, Masamichi: *See—*
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Yonekura, Hiroshi: *See—*
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Zivica, Robert F., to Pro Sports Marketing, Inc. Radio cabinet. 248,651, 7-25-78, Cl. D14-69.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 25, 1978

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CLASS 71	
3	4,102,667
90	4,102,668
94	4,102,669
98	4,102,670
	4,102,671
106	4,102,672
120	4,102,673
CLASS 72	
54	4,102,167
117	4,102,168
128	4,102,169
147	4,102,170
245	4,102,171
254	4,102,172
306	4,102,173
421	4,102,174
CLASS 73	
4 R	4,102,175
12	4,102,176
32 R	4,102,177
49.7	4,102,178
61.1 C	4,102,179
91	4,102,180
119 A	4,102,181
136 R	4,102,182
144	4,102,183
146.2	4,102,184
155	4,102,185
170 R	4,102,188
194 A	4,102,186
209	4,102,187
230	4,102,189
302	4,102,190
313	4,102,191
339 R	4,102,192
	4,102,193
340	4,102,194
	4,102,195
341	4,102,196
354	4,102,197
362 AR	4,102,198
	4,102,199
371	4,102,200
421.5 R	4,102,201
517 B	4,102,202
620	4,102,203
626	4,102,204
	4,102,205
643	4,102,207
644	4,102,206
647	4,102,208
702	4,102,209
727	4,102,210
CLASS 74	
66	4,102,211
89.22	4,102,212
110	4,102,213
230.17 E	4,102,214
243 DR	4,102,215
245 R	4,102,216
492	4,102,217
493	4,102,218
502	4,102,219
572	4,102,220
	4,102,221
866	4,102,222
CLASS 75	
3	4,102,674
24	4,102,675
77	4,102,676
124	4,102,225
128 A	4,102,677
226	4,102,679
257	4,102,680
CLASS 76	
25 A	4,102,223
79	4,102,224
CLASS 81	
3.33	4,102,226
CLASS 83	
7	4,102,227
156	4,102,228
712	4,102,229
835	4,102,230
854	4,102,231
	4,102,232
CLASS 84	
258	4,102,233
322	4,102,234
411 R	4,102,235
	4,102,236
421	4,102,237
CLASS 85	
10 E	4,102,238
50 R	4,102,239
CLASS 86	
20 C	4,102,240
CLASS 89	
155	4,102,241
191 R	4,102,242
193	4,102,243
CLASS 90	
1	4,102,244
12 R	4,102,245
13.2	4,102,246
62 R	4,102,247
CLASS 91	
42	4,102,248
186	4,102,249
412	4,102,250
CLASS 93	
36.3	4,102,252
63 M	4,102,251
93 C	4,102,253
CLASS 96	
1.4	4,102,681
1.5 R	4,102,682
38.4	4,102,683
61 M	4,102,684
73	4,102,685
91 R	4,102,686
114.1	4,102,312
115 R	4,102,687
139	4,102,688
CLASS 98	
115 R	4,102,254
CLASS 99	
303	4,102,255
372	4,102,236
494	4,102,257
532	4,102,258
CLASS 100	
3	4,102,259
24	4,102,260
	4,102,261
53	4,102,262
74	4,102,263
CLASS 101	
77	4,102,264
93.03	4,102,265
124	4,102,266
132.5	4,102,267
399	4,102,268
CLASS 102	
38 LP	4,102,269
49.5	4,102,270
52	4,102,271
CLASS 104	
23 FS	4,102,272
34	4,102,273
CLASS 105	
367	4,102,274
CLASS 106	
1.23	4,102,702
38.28	4,102,690
38.35	4,102,691
38.9	4,102,689
50	4,102,692
54	4,102,693
56	4,102,694
64	4,102,695
65	4,102,698
73.2	4,102,696
84	4,102,699
100	4,102,700
111	4,102,697
	4,102,701
287.14	4,102,703
288 Q	4,102,704
CLASS 108	
92	4,102,275
156	4,102,276
CLASS 110	
105	4,102,278
234	4,102,279
342	4,102,277
CLASS 112	
121.26	4,102,280
	4,102,281
	4,102,282
121.29	4,102,284
131	4,102,283
CLASS 113	
54 R	4,102,285
119	4,102,286
CLASS 114	
39	4,102,287
41	4,102,288
104	4,102,289
222	4,102,290
244	4,102,291
CLASS 115	
1 R	4,102,292
28 R	4,102,293
CLASS 116	
103	4,102,294
114 R	4,102,295
124 B	4,102,296
142 FP	4,102,297
CLASS 118	
5	4,102,298
50	4,102,299
67	4,102,300
	4,102,301
239	4,102,302
326	4,102,303
421	4,102,304
631	4,102,305
658	4,102,306
CLASS 119	
16	4,102,307
52 R	4,102,308
CLASS 122	
136 R	4,102,309
CLASS 123	
117 R	4,102,310
	4,102,311
119 B	4,102,314
119 EC	4,102,313
124 B	4,102,315
198 DB	4,102,316

CLASS 126	
25 B	4,102,317
103	4,102,318
121	4,102,319
	4,102,320
140	4,102,321
198	4,102,322
261	4,102,323
270	4,102,324
	4,102,325
	4,102,326
271	4,102,327
	4,102,328
	4,102,329
374	4,102,330
CLASS 127	
37	4,102,705
CLASS 128	
2.1 A	4,102,332
2.1 E	4,102,331
6	4,102,333
36	4,102,334
68.1	4,102,335
75	4,102,336
80 E	4,102,337
90	4,102,338
92 E	4,102,339
287	4,102,340
303.14	4,102,341
323	4,102,342
327	4,102,343
419 E	4,102,344
419 PS	4,102,346
419 PT	4,102,345
421	4,102,347
422	4,102,348
CLASS 131	
135	4,102,349
CLASS 134	
3	4,102,706
22 R	4,102,707
129	4,102,351
130	4,102,350
CLASS 135	
1 R	4,102,352
5 R	4,102,353
CLASS 136	
233	4,102,708
CLASS 137	
98	4,102,354
596.15	4,102,355
614.06	4,102,356
625.32	4,102,357
CLASS 138	
35	4,102,358
42	4,102,359
127	4,102,360
CLASS 139	
435	4,102,361
	4,102,362
449	4,102,363
CLASS 141	
4	4,102,364
39	4,102,365
150	4,102,366
231	4,102,367
250	4,102,368
CLASS 144	
114 R	4,102,369
134 D	4,102,370
162 R	4,102,371
178	4,102,372
193 A	4,102,373
314 B	4,102,374
CLASS 145	
73	4,102,375
CLASS 148	
2	4,102,709
6.15 R	4,102,710
12.3	4,102,711
113	4,102,713
187	4,102,714
188	4,102,715
CLASS 150	
2	4,102,376
52 M	4,102,377
CLASS 152	
243	4,102,378
405	4,102,379
CLASS 156	
48	4,102,716
64	4,102,717
71	4,102,718
78	4,102,719
	4,102,720
79	4,102,721
99	4,102,722
120	4,102,723
149	4,102,724
200	4,102,725
244.11	4,102,726
251	4,102,727
362	4,102,728
384	4,102,729
499	4,102,730
540	4,102,731
645	4,102,732
655	4,102,733
659	4,102,734
661	4,102,735
CLASS 157	
1.26	4,102,380
CLASS 160	
168 R	4,102,381
188	4,102,382
263	4,102,383
	4,102,384
	4,102,385
CLASS 162	
104	4,102,736
113	4,102,737
117	4,102,738
CLASS 164	
239	4,102,386
CLASS 165	
1	4,102,387
	4,102,388
29	4,102,389
	4,102,390
	4,102,391
62	4,102,392
95	4,102,393
CLASS 166	
65 R	4,102,394
231	4,102,395
252	4,102,396
259	4,102,397
276	4,102,398
	4,102,399
283	4,102,400
284	4,102,401
CLASS 172	
40	4,102,402
	4,102,403
310	4,102,404
378	4,102,405
540	4,102,406
611	4,102,407
CLASS 173	
2	4,102,408
30	4,102,409
133	4,102,410
137	4,102,534
164	4,102,411
CLASS 174	
65 R	4,103,101
68.5	4,103,102
70 S	4,103,104
140 C	4,103,103
CLASS 175	
5	4,102,412
53	4,102,413
85	4,102,414
96	4,102,415
227	4,102,416
253	4,102,417
324	4,102,418
371	4,102,419
CLASS 176	
38	4,102,739
84	4,102,740
87	4,102,741
CLASS 177	
25	4,102,420
185	4,102,421
210 C	4,102,422
CLASS 179	
1 VC	4,103,105
2 EB	4,103,106
2 EC	4,103,107
15 A	4,103,109
	4,103,111
15 BF	4,103,108
15 FD	4,103,110
18 FA	4,103,112
27 CA	4,103,113
84 R	4,103,114
90 B	4,103,115
100.41 M	4,103,116
100.41 Z	4,103,117
170 D	4,103,118
CLASS 180	
7 R	4,102,423
24.02	4,102,424
66 F	4,102,425
98	4,102,426
156	4,102,427
CLASS 181	
116	4,102,428
117	4,102,429
265	4,102,430
CLASS 182	
5	4,102,431
92	4,102,432
164	4,102,433
181	4,102,434
CLASS 187	
8.5	4,102,435
29 R	4,102,436
	4,102,437
CLASS 188	
18 A	4,102,438
24	4,102,439
72.1	4,102,444
72.7	4,102,440
77 W	4,102,441
206 A	4,102,442
218 XL	4,102,443
CLASS 191	
12.2 R	4,102,445
CLASS 192	
91 A	4,102,446
110 B	4,102,447
CLASS 195	
7	4,102,743
28 R	4,102,744
31 R	4,102,745
63	4,102,746
103.5 C	4,102,747
103.5 R	4,102,742
127	4,102,748
CLASS 198	
363	4,102,448
774	4,102,449
	4,102,450
CLASS 200	
33 R	4,103,119
48 A	4,103,121
48 P	4,103,122
48 R	4,103,120
	4,103,123
51 R	4,103,124
	4,103,125
67 C	4,103,126
67 G	4,103,127
144 AP	4,103,128
144 R	4,103,129
148 A	4,103,130
	4,103,131
153 LB	4,103,132
153 N	4,103,133
158	4,103,134
183	4,103,135
302	4,103,136
CLASS 201	
2.5	4,102,749
6	4,102,750
CLASS 202	
151	4,102,751
180	4,102,752
CLASS 203	
64	4,102,753
CLASS 204	
43 T	4,102,755
	4,102,756
73 R	4,102,757
94	4,102,758
	4,102,759
139.18	4,102,760
139.20	4,102,761
139.22	4,102,762
162 R	4,102,763
164	4,102,764
	4,102,765
	4,102,766
	4,102,767
192 P	4,102,768
195 C	4,102,769
195 R	4,102,770
206	4,102,772
275	4,102,754
299 EC	4,102,771
CLASS 206	
219	4,102,451
387	4,102,452
507	4,102,453
514	4,102,454
569	4,102,455
575	4,102,456
611	4,102,457
CLASS 208	
8	4,102,773
	4,102,774
10	4,102,775
64	4,102,776
121	4,102,777
143	4,102,778
211	4,102,779
CLASS 209	
39	4,102,780
86	Re.29,709
166	4,102,781
CLASS 210	
31 C	4,102,782
36	4,102,783
47	4,102,784
63	4,102,785
80	4,102,786
104	4,102,787
230	4,102,788
252 AS	4,102,789
293	4,102,790
326	4,102,791
437	4,102,792
CLASS 211	
4	4,102,458
CLASS 213	
112	4,102,459
CLASS 214	
6 C	4,102,460
132	4,102,461
301	4,102,462
671	4,102,463
750	4,102,464
CLASS 219	
69 W	4,103,137
76.11	4,103,138
101	4,103,139
125.11	4,103,140
130.01	4,103,141
136	4,103,142
145.21	4,103,143
209	4,103,144
222	4,103,145
368	4,103,146
524	4,103,147
CLASS 220	
3	4,102,465
3.8	4,102,466
22.3	4,102,470
67	4,102,467
69	4,102,468
89 A	4,102,469
242	4,102,471
295	4,102,472
319	4,102,473
323	4,102,474
366	4,102,475
CLASS 222	
193	Re.29,707
209	4,102,476
438	4,102,477
465	Re.29,708
CLASS 223	
99	4,102,478
101	4,102,479
	4,102,480
CLASS 228	
6 R	4,102,481
170	4,102,482
244	4,102,483
CLASS 229	
16 A	4,102,484
23 R	4,102,485
37 R	4,102,486
54 R	4,102,487
55	4,102,488
73	4,102,489
CLASS 233	
26	4,102,490
CLASS 235	
92 PC	4,103,148
92 TE	4,103,149
302	4,102,491
375	4,102,492
419	4,102,493
	4,103,150
CLASS 236	
1 B	4,102,494
46 R	4,102,495
48 R	4,102,496
CLASS 238	
14.8	4,102,497
CLASS 239	
265.19	4,102,498
265.27	4,102,499
345	4,102,500
511	4,102,501
CLASS 241	
4	4,102,502
18	4,102,503
166 R	4,102,504
297	4,102,505
CLASS 242	
18 DD	4,102,506
18 PW	4,102,507
	4,102,508
47.04	4,102,509
55.2	4,102,510
64	4,102,511
66	4,102,512
75.4	4,102,513
199	4,102,514
	4,102,515
	4,102,516
201	4,102,517
CLASS 244	
3.11	4,102,521
110 C	4,102,518
125	4,102,519
137 R	4,102,520
CLASS 248	
24	4,102,522
49	4,102,523
56	4,102,524
174	4,102,525
CLASS 250	
203 R	4,103,151
204	4,103,152
227	4,103,153
	4,103,154
231 SE	4,103,155
236	4,103,156
239	4,103,157
269	4,103,158
315 R	4,103,159
334	4,103,160
336	4,103,161
343	4,103,162
344	4,103,163
374	4,103,164
390	4,103,165
391	4,103,166
432 R	4,103,167
442	4,103,168
445 T	4,103,169
451	4,103,170
458	4,103,171
462	4,103,172
483	4,103,173
493	4,103,174
504	4,103,175
516	4,103,176
562	4,103,177
CLASS 251	
139	4,102,526
CLASS 252	
8.1	4,102,793
	4,102,794
8.9	4,102,795
47.5	4,102,796
51.5 A	4,102,797
	4,102,798
99	4,102,799
182	4,102,800
	4,102,801
184	4,102,802
188	4,102,803
189	4,102,804
301.4 F	4,102,805
316	4,102,806
	4,102,807
354	4,102,808
408	4,102,809
	4,102,814
408 R	4,102,810
411 R	4,102,811
421	4,102,812
426	4,102,815
428	4,102,816
429 B	4,102,817
430	4,102,813
439	4,102,818
460	4,102,819
463	4,102,820
	4,102,821
465	4,102,822
535	4,102,823
545	4,102,824
547	4,102,825
548	4,102,826
CLASS 254	
131	4,102,527
139.1	4,102,528
CLASS 256	
70	4,102,529
CLASS 260	
4 AR	4,102,834
5	4,102,835
22 CB	4,102,837
	4,102,838
22 TN	4,102,836
23 XA	4,102,839
29.2 TN	Re.29,711
29.4 R	4,102,840
29.6 N	4,102,841
29.6 PT	4,102,842
29.6 RW	4,102,843
29.7 NR	4,102,845
29.7 T	4,102,844
31.2 N	4,102,846
31.4 R	4,102,847
31.6	4,102,848
33.6 AQ	4,102,849
	4,102,850
37 EP	4,102,851
37 SB	4,102,852
40 R	4,102,853
42.18	4,102,854
42.33	4,102,855
42.53	4,102,856
45.8 A	4,102,859
45.8 N	4,102,857
	4,102,858
45.95 E	4,102,861
112.5 R	4,102,877
	4,102,878
149	4,102,879
156	4,102,880
175	4,103,092
239 BD	4,102,881
239.1	4,102,882
239.55 R	4,102,883
239.57	4,102,884
287 CF	4,102,886
290 HL	4,102,887
294.8 D	4,102,888
296 R	4,102,889
307 F	4,102,890
308 R	4,102,891
314.5	4,102,892
326.14 R	4,102,893
332.3 R	4,102,894
340.6	4,102,895
343	4,102,897
	4,102,898
343.6	4,102,896
	4,102,899
	4,102,900
345.3	4,102,902
345.7 R	4,102,903
	4,102,904
345.8 R	4,102,901
346.3	4,102,905
382	4,102,906
397.3	4,102,907
397.4	4,102,908
404	4,102,909
453 RW	4,102,910
458 R	4,102,911
463	4,102,912
465.1	4,102,913
465.3	4,102,914
465.8 D	4,102,915
501.12	4,102,916
506	4,102,917
507 R	4,102,918
520 E	4,102,919
532	4,102,920
	4,102,921
	4,102,922
553 R	4,102,923
562 P	4,102,924
570.6	4,102,925
576	4,102,926
581	4,102,927
586 C	4,102,928
590 FA	4,102,929
593 R	4,102,930
609 B	4,102,931
609 R	4,102,932
613 D	4,102,933
613 R	4,102,934
656 R	4,102,935
	4,102,936

666 P	4,102,937
676 R	4,102,938
683 D	4,102,939
823	4,102,827
824 R	4,102,940
825	4,102,941
836	4,102,942
850	4,102,943
858	4,102,868
861	4,102,944
878 R	4,102,946
879	4,102,945
	4,102,947
944	4,102,948
985	4,102,949
CLASS 261	
44 A	4,102,952
CLASS 264	
3 B	4,102,953
24	4,102,954
25	4,102,955
32	4,102,956
39	4,102,957
40.6	4,102,958
41	4,102,959
42	4,102,960
57	4,102,961
82	4,102,962
91	4,102,963
97	4,102,964
103	4,102,965
112	4,102,966
113	4,102,967
117	4,102,968
147	4,102,969
176 R	4,102,970
255	4,102,971
256	4,102,972
272	4,102,973
294	4,102,974
322	4,102,975
CLASS 266	
46	4,102,530
CLASS 270	
79	4,102,531
CLASS 273	
1 E	4,102,532
73 E	4,102,533
282	4,102,535
CLASS 274	
23 R	4,102,536
CLASS 277	
153	4,102,538
CLASS 279	
114	4,102,539
CLASS 280	
5 H	4,102,540
11.1 BT	4,102,541
207	4,102,542
CLASS 283	
49	4,102,543
CLASS 285	
8	4,102,544
CLASS 290	
40 R	4,103,178
CLASS 292	
37	4,102,545
346	4,102,546
CLASS 294	
1 R	4,102,547
CLASS 296	
1 S	4,102,548
102	4,102,537
CLASS 297	
383	4,102,549
CLASS 299	
11	4,102,550
CLASS 301	
37 P	Re.29,710
CLASS 303	
24 A	4,102,551
CLASS 307	
88.3	4,103,179
141	4,103,180
203	4,103,182
214	4,103,183
225 C	4,103,184
238	4,103,185
231	4,103,186
	4,103,187
	4,103,188
270	4,103,189
362	4,103,190
CLASS 308	
4 A	4,102,552
6 C	4,102,553
CLASS 310	
49 R	4,103,191
64	4,103,192
68 D	4,103,193
	4,103,194
259	4,103,195
266	4,103,196
267	4,103,197
CLASS 312	
107	4,102,554
240	4,102,555
250	4,102,556
257 R	4,102,557
CLASS 313	
60	4,103,198
101	4,103,199
221	4,103,200
318	4,103,201
336	4,103,202
390	4,103,203
422	4,103,204
	4,103,205
513	4,103,206
CLASS 315	
3.5	4,103,207
51	4,103,208
207	4,103,209
CLASS 318	
46	4,103,210
87	4,103,211
224 A	4,103,212
	4,103,213
326	4,103,214
654	4,103,215
685	4,103,216
CLASS 322	
28	4,103,217
CLASS 323	
1	4,103,218
8	4,103,219
19	4,103,220
92	4,103,221
CLASS 324	
37 R	4,103,223
38.5 C	4,103,224
60 CD	4,103,225
61 R	4,103,226
65 R	4,103,227
	4,103,228
71 CP	4,103,229
77 H	4,103,230
123 R	4,103,231
158 F	4,103,232
207	4,103,222
208	4,103,233
CLASS 325	
38 A	4,103,234
64	4,103,235
132	4,103,236
	4,103,237
141	4,103,238
144	4,103,239
349	4,103,240
373	4,103,241
CLASS 328	
35	4,103,242
169	4,103,243
CLASS 329	
122	4,103,244
CLASS 330	
265	4,103,245
278	4,103,246
284	4,103,247
288	4,103,248
	4,103,249
CLASS 331	
1 A	4,103,250
	4,103,251
48	4,103,252
94.5 C	4,103,255
94.5 G	4,103,253
94.5 L	4,103,256
	4,103,257
94.5 S	4,103,254
111	4,103,258
117 D	4,103,259
CLASS 332	
7.51	4,103,260
	4,103,261
CLASS 333	
6	4,103,262
30 R	4,103,263
72	4,103,264
CLASS 335	
205	4,103,265
289	4,103,266
CLASS 336	
65	4,103,267
208	4,103,268
CLASS 337	
67	4,103,269
178	4,103,270
372	4,103,271
411	4,103,272
CLASS 338	
2	4,103,273
21	4,103,274
25	4,103,275
214	4,103,276
237	4,103,277
CLASS 339	
144 R	4,102,558
CLASS 340	
1 R	4,103,278
3 D	4,103,279
12 R	4,103,280
18 LD	4,103,281
58	4,103,282
	4,103,283
61	4,103,284
65	4,103,285
146.2	4,103,286
146.3 H	4,103,287
152 R	4,103,288
164 R	4,103,289
168 B	4,103,290
309.1	4,103,296
324 M	4,103,297
331	4,103,298
506	4,103,299
514	4,103,293
522	4,103,291
566	4,103,294
572	4,103,295
603	4,103,292
CLASS 343	
6 R	4,103,300
7.7	4,103,301
9	4,103,302
100 SA	4,103,303
113 R	4,103,304
715	4,103,305
CLASS 346	
153	4,103,306
CLASS 350	
96.18	4,102,559
96.19	4,102,560
96.21	4,102,561
105	4,102,562
CLASS 351	
7	4,102,563
	4,102,564
14	4,102,565
131	4,102,566
160	4,102,567
CLASS 353	
28	4,102,568
120	4,102,569
CLASS 354	
23 D	4,103,307
	4,103,308
25	4,103,309
120	4,103,310
152	4,103,311
CLASS 355	
16	4,102,570
CLASS 356	
1	4,102,571
5	4,102,572
86	4,102,573
101	4,102,576
117	4,102,574
120	4,102,578
125	4,102,575
169	4,102,577
201	4,102,579
210	4,102,580
225	4,102,581
241	4,102,582
CLASS 357	
16	4,103,312
CLASS 360	
70	4,103,313
78	4,103,314
110	4,103,315
CLASS 361	
3	4,103,316
31	4,103,317
86	4,103,181
106	4,103,319
215	4,103,320
388	4,103,318
	4,103,321
CLASS 362	
71	4,102,712
101	4,103,322
306	4,103,323
CLASS 363	
22	4,103,356
89	4,103,324
148	4,103,325
CLASS 364	
200	4,103,326
	4,103,327
	4,103,328
	4,103,329
	4,103,330
	4,103,331
449	4,103,332
824	4,103,333
900	4,103,334
	4,103,335
	4,103,336
	4,103,337
	4,103,338
CLASS 365	
1	4,103,339
97	4,103,340
117	4,103,341
149	4,103,342
183	4,103,343
184	4,103,344
190	4,103,345
216	4,103,346
219	4,103,347
228	4,103,348
231	4,103,349
CLASS 366	
22	4,103,350
30	4,103,351
39	4,103,352
81	4,103,353
88	4,103,354
90	4,103,355
152	4,103,357
153	4,103,358
CLASS 401	
259	4,102,584
CLASS 403	
138	4,102,585
188	4,102,586
205	4,102,587
245	4,102,588
373	4,102,589
CLASS 404	
110	4,102,590
CLASS 407	
25	4,102,583
100	4,102,591
CLASS 408	
46	4,102,592
130	4,102,593
166	4,102,594
CLASS 415	
1	4,102,595
101	4,102,596
	4,102,597
135	4,102,598
212 R	4,103,063
219 R	4,102,599
CLASS 416	
91	4,102,600
183	4,102,601
221	4,102,602
244 A	4,102,603
CLASS 417	
19	4,102,604
98	4,102,605
204	4,102,606
222	4,102,607
242	4,102,608
399	4,102,609
417	4,102,610
469	4,102,611
477	4,102,612
516	4,102,613
CLASS 418	
59	4,102,614
86	4,102,615
91	4,102,616
142	4,102,617
CLASS 423	
87	4,102,976
118	4,102,977
239	4,102,980
240	4,102,981
242	4,102,982
245	4,102,983
301	4,102,984
350	4,102,985
402	4,102,986
466	4,102,987
483	4,102,988
541 R	4,102,989
579	4,102,950
594	4,102,951
626	4,102,978
CLASS 424	
1	4,102,979
12	4,102,990
27	4,102,991
49	4,102,992
54	4,102,993
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81	4,102,995
89	4,102,996
115	4,102,997
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269	4,103,015
270	4,103,016
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272	4,103,018
274	4,103,019
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279	4,103,023
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309	4,103,027
315	4,103,028
318	4,103,029
330	4,103,030
337	4,103,031
341	4,103,032
343	4,103,033
CLASS 425	
64	4,102,618
89	4,102,619
147	4,102,620
224	4,102,621
268	4,102,622
393	4,102,623
429	4,102,624
464	4,102,625
526	4,102,626
CLASS 426	
250	4,103,034
321	4,103,035
538	4,103,036
575	4,103,037
601	4,103,038
607	4,103,039
614	4,103,040
CLASS 427	
2	4,103,041
38	4,103,042
49	4,103,043
56	4,103,044
82	4,103,045
113	4,103,046
178	4,102,869
191	4,102,678
242	4,103,047
248 R	4,103,048
341	4,103,049
379	4,103,050
394	4,103,051
CLASS 428	
38	4,103,052
40	4,103,053
91	4,103,054
113	4,103,055
142	4,103,056
155	4,103,002
156	4,103,057
171	4,103,058
178	4,103,059
241	4,103,060
247	4,103,061
283	4,103,062
333	4,103,064
336	4,103,065
337	4,103,066
387	4,103,067
395	4,103,068
403	4,103,069
412	4,103,070
421	4,103,071
425	4,103,072
474	4,103,073
614	4,103,075
653	4,103,076
CLASS 431	
16	4,102,627
20	4,102,629
29	4,102,630
43	4,102,628
152	4,102,633
253	4,102,631
298	4,102,634
CLASS 432	
3	4,102,632
14	4,102,635
30	4,102,636
227	4,102,637
229	4,102,638
CLASS 521	
81	4,102,829
99	4,102,831
103	4,102,832
159	4,102,833
165	4,102,830
174	4,102,828
CLASS 526	
19	4,102,876
31	4,103,077
115	4,103,078
185	4,103,079
303	4,103,080
323.1	4,103,081
CLASS 528	
18	4,102,860
73	4,102,870
88	4,102,862
111	4,102,863
135	4,102,866
173	4,102,864
215	4,102,865
289	4,102,867
324	4,102,871
331	4,102,873
362	4,102,872
387	4,102,874
388	4,102,875
487	4,103,074
CLASS 536	
17	4,103,082
CLASS 542	
427	4,103,083
CLASS 544	
22	4,103,084
27	4,103,085
47	4,103,086
78	4,103,087
190	4,103,088
283	4,102,885
CLASS 548	
344	4,103,089
CLASS 560	
3	4,103,090
106	4,103,091
205	4,103,093
231	4,103,094
232	4,103,095
CLASS 568	
783	4,103,096
807	4,103,097
838	4,103,098

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D2—	27	248,596		17	248,613		121	248,629		30	248,647		18	248,664		5 SS	248,680
	272	248,597		23	248,614	D11—	94	248,631		40	248,648		33	248,665			248,681
D3—	19 E	248,598		82	248,615		131	248,632		53	248,649		36	248,666		15 AD	248,687
D6—	8	248,599		303	248,616		155	248,633		66	248,650		38	248,667			248,688
	31	248,600		313	248,624	D12—	111	248,634		69	248,651		41	248,668		15 AJ	248,682
	47	248,601		337	248,617		125	248,635		70	248,652		99	248,669		15 AM	248,683
	63	248,602		339	248,625		155	248,636		95	248,653	D25—	72	248,670		15 C	248,684
	68	248,603		395	248,618			248,637	D15—	12	248,654	D27—	7	248,673		15 DD	248,686
	97	248,604	D9—	149	248,619		182	248,638		15	248,655		03	248,671		15 PP	248,685
	232	248,605		182	248,620		196	248,639		52	248,656		05	248,672	D48—	2	248,689
D7—	128	248,606		219	248,621		207	248,640			248,657	D28—	9	248,674		32 A	248,690
		248,607		233	248,622	D13—	17	248,641		114	248,658		78	248,675		32 R	248,691
	137	248,608			248,623			248,642		139	248,659	D31—	24	248,676	D52—	3 R	248,692
	152	248,609	D10—	2	248,626			248,643	D16—	33	248,660			248,677			248,693
	187	248,610		46	248,627		18	248,644	D19—	36	248,661	D34—	2 A	248,678	D56—	2	248,694
	194	248,611		75	248,628			248,645	D24—	8	248,662		5 CT	248,679	D64—	11 B	248,695
D8—	13	248,612		112	248,630	D14—	17	248,646		10	248,663						

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(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Arkansas	5	Massachusetts	25	South Carolina	45
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Colorado	8	Mississippi	28	Texas	48
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	:	4,102,988			4,102,189			4,103,033			4,102,734			4,102,096			4,102,154
4	:	4,102,039			4,102,481			4,103,066			4,102,738			4,102,108			4,102,214
		4,102,346			4,103,267			4,103,109			4,102,770			4,102,129			4,102,442
		4,103,325	06	:	4,101,986			4,103,111			4,102,790			4,102,150			4,102,451
6	:	4,101,981			4,101,995			4,103,115			4,102,894			4,102,164			4,102,482
		4,102,019			4,101,997			4,103,118			4,103,063			4,102,194			4,102,669
		4,102,028			4,102,002			4,103,125			4,103,081			4,102,222			4,102,680
		4,102,053			4,102,009			4,103,145			4,103,101			4,102,250			4,102,779
		4,102,071			4,102,015			4,103,147			4,103,132			4,102,251			4,102,902
		4,102,074			4,102,036			4,103,151			4,103,198			4,102,256			4,102,912
		4,102,125			4,102,067			4,103,166	10	:	4,101,989			4,102,258			4,102,934
		4,102,136			4,102,076			4,103,174			4,102,673			4,102,282			4,103,052
		4,102,176			4,102,095			4,103,207			4,102,801			4,102,316			4,103,119
		4,102,220			4,102,142			4,103,225			4,102,831			4,102,340			4,103,261
		4,102,243			4,102,159			4,103,243			4,102,955			4,102,350	19	:	4,102,041
		4,102,249			4,102,166			4,103,254			4,103,317			4,102,364			4,102,062
		4,102,268			4,102,175			4,103,257	11	:	4,102,575			4,102,367			4,102,131
		4,102,377			4,102,186			4,103,260	12	:	4,102,049			4,102,394			4,102,153
		4,102,392			4,102,247			4,103,263			4,102,077			4,102,425			4,102,540
		4,102,411			4,102,263			4,103,291			4,102,086			4,102,464			4,102,544
		4,102,440			4,102,287			4,103,297			4,102,107			4,102,473			4,102,604
		4,102,467			4,102,290			4,103,301			4,102,156			4,102,475			4,102,989
		4,102,470			4,102,296			4,103,303			4,102,160			4,102,524	20	:	4,102,121
		4,102,490			4,102,330			4,103,305			4,102,211			4,102,534			4,102,260
		4,102,516			4,102,354			4,103,315			4,102,252			4,102,545			4,102,261
		4,102,525			4,102,356			4,103,318			4,102,292			4,102,554			4,102,264
		4,102,532			4,102,370			4,103,319			4,102,324			4,102,583			4,102,272
		4,102,572			4,102,375			4,103,326			4,102,359			4,102,586			4,102,307
		4,102,582			4,102,387			4,103,336			4,102,445			4,102,606			4,103,091
		4,102,607			4,102,396			4,103,338			4,102,497			4,102,646	21	:	4,102,113
		4,102,861			4,102,410			4,103,346			4,102,519			4,102,723			4,102,161
		4,102,987			4,102,465			4,103,349			4,102,810			4,102,728			4,102,162
		4,103,042			4,102,468	08	:	4,102,329			4,103,002			4,102,730			4,102,274
		4,103,144			4,102,479			4,102,397			4,103,107			4,102,747			4,102,349
		4,103,189			4,102,501			4,102,424			4,103,140			4,102,769			4,102,391
		4,103,236			4,102,558			4,102,434			4,103,202			4,102,776			4,102,556
		4,103,284			4,102,574			4,102,533			4,103,234			4,102,811			4,102,660
		4,103,293			4,102,613			4,102,655			4,103,279			4,102,821			4,103,092
		4,103,324			4,102,624			4,103,182			4,103,286			4,102,974	22	:	4,102,777
		4,103,330			4,102,638			4,103,214	13	:	4,102,030			4,103,062			4,102,818
		4,103,331			4,102,754			4,103,327			4,102,259			4,103,072			4,102,923
8	:	4,102,085			4,102,773	09	:	4,102,011			4,102,512			4,103,120	23	:	4,102,141
		4,102,513			4,102,796			4,102,029			4,103,353			4,103,121			4,102,642
		4,103,152			4,102,815			4,102,065	15	:	4,102,412			4,103,129	24	:	Re.29,711
9	:	4,102,196			4,102,822			4,102,165			4,103,004			4,103,133			4,101,994
		4,102,234			4,102,827			4,102,174	17	:	Re.29,708			4,103,134			4,102,188
		4,102,242			4,102,856			4,102,178			4,102,005			4,103,231			4,102,195
		4,102,542			4,102,950			4,102,209			4,102,013			4,103,270			4,102,207
		4,102,753			4,102,981			4,102,277			4,102,038			4,103,310			4,102,241
01	:	4,102,580			4,102,982			4,102,428			4,102,066			4,103,322			4,102,270
		4,103,268			4,102,984			4,102,439			4,102,068	18	:	4,102,060			4,102,327
02	:	4,103,176			4,103,005			4,102,569			4,102,069			4,102,114			4,102,417
04	:	4,102,117			4,103,021			4,102,657			4,102,070			4,102,124			4,102,873

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4,101,992
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